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AMDT
07/2017
Effective date
07 DEC 2017
Publication date
07 DEC 2017

wp-AMDT-2017-07

1. SIGNIFICANT INFORMATION AND CHANGES

1.1 Singapore FIR

- a. Implementation of RNAV Route L762 to enhance air traffic management between Singapore and Jakarta FIRs.

1.2 Seletar Airport

- a. Commissioning of taxiway / taxiway centreline lights and intermediate holding position lights to provide pilots with visual guidance while taxiing during night operations and periods of poor visibility.

2. THIS AMENDMENT INCORPORATES INFORMATION CONTAINED IN THE FOLLOWING WHICH ARE HEREBY SUPERSEDED:

NOTAMs:

A3155/17 dated 13/10/17
A3234/17 dated 23/10/17
A3271/17 dated 26/10/17
A3272/17 dated 26/10/17
A3273/17 dated 26/10/17
A3274/17 dated 26/10/17
A3275/17 dated 26/10/17
A3276/17 dated 26/10/17
A3277/17 dated 26/10/17
A3278/17 dated 26/10/17
A3279/17 dated 26/10/17
A3331/17 dated 31/10/17
A3400/17 dated 06/11/17
A3410/17 dated 07/11/17
A3577/17 dated 17/11/17
A3578/17 dated 17/11/17
A3579/17 dated 17/11/17
A3580/17 dated 17/11/17
A3595/17 dated 20/11/17
A3607/17 dated 21/11/17

AIP Supplements:

091/2017 dated 04/09/17
109/2017 dated 28/09/17
116/2017 dated 03/11/17

Amended Pages

GEN 0.2-1: : *replace.*
GEN 0.3-1/2: : *replace.*

GEN 0.3-3/4: : *replace.*
GEN 0.3-5: : *replace.*
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AD 2.WSAG-3: : *replace.*

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

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

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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
218/2014	Paya Lebar Airport - Luffer Cranes	AD	01 AUG 2014 / 30 DEC 2017	
219/2014	Paya Lebar Airport - Luffer Cranes	AD	01 AUG 2014 / 31 DEC 2017	
220/2014	Paya Lebar Airport - Hammerhead and Luffer Cranes	AD	01 AUG 2014 / 31 DEC 2017	
221/2014	Paya Lebar Airport - Luffer Crane	AD	01 AUG 2014 / 31 DEC 2017	
222/2014	Paya Lebar Airport - Luffer Cranes	AD	01 AUG 2014 / 31 DEC 2017	
22/2015	Paya Lebar Airport - Luffer Cranes	AD	02 JAN 2015 / 09 DEC 2017	
23/2015	Paya Lebar Airport - Topless Cranes	AD	02 JAN 2015 / 31 DEC 2017	
24/2015	Paya Lebar Airport - Luffer Crane	AD	02 JAN 2015 / 31 DEC 2017	
25/2015	Paya Lebar Airport - Hammerhead Cranes	AD	02 JAN 2015 / 31 DEC 2017	
74/2015	Paya Lebar Airport - Topless Cranes and Luffer Crane	AD	16 APR 2015 / 31 DEC 2017	
75/2015	Paya Lebar Airport - Hydraulic Crawler Cranes	AD	16 APR 2015 / 07 JAN 2018	
76/2015	Paya Lebar Airport - Tower Cranes	AD	16 APR 2015 / 31 MAR 2018	
77/2015	Paya Lebar Airport - Saddle Cranes	AD	16 APR 2015 / 01 MAY 2018	
109/2015	Singapore Changi Airport - Shortening of Runway 20C approach lighting to 720m to facilitate the construction of the northern end-around-taxiway	AD	02 OCT 2015 / 31 OCT 2018	
126/2015	Paya Lebar Airport - Luffer Crane	AD	01 JUL 2015 / 30 DEC 2017	
129/2015	Tengah Aerodrome - Luffer Crane	AD	01 JUL 2015 / 31 DEC 2017	
130/2015	Sembawang Aerodrome - Luffer Cranes	AD	01 JUL 2015 / 31 DEC 2017	
131/2015	Paya Lebar Airport - Topless Cranes	AD	01 JUL 2015 / 31 DEC 2017	
132/2015	Paya Lebar Airport - Cranes	AD	01 JUL 2015 / 12 APR 2018	
133/2015	Paya Lebar Airport - Luffer Crane and Topless Crane	AD	01 JUL 2015 / 30 JUN 2018	
134/2015	Paya Lebar Airport - Luffer Cranes	AD	01 JUL 2015 / 30 JUN 2018	
135/2015	Tengah Aerodrome - Luffer Cranes	AD	01 JUL 2015 / 30 JUN 2018	
140/2015	Paya Lebar Airport - Luffer Cranes	AD	03 AUG 2015 / 30 DEC 2017	
141/2015	Paya Lebar Airport - Saddle Crane	AD	03 AUG 2015 / 30 DEC 2017	
142/2015	Paya Lebar Airport - Topless Cranes	AD	03 AUG 2015 / 31 AUG 2018	
160/2015	Paya Lebar Airport - Luffer Cranes	AD	21 SEP 2015 / 15 AUG 2018	
161/2015	Paya Lebar Airport - Luffer Cranes	AD	21 SEP 2015 / 01 SEP 2018	

NR/Year	Subject	AIP section(s) affected	Period of validity (from/to)	Cancellation record
162/2015	Sembawang Aerodrome - Topless Cranes	AD	31 OCT 2015 / 31 OCT 2018	
004/2016	Singapore Changi Airport - Shortening of Runway 02C Approach Lighting System to 810M to Facilitate southern End-Round-Taxiway Construction	AD	01 JUN 2016 / 30 APR 2020	
025/2016	Paya Lebar Airport - Luffer Cranes	AD	04 MAR 2016 / 31 DEC 2017	
026/2016	Paya Lebar Airport - Topless Cranes	AD	04 MAR 2016 / 31 DEC 2017	
027/2016	Paya Lebar Airport - Topless Cranes and Luffer Cranes	AD	04 MAR 2016 / 31 DEC 2017	
028/2016	Paya Lebar Airport - Tower Cranes	AD	04 MAR 2016 / 26 MAR 2018	
029/2016	Paya Lebar Airport - Luffer Cranes	AD	04 MAR 2016 / 01 JUN 2018	
030/2016	Paya Lebar Airport - Saddle Cranes	AD	04 MAR 2016 / 17 JUN 2018	
031/2016	Paya Lebar Airport - Saddle Cranes	AD	04 MAR 2016 / 31 DEC 2018	
032/2016	Paya Lebar Airport - Luffer Crane	AD	04 MAR 2016 / 31 DEC 2018	
033/2016	Paya Lebar Airport - Luffer Crane	AD	04 MAR 2016 / 31 DEC 2018	
034/2016	Paya Lebar Airport - Saddle Cranes	AD	04 MAR 2016 / 31 DEC 2018	
037/2016	Paya Lebar Airport - Mobile Cranes and Crawler Cranes	AD	04 MAR 2016 / 07 JAN 2018	
039/2016	Paya Lebar Airport - Topless Cranes	AD	04 MAR 2016 / 31 JAN 2019	
059/2016	Paya Lebar Airport - Luffer Crane	AD	04 AUG 2016 / 31 DEC 2017	
060/2016	Paya Lebar Airport - Luffer Crane	AD	04 AUG 2016 / 31 MAY 2018	
061/2016	Paya Lebar Airport - Luffer Crane and Topless Crane	AD	04 AUG 2016 / 29 JUN 2018	
062/2016	Paya Lebar Airport - Luffer Cranes	AD	04 AUG 2016 / 31 JUL 2018	
063/2016	Paya Lebar Airport - Topless Cranes	AD	04 AUG 2016 / 31 DEC 2018	
064/2016	Paya Lebar Airport - Topless Cranes	AD	04 AUG 2016 / 31 DEC 2018	
065/2016	Paya Lebar Airport - Luffer Crane	AD	04 AUG 2016 / 31 DEC 2018	
066/2016	Paya Lebar Airport - Piling Rig and Crawler Crane	AD	04 AUG 2016 / 01 AUG 2018	
067/2016	Paya Lebar Airport - Topless Cranes and Luffer Crane	AD	04 AUG 2016 / 31 MAR 2019	
068/2016	Paya Lebar Airport - Topless Cranes and Luffer Cranes	AD	04 AUG 2016 / 01 JUN 2019	
069/2016	Paya Lebar Airport - Saddle Cranes	AD	04 AUG 2016 / 30 JUN 2019	
070/2016	Paya Lebar Airport - Luffer Cranes and Topless Cranes	AD	04 AUG 2016 / 31 DEC 2019	
089/2016	Seletar Airport - Partial closure of Taxiway EC and Taxiway EC2 due to new aircraft stands and service road construction and associated works	AD	01 NOV 2016 / 31 MAR 2018	
016/2017	Paya Lebar Airport - Topless Cranes	AD	10 JAN 2017 / 31 JAN 2018	

NR/Year	Subject	AIP section(s) affected	Period of validity (from/to)	Cancellation record
017/2017	Sembawang Aerodrome - Crawler Crane	AD	10 JAN 2017 / 28 FEB 2018	
018/2017	Paya Lebar Airport - Piling Machine	AD	10 JAN 2017 / 06 JUN 2018	
019/2017	Paya Lebar Airport - Topless Cranes	AD	10 JAN 2017 / 06 DEC 2018	
022/2017	Paya Lebar Airport - Topless Cranes	AD	10 JAN 2017 / 31 DEC 2018	
023/2017	Paya Lebar Airport - Luffer Crane	AD	10 JAN 2017 / 31 DEC 2018	
024/2017	Paya Lebar Airport - Topless Cranes and Luffer Cranes	AD	10 JAN 2017 / 31 DEC 2018	
025/2017	Paya Lebar Airport - Topless Cranes	AD	10 JAN 2017 / 21 NOV 2019	
026/2017	Paya Lebar Airport - Luffer Crane	AD	10 JAN 2017 / 08 DEC 2019	
041/2017	Paya Lebar Airport - Luffer Crane	AD	13 APR 2017 / 31 DEC 2017	
042/2017	Sembawang Aerodrome - Crawler Cranes	AD	13 APR 2017 / 31 DEC 2017	
043/2017	Singapore Changi Airport - Crawler Cranes	AD	13 APR 2017 / 31 DEC 2017	
044/2017	Paya Lebar Airport - Mobile Cranes and Crawler Cranes	AD	13 APR 2017 / 07 JAN 2018	
045/2017	Sembawang Aerodrome - Topless Crane	AD	13 APR 2017 / 28 FEB 2018	
046/2017	Sembawang Aerodrome - Mobile Cranes	AD	13 APR 2017 / 15 MAR 2018	
047/2017	Paya Lebar Airport - Luffer Cranes and Topless Cranes	AD	13 APR 2017 / 31 AUG 2018	
048/2017	Paya Lebar Airport - Luffer Crane	AD	13 APR 2017 / 31 DEC 2018	
049/2017	Paya Lebar Airport - Mobile Cranes	AD	13 APR 2017 / 31 DEC 2018	
050/2017	Paya Lebar Airport - Luffer Crane	AD	13 APR 2017 / 31 DEC 2018	
051/2017	Paya Lebar Airport - Mobile Cranes	AD	13 APR 2017 / 05 MAR 2019	
052/2017	Paya Lebar Airport - Topless Cranes	AD	13 APR 2017 / 14 MAR 2019	
053/2017	Paya Lebar Airport - Luffer Crane	AD	13 APR 2017 / 14 MAR 2019	
054/2017	Paya Lebar Airport - Luffer Crane	AD	13 APR 2017 / 23 MAR 2019	
055/2017	Paya Lebar Airport - Topless Cranes and Luffer Crane	AD	13 APR 2017 / 31 MAR 2019	
056/2017	Paya Lebar Airport - Topless Cranes	AD	13 APR 2017 / 30 APR 2019	
057/2017	Paya Lebar Airport - Luffer Cranes	AD	13 APR 2017 / 14 JAN 2020	
058/2017	Paya Lebar Airport - Topless Cranes	AD	13 APR 2017 / 26 OCT 2020	
062/2017	Tengah Aerodrome - Topless Crane and Luffer Crane	AD	13 APR 2017 / 31 MAR 2018	
063/2017	Paya Lebar Airport - Topless Cranes and Luffer Crane	AD	13 APR 2017 / 15 APR 2019	
065/2017	Paya Lebar Airport - Topless Cranes	AD	27 APR 2017 / 20 DEC 2017	
066/2017	Paya Lebar Airport - Luffer Cranes	AD	27 APR 2017 / 31 DEC 2017	

NR/Year	Subject	AIP section(s) affected	Period of validity (from/to)	Cancellation record
067/2017	Sembawang Aerodrome - Topless Crane	AD	27 APR 2017 / 01 FEB 2020	
068/2017	Paya Lebar Airport - Obstacles	AD	27 APR 2017 / 26 OCT 2020	
074/2017	Paya Lebar Airport - Mobile Crane	AD	11 JUL 2017 / 31 DEC 2017	
075/2017	Sembawang Aerodrome - Crawler Crane	AD	11 JUL 2017 / 17 APR 2018	
076/2017	Paya Lebar Airport - Crawler Crane	AD	11 JUL 2017 / 30 JUN 2018	
077/2017	Paya Lebar Airport - Luffer Cranes and Topless Cranes	AD	11 JUL 2017 / 31 AUG 2018	
078/2017	Paya Lebar Airport - Mobile Cranes and Crawler Cranes	AD	11 JUL 2017 / 30 NOV 2018	
079/2017	Paya Lebar Airport - Topless Crane	AD	11 JUL 2017 / 28 APR 2019	
080/2017	Paya Lebar Airport - Topless Cranes	AD	11 JUL 2017 / 29 APR 2019	
081/2017	Paya Lebar Airport - Luffer Crane	AD	11 JUL 2017 / 01 MAY 2019	
082/2017	Paya Lebar Airport - Topless Cranes	AD	11 JUL 2017 / 31 DEC 2019	
083/2017	Paya Lebar Airport - Topless Cranes	AD	11 JUL 2017 / 31 DEC 2019	
084/2017	Paya Lebar Airport - Luffer Cranes	AD	11 JUL 2017 / 31 DEC 2019	
085/2017	Paya Lebar Airport - Topless Cranes	AD	11 JUL 2017 / 01 JUN 2020	
092/2017	Flying displays in conjunction with the Singapore Airshow 2018 exhibition from Wednesday 31 January to Sunday 11 February 2018	AD/ENR	31 JAN 2018 / 11 FEB 2018	
093/2017	Singapore Changi Airport -Works schedule and movement area restrictions pertaining to diversion of airside services and soil improvement works	AD	28 OCT 2017 / 24 MAR 2018	
094/2017	Paya Lebar Airport - Crawler Crane	AD	26 SEP 2017 / 31 DEC 2017	
095/2017	Paya Lebar Airport - Topless Crane and Luffer Cranes	AD	26 SEP 2017 / 31 DEC 2019	
096/2017	Tengah Aerodrome - Mobile Cranes	AD	26 SEP 2017 / 31 DEC 2017	
097/2017	Paya Lebar Airport - Crawler Cranes and Piling Rigs	AD	26 SEP 2017 / 24 JAN 2018	
098/2017	Paya Lebar Airport - Topless Cranes	AD	26 SEP 2017 / 31 DEC 2019	
099/2017	Paya Lebar Airport - Crawler Cranes	AD	26 SEP 2017 / 02 MAY 2018	
100/2017	Paya Lebar Airport - Piling Rig and Crawler Crane	AD	26 SEP 2017 / 15 JUL 2018	
101/2017	Paya Lebar Airport - Piling Rig and Crawler Crane	AD	26 SEP 2017 / 15 JUL 2018	
102/2017	Paya Lebar Airport - Crawler Cranes	AD	26 SEP 2017 / 24 JUL 2018	
103/2017	Paya Lebar Airport - Mobile Crane	AD	26 SEP 2017 / 31 DEC 2017	
104/2017	Paya Lebar Airport - Mobile Cranes	AD	26 SEP 2017 / 31 DEC 2017	
105/2017	Paya Lebar Airport - Luffer Crane and Saddle Crane	AD	29 SEP 2017 / 31 DEC 2018	

NR/Year	Subject	AIP section(s) affected	Period of validity (from/to)	Cancellation record
108/2017	Paya Lebar Airport - Topless Crane and Luffer Cranes	AD	30 SEP 2017 / 06 JUL 2020	
110/2017	Paya Lebar Airport - Piling Rig and Crawler Crane	AD	24 OCT 2017 / 16 OCT 2018	
111/2017	Paya Lebar Airport - Crawler Cranes	AD	24 OCT 2017 / 20 OCT 2018	
112/2017	Paya Lebar Airport - Topless Cranes	AD	24 OCT 2017 / 30 OCT 2018	
113/2017	Paya Lebar Airport - Topless Cranes	AD	24 OCT 2017 / 18 OCT 2019	
114/2017	Paya Lebar Airport - Luffer Crane	AD	24 OCT 2017 / 20 OCT 2019	
115/2017	Paya Lebar Airport - Topless Cranes	AD	24 OCT 2017 / 24 OCT 2019	
117/2017	Flying displays in conjunction with the Republic of Singapore Air Force (RSAF) 50 th Anniversary Family Day 2018 Exhibition on Saturday 03 February 2018	AD/ENR	03 FEB 2018 / 03 FEB 2018	

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GEN 0.4 CHECKLIST OF AIP PAGES

Part 1 – General (GEN)							
GEN 0		GEN 3.3-1	12 NOV 2015	ENR-1.6-11	21 JUL 2016		
GEN 0.1-1	12 NOV 2015	GEN 3.3-2	21 JUL 2016	ENR 1.7-1	12 NOV 2015		
GEN 0.1-2	12 OCT 2017	GEN 3.4-1	12 NOV 2015	ENR 1.7-2	12 NOV 2015		
GEN 0.1-3	21 JUL 2016	GEN 3.4-2	02 MAR 2017	ENR 1.7-3	12 NOV 2015		
GEN 0.2-1	07 DEC 2017	GEN 3.4-3	02 MAR 2017	ENR 1.7-4	17 AUG 2017		
GEN 0.3-1	07 DEC 2017	GEN 3.4-4	02 MAR 2017	ENR 1.7-5	12 NOV 2015		
GEN 0.3-2	07 DEC 2017	GEN 3.4-5	12 NOV 2015	ENR 1.7-6	07 DEC 2017		
GEN 0.3-3	07 DEC 2017	GEN-3.4-7	21 JUL 2016	ENR 1.7-7	12 NOV 2015		
GEN 0.3-4	07 DEC 2017	GEN-3.4-9	21 JUL 2016	ENR 1.7-8	12 NOV 2015		
GEN 0.3-5	07 DEC 2017	GEN 3.5-1	12 NOV 2015	ENR 1.7-9	12 NOV 2015		
GEN 0.4-1	07 DEC 2017	GEN 3.5-2	12 OCT 2017	ENR 1.8-1	07 DEC 2017		
GEN 0.4-2	07 DEC 2017	GEN 3.5-3	12 NOV 2015	ENR 1.8-2	02 MAR 2017		
GEN 0.4-3	07 DEC 2017	GEN 3.5-4	12 NOV 2015	ENR 1.8-3	12 NOV 2015		
GEN 0.5-1	05 JAN 2017	GEN 3.5-5	15 SEP 2016	ENR 1.8-4	12 NOV 2015		
GEN 0.6-1	27 APR 2017	GEN 3.5-6	12 NOV 2015	ENR 1.8-5	12 NOV 2015		
GEN 0.6-2	15 SEP 2016	GEN 3.5-7	12 NOV 2015	ENR 1.8-6	12 NOV 2015		
GEN 0.6-3	22 JUN 2017	GEN 3.5-8	22 JUN 2017	ENR 1.8-7	12 NOV 2015		
GEN 1		GEN 3.5-9	22 JUN 2017	ENR 1.8-8	12 NOV 2015		
GEN 1.1-1	10 NOV 2016	GEN 3.6-1	12 NOV 2015	ENR 1.8-9	12 NOV 2015		
GEN 1.1-2	07 DEC 2017	GEN 3.6-2	12 NOV 2015	ENR 1.8-10	12 NOV 2015		
GEN 1.2-1	15 SEP 2016	GEN 3.6-3	12 NOV 2015	ENR 1.8-11	12 NOV 2015		
GEN 1.2-2	15 SEP 2016	GEN 3.6-4	12 NOV 2015	ENR 1.8-12	12 NOV 2015		
GEN 1.2-3	27 APR 2017	GEN-3.6-5	21 JUL 2016	ENR 1.8-13	07 DEC 2017		
GEN 1.2-4	27 APR 2017	GEN 4		ENR 1.8-14	07 DEC 2017		
GEN 1.2-5	27 APR 2017	GEN 4.1-1	15 SEP 2016	ENR 1.8-15	12 NOV 2015		
GEN 1.2-6	27 APR 2017	GEN 4.2-1	12 NOV 2015	ENR 1.8-16	12 NOV 2015		
GEN 1.3-1	21 JUL 2016	GEN 4.2-2	12 NOV 2015	ENR 1.8-17	07 DEC 2017		
GEN 1.3-2	12 NOV 2015	GEN 4.2-3	12 NOV 2015	ENR 1.8-18	07 DEC 2017		
GEN 1.3-3	12 NOV 2015	GEN 4.2-4	12 NOV 2015	ENR 1.8-19	07 DEC 2017		
GEN-1.3-5	21 JUL 2016	GEN 4.2-5	12 NOV 2015	ENR 1.8-20	07 DEC 2017		
GEN-1.3-7	21 JUL 2016	GEN 4.2-6	12 NOV 2015	ENR 1.8-21	12 NOV 2015		
GEN 1.4-1	12 NOV 2015	Part 2 – EN-ROUTE (ENR)		ENR 1.8-22	02 MAR 2017		
GEN 1.4-2	12 NOV 2015	ENR 0		ENR 1.8-23	12 NOV 2015		
GEN 1.4-3	12 NOV 2015	ENR 0.6-1	05 JAN 2017	ENR 1.8-24	17 AUG 2017		
GEN 1.5-1	12 NOV 2015	ENR 0.6-2	02 MAR 2017	ENR 1.8-25	05 JAN 2017		
GEN 1.6-1	07 DEC 2017	ENR 0.6-3	07 DEC 2017	ENR 1.8-26	05 JAN 2017		
GEN 1.6-2	07 DEC 2017	ENR 0.6-4	27 APR 2017	ENR 1.8-27	05 JAN 2017		
GEN 1.6-3	07 DEC 2017	ENR 0.6-5	27 APR 2017	ENR 1.8-28	05 JAN 2017		
GEN 1.7-1	10 NOV 2016	ENR 0.6-6	27 APR 2017	ENR 1.8-29	05 JAN 2017		
GEN 1.7-2	12 NOV 2015	ENR 1		ENR 1.8-30	05 JAN 2017		
GEN 1.7-3	10 NOV 2016	ENR 1.1-1	12 NOV 2015	ENR 1.8-31	05 JAN 2017		
GEN 1.7-4	10 NOV 2016	ENR 1.1-2	12 NOV 2015	ENR 1.9-1	07 DEC 2017		
GEN 1.7-5	10 NOV 2016	ENR 1.1-3	12 NOV 2015	ENR 1.9-2	27 APR 2017		
GEN 2		ENR 1.1-4	12 NOV 2015	ENR 1.9-3	27 APR 2017		
GEN 2.1-1	12 NOV 2015	ENR 1.1-5	12 NOV 2015	ENR 1.9-4	27 APR 2017		
GEN 2.1-2	12 OCT 2017	ENR 1.1-6	12 NOV 2015	ENR 1.9-5	27 APR 2017		
GEN 2.2-1	02 MAR 2017	ENR 1.1-7	12 NOV 2015	ENR 1.10-1	27 APR 2017		
GEN 2.2-2	02 MAR 2017	ENR 1.1-8	12 NOV 2015	ENR 1.10-2	12 NOV 2015		
GEN 2.2-3	02 MAR 2017	ENR 1.1-9	12 NOV 2015	ENR 1.10-3	12 NOV 2015		
GEN 2.2-4	05 JAN 2017	ENR 1.1-10	10 NOV 2016	ENR 1.11-1	12 NOV 2015		
GEN 2.2-5	10 NOV 2016	ENR 1.1-11	12 NOV 2015	ENR 1.12-1	12 NOV 2015		
GEN 2.3-1	12 NOV 2015	ENR 1.1-12	12 NOV 2015	ENR 1.12-2	12 NOV 2015		
GEN 2.3-2	12 NOV 2015	ENR 1.1-13	02 MAR 2017	ENR 1.12-3	12 NOV 2015		
GEN 2.3-3	12 NOV 2015	ENR 1.1-14	02 MAR 2017	ENR 1.12-4	12 NOV 2015		
GEN 2.4-1	12 NOV 2015	ENR 1.1-15	12 NOV 2015	ENR 1.13-1	12 NOV 2015		
GEN 2.5-1	21 JUL 2016	ENR 1.1-16	12 NOV 2015	ENR 1.14-1	10 DEC 2015		
GEN 2.5-3	21 JUL 2016	ENR 1.2-1	21 JUL 2016	ENR 1.14-2	15 SEP 2016		
GEN 2.6-1	12 NOV 2015	ENR 1.3-1	12 NOV 2015	ENR-1.14-3 to ENR-1.14-4	15 SEP 2016		
GEN 2.6-2	12 NOV 2015	ENR 1.4-1	12 NOV 2015	ENR-1.14-5 to ENR-1.14-6	15 SEP 2016		
GEN 2.7-1	12 NOV 2015	ENR 1.5-1	12 NOV 2015	ENR-1.14-7 to ENR-1.14-8	15 SEP 2016		
GEN 3		ENR 1.5-2	17 AUG 2017	ENR 2			
GEN 3.1-1	21 JUL 2016	ENR 1.5-3	17 AUG 2017	ENR 2.1-1	02 MAR 2017		
GEN 3.1-2	21 JUL 2016	ENR 1.5-4	22 JUN 2017	ENR 2.1-2	02 MAR 2017		
GEN 3.1-3	17 AUG 2017	ENR 1.6-1	12 NOV 2015	ENR 2.1-3	02 MAR 2017		
GEN 3.1-4	12 OCT 2017	ENR 1.6-2	12 NOV 2015	ENR 2.1-4	12 NOV 2015		
GEN 3.2-1	21 JUL 2016	ENR 1.6-3	12 NOV 2015	ENR 2.1-7	21 JUL 2016		
GEN 3.2-2	31 MAR 2016	ENR 1.6-4	17 AUG 2017	ENR-2.1-9	07 DEC 2017		
GEN 3.2-3	31 MAR 2016	ENR 1.6-5	02 MAR 2017	ENR-2.1-11A	21 JUL 2016		
GEN 3.2-4	07 DEC 2017	ENR 1.6-6	02 MAR 2017	ENR-2.1-11B	21 JUL 2016		
GEN 3.2-5	31 MAR 2016	ENR 1.6-7	02 MAR 2017	ENR-2.1-13	21 JUL 2016		
GEN 3.2-6	31 MAR 2016	ENR 1.6-8	02 MAR 2017	ENR-2.1-15	07 DEC 2017		
		ENR 1.6-9	02 MAR 2017	ENR 3			
		ENR-1.6-9	21 JUL 2016	ENR 3.1-1	02 MAR 2017		
				ENR 3.1-2	02 MAR 2017		
				ENR 3.1-3	10 NOV 2016		

ENR 3.1-4	10 NOV 2016	ENR 4.3-1	12 NOV 2015	AD 2.WSSS-27	07 DEC 2017
ENR 3.1-5	12 NOV 2015	ENR 4.4-1	07 DEC 2017	AD 2.WSSS-28	07 DEC 2017
ENR 3.1-6	02 MAR 2017	ENR 4.4-2	07 DEC 2017	AD 2.WSSS-29	07 DEC 2017
ENR 3.1-7	02 MAR 2017	ENR 4.4-3	07 DEC 2017	AD 2.WSSS-30	07 DEC 2017
ENR 3.1-8	10 NOV 2016	ENR 4.4-4	07 DEC 2017	AD 2.WSSS-31	07 DEC 2017
ENR 3.1-9	12 NOV 2015	ENR 4.4-5	17 AUG 2017	AD 2.WSSS-32	07 DEC 2017
ENR 3.1-10	02 MAR 2017	ENR 4.4-6	17 AUG 2017	AD 2.WSSS-33	07 DEC 2017
ENR 3.1-11	02 MAR 2017	ENR 4.5-1	12 OCT 2017	AD 2.WSSS-34	07 DEC 2017
ENR 3.1-12	10 NOV 2016			AD 2.WSSS-35	07 DEC 2017
ENR 3.1-13	12 NOV 2015	ENR 5		AD 2.WSSS-36	07 DEC 2017
ENR 3.1-14	02 MAR 2017	ENR 5.1-1	12 NOV 2015	AD 2.WSSS-37	07 DEC 2017
ENR 3.1-15	12 NOV 2015	ENR 5.1-2	12 NOV 2015	AD 2.WSSS-38	07 DEC 2017
ENR 3.1-16	02 MAR 2017	ENR 5.1-3	22 JUN 2017	AD 2.WSSS-39	07 DEC 2017
ENR 3.1-17	12 NOV 2015	ENR 5.1-4	12 NOV 2015	AD 2.WSSS-40	07 DEC 2017
ENR 3.1-18	02 MAR 2017	ENR 5.1-5	12 NOV 2015	AD 2.WSSS-41	07 DEC 2017
ENR 3.1-19	02 MAR 2017	ENR 5.1-6	12 NOV 2015	AD 2.WSSS-42	07 DEC 2017
ENR 3.1-20	12 NOV 2015	ENR 5.1-7	22 JUN 2017	AD 2.WSSS-43	07 DEC 2017
ENR-3.1/ATS Chart	07 DEC 2017	ENR 5.1-9	22 JUN 2017	AD 2.WSSS-44	07 DEC 2017
ENR 3.3-1	07 DEC 2017	ENR 5.2-1	26 MAY 2016	AD 2.WSSS-45	07 DEC 2017
ENR 3.3-2	02 MAR 2017	ENR 5.2-2	26 MAY 2016	AD 2.WSSS-46	07 DEC 2017
ENR 3.3-3	02 MAR 2017	ENR 5.3-1	05 JAN 2017	AD 2.WSSS-47	07 DEC 2017
ENR 3.3-4	12 NOV 2015	ENR 5.4-1	12 NOV 2015	AD 2.WSSS-48	07 DEC 2017
ENR 3.3-5	12 NOV 2015	ENR 5.5-1	12 NOV 2015	AD 2.WSSS-49	07 DEC 2017
ENR 3.3-6	22 JUN 2017	ENR 5.6-1	12 NOV 2015	AD 2.WSSS-50	07 DEC 2017
ENR 3.3-7	02 MAR 2017	ENR 5.6-2	12 NOV 2015	AD 2.WSSS-51	07 DEC 2017
ENR 3.3-8	02 MAR 2017			AD 2.WSSS-52	07 DEC 2017
ENR 3.3-9	07 DEC 2017	ENR 6		AD 2.WSSS-53	07 DEC 2017
ENR 3.3-10	07 DEC 2017	ENR 6-1	15 SEP 2016	AD 2.WSSS-54	07 DEC 2017
ENR 3.3-11	07 DEC 2017	ERC-6-1 En-Route Chart	07 DEC 2017	AD 2.WSSS-55	07 DEC 2017
ENR 3.3-12	07 DEC 2017	WAC-2860-Singapore-Island	17 AUG 2017	AD 2.WSSS-56	07 DEC 2017
ENR 3.3-13	07 DEC 2017			AD 2.WSSS-57	07 DEC 2017
ENR 3.3-14	07 DEC 2017	Part 3 – AERODROMES (AD)		AD 2.WSSS-58	07 DEC 2017
ENR 3.3-15	07 DEC 2017	AD 0		AD-2-WSSS-ADC-1	15 SEP 2016
ENR 3.3-16	07 DEC 2017			AD-2-WSSS-ADC-2	07 DEC 2017
ENR 3.3-17	07 DEC 2017	AD 0.6-1	07 DEC 2017	AD-2-WSSS-ADC-3	12 OCT 2017
ENR 3.3-18	07 DEC 2017	AD 0.6-2	07 DEC 2017	AD-2-WSSS-AOC-1	07 DEC 2017
ENR 3.3-19	07 DEC 2017	AD 0.6-3	12 OCT 2017	AD-2-WSSS-AOC-2	07 DEC 2017
ENR 3.3-20	07 DEC 2017	AD 0.6-4	12 OCT 2017	AD-2-WSSS-AOC-3	07 DEC 2017
ENR 3.3-21	07 DEC 2017	AD 0.6-5	12 OCT 2017	AD-2-WSSS-PATC-1	07 DEC 2017
ENR 3.3-22	07 DEC 2017	AD 0.6-6	12 OCT 2017	AD-2-WSSS-PATC-2	07 DEC 2017
ENR 3.3-23	07 DEC 2017	AD 0.6-7	12 OCT 2017	AD-2-WSSS-SID-1 to 1.1	07 DEC 2017
ENR 3.3-24	07 DEC 2017			AD-2-WSSS-SID-2 to 2.1	07 DEC 2017
ENR 3.3-25	07 DEC 2017	AD 1		AD-2-WSSS-SID-3 to 3.1	07 DEC 2017
ENR 3.3-26	07 DEC 2017	AD 1.1-1	12 NOV 2015	AD-2-WSSS-SID-4 to 4.1	07 DEC 2017
ENR 3.3-27	07 DEC 2017	AD 1.1-2	12 NOV 2015	AD-2-WSSS-SID-5 to 5.1	07 DEC 2017
ENR 3.3-28	07 DEC 2017	AD 1.1-3	12 NOV 2015	AD-2-WSSS-SID-6 to 6.1	07 DEC 2017
ENR 3.3-29	07 DEC 2017	AD 1.1-4	12 NOV 2015	AD-2-WSSS-SID-7 to 7.1	07 DEC 2017
ENR 3.3-30	07 DEC 2017	AD 1.2-1	12 NOV 2015	AD-2-WSSS-SID-8 to 8.1	07 DEC 2017
ENR 3.3-31	07 DEC 2017	AD 1.3-1	12 NOV 2015	AD-2-WSSS-SID-9 to 9.1	07 DEC 2017
ENR 3.3-32	07 DEC 2017	AD-1.3-3	21 JUL 2016	AD-2-WSSS-SID-10 to 10.1	07 DEC 2017
ENR 3.3-33	07 DEC 2017	AD 1.4-1	12 NOV 2015	AD-2-WSSS-SID-11 to 11.1	07 DEC 2017
ENR 3.3-34	07 DEC 2017	AD 1.5-1	12 NOV 2015	AD-2-WSSS-SID-12 to 12.1	07 DEC 2017
ENR 3.3-35	07 DEC 2017			AD-2-WSSS-SID-13 to 13.1	07 DEC 2017
ENR 3.3-36	07 DEC 2017	AD 2		AD-2-WSSS-SID-14 to 14.1	07 DEC 2017
ENR 3.3-37	07 DEC 2017	AD 2.WSSS-1	27 APR 2017	AD-2-WSSS-SID-15 to 15.1	07 DEC 2017
ENR 3.3-38	07 DEC 2017	AD 2.WSSS-2	17 AUG 2017	AD-2-WSSS-SID-16 to 16.1	07 DEC 2017
ENR 3.3-39	07 DEC 2017	AD 2.WSSS-3	27 APR 2017	AD-2-WSSS-SID-17 to 17.1	07 DEC 2017
ENR 3.3-40	07 DEC 2017	AD 2.WSSS-4	27 APR 2017	AD-2-WSSS-SID-18 to 18.1	07 DEC 2017
ENR 3.3-41	07 DEC 2017	AD 2.WSSS-5	07 DEC 2017	AD-2-WSSS-STAR-1 to 1.1	12 OCT 2017
ENR 3.3-42	07 DEC 2017	AD 2.WSSS-6	02 MAR 2017	AD-2-WSSS-STAR-2 to 2.1	12 OCT 2017
ENR 3.3-43	07 DEC 2017	AD 2.WSSS-7	02 MAR 2017	AD-2-WSSS-STAR-3 to 3.1	12 OCT 2017
ENR 3.4-1	12 NOV 2015	AD 2.WSSS-8	02 MAR 2017	AD-2-WSSS-STAR-4 to 4.1	12 OCT 2017
ENR 3.4-2	12 OCT 2017	AD 2.WSSS-9	02 MAR 2017	AD-2-WSSS-STAR-5 to 5.1	12 OCT 2017
ENR 3.4-3	12 NOV 2015	AD 2.WSSS-10	12 OCT 2017	AD-2-WSSS-STAR-6 to 6.1	12 OCT 2017
ENR 3.4-4	12 NOV 2015	AD 2.WSSS-11	12 OCT 2017	AD-2-WSSS-STAR-7 to 7.1	12 OCT 2017
ENR-3.4-5	22 JUN 2017	AD 2.WSSS-12	12 OCT 2017	AD-2-WSSS-STAR-8 to 8.1	12 OCT 2017
ENR-3.4-7	21 JUL 2016	AD 2.WSSS-13	12 OCT 2017	AD-2-WSSS-STAR-9 to 9.1	12 OCT 2017
ENR 3.5-1	02 MAR 2017	AD 2.WSSS-14	12 OCT 2017	AD-2-WSSS-STAR-11 to 11.1	
ENR 3.5-2	02 MAR 2017	AD 2.WSSS-15	07 DEC 2017		12 OCT 2017
ENR 3.5-3	22 JUN 2017	AD 2.WSSS-16	07 DEC 2017	AD-2-WSSS-STAR-13 to 13.1	
ENR 3.6-1	27 APR 2017	AD 2.WSSS-17	12 OCT 2017		12 OCT 2017
ENR 3.6-2	27 APR 2017	AD 2.WSSS-18	12 OCT 2017	AD-2-WSSS-STAR-14 to 14.1	
ENR-3.6-3	05 JAN 2017	AD 2.WSSS-19	12 OCT 2017		12 OCT 2017
ENR-3.6-5	07 DEC 2017	AD 2.WSSS-20	12 OCT 2017	AD-2-WSSS-STAR-15 to 15.1	
ENR-3.6-7	07 DEC 2017	AD 2.WSSS-21	07 DEC 2017		12 OCT 2017
ENR-3.6-9	07 DEC 2017	AD 2.WSSS-22	07 DEC 2017	AD-2-WSSS-STAR-16 to 16.1	
ENR 4		AD 2.WSSS-23	07 DEC 2017		12 OCT 2017
		AD 2.WSSS-24	07 DEC 2017	AD-2-WSSS-STAR-17 to 17.1	
ENR 4.1-1	02 MAR 2017	AD 2.WSSS-25	07 DEC 2017		12 OCT 2017
ENR 4.1-2	02 MAR 2017	AD 2.WSSS-26	07 DEC 2017		

AD-2-WSSS-STAR-18 to 18.1	12 OCT 2017	AD 2.WSAT-8	12 NOV 2015
AD-2-WSSS-STAR-19 to 19.1	12 OCT 2017	AD-2-WSAT-ADC-1	12 NOV 2015
AD-2-WSSS-STAR-20 to 20.1	12 OCT 2017	AD 2.WSAG-1	12 NOV 2015
AD-2-WSSS-STAR-21 to 21.1	12 OCT 2017	AD 2.WSAG-2	31 MAR 2016
AD-2-WSSS-IAC-1	05 JAN 2017	AD 2.WSAG-3	07 DEC 2017
AD-2-WSSS-IAC-2	05 JAN 2017	AD 2.WMKJ-1	12 NOV 2015
AD-2-WSSS-IAC-5	05 JAN 2017	AD 2.WIDD-1	12 NOV 2015
AD-2-WSSS-IAC-6	05 JAN 2017	AD 2.WIDD-2	12 NOV 2015
AD-2-WSSS-IAC-7	05 JAN 2017	AD-2-WIDD-SID-1	12 NOV 2015
AD-2-WSSS-IAC-9	05 JAN 2017	AD-2-WIDD-SID-2	12 NOV 2015
AD-2-WSSS-IAC-10	05 JAN 2017	AD-2-WIDD-SID-3	12 NOV 2015
AD-2-WSSS-IAC-11	05 JAN 2017	AD-2-WIDD-SID-4	12 NOV 2015
AD-2-WSSS-IAC-12	05 JAN 2017	AD-2-WIDD-STAR-1	12 NOV 2015
AD-2-WSSS-VAC-1	10 NOV 2016	AD-2-WIDD-STAR-2	12 NOV 2015
AD 2.WSSL-1	27 APR 2017	AD-2-WIDD-STAR-3	12 NOV 2015
AD 2.WSSL-2	12 OCT 2017	AD-2-WIDD-STAR-4	12 NOV 2015
AD 2.WSSL-3	07 DEC 2017	AD 2.WIDN-1	05 JAN 2017
AD 2.WSSL-4	07 DEC 2017	AD-2-WIDN-SID-1	12 NOV 2015
AD 2.WSSL-5	12 OCT 2017	AD-2-WIDN-SID-2	12 NOV 2015
AD 2.WSSL-6	12 NOV 2015	AD-2-WIDN-SID-3	12 NOV 2015
AD 2.WSSL-7	12 NOV 2015	AD-2-WIDN-SID-4	12 NOV 2015
AD 2.WSSL-8	12 OCT 2017	AD-2-WIDN-STAR-1	12 NOV 2015
AD 2.WSSL-9	12 OCT 2017	AD-2-WIDN-STAR-2	12 NOV 2015
AD 2.WSSL-10	07 DEC 2017	AD-2-WIDN-STAR-3	21 JUL 2016
AD 2.WSSL-11	12 OCT 2017	AD-2-WIDN-STAR-4	12 NOV 2015
AD 2.WSSL-12	07 DEC 2017		
AD 2.WSSL-13	17 AUG 2017		
AD 2.WSSL-14	12 OCT 2017		
AD 2.WSSL-15	02 MAR 2017		
AD 2.WSSL-16	17 AUG 2017		
AD 2.WSSL-17	02 MAR 2017		
AD 2.WSSL-18	02 MAR 2017		
AD 2.WSSL-19	02 MAR 2017		
AD 2.WSSL-20	17 AUG 2017		
AD 2.WSSL-21	02 MAR 2017		
AD-2-WSSL-ADC-1	12 OCT 2017		
AD-2-WSSL-ADC-2	07 DEC 2017		
AD-2-WSSL-ADC-3	12 OCT 2017		
AD-2-WSSL-AOC-1	17 AUG 2017		
AD-2-WSSL-AOC-2	12 OCT 2017		
AD-2-WSSL-VAC-1	17 AUG 2017		
AD-2-WSSL-VAC-2	17 AUG 2017		
AD-2-WSSL-VAC-3	17 AUG 2017		
AD-2-WSSL-VAC-4	17 AUG 2017		
AD-2-WSSL-VDC-1	17 AUG 2017		
AD-2-WSSL-VDC-2	17 AUG 2017		
AD-2-WSSL-VFR-1	21 JUL 2016		
AD-2-WSSL-IFR-1	21 JUL 2016		
AD-2-WSSL-IFR-2	21 JUL 2016		
AD 2.WSAP-1	12 OCT 2017		
AD 2.WSAP-2	12 OCT 2017		
AD 2.WSAP-3	05 JAN 2017		
AD 2.WSAP-4	05 JAN 2017		
AD 2.WSAP-5	31 MAR 2016		
AD 2.WSAP-6	12 OCT 2017		
AD 2.WSAP-7	12 OCT 2017		
AD 2.WSAP-8	07 DEC 2017		
AD 2.WSAP-9	17 AUG 2017		
AD 2.WSAP-10	17 AUG 2017		
AD 2.WSAP-11	12 OCT 2017		
AD-2-WSAP-ADC-1	12 NOV 2015		
AD-2-WSAP-ADC-2	12 OCT 2017		
AD-2-WSAP-AOC-1	10 NOV 2016		
AD-2-WSAP-IAC-1	05 JAN 2017		
AD-2-WSAP-IAC-2	22 JUN 2017		
AD-2-WSAP-IAC-3	12 OCT 2017		
AD-2-WSAP-IAC-4	12 OCT 2017		
AD-2-WSAP-IAC-5	12 OCT 2017		
AD-2-WSAP-IAC-6	12 OCT 2017		
AD 2.WSAT-1	12 NOV 2015		
AD 2.WSAT-2	12 NOV 2015		
AD 2.WSAT-3	12 NOV 2015		
AD 2.WSAT-4	17 AUG 2017		
AD 2.WSAT-5	07 DEC 2017		
AD 2.WSAT-6	17 AUG 2017		
AD 2.WSAT-7	12 NOV 2015		

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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 AVIATION 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 DIVISION
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:

CUSTOMS AND EXCISE
World Trade Centre, 1 Maritime Square, #03-01 / #10-01
SINGAPORE 099253

Tel: (65) 62728222

Fax: (65) 63752090

URL: www.customs.gov.sg

4 IMMIGRATION

Post:

IMMIGRATION & CHECKPOINTS AUTHORITY
10 Kallang Road, #08-00 ICA Building
SINGAPORE 208718

Tel: (65) 63916100

Fax: (65) 62980837

URL: www.ica.gov.sg

5 HEALTH

Post:

MINISTRY OF ENVIRONMENT
ENVIRONMENTAL PUBLIC HEALTH DIVISION
Environment Building, 40 Scotts Road
SINGAPORE 228231

Tel: (65) 67327733

Fax: (65) 67319456

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 (SINGAPORE) PTE LTD
SELETAR AIRPORT
Building 556, West Camp Road
SINGAPORE 797794

Tel: (65) 64810017

Fax: (65) 64811190

7 AGRICULTURE QUARANTINE

Post:

Head Office: IMPORT AND EXPORT DIVISION, AGRI FOOD AND VET AUTHORITY
5 Maxwell Road #02-03 Tower Block, MND Complex
SINGAPORE 069110

Tel: (65) 62270670 or (65) 63257333

Fax: (65) 62276305

URL: www.ava.gov.sg

Post:

CHANGI ANIMAL AND PLANT QUARANTINE STATION
AGRI-FOOD AND VETERINARY AUTHORITY
Gate C7, Airport Cargo Road Changi Airfreight Centre
Changi Animal and Plant Quarantine
SINGAPORE 918104

Tel: (65) 65457522

Fax: (65) 65453023

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

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GEN 1.6 SUMMARY OF NATIONAL REGULATIONS AND INTERNATIONAL AGREEMENTS/CONVENTIONS

1 LIST OF CIVIL AVIATION LEGISLATION, AIR NAVIGATION REGULATIONS AND ORDERS

The following is a list of legislation (Acts and subsidiary legislation) affecting aviation and air navigation in the Republic of Singapore together with the International Agreements/Conventions acceded to by the Republic of Singapore. It is essential that anyone engaged in air operations be acquainted with the relevant legal documents.

Copies of the legislation may be obtained as follows:

Electronic versions of the legislation may be freely accessed at
<http://statutes.agc.gov.sg/>
<http://www.caas.gov.sg>

Electronic versions of all Singapore legislation may be accessed via subscription to Lawnet at
<http://www.lawnet.com.sg>

Print copies of all the legislation may be purchased from:

Post:
 Toppan Leefung Pte. Ltd.,
 No. 1 Kim Seng Promenade, #18-01,
 Great World City, East Tower
 Singapore 237994.
 Tel: (65) 68269600
 Fax: (65) 68203341
 URL: www.toppanleefung.com

1.1 CIVIL AVIATION LEGISLATION

No	Legislation	Citation
1	Civil Aviation Authority of Singapore Act	Cap. 41
2	Civil Aviation Authority of Singapore (Aviation Levy) Order 2009	S459/2009
3	Civil Aviation Authority of Singapore (Changi Airport) By-laws 2009	S313/2009
4	Civil Aviation Authority of Singapore(Changi Airport) Notification 2009	S293/2009
5	Civil Aviation Authority of Singapore (Composition of Offences) Regulations 2009	S315/2009
6	Civil Aviation Authority of Singapore (Licensing of Airport Operators) Regulations 2009	S311/2009
7	Civil Aviation Authority of Singapore (Seletar Airport) By-laws 2009	S314/2009
8	Civil Aviation Authority of Singapore (Seletar Airport) Notification 2009	S294/2009
9	Civil Aviation Authority of Singapore (Service Charge) Order 2009	S310/2009
10	Air Navigation Act	Cap. 6 (2014 Rev Ed.)
11	Air Navigation Order	Cap. 6, O2 (1990 Rev Ed.)
12	Air Navigation (Aviation Security) Order	Cap. 6, O5
13	Air Navigation (Composition of Offences) Rules 2017	Cap. 6, R1
14	Air Navigation (Delegation of Powers) Notification	Cap. 6, N3
15	Air Navigation (Investigation of Accidents and Incidents) Order 2003	Cap. 6, O7
16	Air Navigation (Licensing of Air Services) Regulations	Cap. 6, Rg 2
17	Air Navigation (Paya Lebar and Tengah Aerodrome Fees) Order	Cap. 6, O1
18	Air Navigation (Prohibited Flights) Order	Cap. 6, O6
19	Air Navigation (Regulated Air Cargo Agents) Regulations 2017	S166/2017
20	Air Navigation (Wreck and Salvage of Aircraft) Regulations	Cap. 6, Rg 1
21	Designation of Authorised Persons	Cap. 6, N2
22	Use of Seletar Aerodrome	Cap. 6, N1
23	Air Navigation (Protected Areas) Order 2015	S350/2015
24	Air Navigation (Protected Areas) (No. 2) Order 2015	S435/2015
25	Carriage by Air Act	Cap. 32A (2001 Rev Ed.)
26	Carriage by Air (Parties to Conventions) Order	Cap. 32A, O1
27	Carriage by Air (Singapore Currency Equivalents) Order	Cap. 32A, O2

No	Legislation	Citation
← 28	Carriage by Air (Montreal Convention, 1999) Act	Cap. 32B (2008 Rev Ed.)
← 29	Carriage by Air (Montreal Convention, 1999) (Exclusion from Convention) Order	Cap. 32B, O1
← 30	Tokyo Convention Act	Cap. 327
← 31	Tokyo Convention (Convention Countries) Notification	Cap. 327, N1
← 32	Hijacking of Aircraft and Protection of Aircraft and International Airports Act	Cap. 124 (1997 Rev Ed.)
← 33	International Interests in Aircraft Equipment Act 2009	Cap. 144B
← 34	Immigration Act	Cap. 133 (2008 Rev Ed.)
← 35	Immigration (Authorised Places Of Entry And Departure, And Rates) Notification 2012	S627/2012
← 36	Immigration Regulations	Cap. 133, Rg 1
← 37	Arms and Explosives Act	Cap. 13 (2003 Rev Ed.)
← 38	Arms and Explosives (Aircraft Exemption) Rules	Cap. 13, R3
← 39	Arms and Explosives (Explosives) Rules	Cap. 13, R2
← 40	Arms and Explosives (Movement Control) Rules	Cap. 13, R4

1.2 OTHER RELEVANT LEGISLATION

No	Legislation	Citation
← 1	Infectious Diseases Act	Cap. 137 (2003 Rev Ed.)
← 2	Infectious Diseases (Quarantine) RG	Cap. 137, Rg 1
← 3	Infectious Diseases (Measures to Prevent or Control the Spread of Infectious Diseases) Regulations 2004	S13/2004
← 4	Infectious Diseases (Certificates of Vaccination or Other Prophylaxis) Regulations 2008	S611/2008
← 5	Arms and Explosives (Arms) Rules	Cap. 13, R1
← 6	Inspector of Explosives	Cap. 13, N1
← 7	Arms Offences Act	Cap. 14 (2008 Rev Ed.)

Note: "Cap." means "Chapter of the 1985 Revised Edition of the Acts of Singapore", unless otherwise stated.

1.3 INTERNATIONAL CONVENTIONS AND PROTOCOLS

No	Legislation
1	Convention on International Civil Aviation, done at Chicago on 7 December 1944
2	International Air Services Transit Agreement, signed at Chicago on 7 December 1944
3	Protocol Relating to an Amendment to the Convention on International Civil Aviation [Article 93 Bis], signed at Montreal on 27 May 1947
4	Protocol Relating to an Amendment to the Convention on International Civil Aviation [Article 45], signed at Montreal on 14 June 1954
5	Protocol Relating to Certain Amendments to the Convention on International Civil Aviation [Articles 48(a), 49(e) and 61], signed at Montreal on 14 June 1954
6	Protocol Relating to an Amendment to the Convention on International Civil Aviation [Article 50(a)], signed at Montreal on 21 June 1961
7	Protocol Relating to an Amendment to the Convention on International Civil Aviation [Article 48(a)], signed at Rome on 15 September 1962
8	Convention for the Unification of Certain Rules Relating to International Carriage by Air signed at Warsaw on 12 October 1929
9	Protocol to Amend the Convention for the Unification of Certain Rules Relating to International Carriage by Air signed at Warsaw on 12 October 1929, done at The Hague on 28 September 1955
10	Convention on Offences and Certain Other Acts Committed on Board Aircraft, signed at Tokyo on 14 September 1963
11	Protocol Relating to an Amendment to the Convention on International Civil Aviation [Article 50(a)], signed at New York on 12 March 1971
12	Protocol Relating to an Amendment to the Convention on International Civil Aviation [Article 56], signed at Vienna on 7 July 1971
13	Protocol Relating to an Amendment to the Convention on International Civil Aviation [Article 50(a)], signed at Montreal on 16 October 1974
14	Convention for the Suppression of Unlawful Seizure of Aircraft, signed at The Hague on 16 December 1970

No	Legislation
15	Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation, signed at Montreal on 23 September 1971
16	Protocol Relating to an Amendment to the Convention on International Civil Aviation [Article 83 Bis], signed at Montreal on 6 October 1980
17	Protocol Relating to an Amendment to the Convention on International Civil Aviation [Article 56], signed at Montreal on 6 October 1989
18	Protocol Relating to an Amendment to the Convention on International Civil Aviation [Article 50(a)], signed at Montreal on 26 October 1990
19	Protocol Relating to an Amendment to the Convention for the Unification of Certain Rules Relating to International Carriage by Air, signed at Montreal on 25 September 1975
20	Convention for the Unification of Certain Rules for International Carriage by Air, signed at Montreal on 28 May 1999
21	Protocol for the Suppression of Unlawful Acts of Violence at Airports Serving International Civil Aviation, Supplementary to the Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation, done at Montreal on 23 September 1971, signed at Montreal on 24 February 1988
22	Convention on the Marking of Plastic Explosives for the Purpose of Detection, signed at Montreal on 1 March 1991
23	Convention on International Interests in Mobile Equipment, signed at Cape Town on 16 November 2001
24	Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Aircraft Equipment, signed at Cape Town on 16 November 2001
25	Agreement on the Joint Financing of Certain Air Navigation Services in Iceland (1956) as amended in 1982 and 2008
26	Agreement on the Joint Financing of Certain Air Navigation Services in Greenland (1956) as amended in 1982 and 2008
27	The International COSPAS-SARSAT Programme Agreement, signed at Paris on 1 July 1988
28	Convention on the Privileges and Immunities of the Specialized Agencies, 21/11/47 - application to ICAO (Annex 111), 21/6/48 18/3
29	Protocol on the Authentic Trilingual Text of the Convention on International Civil Aviation (Chicago, 1944), signed at Buenos Aires on 24 September 1968
30	Protocol Relating to an Amendment to the Convention on International Civil Aviation [Final Paragraph, Russian Text], signed at Montreal on 30 September 1977
31	Protocol on the Authentic Quadrilingual Text of the Convention on International Civil Aviation (Chicago, 1944), signed at Montreal on 30 September 1977

2 TAXATION IN THE FIELD OF INTERNATIONAL AIR TRANSPORT

2.1 *Petroleum exemptions and income tax*

- a. Petroleum for aircraft is granted GST (Goods and Services Tax) relief under item 11 of Part 1 of the Schedule to the GST (Imports Relief) Order (2001 Rev Ed.) respectively.
- b. The matter of income tax on air transport is contained within Section 12(2) of the Income Tax Act.

Where a non-resident person carries on either:

- i. the business of shipowner or charterer, or
- ii. the business of air transport,

and any ship or aircraft owned or chartered by him calls at a port, an aerodrome or an airport in Singapore, his full profits arising from the carriage of passengers, mail, livestock or goods shipped, or loaded into an aircraft, in Singapore shall be deemed to accrue in Singapore.

This subsection shall not apply to passengers, mail, livestock or goods which are brought to Singapore solely for transshipment, or for transfer from one aircraft to another or from an aircraft to a ship or from a ship to an aircraft.

2.2 *Capital gains tax, or income on wealth, etc.*

There is no capital gains tax, or income on wealth, etc., which are chargeable on the sale or use of international air transport.

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k. Visual Approach Chart - ICAO

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

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

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

5 LIST OF AERONAUTICAL CHARTS AVAILABLE

GEN 3.2.5 LIST OF AERONAUTICAL CHARTS AVAILABLE							
<i>Title of Chart Series</i>	<i>Scale</i>	<i>Name and/or number</i>		<i>Price (\$)</i>	<i>Date</i>		
World Aeronautical Chart ICAO (WAC)	1:1 000 000	WAC 2860		In AIP	17 AUG 17		
← Enroute Chart ICAO (ENRC)		ERC 6-1		In AIP	07 DEC 17		
← Instrument Approach Chart ICAO (IAC)	1:400 000	Singapore Changi					
		RWY 02L - ICW ILS/DME	AD-2-WSSS-IAC-1	In AIP	05 JAN 17		
		RWY 02C - ICE ILS/DME	AD-2-WSSS-IAC-2	In AIP	05 JAN 17		
		RWY 20R - ICH ILS/DME	AD-2-WSSS-IAC-5	In AIP	05 JAN 17		
		RWY 20C - ICC ILS/DME	AD-2-WSSS-IAC-6	In AIP	05 JAN 17		
		RWY 20C - VTK DVOR/DME	AD-2-WSSS-IAC-7	In AIP	05 JAN 17		
		RWY 02L - RNAV(GNSS)	AD-2-WSSS-IAC-9	In AIP	05 JAN 17		
		RWY 02C - RNAV(GNSS)	AD-2-WSSS-IAC-10	In AIP	05 JAN 17		
		RWY 20R - RNAV(GNSS)	AD-2-WSSS-IAC-11	In AIP	05 JAN 17		
		RWY 20C - RNAV(GNSS)	AD-2-WSSS-IAC-12	In AIP	05 JAN 17		
		Paya Lebar					
		RWY 20 - PU DVOR/DME	AD-2-WSAP IAC-1	In AIP	05 JAN 17		
		RWY 02 - PU DVOR/DME	AD-2-WSAP IAC-2	In AIP	22 JUN 17		
		RWY 20 - IPS ILS/DME	AD-2-WSAP IAC-3	In AIP	12 OCT 17		
		RWY 02 - IPN ILS/DME	AD-2-WSAP IAC-4	In AIP	12 OCT 17		
		RWY 02 - RNAV(GNSS)	AD-2-WSAP-IAC-5	In AIP	12 OCT 17		
RWY 20 - RNAV(GNSS)	AD-2-WSAP-IAC-6	In AIP	12 OCT 17				
Visual Approach Chart ICAO (VAC)	1:400 000	Singapore Changi		AD-2-WSSS-VAC-1	In AIP	10 NOV 16	
		Seletar					
		RWY 03	AD-2-WSSL-VAC-1	In AIP	17 AUG 17		
		RWY 21	AD-2-WSSL-VAC-2	In AIP	17 AUG 17		
		RWY 03	AD-2-WSSL-VAC-3	In AIP	17 AUG 17		
RWY 21	AD-2-WSSL-VAC-4	In AIP	17 AUG 17				
Visual Departure Chart	1:100 000	Seletar					
		RWY 03	AD-2-WSSL-VDC-1	In AIP	17 AUG 17		
	1:100 000	RWY 21	AD-2-WSSL-VDC-2	In AIP	17 AUG 17		
← Aerodrome Chart ICAO (AC)		Singapore Changi		AD-2-WSSS-ADC-2	In AIP	07 DEC 17	
		Seletar		AD-2-WSSL-ADC-1	In AIP	12 OCT 17	
		Paya Lebar		AD-2-WSAP-ADC-1	In AIP	12 NOV 15	
← Aerodrome Obstacle Chart ICAO TYPE A (AOC)	1:10 000	Singapore Changi					
		RWY 20R/02L	AD-2-WSSS-AOC-1	In AIP	07 DEC 17		
	1:10 000	RWY 20C/02C	AD-2-WSSS-AOC-2	In AIP	07 DEC 17		
	1:10 000	Seletar					
		RWY 03/21	AD-2-WSSL-AOC-1	In AIP	17 AUG 17		
1:20 000	Paya Lebar						
RWY 20/02	AD-2-WSAP-AOC-1	In AIP	10 NOV 16				
← Aerodrome Obstacle Chart ICAO TYPE B (AOC)	1:25 000	Singapore Changi					
		RWY 02L/20R and 02C/20C	AD-2-WSSS-AOC-3	In AIP	07 DEC 17		
	1:12 500	Seletar					
RWY 03/21	AD-2-WSSL-AOC-2	In AIP	12 OCT 17				
← Precision Approach Terrain Chart ICAO (PATC)	1:2 500	Singapore Changi					
		RWY 02L	AD-2-WSSS-PATC-1	In AIP	07 DEC 17		
	1:2 500	RWY 20C	AD-2-WSSS-PATC-2	In AIP	07 DEC 17		

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4.3 VFR FLIGHTS - CRUISING LEVELS WITHIN THE SINGAPORE FIR 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 OPERATING IN UNCONTROLLED AIRSPACE WITHIN PARTS OF SINGAPORE FIR BETWEEN PANGKAL PINANG TMA, PONTIANAK TMA AND PEKAN BARU TMA BELOW FL250

4.4.1 The pilot-in-command of a VFR or IFR flight operating at or above 3,000ft and below FL250 between Pangkal Pinang TMA, Pontianak TMA and Pekan Baru 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	195	200	205
210	215	220	225
230	235	240	245

Note: VFR flights within the Singapore FIR are permitted to operate only up to FL200.

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 transiting 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.

ENR 1.8 REGIONAL SUPPLEMENTARY PROCEDURES

1 RVSM PROCEDURES IN THE SINGAPORE FIR

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

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

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

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

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

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

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

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1.2 RVSM OPERATIONAL APPROVAL AND MONITORING

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

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

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

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

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

1.3 ACAS II AND TRANSPONDER EQUIPAGE

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

1.4 IN-FLIGHT PROCEDURES WITHIN RVSM AIRSPACE

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

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

1.4.2 The pilot must notify ATC whenever the aircraft:

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

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

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

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 the revised South China Sea ATS route structure which forms part of the Singapore FIR. 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 FAA AC 90-45 (Approval of Area Navigation Systems for use in the US National Airspace System).
- 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, B470, G334, L625, L642, L644, L649, L762, M646, M751, M753, M758, M761, M767, M768, M771, M772, M774, N875, N884, N891 and N892 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 600m 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 A (see page ENR 1.8-16).

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, B470, G579, L625, L642, L644, L649, L762, M646, M751, M753, M767, M768, M771, M772, N875, N884, N891 AND N892

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 para 2.5.2 shall be applied.

3 RNP 10 NAVIGATION REQUIREMENTS

3.1 INTRODUCTION

3.1.1 ATC will apply 50NM lateral separation minima to aircraft which are approved for RNP 10 operations on the following segments of RNAV routes which fall within the Singapore FIR:

←	L625	- BTN TOMAN and AKMON
←	L642	- BTN ESPOB and MERSING
	L649	- BTN DAKIX and LAXOR
	M635	- BTN VTK and SURGA
←	M767	- BTN TEGID and TOMAN
←	M771	- BTN MERSING and DUDIS
	M774	- BTN OBDOS and KADAR
←	N884	- BTN MERSING and LAXOR
←	N892	- BTN MELAS and MERSING

3.1.2 ATC will apply 60NM lateral separation minima to aircraft which are approved for RNP 10 operations on RNAV routes:

L644	- BTN DUDIS and KIKOR
M772	- BTN ASISU and LAXOR

3.1.3 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.

3.1.4 Pilots of aircraft meeting RNP 10 navigation requirements must indicate /R at Item 10 of the ICAO Flight Plan.

3.2 OPERATIONS BY AIRCRAFT NOT MEETING RNP 10 REQUIREMENTS

3.2.1 An aircraft that is unable to meet the minimum navigational requirements for RNP 10 must file flight plan at FL280 or below. Operations above FL280 for these aircraft will be subject to ATC approval, in accordance with the provisions of paragraph 3.2.3.

3.2.2 Pilots of such aircraft wishing to operate on ATS routes specified in paragraph 3.1.1, at or above FL290, must indicate their level requirements at Item 18 of the ICAO Flight Plan as RMK/REQ FL (insert level). Approval to operate at the preferred level will be subject to ATC co-ordination and clearance. Flights that are not approved will be required to operate at FL280 or below or via alternative routes.

3.2.3 ATC units receiving a request for a non-RNP 10 approved aircraft to operate on ATS routes specified in paragraph 3.1.1, 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:

- traffic density;
- communications, including the non-availability of normal communications facilities;
- weather conditions en-route; and
- 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. A lateral separation minima of 60NM will be applied between aircraft equipped in accordance with RNP 10 navigation requirements, operating at FL290 or above, on ATS routes L644 and M772 (see paragraph 3.1.2). 50NM lateral separation minima will be applied between aircraft which are approved for RNP10 operations on ATS routes L625, L642, L649, M635, M767, M771, M774, N884 and N892 (see paragraph 3.1.1).
- b. When an aircraft not meeting the RNP 10 navigation requirements is approved to operate at or above FL290, on the ATS routes shown in paragraphs 3.1.1 and 3.1.2, vertical separation shall be applied with aircraft operating on adjacent routes.

3.5.2 Longitudinal Separation

3.5.2.1 80NM RNAV or 10 minutes (or less) Mach Number Technique (MNT) separation minima may be applied between aircraft.

← 3.5.2.2 50NM longitudinal separation may be applied between RNP10 approved aircraft on ATS routes L642, L762, M635, M767, M771, M774 and N884 which either LOGON to CPDLC or are within VHF radio range.

← 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 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 AIP Singapore pages ENR 1.8-3 to ENR 1.8-5.

←
←

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 the Bali, Bangkok, Hanoi, Ho Chi Minh, Hong Kong, Jakarta, Kota Kinabalu (including Brunei), Kuala Lumpur, Manila, Phnom Penh, Sanya, Singapore, Taipei 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/M752 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	Uni-directional
L625	FL310, FL320, FL350, FL360, FL390, FL400	Uni-directional
L642	FL310, FL320, FL350, FL360, FL390, FL400	Uni-directional
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	Uni-directional
M768	Eastbound - FL270, FL330, FL410 Westbound - FL300, FL380	
M771	FL310, FL320, FL350, FL360, FL390, FL400	Uni-directional
← M772	Northbound - FL300, FL380	
← N875	Eastbound - FL290, FL330, FL370 Westbound - FL300, FL340, FL380	
N884	FL310, FL320, FL350, FL360, FL390, FL400	Uni-directional
N891	Northbound - FL260, FL300, FL380 Southbound - FL330	
← N892	FL310, FL320, FL350, FL360, FL390, FL400	Uni-directional

- 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						

Flight Level Allocation (LSWD)	ATS Route and Direction of Flight					
	L642	M771	N892	L625	N884	M767
	SW	NE	SW	NE	NE	SW
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.

ENR 1.9 AIR TRAFFIC FLOW MANAGEMENT (ATFM)

1 AIR TRAFFIC FLOW MANAGEMENT (ATFM)

- 1.1 ATFM is a service established with the objective to assist air traffic services to be delivered in a safe, orderly and efficient manner by regulating air traffic flow to match the prevailing capacity at a given airport or airspace. ATFM provides indication of the predicted airborne delay and allows airspace user (AU) to determine the delay intent for the predicted amount of airborne delay to be absorbed in different phases of the flight. This enables airspace operators (AOs) and AUs to have better predictability of traffic flow and allow airlines to plan their connecting flight schedule 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, ATFM services are provided by Civil Aviation Authority of Singapore (CAAS) from the Singapore ATFM Unit (ATFMU). The services comprise the planning and implementation of ATFM measures to balance demand and capacity and the conduct of post operation analysis of the compliance to the ATFM measures. ATFM measures implemented by Singapore and other arrival ATFMU will be coordinated with AUs and AOs through CDM processes and agreed operating procedure.

2 DAILY ATFM OPERATIONS FOR FLIGHTS ARRIVING AT SINGAPORE CHANGI AIRPORT

- 2.1 ATFM operations will be carried out on a 24-hour basis. 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:

ANSP	Airport
Cambodia	VDPP
China	ZGGG, ZGSZ, ZJHK, ZJSY
Hong Kong	VHHH, VMMC
Indonesia	WIII, WADD, WARR
Malaysia	WBGG, WBGR, WBKK, WMKC, WMKI, WMKJ, WMKK, WMKP, WMSA
Myanmar	VYMD, VYNT, VYYY
Philippines	RPLL
Thailand	VTBS, VTSP, VTBD, VTCC, VTCT, VTSB, VTSG, VTSM, VTSP, VTSS, VTUD

- 2.3 When ATFM measures are applied, flights departing from the airports listed in paragraph 2.2 planning to arrive into Singapore Changi Airport shall adhere to their assigned Calculated Take-Off Times (CTOTs). The compliance to CTOT is important to ensure success in reducing the airborne holding.
- 2.4 All airspace users planning to arrive into WSSS should:
- 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.
- 2.5 FPLs and ATS messages should be addressed to WSJCZQZX.

- 2.6 Singapore ATFM Unit will provide ATFM helpdesk to answer operational queries from airspace users. The contact details are as follows:

Singapore ATFM Unit
 Email: CAAS_ATFMU@caas.gov.sg
 Phone: (065) 6422 7001
 Web Conference Helpdesk link: <https://wemeet.adobeconnect.com/caasatfm>

3 BAY OF BENGAL COOPERATIVE ATFM (BOBCAT)

3.1 INTRODUCTION

- 3.1.1 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.

3.2 PROVISION OF ATFM SERVICES

- 3.2.1 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 entry fix time, Calculated Time-Over (CTO) for each affected flight.
- 3.2.2 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, enroute holding and/or diversion around Kabul FIR.
- 3.2.3 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.
- 3.2.4 The 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 2.3. 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.

3.3 ATFM AFFECTED ATS ROUTES, FLIGHT LEVELS AND APPLICABLE HOURS

- 3.3.1 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	FL300, FL320, FL340, FL360, FL380, FL400
M875	SITAX	FL280
N644	PAVLO	FL280, FL300, FL320, FL340, FL360, FL380, FL400
L750	ROSIE	FL280, FL300, FL320, FL340, FL360, FL380, FL400
P628	ASLUM	FL320, FL340, FL360, FL380, FL400
N638 - P628	SERKA	FL280, FL300

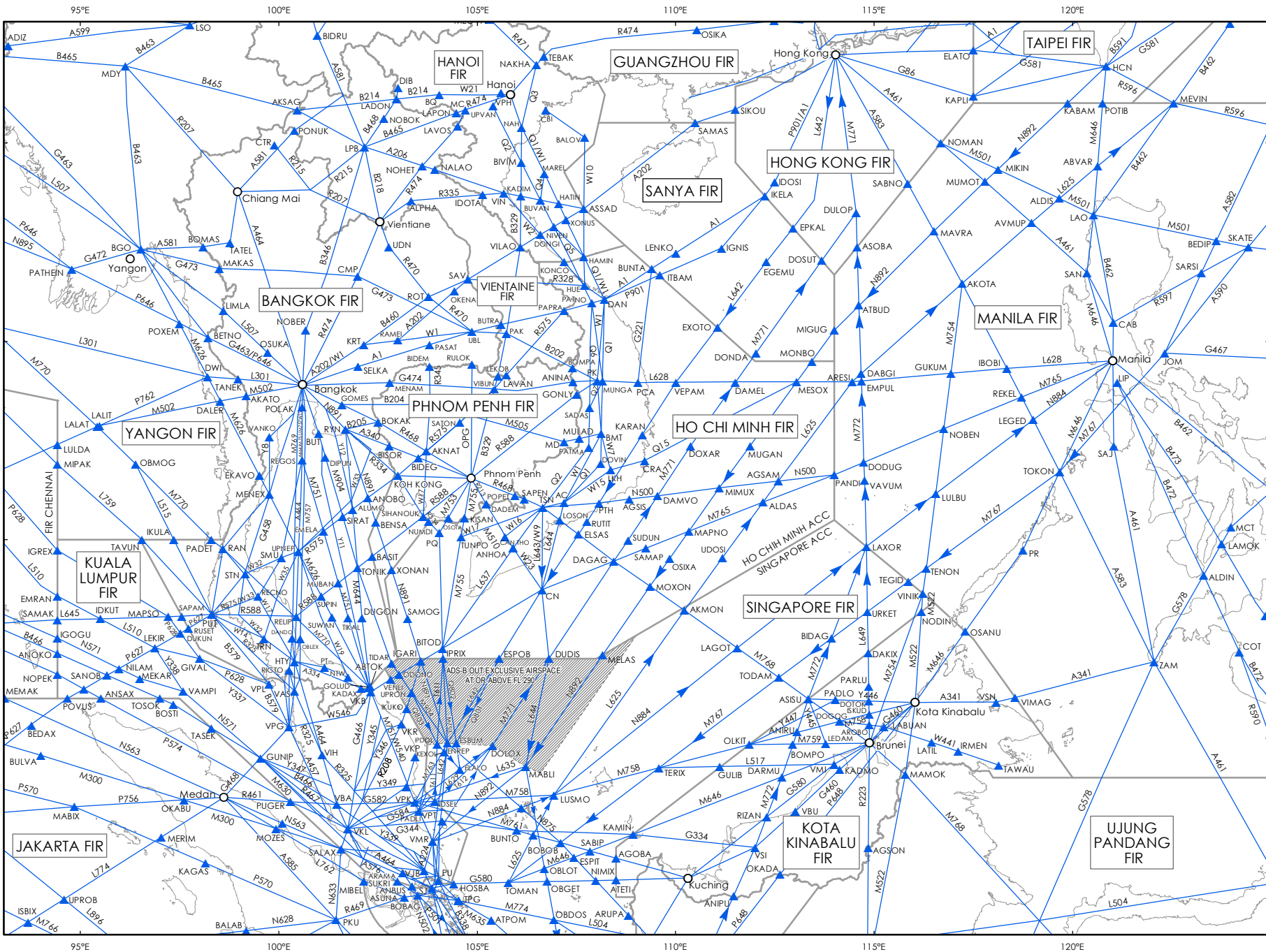
- 3.3.2 Flights that plan to enter Kabul FIR without an ATFM slot allocation will be accommodated only after flights with slots have been processed. Such flights should expect delayed pushback and start clearances, non- preferred routes and/or flight levels, enroute holding and/or diversion around Kabul FIR.
- 3.3.3 In order to ensure availability of slots for westbound departures from designated airports in northern India and Pakistan, departures from these airports are given priority for FL280 in the slot allocation. This does not preclude these flights from requesting higher flight levels with initial slot request.
- 3.3.4 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.

- 3.3.5 Flights exempted from ATFM procedures shall indicate the exemption in their flight plan as follows: (Field 18 - ATFM EXMP).
- 3.3.6 Singapore AIS shall forward the flight plan information to Bangkok ATFMU at AFTN address VTBBZDZX.

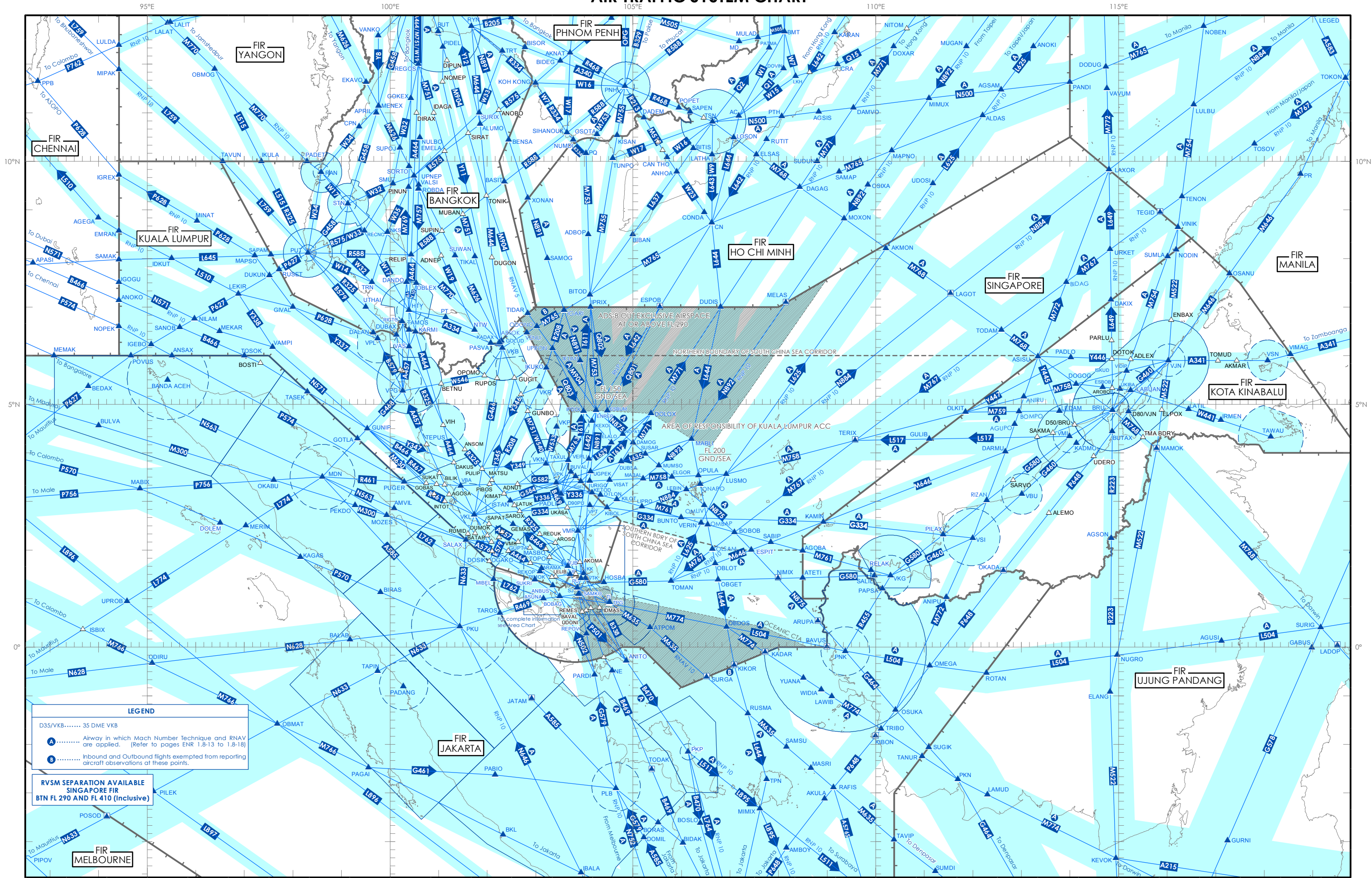
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ATS ROUTE STRUCTURE WITHIN SINGAPORE & ADJACENT FIRS



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AIR TRAFFIC SYSTEM CHART



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ENR 3.3 AREA NAVIGATION (RNAV) ROUTES

Route Designator {RNP Type}	[Route Usage Notes]					
Significant Point Name {RNP Type}	Significant Point Coordinates		Upper limit Lower limit	FL series		Remarks
	Initial Track MAG ↓ ↑	Great Circle Dist NM		↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
L504	Route availability: (1) H24					
▲ OBDOS	002503N 1065551E					
		126.9NM	FL 460 FL 145	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] (2)
▲ BAVUS (WSJC/WIIZ FIR BDRY)	000000N 1090000E					
<p><u>Route Remarks:</u> Lateral Limits: 25NM either side of line joining OBDOS to BAVUS.</p> <p>Singapore ACC FREQ: P134.4 MHz S128.1 MHz</p> <p>ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover within the Singapore FIR.</p> <p><u>Flight Planning:</u> Flights overflying Singapore to destinations north of Kuala Lumpur and Subang are to flight plan via BAVUS L504 OBDOS M774 TPG A464 SJ G579 VJB Y342 AROSO Y339.</p> <p>Flights overflying Singapore to land at Kuala Lumpur and Subang are to flight Plan via BAVUS L504 OBDOS M774 TPG A464 SJ G579 VJB A457.</p> <p><u>Point/Segment Remarks:</u> (2) NIL</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}	Significant Point Coordinates			FL series		Remarks
	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	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)
<p><u>Route Remarks:</u> Lateral Limits: 25NM either side of line joining GULIB to TERIX.</p> <p>ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover within the Singapore FIR.</p> <p><u>Point/Segment Remarks:</u> (2) NIL (3) VMI 269° 173NM</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates			FL series		Remarks
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
L762	Route availability: (1) H24					
▲ ASUNA	005948N 1030954E					(2)
(10)		66.2NM	FL 460 9500 FT ALT	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A]
▲ MIBEL (WIIZ/WSJC FIR BDRY)	012351N 1020816E					(2)
<u>Route Remarks:</u>						
Lateral Limits: 10NM either side of line joining ASUNA and MIBEL						
Available only for aircraft departing or arriving at airports within Singapore FIR.						
Singapore ACC FREQ: P133.25MHz S135.8MHz						
<u>Flight Planning:</u> Westbound - Aircraft originating only from airports within Singapore FIR to Medan and destinations beyond Jakarta FIR.						
Eastbound - Aircraft to destinations within Singapore FIR only.						
<u>Point/Segment Remarks:</u> (2) NIL						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}	Significant Point Coordinates			FL series		Remarks
	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	
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)
<p><u>Route Remarks:</u> Portion of M522 within the Singapore FIR has been delegated to Kota Kinabalu ACC for provision of ATS</p> <p>Kinabalu ACC FREQ: 126.1 MHz</p> <p><u>Point/Segment Remarks:</u> (2) NIL</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates			FL series		Remarks
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
M630	Route availability: (1) H24					
▲ SUKRI	012306N 1025904E					
(5)		37.3NM	FL 460 5500 FT ALT	Odd ⁽¹⁾		[Class A - ABV FL150 Class B - BLW FL150]
Δ BOBAG	010230N 1032954E					⁽²⁾
(5)		61.3NM	FL 460 5500 FT ALT	Odd ⁽¹⁾		[Class A - ABV FL150 Class B - BLW FL150]
▲ TANJUNG PINANG VOR/DME (TPG)	005413N 1043052E					
<p><u>Route Remarks:</u> Lateral Limits: 11.5NM either side of line joining SUKRI to TPG.</p> <p><u>Flight Planning:</u> Southbound flight planning permitted for flights from Kuala Lumpur and airports beyond which are overflying beyond Singapore. Flights landing at Singapore Changi Airport to flight plan on A464.</p> <p>Singapore ACC FREQ: P133.25 MHz S135.8 MHz</p> <p><u>Point/Segment Remarks:</u> (2) NIL</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}	Significant Point Coordinates		Upper limit Lower limit	FL series		Remarks Controlling unit Frequency {Airspace class} Remarks
	Initial Track MAG ↓ ↑	Great Circle Dist NM		↓	↑	
1	2	3	4	5	6	7
M635		Route availability: (1) H24				
▲ TEKONG DVOR/DME (VTK)	012455N 1040120E					(4)
		42.5NM	FL 460 5500 FT ALT	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A - ABV FL150 Class B - BLW FL150] (2)
▲ TANJUNG PINANG VOR/DME (TPG)	005413N 1043052E					
		58.5NM	FL 460 5500 FT ALT	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A - ABV FL150 Class B - BLW FL150] (3)
▲ ATPOM	002425N 1052114E					
		93.1NM	FL 460 5500 FT ALT	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A - ABV FL150 Class B - BLW FL150] (2)
▲ SURGA (WSJC/WIIZ FIR BDRY)	003657S 1063119E					
<p>Route Remarks: Lateral Limits: 25NM either side of line joining VTK to SURGA.</p> <p>Singapore ACC FREQ: P134.4 MHz S128.1 MHz</p> <p>Flight Planning: Flights overflying Singapore to destinations north of Kuala Lumpur and Subang are to flight plan via SURGA M635 TPG A464 SJ G579 VJB Y342 AROSO Y339.</p> <p>Flights overflying Singapore to land at Kuala Lumpur and Subang are to flight plan via SURGA M635 TPG A464 SJ G579 VJB A457.</p> <p>Point/Segment Remarks: (2) NIL (3) TPG 120.5° 58.5 (4) Kuala Lumpur / Singapore FIR boundary approximately 1.2NM north of VTK.</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates				Remarks	
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	FL series ↓ ↑		Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
M646	Route availability: (1) H24					
▲ KAMIN (WBFC/WSJC FIR BDRY)	023442N 1085536E					
		69.6NM	FL 460 FL 240	Even ⁽¹⁾	Odd ⁽¹⁾	[Class A] (2)
▲ SABIP	020940N 1075044E					
		26.1NM	FL 460 FL 240	Even ⁽¹⁾	Odd ⁽¹⁾	[Class A] (2)
▲ ESPIT	020011N 1072624E					
		47.9NM	FL 460 FL 240	Even ⁽¹⁾	Odd ⁽¹⁾	[Class A] (2)
▲ OBLOT	014256N 1064147E					
		58.5NM	FL 460 FL 240	Even ⁽¹⁾	Odd ⁽¹⁾	[Class A] (2)
▲ TOMAN	012147N 1054717E					
<p><u>Route Remarks:</u> Lateral Limits: 25NM either side of TOMAN to KAMIN.</p> <p>ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover (between SABIP and KAMIN) within the Singapore FIR.</p> <p>Singapore ACC FREQ: P134.2 MHz S133.35 MHz</p> <p><u>Point/Segment Remarks:</u> (2) NIL</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}	Significant Point Coordinates			FL series		Remarks
	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	
M753		Route availability: (1) H24				
▲ IPRIX (VVTS/WSJC FIR BDRY)	070000N 1040755E					
		127.2NM	FL 460 FL 155	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] ⁽²⁾
▲ ENREP	045223N 1041442E					
<p><u>Route Remarks:</u> Singapore ACC FREQ: P134.35 MHz S133.6 MHz</p> <p>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.</p> <p><u>Lateral Limits:</u> 25NM either side of line joining ENREP to IPRIX.</p> <p><u>Point/Segment Remarks:</u> (2) NIL</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates			FL series		Remarks
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	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/MMFC FIR BDRY)	080242N 1160054E					
<p><u>Route Remarks:</u> Lateral Limits: 10NM either side of line joining SUMLA to VINIK.</p> <p>Portion of M754 within the Singapore FIR has been delegated to Kinabalu ACC for provision of ATS.</p> <p>Kinabalu ACC FREQ: 126.1 MHz</p> <p><u>Point/Segment Remarks:</u> (2) BRU 019° 238.9NM</p>						

Route Designator {RNP Type}		[Route Usage Notes]					Remarks
Significant Point Name		Significant Point Coordinates		Upper limit Lower limit	FL series		
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM			↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7	
M758		Route availability: (1) H24					
▲ PEKAN DVOR/DME (VPK)	032259N 1032524E						
		30.4NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] ⁽³⁾	
▲ IDSEL (WMFC/WSJC FIR BDRY)	032432N 1035544E						
		11.1NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] ⁽⁴⁾	
▲ URIGO	032505N 1040647E						
		24.8NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] ⁽⁴⁾	
▲ VISAT	032620N 1043134E						
		41.1NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] ⁽⁴⁾	
▲ MABAL	032826N 1051236E						
		35.7NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] ⁽⁴⁾	
▲ ELGOR	033014N 1054818E						
		67.4NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] ⁽⁴⁾	
▲ LUSMO	033341N 1065534E						
		164.6NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] ⁽²⁾	
▲ TERIX	041521N 1093456E						
		140.5NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] ^{(2) (5)}	
▲ OLKIT (WSJC/WBFC FIR BDRY)	045010N 1115118E						
Route Remarks:							
Lateral Limits: 10NM either side of line joining VPK DVOR/DME to IDSEL and 25NM either side of line joining IDSEL to OLKIT.							
Point/Segment Remarks:							
(2) ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover (between LUSMO and OLKIT) within the Singapore FIR.							
(3) Segment from VPK to IDSEL use: P123.7 MHz S127.3 MHz							
(4) Segment from IDSEL to LUSMO use: P134.7 MHz S134.15 MHz							
(5) VJN 255° 258.0NM							

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates				Remarks	
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	FL series ↓ ↑		Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
M761		Route availability: (1) H24				
▲ PEKAN DVOR/DME (VPK)	032259N 1032524E					
		46.0NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] (3)
▲ KETOD (WMFC/WSJC FIR BDRY)	031042N 1040942E					
		10.8NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] (4)
▲ OTLON	030752N 1042006E					
		21.0NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] (4)
▲ KILOT	030217N 1044023E					
		32.3NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] (4)
▲ LIPRO	025342N 1051128E					
		118.8NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] (5)
▲ BOBOB	022206N 1070558E					
		46.5NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] (5)
▲ SABIP	020940N 1075044E					
		40.8NM	FL 460 FL 240	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] (2) (5) (6)
▲ AGOBA (WSJC/WBFC FIR BDRY)	015840N 1083000E					
<p><u>Route Remarks:</u> Lateral Limits: 10NM either side of line joining VPK DVOR/DME to KETOD and 25NM either side of line joining KETOD to AGOBA. Portion of M761 within Singapore FIR between AGOBA and 1080000E has been delegated to Kuching ACC for provision of ATS. Kuching ACC FREQ: 134.5 MHz</p> <p><u>Point/Segment Remarks:</u> (2) ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover (between SABIP and AGOBA) within the Singapore FIR. (3) Segment from VPK to KETOD use: P123.7 MHz S127.3 MHz (4) Segment from KETOD to LIPRO use: P134.7 MHz S134.15 MHz (5) Segment from LIPRO to AGOBA use: P134.2 MHz S133.35 MHz (6) VKG 285° 112.7NM</p>						

Route Designator {RNP Type}		[Route Usage Notes]					Remarks
Significant Point Name {RNP Type}	Significant Point Coordinates		Upper limit Lower limit	FL series		Controlling unit Frequency {Airspace class} Remarks	
	Initial Track MAG ↓ ↑	Great Circle Dist NM		↓	↑		
1	2	3	4	5	6	7	
M763		Route availability: (1) H24					
▲ ENREP	045223N 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						
<p><u>Route Remarks:</u> 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</p> <p><u>Point/Segment Remarks:</u> (2) NIL</p>							

<i>Route Designator {RNP Type}</i>		<i>[Route Usage Notes]</i>				
<i>Significant Point Name</i>	<i>Significant Point Coordinates</i>					<i>Remarks</i>
<i>{RNP Type}</i>	<i>Initial Track MAG</i>	<i>Great Circle Dist NM</i>	<i>Upper limit Lower limit</i>	<i>FL series</i>		<i>Controlling unit Frequency {Airspace class} Remarks</i>
	↓ ↑			↓	↑	
1	2	3	4	5	6	7
M765	<i>Route availability:</i> (1) H24					
▲ IGARI	065610N 1033506E					
		53.3NM	FL 460 FL 135	Even ⁽¹⁾	Odd ⁽¹⁾	[Class B] ⁽²⁾
▲ VENLI (WMFC/WSJC FIR BDRY)	062848N 1024900E					
<i>Route Remarks:</i>						
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						
<i>Point/Segment Remarks:</i>						
(2) VKB 058° 88.8NM						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}	Significant Point Coordinates		Upper limit Lower limit	FL series		Remarks Controlling unit Frequency {Airspace class} Remarks
	Initial Track MAG ↓ ↑	Great Circle Dist NM		↓	↑	
1	2	3	4	5	6	7
M767		Route availability: (1) H24				
▲ TEGID (RPHI/WSJC FIR BDRY)	085656N 1155143E					(2)
(10)		242.5NM	FL 460 FL 205			[Class A]
▲ TODAM	063138N 1123536E					(2)
(10)		225.5NM	FL 460 FL 205			[Class A]
▲ TERIX	041521N 1093456E					(2)
(10)		186.8NM	FL 460 FL 205			[Class A]
▲ BOBOB	022206N 1070558E					(2)
(10)		99.0NM	FL 460 FL 205			[Class A]
▲ TOMAN	012147N 1054717E					(2)
<p><u>Route Remarks:</u> Lateral Limits: 25NM either side of line joining TOMAN to TEGID.</p> <p>ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover (between TEGID and BOBOB) within the Singapore FIR.</p> <p>Singapore ACC FREQ: P134.2 MHz S133.35 MHz</p> <p>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.</p> <p><u>Point/Segment Remarks:</u> (2) NIL</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates			FL series		Remarks
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
M768		Route availability: (1) H24				
▲ AKMON	081256N 1101308E					(2)
		96.9NM	FL 460 FL 135	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A]
▲ LAGOT	071632N 1113243E					(2)
		76.9NM	FL 460 FL 135	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A]
▲ TODAM	063138N 1123536E					(2)
		55.4NM	FL 460 FL 135	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A]
▲ ASISU (WSJC/WBFC FIR BDRY)	055906N 1132046E					(3)
<p><i>Route Remarks:</i> Lateral Limits: 25NM either side of line joining ASISU to AKMON.</p> <p>ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover within the Singapore FIR.</p> <p><i>Point/Segment Remarks:</i> (2) NIL (3) BRU 305° 113.3NM</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}		Significant Point Coordinates			Remarks	
		Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	FL series ↓ ↑	
1		2	3	4	5	6
7						
M771		Route availability: (1) H24				
▲ DUDIS (WSJC/VVTS FIR BDRY)		070000N 1064834E			(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
S133.6 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			FL series		Remarks
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	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)
<p><u>Route Remarks:</u> Lateral Limits: 25NM either side of line joining ASISU to LAXOR.</p> <p>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 WBSG to VHHH only.</p> <p>ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover within the Singapore FIR.</p> <p><u>Point/Segment Remarks:</u> (2) NIL (3) BRU 305° 113.3NM</p>						

Route Designator {RNP Type}		[Route Usage Notes]					Remarks
Significant Point Name		Significant Point Coordinates			FL series		Controlling unit Frequency {Airspace class} Remarks
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑		
1	2	3	4	5	6	7	
M774		Route availability: (1) H24					
▲ TANJUNG PINANG VOR/DME (TPG)	005413N 1043052E					(2)	
		148.1NM	FL 460 5500 FT ALT	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A-ABV FL150 Class B-BLW FL150]	
▲ OBDOS	002503N 1065551E					(3)	
		57.5NM	FL 460 5500 FT ALT	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A-ABV FL150 Class B-BLW FL150]	
▲ KADAR (WSJC/WIIZ FIR BDRY)	000647S 1074342E					(2)	
<p><u>Route Remarks:</u> Lateral Limits: 25NM either side of line joining TPG to KADAR. Route from OBDOS to KADAR is RNAV10. Singapore ACC FREQ: P134.4 MHz S128.1 MHz</p> <p><u>Flight Planning:</u> Flights overflying Singapore to destinations north of Kuala Lumpur and Subang are to flight plan via KADAR M774 TPG A464 SJ G579 VJB Y342 AROSO Y339. Flights overflying Singapore to land at Kuala Lumpur and Subang are to flight plan via KADAR M774 TPG A464 SJ G579 VJB A457.</p> <p><u>Point/Segment Remarks:</u> (2) NIL (3) TPG 101.3° 148.1NM</p>							

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates			FL series		Remarks
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
M904		Route availability: (1) H24				
▲ TIDAR (WSJC/VTBB FIR BDRY)	065230.15N 1024959.82E					
		20.0NM	FL 460 6500 FT ALT	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A (FL290 and ABV)] (2)
▲ ODONO	063613.82N 1030129.41E					
		33.0NM	FL 460 FL 145	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A (FL290 and ABV)] (2)
▲ UPRON	060903.41N 1032039.98E					
		93.0NM	FL 460 FL 245	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A (FL290 and ABV)] (2)
▲ ENREP	045223N 1041442E					
<p><i>Route Remarks:</i> Singapore ACC FREQ: P134.35 MHz S133.6 MHz</p> <p>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.</p> <p>Lateral Limits: 25NM</p> <p><i>Point/Segment Remarks:</i> (2) NIL</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}	Significant Point Coordinates			FL series		Remarks
	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	
N502		Route availability: (1) H24				
▲ BOBAG (R243/24 DME SJ)	010230N 1032954E					(2)
	335° -	105.3NM	FL 460 FL 275		Even ⁽¹⁾	
▲ PARDI	003400S 1041300E					(2)
<p><u>Route Remarks:</u> Lateral Limits: 10NM on the western side and 5NM on the eastern side of line joining BOBAG to PARDI.</p> <p>Singapore ACC FREQ: P134.4 MHz S128.1 MHz</p> <p><u>Point/Segment Remarks:</u> (2) NIL</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates				Remarks	
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	FL series ↓ ↑		Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
N875		Route availability: (1) H24				
▲ ENREP	045223N 1041442E					(6)
		44.1NM	FL 460 FL 245	Odd ⁽¹⁾	Even ⁽¹⁾	[Class B] (3)
▲ NOPAT	042313N 1044756E					(6)
		16.3NM	FL 460 FL 245	Odd ⁽¹⁾	Even ⁽¹⁾	[Class B] (3)
▲ DAMOG	041225N 1050014E					(6)
		20.6NM	FL 460 FL 245	Odd ⁽¹⁾	Even ⁽¹⁾	[Class B] (3)
▲ SUSAR	035848N 1051547E					(6)
		21.8NM	FL 460 FL 245	Odd ⁽¹⁾	Even ⁽¹⁾	[Class B] (4)
▲ MUMSO	034420N 1053213E					(6)
		21.3NM	FL 460 FL 245	Odd ⁽¹⁾	Even ⁽¹⁾	[Class B] (4)
▲ ELGOR	033014N 1054818E					(6)
		23.6NM	FL 460 FL 245	Odd ⁽¹⁾	Even ⁽¹⁾	[Class B] (4)
▲ LEBIN	031438N 1060604E					(6)
		79.5NM	FL 460 FL 245	Odd ⁽¹⁾	Even ⁽¹⁾	[Class B] (5)
▲ BOBOB	022206N 1070558E					(6)
		29.9NM	FL 460 FL 245	Odd ⁽¹⁾	Even ⁽¹⁾	[Class B] (5)
▲ ESPIT	020011N 1072624E					(6)
		48.3NM	FL 460 FL 245	Odd ⁽¹⁾	Even ⁽¹⁾	[Class B] (5)
▲ NIMIX	012452N 1075926E					(6)
		72.4NM	FL 460 FL 245	Odd ⁽¹⁾	Even ⁽¹⁾	[Class B] (2)
▲ ARUPA	003140N 1084846E					(7)
<i>Route Remarks:</i>						
Lateral Limits: 25NM either side of line joining ENREP to ARUPA.						
<i>Point/Segment Remarks:</i>						
(2) ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover (between NIMIX and ARUPA) within the Singapore FIR.						
(3) Segment from ENREP to SUSAR use: P123.7 MHz S127.3 MHz						
(4) Segment from SUSAR to LEBIN use: P134.7 MHz S134.15 MHz						
(5) Segment from LEBIN to NIMIX use: P134.2 MHz S133.35 MHz						
(6) NIL						
(7) PNK 316° 49.6NM						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}	Significant Point Coordinates		Upper limit Lower limit	FL series		Remarks Controlling unit Frequency {Airspace class} Remarks
1	Initial Track MAG ↓ ↑	Great Circle Dist NM	2	3	4	5
N884		Route availability: (1) H24				
▲ LAXOR (WSJC/RPHI FIR BDRY)	094937N 1144829E					(5)
(10)		246.6NM	FL 460 6500 FT ALT			[Class A] (2)
▲ LAGOT	071632N 1113243E					(5)
(10)		354.3NM	FL 460 6500 FT ALT			[Class A] (2)
▲ LUSMO	033341N 1065534E					(6)
(10)		53.0NM	FL 460 6500 FT ALT			[Class A] (3)
▲ LEBIN	031438N 1060604E					(7)
(10)		58.5NM	FL 460 6500 FT ALT			[Class A] (3)
▲ LIPRO	025342N 1051128E					(8)
(10)		34.2NM	FL 460 6500 FT ALT			[Class A] (3)
▲ LENDA (WSJC/MMFC FIR BDRY)	024124N 1043932E					(9)
(10)		50.6NM	FL 460 6500 FT ALT			[Class A] (4)
▲ MERSING DVOR/DME (VMR)	022318N 1035218E					
<p><u>Route Remarks:</u> Lateral Limits: 5NM either side of line joining VMR DVOR/DME to LUSMO funnelling out at an angle of 5° from VMR to 25NM of either side of track. It then continues at this width until LAXOR.</p> <p>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.</p> <p>Not available for flight planning between VMR and LUSMO. Flight Plan via TOMAN L625 LUSMO.</p> <p><u>Point/Segment Remarks:</u> (2) ADS-C and CPDLC services are available to suitably equipped aircraft operating outside radar cover (between LUSMO and LAXOR) within the Singapore FIR. (3) Segment from LUSMO to LENDA use: P134.7 MHz S134.15 MHz (4) Segment from LENDA to VMR use: P133.8 MHz S127.3 MHz (5) NIL (6) VMR 069° 196.3NM (7) VMR 069° 143.3NM (8) VMR069° 84.8NM (9) VMR 069° 50.6NM</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates				Remarks	
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	FL series ↓ ↑		Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
N891		Route availability: (1) H24				
▲ IGARI	065610N 1033506E				(6)	
		65.4NM	FL 460 FL 155	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] (2)
▲ IKUMI	055338N 1035509E				(6)	
		64.0NM	FL 460 FL 155	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] (2)
▲ ENREP	045223N 1041442E				(7)	
		75.5NM	FL 460 FL 155	Odd ⁽¹⁾	Even ⁽¹⁾	[Class A] (3)
▲ UGPEK	033647N 1040752E				(8)	
		11.7NM	FL 460 FL 155	Even ⁽¹⁾	Odd ⁽¹⁾	[Class A] (3)
▲ URIGO	032505N 1040647E				(9)	
		10.6NM	FL 460 FL 155	Even ⁽¹⁾	Odd ⁽¹⁾	[Class A] (3)
▲ MANIM (WMFC/WSJC FIR BDRY)	031431N 1040553E				(10)	
		2.6NM	FL 460 FL 155	Even ⁽¹⁾	Odd ⁽¹⁾	[Class A] (4)
▲ OBDAB	031153N 1040538E				(11)	
		106.4NM	FL 460 FL 155	Even ⁽¹⁾	Odd ⁽¹⁾	[Class A] (4)
▲ PAPA UNIFORM DVOR/DME (PU)	012523.99N 1035559.74E				(5)	
<i>Route Remarks:</i>						
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						
Lateral Limits:						
5NM either side of line joining PU DVOR/DME to ENREP funnelling out at an angle of 5° from PU to 25NM of either side of track. It then continues at this width until WSJC/VVTS FIR BDRY.						
<i>Point/Segment Remarks:</i>						
(2) Segment from IGARI to ENREP use: P134.35 MHz S133.6 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						
(7) PU 005° 206.8NM						
(8) PU 005° 131.3NM						
(9) PU 005° 119.6NM						
(10) PU 005° 109.0NM						
(11) PU 005° 106.4NM						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}		Significant Point Coordinates			Remarks	
		Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	FL series ↓ ↑	
1	2	3	4	5	6	7
N892		Route availability: (1) H24				
▲ MELAS (VTS/WSJC FIR BDRY)	070520N 1080911E					
(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	025229N 1042805E					(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					
<p><u>Route Remarks:</u> Lateral Limits: 10NM either side of line joining VMR DVOR/DME to KIBOL and 25NM either side of line joining KIBOL to MELAS.</p> <p>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.</p> <p><u>Point/Segment Remarks:</u> (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 S133.6 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</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates			FL series		Remarks
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
P501	Route availability: (1) H24					
▲ ARAMA (50DME SJ) (delegated airspace BDRY)	013654N 1030712E					(6)
	146° -	25.0NM	FL 460 9500 FT ALT	Odd ⁽¹⁾		[Class A-ABV FL150 Class B-BLW FL150] (2) (3)
▲ ANBUS (WMFC/WSJC FIR BDRY)	011556N 1032102E					(6)
	146° -	16.0NM	FL 460 9500 FT ALT	Odd ⁽¹⁾		[Class A-ABV FL150 Class B-BLW FL150] (2) (3)
▲ BOBAG (R243/24 DME SJ)	010230N 1032954E					(6)
	133° -	114.1NM	FL 460 FL 275	Odd ⁽¹⁾		(4) (5)
▲ ANITO	001700S 1045200E					(6)
<u>Point/Segment Remarks:</u>						
(2) Lateral Limits: 10NM on the western side and 5NM on the eastern side of line joining ARAMA to BOBAG.						
(3) Singapore ACC FREQ: P133.25 MHz S135.8 MHz						
(4) Lateral Limits: 10NM on the western side and 5NM on the eastern side of line joining BOBAG to ANITO.						
(5) Singapore ACC FREQ: P134.4 MHz S128.1 MHz						
(6) NIL						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}	Significant Point Coordinates			FL series		Remarks
	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
Q801	<i>Route availability:</i> (1) H24					
▲ ESPOB (VVTS/WSJC FIR BDRY)	070000N 1053318E					
		143.0NM	FL 460 FL 200			[Class A]
▲ ESBUM	045210N 1042830E					
<p><i>Route Remarks:</i> Lateral Limits: 15NM either side of line joining ESPOB TO ESBUM.</p> <p>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.</p> <p>Singapore ACC FREQ: P134.35 MHz S133.6 MHz</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates			FL series		Remarks
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
Q802	Route availability: (1) H24					
▲ IPRIX (VVTS/WSJC FIR BDRY)	070000N 1040755E					
		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					
<p><i>Route Remarks:</i> Lateral Limits: 15NM either side of line joining IPRIX to ELALO</p> <p>Singapore ACC FREQ: P134.35 MHz S133.6 MHz</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}	Significant Point Coordinates		Upper limit Lower limit	FL series		Remarks
	Initial Track MAG ↓ ↑	Great Circle Dist NM		↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
Q803		Route availability: (1) H24				
▲ UPRON	060903.41N 1032039.98E					
		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					
<p><i>Route Remarks:</i> Lateral Limits: 15NM either side of line joining UPRON to ELALO</p> <p>Singapore ACC FREQ: P134.35 MHz S133.6 MHz</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates			FL series		Remarks
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
T611		Route availability: (1) H24				
▲ IPRIX (VVTS/WSJC FIR BDRY)	070000N 1040755E					
		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					
<p><u>Route Remarks:</u> Lateral Limits: 15NM either side of line joining IDSEL to IPRIX.</p> <p>Singapore ACC FREQ: P123.7 MHz S127.3 MHz</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}	Significant Point Coordinates		Upper limit Lower limit	FL series		Remarks Controlling unit Frequency {Airspace class} Remarks
1	Initial Track MAG ↓ ↑ 2	Great Circle Dist NM 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					
<p><u>Route Remarks:</u> Lateral Limits: 15NM either side of line joining IDSEL to DOLOX.</p> <p>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.</p> <p>Singapore ACC FREQ: P123.7 MHz S127.30 MHz</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates			FL series		Remarks
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
Y332	Route availability: (1) H24					
▲ TAXUL (WSJC/MMFC FIR BDRY)	035035N 1034037E					(2)
	192° -	42.1NM	FL 460 FL 245	Even ⁽¹⁾		
▲ PADLI	030918N 1033133E					(2)
<p><u>Route Remarks:</u> Lateral Limits: 10NM either side of line joining TAXUL to PADLI.</p> <p>Singapore ACC FREQ: P123.7 MHz S127.3 MHz</p> <p><u>Point/Segment Remarks:</u> (2) NIL</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}	Significant Point Coordinates			FL series		Remarks
	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
Y333	Route availability: (1) H24					
▲ BUVAL (WMFC/WSJC FIR BDRY)	033622N 1034341E					(2)
	024° -	29.5NM	FL 460 FL 245		Odd ⁽¹⁾	
▲ PADLI	030918N 1033133E					(2)
<p><u>Route Remarks:</u> Lateral Limits: 10NM either side of line joining PADLI to BUVAL.</p> <p>Singapore ACC FREQ: P123.7 MHz S127.3 MHz</p> <p><u>Point/Segment Remarks:</u> (2) NIL</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name	Significant Point Coordinates			FL series		Remarks
{RNP Type}	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	Controlling unit Frequency {Airspace class} Remarks
1	2	3	4	5	6	7
Y334	Route availability: (1) H24					
▲ DOVOL (WSJC/MMFC FIR BDRY)	033047N 1034923E					(2)
	219° -	27.8NM	FL 460 FL 245	Even ⁽¹⁾		
▲ PADLI	030918N 1033133E					(2)
<p><u>Route Remarks:</u> Lateral Limits: 10NM either side of line joining DOVOL to PADLI.</p> <p>Singapore ACC FREQ: P123.7 MHz S127.3 MHz</p> <p><u>Point/Segment Remarks:</u> (2) NIL</p>						

Route Designator {RNP Type}		[Route Usage Notes]				
Significant Point Name {RNP Type}	Significant Point Coordinates			FL series		Remarks
	Initial Track MAG ↓ ↑	Great Circle Dist NM	Upper limit Lower limit	↓	↑	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					
	057° 237°	28.5NM	FL 460 FL 245	Even ⁽¹⁾	Odd ⁽¹⁾	⁽²⁾
▲ PADLI	030918N 1033133E					
<p><u>Route Remarks:</u> Lateral Limits: 10NM on either side of line joining IDSEL to PADLI.</p> <p>Singapore ACC FREQ: P123.7 MHz S127.3 MHz</p> <p><u>Point/Segment Remarks:</u> (2) NIL</p>						

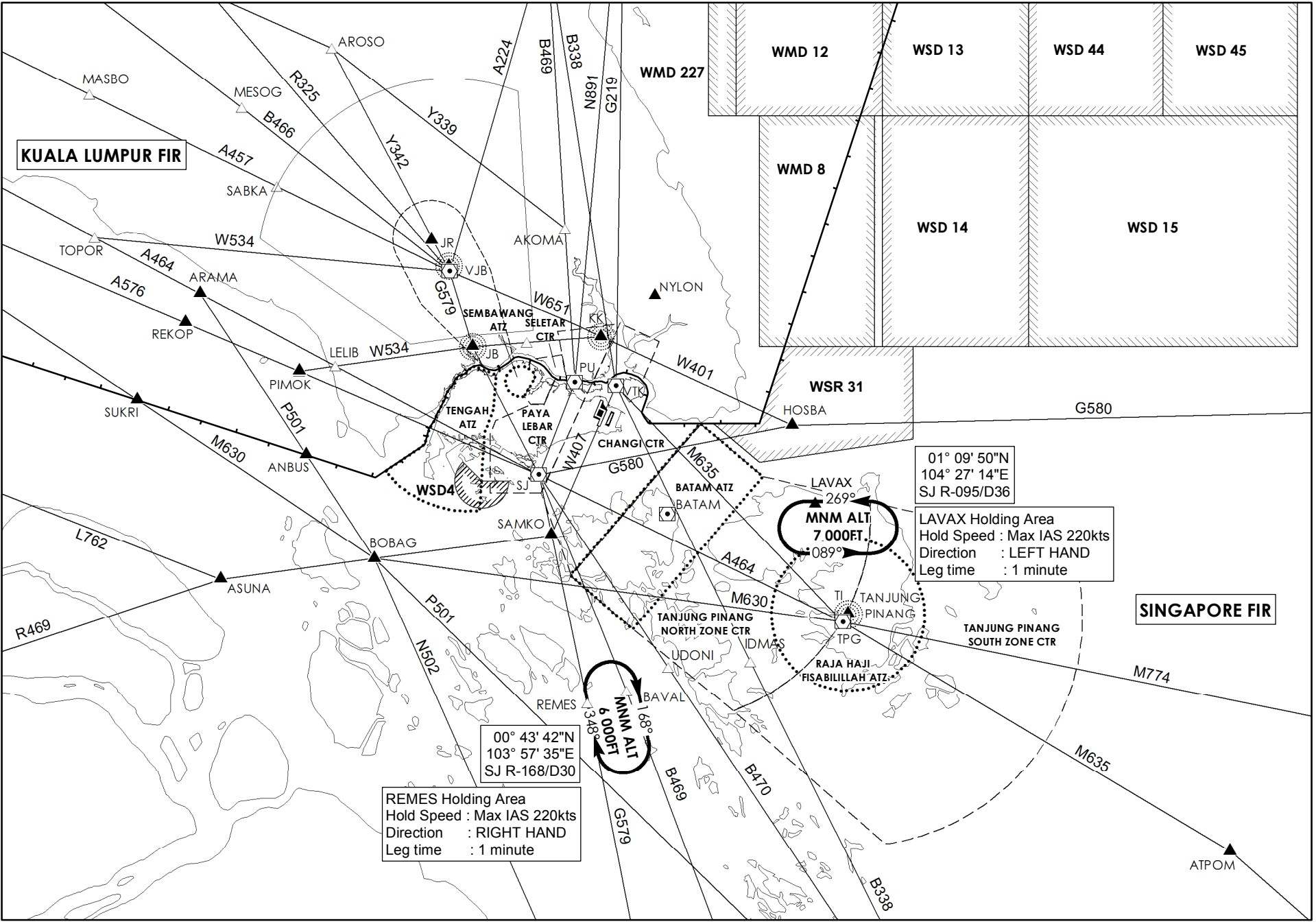
<i>Route Designator {RNP Type}</i>		<i>[Route Usage Notes]</i>				
<i>Significant Point Name</i>	<i>Significant Point Coordinates</i>					<i>Remarks</i>
<i>{RNP Type}</i>	<i>Initial Track MAG</i>	<i>Great Circle Dist NM</i>	<i>Upper limit Lower limit</i>	<i>FL series</i>		<i>Controlling unit Frequency {Airspace class} Remarks</i>
	↓ ↑			↓	↑	
1	2	3	4	5	6	7
Y336	<i>Route availability:</i> (1) H24					
▲ KETOD (WMFC/WSJC FIR BDRY)	031042N 1040942E					
	087° 267°	38.2NM	FL 460 FL 245	Even ⁽¹⁾	Odd ⁽¹⁾	
▲ PADLI	030918N 1033133E					
<i>Route Remarks:</i> 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 {RNP Type}	Significant Point Coordinates		Upper limit Lower limit	FL series		Remarks Controlling unit Frequency {Airspace class} Remarks
1	Initial Track MAG ↓ ↑ 2	Great Circle Dist NM 3	4	↓ 5	↑ 6	7
Y339		Route availability: (1) H24				
Δ AKOMA (20 DME PU)	014522N 1035443E					
(5)		38.3NM	FL 460 5500 FT ALT	Even ⁽¹⁾		[Class A-ABV FL150 Class B-BLW FL150]
Δ AROSO	020846N 1032421E					
<p><u>Route Remarks:</u> Lateral Limits: 11.5NM either side of line joining AKOMA to AROSO.</p> <p><u>Flight Planning</u> Flight planning permitted for flights departing from or overflying Singapore to destinations north of Kuala Lumpur and Subang airports. Flight planning to operate at FL220 and below to flight plan on A457.</p> <p>Singapore ACC FREQ: P133.25 MHz S135.8 MHz</p>						

<i>Route Designator {RNP Type}</i>		<i>[Route Usage Notes]</i>				
<i>Significant Point Name</i>	<i>Significant Point Coordinates</i>					<i>Remarks</i>
<i>{RNP Type}</i>	<i>Initial Track MAG</i>	<i>Great Circle Dist NM</i>	<i>Upper limit Lower limit</i>	<i>FL series</i>		<i>Controlling unit Frequency {Airspace class} Remarks</i>
	↓ ↑			↓	↑	
1	2	3	4	5	6	7
Y342	<i>Route availability:</i> (1) H24					
▲ JOHOR BAHRU DVOR/DME (VJB)	013950.4N 1033939.2E					
(5)		32.6NM	FL 460 4500 FT	Even ⁽¹⁾		[Class A-ABV FL150 Class B-BLW FL150]
Δ AROSO	020846N 1032421E					
<i>Route Remarks:</i> Lateral Limits: 10NM either side of line joining VJB to AROSO.						

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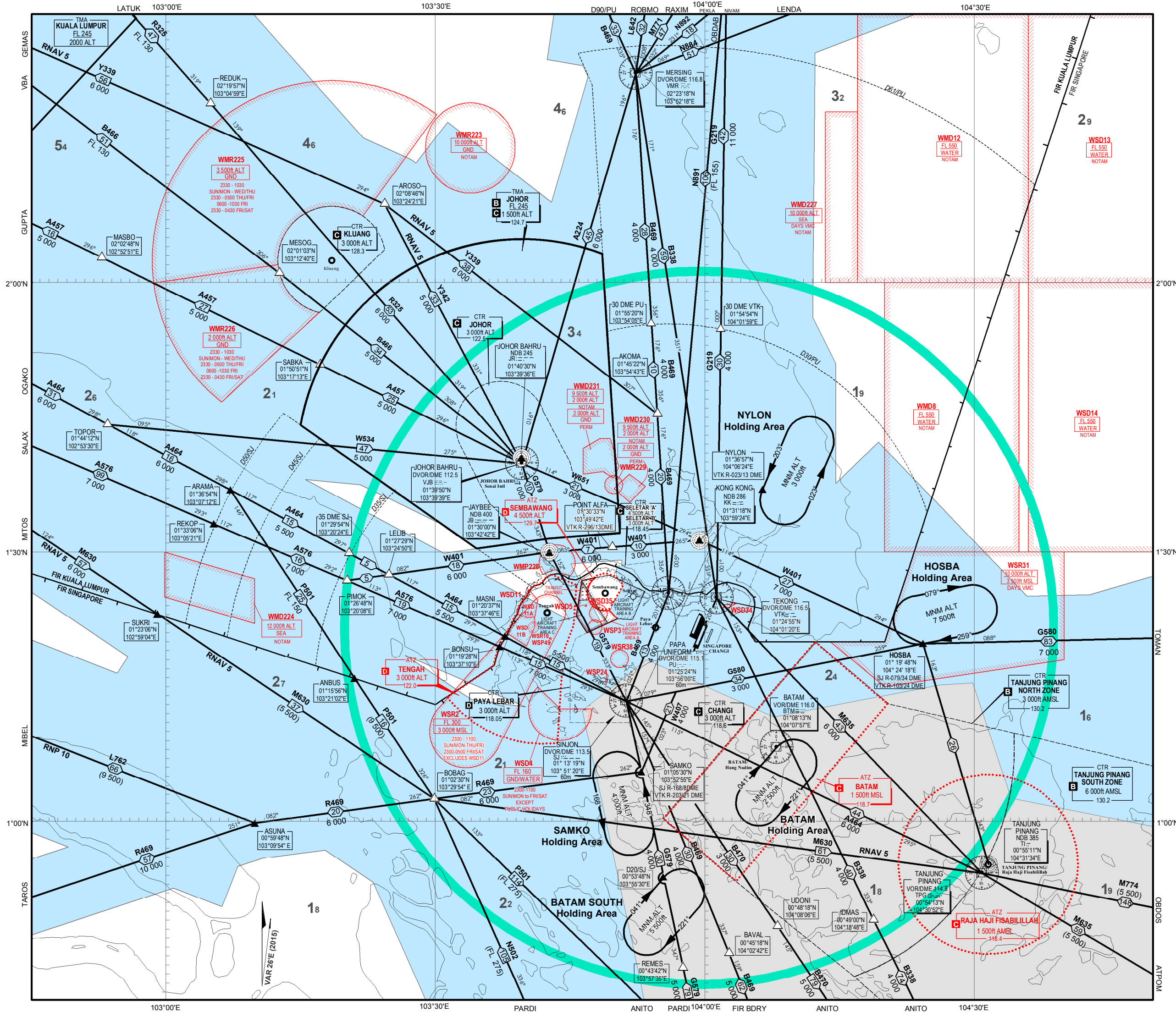
REMES AND LAVAX LOW LEVEL HOLDING AREAS



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AREA CHART - ICAO

SINGAPORE/JOHOR AIRSPACE COMPLEX LOW LEVEL HOLDING AREAS



LEGEND											
Terminal Control Area (TMA)	<table border="1"> <tr><td>Name of TMA</td><td>TMA JOHOR</td></tr> <tr><td>Airspace Classification</td><td>FL 145</td></tr> <tr><td>Upper Limit</td><td>1 500ft</td></tr> <tr><td>Lower Limit</td><td>124.7</td></tr> <tr><td>Radio frequency(ies)</td><td></td></tr> </table>	Name of TMA	TMA JOHOR	Airspace Classification	FL 145	Upper Limit	1 500ft	Lower Limit	124.7	Radio frequency(ies)	
Name of TMA	TMA JOHOR										
Airspace Classification	FL 145										
Upper Limit	1 500ft										
Lower Limit	124.7										
Radio frequency(ies)											
Control Zone (CTR)	<table border="1"> <tr><td>Name of CTR</td><td>CTR CHANGI</td></tr> <tr><td>Airspace Classification</td><td>3 000ft</td></tr> <tr><td>Upper Limit</td><td>118.6m</td></tr> <tr><td>Radio frequency(ies)</td><td></td></tr> </table>	Name of CTR	CTR CHANGI	Airspace Classification	3 000ft	Upper Limit	118.6m	Radio frequency(ies)			
Name of CTR	CTR CHANGI										
Airspace Classification	3 000ft										
Upper Limit	118.6m										
Radio frequency(ies)											
Aerodrome Traffic Zone (ATZ)	<table border="1"> <tr><td>Name of ATZ</td><td>ATZ TENGAH</td></tr> <tr><td>Airspace Classification</td><td>3 000ft</td></tr> <tr><td>Upper Limit</td><td>122.0</td></tr> <tr><td>Radio frequency(ies)</td><td></td></tr> </table>	Name of ATZ	ATZ TENGAH	Airspace Classification	3 000ft	Upper Limit	122.0	Radio frequency(ies)			
Name of ATZ	ATZ TENGAH										
Airspace Classification	3 000ft										
Upper Limit	122.0										
Radio frequency(ies)											
ATS Routes	<table border="1"> <tr><td>Route designator</td><td>B469</td></tr> <tr><td>Distance in nautical miles</td><td>4 000/FL 160</td></tr> <tr><td>Minimum flight altitude (ft)/flight level</td><td>(4 000)/(FL 160)</td></tr> <tr><td>Lower limit (ft)/flight level</td><td></td></tr> </table>	Route designator	B469	Distance in nautical miles	4 000/FL 160	Minimum flight altitude (ft)/flight level	(4 000)/(FL 160)	Lower limit (ft)/flight level			
Route designator	B469										
Distance in nautical miles	4 000/FL 160										
Minimum flight altitude (ft)/flight level	(4 000)/(FL 160)										
Lower limit (ft)/flight level											
Oceanic Control Area (OCA)											
Reporting Point	<table border="1"> <tr><td>Compulsory</td><td>▲</td></tr> <tr><td>On request</td><td>△</td></tr> </table>	Compulsory	▲	On request	△						
Compulsory	▲										
On request	△										
DME distance from SJ Navaid	D35/SJ										
Radio Navigation Aid	<table border="1"> <tr><td>Name</td><td>SINJON DVOR/DME 113.5</td></tr> <tr><td>Vertical limits</td><td>01°19'21"N 103°11'19"E</td></tr> <tr><td>Geographical Coordinates</td><td></td></tr> <tr><td>Elevation of DME site</td><td>60m</td></tr> </table>	Name	SINJON DVOR/DME 113.5	Vertical limits	01°19'21"N 103°11'19"E	Geographical Coordinates		Elevation of DME site	60m		
Name	SINJON DVOR/DME 113.5										
Vertical limits	01°19'21"N 103°11'19"E										
Geographical Coordinates											
Elevation of DME site	60m										
Collocated VOR and DME Radio Navigation Aids	<table border="1"> <tr><td>Compass rose orientated on the chart to Magnetic North</td><td></td></tr> </table>	Compass rose orientated on the chart to Magnetic North									
Compass rose orientated on the chart to Magnetic North											
Restricted Airspace (P - Prohibited, R - Restricted, D - Danger)	<table border="1"> <tr><td>Identification of area</td><td>WSD13</td></tr> <tr><td>Nationality letter</td><td>FL 400</td></tr> <tr><td>Vertical limits</td><td>WATER</td></tr> <tr><td>Activation by NOTAM</td><td>NOTAM</td></tr> </table>	Identification of area	WSD13	Nationality letter	FL 400	Vertical limits	WATER	Activation by NOTAM	NOTAM		
Identification of area	WSD13										
Nationality letter	FL 400										
Vertical limits	WATER										
Activation by NOTAM	NOTAM										

Area Minimum Altitude (AMA)

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

Example : 3 400 feet **34**

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

Speed Control Procedures

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

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

Pilots who may not be able to comply with the speed limits specified above for reasons of flight safety and/or weather should inform ATC and state the speed(s) acceptable.

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

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

SINGAPORE	D-ATIS	128.6
	APP	120.3
		119.3
	TWR	118.6
		118.25

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



PROHIBITED, RESTRICTED AND DANGER AREAS

	ACTIVITY	UPPER LIMIT LOWER LIMIT	REMARKS
WSD1	Rifle Range	500ft ALT GND	Permanently Active as in ENR 5
WSR2	Jet Let-down Sector	FL 300 3 000ft MSL	Permanently Active as in ENR 5
WSP3	-	750ft ALT GND	Permanently Active as in ENR 5
WSD4	A/G and G/G Firing Range	FL 160 GND/WATER	Permanently Active as in ENR 5
WSD5	Rifle Range	500ft ALT GND	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
WSR31	Training Area	10 000ft ALT 3 500ft MSL	Permanently Active as in ENR 5
WSD33	Rifle Range	500ft ALT GND	Permanently Active as in ENR 5
WSD34	Rifle Range	500ft ALT GND	Permanently Active as in ENR 5
WSD35	Rifle Range	900ft ALT GND	Permanently Active as in ENR 5
WSR10	-	5 500ft ALT GND	Permanently Active as in ENR 5
WSR38	-	10 000ft ALT GND	Permanently Active as in ENR 5
WSP49	-	300ft ALT GND	Permanently Active as in ENR 5
	Transit Channel	2 000ft ALT GND	Activated only for Military acft crossing
*	Light Aircraft Training Area A	4 500ft ALT GND/*2 000ft	Training & Local Flts in VMC only
*	Light Aircraft Training Area B	10 500ft ALT 4 500ft ALT	High Flying Training Ops in VMC only
*	Light Aircraft Training Area C	10 500ft ALT 4 500ft ALT	High Flying Training Ops in VMC only
WMR223	Parachute Dropping	10 000ft ALT GND	Permanently Active as in ENR 5
WMD224	Firing Range	12 000ft ALT SEA	Activation by NOTAM
WMR225	RMAF Helicopter Training Area	3 500ft ALT GND	Permanently Active as in ENR 5
WMR226	RMAF Helicopter Training Area	2 000ft ALT GND	Permanently Active as in ENR 5
WMD227	Radar Bombing Range	10 000ft ALT SEA	Activation by NOTAM
WMP228	Sultan's Palace	5 000ft ALT GND	Permanently Active as in ENR 5
WMR229	Helicopter Operations	1 500ft ALT GND	Permanently Active as in ENR 5
WMD230	Artillery Firing Range	2 000ft ALT GND	Permanently Active as in ENR 5
WMD231	Artillery Firing Range	2 000ft ALT GND	Permanently Active as in ENR 5

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

SPECIAL NOTE :-

1. GLIDER FLYING

GLIDER FLYING MAY TAKE PLACE WITHIN TENGAH ATZ BTN 0100/1000 ON SUNDAYS AND PUBLIC HOLIDAYS. VERTICAL LIMIT 3 000ft. DURING ABOVE ACTIVITY NO ATC WILL BE PROVIDED.

2. WEATHER BALLOONS

BALLOONS WILL BE RELEASED FOR MET OBS AT 0120N 10353E (UPPER AIR OBSERVATORY), BRG 244° MAG AND DIST 1.5NM FROM SOUTHERN END OF PAYA LEBAR RWY 02 AND AT 0122N 10359E (CHANGI MET STATION), BRG 014° MAG AND DIST 1.1NM FROM SOUTHERN END OF RWY 02L (SINGAPORE CHANGI).

(A) AT UPPER AIR OBSERVATORY,

(i) BALLOONS WILL BE RELEASED DAILY AT 2330 AND 1000 PLUS OR MINUS 30 MIN. RATE OF ASCENT IS 1 000ft (305m) PER MIN. MAX HGT OF BALLOON 110 000ft (33 500m). THE BALLOON, WHITE IN COLOUR AND 6ft (2m) DIAMETER, IS ATTACHED WITH RADIOSONDE EQUIPMENT. IT WILL BURST 1.5 TO 2 HR AFTER RELEASE AND RADIOSONDE EQUIPMENT WILL DESCEND WITHIN 60NM RADIUS.

(ii) A BALLOON WILL BE RELEASED BETWEEN 0130 - 0230 ON THE SECOND THU OF EVERY MONTH. RATE OF ASCENT IS 1 000ft (305m) PER MIN. MAX HGT OF BALLOON IS 115 000ft (35 000m). THE BALLOON, WHITE IN COLOUR AND 6ft (2m) DIAMETER, IS ATTACHED WITH OZONESONDE/RADIOSONDE EQUIPMENT AND PARACHUTE. IT WILL BURST 1.5 TO 2 HR AFTER RELEASE.

(B) AT CHANGI MET STATION, BALLOONS WILL BE RELEASED DAILY AT 0530 AND 1800 PLUS OR MINUS 15 MIN. RATE OF ASCENT IS 500ft (150m) PER MIN. MAX HGT OF BALLOON IS ABOUT 40 000ft (12 200m). THE BALLOON IS RED IN COLOUR AND 2.1ft (0.7m) IN DIAMETER. AT NIGHT, A SMALL PAPER LANTERN LIGHTED UP WITH A CANDLE IS ATTACHED. THE BALLOON WILL BURST 1 TO 1.5 HR AFTER RELEASE.

3. 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.

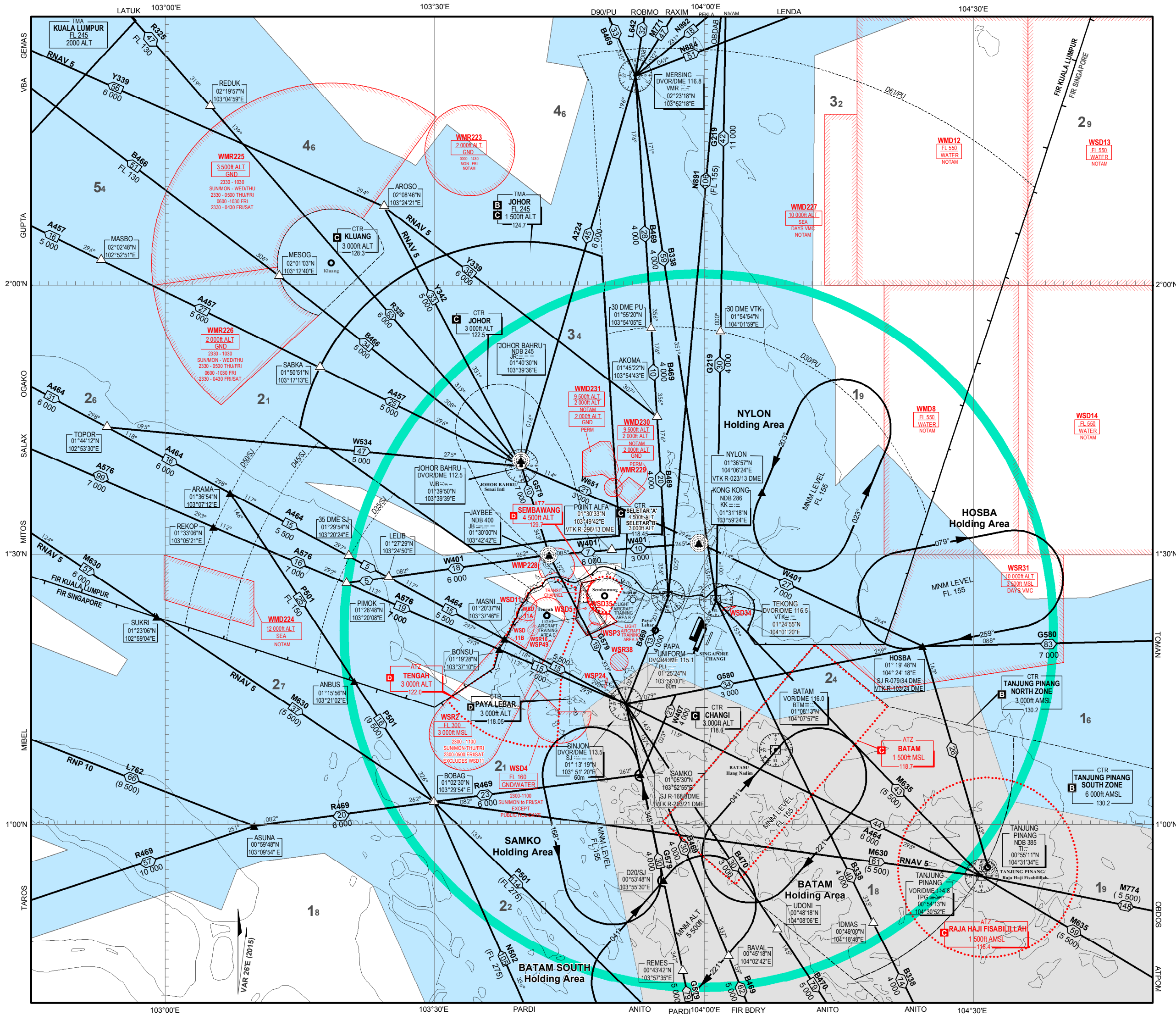
(B) AERO MODELLING AT SEMBAWANG ATZ

AERO MODELLING MAY TAKE PLACE WITHIN SEMBAWANG ATZ BTN 0200/0700 ON SUNDAYS AND PUBLIC HOLIDAYS. DURING THE ABOVE ACTIVITY, SEMBAWANG ATZ WILL BE CLOSED TO ALL AIRCRAFT.

* In Transit Channel

AREA CHART - ICAO

SINGAPORE/JOHOR AIRSPACE COMPLEX
HIGH LEVEL HOLDING AREAS



LEGEND	
Terminal Control Area (TMA)	Name of TMA: JOHOR Airspace Classification: B Upper Limit: FL 145 Lower Limit: 1 500ft Radio frequency(ies): 124.7
Control Zone (CTR)	Name of CTR: CHANGI Airspace Classification: C Upper Limit: 3 000ft Lower Limit: 118.6m Radio frequency(ies):
Aerodrome Traffic Zone (ATZ)	Name of ATZ: TENGAH Airspace Classification: D Upper Limit: 3 000ft Lower Limit: 122.0 Radio frequency(ies):
ATS Routes	Route designator: B469 Distance in nautical miles: 4 000/FL 160 Minimum flight altitude (ft/flight level): (4 000)/(FL 160) Lower limit (ft/flight level):
Oceanic Control Area (OCA)	
Reporting Point	Compulsory: ▲ On request: ▲
DME distance from SJ Navaid	△35/SJ
Radio Navigation Aid	Name: SINJON DVOR/DME 113.5 Identification and frequency: SJ 113.5 Geographical Coordinates: 01°19'21"N 103°51'19"E Elevation of DME site: 60m
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: WSD13 Nationality letter: FL 400 Vertical limits: FL 400 Activation by NOTAM: WATER

NOTE: - See flip side for details of designated areas

Area Minimum Altitude (AMA)

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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.

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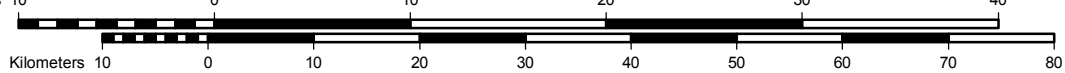
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* In Transit Channel

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		SID-WSSS
ABVON	012028.18N 1035827.03E		IAC-WSSS
ADMIM	005733N 1033033E		SID-WSSS
ADNIK	011651.19N 1035655.43E		IAC-WSSS
AGOBA	015840N 1083000E	M761	
AGROT	010108N 1035808E		SID-WSSS
AGVAR	014719N 1034145E		SID-WSSS
AKIPO	011356.27N 1035541.59E		IAC-WSSS
AKMET	015355N 1034339E		SID-WSSS
AKMON	081256N 1101308E	L625 , M768	
AKOMA	014522N 1035443E	B469 , Y339	SID-WSSS, IAC-WSSS
ANBUS	011556N 1032102E	P501	
ANITO	001700S 1045200E	B338 , B470 , P501	SID-WSSS
ANUMA	011053.11N 1035424.35E		IAC-WSSS
APIPA	010618.43N 1035228.35E		IAC-WSSS
ARAMA	013654N 1030712E	A464 , P501	STAR-WSSS
AROSO	020846N 1032421E	Y339 , Y342	SID-WSSS
ARUPA	003140N 1084846E	N875	
ASISU	055906N 1132046E	M768 , M772	
ASUNA	005948N 1030954E	R469 , L762	STAR-WSSS
ATETI	012540N 1083000E	G580	
ATKAX	000512N 1065946E		SID-WSSS
ATPOM	002425N 1052114E	M635	
ATRUM	013256N 1040057E		SID-WSSS
BAVAL	004518N 1040242E	B469	
BAVUS	000000N 1090000E	L504	
BETBA	013302N 1035331E		STAR-WSSS
BIBVI	024336N 1040618E		STAR-WSSS
BIDAG	073101N 1135544E	M772	
BIDUS	013554.05N 1035754.86E		IAC-WSSS, STAR-WSSS
BIKTA	024337N 1034308E	B469	
BIPOP	013122N 1041018E		IAC-WSSS, STAR-WSSS
BOBAG	010230N 1032954E	R469 , M630 , N502 , P501	HLDG ID, SID-WSSS, STAR-WSSS
BOBOB	022206N 1070558E	M761 , M767 , N875	
BOKIP	010421N 1034353E		SID-WSSS, STAR-WSSS

Name-code designator	Co-ordinates	ATS route or other route	Terminal Area
1	2	3	4
BONSU	011928N 1033710E	A576	
BUNTO	024008N 1055953E	G334	
BUVAL	033622N 1034341E	L629, Y333	
DAKIX	070854N 1145054E	L649	
DAMOG	041225N 1050014E	M771, N875	
DIVSA	011105N 1040303E		SID-WSSS
DOGRA	010525N 1041423E		SID-WSSS
DOKTA	012606N 1041040E		SID-WSSS
DOLOX	044841N 1052247E	L629, M771, T612	
DONDI	011252N 1035855E		SID-WSSS
DOSNO	004757N 1041409E		SID-WSSS
DOSPA	011459N 1040441E		SID-WSSS
DOVAN	011938N 1041249E		STAR-WSSS
DOVOL	033047N 1034923E	L635, Y334	
DUBSA	034901N 1044540E	L635, M771	
DUDIS	070000N 1064834E	L644, M771	
EGOLO	031934N 1040047E	L642	
EGORA	013621.37N 1040607.23E		IAC-WSSS
ELALO	041240N 1043329E	Q802, Q803	HLDG ID, STAR-WSSS
ELALU	013439.87N 1040524.21E		IAC-WSSS
ELBEB	012844.66N 1040254.38E		IAC-WSSS
ELBEX	013148.96N 1040314.18E		IAC-WSSS
ELGAP	012820.28N 1040146.15E		IAC-WSSS
ELGOR	033014N 1054818E	M758, N875	
ELMIN	012549.68N 1040140.51E		IAC-WSSS
EMTAP	011655.88N 1035657.47E		IAC-WSSS
ENLES	010931.51N 1035349.83E		IAC-WSSS
ENREP	045223N 1041442E	L642, M753, M763, M904, N875, N891	
ENSUN	012602.56N 1040048.10E		IAC-WSSS
ERVOT	011120.09N 1035435.85E		IAC-WSSS
ESBIT	012212.07N 1040008.64E		IAC-WSSS
ESBUM	045210N 1042830E	Q801, Q802	
ESLUX	011844.31N 1035840.44E		IAC-WSSS
ESPIT	020011N 1072624E	M646, N875	
ESPOB	070000N 1053318E	L642, Q801	
EXOMO	010425.49N 1040933.17E		IAC-WSSS
GULIB	041714N 1110633E	L517	

	<i>Name-code designator</i>	<i>Co-ordinates</i>	<i>ATS route or other route</i>	<i>Terminal Area</i>
	1	2	3	4
←	HOSBA	011948N 1042418E	G580, W401	HLDG ID
←	IBIVA	011351N 1035637E		SID-WSSS
	IBIXU	011621N 1035740E		SID-WSSS
	IBULA	005036N 1043600E		STAR-WSSS
	IDMAS	004900N 1041848E	B338	
	IDSEL	032432N 1035544E	M758, T611, T612, Y335	
	IDUNA	012305.80N 1035933.58E		IAC-WSSS
	IDURO	012639.84N 1040103.94E		IAC-WSSS
	IDVAS	012934.66N 1040217.75E		IAC-WSSS
	IGARI	065610N 1033506E	R208, M765, N891	
	IGNON	010847N 1041257E		STAR-WSSS
	IGULA	013232.27N 1040332.66E		IAC-WSSS
	IKAGO	003816N 1052931E		STAR-WSSS
	IKIMA	004314N 1045500E		HLDG ID, STAR-WSSS
	IKUKO	054512N 1031324E	R208	
	IKUMI	055338N 1035509E	N891	
	IPDOL	045111N 1035920E	Q803, T611	
	IPNAK	013711.93N 1040530.83E		IAC-WSSS
	IPRIX	070000N 1040755E	M753, Q802, T611	
	KADAR	000647S 1074342E	M774	SID-WSSS
	KAKSA	011702.58N 1035757.92E		IAC-WSSS
	KAMIN	023442N 1085536E	G334, M646	
	KANLA	034556N 1043606E		STAR-WSSS
	KARTO	011124N 1053343E		HLDG ID, STAR-WSSS,
	KASPO	011507.15N 1035709.20E		IAC-WSSS
	KETOD	031042N 1040942E	M761, Y336	
	KEXAS	011019N 1044818E		STAR-WSSS
	KEXOL	043930N 1040942E	Q803	
	KIBOL	025229N 1042805E	G334, N892	
	KIKOR	002244S 1070524E	L644	
	KILOT	030217N 1044023E	M761, N892	STAR-WSSS
	KIMER	011105.74N 1035527.30E		IAC-WSSS
	LAGOT	071632N 1113243E	M768, N884	
	LAGUS	011915.29N 1035854.00E		IAC-WSSS
	LAPOL	012622N 1034435E	G579	
	LASIN	011538.25N 1035722.39E		IAC-WSSS
	LAVAX	010950N 1042714E		HLDG ID, STAR-WSSS,

Name-code designator	Co-ordinates	ATS route or other route	Terminal Area
1	2	3	4
LAXOR	094937N 1144829E	L649, M772, N884	
LEBIN	031438N 1060604E	N875, N884	
LEDOX	011642N 1035651E		SID-WSSS
LEGOL	012053N 1034723E	G579	
LELIB	012729N 1032450E	A464, W401	SID-WSSS, STAR-WSSS
LELON	011243.51N 1035608.62E		IAC-WSSS
LEND A	024124N 1043932E	N884	
LEPNA	010648.29N 1035338.82E		IAC-WSSS
LETGO	011411N 1035548E		SID-WSSS
LIDVA	010505.67N 1035255.38E		IAC-WSSS
LIPRO	025342N 1051128E	M761, N884	
LUSMO	033341N 1065534E	L625, M758, N884	
LUXOL	011802.73N 1035823.38E		IAC-WSSS
MABAL	032826N 1051236E	M758, N892	HLDG ID, STAR-WSSS
MABLI	041717N 1061247E	L635, L644, N892	
MANIM	031431N 1040553E	N891	
MASBO	020248N 1025251E	A457	SID-WSSS
MASNI	012037N 1033746E	A464	
MELAS	070520N 1080911E	N892	
MESOG	020103N 1031240E	B466	
MIBEL	012351N 1020816E	L762	
MUMSO	034420N 1053213E	N875, N892	
NIMIX	012452N 1075926E	G580, N875	
NIVAM	023650N 1040228E	G219	
NODIN	081100N 1161142E	M522	
NOPAT	042313N 1044756E	L629, N875	
NYLON	013656.90N 1040623.80E		HLDG ID, IAC-WSSS, SID-WSSS, STAR-WSSS
OB DAB	031153N 1040538E	N891	
OB DOS	002503N 1065551E	L504, M774	STAR-WSSS
OBGET	012307N 1064531E	G580, L644	
OBLOT	014256N 1064147E	L644, M646	
ODONO	063613.82N 1030129.41E	M904	
OLKIT	045010N 1115118E	M758	
OLSAM	020059N 1063824E	L644	
OMBAP	023116N 1063242E	L644	
OMLIV	025512N 1062812E	L644	
ONAPO	032116N 1062318E	L644	

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1 SAFEGATE AIRCRAFT DOCKING GUIDANCE SYSTEM - SAFEDOCK

1.1 INTRODUCTION

← 1.1.1 The Safegate Aircraft Docking Guidance System (ADGS) - SAFEDOCK is a fully automatic aircraft docking guidance system installed at the contact aircraft stands at Terminals 1, 2, 3 and 4, and at the remote aircraft stands at South Apron of Singapore Changi Airport. There are two types of ADGS in Singapore Changi Airport, Safedock Type 1 ADGS and Safedock Type 2 ADGS.

1.2 DESCRIPTION OF SYSTEM

1.2.1 The system is based on a laser scanning technique and it tracks both the lateral and longitudinal position of the aircraft. This 3D technique allows the system to identify the incoming aircraft and check it against the one selected by the operator to ensure that the pilot is provided with the correct stop indication for the aircraft.

1.2.2 The system is operated only in the Automatic Mode. When the system fails, the aircraft is to be marshalled into the stand manually.

1.2.3 Azimuth guidance, continuous closing rate information, aircraft type, etc., are shown to the pilot on a single display clearly visible for both pilot and co-pilots. Figure A shows the Display and Laser Scanning Unit mounted on the terminal in front of the aircraft stand.

LED DISPLAY AND LASER SCANNING UNIT

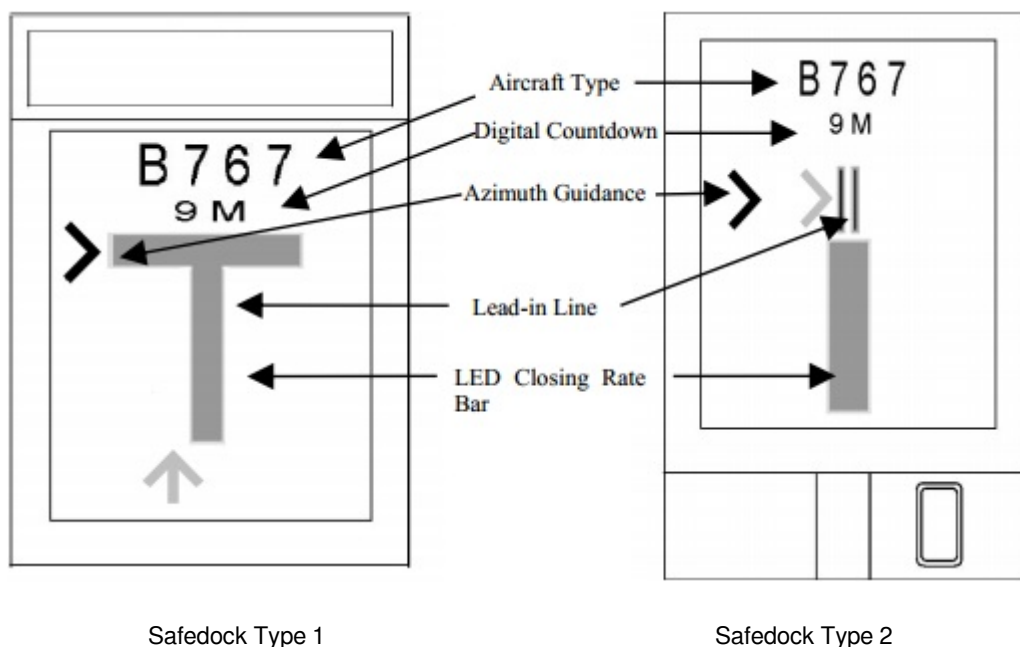

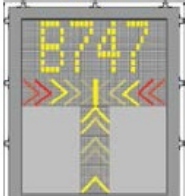
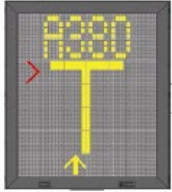
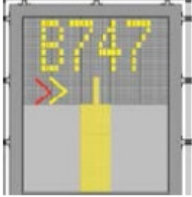
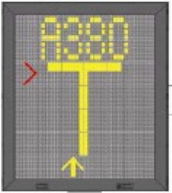
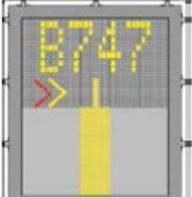

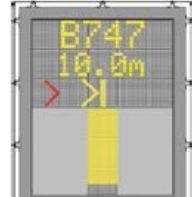

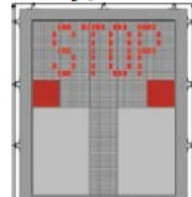

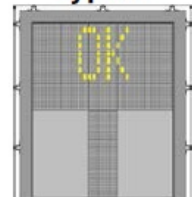


Figure A

1.3 DOCKING PROCEDURES

Description	Display on ADGS	
<p>Checking of Aircraft Type</p> <ul style="list-style-type: none"> • Check that the correct aircraft type is displayed. The scrolling arrows indicate that the system is activated. • Follow the lead-in line. 	<p>Safedock Type 1</p> 	<p>Safedock Type 2</p> 

Description	Display on ADGS	
<p>Capture of Correct Aircraft Type</p> <ul style="list-style-type: none"> When the aircraft has been caught by the scanning unit, the scanning unit checks that the aircraft is the correct type and the display provides azimuth guidance information. When the solid yellow closing rate bar appears, the aircraft is being tracked by the system. 	<p>Safedock Type 1</p> 	<p>Safedock Type 2</p> 
<p>Steering and Alignment of Aircraft</p> <ul style="list-style-type: none"> Look for the flashing red arrow and solid yellow arrow which provide azimuth guidance information. The flashing red arrow shows which direction to steer, while the solid yellow arrow gives an indication of how far the aircraft is off the centreline. 	<p>Safedock Type 1</p> 	<p>Safedock Type 2</p> 
<p>Distance of Aircraft from STOP Position</p> <ul style="list-style-type: none"> When the aircraft is 15m from the stop position, closing rate information is given. "Distance to go" is indicated by turning off one row of LEDs (Laser Electronic Displays) for every half metre that the aircraft advances towards the stop position. From 15m to the stop position, the display will indicate the distance from the stop position for every 1m. At 3m from the stop position, the display will indicate the distance from the stop position for every 0.2m. 	<p>Safedock Type 1</p> 	<p>Safedock Type 2</p> 
<p>STOP Position</p> <ul style="list-style-type: none"> When the correct stop position is reached, all of the LEDs for the closing rate bar will be off, the word "STOP" will appear in the display. For Safedock Type 1 ADGS, the word "STOP" will be displayed in red with red border. For Safedock Type 2 ADGS, the word "STOP" will be displayed in yellow and two red, rectangular fields will light in the azimuth guidance area of the display. 	<p>Safedock Type 1</p> 	<p>Safedock Type 2</p> 
<p>Checking of STOP Position</p> <ul style="list-style-type: none"> If the aircraft stops at the correct position, "OK" will be displayed after a few seconds. 	<p>Safedock Type 1</p> 	<p>Safedock Type 2</p> 

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
← C11	The aircraft (on idle thrust) shall be pushed back following the pushback line to face North until its nose wheel is at the "EOP C11" position. The aircraft shall then be towed forward following the tow line onto Taxilane N2 until its nose wheel is at the "EOT C11, D30" position. The aircraft may breakaway from there.	Standard pushback approved.
← C13	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane N2 to face North until its nose wheel is at the "EOP C13, D32" position. The aircraft shall then be towed forward until its nose wheel is at the "EOT C13, D32" position. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N3 until the nose of the aircraft is behind the stopbar line behind aircraft stand D35. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N1 until the nose of the aircraft is behind the stopbar line behind aircraft stand C16. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face South on Taxilane N3.</p> <p>Pushback approved, to face South on Taxilane N1.</p>
← C15	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane N2 to face North until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane N2 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N3 until the nose of the aircraft is behind the stopbar line behind aircraft stand D35. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N1 until the nose of the aircraft is behind the stopbar line behind aircraft stand C16. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face South on Taxilane N3.</p> <p>Pushback approved, to face South on Taxilane N1.</p>
C16	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto Taxilane N1 to face North until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane N1 centreline. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto Taxilane N1 to face South until the nose of the aircraft is behind the stopbar line behind aircraft stand C16 . The aircraft may breakaway from there. <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand C15 on Taxilane N2. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p> <p>Pushback approved, to face North on Taxilane N2.</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND	
C17	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face North (or South) until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane N1 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand C15 on Taxilane N2. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North (or South).</p> <p>Pushback approved, to face North on Taxilane N2.</p>	
C18	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face North until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane N1 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand C15 on Taxilane N2. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face North on Taxilane N2.</p>	
C19	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N1 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand C18. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p>	
←	D30	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line to face North until its nose wheel is at the "EOP D30" position. The aircraft shall then be towed forward following the tow line onto Taxilane N2 until its nose wheel is at the "EOT C11, D30" position. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p>
←	D32	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane N2 to face North until its nose wheel is at the "EOP C13, D32" position. The aircraft shall then be towed forward until its nose wheel is at the "EOT C13, D32" position. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N3 until the nose of the aircraft is behind the stopbar line behind aircraft stand D35. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N1 until the nose of the aircraft is behind the stopbar line behind aircraft stand C16. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face South on Taxilane N3.</p> <p>Pushback approved, to face South on Taxilane N1.</p>
←	D34	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane N2 to face North until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane N2 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N3 until the nose of the aircraft is behind the stopbar line behind aircraft stand D35. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N2 to face South followed by Taxilane N1 until the nose of the aircraft is behind the stopbar line behind aircraft stand C16. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to face South on Taxilane N3.</p> <p>Pushback approved, to face South on Taxilane N1.</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
F33	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane B2 to face East until its nose wheel is at the "EOP E4, F33" position. The aircraft may breakaway from there.	Standard pushback approved.
	<u>Alternate Pushback Procedure</u>	
	The aircraft (on idle thrust) shall be pushed back onto Taxilane B1 to face South until its nose wheel is at the "EOP A E4, F33" position. The aircraft may breakaway from there.	Pushback approved, to face South on Taxilane B1.
	<u>Alternate Pushback Procedure</u>	
	The aircraft (on idle thrust) shall be pushed back onto Taxilane B3 to face North until its nose wheel is at the "EOP B E4, F33" position. The aircraft may breakaway from there.	Pushback approved, to face North on Taxilane B3.
F34	The aircraft (on idle thrust) shall be pushed back onto Taxilane B3 to face South until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane B3 centreline. The aircraft shall then be towed forward until its nose wheel is at the "EOT F34, F35L, F36" position behind aircraft stand F35. The aircraft may breakaway from there.	Standard pushback approved.
F35, F35R	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane B3 to face South until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane B3 centreline. The aircraft may breakaway from there.	Standard pushback approved.
F35L	The aircraft (on idle thrust) shall be pushed back onto Taxilane B3 to face South until its nose wheel is at the "EOT F34, F35L, F36" position behind aircraft stand F35. The aircraft may breakaway from there.	Standard pushback approved.
F36	The aircraft (on idle thrust) shall be pushed back onto Taxilane B3 to face South until its nose wheel is at the "EOT F34, F35L, F36" position behind aircraft stand F35. The aircraft may breakaway from there.	Standard pushback approved.
<u>T2 SOUTH</u>		
F37	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C2 to face South until its nose wheel is at the "EOT 4" position. The aircraft may breakaway from there.	Standard pushback approved.
	<u>Alternate Pushback Procedure</u>	
	The aircraft (on idle thrust) shall be pushed back onto TWY C1 to face East until its nose wheel is at the "EOP 5" position. The aircraft may breakaway from there.	Pushback approved, to face East on TWY C1.
F40	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face South until its nose wheel is at the "EOP F40, F52" position. The aircraft shall then be towed forward until its nose wheel is at the "EOT F40, F50, F52, F52R" position. The aircraft may breakaway from there.	Standard pushback approved.
F41	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C2 to face South until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane C2 centreline. The aircraft shall then be towed forward until its nose wheel is at the "EOT 4" position. The aircraft may breakaway from there.	Standard pushback approved.
	<u>Alternate Pushback Procedure</u>	
	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C2 to face South, following Taxilane C2 centreline onto Taxilane C6 until its nose wheel is at the intersection of Taxilane C2 and Taxilane C6 centreline. The aircraft may breakaway from there.	Pushback approved, to pushback onto Taxilane C6.

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
← ← ←	<p><u>Main Pushback Procedure (for all aircraft wingspan)</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C2 to face South until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane C2 centreline. The aircraft shall then be towed forward until its nose wheel is at the "EOT 4" position. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure (for all aircraft types except A380)</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C2 to face South, following Taxilane C2 centreline onto Taxilane C6 until its nose wheel is at the intersection of Taxilane C2 and Taxilane C6 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure (for A380 aircraft)</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C2 to face South until its nose wheel is at the "EOP 4A" position. The aircraft shall then be towed forward following the tow line until its nose wheel is at the "EOT 4B" position on Taxilane C6, behind aircraft stand F59. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p> <p>Pushback approved, to pushback onto Taxilane C6.</p> <p>Pushback approved, to pushback onto Taxilane C6.</p>
← 	<p>F50</p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line until its nose wheel is at the "EOP F50" position. The aircraft shall then be towed forward following the tow line onto Taxilane C6 to face South until its nose wheel is at the "EOT F40, F50, F52, F52R" position. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p>
← 	<p>F52</p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face South until its nose wheel is at the "EOP F40, F52" position. The aircraft shall then be towed forward until its nose wheel is at the "EOT F40, F50, F52, F52R" position. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p>
	<p>F52L</p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face South until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p>
← 	<p>F52R</p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face South until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft shall then be towed forward until its nose wheel is at the "EOT F40, F50, F52, F52R" position. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p>
	<p>F54</p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face South until its nose wheel is at the intersection of Taxilane C2 and Taxilane C6 centreline. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p>
	<p>F56</p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face South until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p>
	<p>F56L, F56R</p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face South until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p>
	<p>F58</p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face North (or South) until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North (or South).</p>
	<p>F59</p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face North (or South) until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North (or South).</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
F59L, F59R	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face North (or South) until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
F60	The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face North (or South) until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
T4 APRON		
G1	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L5 to face South until the nose of the aircraft is behind the stopbar behind aircraft stand G6 on Taxilane L5. The aircraft may breakaway from there.	Pushback approved, to face South.
G2	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L5 to face North until its nose wheel is at the "EOP-G2" position. The aircraft may breakaway from there.	Pushback approved, to face North.
G3, G4	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L5 to face North until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane L5 centreline. The aircraft may breakaway from there.	Pushback approved, to face North.
G5, G6, G7, G8, G9, G10, G11, G12, G13	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L5 to face North or South until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane L5 centreline. The aircraft may breakaway from there.	Pushback approved, to face North or South.
G14, G15	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L5 to</p> <ul style="list-style-type: none"> • face North until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane L5 centreline. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • face South until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane L5 centreline. The aircraft shall then be towed forward until its nose wheel is at the "EOT-G14, G15" position behind aircraft stand G14. The aircraft may breakaway from there. 	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
G16, G17	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L5 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand G15. The aircraft may breakaway from there.	Pushback approved, to face North.
G18, G18L, G18R	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L4 to face East until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane L4 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L4 to face East, followed by TWY C6 onto TWY SC2 to face East (West) until the nose of the aircraft is behind the stopbar on TWY SC2. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face East (West) on TWY SC2.</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
G19, G19R	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L4 to face East until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane L4 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto TWY C6 followed by TWY SC2 to face East (West) until the nose of the aircraft is behind the stopbar on TWY SC2. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face East (West) on TWY SC2.</p>
G19L	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L4 to face East until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane L4 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L4 to face East, followed by TWY C6 onto TWY SC2 to face East (West) until the nose of the aircraft is behind the stopbar on TWY SC2. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face East (West) on TWY SC2.</p>
← G20, G20L, G20R	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L4 to face East until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane L4 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L4 to face West, followed by TWY C6 onto TWY SC2 to face East (West) until the nose of the aircraft is behind the stopbar on TWY SC2. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face East (West) on TWY SC2.</p>
G21	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L4 to face East until its nose wheel is at the "EOP G21" position. The aircraft shall then be towed forward until its nose wheel is at the "EOT G21, G21L, G21R" position on Taxilane L4 centreline. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L4 to face West, followed by TWY C6 onto TWY SC2 to face East (West) until the nose of the aircraft is behind the stopbar on TWY SC2. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face East (West) on TWY SC2.</p>
G21L	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L4 to face East until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane L4 centreline. The aircraft shall then be towed forward until its nose wheel is at the "EOT G21, G21L, G21R" position. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L4 to face West, followed by TWY C6 onto TWY SC2 to face East (West) until the nose of the aircraft is behind the stopbar on TWY SC2. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face East (West) on TWY SC2.</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
G21R	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L4 to face East until its nose wheel is at the "EOP G21R" position. The aircraft shall then be towed forward until its nose wheel is at the "EOT G21, G21L, G21R" position. The aircraft may breakaway from there.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane L4 to face West, followed by TWY C6 onto TWY SC2 to face East (West) until the nose of the aircraft is behind the stopbar on TWY SC2. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face East (West) on TWY SC2.</p>
<u>EAST REMOTE</u>		
200	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto Taxilane C6 to face North until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft shall then be towed forward until its nose wheel is at the intersection of aircraft stand 201 lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto Taxilane C6 to face South until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there. 	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
200L	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • following the pushback line onto Taxilane C6 to face North until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft shall then be towed forward until its nose wheel is abeam aircraft stand 200. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • following the pushback line onto Taxilane C6 to face South until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft may breakaway from there. 	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
200R	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane C6 to face North (or South) until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North (or South).</p>
201	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face North (or South) until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North (or South).</p>
202	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto Taxilane C6 to face North until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto Taxilane C6 to face South until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there. 	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
202L, 202R	The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 to face North (or South) until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane C6 centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
203	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto Taxilane C6 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand 203. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto Taxilane C6 to face South until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane C6 centreline. The aircraft may breakaway from there. 	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
<u>SOUTH-EAST REMOTE</u>		
205	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto TWY C7 to face North until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY C7 centreline. The aircraft shall then be towed forward until its nose wheel is at the intersection of aircraft stand 206 lead-in line and TWY C7 centreline. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto TWY C7 to face South until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY C7 centreline. The aircraft may breakaway from there. 	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
206, 207, 208	The aircraft (on idle thrust) shall be pushed back onto TWY C7 to face North (or South) until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY C7 centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
209	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto TWY C7 to face North until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY C7 centreline. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto TWY C7 to face South until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY C7 centreline. The aircraft shall then be towed forward until its nose wheel is at the intersection of aircraft stand 208 lead-in line and TWY C7 centreline. The aircraft may breakaway from there. 	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
<u>NORTH REMOTE</u>		
300	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto TWY NC2 to face East until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until its nose wheel is at the intersection of aircraft stand 301 lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto TWY NC2 to face West until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. 	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face West.</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
301	The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face East (or West) until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there.	Pushback approved, to face East (or West).
302	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto TWY NC2 to face East until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto TWY NC2 to face West until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until its nose wheel is at the intersection of aircraft stand 301 lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. 	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face West.</p>
303	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto TWY NC2 to face East until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until its nose wheel is at the intersection of aircraft stand 304 lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto TWY NC2 to face West until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. 	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face West.</p>
304, 305	The aircraft (on idle thrust) shall be pushed back onto TWY NC2 to face East (or West) until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there.	Pushback approved, to face East (or West).
306	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto TWY NC2 to face East until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto TWY NC2 to face West until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until its nose wheel is at the intersection of aircraft stand 305 lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. 	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face West.</p>
307, 308	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto TWY NC2 to face East until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand 309. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto TWY NC2 to face West until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. 	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face West.</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
309	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto TWY NC2 to face East until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto TWY NC2 to face West until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand 307. The aircraft may breakaway from there. 	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face West.</p>
310	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto TWY NC2 to face East until the nose of the aircraft is behind the stopbar behind aircraft stand 309. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto TWY NC2 to face West until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY NC2 centreline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand 307. The aircraft may breakaway from there. 	<p>Pushback approved, to face East.</p> <p>Pushback approved, to face West.</p>
<u>NORTH-EAST REMOTE</u>		
400, 401, 402, 403, 404	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane A6 to face North (or South) until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane A6 centreline.</p>	<p>Pushback approved, to face North (or South).</p>
<u>SOUTH APRON</u>		
← 461	<p>The aircraft (on idle thrust) shall be pushed back onto TWY S1 to face West until its nose wheel is at "EOP" position. The aircraft shall then be towed forward until its nose wheel is at the "EOT" position. The aircraft may breakaway from there. There shall be no simultaneous aircraft pushback from aircraft stands 462, 462L, 462R, 463, 463L and 463R.</p>	<p>Pushback approved, to face West.</p>
← 462	<p>The aircraft (on idle thrust) shall be pushed back onto TWY S1 to face West until its nose wheel is at the intersection of the aircraft stand pushback line and TWY S1 centreline. The aircraft may breakaway from there. There shall be no simultaneous aircraft pushback from aircraft stands 461, 462L, 462R, 463, 463L and 463R.</p>	<p>Pushback approved, to face West.</p>
← 462L	<p>The aircraft (on idle thrust) shall be pushed back onto TWY S1 to face West until its nose wheel is at the intersection of the aircraft stand pushback line and TWY S1 centreline. The aircraft may breakaway from there. There shall be no simultaneous aircraft pushback from aircraft stands 461, 462, 462R, 463, 463L and 463R.</p>	<p>Pushback approved, to face West.</p>
← 462R	<p>The aircraft (on idle thrust) shall be pushed back onto TWY S1 to face West until its nose wheel is at the intersection of the aircraft stand pushback line and TWY S1 centreline. The aircraft may breakaway from there. There shall be no simultaneous aircraft pushback from aircraft stands 461, 462, 462L, 463, 463L and 463R.</p>	<p>Pushback approved, to face West.</p>
← 463	<p>The aircraft (on idle thrust) shall be pushed back onto TWY S1 to face West until its nose wheel is at the intersection of the aircraft stand pushback line and TWY S1 centreline. The aircraft may breakaway from there. There shall be no simultaneous aircraft pushback from aircraft stands 461, 462, 462L, 462R, 463L and 463R.</p>	<p>Pushback approved, to face West.</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
← 463L	The aircraft (on idle thrust) shall be pushed back onto TWY S1 to face West until its nose wheel is at the intersection of the aircraft stand pushback line and TWY S1 centreline. The aircraft may breakaway from there. There shall be no simultaneous aircraft pushback from aircraft stands 461, 462, 462L, 462R, 463 and 463R.	Pushback approved, to face West.
← 463R	The aircraft (on idle thrust) shall be pushed back onto TWY S1 to face West until the nose of the aircraft is behind the stopbar behind aircraft stand 463L. The aircraft may breakaway from there. There shall be no simultaneous aircraft pushback from aircraft stands 461, 462, 462L, 462R, 463 and 463L.	Pushback approved, to face West.
← 464	The aircraft (on idle thrust) shall be pushed back following the pushback line until its nose wheel is at "EOP 464" position. The aircraft shall then be towed forward onto Taxilane S4 to face West until its nose wheel is at "EOT 464" position. The aircraft may breakaway from there.	Standard pushback approved.
← 465	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane S4 to face West until its nose wheel is at "EOP 465, 467, 468" position. The aircraft may breakaway from there.	Standard pushback approved.
← 466	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane S4 to face West until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane S4 centreline. The aircraft may breakaway from there.	Standard pushback approved.
← 467	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane S4 to face West until its nose wheel is at "EOP 465, 467, 468" position. The aircraft may breakaway from there.	Standard pushback approved.
← 468	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane S4 to face West until its nose wheel is at the "EOP 465, 467, 468" position. The aircraft may breakaway from there.	Standard pushback approved.
← 469	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane S4 to face West until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane S4 centreline. The aircraft may breakaway from there.	Standard pushback approved.
WEST CARGO		
502, 503, 504, 505, 506, 507, 508, 509, 510	The aircraft (on idle thrust) shall be pushed back onto TWY WC to face North (or South) until its nose wheel is at the intersection of the aircraft stand lead-in line and TWY WC centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
511	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto TWY WC to face North until the nose of the aircraft is behind the stopbar behind aircraft stand 511. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto TWY WC to face South until the nose wheel of the aircraft is at the intersection of the aircraft stand lead-in line and TWY WC centreline. The aircraft shall then be towed forward until the nose wheel is at the "EOT" position behind aircraft stand 510. The aircraft may breakaway from there. 	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
512	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto TWY WC to face North until the nose of the aircraft is behind the stopbar behind aircraft stand 511. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto TWY WC to face South until the nose wheel of the aircraft is at the intersection of the aircraft stand lead-in line and TWY WC centreline. The aircraft shall then be towed forward until the nose wheel is at the "EOT" position behind aircraft stand 510. The aircraft may breakaway from there. 	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
513	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto TWY WC to face North until the nose wheel of the aircraft is at the intersection of the aircraft stand lead-in line and TWY WC centreline. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto TWY WC to face South following TWY WC centreline onto Taxilane WD until the nose of the aircraft is behind the stopbar behind aircraft stand 515 on Taxilane WD. The aircraft may breakaway from there. 	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
514	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> • onto TWY WC to face North until the nose of the aircraft is behind the stopbar behind aircraft stand 513. The aircraft may breakaway from there. <p><u>OR</u></p> <ul style="list-style-type: none"> • onto TWY WC to face South following TWY WC centreline onto Taxilane WD until the nose of the aircraft is behind the stopbar behind the aircraft stand 515 on Taxilane WD. The aircraft may breakaway from there. 	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
515	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane WD to face South until the nose of the aircraft is behind the stopbar behind aircraft stand 515. The aircraft may breakaway from there.</p>	Standard pushback approved.
516	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane WD to face South until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane WD centreline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand 515. The aircraft may breakaway from there.</p>	Standard pushback approved.
516L, 516R	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane WD to face South until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane WD centreline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand 515. The aircraft may breakaway from there.</p>	Standard pushback approved.
517	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane WD to face South until its nose wheel is at the "EOP 517" position. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand 515. The aircraft may breakaway from there.</p>	Standard pushback approved.
517L	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane WD to face South until its nose wheel is at the "EOP 517L" position. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand 515. The aircraft may breakaway from there.</p>	Standard pushback approved.

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
517R	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane WD to face South until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane WD centreline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand 515. The aircraft may breakaway from there.	Standard pushback approved.
EAST CARGO		
600	The aircraft (on idle thrust) shall be pushed back onto Taxilane EA to face South until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane EA centreline. The aircraft may break away from there.	Standard pushback approved.
600L, 600R	The aircraft (on idle thrust) shall be pushed back onto Taxilane EA to face South until its nose wheel is at the intersection of the aircraft stand pushback line and Taxilane EA centreline. The aircraft may break away from there.	Standard pushback approved.
601, 602	The aircraft (on idle thrust) shall be pushed back onto Taxilane EA to face South until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane EA centreline. The aircraft may breakaway from there.	Standard pushback approved.
603	The aircraft (on idle thrust) shall be pushed back onto Taxilane EA to face South until its nose wheel is at the intersection of the aircraft stand lead-in line and Taxilane EA centreline. The aircraft shall then be towed forward until its nose wheel is at the "EOT" position behind aircraft stand 602. The aircraft may breakaway from there.	Standard pushback approved.
604	The aircraft (on idle thrust) shall be pushed back onto Taxilane EA to face South until its nose wheel is at the "EOP" position behind aircraft stand 604. The aircraft shall then be towed forward until its nose wheel is at the "EOT" position behind aircraft stand 602. The aircraft may breakaway from there.	Standard pushback approved.
605	The aircraft (on idle thrust) shall be pushed back onto Taxilane EC to face West until its nose wheel is at the "EOP" position on Taxilane EC. The aircraft shall then be towed forward following Taxilane EC centreline onto Taxilane EA until its nose wheel is at the "EOT" position behind aircraft stand 602. The aircraft may breakaway from there.	Standard pushback approved.
611, 612	The aircraft (on idle thrust) shall be pushed back to face North until its nose wheel is at the "EOP" position. The aircraft shall then be towed forward following Taxilane EC centreline onto Taxilane EA until its nose wheel is at the "EOT" position behind aircraft stand 602. The aircraft may breakaway from there. Engine start-up is not permitted during standard pushback.	Standard pushback approved.
←	<p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back to face North until its nose wheel is at the "EOP" position. Engine start-up is permitted only on the port engine. The aircraft shall then be towed forward following Taxilane EC centreline onto Taxilane EA until its nose wheel is at the "EOT" position behind aircraft stand 602. The aircraft may breakaway from there. This alternate pushback procedure can only be exercised if the auxiliary power unit of the aircraft is unserviceable.</p>	Alternate pushback approved.

3 ADVANCED MULTILATERATION SYSTEM

3.1 INTRODUCTION

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

3.2 CARRIAGE OF MODE-S SSR TRANSPONDER

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

3.3 MULTILATERATION SYSTEM OUTLINE

3.3.1 The Multilateration System uses multiple receivers to pick up “squitters” transmitted by aircraft or vehicle Mode S transponders. It calculates the position of an aircraft or a vehicle by comparing the time its “squitter” arrives at each receiver.

3.3.2 The System will derive the identity of an aircraft by selectively interrogating its transponder to receive its assigned Mode A code or extracting its aircraft identification [that is, the ICAO callsign used in flight and inserted in the Flight Management System (FMS) or the Transponder Control Panel], if available, from its squitter. For transponder equipped vehicles, the system will derive their respective identities from the unique Mode S addresses contained in their squitters.

3.4 AIRCRAFT REQUIREMENTS

3.4.1 The Multilateration System is essentially passive. It relies on aircraft transponders squittering at all times when moving on the airfield. At present, some aircraft checklist procedures instruct pilots to turn off the transponder shortly after leaving the runway on arrival and, not to switch it on until reaching the runway holding point for departure. This is in line with the requirement that Mode A/C transponders should not transmit on the ground, which does not apply to Mode S transmissions.

3.4.2 For the Multilateration System to work effectively, all aircraft Mode S transponders need to transmit Mode S squitters at all times when moving on the airfield, starting immediately prior to pushback, and for arrival aircraft until they are stationary at the aircraft stands. The Mode S transponders should not respond to All-Call interrogations, but should respond to addressed interrogations.

3.5 PROCEDURES/ACTIONS REQUIRED BY PILOTS

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

3.5.2 Pre-Pushback / Taxi

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

3.5.3 After Landing

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

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

4.1 INTRODUCTION

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

4.2 ROUTE SELECTION AND PRIORITY

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

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

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

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

4.3 INFORMATION AND MANDATORY SIGNS/MARKINGS

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

4.4 TAXI INSTRUCTIONS USING THE GREEN TAXIWAY CENTRELINE LIGHTS

4.4.1 ATC will use the phraseology "Taxi on the greens" when issuing a clearance to pilots to taxi along the directional guidance provided by the green taxiway centreline lights.

WSSS AD 2.10 AERODROME OBSTACLES

IN APPROACH / TKOF AREAS			IN CIRCLING AREA AND AT AD		
RWY/Area affected	OBST type, ELEV, Markings/LGT	Coordinates	OBST type, ELEV, Markings/LGT	Coordinates	
1	2	3	1	2	
a) RWY 20R APCH RWY 02L TKOF	Mast HGT ranging fm 98ft AMSL and above.	Shipping channel aprx1290m from THR RWY 20R.	a) Surface wind direction sleeves	LOC at each end of RWY adjacent to GP hut	
b) RWY 20C APCH RWY 02C TKOF	Mast HGT ranging fm 98ft AMSL and above.	Shipping channel aprx 2630m from THR RWY 20C.	b) PAR hut	Besides RWY 02L/20R, opposite the PTB	
c) RWY 02L/20R APCH RWY 02L/20R TKOF RWY 02C/20C APCH RWY 02C/20C TKOF	ILS LLZ co-located with LLZ antennas.	Within the RWY strip.	c) Frangible PAR reflectors	Located at ends of RWY 02L/20R	
d) RWY 20R APCH	Two antennae, HGT 72ft AMSL, marked and LGTD	012311N 1035928E	d) GP huts co-located with GP antennas	Within the RWY strip	
e) RWY 20R APCH	Antenna, HGT 88ft AMSL, marked and LGTD	012315N 1035931E	e) Antenna, HGT 82ft AMSL, marked and LGTD	012036N 1035819E	
f) RWY 02L APCH	Antenna, HGT 82ft AMSL, marked and LGTD	012051N 1035827E	f) Antenna, HGT 85ft AMSL, marked and LGTD	012039N 1035821E	

IN APPROACH / TKOF AREAS			IN CIRCLING AREA AND AT AD		
RWY/Area affected	OBST type, ELEV, Markings/LGT	Coordinates	OBST type, ELEV, Markings/LGT	Coordinates	
1	2	3	1	2	
g) RWY 02L APCH	Pole, HGT 128ft AMSL, marked and LGTD	011859N 1035748E	g) Antenna, HGT 78ft AMSL, marked and LGTD	012042N 1035823E	
h) RWY 02L APCH	Pole, HGT 160ft AMSL, marked and LGTD	012058N 1035814E	h) Antenna, HGT 82ft AMSL, marked and LGTD	012053N 1035827E	
i) RWY 02L APCH	Pole, HGT 131ft AMSL, marked and LGTD	012038N 1035848E	i) Antenna, HGT 78ft AMSL, marked and LGTD	012049N 1035826E	
j) RWY 20L APCH	Shipping channel	Aprx1600m from THR RWY 20L.	j) Frangible poles, HGT 9ft AMSL	Installed APRX 200m from centre of RET to identify 58m away from TWY WP CL towards RWY 02L/20R	

Obstacles in the APCH/TKOF areas, circling area and at the aerodrome are shown on the AOC, IAC and VAC.

WSSS AD 2.11 METEOROLOGICAL INFORMATION PROVIDED

1	Associated MET Office	Singapore Changi (WSSS)
2	Hours of service	H24
3	Office responsible for TAF preparation Periods of validity	Singapore Changi (WSSS) 12, 30
4	Type of landing forecast, Interval of issuance	TREND
5	Briefing/consultation provided	P
6	Flight documentation, Language used	Charts or Tabular forms, English
7	Charts and other information available for briefing or consultation	S, U, P
8	Supplementary equipment available for providing information	HRPT: High Resolution Picture Transmission APT: Automatic Picture Transmission MDWR: MET Doppler Weather Radar MAINT: Second WED of every month BTN 0200-0900 ALTN period: THU following the second WED.
9	ATS units provided with information	Singapore ACC, Singapore RCC
10	Additional information	Tel: 65422837 (MET Office)

WSSS AD 2.12 RUNWAY PHYSICAL CHARACTERISTICS

Designations RWY NR	TRUE BRG	Dimensions of RWY	Strength (PCN) and surface of RWY and SWY	THR coordinates (THR Geoid Undulation)	THR elevation and highest elevation of TDZ of precision APCH RWY
1	2	3	4	5	6
02L	023.02°	4000 M x 60 M	72/F/B/W/U Bituminous concrete	012056.27N 1035838.82E (10.24 M)	6.66 M 6.23 M
20R(Threshold displaced by 740m southwards)	203.02°	4000 M x 60 M	72/F/B/W/U Bituminous concrete	012256.13N 1035929.42E (10.25 M)	3.98 M 4.31 M
02C	023.03°	4000 M x 60 M	72/F/B/W/U Bituminous concrete	011943.51N 1035905.86E (10.27 M)	4.22 M 4.52 M
20C	203.03°	4000 M x 60 M	72/F/B/W/U Bituminous concrete	012143.37N 1035956.46E (10.30 M)	4.48 M 4.56 M

Slope of RWY-SWY Transverse / Longitudinal	SWY Dimensions (m)	CWY Dimensions (m)	STRIP dimensions (m)	OFZ	Remarks
7	8	9	10	11	12
RWY 02L 0.76 / 0.24%	60 X 60	270 X 150	4240 X 300	Yes	Scheduled closure of runways (see below)
RWY 20R 1.45 / 0.25%	60 X 60	270 X 150	4240 X 300		
RWY 02C 1.50 / 0.03%	60 X 60	60 X 150	4240 X 300		
RWY 20C 1.38 / 0.07%	60 X 60	60 X 150	4240 X 300		

Remarks (continued from above)

Scheduled Closure of RWY 02L/20R

- 1a) BTN 1630-2200 on every MON and THU of the month (*preventive maintenance work*).
In the event of an emergency, RWY will be re-opened within 30 minutes.
- 1b) BTN 0225-0240 0630-0635 1000-1005 2300-2305 daily (*inspection*).
In the event of an emergency, RWY will be re-opened within 5 minutes.

Scheduled Closure of RWY 02C/20C

- 2a) BTN 1630-2200 on every first, second and fourth WED of the month (*preventive maintenance work*).
In the event of an emergency, RWY will be re-opened within 30 minutes.
- 2b) BTN 0300-0315 0650-0655 1020-1025 2320-2325 daily (*inspection*).
In the event of emergency, RWY will be re-opened within 5 minutes.

WSSS AD 2.13 DECLARED DISTANCES

RWY Designator	Intersection Departures	TORA (m)	TODA (m)	ASDA (m)	LDA (m)	Remarks
1	2	3	4	5	6	7
20R	Not applicable	4000	4270	4060	3260	Thr displaced by 740m southwards
	W2	3850	4120	3910	Not applicable	
	W3	3050	3320	3110	Not applicable	
	W4	2600	2870	2660	Not applicable	
	W5	2150	2420	2210	Not applicable	
02L	Not applicable	4000	4270	4060	4000	NIL
	W8	3850	4120	3910	Not applicable	
	W7	3050	3320	3110	Not applicable	
	W6	2600	2870	2660	Not applicable	
20C	Not applicable	4000	4060	4060	4000	NIL
	E2	3850	3910	3910	Not applicable	
	E3	3425	3485	3485	Not applicable	
	E4	2750	2810	2810	Not applicable	
	E5	2250	2310	2310	Not applicable	
02C	Not applicable	4000	4060	4060	4000	NIL
	E10	3850	3910	3910	Not applicable	
	E9	3345	3405	3405	Not applicable	
	E8	3205	3265	3265	Not applicable	
	E7	2555	2615	2615	Not applicable	
	E6	2105	2165	2165	Not applicable	

Note: Intersection departures are allowed subject to the following:

- initiated by pilot and approved by ATC, traffic permitting.
- ATC is able to keep aircraft visual at all times

WSSS AD 2.14 APPROACH AND RUNWAY LIGHTING

<i>RWY</i>	<i>APCH LGT Type, LEN, Intensity</i>	<i>THR LGT colour WBAR</i>	<i>PAPI (MEHT)</i>	<i>TDZ LGT LEN</i>	<i>RWY Centreline LGT, LEN, spacing, colour, INTST</i>	<i>RWY Edge LGT, LEN, spacing, colour, INTST</i>	<i>RWY End LGT colour</i>	<i>SWY LGT colour</i>
1	2	3	4	5	6	7	8	9
02L	CAT II High Intensity approach lighting (900m) consisting of extended centreline and Red row barrettes, 2 crossbars, 2 approach beacons and sequenced flashing lights.	Green supplemented by Green wing-bar and 2 THR ident lights.	PAPI 003° located either side of RWY, 422m behind RWY THR. 2 White LGT and 2 Red LGT (20.0m), 3 White LGT and 1 Red LGT (24.0m), 4 White LGT (26.4m). ACFT with eye-to-wheel height greater than 8m are advised to fly with 2 White and 2 Red LGT visible so as to achieve sufficient wheel clearance.	White	Inset High Intensity centreline lights as follow: From THR to 900m from RWY end: White, 300m to 900m from RWY end: ALTN Red/ White, 300m to RWY end: Red.	Bi-directional raised White/Amber edge lights.	Red	Elevated Red
20R	CAT I High Intensity approach lighting (900m) distance coded centreline lights showing variable White and crossbars at 150m, 300m, 450m, 600m and 750m.	Green supplemented by Green wing-bar and 2 THR ident lights.	PAPI 003° located either side of RWY, 410m from THR. 2 White LGT and 2 Red LGT (20.0m), 3 White LGT and 1 Red LGT (22.6m), 4 White LGT (25.0m). ACFT with eye-to-wheel height greater than 8m are advised to fly with 2 White and 2 Red LGT visible so as to achieve sufficient wheel clearance.	NIL	Inset High Intensity centreline lights as follow: From THR to 900m from RWY end: White, 300m to 900m from RWY end: ALTN Red/ White, 300m to RWY end: Red.	Red RWY edge lights in the direction of Rwy 20R before the displaced THR. Bi-directional raised White/Amber edge lights after the displaced THR.	Red	Elevated Red
02C	CAT I High Intensity reduced approach lighting (810m) consisting of centreline barrettes showing variable White, 1 crossbar, 2 approach beacons and sequenced flashing lights.	Green supplemented by Green wing-bar and 2 THR ident lights.	PAPI 003° located either side of RWY, 418m from THR. 2 White LGT and 2 Red LGT (19.8m), 3 White LGT and 1 Red LGT (23.7m), 4 White LGT (26.2m). ACFT with eye-to-wheel height greater than 8m are advised to fly with 2 White and 2 Red LGT visible so as to achieve sufficient wheel clearance.	NIL	Inset High Intensity centreline lights as follow: From THR to 900m from RWY end: White, 300m to 900m from RWY end: ALTN Red/ White, 300m to RWY end: Red.	Bi-directional raised White/Amber edge lights.	Red	Elevated Red

<i>RWY</i>	<i>APCH LGT Type, LEN, Intensity</i>	<i>THR LGT colour WBAR</i>	<i>PAPI (MEHT)</i>	<i>TDZ LGT LEN</i>	<i>RWY Centreline LGT, LEN, spacing, colour, INTST</i>	<i>RWY Edge LGT, LEN, spacing, colour, INTST</i>	<i>RWY End LGT colour</i>	<i>SWY LGT colour</i>
1	2	3	4	5	6	7	8	9
20C	CAT II High Intensity reduced approach lighting (720m) consisting of extended centreline and Red row barrettes, 2 crossbars, 2 approach beacons and sequenced flashing lights.	Green supplemented by Green wing-bar and 2 THR ident lights.	PAPI 003° located left side of RWY, 418m from THR. 2 White LGT and 2 Red LGT (19.8m), 3 White LGT and 1 Red LGT (23.7m), 4 White LGT (26.2m). ACFT with eye-to-wheel height greater than 8m are advised to fly with 2 White and 2 Red LGT visible so as to achieve sufficient wheel clearance.	White	Inset High Intensity centreline lights as follow: From THR to 900m from RWY end: White, 300m to 900m from RWY end: ALTN Red/White, 300m to RWY end: Red.	Bi-directional raised White/Amber edge lights.	Red	Elevated Red

WSSS AD 2.15 OTHER LIGHTING, SECONDARY POWER SUPPLY

1	<i>ABN/IBN location, characteristics and hours of operation</i>	ABN: 012209.20N 1035858.43E (western side of RWY 02L/20R) ALTN FLG W G EV 2.3 SEC, Operating hours HN + IMC IBN: 012301.27N 1035959.49E (top of Cargo Agents Building E) FLG G 'CH' EV 7 SEC, Operating hours HN + IMC
2	<i>LDI location and LGT Anemometer location and LGT</i>	Pressure tube anemometer and wind vane situated 345m west of middle of RWY 02L/20R. Cup anemometers and wind vanes at ends and middle of both runways. Windsocks at ends of both runways. Transmissometers at both ends and in the middle of both runways
3	<i>TWY Edge and Centreline Lighting</i>	RWY 02L/20R and RWY 02C/20C: Blue lights on TWY curved edges and apron TWY edges and Green centreline lights on all TWY.
4	<i>Secondary power supply/switch-over time</i>	Automatic standby generator power supply AVBL for airfield lighting with switchover time of 1 second during Category II low visibility operations.
5	<i>Remarks</i>	Vehicles painted yellow or displaying chequered red/white or orange/white flag at highest point of vehicle

WSSS AD 2.16 HELICOPTER LANDING AREA

Refer to [ENR 3.4](#)

WSSS AD 2.17 ATS AIRSPACE

1	<i>Designation and Lateral Limits</i>	CHANGI CTR 013300N 1040149E 013042N 1040654E 012542N 1040448E thence along Kuala Lumpur/Singapore FIR BDRY to 012000N 1041218E 010018N 1035524E 011100N 1035134E 013300N 1040149E
2	<i>Vertical Limits</i>	SFC to 3,000ft ALT
3	<i>Airspace Classification</i>	C
4	<i>ATS Unit Callsign Language(s)</i>	Singapore Tower English
5	<i>Transition Altitude</i>	11000 FT (3,350m)
6	<i>Remarks</i>	A helicopter shall not be operated within the Changi CTR unless prior permission has been obtained from the Director-General of Civil Aviation, CAAS. Email to caas_atc_ansp@caas.gov.sg

WSSS AD 2.18 ATS COMMUNICATION FACILITIES

<i>Service Designation</i>	<i>Call sign</i>	<i>Frequency (P-Pri, S-Sec)</i>	<i>Hours of operation</i>	<i>Remarks</i>	
ACC	Singapore Radar	P123.7 MHz S127.3 MHz	H24	for ATS Routes B469, G219, G334, R208, L625, L629, L635, L642, L644, M751, M753, M758, M761, M763, M771, N884, N891 and N892.	
		133.8 MHz	0000-1430		
		P133.25 MHz S135.8 MHz	H24	for ATS Routes A457, A464, A576, B466, L762, R325 (all northbound) and R469.	
		P134.2 MHz S133.35 MHz			for ATS Routes , G580, L644, M646 and M767
		P134.4 MHz S128.1 MHz 255.4 MHz			for ATS Routes A464, A576, G579 (all southbound), B470, L644, N875 and in area in the immediate vicinity of Singapore.
		124.05 MHz	0000-1530	Flow control service provided for ARR/DEP ACFT	
	MAINT Period: Monthly - EV third SAT 1601-2359				
Singapore Radio	6556 kHz 11297 kHz	H24	SEA 1, Emission: A3AJ. SSB suppressed carrier, SATCOM service available		
	5655 kHz 8942 kHz 11396 kHz		SEA 2, Emission: A3AJ. SSB suppressed carrier, SATCOM service available		
	6556 kHz		SEA 3, Emission: A3AJ. SSB suppressed carrier, SATCOM service available		
APP	Singapore Approach	P120.3 MHz S124.6 MHz	H24	TAR - Intermediate approach to Singapore Changi AP and other airports in Singapore. DEP from all airports in Singapore.	
	Singapore Arrival	119.3 MHz		TAR - Intermediate and final approach to Singapore Changi Airport.	
ASR I MAINT Period: Monthly, EV first SAT 1601-2359 ASR II MAINT Period: Monthly, EV fourth SAT 1601-2359					

<i>Service Designation</i>	<i>Call sign</i>	<i>Frequency (P-Pri, S-Sec)</i>	<i>Hours of operation</i>	<i>Remarks</i>
TWR	Singapore Tower	118.6 MHz	H24 0000-1600	for TKOF/LDG. for ACFT OPR on RWY 02L/20R
		118.25 MHz	0000-1600	for ACFT OPR on RWY 02C/20C
	Singapore Ground	124.3 MHz	1600-0000 0000-1600	for start-up / push-back / taxiing of all aircraft for ground movement of aircraft west of Terminal 3
		121.725 MHz	0000-1700 2100-0000	for ground movement of aircraft east of Terminal 2
		121.85 MHz	0000-1800 2300-0000	for ground movement of aircraft north of Terminal 1
		129.95 MHz	H24	for ground emergency
		122.55 MHz	H24	for ground movement of aircraft east of Terminal 4
	125.65 MHz	H24	for ground movement of aircraft west of Terminal 4	
Singapore Delivery	121.65 MHz	H24	for Pre-flight check/ATC clearance	
Changi Tower / Changi Apron	121.9 MHz	H24	for vehicular movements on taxiways and runways. Towing of all aircraft and requests for engine runs on apron and taxiways, excluding runways, will be regulated by Changi Apron.	
D-ATIS	Singapore Changi Airport Information	128.6 MHz	H24	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

WSSS AD 2.19 RADIO NAVIGATION AND LANDING AIDS

<i>Type of aid and Variation</i>	<i>Ident</i>	<i>Frequency</i>	<i>OPR Hr</i>	<i>Position of Transmitting Antenna Coordinates</i>	<i>DME Transmitting Antenna Elevation / Remarks</i>
1	2	3	4	5	6 & 7
SINJON DVOR/DME	SJ	113.5 MHz CH82X	H24	011319.28N 1035120.08E	201° MAG 14.5km from THR RWY 02 (Paya Lebar). Antenna HGT: 194ft 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	011932.48N 1035901.21E	Located 368m (1207ft) from THR RWY 02C, along RWY centreline. Course width 3.38°. EM: A0/A2.
RWY 20C ILS GP	-	333.2MHz	H24	012131.70N 1035955.79E	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: 17m (56ft). EM: A0/A2.
RWY 20C ILS DME	ICC	CH34X	H24	012131.70N 1035955.79E	DME co-located with GP. EM: P9.
RWY 20C ILS MM	-	75MHz	H24	012212.07N 1040001.14E	Located 957m (3140ft) from THR RWY 20C along extended centreline of RWY. No back beam.

<i>Type of aid and Variation</i>	<i>Ident</i>	<i>Frequency</i>	<i>OPR Hr</i>	<i>Position of Transmitting Antenna Coordinates</i>	<i>DME Transmitting Antenna Elevation / Remarks</i>
1	2	3	4	5	6 & 7
RWY 02C ILS LLZ	ICE	108.3MHz	H24	012154.39N 1040001.14E	Located 368m (1207ft) from THR RWY 20C, along RWY centreline. Course width 3.38°. EM: A0/A2.
RWY 02C ILS GP	-	334.1MHz	H24	011952.09N 1035913.75E	Located 338m (1109ft) from THR RWY 02C on left side of RWY, 120m (394ft) from RWY centreline. GP angle 3°. HGT of ILS Reference Datum: 17m (56ft). EM: A0/A2.
RWY 02C ILS DME	ICE	CH20X	H24	011952.09N 1035913.75E	DME co-located with GP. EM: P9.
RWY 02C ILS MM	-	75MHz	H24	011915.04N 1035853.83E	Located 945m (3100ft) 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 1035834.17E	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 1035834.17E	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.
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.

WSSS AD 2.20 LOCAL TRAFFIC REGULATIONS

1 DESIGNATION OF PAYA LEBAR AIRPORT AS AN ALTERNATE AERODROME FOR SINGAPORE CHANGI AIRPORT

Please refer to section WSAP AD 2.20 for details.

2 WRONG APPROACHES AND LANDINGS OF AIRCRAFT BOUND FOR SINGAPORE CHANGI AND PAYA LEBAR AIRPORTS

2.1 INTRODUCTION

2.1.1 The attention of all pilots is drawn to the existence of Paya Lebar Airport close to Singapore Changi Airport. The runway at Singapore Changi Airport is orientated in the same true bearing as the runway at Paya Lebar Airport i.e. 023°/203°. Due to the close proximity of these two runways, pilots are cautioned against mistaking Paya Lebar Airport for the runway of Singapore Changi Airport and thus making an inadvertent visual landing or approach to land at Paya Lebar.

2.1.2 Erroneous approaches or landings usually occurred during the hours of darkness. In almost every instance, the weather prevailing at the time of the incident was generally good or fair.

2.1.3 There is intensive local flying at Paya Lebar and Seletar during the day and night. Thus, the risk of collision is very great if a wrong approach is made to any of the above two airports. Likewise, wrong approaches into Singapore Changi Airport can also be disastrous.

2.2 POINTS TO BEAR IN MIND WHEN APPROACHING SINGAPORE CHANGI AIRPORT OR PAYA LEBAR

2.2.1 The following points are highlighted to serve as a guide to assist pilots in making a correct approach into Singapore Changi Airport or Paya Lebar Airport and should be remembered and followed:

- a. The runways at Singapore Changi Airport and Paya Lebar Airport are identically aligned on 02/ 20. Therefore exercise extreme vigilance when leaving NYLON or SAMKO Holding Areas inbound and maintain correct tracks to the respective runways as listed below.
- b. Adhere strictly to IFR procedures even in VMC which calls for a procedure turn over NYLON Holding Area or SAMKO Holding Area as prescribed.
- c. Make full use of all available navigational and landing aids available and positively identify every aid used.
- d. Switch to the correct ILS localizer frequency at Singapore Changi Airport under all conditions.

2.3 AERODROME CHARACTERISTICS OF SINGAPORE CHANGI AND PAYA LEBAR AIRPORTS

2.3.1 Tabulated below are details of aerodrome characteristics of Singapore Changi Airport and Paya Lebar Airport which indicate the similarities and significant differences for ease of identification by pilots operating into these two airports.

Aeronautical Service	PAYA LEBAR Airport	SINGAPORE CHANGI Airport	Significant Differences and Remarks
Magnetic heading of RWY	02/20	02L/20R 02C/20C	Exercise caution due to similar RWY alignment

Aeronautical Service	PAYA LEBAR Airport	SINGAPORE CHANGI Airport	Significant Differences and Remarks
Approach Lights	RWY 02 Modified Calvert High INTST with centreline and 3 crossbars. High INTST white LGT with brilliancy control and sequenced flashing lights.	RWY 02L Precision APCH LGT CAT II. Extended centreline with red side row barettes, 2 crossbars, 2 APCH beacons and sequenced flashing lights.	
	RWY 20 Modified Calvert High INTST with centreline and 3 crossbars. High INTST white LGT with brilliancy control and sequenced flashing lights.	RWY 20R Precision APCH LGT CAT I. Centreline barettes flashing white, 2 APCH beacons and sequenced flashing lights. (refer to chart AD-2-WSSS-ADC-2)	
ILS	RWY 20 - NIL	RWY 20R IDENT ICH No back beam LLZ 108.9 MHz GP 329.3 MHz	
	RWY 02 - NIL	RWY 02L IDENT ICW No back beam LLZ 110.9 MHz GP 330.8 MHz	
IBN	Flashing R 'PL' HN and IMC	Flashing G 'CH' HN and IMC	
ABN	NIL	ALTN Flashing W G every 2.3 SEC	

WSSS AD 2.21 NOISE ABATEMENT PROCEDURES

- 1.1 To alleviate the problem of noise, all aircraft on AWY G579 between SINJON (SJ) and JAYBEE (JB) shall operate at/above 5,000ft.
- 1.2 The Standard Instrument Departure routes for aircraft departing on RWY 20R/20C are for the purpose of noise abatement in addition to being used for air traffic control.
- 1.3 Departures on RWY 20R are restricted between 1600-2200UTC. This restriction is not applicable when RWY 20C/02C is unavailable because of maintenance works or for other reasons.
- 1.4 Unless it is necessary for operational or safety reasons, when using engine reverse, arrivals on RWY 02L/20R between 1600-2200UTC may not exceed idle reverse thrust.

WSSS AD 2.22 FLIGHT AND GROUND PROCEDURES

1 LOW VISIBILITY PROCEDURES (LVP) FOR CATEGORY II ILS OPERATIONS

1.1 Introduction

- 1.1.1 Category II ILS approaches will be made available at Singapore Changi Airport to authorised flights during prolonged periods of low visibility, except during thunderstorms. RVR minima for CAT II ILS operations is limited to 350m due to runway and taxiway light spacing requirements on the airfield.

1.2 Authorisation for Category II ILS Approaches

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

1.3 Category II ILS Runways

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

AD-2-WSSS-IAC-1 to AD-2-WSSS-IAC-11 and the Precision Approach Terrain Charts for RWY 02L and RWY 20C at AD-2-WSSS-PATC-1 and AD-2-WSSS-PATC-2 respectively.

1.4 Initiation of Category II ILS Operations

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

1.5 ILS Sensitive Areas

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

1.6 Termination of LVP for Category II ILS Operations

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

1.7 Operations of flights Not Authorised for Category II ILS Operations

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

2 RUNWAY UTILISATION

2.1 Runway-in-use

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

2.2 Departures

- 2.2.1 Pilots should arrange their taxi such that they are ready to depart without delay on reaching the runway holding point. As standard ICAO wake turbulence separation is being applied, pilots are to advise ATC early if more time is needed for the aircraft to be ready for departure. When informed, ATC will be able to make changes in the departure sequence, if necessary, to minimise delays to other succeeding departures.
- 2.2.2 Pilots should complete cockpit checks prior to line-up for departure and keep any checks on the runway to a minimum.
- 2.2.3 Conditional line-up clearance may be used by ATC to facilitate an expeditious flow of traffic. On receipt of line-up clearance, pilots should taxi into position promptly without delay. Unless given instructions to line-up and wait, pilots should be ready and prepared to depart without stopping. On receipt of take-off clearance, pilots to commence take-off roll without delay.

2.3 Clearance for Immediate Take-Off

- 2.3.1 A pilot receiving the ATC instruction 'cleared for immediate take-off' is required to act as follows:
- if waiting clear of the runway, taxi immediately on to it and begin take-off run immediately without stopping the aircraft;
 - if already lined-up on the runway, take-off without delay;
 - if unable to comply with the instruction, inform ATC immediately.

2.4 Arrivals - Minimum Runway Occupancy Time (ROT)

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

- 2.4.2 To achieve minimum ROT and reduce missed approaches due to occupied runway, pilots should vacate the runway via the first available exit taxiway corresponding to operational requirements, or as instructed by ATC. If an exit taxiway other than the first available exit taxiway is required, pilots shall advise the Tower Controller on first contact.
- 2.4.3 To enhance planning, pilots can make reference to the Landing Exit Distance (LED), the distance from threshold to the furthest edge of the exit taxiway:

RWY	Exit Taxiway (LED in metres)	Remarks
20R	<u>W6*(1655)</u> , <u>W7*(2123)</u> and W8 (3061)	Note 1: Recommended exit taxiways are bold and underlined.
20C	<u>E6*(1948)</u> , <u>E7*(2391)</u> and E8 (3152)	
02L	<u>W5*(1966)</u> , <u>W4*(2491)</u> and W3* (2876)	Note 2: * Indicates Rapid Exit Taxiway (RET) and maximum design ground speed for the exit taxiway is 50kts.
02C	<u>E5*(2055)</u> , <u>E4*(2565)</u> and E3* (3267)	

- 2.4.4 Pilots can expect initial taxi instructions from the Runway Controller before clearing the exit taxiway. Aircraft vacating the runway-in-use should not stop on the exit taxiway until the entire aircraft has passed the runway holding point.
- 2.4.5 BTN 0830-1030 daily estimated delays of about 15 minutes can be expected for arrivals into Singapore Changi Airport.

2.5 Land after Procedures

- 2.5.1 Normally, only one aircraft is permitted to land or take-off on the runway-in-use at any one time. However, when the traffic sequence is two successive landing aircraft, the second aircraft may be allowed to land before the first aircraft has cleared the runway-in-use provided:
- the runway is long enough;
 - during daylight hours;
 - the second aircraft will be able to see the first aircraft clearly and continuously until it is clear of the runway;
 - the second aircraft has been warned.

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

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

2.6 Special Landing Procedures

- 2.6.1 Special landing procedures may be in force at Singapore Changi Airport in conditions shown as follows:
- When the runway-in-use is temporarily occupied by other traffic, landing clearance may be issued to an arriving aircraft provided that at the time the aircraft crosses the threshold of the runway-in-use the following separation distances will exist:
 - Landing following landing - The preceding landing aircraft will be clear of the runway-in-use or will be at least 2,500m from the threshold of the runway-in-use.
 - Landing following departure - The departing aircraft will be airborne and at least 2,500m from the threshold of the runway-in-use, or if not airborne, will be at least 2,500m from the threshold of the runway-in-use.
- 2.6.2 These procedures will be used only under the following conditions:
- during daylight hours;
 - visibility of at least 5km;
 - cloud ceiling of 1,500ft in the departure/missed approach area;
 - ATC is satisfied that the pilot of the next arriving aircraft will be able to observe continuously the relevant traffic;
 - no unfavourable surface wind conditions (including significant tailwind, windshear, turbulence, etc);
 - when the runway is dry and free of all precipitants such that there is no evidence that the braking action may be adversely affected.

2.7 Phraseology

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

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

3 AIRPORT COLLABORATIVE DECISION MAKING (A-CDM) MODE OF OPERATIONS

- 3.1 A-CDM aims to optimise airport operations by having an efficient turnaround process and improving the predictability of operational events. It also helps to improve gate management, flight punctuality, reduce apron taxiway and holding point congestion which is beneficial to all airport partners. A-CDM involves sharing of accurate and timely operational information amongst airport partners through different airport systems and improving work processes by implementing a set of operational procedures.
- 3.2 The A-CDM procedures apply to all scheduled flights departing Singapore Changi Airport except for VVIP, CASEVAC, SAR and aircraft on special tasks. ATC shall have full discretion in conduct of such operations.
- 3.3 Definition of commonly used terms in A-CDM
- a. Target Off Block Time (TOBT) – The time an aircraft operator (AO) or ground handling agent (GHA) estimates that an aircraft will be ready, all doors closed, boarding bridge removed, pushback vehicle available and ready to start-up / pushback immediately upon receipt of clearance from ATC.
 - b. Target Start Up Approval Time (TSAT) – The time provided by ATC that an aircraft can expect start-up / push back approval.
 - c. Calculated Take Off Time (CTOT) – A time calculated as a result of tactical slot allocation, at which a flight is expected to become airborne.

4 A-CDM PRE-DEPARTURE PROCEDURES

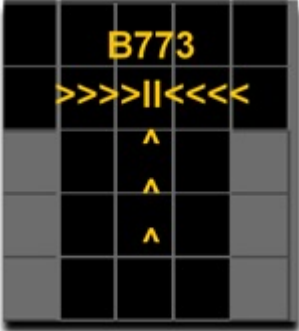





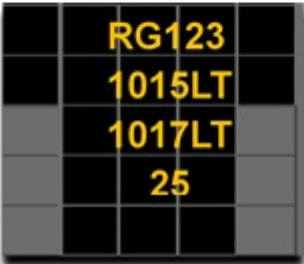
- 4.1 Singapore Changi Airport's A-CDM portal will automatically calculate a system TOBT for each departure flight taking into account the estimated or actual in-block time (EIBT / AIBT), minimum turnaround time (MTT) and scheduled time of departure (STD)
- 4.2 If the calculated TOBT (EIBT / AIBT + MTT) is earlier than STD, the system will take the STD as TOBT.
- 4.3 If the calculated TOBT (EIBT / AIBT + MTT) is later than STD, the amount of turnaround delay that system predicts is equal to TOBT – STD.
- 4.4 AO are required to assess the system generated TOBT at 40 minutes prior to departure and update it if the prediction of departure readiness is different. Thereafter, TOBT needs to be monitored and updated constantly if it is expected to differ by 5 minutes or more until the flight commences pushback. AO can consider delegating the responsibility of TOBT submission to their ground handling agent (GHA) subject to prior internal arrangements between AO and GHA.
- 4.5 TOBT shall be updated through the following systems:
- a. Airport Operations Centre System (AOCS) A-CDM web based portal; or
 - b. Gate Message Input Display (GMID) at boarding rooms;
- 4.6 AO/GHA is encouraged to update TOBT through ONLY one of the above systems in order to avoid any chance of a miscommunication.
- 4.7 TOBT information is available through the following channels:
- a. AOCS A-CDM portal;
 - b. GMID;
 - c. Aircraft Docking Guidance System (ADGS) at contact stands;
 - d. Radio communication with GHA or AO.
- 4.8 The Pre-Departure Sequencer (PDS) will calculate the TSAT automatically by taking into account factors such as TOBT, calculated take-off time (CTOT), variable taxi times (VTT), wake turbulence category, departure separation, etc. A pre-departure sequence is determined from the calculated TSATs, thus the accuracy of TOBT is vital to an optimal TSAT.
- 4.9 Flights with an invalid or expired TOBT will be instructed by ATC to update TOBT when requesting for clearance. For non-compliant flights, delays can be expected. AO or GHA are strongly encouraged to update TOBT as soon as any expected delay to the aircraft readiness for pushback is made available to avoid unnecessary hold-ups.
- 4.10 TSAT information is available through the following channels:
- a. AOCS A-CDM portal;
 - b. GMID;
 - c. ADGS at contact stands;
 - d. Radio communication with GHA or AO;
 - e. ATC - Upon issuance of ATC clearance (for flights parked at aircraft stands without ADGS).



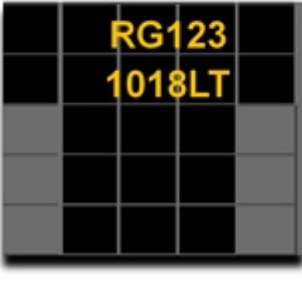
5 A-CDM START-UP PROCEDURES

- 5.1 Pilot shall ensure aircraft is ready for pushback at TOBT.
- 5.2 Pilot to maintain communication with the AO / GHA as they are responsible for updating the TOBT. Notify the AO / GHA to update the TOBT if it is expected to differ by 5 minutes or more.
- 5.3 Pilot to contact Ground Movement Planner (Clearance Delivery) and request for ATC clearance within 5 minutes of TOBT using the following phraseology:
- Callsign
 - Destination
 - Proposed flight level and alternate level, if any
 - Parking position
- a. Pilot shall only request for ATC clearance provided aircraft is ready to pushback at TOBT. Any updates to TOBT after receipt of ATC clearance will result in cancellation of clearance issued as the ATC clearance validity is based on the initial TOBT.
- 5.4 ATC will advise the pilot whether the proposed flight level or other alternate flight level is available and an ATC clearance will be issued accordingly. If pre-departure coordination with an adjacent unit or centre is required, the pilot will be instructed to standby.
- 5.5 ATC will update TSAT changes if any, during issuance of ATC clearances. Note that TSAT displayed on ADGS may not be final and can be revised due to en-route clearance restrictions, ground congestion or flow measures.
- 5.6 Pilot shall request for pushback from Ground Movement Control within 5 minutes of TSAT after obtaining ATC clearance, or as directed by ATC.
- a. ATC may swap pushback sequence based on real-time readiness of aircrafts to maximise apron and runway capacity and reduce the overall delay to traffic as and when required.
- b. At the end of pushback, the departing aircraft must have all engines started and be ready to taxi immediately, unless otherwise instructed by ATC.
- Note: The first aircraft to taxi may not necessarily be the first aircraft to take-off as distances between aircraft stands and the departure runway vary.
- 5.7 A flight issued with gate hold (TSAT>TOBT) but chooses to commence pushback before the assigned time will be allowed to do so subject to traffic. However, the flight should not expect an earlier departure time as the planned pre-departure sequence will be maintained.
- 5.8 If a flight is unable to pushback by TSAT + 5 minutes due to the aircraft being unready, ATC clearance and TSAT will be cancelled. Pilot must notify the AO / GHA to update the TOBT for a new TSAT before requesting for a new ATC clearance. This also applies to aircraft returning back to blocks after pushback.
- a. ATC will inform the aircraft when a clearance is cancelled using the phraseology; "(Callsign of aircraft) your ATC clearance and TSAT is cancelled (reason). Update TOBT before requesting for new clearance".
- b. Flight may also have its ATC clearance cancelled if it develops a technical problem after pushback and is unable to taxi for prolonged duration.
- 5.9 Non-compliance of initial TSAT may result in an aircraft losing its existing position in the pre-departure sequence. Delay can be expected as a result of re-sequencing based on new TOBT input.
- 5.10 If delay in pushback is due to ground traffic movement or ATC clearance restrictions, the ATC clearance and TSAT will remain valid even if it exceeds TSAT + 5 minutes. TOBT need not be updated for such situations.
- 5.11 In the event that A-CDM mode of operations need to be cancelled due to any reason, the termination will be communicated to relevant parties through email by the airport operator and a NOTAM will be issued by ATC. Pilot shall follow the non-CDM procedures detailed in para 12.

6 A-CDM INFORMATION VIA AIRCRAFT DOCKING GUIDANCE SYSTEM (ADGS)

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

Aircraft Docking Guidance System (ADGS)	
Description	Display on ADGS
<p>Aircraft arrival to stand</p> <ul style="list-style-type: none"> No change in existing functionality and display 	
<p>40 minutes prior to TOBT</p> <ul style="list-style-type: none"> ADGS will display TOBT submitted by AO / GHA and a count down timer (2 digits) to TOBT in minutes As ADGS can only display up to 7 characters per line, the displayed message will be scrolling. Timings displayed will be in Local Time (LT) TOBT timings will change instantly if there is an update done by AO / GHA 	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Snapshot 1</p>  </div> <div style="text-align: center;"> <p>Snapshot 2</p>  </div> </div> <div style="text-align: center; margin-top: 20px;"> <p>Snapshot 3</p>  </div>
<p>25 minutes prior to TOBT</p> <ul style="list-style-type: none"> ADGS will display TSAT derived by PDS As ADGS can only display up to 7 characters per line, the displayed message will be scrolling. TSAT timings may change as the PDS is continuously optimising push back times based on real time traffic conditions 	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Snapshot 1</p>  </div> <div style="text-align: center;"> <p>Snapshot 2</p>  </div> </div> <div style="text-align: center; margin-top: 20px;"> <p>Snapshot 3</p>  </div>

Aircraft Docking Guidance System (ADGS)	
Description	Display on ADGS
<p>Aircraft departure from stand</p> <ul style="list-style-type: none"> ADGS will display the actual off-block time (AOBT) As ADGS can only display up to 7 characters per line, the displayed message will be scrolling TOBT, TSAT and TOBT countdown timer will be removed AOBT display will be removed 3 minutes after AOBT 	<p style="text-align: center;">Snapshot 1</p> 
	<p style="text-align: center;">Snapshot 2</p> 
	<p style="text-align: center;">Snapshot 3</p> 

7 CONTACT AND INFORMATION

- 7.1 Please contact the airport operator, Changi Airport Group (CAG), at a-cdm@changiairport.com for application of AOCS A-CDM and GMID account or if you have any queries.
- 7.2 Aircraft operators may also contact their ground handling agent directly on queries regarding TOBT submission.

8 ASSIGNMENT OF FLIGHT LEVELS TO AIRCRAFT DEPARTING FROM SINGAPORE CHANGI AIRPORT

- 8.1 Assignment of flight levels to departing aircraft is made on a best-planned-best-served basis (with reference to TOBT for ATC clearance request detailed in para 5.3). Aircraft will normally be assigned the level requested unless an alternate level is offered after coordination with the adjacent ATC centres.
- 8.2 Departing flights from Singapore requesting FL280 or FL320 on L759, M770, N571, N571/N877 or P628 will be cleared as follows:
 - a. Aircraft departing Singapore will be cleared to FL280;
 - b. Succeeding aircraft on the same route will be cleared to FL280 with 10min longitudinal separation provided there is no closing speed with the preceding aircraft;
 - c. Additional longitudinal separation as appropriate shall be imposed by ATC when the succeeding aircraft is faster than the preceding aircraft on the same route;
 - d. The first aircraft from either Singapore or Kuala Lumpur to be over GUNIP on N571 or N571/N877, the Kuala Lumpur/Bangkok FIR boundary on M770 or L759 and VPL on P628 can expect its requested flight level

9 DELAY IN PUSHBACK AND/OR TAXIING DUE TO OTHER AIRCRAFT

- 9.1 Delays may be expected for the second aircraft to pushback and to taxi when two or more aircraft are parked either adjacent to one another or close together. However, it will retain its ATC clearance even if the 5 minutes grace period allowed for under para 5.8 is exceeded.

Note: The TSAT may not be able to predict delays arising from apron congestion as traffic movement on ground is dynamic and situations may change on a real time basis depending on aircraft readiness. ATC will facilitate pushback as soon as possible when traffic permits.

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

- 10.1 The ATC clearance may require an aircraft to arrive at a reporting point at a specified time and level or to depart a number of minutes behind a preceding traffic to establish the appropriate longitudinal separation. Such delay will not deprive a departing aircraft of its ATC clearance even though the 5 minutes grace period allowed for under para 5.8 is exceeded.

11 DELAY DUE TO OVERFLIGHTS

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

12 NON-CDM MODE OF OPERATIONS

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

- 12.2 If TOBT cannot be submitted or it is unavailable through different channels stated in para 4.5,

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

- 12.3 If TSAT is unavailable through different means stated in para 4.10,

- a. AO and GHA shall continue to submit TOBT and pilots shall request for ATC clearance 5 minutes within TOBT stated in para 5.3
- b. ATC will revert to the gate hold procedures stated in para 13 and issue estimated pushback times accordingly.

13 GATE HOLD PROCEDURES FOR DEPARTING AIRCRAFT (DURING NON-CDM MODE OF OPERATIONS)

- 13.1 Whenever there are about five to seven departing aircraft at the runway holding point, subsequent pushback of departures will be regulated such that the Ground Movement Planner (GMP) on VHF frequency 121.65MHz will start to issue pilots with Expected Pushback Time (EPT) as TSAT used in A-CDM operations is not available. The determination of EPT will take into account an aircraft's parking stand as well as taxi time to the runway-in-use holding point.

- ← 13.2 When an EPT is issued, pilots will be instructed to either remain on GMP frequency or to monitor Singapore Ground Control (frequencies 121.725MHz, 121.85MHz, 122.55MHz, 124.3MHz or 125.65MHz). It should be noted that when instructed to monitor the Singapore Ground frequencies, pilots shall not establish contact with the Singapore Ground Control, rather, pilots shall maintain listening watch on the assigned Singapore Ground Control frequency and wait for pushback instruction. This is to prevent unnecessary frequency congestion.

- 13.3 A flight issued with an EPT but chooses to commence pushback before the assigned time will be allowed to do so subject to traffic. However, the flight should not expect an earlier departure time as the planned pre-departure sequence will be maintained.

- 13.4 In a situation when a departing aircraft is occupying a gate that has been assigned to an arriving aircraft, the departing aircraft will be instructed by GMP to contact Singapore Ground Movement Control for pushback for the purpose of better gate utilisation.

- 13.5 To maximise runway utilisation, departure sequence will be planned on the basis of increasing runway throughput so as to enhance overall efficiency.

14 GROUND MOVEMENT PLANNER ON VHF 121.65MHz

- 14.1 The frequency shall be used for aircraft pre-flight checks and ATC clearances. Pilot-in-command to make his initial call from the parked position on this frequency.

← **15 GROUND MOVEMENT CONTROL ON VHF 121.725MHz, 121.85MHz, 122.55MHz, 124.3MHz and 125.65MHz**

15.1 This frequency shall be used for aircraft start-up/push-back clearance.

← 15.2 Unless otherwise instructed by ATC, the pilot-in-command shall prior to starting engines listen out on the Ground Movement Control frequency on 121.725MHz, 121.85MHz, 122.55MHz, 124.3MHz or 125.65MHz.

15.3 The pilot-in-command shall:

- a. Request and obtain taxi instructions prior to taxiing;
Note: ATC clearance, including the assigned SSR code will normally be issued prior to push back. Pilot shall squawk the SSR code immediately when airborne.
- b. Change from Ground Movement Control frequency to the Runway Control frequency when instructed (118.6MHz or 118.25MHz). It should be noted that when instructed to monitor Singapore Tower frequencies, pilots shall not establish contact with Singapore Tower; rather, pilots shall maintain a listening watch on the assigned Singapore Tower frequency and wait for instruction. This is to prevent unnecessary frequency congestion.

15.4 Departing aircraft will be instructed when to change from 118.6MHz or 118.25MHz to Singapore Departure frequency 120.3MHz.

← 15.5 In the case of the aircraft having landed, the pilot-in-command shall change from 118.6MHz or 118.25MHz to 121.725MHz, 121.85MHz, 122.55MHz, 124.3MHz or 125.65MHz immediately upon instructed by ATC after clearing the runway. He shall maintain watch on 121.725MHz, 121.85MHz, 122.55MHz, 124.3MHz or 125.65MHz for taxiing and parking instructions until he arrives at his aircraft stand.

16 TAXIING

16.1 Taxi clearance given by Singapore Ground Movement Control will relate to movement on the manoeuvring area, but excluding the marshalling area.

16.2 Aircraft taxiing on the manoeuvring area will be regulated by ATC to avoid or reduce possible conflict and will be provided with traffic information and alerting service. ATC shall apply taxiing clearance limits whenever necessary.

16.3 The taxiway routes to be used by aircraft after landing or when taxiing for departure will be specified by ATC. The issuance by ATC of a taxi route to an aircraft does not relieve the pilot-in-command of the responsibility to maintain separation with other aircraft on the manoeuvring area or to comply with ATC directions intended to regulate aircraft on the manoeuvring area.

16.4 Pilots are reminded to always use minimum power when starting engines, when manoeuvring within the apron area or when manoeuvring from apron taxiways to other parts of the aerodrome. It is especially critical when commencing to taxi that break-away thrusts are kept to an absolute minimum and then be reduced to idle thrusts as soon as possible.

17 TAKE-OFF AND LANDING

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

18 STANDARD INSTRUMENT DEPARTURE (SID) AND STANDARD INSTRUMENT ARRIVAL (STAR)**18.1 INTRODUCTION**

- 18.1.1 The SIDs and STARs for Singapore Changi Airport require aircraft to be GNSS-equipped and approved with navigation systems that meet the ICAO RNAV-1 navigation specification in accordance to the ICAO Performance Based Navigation Manual (Doc 9613).
- 18.1.2 To avoid proliferation of SIDs and STARs, the basic RNAV SIDs and STARs follow similar tracks as the RNAV-1 (GNSS) SIDs and STARs using the same set of SIDs and STARs identification.
- 18.1.3 Operators / pilots who are not approved to operate on the RNAV-1 (GNSS) SIDs and STARs shall notify ATC and operate on the alternate basic RNAV SIDs and STARs or expect radar vectors from ATC.

18.2 ARRIVALS

- 18.2.1 Arriving aircraft from the various ATS routes shall plan for the respective RNAV-1 STARs with the associated flight planning requirement as shown below:

ATS Route	RNAV-1 STAR	Remarks and Flight Planning Requirement
A464 (southbound to Singapore)	ARAMA	Default STAR shall be ARAMA. When traffic permits and WSSS Runway 20 is in use, ATC will offer LELIB STAR. Pilots are to request for the STAR from Singapore ATC when the flight is within 120 DME SJ and Runway 20 is in use. Flight shall still remain under the control of WMKK ATC.
A576 (southbound to Singapore)	Not applicable	Southbound flight landing at WSSS are not permitted to flight plan via A576.
G579	REPOV	NIL
G580	KARTO	NIL
L504	OBDOS	NIL
L642	ELALO	ESPOB Q801 Q802 ELALO
L762	ASUNA	NIL
M635	SURGA	NIL
M646	KARTO	NIL
M751 / B469	Not applicable	M751 VPK B469 90 DME PU PIBAP PASPU. After PASPU, expect radar vectors.
M753	ELALO	IPRIX Q802 ELALO
M767	KARTO	NIL
M774	OBDOS	NIL
M904	ELALO	UPRON Q803 ELALO
N891	ELALO	N891 ENREP direct ELALO
N892	MABAL	NIL
R469	ASUNA	NIL

Note: The LEBAR STAR serves as a transition option to the STARs listed above. This is to facilitate arrivals joining downwind to the west of Singapore Changi Airport. ATC may clear arrivals to join the LEBAR STAR when air traffic permits.

- 18.2.2 All RNAV-1 (GNSS) STARs terminate at the initial approach fix (IAF). Arrivals can expect radar vectors to intercept the localizer for an ILS approach to the respective runways.

18.3 DEPARTURES

- 18.3.1 All departing aircraft will be cleared on the appropriate RNAV-1 (GNSS) SIDs and shall climb initially to 3,000ft.
- 18.3.2 RNAV-1 (GNSS) SIDs will be assigned to departures from Singapore Changi Airport that flight plan on the following ATS routes:

ATS Route	RNAV-1 SID	Remarks and Flight Planning Requirements
A457	MASBO	NIL
B470	ANITO	NIL
G580 / M646	TOMAN	NIL
L504	BAVUS	NIL
L625 / N884	TOMAN	NIL

ATS Route	RNAV-1 SID	Remarks and Flight Planning Requirements
L762	ADMIM	NIL
M635	VENIX	NIL
M751	MERSING	NIL
M753	MERSING	VMR L642 ENREP M753 Expect radar vectors or further ATC clearance on approaching VMR.
M771	MERSING	VMR DOLOX M771 Expect radar vectors or further ATC clearance on approaching VMR.
M774	KADAR	NIL
N884	Not applicable	Not available for flight planning between VMR and LUSMO. Flight plan via TOMAN L625 LUSMO N884.
N891	MERSING	VMR ENREP N891 Expect radar vectors or further ATC clearance on approaching VMR.
R469	ADMIM	NIL
Y339	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.

18.4 VERTICAL AND SPEED RESTRICTIONS

18.4.1 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.

18.5 OPERATORS' PROCEDURES

18.5.1 The operator shall ensure that in-flight procedures, crew manuals and training programmes are established in accordance with RNAV-1 (GNSS) navigation requirements.

18.5.2 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.

19 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
ADMIM	005733N	1033033E	VTK R-228.4 / D41.2	SJ R-232.8 / D26.1
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
ASUNA	005948N	1030954E	VTK R-244.1 / D57.3	SJ R-252.0 / D43.6
ATKAX	000512N	1065946E	VTK R-113.9 / D195.5	SJ R-109.7 / D200.6
ATRUM	013256N	1040057E	VTK R-357.3 / D8.0	SJ R-026.1 / D21.8
BAVUS	000000N	1090000E	VTK R-105.9 / D310.5	SJ R-103.4 / D317.3
BETBA	013302N	1035331E	VTK R-316.1 / D11.3	SJ R-006.3 / D19.8
BIBVI	024336N	1040618E	VTK R-003.5 / D78.4	SJ R-009.6 / D91.1
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
BOBAG	010230N	1032954E	VTK R-234.7 / D38.6	SJ R-243.2 / D24.0
BOKIP	010421N	1034353E	VTK R-220.5 / D27.0	SJ R-219.5 / D11.6
BTM	010813N	1040758E	VTK R-158.2 / D17.9	SJ R-107.0 / D17.5
DIVSA	011105N	1040303E	VTK R-172.9 / D13.9	SJ R-100.8 / D11.9
DOGRA	010525N	1041423E	VTK R-146.2 / D23.5	SJ R-108.9 / D24.4

Name	Latitude	Longitude	Radius/Distance from VTK	Radius/Distance from SJ
DOKTA	012606N	1041040E	VTK R-083.0 / D9.4	SJ R-057.0 / D23.2
DONDI	011252N	1035855E	VTK R-191.3/ D12.3	SJ R-093.4 / D7.6
DOSNO	004757N	1041409E	VTK R-160.8 / D39.0	SJ R-137.8 / D34.1
DOSPA	011459N	1040441E	VTK R-161.4 / D10.5	SJ R-082.9 / D13.5
DOVAN	011938N	1041249E	VTK R-114.6 / D12.7	SJ R-073.9 / D22.5
ELALO	041240N	1043329E	VTK R-010.6 / D169.9	SJ R-013.4 / D183.3
HOSBA	011948N	1042418E	VTK R-102.5 / D23.6	SJ R-079.0 / D33.7
← 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
IBULA	005036N	1043600E	VTK R-134.5 / D48.7	SJ R-116.8 / D50.2
IGNON	010847N	1041257E	VTK R-144.1 / D19.8	SJ R-101.8 / D22.2
IKAGO	003816N	1052931E	VTK R-117.7 / D99.8	SJ R-109.5 / D104.4
IKIMA	004314N	1045500E	VTK R-127.6 / D67.9	SJ R-115.1 / D70.5
JB (JAYBEE)	013000N	1034242E	VTK R-285.1 / D19.3	SJ R-332.6 / D18.6
KADAR	000647S	1074342E	VTK R-112.4 / D240.5	SJ R-109.0/ D245.8
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
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
NYLON	013657N	1040624E	VTK R-023.0 / D13.0	SJ R-032.9 / D30.0
OBDOS	002503N	1065551E	VTK R-108.9 / D184.5	SJ R-104.7 / D190.7
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
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
RUVIK	011422N	1042033E	VTK R-118.8 / D21.9	SJ R-088.0 / D29.2
RWY 02C DER	012152N	1040000E	VTK R-203.5 / D3.3	SJ R-046.0 / D12.2
RWY 02L DER	012305N	1035933E	VTK R-224.1 / D2.5	SJ R-040.6 / D12.8
RWY 20C DER	011935N	1035902E	VTK R-203.3 / D5.8	SJ R-051.5 / D10.0
RWY 20R DER	012047N	1035835E	VTK R-213.7 / D4.9	SJ R-044.8 / D10.4
SABKA	015051N	1031713E	VTK R-300.4/ D51.2	SJ R-317.7 / D50.7
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
SJ (SINJON)	011319N	1035120E	-	-
SURGA	003657S	1063119E	VTK R-129.1 / D193.3	SJ R-124.6 / D194.3
TOKIM	012933N	1040315E	VTK R-022.7 / D5.0	SJ R-036.7 / D20.1
TOMAN	012147N	1054717E	VTK R-091.7 / D106.2	SJ R-085.9 / D116.5
TOPOM	012955N	1040227E	VTK R-012.8 / D5.1	SJ R-034.2 / D20.0
VENIX	002156S	1060521E	VTK R-130.6 / D163.5	SJ R-125.3 / D164.3
VENPA	002141N	1044955E	VTK R-142.3 / D79.6	SJ R-131.2 / D78.1
VMR	022318N	1035218E	VTK R-351.2 / D58.8	SJ R-000.9 / D69.6
VTK (TEKONG)	012455N	1040120E	-	-

20 SID / STAR PHRASEOLOGIES

20.1 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.

20.2 The core phraseologies are:

- i. CLIMB VIA SID TO (level)
- ii. DESCEND VIA STAR TO (level)

20.3 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.

20.4 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))

20.5 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.

20.6 Phraseologies for variations to the lateral profile of the SID / STAR are:

- i. PROCEED DIRECT (waypoint), or
- ii. VECTORING

20.7 These phraseologies mean that speed and level restrictions associated with the bypassed waypoints are cancelled.

20.8 Phraseology to clear aircraft to return to SID / STAR is: REJOIN SID / STAR

20.9 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.

20.10 The term 'VIA' will no longer be used when issuing lateral routing clearances.

21 ARRIVING AIRCRAFT

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

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 SIMULTANEOUS INDEPENDENT PARALLEL APPROACHES

23.1 Introduction

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

23.2 Procedures for simultaneous independent parallel approaches

23.2.1 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.

23.2.2 ATC will vector arriving flights into Singapore Changi Airport from the final waypoint of the respective STARs to the respective NOZs.

23.2.3 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.

23.2.4 ATC is not required to provide separation between aircraft on adjacent ILS Localizers and will monitor aircraft for deviation from the approach path.

23.2.5 Aircraft can expect to maintain altitude 3,500ft till Glide Path Interception for Runway 20R / 02L and 2,500ft 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.

23.2.6 Aircraft can expect the following radiotelephony phraseology when intercepting the ILS:

- a. to intercept the Localizer before clearing for ILS

“TURN LEFT (RIGHT) HEADING (three digits) MAINTAIN (altitude) REPORT ESTABLISHED ON THE LOCALIZER RUNWAY (number) LEFT (CENTRE / RIGHT)”

followed by ...

“MAINTAIN (altitude), CLEARED FOR ILS APPROACH RUNWAY (number) LEFT (CENTRE/RIGHT)”

or

- b. to intercept ILS

“TURN LEFT (RIGHT) HEADING (three digits) MAINTAIN (altitude) CLEARED FOR ILS APPROACH RUNWAY (number) LEFT (CENTRE / RIGHT)”

23.2.7 Aircraft can expect to maintain speed 180kt at base turn or earlier till 8NM from touchdown.

23.3 Break-out manoeuvre

23.3.1 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”

23.3.2 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)”

23.4 Pilot notification and conditions for operations

23.4.1 Simultaneous approaches to parallel runways operation will be broadcasted on ATIS during the active period.

23.4.2 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 300g each)
 - grey herons (weighing approximately 500g each)
 - brahminy kites (weighing approximately 600g each)
- 1.2 There could be an increase in bird activities during the migratory months of September to April. During this period, migratory birds may use the airport as their feeding ground.
- 1.3 Handheld laser device, long range acoustic device and alternating amplified bird cries of distress are used for bird dispersal within Singapore Changi Airport.

WSSS AD 2.24 CHARTS RELATED TO AN AERODROME

Location of RWY 02R/20L in relation to RWY 02L/20/R and RWY 02C/20C	AD-2-WSSS-ADC-1
Aerodrome Chart - ICAO	AD-2-WSSS-ADC-2
Aerodrome Advisory Chart - ICAO	AD-2-WSSS-ADC-3
Aerodrome Obstacle Chart - ICAO - TYPE A - RWY 02L/20R	AD-2-WSSS-AOC-1
Aerodrome Obstacle Chart - ICAO - TYPE A - RWY 02C/20C	AD-2-WSSS-AOC-2
Aerodrome Obstacle Chart - ICAO - TYPE B	AD-2-WSSS-AOC-3
Precision Approach Terrain Chart - ICAO - RWY 02L	AD-2-WSSS-PATC-1
Precision Approach Terrain Chart - ICAO - RWY 20C	AD-2-WSSS-PATC-2
RNAV_(GNSS) SIDs and STARs - Introduction	
RNAV _(GNSS) SID - RWY 02L/20R - ANITO 6E/ANITO 6F	AD-2-WSSS-SID-1 to 1.1
RNAV _(GNSS) SID - RWY 02C/20C - ANITO 6A / ANITO 6B	AD-2-WSSS-SID-2 to 2.1
RNAV _(GNSS) SID - RWY 02L/20R - ADMIM 1E / ADMIM 2F	AD-2-WSSS-SID-3 to 3.1
RNAV _(GNSS) SID - RWY 02C/20C - ADMIM 1A / ADMIM 2B	AD-2-WSSS-SID-4 to 4.1
RNAV _(GNSS) SID - RWY 02L/20R - TOMAN 2E / TOMAN 3F	AD-2-WSSS-SID-5 to 5.1
RNAV _(GNSS) SID - RWY 02C/20C - TOMAN 2A / TOMAN 3B	AD-2-WSSS-SID-6 to 6.1
RNAV _(GNSS) SID - RWY 02L/20R - BAVUS 1E / BAVUS 2F	AD-2-WSSS-SID-7 to 7.1
RNAV _(GNSS) SID - RWY 02C/20C - BAVUS 1A / BAVUS 2B	AD-2-WSSS-SID-8 to 8.1
RNAV _(GNSS) SID - RWY 02L/20R - AROSO 2E / AROSO 3F	AD-2-WSSS-SID-9 to 9.1
RNAV _(GNSS) SID - RWY 02L/20R - MASBO 2E / MASBO 3F	AD-2-WSSS-SID-10 to 10.1
RNAV _(GNSS) SID - RWY 02C/20C - AROSO 2A / AROSO 3B	AD-2-WSSS-SID-11 to 11.1
RNAV _(GNSS) SID - RWY 02C/20C - MASBO 2A / MASBO 3B	AD-2-WSSS-SID-12 to 12.1
RNAV _(GNSS) SID - RWY 02L/20R - MERSING 5E / MERSING 7F	AD-2-WSSS-SID-13 to 13.1
RNAV _(GNSS) SID - RWY 02C/20C - MERSING 5A / MERSING 7B	AD-2-WSSS-SID-14 to 14.1
RNAV _(GNSS) SID - RWY 02C/20C - VENIX 1A / VENIX 2B	AD-2-WSSS-SID-15 to 15.1
RNAV _(GNSS) SID - RWY 02L/20R - VENIX 1E / VENIX 2F	AD-2-WSSS-SID-16 to 16.1
RNAV _(GNSS) SID - RWY 02C/20C - KADAR 1A / KADAR 2B	AD-2-WSSS-SID-17 to 17.1
RNAV _(GNSS) SID - RWY 02L/20R - KADAR 1E / KADAR 2F	AD-2-WSSS-SID-18 to 18.1
RNAV _(GNSS) STAR - RWY 02L/02C - ARAMA 1A	AD-2-WSSS-STAR-1 to 1.1
RNAV _(GNSS) STAR - RWY 02L/02C - ASUNA 1A	AD-2-WSSS-STAR-2 to 2.1
RNAV _(GNSS) STAR - RWY 20R/20C - ARAMA 1B	AD-2-WSSS-STAR-3 to 3.1
RNAV _(GNSS) STAR - RWY 20R/20C - ASUNA 1B	AD-2-WSSS-STAR-4 to 4.1
RNAV _(GNSS) STAR - RWY 02L/02C - KARTO 1A	AD-2-WSSS-STAR-5 to 5.1
RNAV _(GNSS) STAR - RWY 02L/02C - OBDOS 1A	AD-2-WSSS-STAR-6 to 6.1
RNAV _(GNSS) STAR - RWY 20R/20C - KARTO 1B	AD-2-WSSS-STAR-7 to 7.1
RNAV _(GNSS) STAR - RWY 20R/20C - OBDOS 1B	AD-2-WSSS-STAR-8 to 8.1
RNAV _(GNSS) STAR - RWY 20R/20C - LELIB 3B	AD-2-WSSS-STAR-9 to 9.1
RNAV _(GNSS) STAR - RWY 02L/02C - MABAL 2A	AD-2-WSSS-STAR-11 to 11.1
RNAV _(GNSS) STAR - RWY 20R/20C - MABAL 2B	AD-2-WSSS-STAR-13 to 13.1
RNAV _(GNSS) STAR - RWY 02L - LEBAR 2A	AD-2-WSSS-STAR-14 to 14.1
RNAV _(GNSS) STAR - RWY 20R - LEBAR 2B	AD-2-WSSS-STAR-15 to 15.1
RNAV _(GNSS) STAR - RWY 02L/02C - REPOV 1A	AD-2-WSSS-STAR-16 to 16.1
RNAV _(GNSS) STAR - RWY 02L/02C - SURGA 1A	AD-2-WSSS-STAR-17 to 17.1
RNAV _(GNSS) STAR - RWY 20R/20C - REPOV 1B	AD-2-WSSS-STAR-18 to 18.1
RNAV _(GNSS) STAR - RWY 20R/20C - SURGA 1B	AD-2-WSSS-STAR-19 to 19.1
RNAV _(GNSS) STAR - RWY 02L/02C - ELALO 1A	AD-2-WSSS-STAR-20 to 20.1
RNAV _(GNSS) STAR - RWY 20R/20C - ELALO 1B	AD-2-WSSS-STAR-21 to 21.1
Instrument Approach Chart - ICAO - RWY 02L - ICW ILS/DME	AD-2-WSSS-IAC-1
Instrument Approach Chart - ICAO - RWY 02C - ICE ILS/DME	AD-2-WSSS-IAC-2
Instrument Approach Chart - ICAO - RWY 20R - ICH ILS/DME	AD-2-WSSS-IAC-5
Instrument Approach Chart - ICAO - RWY 20C - ICC ILS/DME	AD-2-WSSS-IAC-6
Instrument Approach Chart - ICAO - RWY 20C - VTK DVOR/DME	AD-2-WSSS-IAC-7
Instrument Approach Chart - ICAO - RWY 02L - RNAV _(GNSS)	AD-2-WSSS-IAC-9
Instrument Approach Chart - ICAO - RWY 02C - RNAV _(GNSS)	AD-2-WSSS-IAC-10
Instrument Approach Chart - ICAO - RWY 20R - RNAV _(GNSS)	AD-2-WSSS-IAC-11
Instrument Approach Chart - ICAO - RWY 20C - RNAV _(GNSS)	AD-2-WSSS-IAC-12
Visual Approach Chart - ICAO	AD-2-WSSS-VAC-1

AERODROME CHART - ICAO

01° 21' 33"N
103° 59' 22"E

AERODROME ELEVATION 6.66m

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

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

SINGAPORE/SINGAPORE CHANGI

PAPI 3° (MEHT)*

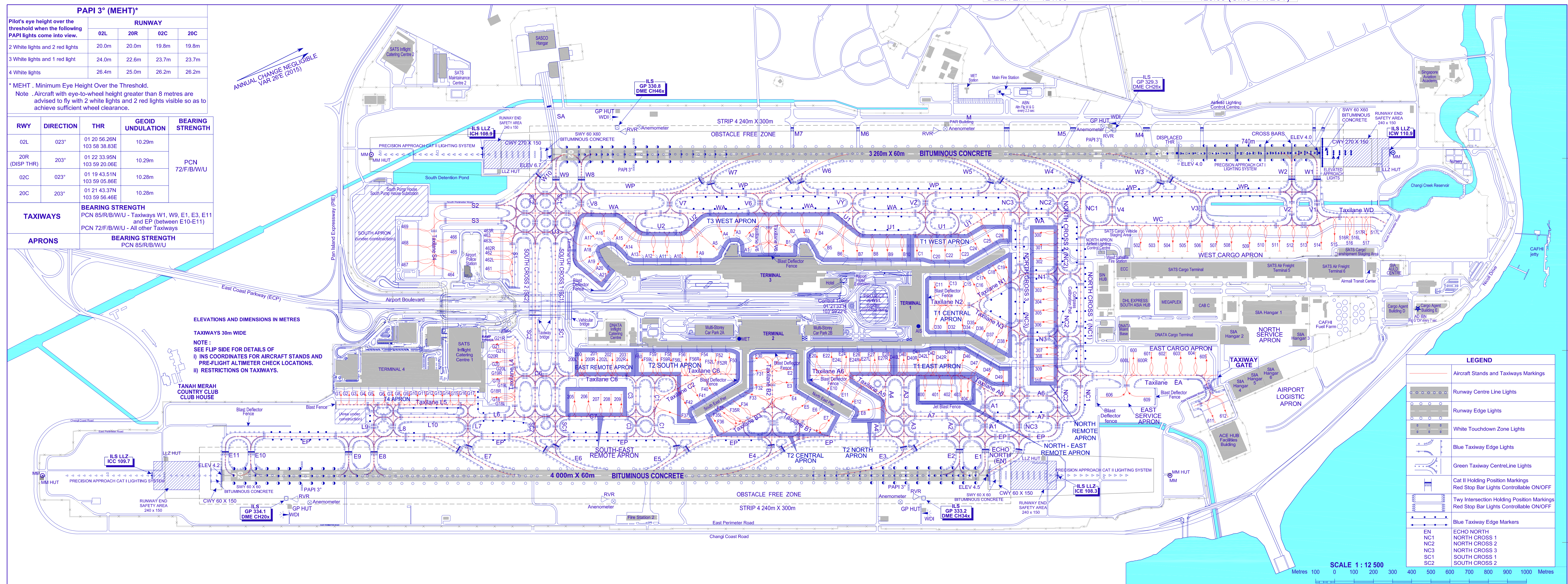
Pilot's eye height over the threshold when the following PAPI lights come into view.	02L	20R	02C	20C
2 White lights and 2 red lights	20.0m	20.0m	19.8m	19.8m
3 White lights and 1 red light	24.0m	22.6m	23.7m	23.7m
4 White lights	26.4m	25.0m	26.2m	26.2m

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

RWY	DIRECTION	THR	GEOID UNDULATION	BEARING STRENGTH
02L	023°	01 20 56.28N 103 58 38.83E	10.29m	PCN 72/F/B/W/U
20R (DISP THR)	203°	01 22 33.95N 103 59 20.06E	10.29m	
02C	023°	01 19 43.51N 103 59 05.86E	10.28m	
20C	203°	01 21 43.37N 103 59 56.46E	10.28m	

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

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



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

LEGEND

- Aircraft Stands and Taxiways Markings
- Runway Centre Line Lights
- Runway Edge Lights
- White Touchdown Zone Lights
- Blue Taxiway Edge Lights
- Green Taxiway Centre Line Lights
- Car II Holding Position Markings
- Red Stop Bar Lights Controllable ON/OFF
- Twy Intersection Holding Position Markings
- Red Stop Bar Lights Controllable ON/OFF
- Blue Taxiway Edge Markers

EN ECHO NORTH
NC1 NORTH CROSS 1
NC2 NORTH CROSS 2
NC3 NORTH CROSS 3
SC1 SOUTH CROSS 1
SC2 SOUTH CROSS 2

INS COORDINATES FOR AIRCRAFT STANDS AND PRE-FLIGHT ALTIMETER CHECK LOCATIONS

LOCATION	STAND NR	NORTH LAT	EAST LONG	ELEVATION	
T3 WEST 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	4.60m (15.29ft)	
	A4	01 21 17.81	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 55.87	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 56.83	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	5.09m (16.70ft)	
B9		01 21 42.19	103 59 16.16	5.13m (16.83ft)	
B10		01 21 44.47	103 59 17.12	5.10m (16.73ft)	
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 01.48	103 59 20.76	5.01m (16.44ft)	
T1 CENTRAL APRON	C11	01 21 47.42	103 59 23.82	5.07m (16.63ft)	
	C13	01 21 49.64	103 59 24.75	5.05m (16.57ft)	
	C15	01 21 51.90	103 59 25.71	5.05m (16.57ft)	
	C16	01 21 53.63	103 59 26.42	4.91m (16.11ft)	
	C17	01 21 55.63	103 59 26.07	5.03m (16.50ft)	
	C18	01 21 57.86	103 59 25.75	4.98m (16.37ft)	
	C19	01 21 59.79	103 59 25.63	4.95m (16.24ft)	
	D30	01 21 44.54	103 59 30.14	5.09m (16.70ft)	
	D32	01 21 46.73	103 59 31.07	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 50.80	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	E1	01 21 20.02	103 59 25.58	4.91m (16.11ft)	
	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)	
T2 SOUTH APRON	F30	01 21 14.71	103 59 23.33	4.92m (16.14ft)	
	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)	
	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 49.19	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 47.91	103 59 18.88	4.74m (15.55ft)
		208	01 20 49.48	103 59 19.54	4.74m (15.55ft)
209		01 20 51.06	103 59 20.21	4.75m (15.58ft)	
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)	
	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)
	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)	
516R		01 22 56.24	103 59 43.80	3.96m (12.98ft)	
517		01 22 54.93	103 59 43.25	3.95m (12.97ft)	
517L	01 22 58.02	103 59 45.08	4.05m (13.27ft)		
517R	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)		

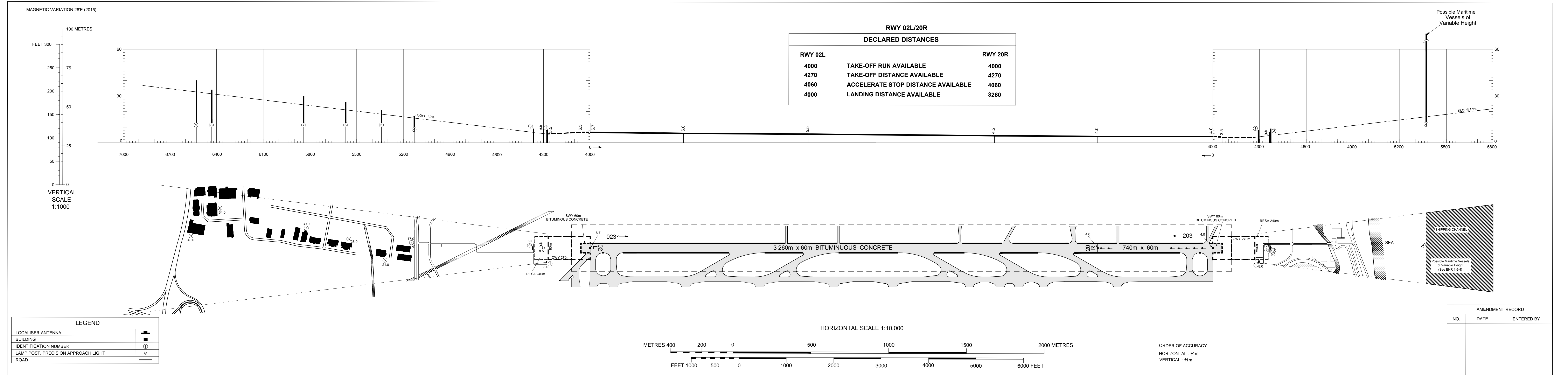
INS COORDINATES FOR AIRCRAFT STANDS AND PRE-FLIGHT ALTIMETER CHECK LOCATIONS

LOCATION	STAND NR	NORTH LAT	EAST LONG	ELEVATION
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	2.43m (7.95ft)
	610	01 22 15.90	103 59 57.55	2.43m (7.95ft)
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	5.92m (1

DIMENSIONS AND ELEVATIONS IN METRES

**AERODROME OBSTACLE CHART - ICAO
TYPE A (OPERATING LIMITATIONS)**

SINGAPORE/Singapore Changi



RWY 02L/20R DECLARED DISTANCES		
RWY 02L		RWY 20R
4000	TAKE-OFF RUN AVAILABLE	4000
4270	TAKE-OFF DISTANCE AVAILABLE	4270
4060	ACCELERATE STOP DISTANCE AVAILABLE	4060
4000	LANDING DISTANCE AVAILABLE	3260

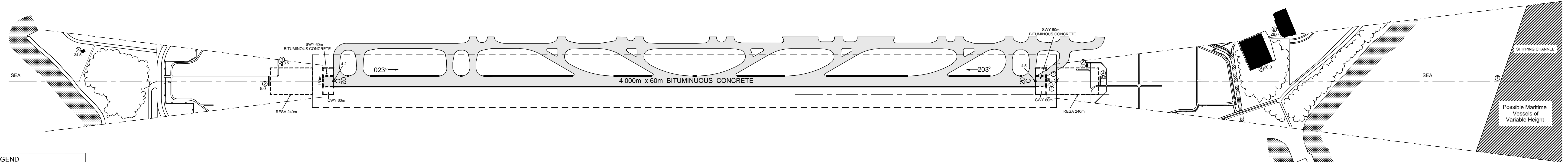
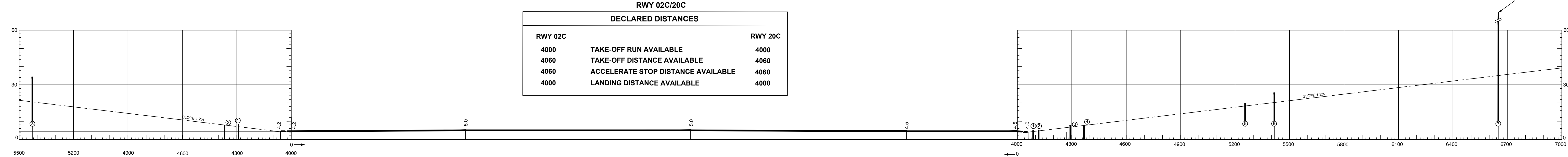
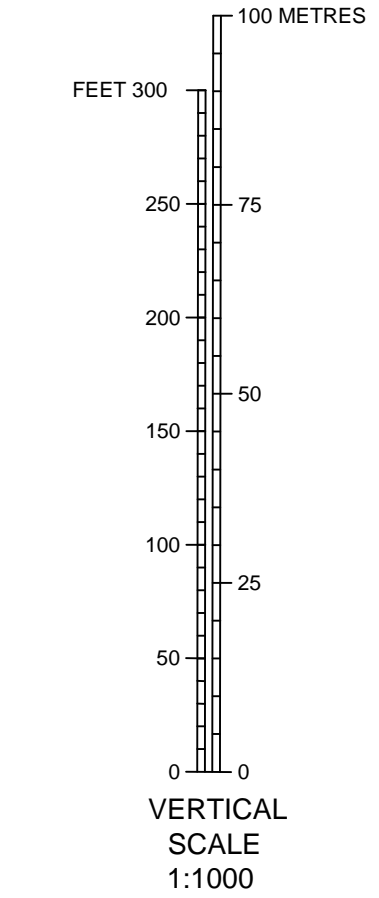
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DIMENSIONS AND ELEVATIONS IN METRES

**AERODROME OBSTACLE CHART - ICAO
TYPE A (OPERATING LIMITATIONS)**

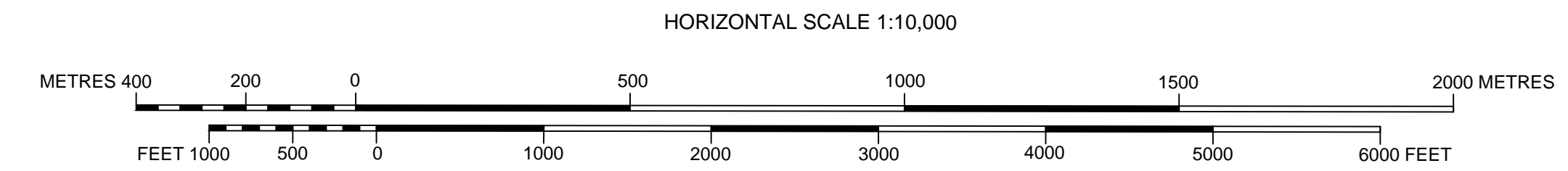
SINGAPORE/Singapore Changi

MAGNETIC VARIATION 26°E (2015)



LEGEND

LOCALISER ANTENNA	⊠
BUILDING	■
IDENTIFICATION NUMBER	①
PRECISION APPROACH LIGHT	⊙
ROAD	—
TREE CANOPY	☁
FENCE	⚡



ORDER OF ACCURACY
HORIZONTAL : ±1m
VERTICAL : ±1m

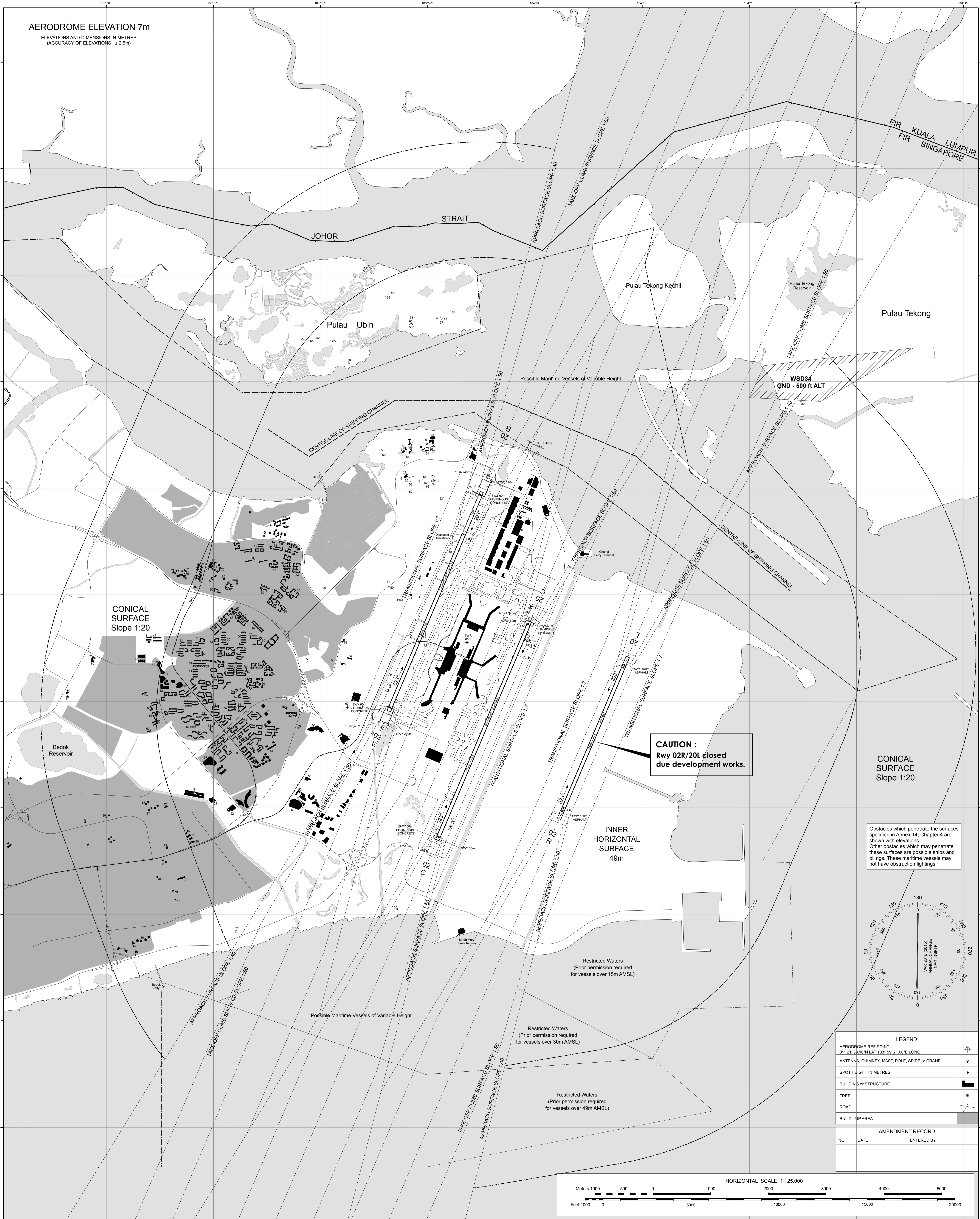
AMENDMENT RECORD

NO.	DATE	ENTERED BY

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AERODROME OBSTACLE CHART - ICAO TYPE B

SINGAPORE / Singapore Changi



AERODROME ELEVATION 7m
ELEVATIONS AND DIMENSIONS IN METRES
(ACCURACY OF ELEVATIONS : ± 2.5m)

CONICAL SURFACE
Slope 1:20

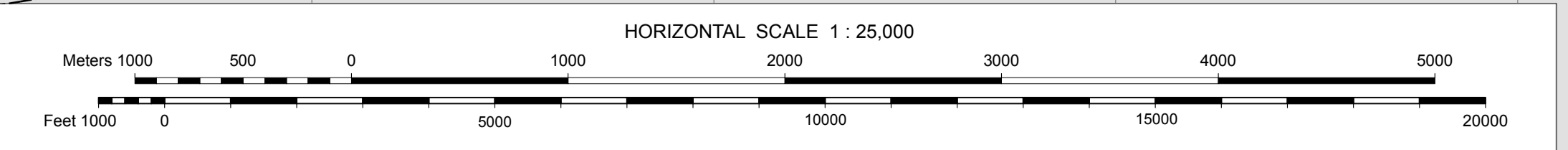
CAUTION :
Rwy 02R/20L closed
due development works.

INNER HORIZONTAL SURFACE
49m

CONICAL SURFACE
Slope 1:20

Obstacles which penetrate the surfaces specified in Annex 14, Chapter 4 are shown with elevations. Other obstacles which may penetrate these surfaces are possible ships and oil rigs. These maritime vessels may not have obstruction lightings.

AMENDMENT RECORD		
NO	DATE	ENTERED BY



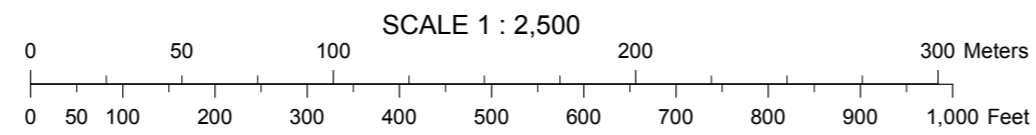
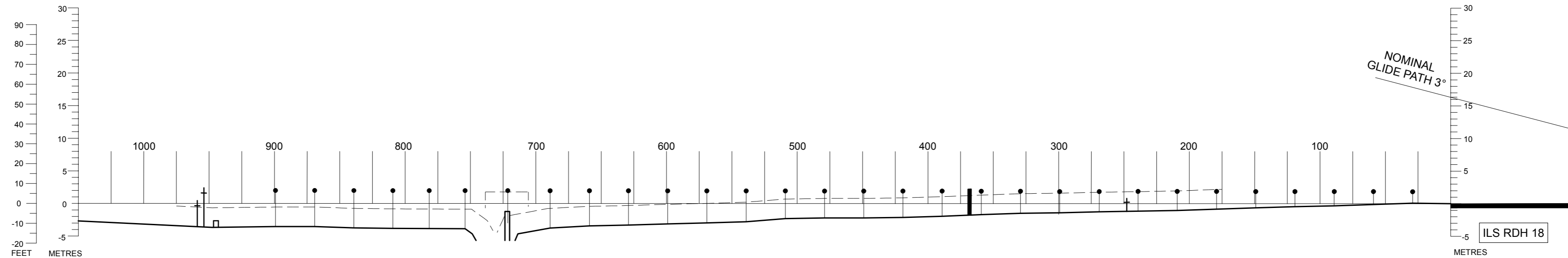
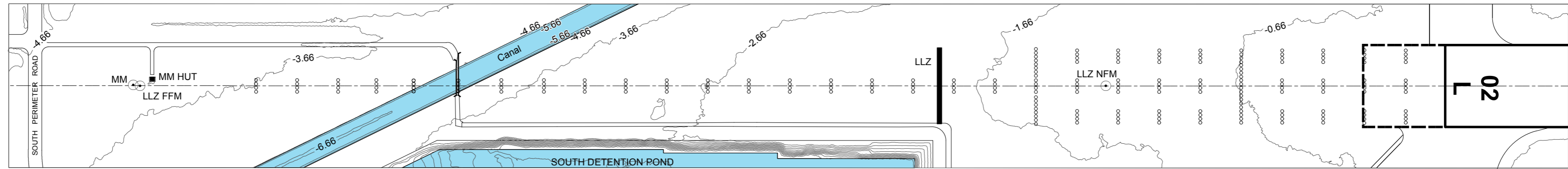
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PRECISION APPROACH TERRAIN CHART - ICAO

SINGAPORE/Singapore Changi

DISTANCES AND HEIGHTS IN METRES

RWY 02L



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

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

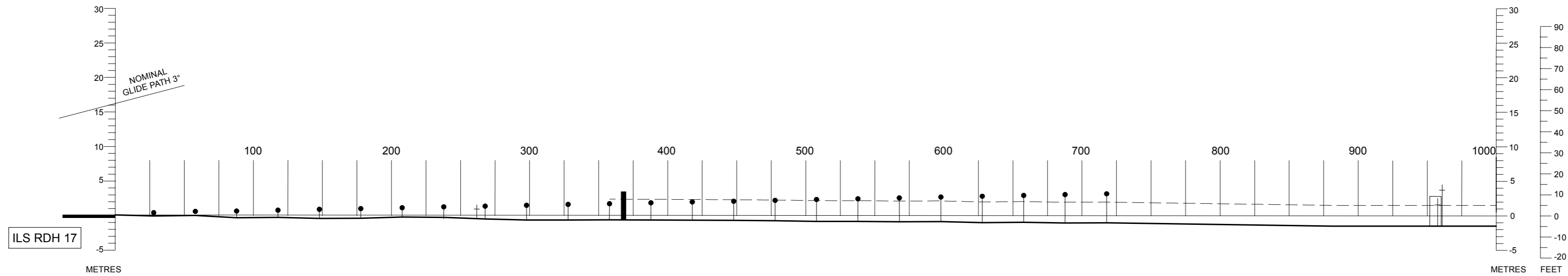
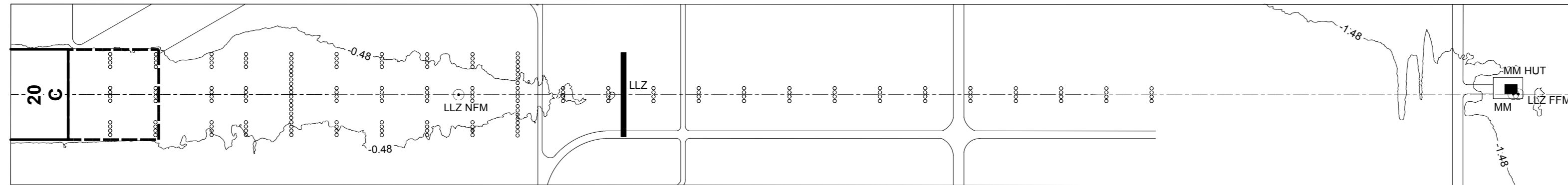
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PRECISION APPROACH TERRAIN CHART - ICAO

SINGAPORE/Singapore Changi

DISTANCES AND HEIGHTS IN METRES

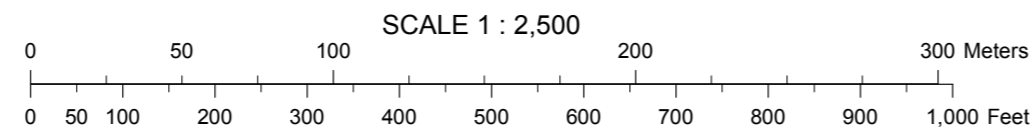
RWY 20C



ILS RDH 17

METRES

METRES FEET



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

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

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

DISTANCES IN NM

NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

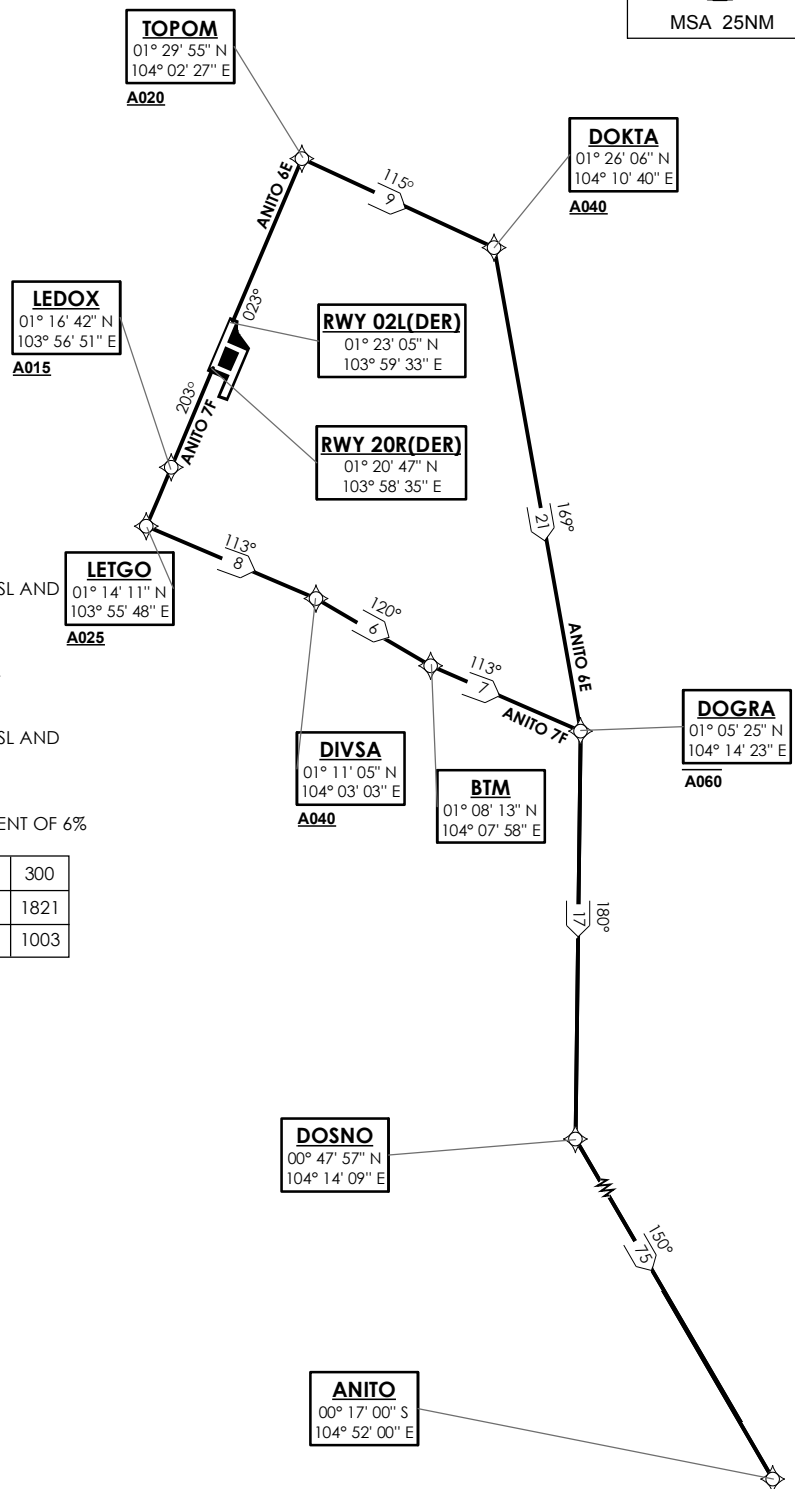
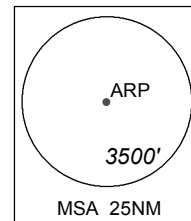
RWY 02L

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET 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

7 DEC 2017

ANITO 6E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

ANITO 7F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	ANITO	-	150(149.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft
D-ATIS AP ID-WSSS
128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
ANITO DEPARTURES
ANITO 6A (R02C)
ANITO 7B (R20C)**

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

DISTANCES IN NM

NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

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

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

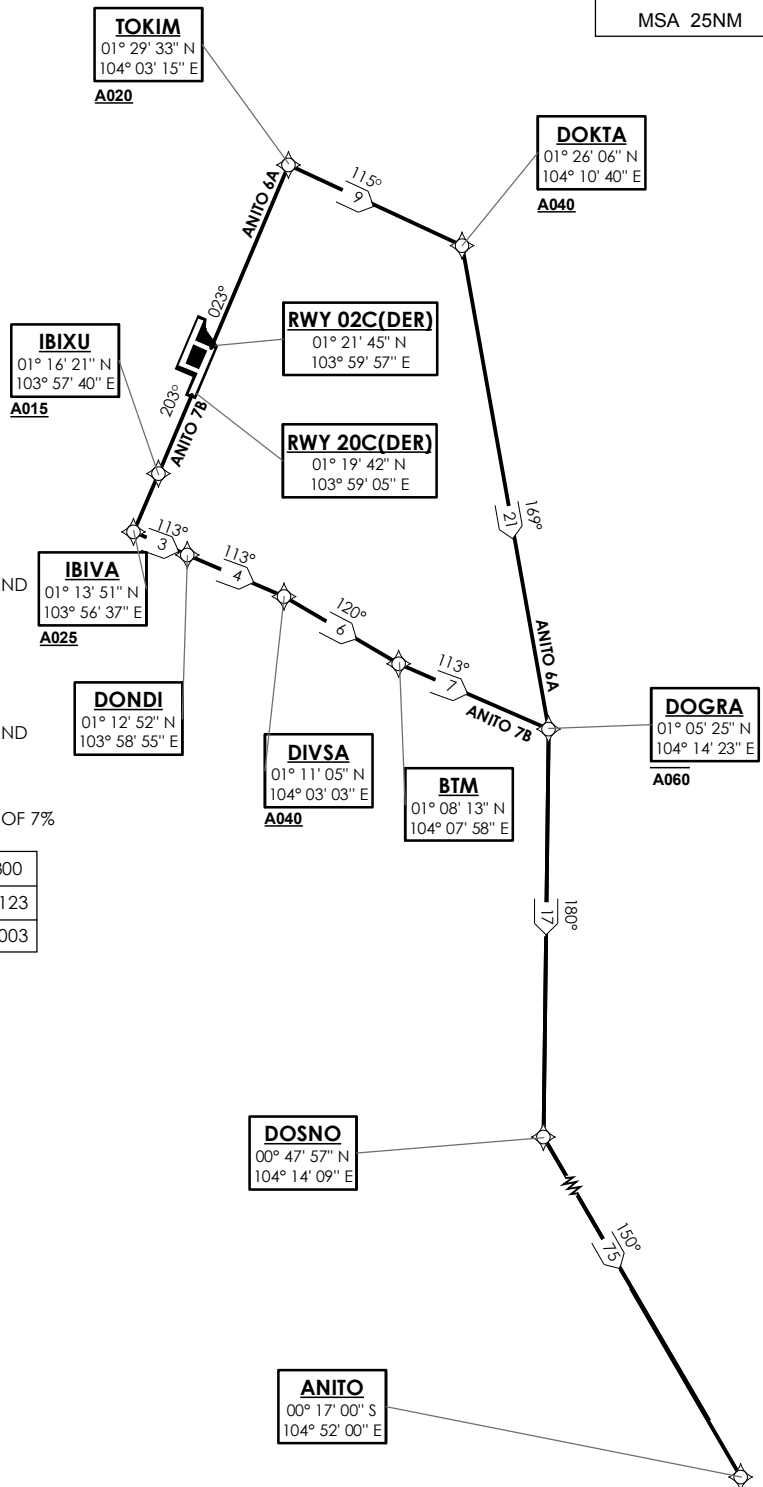
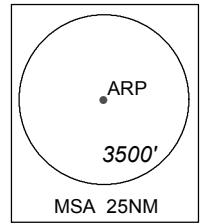
RWY 02C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

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

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



NOT TO SCALE

7 DEC 2017

ANITO 6A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

ANITO 7B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	ANITO	-	150(149.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 133.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

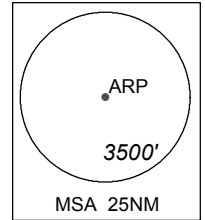
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

DISTANCES IN NM
NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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



GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

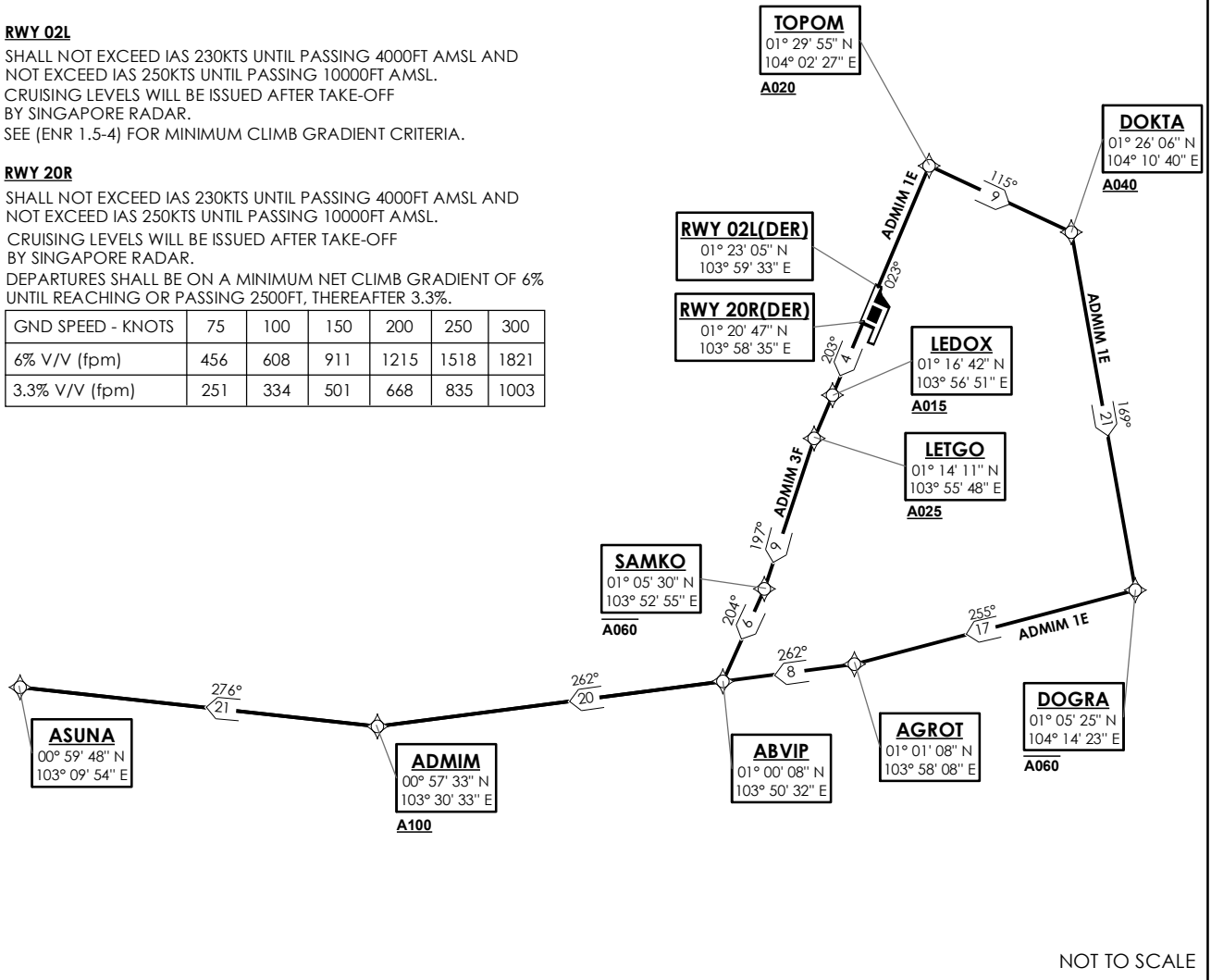
RWY 02L

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.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET 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

7 DEC 2017

ADMIM 1E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

ADMIM 3F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To SAMKO at or below 6000ft, turn right. To ABVIP, turn right. To ADMIM at or above 10000ft, turn right. To ASUNA.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; L] -	TF	N
	SAMKO [A060-; R] -	TF	N
	ABVIP [R] -	TF	N
	ADMIM [A100+; R] -	TF	N
	ASUNA	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	SAMKO	-	197(197.5)	-0.5	R	A060-	-	RNAV1
TF	ABVIP	-	204(203.5)	-0.5	R	-	-	RNAV1
TF	ADMIM	-	262(261.5)	-0.5	R	A100+	-	RNAV1
TF	ASUNA	-	276(275.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 133.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

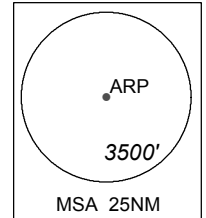
ELEV, ALT IN FEET
BEARINGS, TRACKS AND
RADIALS ARE MAGNETIC
VAR 26°E (2015)

DISTANCES IN NM
NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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



GENERAL INFORMATION

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

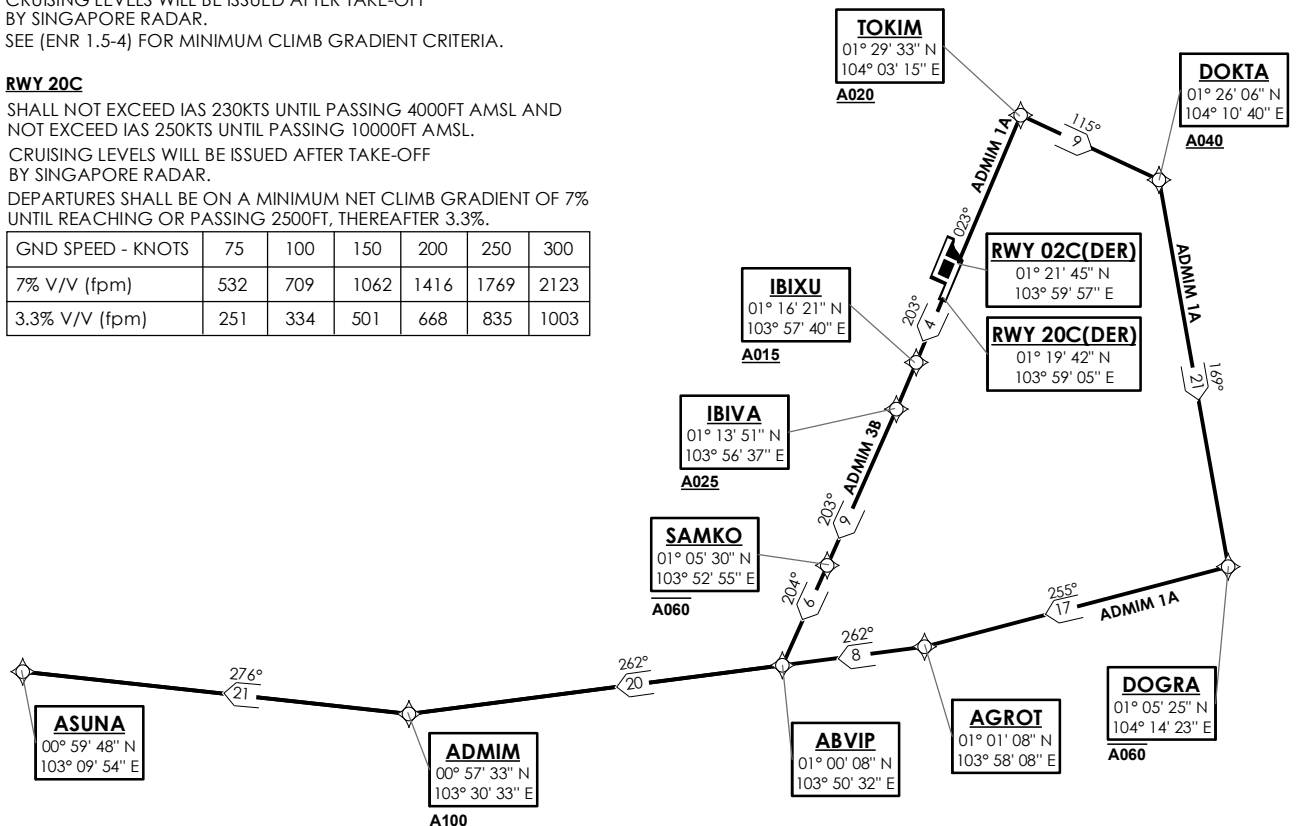
RWY 02C

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.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

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

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



NOT TO SCALE

7 DEC 2017

ADMIM 1A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

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

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft. To SAMKO at or below 6000ft, turn right. To ABVIP, turn right. To ADMIM at or above 10000ft, turn right. To ASUNA.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+] -	TF	N
	SAMKO [A060-; R] -	TF	N
	ABVIP [R] -	TF	N
	ADMIM [A100+; R] -	TF	N
	ASUNA	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	-	A025+	-	RNAV1
TF	SAMKO	-	203(202.5)	-0.5	R	A060-	-	RNAV1
TF	ABVIP	-	204(203.5)	-0.5	R	-	-	RNAV1
TF	ADMIM	-	262(261.5)	-0.5	R	A100+	-	RNAV1
TF	ASUNA	-	276(275.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 134.2

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

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

DISTANCES IN NM
NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02L

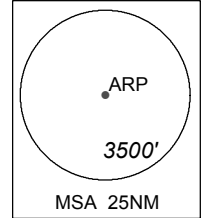
SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.

CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

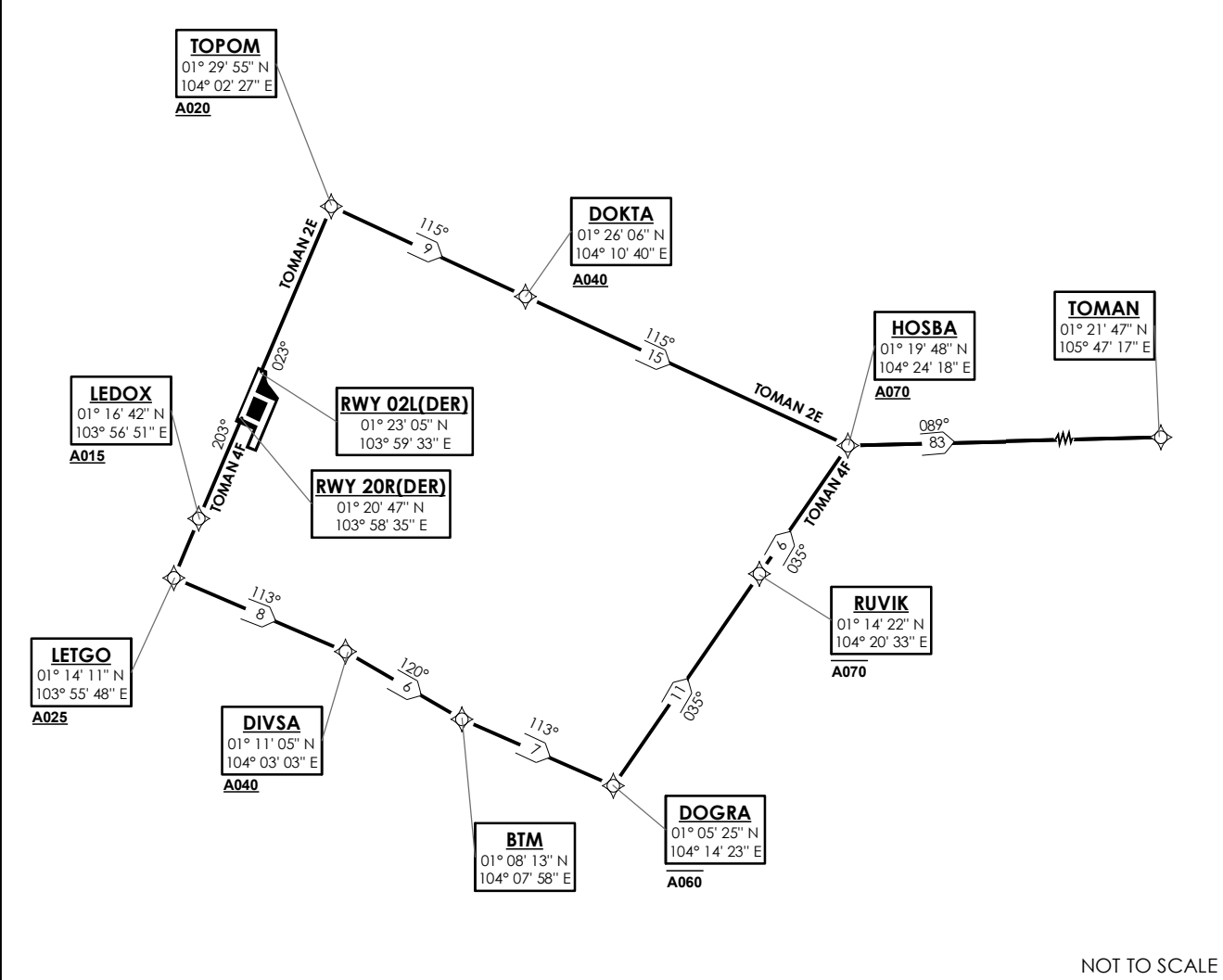
RWY 20R

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

CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 6%
UNTIL REACHING OR PASSING 2500FT, THEREAFTER 3.3%.



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



NOT TO SCALE

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

Formal & Abbreviated Descriptions

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

Tabular Descriptions

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

TOMAN 4F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS

Formal & Abbreviated Descriptions

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To DIVSA at or above 4000ft, turn right. To BTM, turn left. To DOGRA at or below 6000ft, turn left. To RUVIK at or below 7000ft. To HOSBA at or above 7000ft, turn right. To TOMAN.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; L] -	TF	N
	DIVSA [A040+; R] -	TF	N
	BTM [L] -	TF	N
	DOGRA [A060-; L] -	TF	N
	RUVIK [A070-] -	TF	N
	HOSBA [A070+; R] -	TF	N
	TOMAN	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-0.5	L	A060-	-	RNAV1
TF	RUVIK	-	035(034.5)	-0.5	-	A070-	-	RNAV1
TF	HOSBA	-	035(034.5)	-0.5	R	A070+	-	RNAV1
TF	TOMAN	-	089(088.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 134.2

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

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

DISTANCES IN NM
NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

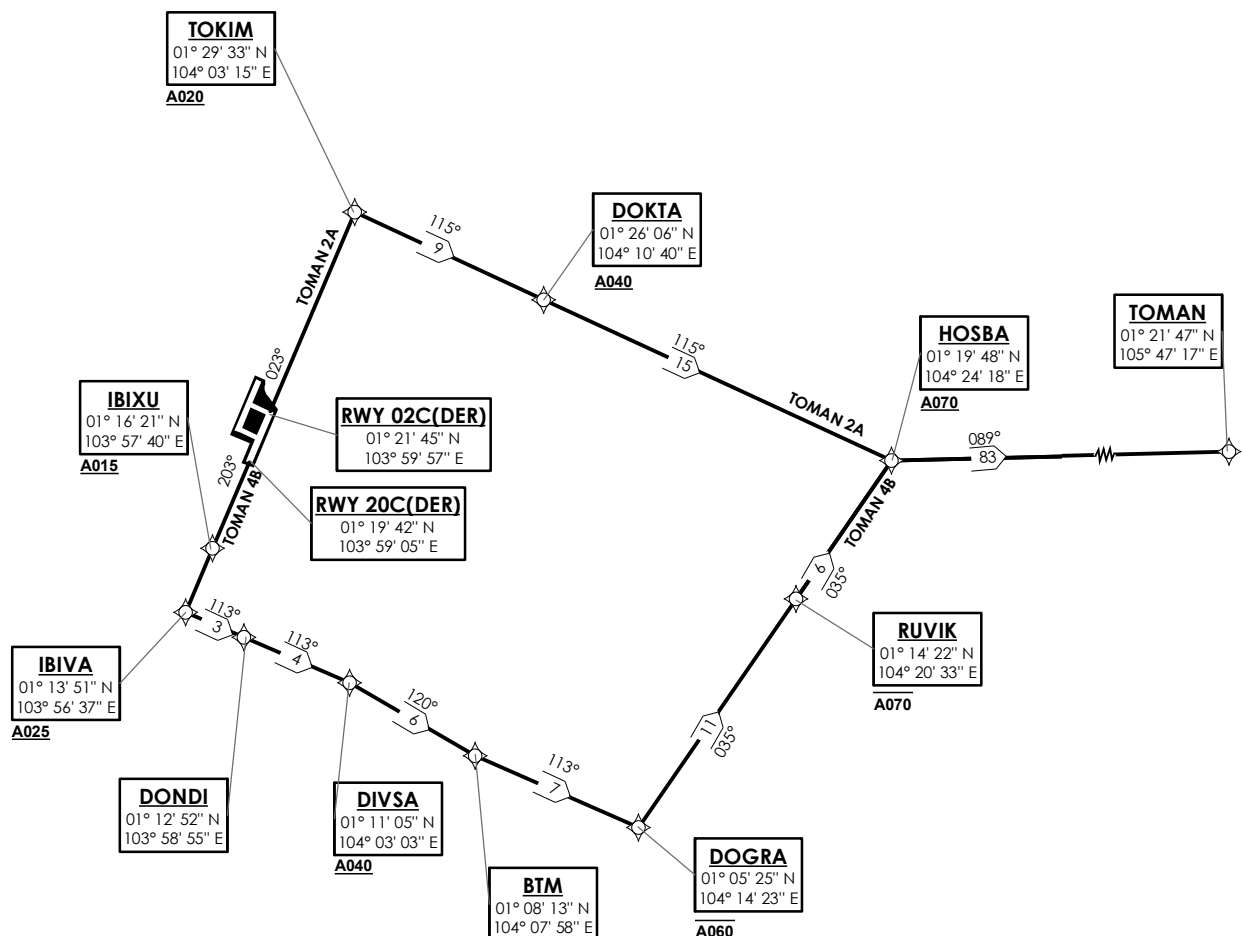
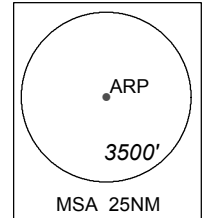
RWY 02C

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.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

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

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



NOT TO SCALE

7 DEC 2017

TOMAN 2A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

TOMAN 4B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft, turn left. To DONDI. To DIVSA at or above 4000ft, turn right. To BTM, turn left. To DOGRA at or below 6000ft, turn left. To RUVIK at or below 7000ft. To HOSBA at or above 7000ft, turn right. To TOMAN.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+; L] -	TF	N
	DONDI -	TF	N
	DIVSA [A040+; R] -	TF	N
	BTM [L] -	TF	N
	DOGRA [A060-; L] -	TF	N
	RUVIK [A070-] -	TF	N
	HOSBA [A070+; R] -	TF	N
TOMAN	TF	N	

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-0.5	L	A060-	-	RNAV1
TF	RUVIK	-	035(034.5)	-0.5	-	A070-	-	RNAV1
TF	HOSBA	-	035(034.5)	-0.5	R	A070+	-	RNAV1
TF	TOMAN	-	089(088.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

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

DISTANCES IN NM

NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

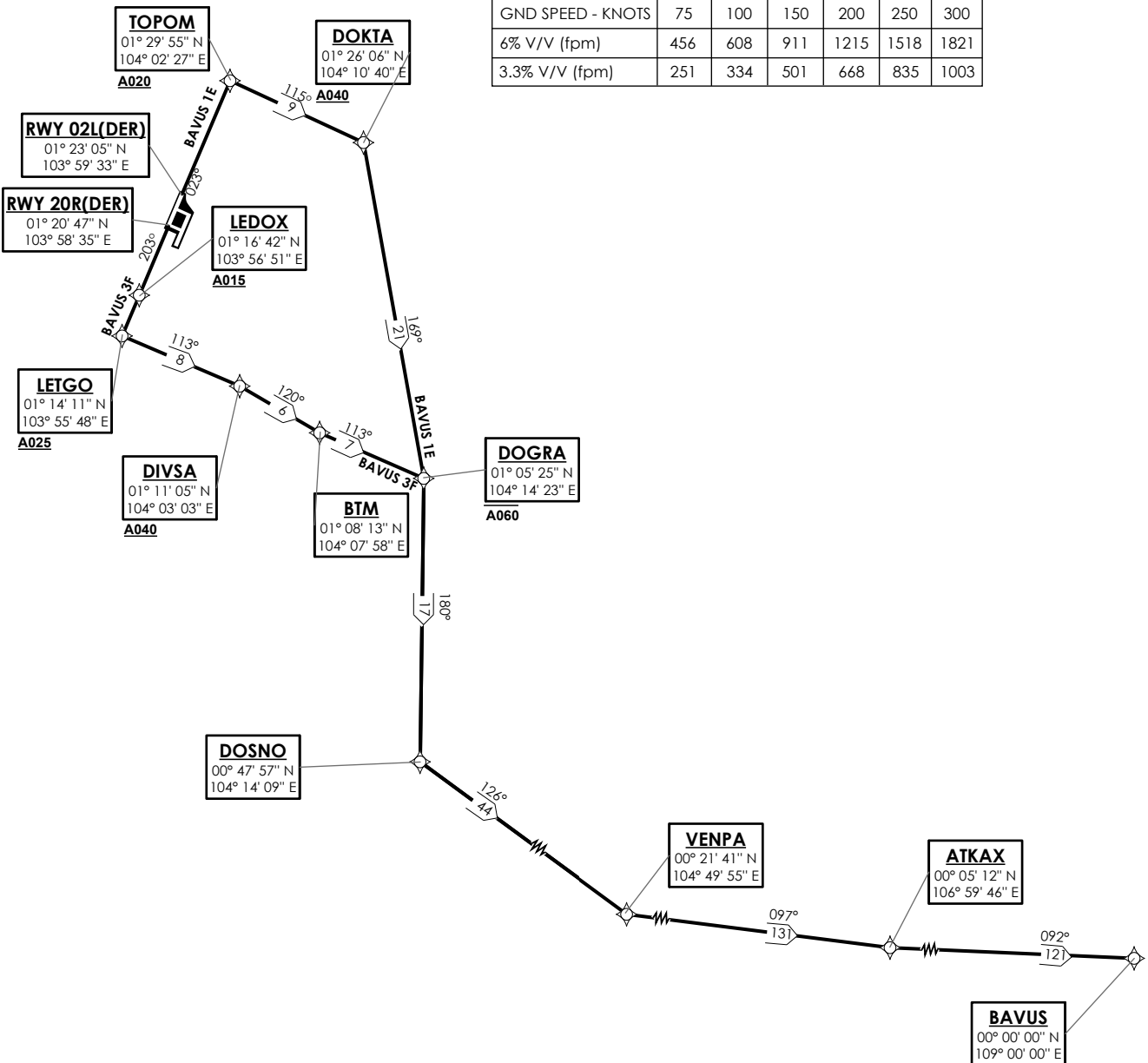
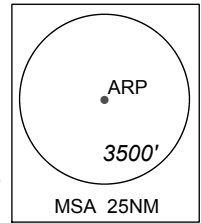
RWY 02L

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.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET 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

7 DEC 2017

BAVUS 1E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

BAVUS 3F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	ATKAX	-	097(096.5)	-0.5	L	-	-	RNAV1
TF	BAVUS	-	092(091.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

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

DISTANCES IN NM

NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

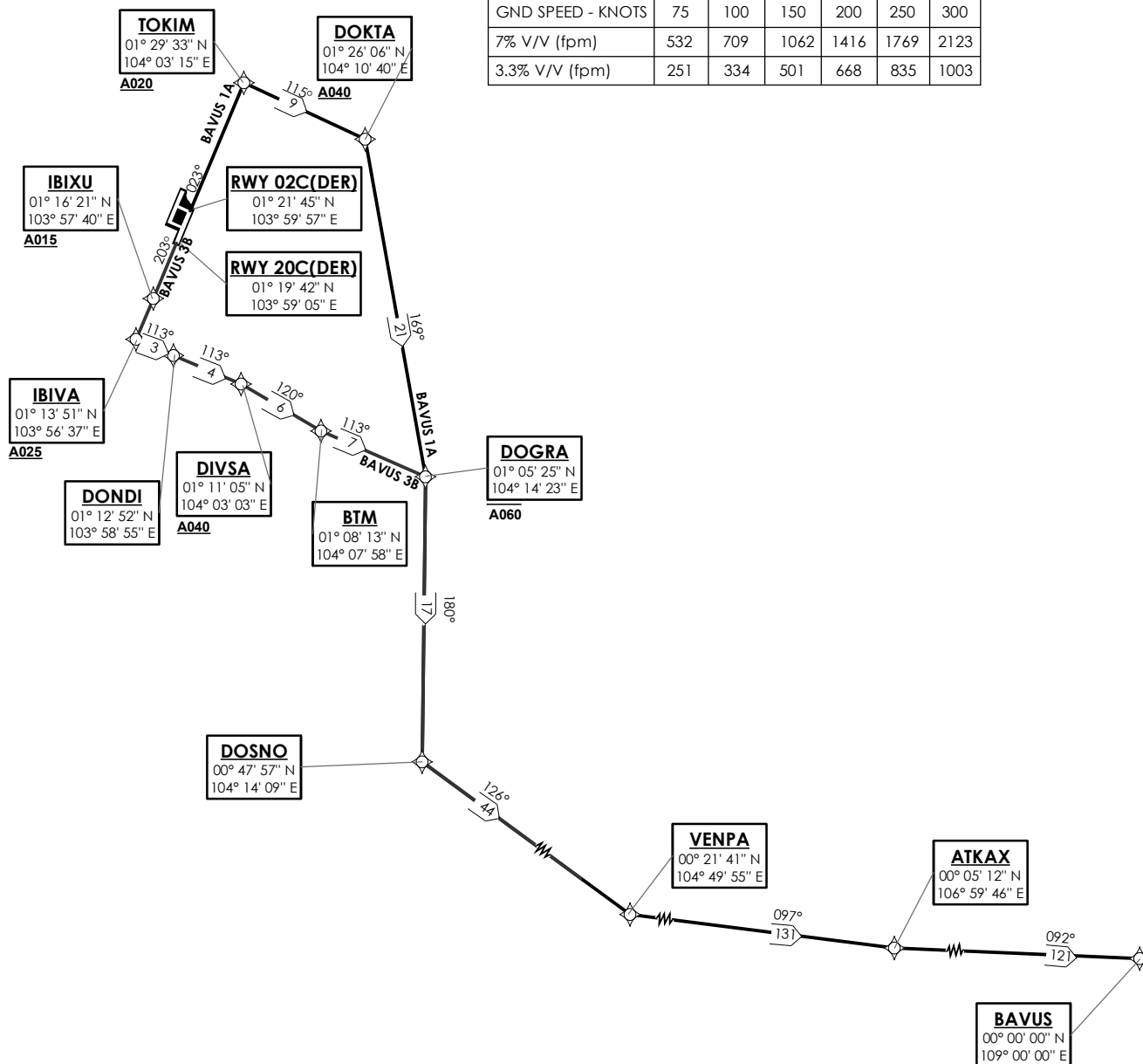
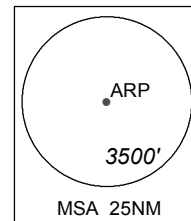
RWY 02C

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.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

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

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



NOT TO SCALE

7 DEC 2017

BAVUS 1A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

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

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

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	ATKAX	-	097(096.5)	-0.5	L	-	-	RNAV1
TF	BAVUS	-	092(091.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 133.25

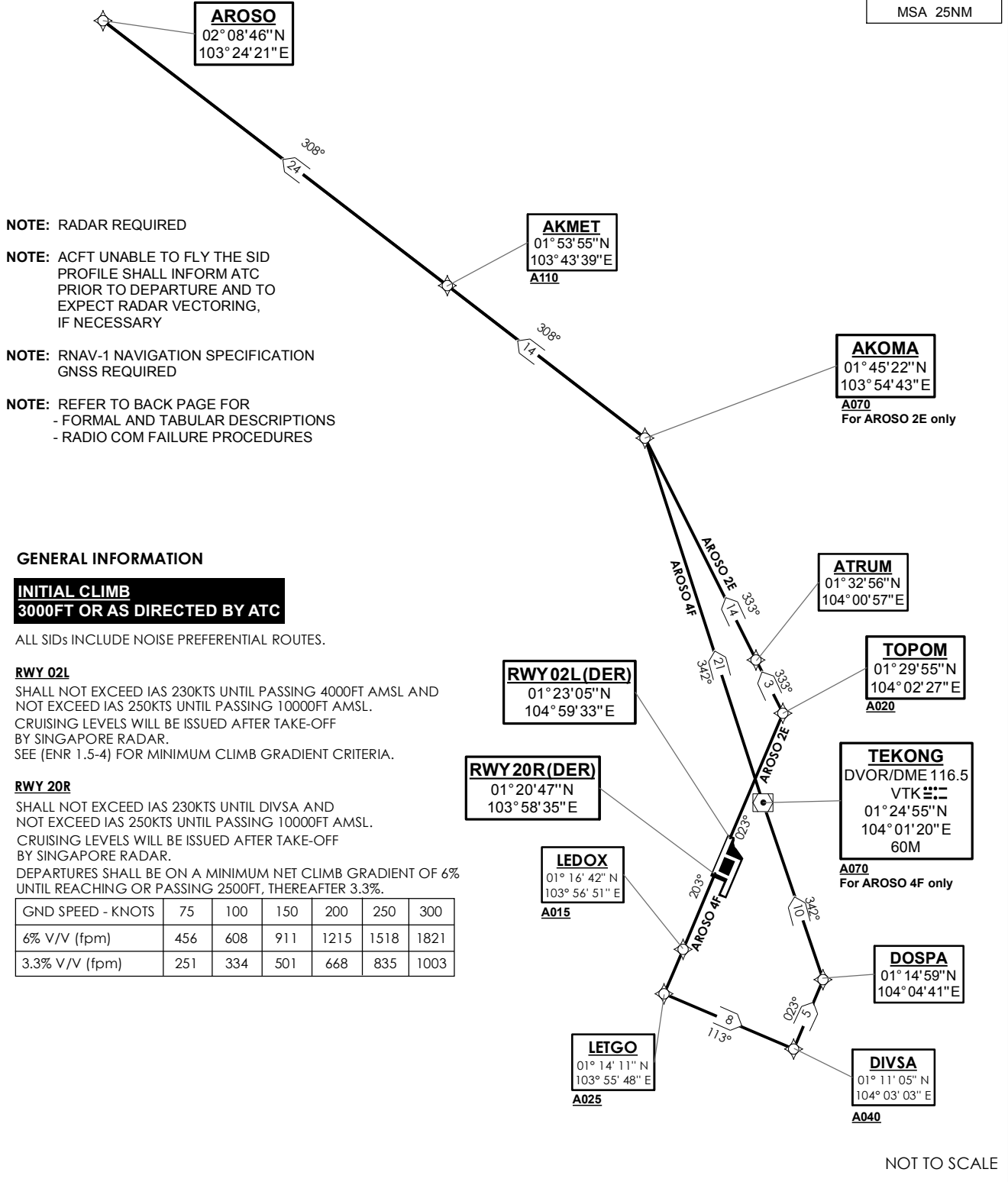
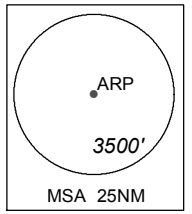
TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

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

DISTANCES IN NM



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

GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02L
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. SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R
SHALL NOT EXCEED IAS 230KTS UNTIL DIVSA AND NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL. CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF BY SINGAPORE RADAR. DEPARTURES SHALL BE ON A MINIMUM NET 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

7 DEC 2017

AROSO 2E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

AROSO 4F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To DIVSA at or above 4000ft, speed 230kts, turn left. To DOSPA, turn left. To VTK at or above 7000ft. To AKOMA, turn left. To AKMET at or above 11000ft. To AROSO.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; L] -	TF	N
	DIVSA [A040+; K230; L] -	TF	N
	DOSPA [L] -	TF	N
	VTK [A070+] -	TF	N
	AKOMA [L] -	TF	N
	AKMET [A110+] -	TF	N
	AROSO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	L	A040+	K230	RNAV1
TF	DOSPA	-	023(022.5)	-0.5	L	-	-	RNAV1
TF	VTK	-	342(341.5)	-0.5	-	A070+	-	RNAV1
TF	AKOMA	-	342(341.5)	-0.5	L	-	-	RNAV1
TF	AKMET	-	308(307.5)	-0.5	-	A110+	-	RNAV1
TF	AROSO	-	308(307.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 133.25

TRANSITION ALTITUDE
11 000ft

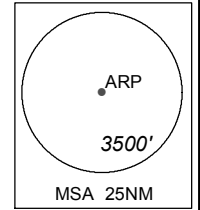
D-ATIS AP ID-WSSS
128.6

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

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

DISTANCES IN NM

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



MASBO
02° 02' 48" N
102° 52' 51" E

SABKA
01° 50' 51" N
103° 17' 13" E

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

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

ATRUM
01° 32' 56" N
104° 00' 57" E

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

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

DOSPA
01° 14' 59" N
104° 04' 41" E

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

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

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

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

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

GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

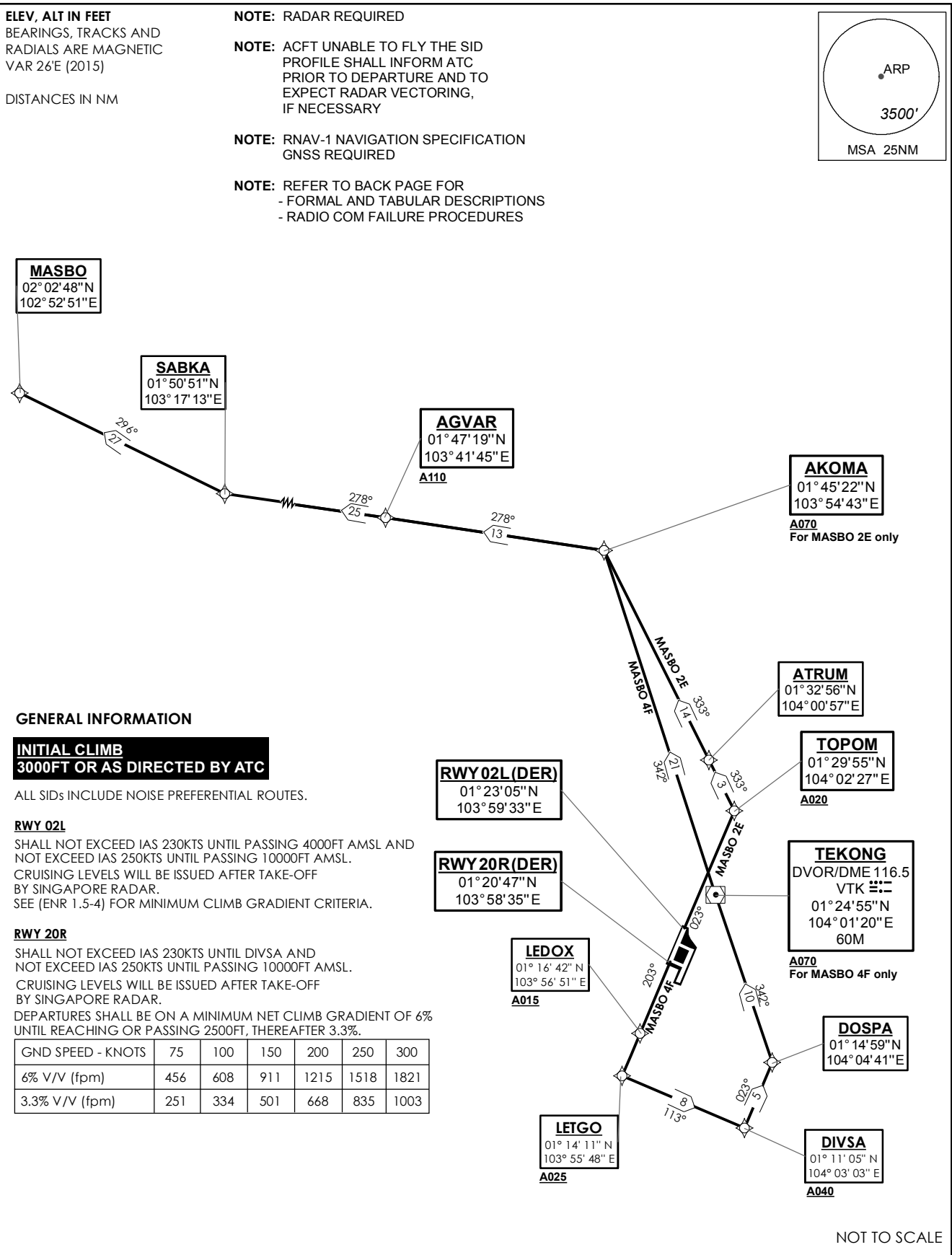
RWY 02L

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL. CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF BY SINGAPORE RADAR. SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL DIVSA AND NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL. CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF BY SINGAPORE RADAR. DEPARTURES SHALL BE ON A MINIMUM NET 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

7 DEC 2017

MASBO 2E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

MASBO 4F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To DIVSA at or above 4000ft, speed 230kts, turn left. To DOSPA, turn left. To VTK at or above 7000ft. To AKOMA, turn left. To AGVAR at or above 11000ft. To SABKA, turn right. To MASBO.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; L] -	TF	N
	DIVSA [A040+; K230; L] -	TF	N
	DOSPA [L] -	TF	N
	VTK [A070+] -	TF	N
	AKOMA [L] -	TF	N
	AGVAR [A110+] -	TF	N
	SABKA [R] -	TF	N
	MASBO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	L	A040+	K230	RNAV1
TF	DOSPA	-	023(022.5)	-0.5	L	-	-	RNAV1
TF	VTK	-	342(341.5)	-0.5	-	A070+	-	RNAV1
TF	AKOMA	-	342(341.5)	-0.5	L	-	-	RNAV1
TF	AGVAR	-	278(277.5)	-0.5	-	A110+	-	RNAV1
TF	SABKA	-	278(277.5)	-0.5	R	-	-	RNAV1
TF	MASBO	-	296(295.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 133.25

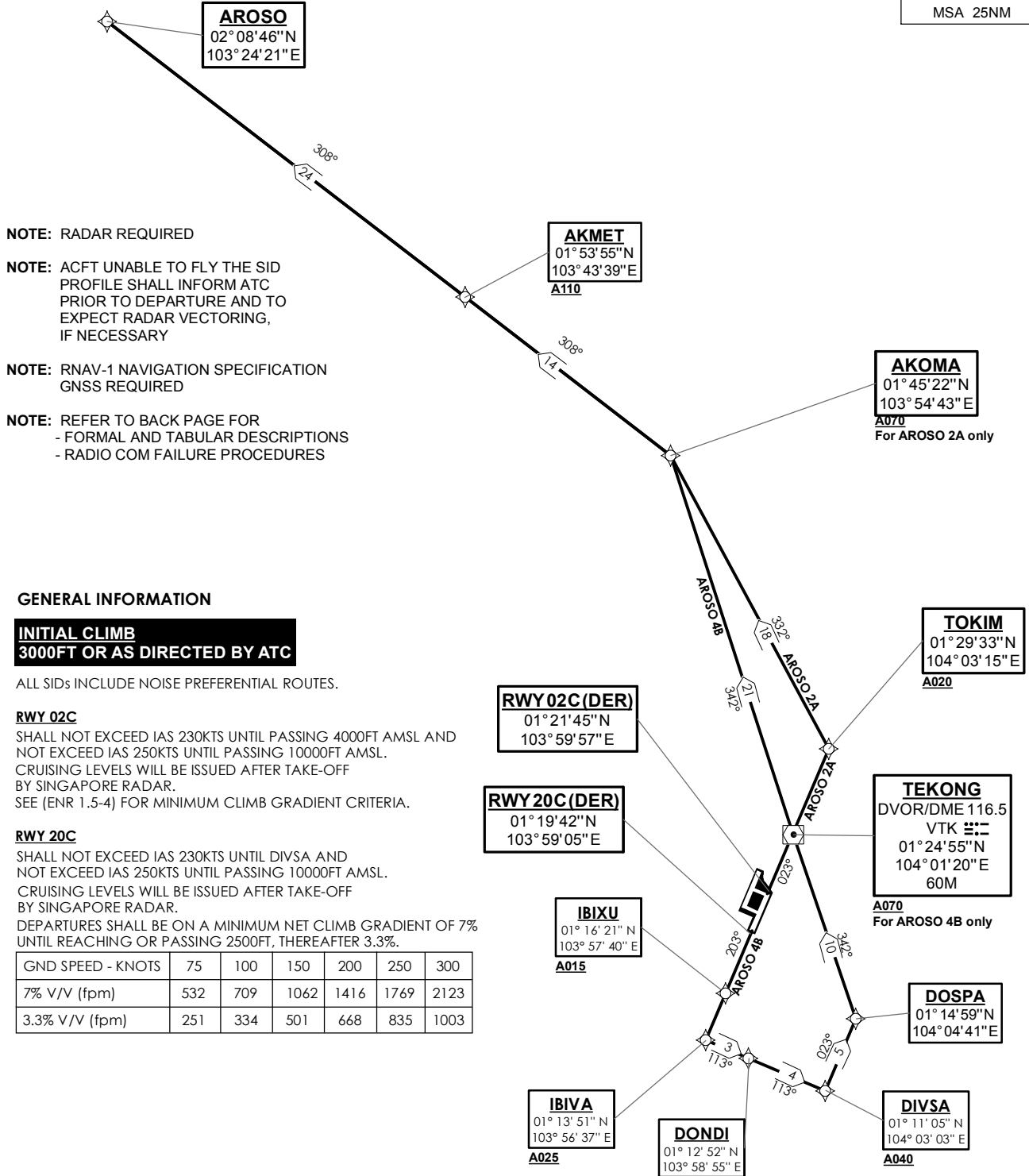
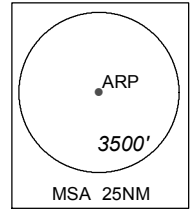
TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

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

DISTANCES IN NM



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

GENERAL INFORMATION

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02C
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. SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

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

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

NOT TO SCALE

7 DEC 2017

AROSO 2A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

AROSO 4B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft, turn left. To DONDI. To DIVSA at or above 4000ft, speed 230kts, turn left. To DOSPA, turn left. To VTK at or above 7000ft. To AKOMA, turn left. To AKMET at or above 11000ft. To AROSO.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+; L] -	TF	N
	DONDI -	TF	N
	DIVSA [A040+; K230; L] -	TF	N
	DOSPA [L] -	TF	N
	VTK [A070+] -	TF	N
	AKOMA [L] -	TF	N
	AKMET [A110+] -	TF	N
AROSO	TF	N	

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(113.3)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(113.3)	-0.5	L	A040+	K230	RNAV1
TF	DOSPA	-	023(023.6)	-0.5	L	-	-	RNAV1
TF	VTK	-	342(341.5)	-0.5	-	A070+	-	RNAV1
TF	AKOMA	-	342(341.5)	-0.5	L	-	-	RNAV1
TF	AKMET	-	308(307.5)	-0.5	-	A110+	-	RNAV1
TF	AROSO	-	308(307.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 133.25

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

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

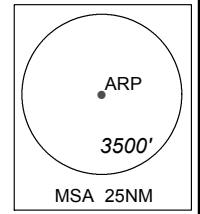
DISTANCES IN NM

NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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



MASBO
02° 02' 48" N
102° 52' 51" E

SABKA
01° 50' 51" N
103° 17' 13" E

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

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

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

RWY 02C (DER)
01° 21' 45" N
103° 59' 57" E

RWY 20C (DER)
01° 19' 42" N
103° 59' 05" E

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

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

DOSPA
01° 14' 59" N
104° 04' 41" E

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

DONDI
01° 12' 52" N
103° 58' 55" E

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

GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

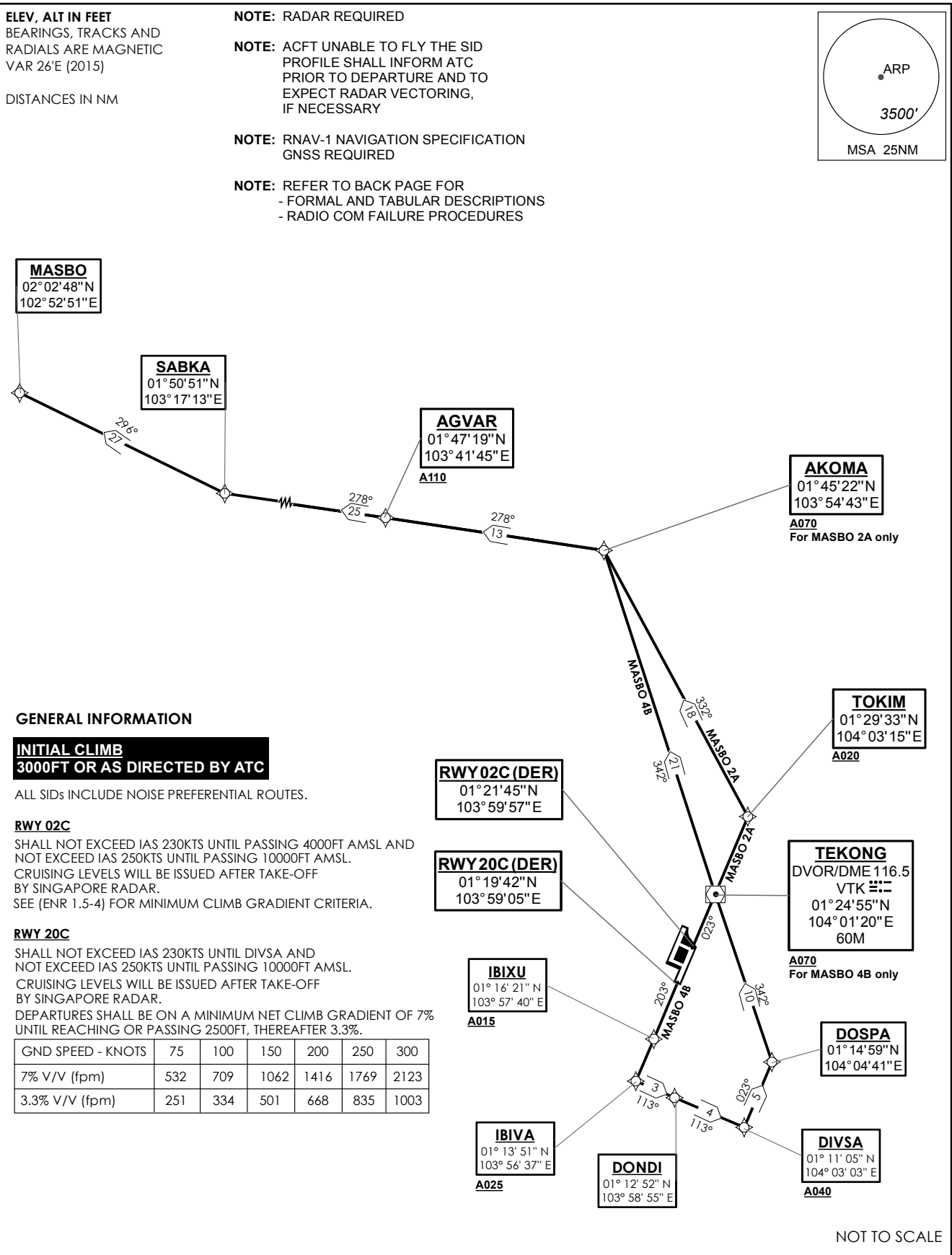
RWY 02C

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL. CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF BY SINGAPORE RADAR. SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

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

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



NOT TO SCALE

7 DEC 2017

MASBO 2A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

MASBO 4B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft, turn left. To DONDI. To DIVSA at or above 4000ft, speed 230kts, turn left. To DOSPA, turn left. To VTK at or above 7000ft. To AKOMA, turn left. To AGVAR at or above 11000ft. To SABKA, turn right. To MASBO.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+; L] -	TF	N
	DONDI -	TF	N
	DIVSA [A040+; K230; L] -	TF	N
	DOSPA [L] -	TF	N
	VTK [A070+] -	TF	N
	AKOMA [L] -	TF	N
	AGVAR [A110+] -	TF	N
	SABKA [R] -	TF	N
	MASBO	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	L	A040+	K230	RNAV1
TF	DOSPA	-	023(022.5)	-0.5	L	-	-	RNAV1
TF	VTK	-	342(341.5)	-0.5	-	A070+	-	RNAV1
TF	AKOMA	-	342(341.5)	-0.5	L	-	-	RNAV1
TF	AGVAR	-	278(277.5)	-0.5	-	A110+	-	RNAV1
TF	SABKA	-	278(277.5)	-0.5	R	-	-	RNAV1
TF	MASBO	-	296(295.5)	-0.5	-	-	-	RNAV1

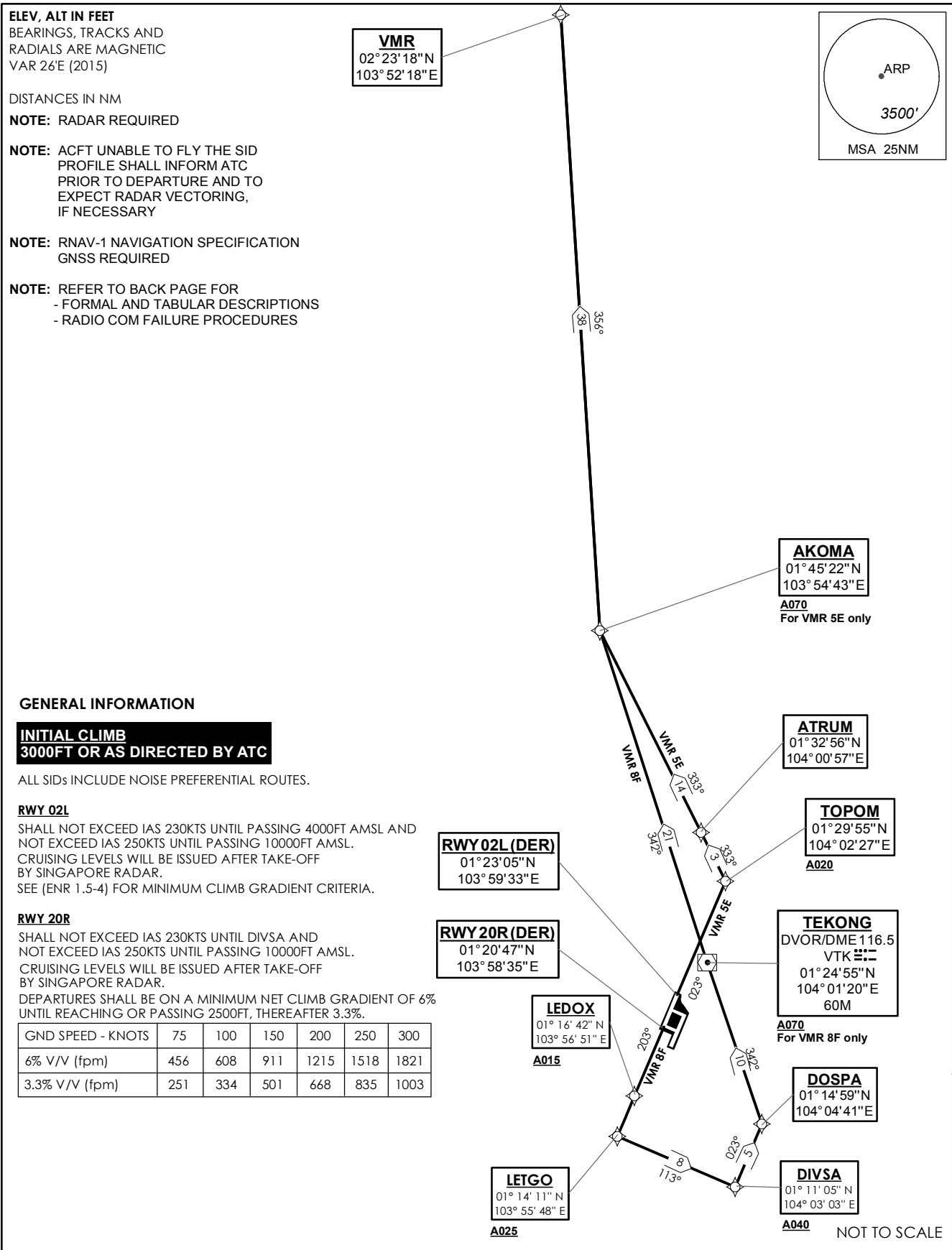
RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25 APP 120.3 ACC 133.8	TRANSITION ALTITUDE 11 000ft
D-ATIS AP ID-WSSS 128.6	

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



7 DEC 2017

VMR 5E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

VMR 8F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To LEDOX on course 203° at or above 1500ft. To LETGO at or above 2500ft, turn left. To DIVSA at or above 4000ft, speed 230kts, turn left. To DOSPA, turn left. To VTK at or above 7000ft. To AKOMA, turn right. To VMR.	LEDOX [M203; A015+] -	CF	N
	LETGO [A025+; L] -	TF	N
	DIVSA [A040+; K230; L] -	TF	N
	DOSPA [L] -	TF	N
	VTK [A070+] -	TF	N
	AKOMA [R] -	TF	N
	VMR	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	L	A040+	K230	RNAV1
TF	DOSPA	-	023(022.5)	-0.5	L	-	-	RNAV1
TF	VTK	-	342(341.5)	-0.5	-	A070+	-	RNAV1
TF	AKOMA	-	342(341.5)	-0.5	R	-	-	RNAV1
TF	VMR	-	356(355.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25 APP 120.3 ACC 133.8	TRANSITION ALTITUDE 11 000ft
	D-ATIS AP ID-WSSS 128.6

**SINGAPORE/Singapore Changi
RWY 02C/20C
MERSING DEPARTURES
VMR 5A (R02C)
VMR 8B (R20C)**

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

DISTANCES IN NM

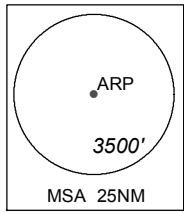
NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

VMR
02° 23' 18" N
103° 52' 18" E



GENERAL INFORMATION

INITIAL CLIMB
3000FT OR AS DIRECTED BY ATC

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

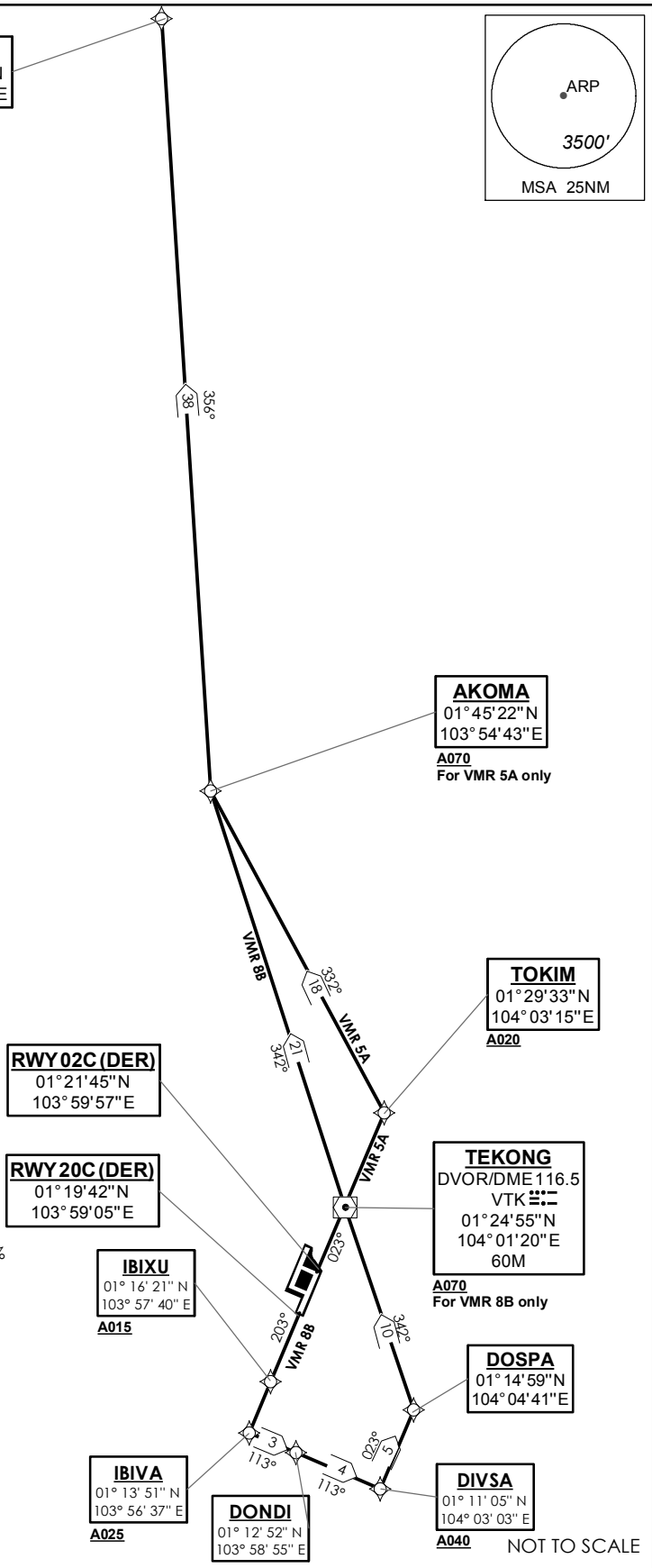
RWY 02C

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.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

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

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



7 DEC 2017

VMR 5A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

VMR 8B (SID) RNAV GNSS RWY 20C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Path Terminator	Fly-Over required
To IBIXU on course 203° at or above 1500ft. To IBIVA at or above 2500ft, turn left. To DONDI. To DIVSA at or above 4000ft, speed 230kts, turn left. To DOSPA, turn left. To VTK at or above 7000ft. To AKOMA, turn right. To VMR.	IBIXU [M203; A015+] -	CF	N
	IBIVA [A025+; L] -	TF	N
	DONDI -	TF	N
	DIVSA [A040+; K230; L] -	TF	N
	DOSPA [L] -	TF	N
	VTK [A070+] -	TF	N
	AKOMA [R] -	TF	N
	VMR	TF	N

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	L	A040+	K230	RNAV1
TF	DOSPA	-	023(022.5)	-0.5	L	-	-	RNAV1
TF	VTK	-	342(341.5)	-0.5	-	A070+	-	RNAV1
TF	AKOMA	-	342(341.5)	-0.5	R	-	-	RNAV1
TF	VMR	-	356(355.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

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

DISTANCES IN NM

NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

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

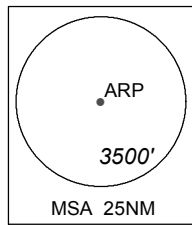
ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02C

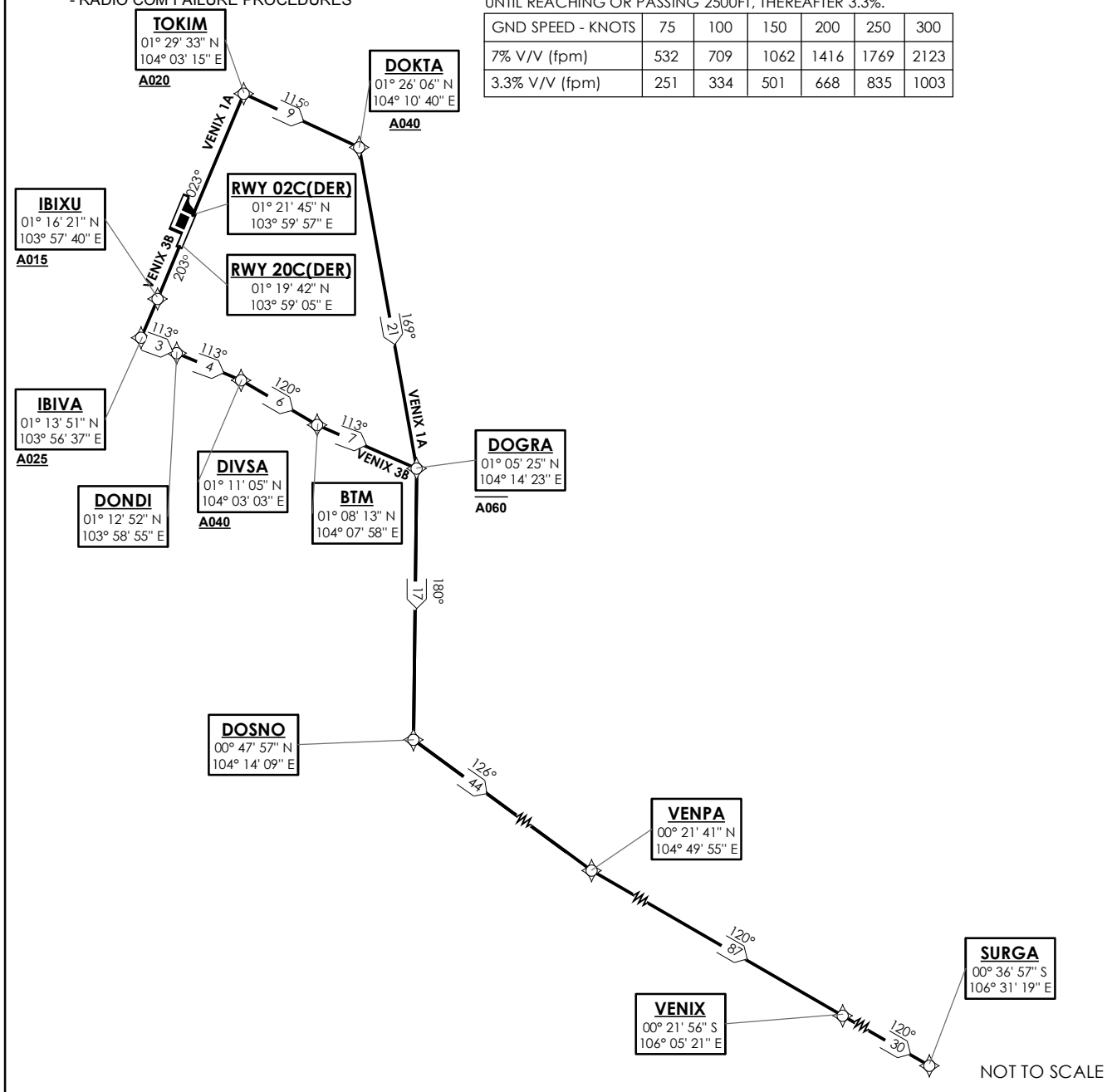
SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

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



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



7 DEC 2017

VENIX 1A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

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

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

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	VENIX	-	120(199.5)	-0.5	-	-	-	RNAV1
TF	SURGA	-	120(199.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

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

DISTANCES IN NM

NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

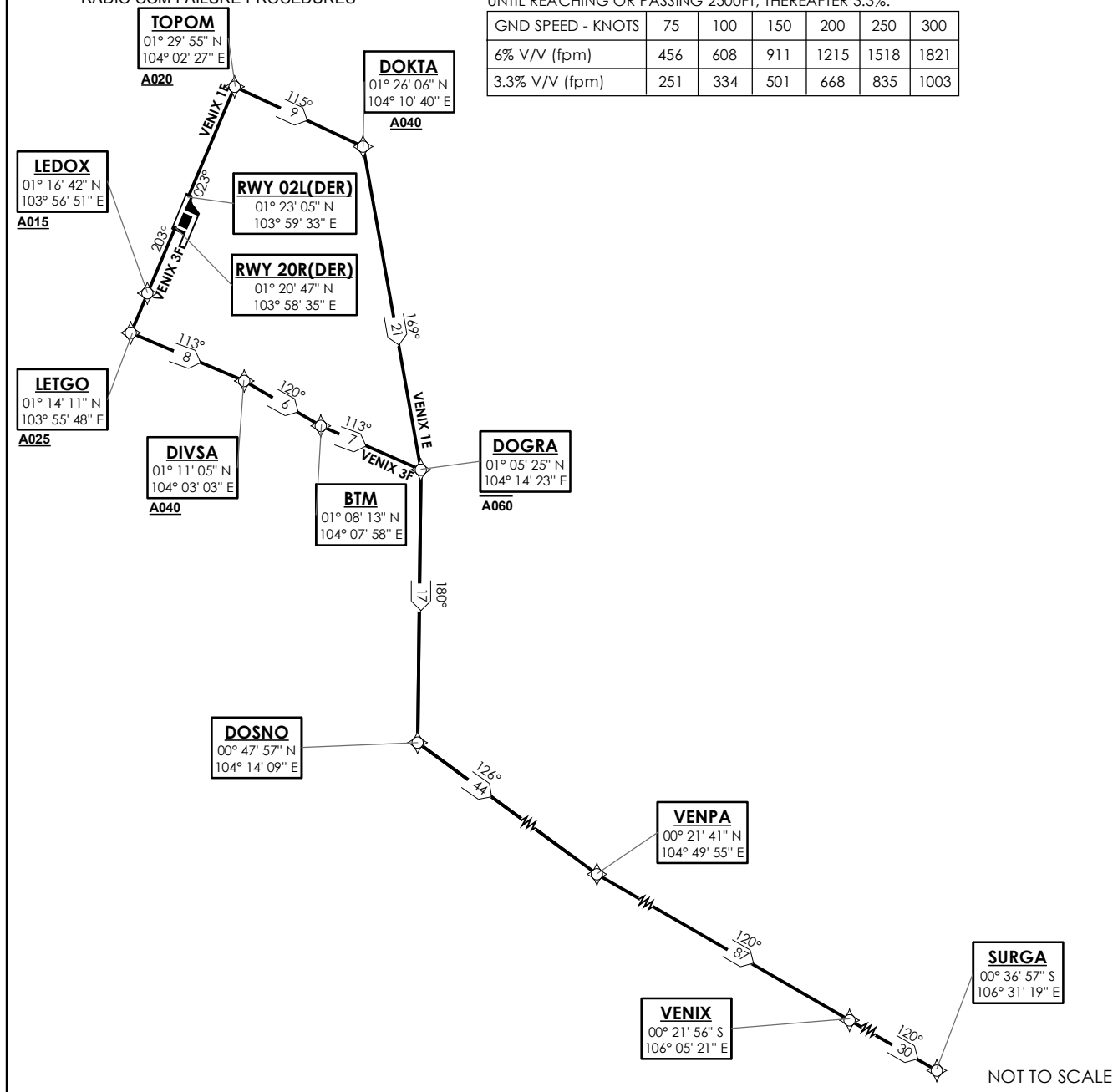
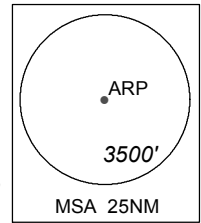
RWY 02L

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.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET 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



7 DEC 2017

VENIX 1E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

VENIX 3F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	VENIX	-	120(199.5)	-0.5	-	-	-	RNAV1
TF	SURGA	-	120(199.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

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

DISTANCES IN NM

NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

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

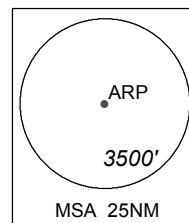
ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

RWY 02C

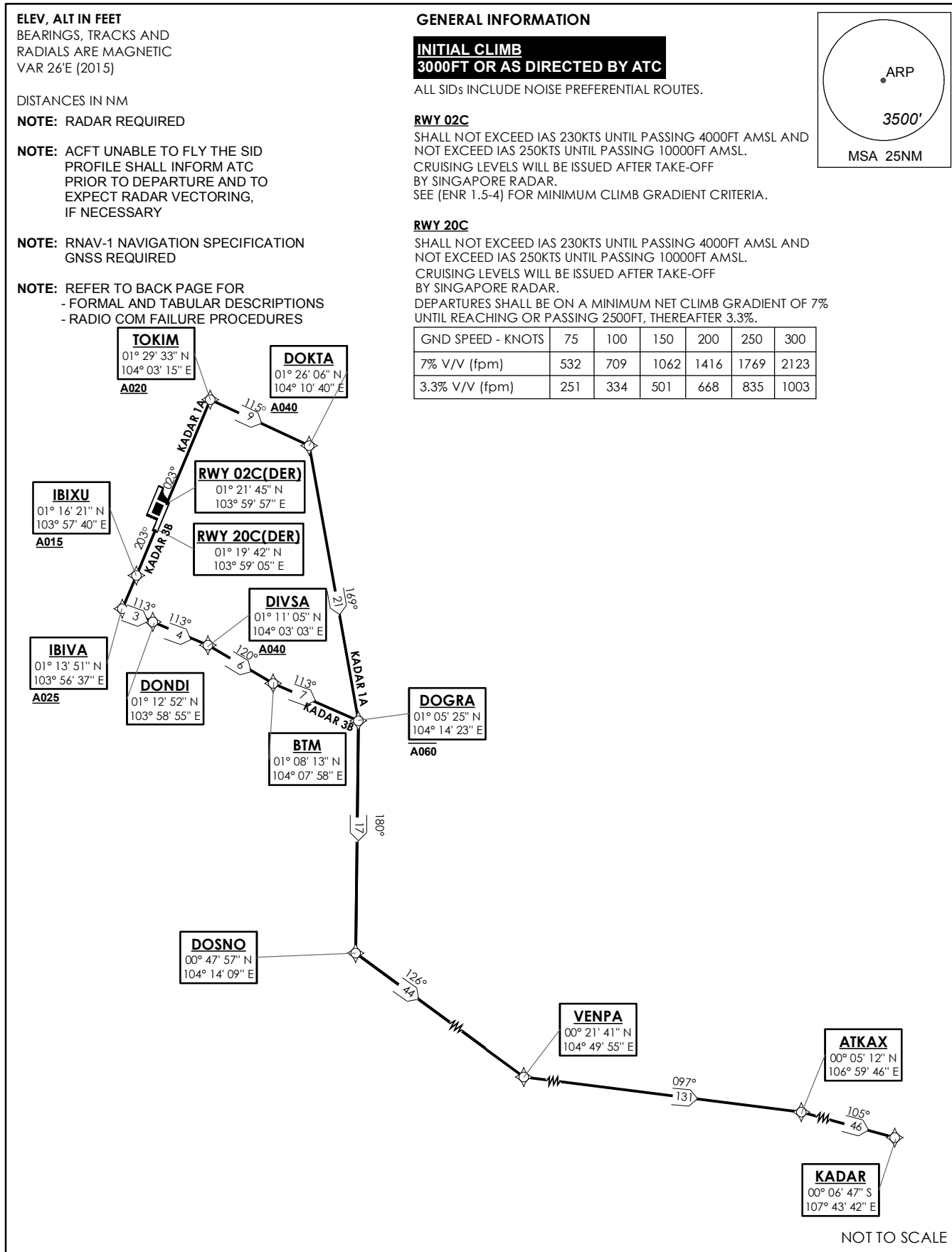
SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20C

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



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



NOT TO SCALE

7 DEC 2017

KADAR 1A (SID) RNAV GNSS RWY 02C - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

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

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

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	IBIXU	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	IBIVA	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DONDI	-	113(112.5)	-0.5	-	-	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	ATKAX	-	097(096.5)	-0.5	R	-	-	RNAV1
TF	KADAR	-	105(104.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

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

TWR 118.6 / 118.25
APP 120.3
ACC 134.4

TRANSITION ALTITUDE
11 000ft

D-ATIS AP ID-WSSS
128.6

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

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

DISTANCES IN NM

NOTE: RADAR REQUIRED

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

NOTE: RNAV-1 NAVIGATION SPECIFICATION
GNSS REQUIRED

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

GENERAL INFORMATION

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

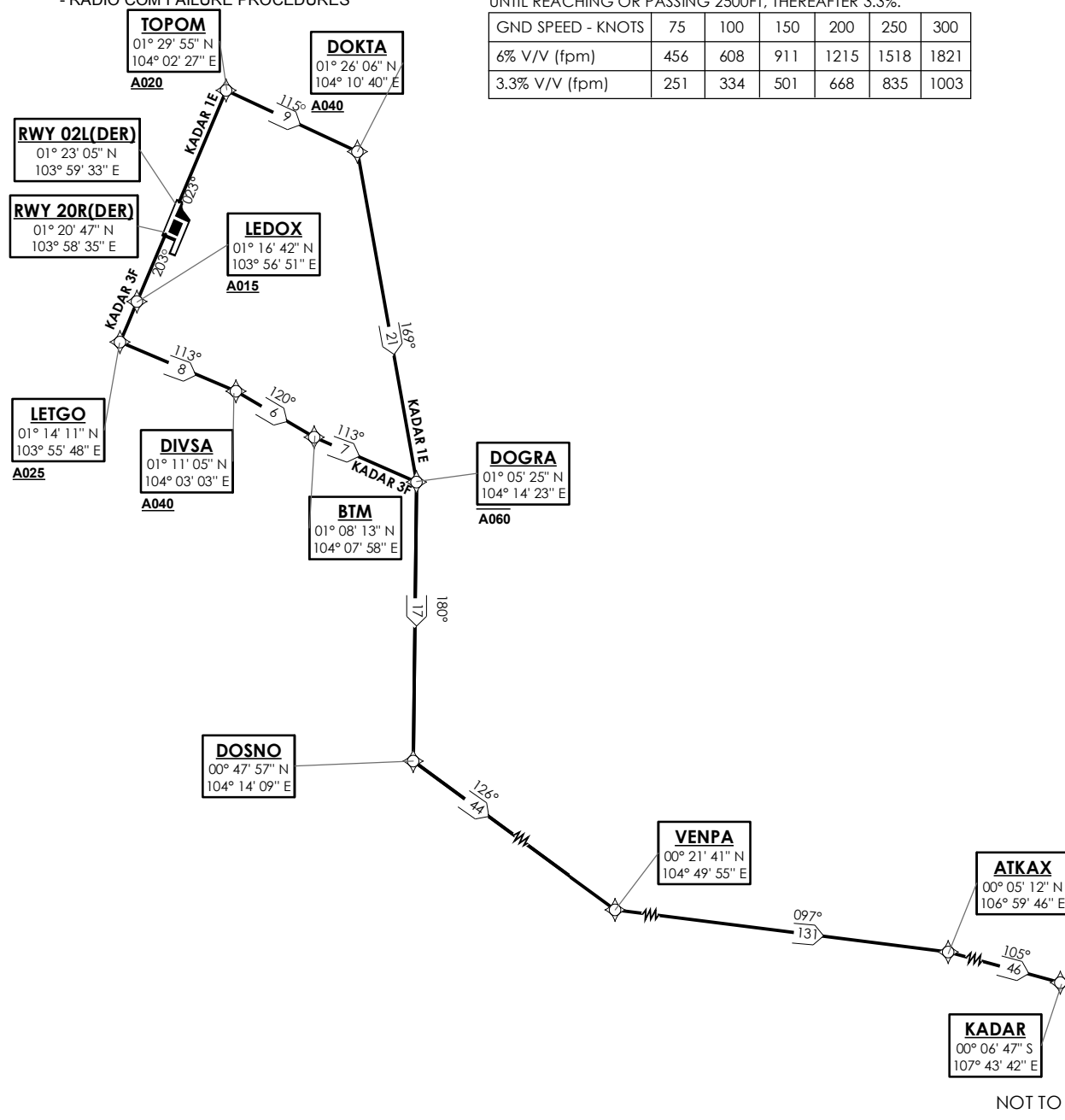
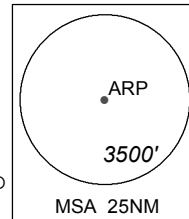
RWY 02L

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.
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

RWY 20R

SHALL NOT EXCEED IAS 230KTS UNTIL PASSING 4000FT AMSL AND
NOT EXCEED IAS 250KTS UNTIL PASSING 10000FT AMSL.
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF
BY SINGAPORE RADAR.
DEPARTURES SHALL BE ON A MINIMUM NET 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

7 DEC 2017

KADAR 1E (SID) RNAV GNSS RWY 02L - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

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

KADAR 3F (SID) RNAV GNSS RWY 20R - DESCRIPTIONS**Formal & Abbreviated Descriptions**

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

Tabular Descriptions

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
CF	LEDOX	-	203(202.5)	-0.5	-	A015+	-	RNAV1
TF	LETGO	-	203(202.5)	-0.5	L	A025+	-	RNAV1
TF	DIVSA	-	113(112.5)	-0.5	R	A040+	-	RNAV1
TF	BTM	-	120(119.5)	-0.5	L	-	-	RNAV1
TF	DOGRA	-	113(112.5)	-0.5	R	A060-	-	RNAV1
TF	DOSNO	-	180(179.5)	-0.5	L	-	-	RNAV1
TF	VENPA	-	126(125.5)	-0.5	L	-	-	RNAV1
TF	ATKAX	-	097(096.5)	-0.5	R	-	-	RNAV1
TF	KADAR	-	105(104.5)	-0.5	-	-	-	RNAV1

RADIO COMMUNICATIONS FAILURE PROCEDURE

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

WSSL AD 2.8 APRONS, TAXIWAYS AND CHECK LOCATIONS/POSITIONS DATA

1	<i>Apron surface and strength</i>	Surface: Bituminous concrete (aircraft stand C7) Strength: PCN44/F/C/X/T Surface: Concrete (all other aircraft stands) Strength: PCN41/R/C/W/T
2	<i>Taxiway width, surface and strength</i>	Width: 23 M (75.5ft), 18 M (59.1ft) TWY EC4, EC5 AND EC6 8 M (26.2ft) TWY WS1 and WS2 Surface: Bituminous concrete Strength: PCN44/F/C/X/T
3	<i>Remarks : NIL</i>	

WSSL AD 2.9 SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS

SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS		
1	<i>Use of aircraft stand ID signs, TWY guidelines and visual docking/parking guidance system of aircraft stands</i>	Taxiing guidance signs at all intersections with TWY and RWY at all holding positions. Guidelines at apron. Nose-in guidance at aircraft stands.
2	<i>RWY and TWY markings and LGT</i>	<p><u>RWY LGT:</u> refer to page WSSL AD 2-5 for details. RWY Turn Pad LGT / Markings: Only AVBL at THR RWY 03. Yellow turnpad centreline.</p> <p><u>TWY LGT:</u> TWY Edge LGT: Blue LGT, inset, elevated and omni-directional. TWY Centreline LGT: Green LGT, fixed. Intermediate Holding Position LGT: Yellow LGT, fixed, unidirectional. TWY markings: Yellow TWY centreline.</p> <p>The fixed green taxiway centreline lights and fixed unidirectional yellow intermediate holding position lights shall be switched on between sunset and sunrise or during periods of poor visibility. ATC will continue to verbalise the taxi route as per current practice. Pilots shall continue to adhere strictly to the taxi clearances issued by ATC at all times.</p> <p>In the event that the fixed green taxiway centreline lights and fixed unidirectional yellow intermediate holding position lights become unserviceable, pilots shall taxi following the single continuous yellow taxiway centreline markings and intermediate holding position markings (single broken line laid across the entire width of the taxiway) as per mode of operations during VMC daylight hours.</p> <p><u>MARKING AIDS:</u> Threshold, touchdown zone, centreline stripes and RWY designation. RWY width outline from bituminous concrete surface by white lines.</p> <p><u>AIMING POINT MARKINGS:</u> RWY 03: coincident with PAPI origin located 311.6m from THR respectively. RWY 21: coincident with PAPI origin located 232.8m from THR respectively.</p>

SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS		
3	Stop Bars	<p>Stop Bars: Red LGT across taxiways W1, W2, W3, E1, E2, E3 and E4, flushed with TWY surface and are supplemented with elevated RWY guard LGT at the sides.</p> <p>By default, red stop bar lights remain on unless deselected by the runway controller. When deselected, these stop bar lights will re-activate automatically after 45 seconds. Pilots shall not cross any lighted red stop bar lights.</p> <p>Pilots and drivers shall enter / cross the runway only when both the following conditions are met:</p> <p>The crew have</p> <ol style="list-style-type: none"> received positive ATC clearance to enter / cross the runway or taxiway, and observed that the red stop bar lights are turned off. <p>Crash Alarm Stop Bars: Red LGT across junctions of EP, EC4 and EH2 TWY, flushed with TWY surface.</p> <p>(Note to pilots and tow-crew: Slow down when taxiing / towing on TWY EP between TWY EC4 and abeam the Control Tower. Keep a lookout for emergency vehicles that may cross the taxiway to respond to emergency on the RWY.)</p>
4	Remarks	<ol style="list-style-type: none"> Aircraft operators/ground handlers shall be responsible for the safe and smooth operations of aircraft at the aircraft stands. To enhance airside safety, all aircraft larger than Code A (i.e. up to but not including 15m wingspan) shall be marshalled into the aircraft stands. Arriving aircraft will be assigned an aircraft stand. A ground handler shall marshal the aircraft into the aircraft stand. A ground handler shall be at the aircraft stand when the aircraft is ready to depart. When the pilot signals that he is ready to taxi, the ground handler shall ensure that the area around the aircraft is clear before marshalling the aircraft out of the aircraft stand. Only Code A aircraft, Code B aircraft, aircraft type Global Express (GLEX), Global 5000 (GL5T), Global Express XRS (GLEX), Fokker 50 (F50), Fokker 70 (F70), Fokker 100 (F100), Gulfstream 500 (GLF5), Gulfstream 550 (GLF5), ATR 42-500 (AT45), ATR 42-600 (AT46), ATR 72-500 (AT75), DASH 7 (DHC7) and Falcon 7X (FA7X) are allowed to self-power out from aircraft stands C1, C2, C3, C4, C5 and C6. Aircraft at stand C1 shall self-power out towards the north only. Aircraft at stand C6 shall self-power towards the south only. Aircraft at stands C2, C3, C4 and C5 are allowed to self-power out towards the south or the north. Aircraft can self-power in from the north as well as the south via TWY WA. All personnel, tow tugs and equipment shall be cleared from the aircraft stand and red chevron markings on the adjacent aircraft stands before self-power out can commence. Aircraft with wingspan larger than 28.35m are not allowed to park at aircraft stand C7. Refuelling will not be allowed at aircraft stand C7. Aircraft stands D50, D51, D52, D53, D54, D55 and D56 will be used for tow operations only.

WSSL AD 2.12 RUNWAY PHYSICAL CHARACTERISTICS

Designations RWY NR	TRUE BRG	Dimensions of RWY (m)	Strength (PCN) and Surface of RWY and SWY	THR coordinates (THR GEOID Undulation)	THR Elevation
1	2	3	4	5	6
03	033.33°	1836 x 46	44/F/C/X/T Bituminous Concrete	012430.846N 1035143.791E (9.78M)	14 M
21	213.33°	1836 x 46	44/F/C/X/T Bituminous Concrete	012520.791N 1035216.425E (9.78M)	5 M

RWY End Elevation	Highest Elevation of Touchdown Zone	CWY Dimensions	STRIP Dimensions (m)	OFZ	Remarks (continued below)
7	8	9	10	11	12
5 M	13 M	60 M x 150 M	1956 M x 150 M	Not applicable	RESA RWY 03 - 240m X 92m
14 M	10 M				RESA RWY 21 - 240m X 150m

12	Remarks:
<p>i) Scheduled closure period for RWY 03/21</p> <p>a) BTN 1600-2300 first FRI of EV month or second FRI if the first FRI is a public holiday. RWY CLSD to all TFC except medevac and EMERG flights. Advance notice of 30 minutes is required for EMERG opening of RWY.</p> <p>b) BTN 0500-0515, 1030-1045, 1600-1615 and 2300-2315 daily for RWY inspection. Aircraft to expect delay.</p> <p>c) BTN 1600-1800 EV TUE and FRI of EV month. RWY CLSD to all TFC except medevac and EMERG flights. Advance notice of 30 minutes is required for EMERG opening of RWY.</p> <p>ii) A lighted runway turn pad with centreline marking is provided at the threshold of RWY 03 which is able to serve aircraft up to B757-200.</p> <p>iii) Orange frangible posts are positioned along the boundary 90m on either sides on the RWY centreline. These posts demarcate the boundary for grass cutting and other maintenance works.</p>	

WSSL AD 2.13 DECLARED DISTANCES

RWY Designator	TORA(m)	TODA(m)	ASDA(m)	LDA(m)	Remarks
1	2	3	4	5	6
03	1836	1896	1836	1836	NIL
21	1836	1896	1836	1836	NIL

WSSL 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 CL 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
03	Simple APCH LGT: 4 rows of barettes of 3 LGT each and 1 crossbar of 13 LGT. White, elevated, uni-directional APCH LGT and white, omni-directional CGL on top of elevated APCH LGT. Simple TDZ LGT: 2 pairs white, inset, uni-directional LGT.	Green with THR IDENT LGT	PAPI 3° (both sides of RWY) 2 white 2 red LGT (17.720m) 3 white 1 red LGT (20.323m) 4 white LGT (22.927m). ACFT with eye-to-wheel HGT greater than 6.3m are ADZ to fly with 2 white 2 red LGT visible so as to achieve sufficient wheel CLR.	NIL	NIL	White with yellow on last 600m of either end. Elevated, omni-directional and brilliancy controlled.	Red	NIL

<i>RWY Designator</i>	<i>APCH LGT type LEN INTST</i>	<i>THR LGT Colour WBAR</i>	<i>VASIS (MEHT) PAPI</i>	<i>TDZ LGT LEN</i>	<i>RWY CL LGT, LEN, spacing, colour, INTST</i>	<i>RWY edge LGT LEN, spacing colour, INTST</i>	<i>RWY End LGT Colour WBAR</i>	<i>SWY LGT LEN Colour</i>
1	2	3	4	5	6	7	8	9
21	APCH LGT: 1 row of inset APCH LGT of 4 LGT and 4 rows of barettes of 4 LGT each. White inset uni-directional APCH LGT and white omni-directional CGL on top of white, elevated uni-directional APCH LGT. Simple TDZ LGT: 2 pairs white, inset, uni-directional LGT.	Green with THR IDENT LGT	PAPI 3.5° (both sides of RWY) 2 white 2 red LGT (17.720m) 3 white 1 red LGT (19.286m) 4 white LGT (20.871m). ACFT with eye-to-wheel HGT greater than 6.3m are ADZ to fly with 2 white 2 red LGT visible so as to achieve sufficient wheel CLR.	NIL	NIL	White with yellow on last 600m of either end. Elevated, omni-directional and brilliancy controlled.	Red	NIL
RWY 21 THR and RWY END LGT symmetrically disposed in 2 groups with a gap between the groups. RWY 21 THR and RWY END LGT reinstated to inset fitting.								

WSSL AD 2.15 OTHER LIGHTING, SECONDARY POWER SUPPLY

1	<i>ABN/IBN location, characteristics and hours of operation</i>	ABN: 012448.000N 1035207.960E (on top of Control Tower) ALTN FLG W G EV 2.5 SEC. HN and IMC IBN: 012509.939N 1035152.143E (on top of West Substation) Flashing G 'SL' repeatedly. HN and IMC
2	<i>LD and LGTI location Anemometer location and LGT</i>	Cup anemometers and wind vanes and windsocks at ends of RWY.
3	<i>TWY edge and centreline lighting</i>	TWY Edge LGT: Blue, elevated and omni-directional. TWY Centreline LGT: Green, fixed. Intermediate holding position LGT: Yellow, fixed, unidirectional.
4	<i>Secondary power supply/switch-over time</i>	Automatic standby generator power supply available for airfield lighting.
5	<i>Remarks</i>	Vehicles painted yellow or displaying checkered red/white or orange/white flag at highest point of vehicle. WDI lighted.

WSSL AD 2.16 HELICOPTER LANDING AREA

1	Coordinates of THR of FATO Geoid undulation	H03 H21 012437.963N 1035152.072E 012446.046N 1035157.344E
2	FATO elevation M/FT	H03- 10.45m/34.3ft; H21 - 9.36m/30.7ft
3	FATO area dimensions, surface, strength, marking	Rectangle 297m x 21.5m, compacted turf, helicopter landing area designations, outline by concrete kerbs painted white.
4	True BRG of FATO	033.33/213.33° Direction of TKOF zones: 034° GEO / 214° GEO
5	Declared distance available	TODAH RTODAH LDAH H03 297m 297m 297m H21 297m 297m 297m
6	Approach and FATO lighting	Nil
7	Remarks	Slope of helicopter landing area (transverse/longitudinal) H03 - 1.19%/0.44% ; H21 - 0.96%/0.44%

WSSL AD 2.17 ATS AIRSPACE

1	<i>Designation and Lateral Limits</i>	<p>SELETAR CTR 012703N 1035009E 012825N 1035009E 012900N 1035425E 012534N 1035454E thence along international boundary to 012556N 1035326E 012227N 1035158E 012232N 1035016E 012327N 1034922E 012607N 1035053E and thence an arc of 2NM radius (centred at position 012527N 1034856E) joining 012607N 1035053E and 012703N 1035009E</p> <p>SELETAR CONTROL ZONE A Portion of Seletar CTR within Singapore FIR is known as Seletar CTR 'A'.</p> <p>SELETAR CONTROL ZONE 'B' The part in the Kuala Lumpur FIR is known as Seletar CTR 'B' and is bounded by 012825N 1035009E, 012900N 1035425E, 012534N 1035454E thence along the Peninsular Malaysia/Singapore international boundary to 012808N 1035010E to 012825N 1035009E from GND/sea level to 3,000ft. It will be activated only with prior approval of Johor Bahru ATC. (see chart AD-2-WSSL-VFR-1).</p>
2	<i>Vertical Limits</i>	<p>SELETAR CONTROL ZONE A SFC to 4 500ft ALT Maximum Usable ALT 4 000ft</p> <p>SELETAR CONTROL ZONE B SFC to 3 000ft ALT</p>
3	<i>Airspace Classification</i>	C
4	<i>ATS Unit Call sign Language(s)</i>	SELETAR TOWER English
5	<i>Transition Altitude</i>	11000 FT (3,350m)
6	<i>Remarks</i>	NIL

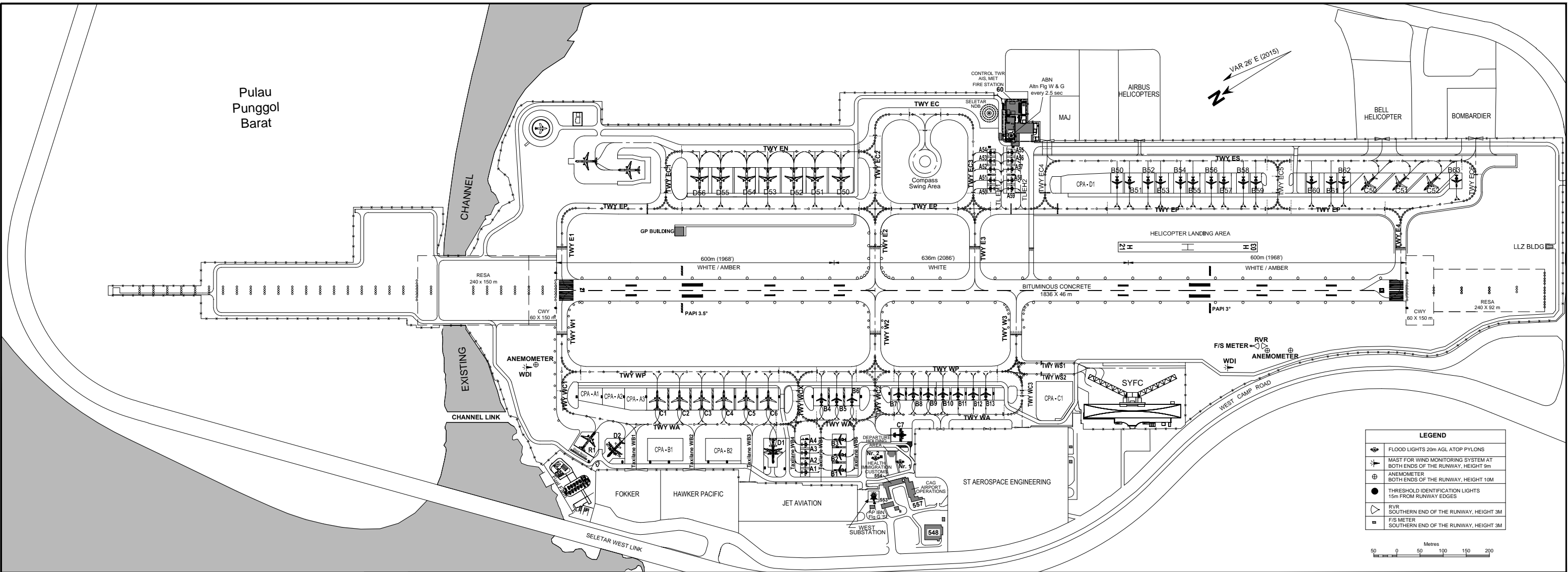
WSSL AD 2.18 ATS COMMUNICATION FACILITIES

Service designation	Call sign	Frequency P-Pri S-Sec	Hours of operation	Remarks
TWR	SELETAR TOWER	P118.45 MHz S130.2 MHz 270.4 MHz	H24	* for vehicular movements For AWY B469, G334, R208, L625, L629, L635, L642, M751, M753, M758, M761, M763, M771, N884, N891 and N892
	SELETAR GROUND	121.6 MHz * 122.9 MHz		
ACC	SINGAPORE RADAR	P123.7 MHz S127.3 MHz	0000-1430	For AWY A457, A464, A576, B466, L762, R325 (all northbound) and R469.
		133.8 MHz		For AWY G580, M646 and M767
		P133.25 MHz S135.8 MHz	H24	For AWY A464, A576, G579 (all southbound), B470, G220, N875 and in area in the immediate vicinity of Singapore
		P134.2 MHz S133.35 MHz		Radar Maint Period: Monthly - every third SAT BTN 1601-2359
	P134.4 MHz S128.1 MHz 255.4 MHz	SEA 1. SATCOM SER AVBL SSB suppressed carrier		
	SINGAPORE RADIO	6556 kHz 11297 kHz		SEA 2. SATCOM SER AVBL SSB suppressed carrier
		5655 kHz 8942 kHz 11396 kHz		SEA 3. SATCOM SER AVBL SSB suppressed carrier
6556 kHz				
APP	SINGAPORE APPROACH	P120.3 MHz S124.6 MHz		TAR: a) Intermediate APCH to Singapore Changi AP and other airports in Singapore b) DEP from all airports in Singapore Maint Period: Monthly: every first THU BTN 0000-0900 (ASR I) and every fourth SAT BTN 1601-2359 (ASR II)

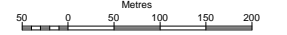
WSSL AD 2.19 RADIO NAVIGATION AND LANDING AIDS

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

SELETAR AERODROME LAYOUT OF SIGNIFICANT AERODROME BUILDINGS AND APRON FACILITIES



LEGEND	
	FLOOD LIGHTS 20m AGL ATOP PYLONS
	MAST FOR WIND MONITORING SYSTEM AT BOTH ENDS OF THE RUNWAY, HEIGHT 9m
	ANEMOMETER BOTH ENDS OF THE RUNWAY, HEIGHT 10M
	THRESHOLD IDENTIFICATION LIGHTS 15m FROM RUNWAY EDGES
	RVR SOUTHERN END OF THE RUNWAY, HEIGHT 3M
	F/S METER SOUTHERN END OF THE RUNWAY, HEIGHT 3M



CHANGES : Taxiway/Taxilane centreline Lights and Intermediate Holding position Lights added.

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WSAP AD 2.14 APPROACH AND RUNWAY LIGHTING

<i>RWY Designator</i>	<i>APCH LGT type LEN INTST</i>	<i>THR LGT colour WBAR</i>	<i>VASIS (MEHT) PAPI</i>	<i>TDZ LGT LEN</i>	<i>RWY Centre Line LGT LEN, spacing, colour, INTST</i>	<i>RWY edge LGT LEN, spacing colour, INTST</i>	<i>RWY END LGT colour WBAR</i>	<i>SWY LGT LEN colour</i>
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

<i>WDI/Taxiway/Stopway</i>	Lighted
IBN	012120.6N 1035410.0E; Flashing Red 'PL'; Operating hours HN and IMC

WSAP AD 2.17 ATS AIRSPACE

1	<i>Designation and Lateral Limits</i>	PAYA LEBAR CTR 011100N 1035134E 013300N 1040149E 013200N 1035344E 012534N 1035454E thence along international BDRY to 012544N 0135320E 012227N 1035158E 012232N 1035016E 012100N 1034654E 012025N 1034539E 011835N 1034459E thence southwards on 180° to 011100N 1034559E and eastwards to join up with 011100N 1035134E.
2	<i>Vertical Limits</i>	GND to 3000 FT ALT
3	<i>Airspace Classification</i>	D
4	<i>ATS Unit Call Sign, Language(s)</i>	PAYA LEBAR TOWER (Singapore APP outside the opr hours of PAYA LEBAR TOWER), English
5	<i>Transition Altitude</i>	11000 FT (3,350m)
6	<i>Remarks</i>	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	PAYA LEBAR APPROACH	119.9 MHz 298.0 MHz *255.8 MHz #127.7 MHz	BTN 2300-1100 SUN-MON to THU-FRI; BTN 2300-0500 FRI-SAT; and on SUN, Public holidays and outside the above	* 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	times PPR from RSAF HQ via Paya Lebar Operations.	† 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
ACC	SINGAPORE RADAR	P123.7 MHz S127.3 MHz	H24	for AWY B469, G219, G334, R208, L625, L629, L635, L642, M751, M753, M758, M761, M763, M771, N884, N891, N892.
		P133.25 MHz S135.8 MHz		for AWY A457, A464, A576, B466, L762, R325 (all northbound) and R469.
		P134.4 MHz S128.1 MHz 255.4 MHz		for AWY A464, A576, G579, (all southbound), B470, G220, N875 and in area in the immediate vicinity of Singapore.
				Radar Maint Period: Monthly - EV third SAT BTN 1601-2359

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	BTN 2300-1100 from SUN-MON to THU-FRI, BTN 2300-0500 FRI-SAT; and on SUN, Public holiday and outside the above times PPR from RSAF HQ via Paya Lebar Operations.	012224.00N 1035451.00E	030° MAG 2.375km from ARP. Maint Period: BTN 0001-0900 Second SAT of EV month RWY 02 step-down fix revised to 4.4 DME at 1060ft.
PAPA UNIFORM DVOR/DME	PU	115.1 MHz CH98X	H24	012523.99N 1035559.74E	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	011319.28N 1035120.08E	201° MAG 14.5km from THR RWY 02 (Paya Lebar). Antenna HGT: 194ft 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

<i>Service designation</i>	<i>Call sign</i>	<i>Frequency P - Primary S - Secondary</i>	<i>Hours of operation</i>	<i>Remarks</i>
ACC	SINGAPORE RADAR	P123.7 MHz S127.3 MHz	H24	for AWY B469, G219, G334, R208, L625, L629, L635, L642, M751, M753, M758, M761, M763, M771, N884, N891 and N892.
		133.8 MHz	0000-1430	
		P133.25 MHz S135.8 MHz	H24	for AWY A457, A464, A576, B466, L762, R325 (all northbound) and R469.
		P134.4 MHz S128.1 MHz 255.4 MHz		for AWY A464, G579, A576 (all southbound), B470, G220, N875 and in area in the immediate vicinity of Singapore
				Radar Maint Period: Monthly - EV third SAT 1601-2359
	SINGAPORE RADIO	6556 kHz 11297 kHz		SEA 1, SATCOM SER AVBL SSB suppressed carrier
		5655 kHz 8942 kHz 11396 kHz		SEA 2, SATCOM SER AVBL SSB suppressed carrier
		6556 kHz		SEA 3, SATCOM SER AVBL SSB suppressed carrier
APP	SINGAPORE APPROACH	P120.3 MHz S124.6 MHz	H24	TAR - Intermediate approach to Singapore Changi airport and other airports in Singapore - DEP from all airports in Singapore Maint Period: Monthly EV first THU 0000-0900 (ASR I) and EV fourth SAT 1601-2359 (ASR II)

WSAT AD 2.19 RADIO NAVIGATION AND LANDING AIDS

RADIO NAVIGATION AND LANDING AIDS					
<i>Type of Aid</i>	<i>IDENT</i>	<i>FREQ</i>	<i>OPR Hour</i>	<i>Coordinates</i>	<i>Remarks</i>
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	011319.28N 1035120.08E	201° MAG 14.5km from THR RWY 02 (Paya Lebar) Antenna HGT: 194ft 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°

RADIO NAVIGATION AND LANDING AIDS					
ILS DME RWY 36	ITN	CH18X	H24	012241.02N 1034226.67E	DME co-located with GP
ILS LLZ RWY 18	ITS	111.3 MHz	H24	012221.63N 1034224.98E	Located 290m from THR RWY 36 along centreline of RWY. Course width 3°
ILS GP RWY 18	-	332.3 MHz	H24	012351.64N 1034237.33E	GP antenna 3°
ILS DME RWY 18	ITS	CH50X	H24	012350.04N 1034236.38E	DME co-located with GP

WSAG AD 2.18 COMMUNICATION FACILITIES

<i>Service designation</i>	<i>Call sign</i>	<i>Frequency</i>	<i>Hours of operation</i>	<i>Remarks</i>
1	2	3	4	5
APP	PAYA LEBAR APPROACH	127.7 MHz 255.8 MHz	BTN 2300-1100 SUN/MON to THU/FRI and BTN 2300-0500 FRI/SAT. Prior permission required on SUN and Public holidays	Nil
TWR	SEMBAWANG TOWER	129.7 MHz 239.0 MHz		Nil
GND	SEMBAWANG GROUND	277.1 MHz 118.8 MHz		Nil
Flight Information Service	SINGAPORE RADAR	119.1 MHz	H24	Nil
ACC	SINGAPORE RADAR	123.7 MHz 127.3 MHz	H24	for AWY B469, G219, G334, R208, L625, L629, L635, L642, L644, M751, M753, M758, M761, M763, M771, N884, N891, N892.
		133.25 MHz 135.8 MHz		for AWY A457, A464, A576, B466, L762, R325 (all northbound) and R469.
		134.4 MHz 128.1 MHz 255.4 MHz		for AWY A464, A576, G579 (all southbound), B470, L644, N875 and in the area in the immediate vicinity of Singapore.
		124.05 MHz		Flow control service provided for ARR / DEP ACFT.
		MAINT Period: Monthly - EV 3rd SAT 1601-2359		
ACC	SINGAPORE RADIO	6556 kHz 11297 kHz	H24	SEA 1. Emission A3AJ. SSB suppressed carrier. SATCOM SER AVBL.
		5655 kHz 8942 kHz 11396 kHz		SEA 2. Emission A3AJ. SSB suppressed carrier. SATCOM SER AVBL.
		6556 kHz		SEA 3. Emission A3AJ. SSB suppressed carrier. SATCOM SER AVBL.
APP	SINGAPORE APPROACH	P120.3 MHz S124.6 MHz	H24	TAR - Intermediate approach to Singapore Changi AP and other airports in Singapore. DEP from all airports in Singapore.
	SINGAPORE ARRIVAL	119.3 MHz		TAR - Intermediate and final approach to Singapore Changi Airport.
ASR I MAINT Period: Monthly - EV 1st SAT 1601-2359 ASR II MAINT Period: Monthly - EV 4th SAT 1601-2359				

WSAG AD 2.19 RADIO NAVIGATION AND LANDING AIDS

<i>Type of Aid</i>	<i>IDENT</i>	<i>Frequency</i>	<i>OPR HR</i>	<i>Coordinates</i>	<i>Remarks</i>
1	2	3	4	5	6
SEMBAWANG NDB	AG	325 kHz	H24	012524.00N 1034924.00E	198° MAG 0.54km from ARP Coverage 30NM. MAINT Period: Monthly - EV 2nd FRI 0200-0400. For training approaches in VMC only.

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