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**AMDT**  
**01/2017**  
**Effective date**  
**05 JAN 2017**  
**Publication date**  
**05 JAN 2017**

## wp-AMDT-2017-01

### 1. SIGNIFICANT INFORMATION AND CHANGES

#### 1.1 Singapore FIR

- a. Inclusion of Air Traffic Management Contingency Plan

#### 1.2 Singapore Changi Airport (WSSS)

- a. Implementation of Airport Collaborative Decision Making (A-CDM) operations

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 THIS AMENDMENT INCORPORATES INFORMATION CONTAINED IN THE FOLLOWING WHICH ARE HERBY SUPERSEDED:

NOTAMs:

A2552/16 dated 21/10/16  
A2701/16 dated 07/11/16  
A2705/16 dated 18/10/16  
A2783/16 dated 15/11/16  
A3052/16 dated 12/12/16  
A3068/16 dated 15/12/16  
A3069/16 dated 15/12/16

AIP Supplements:

079/2016 dated 01/09/16  
083/2016 dated 28/09/16  
086/2016 dated 13/10/16  
088/2016 dated 17/10/16  
090/2016 dated 15/11/16

## Amended Pages

GEN 0.2-1: : *replace.*  
GEN 0.3-1/2: : *replace.*  
GEN 0.3-3/4: : *replace.*  
GEN 0.3-5: : *replace.*  
GEN 0.4-1/2: : *replace.*  
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GEN 0.5-1: : *replace.*  
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GEN 2.1-1/2: : *replace.*  
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ENR 1.8-25/26: : *replace.*  
ENR 1.8-27/28: : *insert.*  
ENR 1.8-29/30: : *insert.*  
ENR 1.8-31: : *insert.*  
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ENR-3.6-7: : *replace.*  
ENR-3.6-9: : *replace.*  
ENR 5.3-1: : *replace.*  
ERC-6-1 En-Route Chart: : *replace.*  
AD 0.6-1/2: : *replace.*  
AD 0.6-3/4: : *replace.*  
AD 0.6-5/6: : *replace.*  
AD 0.6-7: : *replace.*  
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AD 2.WSSS-43/44: : *replace.*  
AD 2.WSSS-45/46: : *replace.*  
AD 2.WSSS-47/48: : *replace.*  
AD 2.WSSS-49/50: : *replace.*  
AD 2.WSSS-51/52: : *replace.*  
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AD 2.WSSS-57/58: : *insert.*  
AD 2.WSSS-59: : *insert.*  
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AD-2-WSSS-STAR-9 to 9.1: : *replace.*  
AD-2-WSSS-STAR-14 to 14.1: : *replace.*  
AD-2-WSSS-STAR-15 to 15.1: : *replace.*  
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AD-2-WSSL-VDC-2: : *replace.*  
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AD 2.WSAP-9/10: : *replace.*



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AD-2-WSAP-IAC-6: : *replace.*  
AD 2.WIDN-1: : *replace.*

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

<b>NR/Year</b>	<b>Publication date</b>	<b>Date inserted</b>	<b>Inserted by</b>
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	

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**GEN 0.3 RECORD OF CURRENT AIP SUPPLEMENTS**

<b>NR/Year</b>	<b>Subject</b>	<b>AIP section(s) affected</b>	<b>Period of validity (from/to)</b>	<b>Cancellation record</b>
218/2014	Paya Lebar AP - Luffer Cranes	AD	01 AUG 2014 / 30 DEC 2017	
219/2014	Paya Lebar AP - Luffer Cranes	AD	01 AUG 2014 / 31 DEC 2017	
220/2014	Paya Lebar AP - Hammerhead and Luffer Cranes	AD	01 AUG 2014 / 31 DEC 2017	
221/2014	Paya Lebar AP - Luffer Crane	AD	01 AUG 2014 / 31 DEC 2017	
222/2014	Paya Lebar AP - Luffer Cranes	AD	01 AUG 2014 / 31 DEC 2017	
21/2015	Paya Lebar AP - Saddle Crane	AD	02 JAN 2015 / 04 DEC 2017	
22/2015	Paya Lebar AP - Luffer Cranes	AD	02 JAN 2015 / 09 DEC 2017	
23/2015	Paya Lebar AP - Topless Cranes	AD	02 JAN 2015 / 31 DEC 2017	
24/2015	Paya Lebar AP - Luffer Crane	AD	02 JAN 2015 / 31 DEC 2017	
25/2015	Paya Lebar AP - Hammerhead Cranes	AD	02 JAN 2015 / 31 DEC 2017	
27/2015	Singapore Changi AP - Work activities due to construction of new aircraft stands and modification of engine run-up bays at East Cargo Area	AD	12 JAN 2015 / 31 MAR 2017	
32/2015	Paya Lebar AP - Luffer Crane	AD	02 FEB 2015 / 31 JAN 2017	
33/2015	Paya Lebar AP - Luffer Crane and Topless Cranes	AD	02 FEB 2015 / 31 JAN 2017	
68/2015	Paya Lebar AP - Luffer Crane	AD	16 APR 2015 / 07 JUL 2017	
69/2015	Paya Lebar AP - Tower Cranes	AD	16 APR 2015 / 31 JUL 2017	
70/2015	Paya Lebar AP - Luffer Cranes and Saddle Cranes	AD	16 APR 2015 / 19 AUG 2017	
71/2015	Paya Lebar AP - Tower Cranes	AD	16 APR 2015 / 10 SEP 2017	
72/2015	Paya Lebar AP - Tower Cranes	AD	16 APR 2015 / 10 SEP 2017	
73/2015	Paya Lebar AP - Saddle Cranes	AD	16 APR 2015 / 09 OCT 2017	
74/2015	Paya Lebar AP - Topless Cranes and Luffer Crane	AD	16 APR 2015 / 31 DEC 2017	
75/2015	Paya Lebar AP - Hydraulic Crawler Cranes	AD	16 APR 2015 / 07 JAN 2018	
76/2015	Paya Lebar AP - Tower Cranes	AD	16 APR 2015 / 31 MAR 2018	
77/2015	Paya Lebar AP - Saddle Cranes	AD	16 APR 2015 / 01 MAY 2018	
78/2015	Paya Lebar AP - Tower Cranes	AD	16 APR 2015 / 01 MAR 2017	
79/2015	Paya Lebar AP - Hammerhead Cranes	AD	16 APR 2015 / 04 MAR 2017	
80/2015	Paya Lebar AP - Topless Cranes	AD	16 APR 2015 / 01 APR 2017	
81/2015	Paya Lebar AP - Hammerhead Cranes	AD	16 APR 2015 / 29 APR 2017	

<b>NR/Year</b>	<b>Subject</b>	<b>AIP section(s) affected</b>	<b>Period of validity (from/to)</b>	<b>Cancellation record</b>
82/2015	Paya Lebar AP - Topless Cranes	AD	16 APR 2015 / 10 MAY 2017	
83/2015	Paya Lebar AP - Luffer Cranes	AD	16 APR 2015 / 01 FEB 2017	
84/2015	Paya Lebar AP - Hammerhead Cranes	AD	16 APR 2015 / 28 FEB 2017	
85/2015	Paya Lebar AP - Crane	AD	16 APR 2015 / 28 FEB 2017	
86/2015	Paya Lebar AP - Luffer Crane	AD	16 APR 2015 / 28 FEB 2017	
87/2015	Sembawang AP - Hammerhead Cranes	AD	16 APR 2015 / 01 FEB 2017	
109/2015	Singapore Changi AP - 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	
120/2015	Paya Lebar AP - Topless Tower Cranes	AD	01 JUL 2015 / 01 APR 2017	
121/2015	Paya Lebar AP - Luffer Crane	AD	01 JUL 2015 / 01 JUN 2017	
122/2015	Paya Lebar AP - Topless Cranes	AD	01 JUL 2015 / 30 JUN 2017	
123/2015	Paya Lebar AP - Topless Cranes	AD	01 JUL 2015 / 30 JUN 2017	
124/2015	Paya Lebar AP - Luffer Cranes	AD	01 JUL 2015 / 30 JUN 2017	
125/2015	Paya Lebar AP - Luffer Crane	AD	01 JUL 2015 / 01 JUL 2017	
126/2015	Paya Lebar AP - Luffer Crane	AD	01 JUL 2015 / 30 DEC 2017	
127/2015	Tengah AD - Topless Cranes and Luffer Crane	AD	01 SEP 2015 / 31 AUG 2017	
128/2015	Tengah AD - Topless Cranes	AD	01 SEP 2015 / 31 AUG 2017	
129/2015	Tengah AD - Luffer Crane	AD	01 JUL 2015 / 31 DEC 2017	
130/2015	Sembawang AD - Luffer Cranes	AD	01 JUL 2015 / 31 DEC 2017	
131/2015	Paya Lebar AP - Topless Cranes	AD	01 JUL 2015 / 31 DEC 2017	
132/2015	Paya Lebar AP - Cranes	AD	01 JUL 2015 / 12 APR 2018	
133/2015	Paya Lebar AP - Luffer Crane and Topless Crane	AD	01 JUL 2015 / 30 JUN 2018	
134/2015	Paya Lebar AP - Luffer Cranes	AD	01 JUL 2015 / 30 JUN 2018	
135/2015	Tengah AD - Luffer Cranes	AD	01 JUL 2015 / 30 JUN 2018	
138/2015	Paya Lebar AP - Luffer Crane	AD	03 AUG 2015 / 30 JUN 2017	
139/2015	Paya Lebar AP - Topless Cranes and Luffer Crane	AD	03 AUG 2015 / 30 JUN 2017	
140/2015	Paya Lebar AP - Luffer Cranes	AD	03 AUG 2015 / 30 DEC 2017	
141/2015	Paya Lebar AP - Saddle Crane	AD	03 AUG 2015 / 30 DEC 2017	
142/2015	Paya Lebar AP - Topless Cranes	AD	03 AUG 2015 / 31 AUG 2018	
155/2015	Paya Lebar AP - Luffer Crane	AD	21 SEP 2015 / 31 MAY 2017	

<b>NR/Year</b>	<b>Subject</b>	<b>AIP section(s) affected</b>	<b>Period of validity (from/to)</b>	<b>Cancellation record</b>
156/2015	Paya Lebar AP - Topless Cranes	AD	21 SEP 2015 / 01 JUN 2017	
157/2015	Paya Lebar AP- Luffer Crane	AD	21 SEP 2015 / 14 AUG 2017	
158/2015	Paya Lebar AP - Hammerhead and Luffer Cranes	AD	21 SEP 2015 / 30 JUN 2017	
159/2015	Paya Lebar AP - Luffer Cranes	AD	21 SEP 2015 / 31 JUL 2017	
160/2015	Paya Lebar AP - Luffer Cranes	AD	21 SEP 2015 / 15 AUG 2018	
161/2015	Paya Lebar AP - Luffer Cranes	AD	21 SEP 2015 / 01 SEP 2018	
162/2015	Sembawang AD - 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	
017/2016	Paya Lebar AP - Topless Cranes	AD	04 MAR 2016 / 31 JAN 2017	
022/2016	Sembawang AD - Tower Cranes and Piling Rigs	AD	04 MAR 2016 / 20 JAN 2017	
023/2016	Paya Lebar AP - Topless Cranes and Luffer Cranes	AD	04 MAR 2016 / 31 JAN 2017	
024/2016	Paya Lebar AP - Luffer Crane	AD	04 MAR 2016 / 31 JAN 2017	
025/2016	Paya Lebar AP - Luffer Cranes	AD	04 MAR 2016 / 31 DEC 2017	
026/2016	Paya Lebar AP - Topless Cranes	AD	04 MAR 2016 / 31 DEC 2017	
027/2016	Paya Lebar AP - Topless Cranes and Luffer Cranes	AD	04 MAR 2016 / 31 DEC 2017	
028/2016	Paya Lebar AP - Tower Cranes	AD	04 MAR 2016 / 26 MAR 2018	
029/2016	Paya Lebar AP - Luffer Cranes	AD	04 MAR 2016 / 01 JUN 2018	
030/2016	Paya Lebar AP - Saddle Cranes	AD	04 MAR 2016 / 17 JUN 2018	
031/2016	Paya Lebar AP - Saddle Cranes	AD	04 MAR 2016 / 31 DEC 2018	
032/2016	Paya Lebar AP - Luffer Crane	AD	04 MAR 2016 / 31 DEC 2018	
033/2016	Paya Lebar AP - Luffer Crane	AD	04 MAR 2016 / 31 DEC 2018	
034/2016	Paya Lebar AP - Saddle Cranes	AD	04 MAR 2016 / 31 DEC 2018	
036/2016	Paya Lebar AP - Luffer Crane	AD	04 MAR 2016 / 01 AUG 2017	
037/2016	Paya Lebar AP - Mobile Cranes and Crawler Cranes	AD	04 MAR 2016 / 07 JAN 2018	
039/2016	Paya Lebar AP - Topless Cranes	AD	04 MAR 2016 / 31 JAN 2019	
047/2016	Seletar Airport - Construction of New Sunken Glide Path Building, Service Road and Associated Works at Northeast Apron	AD	14 JUL 2016 / 01 JUL 2017	
053/2016	Paya Lebar AP - Luffer Crane	AD	04 AUG 2016 / 30 MAR 2017	
054/2016	Paya Lebar AP - Crawler Cranes	AD	04 AUG 2016 / 22 MAY 2017	

<b>NR/Year</b>	<b>Subject</b>	<b>AIP section(s) affected</b>	<b>Period of validity (from/to)</b>	<b>Cancellation record</b>
055/2016	Paya Lebar AP - Mobile Crane and Crawler Crane	AD	04 AUG 2016 / 30 JUN 2017	
056/2016	Paya Lebar AP - Mobile Crane and Crawler Cranes	AD	04 AUG 2016 / 30 JUL 2017	
057/2016	Paya Lebar AP - Mobile Crane	AD	04 AUG 2016 / 31 JUL 2017	
058/2016	Paya Lebar AP - Saddle Cranes	AD	04 AUG 2016 / 15 NOV 2017	
059/2016	Paya Lebar AP - Luffer Crane	AD	04 AUG 2016 / 31 DEC 2017	
060/2016	Paya Lebar AP - Luffer Crane	AD	04 AUG 2016 / 31 MAY 2018	
061/2016	Paya Lebar AP - Luffer Crane and Topless Crane	AD	04 AUG 2016 / 29 JUN 2018	
062/2016	Paya Lebar AP - Luffer Cranes	AD	04 AUG 2016 / 31 JUL 2018	
063/2016	Paya Lebar AP - Topless Cranes	AD	04 AUG 2016 / 31 DEC 2018	
064/2016	Paya Lebar AP - Topless Cranes	AD	04 AUG 2016 / 31 DEC 2018	
065/2016	Paya Lebar AP - Luffer Crane	AD	04 AUG 2016 / 31 DEC 2018	
066/2016	Paya Lebar AP - Piling Rig and Crawler Crane	AD	04 AUG 2016 / 01 AUG 2018	
067/2016	Paya Lebar AP - Topless Cranes and Luffer Crane	AD	04 AUG 2016 / 31 MAR 2019	
068/2016	Paya Lebar AP - Topless Cranes and Luffer Cranes	AD	04 AUG 2016 / 01 JUN 2019	
069/2016	Paya Lebar AP - Saddle Cranes	AD	04 AUG 2016 / 30 JUN 2019	
070/2016	Paya Lebar AP - Luffer Cranes and Topless Cranes	AD	04 AUG 2016 / 31 DEC 2019	
072/2016	Paya Lebar AP - Saddle Cranes	AD	04 AUG 2016 / 10 MAR 2017	
073/2016	Paya Lebar AP - Crawler Cranes	AD	04 AUG 2016 / 22 MAY 2017	
074/2016	Paya Lebar AP - Luffer Cranes	AD	04 AUG 2016 / 04 JUL 2017	
075/2016	Paya Lebar AP - Topless Cranes	AD	04 AUG 2016 / 31 OCT 2017	
084/2016	Singapore Changi AP - Works schedule and movement area restrictions pertaining to runway resurfacing works, diversion of airside services and soil improvement works	AD	29 OCT 2016 / 24 MAR 2017	
085/2016	Singapore Changi Airport - Air Traffic Flow Management (ATFM) Operations during November - December 2016	AD	04 NOV 2016 / 30 DEC 2016	
089/2016	Seletar AP- 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	
091/2016	Singapore Changi Airport - Remote aircraft stands 17 to 1 and 104 to 101 to be renamed as aircraft stands G1 to G17 and G18 to G21 respectively	AD	04 JAN 2017 UFN	
092/2016	Singapore Changi Airport - Air Traffic Flow Management (ATFM) Bay of Bengal Cooperative ATFM (BOBCAT) System	AD	02 FEB 2017 UFN	
093/2016	Singapore Changi Airport - Implementation of Simultaneous Independent Parallel Approaches	AD	05 JAN 2017 UFN	



<b>NR/Year</b>	<b>Subject</b>	<b>AIP section(s) affected</b>	<b>Period of validity (from/to)</b>	<b>Cancellation record</b>
094/2016	Singapore Changi Airport - Introduction of new ATS routes within Singapore FIR, revisions to existing Standard Instrument Departures (SIDs), Standard Terminal Arrival Routes (STARs) and establishment of new Enroute Holding Areas	AD/FIR	02 MAR 2017 UFN	

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**GEN 0.4 CHECKLIST OF AIP PAGES**

<b>Part 1 – General (GEN)</b>							
<b>GEN 0</b>		GEN 3.2-6	31 MAR 2016	ENR 1.7-1	12 NOV 2015		
GEN 0.1-1	12 NOV 2015	GEN 3.3-1	12 NOV 2015	ENR 1.7-2	12 NOV 2015		
GEN 0.1-2	10 NOV 2016	GEN 3.3-2	21 JUL 2016	ENR 1.7-3	12 NOV 2015		
GEN 0.1-3	21 JUL 2016	GEN 3.4-1	12 NOV 2015	ENR 1.7-4	12 NOV 2015		
GEN 0.2-1	05 JAN 2017	GEN 3.4-2	12 NOV 2015	ENR 1.7-5	12 NOV 2015		
GEN 0.3-1	05 JAN 2017	GEN 3.4-3	12 NOV 2015	ENR 1.7-6	12 NOV 2015		
GEN 0.3-2	05 JAN 2017	GEN 3.4-4	12 NOV 2015	ENR 1.7-7	12 NOV 2015		
GEN 0.3-3	05 JAN 2017	GEN 3.4-5	12 NOV 2015	ENR 1.7-8	12 NOV 2015		
GEN 0.3-4	05 JAN 2017	GEN-3.4-7	21 JUL 2016	ENR 1.7-9	12 NOV 2015		
GEN 0.3-5	05 JAN 2017	GEN-3.4-9	21 JUL 2016	ENR 1.8-1	12 NOV 2015		
GEN 0.4-1	05 JAN 2017	GEN 3.5-1	12 NOV 2015	ENR 1.8-2	04 FEB 2016		
GEN 0.4-2	05 JAN 2017	GEN 3.5-2	21 JUL 2016	ENR 1.8-3	12 NOV 2015		
GEN 0.4-3	05 JAN 2017	GEN 3.5-3	12 NOV 2015	ENR 1.8-4	12 NOV 2015		
GEN 0.5-1	05 JAN 2017	GEN 3.5-4	12 NOV 2015	ENR 1.8-5	12 NOV 2015		
GEN 0.6-1	10 NOV 2016	GEN 3.5-5	15 SEP 2016	ENR 1.8-6	12 NOV 2015		
GEN 0.6-2	15 SEP 2016	GEN 3.5-6	12 NOV 2015	ENR 1.8-7	12 NOV 2015		
GEN 0.6-3	15 SEP 2016	GEN 3.5-7	12 NOV 2015	ENR 1.8-8	12 NOV 2015		
<b>GEN 1</b>		GEN 3.5-8	12 NOV 2015	ENR 1.8-9	12 NOV 2015		
GEN 1.1-1	10 NOV 2016	GEN 3.6-1	12 NOV 2015	ENR 1.8-10	12 NOV 2015		
GEN 1.1-2	05 JAN 2017	GEN 3.6-2	12 NOV 2015	ENR 1.8-11	12 NOV 2015		
GEN 1.2-1	15 SEP 2016	GEN 3.6-3	12 NOV 2015	ENR 1.8-12	12 NOV 2015		
GEN 1.2-2	15 SEP 2016	GEN 3.6-4	12 NOV 2015	ENR 1.8-13	12 NOV 2015		
GEN 1.2-3	15 SEP 2016	GEN-3.6-5	21 JUL 2016	ENR 1.8-14	12 NOV 2015		
GEN 1.2-4	15 SEP 2016	<b>GEN 4</b>		ENR 1.8-15	12 NOV 2015		
GEN 1.2-5	15 SEP 2016	GEN 4.1-1	15 SEP 2016	ENR 1.8-16	12 NOV 2015		
GEN 1.2-6	15 SEP 2016	GEN 4.2-1	12 NOV 2015	ENR 1.8-17	12 NOV 2015		
GEN 1.2-7	15 SEP 2016	GEN 4.2-2	12 NOV 2015	ENR 1.8-18	12 NOV 2015		
GEN 1.3-1	21 JUL 2016	GEN 4.2-3	12 NOV 2015	ENR 1.8-19	12 NOV 2015		
GEN 1.3-2	12 NOV 2015	GEN 4.2-4	12 NOV 2015	ENR 1.8-20	12 NOV 2015		
GEN 1.3-3	12 NOV 2015	GEN 4.2-5	12 NOV 2015	ENR 1.8-21	12 NOV 2015		
GEN-1.3-5	21 JUL 2016	GEN 4.2-6	12 NOV 2015	ENR 1.8-22	12 NOV 2015		
GEN-1.3-7	21 JUL 2016	<b>Part 2 – EN-ROUTE (ENR)</b>		ENR 1.8-23	12 NOV 2015		
GEN 1.4-1	12 NOV 2015	<b>ENR 0</b>		ENR 1.8-24	12 NOV 2015		
GEN 1.4-2	12 NOV 2015	ENR 0.6-1	05 JAN 2017	ENR 1.8-25	05 JAN 2017		
GEN 1.4-3	12 NOV 2015	ENR 0.6-2	05 JAN 2017	ENR 1.8-26	05 JAN 2017		
GEN 1.5-1	12 NOV 2015	ENR 0.6-3	05 JAN 2017	ENR 1.8-27	05 JAN 2017		
GEN 1.6-1	12 NOV 2015	ENR 0.6-4	05 JAN 2017	ENR 1.8-28	05 JAN 2017		
GEN 1.6-2	12 NOV 2015	ENR 0.6-5	05 JAN 2017	ENR 1.8-29	05 JAN 2017		
GEN 1.6-3	12 NOV 2015	ENR 0.6-6	05 JAN 2017	ENR 1.8-30	05 JAN 2017		
GEN 1.7-1	10 NOV 2016	<b>ENR 1</b>		ENR 1.8-31	05 JAN 2017		
GEN 1.7-2	12 NOV 2015	ENR 1.1-1	12 NOV 2015	ENR 1.9-1	12 NOV 2015		
GEN 1.7-3	10 NOV 2016	ENR 1.1-2	12 NOV 2015	ENR 1.9-2	12 NOV 2015		
GEN 1.7-4	10 NOV 2016	ENR 1.1-3	12 NOV 2015	ENR 1.9-3	12 NOV 2015		
GEN 1.7-5	10 NOV 2016	ENR 1.1-4	12 NOV 2015	ENR 1.9-4	12 NOV 2015		
<b>GEN 2</b>		ENR 1.1-5	12 NOV 2015	ENR 1.9-5	12 NOV 2015		
GEN 2.1-1	12 NOV 2015	ENR 1.1-6	12 NOV 2015	ENR 1.10-1	12 NOV 2015		
GEN 2.1-2	05 JAN 2017	ENR 1.1-7	12 NOV 2015	ENR 1.10-2	12 NOV 2015		
GEN 2.2-1	10 NOV 2016	ENR 1.1-8	12 NOV 2015	ENR 1.10-3	12 NOV 2015		
GEN 2.2-2	10 NOV 2016	ENR 1.1-9	12 NOV 2015	ENR 1.11-1	12 NOV 2015		
GEN 2.2-3	10 NOV 2016	ENR 1.1-10	10 NOV 2016	ENR 1.12-1	12 NOV 2015		
GEN 2.2-4	05 JAN 2017	ENR 1.1-11	12 NOV 2015	ENR 1.12-2	12 NOV 2015		
GEN 2.2-5	10 NOV 2016	ENR 1.1-12	12 NOV 2015	ENR 1.12-3	12 NOV 2015		
GEN 2.3-1	12 NOV 2015	ENR 1.1-13	12 NOV 2015	ENR 1.12-4	12 NOV 2015		
GEN 2.3-2	12 NOV 2015	ENR 1.1-14	15 SEP 2016	ENR 1.13-1	12 NOV 2015		
GEN 2.3-3	12 NOV 2015	ENR 1.1-15	12 NOV 2015	ENR 1.14-1	10 DEC 2015		
GEN 2.4-1	12 NOV 2015	ENR 1.1-16	12 NOV 2015	ENR 1.14-2	15 SEP 2016		
GEN 2.5-1	21 JUL 2016	ENR 1.2-1	21 JUL 2016	ENR-1.14-3 to ENR-1.14-4	15 SEP 2016		
GEN-2.5-3	21 JUL 2016	ENR 1.3-1	12 NOV 2015	ENR-1.14-5 to ENR-1.14-6	15 SEP 2016		
GEN 2.6-1	12 NOV 2015	ENR 1.4-1	12 NOV 2015	ENR-1.14-7 to ENR-1.14-8	15 SEP 2016		
GEN 2.6-2	12 NOV 2015	ENR 1.5-1	12 NOV 2015	<b>ENR 2</b>			
GEN 2.7-1	12 NOV 2015	ENR 1.5-2	21 JUL 2016	ENR 2.1-1	21 JUL 2016		
<b>GEN 3</b>		ENR 1.5-3	31 MAR 2016	ENR 2.1-2	21 JUL 2016		
GEN 3.1-1	21 JUL 2016	ENR 1.5-4	05 JAN 2017	ENR 2.1-3	12 NOV 2015		
GEN 3.1-2	21 JUL 2016	ENR 1.6-1	12 NOV 2015	ENR 2.1-4	12 NOV 2015		
GEN 3.1-3	10 NOV 2016	ENR 1.6-2	12 NOV 2015	ENR-2.1-7	21 JUL 2016		
GEN 3.1-4	21 JUL 2016	ENR 1.6-3	12 NOV 2015	ENR-2.1-9	15 SEP 2016		
GEN 3.2-1	21 JUL 2016	ENR 1.6-4	12 NOV 2015	ENR-2.1-11A	21 JUL 2016		
GEN 3.2-2	31 MAR 2016	ENR 1.6-5	12 NOV 2015	ENR-2.1-11B	21 JUL 2016		
GEN 3.2-3	31 MAR 2016	ENR 1.6-6	12 NOV 2015	ENR-2.1-13	21 JUL 2016		
GEN 3.2-4	05 JAN 2017	ENR 1.6-7	12 NOV 2015	ENR-2.1-15	15 SEP 2016		
GEN 3.2-5	31 MAR 2016	ENR 1.6-8	12 NOV 2015	<b>ENR 3</b>			
		ENR 1.6-9	21 JUL 2016	ENR 3.1-1	12 NOV 2015		
		ENR-1.6-11	21 JUL 2016	ENR 3.1-2	12 NOV 2015		
				ENR 3.1-3	10 NOV 2016		
				ENR 3.1-4	10 NOV 2016		

ENR 3.1-5	12 NOV 2015	ENR 4.5-1	12 NOV 2015	AD 2.WSSS-34	05 JAN 2017
ENR 3.1-6	12 NOV 2015			AD 2.WSSS-35	05 JAN 2017
ENR 3.1-7	10 NOV 2016	<b>ENR 5</b>		AD 2.WSSS-36	05 JAN 2017
ENR 3.1-8	10 NOV 2016	ENR 5.1-1	12 NOV 2015	AD 2.WSSS-37	05 JAN 2017
ENR 3.1-9	12 NOV 2015	ENR 5.1-2	12 NOV 2015	AD 2.WSSS-38	05 JAN 2017
ENR 3.1-10	12 NOV 2015	ENR 5.1-3	12 NOV 2015	AD 2.WSSS-39	05 JAN 2017
ENR 3.1-11	10 NOV 2016	ENR 5.1-4	12 NOV 2015	AD 2.WSSS-40	05 JAN 2017
ENR 3.1-12	10 NOV 2016	ENR 5.1-5	12 NOV 2015	AD 2.WSSS-41	05 JAN 2017
ENR 3.1-13	12 NOV 2015	ENR 5.1-6	12 NOV 2015	AD 2.WSSS-42	05 JAN 2017
ENR 3.1-14	12 NOV 2015	ENR-5.1-7	21 JUL 2016	AD 2.WSSS-43	05 JAN 2017
ENR 3.1-15	12 NOV 2015	ENR-5.1-9	21 JUL 2016	AD 2.WSSS-44	05 JAN 2017
ENR 3.1-16	12 NOV 2015	ENR 5.2-1	26 MAY 2016	AD 2.WSSS-45	05 JAN 2017
ENR 3.1-17	12 NOV 2015	ENR 5.2-2	26 MAY 2016	AD 2.WSSS-46	05 JAN 2017
ENR 3.1-18	12 NOV 2015	ENR 5.3-1	05 JAN 2017	AD 2.WSSS-47	05 JAN 2017
ENR 3.1-19	12 NOV 2015	ENR 5.4-1	12 NOV 2015	AD 2.WSSS-48	05 JAN 2017
ENR 3.1-20	12 NOV 2015	ENR 5.5-1	12 NOV 2015	AD 2.WSSS-49	05 JAN 2017
ENR-3.1/ATS Chart	15 SEP 2016	ENR 5.6-1	12 NOV 2015	AD 2.WSSS-50	05 JAN 2017
ENR 3.3-1	12 NOV 2015	ENR 5.6-2	12 NOV 2015	AD 2.WSSS-51	05 JAN 2017
ENR 3.3-2	12 NOV 2015			AD 2.WSSS-52	05 JAN 2017
ENR 3.3-3	12 NOV 2015	<b>ENR 6</b>		AD 2.WSSS-53	05 JAN 2017
ENR 3.3-4	12 NOV 2015	ENR 6-1	15 SEP 2016	AD 2.WSSS-54	05 JAN 2017
ENR 3.3-5	12 NOV 2015	ERC-6-1 En-Route Chart	05 JAN 2017	AD 2.WSSS-55	05 JAN 2017
ENR 3.3-6	12 NOV 2015	WAC-2860-Singapore-Island	21 JUL 2016	AD 2.WSSS-56	05 JAN 2017
ENR 3.3-7	12 NOV 2015			AD 2.WSSS-57	05 JAN 2017
ENR 3.3-8	12 NOV 2015	<b>Part 3 – AERODROMES (AD)</b>		AD 2.WSSS-58	05 JAN 2017
ENR 3.3-9	12 NOV 2015	<b>AD 0</b>		AD 2.WSSS-59	05 JAN 2017
ENR 3.3-10	12 NOV 2015			AD-2-WSSS-ADC-1	15 SEP 2016
ENR 3.3-11	12 NOV 2015	AD 0.6-1	05 JAN 2017	AD-2-WSSS-ADC-2	05 JAN 2017
ENR 3.3-12	12 NOV 2015	AD 0.6-2	05 JAN 2017	AD-2-WSSS-ADC-3	12 NOV 2015
ENR 3.3-13	12 NOV 2015	AD 0.6-3	05 JAN 2017	AD-2-WSSS-AOC-1	12 NOV 2015
ENR 3.3-14	12 NOV 2015	AD 0.6-4	05 JAN 2017	AD-2-WSSS-AOC-2	21 JUL 2016
ENR 3.3-15	12 NOV 2015	AD 0.6-5	05 JAN 2017	AD-2-WSSS-AOC-3	31 MAR 2016
ENR 3.3-16	15 SEP 2016	AD 0.6-6	05 JAN 2017	AD-2-WSSS-PATC-1	12 NOV 2015
ENR 3.3-17	12 NOV 2015	AD 0.6-7	05 JAN 2017	AD-2-WSSS-PATC-2	12 NOV 2015
ENR 3.3-18	12 NOV 2015			AD-2-WSSS-SID-1 to 1.1	10 NOV 2016
ENR 3.3-19	12 NOV 2015	<b>AD 1</b>		AD-2-WSSS-SID-2 to 2.1	10 NOV 2016
ENR 3.3-20	12 NOV 2015	AD 1.1-1	12 NOV 2015	AD-2-WSSS-SID-3 to 3.1	10 NOV 2016
ENR 3.3-21	12 NOV 2015	AD 1.1-2	12 NOV 2015	AD-2-WSSS-SID-4 to 4.1	10 NOV 2016
ENR 3.3-22	12 NOV 2015	AD 1.1-3	12 NOV 2015	AD-2-WSSS-SID-5 to 5.1	10 NOV 2016
ENR 3.3-23	12 NOV 2015	AD 1.1-4	12 NOV 2015	AD-2-WSSS-SID-6 to 6.1	10 NOV 2016
ENR 3.3-24	12 NOV 2015	AD 1.2-1	12 NOV 2015	AD-2-WSSS-SID-7 to 7.1	10 NOV 2016
ENR 3.3-25	12 NOV 2015	AD 1.3-1	12 NOV 2015	AD-2-WSSS-SID-8 to 8.1	10 NOV 2016
ENR 3.3-26	12 NOV 2015	AD-1.3-3	21 JUL 2016	AD-2-WSSS-SID-9 to 9.1	10 NOV 2016
ENR 3.3-27	12 NOV 2015	AD 1.4-1	12 NOV 2015	AD-2-WSSS-SID-10 to 10.1	10 NOV 2016
ENR 3.3-28	12 NOV 2015	AD 1.5-1	12 NOV 2015	AD-2-WSSS-SID-11 to 11.1	10 NOV 2016
ENR 3.3-29	12 NOV 2015			AD-2-WSSS-SID-12 to 12.1	10 NOV 2016
ENR 3.3-30	12 NOV 2015	<b>AD 2</b>		AD-2-WSSS-SID-13 to 13.1	10 NOV 2016
ENR 3.3-31	12 NOV 2015	AD 2.WSSS-1	31 MAR 2016	AD-2-WSSS-SID-14 to 14.1	10 NOV 2016
ENR 3.3-32	12 NOV 2015	AD 2.WSSS-2	31 MAR 2016	AD-2-WSSS-SID-15 to 15.1	10 NOV 2016
ENR 3.3-33	12 NOV 2015	AD 2.WSSS-3	31 MAR 2016	AD-2-WSSS-SID-16 to 16.1	10 NOV 2016
ENR 3.3-34	12 NOV 2015	AD 2.WSSS-4	15 SEP 2016	AD-2-WSSS-SID-17 to 17.1	10 NOV 2016
ENR 3.3-35	15 SEP 2016	AD 2.WSSS-5	12 NOV 2015	AD-2-WSSS-SID-18 to 18.1	10 NOV 2016
ENR 3.3-36	12 NOV 2015	AD 2.WSSS-6	12 NOV 2015	AD-2-WSSS-STAR-1 to 1.1	21 JUL 2016
ENR 3.3-37	12 NOV 2015	AD 2.WSSS-7	12 NOV 2015	AD-2-WSSS-STAR-2 to 2.1	21 JUL 2016
ENR 3.4-1	12 NOV 2015	AD 2.WSSS-8	05 JAN 2017	AD-2-WSSS-STAR-3 to 3.1	21 JUL 2016
ENR 3.4-2	12 NOV 2015	AD 2.WSSS-9	05 JAN 2017	AD-2-WSSS-STAR-4 to 4.1	21 JUL 2016
ENR 3.4-3	12 NOV 2015	AD 2.WSSS-10	05 JAN 2017	AD-2-WSSS-STAR-5 to 5.1	21 JUL 2016
ENR 3.4-4	12 NOV 2015	AD 2.WSSS-11	05 JAN 2017	AD-2-WSSS-STAR-6 to 6.1	21 JUL 2016
ENR-3.4-5	21 JUL 2016	AD 2.WSSS-12	05 JAN 2017	AD-2-WSSS-STAR-7 to 7.1	21 JUL 2016
ENR-3.4-7	21 JUL 2016	AD 2.WSSS-13	10 NOV 2016	AD-2-WSSS-STAR-8 to 8.1	21 JUL 2016
ENR 3.5-1	10 NOV 2016	AD 2.WSSS-14	04 FEB 2016	AD-2-WSSS-STAR-9 to 9.1	05 JAN 2017
ENR 3.5-2	10 NOV 2016	AD 2.WSSS-15	05 JAN 2017	AD-2-WSSS-STAR-10 to 10.1	21 JUL 2016
ENR-3.5-3	21 JUL 2016	AD 2.WSSS-16	21 JUL 2016	AD-2-WSSS-STAR-11 to 11.1	21 JUL 2016
ENR 3.6-1	10 NOV 2016	AD 2.WSSS-17	05 JAN 2017	AD-2-WSSS-STAR-12 to 12.1	21 JUL 2016
ENR 3.6-2	10 NOV 2016	AD 2.WSSS-18	05 JAN 2017	AD-2-WSSS-STAR-13 to 13.1	21 JUL 2016
ENR-3.6-3	05 JAN 2017	AD 2.WSSS-19	05 JAN 2017	AD-2-WSSS-STAR-14 to 14.1	05 JAN 2017
ENR-3.6-5	21 JUL 2016	AD 2.WSSS-20	05 JAN 2017	AD-2-WSSS-STAR-15 to 15.1	05 JAN 2017
ENR-3.6-7	05 JAN 2017	AD 2.WSSS-21	05 JAN 2017	AD-2-WSSS-STAR-16 to 16.1	21 JUL 2016
ENR-3.6-9	05 JAN 2017	AD 2.WSSS-22	05 JAN 2017	AD-2-WSSS-STAR-17 to 17.1	21 JUL 2016
		AD 2.WSSS-23	05 JAN 2017	AD-2-WSSS-STAR-18 to 18.1	21 JUL 2016
		AD 2.WSSS-24	05 JAN 2017	AD-2-WSSS-STAR-19 to 19.1	21 JUL 2016
		AD 2.WSSS-25	05 JAN 2017	AD-2-WSSS-STAR-20 to 20.1	21 JUL 2016
ENR 4.1-1	10 NOV 2016	AD 2.WSSS-26	05 JAN 2017	AD-2-WSSS-STAR-21 to 21.1	21 JUL 2016
ENR 4.1-2	12 NOV 2015	AD 2.WSSS-27	05 JAN 2017	AD-2-WSSS-IAC-1	05 JAN 2017
ENR 4.3-1	12 NOV 2015	AD 2.WSSS-28	05 JAN 2017	AD-2-WSSS-IAC-2	05 JAN 2017
ENR 4.4-1	21 JUL 2016	AD 2.WSSS-29	05 JAN 2017	AD-2-WSSS-IAC-5	05 JAN 2017
ENR 4.4-2	10 NOV 2016	AD 2.WSSS-30	05 JAN 2017	AD-2-WSSS-IAC-6	05 JAN 2017
ENR 4.4-3	10 NOV 2016	AD 2.WSSS-31	05 JAN 2017	AD-2-WSSS-IAC-7	05 JAN 2017
ENR 4.4-4	10 NOV 2016	AD 2.WSSS-32	05 JAN 2017	AD-2-WSSS-IAC-9	05 JAN 2017
ENR 4.4-5	10 NOV 2016	AD 2.WSSS-33	05 JAN 2017	AD-2-WSSS-IAC-10	05 JAN 2017
ENR 4.4-6	10 NOV 2016				

AD-2-WSSS-IAC-11	05 JAN 2017	AD-2-WIDN-SID-1	12 NOV 2015
AD-2-WSSS-IAC-12	05 JAN 2017	AD-2-WIDN-SID-2	12 NOV 2015
AD-2-WSSS-VAC-1	10 NOV 2016	AD-2-WIDN-SID-3	12 NOV 2015
AD 2.WSSL-1	12 NOV 2015	AD-2-WIDN-SID-4	12 NOV 2015
AD 2.WSSL-2	12 NOV 2015	AD-2-WIDN-STAR-1	12 NOV 2015
AD 2.WSSL-3	15 SEP 2016	AD-2-WIDN-STAR-2	12 NOV 2015
AD 2.WSSL-4	15 SEP 2016	AD-2-WIDN-STAR-3	21 JUL 2016
AD 2.WSSL-5	15 SEP 2016	AD-2-WIDN-STAR-4	12 NOV 2015
AD 2.WSSL-6	12 NOV 2015		
AD 2.WSSL-7	12 NOV 2015		
AD 2.WSSL-8	12 NOV 2015		
AD 2.WSSL-9	15 SEP 2016		
AD 2.WSSL-10	31 MAR 2016		
AD 2.WSSL-11	31 MAR 2016		
AD 2.WSSL-12	12 NOV 2015		
AD 2.WSSL-13	12 NOV 2015		
AD 2.WSSL-14	12 NOV 2015		
AD 2.WSSL-15	05 JAN 2017		
AD 2.WSSL-16	26 MAY 2016		
AD 2.WSSL-17	26 MAY 2016		
AD 2.WSSL-18	26 MAY 2016		
AD 2.WSSL-19	26 MAY 2016		
AD 2.WSSL-20	26 MAY 2016		
AD-2-WSSL-ADC-1	05 JAN 2017		
AD-2-WSSL-ADC-2	05 JAN 2017		
AD-2-WSSL-AOC-1	05 JAN 2017		
AD-2-WSSL-AOC-2	05 JAN 2017		
AD-2-WSSL-VAC-1	05 JAN 2017		
AD-2-WSSL-VAC-2	05 JAN 2017		
AD-2-WSSL-VAC-3	05 JAN 2017		
AD-2-WSSL-VAC-4	05 JAN 2017		
AD-2-WSSL-VDC-1	05 JAN 2017		
AD-2-WSSL-VDC-2	05 JAN 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 NOV 2015		
AD 2.WSAP-2	12 NOV 2015		
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	05 JAN 2017		
AD 2.WSAP-7	31 MAR 2016		
AD 2.WSAP-8	05 JAN 2017		
AD 2.WSAP-9	05 JAN 2017		
AD 2.WSAP-10	05 JAN 2017		
AD 2.WSAP-11	15 SEP 2016		
AD-2-WSAP-ADC-1	12 NOV 2015		
AD-2-WSAP-ADC-2	12 NOV 2015		
AD-2-WSAP-AOC-1	10 NOV 2016		
AD-2-WSAP-IAC-1	05 JAN 2017		
AD-2-WSAP-IAC-2	05 JAN 2017		
AD-2-WSAP-IAC-3	05 JAN 2017		
AD-2-WSAP-IAC-4	05 JAN 2017		
AD-2-WSAP-IAC-5	05 JAN 2017		
AD-2-WSAP-IAC-6	05 JAN 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	12 NOV 2015		
AD 2.WSAT-5	31 MAR 2016		
AD 2.WSAT-6	10 NOV 2016		
AD 2.WSAT-7	12 NOV 2015		
AD 2.WSAT-8	12 NOV 2015		
AD-2-WSAT-ADC-1	12 NOV 2015		
AD 2.WSAG-1	12 NOV 2015		
AD 2.WSAG-2	31 MAR 2016		
AD 2.WSAG-3	12 NOV 2015		
AD 2.WMKJ-1	12 NOV 2015		
AD 2.WIDD-1	12 NOV 2015		
AD 2.WIDD-2	12 NOV 2015		
AD-2-WIDD-SID-1	12 NOV 2015		
AD-2-WIDD-SID-2	12 NOV 2015		
AD-2-WIDD-SID-3	12 NOV 2015		
AD-2-WIDD-SID-4	12 NOV 2015		
AD-2-WIDD-STAR-1	12 NOV 2015		
AD-2-WIDD-STAR-2	12 NOV 2015		
AD-2-WIDD-STAR-3	12 NOV 2015		
AD-2-WIDD-STAR-4	12 NOV 2015		
AD 2.WIDN-1	05 JAN 2017		

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**GEN 0.5 LIST OF HAND AMENDMENTS TO THE AIP**

<i>AIP page(s) affected</i>	<i>Amendment text</i>	<i>Introduced by AIP Amendment NR</i>
WAC 2860/chart	a) Delete SJ NDB.	1/01
	b) Redesignation of Danger Areas WSD8, WSD12, WSD21 to read as WMD8, WMD12, WMD21 respectively.	5/07
	c) Upper limit of WSD13/14/15/44/45 and WMD8/12 to read as FL550.	2/10

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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](http://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](http://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](http://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](http://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](http://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](http://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) 65956010

Fax: (65) 65422394

URL: [www.mot.gov.sg](http://www.mot.gov.sg)

# GEN 2 TABLES AND CODES

## GEN 2.1 MEASURING SYSTEM, AIRCRAFT MARKING, HOLIDAYS

### 1 UNITS OF MEASUREMENT

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

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

### 2 TIME SYSTEM

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

### 3 GEODETIC REFERENCE DATUM

#### 3.1 *Name/designation of datum*

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

#### 3.2 *Area of Application*

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

#### 3.3 *Use of asterisk*

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

### 4 AIRCRAFT NATIONALITY AND REGISTRATION MARKS

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

## 5 PUBLIC HOLIDAYS IN SINGAPORE

5.1 The following dates are notified as public holidays:

Name of Holiday	Date	Day
New Year's Day	1 January 2017	Sunday*
Chinese New Year	28 January 2017	Saturday
Chinese New Year	29 January 2017	Sunday*
Good Friday	14 April 2017	Friday
Labour Day	1 May 2017	Monday
Vesak Day	10 May 2017	Wednesday
Hari Raya Puasa	25 June 2017	Sunday*
National Day	9 August 2017	Wednesday
Hari Raya Haji	1 September 2017	Friday
Deepavali	18 October 2017	Wednesday
Christmas Day	25 December 2017	Monday

\* When a public holiday falls on a Sunday, the following Monday will be a public holiday.

INS	Inertial navigation system	MNM	Minimum
INSTL	Install or installed or installation	MNPS	Minimum navigation performance specifications
INSTR	Instrument	MNT	Monitor or monitoring or monitored
INT	Intersection	MNTN	Maintain
INTL	International	MOA	Military operating area
INTRG	Interrogator	MOC	Minimum obstacle clearance (required)
INTRP	Interrupt or interruption or interrupted	MOCA	Minimum obstacle clearance altitude
INTST	Intensity	MON	Monday
IRS	Inertial reference system	MOPS	Minimum operational performance standards
ISA	International standard atmosphere	MOV	Move or moving or movement
<b>J</b>			
JAN	January	MPS	Metres per second
JUL	July	MSA	Minimum sector altitude
JUN	June	MSAW	Minimum safe altitude warning
<b>K</b>			
KG	Kilograms	MSG	Message
KHZ	Kilohertz	MSL	Mean sea level
KM	Kilometres	MWO	Meteorological watch office
KMH	Kilometres per hour	<b>N</b>	
KPA	Kilopascal	N	North or northern latitude
KT	Knots	NAV	Navigation
KW	Kilowatts	NAVAID	Navigation aid
<b>.</b>			
... L	Left (preceded by runway designation number to identify a parallel runway)	NC	No change
<b>L</b>			
L	Locator (see LM, LO)	NDB	Non-directional radio beacon
LAT	Latitude	NGT	Night
LDA	Landing distance available	NM	Nautical miles
LDAH	Landing distance available, helicopter	NML	Normal
LDG	Landing	NOF	International NOTAM Office
LDI	Landing direction indicator	NONSTD	Non-standard
LEN	Length	NOSIG	No significant change (used in trend-type landing forecasts)
LGT	Light or lighting	NOTAM	A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations
LGTD	Lighted	NOV	November
LIH	Light intensity high	NR	Number
LIL	Light intensity low	<b>O</b>	
LIM	Light intensity medium	OAC	Oceanic area control centre
LLZ	Localizer	OAS	Obstacle assessment surface
LM	Locator middle	OBS	Observe or observed or observation
LNAV	Lateral navigation	OBST	Obstacle
LO	Locator, outer	OCA	Oceanic control area or Obstacle clearance altitude
LONG	Longitude	OCC	Occulting (light)
LORAN	LORAN (Long range air navigation system)	OCH	Obstacle clearance height
LRG	Long range	OCNL	Occasional or occasionally
LT*	Local time	OCS	Obstacle clearance surface
LTD	Limited	OCT	October
LVL	Level	OFZ*	Obstacle free zone
LVP	Low visibility procedures	OHD	Overhead
<b>M</b>			
M	Mach number (followed by figures) or Metres (preceded by figures)	OM	Out marker
MAD*	Maximum Acceptable Delay	OPMET	Operational meteorological (information)
MAG	Magnetic	OPR	Operator or operate or operative or operating or operational
MAINT	Maintenance	OPS	Operations
MAP	Aeronautical maps and charts	O/R	On request
MAPT	Missed approach point	OTP	On top
MAR	March	OTS	Organized track system
MAX	Maximum	OUBD	Outbound
MAY	May	<b>P</b>	
MCA	Minimum crossing altitude	P ...	Prohibited area (followed by identification)
MDA	Minimum descent altitude	PA	Precision approach
MDH	Minimum descent height	PALS	Precision approach lighting system (specify category)
MEA	Minimum en-route altitude	PANS	Procedures for air navigation services
MEDEVAC	Medical evacuation flight	PAPI	Precision approach path indicator
MEHT	Minimum eye height over threshold (for visual approach slope indicator systems)	PAR	Precision approach radar
MET	Meteorological or meteorology	PARA*	Paragraph
METAR	Aerodrome routine meteorological report (in meteorological code)	PARL	Parallel
MHA	Minimum holding altitude	PAX	Passenger(s)
MHZ	Megahertz	PBC	Performance-based communication
MID	Mid-point (related to RVR)	PBN	Performance-based navigation
MIL	Military	PBS	Performance-based surveillance
MIN	Minutes	PCD	Proceed or proceeding
MINDEF*	Ministry of Defence	PCL	Pilot-controlled lighting
MLS	Microwave landing system	PCN	Pavement classification number
MM	Middle marker	PDC	Pre-departure clearance
		PER	Performance
		PERM	Permanent
		PIB	Pre-flight information bulletin
		PJE	Parachute jumping exercise

PLA	Practice low approach
PN	Prior notice required
PNR	Point of no return
POB	Persons on board
PPR	Prior permission required
PRI	Primary
PRKG	Parking
PROC	Procedure
PSN	Position
PSP	Pierced steel plank
PSR	Primary surveillance radar
PT*	Point(s)
PTN	Procedure turn
PVT*	Private
PWR	Power

**Q**

QDM	Magnetic heading (zero wind)
QDR	Magnetic bearing
QFE	Atmospheric pressure at aerodrome elevation (or at runway threshold)
QFU	Magnetic orientation of runway
QNH	Altimeter sub-scale setting to obtain elevation when on the ground
QTE	True bearing
QUAD	Quadrant

**R**

R ...	Restricted area (followed by identification)
R ...	Radial from VOR (followed by three figures)

**.**

... R	Right (preceded by runway designation number to identify a parallel runway)
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**R**

RA	Rain
RAD*	Radius
RAF*	Royal Air Force
RAG	Runway arresting gear
RAI	Runway alignment indicator
RAIM	Receiver autonomous integrity monitoring
RB	Rescue boat
RCC	Rescue coordination centre
RCF	Radiocommunication failure (message type designator)
RCL	Runway centre line
RCLL	Runway centre line light(s)
RCP	Required communication performance
RDH	Reference datum height
RDL	Radial
RDO	Radio
REC	Receive or receiver
REDL	Runway edge light(s)
REF	Reference to ... or refer to ...
REG	Registration
RENL	Runway end light(s)
REP	Report or reporting or reporting point
REQ	Request or requested
RESA	Runway end safety area
RFC*	Radio facility chart
RFFS	Rescue and fire fighting services
RH*	Rescue helicopter
RHC	Right-hand circuit
RIF	Reclearance in flight
RLLS	Runway lead-in lighting system
RMAF*	Royal Malaysian Air Force
RMK	Remark
RNAV	(to be pronounced "AR-NAV") Area navigation
RNP	Required navigation performance
ROC	Rate of climb
ROD	Rate of descent
RPI	Receiving only
RPLC	Replace or replaced
RPS	Radar position symbol
RQMNTS	Requirements
RQP	Request flight plan (message type designator)
RQS	Request supplementary flight plan (message type designator)
RSAF*	Republic of Singapore Air Force
RSC	Rescue sub-centre
RSCD	Runway surface condition
RSFC*	Republic of Singapore Flying Club
RSP	Required surveillance performance

RSP	Responder beacon
RSR	En-route surveillance radar
RTE	Route
RTF	Radiotelephone
RTHL	Runway threshold light(s)
RTN	Return or returned or returning
RTODAH	Rejected take-off distance available, helicopter
RTT	Radioteletypewriter
RTZL	Runway touchdown zone light(s)
RUT	Standard regional route transmitting frequencies
RV	Rescue vessel
RVA	Radar vectoring area
RVR	Runway visual range
RWY	Runway
RVSM	Reduced vertical separation minimum (300m(1000ft)) between FL290 and FL410

**S**

S	South or southern latitude
SAF*	Singapore Armed Forces
SALS	Simple approach lighting system
SAR	Search and rescue
SARPS	Standards and recommended practices (ICAO)
SAT	Saturday
SATCC*	Singapore Air Traffic Control Centre
SATCOM	Satellite communication (used only when referring generally to both voice and data satellite communication or only data satellite communication)
SATVOICE	Satellite voice communication
SDBY	Stand by
SDF	Step down fix
SEC	Seconds
SELCAL	Selective calling system
SEP	September
SER	Service or servicing or served
SFC	Surface
SFL*	Sequenced flashing light
SGL	Signal
SIA*	Singapore Airlines Limited
SID	Standard instrument departure
SIG	Significant
SIGMET	Information concerning en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations
SIMUL	Simultaneous or simultaneously
SKED	Schedule or scheduled
SMC	Surface movement control
SMR	Surface movement radar
SOC	Start of climb
SPECI	Aerodrome special meteorological report (in meteorological code)
SPECIAL	Local special meteorological report (in abbreviated plain language)
SPL	Supplementary flight plan (message type designator)
SPOT	Spot wind
SQ	Squall
SR	Sunrise
SRA	Surveillance radar approach
SRE	Surveillance radar element of precision approach radar system
SRR	Search and rescue region
SRY	Secondary
SS	Sunset
SSR	Secondary surveillance radar
STA	Straight-in approach
STAR	Standard instrument arrival
STD	Standard
STN	Station
STOL	Short take-off and landing
STS	Status
STT*	Standard Taxi Time
STWL	Stopway light(s)
SUBJ	Subject to
SUN	Sunday
SUP	Supplement (AIP Supplement)
SUPPS	Regional supplementary procedures
SVCBL	Serviceable
SWY	Stopway

**T**

TA	Traffic advisory
TAA	Terminal arrival altitude

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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>		
<b>World Aeronautical Chart</b> ICAO (WAC)	1:1 000 000	WAC 2860		In AIP	21 JUL 16		
← <b>Enroute Chart</b> ICAO (ENRC)		ERC 6-1		In AIP	05 JAN 17		
← <b>Instrument Approach Chart</b> ICAO (IAC)	1:400 000	<b>Singapore Changi</b>					
		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		
		<b>Paya Lebar</b>					
		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	05 JAN 17				
RWY 20 - IPS ILS/DME	AD-2-WSAP IAC-3	In AIP	05 JAN 17				
RWY 02 - IPN ILS/DME	AD-2-WSAP IAC-4	In AIP	05 JAN 17				
RWY 02 - RNAV(GNSS)	AD-2-WSAP-IAC-5	In AIP	05 JAN 17				
RWY 20 - RNAV(GNSS)	AD-2-WSAP-IAC-6	In AIP	05 JAN 17				
← <b>Visual Approach Chart</b> ICAO (VAC)	1:400 000	<b>Singapore Changi</b>		AD-2-WSSS-VAC-1	In AIP	10 NOV 16	
		<b>Seletar</b>					
		RWY 03	AD-2-WSSL-VAC-1	In AIP	05 JAN 17		
		RWY 21	AD-2-WSSL-VAC-2	In AIP	05 JAN 17		
		RWY 03	AD-2-WSSL-VAC-3	In AIP	05 JAN 17		
RWY 21	AD-2-WSSL-VAC-4	In AIP	05 JAN 17				
← <b>Visual Departure Chart</b>	1:100 000	<b>Seletar</b>					
		RWY 03	AD-2-WSSL-VDC-1	In AIP	05 JAN 17		
	1:100 000	RWY 21	AD-2-WSSL-VDC-2	In AIP	05 JAN 17		
← <b>Aerodrome Chart</b> ICAO (AC)		<b>Singapore Changi</b>		AD-2-WSSS-ADC-2	In AIP	05 JAN 17	
		<b>Seletar</b>		AD-2-WSSL-ADC-1	In AIP	05 JAN 17	
		<b>Paya Lebar</b>		AD-2-WSAP-ADC-1	In AIP	12 NOV 15	
← <b>Aerodrome Obstacle Chart</b> ICAO TYPE A (AOC)	1:10 000	<b>Singapore Changi</b>					
		RWY 20R/02L	AD-2-WSSS-AOC-1	In AIP	12 NOV 15		
	1:10 000	RWY 20C/02C	AD-2-WSSS-AOC-2	In AIP	21 JUL 16		
	1:10 000	<b>Seletar</b>					
		RWY 03/21	AD-2-WSSL-AOC-1	In AIP	05 JAN 17		
1:20 000	<b>Paya Lebar</b>		AD-2-WSAP-AOC-1	In AIP	10 NOV 16		
← <b>Aerodrome Obstacle Chart</b> ICAO TYPE B (AOC)	1:25 000	<b>Singapore Changi</b>		AD-2-WSSS-AOC-3	In AIP	31 MAR 16	
		<b>Seletar</b>					
	1:12 500	RWY 03/21	AD-2-WSSL-AOC-2	In AIP	05 JAN 17		
← <b>Precision Approach Terrain Chart</b> ICAO (PATC)	1:2 500	<b>Singapore Changi</b>					
		RWY 02L	AD-2-WSSS-PATC-1	In AIP	12 NOV 15		
	1:2 500	RWY 20C	AD-2-WSSS-PATC-2	In AIP	12 NOV 15		



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

**3 DEPARTING FLIGHTS****3.1 INTRODUCTION**

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

**3.2 RUNWAY 02L**

- a. When there are no reports of vessel movement along the northern shipping channel or where the reported vessel height is less than 35m AMSL, the aircraft minimum net climb gradient shall be at 3.3%.
- b. Where the reported vessel height is 35m or higher, ATC shall advise departing pilots of the vessel height. Pilots on receipt of this information shall apply the minimum net climb gradient in accordance with the following table:

HGT OF VESSEL (metres AMSL)	Gradient (%)	MINIMUM CROSSING ALTITUDE OVER VESSEL	
		(metres)	(feet)
35	3.4	44	142
40	3.9	49	158
50	4.8	59	191
60	5.8	69	224
70	6.8	79	257
80	7.8	89	290
90	8.8	99	322
100	9.7	109	355
110	10.7	119	388
120	11.7	129	421
130	12.7	139	454
140	13.7	149	486

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

**3.3 RUNWAY 02C**

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

HGT OF VESSEL (metres AMSL)	Gradient (%)	MINIMUM CROSSING ALTITUDE OVER VESSEL	
		(metres)	(feet)
70	3.4	89	292
80	3.8	99	325
90	4.3	109	358
100	4.7	119	390

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

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

### 3.4 RUNWAYS 20C AND 20R

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

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

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

### 3.5 DETERMINATION OF CLIMB GRADIENT BY OPERATORS

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

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

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

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

DEP RWY	02L	02C	20C	20R
Distance <b>d</b>	1 020m	2 360m	9 730m	13 100m



**7.3 STATE AIRCRAFT**

7.3.1 The conditions stipulated apply to STATE aircraft intending to operate within the delineated airspace.

**7.4 INFLIGHT CONTINGENCIES**

7.4.1 The pilot-in-command, upon awareness of an onboard ADS-B equipment failure, must inform ATC as soon as possible. ATC would then provide the necessary clearance to ensure separation with other flights operating in the delineated airspace.

**7.5 ATC-PILOT PHRASEOLOGIES**

7.5.1 Aircraft operators and pilots are to note the following phraseologies when operating in the delineated airspace:

	<b>Circumstances</b>	<b>Phraseologies</b>
1	To request the capability of the ADS-B equipment	a) ADVISE ADS-B CAPABILITY *b) ADS-B TRANSMITTER (data link) *c) ADS-B RECEIVER (data link) *d) NEGATIVE ADS-B * Denotes pilot transmission
2	To request reselection of aircraft identification	RE-ENTER ADS-B AIRCRAFT IDENTIFICATION
3	To request the operation of the IDENT feature	TRANSMIT ADS-B IDENT
4	To request transmission of pressure-altitude	TRANSMIT ADS-B ALTITUDE
5	To request termination of transponder and / or ADS-B transmitter operation	a) STOP SQUAWK [TRANSMIT ADS-B ONLY] b) STOP ADS-B TRANSMISSION [SQUAWK (code) ONLY]
6	To request termination of pressure-altitude transmission because of faulty operation	STOP ADS-B ALTITUDE TRANSMISSION [WRONG INDICATION, or reason]
7	Confirmation of ADS-B operations	ADS-B TRANSMISSION NOT RECEIVED, CONFIRM ADS-B OPERATIONAL
8	To inform an aircraft that its ADS-B transmitter appears to be inoperative or malfunctioning	ADS-B TRANSMITTER APPEARS TO BE INOPERATIVE / MALFUNCTION
9	ATS ADS-B surveillance system ground equipment un-serviceability	ADS-B OUT OF SERVICE (appropriate information as necessary)

**8 AIR TRAFFIC MANAGEMENT CONTINGENCY PLAN****8.1 INTRODUCTION**

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

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

8.1.3 This ATM Contingency Plan provides:

- a. the contingency routes structure using existing published airways to enable transit through the Singapore FIR; and
- b. the associated Air Traffic Control (ATC) procedures to support the contingency plan.

8.1.4 As and where dictated by circumstances, aircraft planning to operate through Singapore FIR that have not yet departed may be temporarily suspended until a full assessment of the prevailing conditions has been determined and sufficient air traffic services restored.

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

8.1.6 Aircraft operators may elect to avoid the Singapore FIR by using ATS routes outside of Singapore FIR.

## **8.2 REDUCED ATS AND PROVISION OF FLIGHT INFORMATION SERVICES (FIS)**

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

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

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

8.2.4 In the event that ATS cannot be provided in the Singapore FIR, a NOTAM shall be issued indicating the following:

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

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

## **8.3 AIRCRAFT SEPARATION AND SPACING**

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

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

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

## **8.4 PRIORITY FOR FLIGHT LEVELS**

8.4.1 Where possible, aircraft on long-haul international flights shall be afforded priority for cruising levels assigned in accordance with the flight level allocation scheme as specified in paragraph 8.10.

## **8.5 AIRSPACE CLASSIFICATIONS**

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

## **8.6 AIRCRAFT POSITION REPORTING**

8.6.1 Beyond VHF coverage, Automatic Dependent Surveillance - Contract (ADS-C) shall replace any requirement for voice position reporting to ATC for suitably equipped aircraft and in this case Controller-Pilot Data Link Communications (CPDLC) or HF will be the secondary means of communication. When CPDLC has been authorised for use by the relevant ATC authority, this will become the primary means of communication while HF will act as the secondary means of communication. If means of communication (i.e. ADS-C, CPDLC, HF, VHF) are not available, aircraft operators shall comply with the communications procedures as stated in paragraph 8.9.

8.6.2 In the event that communication with the appropriate ATS authority could not be established, aircraft operators may apply Traffic Information Broadcast by Aircraft (TIBA) procedures in the Singapore FIR as outline in paragraph 8.11 on 121.5MHz.

## **8.7 EXCLUSIONS**

8.7.1 VFR flights shall not operate in the Singapore FIR during contingency operations, except for State aircraft, Medevac flights, and any other aircraft as authorised by CAAS.

## **8.8 PILOT AND OPERATOR PROCEDURES**

### **8.8.1 Filing of flight plans**

- 8.8.1.1 Flight planning requirements detailed in AIP Singapore continue to apply during contingency operations, except where modified by the contingency ATS routes and flight level allocation scheme specified by ATC and / or in NOTAM.
- 8.8.1.2 Airspace users are expected to familiarize themselves with the Contingency Plan of the Singapore FIR and the activation times. For aircraft intending to operate in areas during periods when the Contingency Plan is activated, the operators shall plan the flight to conform to the requirements of Contingency Plan.
- 8.8.1.3 The flight planning requirements during contingency periods will be in accordance to ICAO Annex 2 Chapter 3 and DOC 4444 Chapter 4 and Appendix 2. Additional information, will, however, be required, to indicate that the aircraft will operate in airspace where the Contingency Plan is active.

### **8.8.2 Overflight approval**

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

### **8.8.3 Pilot operating procedures**

- 8.8.3.1 Pilots will continue to make or broadcast routine position reports in line with normal ATC procedures.
- 8.8.3.2 Pilots of aircraft operating in the Singapore FIR during contingency operations shall comply with the following procedures:
- a. all aircraft proceeding along the ATS routes established in this Contingency Plan will comply with the instrument flight rules (IFR) and will be assigned a flight level in accordance with the flight level allocation scheme applicable to the route(s) being flown as specified in paragraph 8.10;
  - b. aircraft are to flight plan using the Contingency Routes specified in paragraph 8.10, according to their airport of origin and destination;
  - c. aircraft are to operate as close as possible to the centre line of the assigned contingency route;
  - d. a continuous communications watch shall be maintained on the specified contingency frequency as specified in paragraph 8.10;
  - e. aircraft position reports and other information as necessary shall be broadcast in accordance with TIBA procedures defined in paragraph 8.11;
  - f. aircraft navigation and anti-collision lights shall be displayed;
  - g. except in cases of emergency or for reasons of flight safety, pilots are to maintain the last assigned flight level, MACH number and SSR transponder code during their entire flight within Singapore FIR. If no transponder code has been assigned, aircraft shall squawk Code 2000.
  - h. aircraft are to reach the flight level last assigned by the responsible ACC at least 10 minutes before entering the Singapore FIR or as otherwise instructed by the ATC unit acting in accordance with the Operational Contingency Arrangement;
  - i. pilots are to contact the next adjacent ACC as soon as possible, and in any event not less than ten (10) minutes before the estimated time of arrival over the relevant exit point from the Singapore FIR;
  - j. pilots are to strictly adhere to the ICAO Traffic Information Broadcasts by Aircraft (TIBA) procedures, reproduced in paragraph 8.11, on the specified VHF and HF frequencies listed in paragraph 8.10. When necessitated by emergency conditions or flight safety requirements, pilots are to transmit blind on these frequencies, their current circumstances and the commencement and completion of any climb and descent or deviation from the cleared contingency route;
  - k. whenever emergencies and / or flight safety reasons make it impossible to maintain the flight level assigned for transit of Singapore FIR, pilots are to comply with the special procedures for in-flight contingencies set out in ENR 1.8 paragraph 1.5. If the deviation brings the aircraft out of Singapore FIR, pilots are to immediately inform the ACC unit responsible for that airspace. Pilots are to broadcast details of any level change including aircraft identification, aircraft position and route, vacated flight level, intended flight level; flight level passed and cruising flight level on 121.5MHz;
  - l. pilots are to maintain own longitudinal separation of 15 minutes from preceding aircraft at the same cruising level. However, this may be reduced to 10 minutes in conjunction with application of the Mach number technique where authorized by CAAS and the agreed ATS coordination with the adjacent ATS authority; and
  - m. not all operational circumstances can be addressed by this Contingency Plan and pilots are to maintain a high level of alertness when operating in the contingency airspace and take appropriate action to ensure safety of aircraft.

**8.8.4 Interception of civil aircraft**

- 8.8.4.1 Aircraft operators must be familiar with international intercept procedures contained in ICAO Annex 2 - Rules of the Air, paragraph 3.8 and Appendix 2, Sections 2 and 3.
- 8.8.4.2 Pilots are to comply with instructions given by the pilot of the intercepting aircraft. In such circumstances, the pilot of the aircraft being intercepted shall broadcast information on the situation.
- 8.8.4.3 If circumstances leading to the closure of the Singapore FIR where no contingency routes are available, aircraft will be required to keep clear of Singapore FIR. As much warning as possible will be provided by the appropriate ATS authorities in the event of the complete closure of airspace.
- 8.8.4.4 Pilots shall continuously guard the VHF emergency frequency 121.5MHz and shall operate their transponder at all times during flight, regardless of whether the aircraft is within or outside airspace where secondary surveillance radar (SSR) is used for ATS purposes. Transponder should be set on the last discrete code assigned by ATC or select Code 2000 if no code was assigned.

**8.9 COMMUNICATION PROCEDURES****8.9.1 Degradation of Communication - Pilot Radio Procedures**

- 8.9.1.1 When operating within the contingency airspace, pilots should use normal radio communication procedures where ATS services are available. Where limited or no ATS is available, communications shall be conducted in accordance with the procedures in this Plan or as otherwise notified by NOTAM.
- 8.9.1.2 If communications are lost unexpectedly on the normal ATS frequencies, pilots shall try the next applicable frequency, e.g. if en-route contact is lost, pilots shall try the next appropriate frequency (the next normal handover frequency). Pilots should also consider attempting to contact ATC on the last frequency where two-way communication had been established. In the absence of communication with ATC, the pilot shall continue to make routine position reports on the assigned frequency, and also broadcast positions in accordance with the TIBA procedures in paragraph 8.11.

**8.9.2 Communication frequencies**

- 8.9.2.1 A list of frequencies to be used for the contingency routes and the ATS units providing FIS and air-ground communication monitoring for the Singapore FIR is detailed in paragraph 8.10.

**8.10 CONTINGENCY ROUTES****8.10.1 Between Singapore and Manila FIR**

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

CR	ATS Route	Direction	FLAS	ACC	Transfer of Communication (TOC)	Remarks
CRS-3	N884 (N075400 E1122000 - LAXOR)	East	FL310 FL350	Manila ACC	At N075400 E1122000, contact Manila ACC: - ADS/CPDLC: Logon RPHI - HF: 5655 / 8942 - VHF : 118.9 (LAXOR)	Aircraft operators may choose to avoid the Singapore FIR by using alternate ATS routes in other FIRs.
CRM-3	N884 (LAXOR - CAB)	East	FL310 FL350 FL390	Naha ACC	At CAB, contact Tokyo Radio: - HF: 8903 / 4666 - VHF: 123.9 (LEBIX)	Aircraft operators may choose to avoid the Manila FIR by using alternate ATS routes in other FIRs.
CRM-4	M767 (JOM - TEGID)	West	FL320 FL360 FL400	Singapore ACC	At JOM, contact Singapore ATC: - ADS/CPDLC: Logon WSJC - HF: 5655 / 8942	Aircraft operators may choose to avoid the Manila FIR by using alternate ATS routes in other FIRs.
N/A	M772	N/A	N/A	N/A	Not applicable. M772 will be suspended. No flight planning is allowed.	N/A

**8.10.2 Between Singapore and Ho Chi Minh FIR**

8.10.2.1 To be developed

**8.10.3 Between Singapore and Kota Kinabalu FIR**

8.10.3.1 To be developed

**8.10.4 Between Singapore and Kuala Lumpur FIR**

8.10.4.1 To be developed

**8.11 TRAFFIC INFORMATION BROADCASTS BY AIRCRAFT (TIBA)****8.11.1 Introduction and applicability of broadcasts**

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

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

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

- a. there is a need to supplement collision hazard information provided by air traffic services outside controlled airspace; or
- b. there is a temporary disruption of normal air traffic services.

8.11.1.4 Such airspaces shall be identified by the States responsible for provision of air traffic services within these airspaces, if necessary with the assistance of the appropriate ICAO Regional Office(s), and duly promulgated in aeronautical information publications or NOTAM, together with the VHF RTF frequency, the message formats and the procedures to be used. Where, in the case of paragraph 8.11.1.3 a., more than one State is involved, the airspace should be designated on the basis of regional air navigation agreements and promulgated in Doc 7030.

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

**8.11.2 Details of broadcasts**VHF RTF frequency to be used

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

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

Listening watch

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

Time of broadcasts

8.11.2.4 A broadcast shall be made:

- a. 10 minutes before entering the designated airspace or, for a pilot taking off from an aerodrome located within the lateral limits of the designated airspace, as soon as appropriate after take-off;
- b. 10 minutes prior to crossing a reporting point;
- c. 10 minutes prior to crossing or joining an ATS route;
- d. at 20-minute intervals between distant reporting points;
- e. 2 to 5 minutes, where possible, before a change in flight level;

- f. at the time of a change in flight level; and
- g. at any other time considered necessary by the pilot.

Forms of broadcast

8.11.2.5 The broadcasts other than those indicating changes in flight level, i.e. the broadcasts referred to in paragraph 8.11.2.4 a., b., c., d. and g., should be in the following form:

ALL STATIONS (necessary to identify a traffic information broadcast)

(call sign)

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

(direction)

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

POSITION (position\*\*) AT (time)

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

(call sign)

FLIGHT LEVEL (number) (direction)

Fictitious example:

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

8.11.2.6 Before a change in flight level, the broadcast (referred to in paragraph 8.11.2.4 e.) should be in the following form:

ALL STATIONS

(call sign)

(direction)

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

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

8.11.2.7 Except as provided in paragraph 8.11.2.8, the broadcast at the time of a change in flight level (referred to in paragraph 8.11.2.4 f.) should be in the following form:

ALL STATIONS

(call sign)

(direction)

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

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

ALL STATIONS

(call sign)

MAINTAINING FLIGHT LEVEL (number)

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

ALL STATIONS

(call sign)

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

ALL STATIONS

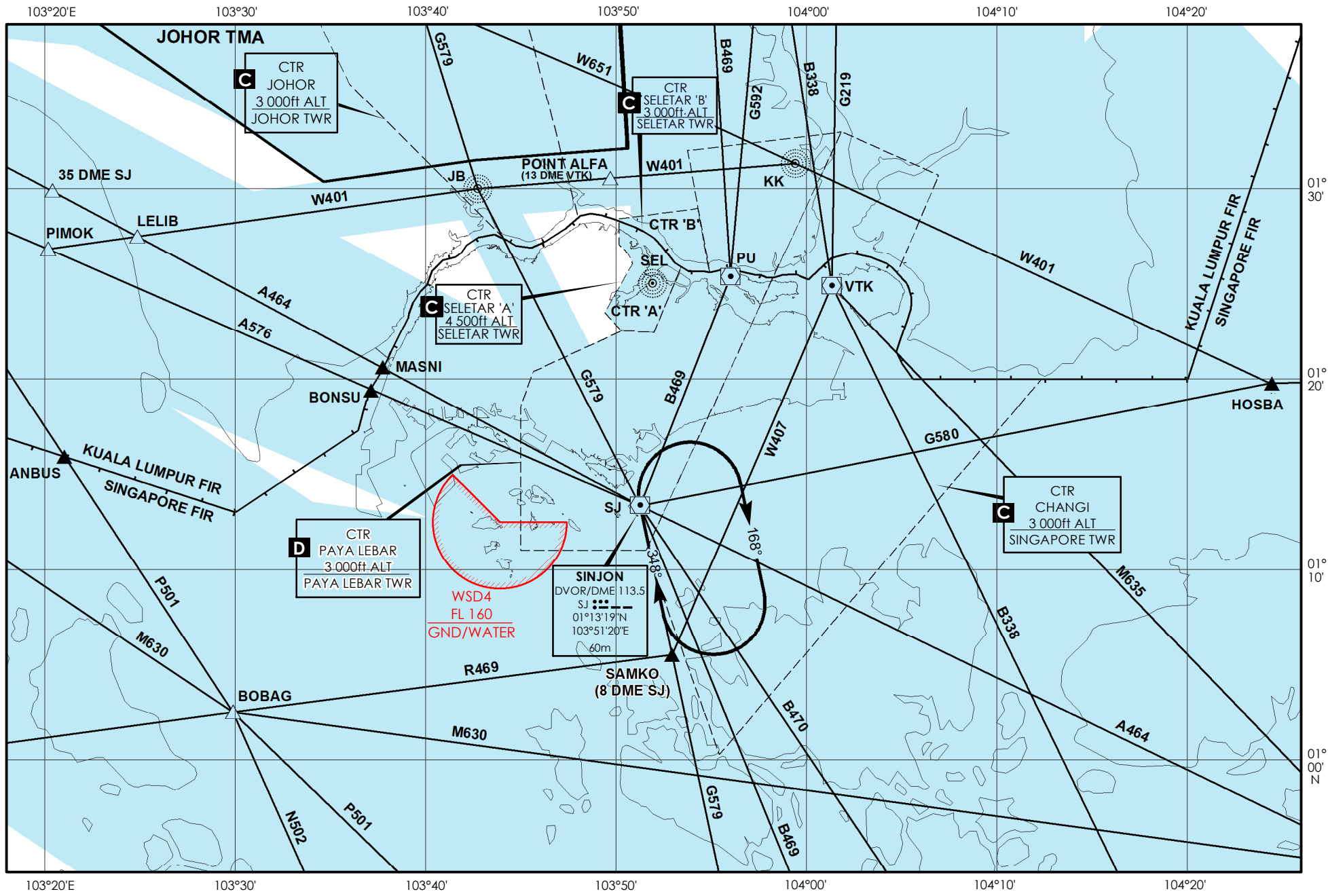
(call sign)

RETURNING TO FLIGHT LEVEL (number) NOW

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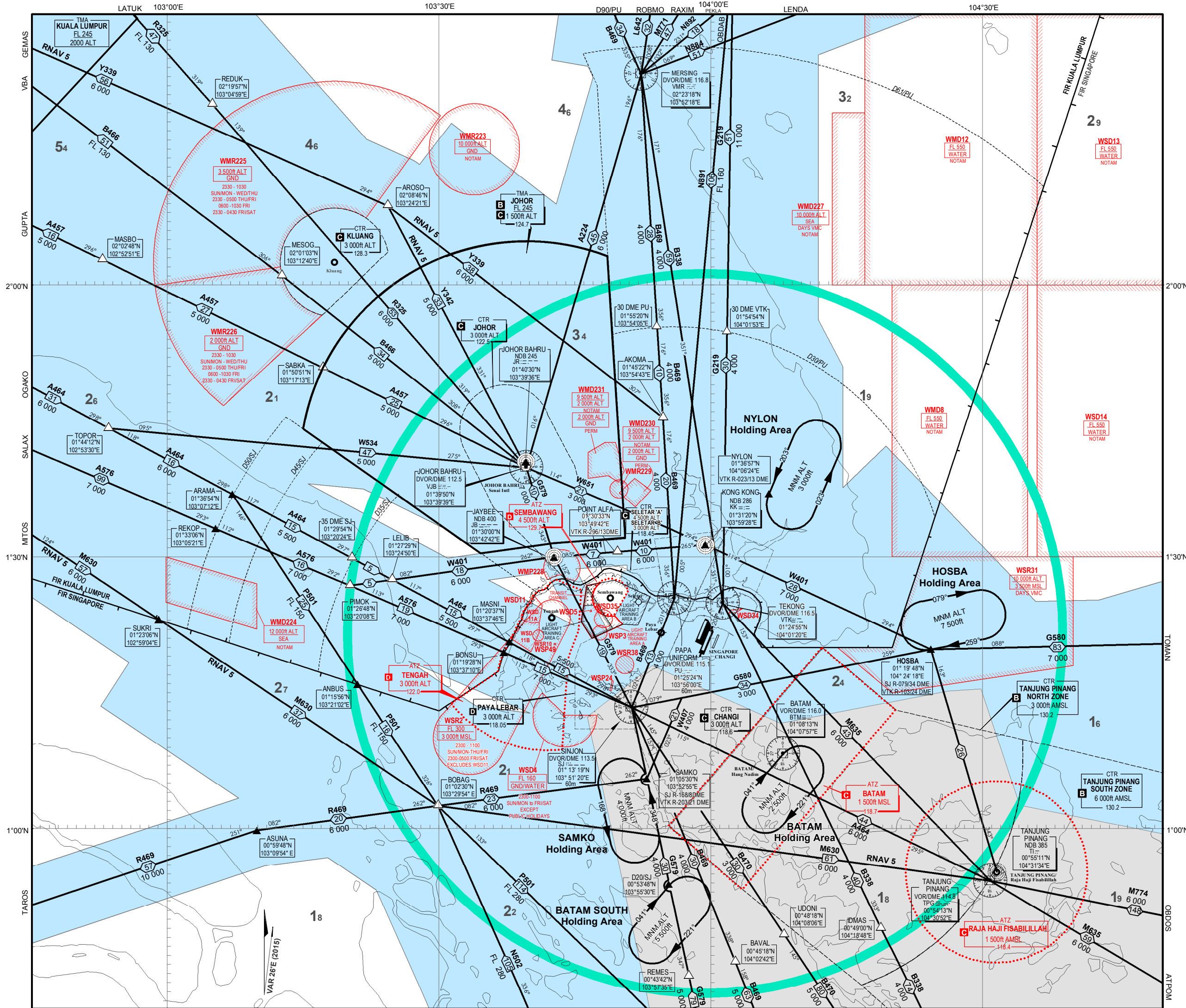
SINJON DVOR/DME LOW LEVEL HOLDING AREA



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# AREA CHART - ICAO

## SINGAPORE/JOHOR AIRSPACE COMPLEX LOW LEVEL HOLDING AREAS



LEGEND											
<b>Terminal Control Area (TMA)</b>	<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>1500ft</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	1500ft	Lower Limit	124.7	Radio frequency(ies)	
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Compulsory	▲										
On request	△										
<b>DME distance from SJ Navaid</b>	D35/SJ										
<b>Radio Navigation Aid</b>	<table border="1"> <tr> <td>Name</td> <td>SINJON DVOR/DME 113.5</td> </tr> <tr> <td>Identification and frequency</td> <td>SJ 113.5</td> </tr> <tr> <td>Geographical Coordinates</td> <td>01°12'21"N 103°11'19"E</td> </tr> <tr> <td>Elevation of DME site</td> <td>60m</td> </tr> </table>	Name	SINJON DVOR/DME 113.5	Identification and frequency	SJ 113.5	Geographical Coordinates	01°12'21"N 103°11'19"E	Elevation of DME site	60m		
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<b>Collocated VOR and DME Radio Navigation Aids</b>	<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	☉								
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<b>Restricted Airspace (P - Prohibited, R - Restricted, D - Danger)</b>	<table border="1"> <tr> <td>Identification of area</td> <td>WSR13</td> </tr> <tr> <td>Nationality letter</td> <td>FL 400</td> </tr> <tr> <td>Vertical limits</td> <td>FL 400</td> </tr> <tr> <td>Activation by NOTAM</td> <td>NOTAM</td> </tr> </table>	Identification of area	WSR13	Nationality letter	FL 400	Vertical limits	FL 400	Activation by NOTAM	NOTAM		
Identification of area	WSR13										
Nationality letter	FL 400										
Vertical limits	FL 400										
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.

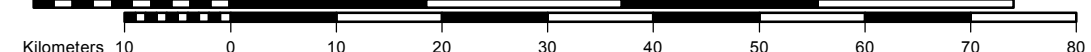
**AIRSPACE CLASSIFICATION IN THE SINGAPORE FIR**

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**

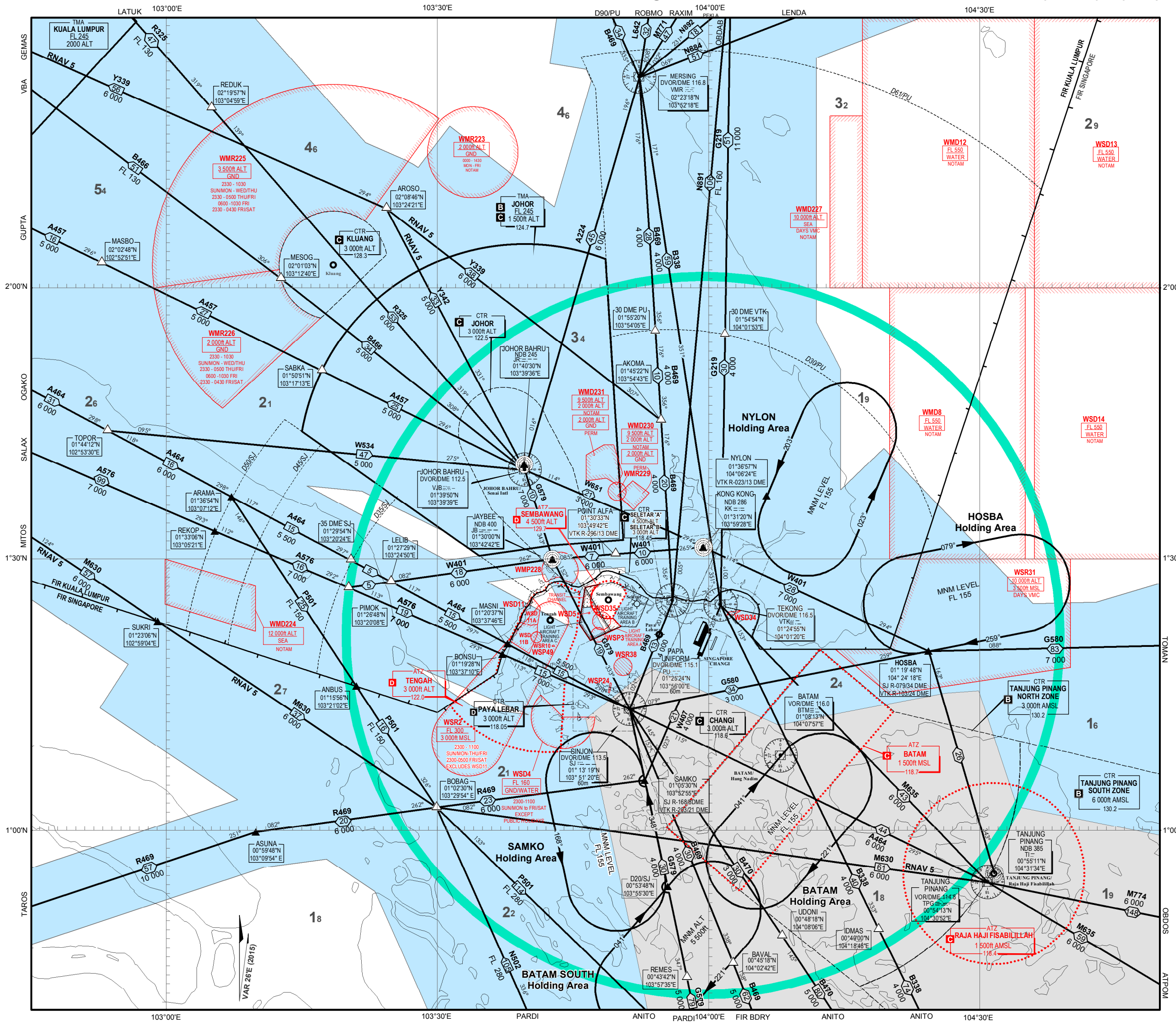
AERO MODELLING MAY TAKE PLACE WITHIN SEMBAWANG ATZ BTN 0200/0700 ON SUNDAYS AND PUBLIC HOLIDAYS. DURING THE ABOVE ACTIVITY, SEMBAWANG ATZ WILL BE CLOSED TO ALL AIRCRAFT.

\* In Transit Channel



# AREA CHART - ICAO

SINGAPORE/JOHOR AIRSPACE COMPLEX  
HIGH LEVEL HOLDING AREAS



LEGEND	
<b>Terminal Control Area (TMA)</b>	<ul style="list-style-type: none"> <li>Name of TMA: JOHOR</li> <li>Airspace Classification: B</li> <li>Upper Limit: FL 145</li> <li>Lower Limit: 1500ft</li> <li>Radio frequency(ies): 124.7</li> </ul>
<b>Control Zone (CTR)</b>	<ul style="list-style-type: none"> <li>Name of CTR: CHANGI</li> <li>Airspace Classification: C</li> <li>Upper Limit: 3000ft</li> <li>Lower Limit: 118.6m</li> <li>Radio frequency(ies):</li> </ul>
<b>Aerodrome Traffic Zone (ATZ)</b>	<ul style="list-style-type: none"> <li>Name of ATZ: TENGAH</li> <li>Airspace Classification: D</li> <li>Upper Limit: 3000ft</li> <li>Lower Limit: 122.0</li> <li>Radio frequency(ies):</li> </ul>
<b>ATS Routes</b>	<ul style="list-style-type: none"> <li>Route designator: B469</li> <li>Distance in nautical miles: 4 000/FL 160</li> <li>Minimum flight altitude (ft)/flight level:</li> </ul>
<b>Oceanic Control Area (OCA)</b>	
<b>Reporting Point</b>	<ul style="list-style-type: none"> <li>Compulsory: ▲</li> <li>On request: △</li> </ul>
<b>DME distance from SJ Navaid</b>	D35/SJ
<b>Radio Navigation Aid</b>	<ul style="list-style-type: none"> <li>Name: SINJON DVOR/DME 113.5</li> <li>Identification and frequency: SJ 113.5</li> <li>Geographical Coordinates: 01°19'27"N 103°51'19"E</li> <li>Elevation of DME site: 60m</li> </ul>
<b>Collocated VOR and DME Radio Navigation Aids</b>	<ul style="list-style-type: none"> <li>Compass rose orientated on the chart to Magnetic North</li> </ul>
<b>Restricted Airspace (P - Prohibited, R - Restricted, D - Danger)</b>	<ul style="list-style-type: none"> <li>Identification of area: WSD13</li> <li>Nationality letter: FL 400</li> <li>Vertical limits: WATER</li> <li>Activation by NOTAM:</li> </ul>

NOTE: - See flip side for details of designated areas

**Area Minimum Altitude (AMA)**

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

Example : 3 400 feet **34**

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

**Speed Control Procedures**

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

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

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.

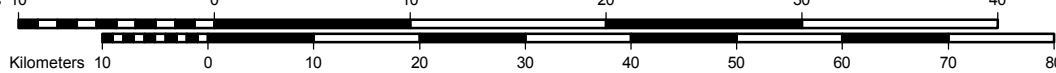
**AIRSPACE CLASSIFICATION IN THE SINGAPORE FIR**

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 ATIS 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

**ENR 5.3 OTHER ACTIVITIES OF A DANGEROUS NATURE****1 WEATHER BALLOONS**

- ← 1.1 Balloons will be released for MET observation at the Centre for Climate Research Singapore, Upper Air Observatory (012025N 1035317E).
- 1.1.1 At Upper Air Observatory, balloons will be released daily at 2330UTC and 1040UTC. Cut-off timings for the release are at 0030UTC and 1230UTC respectively.
- Rate of ascent of balloon: 320m per minute.  
Maximum height of balloon: 115 000ft (35 000m).  
Colour of balloon: uncoloured.  
Diameter of balloon: 162m.
- The balloon is attached with radiosonde equipment.  
Weight of radiosonde equipment: 130g.  
Payload (radiosonde plus parachute): 170g.  
Size of radiosonde equipment: 145mm x 63mm x 46mm.
- The balloon will burst 1.5 to 2 hours after release and radiosonde equipment will descend within 60NM radius.
- ← 1.1.2 At Upper Air Observatory, a balloon will be released between 2330UTC and 0030UTC on either the 2nd or 3rd week of the month.
- Rate of ascent of balloon: 320m per minute.  
Maximum height of balloon: 115 000ft (35 000m).  
Colour of balloon: uncoloured.  
Diameter of balloon: 191cm.
- ← The balloon is attached with ozonesonde/radiosonde equipment and parachute.  
Payload (ozonesonde/radiosonde equipment with parachute): 910g.  
Size of ozonesonde equipment box: 191mm x 191mm x 254mm.  
Size of radiosonde equipment: 145mm x 63mm x 46mm.
- The balloon will burst 1.5 to 2 hours after release. Equipment will descend within 60NM radius.

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### ENROUTE CHART - ICAO

**LEGEND**

**Aerodrome**  
 Name of FIR  
 Name of UNL  
 Lower limit  
 GND/WATER  
 ACC SINGAPORE

**Flight Information Region (FIR)**  
 Name of FIR  
 Name of UNL  
 Lower limit  
 GND/WATER  
 ACC SINGAPORE

**Terminal Control Area (TMA)**  
 Name of TMA  
 Airspace Classification  
 Upper limit  
 Lower limit  
 Radio frequency (MHz)

**Control Zone (CTR)**  
 Name of CTR  
 Airspace Classification  
 Upper limit  
 Lower limit  
 Radio frequency (MHz)

**ATS route**  
 Route designator  
 Magnetic track  
 Distance in nautical miles  
 Minimum flight altitude  
 Required navigation performance

**ATS route reporting point-by-pass**  
 (No report is required on this route)

**Reporting Point (REP)**  
 Compulsory  
 On Request

**ATS/MET reporting point (MRP)**  
 Compulsory  
 On Request

**Restricted Airspace**  
 (Prohibited, R-Identified, D-Danger)  
 Identification of area  
 Nationality letter  
 Vertical limits

**Collocated VOR and DME navigation aids (VORDME)**  
 Compass rose oriented on the chart to Magnetic North

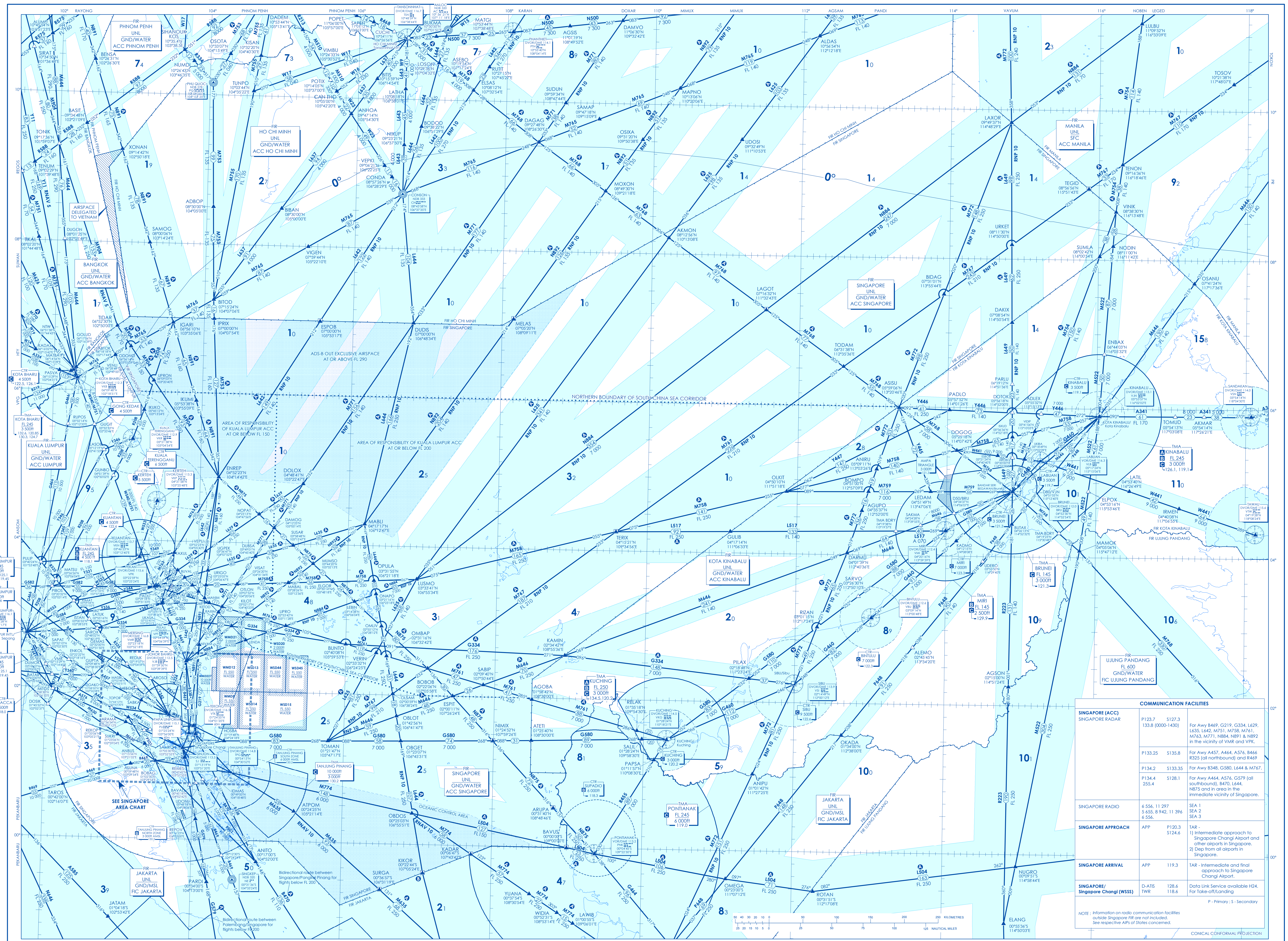
**Identification for radio navigation aids (NAVAID)**  
 Name  
 MHA/DME frequency identification or call sign  
 Geographical coordinates in WGS 84  
 Elevation of DME site (to the nearest 5m)

**COP at mid-point between VOR are not shown**

**Area Minimum Altitude (AMA)**  
 Each 2° quadrilateral contains an area minimum altitude (AMA) which represents the lowest altitude which may be used under instrument meteorological conditions (IMC). The AMA provides a minimum clearance of 1 000 feet (300m) above all terrain and obstacles in the quadrilateral. It is represented in thousands and hundreds of feet above mean sea level.  
 Example: 3 500 feet

**Always in which Mach Number Technique and RNAV are applied**  
 (Refer to pages ENR 1.8-13 to 1.8-18)

**Inbound and Outbound flights exempted from reporting aircraft observations at these points**



**WSIC/WMFC FIR BDRY REPORTING POINTS**

TAKUL	03 35 32N	104 05 53E
MANIM	03 14 31N	104 05 53E
REKOD	03 36 22N	104 09 42E
NIVAL	03 36 22N	104 09 42E
DOVOL	03 36 22N	104 09 42E
ISLE	03 24 32N	104 17 32E
ESOLO	03 24 32N	104 26 05E
LINDA	03 19 34N	104 39 32E
MANIM	03 14 31N	104 39 32E

**RYSM SEPARATION AVAILABLE SINGAPORE FIR**  
 BTN FL 290 AND FL 410 (inclusive)

**AIRSPACE CLASSIFICATION IN THE SINGAPORE FIR**

Airspace	Levels	Classification
Controlled airspace	FL 150 to FL 460	A
Controlled airspace more than 100 nm seaward from the shoreline	Surface to FL 460	A
Control Zones (CTR)	Change CTR	C
Control Zones (CTR)	Fixed labor CTR	C
Control Zones (CTR)	Selector CTR	C
ATZ	Surface to upper limit	D
Uncontrolled airspace		G*

**CAUTION**  
 Consult respective NOTAMs and AIPs of States concerned for the latest information and the Civil Aviation Authority of Singapore does not accept responsibility for any errors or omissions in the information shown outside of Singapore FIR

**MAGNETIC INFORMATION FOR THE YEAR 2015**

**SEE SINGAPORE AREA CHART**

**COMMUNICATION FACILITIES**

SINGAPORE (ACC)	P123.7	S127.3	For Awy B469, G239, G334, L429, L635, L442, M751, M758, M761, M763, M771, N884, N891 & N892 in the vicinity of VFR and VPK.
SINGAPORE RADAR	133.8 (0000-1430)		
	P133.25	S135.8	For Awy A457, A464, A576, B466 R325 (all northbound) and R469.
	P134.2	S133.35	For Awy B348, G580, L644 & M767.
	P134.4	S128.1	For Awy A464, A576, G579 (all southbound), B470, L644, N875 and in area in the immediate vicinity of Singapore.
SINGAPORE RADIO	6 536, 11 297, 5 455, 8 942, 11 396, 6 556.		SEA 1 SEA 2 SEA 3
SINGAPORE APPROACH	APP P120.3	TAR-	1) Intermediate approach to Singapore Changi Airport and other airports in Singapore. 2) Dep from all airports in Singapore.
SINGAPORE ARRIVAL	APP P119.3	TAR-	Intermediate and final approach to Singapore Changi Airport.
SINGAPORE/Singapore Changi (WSSS)	D-ATIS 128.6 TWR 118.6		Data Link Service available H24. For Take-off/Landing.

NOTE: Information on radio communication facilities outside Singapore FIR are not included. See respective AIPs of States concerned.

P - Primary; S - Secondary



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1	PROCEDURES FOR ARRIVALS INTO SELETAR AERODROME	AD 2.WSSL-16
2	DEPARTURES FROM SELETAR AERODROME	AD 2.WSSL-18
<a href="#">WSSL AD 2.23</a>	ADDITIONAL INFORMATION	AD 2.WSSL-19
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<a href="#">WSSL AD 2.24</a>	CHARTS RELATED TO SELETAR AIRPORT	AD 2.WSSL-20
<b>WSAP</b>	<b>PAYA LEBAR</b>	
<a href="#">WSAP AD 2.1</a>	AERODROME LOCATION INDICATOR AND NAME	AD 2.WSAP-1
<a href="#">WSAP AD 2.2</a>	AERODROME GEOGRAPHICAL AND ADMINISTRATIVE DATA	AD 2.WSAP-1
<a href="#">WSAP AD 2.3</a>	OPERATIONAL HOURS	AD 2.WSAP-1
<a href="#">WSAP AD 2.4</a>	HANDLING SERVICES AND FACILITIES	AD 2.WSAP-2
<a href="#">WSAP AD 2.5</a>	PASSENGER FACILITIES	AD 2.WSAP-2
<a href="#">WSAP AD 2.6</a>	RESCUE AND FIRE FIGHTING SERVICES	AD 2.WSAP-2
<a href="#">WSAP AD 2.7</a>	SEASONAL AVAILABILITY - CLEARING	AD 2.WSAP-2
<a href="#">WSAP AD 2.8</a>	APRONS, TAXIWAYS AND CHECK LOCATIONS DATA	AD 2.WSAP-2
<a href="#">WSAP AD 2.9</a>	SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS	AD 2.WSAP-3
<a href="#">WSAP AD 2.10</a>	AERODROME OBSTACLES	AD 2.WSAP-4
<a href="#">WSAP AD 2.11</a>	METEOROLOGICAL INFORMATION PROVIDED	AD 2.WSAP-6
<a href="#">WSAP AD 2.12</a>	RUNWAY PHYSICAL CHARACTERISTICS	AD 2.WSAP-6
<a href="#">WSAP AD 2.13</a>	DECLARED DISTANCES	AD 2.WSAP-6
<a href="#">WSAP AD 2.14</a>	APPROACH AND RUNWAY LIGHTING	AD 2.WSAP-7
<a href="#">WSAP AD 2.15</a>	OTHER LIGHTING, SECONDARY POWER SUPPLY	AD 2.WSAP-7
<a href="#">WSAP AD 2.16</a>	[NIL] HELICOPTER LANDING AREA	NIL
<a href="#">WSAP AD 2.17</a>	ATS AIRSPACE	AD 2.WSAP-7
<a href="#">WSAP AD 2.18</a>	ATS COMMUNICATION FACILITIES	AD 2.WSAP-8
<a href="#">WSAP AD 2.19</a>	RADIO NAVIGATION AND LANDING AIDS	AD 2.WSAP-8
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1	INTRODUCTION	AD 2.WSAP-9
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<a href="#">8</a>	GROUND OPERATIONS	AD2.WSAP-10
<a href="#">9</a>	FULL EMERGENCY/CRASH PROCEDURE	AD2.WSAP-10
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<a href="#">11</a>	ATC SERVICE OUTSIDE STIPULATED OPERATING HOURS	AD2.WSAP-10
<a href="#">WSAP AD 2.21</a>	[NIL] NOISE ABATEMENT PROCEDURES	NIL
<a href="#">WSAP AD 2.22</a>	FLIGHT AND GROUND PROCEDURES	AD2.WSAP-10
<a href="#">1</a>	DEPARTURE AND ARRIVAL PROCEDURES	AD2.WSAP-10
<a href="#">2</a>	STANDARD INSTRUMENT DEPARTURES	AD2.WSAP-10
<a href="#">3</a>	STANDARD ARRIVALS	AD2.WSAP-10
<a href="#">WSAP AD 2.23</a>	[NIL] ADDITIONAL INFORMATION	NIL
<a href="#">WSAP AD 2.24</a>	CHARTS RELATED TO PAYA LEBAR AIRPORT	AD2.WSAP-11
<b><a href="#">WSAT</a></b>	<b>TENGAH</b>	
<a href="#">WSAT AD 2.1</a>	AERODROME LOCATION INDICATOR AND NAME	AD 2.WSAT-1
<a href="#">WSAT AD 2.2</a>	AERODROME GEOGRAPHICAL AND ADMINISTRATIVE DATA	AD 2.WSAT-1
<a href="#">WSAT AD 2.3</a>	OPERATIONAL HOURS	AD 2.WSAT-1
<a href="#">WSAT AD 2.4</a>	HANDLING SERVICES AND FACILITIES	AD 2.WSAT-1
<a href="#">WSAT AD 2.5</a>	PASSENGER FACILITIES	AD 2.WSAT-2
<a href="#">WSAT AD 2.6</a>	RESCUE AND FIRE FIGHTING SERVICES	AD 2.WSAT-2
<a href="#">WSAT AD 2.7</a>	SEASONAL AVAILABILITY - CLEARING	AD 2.WSAT-2
<a href="#">WSAT AD 2.8</a>	APRONS, TAXIWAYS AND CHECK LOCATIONS/POSITIONS DATA	AD 2.WSAT-2
<a href="#">WSAT AD 2.9</a>	[NIL] SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS	NIL
<a href="#">WSAT AD 2.10</a>	AERODROME OBSTACLES	AD 2.WSAT-2
<a href="#">WSAT AD 2.11</a>	[NIL] METEOROLOGICAL INFORMATION PROVIDED	NIL
<a href="#">WSAT AD 2.12</a>	RUNWAY PHYSICAL CHARACTERISTICS	AD 2.WSAT-3
<a href="#">WSAT AD 2.13</a>	DECLARED DISTANCES	AD 2.WSAT-3
<a href="#">WSAT AD 2.14</a>	APPROACH AND RUNWAY LIGHTING	AD 2.WSAT-3
<a href="#">WSAT AD 2.15</a>	OTHER LIGHTING, SECONDARY POWER SUPPLY	AD 2.WSAT-3
<a href="#">WSAT AD 2.16</a>	[NIL] HELICOPTER LANDING AREA	NIL
<a href="#">WSAT AD 2.17</a>	ATS AIRSPACE	AD 2.WSAT-4
<a href="#">WSAT AD 2.18</a>	ATS COMMUNICATION FACILITIES	AD 2.WSAT-5
<a href="#">WSAT AD 2.19</a>	RADIO NAVIGATION AND LANDING AIDS	AD 2.WSAT-5
<a href="#">WSAT AD 2.20</a>	LOCAL TRAFFIC REGULATIONS - USE OF RSAF TENGAH AIR BASE AS AN EMERGENCY DIVERSION AERODROME FOR SINGAPORE CHANGI AIRPORT	AD 2.WSAT-7
<a href="#">1</a>	INTRODUCTION	AD 2.WSAT-7
<a href="#">2</a>	MANNING OF TENGAH AIR BASE	AD 2.WSAT-7
<a href="#">3</a>	OPERATIONAL SERVICES	AD 2.WSAT-7
<a href="#">4</a>	PASSENGER CLEARANCE	AD 2.WSAT-7
<a href="#">5</a>	SECURITY	AD 2.WSAT-7
<a href="#">6</a>	AIRCRAFT STAND ALLOCATION	AD 2.WSAT-7
<a href="#">7</a>	COMMUNICATIONS	AD 2.WSAT-7
<a href="#">8</a>	FUEL	AD 2.WSAT-8
<a href="#">9</a>	AIRCRAFT SERVICES	AD 2.WSAT-8

<a href="#">10</a>	RESCUE AND FIRE FIGHTING FACILITIES	AD 2.WSAT-8
<a href="#">11</a>	FULL EMERGENCY/CRASH PROCEDURE	AD 2.WSAT-8
<a href="#">12</a>	ATC SERVICE OUTSIDE OPERATING HOURS	AD 2.WSAT-8
<a href="#">WSAT AD 2.21</a>	[NIL] NOISE ABATEMENT PROCEDURES	NIL
<a href="#">WSAT AD 2.22</a>	[NIL] FLIGHT PROCEDURES	NIL
<a href="#">WSAT AD 2.23</a>	[NIL] ADDITIONAL INFORMATION	NIL
<a href="#">WSAT AD 2.24</a>	CHARTS RELATED TO AN AERODROME	AD 2.WSAT-8
<b>WSAG</b>	<b>SEMBAWANG</b>	
<a href="#">WSAG AD 2.1</a>	AERODROME LOCATION INDICATOR AND NAME	AD 2.WSAG-1
<a href="#">WSAG AD 2.2</a>	AERODROME GEOGRAPHICAL AND ADMINISTRATIVE DATA	AD 2.WSAG-1
<a href="#">WSAG AD 2.3</a>	OPERATIONAL HOURS	AD 2.WSAG-1
<a href="#">WSAG AD 2.4</a>	[NIL] HANDLING SERVICES AND FACILITIES	NIL
<a href="#">WSAG AD 2.5</a>	[NIL] PASSENGER FACILITIES	NIL
<a href="#">WSAG AD 2.6</a>	RESCUE AND FIRE FIGHTING SERVICES	AD 2.WSAG-1
<a href="#">WSAG AD 2.7</a>	[NIL] SEASONAL AVAILABILITY - CLEARING	NIL
<a href="#">WSAG AD 2.8</a>	APRON, TAXIWAYS AND CHECK LOCATIONS/POSITIONS DATA	AD 2.WSAG-1
<a href="#">WSAG AD 2.9</a>	[NIL] SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS	NIL
<a href="#">WSAG AD 2.10</a>	AERODROME OBSTACLES	AD 2.WSAG-2
<a href="#">WSAG AD 2.11</a>	[NIL] METEOROLOGICAL INFORMATION PROVIDED	NIL
<a href="#">WSAG AD 2.12</a>	RUNWAY PHYSICAL CHARACTERISTICS	AD 2.WSAG-2
<a href="#">WSAG AD 2.13</a>	DECLARED DISTANCES	AD 2.WSAG-2
<a href="#">WSAG AD 2.14</a>	[NIL] APPROACH AND RUNWAY LIGHTING	NIL
<a href="#">WSAG AD 2.15</a>	OTHER LIGHTING, SECONDARY POWER SUPPLY	AD 2.WSAG-2
<a href="#">WSAG AD 2.16</a>	[NIL] HELICOPTER LANDING AREA	NIL
<a href="#">WSAG AD 2.17</a>	ATS AIRSPACE	AD 2.WSAG-2
<a href="#">WSAG AD 2.18</a>	COMMUNICATION FACILITIES	AD 2.WSAG-3
<a href="#">WSAG AD 2.19</a>	RADIO NAVIGATION AND LANDING AIDS	AD 2.WSAG-3
<a href="#">WSAG AD 2.20</a>	[NIL] LOCAL TRAFFIC REGULATIONS	NIL
<a href="#">WSAG AD 2.21</a>	[NIL] NOISE ABATEMENT PROCEDURES	NIL
<a href="#">WSAG AD 2.22</a>	[NIL] FLIGHT PROCEDURES	NIL
<a href="#">WSAG AD 2.23</a>	[NIL] ADDITIONAL INFORMATION	NIL
<a href="#">WSAG AD 2.24</a>	[NIL] CHARTS RELATED TO AN AERODROME	NIL
<b>WMKJ</b>	<b>JOHOR BAHRU</b>	
<a href="#">WMKJ AD 2.1</a>	AERODROME LOCATION INDICATOR AND NAME	AD 2.WMKJ-1
<a href="#">WMKJ AD 2.2</a>	[NIL] AERODROME GEOGRAPHICAL AND ADMINISTRATIVE DATA	NIL
<a href="#">WMKJ AD 2.3</a>	[NIL] OPERATIONAL HOURS	NIL
<a href="#">WMKJ AD 2.4</a>	[NIL] HANDLING SERVICES AND FACILITIES	NIL
<a href="#">WMKJ AD 2.5</a>	[NIL] PASSENGER FACILITIES	NIL
<a href="#">WMKJ AD 2.6</a>	[NIL] RESCUE AND FIRE FIGHTING SERVICES	NIL
<a href="#">WMKJ AD 2.7</a>	[NIL] SEASONAL AVAILABILITY - CLEARING	NIL
<a href="#">WMKJ AD 2.8</a>	[NIL] APRONS, TAXIWAYS AND CHECK LOCATIONS DATA	NIL
<a href="#">WMKJ AD 2.9</a>	[NIL] SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS	NIL
<a href="#">WMKJ AD 2.10</a>	[NIL] AERODROME OBSTACLES	NIL
<a href="#">WMKJ AD 2.11</a>	[NIL] METEOROLOGICAL INFORMATION PROVIDED	NIL
<a href="#">WMKJ AD 2.12</a>	[NIL] RUNWAY PHYSICAL CHARACTERISTICS	NIL
<a href="#">WMKJ AD 2.13</a>	[NIL] DECLARED DISTANCES	NIL

<a href="#">WMKJ AD 2.14</a>	[NIL] APPROACH AND RUNWAY LIGHTING	NIL
<a href="#">WMKJ AD 2.15</a>	[NIL] OTHER LIGHTING, SECONDARY POWER SUPPLY	NIL
<a href="#">WMKJ AD 2.16</a>	[NIL] HELICOPTER LANDING AREA	NIL
<a href="#">WMKJ AD 2.17</a>	ATS AIRSPACE	AD 2.WMKJ-1
<a href="#">WMKJ AD 2.18</a>	[NIL] ATS COMMUNICATION FACILITIES	NIL
<a href="#">WMKJ AD 2.19</a>	[NIL] RADIO NAVIGATION AND LANDING AIDS	NIL
<a href="#">WMKJ AD 2.20</a>	[NIL] LOCAL TRAFFIC REGULATIONS	NIL
<a href="#">WMKJ AD 2.21</a>	[NIL] NOISE ABATEMENT PROCEDURES	NIL
<a href="#">WMKJ AD 2.22</a>	[NIL] FLIGHT PROCEDURES	NIL
<a href="#">WMKJ AD 2.23</a>	[NIL] ADDITIONAL INFORMATION	NIL
<a href="#">WMKJ AD 2.24</a>	[NIL] CHARTS RELATED TO AN AERODROME	NIL

**WIDD BATAM/HANG NADIM (INDONESIA)**

<a href="#">WIDD AD 2.1</a>	AERODROME LOCATION INDICATOR AND NAME	AD 2.WIDD-1
<a href="#">WIDD AD 2.2</a>	[NIL] AERODROME GEOGRAPHICAL AND ADMINISTRATIVE DATA	NIL
<a href="#">WIDD AD 2.3</a>	[NIL] OPERATIONAL HOURS	NIL
<a href="#">WIDD AD 2.4</a>	[NIL] HANDLING SERVICES AND FACILITIES	NIL
<a href="#">WIDD AD 2.5</a>	[NIL] PASSENGER FACILITIES	NIL
<a href="#">WIDD AD 2.6</a>	[NIL] RESCUE AND FIRE FIGHTING SERVICES	NIL
<a href="#">WIDD AD 2.7</a>	[NIL] SEASONAL AVAILABILITY - CLEARING	NIL
<a href="#">WIDD AD 2.8</a>	[NIL] APRONS, TAXIWAYS AND CHECK LOCATIONS DATA	NIL
<a href="#">WIDD AD 2.9</a>	[NIL] SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS	NIL
<a href="#">WIDD AD 2.10</a>	[NIL] AERODROME OBSTACLES	NIL
<a href="#">WIDD AD 2.11</a>	[NIL] METEOROLOGICAL INFORMATION PROVIDED	NIL
<a href="#">WIDD AD 2.12</a>	[NIL] RUNWAY PHYSICAL CHARACTERISTICS	NIL
<a href="#">WIDD AD 2.13</a>	[NIL] DECLARED DISTANCES	NIL
<a href="#">WIDD AD 2.14</a>	[NIL] APPROACH AND RUNWAY LIGHTING	NIL
<a href="#">WIDD AD 2.15</a>	[NIL] OTHER LIGHTING, SECONDARY POWER SUPPLY	NIL
<a href="#">WIDD AD 2.16</a>	[NIL] HELICOPTER LANDING AREA	NIL
<a href="#">WIDD AD 2.17</a>	ATS AIRSPACE	AD 2.WIDD-1
<a href="#">WIDD AD 2.18</a>	ATS COMMUNICATION FACILITIES	AD 2.WIDD-1
<a href="#">WIDD AD 2.19</a>	[NIL] RADIO NAVIGATION AND LANDING AIDS	NIL
<a href="#">WIDD AD 2.20</a>	[NIL] LOCAL TRAFFIC REGULATIONS	NIL
<a href="#">WIDD AD 2.21</a>	[NIL] NOISE ABATEMENT PROCEDURES	NIL
<a href="#">WIDD AD 2.22</a>	[NIL] FLIGHT PROCEDURES	NIL
<a href="#">WIDD AD 2.23</a>	[NIL] ADDITIONAL INFORMATION	NIL
<a href="#">WIDD AD 2.24</a>	CHARTS RELATED TO AN AERODROME	AD 2.WIDD-2

**WIDN TANJUNG PINANG/RAJA HAJI FISABILILLAH (INDONESIA)**

<a href="#">WIDN AD 2.1</a>	AERODROME LOCATION INDICATOR AND NAME	AD 2.WIDN-1
<a href="#">WIDN AD 2.2</a>	[NIL] AERODROME GEOGRAPHICAL AND ADMINISTRATIVE DATA	NIL
<a href="#">WIDN AD 2.3</a>	[NIL] OPERATIONAL HOURS	NIL
<a href="#">WIDN AD 2.4</a>	[NIL] HANDLING SERVICES AND FACILITIES	NIL
<a href="#">WIDN AD 2.5</a>	[NIL] PASSENGER FACILITIES	NIL
<a href="#">WIDN AD 2.6</a>	[NIL] RESCUE AND FIRE FIGHTING SERVICES	NIL
<a href="#">WIDN AD 2.7</a>	[NIL] SEASONAL AVAILABILITY - CLEARING	NIL
<a href="#">WIDN AD 2.8</a>	[NIL] APRONS, TAXIWAYS AND CHECK LOCATIONS DATA	NIL
<a href="#">WIDN AD 2.9</a>	[NIL] SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS	NIL



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<a href="#">WIDN AD 2.10</a>	[NIL] AERODROME OBSTACLES	NIL
<a href="#">WIDN AD 2.11</a>	[NIL] METEOROLOGICAL INFORMATION PROVIDED	NIL
<a href="#">WIDN AD 2.12</a>	[NIL] RUNWAY PHYSICAL CHARACTERISTICS	NIL
<a href="#">WIDN AD 2.13</a>	[NIL] DECLARED DISTANCES	NIL
<a href="#">WIDN AD 2.14</a>	[NIL] APPROACH AND RUNWAY LIGHTING	NIL
<a href="#">WIDN AD 2.15</a>	[NIL] OTHER LIGHTING, SECONDARY POWER SUPPLY	NIL
<a href="#">WIDN AD 2.16</a>	[NIL] HELICOPTER LANDING AREA	NIL
<a href="#">WIDN AD 2.17</a>	ATS AIRSPACE	AD 2.WIDN-1
<a href="#">WIDN AD 2.18</a>	ATS COMMUNICATION FACILITIES	AD 2.WIDN-1
<a href="#">WIDN AD 2.19</a>	[NIL] RADIO NAVIGATION AND LANDING AIDS	NIL
<a href="#">WIDN AD 2.20</a>	[NIL] LOCAL TRAFFIC REGULATIONS	NIL
<a href="#">WIDN AD 2.21</a>	[NIL] NOISE ABATEMENT PROCEDURES	NIL
<a href="#">WIDN AD 2.22</a>	[NIL] FLIGHT PROCEDURES	NIL
<a href="#">WIDN AD 2.23</a>	[NIL] ADDITIONAL INFORMATION	NIL
<a href="#">WIDN AD 2.24</a>	CHARTS RELATED TO AN AERODROME	AD 2.WIDN-1

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

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- 1.3.8 If the aircraft has gone past the correct stop position, the display will show "TOO FAR" (see figure 7).
- 1.3.9 If some object is blocking the view towards the approaching aircraft or the detected aircraft is lost before 12m to the correct stop position, the system will show "WAIT" (see figure 8).
- 1.3.10 The aircraft must be identified at least 12m before the correct stop position. Otherwise, the display will show "WAIT", "STOP" and "ID FAIL" (see figures 8, 9 and 10).

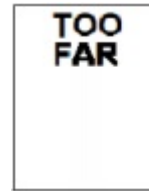
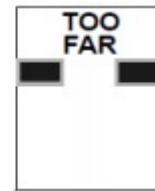
**Safedock  
Type 1****Safedock  
Type 2**

Figure 7

Indicates that the aircraft has gone beyond the stopbar.  
Pilot to check with ground engineer on the next move.

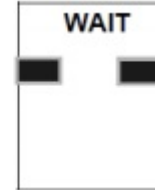
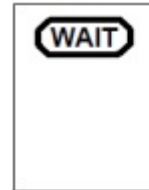


Figure 8

Pilot to hold aircraft and wait for other instructions from the display.

**1.4 SAFETY MEASURES**

- 1.4.1 Pilot should not turn an aircraft into the parking stand if the docking system is not activated or on seeing a wrong aircraft type displayed on the system.
- 1.4.2 Pilot should not proceed beyond the passenger loading bridges unless the scrolling arrows (see figure 1) have been superseded by the solid yellow closing rate bar (see figure 2).

- ← 1.4.3 When using the docking system, pilots are to taxi into the aircraft stand at minimum speed. The system will display "SLOW" to inform the pilot if the aircraft's taxiing speed exceeded 1.2 m/s (see figure 11).

- 1.4.4 In bad weather conditions, the docking system may go into downgrade mode. The display will show the aircraft type and "SLOW" and the scrolling arrows are disabled (see figure 12). When the system has detected the aircraft, the solid yellow closing rate bar appears. Docking process is allowed to continue but pilots should exercise caution.

- 1.4.5 To avoid overshooting, pilots are advised to approach the stop position slowly and observe the closing rate information displayed. Pilots should stop the aircraft immediately when seeing the "STOP" or "WAIT" display, when given the stop sign by the aircraft marshaller or is unsure of the information displayed during the docking process.

- 1.4.6 Pilot should stop the aircraft immediately if the display goes black during the docking process. The aircraft is to be marshalled into the stand manually.

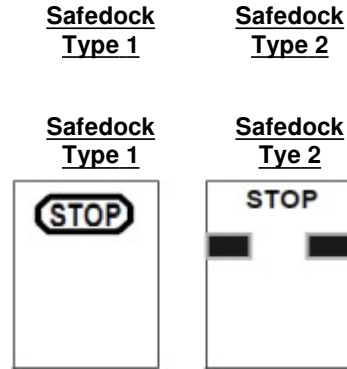


Figure 9  
"STOP" may appear suddenly in the process of docking. Pilot to stop immediately and wait for further instructions.

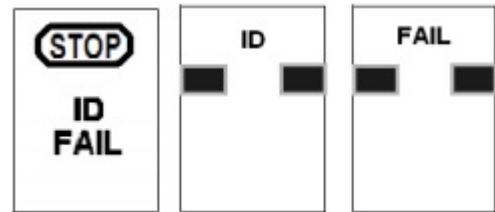


Figure 10  
Indicates the system fails to identify the aircraft.

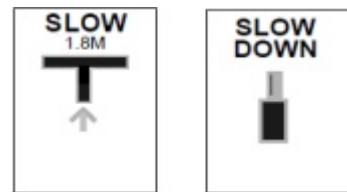


Figure 11  
Informs the pilot that the aircraft travelling speed is too fast. Pilot to slow down the speed. Similar for both Safedock Type 1 and Type 2

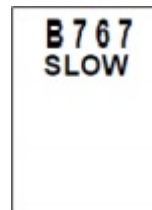


Figure 12  
The system goes into 'downgrade' mode due to bad weather conditions, pilot will be prompted to slow down. Docking process will continue when the aircraft is detected but pilot should exercise caution.

**2 AIRCRAFT PARKING RESTRICTIONS**

**2.1 TERMINAL 1 AIRCRAFT STANDS**

Aircraft types that can be parked at stands (→) are as follows:

Stands	C1	C11	C13	C15	C16	C17	C18	C19	C20	C22	C23	C24	C25	C26
A300	→		→	→	→	→	→					→	→	→
A310	→		→	→	→	→	→			→	→	→	→	→
A319	→	→	→	→	→	→	→	→	→	→	→	→	→	→
A320	→	→	→	→	→	→	→	→	→	→	→	→	→	→
A321	→	→	→	→	→	→	→	→	→	→	→	→	→	→
A332	→		→	→		→	→		→	→	→	→	→	→
A333	→		→	→		→	→		→	→	→	→	→	→
A342	→		→	→		→	→		→	→	→	→	→	→
A343	→		→	→		→	→		→	→	→	→	→	→
A345	→		→	→					→	→	→	→	→	→
A346			→									→		→
A359	→		→	→					→	→	→	→	→	→
A380											→		→	→
B707	→		→	→										
B717	→		→	→	→	→	→	→						
B727	→		→							→				
B737	→	→	→	→	→	→	→	→	→	→	→	→	→	→
B747	→		→	→					→	→	→	→	→	→
B74S	→		→	→									→	→
B757	→		→	→	→	→	→			→	→	→	→	→
B762	→		→	→	→	→	→		→	→	→	→	→	→
B763	→		→	→	→	→	→		→	→	→	→	→	→
B772	→		→	→		→	→		→	→	→	→	→	→
B773	→		→	→					→	→	→	→	→	→
B773ER	→		→	→					→	→	→	→	→	→
B788	→		→	→		→			→	→	→		→	→
B789	→		→	→		→			→	→	→	→	→	→
BA146			→											
DC10	→			→		→	→						→	→
DC9			→	→										
F100	→		→	→	→	→	→	→						
IL62	→		→	→	→	→	→						→	→
IL86	→		→	→	→	→	→						→	→
IL96	→		→	→	→	→	→						→	→
L101	→			→		→	→						→	→
MD11	→			→		→	→			→	→	→	→	→
MD80/82	→		→	→	→	→	→	→					→	→
MD83			→	→	→	→	→	→						
MD88	→		→	→	→	→	→	→					→	→

**2.2 TERMINAL 1 AIRCRAFT STANDS**

Aircraft types that can be parked at stands (✈) are as follows:

Stands	D30	D32	D34	D35	D36	D37	D38	D40	D41	D42	D42L & D42R	D44	D46	D47	D48	D49
A300		✈		✈	✈	✈		✈	✈			✈	✈	✈	✈	✈
A310		✈		✈	✈	✈		✈	✈			✈	✈	✈	✈	✈
A319	✈	✈	✈	✈	✈	✈	✈	✈	✈		✈	✈	✈	✈	✈	✈
A320	✈	✈	✈	✈	✈	✈	✈	✈	✈		✈	✈	✈	✈	✈	✈
A321	✈	✈	✈	✈	✈	✈	✈	✈	✈		✈	✈	✈	✈	✈	✈
A332		✈	✈		✈	✈		✈	✈	✈		✈	✈	✈	✈	✈
A333		✈	✈		✈	✈		✈	✈	✈		✈	✈	✈	✈	✈
A342		✈	✈		✈	✈		✈	✈			✈	✈	✈	✈	✈
A343		✈	✈		✈	✈		✈	✈	✈		✈	✈	✈	✈	✈
A345		✈	✈					✈	✈			✈	✈	✈	✈	✈
A346		✈	✈										✈			✈
A359		✈	✈					✈	✈	✈		✈	✈	✈	✈	✈
A380													✈			✈
B707		✈							✈			✈				
B717		✈		✈	✈	✈	✈		✈			✈	✈	✈	✈	
B727		✈							✈			✈				
B737	✈	✈	✈	✈	✈	✈	✈	✈	✈		✈	✈	✈	✈	✈	✈
B747		✈	✈					✈	✈			✈	✈	✈	✈	✈
B74S		✈							✈			✈	✈	✈	✈	✈
B757		✈		✈	✈	✈		✈	✈			✈	✈	✈	✈	✈
B762		✈	✈	✈	✈	✈		✈	✈	✈		✈	✈	✈	✈	✈
B763		✈	✈	✈	✈	✈		✈	✈	✈		✈	✈	✈	✈	✈
B772		✈	✈		✈	✈		✈	✈	✈		✈	✈	✈	✈	✈
B773		✈	✈						✈	✈		✈				✈
B773ER		✈	✈						✈	✈		✈				✈
B788		✈	✈					✈	✈	✈		✈	✈			✈
B789		✈	✈			✈		✈	✈	✈		✈	✈		✈	✈
BA146		✈														
DC10					✈	✈			✈			✈	✈	✈	✈	✈
DC9		✈														
F100		✈		✈	✈	✈	✈		✈			✈		✈	✈	
IL62		✈		✈	✈	✈			✈			✈	✈	✈	✈	✈
IL86		✈		✈	✈	✈			✈			✈	✈	✈	✈	✈
IL96		✈		✈	✈	✈			✈			✈	✈	✈	✈	✈
L101					✈	✈			✈			✈	✈	✈	✈	✈
MD11					✈	✈			✈			✈	✈	✈	✈	✈
MD80		✈		✈	✈	✈	✈		✈			✈	✈	✈	✈	✈
MD82		✈		✈	✈	✈	✈		✈			✈	✈	✈	✈	✈
MD83		✈	✈	✈	✈	✈	✈	✈	✈	✈		✈	✈	✈	✈	✈
MD88		✈		✈	✈	✈	✈		✈			✈	✈	✈	✈	✈

**2.3 TERMINAL 2 AIRCRAFT STANDS**

Aircraft types that can be parked at stands (→) are as follows:

Stands	E1	E2	E3	E4	E5	E6	E7	E8	E10	E11	E12	E20	E22	E24	E24L	E24R	E26	E27	E28
A300		→		→	→	→		→		→	→	→	→	→			→	→	→
A310	→	→		→	→	→	→	→		→	→	→	→	→			→	→	→
A319	→	→	→	→	→	→	→	→	→	→	→	→	→		→	→	→	→	→
A320	→	→	→	→	→	→	→	→		→	→	→	→		→	→	→	→	→
A321			→		→								→		→	→	→	→	→
A332			→	→	→			→		→	→	→	→	→			→	→	→
A333			→	→	→			→		→	→	→	→	→			→	→	→
A342			→	→	→			→		→	→		→	→			→	→	→
A343			→	→	→			→		→	→		→	→			→	→	→
A345			→	→	→			→		→	→		→	→			→	→	→
A346				→	→			→											
A359			→	→	→			→		→	→	→	→	→			→	→	→
A380					→			→		→									
B707																	→	→	→
B727	→	→		→	→	→		→		→	→	→	→	→			→	→	→
B737	→	→	→	→	→	→	→	→		→	→	→	→		→	→	→	→	→
B747			→	→	→			→		→	→	→	→	→			→	→	→
B748					→			→		→									
B74S				→	→			→		→	→		→	→			→	→	→
B757	→	→		→	→	→		→		→	→	→	→	→			→	→	→
B762	→	→	→	→	→	→		→		→	→	→	→	→			→	→	→
B763	→	→	→	→	→	→		→		→	→	→	→	→			→	→	→
B772			→	→	→			→		→	→	→	→	→			→	→	→
B772LR			→							→									
B773				→	→	→		→		→			→	→			→	→	→
B773ER				→	→			→		→			→	→			→	→	→
B788			→	→	→			→		→	→	→	→	→			→	→	→
B789			→	→	→			→		→	→	→	→	→			→	→	→
DC10				→	→	→		→		→	→						→	→	→
DC9													→						
F70	→	→		→	→	→	→	→	→	→	→	→	→	→					
F100																	→	→	→
IL62																	→	→	→
IL86																	→	→	→
IL96																	→	→	→
L101				→	→	→		→		→	→						→	→	→
MD11				→	→	→		→		→	→						→	→	→
MD80																	→	→	→
MD82																	→	→	→
MD83															→	→		→	
MD87												→							
MD88																	→	→	→

**2.4 TERMINAL 2 AIRCRAFT STANDS**

Aircraft types that can be parked at stands (↗) are as follows:

Stands	F30	F31	F32	F33	F34	F35	F36	F37	F40	F41	F42	F50	F52	F54	F56	F58	F59	F60
← A300		↗	↗		↗				↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
← A310		↗	↗	↗	↗				↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
← A319	↗	↗	↗	↗	↗		↗	↗	↗	↗	↗	↗		↗		↗		↗
← A320	↗	↗	↗	↗	↗		↗	↗	↗	↗	↗	↗		↗		↗		↗
A332		↗			↗				↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
A333		↗			↗				↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
A342		↗			↗				↗	↗	↗		↗	↗	↗	↗	↗	↗
A343		↗			↗				↗	↗	↗		↗	↗	↗	↗	↗	↗
A345		↗			↗				↗	↗	↗		↗	↗	↗	↗	↗	↗
A346											↗							↗
A359		↗				↗					↗	↗		↗	↗	↗	↗	↗
A380		↗									↗							↗
B707												↗		↗				↗
← B727	↗	↗	↗	↗	↗			↗	↗	↗	↗	↗		↗	↗	↗	↗	↗
← B737	↗	↗	↗	↗	↗		↗	↗	↗	↗	↗	↗		↗		↗		↗
← B747		↗			↗				↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
B748		↗									↗							↗
B74S		↗			↗				↗	↗	↗			↗	↗	↗	↗	↗
← B757		↗	↗	↗	↗				↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
B762		↗	↗		↗	↗			↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
B763		↗	↗		↗	↗			↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
B772		↗		↗	↗				↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
B772LR														↗		↗		↗
B773									↗	↗				↗	↗	↗	↗	↗
B773ER									↗	↗				↗	↗	↗	↗	↗
B788		↗		↗	↗	↗				↗	↗	↗	↗	↗	↗	↗	↗	↗
B789		↗		↗	↗	↗				↗	↗	↗	↗	↗	↗	↗	↗	↗
← DC10					↗				↗	↗				↗	↗	↗	↗	↗
DC9												↗		↗	↗	↗		
← F70	↗	↗	↗	↗	↗			↗	↗	↗	↗	↗		↗	↗	↗	↗	↗
← L101					↗				↗	↗				↗	↗	↗	↗	↗
← MD11					↗				↗	↗				↗	↗	↗	↗	↗
MD87												↗		↗				

Stands	F35L	F35R	F52L	F52R	F56L	F56R	F59L	F59R
A319	↗	↗	↗	↗	↗	↗	↗	↗
A320	↗	↗	↗	↗	↗	↗	↗	↗
A321	↗	↗	↗	↗	↗	↗	↗	↗
B737	↗	↗						
B737(100-500)			↗	↗	↗	↗	↗	↗
B737(600-900)			↗	↗	↗	↗		↗
MD83			↗	↗	↗	↗	↗	↗



2.7

**CARGO STANDS**

Aircraft types that can be parked at stands (→) are as follows:

←	Stands	502	503	504	505	506	507	508	509	510 to 515	600	600L	600R	601	602	603	604	605	611	612
←	A300	→	→	→	→	→	→	→	→	→	→			→	→	→	→			
←	A306																		→	→
←	A310	→	→	→	→	→	→	→	→	→				→	→	→	→		→	→
←	A319											→	→					→		
←	A320											→	→					→		
←	A321											→	→					→		
←	A330													→	→	→	→		→	→
←	A332	→	→	→	→	→	→	→	→	→	→			→	→	→	→			
←	A333	→	→	→	→	→	→	→	→	→	→			→	→	→	→			
←	A342	→	→	→	→	→	→	→	→	→				→	→	→	→		→	→
←	A343	→	→	→	→	→	→	→	→	→	→			→	→	→	→		→	→
←	A345	→							→	→	→									
←	A346	→							→	→	→									
←	A359	→	→	→	→	→	→	→	→	→	→			→	→	→	→			
←	A380	→							→											
←	AN24	→							→											
←	B707	→	→	→	→	→	→	→	→					→	→	→	→			
←	B727	→	→	→	→	→	→	→	→	→	→			→	→	→	→		→	→
←	B737	→	→	→	→	→	→	→	→	→		→	→	→	→	→	→	→	→	→
←	B744	→	→	→	→	→	→	→	→		→			→	→					
←	B747	→	→	→	→	→	→	→	→	→				→	→	→	→			
←	B748						→	→	→							→	→			
←	B74S	→	→	→	→	→	→	→	→					→	→	→	→			
←	B752																		→	→
←	B753																		→	→
←	B757	→	→	→	→	→	→	→	→	→	→			→	→	→	→			
←	B762	→	→	→	→	→	→	→	→	→	→			→	→	→	→		→	→
←	B763	→	→	→	→	→	→	→	→	→	→			→	→	→	→		→	→
←	B764	→	→	→					→	→	→					→	→			
←	B772	→	→	→	→	→	→	→	→	→	→			→	→	→	→		→	→
←	B772LR	→	→	→	→	→	→	→	→	→	→			→	→	→	→		→	→
←	B773	→	→	→	→	→	→	→	→	→	→			→	→	→	→			
←	B773ER	→	→	→	→	→	→	→	→	→	→			→	→	→	→			
←	B777F																		→	→
←	B788	→	→	→	→	→	→	→	→	→	→			→	→	→	→		→	→
←	B789	→	→	→	→	→	→	→	→	→	→			→	→	→	→		→	→
←	DC8	→	→	→	→	→	→	→	→					→	→	→	→		→	→
←	DC10	→	→	→	→	→	→	→	→	→				→	→	→	→		→	→
←	IL62	→	→	→	→	→	→	→	→					→	→	→	→		→	→
←	IL86	→	→	→	→	→	→	→	→					→	→	→	→		→	→
←	L101	→	→	→	→	→	→	→	→	→				→	→	→	→		→	→
←	MD11	→	→	→	→	→	→	→	→	→	→			→	→	→	→		→	→

## 2.8 REMOTE STANDS

Aircraft types that can be parked at stands (↗) are as follows:

Stands	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	701	702
AT72	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗					
ATR72-500															↗	↗	↗	↗	↗
A318															↗	↗	↗	↗	↗
A319	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
A320	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
A321											↗	↗	↗	↗	↗	↗	↗	↗	↗
B733															↗	↗	↗	↗	↗
B734															↗	↗	↗	↗	↗
B735															↗	↗	↗	↗	↗
B736															↗	↗	↗	↗	↗
B737	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
B738															↗	↗	↗	↗	↗
B739															↗	↗	↗	↗	↗
DHC7	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗

## 2.9 MARS STANDS

Aircraft types that can be parked at stands (↗) are as follows:

Stands	101	101L	101R	102	102L	102R	516	516L	516R	517	517L	517R
A300	↗			↗			↗			↗		
A310	↗			↗			↗			↗		
A319		↗	↗		↗	↗		↗	↗		↗	↗
A320		↗	↗		↗	↗		↗	↗		↗	↗
A321		↗	↗		↗	↗		↗	↗		↗	↗
A332	↗			↗			↗			↗		
A333	↗			↗			↗			↗		
A342	↗			↗			↗			↗		
A343	↗			↗			↗			↗		
A345	↗			↗			↗			↗		
A346							↗			↗		
A359	↗			↗			↗			↗		
A388	↗			↗			↗			↗		
AN124							↗			↗		
B727							↗			↗		
B737		↗	↗		↗	↗		↗	↗		↗	↗
B747	↗			↗			↗			↗		
B748	↗			↗			↗			↗		
B757	↗			↗			↗			↗		
B762	↗			↗			↗			↗		
B763	↗			↗			↗			↗		
B764							↗			↗		
B772	↗			↗			↗			↗		
B772LR							↗			↗		
B773	↗			↗			↗			↗		
B773ER	↗			↗			↗			↗		
B788	↗			↗			↗			↗		
B789	↗			↗			↗			↗		
DC10							↗			↗		
L101							↗			↗		
MD11							↗			↗		

**2.10*****SOUTH APRON***

Aircraft types that can be parked at stands (→) are as follow:

Stands	461	462	462L	462R	463	463L	463R
A306	→	→			→		
A310	→	→			→		
A318	→		→	→		→	→
A319	→		→	→		→	→
A320	→		→	→		→	→
A321	→		→	→		→	→
A332	→	→			→		
A333	→	→			→		
A342	→	→			→		
A343	→	→			→		
A345	→	→			→		
A346	→	→			→		
A359	→	→			→		
A380		→			→		
B733	→		→	→		→	→
B734	→		→	→		→	→
B735	→		→	→		→	→
B736			→	→		→	→
B737	→		→	→		→	→
B738	→		→	→		→	→
B739	→		→	→		→	→
B744	→	→			→		
B752	→	→			→		
B753		→			→		
B762	→	→			→		
B763	→	→			→		
B764	→	→			→		
B772	→	→			→		
B773	→	→			→		
B773ER	→	→			→		
B788	→	→			→		
B789	→	→			→		

### 3 PROCEDURES FOR START-UP AND PUSHBACK OF AIRCRAFT

- 3.1 Ground crew must ensure that the area behind an aircraft is clear of vehicles, equipment and other obstructions before the start-up or pushback of aircraft commences.
- 3.2 When the pilot is ready for start-up and pushback, he shall seek confirmation from the ground crew that there is no hazard to his aircraft starting up. He shall then notify the Ground Movement Controller (Callsign: Singapore Ground) that he is ready for pushback. On being told by Singapore Ground that pushback is approved, he shall co-ordinate with the ground crew for the start-up and pushback of the aircraft.
- 3.3 The following table describes the procedures for the pushback of aircraft from the various aircraft stands. When it becomes necessary to vary a procedure to expedite aircraft movements, Singapore Ground will issue specific instructions to the pilot.
- 3.4 The lead-in lines are for aircraft nose-in guidance. For aircraft stands without dedicated pushback lines, ground crew may use the lead-in lines for pushback guidance.

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
<b>T3 WEST</b>		
A1	<p>The aircraft shall be pushed back onto TWY V6 to face West such that the pushback line is always kept midway between the aircraft main gear until its nosewheel is at the "END OF PUSH (for A1 nose gear)" position. The aircraft shall then be towed forward along the pushback line until its nosewheel is at the "END OF TOW (for A1, A2, B1, B2)" position. The aircraft may breakaway from there. Engine start up is not permitted during standard pushback.</p> <p><u>Alternate Pushback</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane V6 to face East, followed by TWY WA, such that the alternate pushback line is always kept midway between the aircraft main gear until the nose of the aircraft is behind the stopbar behind aircraft stand A3 or B2. The aircraft may breakaway from there. <b>This alternate pushback procedure can only be exercised if the auxiliary power unit of aircraft is unserviceable.</b></p>	<p>Standard pushback approved</p> <p>Pushback approved, to face North (or South) on TWY WA</p>
A2	<p>The aircraft (on idle thrust) shall be pushed back onto TWY V6 to face West such that the pushback line is always kept midway between the aircraft main gear until its main gear is at the intersection of the pushback line and TWY V6 centreline and the nosewheel stops at the "END OF PUSH (A2, B2)" position. The aircraft shall then be towed forward along TWY V6 centreline until its nosewheel is at the "END OF TOW (for A1, A2, B1, B2)" position. The aircraft may breakaway from there.</p>	<p>Standard pushback approved</p>
A3	<p>The aircraft (on idle thrust) shall be pushed back onto TWY WA until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY WA centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North (or South).</p>
A4	<p>The aircraft (on idle thrust) shall be pushed back onto TWY WA to face North (or South) such that the pushback line is always kept midway between the aircraft main gear until its nosewheel is at TWY WA centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North (or South).</p>
A5, A9	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• onto TWY U2 to face North such that the pushback line is always kept midway between the aircraft main gear until the nose of the aircraft is behind the stopbar behind aircraft stand A11. The aircraft may breakaway from there.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY WA to face South until the nose of the aircraft is behind the stopbar behind aircraft stand A4. The aircraft may breakaway from there.</li> </ul>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
A10	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• onto TWY U2 to face North until the nose of the aircraft is behind the stopbar behind aircraft stand A11. The aircraft may breakaway from there.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY WA to face South until the nose of the aircraft is behind the stopbar behind aircraft stand A4. The aircraft may breakaway from there.</li> </ul>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
A11	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• onto TWY U2 to face North until the nose of the aircraft is at the intersection of the aircraft stand lead-in line and TWY U2 centreline. The aircraft shall then be towed forward until the nose of the aircraft is behind the stopbar behind aircraft stand A11. The aircraft may breakaway from there.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY U2 to face South until the nose of the aircraft is at the intersection of the aircraft stand lead-in line and TWY U2 centreline. The aircraft shall then be towed forward until its nosewheel is behind the stopbar behind aircraft stand A12. The aircraft may breakaway from there.</li> </ul>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
A12	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• onto TWY U2 to face North until the nose of the aircraft is at the intersection of the aircraft stand lead-in line and TWY U2 centreline. The aircraft shall then be towed forward until its nosewheel is behind the stopbar behind aircraft stand 11. The aircraft may breakaway from there.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY U2 to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY U2 centreline. The aircraft may breakaway from there.</li> </ul>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
A13, A14, A15	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• onto TWY WA to face North until the nose of the aircraft is behind the stopbar behind aircraft stand A16. The aircraft may breakaway from there.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY U2 to face South until the nose of the aircraft is behind the stopbar behind aircraft stand A12. The aircraft may breakaway from there.</li> </ul>	<p>Pushback approved to face North.</p> <p>Pushback approved to face South.</p>
A16	<p>The aircraft (on idle thrust) shall be pushed back onto TWY WA until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY WA centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved to face North (or South).</p>
A17	<p><u>Pushback facing West</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY V8 to face West until its nosewheel is at the "END OF PUSH" position behind aircraft stand A17. The aircraft may breakaway from there.</p> <p><u>Pushback facing South</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto TWY WA to face South until the nose of the aircraft is behind the stopbar behind aircraft stand A16. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face West.</p> <p>Pushback approved, to face South.</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
A18	The aircraft (on idle thrust) shall be pushed back onto TWY U4 to face West such that the pushback line is always kept midway between the aircraft main gear until its main gear is aligned with the centreline of TWY U4 and the nose of the aircraft is behind the stopbar behind aircraft stand A18. The aircraft may breakaway from there. Pushback to face East is not permitted.	Standard pushback approved
A19	The aircraft (on idle thrust) shall be pushed back onto TWY U4 to face West such that the pushback line is always kept midway between the aircraft main gear until its main gear is aligned with the centreline of TWY U4 and the nose of the aircraft is behind the stopbar behind the "END OF PUSH" line. The aircraft may breakaway from there. Pushback to face East is not permitted.	Standard pushback approved
A20	The aircraft (on idle thrust) shall be pushed back onto TWY U4 to face West such that the pushback line is always kept midway between the aircraft main gear until its main gear is aligned with the centreline of TWY U4 and the nose of the aircraft is behind the stopbar behind the "END OF PUSH (for A20 nose gear)" position. The aircraft may breakaway from there. Pushback to face East is not permitted.	Standard pushback approved
A21	The aircraft (on idle thrust) shall be pushed back onto Taxilane U4 to face East such that the pushback line is always kept midway between the aircraft main gear until its nosewheel is at the "END OF PUSH (for A21 nose gear)" position. The aircraft shall then be towed forward to face West until its nose is behind the stopbar behind aircraft stand A18. The aircraft may breakaway from there	Standard pushback approved
B1	<p>The aircraft shall be pushed back onto TWY V6 to face West such that the pushback line is always kept midway between the aircraft main gear until its nosewheel is at the "END OF PUSH (for B1 nose gear)" position. The aircraft shall then be towed forward along the pushback line until its nosewheel is at the "END OF TOW (for A1, A2, B1, B2)" position. The aircraft may breakaway from there. Engine start up is not permitted during standard pushback.</p> <p><u>Alternate Pushback</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane V6 to face East, followed by TWY WA, such that the alternate pushback line is always kept midway between the aircraft main gear until the nose of the aircraft is behind the stopbar behind aircraft stand A3 or B2. The aircraft may breakaway from there. <b>This alternate pushback procedure can only be exercised if the auxiliary power unit of aircraft is unserviceable.</b></p>	<p>Standard pushback approved</p> <p>Pushback approved, to face North (or South) on TWY WA.</p>
B2	The aircraft (on idle thrust) shall be pushed back onto TWY V6 to face West such that the pushback line is always kept midway between the aircraft main gear until its main gear is at the intersection of the pushback line and TWY V6 centreline and the nosewheel stops at the "END OF PUSH (A2, B2)" position. The aircraft shall then be towed forward along TWY V6 centreline until its nosewheel is at the "END OF TOW (for A1, A2, B1, B2)" position. The aircraft may breakaway from there.	Standard pushback approved
B3	The aircraft (on idle thrust) shall be pushed back onto TWY WA until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY WA centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).
B4	The aircraft (on idle thrust) shall be pushed back onto TWY WA to face North (or South) such that the pushback line is always kept midway between the aircraft main gear until its nosewheel is at TWY WA centreline. The aircraft may breakaway from there.	Pushback approved, to face North (or South).

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
B5, B6	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• onto TWY WA to face North until the nose of the aircraft is behind the stopbar behind aircraft stand B4. The aircraft may breakaway from there.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY U1 to face South such that the pushback line is always kept midway between the aircraft main gear until the nose of the aircraft is behind the stopbar behind aircraft stand B7. The aircraft may breakaway from there.</li> </ul>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
B7	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• onto TWY U1 to face South until the nose of the aircraft is behind the stopbar behind aircraft stand B7. The aircraft may breakaway from there.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY WA to face North until the nose of the aircraft is behind the stopbar behind aircraft stand B4. The aircraft may breakaway from there.</li> </ul>	<p>Pushback approved, to face South.</p> <p>Pushback approved, to face North.</p>
B8	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• onto TWY U1 to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY U1 centreline. The aircraft may breakaway from there.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY U1 to face North until its nosewheel is at the intersection of the lead-in line and TWY U1 centreline. The aircraft shall then be towed forward until its nosewheel is at the intersection of the aircraft stand B9 lead-in line and TWY U1 centreline. The aircraft may breakaway from there.</li> </ul>	<p>Pushback approved, to face South.</p> <p>Pushback approved, to face North.</p>
B9, B10	<p>The aircraft (on idle thrust) shall be pushed back onto TWY U1 until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY U1 centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North (or South).</p>
<b><u>MARS REMOTE</u></b>		
101, 101R	<p>The aircraft (on idle thrust) shall be pushed back to face East until its nosewheel is at the "END OF PUSH" position. The aircraft shall then be towed forward until its nosewheel is at the "END OF TOW (EOT)" position on TWY L4 centreline. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p>
101L	<p>The aircraft (on idle thrust) shall be pushed back onto TWY L4 centreline to face East. The aircraft shall then be towed forward along the centreline of TWY L4 until its nosewheel is at the "END OF TOW (EOT)" position. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p>
102, 102R, 102L	<p>The aircraft (on idle thrust) shall be pushed back onto TWY L4 centreline to face East. The aircraft shall then be towed forward along the centreline of TWY L4 until the nose of the aircraft is behind the stopbar behind aircraft stand 102. The aircraft may breakaway from there.</p>	<p>Standard pushback approved.</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
<b><u>EAST REMOTE</u></b>		
200, 201, 202, 203	The aircraft (on idle thrust) shall be pushed back onto TWY C6 to face North (or South).	Pushback approved, to face North (or South).
200L	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• onto Taxilane C6 centreline to face North until its nosewheel is on the end of push behind aircraft stand 200L. The aircraft may breakaway from there.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto Taxilane C6 centreline to face South.</li> </ul>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>
200R, 202L 202R	The aircraft (on idle thrust) shall be pushed back onto Taxilane C6 centreline to face North (or South).	Pushback approved, to face North (or South).
<b><u>SOUTH-EAST REMOTE</u></b>		
103, 104	The aircraft (on idle thrust) shall be pushed back onto Taxilane L4 centreline to face East until the nose of the aircraft is behind the stopbar behind aircraft stand 102. The aircraft may breakaway from there.	Standard pushback approved.
205, 206 207, 208	The aircraft (on idle thrust) shall be pushed back onto TWY C7 to face North (or South).	Pushback approved, to face North (or South).
209	The aircraft (on idle thrust) shall be pushed back to face North (or South) until its nosewheel is at the intersection of the lead-in line and TWY C7 centreline.	Pushback approved, to face North (or South).
<b><u>NORTH REMOTE</u></b>		
300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• facing West until its nosewheel is at the intersection of the lead-in line and taxiway NC2 centreline.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• facing East until its nosewheel is at the intersection of the lead-in line and taxiway NC2 centreline.</li> </ul>	<p>Pushback approved, to face West.</p> <p>Pushback approved, to face East.</p>
<b><u>NORTH-EAST REMOTE</u></b>		
400, 401, 402 403, 404	The aircraft (on idle thrust) shall be pushed back to face North (or South) until its nosewheel is at the intersection of the lead-in line and TWY A6 centreline.	Pushback approved, to face North (or South).
<b><u>WEST CARGO</u></b>		
502	The aircraft (on idle thrust) shall be pushed back to face North (or South). The aircraft may breakaway from here. There shall be no simultaneous pushback of aircraft unless with two aircraft stands separation.	Pushback approved, to face North (or South).
503, 504 505, 506	The aircraft (on idle thrust) shall be pushed back to face North (or South).	Pushback approved, to face North (or South).
507, 508, 509	The aircraft (on idle thrust) shall be pushed back to face North (or South). The aircraft may breakaway from there. There shall be no simultaneous pushback of aircraft unless with two aircraft stands separation.	Pushback approved, to face North (or South).
510	The aircraft (on idle thrust) shall be pushed back to face North (or South) until the nosewheel of the aircraft is at the intersection of the aircraft stand lead-in line and Taxiway WC centreline. The aircraft may breakaway from there. There shall be no simultaneous pushback of aircraft unless with two aircraft stands separation.	Pushback approved, to face North (or South).



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

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
<b><u>EAST CARGO</u></b>		
600	The aircraft (on idle thrust) shall be pushed back onto Taxilane EA to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane EA centreline. The aircraft may breakaway from there.	Standard pushback approved
600L, 600R	The aircraft (on idle thrust) shall be pushed back onto Taxilane EA to face South until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane EA centreline. The aircraft may breakaway from there.	Standard pushback approved
601, 602	The aircraft (on idle thrust) shall be pushed back to face South until its nosewheel is at the intersection of the lead-in line and taxilane EA centreline.	Standard pushback approved
603	The aircraft (on idle thrust) shall be pushed back to face South until its nosewheel is at the intersection of the lead-in line and taxilane EA centreline. The aircraft shall then be towed forward along the centreline of taxilane EA till its nosewheel is on the "END OF TOW" marking behind aircraft stand 602.	Standard pushback approved
604	The aircraft (on idle thrust) shall be pushed back to face South until its nosewheel is at the position of "END OF PUSH". The aircraft shall then be towed forward along the centreline of taxilane EA till its nosewheel is on the "END OF TOW" marking behind aircraft stand 602.	Standard pushback approved
605	The aircraft (on idle thrust) shall be pushed back to face West until its nosewheel of the aircraft is at the position of "EOP"on Taxilane EC. The aircraft shall then be towed forward along the centreline of taxilane EA till its nosewheel is on the "END OF TOW" marking behind aircraft stand 602. The aircraft may breakaway from there.	Standard pushback approved
611, 612	<p>The aircraft shall be pushed back to face North until its nosewheel is at the "END OF PUSH" position. The aircraft shall then be towed forward along the centreline of taxilane EC and turn left onto the centreline of taxilane EA until its nosewheel is at the "END OF TOW" marking behind aircraft stand 602. The aircraft may breakaway from there. Engine start-up is not permitted during standard pushback.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back to face North until its nosewheel is at the "END OF PUSH" position. Engine start-up is permitted only on the port engine. The aircraft shall then be towed forward along the centreline of taxilane EC and turn left onto the centreline of taxilane EA until its nosewheel is at the "END OF TOW" position (marking 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>	<p>Standard pushback approved</p> <p>Alternate pushback approved</p>
<b><u>T1 WEST</u></b>		
C1, C20, C22, C23, C24, C25	The aircraft (on idle thrust) shall be pushed back onto TWY U1 to face North (or South).	Pushback approved, to face North (or South).
C26	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• onto TWY WA to face North. The aircraft may breakaway from there.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY WA to face South until its nosewheel is at the intersection of the aircraft stand lead-in line and TWY WA centreline. The aircraft shall then be towed forward until its nosewheel is on the "END OF TOW" position. This is marked as "EOT" on the ground. The aircraft may breakaway from there.</li> </ul>	<p>Pushback approved, to face North.</p> <p>Pushback approved, to face South.</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
<b>T1 CENTRAL</b>		
C11	The aircraft (on idle thrust) shall be pushed back such that the pushback line is always kept midway between the aircraft main gear until the nosewheel of aircraft is at the "EOP 21" position. The aircraft shall then be towed forward until its nosewheel is at the "EOT 22A" position.	Standard pushback approved
C13	<p>The aircraft (on idle thrust) shall push back to face North such that the pushback line is always kept midway between the aircraft main gear until its nosewheel is at the "EOP 22" position. The aircraft shall be towed forward until its nosewheel is at the "EOT 22A" position.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall push back onto TWY N2 to face South followed by TWY 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 push back onto TWY N2 to face South followed by TWY 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, onto TWY N3 to face South.</p> <p>Pushback approved, onto TWY N1 to face South.</p>
C15	<p>The aircraft (on idle thrust) shall push back facing North until its nosewheel is at the intersection of the lead-in line and TWY N2 centreline.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall push back onto TWY N2 to face South followed by TWY 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 push back onto TWY N2 to face South followed by TWY 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, onto TWY N3 to face South.</p> <p>Pushback approved, onto TWY N1 to face South.</p>
C16	<p>The aircraft (on idle thrust) shall be pushed back to face North (or South) until its nosewheel is at the intersection of the lead-in line and TWY N1 centreline.</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 line 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>
C17	<p>The aircraft (on idle thrust) shall be pushed back to face North (or South) until its nosewheel is at the intersection of the lead-in line and TWY N1 centreline.</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 line 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>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
C18	<p>The aircraft (on idle thrust) shall be pushed back to face North until its nosewheel is at the intersection of the lead-in line and TWY N1 centreline.</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 line 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 to face North along TWY N1 until the "END OF PUSH" position.</p>	<p>Standard pushback approved</p>
D30	<p>The aircraft (on idle thrust) shall be pushed back such that the pushback line is always kept midway between the aircraft main gear until the nosewheel of the aircraft is at the "EOP 20" position. The aircraft shall then be towed forward until its nosewheel is at the "EOT 22A" position.</p>	<p>Standard pushback approved</p>
D32	<p>The aircraft (on idle thrust) shall push back to face North such that the pushback line is always kept midway between the aircraft main gear until its nosewheel is at the "EOP 22" position. The aircraft shall then be towed forward until its nosewheel is at the "EOT 22A" position.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall push back onto TWY N2 to face South followed by TWY 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 push back onto TWY N2 to face South followed by TWY 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, onto TWY N3 to face South.</p> <p>Pushback approved, onto TWY N1 to face South.</p>
D34	<p>The aircraft (on idle thrust) shall push back to face North until its nosewheel is at the intersection of the lead-in line and TWY N2 centreline.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall push back onto TWY N2 to face South followed by TWY 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 push back onto TWY N2 to face South followed by TWY 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, onto TWY N3 to face South.</p> <p>Pushback approved, onto TWY N1 to face South.</p>
D35, D36	<p>The aircraft (on idle thrust) shall be pushed back to face North (or South) until its nosewheel is at the intersection of the lead-in line and TWY N3 centreline.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N3 to face North until the nose of the aircraft is behind the stopbar line behind aircraft stand D34 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>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
D37	<p>The aircraft (on idle thrust) shall be pushed back to face North until its nosewheel is at the intersection of the lead-in line and TWY N3 centreline.</p> <p><u>Alternate Pushback Procedure</u></p> <p>The aircraft (on idle thrust) shall be pushed back onto Taxilane N3 to face North until the nose of the aircraft is behind the stopbar line behind aircraft stand D34 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>
D38	<p>The aircraft (on idle thrust) shall be pushed back to face North along TWY N3 until the "END OF PUSH" position.</p>	<p>Standard pushback approved</p>
<b><u>T1 EAST</u></b>		
← D40, D41, D44, D46, D47, D48, D49	<p>The aircraft (on idle thrust) shall be pushed back to face North (or South) until its nosewheel is at the intersection of the lead-in line and TWY A6 centreline.</p>	<p>Pushback approved, to face North (or South).</p>
D42	<p>The aircraft (on idle thrust) shall be pushed back onto Taxilane A6 to face North (or South) until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane A6 centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North (or South) on Taxilane A6.</p>
D42L, D42R	<p>The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane A6 to face North (or South) until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane A6 centreline. The aircraft may breakaway from there.</p>	<p>Pushback approved, to face North (or South) on Taxilane A6.</p>
<b><u>T2 CENTRAL</u></b>		
E1	<p>The aircraft (on idle thrust) shall be pushed back such that the pushback line is always kept midway between the aircraft main gear until its nosewheel is at Stopbar 12. This is marked as "END OF PUSH" on the ground. The aircraft shall then be towed forward to Stopbar 9. This is marked as "END OF TOW" on the ground.</p>	<p>Standard pushback approved</p>
E2	<p>The aircraft (on idle thrust) shall be pushed back until its nosewheel is at the intersection of the lead-in line and TWY B2 centreline. The aircraft shall then be towed forward to Stopbar 9. This is marked as "END OF TOW" on the ground.</p>	<p>Standard pushback approved</p>
E3	<p>The aircraft (on idle thrust) shall be pushed back until its nosewheel is at Stopbar 9. This is marked as "END OF TOW" on the ground.</p>	<p>Standard pushback approved</p>
E4	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• until its nosewheel is at the "END OF PUSH" 8 position</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY B1 until its nosewheel is at the "END OF PUSH" 13A position</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY B3 until its nosewheel is at the "END OF PUSH" 7A position.</li> </ul>	<p>Standard pushback approved</p> <p>Pushback approved, to pushback onto TWY B1</p> <p>Pushback approved, to pushback onto TWY B3.</p>
E5, E6	<p>The aircraft (on idle thrust) shall be pushed back until its nosewheel is at the intersection of the lead-in line and TWY B1 centreline. The aircraft shall then be towed forward to Stopbar 13. This is marked as "END OF TOW" on the ground.</p>	<p>Standard pushback approved</p>
E7	<p>The aircraft (on idle thrust) shall be pushed back until its nosewheel is at Stopbar 13. This is marked as "END OF TOW" on the ground.</p>	<p>Standard pushback approved</p>

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
F30	The aircraft (on idle thrust) shall be pushed back such that the pushback line is always kept midway between the aircraft main gear until its nosewheel is at Stopbar 11. This is marked as "END OF PUSH" on the ground. The aircraft shall then be towed forward to Stopbar 9. This is marked as "END OF TOW" on the ground.	Standard pushback approved
F31	The aircraft (on idle thrust) shall be pushed back until its nosewheel is at Stopbar 10. This is marked as "END OF PUSH" on the ground. The aircraft shall then be towed forward to Stopbar 9. This is marked as "END OF TOW" on the ground.	Standard pushback approved
F32	The aircraft (on idle thrust) shall be pushed back until its nosewheel is at Stopbar 9. This is marked as "END OF TOW" on the ground.	Standard pushback approved
F33	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• until its nosewheel is at "END OF PUSH" 8 position.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY B1 until its nosewheel is at the "END OF PUSH" 13A position.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY B3 until its nosewheel is at the "END OF PUSH" 7A position.</li> </ul>	<p>Standard pushback approved</p> <p>Pushback approved, to pushback onto TWY B1</p> <p>Pushback approved, to pushback onto TWY B3.</p>
← F34	The aircraft (on idle thrust) shall be pushed back until its nosewheel is at the intersection of the lead-in line and TWY B3 centreline. The aircraft shall then be towed forward to Stopbar 7. This is marked as "END OF TOW" on the ground.	Standard pushback approved
F35	The aircraft (on idle thrust) shall be pushed back onto Taxilane B3 to face south until its nosewheel is at the intersection of the aircraft stand lead-in line and Taxilane B3 centreline. The aircraft may breakaway from there.	Standard pushback approved
F35L	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane B3 to face south until the nose of the aircraft is behind the stopbar behind aircraft stand F35. The aircraft may breakaway from there.	Standard pushback approved
F35R	The aircraft (on idle thrust) shall be pushed back following the pushback line onto Taxilane B3 to face south until its nosewheel is at the intersection of the aircraft stand pushback line and Taxilane B3 centreline. The aircraft may breakaway from there.	Standard pushback approved
F36	The aircraft (on idle thrust) shall be pushed back until its nosewheel is at Stopbar 7. This is marked as "END OF TOW" on the ground.	Standard pushback approved

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
<b>T2 NORTH</b>		
E8	The aircraft (on idle thrust) shall be pushed back until its nosewheel is at Stopbar 14. This is marked as "END OF PUSH" on the ground. The aircraft shall then be towed forward to Stopbar 15. This is marked as "END OF TOW" on the ground.	Standard pushback approved
E10	The aircraft (on idle thrust) shall be pushed back with the main gear mid-point following the pushback line until its nosewheel is at position EOP 19.	Standard pushback approved
E11	<p><u>Main pushback procedure (for all aircraft wingspan)</u></p> <p>The aircraft (on idle thrust) shall be pushed back with the main gear mid-point following the main gear pushback line onto TWY A6 centreline. The aircraft shall then be towed forward to Stopbar 16 on TWY A5. This is marked as "END OF TOW" on the ground.</p> <p><u>Alternate pushback procedure (for aircraft with wingspan of less than 65m)</u></p> <p>The aircraft (on idle thrust) shall be pushed back with the main gear mid-point following the main gear pushback line until its body is aligned with TWY A6 centreline.</p> <p><u>Alternate pushback procedure (for aircraft with wingspan of more than 65m)</u></p> <p>The aircraft (on idle thrust) shall be pushed back with the main gear mid-point following the main gear pushback line until its nosewheel is at the 'EOP 19A' position behind aircraft stand E24. The aircraft shall then be towed forward to 'EOT 18B' behind aircraft stand E26.</p>	<p>Standard pushback approved</p> <p>Pushback approved, to pushback onto TWY A6.</p> <p>Pushback approved, to pushback onto TWY A6.</p>
E12	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• until its nosewheel is at the intersection of the lead-in line and TWY A5 centreline. The aircraft shall then be towed forward to Stopbar 16. This is marked as "END OF TOW" on the ground.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY A6 until its nosewheel is at the intersection of TWY A5 and A6 centrelines.</li> </ul>	<p>Standard pushback approved</p> <p>Pushback approved, to pushback onto TWY A6.</p>
E20	The aircraft (on idle thrust) shall be pushed back with the main gear mid-point following the main gear pushback line until its nosewheel is at Stopbar 17. The aircraft shall then be towed forward to "END OF TOW" Stopbar 18A. Aircraft may breakaway from there.	Standard pushback approved
E22	The aircraft (on idle thrust) shall be pushed back with the main gear mid-point following the main gear pushback line until its nosewheel is at Stopbar 19. This is marked as "END OF PUSH" on the ground. The aircraft shall then be towed forward to Stopbar 18. This is marked as "END OF TOW" on the ground.	Standard pushback approved
E24	The aircraft (on idle thrust) shall be pushed back facing North until its body is aligned with TWY A6 centreline. Aircraft may breakaway from there.	Standard pushback approved
E24L, E24R	The aircraft (on idle thrust) shall be pushed back facing North until its body is aligned with TWY A6 centreline. Aircraft may breakaway from there.	Standard pushback approved
E26	The aircraft (on idle thrust) shall be pushed back to face North until its body is aligned with TWY A6 centreline.	Standard pushback approved
E27, E28	The aircraft (on idle thrust) shall be pushed back to face North (or South) until its body is aligned with TWY A6 centreline.	Pushback approved, to face North (or South).

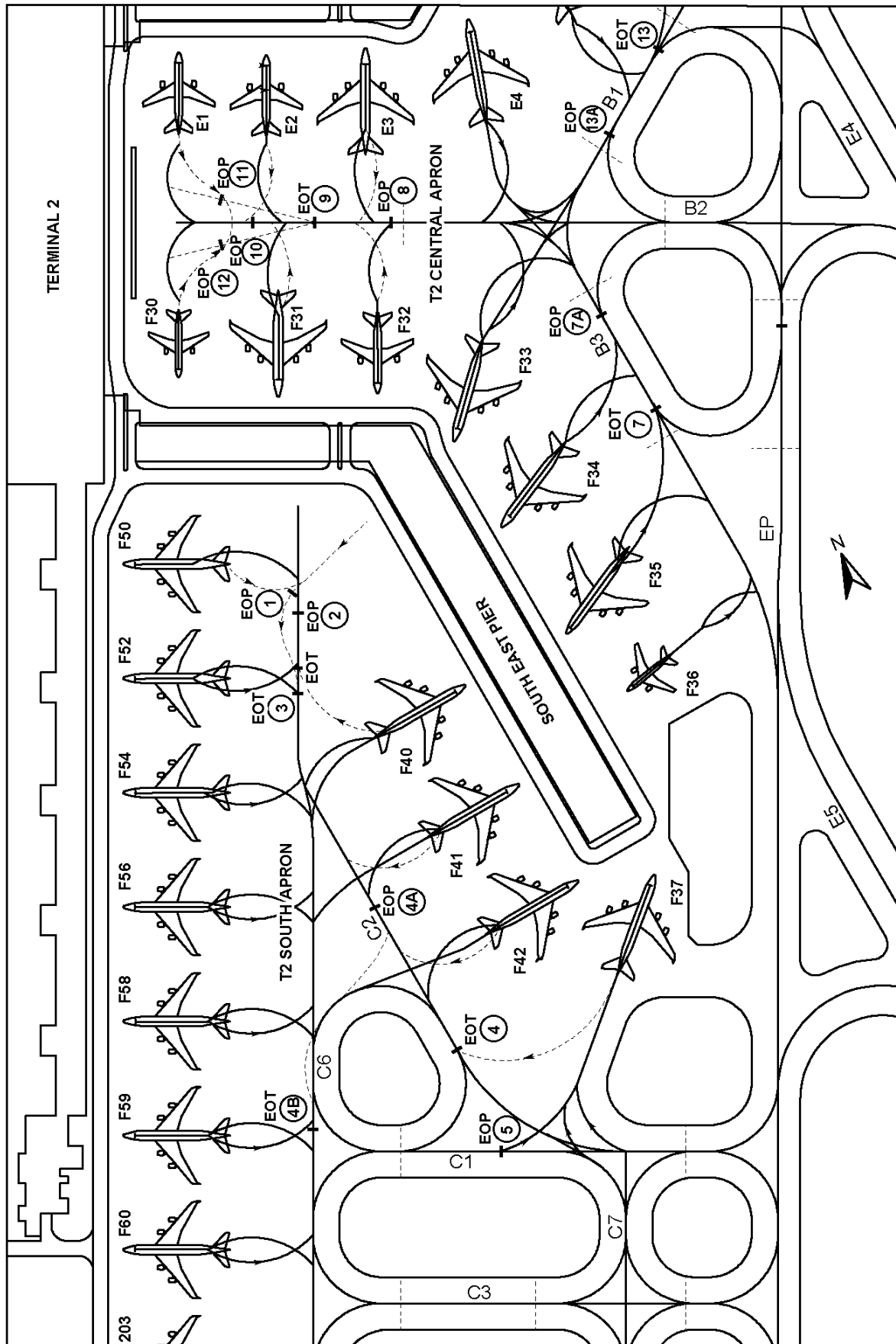
APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
<b>T2 SOUTH</b>		
F37	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• with the main gear following the main gear pushback line, until its nosewheel is behind aircraft stand F42. The aircraft shall then be towed forward to Stopbar 4. This is marked as “EOT 4” on the ground.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• with the main gear following the main gear pushback line, until its nosewheel is on the “END OF PUSH (EOP)” Stopbar 5 on TWY C1.</li> </ul>	<p>Standard pushback approved</p> <p>Pushback approved, to face East on TWY C1.</p>
F40, F52	<p>The aircraft (on idle thrust) shall be pushed back until its nosewheel is at Stopbar 2. This is marked as “END OF PUSH” on the ground. The aircraft shall then be towed forward to Stopbar 3. This is marked as “END OF TOW” on the ground.</p>	<p>Standard pushback approved</p>
F41	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>• until its nosewheel is at the intersection of the lead-in line and the TWY C2 centreline. The aircraft shall then be towed forward to Stopbar 4. This is marked as “EOT 4” on the ground.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• onto TWY C6 until its nosewheel is at the intersection of TWY C2 and TWY C6 centreline.</li> </ul>	<p>Standard pushback approved</p> <p>Pushback approved, to pushback onto TWY C6.</p>
F42	<p><u>Main pushback procedure (for all aircraft wingspan)</u></p> <p>The aircraft (on idle thrust) shall be pushed back until its nosewheel is at the intersection of the lead-in line and the TWY C2 centreline. The aircraft shall then be towed forward to Stopbar 4. This is marked as “EOT 4” on the ground.</p> <p><u>Alternate pushback procedure (for aircraft with wingspan of less than 65m)</u></p> <p>The aircraft (on idle thrust) shall be pushed onto TWY C6 until its nosewheel is at the intersection of TWY C2 and TWY C6 centreline.</p> <p><u>Alternate pushback procedure (for aircraft with wingspan of more than 65m)</u></p> <p>The aircraft (on idle thrust) shall be pushed back until its nosewheel is at the ‘EOP 4A’ position. The aircraft shall then be towed forward with its nosewheel following the towed forward line until its nosewheel is on the ‘EOT 4B’ position, behind aircraft stand F59.</p>	<p>Standard pushback approved</p> <p>Pushback approved, to pushback onto TWY C6.</p> <p>Pushback approved, to pushback onto TWY C6.</p>
F50	<p>The aircraft (on idle thrust) shall be pushed back with the main gear following the main gear pushback line, facing south until its nosewheel is on the “END OF PUSH” Stopbar 1 marking painted on the ground behind aircraft stand F50. The aircraft shall then be towed forward with the nosewheel following the tow-forward line until its nosewheel is on the “END OF TOW” Stopbar 3 marking painted on the ground behind aircraft stand F52.</p>	<p>Standard pushback approved</p>
F52L	<p>The aircraft (on idle thrust) shall be pushed back to face south until its nosewheel is at the intersection of the aircraft pushback line and taxiway C6.</p>	<p>Standard pushback approved</p>
F52R	<p>The aircraft (on idle thrust) shall be pushed back to face south until its nosewheel is at the intersection of the aircraft pushback line and taxiway C6. The aircraft shall then be towed forward until its nosewheel is on the “END OF TOW” position.</p>	<p>Standard pushback approved</p>
F54	<p>The aircraft (on idle thrust) shall be pushed back until its nosewheel is at a point on TWY C6 in line with the mid-point of aircraft stands F52 and F54. It shall breakaway from this position.</p>	<p>Standard pushback approved</p>



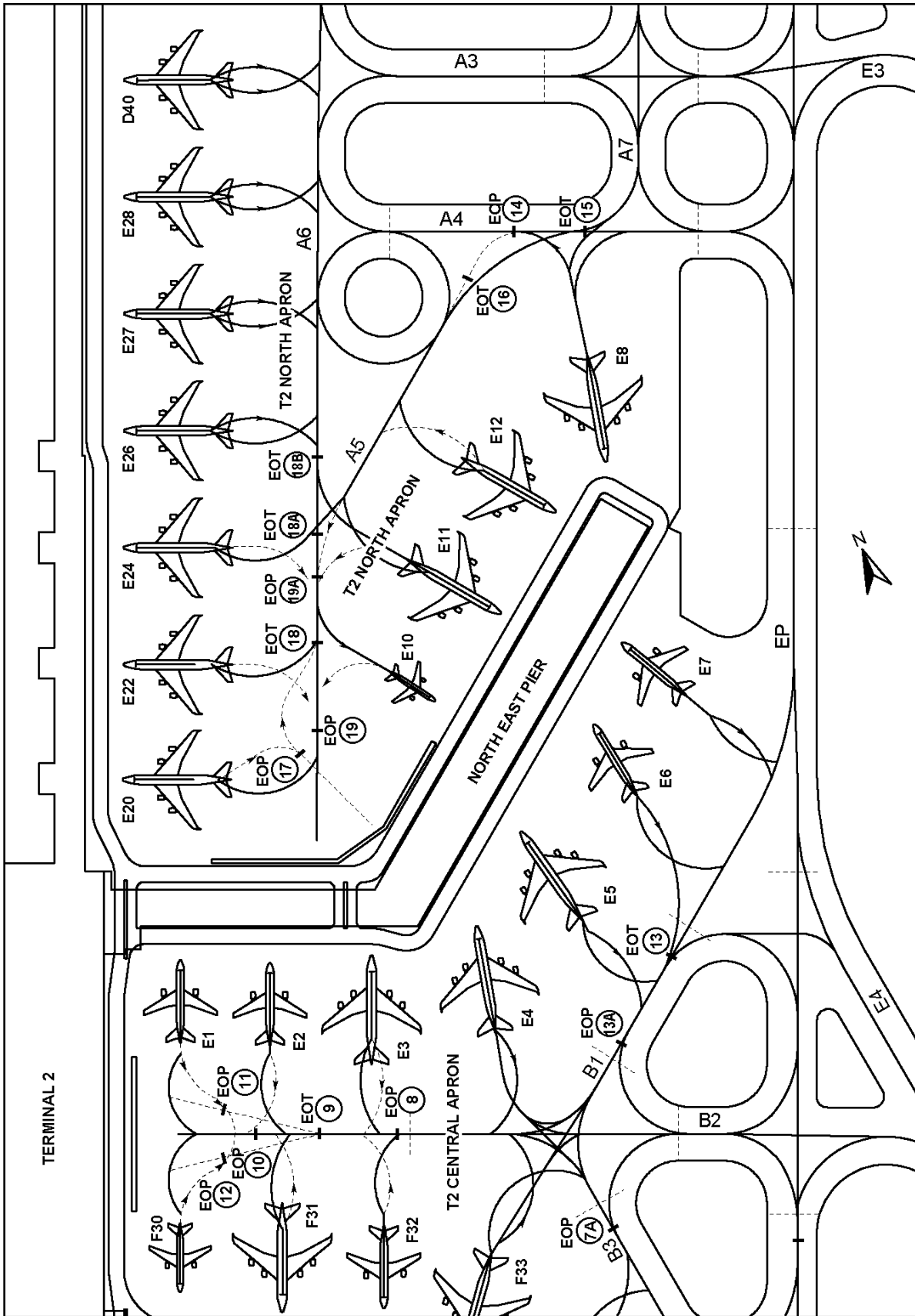
APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
F56	The aircraft (on idle thrust) shall be pushed back to face South until its nosewheel is at the intersection of the aircraft pushback line and taxiway C6. The aircraft shall then be towed forward until its nosewheel is abeam aircraft stand F56.	Standard pushback approved
← F56L, F56R	The aircraft (on idle thrust) shall be pushed back to face South until its nosewheel is at the intersection of the aircraft pushback line and taxiway C6. The aircraft shall then be towed forward until its nosewheel is abeam aircraft stand F56.	Standard pushback approved
F58	The aircraft (on idle thrust) shall be pushed back to face North (or South), on TWY C6 centreline.	Pushback approved, to face North (or South).
F59	The aircraft (on idle thrust) shall be pushed back to face North on TWY C6 centreline until its nosewheel is abeam aircraft stand F60.  <u>OR</u>  The aircraft (on idle thrust) shall be pushed back to face South on TWY C6.	Pushback approved, to face North.   Pushback approved, to face South.
F59L, F59R	The aircraft (on idle thrust) shall be pushed back to face North on taxiway C6 centreline until its nosewheel is abeam aircraft stand F60.  <u>OR</u>  The aircraft (on idle thrust) shall be pushed back to face South on taxiway C6 centreline.	Pushback approved, to face North.   Pushback approved, to face South.
F60	The aircraft (on idle thrust) shall be pushed back to face North (or South), on TWY C6 centreline.	Pushback approved, to face North (or South).
1, 2	The aircraft (on idle thrust) shall be pushed back:  • to face West onto TWY L7 until its nosewheel is at the stopbar marked "END OF PUSH" behind aircraft stand 2. The aircraft may breakaway from there. Simultaneous pushback is not permitted for aircraft stands 1, 2 and 3.  <u>OR</u>  • onto TWY L5 to face North until its nosewheel is behind the stopbar behind aircraft stand 3. The aircraft may breakaway from there. Simultaneous pushback is not permitted for aircraft stands 1, 2 and 3. Pushback from aircraft stands 1 and 2 to face South is not permitted.	Pushback approved, to face West.   Pushback approved, to face North.
3, 4, 5, 6, 7, 8, 9, 10	The aircraft (on idle thrust) shall be pushed back onto TWY L5 to face North or South until its nosewheel is at the intersection of the aircraft stand lead-in line and the centreline of TWY L5. The aircraft may breakaway from there. There shall be no simultaneous pushback of aircraft unless there is at least one aircraft stand separation. Simultaneous pushback is not permitted for aircraft stands 1, 2 and 3.	Pushback approved, to face North or South.
11, 12, 13	The aircraft (on idle thrust) shall be pushed back onto TWY L5 to face North or South until its nosewheel is at the "END OF PUSH (EOP)" position and the centreline of TWY L5. The aircraft may breakaway from there. There shall be no simultaneous pushback of aircraft unless there is at least one aircraft stand separation.	Pushback approved, to face North or South.
14	The aircraft (on idle thrust) shall be pushed back onto TWY L5 to face North until its nosewheel is at the "END OF PUSH (EOP)" position and the centreline of TWY L5. The aircraft may breakaway from there. There shall be no simultaneous pushback of aircraft unless there is at least one aircraft stand separation.	Pushback approved, to face North.
15, 16, 701, 702	The aircraft (on idle thrust) shall be pushed back onto TWY L5 centreline to face North. The aircraft shall then be towed forward until its nosewheel is at the position between aircraft stands 12 and 13. The aircraft may breakaway from there.	Pushback approved, to face North.

APRON/ ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
17	The aircraft (on idle thrust) shall be pushed back to face West until its nosewheel is at the "END OF PUSH (EOP)" position. The aircraft shall then be towed forward onto TWY L5 to face North until its nosewheel is at the position between aircraft stands 12 and 13. The aircraft may breakaway from there.	Standard pushback approved.
<b>SOUTH APRON</b>		
461	The aircraft (on idle thrust) shall be pushed back onto taxiway S1 to face west until its nosewheel is at EOP position. The aircraft may breakaway from there. There shall be no simultaneous aircraft pushback from aircraft stands 462, 462L, 462R, 463, 463L and 463R.	Pushback approved, to face west
462	The aircraft (on idle thrust) shall be pushed back onto taxiway S1 to face west until its nosewheel is at the intersection of the aircraft stand pushback line and taxiway 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.	Pushback approved, to face west
462L	The aircraft (on idle thrust) shall be pushed back onto taxiway S1 to face west until its nosewheel is at the intersection of the aircraft stand pushback line and taxiway 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.	Pushback approved, to face west
462R	The aircraft (on idle thrust) shall be pushed back onto taxiway S1 to face west until its nosewheel is at the intersection of the aircraft stand pushback line and taxiway 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.	Pushback approved, to face west
463	The aircraft (on idle thrust) shall be pushed back onto taxiway S1 to face west until its nosewheel is at the intersection of the aircraft stand pushback line and taxiway 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.	Pushback approved, to face west
463L	The aircraft (on idle thrust) shall be pushed back onto taxiway S1 to face west until its nosewheel is at the intersection of the aircraft stand pushback line and taxiway 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 taxiway S1 to face west until the nose of the aircraft is behind the stop bar 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

### PUSHBACK PROCEDURES FOR AIRCRAFT



### PUSHBACK PROCEDURES FOR AIRCRAFT



## **4 ADVANCED MULTILATERATION SYSTEM**

### **4.1 INTRODUCTION**

4.1.1 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.

### **4.2 CARRIAGE OF MODE-S SSR TRANSPONDER**

4.2.1 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.

### **4.3 MULTILATERATION SYSTEM OUTLINE**

4.3.1 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.

4.3.2 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.

### **4.4 AIRCRAFT REQUIREMENTS**

4.4.1 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.

4.4.2 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.

### **4.5 PROCEDURES/ACTIONS REQUIRED BY PILOTS**

4.5.1 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.

#### **4.5.2 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).

#### **4.5.3 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).

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

**5.1 INTRODUCTION**

5.1.1 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).

**5.2 ROUTE SELECTION AND PRIORITY**

5.2.1 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.

5.2.2 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.

5.2.3 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.

**5.3 INFORMATION AND MANDATORY SIGNS/MARKINGS**

5.3.1 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.

**5.4 TAXI INSTRUCTIONS USING THE GREEN TAXIWAY CENTRELINE LIGHTS**

5.4.1 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**

<b>IN APPROACH / TKOF AREAS</b>			<b>IN CIRCLING AREA AND AT AD</b>		
<i>RWY/Area affected</i>	<i>OBST type, ELEV, Markings/LGT</i>	<i>Coordinates</i>	<i>OBST type, ELEV, Markings/LGT</i>	<i>Coordinates</i>	
1	2	3	1	2	
a) RWY 20R APCH RWY 02L TKOF	Mast HGT ranging fm 98ft AMSL and above.	Shipping channel aprx 1290m 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	3	
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	012056.26N 1035838.83E (10.29 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	012233.95N 1035920.06E (10.29 M)	4.01 M 4.31 M
02C	023.03°	4000 M x 60 M	72/F/B/W/U Bituminous concrete	011943.51N 1035905.86E (10.28 M)	4.32 M 4.52 M
20C	203.03°	4000 M x 60 M	72/F/B/W/U Bituminous concrete	012143.37N 1035956.46E (10.28 M)	4.58 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:

- a. initiated by pilot and approved by ATC, traffic permitting.
- b. 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
<b>02L</b>	CAT II High Intensity 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 threshold lights.	PAPI 003° located either side of runway, 422m behind runway threshold, 2 White light and 2 Red light (20.6m), 3 White light and 1 Red light (23.1m), 4 White light (25.6m). Aircraft with eye-to-wheel height greater than 8m are advised to fly with 2 White and 2 Red light visible so as to achieve sufficient wheel clearance.	White	Inset High Intensity centreline lights as follows: From threshold to 900m from runway end: White, 300m to 900m from runway end: Alternating Red/ White, 300m to runway end: Red.	Bi-directional raised White/Amber edge lights.	Red	Elevated Red
<b>20R</b>	CAT I High Intensity distance coded centreline lights showing variable White and crossbars at 150m, 300m, 450m, 600m and 750m.	Green supplemented by green wing bar and 2 threshold lights.	PAPI 003° located either side of runway, 410m from threshold. 2 White light and 2 Red light (20.0m), 3 white light and 1 Red light (22.6m), 4 White light (25.0m). Aircraft with eye-to-wheel height greater than 8m are advised to fly with 2 White and 2 Red light visible so as to achieve sufficient wheel clearance.	Nil	Inset High Intensity centreline lights as follows: From threshold to 900m from runway end: White, 300m to 900m from runway end: Alternating Red/ White, 300m to runway end: Red.	Red runway edge lights in the direction of Runway 20R before the displaced threshold. Bi-directional raised White/Amber edge lights after the displaced threshold.	Red	Elevated Red
<b>02C</b>	CAT I High Intensity consisting of centreline barrettes showing variable white, 1 crossbar, 2 approach beacons and sequenced flashing lights.	Green supplemented by green wing bar and 2 threshold lights.	PAPI 003° located either side of runway, 418m from threshold. 2 White light and 2 Red light (20.4m), 3 White light and 1 Red light (23.1m), 4 White light (25.5m). Aircraft with eye-to-wheel height greater than 8m are advised to fly with 2 White and 2 Red light visible so as to achieve sufficient wheel clearance.	Nil	Inset High Intensity centreline lights as follows: From threshold to 900m from runway end: White, 300m to 900m from runway end: Alternating red/ white, 300m to runway 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
<b>20C</b>	CAT II High Intensity 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 fm 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 hgt greater than 8m are adz to fly with 2 White and 2 Red lgt visible so as to achieve sufficient wheel clearance.	White	Inset High Intensity centreline lights as flw: From THR to 900m fm RWY end: White, 300m to 900m fm 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: 012209.22N 1035858.47E (western side of RWY 02L/20R) ALTN FLG W G EV 2.3 SEC, OPR hours HN + IMC IBN: 012301.28N 1035959.52E (top of building N of SIA hangar) FLG G 'CH' EV 7 SEC, OPR 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>	<b>CHANGI CTR</b> 013300N 1040149E 013042N 1040654E 012542N 1040448E thence along Kuala Lumpur/Singapore FIR bdy 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_ats_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>	
<b>ACC</b>	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, 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		0000-1530	for ATS Routes A464, A576, G579 (all southbound), B470, L644, N875 and in area in the immediate vicinity of Singapore.
		124.05 MHz	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	
<b>APP</b>	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>
<b>TWR</b>	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
	Singapore Delivery	129.95 MHz	H24	for ground emergency
	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.	
<b>D-ATIS</b>	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 1035901.20E	Located 368m (1207ft) from THR RWY 02C, along RWY centreline. Course width 3.38°. EM: A0/A2. Maintenance Period: May - October Second Friday of every month between 1600-2300 November - April Second Friday of every month between 0200-0900
RWY 20C ILS GP	-	333.2MHz	H24	012131.73N 1035955.72E	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	012131.73N 1035955.72E	DME co-located with GP. EM: P9
RWY 20C ILS MM	-	75MHz	H24	012211.94N 1040008.52E	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	012154.41N 1040001.08E	Located 368m (1207ft) from THR RWY 20C, along RWY centreline. Course width 3.38°. EM: A0/A2. Maintenance Period: May - October Second Friday of every month between 0200-0900 November - April Second Saturday of every month between 0200-0900
RWY 02C ILS GP	-	334.1MHz	H24	011952.11N 1035913.68E	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: 18m (58ft) EM: A0/A2
RWY 02C ILS DME	ICE	CH20X	H24	011952.11N 1035913.68E	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. Maintenance Period: May - October First Saturday of every month between 0200-0900 November - April First Friday of every month between 0200-0900
RWY 20R ILS GP	-	329.3MHz	H24	012225.54N 1035912.29E	Located 330m (1083ft) from displaced THR RWY 20R on right side of the RWY, 120m (394ft) from RWY centreline. GP angle 3°. HGT of ILS REF datum: 17m (56ft) EM: A0/A2
RWY 20R ILS DME	ICH	CH26X	H24	012225.54N 1035912.29E	DME co-located with GP. Rwy 20R ILS DME not available beyond 15 degrees west of RWY 20R centreline below 2500ft. EM: P9
RWY 20R ILS MM	-	75MHz	H24	012307.50N 1035934.23E	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 Maintenance Period: May - October First Friday of every month between 0200-0900 November - April First Saturday of every month between 0200-0900
RWY 02L ILS GP	-	330.8MHz	H24	012108.34N 1035838.94E	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: 18m (58ft) EM:A0/A2
RWY 02L ILS DME	ICW	CH46X	H24	012108.34N 1035838.94E	DME co-located with GP EM:P9
RWY 02L ILS MM	-	75MHz	H24	012027.53N 1035826.70E	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 pages WSAP AD 2-5 to WSAP AD 2-7 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.

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

Aeronautical Service	PAYA LEBAR Airport	SINGAPORE CHANGI Airport	Significant Differences and Remarks
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:

- a. if waiting clear of the runway, taxi immediately on to it and begin take-off run immediately without stopping the aircraft;
- b. if already lined-up on the runway, take-off without delay;
- c. 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.  Note 2: * Indicates Rapid Exit Taxiway (RET) and maximum design ground speed for the exit taxiway is 50kts.
20C	<u>E6*(1948)</u> , <u>E7*(2391)</u> and E8 (3152)	
02L	<u>W5*(1966)</u> , <u>W4*(2491)</u> and W3* (2876)	
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:

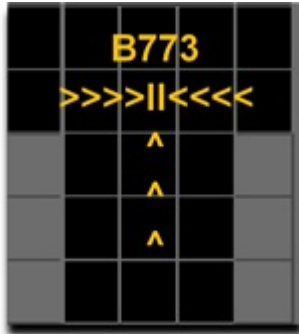





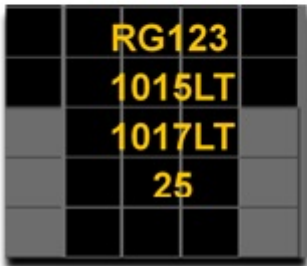
- a. AOCS A-CDM portal;
- b. GMID;
- c. ADGS at contact stands;
- d. Radio communication with GHA or AO;
- e. ATC - Upon issuance of ATC clearance (for flights parked at aircraft stands without ADGS).



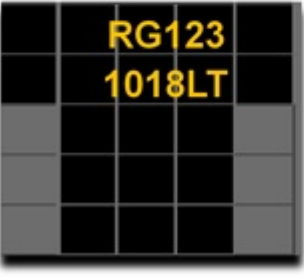
**5 A-CDM START-UP PROCEDURES**

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><b>Aircraft arrival to stand</b></p> <ul style="list-style-type: none"> <li>No change in existing functionality and display</li> </ul>	
<p><b>40 minutes prior to TOBT</b></p> <ul style="list-style-type: none"> <li>ADGS will display TOBT submitted by AO / GHA and a count down timer (2 digits) to TOBT in minutes</li> <li>As ADGS can only display up to 7 characters per line, the displayed message will be scrolling.</li> <li>Timings displayed will be in Local Time (LT)</li> <li>TOBT timings will change instantly if there is an update done by AO / GHA</li> </ul>	<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><b>25 minutes prior to TOBT</b></p> <ul style="list-style-type: none"> <li>ADGS will display TSAT derived by PDS</li> <li>AS ADGS can only display up to 7 characters per line, the displayed message will be scrolling.</li> <li>TSAT timings may change as the PDS is continuously optimising push back times based on real time traffic conditions</li> </ul>	<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><b>Aircraft departure from stand</b></p> <ul style="list-style-type: none"> <li>ADGS will display the actual off-block time (AOBT)</li> <li>As ADGS can only display up to 7 characters per line, the displayed message will be scrolling</li> <li>TOBT, TSAT and TOBT countdown timer will be removed</li> <li>AOBT display will be removed 3 minutes after AOBT</li> </ul>	<p>Snapshot 1</p> 
	<p>Snapshot 2</p> 
	<p>Snapshot 3</p> 

## 7 CONTACT AND INFORMATION

7.1 Please contact the airport operator, Changi Airport Group (CAG), at [a-cdm@changiairport.com](mailto: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:

- Aircraft departing Singapore will be cleared to FL280;
- 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;
- Additional longitudinal separation as appropriate shall be imposed by ATC when the succeeding aircraft is faster than the preceding aircraft on the same route;
- 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 124.3MHz, 121.725MHz or 121.85MHz). 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 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 124.3MHZ, 121.85MHZ AND 121.725MHZ**

- 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 124.3MHz, 121.85MHz or 121.725MHz.
- 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 124.3MHz, 121.85MHz or 121.725MHz immediately upon instructed by ATC after clearing the runway. He shall maintain watch on 124.3MHz, 121.85MHz or 121.725MHz for taxiing and parking instructions until he arrives at his aircraft stand.

**16 TAXIING**

- 16.1 Taxi clearance given by 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 Ground 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 RNAV<sub>(GNSS)</sub> SIDs and STARs**

### **18.1 INTRODUCTION**

- 18.1.1 The RNAV<sub>(GNSS)</sub> SIDs and STARs are designed in accordance with the ICAO RNAV<sub>(GNSS)</sub> Departure and Arrival criteria as stipulated in the ICAO PANS-OPS (Doc 8168) Volume II.
- 18.1.2 For RNAV<sub>(GNSS)</sub> SIDs and STARs operations, the aircraft shall be GNSS-equipped and the navigation systems shall meet ICAO RNP-1 standard of accuracy, or equivalent, such as JAA TGL 10 or FAA AC 90-96A Appendix 2 - Precision Area Navigation (P-RNAV).
- 18.1.3 To avoid proliferation of SIDs and STARs, the basic RNAV SIDs and STARs have been modified to follow similar tracks as the RNAV<sub>(GNSS)</sub> SIDs and STARs using the same set of SIDs and STARs identification.
- 18.1.4 Operators/pilots who are not approved to fly the RNAV<sub>(GNSS)</sub> SIDs and STARs shall fly the alternate basic RNAV SIDs and STARs or expect radar vectors from ATC.

### **18.2 ARRIVALS**

- 18.2.1 STARs are presented in diagrammatic and textual format on a chart which comprises two main elements:
- a. A TRANSITION route; and
  - b. An ARRIVAL route.
- 18.2.2 A TRANSITION starts at a waypoint on the ATS route and then requires VOR/DME or RNAV tracking to position the aircraft for the ARRIVAL route.
- 18.2.3 All arriving aircraft are required to follow the appropriate TRANSITION and ARRIVAL routes. The TRANSITION routes are as follows:



ATS Route	Transition	Transition Route	RNAV STAR
B469 (southbound to Singapore) L642 N892	BIKTA VEPLI MABAL	BIKTA-PIBAP-PASPU VEPLI-VINIL-PIBAP-PASPU MABAL-KILOT-VINIL-PIBAP-PASPU	PASPU ARRIVAL
A464 (southbound to Singapore) A576 (southbound to Singapore) R469	ARAMA REKOP no transition	ARAMA-BOBAG REKOP-BOBAG no transition	BOBAG ARRIVAL
G579	no transition	no transition	REMES ARRIVAL
L504 M635 M774	OBDOS SURGA OBDOS	OBDOS-IKAGO-IKIMA-IBULA-LAVAX SURGA-IKAGO-IKIMA-IBULA-LAVAX OBDOS-IKAGO-IKIMA-IBULA-LAVAX	LAVAX ARRIVAL
M767 / G580 M646 / G580 G580	TOMAN	TOMAN-KARTO-KEXAS-LAVAX	
Note: Aircraft landing at Singapore Changi Airport operating on N891, M753 and L642 shall flight plan only on L642 after ENREP			

18.2.4 Additional elements on the STAR chart include the following:

- Vertical restrictions*, designed to contain aircraft in controlled airspace and to separate aircraft from obstacles and to avoid, to the degree possible, conflict with departing traffic.
- Speed restrictions*, designed for flow control purposes.
- Minimum safe altitude (MSA)* within 25NM of VTK and SJ DVOR/DME. The MSA provides a minimum of 1000ft vertical clearance within 5NM of any obstacle.

18.2.5 Arrivals to Singapore Changi Airport can expect radar vectors to intercept the localizer for an ILS approach after the initial approach fix on the RNAV STARs.

18.2.6 STARs shall be issued by ATC in the following order:

- ARRIVAL identifier;
- TRANSITION identifier;
- Runway-in-use;
- An assigned level

Example:

<Callsign> cleared to Singapore via PASPU 1A ARRIVAL, VEPLI TRANSITION, Runway 02, maintain / descend to flight level one five zero.

### 18.3 DEPARTURES

18.3.1 All departing aircraft will be cleared on the appropriate RNAV<sub>(GNSS)</sub> SID and shall climb initially to 3,000ft.

18.3.2 Operators are to note that RNAV<sub>(GNSS)</sub> SIDs VENPA 1A and 1B will be assigned to departures from Singapore Changi Airport that flight plan to destinations south of Singapore on L504, M635 and M774.

There will be 3 Transitions as shown below:

ATS Route	Transition	Transition Route	RNAV SID
L504	BAVUS	VENPA-ATKAX-BAVUS	VENPA DEPARTURE
M635	SURGA	VENPA-VENIX-SURGA	
M774	KADAR	VENPA-ATKAX-KADAR	

18.3.3 A Transition will be issued by ATC in conjunction with the RNAV<sub>(GNSS)</sub> SID, for example a departure from Singapore to Brisbane via airway M774 will read as follows:

Example:

<Callsign> cleared to Brisbane via VENPA 1A departure Transition KADAR, airway M774, flight plan route, maintain FL330, squawk alfa 2234 on departure.

**18.4 TRANSITION**

18.4.1 Aircraft may be radar vectored off a Transition / RNAV SID / RNAV STAR. Such aircraft will subsequently be given an instruction to intercept the appropriate Transition / RNAV SID / RNAV STAR.

**18.5 VERTICAL AND SPEED RESTRICTIONS**

18.5.1 Pilots shall comply with an ATC assigned level. Pilots shall also adhere to the vertical and speed restrictions depicted on the cleared Transition and RNAV<sub>(GNSS)</sub> SIDs / 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 Transition and RNAV<sub>(GNSS)</sub> SIDs / STARs.

**18.6 OPERATORS' PROCEDURES**

18.6.1 The operator shall ensure that in-flight procedures, crew manuals and training programmes are established in accordance with RNAV requirements.

18.6.2 Pilots shall inform ATC when on-board equipment does not meet the requirements of RNAV. 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 / D 17.2
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 / D 195.5	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
BIDUS	013554N	1035755E	VTK R-326.0 / D13.2	SJ R-006.9 / D22.6
BIKTA	024337N	1034308E	VTK R-346.9 / D80.4	SJ R-355.0 / D90.2
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
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
HOSBA	011948N	1042418E	VTK R-102.5 / D23.6	SJ R-079.0 / D33.7
IBIBI	011503N	1035707E	VTK R-203.1 / D10.7	SJ R-073.4 / D6.0
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
KARTO	011124N	1053343E	VTK R-098.3 / D93.5	SJ R-091.1 / D102.6

Name	Latitude	Longitude	Radius/Distance from VTK	Radius/Distance from SJ
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
LEGAS	011524N	1035618E	VTK R-207.9 / D10.8	SJ R-067.3 / D5.4
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
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
VEPLI	035223N	1040542E	VTK R-001.7 / D146.8	SJ R-005.2 / D158.9
VINIL	025500N	1040618E	VTK R-003.2 / D89.8	SJ R-008.5 / D102.3
VMR	022318N	1035218E	VTK R-351.2 / D58.8	SJ R-000.9 / D69.6
VTK (TEKONG)	012455N	1040120E	-	-

## 20 ARRIVING AIRCRAFT

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

## 21 LIGHT AIRCRAFT OPERATIONS

21.1 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.

21.2 Flight notification shall be given by filing a flight plan.

21.3 All such operations will be regulated in accordance with IFR procedures.

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

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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

SINGAPORE/SINGAPORE CHANGI

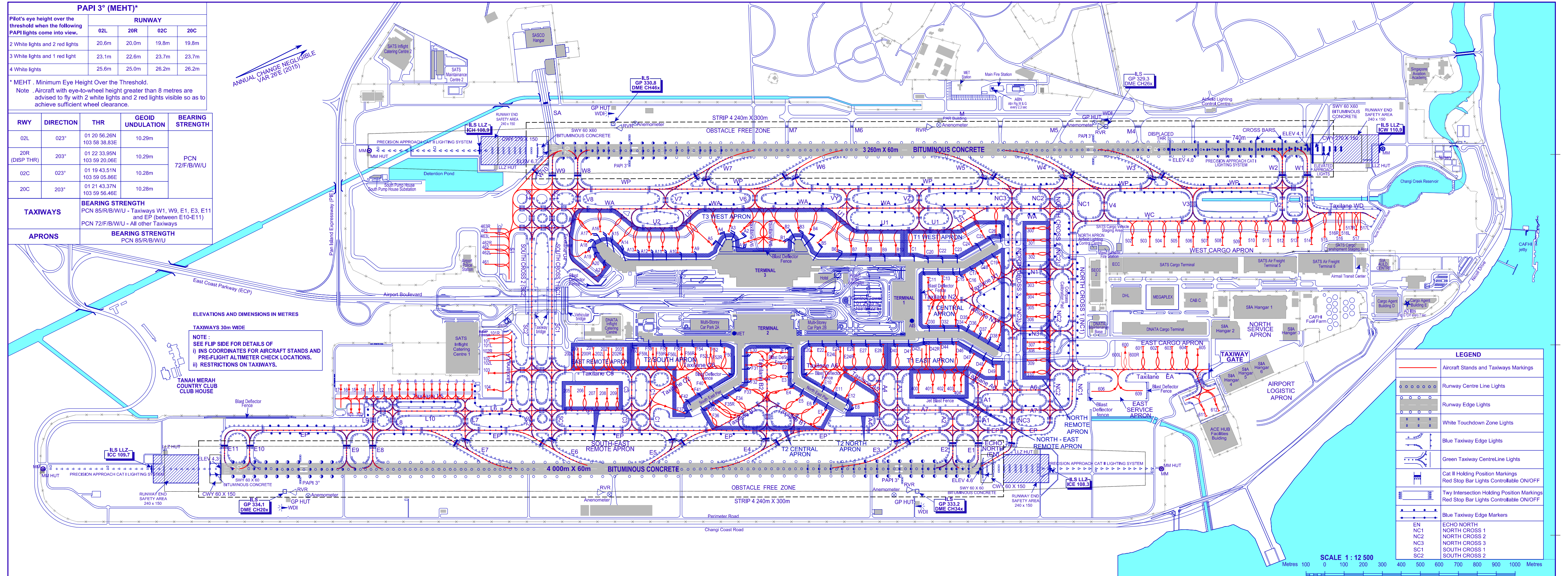
PAPI 3° (MEHT)*				
Pilot's eye height over the threshold when the following PAPI lights come into view.	RUNWAY			
	02L	20R	02C	20C
2 White lights and 2 red lights	20.6m	20.0m	19.8m	19.8m
3 White lights and 1 red light	23.1m	22.6m	23.7m	23.7m
4 White lights	25.6m	25.0m	26.2m	26.2m

\* 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	GEOD UNDULATION	BEARING STRENGTH
02L	023°	01 20 56.26N 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) and EP (between E10-E11)

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

SCALE 1 : 12 500

Metres 100 0 100 200 300 400 500 600 700 800 900 1000 Metres



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 19.96	103 59 02.79	4.68m (15.29ft)	
	A4	01 21 17.61	103 59 02.54	4.79m (15.72ft)	
	A5	01 21 15.50	103 59 03.62	4.86m (15.94ft)	
	A9	01 21 12.56	103 59 03.65	5.02m (16.47ft)	
	A10	01 21 10.34	103 59 02.40	5.04m (16.54ft)	
	A11	01 21 07.93	103 59 01.41	5.25m (17.22ft)	
	A12	01 21 05.76	103 59 00.49	5.38m (17.65ft)	
	A13	01 21 03.59	103 58 59.58	5.48m (17.98ft)	
	A14	01 21 01.66	103 58 57.59	5.57m (18.27ft)	
	A15	01 21 00.77	103 58 55.41	5.46m (17.91ft)	
	A16	01 20 59.27	103 58 54.20	5.51m (18.08ft)	
	A17	01 20 57.25	103 58 54.06	5.23m (17.16ft)	
	A18	01 20 55.87	103 58 55.25	5.37m (17.62ft)	
	A19	01 20 55.26	103 58 55.23	5.40m (17.72ft)	
	A20	01 20 56.09	103 58 58.83	5.45m (17.88ft)	
	A21	01 20 57.10	103 59 00.80	5.49m (18.01ft)	
	T3 NORTH APRON	B1	01 21 26.86	103 59 08.37	4.82m (15.81ft)
		B2	01 21 28.18	103 59 06.82	4.68m (15.35ft)
		B3	01 21 30.33	103 59 07.30	4.65m (15.26ft)
B4		01 21 32.03	103 59 08.60	4.75m (15.58ft)	
B5		01 21 32.98	103 59 10.89	4.80m (15.75ft)	
B6		01 21 35.15	103 59 13.16	4.96m (16.27ft)	
B7		01 21 37.65	103 59 13.93	4.97m (16.31ft)	
B8		01 21 39.94	103 59 15.20	5.09m (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 55.83	103 59 26.07	5.03m (16.50ft)	
C18		01 21 57.96	103 59 25.75	4.99m (16.37ft)	
C19		01 21 59.79	103 59 25.63	4.95m (16.24ft)	
T1 EAST APRON		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)	
	D40	01 21 38.13	103 59 32.89	5.07m (16.63ft)	
	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)	
T2 NORTH APRON	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)	
	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)		
T2 CENTRAL APRON	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 33.46	103 59 30.93	5.03m (16.50ft)	
	E28	01 21 35.74	103 59 31.89	5.08m (16.67ft)	
	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)		
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)		

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

LOCATION	STAND NR	NORTH LAT	EAST LONG	ELEVATION	
T2 SOUTH APRON	F37	01 20 59.83	103 59 27.87	4.75m (15.58ft)	
	F40	01 21 05.62	103 59 25.34	4.85m (15.91ft)	
	F41	01 21 03.19	103 59 25.58	4.82m (15.81ft)	
	F42	01 21 00.61	103 59 25.96	4.72m (15.49ft)	
	F50	01 21 10.69	103 59 21.32	5.03m (16.50ft)	
	F52	01 21 08.51	103 59 20.40	5.11m (16.77ft)	
	F52L	01 21 07.82	103 59 20.11	5.16m (16.93ft)	
	F52R	01 21 09.04	103 59 20.62	5.08m (16.67ft)	
	F54	01 21 06.14	103 59 19.40	5.22m (17.13ft)	
	F56	01 21 03.96	103 59 18.48	5.30m (17.39ft)	
	F56L	01 21 03.27	103 59 18.18	5.42m (17.78ft)	
	F56R	01 21 04.49	103 59 18.70	5.34m (17.52ft)	
	F58	01 21 01.58	103 59 17.47	5.49m (18.01ft)	
	F59	01 20 59.41	103 59 16.55	5.64m (18.50ft)	
	F59L	01 20 58.72	103 59 16.26	5.67m (18.60ft)	
	F59R	01 20 59.93	103 59 16.78	5.60m (18.37ft)	
	F60	01 20 56.91	103 59 15.50	5.77m (18.93ft)	
	EAST REMOTE APRON	200	01 20 47.83	103 59 11.67	6.23m (20.44ft)
		200L	01 20 46.91	103 59 11.92	6.29m (20.64ft)
		200R	01 20 48.35	103 59 11.89	6.18m (20.28ft)
		201	01 20 49.99	103 59 12.62	5.96m (19.55ft)
202		01 20 52.34	103 59 13.57	5.94m (19.49ft)	
202L		01 20 51.65	103 59 13.28	5.76m (18.90ft)	
202R		01 20 52.87	103 59 13.79	5.73m (18.80ft)	
203		01 20 54.52	103 59 14.47	5.92m (19.42ft)	
SOUTH-EAST REMOTE APRON		101	01 20 34.88	103 59 04.05	4.49m (14.73ft)
		101L	01 20 34.60	103 59 04.70	4.60m (15.09ft)
	101R	01 20 35.11	103 59 03.50	4.53m (14.86ft)	
	102	01 20 33.76	103 59 06.65	4.49m (14.73ft)	
	102L	01 20 33.53	103 59 07.33	4.62m (15.16ft)	
	102R	01 20 34.00	103 59 06.10	4.60m (15.09ft)	
	103	01 20 32.88	103 59 09.35	4.67m (15.32ft)	
	104	01 20 31.77	103 59 11.96	4.39m (14.40ft)	
	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 44.87	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 38.72	103 59 38.56	4.09m (13.42ft)	
	510	01 22 41.37	103 59 40.18	4.19m (13.75ft)	
	511	01 22 43.54	103 59 41.09	4.22m (13.85ft)	
512	01 22 45.71	103 59 42.01	4.24m (13.91ft)		
513	01 22 47.89	103 59 42.92	4.26m (13.98ft)		
514	01 22 50.19	103 59 43.54	4.36m (14.30ft)		
515	01 22 52.90	103 59 43.20	4.09m (13.43ft)		
516	01 22 55.39	103 59 43.97	4.04m (13.26ft)		
516L	01 22 56.24	103 59 43.80	3.96m (12.98ft)		
516R	01 22 54.93	103 59 43.25	3.95m (12.97ft)		
517	01 22 58.02	103 59 45.08	4.05m (13.27ft)		
517L	01 22 58.83	103 59 44.99	3.98m (13.05ft)		
517R	01 22 57.55	103 59 44.35	3.96m (12.98ft)		
EAST CARGO APRON	600	01 22 14.12	103 59 48.10	4.25m (13.94ft)	
	600L	01 22 13.28	103 59 48.27	4.22m (13.83ft)	
	600R	01 22 14.58	103 59 48.81	4.15m (13.60ft)	
	601	01 22 16.52	103 59 49.27	4.27m (14.01ft)	
602	01 22 18.80	103 59 50.23	4.30m (14.11ft)		
603	01 22 21.15	103 59 51.02	4.29m (14.07ft)		
604	01 22 23.46	103 59 51.99	4.31m (14.14ft)		
605	01 22 25.19	103 59 52.75	4.27m (14.01ft)		
EAST SERVICE APRON	606	01 22 09.09	103 59 53.22	2.70m (8.86ft)	
	609	01 22 12.19	103 59 54.57	3.01m (9.88ft)	
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)	



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

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

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

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

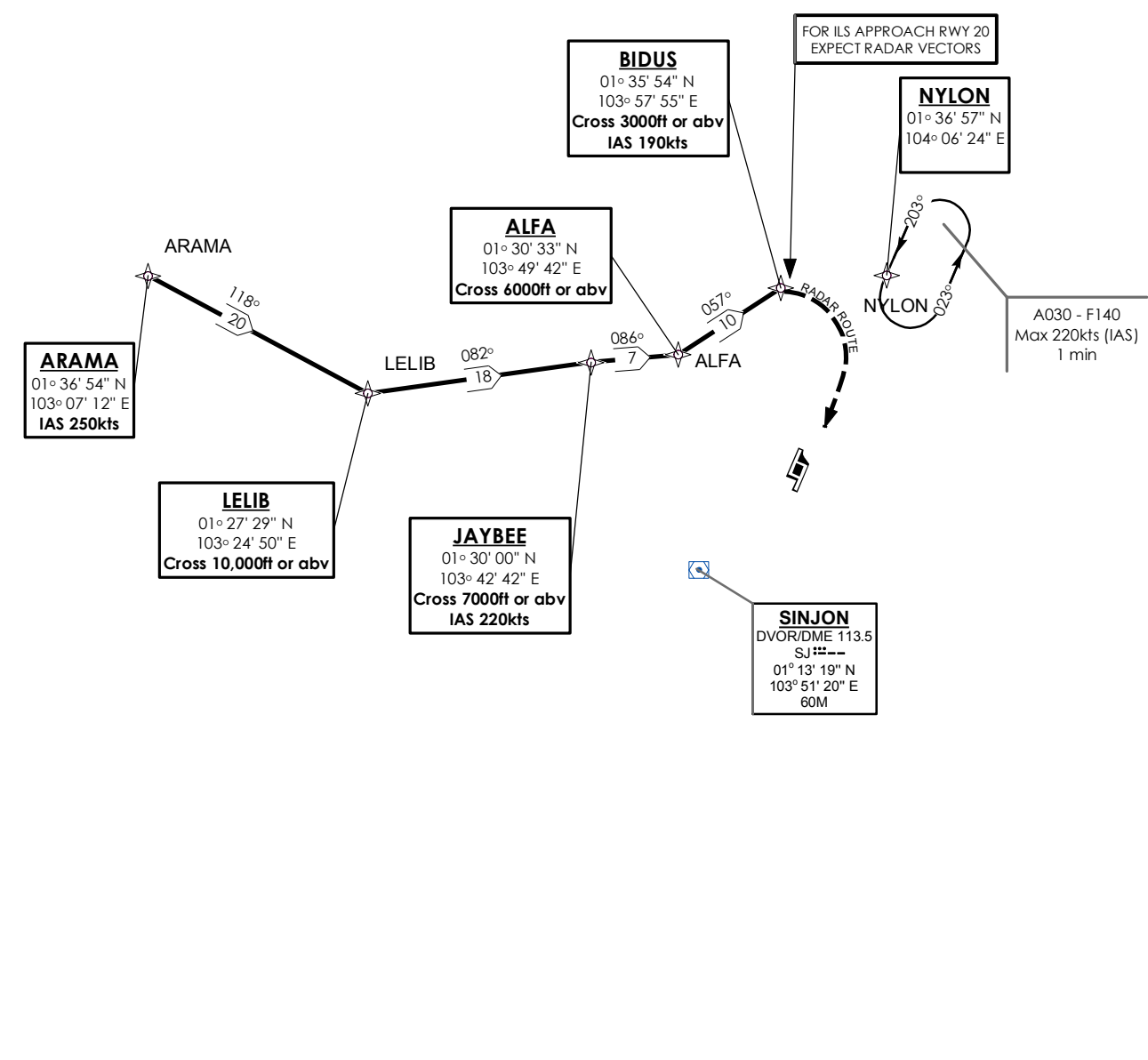
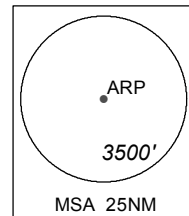
ELEV, ALT IN FEET  
BEARINGS, TRACKS AND  
RADIALS ARE MAGNETIC  
VAR 26°E (2015)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

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



For flight landing at Singapore Changi Airport, pilots are to request for the STAR from Singapore ATC when the flight is within 120 DME SJ and RWY 20 is in use. Flight shall still remain under the control of WMKK ATC.

NOT TO SCALE

**LELIB 3B (STAR) RNAV GNSS RWY 20R/20C - DESCRIPTIONS**

**Formal & Abbreviated Descriptions**

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

**Tabular Descriptions**

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	ARAMA	-	-	-0.5	-	-	K250	RNAV1
TF	LELIB	-	118(118.5)	-0.5	L	A100+	-	RNAV1
TF	JAYBEE	-	082(082.0)	-0.5	R	A070+	K220	RNAV1
TF	ALFA	-	086(086.5)	-0.5	L	A060+	-	RNAV1
TF	BIDUS	-	057(057.1)	-0.5	-	A030+	K190	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

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

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

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

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

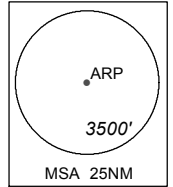
ELEV, ALT IN FEET  
BEARINGS, TRACKS AND  
RADIALS ARE MAGNETIC  
VAR 26°E (2015)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: RNAV-1 NAVIGATION SPECIFICATION GNSS REQUIRED

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



**PASPU**  
01° 59' 15" N  
104° 06' 18" E  
IAS 220kts

**PAPA UNIFORM**  
DVOR/DME 115.1  
PU :---  
01° 25' 24" N  
103° 56' 00" E  
60M  
Cross 7,000ft or abv

DEVIATION IS NOT PERMITTED  
BETWEEN SJ AND PU

**WSR38**  
10,000ft ALT  
GND

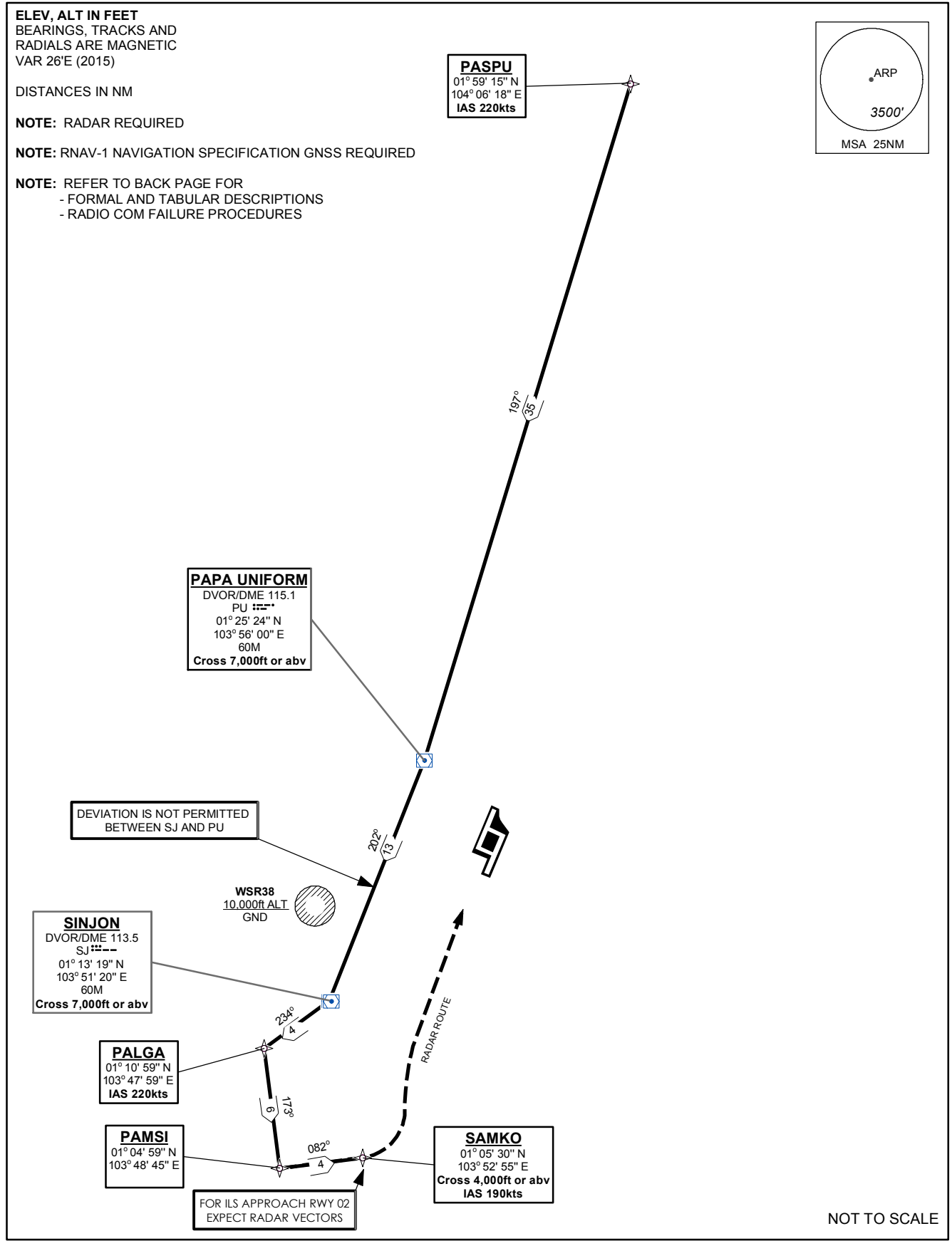
**SINJON**  
DVOR/DME 113.5  
SJ :---  
01° 13' 19" N  
103° 51' 20" E  
60M  
Cross 7,000ft or abv

**PALGA**  
01° 10' 59" N  
103° 47' 59" E  
IAS 220kts

**PAMSI**  
01° 04' 59" N  
103° 48' 45" E

**SAMKO**  
01° 05' 30" N  
103° 52' 55" E  
Cross 4,000ft or abv  
IAS 190kts

FOR ILS APPROACH RWY 02  
EXPECT RADAR VECTORS



NOT TO SCALE

**LEBAR 2A (STAR) RNAV GNSS RWY 02L - DESCRIPTIONS**

**Formal & Abbreviated Descriptions**

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

**Tabular Descriptions**

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	PASPU	-	-	-0.5	-	-	K220	RNAV1
TF	PU	-	197(197.5)	-0.5	R	A070+	-	RNAV1
TF	SJ	-	202(202.5)	-0.5	R	A070+	-	RNAV1
TF	PALGA	-	234(234.5)	-0.5	L	-	K220	RNAV1
TF	PAMSI	-	173(173.5)	-0.5	L	-	-	RNAV1
TF	SAMKO	-	082(082.5)	-0.5	-	A040+	K190	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

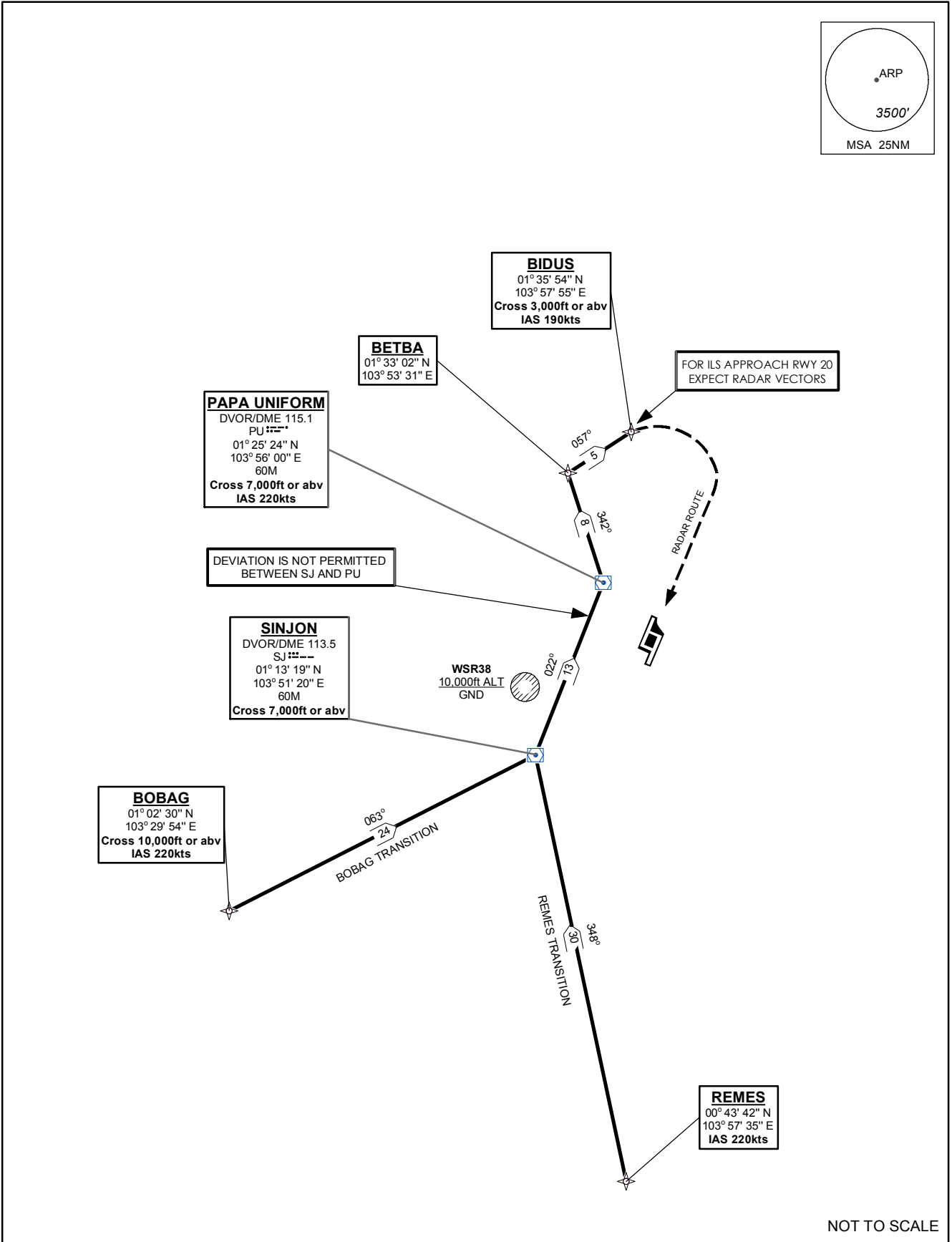
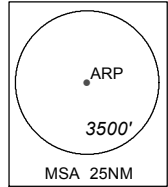
**STANDARD ARRIVAL CHART**  
**RNAV (GNSS) -**  
**INSTRUMENT (STAR)**

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

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

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



**LEBAR 2B (STAR) RNAV GNSS RWY 20R - DESCRIPTIONS**

**Formal & Abbreviated Descriptions**

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

**Tabular Descriptions (BOBAG Transition)**

Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	BOBAG	-	-	-0.5	-	A100+	K220	RNAV1
TF	SJ	-	063(063.5)	-0.5	L	A070+	-	RNAV1
TF	PU	-	022(022.5)	-0.5	L	A070+	K220	RNAV1
TF	BETBA	-	342(342.5)	-0.5	R	-	-	RNAV1
TF	BIDUS	-	057(057.5)	-0.5	-	A030+	K190	RNAV1

**Tabular Descriptions (REMES Transition)**

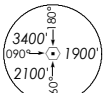
Path Term	Waypoint Name	Fly-Over	Course °M(°T)	Magnetic Variation	Turn Direction	Altitude	Speed Limit	Navigation Spec
IF	REMES	-	-	-0.5	-	-	K220	RNAV1
TF	SJ	-	348(348.5)	-0.5	R	A070+	-	RNAV1
TF	PU	-	022(022.5)	-0.5	L	A070+	K220	RNAV1
TF	BETBA	-	342(342.5)	-0.5	R	-	-	RNAV1
TF	BIDUS	-	057(057.5)	-0.5	-	A030+	K190	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

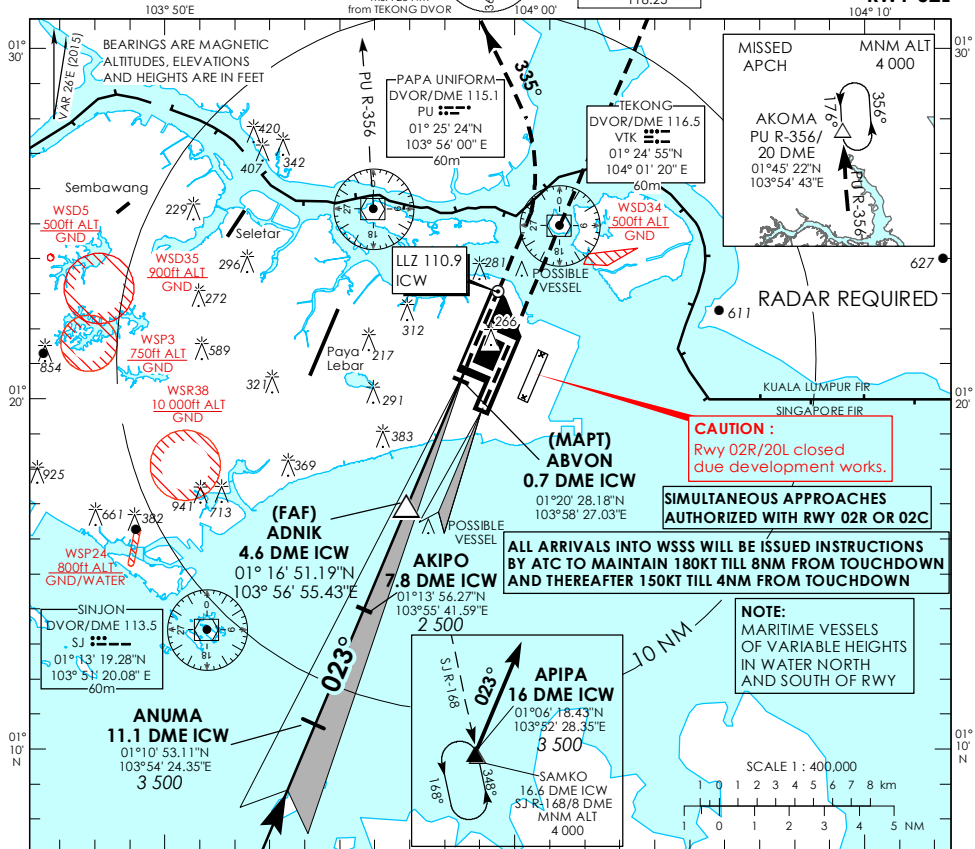
**INSTRUMENT APPROACH CHART**

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



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

**SINGAPORE/ SINGAPORE CHANGI ICW ILS/DME RWY 02L**

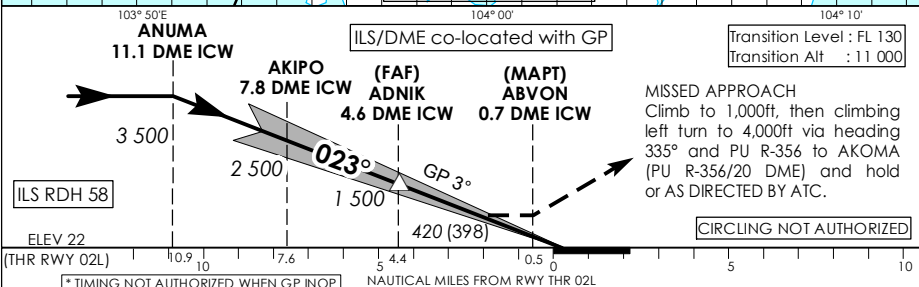


**CAUTION :**  
Rwy 02R/20L closed due development works.

**SIMULTANEOUS APPROACHES AUTHORIZED WITH RWY 02R OR 02C**

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

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



Transition Level : FL 130  
Transition Alt : 11 000

**MISSED APPROACH**  
Climb to 1,000ft, then climbing left turn to 4,000ft via heading 335° and PU R-356 to AKOMA (PU R-356/20 DME) and hold or AS DIRECTED BY ATC.

\* TIMING NOT AUTHORIZED WHEN GP INOP

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

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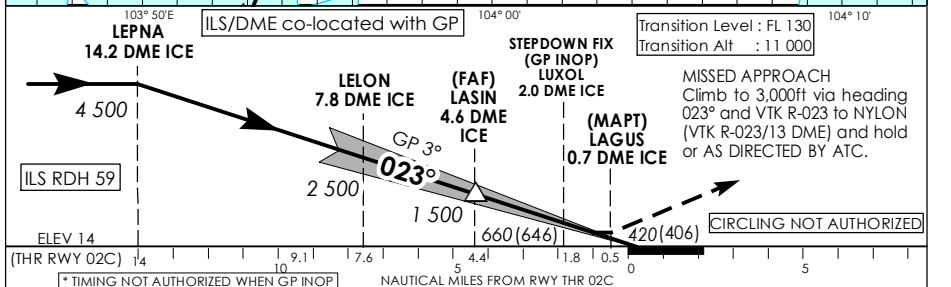
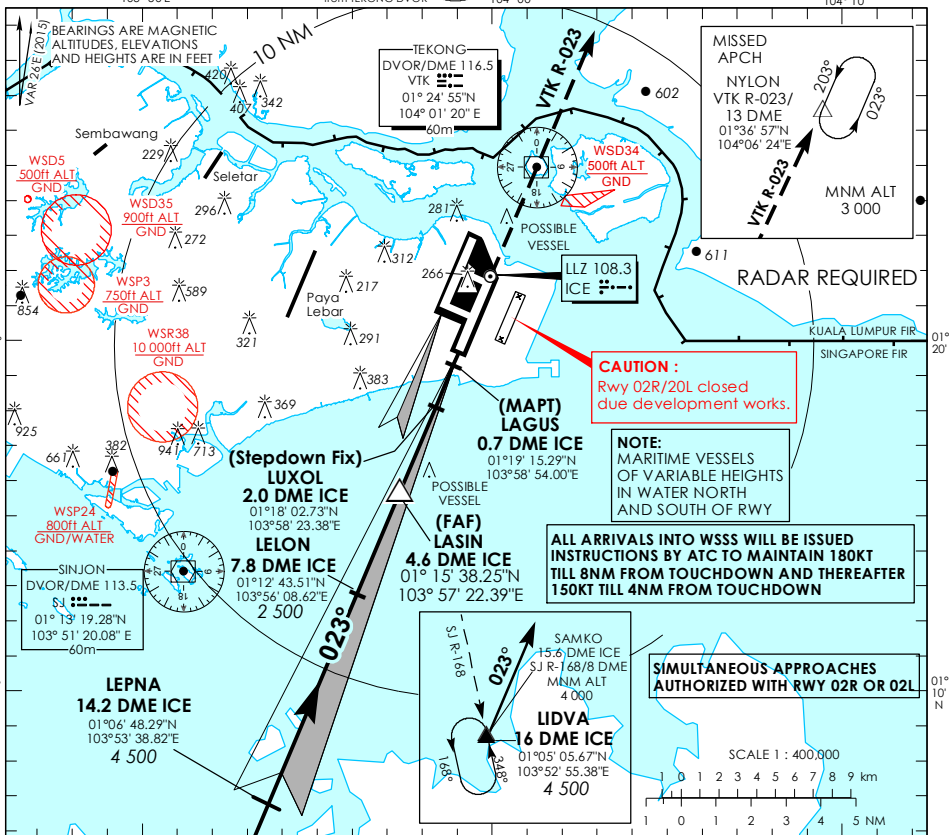


**INSTRUMENT APPROACH CHART** AERODROME ELEV 22ft  
HEIGHT RELATED TO  
THR RWY 02C - ELEV 14ft

MSA 25 NM from TEKONG DVOR

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

**SINGAPORE/ SINGAPORE CHANGI ICE ILS/DME RWY 02C**



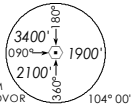
\* TIMING NOT AUTHORIZED WHEN GP INOP

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

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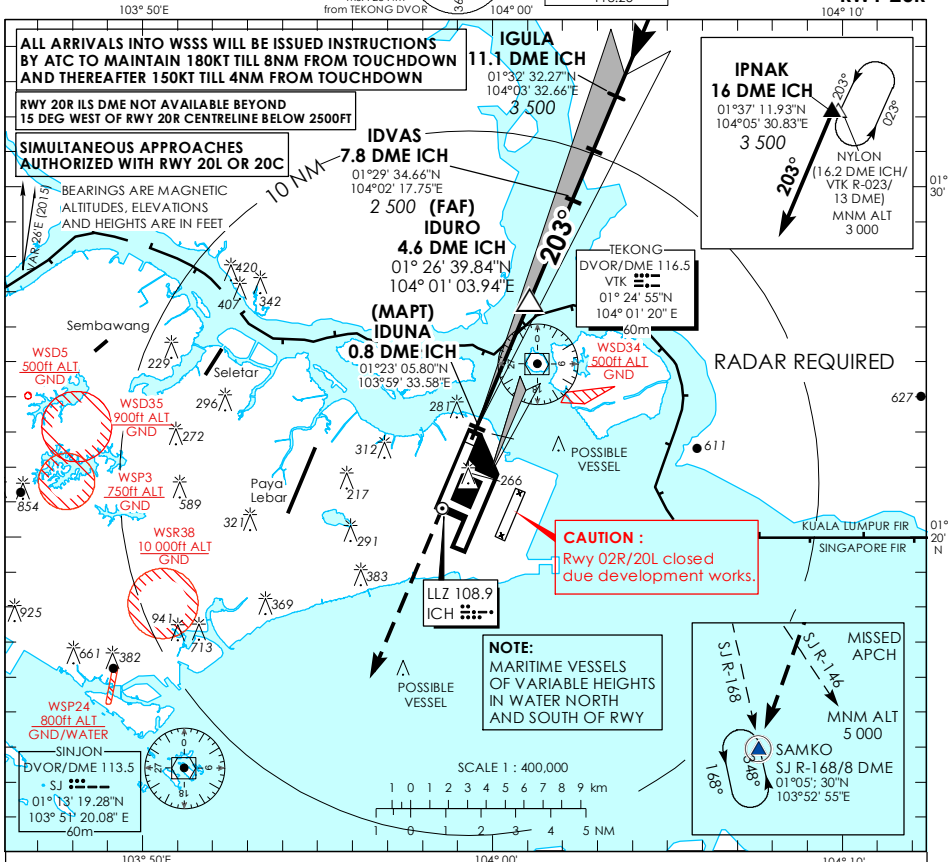
**INSTRUMENT  
APPROACH  
CHART**

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

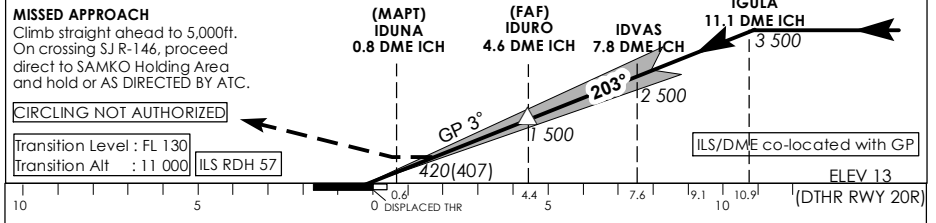


D-TIS AP ID WSSS	128.6
APP	120.3
TWR	119.3
	118.6
	118.25

**SINGAPORE/  
SINGAPORE CHANGI  
ICH ILS/DME  
RWY 20R**



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



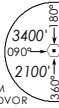
**\* TIMING NOT AUTHORIZED WHEN GP IN OP**

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

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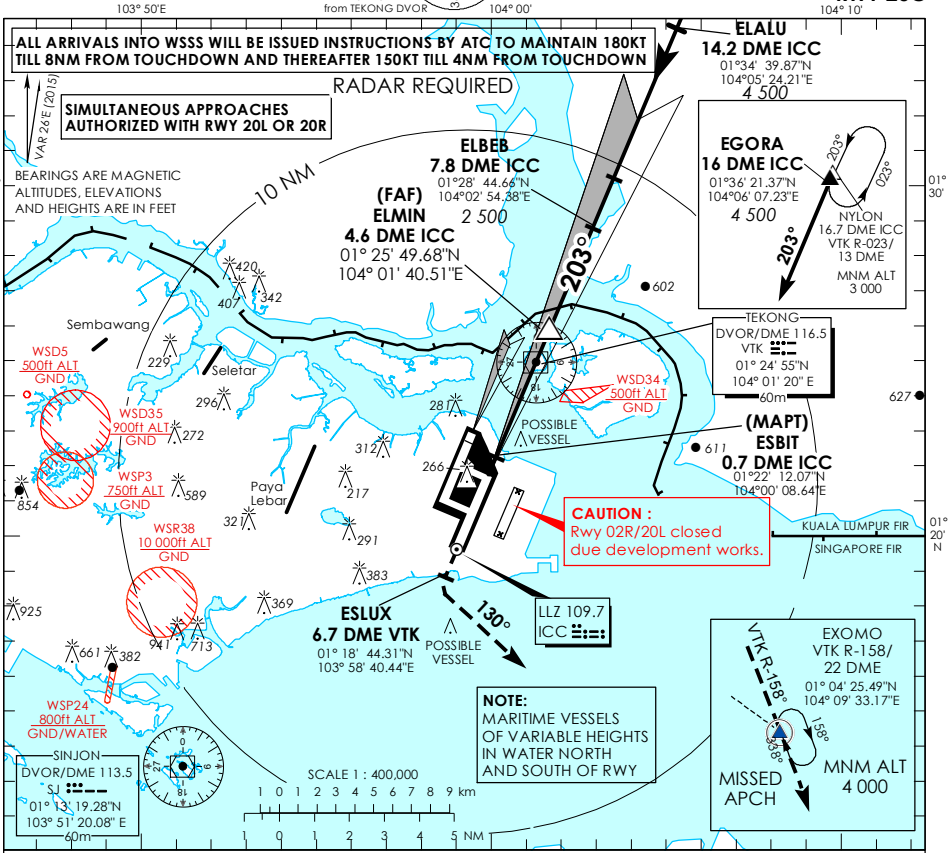
**INSTRUMENT APPROACH CHART**

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

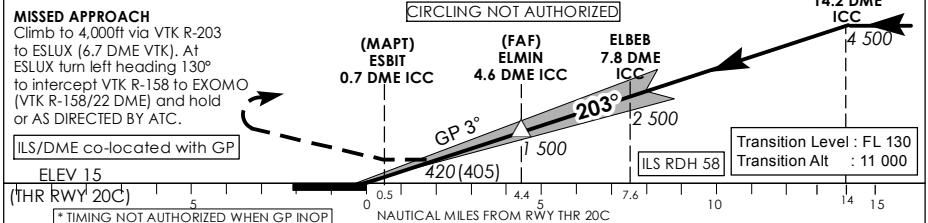


D-ATIS AP ID WSSS	128.6
APP	120.3
TWR	119.3
	118.6
	118.25

**SINGAPORE/ SINGAPORE CHANGI ICC ILS/DME RWY 20C**



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

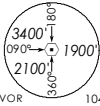


Category of Aircraft	OCA (OCH)					
	A	B	C	D	D <sub>L</sub>	
Straight-in	CAT I ILS	166 (151)	180 (165)	196 (181)	209 (194)	212 (197)
	CAT II ILS	71 (56)	78 (63)	91 (76)	101 (86)	107 (92)
	GP INOP	420 (405)				
Distance	4 DME		3 DME		2 DME	
Altitude (Height)	1290 (1275)		980 (965)		660 (645)	
Speed	knots	70	120	150	185	
FAF - MAPT 3.9nm	min : s *	3 : 21	1 : 57	1 : 34	1 : 16	
Rate of descent/GS	ft/min	370	635	795	980	

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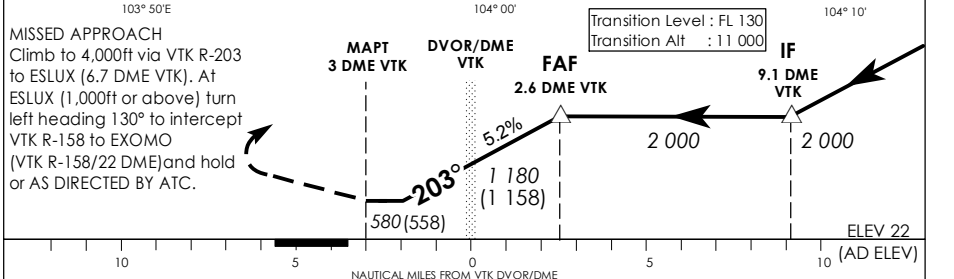
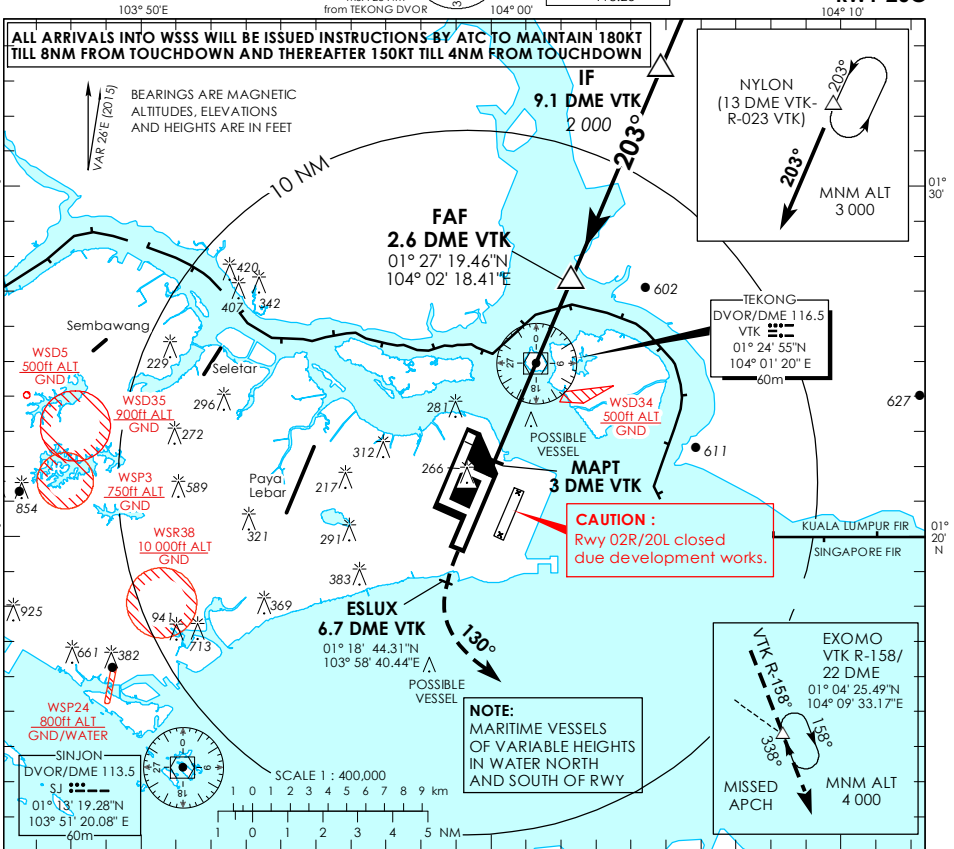
**INSTRUMENT  
APPROACH  
CHART - ICAO**

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



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

**SINGAPORE/  
SINGAPORE CHANGI  
VTK DVOR/DME  
RWY 20C**



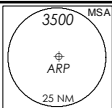
OCA (OCH)				
Category of Aircraft	A	B	C	D
Straight-in	580 (558)			
Distance	2 DME	1 DME	VTK	1 DME
Altitude (Height)	1820 (1798)	1500 (1478)	1180 (1158)	860 (838)
Speed	knots	70	120	150
FAF - MAPT 5.6nm	min : s	4 : 48	2 : 48	2 : 15
Rate of descent/GS	ft/min	370	635	795
			150	185
			1 : 49	838
			795	980

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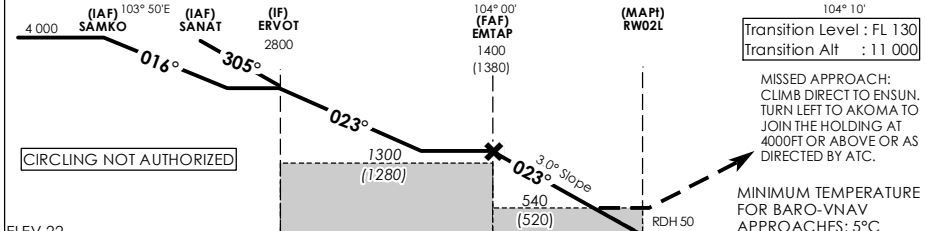
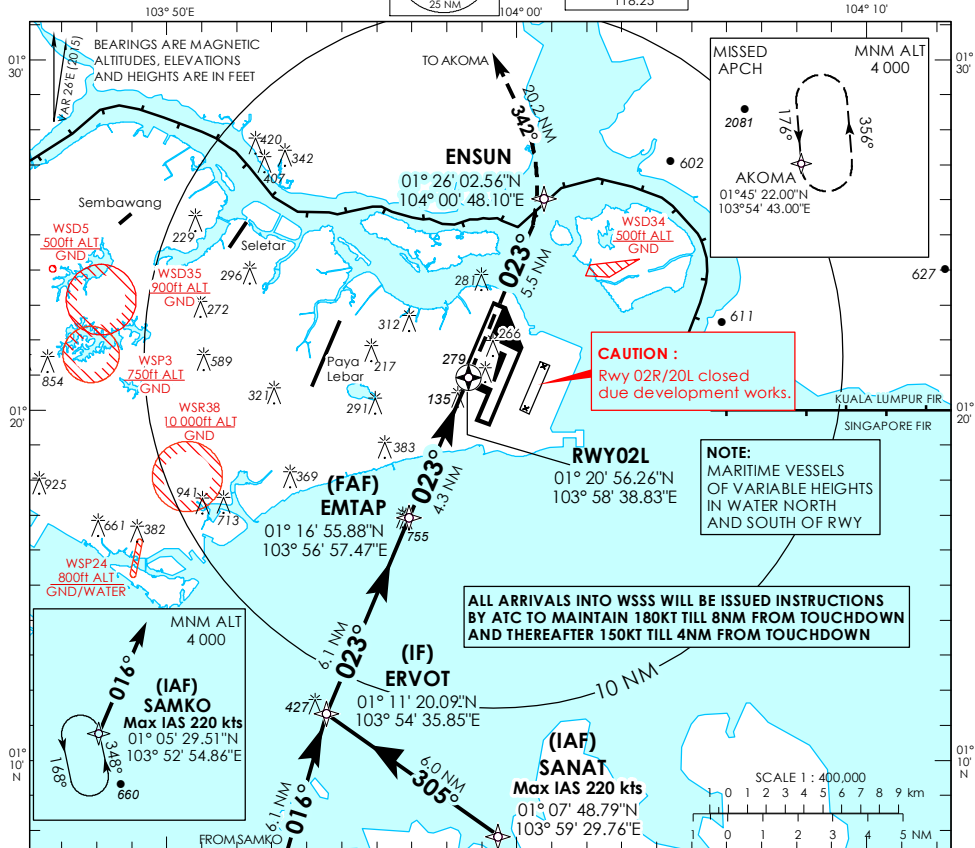
**INSTRUMENT APPROACH CHART**

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



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

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



ELEV 22 (THR RWY 02L)

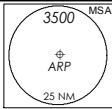
12 10 5 NAUTICAL MILES FROM THR RWY 02L

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

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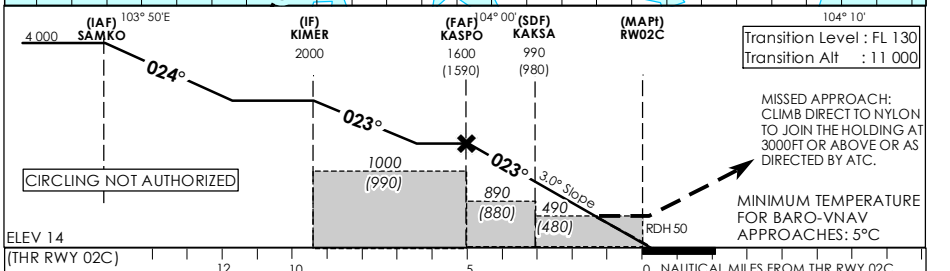
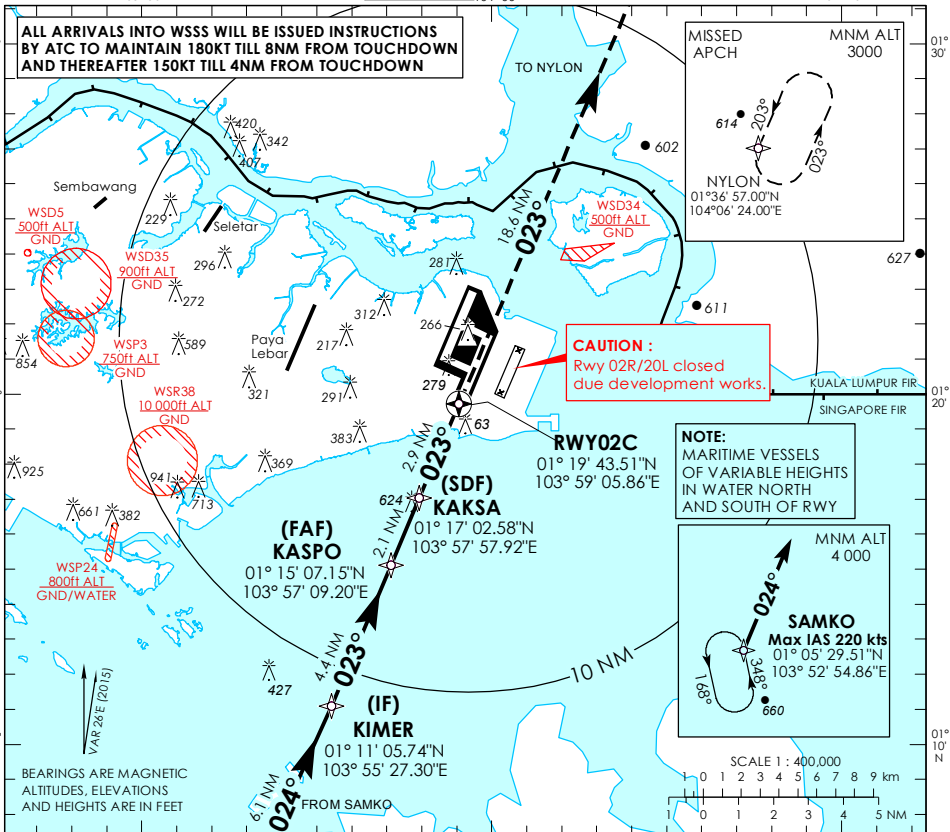
**INSTRUMENT APPROACH CHART**

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



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

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



		OCA (OCH)			
Category of Aircraft		A	B	C	D
RNAV	2.5%		<b>490 (480)</b>		
RNAV without SDF	2.5%		<b>890 (880)</b>		
RNAV/VNAV	2.5%		<b>360 (350)</b>		

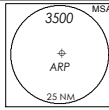
  

Fix		SAMKO	KIMER	KASPO	KAKSA	RW02C	NYLON
Altitude (Height)		<b>4000 (3986)</b>	<b>2000 (1986)</b>	<b>1600 (1586)</b>	<b>990 (976)</b>	<b>490 (476)</b>	<b>3000 (2986)</b>
Speed	knots	80	100	120	140	160	180
FAF - MAP1 5nm	min : s	<b>3 : 45</b>	<b>3 : 00</b>	<b>2 : 30</b>	<b>2 : 09</b>	<b>1 : 53</b>	<b>1 : 40</b>
Rate of descent/GS	ft/min	<b>425</b>	<b>531</b>	<b>637</b>	<b>743</b>	<b>849</b>	<b>955</b>

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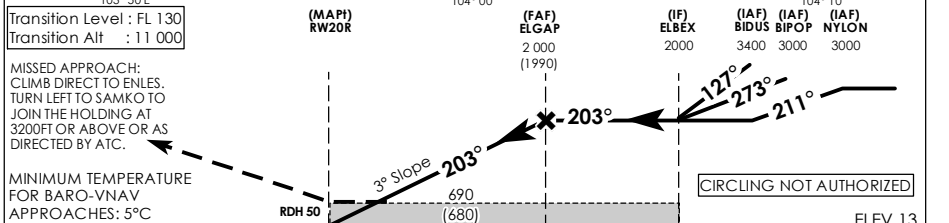
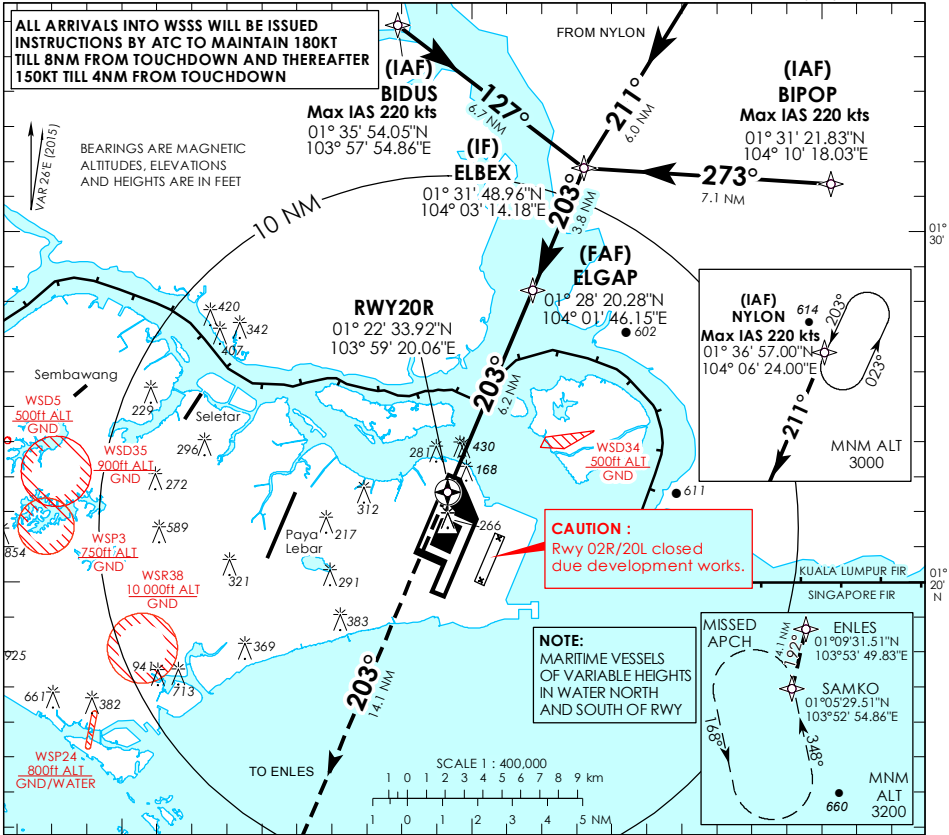
**INSTRUMENT  
APPROACH  
CHART - ICAO**

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



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

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

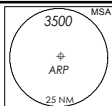


Transition Level : FL 130 Transition Alt : 11 000		(MAP) RWY20R	(FAF) ELGAP	(IF) ELBEX	(IAF) BIDUS	(IAF) BIPOP	(IAF) NYLON																								
		2 000 (1990)	2 000 (1990)	2000	3400	3000	3000																								
MISSED APPROACH: CLIMB DIRECT TO ENLES. TURN LEFT TO SAMKO TO JOIN THE HOLDING AT 3200FT OR ABOVE OR AS DIRECTED BY ATC.																															
MINIMUM TEMPERATURE FOR BARO-VNAV APPROACHES: 5°C		<p>RDH 50</p> <p>DISPLACED THR</p> <p>NAUTICAL MILES FROM DTHR RWY 20R</p> <p>OCA (OCH)</p>																													
		<table border="1"> <tr> <td>Category of Aircraft</td> <td colspan="2">A</td> <td colspan="2">B</td> <td colspan="2">C</td> <td>D</td> </tr> <tr> <td>LNAV/VNAV</td> <td colspan="2">2.5%</td> <td colspan="2">690 (680)</td> <td colspan="2"></td> <td></td> </tr> <tr> <td>LNAV</td> <td colspan="2">2.5%</td> <td colspan="2">690 (680)</td> <td colspan="2"></td> <td></td> </tr> </table>						Category of Aircraft	A		B		C		D	LNAV/VNAV	2.5%		690 (680)					LNAV	2.5%		690 (680)				
Category of Aircraft	A		B		C		D																								
LNAV/VNAV	2.5%		690 (680)																												
LNAV	2.5%		690 (680)																												
Fix	BIDUS	NYLON	BIPOP	ELBEX	ELGAP	RWY20R	ENLES	SAMKO																							
Altitude (Height)	3400 (3387)	3000 (2987)	3000 (2987)	2000 (1987)	2000 (1987)	690 (680)	2180 (2167)	3200 (3187)																							
Speed	knots	80	100	120	140	160	180																								
FAF - MAP	6.2 nm	min : s	4 : 39	3 : 44	3 : 06	2 : 40	2 : 20	2 : 04																							
Rate of descent/GS	ft/min	425	531	637	743	849	955																								

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**INSTRUMENT APPROACH CHART - ICAO**

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

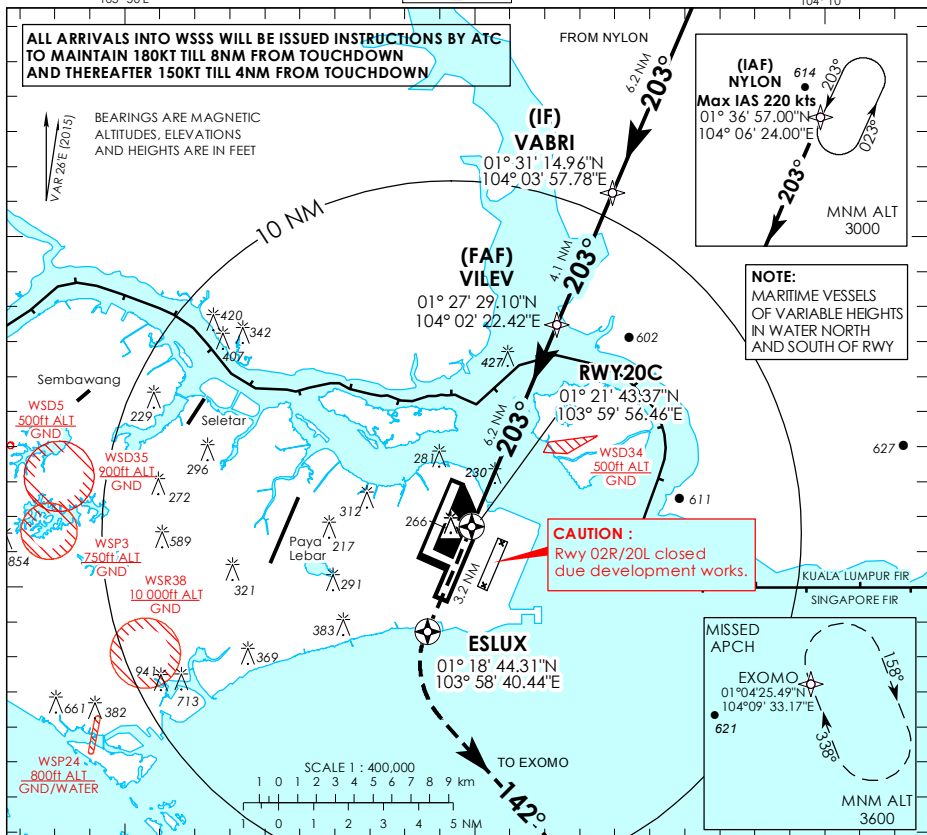


D-TIS	AP ID	WSSS
APP	128.6	
	120.3	
TWR	119.3	
	118.6	
	118.25	

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

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

BEARINGS ARE MAGNETIC  
ALTITUDES, ELEVATIONS  
AND HEIGHTS ARE IN FEET  
VAR 26 E (2015)



**(IAF) NYLON**  
Max IAS 220 kts  
01° 36' 57.00"N  
104° 06' 24.00"E  
MNM ALT 3000

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

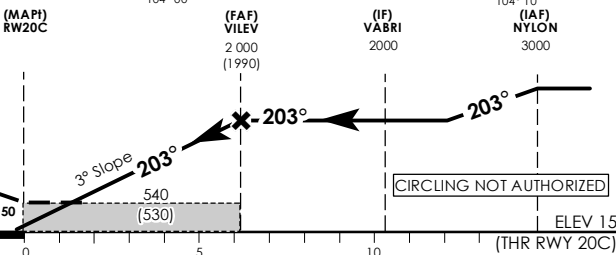
**CAUTION :**  
Rwy 02R/20L closed  
due development works.

**MISSED APCH**  
EXOMO  
01°04'25.49"N  
104°09'33.17"E  
MNM ALT 3600

Transition Level : FL 130  
Transition Alt : 11 000

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

**MINIMUM TEMPERATURE  
FOR BARO-VNAV  
APPROACHES: 5°C**



		NAUTICAL MILES FROM DTHR RWY 20C					
		OCA (OCH)					
Category of Aircraft		A	B	C	D		
LNAV/VNAV	2.5%	490 (480)					
LNAV	2.5%	540 (530)					
Fix		NYLON	VABRI	VILEV	RW20C	ESLUX	EXOMO
Altitude (Height)		3000 (2985)	2000 (1985)	2000 (1985)	540 (525)	540 (525)	3600 (3585)
Speed	knots	80	100	120	140	160	180
FAF - MAP 6.2 nm	min : s	4 : 39	3 : 44	3 : 06	2 : 40	2 : 20	2 : 04
Rate of descent/GS	ft/min	425	531	637	743	849	955

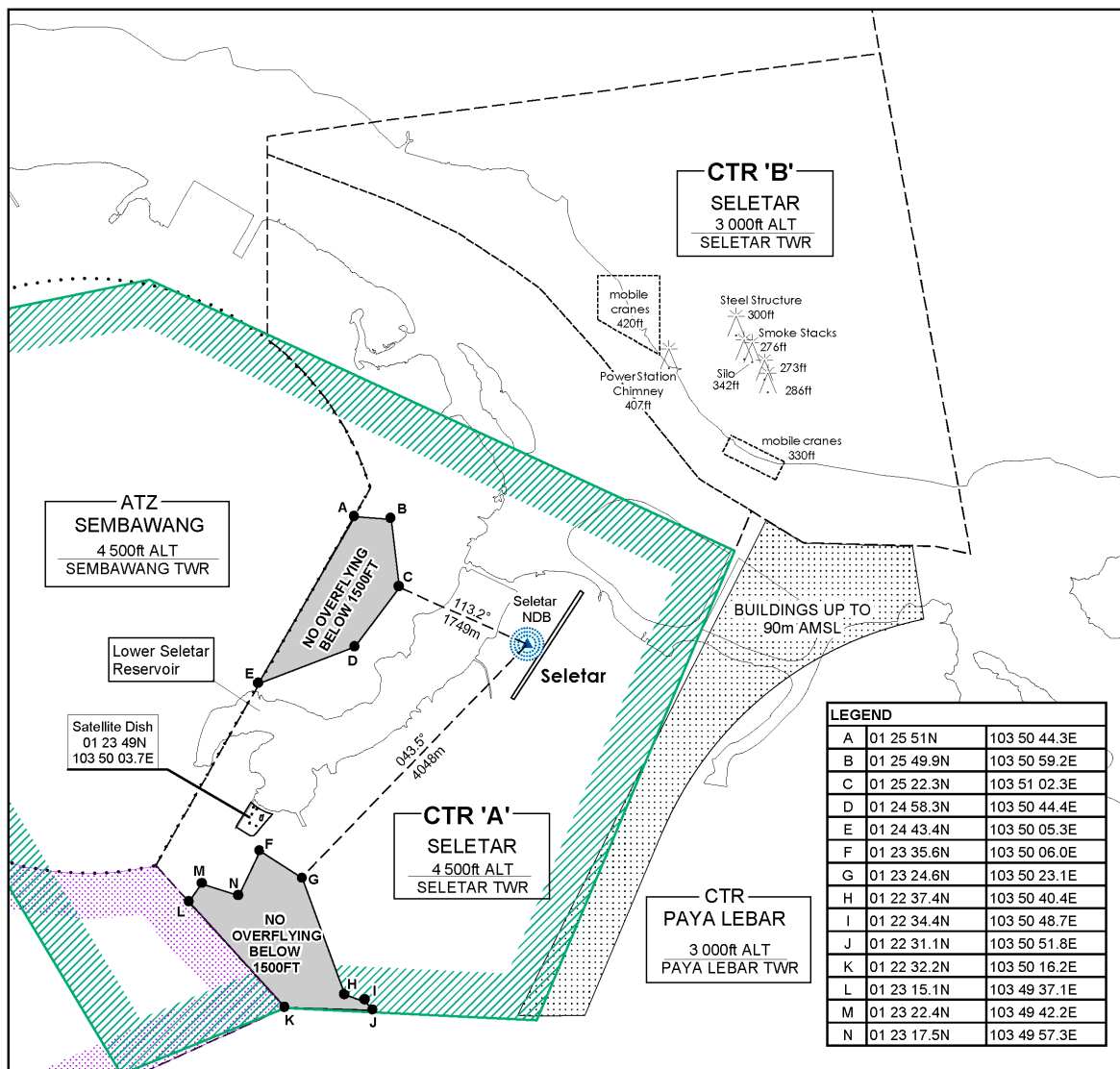
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1.2 Aircraft are restricted from overflying the built-up residential areas around Seletar Airport that are bounded by the following points, at any altitude below 1,500ft (see Charts AD-2-WSSL-VAC-1, AD-2-WSSL-VAC-2, AD-2-WSSL-VAC-3 AND AD-2-WSSL-VAC-4):

POINT	COORDINATES
A	012551.0N 1035044.3E
B	012549.9N 1035059.2E
C	012522.3N 1035102.3E
D	012458.3N 1035044.4E
E	012443.4N 1035005.3E
F	012335.6N 1035006.0E
G	012324.6N 1035023.1E
H	012237.4N 1035040.4E
I	012234.4N 1035048.7E
J	012231.1N 1035051.8E
K	012232.2N 1035016.2E
L	012315.1N 1034937.1E
M	012322.4N 1034942.2E
N	012317.5N 1034957.3E

1.3 The map below shows the location of the satellite dishes as well as the overflight restriction areas west and south of Seletar Control Zone.



- 1.4 Aircraft types which are unable to safely manoeuvre clear of the built-up residential areas are not allowed to operate at Seletar Airport. As a visual reference, pilots may wish to use the satellite dish located south of 012349.0N 1035003.7E (Lower Seletar Reservoir) as a guide when making approaches for Runway 03.
- 1.5 Freighter flights are not permitted between 1400-2300.
- 1.6 No engine run up shall be permitted between 1400-2300.

## WSSL AD 2.22 FLIGHT PROCEDURES

### 1 PROCEDURES FOR ARRIVALS INTO SELETAR AERODROME

#### 1.1 *Introduction*

- 1.1.1 Aircraft on VFR flight plan, routing via Tebrau City Mall (013259N1034748E) to Seletar shall follow the joining procedures as described in paragraph 1.2 and illustrated in charts AD-2-WSSL-VAC-1, AD-2-WSSL-VAC-2 and AD-2-WSSL-VFR-1.
- 1.1.2 Aircraft returning from Light Aircraft Training Areas shall follow the joining procedures as described in paragraph 1.3 and illustrated in charts AD-2-WSSL-VAC-1 and AD-2-WSSL-VAC-2.
- 1.1.3 Aircraft on IFR flight plan, routing via JB or KK to Seletar shall be vectored under radar for a visual approach. Paya Lebar Approach shall provide the radar service. When Paya Lebar Approach is closed, Singapore Approach shall provide the service. Unless authorised by ATC, pilots shall follow the joining procedures as described in paragraph 1.4 and 1.5. The joining procedures are illustrated in charts AD-2-WSSL-VAC-3, AD-2-WSSL-VAC-4, AD-2-WSSL-IFR-1 and AD-2-WSSL-IFR-2.
- 1.1.4 When within 5km of the aerodrome reference point, aircraft are to fly; at a manoeuvring speed of not more than 170kt unless otherwise authorised by ATC. All aircraft are required to keep well clear of Sembawang ATZ and Paya Lebar CTR.
- 1.1.5 Circuit traffic already downwind shall have priority. Arriving aircraft shall position and sequence itself accordingly, unless directed otherwise by ATC.
- 1.1.6 Pilots shall not fly east of the runway. This is due to tall buildings up to 90m (296ft) AMSL to the east of Seletar CTR (the location is depicted in charts AD-2-WSSL-VAC-1 to AD-2-WSSL-VAC-4).

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

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

#### 1.3 *Joining Procedures from Light Aircraft Training Areas*

- 1.3.1 Unless otherwise authorised by ATC, aircraft are to join overhead the airfield at 2,000ft keeping clear of Sembawang ATZ and Paya Lebar CTR.
- 1.3.2 When overhead the airfield, the joining aircraft shall make a turn to the eastern side of the runway and after passing abeam the Control Tower, commence descent as cleared to cross the upwind end of the runway at 1,500ft. Passing over the end of the runway, descend to circuit altitude as cleared by ATC. Pilots shall ensure to keep clear of Sembawang ATZ and Paya Lebar CTR and not to fly east of the runway. This is to keep clear of tall buildings up to 90m AMSL to the east of Seletar CTR. The area where the tall buildings are located is

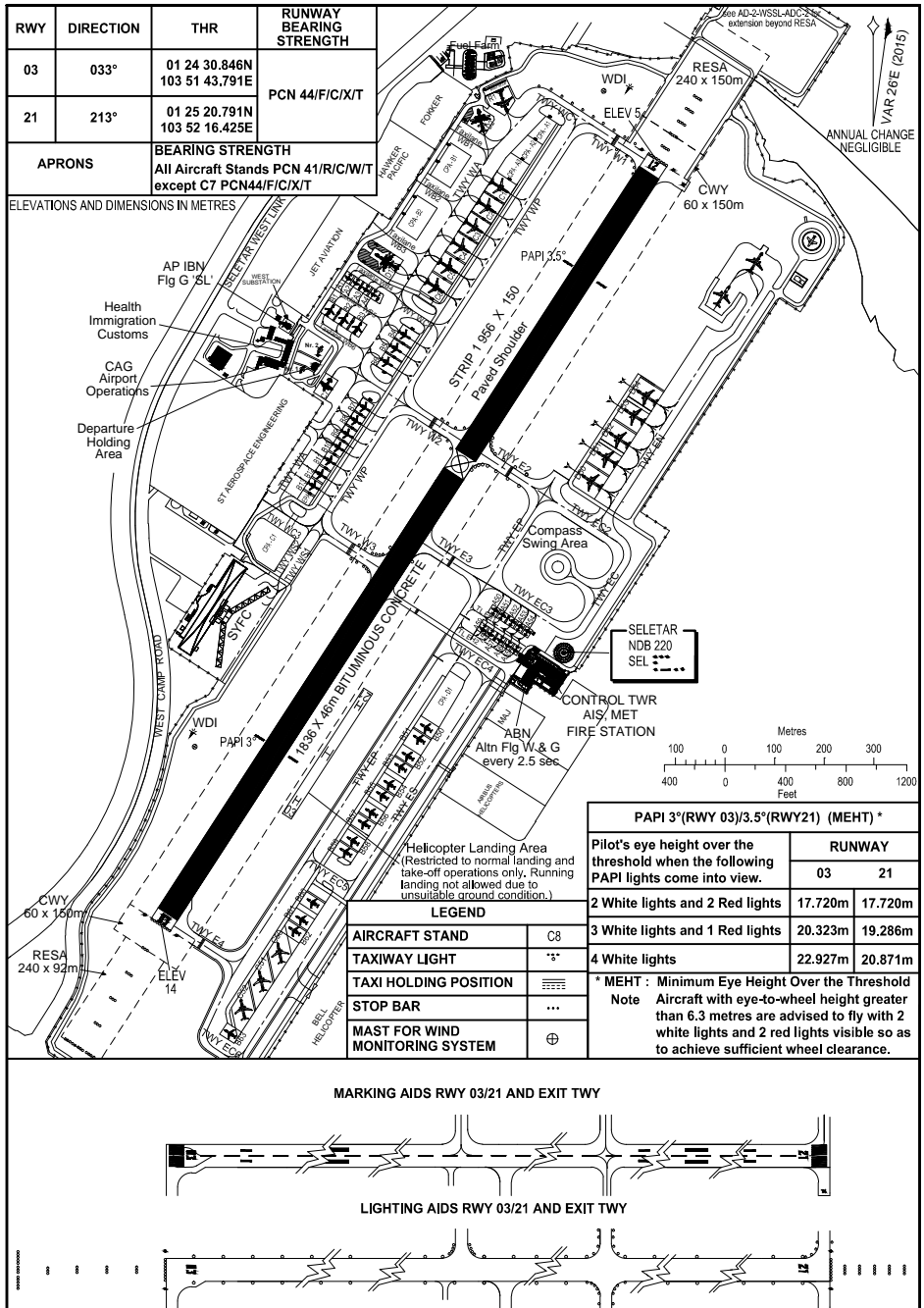
AERODROME CHART - ICAO

01° 25' 01.04"N  
103° 52' 03.52"E

ELEV 14m

TWR 118.45  
121.6

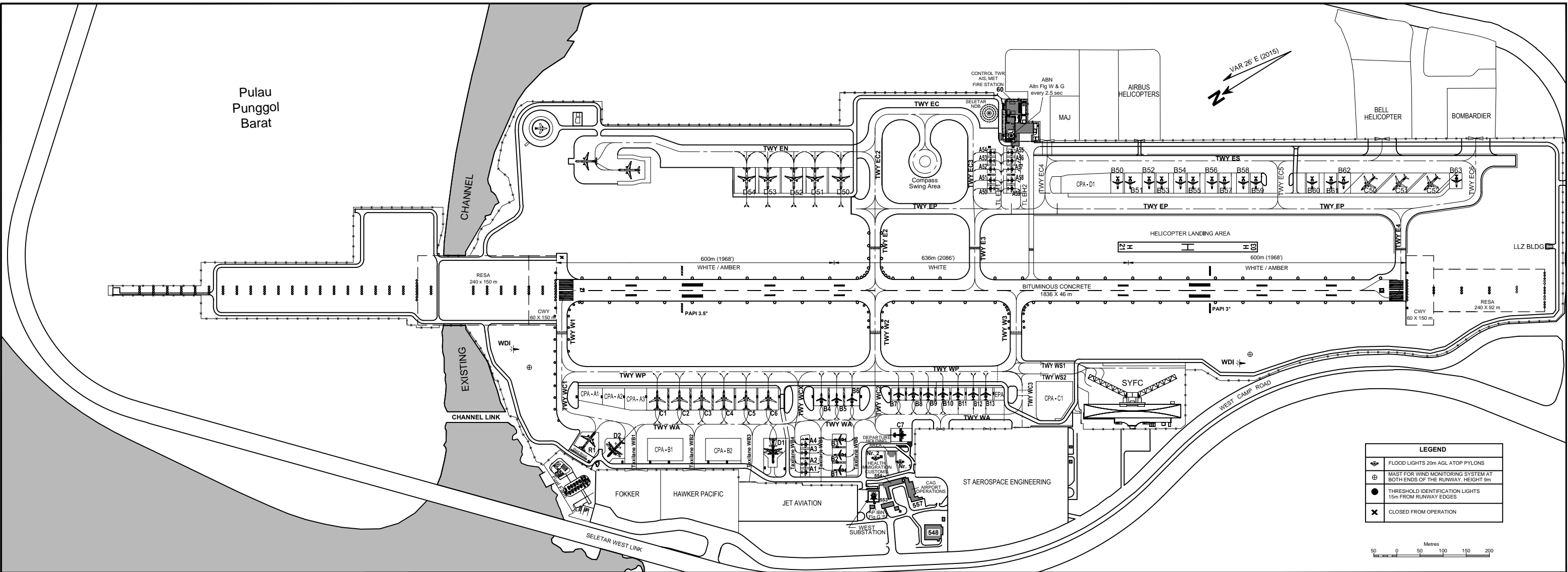
SINGAPORE/SELETAR



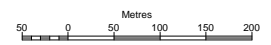
## INS COORDINATES FOR AIRCRAFT STANDS

STAND NR	NORTH LATITUDE	EAST LONGITUDE	ELEVATION
A1	01 25 13.102	103 51 56.167	6.181m (20.280ft)
A2	01 25 12.779	103 51 56.653	6.338m (20.795ft)
A3	01 25 12.350	103 51 57.301	6.586m (21.609ft)
A4	01 25 12.029	103 51 57.787	6.761m (22.183ft)
A50	01 24 51.431	103 52 05.765	7.807m (25.615ft)
A51	01 24 51.110	103 52 06.251	7.948m (26.077ft)
A52	01 24 50.681	103 52 06.900	8.105m (26.593ft)
A53	01 24 50.358	103 52 07.387	8.211m (26.940ft)
A54	01 24 50.036	103 52 07.874	8.337m (27.354ft)
A55	01 24 48.591	103 52 06.930	8.750m (28.709ft)
A56	01 24 48.913	103 52 06.443	8.587m (28.174ft)
A57	01 24 49.236	103 52 05.957	8.402m (27.567ft)
A58	01 24 49.665	103 52 05.309	8.179m (26.835ft)
A59	01 24 49.987	103 52 04.822	8.014m (26.294ft)
B1	01 25 11.401	103 51 55.231	6.301m (20.674ft)
B2	01 25 10.817	103 51 56.116	6.639m (21.783ft)
B3	01 25 10.221	103 51 57.014	6.967m (22.859ft)
B4	01 25 09.180	103 52 00.361	7.703m (25.274ft)
B5	01 25 08.258	103 51 59.758	7.933m (26.028ft)
B6	01 25 07.348	103 51 59.163	8.163m (26.783ft)
B7	01 25 04.505	103 51 57.519	8.442m (27.698ft)
B8	01 25 03.635	103 51 56.951	8.406m (27.580ft)
B9	01 25 02.765	103 51 56.382	8.396m (27.547ft)
B10	01 25 01.893	103 51 55.814	8.383m (27.505ft)
B11	01 25 01.006	103 51 55.237	8.330m (27.331ft)
B12	01 25 00.109	103 51 54.650	8.449m (27.721ft)
B13	01 24 59.374	103 51 54.170	8.571m (28.121ft)
B50	01 24 43.887	103 52 00.875	8.753m (28.719ft)
B51	01 24 43.153	103 52 00.394	8.847m (29.027ft)
B52	01 24 42.063	103 51 59.681	8.988m (29.490ft)
B53	01 24 41.328	103 51 59.202	9.183m (30.129ft)
B54	01 24 40.154	103 51 58.435	9.358m (30.704ft)
B55	01 24 39.420	103 51 57.954	9.434m (30.953ft)
B56	01 24 38.347	103 51 57.253	9.592m (31.471ft)
B57	01 24 37.614	103 51 56.774	9.679m (31.757ft)
B58	01 24 36.462	103 51 56.021	9.806m (32.172ft)
B59	01 24 35.728	103 51 55.541	9.930m (32.580ft)
B60	01 24 32.416	103 51 53.376	10.094m (33.117ft)
B61	01 24 31.265	103 51 52.624	10.177m (33.389ft)
B62	01 24 30.529	103 51 52.144	10.246m (33.617ft)
B63	01 24 23.858	103 51 47.937	10.639m (34.907ft)
C1	01 25 18.803	103 52 06.627	5.105m (16.750ft)
C2	01 25 17.498	103 52 05.773	5.423m (17.793ft)
C3	01 25 16.192	103 52 04.921	5.759m (18.895ft)
C4	01 25 14.887	103 52 04.067	6.256m (20.526ft)
C5	01 25 13.581	103 52 03.214	6.824m (22.390ft)
C6	01 25 12.275	103 52 02.360	7.304m (23.964ft)
C7	01 25 05.738	103 51 54.466	7.192m (23.596ft)
C50	01 24 29.476	103 51 51.396	10.381m (34.060ft)
C51	01 24 27.626	103 51 50.188	10.589m (34.743ft)
C52	01 24 25.781	103 51 48.979	10.770m (35.335ft)
D1	01 25 14.663	103 51 58.151	6.408m (21.025ft)
D2	01 25 24.033	103 52 04.804	3.471m (11.388ft)
D50	01 25 00.056	103 52 11.563	6.680m (21.916ft)
D51	01 25 01.585	103 52 12.561	6.440m (21.129ft)
D52	01 25 02.828	103 52 13.373	6.280m (20.604ft)
D53	01 25 04.357	103 52 14.372	6.040m (19.816ft)
D54	01 25 05.600	103 52 15.184	5.820m (19.094ft)

### 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
	THRESHOLD IDENTIFICATION LIGHTS 15m FROM RUNWAY EDGES
	CLOSED FROM OPERATION

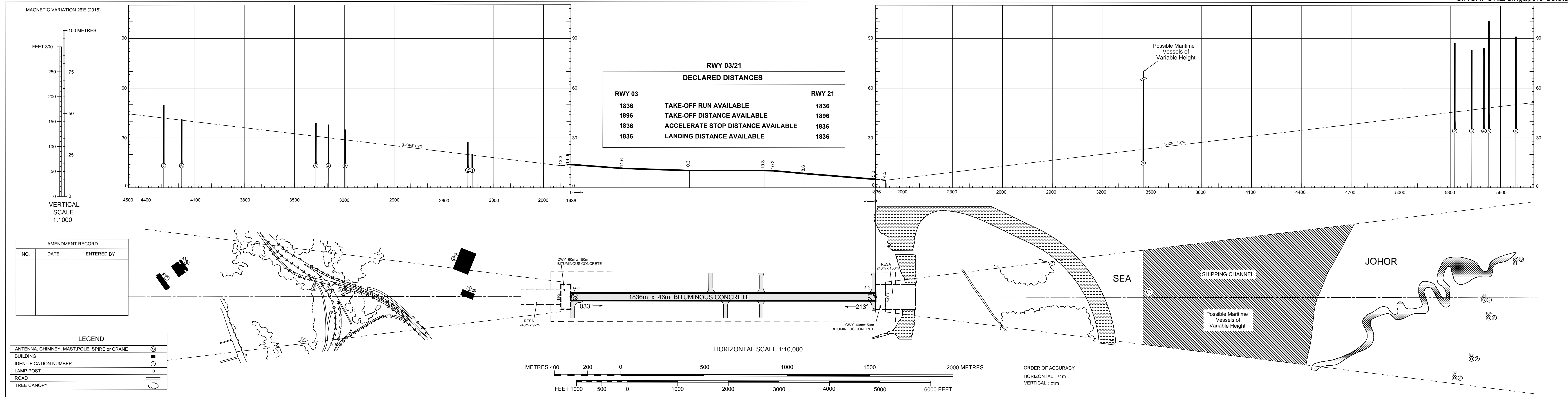


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DIMENSIONS AND ELEVATIONS IN METRES

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

SINGAPORE/Singapore Seletar

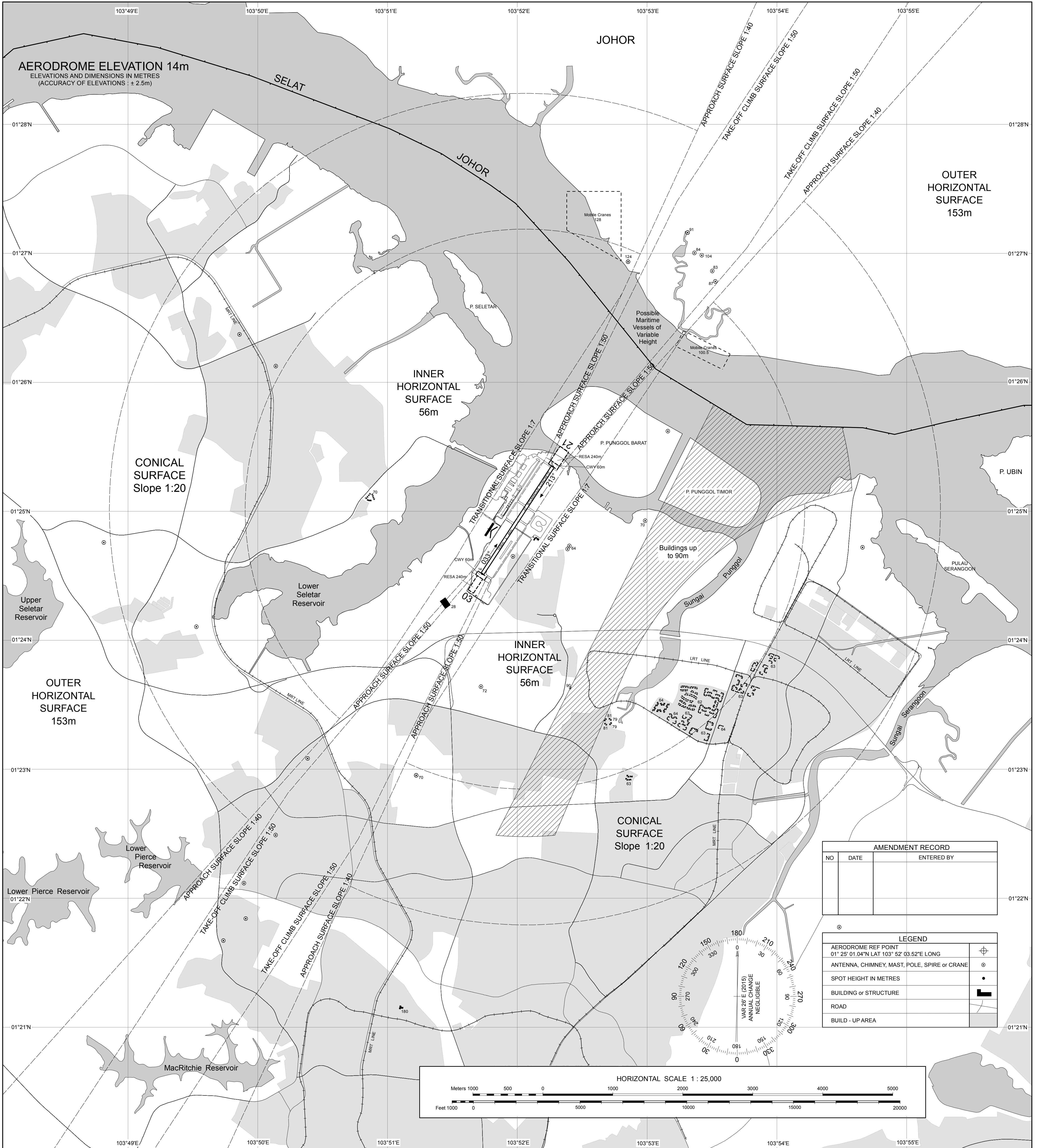


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### AERODROME OBSTACLE CHART - ICAO TYPE B

SINGAPORE / Seletar



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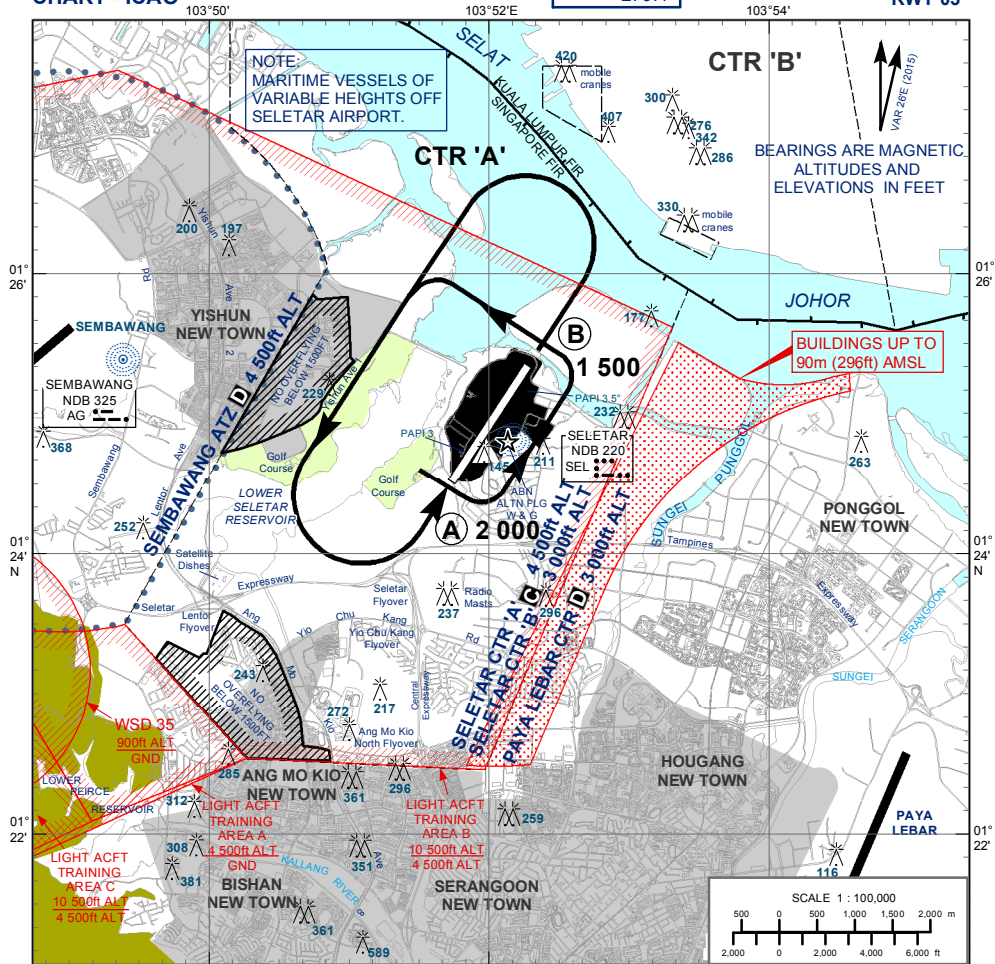
**VISUAL  
APPROACH  
CHART - ICAO**

AD ELEV 46 ft

APP	120.3
TWR	118.45
	270.4

**SINGAPORE/SELETAR**

**RWY 03**



**JOINING PROCEDURE - RWY 03**

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

**CAUTION**

- a) Pilots are required to keep clear of Sembawang ATZ.
- b) Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 90m (296ft) AMSL to the east of Seletar CTR. (See area shaded in red).



Built-up residential areas - No overflying below 1 500ft (458m). Aircraft types which are unable to safely manoeuvre clear of the restricted areas are not allowed to operate at Seletar Airport.

PAPI 3°	RUNWAY	
	03	21
Pilot's eye height over the threshold when the following PAPI lights come into view		
2 white lights and 2 red lights (MEHT)*	15.2m	15.3m
3 white lights and 1 red light	17.1m	16.6m
4 white lights	18.8m	18.0m

\*MEHT : Minimum Eye Height Over the Threshold.

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

**Note:**

- 1) Pilots are to be advised of the Silo 104m (342ft) AMSL 2nm north of the airfield.
- 2) Pilots are required to keep their turns within Seletar Control Zone.
- 3) Pilots are required to keep clear of Sembawang CTR and Paya Lebar CTR.

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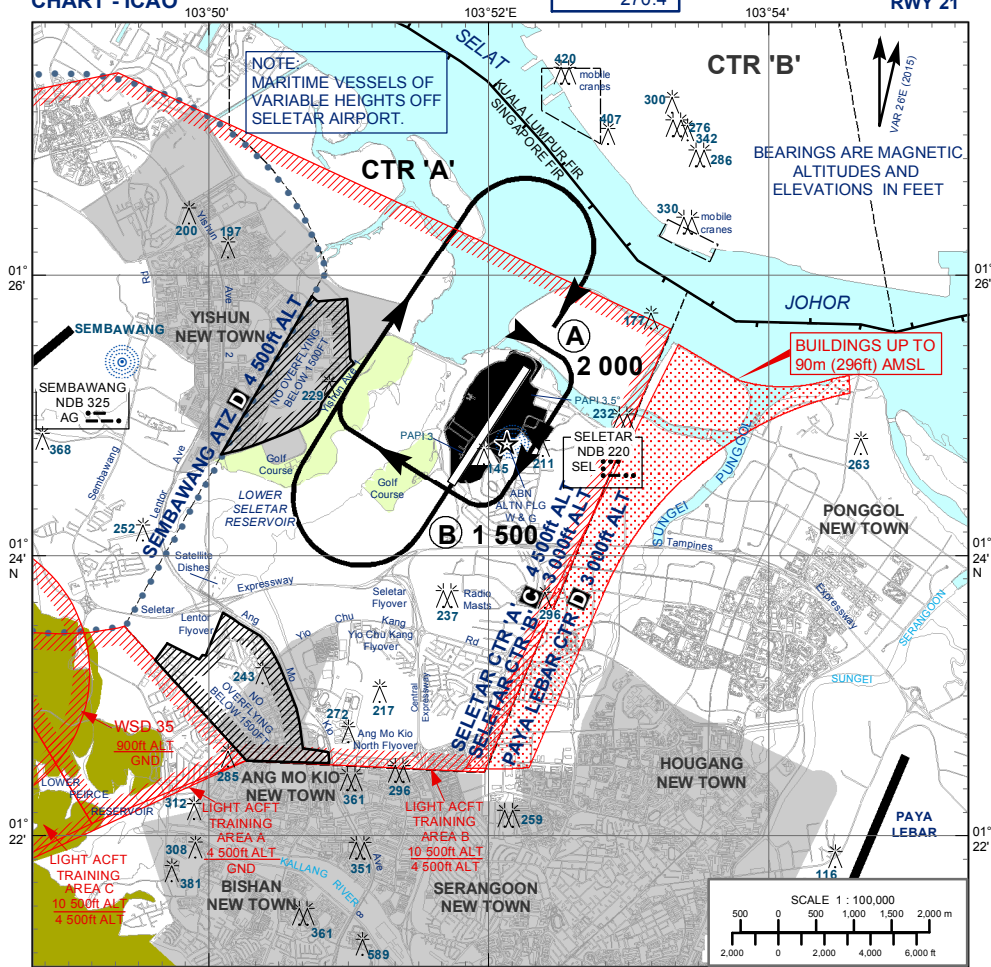
**VISUAL  
APPROACH  
CHART - ICAO**

AD ELEV 46 ft

APP	120.3
TWR	118.45
	270.4

**SINGAPORE/SELETAR**

**RWY 21**



**JOINING PROCEDURE - RWY 21**

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

**CAUTION**

- a) Pilots are required to keep clear of Sembawang ATZ.
- b) Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 90m (296ft) AMSL to the east of Seletar CTR. (See area shaded in red).



Built-up residential areas - No overflying below 1 500ft (458m). Aircraft types which are unable to safely manoeuvre clear of the restricted areas are not allowed to operate at Seletar Airport.

Pilot's eye height over the threshold when the following PAPI lights come into view	RUNWAY	
	03	21
2 white lights and 2 red lights (MEHT)*	15.2m	15.3m
3 white lights and 1 red light	17.1m	16.6m
4 white lights	18.8m	18.0m

\*MEHT : Minimum Eye Height Over the Threshold.

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

Note:

- 1) Pilots are to be advised of the Silo 104m (342ft) AMSL 2m north of the airfield.
- 2) Pilots are required to keep their turns within Seletar Control Zone.
- 3) Pilots are required to keep clear of Sembawang CTR and Paya Lebar CTR.

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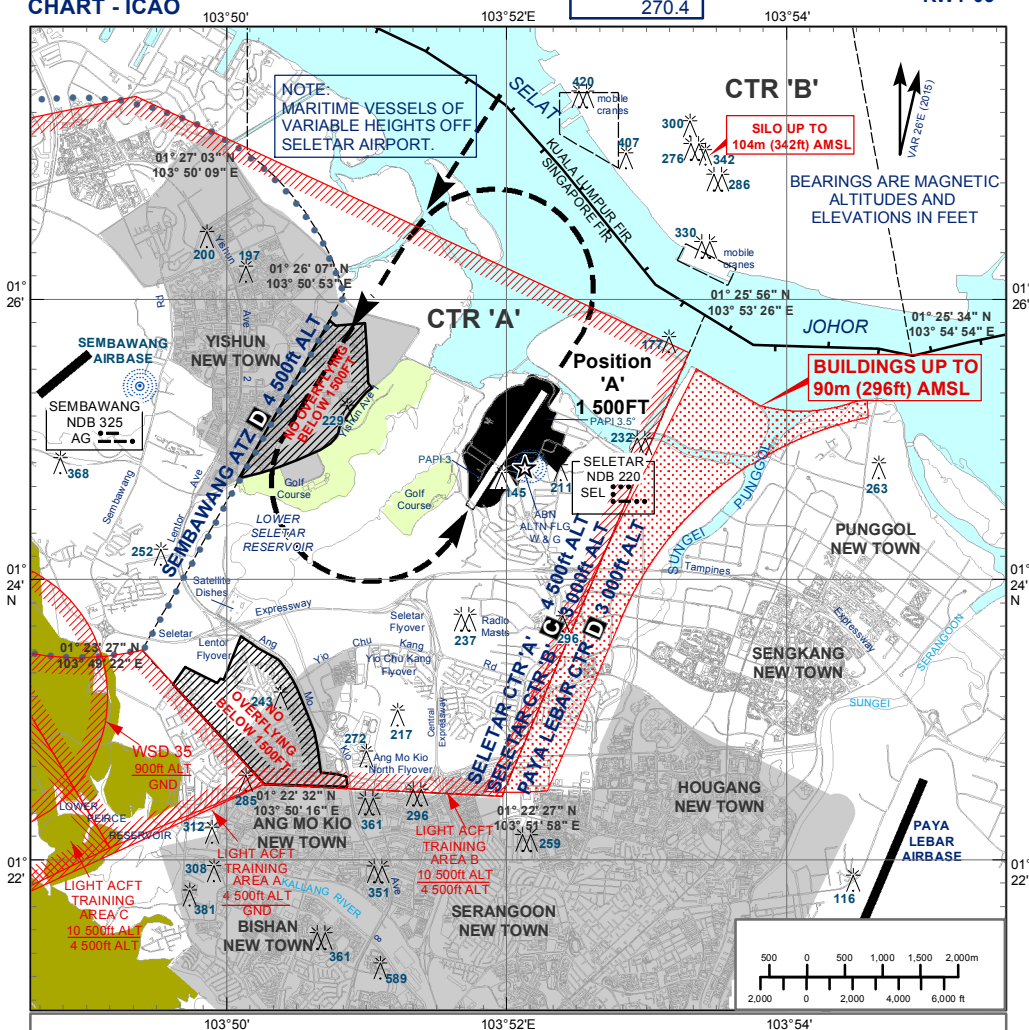
**VISUAL  
APPROACH  
CHART - ICAO**

AD ELEV 46 ft

APP 120.3  
TWR 118.45  
270.4

**SINGAPORE/SELETAR**

**RWY 03**



**ADVISORY JOINING PROCEDURES FROM JB AND KK - RWY 03**

**Straight-in Approach**

- 1) Join downwind at 2 000ft at a speed of not more than 170kt.
- 2) When downwind, descend from 2 000ft for a visual approach or as cleared by ATC. Pilots should have runway in sight.
- 3) Joining aircraft shall give way to circuit traffic already on downwind.

**Circling Approach**

- 1) Join downwind at 2 000ft at a speed of not more than 160kt.
- 2) When passing over position 'A', descend from 2 000ft to 1 500ft and turn left for downwind Runway 03. At downwind, descend for a visual approach or as cleared by ATC. Pilots should have runway in sight.
- 3) Joining aircraft shall give way to circuit traffic already on downwind.

**CAUTION**

- a) Pilots are required to keep clear of Sembawang ATZ and Paya Lebar CTR. Turns should therefore be kept within Seletar CTR.
- b) Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 90m (296ft) AMSL there. Pilots should have all relevant obstructions in sight, including the Silo 104m (342ft) AMSL 2nm north of the airfield.



Built-up residential areas - No overflying below 1 500ft (458m).  
Aircraft types which are unable to safely manoeuvre clear of the restricted areas are not allowed to operate at Seletar Airport.

	PAPI 3°	
	RUNWAY	
Pilot's eye height over the threshold when the following PAPI lights come into view	03	21
2 white lights and 2 red lights (MEHT)	15.2m	15.3m
3 white lights and 1 red light	17.1m	16.6m
4 white lights	18.8m	18.0m

\*MEHT : Minimum Eye Height Over the Threshold.

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

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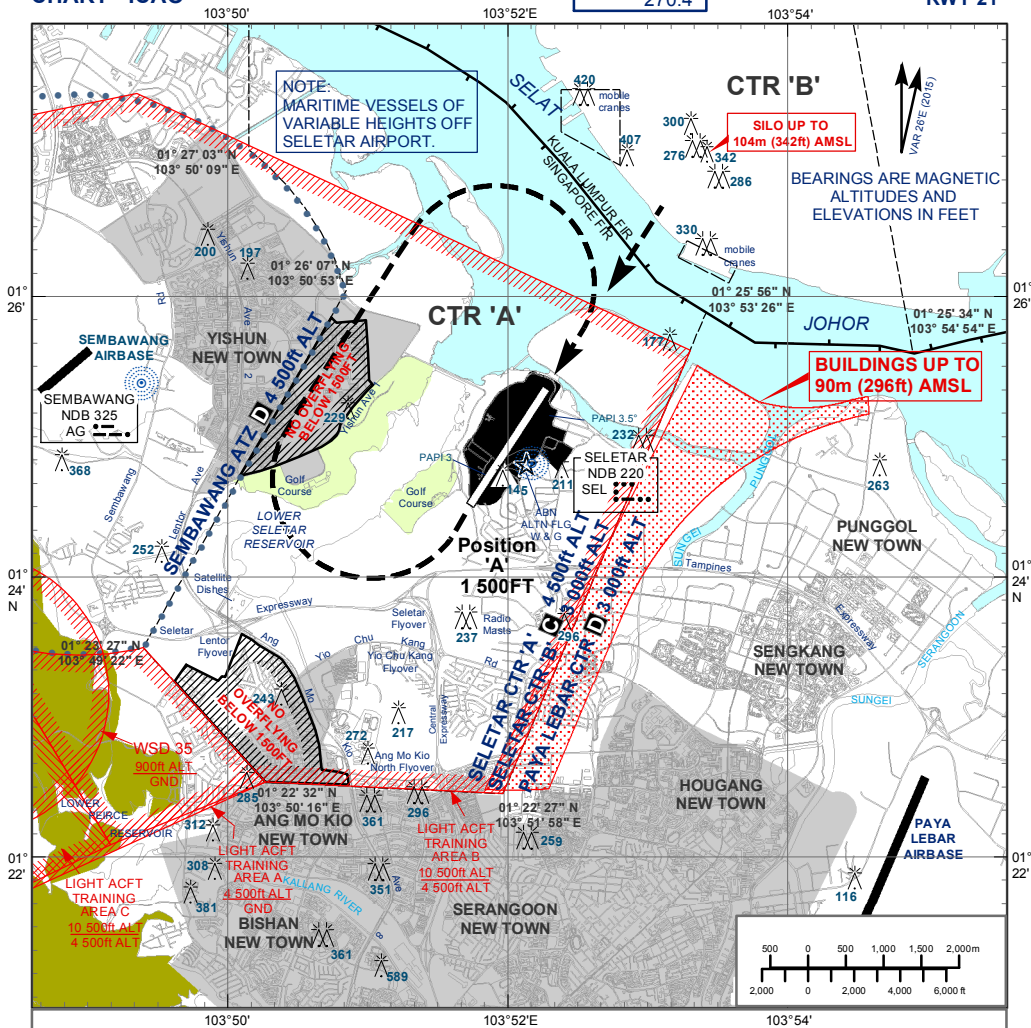
**VISUAL APPROACH CHART - ICAO**

AD ELEV 46 ft

APP 120.3  
TWR 118.45  
270.4

**SINGAPORE/SELETAR**

**RWY 21**



**ADVISORY JOINING PROCEDURES FROM JB AND KK - RWY 21**


**Straight-in Approach**

- 1) Join direct for a visual approach Runway 21, descending from 2 000ft at a speed of not more than 170kt, or as cleared by ATC. Pilots should have runway in sight.
- 2) Joining aircraft shall give way to circuit traffic already on downwind.

**Circling Approach**

- 1) Overfly the runway at 2 000ft at a speed of not more than 160kt.
- 2) When passing over position 'A', descend from 2 000ft to 1 500ft and turn right for downwind Runway 21. At downwind, descend for a visual approach or as cleared by ATC. Pilots should have the runway in sight.
- 3) Joining aircraft shall give way to circuit traffic already on downwind.

**CAUTION**

- a) Pilots are required to keep clear of Sembawang ATZ and Paya Lebar CTR. Turns should therefore be kept within Seletar CTR.
- b) Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 90m (296ft) AMSL there. Pilots should have all relevant obstructions in sight, including the Silo 104m (342ft) AMSL 2nm north of the airfield.
- c)  Built-up residential areas - No overflying below 1 500ft (458m). Aircraft types which are unable to safely manoeuvre clear of the restricted areas are not allowed to operate at Seletar Airport.

Pilot's eye height over the threshold when the following PAPI lights come into view	PAPI 3.5° RUNWAY	
	03	21
2 white lights and 2 red lights (MEHT)*	15.2m	15.3m
3 white lights and 1 red light	17.1m	16.6m
4 white lights	18.8m	18.0m

\*MEHT : Minimum Eye Height Over the Threshold

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

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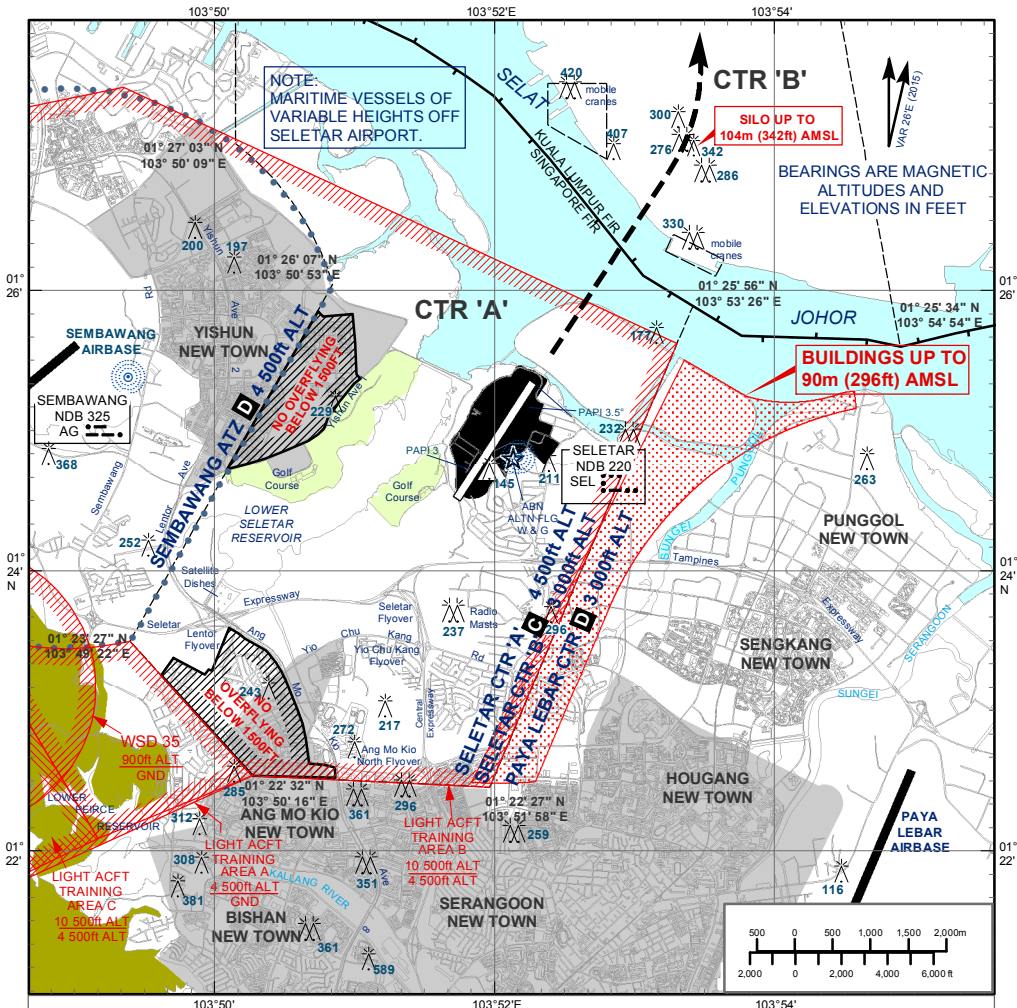
**VISUAL DEPARTURE CHART**

AD ELEV 46 ft

TWR 118.45  
270.4

SINGAPORE/SELETAR


RWY 03



**ADVISORY DEPARTURE PROCEDURE FOR RUNWAY 03**

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

**CAUTION**

- a) Pilots are required to keep clear of Sembawang ATZ and Paya Lebar CTR. Turns should therefore be kept within Seletar CTR.
- b) Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 90m (296ft) AMSL there. Pilots should have all relevant obstructions in sight, including the Silo 104m (342ft) AMSL 2nm north of the airfield.
- c)  Built-up residential areas - No overflying below 1 500ft (458m)  
Aircraft types which are unable to safely manoeuvre clear of the restricted areas are not allowed to operate at Seletar Airport.

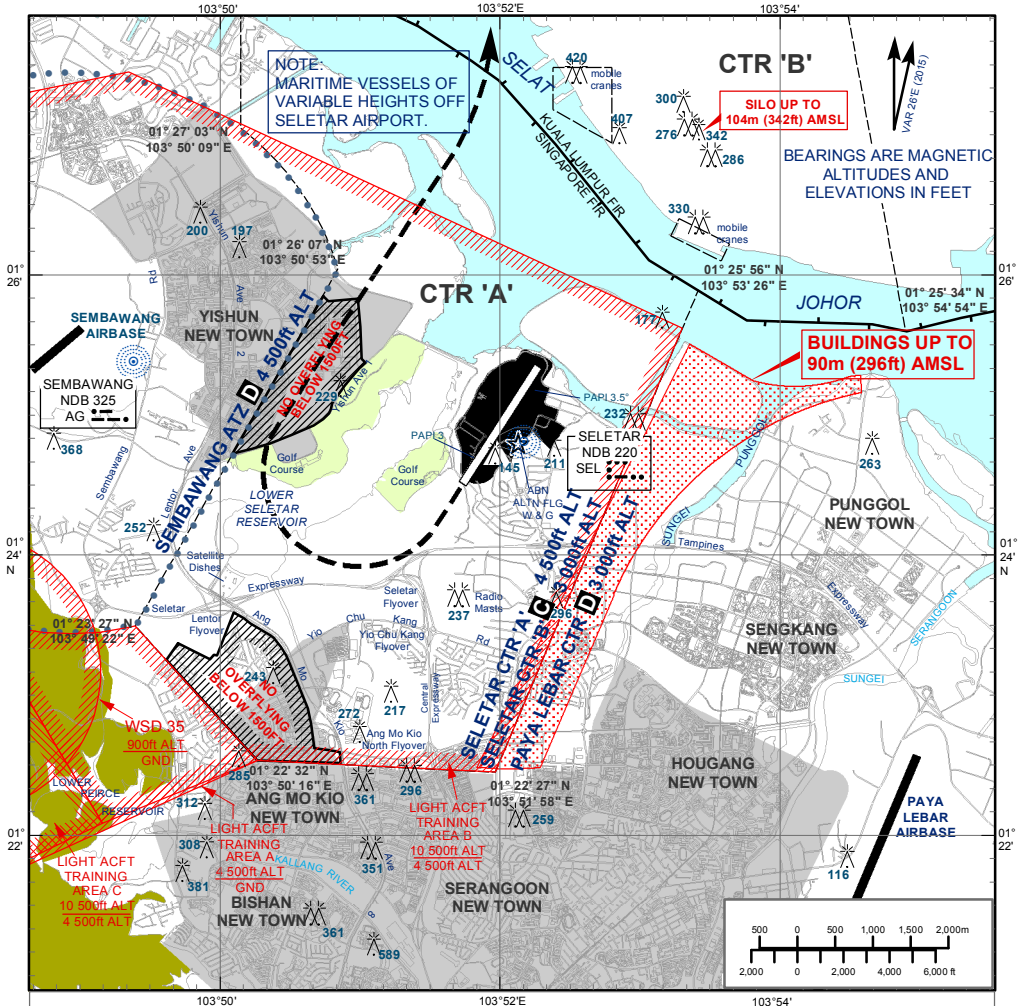
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**VISUAL  
DEPARTURE  
CHART**

AD ELEV 4ft

TWR 118.45  
270.4**SINGAPORE/SELETAR**


RWY 21

**ADVISORY DEPARTURE PROCEDURES FOR RUNWAY 21**

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

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

**CAUTION**

- a) Pilots are required to keep clear of Sembawang ATZ and Paya Lebar CTR. Turns should therefore be kept within Seletar CTR.
- b) Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 90m (296ft) AMSL there. Pilots should have all relevant obstructions in sight, including the Silo 104m (342ft) AMSL 2nm north of the airfield.
- c)  Built-up residential areas - No overflying below 1 500ft (458m)  
Aircraft types which are unable to safely manoeuvre clear of the restricted areas are not allowed to operate at Seletar Airport.

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## WSAP AD 2.9 SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS

SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS		
1	<b>Aircraft Parking Restrictions</b>	
	There are 4 designated parking aprons: Apron A, Apron C, Jet Apron and Jet Apron Extension:	
	ACFT Stand	Largest ACFT Type
	Apron A	A1 to A5 C17
	Apron C	C1 to C7 (reserved for RSAF) C8 to C9 C10 C10A C11 C11A C130 C130 KC135 B747-400 C17 C5, AN124
	Jet Apron	J1 to J3 J1A and J2A C130 B747
	Jet Apron Extension	J4 and J5 C17
2	<b>Taxiing Procedures</b>	
2.1	Taxiing in/out of Apron Areas	
	Pilots taxiing in/out of apron areas must adhere to ATC's instructions. Once a pilot has reported visual with the marshallers, the pilot will be instructed to continue to taxi and follow the marshaller's instructions. At any time, should the aircraft pilot decide not to comply with the marshaller's instructions, it is mandatory for the pilot or the marshalling agency to inform ATC immediately. All marshalling services shall terminate at that moment and the pilot will be instructed by ATC to shutdown the aircraft. Concurrently, ATC will also inform the marshallers via the ground communications network. Subsequently, the aircraft will be towed to its allocated aircraft stand. Pilots are to exercise caution when operating in the apron areas due to close proximity of obstacles (e.g. Floodlights, buildings, etc.)	
2.2	To minimize the possibility of ground taxiing confliction within the apron areas as well as to achieve an orderly flow of aircraft ground movements, the following guidelines are recommended for both RWY 02 (Departures) and RWY 20 (Arrivals):	
	Apron	Departures
	Apron A	Taxi for RWY 02 departure via TWY F4.
		Arrivals Aircraft bound for aircraft stands A4-A5 shall taxi via TWY F4. Aircraft bound for aircraft stands A1-A3 and A6-A9 shall taxi via TWY F3.
	Apron B	No taxiing is allowed within Apron B and TWY W7. Aircraft will be towed in/out of Apron B to an assigned aircraft stand via TWY W7.
	Apron C	TWY F1 TWY F1 or F2
	Jet Apron/Jet Apron Extension	TWY F3 TWY F3
3	<b>Ground Taxiing Guidelines</b>	
3.1	The recommended taxiing guidelines may be subject to changes due to work-in-progress or unforeseen circumstances and shall be included in the NOTAM. Pilots will receive a taxiing brief from the Flight Planning office prior to departure.	
4	<b>Ground Restrictions due to Weather</b>	
4.1	In the event of inclement weather over Paya Lebar airport, ground support services for aircraft are to be terminated when the meteorological office issues a Lightning Risk Category 1 (very high lightning risk with extremely probable lightning producing CB clouds over the affected area). Ground agencies will be alerted of the warnings through the Base Public Announcement system as well as through the ground communications network. The following ground support services are to be terminated: a) aircraft refuelling and de-refuelling b) towing of aircraft in the open c) maintenance works on aircraft on the apron areas d) marshalling of aircraft in and out of the apron areas e) loading and unloading of cargo from aircraft f) customs and immigration checks in the apron areas	
4.2	There is no work restriction for Lightning Risk Categories 2, 3, 4 and 5. As aircraft marshalling is not permitted during Lightning Risk Category 1, aircraft that has landed at Paya Lebar Airport will be instructed to hold at the following designated areas until the warning has expired: a) Non-VIP aircraft at TWY F1, F2, F3 or F4 b) VIP aircraft at TWY F3 or F4	

**SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS**

4.3	There may be occasions when despite a declaration of Lightning Risk Category 1, certain activities would still need to be performed in the open areas due to critical or operational requirements. In such instances, approval must be sought from Paya Lebar Tower after careful assessment of the overall weather situation over Paya Lebar Airport. Examples of such critical activities include: a) Marshalling of VVIP / VIP aircraft b) Embarkation / disembarkation of VIP from aircraft
5.	<b>Ground Procedures - General</b>
5.1	<u>Engine Start-ups and Ground Runs</u> Clearance from the Ground Controller must be sought and obtained for all engine start-ups or any associated activities within the apron areas. In addition, all engine ground runs, regardless of intensity, must be co-ordinated with ATC for approval. However, ground runs exceeding 85% of the engine power are prohibited within the apron areas. Within Paya Lebar Airport, the designated area for engine ground runs exceeding 85% of the engine power are the Northern Access Run-up Pad and Hush-House or as designated by Paya Lebar Operations Centre. The area allocated will be dependent on the type of aircraft concerned.
5.2	<u>Aircraft to/from Apron B</u> Engine start-ups and shutdowns at TWY W7 are strictly prohibited. Aircraft departing or arriving to/from Apron B shall be allocated the appropriate aircraft stands for their start-ups or shutdowns and shall be towed in/out of the allocated aircraft stand. In addition, wing-walkers are to be provided for large aircraft on tow at TWY W7 due to construction works located next to TWY W7.
5.3	<u>Prohibited Activities - Smoking in the Apron Areas</u> Smoking is strictly prohibited within the Apron areas. Disciplinary action will be taken on any personnel caught contravening this restriction.

**WSAP AD 2.10 AERODROME OBSTACLES**

**IN APPROACH / TKOF AREAS**

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



<i>IN CIRCLING AREA AND AT AERODROME</i>	
<i>OBST type, ELEV, Markings/LGT</i>	
1	2
a. ILS GP huts co-located with GP antenna mast (HGT 53ft AGL).	GP RWY 02 located 296ft west of western edge of RWY and 858ft from RWY 02 THR. GP RWY 20 located 296ft west of western edge of RWY and 984ft from RWY 20 THR.
b. PAR hut, HGT 46.2ft AGL, marked and LGTD.	211ft east of eastern edge of RWY, 7089ft north of RWY 02 THR.
c. 2 x Frangible PAR Moving Target Indicator (MTI) reflectors.	RWY 02 MTI reflectors, HGT 16ft AGL, located 213ft east of eastern edge of RWY, 4389ft from RWY 02 THR. RWY 20 MTI reflectors, HGT 16ft AGL, located 209ft east of eastern edge of RWY, 2911ft from RWY 20 THR.
d. Arrestor hookwire installed 1200ft from RWY 02 THR and 1100ft from RWY 20 THR.	Within the RWY strip. Retriever Unit located 52ft from both sides of the RWY edges, 4ft in HGT.
e. Arrestor barrier installed 210ft south of RWY 02 THR and 118ft north of RWY 20 THR.	Within the RWY strip.
f. Surface wind direction sleeves (HGT 25ft AGL).	344ft west of western edge of RWY for both sides, 458ft from RWY 02 THR and 307ft from RWY 20 THR.
g. AWOS stanchions (HGT 23ft AGL).	296ft west of western edge of RWY on both sides, 658ft from RWY 02 THR and 654ft from RWY 20 THR.
h. One wheel structure (HGT 178m AMSL).	erected at 011726N 1035150E, BRG 216 DEG, DIST 5NM from WSAP ARP - within WSAP CTR). Structure marked/LGTD.
i. One Building (HGT 245m AMSL).	erected at 011642N 1035105E, BRG 216 DEG, DIST 6.2NM from WSAP ARP - within WSAP CTR). Building marked/LGTD.
j. Mobile aircraft arrestor gear (HGT 2m AGL)	12m from edge of western taxiway between TWY 1 and W2 at 415m south of TWY W1. Lighted at night.
k. Lightning protection system, HGT 218ft AMSL	erected at 012203.36N 1035509.39E.
l. Portable aircraft arrestor gear, HGT 6.6ft AGL	300ft south of RWY 20 THR, 33ft from RWY edge on both sides. All RWY 20 inbound shall land 500ft up RWY 20 THR. LDA 11,900ft.

## WSAP AD 2.11 METEOROLOGICAL INFORMATION PROVIDED

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

## WSAP AD 2.12 RUNWAY PHYSICAL CHARACTERISTICS

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

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

## WSAP AD 2.13 DECLARED DISTANCES

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

**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>	<b>PAYA LEBAR CTR</b> 011100N 1035134E 013300N 1040149E 013200N 1035344E 012534N 1035454E thence along international BDRY to 012544N 1035320E 012227N 1035158E 012232N 1035016E 012100N 1034654E 012025N 1034539E 011835N 1034459E thence southwards on 180° to 011100N 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 times PPR from RSAF HQ via Paya Lebar Operations.	* 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		
GND	PAYA LEBAR GROUND	121.7 MHz 296.0 MHz		
PAR	PAYA LEBAR TALKDOWN	119.9 MHz †269.0 MHz ◆240.5 MHz		† for Talkdown 1, ◆for Talkdown 2 Maint Period: BTN 0001-1100 First THU of EV month
SRE	PAYA LEBAR DIRECTOR	283.0 MHz		Maint Period: BTN 0001-1100 Second THU of EV month
ACC	SINGAPORE RADAR	P123.7 MHz S127.3 MHz  P133.25 MHz S135.8 MHz  P134.4 MHz S128.1 MHz 255.4 MHz	H24	for AWY B469, G219, G334, R208, L625, L629, L635, L642, M751, M753, M758, M761, M763, M771, N884, N891, N892.  for AWY A457, A464, A576, B466, R325 (all northbound) and R469.  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
ILS GP RWY 02	-	332.00MHz	H24	012050.42N 1035410.11E	GP angle 3 DEG.

<i>Type of Aid and MAG Variation</i>	<i>IDENT</i>	<i>FREQ</i>	<i>OPR Hour</i>	<i>Position of transmitting Antenna Coordinates</i>	<i>DME transmitting Antenna Elevation / Remarks</i>
ILS DME RWY 02	IPN	CH30X	H24	012050.42N 1035410.11E	DME co-located with GP
ILS LLZ RWY 20	IPS	111.5MHz	H24	012027.24N 1035404.48E	LOC 462m from THR RWY 02 along centreline of RWY. Course width 3 deg. Maint Period: BTN 0001-0900 Second SUN of EV month
ILS GP RWY 20	-	332.90MHz	H24	012227.29N 1035451.29E	GP angle 3 deg.
ILS DME RWY 20	IPS	CH52X	H24	012227.29N 1035451.29E	DME co-located with GP

## **WSAP AD 2.20 LOCAL TRAFFIC REGULATIONS - DESIGNATION OF PAYA LEBAR AIRPORT AS AN ALTERNATE AD FOR SINGAPORE CHANGI AIRPORT**

### **1 INTRODUCTION**

- 1.1 Paya Lebar Airport is designated as an alternate aerodrome to Singapore Changi Airport.
- 1.2 As Paya Lebar Airport is a joint civil/military aerodrome, its use as a planned alternate aerodrome for Singapore Changi Airport is subjected to certain restrictions and limitations. It also has limited ground, baggage and passenger handling facilities for civilian aircraft operations, such as passenger boarding bridges.

### **2 MANNING OF PAYA LEBAR AIRPORT**

- 2.1 The airport is open from 2300-1100 on SUN-MON to THU-FRI and 2300-0500 on FRI-SAT. It is closed on Sundays and Public Holidays. Outside the stipulated operating hours and during airport closure, Paya Lebar Airport will be opened at 30 minutes' notice to accept diversion flights into the aerodrome.
- 2.2 Airline operators are requested to inform the Airport Manager and the Duty Tower Controller or SATCC Watch Manager at Singapore Changi Airport as soon as it is known that their service will require the use of Paya Lebar Airport. Revised ETAs and/or ETDs are to be notified as soon as known.
- 2.3 The airport will hold off all departures and arrivals when the aerodrome visibility falls below 3km, or when the aerodrome prevailing cloud base is lower than 500ft. This is a safety consideration to avoid aircraft from carrying out a missed approach under an adverse weather condition. For maintenance/test flights scheduled to depart and arrive back to the airport, such departures may be held off when the aerodrome visibility falls below 6km, or when the aerodrome prevailing cloud base is lower than 1,000ft.

### **3 OPERATIONAL SERVICES**

- 3.1 Air-ground-air communications maintained by Paya Lebar Airport for aerodrome/approach control service are listed in page WSAP AD 2-7.

### **4 PASSENGER CLEARANCE**

- 4.1 All Customs, Health and Immigration clearances will be carried out at Singapore Changi Airport.
- 4.2 The diverting aircraft Airline's Coordinator and its ground handling agency staff shall be present to provide assistance when an aircraft is required to land at Paya Lebar Airport.

### **5 SECURITY**

- 5.1 All airline personnel, including ground handlers and support staff who have to proceed to Paya Lebar Airport must wear their Singapore Changi Airport passes at a prominent position for entry to the aircraft parking area. All personnel not in possession of the laminated Singapore Changi Airport pass will be denied entry into Paya Lebar Airport by the RSAF Security Guard. Entry into the airport by both the airline personnel and service equipment is via the main gate. The Airline Engineering Coordinator shall be responsible for the proper positioning of the ground servicing equipment and vehicles in the Apron Area where arriving aircraft are to be parked.
- 5.2 The security of civil aircraft parked in the Apron is the responsibility of the aircraft owner and any security service obtained shall first be cleared with the Paya Lebar Airport flight security.

## **6 AIRCRAFT STAND ALLOCATION**

- 6.1 Nine aircraft parking positions in Apron C and on taxiway fillets are available for civil aircraft. A separation of 40 feet between wing-tips should be maintained.
- 6.2 Aircraft parking positions will be issued by the Paya Lebar Tower and the Airline Engineering Coordinator shall provide the marshalling services. Close coordination between the Airline Engineering Coordinator and the Tower Controller is essential in regard to aircraft parking and positioning of servicing equipment in and around the parking apron.

## **7 AIRCRAFT REFUELLING**

- 7.1 ST Airport Services Pte Ltd (STARS) is the assigned aircraft fuelling agency. However, prior arrangement must be made between the airline and STARS for such services. The refuelling rate available is 350 imperial gallons per minute (IGPM).

## **8 GROUND OPERATIONS**

- 8.1 Singapore Airport Terminal Services (SATS) and DNATA Singapore Pte Ltd (DNATA) will provide all ground services at one hour's prior notice except engineering services which will be provided by Singapore Airlines.

## **9 FULL EMERGENCY/CRASH PROCEDURE**

- 9.1 In the event of a Full Emergency being declared on a civil aircraft diverted to Paya Lebar AP, Full Emergency/Crash Procedures applicable to Singapore Changi AP will equally apply to Paya Lebar AP.
- 9.2 Alerting of all outside organisations such as the Singapore Civil Defence Force, Police, MINDEF and ambulance services shall be carried out by the Singapore Changi AP Tower Controller.

## **10 METEOROLOGICAL AND AERONAUTICAL INFORMATION SERVICE**

- 10.1 Meteorological service is available 24 hours at the 6th floor of the Old Operations Building, Paya Lebar Airport.
- 10.2 Aeronautical Information Service is available at Singapore Changi Airport.

## **11 ATC SERVICE OUTSIDE STIPULATED OPERATING HOURS**

- 11.1 Radar service will not be available at Paya Lebar Airport outside its stipulated operating hours.

# **WSAP AD 2.22 FLIGHT AND GROUND PROCEDURES**

## **1 DEPARTURE AND ARRIVAL PROCEDURES**

- 1.1 The designated runway for departures is RWY 02 and for arrivals is RWY 20.
- 1.2 The airport will hold off all departures and arrivals when the aerodrome visibility falls below 3km, or when the aerodrome prevailing cloud base is lower than 500ft. This is a safety consideration to avoid aircraft from carrying out a missed approach and overflying the populace under an adverse weather condition.

## **2 STANDARD INSTRUMENT DEPARTURES**

November 1 Departure - Climb to maintain 3,000ft on RWY heading for PU DVOR/DME. At PU DVOR/ DME, turn left heading 010. Contact Paya Lebar APP on 119.9MHz or 298.0MHz or as instructed by ATC.

November 2 Departure - Climb to maintain 3,000ft on RWY heading for PU DVOR/DME. At PU DVOR/ DME, maintain heading 020. Contact Paya Lebar APP on 119.9MHz or 298.0MHz or as instructed by ATC.

November 3 Departure - Climb to maintain 3,000ft on RWY heading for PU DVOR/DME. At PU DVOR/ DME, turn left heading 360. Contact Paya Lebar APP on 119.9MHz or 298.0MHz or as instructed by ATC.

## **3 STANDARD ARRIVALS**

When Paya Lebar is VMC - Expect radar vector to RWY 20 for visual straight-in approach.

When Paya Lebar is IMC - Expect radar vector to RWY 20 for ILS or PU DVOR/DME approach.

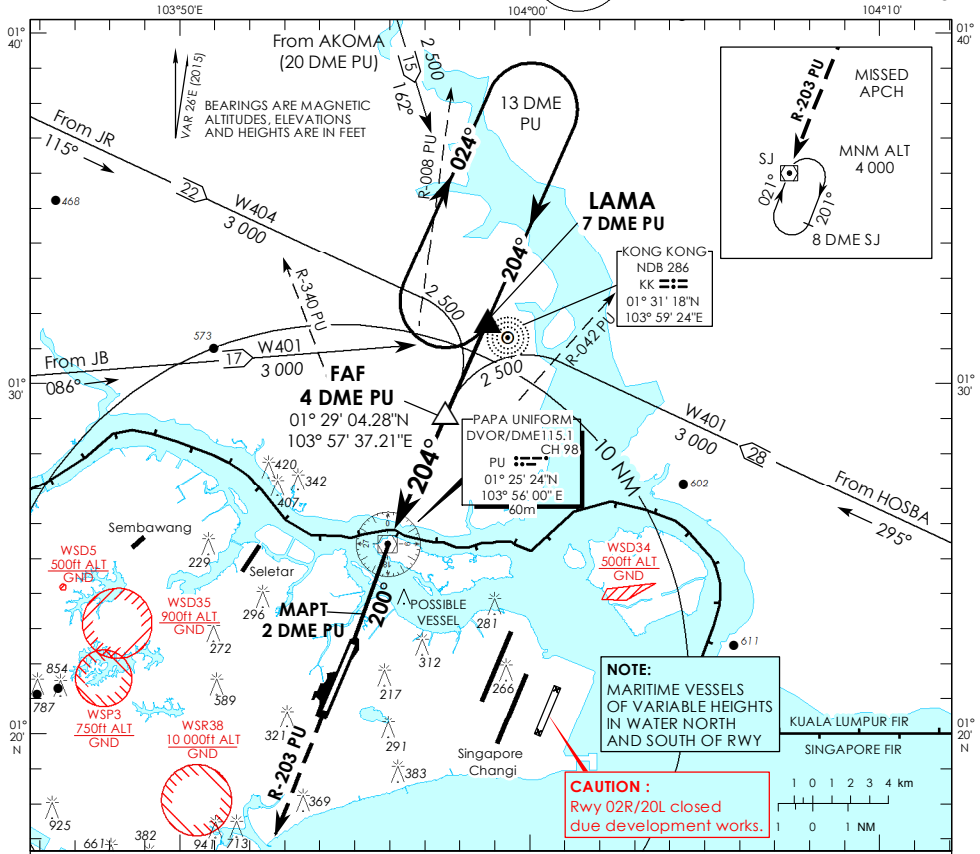
**INSTRUMENT  
APPROACH  
CHART**

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



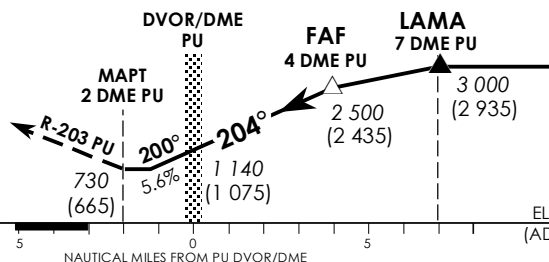
APP 120.3  
119.9  
TWR 118.05

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



Transition Level : FL 130  
Transition Alt : 11 000

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



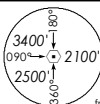
OCA (OCH)								
Category of Aircraft	A		B		C		D	
Straight-in	730 (665)							
Distance	3 DME	2 DME	1 DME	PU DVOR/DME	1 DME			
Altitude (Height)	2160 (2095)	1820 (1755)	1480 (1415)	1140 (1075)	800 (735)			
Speed	knots	70	120	150	185			
FAF - MAPT 6nm	min : s	5 : 09	3 : 00	2 : 24	1 : 57			
Rate of descent/GS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

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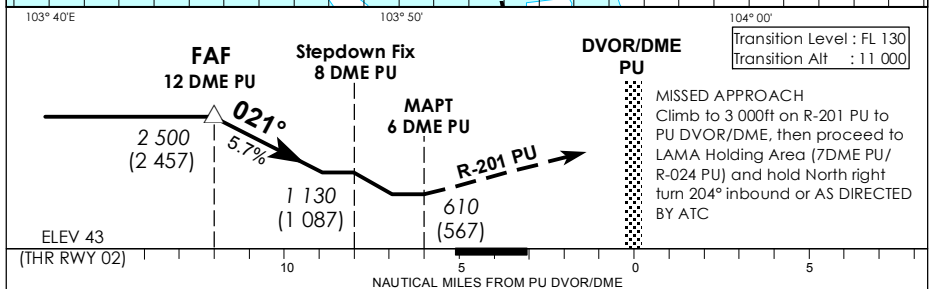
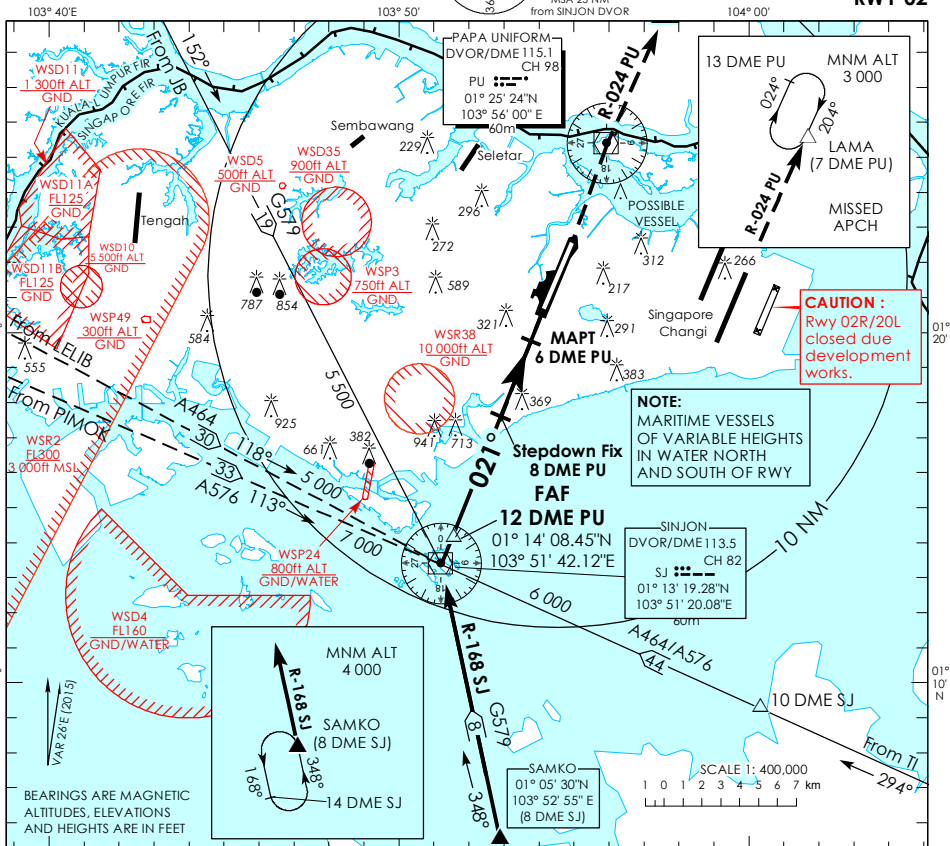
**INSTRUMENT  
APPROACH  
CHART**

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



APP 120.3  
119.9  
TWR 118.05

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

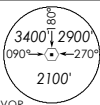


OCA (OCH)					
Category of Aircraft	A	B	C	D	
Straight-in (with stepdown fix)	610 (567)				
Straight-in (without stepdown fix)	1 130 (1 087)				
Distance	11 DME	10 DME	9 DME	8 DME	7 DME
Altitude (Height)	2170 (2127)	1820 (1777)	1470 (1427)	1130 (1087)	780 (737)
Speed	knots	70	120	150	185
FAF - MAPT 6nm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

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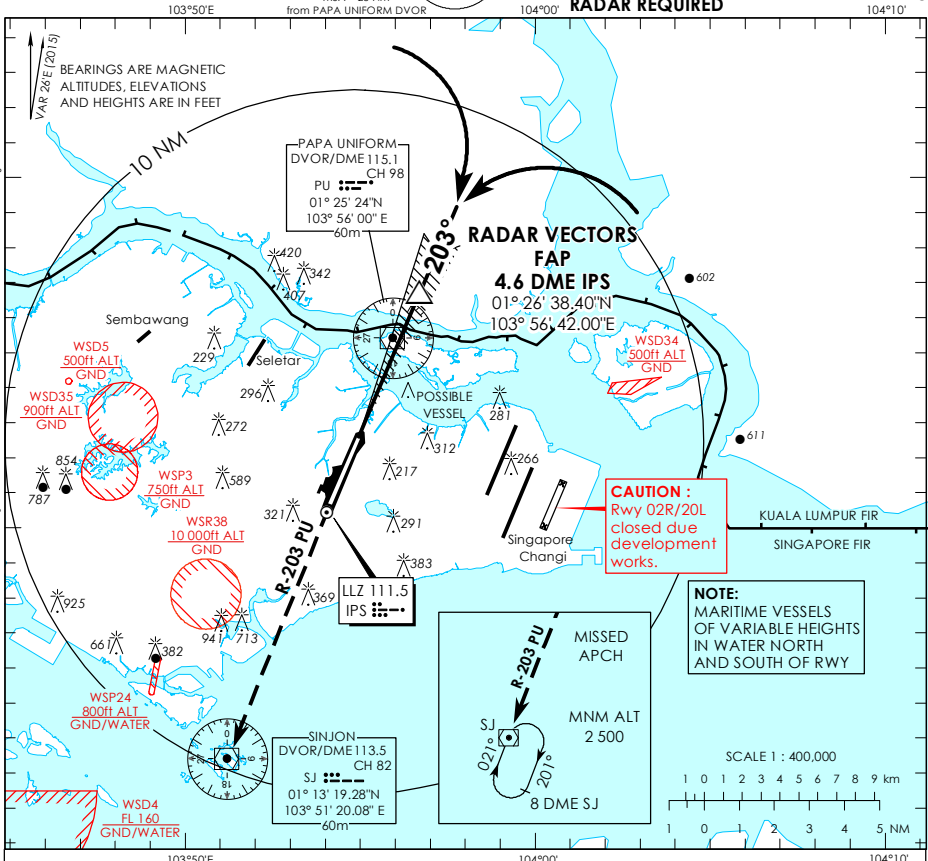
**INSTRUMENT  
APPROACH  
CHART**

**AERODROME ELEV 65ft**  
HEIGHT RELATED TO  
THR RWY 20 - 65ft



ATIS Paya Lebar	148.9
Singapore APP	120.3
Paya Lebar APP	119.9 298.0
Paya Lebar TWR	118.05 263.1
GND CON	121.7 296.0

**SINGAPORE/  
PAYA LEBAR  
IPS ILS/DME  
RWY 20**

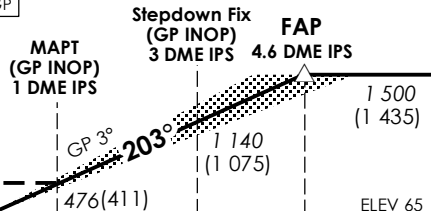


Transition Level : FL 130  
Transition Alt : 11 000

ILS/DME co-located with GP

ILS RDH 55

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



OCA (OCH)					
Category of Aircraft	A	B	C	D	
Straight-in	CAT I ILS	194 (129)	204 (139)	214 (149)	224 (159)
	GP INOP	476 (411)			
Distance	4 DME	3 DME	2 DME		
Altitude (Height)	1300 (1235)	1140 (1075)	820 (755)		
Speed	knots	70	120	150	185
FAF - MAPT 3.6nm	min : s	3 : 06	1 : 48	1 : 27	1 : 11
Rate of descent/GS	ft/min	370	635	795	980

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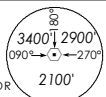
**INSTRUMENT APPROACH CHART**

AERODROME ELEV **65ft**

HEIGHT RELATED TO

THR RWY 02 - ELEV **43ft**

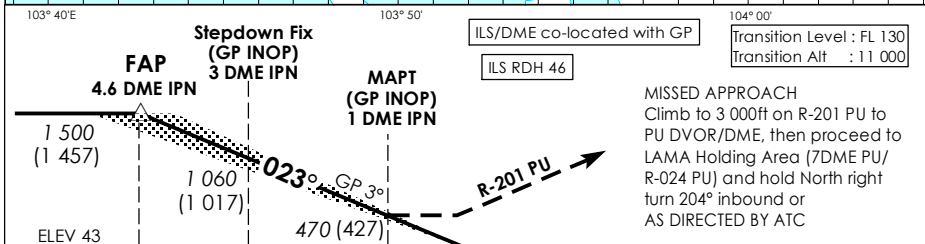
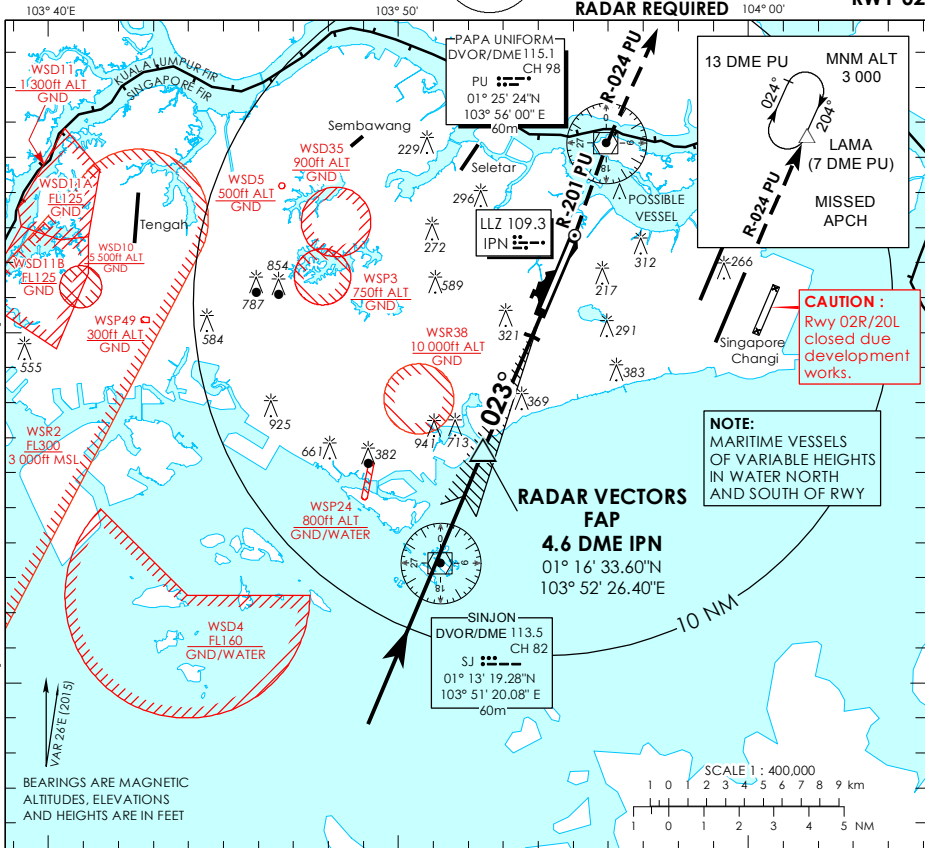
MSA 25 NM from PAPA UNIFORM DVOR



ATIS Paya Lebar	148.9
Singapore APP	120.3
Paya Lebar APP	119.9 298.0
Paya Lebar TWR	118.05 263.1
GND CON	121.7 296.0

**SINGAPORE/PAYA LEBAR**

**IPN ILS/DME RWY 02**



OCA (OCH)					
Category of Aircraft	A	B	C	D	
Straight-in	CAT I ILS	178 (135)	188 (145)	198 (155)	208 (165)
	GP INOP	470 (427)			
Distance	4 DME	3 DME	2 DME		
Altitude (Height)	1300 (1257)	1060 (1017)	740 (697)		
Speed	knots	70	120	150	185
FAF - MAPT 3.6nm	min : s	3 : 06	1 : 48	1 : 27	1 : 11
Rate of descent/GS	ft/min	370	635	795	980

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**INSTRUMENT APPROACH CHART**

AERODROME ELEV **65ft**

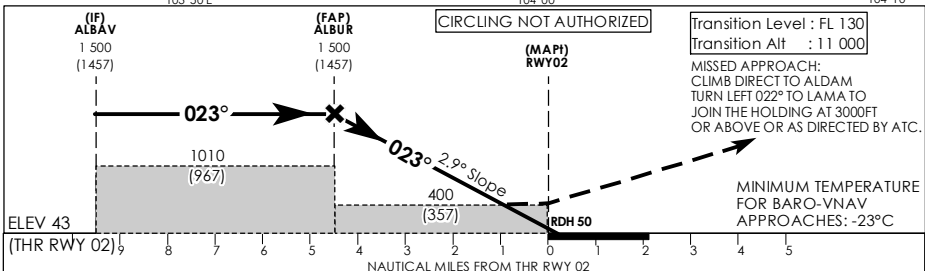
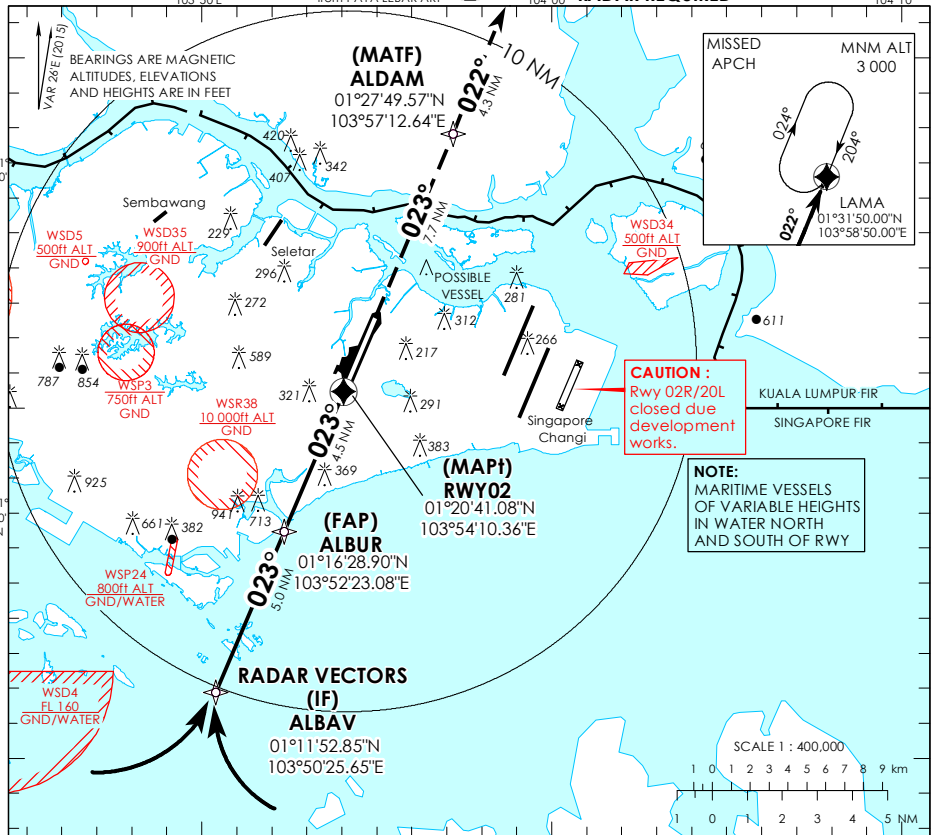
HEIGHT RELATED TO THR RWY 02 - **43ft**

MSEA 25 NM from PAYA LEBAR ARP

3500  
+  
ARP  
25 NM

ATIS Paya Lebar	148.9
Singapore APP	120.3
Paya Lebar APP	119.9
Paya Lebar TWR	118.05
GND CON	121.7
	296.0

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



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

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**INSTRUMENT APPROACH CHART**

AERODROME ELEV 65ft

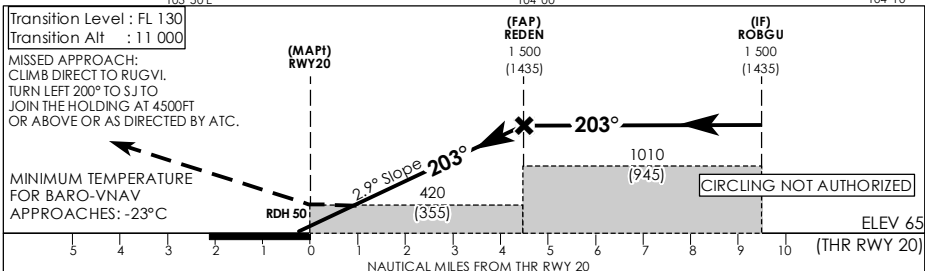
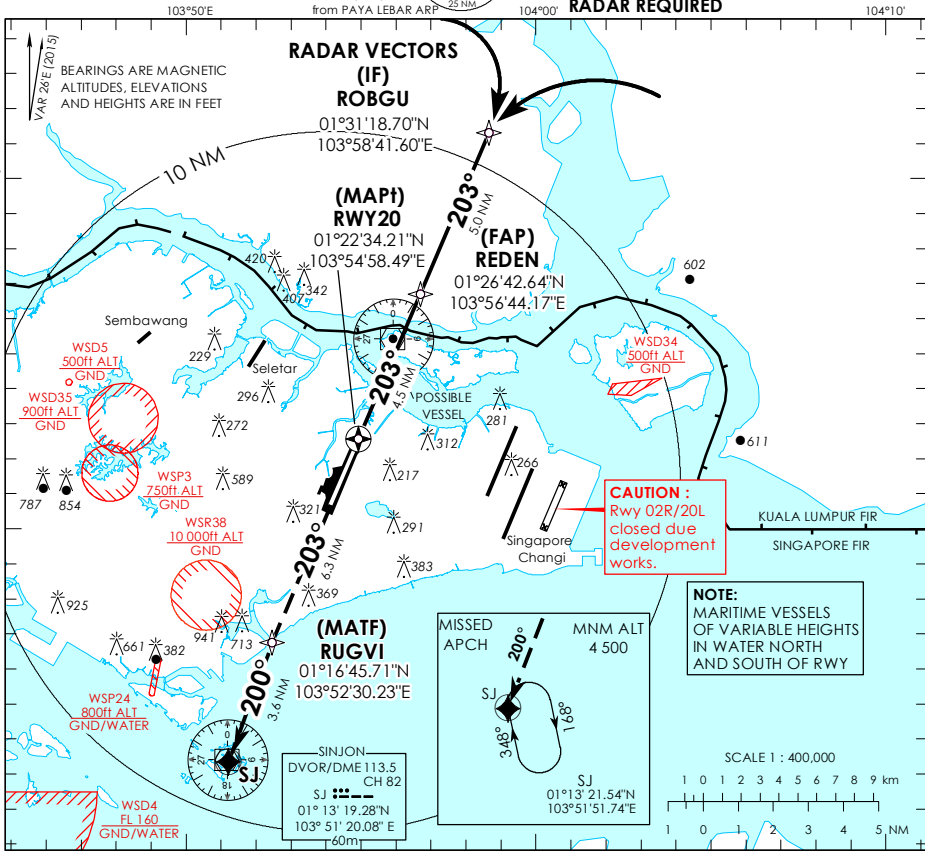
HEIGHT RELATED TO THR RWY 20 - 65ft



ATIS Paya Lebar	148.9
Singapore APP	120.3
Paya Lebar APP	119.9 298.0
Paya Lebar TWR	118.05 263.1
GND CON	121.7 296.0

**SINGAPORE/PAYA LEBAR RNAV (GNSS) RWY 20**

**RADAR REQUIRED**



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

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## WIDN — TANJUNG PINANG/RAJA HAJI FISABILILLAH (INDONESIA)

*Note: The following sections in this chapter are intentionally left blank:*

*AD 2.2, AD 2.3, AD 2.4, AD 2.5, AD 2.6, AD 2.7, AD 2.8, AD 2.9, AD 2.10, AD 2.11, AD 2.12, AD 2.13, AD 2.14, AD 2.15, AD 2.16, AD 2.19, AD 2.20, AD 2.21, AD 2.22, AD 2.23.*

### WIDN AD 2.1 AERODROME LOCATION INDICATOR AND NAME

WIDN — TANJUNG PINANG/RAJA HAJI FISABILILLAH (INDONESIA)

#### WIDN AD 2.17 ATS AIRSPACE

1	<i>Designation and Lateral Limits</i>	<b>RAJA HAJI FISABILILLAH ATZ</b> A circle with a radius of 10 NM centred at TPG VOR/DME (005412.76N 1043052.42E)
2	<i>Vertical Limits</i>	GND to 1500 FT
3	<i>Airspace Classification</i>	C
4	<i>ATS Unit Callsign Language(s)</i>	RAJA TOWER English
5	<i>Transition Altitude</i>	11000 FT ALT (3,350m)
6	<i>Remarks</i>	Operating Hours: 0000-1200 daily  Controlling Authority: Raja Tower  Local Traffic Regulations: Due to obstacle (hill), TKOF shall use RWY 22 and LDG shall use RWY 04.

#### WIDN AD 2.18 ATS COMMUNICATION FACILITIES

<i>Service designation</i>	<i>Callsign</i>	<i>Frequency</i>	<i>Hours of operation</i>	<i>Remarks</i>
TWR	RAJA TOWER	118.95 MHz	0000-1100	TWR coordinates: 005510.94N 1043140.25E
APP	TANJUNG PINANG APPROACH	130.2 MHz	0000-1400	Radar Operation.

#### WIDN AD 2.24 CHARTS RELATED TO AN AERODROME

SID - RWY 04/22 WEST POINT 1A/1B DEP, KIRDA 1A/1B DEP .....	<a href="#">AD-2-WIDN-SID-1</a>
SID - RWY 04/22 SINGKEP 1A/1B DEP, TANGO INDIA 1A/1B DEP .....	<a href="#">AD-2-WIDN-SID-2</a>
SID - RWY 04/22 TOMAN 1A/1B DEP, JITLIM 1 AD A/1B DEP .....	<a href="#">AD-2-WIDN-SID-3</a>
SID - RWY 04/22 TEKONG 1A/1B DEP .....	<a href="#">AD-2-WIDN-SID-4</a>
STAR - RWY 04/22 WEST POINT 1A/1B ARR, TANGO INDIA 1A/1B ARR .....	<a href="#">AD-2-WIDN-STAR-1</a>
STAR - RWY 04/22 TOMAN 1A/1B ARR, JITLIM 1A/1B ARR .....	<a href="#">AD-2-WIDN-STAR-2</a>
STAR - RWY 04/22 SINGKEP 1A/1B ARR, PARDI 1A/1B ARR .....	<a href="#">AD-2-WIDN-STAR-3</a>
STAR - RWY 04/22 TEKONG 1A/1B ARR .....	<a href="#">AD-2-WIDN-STAR-4</a>

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