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## REPUBLIC OF SINGAPORE

**AERONAUTICAL INFORMATION SERVICES**  
CIVIL AVIATION AUTHORITY OF SINGAPORE  
SINGAPORE CHANGI AIRPORT  
P.O. BOX 1, SINGAPORE 918141

# AIP

**AMENDMENT NR 3/14**  
**29 MAY 2014**

### 1. SIGNIFICANT INFORMATION AND CHANGES

#### 1.1 Singapore FIR

- a) Use of appropriate radiotelephony phraseology for notification of low fuel state ENR 1.1-4
- b) Introduction of enroute Waypoint SABKA for ATS Route A457 ENR 3.1-1  
ENR 2.1-9 / Chart  
ENR 3.6-5 / Chart  
ENR 3.6-7 / Chart  
ENR 3.6-9 / Chart  
ENR 5.1-7 / Chart  
ENR 6-1 / Chart

#### 1.2 Singapore Changi Airport (WSSS)

- a) Inclusion of RVR minima for CAT II ILS operations WSSS AD 2-1  
WSSS AD 2-22
- b) Update to Singapore Changi Aerodrome Obstacle Chart - ICAO Type A, RWY 20R/02L WSSS AD 2-37 / Chart
- c) Installation of frangible poles for the purpose of identifying 90m away from the centreline of RWY 02L/20R and RWY 02C/20C WSSS AD 2-1

#### 1.3 Tengah Aerodrome (WSAT)

- a) Update to Aerodrome Plan WSAT AD 2-11

### 2. INSERT THE ATTACHED REPLACEMENT PAGES WHICH ARE MARKED WITH ASTERISKS IN THE CHECKLIST OF PAGES - GEN 0.4-1 TO GEN 0.4-4.

### 3. NEW OR REVISED INFORMATION IS INDICATED EITHER BY A HORIZONTAL ARROW OR A VERTICAL LINE.

### 4. RECORD ENTRY OF AMENDMENT ON PAGE GEN 0.2-1.

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 THIS AMENDMENT INCORPORATES INFORMATION CONTAINED IN THE FOLLOWING WHICH ARE HEREBY SUPERSEDED:

#### NOTAM:

A1916/13 dated 15 AUG 13  
A0767/14 dated 24 APR 14  
A0916/14 dated 16 MAY 14

#### AIP Supplement:

87/14 dated 20 MAR 14



<b>GEN 0.3 RECORD OF CURRENT AIP SUPPLEMENTS</b>				
<i>NR/ Year</i>	<i>Subject</i>	<i>AIP section affected</i>	<i>Period of validity (from / to)</i>	<i>Cancellation record</i>
90/13	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 1 JAN 16	
91/13	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 1 JAN 16	
92/13	Paya Lebar AP - Tower Cranes	AD	WIE / 25 JAN 16	
93/13	Paya Lebar AP - Topless Cranes	AD	WIE / 31 JAN 16	
94/13	Paya Lebar AP - Luffer Crane	AD	WIE / 31 JAN 16	
172/13	Paya Lebar AP - Luffer Crane	AD	WIE / 30 DEC 15	
173/13	Paya Lebar AP - Luffer Crane	AD	WIE / 30 DEC 15	
174/13	Paya Lebar AP - Tower Crane	AD	WIE / 31 DEC 15	
175/13	Paya Lebar AP - Hammerhead and Luffer Cranes	AD	WIE / 31 DEC 15	
176/13	Paya Lebar AP - Topless and Luffer Cranes	AD	WIE / 31 DEC 15	
183/13	Paya Lebar AP - Luffer Crane	AD	WIE / 28 JUL 14	
184/13	Paya Lebar AP - Tower Cranes	AD	WIE / 31 JUL 14	
185/13	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 JUL 14	
186/13	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 JUL 14	
187/13	Paya Lebar AP - Tower Crane	AD	WIE / 31 JUL 14	
208/13	Paya Lebar AP - Hammerhead Crane	AD	WIE / 1 NOV 15	
209/13	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 1 NOV 15	
210/13	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 NOV 15	
211/13	Paya Lebar AP - Topless and Luffer Cranes	AD	WIE / 30 NOV 15	
212/13	Paya Lebar AP - Topless and Luffer Cranes	AD	WIE / 30 NOV 15	
213/13	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 AUG 16	
214/13	Paya Lebar AP - Saddle and Luffer Cranes	AD	WIE / 31 AUG 16	
215/13	Paya Lebar AP - Saddle Cranes	AD	WIE / 1 SEP 16	
216/13	Paya Lebar AP - Luffer Cranes	AD	WIE / 10 SEP 16	
217/13	Paya Lebar AP - Topless Cranes	AD	WIE / 30 SEP 16	
218/13	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 1 JAN 15	
219/13	Paya Lebar AP - Luffer Crane	AD	WIE / 9 JAN 15	
220/13	Paya Lebar AP - Hammerhead and Luffer Cranes	AD	WIE / 31 JAN 15	
221/13	Paya Lebar AP - Luffer Crane	AD	WIE / 31 JAN 15	
222/13	Paya Lebar AP - Luffer Crane	AD	WIE / 31 JAN 15	
228/13	Paya Lebar AP - Luffer Cranes	AD	WIE / 15 MAR 15	
229/13	Paya Lebar AP - Luffer Cranes	AD	WIE / 15 MAR 15	
230/13	Paya Lebar AP - Luffer and Topless Cranes	AD	WIE / 31 MAR 15	
231/13	Paya Lebar AP - Topless Cranes	AD	WIE / 31 MAR 15	
232/13	Paya Lebar AP - Topless Cranes	AD	WIE / 31 MAR 15	
238/13	Paya Lebar AP - Cranes	AD	WIE / 9 JUL 15	
239/13	Paya Lebar AP - Saddle and Luffer Cranes	AD	WIE / 31 JUL 15	
240/13	Paya Lebar AP - Saddle Cranes	AD	WIE / 1 AUG 15	
241/13	Paya Lebar AP - Topless Cranes	AD	WIE / 30 SEP 15	
242/13	Paya Lebar AP - Luffer Crane	AD	WIE / 1 NOV 15	
243/13	Paya Lebar AP - Hammerhead and Luffer Cranes	AD	WIE / 31 MAR 16	
244/13	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 MAR 16	
245/13	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 1 APR 16	
246/13	Paya Lebar AP - Luffer Crane	AD	WIE / 30 MAY 16	
247/13	Paya Lebar AP - Luffer Crane	AD	WIE / 22 JUN 16	
248/13	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 JUN 16	
249/13	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 JUN 16	
250/13	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 16	
251/13	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 16	
252/13	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 17	
254/13	Singapore FIR - Implementation of ADS-B Out Exclusive Airspace within parts of Singapore FIR	ENR	WEF 12 DEC 13 / PERM	
255/13	Paya Lebar AP - Hammerhead and Topless Cranes	AD	WIE / 31 DEC 16	

<b>GEN 0.3 RECORD OF CURRENT AIP SUPPLEMENTS</b>				
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256/13	Paya Lebar AP - Topless Cranes / A Frames	AD	WIE / 31 DEC 16	
257/13	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 16	
258/13	Paya Lebar AP - Luffer and Hammerhead Canes	AD	WIE / 31 DEC 16	
259/13	Paya Lebar AP - Topless and Hammerhead Cranes	AD	WIE / 31 DEC 16	
260/13	Paya Lebar AP - Luffer Cranes	AD	WIE / 1 DEC 15	
261/13	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 20 DEC 15	
262/13	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 15	
263/13	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 15	
264/13	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 15	
1/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 16	
2/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 16	
3/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 16	
4/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 16	
5/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 16	
6/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 JUN 14	
7/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 30 JUN 14	
8/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 30 JUN 14	
9/14	Paya Lebar AP - Tower Cranes	AD	WIE / 30 JUN 14	
10/14	Paya Lebar AP - Cranes	AD	WIE / 30 JUN 14	
11/14	Paya Lebar AP - Hammerhead Crane	AD	WIE / 1 DEC 15	
12/14	Paya Lebar AP - Luffer Crane	AD	WIE / 15 DEC 15	
13/14	Paya Lebar AP - Luffer Crane	AD	WIE / 27 DEC 15	
14/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 15	
15/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 15	
16/14	Paya Lebar AP - Tower Cranes	AD	WIE / 25 JUN 15	
17/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 30 JUN 15	
18/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 30 JUN 15	
19/14	Paya Lebar AP- Cranes	AD	WIE / 30 JUN 15	
20/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 JUN 15	
30/14	Paya Lebar AP - Mobile Cranes	AD	WIE / 1 JAN 17	
31/14	Paya Lebar AP - Cranes	AD	WIE / 31 DEC 14	
32/14	Paya Lebar AP - Tower Crane	AD	WIE / 31 DEC 14	
33/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 14	
34/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 31 DEC 14	
35/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 14	
36/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 30 DEC 14	
37/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 14	
38/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 14	
39/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 31 DEC 14	
40/14	Paya Lebar AP - Cranes	AD	WIE / 31 DEC 14	
41/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 31 DEC 14	
42/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 14	
43/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 14	
44/14	Paya Lebar AP - Saddle Tower Cranes	AD	WIE / 31 DEC 14	
45/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 31 DEC 14	
46/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 31 DEC 14	
47/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 14	
48/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 14	
49/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 14	
50/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 14	
51/14	Paya Lebar AP - Cranes	AD	WIE / 31 DEC 15	
52/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 15	

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53/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 15	
54/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 15	
55/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 15	
56/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 JUN 14	
57/14	Paya Lebar AP - Tower and Topless Cranes	AD	WIE / 30 JUN 14	
58/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 JUN 14	
59/14	Paya Lebar AP - Crawler Crane	AD	WIE / 30 JUN 14	
60/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 30 JUN 14	
61/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 15	
62/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 15	
63/14	Paya Lebar AP - Cranes	AD	WIE / 31 DEC 15	
64/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 15	
65/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 15	
66/14	Paya Lebar AP - Saddle Cranes	AD	WIE / 30 DEC 15	
67/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 15	
68/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 15	
69/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 15	
70/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 31 DEC 15	
76/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 DEC 14	
77/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 14	
79/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 14	
80/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 14	
82/14	Paya Lebar AP - Topless Cranes	AD	WIE / 12 JUN 14	
86/14	Singapore Changi AP - Work activities due to construction of new water retention pond at south end reservoir	AD	WIE / 31 DEC 14	
88/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 AUG 14	
89/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 AUG 14	
90/14	Paya Lebar AP - Tower Cranes	AD	WIE / 31 AUG 14	
91/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 AUG 14	
92/14	Paya Lebar AP - Tower Crane	AD	WIE / 31 AUG 14	
93/14	Paya Lebar AP - Luffer Crane	AD	WIE / 1 SEP 14	
94/14	Paya Lebar AP - Topless Cranes	AD	WIE / 30 SEP 14	
95/14	Paya Lebar AP - Topless Cranes	AD	WIE / 30 SEP 14	
96/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 SEP 14	
97/14	Paya Lebar AP - Cranes	AD	WIE / 30 SEP 14	
98/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 JUN 14	
99/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 JUN 14	
100/14	Paya Lebar AP - Hammerhead Crane	AD	WIE / 31 JUL 14	
101/14	Paya Lebar AP - Flat Top Cranes	AD	WIE / 29 AUG 14	
102/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 SEP 14	
103/14	Paya Lebar AP - Cranes	AD	WIE / 10 OCT 14	
104/14	Paya Lebar AP - Tower Cranes	AD	WIE / 30 NOV 14	
105/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 NOV 14	
106/14	Paya Lebar AP - Cranes	AD	WIE / 2 DEC 14	
107/14	Paya Lebar AP - Topless Cranes	AD	WIE / 29 DEC 14	
108/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 24 FEB 15	
109/14	Paya Lebar AP - Flat Top Cranes	AD	WIE / 28 FEB 15	
110/14	Paya Lebar AP - Luffer Crane	AD	WIE / 28 FEB 15	
111/14	Paya Lebar AP - Hammerhead and Luffer Cranes	AD	WIE / 28 FEB 15	
112/14	Paya Lebar AP - Topless Cranes	AD	WIE / 28 FEB 15	
113/14	Paya Lebar AP - Cranes	AD	WIE / 1 MAR 15	

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114/14	Paya Lebar AP - Cranes	AD	WIE / 15 MAR 15	
115/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 MAY 15	
116/14	Paya Lebar AP - Mobile Cranes	AD	WIE / 6 JUN 15	
118/14	Paya Lebar AP - Crane	AD	WIE / 28 FEB 17	
119/14	Paya Lebar AP - Cranes	AD	WIE / 1 MAR 16	
120/14	Paya Lebar AP - Cranes	AD	WIE / 1 MAR 16	
121/14	Paya Lebar AP - Cranes	AD	WIE / 30 MAR 16	
122/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 SEP 16	
124/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 JAN 17	
125/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 1 FEB 17	
126/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 1 FEB 17	
127/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 28 FEB 17	
128/14	Paya Lebar AP - Tower Cranes	AD	WIE / 1 MAR 17	
129/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 4 MAR 17	
130/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 DEC 17	
131/14	Paya Lebar AP - Hammerhead and Luffer Cranes	AD	WIE / 31 DEC 17	
132/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 17	
133/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 17	
134/14	Paya Lebar AP - Mobile Crane	AD	WIE / 11 MAY 15	
135/14	Paya Lebar AP - Tower and Topless Cranes	AD	WIE / 14 MAY 15	
136/14	Paya Lebar AP - Luffer Crane	AD	WIE / 20 MAY 15	
137/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 MAY 15	
138/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 MAY 15	
139/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 JUL 14	
140/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 SEP 14	
141/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 31 OCT 14	
142/14	Paya Lebar AP - Luffer Crane	AD	WIE / 1 NOV 14	
143/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 31 DEC 14	
144/14	Paya Lebar AP - Crawler Cranes	AD	WIE / 15 NOV 14	
145/14	Paya Lebar AP - Tower Cranes	AD	WIE / 31 DEC 14	
146/14	Paya Lebar AP - Tower Crane	AD	WIE / 15 JAN 15	
147/14	Paya Lebar AP - Luffer Crane	AD	WIE / 14 FEB 15	
148/14	Paya Lebar AP - Crawler Crane	AD	WIE / 15 MAR 15	
149/14	Paya Lebar AP - Mobile Crane	AD	WIE / 14 MAR 15	
150/14	Paya Lebar AP - Topless Cranes	AD	WIE / 30 APR 15	
151/14	Paya Lebar AP - Topless Cranes	AD	WIE / 30 APR 15	
152/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 APR 15	
153/14	Paya Lebar AP - Topless Cranes	AD	WIE / 30 SEP 14	
154/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 1 JUN 15	
155/14	Paya Lebar AP - Mobile Crane	AD	WIE / 6 JUN 15	
156/14	Paya Lebar AP - Cranes	AD	WIE / 30 JUN 15	
157/14	Paya Lebar AP - Tower Cranes	AD	WIE / 3 JUL 15	
158/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 4 JUL 15	
159/14	Paya Lebar AP - Luffer Cranes and Tower Crane	AD	WIE / 28 JUL 15	
160/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 SEP 15	
161/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 OCT 15	
162/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 NOV 15	
163/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 15	
164/14	Sembawang AD - Luffer Cranes	AD	WIE / 28 FEB 16	








GEN 0.4 CHECKLIST OF AIP PAGES					
PAGE	DATE	PAGE	DATE	PAGE	DATE
<b><u>PART 1 - GENERAL (GEN)</u></b>			<b><u>PART 2 - EN-ROUTE (ENR)</u></b>		
<b>GEN 0</b>				<b>ENR 0</b>	
0.1-1	12 DEC 13	2.2-6	23 SEP 10	0.6-1	10 MAR 11
0.1-2	12 DEC 13	2.2-7	20 DEC 07	0.6-2	10 MAR 11
0.1-3	28 SEP 06	2.2-8	20 DEC 07	0.6-3	27 JUN 13
0.2-1	13 JAN 11	2.3-1	18 JAN 07	0.6-4	27 JUN 13
* 0.3-1	29 MAY 14	2.3-2	18 JAN 07		
* 0.3-2	29 MAY 14	2.4-1	3 JUN 10		
* 0.3-3	29 MAY 14	2.5-1	18 JAN 07	<b>ENR 1</b>	
* 0.3-4	29 MAY 14	2.5-3/chart	15 MAR 07	1.1-1	1 SEP 05
* 0.3-5	29 MAY 14	2.6-1	28 SEP 06	1.1-2	1 SEP 05
* 0.4-1	29 MAY 14	2.6-2	28 SEP 06	* 1.1-3	29 MAY 14
* 0.4-2	29 MAY 14	2.7-1	18 NOV 10	* 1.1-4	29 MAY 14
* 0.4-3	29 MAY 14			1.1-5	8 JUN 06
* 0.4-4	29 MAY 14	<b>GEN 3</b>		1.1-6	8 JUN 06
* 0.5-1	29 MAY 14	3.1-1	12 DEC 13	1.1-7	28 SEP 06
0.6-1	5 MAY 11	3.1-2	12 DEC 13	1.1-8	28 SEP 06
0.6-2	5 MAY 11	3.1-3	9 FEB 12	1.1-9	28 SEP 06
0.6-3	20 SEP 12	3.1-4	9 FEB 12	1.1-10	28 SEP 06
		3.1-5	9 FEB 12	1.1-11	27 AUG 09
<b>GEN 1</b>		3.2-1	27 AUG 09	1.1-12	27 AUG 09
1.1-1	15 NOV 12	3.2-2	27 AUG 09	1.1-13	15 NOV 12
1.1-2	15 NOV 12	3.2-3	10 MAY 07	1.1-14	15 NOV 12
1.2-1	5 JUN 08	* 3.2-5	29 MAY 14	1.1-15	15 NOV 12
1.2-2	5 JUN 08	* 3.2-6	29 MAY 14	1.1-16	15 NOV 12
1.2-3	5 APR 12	3.2-7	18 JAN 07		
1.2-4	5 APR 12	3.3-1	27 AUG 09	1.2-1	10 MAY 07
1.2-5	6 FEB 14	3.3-2	27 AUG 09	1.3-1	29 JUL 10
1.2-6	6 FEB 14	3.4-1	10 MAR 11	1.4-1	18 NOV 10
1.3-1	3 JUN 10	3.4-2	10 MAR 11	1.5-1	20 NOV 08
1.3-2	3 JUN 10	3.4-3	18 JAN 07	1.5-2	20 NOV 08
1.3-3	22 AUG 13	3.4-4	18 JAN 07	1.5-3	23 NOV 06
1.3-4	22 AUG 13	3.4-5	28 SEP 06	1.5-4	23 NOV 06
1.3-5/chart	18 APR 02	3.4-6	28 SEP 06	1.5-5	23 NOV 06
1.3-7/chart	18 APR 02	3.4-7/diagram	18 NOV 10	1.6-1	10 MAR 11
1.4-1	5 MAY 11	3.4-9/diagram	28 SEP 06	1.6-2	10 MAR 11
1.4-2	5 MAY 11	3.5-1	6 FEB 14	1.6-3	17 OCT 13
1.4-3	5 MAY 11	3.5-2	6 FEB 14	1.6-4	17 OCT 13
1.5-1	22 OCT 09	* 3.5-3	29 MAY 14	1.6-5	6 FEB 14
* 1.6-1	29 MAY 14	* 3.5-4	29 MAY 14	1.6-6	6 FEB 14
* 1.6-2	29 MAY 14	* 3.5-5	29 MAY 14	1.6-7	10 MAR 11
1.6-3	3 APR 14	* 3.5-6	29 MAY 14	1.6-8	10 MAR 11
1.6-4	3 APR 14	3.5-7	20 NOV 08	1.6-9/chart	18 APR 02
1.7-1	7 MAR 13	3.5-8	20 NOV 08	1.6-11/chart	18 APR 02
1.7-2	7 MAR 13	* 3.5-9	29 MAY 14		
1.7-3	6 FEB 14	* 3.5-10	29 MAY 14	1.7-1	15 MAR 07
1.7-4	6 FEB 14	3.6-1	3 APR 14	1.7-2	15 MAR 07
1.7-5	6 FEB 14	3.6-2	3 APR 14	1.7-3	15 MAR 07
		3.6-3	3 APR 14	1.7-4	15 MAR 07
<b>GEN 2</b>		3.6-4	3 APR 14	1.7-5	29 JUL 10
2.1-1	27 JUN 13	3.6-5/chart	18 JAN 07	1.7-6	29 JUL 10
2.1-2	27 JUN 13			1.7-7	11 FEB 10
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1.8-7	31 JUL 08	3.1-7	20 SEP 12	WAC 2860	15 JUL 99
1.8-8	31 JUL 08	3.1-8	20 SEP 12	<b>PART 3 - AERODROME (AD)</b>	
1.8-9	1 SEP 05	* <b>3.1-17/chart</b>	<b>29 MAY 14</b>	<b>AD 0</b>	
1.8-10	1 SEP 05	* <b>3.3-1</b>	<b>29 MAY 14</b>	0.6-1	17 OCT 13
1.8-11	3 JUN 10	* <b>3.3-2</b>	<b>29 MAY 14</b>	0.6-2	17 OCT 13
1.8-12	3 JUN 10	3.3-3	6 FEB 14	0.6-3	17 OCT 13
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1.8-14	29 JUL 10	3.3-5	20 SEP 12	<b>AD 1</b>	
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1.8-16	27 JUN 13	* <b>3.3-7</b>	<b>29 MAY 14</b>	1.1-2	27 AUG 09
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1.9-1	15 JAN 09	3.4-1	3 APR 14	<b>AD 2</b>	
1.9-2	15 JAN 09	3.4-2	3 APR 14	* <b>WSSS AD 2-1</b>	<b>29 MAY 14</b>
1.9-3	5 JUL 07	3.4-3	18 NOV 10	* <b>WSSS AD 2-2</b>	<b>29 MAY 14</b>
1.9-4	5 JUL 07	3.4-4	18 NOV 10	WSSS AD 2-3	3 APR 14
1.9-5	5 JUL 07	3.4-5/chart	3 APR 14	WSSS AD 2-4	3 APR 14
1.10-1	3 APR 14	3.4-7/chart	18 JAN 07	WSSS AD 2-5.1	6 FEB 14
1.10-2	3 APR 14	3.5-1	27 JUN 13	WSSS AD 2-5.2	6 FEB 14
1.10-3	15 NOV 12	3.5-2	27 JUN 13	WSSS AD 2-5.3	6 FEB 14
1.10-4	15 NOV 12	3.5-3/chart	13 JAN 11	WSSS AD 2-6.1	15 NOV 12
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1.12-1	8 APR 10	3.6-2	20 OCT 11	WSSS AD 2-6.3	3 APR 14
1.12-2	8 APR 10	3.6-3/chart	20 SEP 12	WSSS AD 2-6.4	3 APR 14
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* <b>2.1-9/chart</b>	<b>29 MAY 14</b>	5.1-6	10 MAR 11	WSSS AD 2-7.15	2 MAY 13
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* <b>WSSS AD 2-21</b>	<b>29 MAY 14</b>	WSSS AD 2-82	26 JUL 12	WSSL AD 2-1	12 DEC 13
* <b>WSSS AD 2-22</b>	<b>29 MAY 14</b>	WSSS AD 2-81-1/chart	5 APR 12	WSSL AD 2-2	12 DEC 13
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		WSSS AD 2-98-1	5 APR 12	WSAP AD 2-5	6 FEB 14
WSSS AD 2-63/chart	10 JAN 13	WSSS AD 2-99/chart	26 JUL 12	WSAP AD 2-6	6 FEB 14
WSSS AD 2-64	10 JAN 13	WSSS AD 2-100	26 JUL 12	WSAP AD 2-7	20 OCT 11
WSSS AD 2-65/chart	10 JAN 13	WSSS AD 2-99-1/chart	5 APR 12	WSAP AD 2-8	20 OCT 11
WSSS AD 2-66	10 JAN 13	WSSS AD 2-100-1	5 APR 12	WSAP AD 2-9	18 NOV 10
WSSS AD 2-67/chart	10 JAN 13			WSAP AD 2-10	18 NOV 10
WSSS AD 2-68	10 JAN 13			WSAP AD 2-11/chart	3 APR 14
WSSS AD 2-69/chart	10 JAN 13			WSAP AD 2-13/chart	3 APR 14
WSSS AD 2-70	10 JAN 13			WSAP AD 2-15/chart	25 APR 96
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* WSAT AD 2-6	29 MAY 14				
* WSAT AD 2-7	29 MAY 14				
* WSAT AD 2-8	29 MAY 14				
* WSAT AD 2-9	29 MAY 14				
* WSAT AD 2-11/chart	29 MAY 14				
WSAG AD 2-1	5 APR 12				
WSAG AD 2-2	5 APR 12				
* WSAG AD 2-3	29 MAY 14				
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WIDD AD 2-11/chart	12 MAY 05				
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WIDN AD 2-8/chart	15 DEC 11				
WIDN AD 2-9/chart	15 DEC 11				
WIDN AD 2-10/chart	15 DEC 11				
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WIDN AD 2-12/chart	15 DEC 11				

**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. b) Redesignation of Danger Areas WSD8, WSD12, WSD21 to read as WMD8, WMD12, WMD21 respectively. c) Upper limit of WSD13/14/15/44/45 and WMD8/12 to read as FL550.	1/01 5/07 2/10
WSSS AD 2-45	RWY 02R and 20L to read as RWY 02C and 20C.	1/05
WSAP AD 2-15 	Magnetic Variation to read as 27°E(2010).	6/10

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## GEN 1.6 SUMMARY OF NATIONAL REGULATIONS AND INTERNATIONAL AGREEMENTS/CONVENTIONS

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

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

→ Copies of the legislation may be obtained as follows:

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

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

Print copies of all the legislation may be purchased from:  
 Toppan Leefung Pte. Ltd.,  
 No. 1 Kim Seng Promenade, #18-01,  
 Great World City, East Tower  
 Singapore 237994.

TEL: (65) 68269600  
 FAX: (65) 68203341  
 Website: [www.toppanleefung.com](http://www.toppanleefung.com)

#### 1.1 CIVIL AVIATION LEGISLATION

No	Legislation	Citation
1	Civil Aviation Authority of Singapore Act 2009	No. 17 of 2009
2	Civil Aviation Authority of Singapore (Aviation Levy) 2009	S459/2009
→ 3	Civil Aviation Authority of Singapore (Changi Airport) By-laws 2009	S313/2009
4	Civil Aviation Authority of Singapore (Changi Airport) Notification 2009	S293/2009
5	Civil Aviation Authority of Singapore (Composition of Offences) Regulations 2009	S315/2009
6	Civil Aviation Authority of Singapore (Licensing of Airport Operators) Regulations 2009	S311/2009
→ 7	Civil Aviation Authority of Singapore (Seletar Airport) By-laws 2009	S314/2009
8	Civil Aviation Authority of Singapore (Seletar Airport) Notification 2009	S294/2009
9	Civil Aviation Authority of Singapore (Service Charge) Order 2009	S310/2009
10	Air Navigation Act	Cap. 6 (1985 Rev Ed.)
11	Air Navigation Order	Cap. 6, O2 (1990 Rev Ed.)
12	Air Navigation (Aviation Security) Order	Cap. 6, O5
13	Air Navigation (Composition of Offences) Rules	Cap. 6, R1
14	Air Navigation (Delegation of Powers) Notification	Cap. 6, N3
15	Air Navigation (Investigation of Accidents and Incidents) Order 2003	Cap. 6, O7
16	Air Navigation (Licensing of Air Services) Regulations	Cap. 6, Rg 2
17	Air Navigation (Paya Lebar and Tengah Aerodrome Fees) Order	Cap. 6, O1
18	Air Navigation (Prohibited Flights) Order	Cap. 6, O6

**GEN 1.6 SUMMARY OF NATIONAL REGULATIONS AND INTERNATIONAL AGREEMENTS/CONVENTIONS**

No	Legislation	Citation
19	Air Navigation (Regulated Air Cargo Agents) Order	Cap. 6, O8
20	Air Navigation (Wreck and Salvage of Aircraft) Regulations	Cap. 6, Rg 1
21	Designation of Authorised Persons	Cap. 6, N2
22	Use of Seletar Aerodrome	Cap. 6, N1
23	Carriage by Air Act	Cap. 32A (2001 Rev Ed.)
24	Carriage by Air (Parties to Conventions) Order	Cap. 32A, O1
25	Carriage by Air (Singapore Currency Equivalents) Order	Cap. 32A, O2
26	Carriage by Air (Montreal Convention, 1999) Act	Cap. 32B (2008 Rev Ed.)
27	Carriage by Air (Montreal Convention, 1999) (Exclusion from Convention) Order	Cap. 32B, O1
28	Tokyo Convention Act	Cap. 327
29	Tokyo Convention (Convention Countries) Notification	Cap. 327, N1
30	Hijacking of Aircraft and Protection of Aircraft and International Airports Act	Cap. 124 (1997 Rev Ed.)
31	International Interests in Aircraft Equipment Act 2009	Cap. 144B
32	Immigration Act	Cap. 133
33	Immigration (Authorised Places Of Entry And Departure, And Rates) Notification 2012	S627/2012
34	Immigration Regulations	Cap. 133, Rg 1
35	Arms and Explosives Act	Cap. 13 (2003 Rev Ed.)
36	Arms and Explosives (Aircraft Exemption) Rules	Cap. 13, R3
37	Arms and Explosives (Explosives) Rules	Cap. 13, R2
38	Arms and Explosives (Movement Control) Rules	Cap. 13, R4

**1.2 OTHER RELEVANT LEGISLATION**

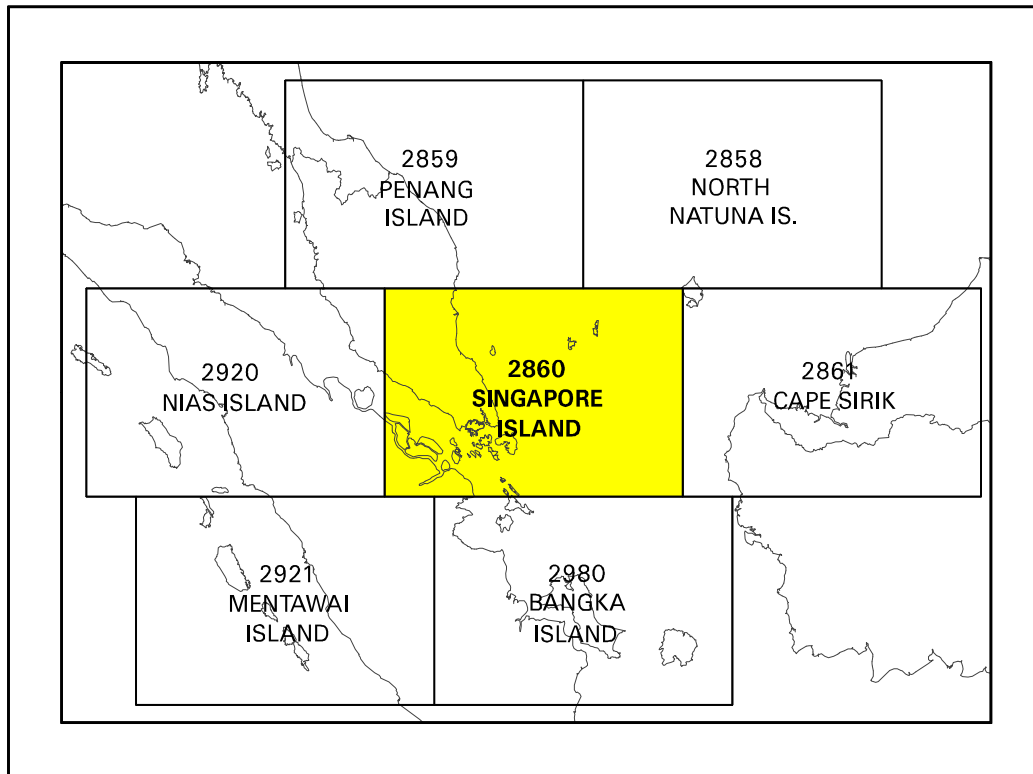
No	Legislation	Citation
1	Infectious Diseases Act	Cap. 137 (2003 Rev Ed.)
2	Infectious Diseases (Quarantine) Regulations	Cap. 137, Rg 1
3	Infectious Diseases (Measures to Prevent or Control the Spread of Infectious Diseases) Regulations 2004	S13/2004
4	Infectious Diseases (Certificates of Vaccination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

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



<b>GEN 3.2.5 LIST OF AERONAUTICAL CHARTS AVAILABLE</b>					
<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	15 JUL 99
<b>Enroute Chart</b> ICAO (ENRC)		ENR 6-1		In AIP	29 MAY 14
<b>Instrument Approach Chart</b> ICAO (IAC)	1:400 000	<b>Singapore Changi</b> RWY 02L - ICW ILS/DME WSSS AD 2-101		In AIP	10 MAR 11
	1:400 000	RWY 02C - ICE ILS/DME WSSS AD 2-103		In AIP	10 MAR 11
	1:400 000	RWY 02C - VTK DVOR/DME WSSS AD 2-105		In AIP	10 MAR 11
	1:400 000	RWY 02R - ICX ILS/DME WSSS AD 2-107		In AIP	10 MAR 11
	1:400 000	RWY 20R - ICH ILS/DME WSSS AD 2-109		In AIP	10 MAR 11
	1:400 000	RWY 20C - ICC ILS/DME WSSS AD 2-111		In AIP	10 MAR 11
	1:400 000	RWY 20C - VTK DVOR/DME WSSS AD 2-113		In AIP	10 MAR 11
	1:400 000	RWY 20L - ICZ ILS/DME WSSS AD 2-115		In AIP	10 MAR 11
	1:400 000	RWY 02L - RNAV(GNSS) WSSS AD 2-117		In AIP	10 MAR 11
	1:400 000	RWY 20R - RNAV(GNSS) WSSS AD 2-119		In AIP	7 MAR 13
	1:400 000	<b>Paya Lebar</b> RWY 20 - PU DVOR/DME WSAP AD 2-17		In AIP	10 MAR 11
	1:400 000	RWY 02 - PU DVOR/DME WSAP AD 2-19		In AIP	10 MAR 11
	1:400 000	RWY 20 - IPS ILS/DME WSAP AD 2-21		In AIP	10 MAR 11
	1:400 000	RWY 02 - IPN ILS/DME WSAP AD 2-23		In AIP	10 MAR 11
	<b>Visual Approach Chart</b> ICAO (VAC)	1:400 000	<b>Singapore Changi</b> WSSS AD 2-121		In AIP
1:100 000		<b>Seletar</b> RWY 03 WSSL AD 2-21		In AIP	9 FEB 12
1:100 000		RWY 21 WSSL AD 2-23		In AIP	9 FEB 12
1:100 000		RWY 03 WSSL AD 2-25		In AIP	9 FEB 12
1:100 000		RWY 21 WSSL AD 2-27		In AIP	9 FEB 12
<b>Visual Departure Chart</b>	1:100 000	<b>Seletar</b> RWY 03 WSSL AD 2-29		In AIP	9 FEB 12
	1:100 000	RWY 21 WSSL AD 2-31		In AIP	9 FEB 12
<b>Aerodrome Chart</b> ICAO (AC)		<b>Singapore Changi</b> WSSS AD 2-31		In AIP	3 APR 14
		<b>Seletar</b> WSSL AD 2-13		In AIP	3 APR 14
		<b>Paya Lebar</b> WSAP AD 2-11		In AIP	3 APR 14
<b>Aerodrome Obstacle Chart</b> ICAO TYPE A (AOC)	1:10 000	<b>Singapore Changi</b> RWY 20R/02L WSSS AD 2-37		In AIP	3 APR 14
	1:10 000	RWY 20C/02C WSSS AD 2-39		In AIP	3 APR 14
	1:10 000	<b>Seletar</b> RWY 03/21 WSSL AD 2 -17		In AIP	6 FEB 14
	1:20 000	<b>Paya Lebar</b> RWY 20/02 WSAP AD 2-15		In AIP	25 APR 96
<b>Aerodrome Obstacle Chart</b> ICAO TYPE B (AOC)	1:25 000	<b>Singapore Changi</b> RWY 02L/20R and 02C/20C WSSS AD 2-41		In AIP	3 APR 14
	1:12 500	<b>Seletar</b> RWY 03/21 WSSL AD 2-19		In AIP	6 FEB 14
<b>Precision Approach Terrain Chart - ICAO (PATC)</b>	1:2 500	<b>Singapore Changi</b> RWY 02L WSSS AD 2-43		In AIP	25 APR 96
	1:2 500	RWY 02C WSSS AD 2-45		In AIP	25 APR 96

**GEN 3.2.6 INDEX TO THE WORLD AERONAUTICAL CHART (WAC) - ICAO 1:1 000 000**



#### 4. TYPES OF SERVICES

- 4.1 The Meteorological Office and Meteorological Watch Office at Singapore Changi Airport operate H24 and provide the following services for civil aviation:
- a) Full meteorological documentation and briefing for current operational planning for all flights operating out of Singapore Changi Airport;
  - b) Area meteorological watch over the Singapore FIR with the supply of meteorological information including SIGMET information to aircraft in flight through the Singapore ATS radio channels (see subsection AD 2.11);
  - c) HF RTF VOLMET broadcasts of meteorological information (see page GEN 3.5-7), Aviation weather report with trend statement, strong low level vertical wind shear report and aerodrome warnings are also included in VHF ATIS broadcasts for Singapore Changi Airport (see page GEN 3.4-3);
  - d) Meteorological information for ATS
- 4.2 Weather briefing by a forecaster is available H24 to qualified flight operations personnel at the Meteorological Office at Singapore Changi Airport or via telephone at (65)65425059 / (65)65422837. Weather information is available online via our Aviation Intranet at URL <http://www.weather.gov.sg/> (see paragraph 9.2 for further details).
- 4.3 The Meteorological Office at Seletar Aerodrome operates H24 and provides meteorological documentation without briefing for international and general aviation flights operating out of Seletar Aerodrome.
- 4.4 Details of documentation supplied for each flight are determined by arrangement between the operator and the Meteorological Office. In general, the pilot-in-command is provided with documentation comprising one or more fixed-time prognostic streamline/istotach/spot temperature charts of standard isobaric surfaces appropriate to the cruising level (ICAO model IS), one of fixed-time prognostic significant weather chart code form. Alternatively, he may be provided with a tabular forecast of en-route conditions with wind and temperature conditions for climb and descent and for one or more standard levels appropriate to the cruising level (ICAO model TA), and appropriate aerodrome forecasts in TAF code form.
- 4.5 Routine aerodrome forecasts received from other Meteorological Offices are normally included in meteorological documentation without modification. When a required aerodrome forecast is not received, a provisional forecast may be issued by the Meteorological Office providing the documentation.
- 4.6 After documentation has been issued and until take-off (i.e. the latest ETD notified to the Meteorological Office), the Meteorological Office at Singapore Changi Airport makes available amendments to the documentation. It is the responsibility of the operator's local representative or the pilot-in-command to obtain any pre-departure amendment(s) from the Meteorological Office at Singapore Changi Airport. The pilot-in-command may request pre-departure amendment(s) through the Singapore Changi Airport Control Tower.
- 4.7 Climatological Summaries for Singapore Changi (WSSS-48698) are available from the Meteorological Service Singapore. For enquiry, please email to [sales\\_climo@nea.gov.sg](mailto:sales_climo@nea.gov.sg)

**4.8 OBSERVING SYSTEMS AND OPERATING PROCEDURES AT SINGAPORE CHANGI AIRPORT AND SELETAR AERODROME**

**4.8.1 SINGAPORE CHANGI AIRPORT**

4.8.1.1 RWY 02L/20R (Runway 1)

4.8.1.1.1 Surface wind is measured by three cup anemometers and wind vanes located as follows:

	<u>DIST FROM END OF RWY</u>	<u>DIST FROM RWY CENTRELINE</u>
(i) One set at	470 metres north of RWY 02L	130 metres
(ii) One set at	middle of runway	130 metres
(iii) One set at	470 metres south of RWY 20R	130 metres

4.8.1.1.2 RVR observations are made by means of three sets of transmissometers, located as follows:

	<u>DIST FROM END OF RWY</u>	<u>DIST FROM RWY CENTRELINE</u>
1st set	370 metres north of RWY 02L	110 metres
2nd set	Middle of runway	110 metres
3rd set	360 metres south of RWY 20R	110 metres

RVR is reported in steps of 25 metres between 0 and 400 metres, 50 metres between 400 and 800 metres and 100 metres between 800 and 1,500 metres.

4.8.1.2 RWY 02C/20C (Runway II)

4.8.1.2.1 Surface wind is measured by three cup anemometers and wind vanes located as follows:

	<u>DIST FROM END OF RWY</u>	<u>DIST FROM RWY CENTRELINE</u>
(i) One set at	450 metres north of RWY 02C	130 metres
(ii) One set at	middle of runway	130 metres
(iii) One set at	450 metres south of RWY 20C	130 metres

4.8.1.2.2 RVR observations are made by means of three sets of transmissometers, located as follows:

	<u>DIST FROM END OF RWY</u>	<u>DIST FROM RWY CENTRELINE</u>
1st set	400 metres north of RWY 02C	110 metres
2nd set	Middle of runway	110 metres
3rd set	400 metres south of RWY 20C	110 metres

RVR is reported in steps of 25 metres between 0 and 400 metres, 50 metres between 400 and 800 metres and 100 metres between 800 and 1,500 metres.

4.8.1.2.3 Surface wind is also measured by an ultrasonic wind sensor located at the meteorological station, which is situated at 345 metres west of middle of RWY 02L/20R. Surface wind report in METAR and SPECI is taken from this measurement.

**4.8.1.3 Wind Shear Observations (Singapore Changi Airport)**

4.8.1.3.1 Horizontal low level wind shear observations are measured continuously by a system of 13 wind sensors located in Singapore Changi airport and its vicinity.

4.8.1.3.2 ATC will pass to all aircraft taking off or landing for the next 1/2 hour from the time of report whenever microburst or wind shear of intensity 10 knots or greater is observed/reported.

4.8.1.3.3 The phraseology used by ATC to warn pilots of the presence of wind shear of intensity between 10 and 30 knots is:

“..... (callsign) WIND SHEAR WARNING  
STRONG LOW LEVEL WIND SHEAR OBSERVED IN THE VICINITY OF  
CHANGI AIRPORT AT ..... (time)”

- 4.8.1.3.4 The phraseology used by ATC to warn pilots of the presence of wind shear of intensity greater than 30 knots is:

“.....(callsign) WIND SHEAR WARNING  
SEVERE LOW LEVEL WIND SHEAR OBSERVED IN THE VICINITY OF  
CHANGI AIRPORT AT .....(time)”

- 4.8.1.3.5 The presence of wind shear will also be broadcast in the ATIS for the next half an hour.

#### **4.8.2 SELETAR AERODROME**

- 4.8.2.1 Surface wind is measured by cup anemometers and wind vanes at ends of runway. Surface wind report in METAR and SPECI is taken from measurements of cup anemometer and wind vane at RWY 03.

- 4.8.2.2 Wind Shear Observations (Seletar Aerodrome)

- 4.8.2.1 ATC will pass to all aircraft taking off or landing for the next  $\frac{1}{2}$  hour from the time of report whenever microburst or windshear of intensity 10 knots or greater is observed/reported.

- 4.8.2.2.2 The phraseology used by ATC to warn pilots of the presence of wind shear of intensity between 10 and 30 knots is:

“.....(callsign) WIND SHEAR WARNING  
STRONG LOW LEVEL WIND SHEAR OBSERVED IN THE VICINITY OF  
SELETAR AIRPORT AT .....(time)”

- 4.8.2.2.3 The phraseology used by ATC to warn pilots of the presence of wind shear of intensity greater than 30 knots is:

“.....(callsign) WIND SHEAR WARNING  
SEVERE LOW LEVEL WIND SHEAR OBSERVED IN THE VICINITY OF  
SELETAR AIRPORT AT .....(time)”

### **5. NOTIFICATION REQUIRED FROM OPERATORS**

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

### **6. AIRCRAFT REPORTS REQUIRED FROM OPERATORS**

#### **6.1 AIREP**

- 6.1.1 Routine aircraft meteorological observations shall be made and the reports transmitted at ATS/MET reporting points listed on page GEN 3.5-6 and as indicated in subsection ENR 3.1 - ATS ROUTES.

- 6.1.2 Special aircraft observations and aircraft observations during climb-out and approach shall be made and the reports transmitted as necessary.

- 6.1.3 Special aircraft observations of pre-eruption volcanic activity, volcanic eruption or volcanic ash cloud shall be recorded on the special Air-Report of Volcanic Activity form which can be downloaded from URL <https://fpl-1.caasaim.gov.sg/>. A copy of the completed Volcanic Activity Report shall be delivered by the operator or a flight crew member, without delay, either personally or by telephone facsimile (TEL: 65425026 or 65429978) to the Meteorological Office, Singapore Changi Airport.

**6.2 REPORTING OF LOW LEVEL WIND SHEAR**

6.2.1 Pilots encountering wind shear shall report to ATC as soon as possible.

6.2.2 When reporting wind shear on radiotelephony, the information should be transmitted in this order:

- a) Aircraft callsign;
- b) WIND SHEAR report;
- c) Time (of wind shear occurrence);
- d) Position (of wind shear);
- e) Intensity (moderate, strong or severe);
- f) Average height of wind shear layer.

6.2.3 On receipt of a wind shear report from a pilot, ATC will pass it to other aircraft in the vicinity. The following phraseology will be used:

“WIND SHEAR WARNING  
ARRIVING (or DEPARTING) ..... (type of aircraft)  
REPORTED ..... (moderate, strong, severe)  
WIND SHEAR IN APPROACH (or DEPARTURE)  
RUNWAY ..... (number) AT ..... (time)  
HEIGHT OF WIND SHEAR LAYER ..... (feet)”

6.2.4 The presence of wind shear as reported by a pilot will also be broadcast in the ATIS for the next half an hour unless subsequent reports indicate that wind shear no longer exists.

**6.3 AIRCRAFT ATS/MET REPORTING POINTS IN THE SINGAPORE FIR**

6.3.1. Aircraft Meteorological Observations shall be made in relation to and transmitted in flight by all aircraft at the following selected Air Traffic Services position reporting points within the Singapore FIR except when:

- a) The flight duration is less than 2 hours, or
- b) The altitude of the flight path is less than 5 000ft, or
- c) The aircraft is less than 1 hour’s flying time from the next intended point of landing.

6.3.2. The aircraft ATS/MET reporting points listed below are indicated in chart page ENR 3.1-17.

6.3.3. The position of the mean wind or spot wind, to the nearest whole degree latitude and longitude, shall be recorded and transmitted in flight.

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

8.1 General

8.1.1 For the safety of air traffic, the Meteorological Authority maintains an area meteorological watch and warning service. This service consists partly of a continuous weather watch within the lower and upper FIR and issuance of appropriate information (SIGMET) by Meteorological Watch Office and partly of the issuing of warnings for Changi Airport.

**8.2 Area Meteorological Watch Service**

8.2.1 The area meteorological watch service is performed by the Meteorological Office, Singapore.

8.2.2 The Meteorological Office, Singapore issues information in the form of SIGMET messages about the occurrence or expected occurrence of one or several of the following significant meteorological phenomena:

- thunderstorms \*
- severe turbulence
- severe icing
- severe mountain waves
- heavy sand storm/dust storm
- volcanic ash cloud
- tropical cyclone

\* Area of widespread cumulonimbus clouds or cumulonimbus along a line (squall line) with little or no space between individual clouds, or cumulonimbus embedded in cloud layers or obscured by haze.

8.2.3 The SIGMETs are issued in abbreviated plain language using ICAO abbreviations and are respectively numbered consecutively for each day commencing at 0001. Their period of validity is generally not more than 4 hours and less than 6 hours from the time of transmission.

8.2.4 SIGMETs issued by the Meteorological Office, Singapore are transmitted to adjacent MWOs in accordance with regional air navigation agreements and inserted in the MET page of LORADS (Long Range Radar and Display System) for use by the Singapore Air Traffic Control Centre.

**8.3 Warning Service**

8.3.1 Aerodrome warnings for Changi Airport are issued by Meteorological Office, Singapore if one or several of the following phenomena are expected to occur at the airport:

- squall
- thunderstorm
- hail
- tornado
- horizontal visibility and/or RVR of 800 metres or less
- mean surface wind speed of 25 knots or more
- wind gusts of 35 knots or more
- cloud of BKN or OVC amount with base 500 feet or less

8.3.2 The warnings are:

- for the protection of parked and moored aircraft,
- for the protection of equipment at the airport, and
- for the safety of arriving and departing aircraft.

8.3.3 The warnings are issued in English and are distributed in accordance with a distribution list which has to be agreed upon locally. In order to guarantee rapid dissemination of the warnings, the distribution list to be used shall, as far as possible, contain only one recipient for an interested group; this recipient will be responsible for the further dissemination of the warning within the group.

8.3.4 SIGMET is disseminated by directed transmissions to aircraft through general calls by the Area Control Centre, Singapore for Singapore FIR.

**9. OTHER AUTOMATED METEOROLOGICAL SERVICES**

- 9.1 Besides VOLMET and ATIS broadcasts, airline operators can obtain access to various operational meteorological information through our Aviation Intranet dedicated computer to computer links and automated faxing service.
- 9.2 Aviation Intranet is free to airlines or flight operators with flights departing from Changi and Seletar Airports. It is accessible at URL <http://www.weather.gov.sg/>. A registered user account is required for the access. For registration, please email to [MSS\\_Operations@nea.gov.sg](mailto:MSS_Operations@nea.gov.sg).

**TABLE 3.5.9 AVIATION INTRANET**

<i>Service Name</i>	<i>Information Available</i>	<i>Area, Route and Aerodrome Coverage</i>	<i>Telephone and Telefax numbers Remarks</i>
1	2	3	4
Aviation Intranet	METAR, SPECI, TAF, SIGMET, Typhoon and Tropical Cyclone Warnings, Tropical Cyclone / Volcanic Ash Advisories  Latest hourly IR MTSAT-1R and FY2E Satellite pictures  Latest images from other satellites  Mid-Level Significant Weather charts  WAFS (World Area Forecast System) SIGWX charts  Prognostic Wind-Temperature charts  Weather Radar images	All METAR, SPECI, TAF, SIGMET, Typhoon and Tropical Cyclone Warnings, Tropical Cyclone / Volcanic Ash Advisories received  Southeast Asia and full globe  Europe, America and Asia Pacific  Medium-High level (FL100-FL450) covering 30E -180E; 45N - 45S  Medium-High level covering Asia, Middle East, Africa, America and Europe  Standard levels covering Europe, America and the Asia-Pacific Regions  Latest Singapore Changi Airport 70km range rain intensity radar plots.	

Note: Details of meteorological briefing at aerodromes are given in the individual aerodrome sections, i.e. AD2



- 2.3.15 In the event of an aircraft arriving at the clearance limit without having received a further clearance, the pilot-in-command shall immediately request a further clearance and hold in accordance with the specified holding pattern where one is established or otherwise the standard holding pattern, maintaining the last assigned cruising level until further clearance is received. Where no direct ATC co-ordination facilities between Regional Area Control Centres exist, pilots on such routes must endeavour, when airborne, to contact the Area Control Centre of the next FIR which the aircraft is entering and obtain clearance to enter its Control Area before reaching the transfer point of the two ACCs.
- 2.3.16 When a flight operates successively in a Control Area and subsequently along the advisory route or area, the clearance issued for the flight or any revisions thereto will only apply to those portions of the flight conducted within controlled airspaces.

## **2.4 ROUTE AND LEVEL ASSIGNMENT**

- 2.4.1 The pilot-in-command shall fly in strict accordance to the route specified by ATC. Deviation from the specified route may be permitted by ATC if traffic conditions permit.
- 2.4.2 Traffic permitting ATC will assign the flight planned level if in accordance with the table of Semi-Circular System of Cruising Levels. Cruising levels below the minimum specified in subsection ENR 3.1 will not be assigned.

## **2.5 ESSENTIAL TRAFFIC INFORMATION**

- 2.5.1 Essential traffic is that controlled traffic to which the provision of separation by ATC is applicable but, which in relation to a particular controlled traffic, does not have the required minimum separation.
- 2.5.2 Essential traffic information shall be issued to controlled flights concerned whenever they constitute essential traffic to each other.

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

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

## **2.6 INSTRUCTIONS TO DEPARTING AIRCRAFT**

- 2.6.1 ATC may specify any or all of the following items when issuing clearance to departing aircraft:
- a) Turn after take-off;
  - b) Track to make good before turning on desired route;
  - c) Initial level to maintain;
  - d) Time, point and/or rate at which level change shall be made.
- 2.6.2 ATC may instruct a departing aircraft to leave a reporting point at a specified time or to be at a specified level at a specified point or time. The pilot-in-command shall notify ATC if these instructions cannot be complied with.

## **2.7 ARRIVAL/APPROACH INSTRUCTIONS**

- 2.7.1 ATC clearance or control instructions for approach to an aerodrome or holding point will be issued to an arriving aircraft on initial contact with the appropriate ATC unit.
- 2.7.2 The clearance will specify the clearance limit, route and level to be flown. An Expected Approach Time will be included if it is anticipated that the arriving aircraft will be required to hold.
- 2.7.3 Pilots are reminded to use the phraseology minimum fuel and MAYDAY MAYDAY MAYDAY fuel to notify ATC of their low fuel state or fuel emergency. For details, refer to CAAS Information Circular IC 5/2013 available at URL <http://www.caas.gov.sg> - Regulations - Safety - Documents and Notices - Information Circulars.

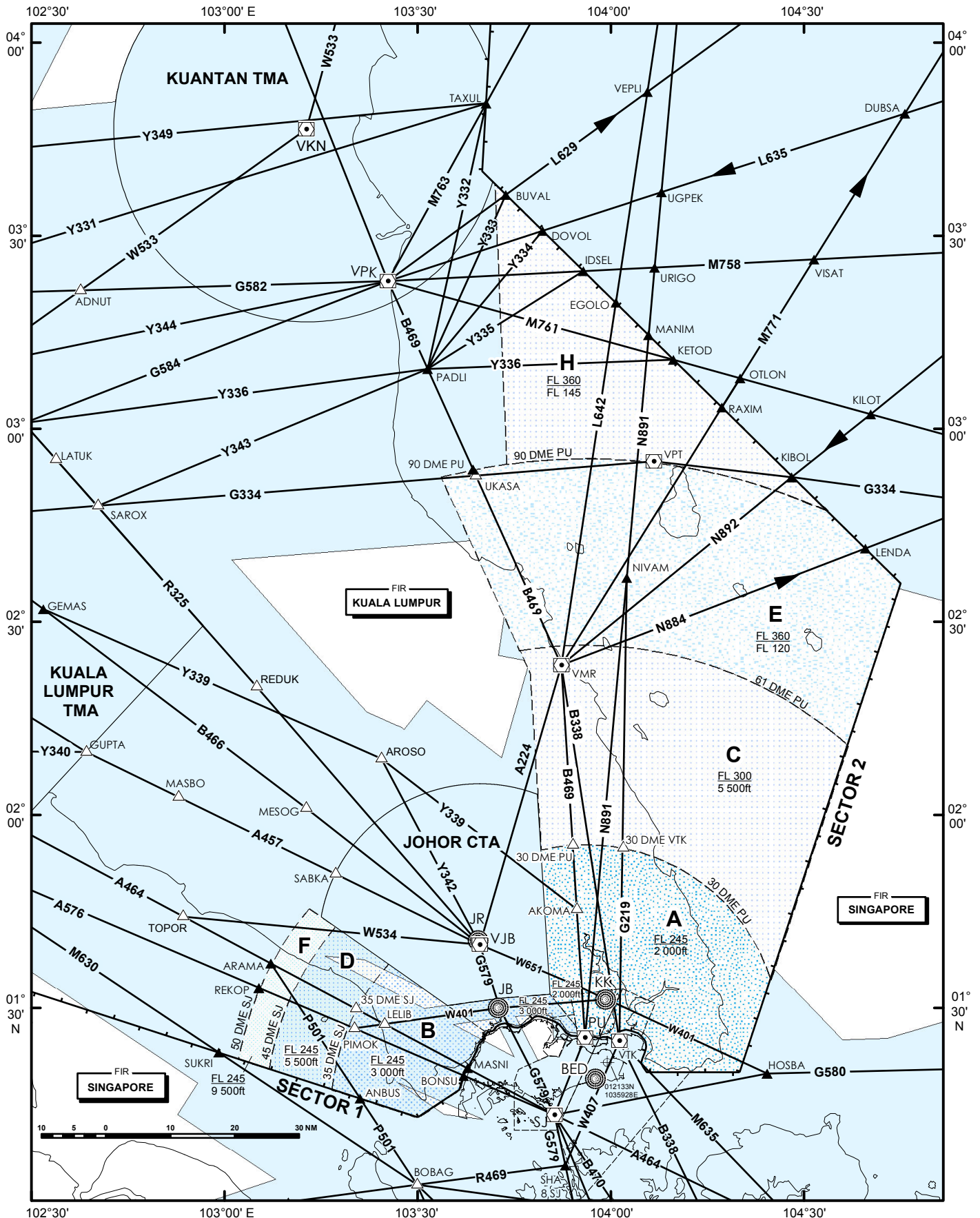
## **2.8 WEATHER INFORMATION**

- 2.8.1 Weather information will be passed to inbound aircraft on request. However, pilots should tune on to ATIS frequency 128.6MHz for the weather.
- 2.8.2 The term CAVOK will be used in place of visibility, weather and cloud when the following conditions apply simultaneously:
- Visibility 10km or more;
  - No precipitations or thunderstorms;
  - No cloud below 1 500m.
- 2.8.3 Deterioration and improvement weather reports and significant weather information, e.g. severe turbulence, thunderstorms, icing conditions etc. will be passed to all aircraft concerned.

## **2.9 AIRCRAFT JOINING OR CROSSING AIRWAYS**

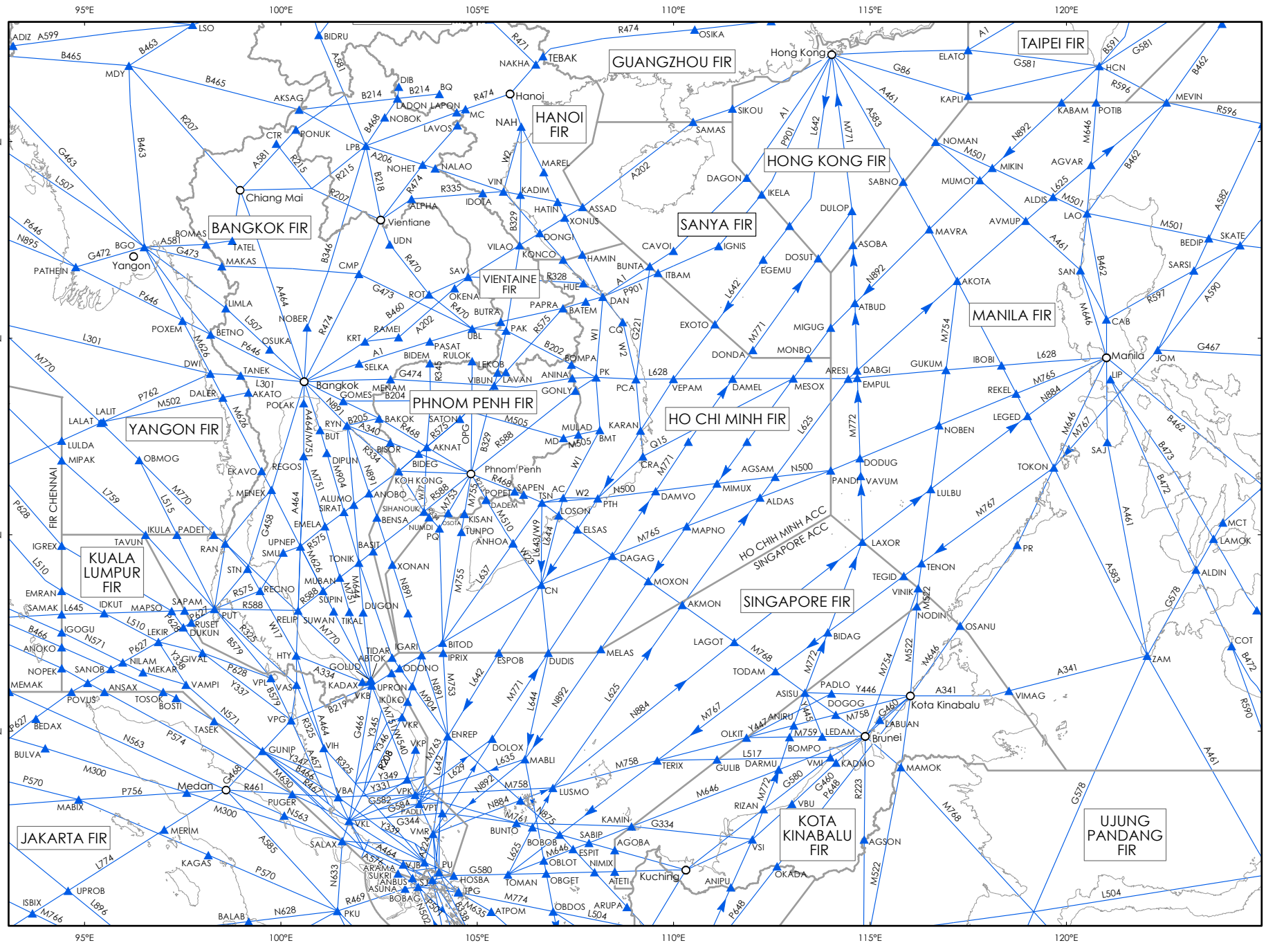
- 2.9.1 Pilots-in-command of aircraft joining or crossing an airway will:
- When flying under VFR outside the Singapore/Johor Airspace Complex and CTRs notify the appropriate authority; or
  - When flying under IFR, or when joining or crossing the Singapore/Johor Airspace Complex and CTRs request clearance from the appropriate authority not later than 10 minutes on VHF RTF or 20 minutes on HF RTF before joining or crossing.
- 2.9.2 An in-flight request or notification or intention to join an Airway shall include the following information, as appropriate:
- Aircraft identification;
  - Aircraft type;
  - Position;
  - Level and flight conditions;
  - Estimated time at point of joining;
  - Desired level;
  - Route and point of first intended landing;
  - True airspeed;
  - The words "Request joining clearance".
- 2.9.3 An in-flight request or notification of intention to cross an Airway shall include the following information:
- Aircraft identification;
  - Aircraft type;
  - True track;
  - Place and estimated time of crossing;
  - Desired crossing level;
  - Ground Speed;
  - The words "Request crossing clearance"
- 2.9.4 The selected crossing or joining point should, where possible, be associated with a radio facility to assist accurate navigation.

### AIRSPACE DIVISION KUALA LUMPUR/SINGAPORE AREAS CONTROL CENTRES





# ATS ROUTE STRUCTURE WITHIN SINGAPORE & ADJACENT FIRS



CIVIL AVIATION AUTHORITY  
SINGAPORE

CHANGES : New RNAV routes Y343 to Y349 added.

AIP AMDT 3/14

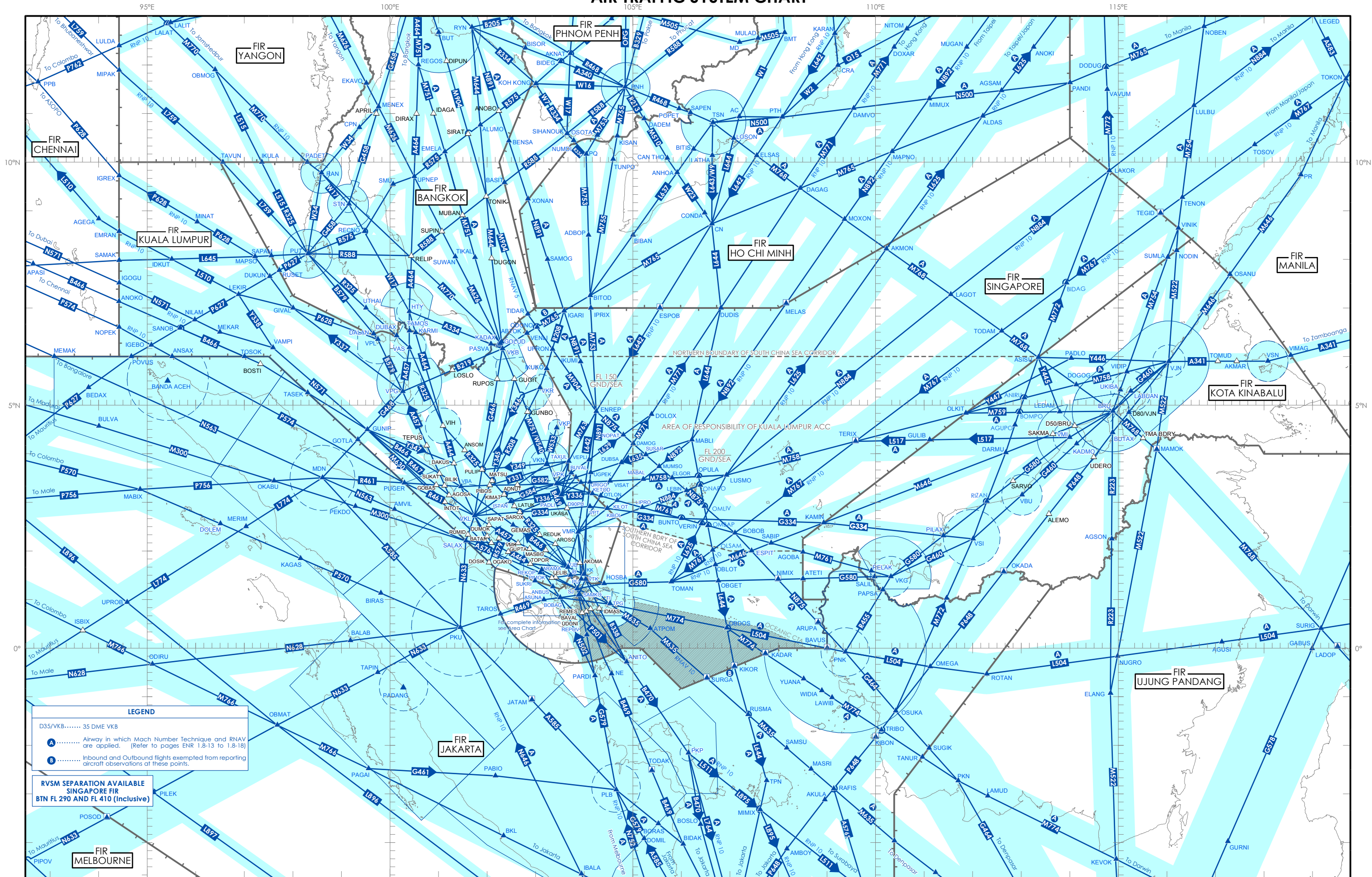


ENR 3. ATS ROUTES ENR 3.1 ATS ROUTES						
Route Designator Name of Significant Points Coordinates	Track MAG (GEO) VOR RDL DIST (COP)	Upper Limits Lower Limits Minimum Flt Alt Airspace Classification	Lateral Limits (NM)	Direction of Cruising Levels		Remarks Controlling Unit Frequency
				Odd	Even	
1	2	3	4	5		6
<b>A224</b>						
▲ JOHORE BAHRU DVOR/DME (VJB) 013950N 1033939E	196° 016° 45.3NM	FL 460 5 500ft ALT 6 000ft	10	↓	↑	
▣ MERSING DVOR/DME (VMR) (58 DME PU) 022318N 1035218E		Class A –ABV FL150 Class B –BLW FL150				
<b>A457</b>						
▲ JOHORE BAHRU DVOR/DME (VJB) 013950N 1033939E	296° 116° 25NM	FL 460 4 500ft ALT 5 000ft	20	↓		<u>Flight Planning:</u> Northbound flights landing at WMKK and WMSA are to flight plan via A457.  Tolerances of airway infringe WMD222 ASAHAN (activated by NOTAM) – Military activities
△ SABKA 015051N 1031713E	296° 116° 27.1NM	Class A –ABV FL150 Class B –BLW FL150				
△ MASBO 020248N 1025251E						
<b>A464</b>						
▲ ARAMA (50 DME SJ) 013654N 1030712E (Delegated airspace BDRY)	117° 297° 14.9NM	FL 460 3 500ft ALT 5 500ft	10 ♦	↓		<u>Flight Planning:</u> All southbound flights from the west landing at Singapore Changi Airport are to request for the STAR only from Singapore ATC on PRI FREQ 133.25MHz or SEC frequency 135.8MHz when RWY in use is 20 and within 120 DME SJ. FLT shall still remain under the control of WMKK ATC.  Changi arrivals via ATS Route A464 shall flight plan BOBAG 1A or BOBAG 1B as STAR Route. When traffic permits, BOBAG 1K, BOBAG 1L or LELIB 2B STAR would be issued to pilots.  ♦5NM either side of track to SJ Singapore ACC FREQ: P133.25MHz S135.8MHz
△ 35 DME SJ 012954N 1032024E		118° 298° 5.0NM				
△ LELIB 012729N 1032450E	117° 297° 14.6NM	Class A –ABV FL150 Class B –BLW FL150				
▲ MASNI (FIR BDRY) 012037N 1033746E	118° 298° 15.3NM					
▲ SINJON DVOR/DME (SJ) 011321N 1035115E	114° 294° 44.0NM	FL 460 2 000ft ALT 6 000ft *	♣	↓		♣ within the lateral limits of the OCA. 15min longitudinal separation minima will apply in OCA A464/A576.  * Eastbound aircraft to reach 6,000ft ALT when 25NM SE of SJ.  Singapore ACC FREQ: P134.4MHz S128.1MHz
▲ TANJUNG PINANG DVOR/DME (TPG) 005413N 1043052E						

ENR 3. ATS ROUTES						
ENR 3.1 ATS ROUTES						
Route Designator Name of Significant Points Coordinates	Track MAG (GEO) VOR RDL DIST (COP)	Upper Limits Lower Limits Minimum Flt Alt Airspace Classification	Lateral Limits (NM)	Direction of Cruising Levels		Route Designator Name of Significant Points Coordinates
				Odd	Even	
1	2	3	4	5		6
<b>A576</b>						
▲ REKOP (50 DME SJ) 013306N 1030521E (delegated airspace BDRY)	<u>112°</u> 292° 16.1NM	<u>FL 460</u> 6 500ft ALT 7 000ft  Class A –ABV FL150 Class B –BLW FL150	*	↓	↑	15 min longitudinal separation. RMK: AVBL for southbound FLT only BTN PIMOK and SJ DVOR/DME. * 5NM either side of a rhumb line joining MDN and SJ, funnelling out at 7.5° to a width of 15NM either side of track. All southbound FLT from the west landing at WSSS are to request for the STAR only from Singapore ATC on PRI freq 133.25MHz or SEC freq 135.8MHz when RWY in use is 20 and within 120 DME SJ. Flt shall still remain under the control of WMKK ATC. Singapore ACC FREQ: P133.25MHz S135.8MHz (westbound) P134.4MHz S128.1MHz (southbound)
△ PIMOK 012648N 1032008E	<u>113°</u> 293° 18.6NM			↓		
▲ BONSU (FIR BDRY) 011928N 1033710E	<u>113°</u> 293° 15.4NM					
▲ SINJON DVOR/DME (SJ) 011321N 1035115E						
<b>B338</b>						
▣ MERSING DVOR/DME (VMR) 022318N 1035218E	<u>171°</u> 351° 38.1NM	<u>FL 460</u> 3 500ft ALT 4 000ft Class A –ABV FL150 Class B –BLW FL150		↓		* Kuala Lumpur/Singapore FIR boundary approximately 1.2NM north of VTK.  * Not a REP
△ 20 DME PU 014530N 1035812E	<u>171°</u> 351° 20.7NM					
▲ TEKONG DVOR/DME (VTK) * 012455N 1040120E	<u>153°</u> 333° 39.8NM					
△ IDMAS (40 DME VTK) 004900N 1041848E	<u>153°</u> 333° 56.1NM					
* FIR BDRY 000124S 1044405E	<u>152°</u> 332° 17.4NM				↑	
▲ ANITO 001700S 1045200E						
<b>B466</b>						
▲ JOHORE BAHRU DVOR/DME (VJB) 013950N 1033939E	<u>308°</u> 128° 34.3NM	<u>FL 460</u> 4 500ft ALT 5 000ft Class A – ABV FL150 Class B – BLW FL150	20	↓		<u>Flight Planning</u> Flight planning not permitted between VJB and GEMAS.
△ MESOG 020103N 1031240E						



# AIR TRAFFIC SYSTEM CHART





<b>ENR 3 ATS ROUTES ENR 3.3 AREA NAVIGATION (RNAV) ROUTES</b>						
Route Designator (RNP Type) Name of Significant Points Coordinates	Way-point IDENT of VOR/DME BRG & DIST ELEV DME Antenna	Great Circle DIST (NM)	<u>Upper Limits</u> <u>Lower Limits</u>  Minimum Ft Alt Airspace Classification	Direction of Cruising Levels		Remarks Controlling Unit Frequency
				Odd	Even	
1	2	3	4	5		6
<b>L504 (RNAV)</b>						
▲ OBDOS 002503N 1065551E  ▲ BAVUS (WSJC/WIIZ FIR BDRY) 000000S 1090000E	NIL	126.9	FL 460 FL 145  FL 150  Class A	↓	↑	<b>Lateral Limits:</b> 25NM either side of line joining OBDOS to BAVUS.  Singapore ACC FREQ: P134.4 MHz S128.1 MHz
<b>L517</b>						
▲ TERIX 041521N 1093456E  ▲ GULIB (WSJC/WBFC FIR BDRY) 041714N 1110633E	NIL  VMI 269° 173NM	92	FL 460 FL 240  FL 250  Class A		↑	<b>Lateral Limits:</b> 25NM either side of line joining GULIB to TERIX.  Singapore ACC FREQ: P123.7 MHz S127.3 MHz
<b>L625 (RNP 10)</b>						
▲ AKMON 081256N 1101308E  ▲ LUSMO 033341N 1065534E  ▲ VERIN 023332N 1062425E  ▲ TOMAN 012147N 1054717E	NIL  VMR 069° 196.3NM  NIL  NIL	035° 340.6  027° 67.5  027° 80.5	FL 460 FL 135  Class A  FL 460 FL 245  Class A		*	<b>Lateral Limits:</b> 10NM either side of line joining TOMAN to LUSMO and 25NM either side of the line joining LUSMO to AKMON. Singapore ACC FREQ: P123.7 MHz S127.3 MHz  Singapore ACC FREQ: P134.2MHz S133.35MHz * Uni-directional for north- east bound flights from TOMAN to AKMON. No PDC Flight Levels FL310, FL320, FL350, FL360, FL390, FL400 applicable. Other levels available with prior approval.
<b>L629</b>						
▲ DOLOX 044841N 1052247E  ▲ NOPAT 042313N 1044756E  ▲ VEPLI 035223N 1040542E  ▲ BUVAL (WSJC/MMFC FIR BDRY) 033622N 1034341 E  ▲ PEKAN DVOR/DME (VPK) 032259N 1032524E	NIL  NIL  NIL  NIL	43.1  52.2  27.2  22.6	FL 460 FL 240  FL 250  Class A		↑	<b>Lateral Limits:</b> 10NM either side of line joining VPK DVOR/DME to BUVAL and 25NM either side of line joining BUVAL to DOLOX.  Singapore ACC FREQ: P123.7MHz S127.3 MHz

<b>ENR 3. ATS ROUTES</b>						
<b>ENR 3.3 AREA NAVIGATION (RNAV) ROUTES</b>						
Route Designator (RNP Type) Name of Significant Points Coordinates	Way-point IDENT of VOR/DME BRG & DIST ELEV DME Antenna	Great Circle DIST (NM)	Upper Limits Lower Limits Minimum Flt Alt Airspace Classification	Direction of Cruising Levels		Remarks Controlling Unit Frequency
				Odd	Even	
1	2	3	4	5		6
<b>L635</b>						
▲ MABLI 041717N 1061247E	NIL	59.9	FL 460 FL 240  FL 250  Class A	↓		<b>Lateral Limits:</b> 10NM either side of line joining VPK DVOR/DME to DOVOL and 25NM either side of the line joining DOVOL to MABLI  Singapore ACC FREQ: P123.7 MHz S127.3 MHz
▲ SUSAR 035848N 1051547E	NIL	31.6				
▲ DUBSA 034901N 1044540E	NIL	39.7				
▲ UGPEK 033647N 1040752E	NIL	19.4				
▲ DOVOL (WSJC/MMFC FIR BDRY) 033047N 1034923E	NIL	25.2				
▲ PEKAN DVOR/DME (VPK) 032259N 1032524E						
<b>L642</b> (RNP 10)						
▣ ESPOB (VVTS/WSJC FIR BDRY) 070000N 1053317E	NIL	149.2		*		* Uni-directional for southbound flights from ESPOB to ENREP. No PDC Flight Levels FL310, FL320, FL350, FL360, FL390, FL400 applicable. Other levels available with prior approval.  <b>Lateral Limits:</b> 10NM either side of line joining VMR DVOR/DME to EGOLO and 25NM either side of line joining EGOLO to ESPOB.  Bi-directional between VMR and ENREP.  Singapore ACC FREQ: P123.7 MHz S127.3 MHz
▲ ENREP 045223N 1041442E	VMR 008° 150.0NM	60.4	FL 460 FL 135  FL 140  Class A	↓		
▲ VEPLI 035223N 1040542E	VMR 008° 89.7NM	33.0				
▲ EGOLO (WSJC/MMFC FIR BDRY) 031934N 1040047E	VMR 008° 56.6NM	25.1				
▲ ROBMO 025440N 1035700E	VMR 008° 31.6NM	31.6				
▲ MERSING DVOR/DME (VMR) 022318N 1035218E						

<b>ENR 3. ATS ROUTES</b>						
<b>ENR 3.3 AREA NAVIGATION (RNAV) ROUTES</b>						
Route Designator (RNP Type) Name of Significant Points Coordinates	Way-point IDENT of VOR/DME BRG & DIST ELEV DME Antenna	Great Circle DIST (NM)	Upper Limits Lower Limits Minimum Ft Alt Airspace Classification	Direction of Cruising Levels		Remarks Controlling Unit Frequency
				Odd	Even	
1	2	3	4	5		6
<b>M765</b>						
▲ IGARI 065610N 1033506E  ▲ VENLI (WMFC/WSJC FIR BDRY) 062848N 1024900E	VKB 058° 88.8NM	53.3	FL 460 FL 135	↓  ↑	<b>Lateral Limits:</b> 10NM either side of line joining VKB DVOR/DME to IGARI.  Portion of M765 within the Singapore FIR has been delegated to Lumpur ACC for provision of ATS.  Lumpur ACC FREQ: 132.6MHz	
			FL 140  Class B			
<b>M767</b> (RNP 10)						
▲ TEGID (RPHI/WSJC FIR BDRY) 085656N 1155143E  ▲ TODAM 063138N 1123536E  ▲ TERIX 041521N 1093456E  ▲ BOBOB 022206N 1070558E  ▲ TOMAN 012147N 1054717E	NIL	242.5	FL 460 FL 205  FL 210  Class A	*	<b>Lateral Limits:</b> 25NM either side of line joining TOMAN to TEGID.  Singapore ACC FREQ: P134.2MHz S133.35MHz  * Uni-directional for south-west bound flights from TEGID to TOMAN. No PDC Flight Levels FL310, FL320, FL350, FL360, FL390, FL400 applicable. Other levels available with prior approval.	
	NIL	225.5				
	NIL	186.8				
	NIL	99.0				
	NIL					

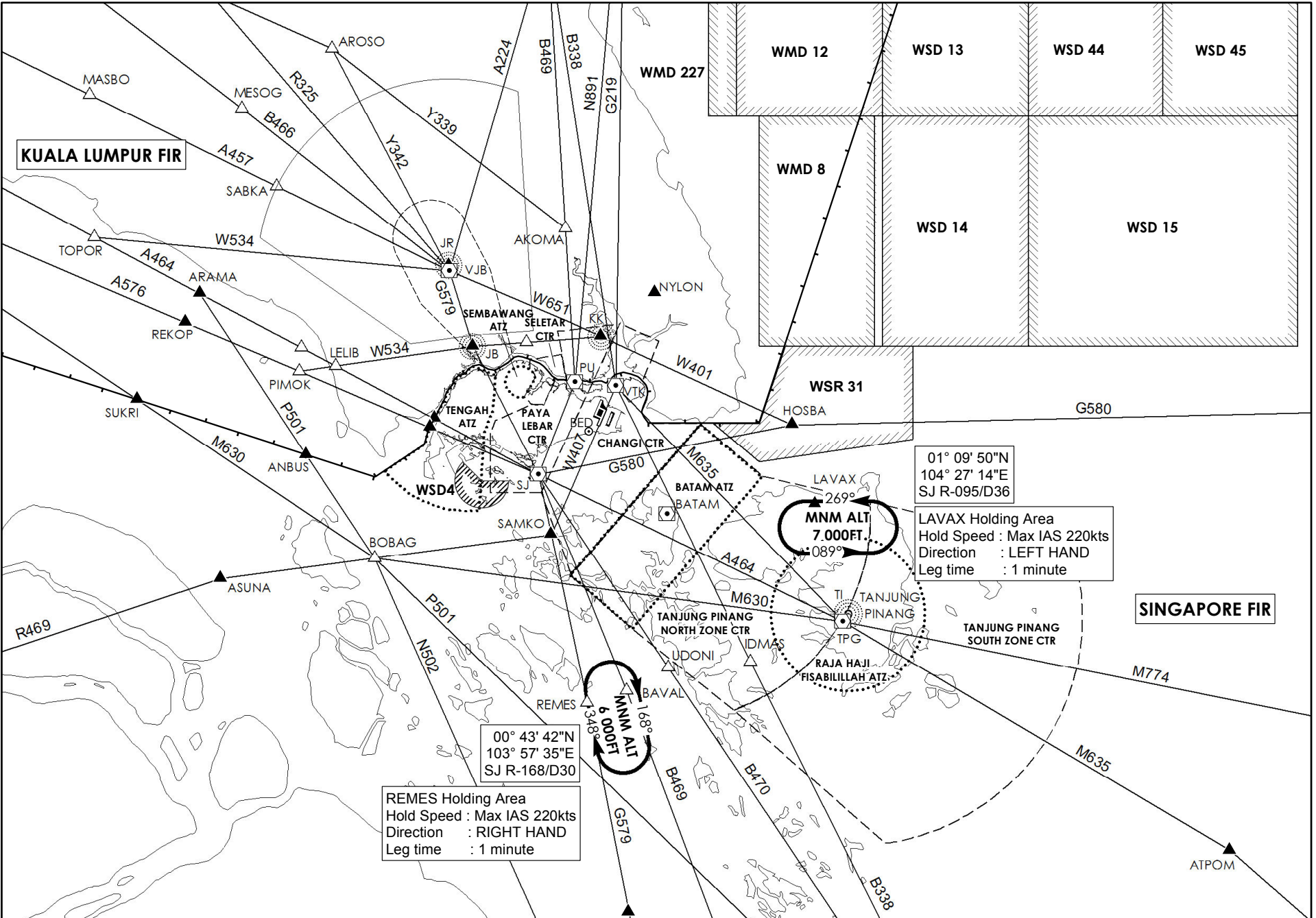
<b>ENR 3. ATS ROUTES ENR 3.3 AREA NAVIGATION (RNAV) ROUTES</b>						
<i>Route Designator (RNP Type) Name of Significant Points Coordinates</i>	<i>Way-point IDENT of VOR/DME BRG &amp; DIST ELEV DME Antenna</i>	<i>Great Circle DIST (NM)</i>	<i>Upper Limits Lower Limits  Minimum Flt Alt Airspace Classification</i>	<i>Direction of Cruising Levels</i>		<i>Remarks Controlling Unit Frequency</i>
				<i>Odd</i>	<i>Even</i>	
1	2	3	4	5		6
<b>M768</b>						
▲ AKMON 081256N 1101308E	NIL	96.9	FL 460 FL 135  FL 140  Class A	↓	↑	<b>Lateral Limits:</b> 25NM either side of line joining ASISU to AKMON.  Singapore ACC FREQ: P123.7 MHz S127.3 MHz
▲ LAGOT 071632N 1113243E	NIL	76.9				
▲ TODAM 063138N 1123536E	NIL	55.4				
▲ ASISU (WSJC/WBFC FIR BDRY) 055906N 1132046E	BRU 305° 113.3NM					
<b>M771 (RNP 10)</b>						
▲ DUDIS (WSJC/VVTS FIR BDRY) 070000N 1064834E	NIL	156.2	FL 460 FL 135  FL 140  Class A	*	↓	<b>Lateral Limits:</b> 10NM either side of line joining VMR DVOR/DME to RAXIM and 25NM either side of line joining RAXIM to DUDIS.  Singapore ACC FREQ: P123.7 MHz S127.3 MHz  * Uni-directional for north-east bound flights from VMR to DUDIS. No PDC Flight Levels FL310, FL320, FL350, FL360, FL390, FL400 applicable. Other levels available with prior approval.
▲ DOLOX 044841N 1052247E	VMR 031° 170.6NM	42.5				
▲ DAMOG 041225N 1050014E	VMR 031° 128.1NM	27.5				
▲ DUBSA 034901N 1044540E	VMR 032° 100.6NM	26.6				
▲ VISAT 032620N 1043134E	VMR 032° 74.0NM	21.7				
▲ OTLON 030752N 1042006E	VMR 032° 52.4NM	5.4				
▲ RAXIM (WMFC/WSJC FIR BDRY) 030318N 1041713E	VMR 032° 47.0NM	47.0				
▲ MERSING DVOR/DME (VMR) 022318N 1035218E						

ENR 3 ATS ROUTES ENR 3.3 AREA NAVIGATION (RNAV) ROUTES						
Route Designator (RNP Type) Name of Significant Points Coordinates	Way-point IDENT of VOR/DME BRG & DIST ELEV DME Antenna	Great Circle DIST (NM)	Upper Limits Lower Limits Minimum Flt Alt Airspace Classification	Direction of Cruising Levels		Remarks Controlling Unit Frequency
				Odd	Even	
1	2	3	4	5		6
<b>N884</b> (RNP 10)						
▲ LAXOR (WSJC/RPHI FIR BDRY) 094937N 1144829E	NIL	246.6	FL 460 6 500ft ALT  7 000ft  Class A	*		<b>Lateral Limits:</b> 5NM either side of line joining VMR DVOR/DME to LUSMO funnelling out at an angle of 5° from VMR to 25NM of either side of track. It then continues at this width until LAXOR.  Singapore ACC FREQ: P123.7 MHz S127.3 MHz  * Uni-directional for east bound flights from VMR to LAXOR. No PDC Flight Levels FL310, FL320, FL350, FL360, FL390, FL400 applicable. Other levels available with prior approval.
▣ LAGOT 071632N 1113243E	NIL	354.3				
▲ LUSMO 033341N 1065534E	VMR 069° 196.3NM	53.0				
▲ LEBIN 031438N 1060604E	VMR 069° 143.3NM	58.5				
▲ LIPRO 025342N 1051128E	VMR 069° 84.8NM	34.2				
▲ LENDA (WSJC/MMFC FIR BDRY) 024124N 1043932E	VMR 069° 50.6NM	50.6				
▲ MERSING DVOR/DME (VMR) 022318N 1035218E						
<b>N891</b>						
▲ IGARI 065610N 1033506E	NIL	65.4	FL 460 FL 155  FL 160  Class A		<b>Lateral Limits:</b> 5NM either side of line joining PU DVOR/DME to ENREP funnelling out at an angle of 5° from PU to 25NM of either side of track. It then continues at this width until WSJC/VVTS FIR BDRY.  *WSJC/MMFC FIR boundary approximately 0.4NM North of PU.  Singapore ACC FREQ: P123.7 MHz S127.3 MHz	
▲ IKUMI 055338N 1035509E	NIL	64.0				
▲ ENREP 045223N 1041442E	PU 005° 206.8NM 60m	75.5				
▲ UGPEK 033647N 1040752E	PU 005° 131.3NM 60m	11.7				
▲ URIGO 032505N 1040647E	PU 005° 119.6NM 60m	10.6				
▲ MANIM (MMFC/WSJC FIR BDRY) 031431N 1040553E	PU 005° 109.0NM 60m	2.6				
▲ OBDAB 031153N 1040538E	PU 005° 106.4NM 60m	106.4				
▲ PAPA UNIFORM* DVOR/DME (PU) 012524N 1035600N						

ENR 3. ATS ROUTES ENR 3.3 AREA NAVIGATION (RNAV) ROUTES						
Route Designator (RNP Type) Name of Significant Points Coordinates	Way-point IDENT of VOR/DME BRG & DIST ELEV DME Antenna	Great Circle DIST (NM)	Upper Limits Lower Limits Minimum Flt Alt Airspace Classification	Direction of Cruising Levels		Remarks Controlling Unit Frequency
				Odd	Even	
1	2	3	4	5		6
<b>N892</b>						
(RNP 10)						
<p>▲ MELAS (VVTWSJJC FIR BDRY) 070520N 108091E</p> <p>▲ MABLI 041717N 106124E</p> <p>▲ MUMSO 034420N 105321E</p> <p>▲ MABAL 032826N 105123E</p> <p>▲ KILOT 030217N 104402E</p> <p>▲ KIBOL WSJJC/WMFC FIR BDRY 025229N 104280E</p> <p>▲ PEKLA 023437N 104061E</p> <p>▲ MERSING DVOR/DME (VMR) 022318N 103521E</p>	<p>VMR 051° 180.6NM</p> <p>VMR 051° 128.4NM</p> <p>VMR 051° 103.2NM</p> <p>VMR 051° 61.8NM</p> <p>VMR 050° 46.1NM</p> <p>VMR 051° 18.0NM</p>	<p>203.6</p> <p>52.1</p> <p>25.2</p> <p>41.4</p> <p>15.7</p> <p>28.1</p> <p>18.0</p>	<p>FL 460 FL 135</p> <p>FL 140</p> <p>Class A</p>	<p>*</p>		<p><b>Lateral Limits:</b> 10NM either side of line joining VMR DVOR/DME to KIBOL and 25NM either side of line joining KIBOL to MELAS.</p> <p>Singapore ACC FREQ: P123.7MHz S127.3MHz</p> <p>* Uni-directional for south-west bound flights from MELAS to VMR. No PDC Flight Levels FL310, FL320, FL350, FL360, FL390, FL400 applicable. Other levels available with prior approval.</p>
<b>P501</b>						
<p>▲ ARAMA (50DME SJ) 013654N 103071E) (delegated airspace BDRY)</p> <p>▲ ANBUS (WMFC/WSJJC FIR BDRY) 011556N 103210E</p> <p>▲ BOBAG (R243/24 DME SJ) 010230N 103295E</p> <p>▲ ANITO 001700S 104520E</p>	<p>NIL</p> <p>NIL</p> <p>NIL</p> <p>NIL</p>	<p>146° 25.0</p> <p>146° 16.0</p> <p>133° 114.1</p>	<p>FL460 9 500ft ALT</p> <p>10 000ft</p> <p>Class A-ABV FL150 Class B-BLW FL150</p> <p>FL460 FL275</p> <p>FL280</p>	<p>↓</p> <p>↓</p>		<p><b>Lateral Limits:</b> 10NM on the western side and 5NM on the eastern side of line joining ARAMA to BOBAG.</p> <p>Singapore ACC FREQ: P133.25MHz S135.8MHz</p> <p><b>Lateral Limits:</b> 10NM on the western side and 5NM on the eastern side of line joining BOBAG to ANITO.</p> <p>Singapore ACC FREQ: P134.4MHz S128.1MHz</p>



# REMES AND LAVAX LOW LEVEL HOLDING AREAS



**KUALA LUMPUR FIR**

**SINGAPORE FIR**

01° 09' 50"N  
104° 27' 14"E  
SJ R-095/D36

LAVAX Holding Area  
Hold Speed : Max IAS 220kts  
Direction : LEFT HAND  
Leg time : 1 minute

MNM ALT  
7.000FT  
089°

00° 43' 42"N  
103° 57' 35"E  
SJ R-168/D30

REMES Holding Area  
Hold Speed : Max IAS 220kts  
Direction : RIGHT HAND  
Leg time : 1 minute

MNM ALT  
6.000FT  
348°



# AREA CHART - ICAO

SINGAPORE/JOHOR AIRSPACE COMPLEX  
LOW LEVEL HOLDING AREAS



LEGEND	
<b>Terminal Control Area (TMA)</b>	Name of TMA: <b>JOHOR</b> Airspace Classification: <b>B</b> Upper Limit: <b>FL 145</b> Lower Limit: <b>C</b> Radio frequency(ies): <b>124.7</b>
<b>Control Zone (CTR)</b>	Name of CTR: <b>CHANGI</b> Airspace Classification: <b>G</b> Upper Limit: <b>3 000ft AMSL</b> Radio frequency(ies): <b>118.6m</b>
<b>Aerodrome Traffic Zone (ATZ)</b>	Name of ATZ: <b>TENGGAH</b> Airspace Classification: <b>D</b> Upper Limit: <b>3 000ft AMSL</b> Radio frequency(ies): <b>122.0</b>
<b>ATS Routes</b>	Route designator: <b>B469</b> Distance in nautical miles: <b>4 000/FL 160</b> Minimum flight altitude (ft)/flight level:
<b>Oceanic Control Area (OCA)</b>	
<b>Reporting Point</b>	Compulsory: <b>▲</b> On request: <b>△</b>
<b>DME distance from SJ Navaid</b>	<b>D35/SJ</b>
<b>Radio Navigation Aid</b>	Name: <b>SINJON DVOR/DME 113.5</b> Identification and frequency: <b>SJ 113.5</b> Geographical Coordinates: <b>01° 19' 21"N 103° 51' 19"E</b> Elevation of DME site: <b>60m</b>
<b>Collocated VOR and DME Radio Navigation Aids</b>	Compass rose orientated on the chart to Magnetic North
<b>Restricted Airspace (P - Prohibited, R - Restricted, D - Danger)</b>	Identification of area: <b>WSD13</b> Nationality letter: <b>FL 550</b> Vertical limits: <b>WATER</b> Activation by NOTAM: <b>NOTAM</b>

**Area Minimum Altitude (AMA)**

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

Example: 3 400 feet **34**

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

**Speed Control Procedures**

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

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

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

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

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

SINGAPORE	D-ATIS	128.6
	APP	120.3
	TWR	119.3
		118.6
		118.25

Note: FOR DEPARTURE AND ARRIVAL ROUTES REFER TO 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
WSP36	-	1 000ft 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	3 500ft ALT GND/*2 000ft	Training & Local Flts in VMC only
*	Light Aircraft Training Area B	10 000ft ALT 4 000ft ALT	High Flying Training Ops in VMC only
*	Light Aircraft Training Area C	10 000ft ALT 4 000ft 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 WATER	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 WATER	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.

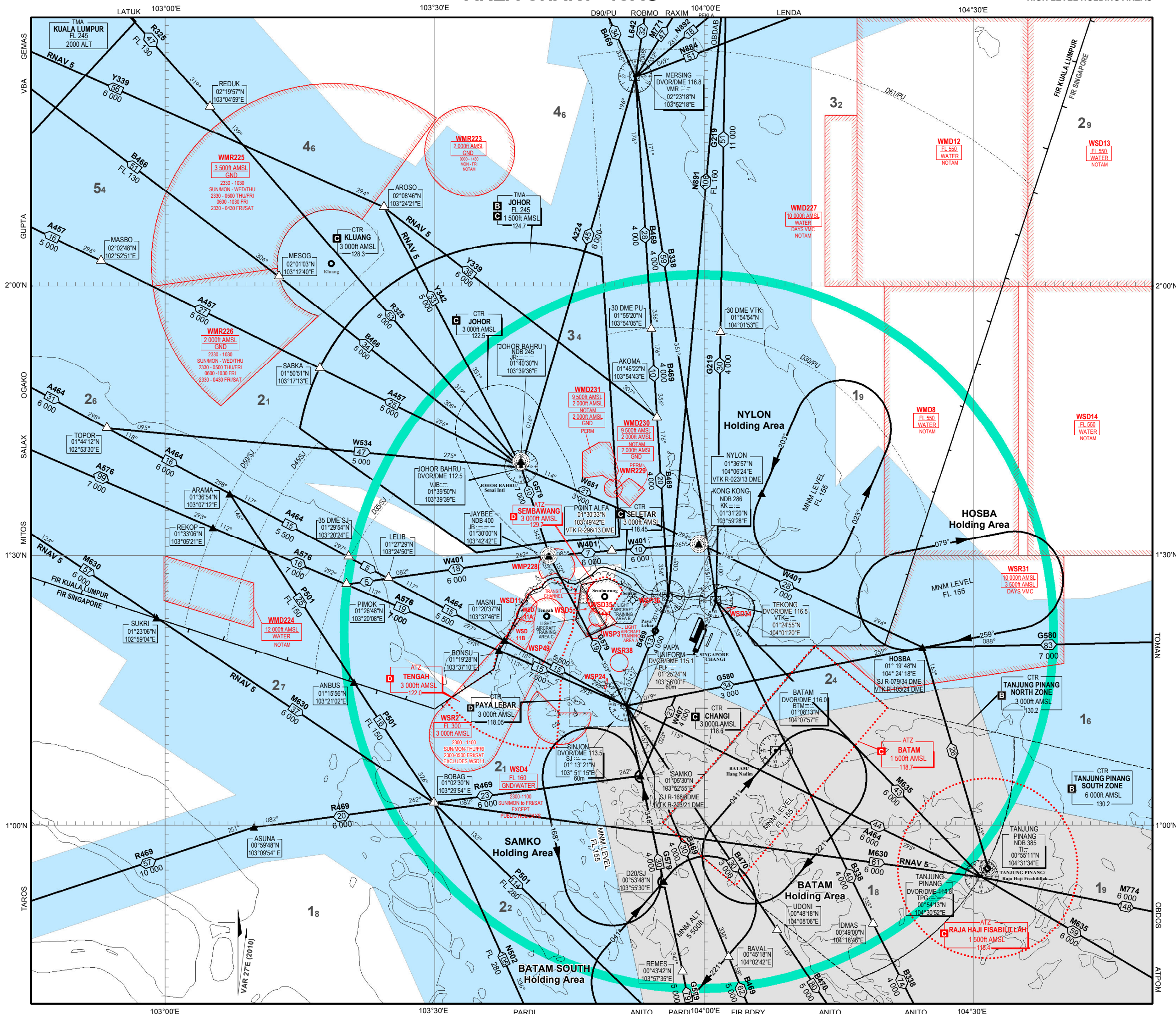
**(B) AERO MODELLING AT SEMBAWANG ATZ**

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>	<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>1500R AMSL</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	1500R AMSL	Lower Limit	124.7	Radio frequency(ies)	
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Airspace Classification	FL 145										
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<b>Control Zone (CTR)</b>	<table border="1"> <tr> <td>Name of CTR</td> <td>CTR CHANGI</td> </tr> <tr> <td>Airspace Classification</td> <td>3 000R AMSL</td> </tr> <tr> <td>Upper Limit</td> <td>118.6m</td> </tr> <tr> <td>Radio frequency(ies)</td> <td></td> </tr> </table>	Name of CTR	CTR CHANGI	Airspace Classification	3 000R AMSL	Upper Limit	118.6m	Radio frequency(ies)			
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Upper Limit	118.6m										
Radio frequency(ies)											
<b>Aerodrome Traffic Zone (ATZ)</b>	<table border="1"> <tr> <td>Name of ATZ</td> <td>ATZ TENGAH</td> </tr> <tr> <td>Airspace Classification</td> <td>3 000R AMSL</td> </tr> <tr> <td>Upper Limit</td> <td>122.0</td> </tr> <tr> <td>Radio frequency(ies)</td> <td></td> </tr> </table>	Name of ATZ	ATZ TENGAH	Airspace Classification	3 000R AMSL	Upper Limit	122.0	Radio frequency(ies)			
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<b>ATS Routes</b>	<table border="1"> <tr> <td>Route designator</td> <td>B469</td> </tr> <tr> <td>Distance in nautical miles</td> <td>4 000/FL 160</td> </tr> <tr> <td>Minimum flight altitude (ft)/flight level</td> <td></td> </tr> </table>	Route designator	B469	Distance in nautical miles	4 000/FL 160	Minimum flight altitude (ft)/flight level					
Route designator	B469										
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<b>Oceanic Control Area (OCA)</b>											
<b>Reporting Point</b>	<table border="1"> <tr> <td>Compulsory</td> <td>▲</td> </tr> <tr> <td>On request</td> <td>△</td> </tr> </table>	Compulsory	▲	On request	△						
Compulsory	▲										
On request	△										
<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°19'21"N 103°51'19"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°19'21"N 103°51'19"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>W</td> </tr> <tr> <td>Vertical limits</td> <td>FL 550</td> </tr> <tr> <td>Activation by NOTAM</td> <td>WATER</td> </tr> </table>	Identification of area	WSR13	Nationality letter	W	Vertical limits	FL 550	Activation by NOTAM	WATER		
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NOTE :- See flip side for details of designated areas											
<b>Area Minimum Altitude (AMA)</b>											
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 <b>34</b>											
NOTE :- In computing the area minimum altitude, a margin of 200 feet (60m) for vegetation has been added for spot elevations.											

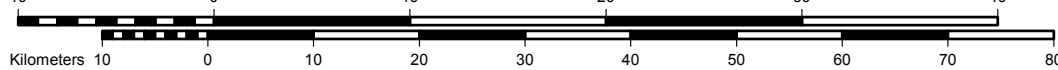
Speed Control Procedures	
Speed control procedures are in force unless notified otherwise by ATC or ATIS.	
All arriving turbo-propeller and turbo-jet aircraft are to fly at not faster than indicated air speed 250 knots when within 40nm from Singapore Changi Airport or when at or below 10,000ft except 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
WSP36	-	1 000ft 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	3 500ft ALT GND/*2 000ft	Training & Local Flts in VMC only
*	Light Aircraft Training Area B	10 000ft ALT 4 000ft ALT	High Flying Training Ops in VMC only
*	Light Aircraft Training Area C	10 000ft ALT 4 000ft 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 WATER	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 WATER	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.

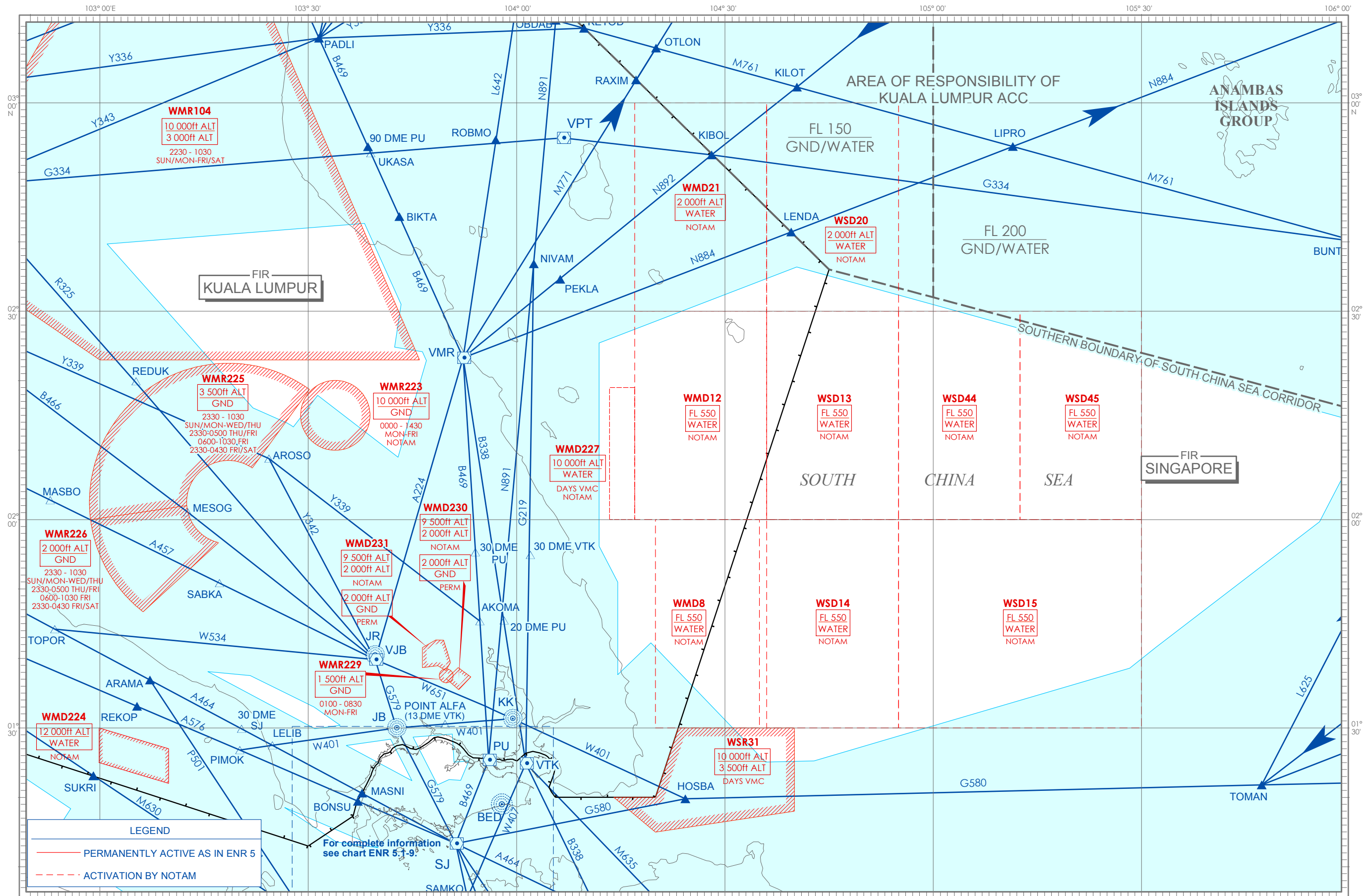
iii) ACCORDING TO THE SINGAPORE AIR NAVIGATION ORDER, 1985, KITE FLYING AND AERO MODEL FLYING ARE NOT PERMITTED ABOVE 200ft OR WITHIN 5km OF AN AERODROME. HOWEVER, PILOTS ARE ADVISED TO LOOK OUT FOR SUCH HAZARDS AT ALL TIMES AS MEMBERS OF THE PUBLIC MAY INADVERTENTLY FLY KITES OR AERO MODELS ABOVE THE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

### PROHIBITED, RESTRICTED AND DANGER AREAS - CHART 1







ENROUTE CHART - ICAO

**LEGEND**

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

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

**Terminal Control Area (TMA)**  
 Name of TMA  
 Airspace Classification  
 Upper limit  
 Lower limit  
 Radio frequency (MHz)  
 134.5, 120.2

**Control Zone (CTR)**  
 Name of CTR  
 Airspace Classification  
 Upper limit  
 Lower limit  
 Radio frequency (MHz)  
 120.2

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

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

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

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

**Restricted Airspace**  
 (Prohibited, Restricted, D-Danger)  
 Identification of area  
 Nationality letter  
 Vertical limit  
 W501  
 FL 400  
 WATER

**Collocated VOR and DME navigation aids (VOR/DME)**  
 Compass rose oriented on the chart to magnetic north

**Identification for radio navigation aids (NAVAID)**  
 Name  
 MVAR/DME frequency identification or call sign  
 Geographical coordinates in WGS 84  
 Elevation of DME site (to the nearest 50ft)

**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 35

**A** Airway in which Mach Number Technique and RNAV are applied (Refer to pages ENR 1.8-13 to 1.8-18)  
**B** Inbound and Outbound flights exempted from reporting aircraft observations at these points.

**WSIC/WMFC FIR BDRY REPORTING POINTS**

TAKUL	03 35 33N	104 05 53E
MANIM	03 14 31N	104 05 53E
KEROO	03 36 22N	104 09 48E
NIVAL	03 36 22N	104 09 48E
DOVOL	03 36 22N	104 17 38E
OSLO	03 24 32N	104 26 05E
ESGLO	03 19 34N	104 00 47E
LINDA	02 41 24N	104 39 32E

**RYSM SEPARATION AVAILABLE SINGAPORE FIR B7N FL 290 AND FL 410 (inclusive)**

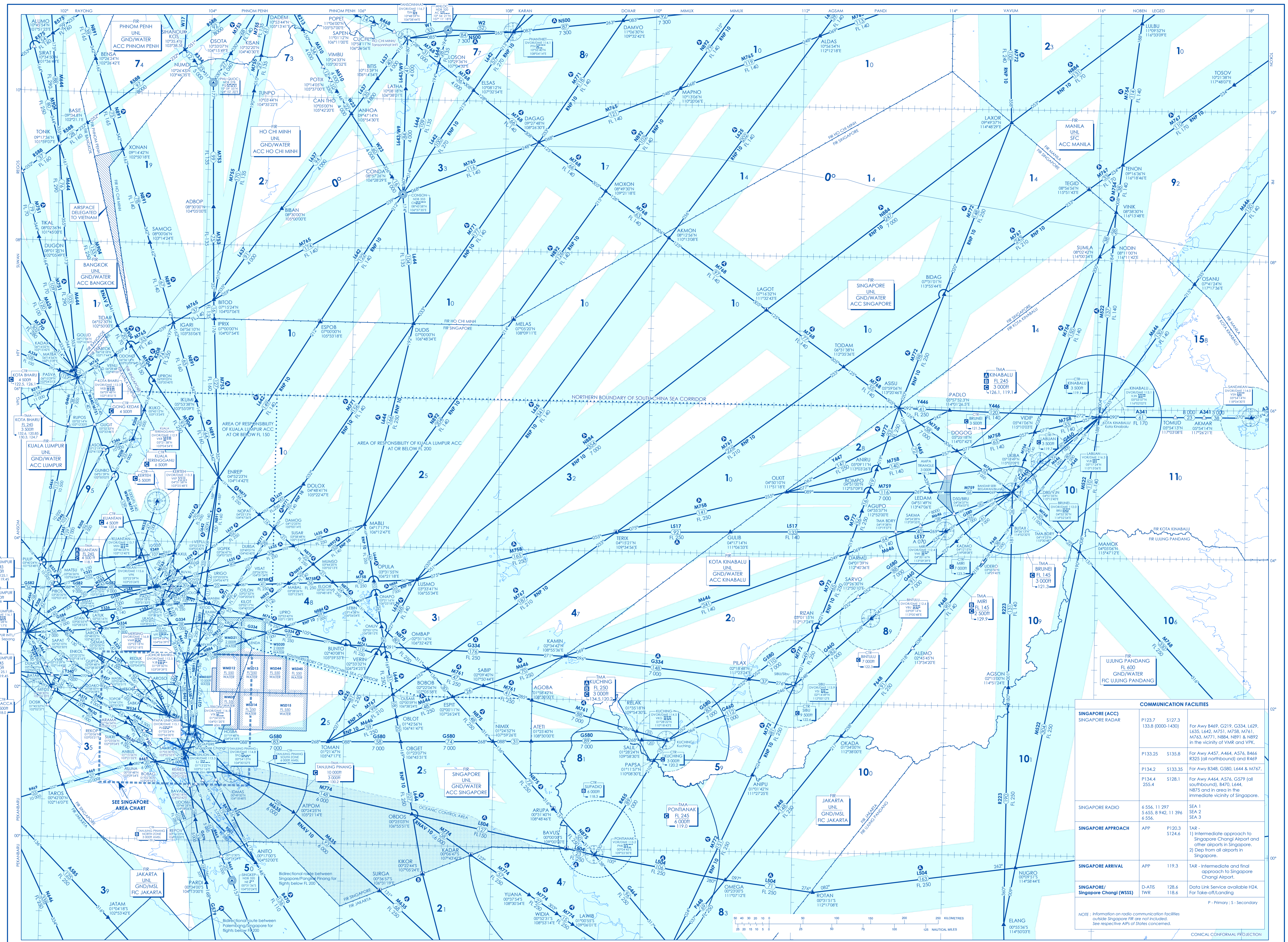
ATZ	FL 150 to FL 440	A
Controlled airspace	Surface to FL 150	B
Controlled airspace more than 100 nm seaward from the shoreline	Lower limit to FL 440	A
Control Zones (CTR)	Change CTR	C
	Payo labor CTR	D
	Sektor CTR	D
ATZ	Surface to upper limit	C
Uncontrolled airspace		G*

**AIRSPACE CLASSIFICATION IN THE SINGAPORE FIR**

Airspace	Levels	Classification
Controlled airspace	FL 150 to FL 440	A
Controlled airspace more than 100 nm seaward from the shoreline	Surface to FL 440	A
Control Zones (CTR)	Change CTR	C
	Payo labor CTR	D
	Sektor CTR	D
ATZ	Surface to upper limit	C
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 2010



**COMMUNICATION FACILITIES**

SINGAPORE (ACC)	P123.7 133.8 (0000-1430)	S127.3	For Awy B469, G219, G334, L429, L635, L642, M751, M758, M761, M763, M771, N884, N891 & N892 in the vicinity of VMR and VPK.
SINGAPORE RADAR	P133.25	S135.8	For Awy A457, A464, A576, B466 R325 (all northbound) and R469.
SINGAPORE RADIO	P134.2 255.4	S133.35	For Awy A464, A576, G579 (all southbound), B470, L644, N875 and in area in the immediate vicinity of Singapore.
SINGAPORE APPROACH	APP P120.3	TAR-1 S124.6	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-2 S124.6	Intermediate and final approach to Singapore Changi Airport.
SINGAPORE SINGAPORE CHANGI (WSSS)	D-ATIS TWR P118.6	S128.6 S118.6	Data Link Service available H24. For Take-off/Landing.

**SINGAPORE RADIO**  
 6 536, 11 297, 5 455, 8 942, 11 396, 6 556, SEA 3

**SINGAPORE APPROACH**  
 APP P120.3  
 T-1 Intermediate approach to Singapore Changi Airport and other airports in Singapore.  
 T-2 Dep from all airports in Singapore.

**SINGAPORE ARRIVAL**  
 APP P119.3  
 T-1 Intermediate and final approach to Singapore Changi Airport.

**SINGAPORE SINGAPORE CHANGI (WSSS)**  
 D-ATIS 128.6  
 TWR 118.6  
 Data Link Service available H24. For Take-off/Landing.

P - Primary; S - Secondary

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

CONICAL CONFORMAL PROJECTION



**AD 2 AERODROMES**

<b>WSSS AD 2.1 AERODROME LOCATION INDICATOR AND NAME</b>	
WSSS - SINGAPORE/Singapore Changi International	

**WSSS AD 2.2 AERODROME GEOGRAPHICAL AND ADMINISTRATIVE DATA**

1	<i>ARP coordinates and site at AD</i>	012133.16N 1035921.57E (Control Tower)		
2	<i>Direction and distance from (city)</i>	061°, 17.2km from City Centre (The Fullerton, Singapore)		
3	<i>Elevation/Reference temperature</i>	6.66m (21.85ft) / 32.4°C		
4	<i>Geoid Undulation (AD elevation position)</i>	10.29m		
5	<i>MAG VAR /Annual change</i>	27'E (2010) / negligible		
6	<i>AD Administration, address, telephone, telefax, AFS</i>			
	<u>RWY 02L/20R and RWY 02C/20C</u> Changi Airport Group (Singapore) Pte Ltd Singapore Changi Airport P.O.Box 168, Singapore 918146 Tel: (65)65956868 or (65)65423223 AFS: WSSSYAYX		<u>RWY 02R/20L</u> Republic of Singapore Air Force Headquarters, Changi Air Base 508A, Cranwell Road Singapore 509863 Tel: (65) 65864033 (Base Operations)	
7	<i>Types of traffic permitted</i>	IFR		
8	<i>Remarks</i>			
	a) Scheduled closure periods for RWY 02L/20R and RWY 02C/20C: see AIP page WSSS AD 2-12. b) Not avbl to all non-scheduled civil acft types of 40-seater or below except in special circumstances. Acft larger than the above category shall not plan their arrival between 0900-1559UTC. c) Aircraft shall leave nose-in position (90 degrees) with the aid of aircraft tow tractors. Reverse thrust or variable pitch propellers shall not be used. Aircraft operators shall make suitable arrangements. d) PPR for aircraft not equipped with RTF. e) A subsonic jet aircraft, unless otherwise exempted, is not permitted to operate in Singapore unless it possesses a noise certificate stating that it meets the noise standards of ICAO Annex 16, Volume 1, Chapter 3, or equivalent. The noise certificate may also take the form of a suitable statement contained in another document approved by the State of Registry of the aircraft. f) Direct transit area: Overnight transit in Singapore City, TEL: (65)65956868 or (65)65423223 g) RWY 02R/20L is solely for use by Republic of Singapore Air Force (RSAF) aircraft. h) RVR minima for CAT II ILS operations is limited to 350m due to runway and taxiway light spacing requirements on the airfield. i) Frangible poles are installed for the purpose of identifying 90m away from the centreline of RWY 02L/20R and RWY 02C/20C.			

**WSSS AD 2.3 OPERATIONAL HOURS**

1	<i>Aerodrome Administration:</i>					
	RWY 02L/20R and RWY 02C/20C	H24				
	RWY 02R/20L	2300-1100 SUN/MON to THU/FRI. Prior permission required from RSAF Headquarters via Changi Operations outside these hours and on public holidays.				
2	<i>Customs and Immigration</i>	H24		5	<i>ATS Reporting Office</i>	H24
3	<i>Health and Sanitation</i>	H24		6	<i>MET Briefing Office</i>	H24
4	<i>AIS Briefing Office</i>	H24		7	<i>Air Traffic Services</i>	H24

<b>WSSS AD 2.4 HANDLING SERVICES AND FACILITIES</b>		
1	<i>Cargo Handling Facilities</i>	Cargo terminals equipped with advanced storage stacker, material and pallet container handling systems, computerised cargo information, data and documentation systems. Forklift (10 tonnes), Aircraft Main Deck Loaders (27 tonnes), trailers (e.g. 20-40 containers) on hire from hauliers.
2	<i>Fuel / Oil Types</i>	JET A1 (for jet aircraft), Engine Oil - 2380, MJ02, 750, ET025. Lubricating Oil - Aeroshell 390, 750. Hydraulic Oil - Skydrol LD4, 500B4, 500B, Hyjet IV
3	<i>Fuelling Facilities / Capacity</i>	No limitation. H24 service.
4	<i>Hangar space for visiting aircraft</i>	By arrangement with SIA Engineering Company (SIAEC) or ST Aerospace Services Co. Maintenance hangars with multiple aircraft stands to accommodate up to A380 size aircraft.
5	<i>Repair facilities for visiting aircraft</i>	Major and minor maintenance and repairs for commercial aircraft up to and including A380, subject to availability of specialised equipment/spares/toolings.
6	<i>Remarks</i>	a) Marshalling Service: No pilot shall taxi an aircraft on its own into a gate/stand without the aid of a docking system or a marshaller.  b) Oxygen And Related Servicing: Oxygen for all cabin and aircraft system. No CO2 recharging facilities.

<b>WSSS AD 2.5 PASSENGER FACILITIES</b>		
1	<i>Hotels</i>	Rooms available inside transit area, adjacent to airport terminal and in the city but advisable advance booking.
2	<i>Restaurants</i>	Available in both transit and public areas.
3	<i>Transportation</i>	Buses, taxis and MRT train. Car rental service is available from 0700-2300 hrs daily
4	<i>Medical Facilities</i>	Available H24 at Airport Clinic. Ambulance. General Hospitals located at Simei (12km) and City (23km).
5	<i>Banks and Post Offices</i>	Available at airport
6	<i>Tourist Office</i>	Available at airport
7	<i>Remarks</i>	Internet address: <a href="http://www.changiairport.com.sg">http://www.changiairport.com.sg</a> for airport and flight information, shops and restaurants, facilities and services, flight connections and tourist information.

## 2.3 AERODROME CHARACTERISTICS OF SINGAPORE CHANGI AND PAYA LEBAR AIRPORTS

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

Aeronautical Service	Paya Lebar Airport	Singapore Changi Airport	Significant Differences and Remarks
Magnetic heading of RWY	02/20	02L/20R 02C/20C 02R/20L	Exercise caution due to similar RWY alignment
Track/DIST from SAMKO Holding Area (8 DME/DVOR SJ 348°)	Nil	020°/14.3NM to "BED" NDB	Differences in track and distances
Track/DIST from NYLON Holding Area (13 DME/DVOR VTK 203°)	Nil	206°/19.8NM to "BED" NDB	
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. (ref chart WSSS AD 2-31)	
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 WSSS AD 2-101 to WSSS AD 2-119 and the Precision Approach Terrain Charts for RWY 02L and RWY 20C at WSSS AD 2-43 and WSSS AD 2-45 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.

## AD 2 - AERODROMES

WSAT AD 2.1 AERODROME LOCATION INDICATOR AND NAME	
WSAT - TENGAH AIRPORT	

WSAT AD 2.2 AERODROME GEOGRAPHICAL AND ADMINISTRATIVE DATA		
1	<i>ARP coordinates and site at AD</i>	012315N 1034229E
2	<i>Direction and distance from (city)</i>	-
3	<i>Elevation/Reference temperature</i>	15.24m (50ft) / 31.5°C
4	<i>MAG VAR</i>	27'E (2010)
5	<i>AD Administration, address, telephone, telefax, telex, AFS</i>	RSAF Tengah Airbase Choa Chu Kang Road Singapore 669638 TEL: (65) 67612222 AFS: WSATYWYX
6	<i>Types of traffic permitted</i>	IFR
7	<i>Remarks</i>	Emergency Diversion Aerodrome for Singapore Changi Airport (see page WSAT AD 2-7)

WSAT AD 2.3 OPERATIONAL HOURS		
1	<i>Aerodrome Administration</i>	2300-1100 SUN/MON to THU/FRI. Public holidays and outside the above stipulated operating hours, prior permission required from RSAF Headquarters via Tengah Operations. For EMERG diversions AD AVBL at 2 hours notice. Only Aerodrome Control Service provided. No radar service AVBL outside OPR hours during AD non-operating times.
2	<i>Customs and Immigration</i>	by prior arrangement
3	<i>Health and Sanitation</i>	by prior arrangement
4	<i>AIS Briefing Office</i>	-
5	<i>ATS Reporting Office</i>	-
6	<i>MET Briefing Office</i>	-
7	<i>Air Traffic Services</i>	-
8	<i>Remarks</i>	-

<b>WSAT AD 2.4 HANDLING SERVICES AND FACILITIES</b>		
1	<i>Cargo Handling Facilities</i>	-
2	<i>Fuel / Oil Types</i>	JET A1, F3
3	<i>Fuelling Facilities / Capacity</i>	2300-1100 SUN/MON to THU/FRI; Public holidays & outside OPR HR PPR from RSAF HQ via Tengah Operations.
4	<i>Hangar space for visiting aircraft</i>	-
5	<i>Repair facilities for visiting aircraft</i>	-
6	<i>Remarks</i>	Nil

<b>WSAT AD 2.5 PASSENGER FACILITIES</b>		
1	<i>Hotels</i>	-
2	<i>Restaurants</i>	-
3	<i>Transportation</i>	-
4	<i>Medical Facilities</i>	-
5	<i>Banks and Post Offices</i>	-
6	<i>Tourist Office</i>	-
7	<i>Remarks</i>	Nil

<b>WSAT AD 2.6 RESCUE AND FIRE FIGHTING SERVICES</b>		
1	<i>AD category for fire fighting</i>	CAT 7
2	<i>Rescue equipment</i>	Adequately provided as recommended by ICAO
3	<i>Capability for removal of disabled aircraft</i>	Sufficient salvage equipment provided by Airfield Ground Services section at Military bases.
4	<i>Remarks</i>	All Airport Emergency Services personnel are trained in rescue and fire-fighting as well as medical first-aid.

<b>WSAT AD 2.7 SEASONAL AVAILABILITY - CLEARING</b>		
The aerodrome is available throughout the year.		



WSAT AD 2.8 APRONS, TAXIWAYS AND CHECK LOCATIONS/POSITIONS DATA		
1	Apron surface and strength	-
2	Taxiway width, surface and strength	Strength: LCN 80 (Taxiway E) Surface: Asphalt
3	Remarks	Nil

WSAT AD 2.10 AERODROME OBSTACLES	
In APCH / TKOF Areas	In Circling Area and at Aerodrome
<p><u>RWY 18/36 APCH / TKOF Areas</u></p> <p>ILS LLZ co-located with LLZ antenna, HGT 21m AGL, 004 degrees MAG 260m from THR RWY 18</p> <p>ILS LLZ co-located with LLZ antenna, HGT 15m AGL, 184 degrees MAG 290m from THR RWY 36</p>	<p>2 masts, HGT 6m, located on eastern shoulders of RWY 36, 233m from THR, 100m from RWY centreline and RWY 18, 273m from THR, 100m from RWY centreline. Masts LGTD at NGT.</p> <p>PAR hut co-located with GP antenna mast, HGT 16m AGL, 074 degrees MAG 100m from WSAT ARP.</p> <p>ILS GP huts co-located with GP antenna mast, HGT 19m AGL, at 029 degrees MAG 322m from THR RWY 36 and 123 degrees MAG 303m from THR RWY 18.</p>

WSAT AD 2.12 RUNWAY PHYSICAL CHARACTERISTICS					
Designation RWY NR	TRUE & MAG BRG	Dimensions of RWY (m)	Strength (PCN) and surface of RWY and SWY	THR coordinates	THR elevation and highest elevation of TDZ of precision APCH RWY
1	2	3	4	5	6
18	184.5	2 743 x 45	PCN 110 F/A/W/T	-	50ft
36	004.5	2 743 x 45	PCN 110 F/A/W/T	-	50ft

12	Remarks	<p>a) Intensive fixed wing flying operation east of runway.</p> <p>b) Helizone adjacent east of runway up to 800ft QNH.</p> <p>c) Arrestor Barrier both ends of runway.</p> <p>d) Hookwire cable installed 366m inwards from each end of runway.</p> <p>e) Intense bird activity after rain, and up to 2 hour after dusk and dawn.</p>
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WSAT AD 2.13 DECLARED DISTANCES					
RWY Designator	TORA (m)	TODA (m)	ASDA (m)	LDA (m)	Remarks
1	2	3	4	5	6
18	2 743	3 115	2 743	2 743	Nil
36	2 743	3 030	2 743	2 743	Nil

WSAT AD 2.14 APPROACH AND RUNWAY LIGHTING									
RWY	APCH LGT Type, LEN INTST	THR LGT colour WBAR	VASIS (MEHT) PAPI	TDZ LGT LEN	RCL LGT, LEN, spacing, colour, INTST	RWY edge LGT, LEN, spacing, colour, INTST	RWY End LGT, colour WBAR	SWY LGT, LEN colour	Remarks
1	2	3	4	5	6	7	8	9	10
18	High INTST white centre line and two bars, superimposed omni-directional RED 'T' PAPI Sequenced flashing lights	Green	4 units PAPI on each side of RWY at 3° Glide Slope	Nil	Nil	High INTST omni-directional white variable INTST	Red	Nil	Distance to run markers illuminated
36	High INTST white centre line and five bars, superimposed omni-directional RED 'T' PAPI Sequenced flashing lights	Green	4 units PAPI on each side of RWY at 3° Glide Slope	Nil	Nil	High INTST omni-directional white variable INTST	Red	Nil	Distance to run markers illuminated

WSAT AD 2.15 OTHER LIGHTING, SECONDARY POWER SUPPLY	
TWY Lighting	blue edge lights
IBN	012400N 1034254E, FLG R 'TN' , operating hours HN and IMC.
Remarks	WDI lighted. Dispersal area floodlights

WSAT AD 2.17 ATS AIRSPACE	
1	<p><i>Designation and Lateral Limits</i></p> <p><b>TENGAH ATZ</b> 010842N 1034336E thence clockwise around the arc of radius 14 NM centred on 012242N 1034203E to 011351N 1033117E thence east along the Singapore - Kuala Lumpur FIR boundary to 012728N 1034302E 012620N 1034544E 012150N 1034524E 011845N 1034414E 010842N 1034336E.</p>
2	<p><i>Vertical Limits</i></p> <p>SFC to 3,000ft ALT</p>
3	<p><i>Airspace Classification</i></p> <p>D</p>
4	<p><i>ATS Unit Callsign Language(s)</i></p> <p>Tengah Approach English</p>
5	<p><i>Transition Altitude</i></p> <p>11,000ft (3,350m)</p>
6	<p><i>Remarks</i></p> <p>Controlling Authority: Tengah Approach</p> <p><u>During Aerodrome operating hours:</u> Contact Tengah APP on 130.0MHz, 263.4MHz or 122.0MHz</p> <p><u>Outside Aerodrome operating hours:</u> Contact SATCC (RSAF element) on 123.4MHz or 288.2MHz</p>

<b>WSAT AD 2.18 ATS COMMUNICATION FACILITIES</b>					
<i>Service Designation</i>	<i>Call sign</i>	<i>Frequency P - Primary S - Secondary</i>	<i>Hours of operation</i>	<i>Remarks</i>	
APP	Tengah Approach	P130.0 MHz P263.4 MHz S122.0 MHz	BTN 2300-1100 SUN/MON to THU/FRI; and  On SUN, Public holidays and outside the above times, PPR from RSAF HQ via Tengah Ops.		
TWR	Tengah Tower	P122.0 MHz P282.5 MHz S263.4 MHz			
	Tengah Ground	122.0 MHz 337.8MHz			
	Tengah Talkdown	130.0 MHz 290.8 MHz 328.5 MHz			
ACC	Singapore Radar	P123.7 MHz S127.3 MHz	H24	for AWY B469, G219, G334, R208, L625, L629, L635, L642, M751, M753, M758, M761, M763, M771, N884, N891 and N892.	
		133.8 MHz	0000-1430		
		P133.25 MHz S135.8 MHz	H24	for AWY A457, A464, A576, B466, R325 (all northbound) and R469.	
		P134.4 MHz S128.1 MHz 255.4 MHz		for AWY A464, G579, A576 (all southbound), B470, G220, N875 and in area in the immediate vicinity of Singapore	
				Radar Maint Period: Monthly - EV third SAT 1601-2359	
	Singapore Radio	6 556 KHz 11 297 KHz	H24	SEA 1, SATCOM SER AVBL SSB suppressed carrier	
		5 655 KHz 8 942 KHz 11 396 KHz		SEA 2, SATCOM SER AVBL SSB suppressed carrier	
		6 556 KHz		SEA 3, SATCOM SER AVBL SSB suppressed carrier	
	APP	Singapore Approach		P120.3 MHz S124.6 MHz	TAR - Intermediate approach to Singapore Changi AP and other airports in Singapore - DEP from all airports in Singapore  Maint Period: Monthly EV first THU 0000-0900 (ASR I) and EV fourth SAT 1601-2359 (ASR II)

WSAT AD 2.19 RADIO NAVIGATION AND LANDING AIDS					
Type of Aid	IDENT	FREQ	OPR Hour	Coordinates	Remarks
TACAN	TNG	CH86X	2300-1100 from SUN/MON to THU/FRI  SUN, Public holidays and outside the above timings, prior permission required from RSAF HQ via Tengah Operations.	012336.00N 1034242.00E	043° MAG 0.55km from ARP  Maint Period: 0001-0900 second SAT of EV month
SINJON DVOR/DME	SJ	113.5MHz CH82X	H24	011321.54N 1035115.74E	201° MAG 14.5km from THR RWY 02 (Paya Lebar)  Antenna HGT: 194ft AMSL. Coverage 200NM  Maint Period: 0200-0600 third THU of EV month
ILS LLZ RWY 36	ITN	108.1MHz	H24	012408.43N 1034226.67E	Located 260m from THR RWY 18 along centreline of RWY. Course width 3°
ILS GP RWY 36	-	334.7MHz	H24	012241.02N 1034226.67E	GP antenna 3°
ILS DME RWY 36	ITN	CH18X	H24	012241.02N 1034226.67E	DME co-located with GP
ILS LLZ RWY 18	ITS	111.3MHz	H24	012221.63N 1034224.98E	Located 290m from THR RWY 36 along centreline of RWY. Course width 3°
ILS GP RWY 18	-	323.4MHz	H24	012350.04N 1034236.38E	GP antenna 3°
ILS ME RWY 18	ITS	CH50X	H24	012350.04N 1034236.38E	DME co-located with GP

## WSAT AD 2.20 LOCAL TRAFFIC REGULATIONS

### USE OF RSAF TENGAH AIR BASE AS AN EMERGENCY DIVERSION AERODROME FOR SINGAPORE CHANGI AIRPORT

#### 1. INTRODUCTION

- 1.1 RSAF Tengah Air Base is nominated as the emergency diversionary aerodrome for Singapore Changi Airport. The arrangement outlined below is applicable for the handling of any civil aircraft movement that is diverted to RSAF Tengah Air Base.
- 1.2 It is emphasised that RSAF Tengah Air Base **is not an ICAO designated alternate aerodrome for Singapore Changi Airport** and therefore should not be flight planned as such. Its use by civil aircraft is permitted for emergency purposes only when Singapore Changi Airport runway is obstructed.

#### 2. MANNING OF TENGAH AIR BASE

- 2.1 Tengah Air Base is open from 2300-1100 SUN/MON to THU/FRI. It is closed on SAT, SUN and public holidays. Outside the above stipulated operating hours, Tengah Air Base can be opened on 2 hours' prior notice. This arrangement, if necessary, will be undertaken by the Duty Tower Controller or SATCC Supervisor of Singapore Changi Airport who will inform RSAF Headquarters via Tengah Ops.
- 2.2 Airline operators are requested to inform the Airport Manager and the Duty Tower or SATCC Supervisor at Singapore Changi Airport as soon as it is known that their service will require the use of Tengah Air Base. Revised ETAs/ETDs are to be notified as soon as known.

#### 3. OPERATIONAL SERVICES

- 3.1 The layout of Tengah Airbase with the aircraft parking apron which is available for the use of civil aircraft (except B747 acft types) in the event of an emergency diversion from Singapore Changi Airport, is indicated in page WSAT AD 2-11. It is to be noted that only a limited number of civil aircraft can be accommodated at any one time.
- 3.2 Air-ground-air communication maintained by RSAF Tengah Tower/APP for AD Control Services is VHF 122.0MHz.

#### 4. PASSENGER CLEARANCE

- 4.1 Once the aircraft has shutdown, only the Captain of the aircraft will be allowed out of the aircraft. All other passengers will remain in the aircraft due to space constraints and to avoid possible immigration problems.
- 4.2 Arrangements will be made to transport all the passengers back to Singapore Changi Airport for immigration processing.
- 4.3 The Airport Manager or his representative will be present at the Passenger Terminal to provide assistance when aircraft are required to land at Tengah Air Base.
- 4.4 No refreshment facilities are available.

#### 5. SECURITY

- 5.1 All Airline personnel who are required to proceed to Tengah Air Base must wear their Singapore Changi Airport Passes at a prominent position and they will be escorted to the respective areas. All personnel not in possession of the laminated pass except Customs and Government Officers in uniform will be denied entry into Tengah Air Base by the RSAF Security Guard. Entry into the Air Base by both the airline personnel and service equipment is via the main gate. The Airline Engineering Coordinator shall be responsible for the proper positioning of the ground servicing equipment and vehicles in the Apron Area where arriving aircraft are to be parked.

- 5.2 No equipment, vehicles, stores, cargo or mail shall be left overnight at Tengah Air Base.
- 5.3 The security of civil aircraft parked in the Apron is the responsibility of the aircraft owner and any security service obtained shall first be cleared with the Tengah Air Base Security Authorities.

## **6. AIRCRAFT STAND ALLOCATION**

- 6.1 Aircraft parking positions will be issued by the RSAF Tower Controller. A "follow-me" vehicle will be waiting at the accesses to guide the aircraft to the allocated parking stands.

## **7. COMMUNICATIONS**

- 7.1 No VHF RTF surface movement frequency is available at Tengah Tower. Communication with the Tower will be by telephone, the nearest of which is in the Fire Station Building in front of the aircraft parking apron.

## **8. FUEL**

- 8.1 Fuel available JET A1 F3X.

## **9. AIRCRAFT SERVICES**

- 9.1 Airlines will have to provide their own services. Limited aircraft services can be obtained from the Aircraft Maintenance Unit by prior arrangement only.
- 9.2 Where essential facilities and services are not available at Tengah Air Base, such as the disposal of toilet waste or refuse, the resources available at Singapore Changi Airport shall be used.

## **10. RESCUE AND FIRE FIGHTING FACILITIES**

- 10.1 The rescue and fire fighting facilities available at Tengah Airbase is up to ICAO CAT 7. ←

## **11. FULL EMERGENCY/CRASH PROCEDURE**

- 11.1 In the event of a Full Emergency being declared on a civil aircraft diverted to Tengah Air Base, Full Emergency/Crash Procedures applicable to Singapore Changi Airport will equally apply to Tengah Air Base.
- 11.2 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 Airport Tower Controller.
- 11.3 The assembly point for all units attending to the Full Emergency incident will be at the Fire Station. No casualty clearance station is available at Tengah Air Base and in the event of an aircraft crash occurring, casualties if any, will be transported directly from the scene of crash to the Singapore General Hospital.

## **12. ATC SERVICE OUTSIDE OPERATING HOURS**

- 12.1 Normal radar service will be provided by Singapore Radar (Civil). All aircraft diverting to Tengah will be vectored by Approach Control to SJ or to an agreed transfer control point before they are handed over to Tengah Tower. No radar service will be provided by Tengah.

**WSAT AD 2.24 CHARTS RELATED TO TENGAH AERODROME**

	<i>Page</i>
Aerodrome Plan	WSAT AD 2-11

*INTENTIONALLY*

*LEFT*

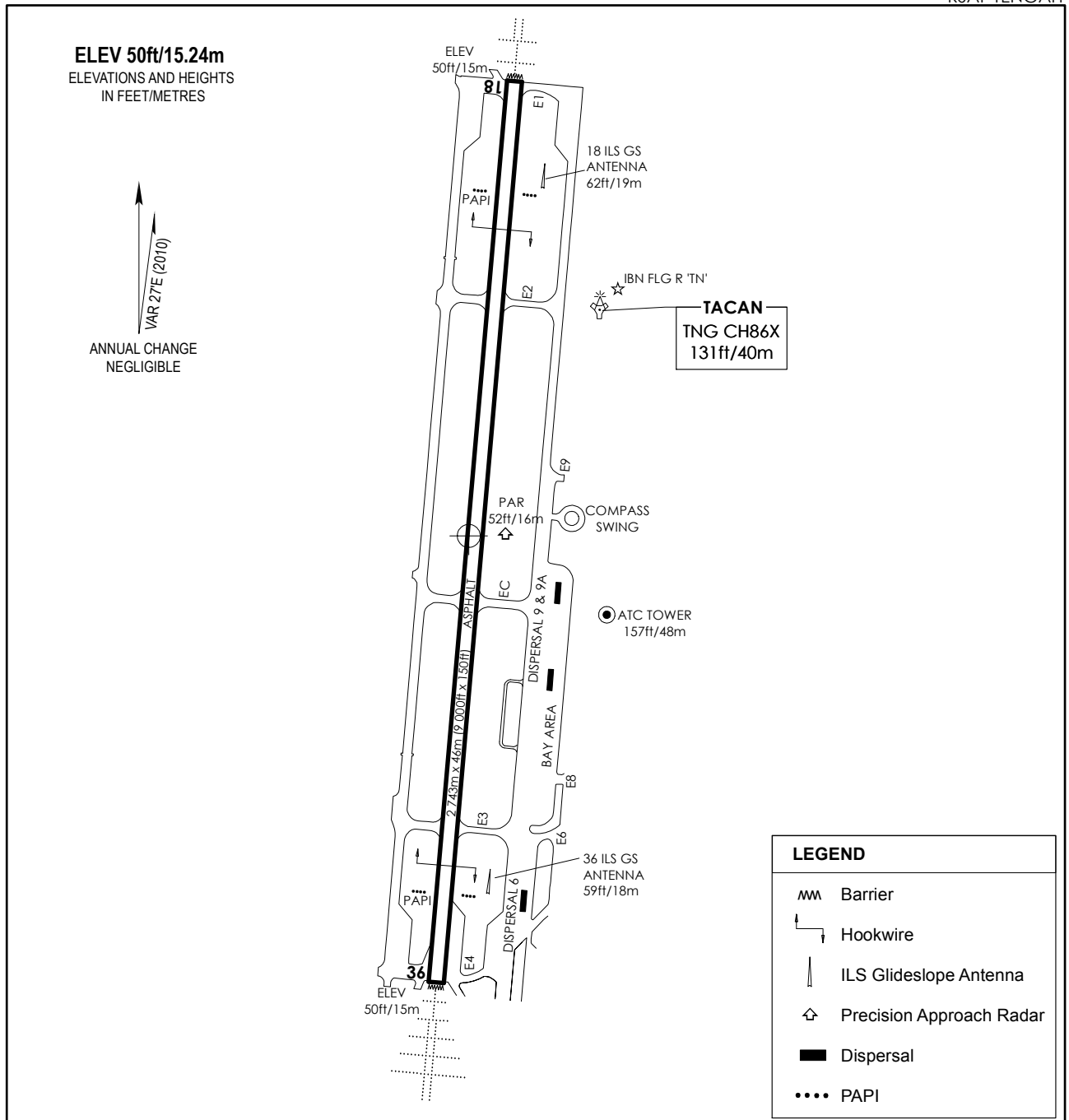
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# AERODROME CHART - TENGAH

01°23'15"N 103°42'30"E

RSAF TENGAH



AERODROME LIGHTING	CAUTION
<p><b>APPROACH LIGHTING :</b></p> <p>Approach RWY 18 High intensity white centre line and 2 bars. Superimposed omni-directional RED 'T'.</p> <p>Approach RWY 36 High intensity white centre line and 5 bars. Superimposed omni-directional RED 'T'.</p> <p>RWY 18/36 Sequenced flashing lights.</p> <p><b>RUNWAY LIGHTING :</b></p> <p>RWY 18/36 High intensity omni-directional white edge lights. Green THR lights. Red RWY end lights.</p> <p>Ident Beacon TN coding in RED.</p> <p>Taxiway Blue edge lights. Green centreline lights.</p> <p>Dispersal Blue edge lights. Floodlights</p> <p>Illuminated distance to run marker boards.</p>	<ol style="list-style-type: none"> <li>RWY lights 0.3m out from RWY edge.</li> <li>All circuits east of aerodrome within 3NM up to 1 500ft (457m).</li> <li>RWY 36 - Right hand circuit.</li> <li>Two masts, height 6m, located on the eastern shoulders :                     <ol style="list-style-type: none"> <li>Runway 36 - 233m from threshold, 100m from runway centre line.</li> <li>Runway 18 - 273m from threshold, 100m from runway centre line.</li> </ol> </li> </ol> <p>Obstacles lit at night. Helicopters operating in Helizone are to exercise extreme caution.</p>



WSAG AD 2.18 COMMUNICATION FACILITIES				
<i>Service Designation</i>	<i>Callsign</i>	<i>Frequency</i>	<i>Hours of operation</i>	<i>Remarks</i>
1	2	3	4	5
APP	Paya Lebar Approach	127.7 MHz 255.8 MHz	BTN 2300-1100 SUN/MON to THU/FRI and BTN 2300-0500 FRI/SAT. Prior permission required on SUN and Public holidays	Nil
TWR	Sembawang Tower	129.7 MHz 239.0 MHz		Nil
GND	Sembawang Ground	277.1 MHz		Nil
ACC	Singapore Radar	123.7 MHz 127.3 MHz	H24	for AWY B469, G219, G334, R208, L625, L629, L635, L642, L644, M751, M753, M758, M761, M763, M771, N884, N891, N892.
		133.25 MHz 135.8 MHz		for AWY A457, A464, A576, B466, R325, (all northbound) and R469.
		134.4 MHz 128.1 MHz 255.4 MHz		for AWY A464, A576, G579 (all southbound), B470, G220, N875 and in the area in the immediate vicinity of Singapore.
				Radar Maint Period: Monthly EV 3rd SAT BTN 1601-2359.
ACC	Singapore Radio	6556 KHz 11297 KHz	H24	SEA 1. SATCOM SER AVBL. SSB suppressed carrier.
		5655 KHz 8942 KHz 11396 KHz		SEA 2. SATCOM SER AVBL. SSB suppressed carrier.
		6556 KHz		SEA 3. SATCOM SER AVBL. SSB suppressed carrier.
APP	Singapore Approach	P120.3 MHz S124.6 MHz	H24	TAR: Intermediate approach to Singapore Changi AP and other airports in Singapore. DEP from all airports in Singapore. Maint Period: EV 1st THU BTN 0000-0900 -ASR I EV 4th SAT BTN 1601-2359 -ASR II

WSAG AD 2.19 RADIO NAVIGATION AND LANDING AIDS					
Type of Aid	IDENT	Frequency	OPR HR	Coordinates	Remarks
1	2	3	4	5	6
SEMBAWANG NDB	AG	325 KHz	H24	012524.00N 1034924.00E	198° MAG 0.54km from ARP Coverage 30NM. Maint Period: BTN 0200-0400 2nd FRI of EV month. For training approaches in VMC only.