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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 2/15**  
**5 MARCH 2015**

### 1. SIGNIFICANT INFORMATION AND CHANGES

#### 1.1 Singapore FIR

- a) Requirement for helicopter operating within Changi Control Zone or overland and outside of Heli-Route Charlie to obtain prior permission from the Director-General of Civil Aviation. ENR 3.4-3  
WSSS AD 2-16

#### 1.2 Singapore Changi Airport (WSSS)

- a) Operationalization of ground emergency frequency 129.95MHz. WSSS AD 2-17
- b) Inclusion of military taxiways M4, M5 and obstacle free zone WSSS AD 2-31 / Chart

#### 1.3 Seletar Airport (WSSL)

- a) Installation of red crash alarm stop bar lights across junctions of TWY EP, TWY EC4 and Taxilane EH2 WSSL AD 2-3-1  
WSSL AD 2-13 / Chart  
WSSL AD 2-15 / Chart
- b) Realignment of the western boundary of the 90m height zone from the current Seletar CTR boundary to the new Seletar Obstacle Assessment Surface eastern boundary. WSSL AD 2-21 / Chart  
WSSL AD 2-23 / Chart  
WSSL AD 2-25 / Chart  
WSSL AD 2-27 / Chart  
WSSL AD 2-29 / Chart  
WSSL AD 2-31 / Chart  
WSSL AD 2-33 / Chart  
WSSL AD 2-35 / Chart  
WSSL AD 2-37 / Chart

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 THIS AMENDMENT INCORPORATES INFORMATION CONTAINED IN THE FOLLOWING NOTAMs WHICH ARE HEREBY SUPERSEDED:

A2358/14 dated 28 NOV 14, A2591/14 dated 29 Dec 14, A2592/14 dated 29 Dec 14, A2593/14 dated 29 Dec 14, A2594/14 dated 20 Dec 14, A0154/15 dated 26 Jan 15, A0163/15 dated 27 Jan 15, A0184/15 dated 30 Jan 15, A0185/15 dated 30 Jan 15, A0186/15 dated 30 Jan 15, A0187/15 dated 30 Jan 15, A0204/15 dated 2 Feb 15 and A0359/15 dated 25 Feb 15.



<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>
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	
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	
51/14	Paya Lebar AP - Cranes	AD	WIE / 31 DEC 15	
52/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 15	
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	
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	
86/14	Singapore Changi AP - Work activities due to construction of new water retention pond at south end reservoir	AD	WIE / 31 MAR 15	
125/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 1 FEB 17	
126/14	Sembawang AD - 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	
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	
213/14	Paya Lebar AP - Cranes	AD	WIE / 1 MAR 16	
214/14	Paya Lebar AP - Cranes	AD	WIE / 1 MAR 16	
215/14	Paya Lebar AP - Cranes	AD	WIE / 30 MAR 16	
216/14	Paya Lebar AP - Hammerhead and Luffer Cranes	AD	WIE / 31 MAR 16	
217/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 MAR 16	
218/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 DEC 17	
219/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 17	
220/14	Paya Lebar AP - Hammerhead and Luffer Cranes	AD	WIE / 31 DEC 17	
221/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 17	
222/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 17	
223/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 1 JUN 16	

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<i>NR/ Year</i>	<i>Subject</i>	<i>AIP section affected</i>	<i>Period of validity (from / to)</i>	<i>Cancellation record</i>
224/14	Paya Lebar AP - Mobile Crane	AD	WIE / 1 JUN 16	
225/14	Paya Lebar AP - Crane	AD	WIE / 14 JUN 16	
226/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 JUN 16	
227/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 JUN 16	
235/14	Paya Lebar AP - Mobile Crane	AD	WIE / 14 MAR 15	
236/14	Paya Lebar AP - Cranes	AD	WIE / 15 MAR 15	
237/14	Paya Lebar AP - Crawler Crane	AD	WIE / 15 MAR 15	
238/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 1 DEC 16	
239/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 16	
240/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 16	
241/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 16	
242/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 16	
243/14	Paya Lebar AP - Tower Cranes	AD	WIE / 3 JUL 15	
244/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 4 JUL 15	
245/14	Paya Lebar AP - Cranes	AD	WIE / 9 JUL 15	
246/14	Paya Lebar AP - Luffer Cranes and Tower Crane	AD	WIE / 28 JUL 15	
247/14	Paya Lebar AP - Saddle and Luffer Cranes	AD	WIE / 31 JUL 15	
273/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 29 APR 17	
274/14	Paya Lebar AP - Topless Cranes	AD	WIE / 10 MAY 17	
275/14	Paya Lebar AP - Topless Cranes	AD	WIE / 1 JUN 17	
279/14	Singapore Changi AP - Construction of new aircraft stands and connecting taxiway at southern end	AD	WIE / 31 MAR 15	
289/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 OCT 15	
291/14	Paya Lebar AP - Luffer Crane	AD	WIE / 7 JUL 17	
292/14	Paya Lebar AP - Tower Cranes	AD	WIE / 31 JUL 17	
293/14	Paya Lebar AP - Luffer Cranes and Saddle Cranes	AD	WIE / 19 AUG 17	
296/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 SEP 15	
297/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 SEP 15	
298/14	Paya Lebar AP - Topless Cranes	AD	WIE / 30 SEP 15	
299/14	Paya Lebar AP - Topless Cranes	AD	WIE / 30 SEP 15	
300/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 SEP 15	
303/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 OCT 15	
308/14	Sembawang AD - Luffer Cranes	AD	WIE / 28 FEB 16	
315/14	Paya Lebar AP - Tower Cranes	AD	WIE / 10 SEP 17	
316/14	Paya Lebar AP - Topless Cranes	AD	WIE / 30 APR 15	
317/14	Paya Lebar AP - Topless Cranes	AD	WIE / 30 APR 15	
318/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 APR 15	
319/14	Sembawang AD - Luffer Cranes	AD	WIE / 1 MAY 15	
320/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 MAY 15	
325/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 MAR 16	
326/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 1 APR 16	
327/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 MAY 16	
328/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 AUG 16	
329/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 SEP 16	
330/14	Paya Lebar AP - Crane	AD	WIE / 30 NOV 16	
333/14	Singapore Changi AP - Work activities due to construction of new aircraft stands and new taxiways at West Cargo Area	AD	WIE / 31 AUG 16	
334/14	Paya Lebar AP - Crane	AD	WIE / 28 FEB 17	
335/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 4 MAR 17	
336/14	Paya Lebar AP - Tower Cranes	AD	WIE / 10 SEP 17	
337/14	Paya Lebar AP - Saddle Cranes	AD	WIE / 9 OCT 17	



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341/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 SEP 15	
342/14	Paya Lebar AP - Luffer Crane	AD	WIE / 30 NOV 15	
343/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 16	
350/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 15 MAR 15	
351/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 15 MAR 15	
352/14	Paya Lebar AP - Luffer Crane	AD	WIE / 1 FEB 16	
353/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 MAR 15	
354/14	Paya Lebar AP - Luffer and Topless Cranes	AD	WIE / 31 MAR 15	
360/14	Paya Lebar AP - Topless Cranes and Luffer Cranes	AD	WIE / 1 DEC 15	
361/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 20 DEC 15	
362/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 15	
363/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 15	
364/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 15	
365/14	Paya Lebar AP - Hammerhead and Luffer Cranes	AD	WIE / 30 JUN 17	
370/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 1 JAN 16	
371/14	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 1 JAN 16	
372/14	Paya Lebar AP - Tower Cranes	AD	WIE / 25 JAN 16	
373/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 JAN 16	
374/14	Paya Lebar AP - Luffer Crane	AD	WIE / 31 JAN 16	
375/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 AUG 16	
376/14	Paya Lebar AP - Saddle Cranes and Luffer Crane	AD	WIE / 31 AUG 16	
377/14	Paya Lebar AP - Saddle Cranes	AD	WIE / 1 SEP 16	
378/14	Paya Lebar AP - Luffer Cranes	AD	WIE / 10 SEP 16	
379/14	Paya Lebar AP - Topless Cranes	AD	WIE / 30 SEP 16	
380/14	Paya Lebar AP - Hammerhead and Topless Cranes	AD	WIE / 31 DEC 16	
381/14	Paya Lebar AP - Topless Cranes / A Frames	AD	WIE / 31 DEC 16	
382/14	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 16	
383/14	Paya Lebar AP - Luffer and Hammerhead Canes	AD	WIE / 31 DEC 16	
384/14	Paya Lebar AP - Topless and Hammerhead Cranes	AD	WIE / 31 DEC 16	
385/14	Singapore Changi AP - New Standard Terminal Arrival Route (STAR)	AD	WEF 5 MAR 15 / PERM	
1/15	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 1 JUN 15	
2/15	Paya Lebar AP - Mobile Crane	AD	WIE / 6 JUN 15	2/15
3/15	Paya Lebar AP - Topless Cranes and Luffer Crane	AD	WIE / 30 JUN 15	3/15
4/15	Paya Lebar AP - Crawler Crane	AD	WIE / 30 JUN 15	4/15
5/15	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 JUN 15	5/15
6/15	Paya Lebar AP - Luffer Crane	AD	WIE / 1 NOV 15	6/15
7/15	Paya Lebar AP - Hammerhead Crane	AD	WIE / 1 NOV 15	7/15
8/15	Paya Lebar AP - Hammerhead Cranes	AD	WIE / 1 NOV 15	8/15
9/15	Paya Lebar AP - Luffer Cranes	AD	WIE / 30 NOV 15	9/15
10/15	Paya Lebar AP - Topless Cranes and Luffer Crane	AD	WIE / 30 NOV 15	10/15
11/15	Paya Lebar AP - Tower Cranes	AD	WIE / 30 DEC 15	11/15
12/15	Paya Lebar AP - Luffer Crane	AD	WIE / 30 DEC 15	12/15
13/15	Paya Lebar AP - Luffer Crane	AD	WIE / 31 DEC 15	13/15
14/15	Paya Lebar AP - Topless Cranes	AD	WIE / 31 DEC 15	14/15
15/15	Paya Lebar AP - Luffer Cranes	AD	WIE / 31 DEC 15	15/15
16/15	Paya Lebar AP - Luffer Crane and Saddle Crane	AD	WIE / 31 DEC 15	16/15
17/15	Paya Lebar AP - Tower Crane	AD	WIE / 31 DEC 15	17/15
18/15	Paya Lebar AP - Hammerhead and Luffer Cranes	AD	WIE / 31 DEC 15	18/15
19/15	Paya Lebar AP - Topless Cranes and Luffer Cranes	AD	WIE / 31 DEC 15	19/15
20/15	Paya Lebar AP - Crawler Crane and Mobile Crane	AD	WIE / 31 JAN 16	20/15
21/15	Paya Lebar AP - Saddle Crane	AD	WIE / 4 DEC 17	21/15



GEN 0.4 CHECKLIST OF AIP PAGES					
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0.1-2	13 NOV 14	2.2-8	13 NOV 14	0.6-2	10 MAR 11
0.1-3	13 NOV 14	2.3-1	18 JAN 07	0.6-3	13 NOV 14
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* 0.3-2	5 MAR 15	2.5-1	13 NOV 14	<b>ENR 1</b>	
* 0.3-3	5 MAR 15	2.5-3/chart	15 MAR 07	1.1-1	1 SEP 05
* 0.3-4	5 MAR 15	2.6-1	28 SEP 06	1.1-2	1 SEP 05
		2.6-2	28 SEP 06	1.1-3	29 MAY 14
* 0.4-1	5 MAR 15	2.7-1	18 NOV 10	1.1-4	29 MAY 14
* 0.4-2	5 MAR 15			1.1-5	8 JUN 06
* 0.4-3	5 MAR 15	<b>GEN 3</b>		1.1-6	8 JUN 06
* 0.4-4	5 MAR 15	3.1-1	13 NOV 14	1.1-7	28 SEP 06
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0.6-3	20 SEP 12	3.1-5	13 NOV 14	1.1-11	27 AUG 09
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1.1-2	15 NOV 12	3.2-3	10 MAY 07	1.1-14	15 NOV 12
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1.2-4	8 JAN 15	3.3-1	13 NOV 14	1.2-1	10 MAY 07
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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
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1.6-4	3 APR 14	* 3.5-7	5 MAR 15	1.6-9/chart	18 APR 02
* 1.7-1	5 MAR 15	* 3.5-8	5 MAR 15	1.6-11/chart	18 APR 02
* 1.7-2	5 MAR 15	3.5-9	29 MAY 14		
* 1.7-3	5 MAR 15	3.5-10	29 MAY 14	1.7-1	15 MAR 07
* 1.7-4	5 MAR 15	3.6-1	3 APR 14	1.7-2	15 MAR 07
* 1.7-5	5 MAR 15	3.6-2	3 APR 14	1.7-3	15 MAR 07
		3.6-3	3 APR 14	1.7-4	15 MAR 07
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				1.8-4	31 JUL 08

GEN 0.4 CHECKLIST OF AIP PAGES					
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1.8-8	31 JUL 08	3.1-7	20 SEP 12		
1.8-9	1 SEP 05	3.1-8	20 SEP 12		
1.8-10	1 SEP 05	3.1-17/chart	8 JAN 15	<b>PART 3 - AERODROME (AD)</b>	
1.8-11	3 JUN 10	3.3-1	29 MAY 14	<b>AD 0</b>	
1.8-12	3 JUN 10	3.3-2	29 MAY 14	* <b>0.6-1</b>	<b>5 MAR 15</b>
* <b>1.8-13</b>	<b>5 MAR 15</b>	3.3-3	6 FEB 14	* <b>0.6-2</b>	<b>5 MAR 15</b>
* <b>1.8-14</b>	<b>5 MAR 15</b>	3.3-4	6 FEB 14	0.6-3	17 OCT 13
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* <b>1.8-23</b>	<b>5 MAR 15</b>	3.3-13	20 SEP 12	1.3-1	10 MAY 07
* <b>1.8-24</b>	<b>5 MAR 15</b>	3.3-14	20 SEP 12	1.3-3/chart	15 MAR 07
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1.9-2	15 JAN 09	* <b>3.4-3</b>	<b>5 MAR 15</b>		
1.9-3	5 JUL 07	* <b>3.4-4</b>	<b>5 MAR 15</b>	<b>AD 2</b>	
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* <b>1.10-1</b>	<b>5 MAR 15</b>	3.5-1	27 JUN 13	WSSS AD 2-3	3 APR 14
* <b>1.10-2</b>	<b>5 MAR 15</b>	3.5-2	27 JUN 13	WSSS AD 2-4	3 APR 14
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1.11-1	10 MAR 11	3.6-1	20 OCT 11	WSSS AD 2-5.1	6 FEB 14
1.12-1	8 APR 10	3.6-2	20 OCT 11	WSSS AD 2-5.2	6 FEB 14
1.12-2	8 APR 10	3.6-3/chart	20 SEP 12	WSSS AD 2-5.3	6 FEB 14
1.12-3	18 JAN 07	3.6-5/chart	29 MAY 14		
1.12-4	18 JAN 07	* <b>3.6-7/chart</b>	<b>5 MAR 15</b>	* <b>WSSS AD 2-6.1</b>	<b>5 MAR 15</b>
1.13-1	18 JAN 07	* <b>3.6-9/chart</b>	<b>5 MAR 15</b>	* <b>WSSS AD 2-6.2</b>	<b>5 MAR 15</b>
1.14-1	10 MAR 11	<b>ENR 4</b>	20 SEP 12	* <b>WSSS AD 2-6.3</b>	<b>5 MAR 15</b>
1.14-2	10 MAR 11	4.1-1	20 SEP 12	* <b>WSSS AD 2-6.4</b>	<b>5 MAR 15</b>
1.14-3	3 JUN 10	4.1-2	10 MAR 11	* <b>WSSS AD 2-6.5</b>	<b>5 MAR 15</b>
1.14-4	3 JUN 10	4.2-1	10 MAR 11	* <b>WSSS AD 2-6.6</b>	<b>5 MAR 15</b>
1.14-5	3 JUN 10	4.3-1	18 SEP 14	WSSS AD 2-6.7	8 JAN 15
1.14-6	3 JUN 10	* <b>4.4-1</b>	<b>5 MAR 15</b>	WSSS AD 2-6.8	8 JAN 15
1.15-1	10 JAN 13	* <b>4.4-2</b>	<b>5 MAR 15</b>	WSSS AD 2-7.1	7 MAY 09
1.15-3	2 MAY 13	* <b>4.4-3</b>	<b>5 MAR 15</b>	WSSS AD 2-7.2	7 MAY 09
1.15-4	2 MAY 13	* <b>4.4-4</b>	<b>5 MAR 15</b>	WSSS AD 2-7.3	7 MAY 09
<b>ENR 2</b>		4.4-5	10 MAR 11	WSSS AD 2-7.4	7 MAY 09
2.1-1	18 NOV 10	4.5-1		WSSS AD 2-7.5	6 FEB 14
2.1-2	18 NOV 10	<b>ENR 5</b>	8 APR 10	WSSS AD 2-7.6	6 FEB 14
2.1-3	18 NOV 10	5.1-1	10 MAR 11	WSSS AD 2-7.7	2 MAY 13
2.1-4	18 NOV 10	5.1-3	10 MAR 11	WSSS AD 2-7.8	2 MAY 13
* <b>2.1-7/chart</b>	<b>5 MAR 15</b>	5.1-4	10 MAR 11	WSSS AD 2-7.9	18 SEP 14
2.1-9/chart	29 MAY 14	5.1-5	10 MAR 11	WSSS AD 2-7.10	18 SEP 14
2.1-11A/diagram	8 APR 10	5.1-6	29 MAY 14	* <b>WSSS AD 2-7.11</b>	<b>5 MAR 15</b>
2.1-11B/diagram	8 APR 10	5.1-7/chart	10 MAR 11	* <b>WSSS AD 2-7.12</b>	<b>5 MAR 15</b>
2.1-13/diagram	8 OCT 98	5.1-9/chart	18 NOV 10	WSSS AD 2-7.13	8 JAN 15
2.1-15/chart	18 SEP 14	5.2-1	18 NOV 10		
2.2-1	18 JAN 07	5.2-2	11 FEB 10	WSSS AD 2-7.15	2 MAY 13
<b>ENR 3</b>		5.3-1	10 MAR 11	WSSS AD 2-7.16	2 MAY 13
3.1-1	29 MAY 14	5.4-1	15 DEC 11	WSSS AD 2-8.1	8 APR 10
3.1-2	29 MAY 14	5.5-1	10 JAN 13	WSSS AD 2-8.2	8 APR 10
3.1-3	20 SEP 12	5.6-1	10 JAN 13		
		5.6-3			

GEN 0.4 CHECKLIST OF AIP PAGES					
PAGE	DATE	PAGE	DATE	PAGE	DATE
* WSSS AD 2-9	5 MAR 15	* WSSS AD 2-71-1/chart	5 MAR 15	* WSSS AD 2-111/chart	5 MAR 15
* WSSS AD 2-10	5 MAR 15	* WSSS AD 2-72-1	5 MAR 15	* WSSS AD 2-113/chart	5 MAR 15
WSSS AD 2-11	3 APR 14	* WSSS AD 2-73/chart	5 MAR 15	* WSSS AD 2-115/chart	5 MAR 15
WSSS AD 2-12	3 APR 14	* WSSS AD 2-74	5 MAR 15	* WSSS AD 2-117/chart	5 MAR 15
WSSS AD 2-13	23 NOV 06	* WSSS AD 2-73-1/chart	5 MAR 15	* WSSS AD 2-118/chart	5 MAR 15
WSSS AD 2-14	23 NOV 06	* WSSS AD 2-74-1	5 MAR 15	* WSSS AD 2-119/chart	5 MAR 15
* WSSS AD 2-15	5 MAR 15	* WSSS AD 2-75/chart	5 MAR 15	* WSSS AD 2-120/chart	5 MAR 15
* WSSS AD 2-16	5 MAR 15	* WSSS AD 2-76	5 MAR 15	* WSSS AD 2-121/chart	5 MAR 15
* WSSS AD 2-17	5 MAR 15	* WSSS AD 2-77/chart	5 MAR 15		
* WSSS AD 2-18	5 MAR 15	* WSSS AD 2-78	5 MAR 15	* WSSL AD 2-1	5 MAR 15
WSSS AD 2-19	24 JUL 14			* WSSL AD 2-2	5 MAR 15
WSSS AD 2-20	24 JUL 14	* WSSS AD 2-81/chart	5 MAR 15	* WSSL AD 2-3-1	5 MAR 15
WSSS AD 2-21	29 MAY 14	* WSSS AD 2-82	5 MAR 15	* WSSL AD 2-3-2	5 MAR 15
WSSS AD 2-22	29 MAY 14	* WSSS AD 2-81-1/chart	5 MAR 15	WSSL AD 2-4-1	13 NOV 14
WSSS AD 2-23	13 NOV 14	* WSSS AD 2-82-1	5 MAR 15	WSSL AD 2-4-2	13 NOV 14
WSSS AD 2-24	13 NOV 14	* WSSS AD 2-83/chart	5 MAR 15	* WSSL AD 2-4-3	5 MAR 15
WSSS AD 2-25	8 JAN 15	* WSSS AD 2-84	5 MAR 15	* WSSL AD 2-4-4	5 MAR 15
WSSS AD 2-26	8 JAN 15	* WSSS AD 2-83-1/chart	5 MAR 15	WSSL AD 2-5	13 NOV 14
WSSS AD 2-27	13 NOV 14	* WSSS AD 2-84-1	5 MAR 15	WSSL AD 2-6	13 NOV 14
WSSS AD 2-28	13 NOV 14	* WSSS AD 2-85/chart	5 MAR 15	* WSSL AD 2-7	5 MAR 15
WSSS AD 2-29	1 SEP 05	* WSSS AD 2-86	5 MAR 15	* WSSL AD 2-8	5 MAR 15
		* WSSS AD 2-85-1/chart	5 MAR 15	WSSL AD 2-9	13 NOV 14
* WSSS AD 2-31/chart	5 MAR 15	* WSSS AD 2-86-1	5 MAR 15	WSSL AD 2-10	13 NOV 14
WSSS AD 2-33/chart	15 JAN 09	* WSSS AD 2-86-2	5 MAR 15	WSSL AD 2-11	20 OCT 11
* WSSS AD 2-37/chart	5 MAR 15	* WSSS AD 2-87/chart	5 MAR 15	WSSL AD 2-12	20 OCT 11
* WSSS AD 2-39/chart	5 MAR 15	* WSSS AD 2-88	5 MAR 15	WSSL AD 2-12-1	12 DEC 13
* WSSS AD 2-41/chart	5 MAR 15	* WSSS AD 2-87-1/chart	5 MAR 15	WSSL AD 2-12-2	12 DEC 13
WSSS AD 2-43/chart	25 APR 96	* WSSS AD 2-88-1	5 MAR 15	* WSSL AD 2-13/chart	5 MAR 15
WSSS AD 2-45/chart	25 APR 96	* WSSS AD 2-88-2	5 MAR 15	* WSSL AD 2-15/chart	5 MAR 15
* WSSS AD 2-47	5 MAR 15	* WSSS AD 2-89/chart	5 MAR 15	* WSSL AD 2-17/chart	5 MAR 15
* WSSS AD 2-48	5 MAR 15	* WSSS AD 2-90	5 MAR 15	* WSSL AD 2-19/chart	5 MAR 15
WSSS AD 2-49	20 SEP 12			* WSSL AD 2-21/chart	5 MAR 15
WSSS AD 2-50	20 SEP 12	* WSSS AD 2-91/chart	5 MAR 15	* WSSL AD 2-23/chart	5 MAR 15
* WSSS AD 2-50-1	5 MAR 15	* WSSS AD 2-92	5 MAR 15	* WSSL AD 2-25/chart	5 MAR 15
* WSSS AD 2-50-2	5 MAR 15	* WSSS AD 2-91-1/chart	5 MAR 15	* WSSL AD 2-27/chart	5 MAR 15
WSSS AD 2-50-3	5 APR 12	* WSSS AD 2-92-1	5 MAR 15	* WSSL AD 2-29/chart	5 MAR 15
WSSS AD 2-50-4	5 APR 12	* WSSS AD 2-92-2	5 MAR 15	* WSSL AD 2-31/chart	5 MAR 15
		* WSSS AD 2-93/chart	5 MAR 15	* WSSL AD 2-33/chart	5 MAR 15
* WSSS AD 2-51/chart	5 MAR 15	* WSSS AD 2-94	5 MAR 15	* WSSL AD 2-35/chart	5 MAR 15
* WSSS AD 2-52	5 MAR 15	* WSSS AD 2-93-1/chart	5 MAR 15	* WSSL AD 2-37/chart	5 MAR 15
* WSSS AD 2-53/chart	5 MAR 15	* WSSS AD 2-94-1	5 MAR 15		
* WSSS AD 2-54	5 MAR 15	* WSSS AD 2-94-2	5 MAR 15	WSAP AD 2-1	6 FEB 14
* WSSS AD 2-55/chart	5 MAR 15			WSAP AD 2-2	6 FEB 14
* WSSS AD 2-56	5 MAR 15	* WSSS AD 2-97/chart	5 MAR 15	WSAP AD 2-3	18 NOV 10
* WSSS AD 2-57/chart	5 MAR 15	* WSSS AD 2-98	5 MAR 15	WSAP AD 2-4	18 NOV 10
* WSSS AD 2-58	5 MAR 15	* WSSS AD 2-97-1/chart	5 MAR 15	WSAP AD 2-5	13 NOV 14
		* WSSS AD 2-98-1	5 MAR 15	WSAP AD 2-6	13 NOV 14
* WSSS AD 2-63/chart	5 MAR 15	* WSSS AD 2-99/chart	5 MAR 15	WSAP AD 2-7	20 OCT 11
* WSSS AD 2-64	5 MAR 15	* WSSS AD 2-100	5 MAR 15	WSAP AD 2-8	20 OCT 11
* WSSS AD 2-65/chart	5 MAR 15	* WSSS AD 2-99-1/chart	5 MAR 15	WSAP AD 2-9	18 NOV 10
* WSSS AD 2-66	5 MAR 15	* WSSS AD 2-100-1	5 MAR 15	WSAP AD 2-10	18 NOV 10
* WSSS AD 2-67/chart	5 MAR 15			* WSAP AD 2-11/chart	5 MAR 15
* WSSS AD 2-68	5 MAR 15	* WSSS AD 2-101/chart	5 MAR 15	* WSAP AD 2-13/chart	5 MAR 15
* WSSS AD 2-69/chart	5 MAR 15	* WSSS AD 2-103/chart	5 MAR 15	* WSAP AD 2-15/chart	5 MAR 15
* WSSS AD 2-70	5 MAR 15	* WSSS AD 2-105/chart	5 MAR 15	* WSAP AD 2-17/chart	5 MAR 15
* WSSS AD 2-71/chart	5 MAR 15	* WSSS AD 2-107/chart	5 MAR 15	* WSAP AD 2-19/chart	5 MAR 15
* WSSS AD 2-72	5 MAR 15	* WSSS AD 2-109/chart	5 MAR 15	* WSAP AD 2-21/chart	5 MAR 15
				* WSAP AD 2-23/chart	5 MAR 15

GEN 0.4 CHECKLIST OF AIP PAGES					
PAGE	DATE	PAGE	DATE	PAGE	DATE
WSAT AD 2-1	24 JUL 14				
WSAT AD 2-2	24 JUL 14				
WSAT AD 2-3	24 JUL 14				
WSAT AD 2-4	24 JUL 14				
WSAT AD 2-5	29 MAY 14				
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				
* <b>WSAT AD 2-11/chart</b>	<b>5 MAR 15</b>				
WSAG AD 2-1	5 APR 12				
WSAG AD 2-2	5 APR 12				
WSAG AD 2-3	29 MAY 14				
WMKJ AD 2-1	7 MAR 13				
WIDD AD 2-1	20 SEP 12				
WIDD AD 2-3	12 MAY 05				
WIDD AD 2-5/chart	12 MAY 05				
WIDD AD 2-6/chart	12 MAY 05				
WIDD AD 2-7/chart	12 MAY 05				
WIDD AD 2-8/chart	12 MAY 05				
WIDD AD 2-9/chart	12 MAY 05				
WIDD AD 2-10/chart	12 MAY 05				
WIDD AD 2-11/chart	12 MAY 05				
WIDD AD 2-12/chart	12 MAY 05				
* <b>WIDN AD 2-1</b>	<b>5 MAR 15</b>				
WIDN AD 2-3	15 DEC 11				
WIDN AD 2-5/chart	15 DEC 11				
WIDN AD 2-6/chart	15 DEC 11				
WIDN AD 2-7/chart	15 DEC 11				
WIDN AD 2-8/chart	15 DEC 11				
WIDN AD 2-9/chart	15 DEC 11				
WIDN AD 2-10/chart	15 DEC 11				
WIDN AD 2-11/chart	15 DEC 11				
WIDN AD 2-12/chart	15 DEC 11				

**GEN 1.7 DIFFERENCES FROM ICAO STANDARDS, RECOMMENDED PRACTICES  
AND PROCEDURES**

**ANNEX 1 Personnel Licensing, 11th edition**

Chapter 2 (10th edition, Amendment 169)

- 2.3.3.1.2 Due to local geographical constraints and boundary, it is not possible to complete one cross-country flight totalling not less than 270km (150NM) in the course of which full-stop landings at two different aerodromes are made. In such cases, a Private Pilot Licence with restriction to fly within Singapore only will be issued.
- 2.8.2.1 Singapore issues two types of ratings for flying instructors: Flying Instructor Rating and Assistant Flying Instructor Rating. Both ratings meet the ICAO standards for flying instructors. Newly qualified instructors are issued with an Assistant Flying Instructor Rating, and may qualify for a Flying Instructor Rating after acquiring additional flying and instructional experience.
- An Assistant Flying Instructor Rating does not entitle the holder to:
- (a) give flying instructions unless under the supervision of a person holding a Flying Instructor Rating; or
  - (b) give directions in respect of the student pilot's first solo day/night flight and first solo cross-country day/night flight.
- 2.9.1.1 The applicant for a Commercial Pilot Licence (Gliders) shall not be less than 18 years of age.
- 2.10.1.1 The applicant for a Private Pilot Licence (Balloons and Airships) shall not be less than 17 years of age. The applicant for a Commercial Pilot Licence (Balloons and Airships) shall not be less than 18 years of age.

**ANNEX 2 Rules of the Air, 10th edition**

Appendix 3 (Amendment 42)

VFR or IFR flights when operating in uncontrolled airspace within certain parts of the Singapore FIR at or above 3,000ft and below FL250 are required to use the cruising levels specified in the quadrantal table of cruising levels (quadrantal rule) as shown in page ENR 1.7-5 para 4.4.

**DOC 4444 Procedures for Air Navigation Services - Air Traffic Management, 15th edition (PANS-ATM)**

- Nil differences.

**DOC 7030 Regional Supplementary Procedures, 5th edition**

MID/ASIA REGIONAL SUPPLEMENTARY PROCEDURES

- 1.2.1 Flights shall be conducted in accordance with the Instrument Flight Rules (even when not operating in instrument meteorological conditions) when operated:
- a) Above FL200.

**ANNEX 3 Meteorological Service for International Air Navigation, 18th edition** ←

Chapter 4 (Amendment 75)  
4.3.2(a) The automated weather observing system (AWOS) provides for visual display system at the appropriate ATS units (corresponding to the visual display system in the meteorological station) showing real-time weather conditions at appropriate locations along the runways. The ATS units use these real-time weather conditions for aircraft landing and take-off. The information provided by the visual display system at the ATS units is used in place of specifically-formatted local routine reports.

**ANNEX 4 Aeronautical Charts, 11th edition**

Chapter 4 (Amendment 34)  
4.4.2 ICAO requires the horizontal scale of the Aerodrome Obstacle Chart - ICAO Type B to be between 1:10,000 and 1:20,000. Our national requirement for the horizontal scale for this chart is 1:25,000. The Aerodrome Obstacle Chart - ICAO Type B contained in the Singapore AIP is published according to the scale of 1:25,000.

**ANNEX 5 Units of Measurement to be used in Air and Ground Operations, 5th edition (Amendment 17)**  
- Nil differences.

**ANNEX 6 Operation of Aircraft**

Part I (International Commercial Air Transport - Aeroplanes) - 9th edition

Chapter 6 (Amendment 34)  
6.3.1.2.3 All aeroplanes of a MTWA of over 5700kg, regardless of the date that their individual certificate of airworthiness is first issued, shall be equipped with a Type I FDR.  
6.3.1.2.4 As above for ICAO ANNEX 6 Part I paragraph 6.3.1.2.3.  
6.3.1.2.6 As above for ICAO ANNEX 6 Part I paragraph 6.3.1.2.3.  
6.3.1.2.9 As above for ICAO ANNEX 6 Part I paragraph 6.3.1.2.3.  
6.3.1.3.3 As above for ICAO ANNEX 6 Part I paragraph 6.3.1.2.3.  
6.3.2.1.3 As above for ICAO ANNEX 6 Part I paragraph 6.3.1.2.3.  
6.3.2.1.4 As above for ICAO ANNEX 6 Part I paragraph 6.3.1.2.3.

Chapter 12 (Amendment 34)  
12.4(b) Singapore regulations do not require all cabin crew to be trained on the use of automated external defibrillator (AED). However, the regulations require that at least one senior cabin crew on board every aircraft carrying AED to be trained on the use of AED.

Part II (International General Aviation - Aeroplanes) - 8th edition ←

Chapter 3 (Amendment 29)  
3.6.3.1.2.2 All aeroplanes of a MTWA of over 5700kg, regardless of the date that their individual certificate of airworthiness is first issued, shall be equipped with a Type I FDR.  
3.6.3.1.3.3 Currently, the use of analogue FDRs using FM is not permitted.  
3.6.3.2.1.3 All aeroplanes of a MTWA of over 5700kg, regardless of the date that their individual certificate of airworthiness is first issued, shall be equipped with a CVR.

Chapter 6 (Amendment 29)  
6.1.1 General aviation aircraft in Singapore are required to be registered in the Public Transport Category.

Part III (International Operations - Helicopters) - 7th edition

Chapter 4 (Amendment 15)  
4.3.2.1.1 All helicopters of a MTWA of over 3180kg (adopting ICAO recommendation of ANNEX 6 Part III paragraph 4.3.2.1.2), instead of 7000kg, are required to be equipped with a CVR.  
4.3.2.1.3 As above for ICAO ANNEX 6 Part III paragraph 4.3.2.1.1.



**ANNEX 7 Aircraft Nationality and Registration Marks**, 6th edition (Amendment 6)

- Nil differences.

➔ **ANNEX 8 Airworthiness of Aircraft**, 11th edition (Amendment 104)

- Nil differences.

**ANNEX 9 Facilitation**, 13th edition (Amendment 22)

Chapter 2

- 2.4 General Declaration is required.
- 2.5 Name of flight crew members are required and to be provided on General Declaration on entry and departure of aircraft.
- 2.6 Two copies of Embarking Passenger manifests are required.
- 2.12 Crew lists are required.
- 2.15 Crew lists are required.
- 2.18 Documents for entry and departure of aircraft should be in English.

Chapter 3

- 3.7 Visa is only required for persons who are holders of Certificate of Identity and Travel Documents issued by countries which have not entered visa agreement with the Singapore Government.
- 3.8 Visa fees are payable at standard rates.
- 3.8.4 Permanent residents who are not Singapore Citizens are required to be in possession of Re-Entry Permits when they return from overseas trips.
- 3.9 Embarkation/Disembarkation forms and certain supplementary information are required.
- 3.10 Embarkation/Disembarkation forms and certain supplementary information are required.
- 3.23 Crew members when travelling as passengers are required to be in possession of passports.

Chapter 4

- 4.8 Except for certain scheduled items for which a Diversion Certificate or other authority is required, in/out cargo is as free as possible of governmental documentary requirements.

Chapter 5

- 5.2 Facilities for provisional declarations are available to expedite clearance.
- 5.4.1 Passports and visas, when necessary, are required where passengers have to leave the International Airport and stay in Singapore.

Chapter 6

- 6.57 Any requests to station representatives of the public authorities of another State will be considered on its merits.

Chapter 8

- 8.1 As laws differ between Government Departments, the use of a single comprehensive bond is not acceptable.
- 8.14 There is a medical centre at the airport which provides consultation, pharmaceutical, dental, x-ray and minor operations facilities. Requests for medical care and assistance could be made prior to arrival of aircraft.

**ANNEX 10     Aeronautical Telecommunications**

- Volume I     (Radio Navigation Aids) - 6th edition (Amendment 87)
- Volume II     (Communication Procedures including those with PANS status) - 6th edition (Amendment 87)
- Volume III     (Communications Systems) - 2nd edition (Amendment 87)  
                  Part I - Digital Data Communication Systems (Amendment 87)  
                  Part II - Voice Communication Systems (Amendment 87)
- Volume IV     (Surveillance Radar and Collision Avoidance Systems) - 4th edition (Amendment 87)
- Volume V     (Aeronautical Radio Frequency Spectrum Utilization) - 3rd edition (Amendment 88-A)

- Nil Differences

**ANNEX 11     Air Traffic Services, 13th edition**

- Chapter 4     (Amendment 47)
- 4.3.6.1(g)     The AWOS systems at the airports have visual display systems at the relevant ATS units showing real-time weather conditions at appropriate locations along the runways. The ATS units use these real-time weather conditions for aircraft landing and take-off. However, specifically formatted MET REPORT and SPECIAL as described in Annex 3 paragraphs 4.3.2(a) and 4.4.2(a) are not prepared.

**ANNEX 12     Search and Rescue, 8th edition (Amendment 18)**

- Nil Differences

**ANNEX 13     Aircraft Accident and Incident Investigation, 10th edition**

- Chapter 5     (Amendment 13)
- 5.1.2     ICAO requires States to investigate serious incident involving aircraft of a maximum certificated take-off (MCT) mass of over 2250kg. With effect from 2 August 2010, Singapore requires all serious incidents to be investigated, regardless of the aircraft's MCT mass.

**ANNEX 14     Aerodromes**

- Volume I     (Aerodrome Design and Operations) - 6th edition

- Chapter 2
- 2.5.3     Geographical coordinates of appropriate taxiway centre line points are not provided at Changi Airport and Seletar Airport.

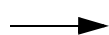
- Chapter 4
- 4.2.13     In addition to the obstacle limitation surfaces described in para 4.2.13 of the Annex, the inner approach surface, inner transitional surfaces and balked landing surface shall also be established for a precision approach runway category I.

Chapter 7

7.4.1 In addition to para 7.4.1 of the Annex, unserviceability markers shall also be displayed at the entrances to a permanently or temporarily closed runway or taxiway, or part thereof.

Chapter 9

9.2.3 The remission factor described in para 9.2.3 of the Annex has been removed from our national regulations.



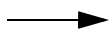
Volume II (Heliports) - 4th edition (Amendment 6)  
- Not applicable

**ANNEX 15 Aeronautical Information Services**, 14th edition

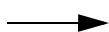
Chapter 10 (Amendment 36)

Singapore has not promulgated regulations or requirements on electronic terrain and obstacle data (ETOD). ETOD is currently not provided in Singapore.

**ANNEX 16 Environmental Protection**



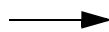
Volume I (Aircraft Noise) - 7th edition (Amendment 11-B)



Volume II (Aircraft Engine Emissions) - 3rd edition (Amendment 8)

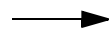
- Nil Differences

**ANNEX 17 Security - Safeguarding International Civil Aviation Against Acts of Unlawful Interference**, 9th edition (Amendment 14)



- Nil Differences

**ANNEX 18 The Safe Transport of Dangerous Goods by Air**, 4th edition (Amendment 11)



- Nil Differences

**ANNEX 19 Safety Management**, 1st edition

- Nil Differences

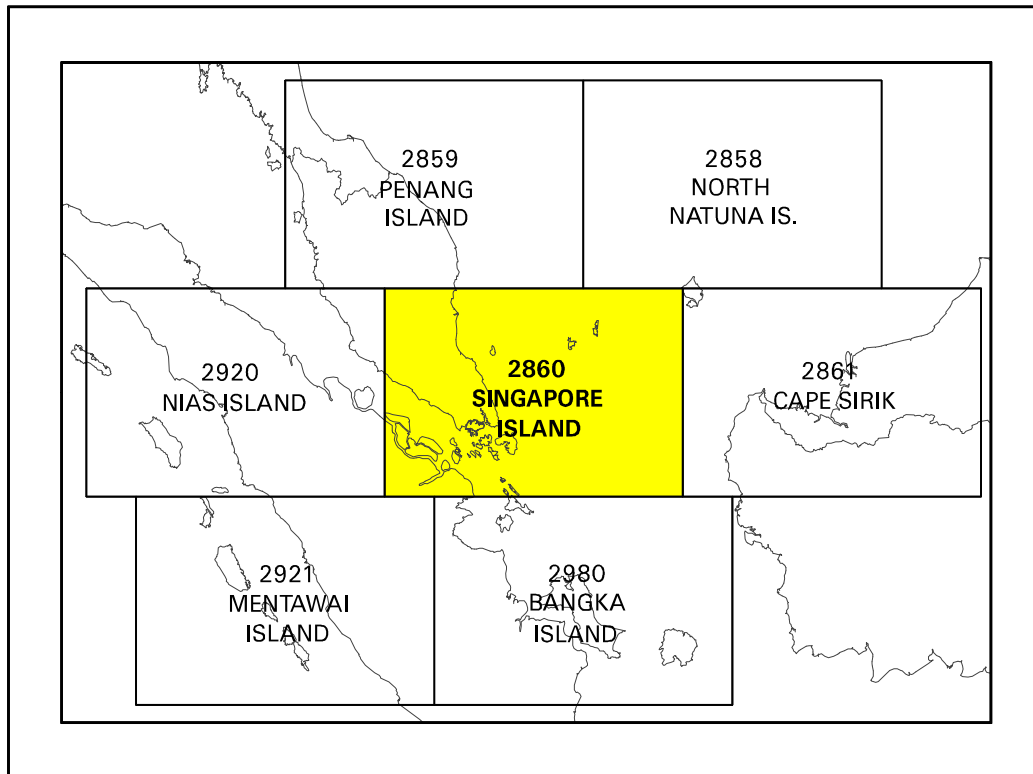
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GEN 3.2.5 LIST OF AERONAUTICAL CHARTS AVAILABLE					
<i>Title of Chart Series</i>	<i>Scale</i>	<i>Name and/or number</i>		<i>Price (\$)</i>	<i>Date</i>
<b>World Aeronautical Chart</b> ICAO (WAC)	1:1 000 000	WAC 2860		In AIP	15 JUL 99
<b>Enroute Chart</b> ICAO (ENRC)		ENR 6-1		In AIP	8 JAN 15
<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	5 MAR 15
	1:400 000	RWY 02C - ICE ILS/DME WSSS AD 2-103		In AIP	5 MAR 15
	1:400 000	RWY 02C - VTK DVOR/DME WSSS AD 2-105		In AIP	5 MAR 15
	1:400 000	RWY 02R - ICX ILS/DME WSSS AD 2-107		In AIP	5 MAR 15
	1:400 000	RWY 20R - ICH ILS/DME WSSS AD 2-109		In AIP	5 MAR 15
	1:400 000	RWY 20C - ICC ILS/DME WSSS AD 2-111		In AIP	5 MAR 15
	1:400 000	RWY 20C - VTK DVOR/DME WSSS AD 2-113		In AIP	5 MAR 15
	1:400 000	RWY 20L - ICZ ILS/DME WSSS AD 2-115		In AIP	5 MAR 15
	1:400 000	RWY 02L - RNAV(GNSS) WSSS AD 2-117		In AIP	5 MAR 15
	1:400 000	RWY 20R - RNAV(GNSS) WSSS AD 2-119		In AIP	5 MAR 15
	1:400 000	RWY 20C - RNAV(GNSS) WSSS AD 2-120		In AIP	5 MAR 15
	1:400 000	<b>Paya Lebar</b> RWY 20 - PU DVOR/DME WSAP AD 2-17		In AIP	5 MAR 15
	1:400 000	RWY 02 - PU DVOR/DME WSAP AD 2-19		In AIP	5 MAR 15
	1:400 000	RWY 20 - IPS ILS/DME WSAP AD 2-21		In AIP	5 MAR 15
	1:400 000	RWY 02 - IPN ILS/DME WSAP AD 2-23		In AIP	5 MAR 15
	<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	5 MAR 15
1:100 000		RWY 21 WSSL AD 2-23		In AIP	5 MAR 15
1:100 000		RWY 03 WSSL AD 2-25		In AIP	5 MAR 15
1:100 000		RWY 21 WSSL AD 2-27		In AIP	5 MAR 15
<b>Visual Departure Chart</b>	1:100 000	<b>Seletar</b> RWY 03 WSSL AD 2-29		In AIP	5 MAR 15
	1:100 000	RWY 21 WSSL AD 2-31		In AIP	5 MAR 15
<b>Aerodrome Chart</b> ICAO (AC)		<b>Singapore Changi</b> WSSS AD 2-31		In AIP	5 MAR 15
		<b>Seletar</b> WSSL AD 2-13		In AIP	5 MAR 15
		<b>Paya Lebar</b> WSAP AD 2-11		In AIP	5 MAR 15
<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	5 MAR 15
	1:10 000	RWY 20C/02C WSSS AD 2-39		In AIP	5 MAR 15
	1:10 000	<b>Seletar</b> RWY 03/21 WSSL AD 2-17		In AIP	5 MAR 15
	1:20 000	<b>Paya Lebar</b> RWY 20/02 WSAP AD 2-15		In AIP	5 MAR 15
	1:25 000	<b>Singapore Changi</b> RWY 02L/20R and 02C/20C WSSS AD 2-41		In AIP	5 MAR 15
<b>Aerodrome Obstacle Chart</b> ICAO TYPE B (AOC)	1:12 500	<b>Seletar</b> RWY 03/21 WSSL AD 2-19		In AIP	5 MAR 15
	1:2 500	<b>Singapore Changi</b> RWY 02L WSSS AD 2-43		In AIP	25 APR 96
<b>Precision Approach Terrain Chart - ICAO (PATC)</b>	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**



7. VOLMET SERVICE

TABLE GEN 3.5.7 VOLMET SERVICE

Name of station	CALLSIGN IDENT (EM)	Frequency	Broad-cast period	HR of SER	Aerodromes included	Contents and format of REP and FCST
1	2	3	4	5	6	7
SINGAPORE	SINGAPORE RADIO  (A3J)	6676KHz (1230-2230)  11387KHz (2230-1230)	H + 20 to H + 25	H24	SINGAPORE (1) SINGAPORE (2) KUALA LUMPUR (3)(4) SUBANG AIRPORT (4) SOEKARNO-HATTA (3)(4) KUCHING (3)(4) BRUNEI (3)(4) KOTA KINABALU (3)(4) DEN PASAR (3) (4) PENANG (3)(4) SINGAPORE (5) KUALA LUMPUR (4)(8)	SIGMET METAR METAR METAR METAR METAR METAR METAR METAR TAF TAF
			and		H + 50 to H + 55	SINGAPORE (1) SINGAPORE (6) KUALA LUMPUR (4)(7) SUBANG AIRPORT (4) SOEKARNO-HATTA (4)(7) KUCHING (4)(7) BRUNEI (4)(7) KOTA KINABALU (4)(7) DEN PASAR (4)(7) PENANG (4)(7) SINGAPORE (5) SOEKARNO HATTA (4)(8)
Plain Language EN.						
(1) SIGMET message or 'NIL' is transmitted. (2) Latest routine report H+00 including trend statement; repeated at end of broadcast, time permitting. (3) H+00 (or the previous H+30 report when the H+00 report is not available) including trend statement when appended. (4) As available. (5) Valid for 12 hours. (6) Latest routine report H+30 including trend statement; repeated at end of broadcast, time permitting. (7) H+30 (or the H+00 report when the H+30 report is not available) including trend statement when appended. (8) Valid for 30 hours.						
SINGAPORE	SINGAPORE VOLMET	D-VOLMET	as required	H24	SINGAPORE KUALA LUMPUR SOEKARNO-HATTA SINGAPORE KUALA LUMPUR SUBANG AIRPORT SOEKARNO-HATTA KUCHING BRUNEI KOTA KINABALU DEN PASAR PENANG SINGAPORE KUALA IUMPUR SOEKARNO-HATTA	SIGMET SIGMET SIGMET METAR METAR METAR METAR METAR METAR METAR METAR METAR TAF TAF TAF
Data Link VOLMET (D-VOLMET) service available H24. AP Ident WSSS. Messages comply with ARINC 623 standards.						

**8. SIGMET SERVICE****TABLE GEN 3.5.8 SIGMET SERVICE**

<i>Name of MWO/ location indicators</i>	<i>Hours of Operation</i>	<i>FIR or CTA served</i>	<i>Type of SIGMET / validity</i>	<i>Specific procedures</i>	<i>ATS unit served</i>	<i>Additional Information</i>
1	2	3	4	5	6	7
SINGAPORE	H24	Singapore FIR	SIGMET / 4-6HR	Nil	Singapore ACC	Nil



**ENR 1.4 ATS AIRSPACE CLASSIFICATION AND DESCRIPTION****1. INTRODUCTION**

1.1 The airspace in the Singapore FIR has been classified in accordance with Appendix 4 of ICAO Annex 11.

**2. AIRSPACE CLASSIFICATION**

2.1 Within the Singapore FIR, the airspace is divided into 5 classes as shown in the table below:

**AIRSPACE CLASSIFICATION IN THE SINGAPORE FIR**

<i>Airspace</i>		<i>Flight Levels</i>	<i>Classification</i>
Controlled Airspace		FL150 to FL460	A
		Surface to FL150	B
Controlled Airspace more than 100NM seaward from the shoreline		Lower Limit to FL460	A
Control Zones (CTRs)	Changi CTR	Surface to Upper Limit	C
	Paya Lebar CTR		D
	Seletar CTR		C
ATZs		Surface to Upper Limit	D
Uncontrolled Airspace			G*

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

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

### 2.1 INTRODUCTION

- 2.1.1 RNAV is a method which permits aircraft navigation along any desired flight path within the coverage of the associated navigation aids, or within the limits of the capability of self-contained aids, or a combination of these methods. RNAV equipment is considered to be that equipment which operates by automatically determining aircraft position from one, or a combination of the following sensors with the means to establish and follow a desired path: VOR/DME, DME/DME, INS, LORAN C, GNSS.
- 2.1.2 Only aircraft equipped with RNAV systems would be able to operate on the RNAV routes in the revised South China Sea ATS route structure which forms part of the Singapore FIR. Aircraft that are not RNAV compliant will only be cleared to operate on non-RNAV routes.
- 2.1.3 The requirements for conduct of RNAV operations are stated in ICAO Doc 9613 (Manual on Required Navigation Performance) and FAA AC 90-45 (Approval of Area Navigation Systems for use in the US National Airspace System).
- 2.1.4 Minimum longitudinal separation of 10 minutes between RNAV equipped aircraft based on Mach Number Technique is applied on ATS routes A464, A576, B470, G334, L625, L642, L644, M646, M751, M753, M758, M761, M767, M768, M771, M772, M774, N875, N884, N891 and N892 in accordance with DOC 7030/4. MNPS criteria is not required. If item 10 of the flight plan does not include any of the following equipment designators "G", "I" or "R", operators shall insert "NAV/NON-RNAV" in item 18 of the flight plan.
- 2.1.5 Operators of aircraft to which the Mach Number Technique and RNAV procedures will be applied must ensure that the equipment carried on their aircraft have been calibrated in accordance with the applicable airworthiness practices.
- 2.1.6 An 80NM RNAV distance-based longitudinal separation minima, with Mach Number Technique being applied, is permanently implemented on ATS routes within the oceanic portion of the Singapore FIR.

### 2.2 MACH NUMBER IN A FLIGHT PLAN

- 2.2.1 Aircraft are required to include their true Mach Number in item 15 of the ICAO flight plan as follows:
- True airspeed and level preceding the entry point.
  - True Mach Number and level at entry point.

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

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

### 2.3 ATC CLEARANCE

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

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

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

## **2.4 MAINTENANCE/CHANGE OF MACH NUMBER**

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

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

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

Example

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

## **2.5 LONGITUDINAL SEPARATION ON ATS ROUTES M758 AND M761**

2.5.1 Longitudinal Separation Minimum

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

2.5.2 Separation of aircraft when the following aircraft is faster

When the following aircraft is faster, for each 600m in distance between the entry and exit points of the area where the Mach Number Technique is used, 1 minute is added for each 0.01 difference in Mach number between the two aircraft concerned to compensate for the fact that the second aircraft is overtaking the first aircraft according to the table in Appendix A (see page ENR 1.8-16).

2.5.3 Separation of aircraft when the preceding aircraft is faster

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

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

## **2.6 LONGITUDINAL SEPARATION ON ATS ROUTES A464, A576, B470, G579, L625, L642, L644, M646, M751, M753, M767, M768, M771, M772, N875, N884, N891 AND N892**

2.6.1 Requirements

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

2.6.2 Separation of aircraft with the same Mach number

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

2.6.3 Separation of aircraft when the following aircraft is faster

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

## 6.4.4 DETAILS OF APPROACH AIRSPACE HOLDING AREAS

Holding Fix / ID / Co-ordinates	Inbound Track °M	Direction of Turn	MAX HLDG Speed (IAS)	Time (MIN)	MNM-MAX HLDG Level	Controlling Unit and Frequency
1	2	3	4	5	6	7
<b>NYLON</b> 013657N 1040624E	203°	Left	220 knots	1	<u>FL140</u> 3,000ft	Singapore Approach 124.05MHz (PRI) 132.15MHz (SRY)
<b>LAVAX</b> 010950N 1042714E	269°	Left	220 knots	1	<u>FL140</u> 7,000ft	Singapore Approach 124.05MHz (PRI) 132.15MHz (SRY)
<b>REMES</b> 004342N 1035735E	348°	Right	220 knots	1	<u>FL140</u> 6,000ft	Singapore Approach 124.6MHz (PRI) 132.15MHz (SRY)
<b>BOBAG</b> 010230N 1032954E	083°	Right	220 knots	1	<u>FL140</u> 6,000ft	Singapore Approach 124.6MHz (PRI) 132.15MHz (SRY)

## 6.4.5 ALTERNATE HOLDING AREAS

In the event of inclement weather or capacity constraints rendering a specific holding area unusable, arrivals may be cleared to an alternate holding area for re-sequencing. To ensure smooth transition to alternate holding area, all arrivals bound for Singapore Changi Airport shall have their FMS programmed with all the four promulgated holding areas (paragraph 6.4.4)

## 6.5 EXPECTED TIME TO LEAVE HOLDING AREA

6.5.1 If arrival delay is processed by means of holding, pilots will be informed of the expected time to leave the respective holding area.

6.5.2 The expected time to leave is issued to serve as an early notification of the probable holding duration as well as for unforeseen circumstance such as radio failure (see page ENR 1.6-4). Subsequently, a specified time to leave the holding area will be issued to pilots to resume the flight according to the assigned RNAV STARs.

## 6.6 DEPARTING AIRCRAFT FROM SINGAPORE CHANGI AIRPORT

## 6.6.1 DEPARTURE SPEED CONTROL

Departing aircraft shall fly at IAS 220 knots or less below 4000 feet or at the waypoints specified in the SID and thereafter IAS 250 knots or less below 10000 feet AMSL. Pilots shall also comply with speed control restrictions according to published SIDs.

**7. AUTOMATIC DEPENDENT SURVEILLANCE BROADCAST (ADS-B) OUT EXCLUSIVE AIRSPACE WITHIN PARTS OF THE SINGAPORE FIR**

**7.1 ADS-B BASED SURVEILLANCE AIRSPACE AND AIRCRAFT OPERATOR APPROVAL**

- 7.1.1 Aircraft that operates on ATS routes L642, M771, N891 M753, L644, N892 and M904 within airspace bounded by 073605N 1090045E, 040713N 1063543E, 041717N 1061247E (MABLI), 044841N 1052247E (DOLOX), 045223N 1041442E (ENREP), 045000N 1034400E, thence north along the Singapore FIR boundary to 070000N 1080000E at or above FL290 must carry serviceable ADS-B transmitting equipment that has been certified as meeting EASA AMC 20-24, or FAA AC No. 20-165A - Airworthiness Approval of ADS-B, or meets the equipment configuration standards in Appendix XI of Civil Aviation Order 20.18 of the Civil Aviation Safety Authority of Australia.
- 7.1.2 Aircraft that does not comply with the requirements stipulated in paragraph 7.1.1 will not be accorded priority in the delineated airspace and flight level assignments would be subjected to air traffic conditions.
- 7.1.3 If an aircraft carries ADS-B transmitting equipment but does not comply with the requirements stipulated in paragraph 7.1.1, the aircraft must not fly in the delineated airspace unless the equipment is deactivated or set to transmit only a value of zero for the Navigation Uncertainty Category (NUCp) or Navigation Integrity Category (NIC).
- 7.1.4 Flights operating in the delineated airspace are to contact Singapore Radar on 134.35MHz (primary frequency) and 133.6MHz (secondary frequency).

**7.2 FLIGHT PLANNING REQUIREMENTS**

- 7.2.1 Aircraft operators complying with the requirements stipulated in paragraph 7.1.1 are to indicate the appropriate ADS-B designator in Item 10 of the ICAO flight plan:

- B1 ADS-B with dedicated 1090 MHz ADS-B “out” capability  
B2 ADS-B with dedicated 1090 MHz ADS-B “out” and “in” capability

- 7.2.2 Aircraft operators are to include the aircraft address (24 Bit Code) in hexadecimal format in Item 18 of the ICAO flight plan as per the following example:

CODE/7C432B

- 7.2.3 Aircraft Identification (ACID) not exceeding 7 characters must be accurately indicated in Item 7 of the ICAO flight plan and replicated exactly when set in the aircraft avionics (for transmission as Flight ID) as follows:

either

- a) The three-letter ICAO designator of the aircraft operator followed by the flight number (e.g. SIA123, MAS123, GIA123), when radiotelephony callsign consists of the associated ICAO telephony designator for the aircraft operator followed by the flight number (e.g. SINGAPORE 123, MALAYSIAN 123, INDONESIA 123).

or

- b) The aircraft registration (e.g. N555AB, 9VABC) when the radiotelephony callsign consists of the aircraft registration.

***Important: ACID entered should not have any leading zeros unless it is part of the flight number as indicated in Item 7 of the ICAO flight plan. Hyphens, dashes or spaces are NOT to be used.***

**ENR 1.10 FLIGHT PLANNING**

**1. PROCEDURES FOR SUBMISSION OF A FLIGHT PLAN**

**1.1 Requirement for submission of a Flight Plan**

1.1.1 The pilot-in-command or the operator shall submit a flight plan to ATC in respect of the following flights via the AFS and / or Internet:

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

1.1.2 The pilot-in-command or the operator shall use the ICAO flight plan form except for where a flight is planned to be conducted in the Seletar aerodrome circuit or departing Seletar Aerodrome for Light Aircraft Training Areas A, B and C. Details of the flight shall be submitted by electronic mail using a standard format and submission procedure can be found in the following webpage: [http://www.caas.gov.sg/caasWeb2010/export/sites/caas/en/eServices\\_Forms/Aeronautical\\_Information\\_Services.html?\\_locale=en](http://www.caas.gov.sg/caasWeb2010/export/sites/caas/en/eServices_Forms/Aeronautical_Information_Services.html?_locale=en)

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

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

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

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

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

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

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

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

1.2.5 Procedures for application to conduct test flights are provided on page GEN 1.2-6 paragraph 4.

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

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

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

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

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

1.3.5 A pilot-in-command may change from an IFR flight plan to a VFR flight plan by reporting "CANCELLING MY IFR FLIGHT" when weather conditions indicate that the remainder of the flight can be conducted under VFR. [However, within Singapore, all flights whether IFR or VFR shall be regulated in accordance with instrument flight rules.] (see note 2 below).

1.3.6 ATC will acknowledge:

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

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

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

*Note 1:* The fact that pilot flying in VMC does not by itself constitute cancellation of an IFR flight plan.

*Note 2:* Within the Singapore/Johor Airspace Complex and Control Zones all flights are regulated in accordance with IFR separation standards.

**1.4 Persons on board (POB)**

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

**1.5 DATA LINK Communication**

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

- J1** CPDLC ATN VDL Mode 2
- J2** CPDLC FANS 1/A HFDL
- J3** CPDLC FANS 1/A VDL Mode 4A
- J4** CPDLC FANS 1/A VDL Mode 2
- J5** CPDLC FANS 1/A SATCOM (INMARSAT)
- J6** CPDLC FANS 1/A SATCOM (MTSAT)

**1.6 RNAV Approved Aircraft**

1.6.1 Aircraft flying on RNAV routes A464, A576, B470, G334, L625, L642, L644, M646, M751, M753, M758, M761, M767, M768, M771, M772, M774, N875, N884, N891 and N892 (see page ENR 1.8-13) must be RNAV equipped and should annotate their flight plan as follows:

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

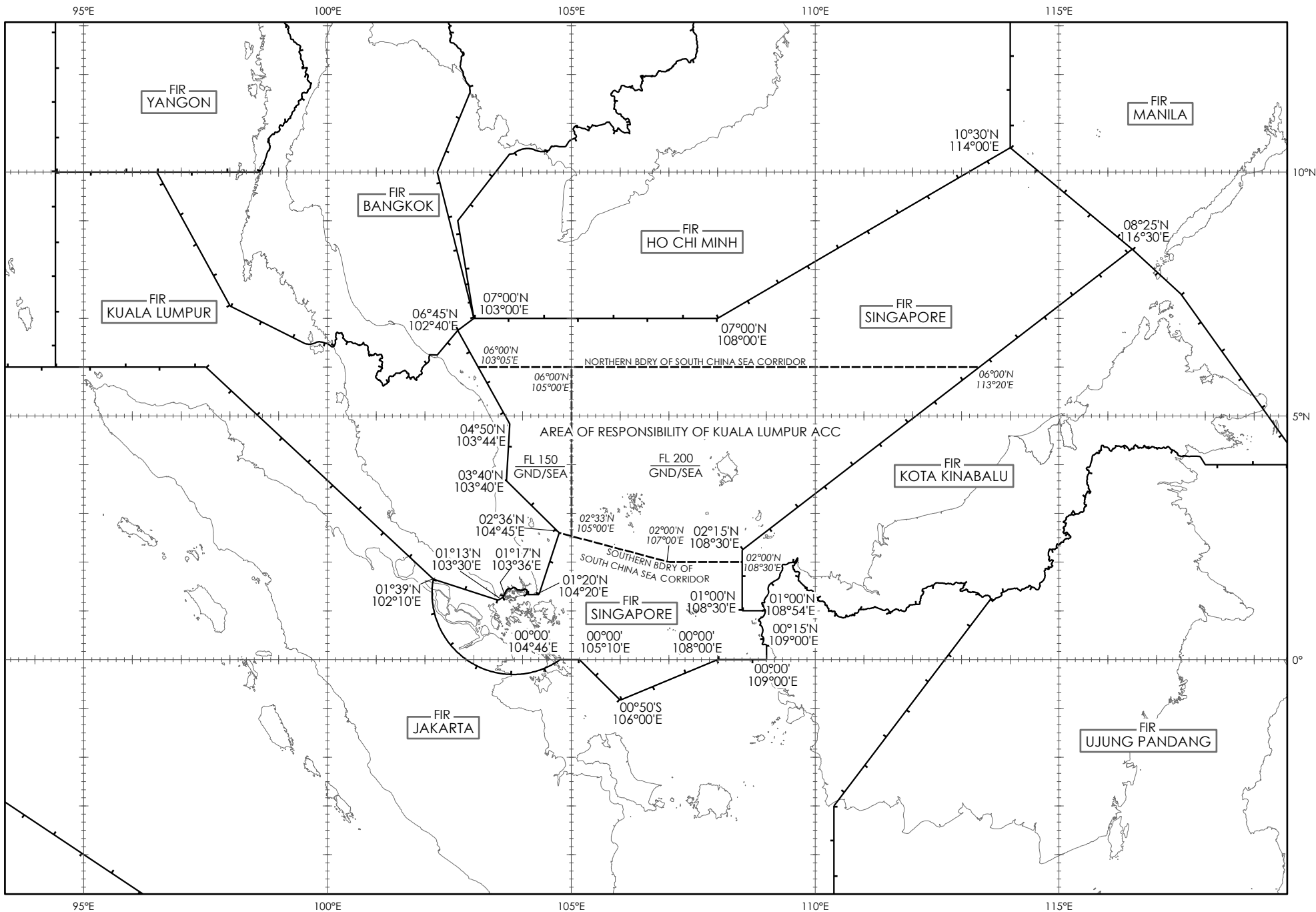
1.6.2 Aircraft flying on RNAV routes L642(CHEUNG CHAU-MERSING), L644(DUDIS-KIKOR), M771(MERSING-CHEUNG CHAU), M772(ASISU-LAXOR), N892(HENGCHUN-MERSING), L625(LUSMO-MEVIN), N884(MERSING-MANILA) and M767(JOMALIG-TOMAN) (see page ENR 1.8-17) must be RNP 10 approved and shall indicate in their flight plan:  
Item 10 - “R” where R = PBN approved  
Item 18 - PBN/A1 where A1 = RNAV 10 (RNP 10)

1.6.3 Operators of aircraft unable to meet the RNP 10 requirements (see page ENR 1.8-17) and wishing to operate at or above FL290 on RNAV routes specified in paragraph 1.6.2 shall annotate their flight plan as follows:

Item 18 - insert “RMK/REQ FL (insert level)” where FL = the preferred flight level (subject to ATC co-ordination)



SINGAPORE AND ADJACENT FLIGHT INFORMATION REGIONS





## **1.7 FLIGHTS OPERATING OUTSIDE THE ESTABLISHED ROUTEINGS**

- 1.7.1 With the exception of an emergency situation, at all times, a helicopter shall not be operated within the Changi Control Zone or overland and outside of Heli-Route Charlie, unless prior permission has been obtained from the Director-General, CAAS.
- 1.7.2 While this requirement is not applicable for helicopter training flights operating within a designated aircraft training area (Light Aircraft Training Areas A, B or C), flight planning requirements per paragraphs 1.1.2 and 1.1.3 in page ENR 1.10-1 remain applicable.
- 1.7.3 An application for permission can be submitted to [caas\\_atc\\_ansp@caas.gov.sg](mailto:caas_atc_ansp@caas.gov.sg). CAAS may ask for a flight inspection of the proposed route and / or areas of operation. The applicant shall provide the means and bear the cost of the flight inspection. Each case would be considered on its own merits and unless CAAS is satisfied that there are very good justifications, approval would normally not be given.

## **1.8 FLIGHT PLAN REQUIREMENTS**

- 1.8.1 Although the requirement for written flight plans has been waived, as conveyed in paragraph 1.1, 2b) page ENR 1.10-1, flight details especially the routing and first point of landing must be submitted to the appropriate ATC authority at least 60 minutes prior to the estimated time of departure by telephone. Only approved heli-routes may be used.

## **2. PROCEDURES FOR THE CONTROL OF HELICOPTER OPERATIONS AT SINGAPORE CHANGI AIRPORT**

### **2.1 APPROACH AND DEPARTURE PROCEDURES**

2.1.1 Before entering the Changi Control Zone, a helicopter pilot is to advise Singapore Tower of his direction of approach, distance from the airport, altitude and type of helicopter. Singapore Tower will pass to the pilot the runway in use, QNH (QFE on request), surface wind and direction and if necessary the position of the helicopter alighting area:

Example: RWY 20R QNH 1008, Wind 020/7kt, light on the runway, Clear to make an approach or hold clear of the Control Zone until advised.

2.1.2 All alightings and take-offs are to be made in a north/south direction as determined by the prevailing wind. The approach from and the turn after take-off shall be made clear of all airport buildings, aprons and obstructions. Requests for approach into and take-offs from Singapore Changi Airport shall be made to Singapore Tower.

2.1.3 Helicopters intending to cross the Changi Control Zone must cross the runway immediately on receipt of clearance and cross at right angles to the runway. Helicopters would be cleared to cross the runway up to the time when a fixed wing aircraft has reached 4NM final approach and Singapore Tower has the landing aircraft in sight. If the weather condition is such that it is not expected that Singapore Tower can see the landing aircraft at 4NM final approach, crossing will only be cleared up to the time the landing aircraft reports leaving the Samko Holding Area or Nylon Holding Area inbound.

2.1.4 After take-off, the helicopter is to make a turn-off right or left as appropriate as soon as possible and proceed until well clear of the Changi Control Zone. On reaching the boundary of the zone, the pilot will report 'clearing your zone' and normal clearance will be given.

### **2.2. GROUND OR AIR TAXIING**

2.2.1 After landing, the helicopter is required either to ground or air taxi via the taxiways into its allocated aircraft stand.

2.2.2 For take-offs, the helicopter will either ground or air taxi away from its aircraft stand and move out of the parking area via taxiways to the runway or helicopter area for take-off.

### **2.3. ALLOCATION OF AIRCRAFT STANDS**

2.3.1 The allocation of aircraft stands for helicopters rests with the Apron Control Unit. In allocating aircraft stands the Duty Officer at the Apron Control Unit shall take into consideration the type of helicopter, stand occupancy time and the nature of the flight i.e. passenger carrying, training or for maintenance purposes.

2.3.2 Helicopter ferrying passengers will normally be allocated remote aircraft stands, i.e. stands without aerobridges.

### **2.4. RADIO FAILURE PROCEDURE**

2.4.1 In the event of radio failure, the helicopter affected if on the ground shall not take-off.

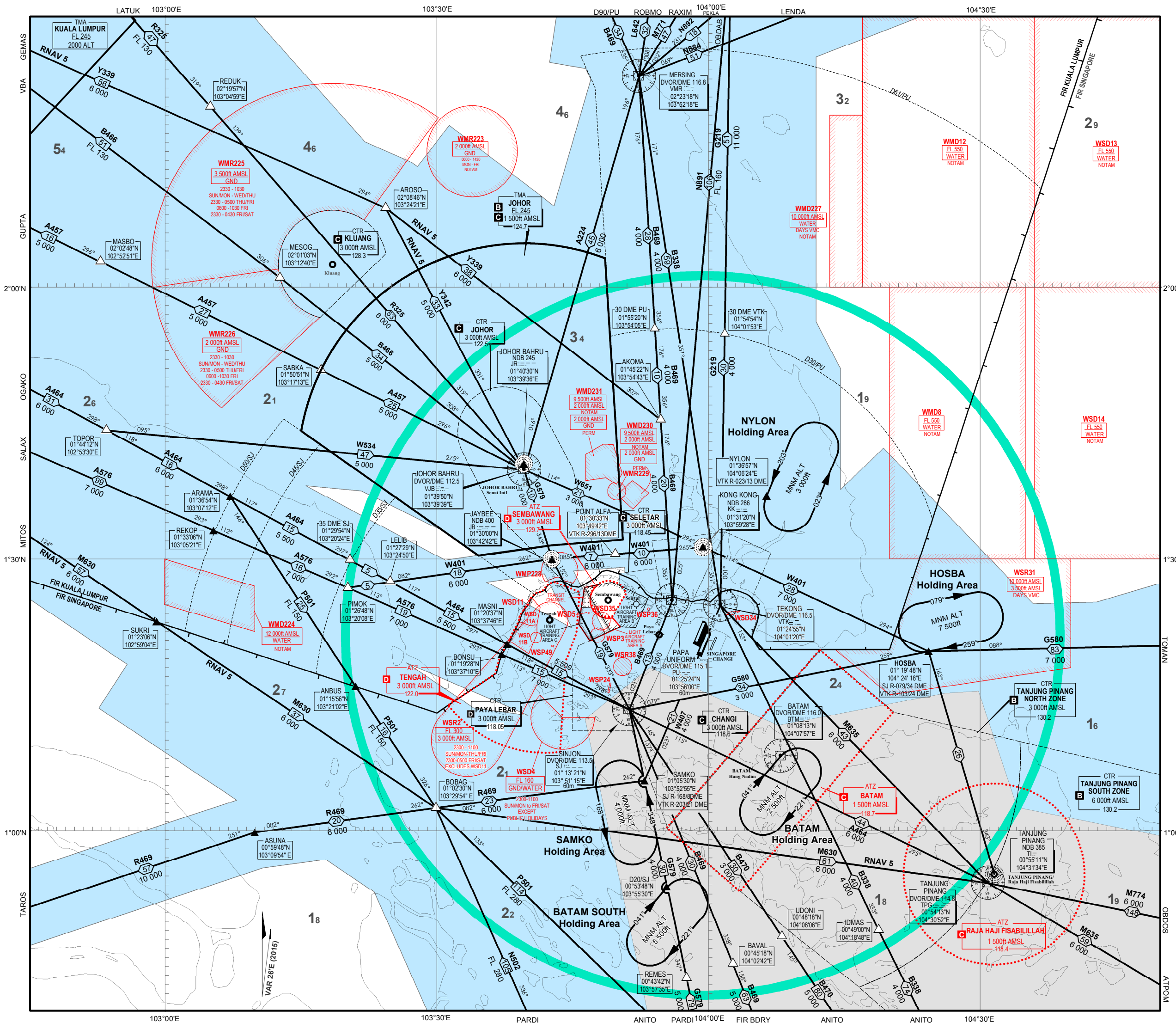
2.4.2 If radio failure occurs while in the air, alighting and taxiing clearances will be given by the Tower by the use of the appropriate light signals as described in page ENR 1.1-12, Appendix 'A'.

### **2.5. NIGHT OPERATIONS BY HELICOPTERS**

2.5.1 Helicopters that are required to operate into and out of Singapore Changi Airport at night shall land on the runway and ground taxi into its aircraft stand via the lighted taxiways.

# AREA CHART - ICAO

SINGAPORE/JOHOR AIRSPACE COMPLEX  
LOW LEVEL HOLDING AREAS



LEGEND	
<b>Terminal Control Area (TMA)</b>	<ul style="list-style-type: none"> <li>Name of TMA: <b>JOHOR</b></li> <li>Airspace Classification: <b>B</b></li> <li>Upper Limit: <b>FL 145</b></li> <li>Lower Limit: <b>1 500ft AMSL</b></li> <li>Radio frequency(ies): <b>124.7</b></li> </ul>
<b>Control Zone (CTR)</b>	<ul style="list-style-type: none"> <li>Name of CTR: <b>CHANGI</b></li> <li>Airspace Classification: <b>C</b></li> <li>Upper Limit: <b>3 000ft AMSL</b></li> <li>Lower Limit: <b>118.6m</b></li> <li>Radio frequency(ies): <b>118.6m</b></li> </ul>
<b>Aerodrome Traffic Zone (ATZ)</b>	<ul style="list-style-type: none"> <li>Name of ATZ: <b>TENGAH</b></li> <li>Airspace Classification: <b>D</b></li> <li>Upper Limit: <b>3 000ft AMSL</b></li> <li>Lower Limit: <b>122.0</b></li> <li>Radio frequency(ies): <b>122.0</b></li> </ul>
<b>ATS Routes</b>	<ul style="list-style-type: none"> <li>Route designator: <b>B469</b></li> <li>Distance in nautical miles: <b>4 000</b></li> <li>Minimum flight altitude (ft)/flight level: <b>FL 160</b></li> </ul>
<b>Oceanic Control Area (OCA)</b>	
<b>Reporting Point</b>	<ul style="list-style-type: none"> <li>Compulsory: <b>▲</b></li> <li>On request: <b>△</b></li> </ul>
<b>DME distance from SJ Navaid</b>	<b>D35/SJ</b>
<b>Radio Navigation Aid</b>	<ul style="list-style-type: none"> <li>Name: <b>SINJON</b></li> <li>Identification and frequency: <b>DVOR/DME 113.5</b></li> <li>Geographical Coordinates: <b>01°12'27"N 103°51'19"E</b></li> <li>Elevation of DME site: <b>60m</b></li> </ul>
<b>Collocated VOR and DME Radio Navigation Aids</b>	<ul style="list-style-type: none"> <li>Compass rose oriented on the chart to Magnetic North</li> </ul>
<b>Restricted Airspace (P - Prohibited, R - Restricted, D - Danger)</b>	<ul style="list-style-type: none"> <li>Identification of area: <b>WSD13</b></li> <li>Nationality letter: <b>FL 550</b></li> <li>Vertical limits: <b>WATER</b></li> <li>Activation by NOTAM: <b>NOTAM</b></li> </ul>

NOTE: - See flip side for details of designated areas

**Area Minimum Altitude (AMA)**

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

Example: 3 400 feet **34**

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

**Speed Control Procedures**

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

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

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

**AIRSPACE CLASSIFICATION IN THE SINGAPORE FIR**

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

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

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**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**

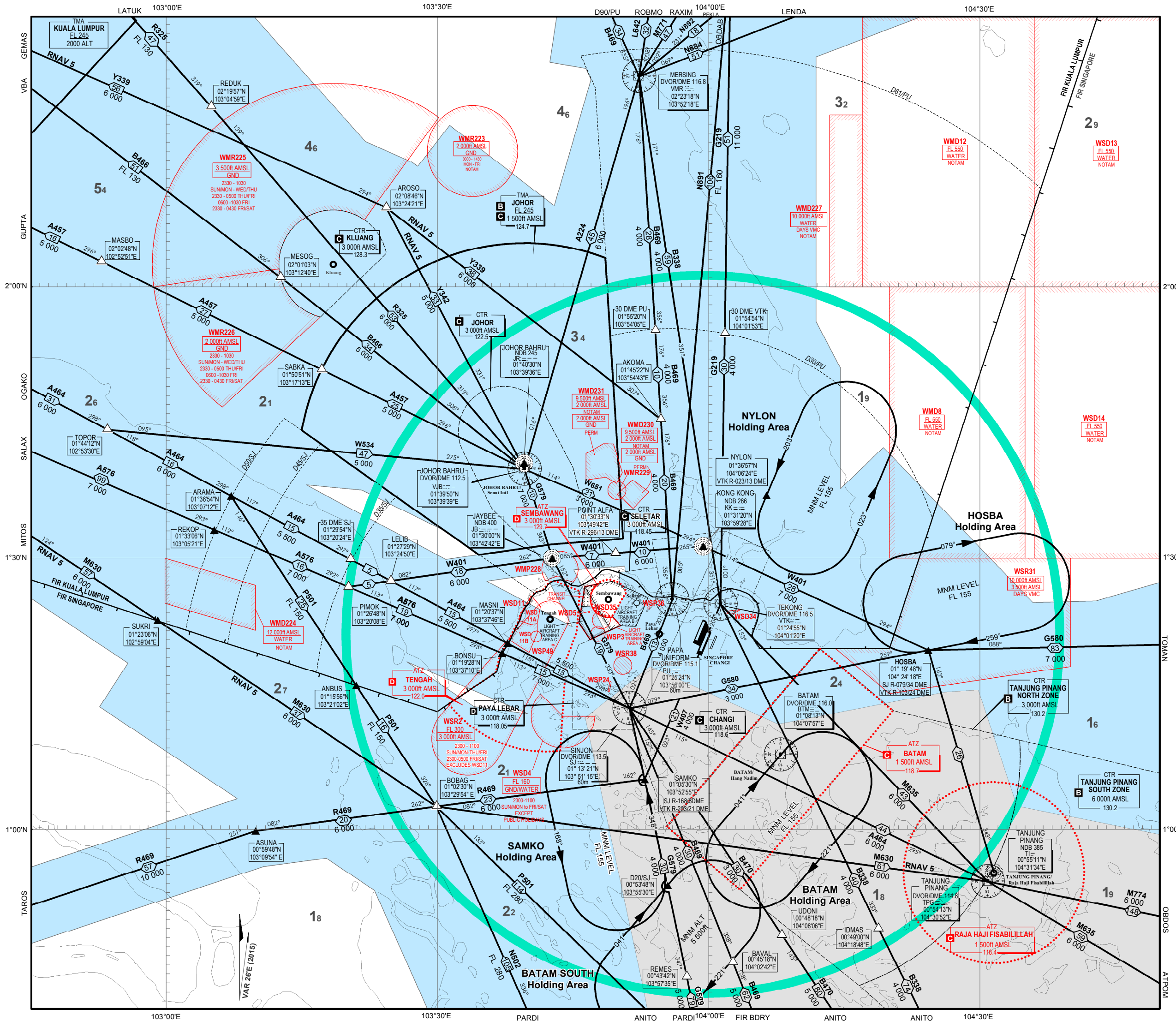
AERO MODELLING MAY TAKE PLACE WITHIN SEMBAWANG ATZ BTN 0200/0700 ON SUNDAYS AND PUBLIC HOLIDAYS. DURING THE ABOVE ACTIVITY, SEMBAWANG ATZ WILL BE CLOSED TO ALL AIRCRAFT.

\* 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>FL 145</td> </tr> <tr> <td>Lower Limit</td> <td>124.7</td> </tr> <tr> <td>Radio frequency(ies)</td> <td>124.7</td> </tr> </table>	Name of TMA	TMA JOHOR	Airspace Classification	FL 145	Upper Limit	FL 145	Lower Limit	124.7	Radio frequency(ies)	124.7
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NOTE :- See flip side for details of designated areas

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Example : 3 400 feet **34**

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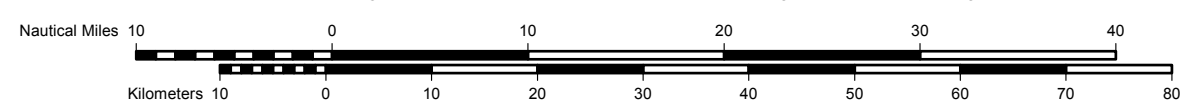
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SINGAPORE	D-ATIS	128.6
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Note :  
FOR DEPARTURE AND ARRIVAL ROUTES  
REFER TO WSSS AD 2-51 TO WSSS AD 2-100



**PROHIBITED, RESTRICTED AND DANGER AREAS**

	ACTIVITY	UPPER LIMIT LOWER LIMIT	REMARKS
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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
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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).

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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



<b>ENR 4.4 NAME-CODE DESIGNATORS FOR SIGNIFICANT POINTS</b>		
<i>Name-code Designator</i>	<i>Coordinates</i>	<i>ATS route or Other route</i>
1	2	3
ABVON	012028.18N 1035827.03E	IAC-WSSS
ADNIK	011651.19N 1035655.43E	IAC-WSSS
AGOBA	015840N 1083000E	M761
AKIPO	011356.27N 1035541.59E	IAC-WSSS
AKMON	081256N 1101308E	L625, M768
AKOMA	014522N 1035443E	B469, SID-WSSS, IAC-WSSS
ANBUS	011556N 1032102E	P501, STAR-WSSS
ANITO	001700S 1045200E	B338, B470, P501, SID-WSSS
ANUMA	011053.11N 1035424.35E	IAC-WSSS
APIPA	010618.43N 1035228.35E	IAC-WSSS
ARAMA	013654N 1030712E	A464, P501, STAR-WSSS
AROSO	020846N 1032421E	Y339, Y342, SID-WSSS
ARUPA	003140N 1084846E	N875
ASISU	055906N 1132046E	M768, M772
ASUNA	005948N 1030954E	R469, STAR-WSSS
ATETI	012540N 1083000E	G580
ATKAX	000512N 1065946E	SID-WSSS
ATPOM	002425N 1052114E	M635
BATOT	011930.30N 1040003.55E	IAC-WSSS
BAVAL	004518N 1040242E	B469
BAVUS	000000S 1090000E	L504
BEKTA	011551.58N 1035831.21E	IAC-WSSS
BELAT	011256.77N 1035717.42E	IAC-WSSS
BIDAG	073101N 1135544E	M772
BIDUS	013554.05N 1035754.86E	IAC-WSSS, STAR-WSSS
BIGMO	011129.09N 1035640.41E	IAC-WSSS
BIKTA	024337N 1034308E	STAR-WSSS
BIPOP	013122N 1041018E	IAC-WSSS, STAR-WSSS
BITEP	010519.01N 1035404.21E	IAC-WSSS
BOBAG	010230N 1032954E	M630, N502, P501, R469, HLDG ID, SID-WSSS, STAR-WSSS
BOBOB	022206N 1070558E	N875, M761, M767
BOKIP	010421N 1034353E	SID-WSSS, STAR-WSSS
BONSU	011928N 1033710E	A576
BUNTO	024008N 1055953E	G334, G584
BUVAL	033622N 1034341E	L629, Y333
DAMOG	041225N 1050014E	M771, N875
DOBLU	010347N 1041315E	SID-WSSS
DOKTA	012606N 1041040E	SID-WSSS
DOLOX	044841N 1052247E	L629, M771
DOSNO	004757N 1041409E	SID-WSSS
DOVAN	011938N 1041249E	STAR-WSSS
DOVOL	033047N 1034923E	L635, Y334
DUBSA	034901N 1044540E	L635, M771
DUDIS	070000N 1064834E	L644, M771

<b>ENR 4.4 NAME-CODE DESIGNATORS FOR SIGNIFICANT POINTS</b>		
<i>Name-code Designator</i>	<i>Coordinates</i>	<i>ATS route or Other route</i>
1	2	3
DUNAL	010138N 1035808E	SID-WSSS
EGOLO	031934N 1040047E	L642
EGORA	013621.37N 1040607.23E	IAC-WSSS
ELALU	013439.87N 1040524.21E	IAC-WSSS
ELBEB	012844.66N 1040254.38E	IAC-WSSS
ELBEX	013148.96N 1040314.18E	IAC-WSSS
ELGAP	012820.28N 1040146.15E	IAC-WSSS
ELGOR	033014N 1054818E	M758, N875
ELMIN	012549.68N 1040140.51E	IAC-WSSS
EMTAP	011655.88N 1035657.47E	IAC-WSSS
ENLES	010931.51N 1035349.83E	IAC-WSSS
ENREP	045223N 1041442E	L642, M753, M763, N875, N891
ENSUN	012602.56N 1040048.10E	IAC-WSSS
ERVOT	011120.09N 1035435.85E	IAC-WSSS
ESBIT	012212.07N 1040008.64E	IAC-WSSS
ESLUX	011844.31N 1035840.44E	IAC-WSSS
ESPIT	020011N 1072624E	M646, N875
ESPOB	070000N 1053317E	L642
EXOMO	010425.49N 1040933.17E	IAC-WSSS
HOSBA	011948N 1042418E	G580, W401, HLDG ID
IBULA	005036N 1043600E	STAR-WSSS
IDMAS	004900N 1041848E	B338
IDSEL	032432N 1035544E	M758, Y335
IDUNA	012305.80N 1035933.58E	IAC-WSSS
IDURO	012639.84N 1040103.94E	IAC-WSSS
IDVAS	012934.66N 1040217.75E	IAC-WSSS
IGARI	065610N 1033506E	M765, N891, R208
IGNON	010847N 1041257E	STAR-WSSS
IGULA	013232.27N 1040332.66E	IAC-WSSS
IKAGO	003816N 1052931E	STAR-WSSS
IKIMA	004314N 1045500E	HLDG ID, STAR-WSSS
IKUKO	054512N 1031324E	R208
IKUMI	055338N 1035509E	N891
IPNAK	013711.93N 1040530.83E	IAC-WSSS
IPRIX	070000N 1040755E	M753
KADAR	000647S 1074342E	M774
KAKSA	011702.58N 1035757.92E	IAC-WSSS
KAMIN	023442N 1085536E	G334, M646
KARTO	011124N 1053343E	HLDG ID, SID-WSSS, STAR-WSSS
KASPO	011507.15N 1035709.20E	IAC-WSSS
KETOD	031044N 1040943E	M761, Y336
KEXAS	011019N 1044818E	SID-WSSS, STAR-WSSS
KIBOL	025229N 1042805E	G334, N892
KILOT	030217N 1044023E	M761, N892, STAR-WSSS
KIMER	011105.74N 1035527.30E	IAC-WSSS
LAGOT	071632N 1113243E	M768, N884

**ENR 4.4 NAME-CODE DESIGNATORS FOR SIGNIFICANT POINTS**

<i>Name-code Designator</i>	<i>Coordinates</i>	<i>ATS route or Other route</i>
1	2	3
LAGUS	011915.29N 1035854.00E	IAC-WSSS
LAPOL	012622N 1034435E	G579
LASIN	011538.25N 1035722.39E	IAC-WSSS
LAVAX	010950N 1042714E	HLDG ID, SID-WSSS, STAR-WSSS
LAXOR	094937N 1144829E	M772, N884
LEBIN	031438N 1060604E	N875, N884
LEGOL	012053N 1034723E	G579
LELIB	012729N 1032450E	A464, W401, SID-WSSS, STAR-WSSS
LELON	011243.51N 1035608.62E	IAC-WSSS
LENDAL	024124N 1043932E	N884
LEPNA	010648.29N 1035338.82E	IAC-WSSS
LIDVA	010505.67N 1035255.38E	IAC-WSSS
LIPRO	025342N 1051128E	M761, N884
LUSMO	033341N 1065534E	L625, M758, N884
LUXOL	011802.73N 1035823.38E	IAC-WSSS
MABAL	032826N 1051236E	M758, N892, HLDG ID, STAR-WSSS
MABLI	041717N 1061247E	L635, L644, N892
MAKUM	012148.20N 1040101.76E	IAC-WSSS
MANIM	031431N 1040553E	N891
MASBO	020248N 1025251E	A457, SID-WSSS
MASNI	012037N 1033746E	A464
MELAS	070520N 1080911E	N892
MEMUS	012526.97N 1040234.12E	IAC-WSSS
MESOG	020103N 1031240E	B466
MILIN	012821.75N 1040347.92E	IAC-WSSS
MOLRO	012949.16N 1040424.82E	IAC-WSSS
MOSTU	013559.47N 1040701.19E	IAC-WSSS
MUMSO	034420N 1053213E	N875, N892
NIMIX	012452N 1075926E	G580, N875
NITAD	013257N 1040154E	SID-WSSS
NIVAM	023650N 1040228E	G219
NODIN	081100N 1161142E	M522
NOPAT	042313N 1044756E	L629, N875
NYLON	013656.9N 1040623.8E	HLDG ID, IAC-WSSS, SID-WSSS, STAR-WSSS
OBDBAB	031153N 1040538E	N891
OBDOS	002503N 1065551E	L504, M774
OBGET	012307N 1064531E	G580, L644
OBLLOT	014256N 1064147E	L644, M646
ODONO	063613.82N 1030129.41E	M904
OLKIT	045010N 1115118E	M758, M759
OLSAM	020059N 1063824E	L644
OMBAP	023116N 1063242E	L644
OMLIV	025512N 1062812E	L644
ONAPO	032116N 1062318E	L644
OPULA	033155N 1062118E	L644
OTLON	030752N 1042006E	M761, M771

<b>ENR 4.4 NAME-CODE DESIGNATORS FOR SIGNIFICANT POINTS</b>		
<i>Name-code Designator</i>	<i>Coordinates</i>	<i>ATS route or Other route</i>
1	2	3
PADLI	030918N 1033133E	B469, Y332, Y333, Y334, Y335, Y336
PARDI	003400S 1041300E	G579, N502
PASPU	015915N 1040618E	SID-WSSS, STAR-WSSS
PEKLA	023437N 1040618E	N892
PIBAP	023023N 1040618E	SID-WSSS, STAR-WSSS
PIMOK	012648N 1032008E	A576, W401, SID-WSSS, STAR-WSSS
POSUB	012725N 1040748E	SID-WSSS, STAR-WSSS
RAXIM	030318N 1041713E	M771
REDUK	021957N 1030459E	R325
REKOP	013306N 1030521E	A576, STAR-WSSS
REMES	004342N 1035735E	G579, HLDG ID, STAR-WSSS
REPOV	001623N 1040300E	HLDG ID, STAR-WSSS
ROBMO	025440N 1035700E	L642
RUTOT	011453N 1041948E	SID-WSSS, STAR-WSSS
SABIP	020940N 1075044E	M646, M761
SABUG	011554N 1040312E	SID-WSSS
SAMKO	010529.5N 1035254.9E	R469, W407, HLDG ID, SID-WSSS, STAR-WSSS
SANAT	010749N 1035930E	SID-WSSS, STAR-WSSS
SUDPO	011731N 1035808E	SID-WSSS
SUKRI	012306N 1025904E	M630
SUMLA	080242N 1160054E	M754
SUNVA	011756N 1035722E	SID-WSSS
SURGA	003657S 1063119E	M635
SUSAR	035848N 1051547E	L635, N875
SUSIN	011229N 1035808E	SID-WSSS
TAROS	004200N 1021607E	R469
TAXUL	035035N 1034037E	M763, Y332
TEGID	085656N 1155143E	M767
TERIX	041521N 1093456E	M758, M767
TIDAR	065230.15N 1024959.82E	M904
TODAM	063138N 1123536E	M767, M768
TOKIM	012933N 1040315E	SID-WSSS
TOMAN	012147N 1054717E	G580, L625, M646, M767, SID-WSSS, STAR-WSSS
TOPOM	012955N 1040227E	SID-WSSS
TOPOR	014412N 1025330E	W534
UDONI	004818N 1040806E	B470
UGPEK	033647N 1040752E	L635, N891
UKASA	025245N 1033901E	G334/B469
UPRON	060903N 1032040E	M904
URIGO	032505N 1040647E	M758, N891
VABRI	013114.96N 1040357.78E	IAC-WSSS
VENIX	002156S 1060521E	SID-WSSS
VENLI	062848N 1024900E	M765
VENPA	002141N 1044955E	SID-WSSS
VEPLI	035223N 1040542E	L629, L642, HLDG ID, STAR-WSSS
VERIN	023332N 1062425E	L625

**PART 3 - AERODROMES (AD)****AD 0**

AD 0.1	PREFACE	- Not applicable
AD 0.2	RECORD OF AIP AMENDMENTS	- Not applicable
AD 0.3	RECORD OF AIP SUPPLEMENTS	- Not applicable
AD 0.4	CHECKLIST OF AIP PAGES	- Not applicable
AD 0.5	LIST OF HAND AMENDMENTS TO THE AIP	- Not applicable

**AD 0.6 TABLE OF CONTENTS TO PART 3****AD 1. AERODROMES - INTRODUCTION**

<b>AD 1.1</b>	<b>AERODROME AVAILABILITY</b>	AD 1.1-1
	1. Introduction	AD 1.1-1
	2. Applicable ICAO Documents	AD 1.1-2
	3. Civil Use of Military Air Bases	AD 1.1-2
	4. Cat II/III Operations at Aerodromes	AD 1.1-3
	5. Friction Measuring Device used and Friction Level below which the Runway is declared slippery when it is wet	AD 1.1-3
	6. Dissemination of Information on Wet Runways	AD 1.1-4
<b>AD 1.2</b>	<b>RESCUE AND FIRE FIGHTING SERVICES</b>	AD 1.2-1
<b>AD 1.3</b>	<b>INDEX TO AERODROMES</b>	AD 1.3-1
	Chart Aerodrome Index	AD 1.3-3
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WSSS AD 2.2	Aerodrome Geographical and Administrative Data	WSSS AD 2-1
WSSS AD 2.3	Operational Hours	WSSS AD 2-1
WSSS AD 2.4	Handling Services and Facilities	WSSS AD 2-2
WSSS AD 2.5	Passenger Facilities	WSSS AD 2-2
WSSS AD 2.6	Rescue and Fire Fighting Services	WSSS AD 2-3
WSSS AD 2.7	Seasonal Availability - Clearing	WSSS AD 2-3
WSSS AD 2.8	Aprons, Taxiways and Check Locations/Positions Data	WSSS AD 2-3
WSSS AD 2.9	Surface Movement Guidance and Control System and Markings	WSSS AD 2-4
	Safegate Aircraft Docking Guidance System	WSSS AD 2-5.1/3
	Aircraft Parking Restrictions	WSSS AD 2-6.1/8
	Procedures for Start-up and Pushback of Aircraft	WSSS AD 2-7.1/16
	Advanced-Multilateration System	WSSS AD 2-8.1/2
	Taxiing Guidance System at Singapore Changi Airport	WSSS AD 2-9
WSSS AD 2.10	Aerodrome Obstacles	WSSS AD 2-10
WSSS AD 2.11	Meteorological Information Provided	WSSS AD 2-11
WSSS AD 2.12	Runway Physical Characteristics	WSSS AD 2-11/12
WSSS AD 2.13	Declared Distances	WSSS AD 2-13
WSSS AD 2.14	Approach and Runway Lighting	WSSS AD 2-14/15
WSSS AD 2.15	Other Lighting, Secondary Power Supply	WSSS AD 2-16
WSSS AD 2.16	Helicopter Landing Area	WSSS AD 2-16
WSSS AD 2.17	ATS Airspace	WSSS AD 2-16

WSSS AD 2.18	ATS Communication Facilities	WSSS AD 2-17
WSSS AD 2.19	Radio Navigation and Landing Aids	WSSS AD 2-18/19
WSSS AD 2.20	Local Traffic Regulations	WSSS AD 2-20
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	Low Visibility Procedures for CAT II ILS Operations	WSSS AD 2-22
	RWY Utilisation	WSSS AD 2-23
	Procedures for push-back and assignment of flight levels to aircraft departing from Singapore Changi Airport	WSSS AD 2-24
	Gate Hold Procedures for departing aircraft	WSSS AD 2-25
	Delay in push-back and/or taxiing due to other aircraft	WSSS AD 2-25
	Delay in take-off due to restrictions in the ATC Clearance	WSSS AD 2-25
	Delay due to Overflights	WSSS AD 2-25
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	Ground Movement Control on VHF 124.3MHz	WSSS AD 2-26
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**SELETAR AIRPORT (WSSL)**

WSSL AD 2.1	Aerodrome Location Indicator and Name	WSSL AD 2-1
WSSL AD 2.2	Aerodrome Geographical and Administrative Data	WSSL AD 2-1
WSSL AD 2.3	Operational Hours	WSSL AD 2-1
WSSL AD 2.4	Handling Services and Facilities	WSSL AD 2-2
WSSL AD 2.5	Passenger Facilities	WSSL AD 2-2
WSSL AD 2.6	Rescue and Fire Fighting Services	WSSL AD 2-2
WSSL AD 2.7	Seasonal Availability - Clearing	WSSL AD 2-3
WSSL AD 2.8	Aprons, Taxiways and Check Locations/Positions Data	WSSL AD 2-3-1
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	Procedures for Pushback / Tow Forward of Aircraft	WSSL AD 2-4-1
WSSL AD 2.10	Aerodrome Obstacles	WSSL AD 2-4-4
WSSL AD 2.11	Meteorological Information Provided	WSSL AD 2-4-4
WSSL AD 2.12	Runway Physical Characteristics	WSSL AD 2-5
WSSL AD 2.13	Declared Distances	WSSL AD 2-5
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WSSL AD 2.15	Other Lighting, Secondary Power Supply	WSSL AD 2-6
WSSL AD 2.16	Helicopter Landing Area	WSSL AD 2-6
WSSL AD 2.17	ATS Airspace	WSSL AD 2-6
WSSL AD 2.18	ATS Communication Facilities	WSSL AD 2-7
WSSL AD 2.19	Radio Navigation and Landing Aids	WSSL AD 2-7
WSSL AD 2.20	Local Traffic Regulations - Local Flying Restrictions	WSSL AD 2-8
	Test/Training Flights	WSSL AD 2-8
	Differences between Seletar and Sembawang AD	WSSL AD 2-9
WSSL AD 2.21	Noise Abatement Procedures	WSSL AD 2-10
WSSL AD 2.22	Flight Procedures - for Arrival into / Departures from Seletar	WSSL AD 2-10/12
WSSL AD 2.23	Additional Information - Bird Activity, Helicopter Crossing	WSSL AD 2-12.1
	Northern Extended Centreline	
WSSL AD 2.24	Index to Charts related to Seletar Aerodrome	WSSL AD 2-12.2

**PAYA LEBAR AIRPORT (WSAP)**

WSAP AD 2.1	Aerodrome Location Indicator and Name	WSAP AD 2-1
WSAP AD 2.2	Aerodrome Geographical and Administrative Data	WSAP AD 2-1
WSAP AD 2.3	Operational Hours	WSAP AD 2-1
WSAP AD 2.4	Handling Services and Facilities	WSAP AD 2-1
WSAP AD 2.5	Passenger Facilities	WSAP AD 2-2
WSAP AD 2.6	Rescue and Fire Fighting Services	WSAP AD 2-2
WSAP AD 2.7	Seasonal Availability - Clearing	WSAP AD 2-2
WSAP AD 2.8	Aprons, Taxiways and Check Locations/Positions Data	WSAP AD 2-2
WSAP AD 2.9	Surface Movement Guidance and Control System and Markings	WSAP AD 2-3/4

**WSSS AD 2.9 SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS**

**AIRCRAFT PARKING RESTRICTIONS**

1. **TERMINAL 1 AIRCRAFT STANDS** - Aircraft types that can be parked at stands (→) are as follows:

Stands	C1	C11	C13	C15	C16	C17	C18	C19	C20	C22	C23	C24	C25	C26
A300	→		→	→	→	→	→					→	→	→
A310	→		→	→	→	→	→		→	→	→	→	→	→
A319	→	→	→	→	→	→	→	→	→	→	→	→	→	→
A320	→	→	→	→	→	→	→	→	→	→	→	→	→	→
A321	→	→	→	→	→	→	→	→	→	→	→	→	→	→
A332	→		→	→		→	→		→	→	→	→	→	→
A333	→		→	→		→	→		→	→	→	→	→	→
A342	→		→	→		→	→		→	→	→	→	→	→
A343	→		→	→		→	→		→	→	→	→	→	→
A345	→		→	→					→	→	→	→	→	→
A346			→									→		→
A380											→		→	→
B707	→		→	→										
B717	→		→	→	→	→	→	→						
B727	→		→						→	→				
B737	→	→	→	→	→	→	→	→	→	→	→	→	→	→
B747	→		→	→					→	→	→	→	→	→
B74S	→		→	→									→	→
B757	→		→	→	→	→	→		→	→	→	→	→	→
B762	→		→	→	→	→	→		→	→	→	→	→	→
B763	→		→	→	→	→	→		→	→	→	→	→	→
B772	→		→	→		→	→		→	→	→	→	→	→
B773	→		→	→					→	→	→	→	→	→
B773ER	→		→	→					→	→	→	→	→	→
B788	→			→		→			→	→	→		→	→
B789									→					
BA146			→											
DC10	→			→		→	→						→	→
DC9			→	→										
F100	→		→	→	→	→	→	→						
IL62	→		→	→	→	→	→						→	→
IL86	→		→	→	→	→	→						→	→
IL96	→		→	→	→	→	→						→	→
L101	→			→		→	→						→	→
MD11	→			→		→	→		→	→	→	→	→	→
MD80	→		→	→	→	→	→	→					→	→
MD82	→		→	→	→	→	→	→					→	→
MD88	→		→	→	→	→	→	→					→	→



**2. TERMINAL 1 AIRCRAFT STANDS** - Aircraft types that can be parked at stands (→) are as follows:

Stands	D30	D32	D34	D35	D36	D37	D38	D40	D41	D42	D44	D46	D47	D48	D49
A300		→	→	→	→	→		→	→	→	→	→	→	→	→
A310		→	→	→	→	→		→	→	→	→	→	→	→	→
A319	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
A320	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
A321	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
A332		→	→		→	→		→	→	→	→	→	→	→	→
A333		→	→		→	→		→	→	→	→	→	→	→	→
A342		→	→		→	→		→	→	→	→	→	→	→	→
A343		→	→		→	→		→	→	→	→	→	→	→	→
A345		→	→					→	→	→	→	→	→	→	→
A346		→	→									→			→
A380												→			→
B707		→	→					→	→	→	→				
B717		→	→	→	→	→	→	→	→	→	→	→	→	→	
B727		→	→					→	→	→	→				
B737	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
B747		→	→					→	→	→	→	→	→	→	→
B74S		→	→					→	→	→	→	→	→	→	→
B757		→	→	→	→	→		→	→	→	→	→	→	→	→
B762		→	→	→	→	→		→	→	→	→	→	→	→	→
B763		→	→	→	→	→		→	→	→	→	→	→	→	→
B772		→	→		→	→		→	→	→	→	→	→	→	→
B773		→	→						→	→	→				→
B773ER		→	→						→	→	→				→
B788								→	→	→	→	→			→
BA146		→	→												
DC10			→		→	→		→	→	→	→	→	→	→	→
DC9		→	→												
F100		→	→	→	→	→	→	→	→	→	→		→	→	
IL62		→	→	→	→	→		→	→	→	→	→	→	→	→
IL86		→	→	→	→	→		→	→	→	→	→	→	→	→
IL96		→	→	→	→	→		→	→	→	→	→	→	→	→
L101			→		→	→		→	→	→	→	→	→	→	→
MD11			→		→	→		→	→	→	→	→	→	→	→
MD80		→	→	→	→	→	→	→	→	→	→	→	→	→	→
MD82		→	→	→	→	→	→	→	→	→	→	→	→	→	→
MD88		→	→	→	→	→	→	→	→	→	→	→	→	→	→
YK42										→					



**3. TERMINAL 2 AIRCRAFT STANDS** - Aircraft types that can be parked at stands (→) are as follows:

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

Stands	E24L	E24R
A319, A320, A321, B737	→	→

4. TERMINAL 2 AIRCRAFT STANDS - Aircraft types that can be parked at stands (→) are as follows:

Stands	F30	F31	F32	F33	F34	F35	F36	F37	F40	F41	F42	F50	F52	F52L	F52R	F54	F56	F58	F59	F60
A300		→	→		→	→			→	→	→	→	→			→	→	→	→	→
A310		→	→	→	→	→	→		→	→	→	→	→			→	→	→	→	→
A319	→	→	→	→	→	→	→	→	→	→	→	→		→	→	→		→		→
A320	→	→	→	→	→	→	→	→	→	→	→	→		→	→	→		→		→
A321														→	→					
A332		→			→				→	→	→	→	→			→	→	→	→	→
A333		→			→				→	→	→	→	→			→	→	→	→	→
A342		→			→				→	→	→		→			→	→	→	→	→
A343		→			→				→	→	→		→			→	→	→	→	→
A345		→			→				→	→	→		→			→	→	→	→	→
A346											→									→
A380		→									→									→
B707												→				→			→	→
B727	→	→	→	→	→	→		→	→	→	→	→				→	→	→	→	→
B737	→	→	→	→	→	→	→	→	→	→	→	→		→	→	→		→		→
B747		→			→	→			→	→	→	→	→			→	→	→	→	→
B74S		→			→				→	→	→					→	→	→	→	→
B757		→	→	→	→	→			→	→	→	→	→			→	→	→	→	→
B762		→	→		→	→			→	→	→	→	→			→	→	→	→	→
B763		→	→		→	→			→	→	→	→	→			→	→	→	→	→
B772		→		→	→				→	→	→	→	→			→	→	→	→	→
B773										→	→					→	→	→	→	→
B773ER										→	→					→	→	→	→	→
B788		→										→	→			→	→	→	→	→
B789		→										→	→			→	→	→	→	→
DC10					→	→				→	→					→	→	→	→	→
DC8																				
DC9												→				→	→	→		
F70	→	→	→	→	→	→	→	→	→	→	→	→				→	→	→	→	→
L101					→	→				→	→					→	→	→	→	→
MD11					→	→				→	→					→	→	→	→	→
MD87												→				→				



Stands	F56L	F56R	F59L	F59R
A319	→	→	→	→
A320	→	→	→	→
A321	→	→	→	→
B737	→	→		→

**5. TERMINAL 3 AIRCRAFT STANDS** - Aircraft types that can be parked at stands (→) are as follows:

Stands	A1	A2	A3	A4	A5	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21
A300		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→		
A310		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→		
A319		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→		
A320		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→		
A321		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→		
A332	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→		→
A333	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
A343	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
A345	→	→	→	→	→		→	→	→	→	→	→	→	→				
A346		→		→	→		→	→	→	→	→							
A380		→		→	→		→											
B737			→					→	→	→	→		→	→	→	→		
B744	→	→	→	→	→		→	→	→	→	→	→	→	→				
B788		→		→			→									→	→	→
B757		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→		
B767		→	→	→	→	→	→	→	→	→	→	→	→	→	→	→		
B772	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
B773		→		→	→		→	→	→	→	→							
B773ER		→		→	→		→	→	→	→	→							

Stands	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
A300		→	→	→	→	→	→	→	→	→
A310		→	→	→	→	→	→	→	→	→
A319		→	→	→	→	→	→	→	→	→
A320		→	→	→	→	→	→	→	→	→
A321		→	→	→	→	→	→	→	→	→
A332	→	→	→	→	→	→	→	→	→	→
A333	→	→	→	→	→	→	→	→	→	→
A343	→	→	→	→	→	→	→	→	→	→
A345	→	→	→	→	→	→	→	→	→	→
A346		→		→	→		→			
A380		→		→	→		→			
B707									→	→
→ B737			→			→				
B744	→	→	→	→	→	→	→	→	→	→
B788								→	→	→
B757		→	→	→	→	→	→	→	→	→
B767		→	→	→	→	→	→	→	→	→
B772	→	→	→	→	→	→	→	→	→	→
B773		→		→	→	→	→	→	→	→
B773ER		→		→	→	→	→	→	→	→

**6. REMOTE STANDS** - Aircraft types that can be parked at stands (→) are as follows:

Stands	103	104	200	200L	200R	201	202	202L	202R	203	205	206	207	208	209
A300, A310	→	→	→			→	→			→	→	→	→	→	→
A319, A320	→	→		→	→	→		→	→	→	→	→	→	→	→
A321				→	→			→	→						
A330, A342	→	→	→			→	→			→	→	→			
A343, A345	→	→	→			→	→			→	→	→			
A380	→	→													
AT72			→			→	→			→	→	→	→	→	→
B707, B727	→	→	→			→	→			→	→	→	→	→	→
B737	→	→		→	→	→		→	→	→	→	→	→	→	→
B747, B74S, B788	→	→	→			→	→			→	→	→			
B748	→	→													
B757	→	→	→			→	→			→	→	→	→	→	→
B767, B772, B773	→	→	→			→	→			→	→	→			
B773ER	→	→	→			→	→			→	→	→			
B789	→	→	→			→	→			→	→	→			
DC8	→	→													
DC10	→	→	→			→	→			→	→	→			
DHC7													→	→	→
F70	→	→	→			→	→			→	→	→	→	→	→
IL62			→			→	→			→	→	→			
L101	→	→	→			→	→			→	→	→			
MD11	→	→	→			→	→			→	→	→			



Stands	300	301	302	303	304	305	306	307	308	309	310	400	401	402	403	404
A300, A310	→	→	→	→	→	→	→			→	→	→	→	→	→	
A319, A320	→	→	→	→	→	→	→			→	→	→	→	→	→	
A330, A342	→		→								→	→	→			
A343, A345	→		→								→	→	→			
AT72				→	→	→	→									
B707	→	→	→	→	→	→	→			→	→	→	→	→	→	
B727	→	→	→	→	→	→	→			→	→	→	→	→	→	→
B737	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
B747	→		→								→	→	→			
B74S, B788	→		→								→	→	→			
B757, B767	→	→	→	→	→	→	→			→	→	→	→	→	→	
B772, B773	→		→								→	→	→			
B773ER	→		→								→	→	→			
B789	→		→								→	→	→			
DC10	→		→				→				→	→	→			
DC8	→	→	→	→	→	→	→			→	→					
F70	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
L101	→		→				→				→	→	→			
MD11	→		→				→				→	→	→			



APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
E20	The aircraft (on idle thrust) shall be pushed back with the main gear mid-point following the main gear pushback line until its nosewheel is at Stopbar 17. The aircraft shall then be towed forward to "END OF TOW" Stopbar 18A. Aircraft may breakaway from there.	Standard pushback approved
E22	The aircraft (on idle thrust) shall be pushed back with the main gear mid-point following the main gear pushback line until its nosewheel is at Stopbar 19. This is marked as "END OF PUSHBACK" on the ground. The aircraft shall then be towed forward to Stopbar 18. This is marked as "END OF TOW" on the ground.	Standard pushback approved
E24	The aircraft (on idle thrust) shall be pushed back facing North until its body is aligned with TWY A6 centreline. Aircraft may breakaway from there.	Standard pushback approved
E24L, E24R	The aircraft (on idle thrust) shall be pushed back facing North until its body is aligned with TWY A6 centreline. Aircraft may breakaway from there.	Standard pushback approved
E26	The aircraft (on idle thrust) shall be pushed back to face North until its body is aligned with TWY A6 centreline.	Standard pushback approved
E27, E28	The aircraft (on idle thrust) shall be pushed back to face North (or South) until its body is aligned with TWY A6 centreline.	Pushback approved, to face North (or South).
<b><u>T2 SOUTH</u></b>		
F37	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>● with the main gear following the main gear pushback line, until its nosewheel is on the "END OF PUSH (EOP)" Stopbar 4 behind aircraft stand F42.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>● with the main gear following the main gear pushback line, until its nosewheel is on the "END OF PUSH (EOP)" Stopbar 5 on TWY C1.</li> </ul>	<p>Standard pushback approved</p> <p>Pushback approved, to face East on TWY C1.</p>
F40, F52	The aircraft (on idle thrust) shall be pushed back until its nosewheel is at Stopbar 2. This is marked as "END OF PUSH" on the ground. The aircraft shall then be towed forward to Stopbar 3. This is marked as "END OF TOW" on the ground.	Standard pushback approved
F41	<p>The aircraft (on idle thrust) shall be pushed back:</p> <ul style="list-style-type: none"> <li>● until its nosewheel is at the intersection of the lead-in line and the TWY C2 centreline. The aircraft shall then be towed forward to Stopbar 4. This is marked as "EOT 4" on the ground.</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>● onto TWY C6 until its nosewheel is at the intersection of TWY C2 and TWY C6 centreline.</li> </ul>	<p>Standard pushback approved</p> <p>Pushback approved, to pushback onto TWY C6.</p>
F42	<p><u>Main pushback procedure (for all aircraft wingspan)</u> The aircraft (on idle thrust) shall be pushed back until its nose-wheel is at the intersection of the lead-in line and the TWY C2 centreline. The aircraft shall then be towed forward to Stopbar 4. This is marked as "EOT 4" on the ground.</p> <p><u>Alternate pushback procedure (for aircraft with wingspan of less than 65m)</u> The aircraft (on idle thrust) shall be pushed onto TWY C6 until its nosewheel is at the intersection of TWY C2 and TWY C6 centreline.</p> <p><u>Alternate pushback procedure (for aircraft with wingspan of more than 65m)</u> The aircraft (on idle thrust) shall be pushed back until its nosewheel is at the 'EOP 4A' position. The aircraft shall then be towed forward with its nosewheel following the towed forward line until its nosewheel is on the 'EOT 4B' position, behind aircraft stand F59.</p>	<p>Standard pushback approved</p> <p>Pushback approved, to pushback onto TWY C6.</p> <p>Pushback approved, to pushback onto TWY C6.</p>

APRON/ACFT STANDS	PUSHBACK PROCEDURES	PHRASEOLOGY USED BY SINGAPORE GROUND
F50	The aircraft (on idle thrust) shall be pushed back with the main gear following the main gear pushback line, facing south until its nosewheel is on the "END OF PUSH" Stopbar 1 marking painted on the ground behind aircraft stand F50. The aircraft shall then be towed forward with the nosewheel following the tow-forward line until its nosewheel is on the "END OF TOW" Stopbar 3 marking painted on the ground behind aircraft stand F52.	Standard pushback approved
F52L	The aircraft (on idle thrust) shall be pushed back to face south until its nosewheel is at the intersection of the aircraft pushback line and taxiway C6.	Standard pushback approved
F52R	The aircraft (on idle thrust) shall be pushed back to face south until its nosewheel is at the intersection of the aircraft pushback line and taxiway C6. The aircraft shall then be towed forward until its nosewheel is on the "END OF TOW" position.	Standard pushback approved
F54	The aircraft (on idle thrust) shall be pushed back until its nosewheel is at a point on TWY C6 in line with the mid-point of aircraft stands F52 and F54. It shall breakaway from this position.	Standard pushback approved
<b><u>T2 SOUTH</u></b>		
F56	The aircraft (on idle thrust) shall be pushed back to face South until its nosewheel is at the intersection of the aircraft pushback line and taxiway C6. The aircraft shall then be towed forward until its nosewheel is abeam aircraft stand F56.	Standard pushback approved
F56L, 56R	The aircraft (on idle thrust) shall be pushed back to face South until its nosewheel is at the intersection of the aircraft pushback line and taxiway C6. The aircraft shall then be towed forward until its nosewheel is abeam aircraft stand F56.	Standard pushback approved
F58	The aircraft (on idle thrust) shall be pushed back to face North (or South), on TWY C6 centreline.	Pushback approved, to face North (or South).
F59	The aircraft (on idle thrust) shall be pushed back to face North on TWY C6 centreline until its nosewheel is abeam aircraft stand F60. OR The aircraft (on idle thrust) shall be pushed back to face South on TWY C6.	Pushback approved, to face North.  Pushback approved, to face South.
F59L, F59R	The aircraft (on idle thrust) shall be pushed back to face North on taxiway C6 centreline until its nosewheel is abeam aircraft stand F60. OR The aircraft (on idle thrust) shall be pushed back to face South on taxiway C6 centreline.	Pushback approved, to face North.  Pushback approved, to face South.
F60	The aircraft (on idle thrust) shall be pushed back to face North (or South), on TWY C6 centreline.	Pushback approved, to face North (or South).



**WSSS AD 2.9 SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS**

**TAXIING GUIDANCE SYSTEM AT SINGAPORE CHANGI AIRPORT**

**1. INTRODUCTION**

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

**2. ROUTE SELECTION AND PRIORITY**

- 2.1 When a taxiing route is selected on the TLCP, corresponding segments of taxiway centreline lights on the manoeuvring area are switched on automatically. When two or more routes are selected, the system will give priority to the first route and activate red stopbar lights across conflicting routes, as necessary. A segment of the centreline lights of the conflicting routes that cut across the first route will also be suppressed. The GMC has the option of over-riding the taxiing route priority by selecting or deselecting the appropriate stopbar lights.
- 2.2 All taxiing guidance lights on taxiways leading to the runways terminate at the runway holding positions where, by default, red stopbar lights remain on unless deselected by the runway controller. When deselected, these stopbar lights will re-activate automatically after 50 seconds.

**3. INFORMATION AND MANDATORY SIGNS/MARKINGS**

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

**4. TAXI INSTRUCTIONS USING THE GREEN TAXIWAY CENTRELINE LIGHTS**

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

WSSS AD 2.10 AERODROME OBSTACLES						
IN APPROACH / TKOF AREAS			IN CIRCLING AREA AND AT AD			
RWY/Area affected		OBST type, ELEV, Markings/LGT	Coordinates	OBST type, ELEV, Markings/LGT		Coordinates
1		2	3	1		2
a)	RWY 20R APCH RWY 02L TKOF	Mast HGT ranging fm 98ft AMSL and above.	Shipping channel aprx1290m from THR RWY 20R.	a)	Surface wind direction sleeves	LOC at each end of RWY adjacent to GP hut
b)	RWY 20C APCH RWY 02C TKOF	Mast HGT ranging fm 98ft AMSL and above.	Shipping channel aprx 2630m from THR RWY 20C.	b)	PAR hut	Besides RWY 02L/20R, opposite the PTB
c)	RWY 02L/20R APCH RWY 02L/20R TKOF RWY 02C/20C APCH RWY 02C/20C TKOF	ILS LLZ co-located with LLZ antennas.	Within the RWY strip.	c)	Frangible PAR reflectors	LOC at ends of RWY 02L/20R
d)	RWY 20R APCH	Two antennae, HGT 72ft AMSL, marked and LGTD	012311N 1035928E	d)	GP huts co-located with GP antennas	Within the RWY strip
e)	RWY 20R APCH	Antenna, HGT 88ft AMSL, marked and LGTD	012315N 1035931E	e)	Antenna, HGT 82ft AMSL, marked and LGTD	012036N 1035819E
f)	RWY 02L APCH	Antenna, HGT 82ft AMSL, marked and LGTD	012051N 1035827E	f)	Antenna, HGT 85ft AMSL, marked and LGTD	012039N 1035821E
g)	RWY 02L APCH	Pole, HGT 128ft AMSL, marked and LGTD	011859N 1035748E	g)	Antenna, HGT 78ft AMSL, marked and LGTD	012042N 1035823E
h)	RWY 02L APCH	Pole, HGT 160ft AMSL, marked and LGTD	012058N 1035814E	h)	Antenna, HGT 82ft AMSL, marked and LGTD	012053N 1035827E
i)	RWY 02L APCH	Pole, HGT 131ft AMSL, marked and LGTD	012038N 1035848E	i)	Antenna, HGT 78ft AMSL, marked and LGTD	012049N 1035826E
j)	RWY 20L APCH	Shipping channel	Aprx1600m from THR RWY 20L.	j)	ILS glide slope antenna hut	LOC 93m west of RWY 02R/20L CL and 300m(1,000ft) up corresponding THR.
				k)	Surface wind measurement wind sleeves	LOC each end of RWY 02R/20L adjacent to glide slope hut 300m (1,000ft) up the THR.
				l)	Frangible poles, HGT 9ft AMSL	Installed aprx 200m fm centre of RET to identify 58m away fm TWY WP CL towards RWY 02L/20R

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



WSSS AD 2.14 APPROACH AND RUNWAY LIGHTING (continued)								
RWY	Apch Lgt Type, Len Intensity	THR Lgt colour WBAR	PAPI (MEHT)	TDZ Lgt Len	RWY Centreline Lgt Len, spacing, colour, INTST	RWY Edge Lgt, Len, spacing, colour, INTST	RWY End Lgt colour	SWY Lgt colour
1	2	3	4	5	6	7	8	9
<b>20C</b>	CAT II High Intensity consisting of extended centreline and red row barrettes, 2 crossbars, 2 approach beacons and sequenced flashing lights.	Green supplemented by green wing-bar and 2 THR ident lights.	PAPI 3° located left side of RWY, 418m fm THR. 2 white LGT and 2 red LGT (20.4m), 3 white LGT and 1 red LGT (23.1m), 4 white LGT (25.5m) Aircraft with eye-to-wheel hgt greater than 8m are adz to fly with 2 white and 2 red LGT visible so as to achieve sufficient wheel clr.	White	Inset High Intensity centreline lights as flw: From THR to 900m fm RWY end: White, 300m to 900m fm RWY end: Altn red/white, 300m to RWY end: Red.	Bi-directional raised white/amber edge lights.	Red	Elevated Red
<b>02R</b>	CAT I 1 centreline barricade showing white flashes, 5 crossbars and capacitor discharge strobe lights.	Green supplemented by 10 green wing-bars.	PAPI 3° loc at 323m up the THR. 2 units on each side of the RWY at RWY 02R apch and only 1 unit on west side of the RWY at RWY 20L apch.	Nil	Nil	Bi-directional elevated and inset high intensity edge white/amber lights.	Red	Red
<b>20L</b>	CAT I 1 centreline barricade showing white flashes, 5 crossbars and capacitor discharge strobe lights.	Green supplemented by 10 green wing-bars.	PAPI 3° loc at 323m up the THR. 2 units on each side of the RWY at RWY 02R apch and only 1 unit on west side of the RWY at RWY 20L apch.	Nil	Nil	Bi-directional elevated and inset high intensity edge white/amber lights.	Red	Red

<b>WSSS AD 2.15 OTHER LIGHTING, SECONDARY POWER SUPPLY</b>		
1	<i>ABN/IBN location, characteristics and hours of operation</i>	ABN: 012209.22N 1035858.47E (western side of RWY 02L/20R) Altn FLG W G EV 2.3 SEC, Opr hours HN + IMC IBN: 012301.28N 1035959.52E (top of building N of SIA hangar) FLG G 'CH' EV 7 SEC, Opr hours HN + IMC
2	<i>LDI location and LGT Anemometer location and LGT</i>	Pressure tube anemometer and wind vane situated 345m west of middle of RWY 02L/20R. Cup anemometers and wind vanes at ends and middle of both runways. Windssocks at ends of both runways. Transmissometers at both ends and in the middle of both runways
3	<i>TWY Edge and Centreline Lighting</i>	RWY 02L/20R and RWY 02C/20C: blue lgts on twy curved edges and apron twy edges and green centreline lgts on all twy. RWY 02R/20L: Elevated and inset blue twy edge lgt.
4	<i>Secondary power supply/switch-over time</i>	Automatic standby generator power supply available for airfield lighting with switchover time of 1 second during Category II low visibility operations.
5	<i>Remarks</i>	Vehicles painted yellow or displaying chequered red/white or orange/white flag at highest point of vehicle

<b>WSSS AD 2.16 HELICOPTER LANDING AREA</b>	
Please see section ENR 3.4	

<b>WSSS AD 2.17 ATS AIRSPACE</b>		
1	<i>Designation and Lateral Limits</i>	<b>CHANGI CTR</b> 013300N 1040149E 013042N 1040654E 012542N 1040448E thence along Kuala Lumpur/Singapore FIR bdry to 012000N 1041218E 010018N 1035524E 011100N 1035134E 013300N 1040149E
2	<i>Vertical Limits</i>	SFC to 3,000ft ALT
3	<i>Airspace Classification</i>	C
4	<i>ATS Unit Callsign Language(s)</i>	Singapore Tower English
5	<i>Transition Altitude</i>	11,000ft (3,350m)
6	<i>Remarks</i>	A helicopter shall not be operated within the Changi CTR unless prior permission has been obtained from the Director-General of Civil Aviation, CAAS. Email to caas_atn_ansp@caas.gov.sg

<b>WSSS AD 2.18 ATS COMMUNICATION FACILITIES</b>					
<i>Service Designation</i>	<i>Call sign</i>	<i>Frequency (P-PRI, S-SEC)</i>	<i>Hours of operation</i>	<i>Remarks</i>	
<b>ACC</b>	Singapore Radar	P123.7 MHz S127.3 MHz	H24	for ATS Routes B469, G219, G334, R208, L625, L629, L635, L642, L644, M751, M753, M758, M761, M763, M771, N884, N891 and N892.	
		133.8 MHz	0000-1430		
			P133.25 MHz S135.8 MHz	H24	for ATS Routes A457, A464, A576, B466, R325 (all northbound) and R469.
			P134.2 MHz S133.35 MHz		for ATS Routes G580, L644, M646 and M767
			P134.4 MHz S128.1 MHz 255.4 MHz		for ATS Routes A464, A576, G579 (all southbound), B470, L644, N875 and in area in the immediate vicinity of Singapore.
			124.05 MHz		0000-1530
	MAINT Period: Monthly - EV third SAT 1601-2359				
Singapore Radio		6 556 KHz 11 297 KHz	H24	SEA 1, Emission: A3AJ. SSB suppressed carrier, SAT-COM service available	
		5 655 KHz 8 942 KHz 11 396 KHz		SEA 2, Emission: A3AJ. SSB suppressed carrier, SAT-COM service available	
		6 556 KHz		SEA 3, Emission: A3AJ. SSB suppressed carrier, SAT-COM service available	
<b>APP</b>	Singapore Approach	P120.3 MHz S124.6 MHz	H24	TAR - Intermediate approach to Singapore Changi Airport and other airports in Singapore. Departures from all airports in Singapore.	
	Singapore Arrival	119.3 MHz		TAR - Intermediate and final approach to Singapore Changi Airport.	
ASR I MAINT Period: Monthly, EV first SAT 1601-2359 ASR II MAINT Period: Monthly, EV fourth SAT 1601-2359					
<b>TWR</b>	Singapore Tower	118.6 MHz	H24 0000-1600	for takeoff / landing for aircraft operating on RWY 02L/20R	
		118.25 MHz	0000-1600	for aircraft operating on RWY 02C/20C	
	Singapore Ground	124.3 MHz	1600-0000 0000-1600	for start-up / push-back / taxiing of all aircraft for ground movement of aircraft west of Terminal 3	
		121.725 MHz	0000-1700 2100-0000	for ground movement of aircraft east of Terminal 2	
		121.85 MHz	0000-1800 2300-0000	for ground movement of aircraft north of Terminal 1	
		129.95 MHz	H24	for ground emergency	
	Singapore Delivery	121.65 MHz		for Pre-flight check / ATC clearance	
Changi Tower / Changi Apron	121.9 MHz	H24	for vehicular movements on taxiways and runways. Towing of all aircraft and requests for engine runs on apron and taxiways, excluding runways, will be regulated by Changi Apron.		
<b>D-ATIS</b>	Singapore Changi AP Information	128.6 MHz	H24	Data Link Service available. AP IDENT WSSS. Messages comply with ARINC 623 Standards. Updating of data: H+00 to H+10 and H+30 to H+40	

WSSS AD 2.19 RADIO NAVIGATION AND LANDING AIDS					
Type of aid and MAG Variation	IDENT	Frequency	OPR HR	Position of Transmitting Antenna Coordinates	DME Transmitting Antenna Elevation / Remarks
1	2	3	4	5	6 & 7
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. EM: F1. Maintenance period: Third Thursday of every month between 0200-0600
TEKONG DVOR/DME	VTK	116.5MHz CH112X	H24	012455.36N 1040120.17E	023° MAG 6.4km from THR RWY 20C (Singapore Changi). Antenna HGT: 150ft AMSL. Coverage 200NM. EM:F1 Maintenance period: Third Friday of every month between 0200-0600
BEDOK NDB	BED	232KHz	H24	011858.39N 1035749.07E	203° MAG 3.9km from THR RWY 02L (Singapore Changi). Coverage 25NM. EM: A0/A2
RWY 20C ILS LLZ	ICC	109.7MHz	H24	011935.97N 1035902.64E	LOC 250m (820ft) from THR RWY 02C, along RWY centreline. Course width 3°. EM: A0/A2. Maintenance period: May - October Second Friday of every month between 1600-2300 November - April Second Friday of every month between 0200-0900
RWY 20C ILS GP	-	333.2MHz	H24	012131.32N 1035956.57E	LOC 338m (1109ft) from THR RWY 20C on left side of RWY, 148m (486ft) from RWY centreline. GP angle 3°. HGT of ILS reference datum: 18m (58ft) EM: A0/A2
RWY 20C ILS DME	ICC	CH34X	H24	012131.32N 1035956.57E	DME co-located with GP. EM: P9
RWY 20C ILS MM	-	75MHz	H24	012211.94N 1040008.52E	LOC 955m (3133ft) from THR RWY 20C along extended centreline of RWY. No back beam.
RWY 02C ILS LLZ	ICE	108.3MHz	H24	012150.84N 1035959.58E	LOC 250m (820ft) from THR RWY 20C, along RWY centreline. Course width 3°. EM: A0/A2. Maintenance period: May - October Second Friday of every month between 0200-0900 November - April Second Saturday of every month between 0200-0900
RWY 02C ILS GP	-	334.1MHz	H24	011951.64N 1035914.70E	LOC 338m (1109ft) from THR RWY 02C on right side of RWY, 154m (505ft) from RWY centreline. GP angle 3°. HGT of ILS reference datum: 18m (58ft) EM: A0/A2
RWY 02C ILS DME	ICE	CH20X	H24	011951.64N 1035914.70E	DME co-located with GP. EM: P9
RWY 02C ILS MM	-	75MHz	H24	011915.15N 1035853.88E	LOC 945m (3100ft) from THR RWY 02C along extended centreline of RWY. No back beam.



**AERODROME CHART - ICAO**

01° 21' 33"N  
103°59' 22"E

**AERODROME ELEVATION 6.66m**

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

**SINGAPORE/SINGAPORE CHANGI**

PAPI 3° (MEHT)*				
Pilot's eye height over the threshold when the following PAPI lights come into view.	RUNWAY			
	02L	20R	02C	20C
2 White lights and 2 red lights	20.6m	20.0m	20.4m	20.4m
3 White lights and 1 red light	23.1m	22.6m	23.1m	23.1m
4 White lights	25.6m	25.0m	25.5m	25.5m

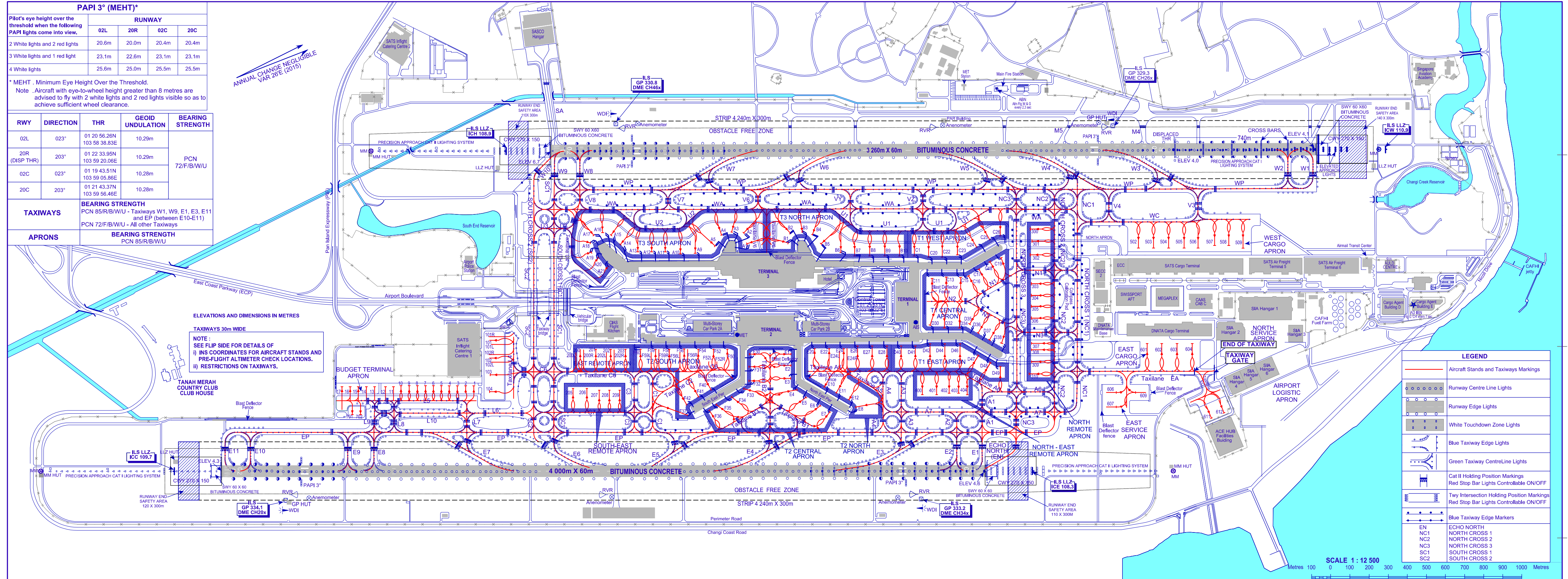
\* MEHT - Minimum Eye Height Over the Threshold.  
Note - Aircraft with eye-to-wheel height greater than 8 metres are advised to fly with 2 white lights and 2 red lights visible so as to achieve sufficient wheel clearance.

RWY	DIRECTION	THR	GEOD UNDULATION	BEARING STRENGTH
02L	023°	01 20 56.26N 103 58 38.83E	10.29m	PCN 72/F/B/W/U
20R (DISP THR)	203°	01 22 33.95N 103 59 20.06E	10.29m	
02C	023°	01 19 43.51N 103 59 05.86E	10.28m	
20C	203°	01 21 43.37N 103 59 56.46E	10.28m	

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

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

ANNUAL CHANGE NEGLIGIBLE  
VAR 26°E (2015)



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

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

SCALE 1 : 12 500  
Metres 100 0 100 200 300 400 500 600 700 800 900 1000 Metres



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

LOCATION	STAND NR	NORTH LAT	EAST LONG	ELEVATION	
T3 SOUTH APRON	A1	01 21 21.52	103 59 06.25	4.75m (15.58ft)	
	A2	01 21 21.75	103 59 04.00	4.65m (15.26ft)	
	A3	01 21 19.86	103 59 02.79	4.66m (15.29ft)	
	A4	01 21 17.61	103 59 02.54	4.79m (15.72ft)	
	A5	01 21 15.50	103 59 03.62	4.86m (15.94ft)	
	A9	01 21 12.56	103 59 03.65	5.02m (16.47ft)	
	A10	01 21 10.34	103 59 02.40	5.04m (16.54ft)	
	A11	01 21 07.93	103 59 01.41	5.25m (17.22ft)	
	A12	01 21 05.73	103 59 01.49	5.38m (17.65ft)	
	A13	01 21 03.59	103 58 59.58	5.48m (17.98ft)	
	A14	01 21 01.66	103 58 57.59	5.57m (18.27ft)	
	A15	01 21 00.77	103 58 55.41	5.46m (17.91ft)	
	A16	01 20 59.27	103 58 54.20	5.51m (18.08ft)	
	A17	01 20 57.25	103 58 54.06	5.23m (17.16ft)	
	A18	01 20 55.87	103 58 55.25	5.37m (17.62ft)	
	A19	01 20 55.26	103 58 57.13	5.40m (17.72ft)	
	A20	01 20 56.09	103 58 58.83	5.45m (17.88ft)	
	A21	01 20 57.10	103 59 00.80	5.49m (18.01ft)	
	T3 NORTH APRON	B1	01 21 26.86	103 59 08.37	4.82m (15.81ft)
		B2	01 21 28.18	103 59 06.82	4.68m (15.35ft)
		B3	01 21 30.33	103 59 07.30	4.65m (15.26ft)
B4		01 21 32.03	103 59 08.60	4.75m (15.58ft)	
B5		01 21 32.99	103 59 10.89	4.80m (15.75ft)	
B6		01 21 35.15	103 59 13.16	4.96m (16.27ft)	
B7		01 21 37.65	103 59 13.93	4.97m (16.31ft)	
B8		01 21 39.94	103 59 15.20	5.09m (16.70ft)	
B9		01 21 42.19	103 59 16.16	5.13m (16.83ft)	
B10		01 21 44.47	103 59 17.12	5.10m (16.73ft)	
T1 WEST APRON	C1	01 21 46.75	103 59 18.08	5.09m (16.70ft)	
	C20	01 21 48.83	103 59 19.23	5.08m (16.67ft)	
	C22	01 21 51.00	103 59 20.13	5.15m (16.90ft)	
	C23	01 21 53.56	103 59 20.77	5.08m (16.67ft)	
	C24	01 21 56.54	103 59 20.97	4.89m (16.04ft)	
	C25	01 21 59.12	103 59 20.59	4.99m (16.37ft)	
	C26	01 22 01.48	103 59 20.76	5.01m (16.44ft)	
	T1 CENTRAL APRON	C11	01 21 47.42	103 59 23.82	5.07m (16.63ft)
		C13	01 21 49.64	103 59 24.75	5.05m (16.57ft)
		C15	01 21 51.90	103 59 25.71	5.05m (16.57ft)
C16		01 21 53.63	103 59 26.42	4.91m (16.11ft)	
C17		01 21 55.63	103 59 26.07	5.03m (16.50ft)	
C18		01 21 57.86	103 59 25.75	4.99m (16.37ft)	
C19		01 21 59.79	103 59 25.63	4.95m (16.24ft)	
D30		01 21 44.54	103 59 30.14	5.09m (16.70ft)	
D32		01 21 46.73	103 59 31.07	5.08m (16.67ft)	
D34		01 21 49.03	103 59 32.04	5.07m (16.63ft)	
D35	01 21 50.87	103 59 32.82	5.02m (16.47ft)		
D36	01 21 51.98	103 59 34.52	5.06m (16.60ft)		
D37	01 21 53.37	103 59 36.28	4.97m (16.31ft)		
D38	01 21 54.58	103 59 37.77	4.99m (16.37ft)		
T1 EAST APRON	D40	01 21 38.02	103 59 32.85	5.07m (16.63ft)	
	D41	01 21 40.30	103 59 33.81	5.07m (16.63ft)	
	D42	01 21 42.70	103 59 34.48	5.11m (16.77ft)	
	D44	01 21 44.97	103 59 35.44	5.14m (16.86ft)	
	D46	01 21 47.40	103 59 36.72	5.08m (16.67ft)	
	D47	01 21 49.19	103 59 38.89	4.93m (16.17ft)	
	D48	01 21 50.60	103 59 40.77	4.97m (16.31ft)	
	D49	01 21 52.23	103 59 42.35	4.98m (16.34ft)	
	T2 NORTH APRON	E8	01 21 27.99	103 59 38.45	4.68m (15.35ft)
		E10	01 21 24.15	103 59 32.67	4.71m (15.45ft)
E11		01 21 25.57	103 59 34.37	4.78m (15.68ft)	
E12		01 21 27.20	103 59 36.42	4.75m (15.58ft)	
E20		01 21 24.36	103 59 27.08	5.04m (16.54ft)	
E22		01 21 26.64	103 59 28.04	5.07m (16.63ft)	
E24	01 21 29.01	103 59 29.06	5.09m (16.70ft)		
E24L	01 21 28.32	103 59 28.77	5.10m (16.73ft)		
E24R	01 21 29.53	103 59 29.28	5.08m (16.67ft)		
E26	01 21 31.19	103 59 29.96	5.08m (16.67ft)		
E27	01 21 33.46	103 59 30.93	5.03m (16.50ft)		
E28	01 21 35.74	103 59 31.89	5.08m (16.67ft)		
T2 CENTRAL APRON	E1	01 21 20.02	103 59 25.58	4.91m (16.11ft)	
	E2	01 21 19.28	103 59 27.30	4.90m (16.08ft)	
	E3	01 21 18.44	103 59 29.27	4.82m (15.81ft)	
	E4	01 21 18.10	103 59 31.70	4.80m (15.75ft)	
	E5	01 21 19.56	103 59 33.72	4.90m (16.08ft)	
	E6	01 21 21.22	103 59 35.93	4.84m (15.88ft)	
	E7	01 21 22.48	103 59 37.46	4.73m (15.52ft)	
	F30	01 21 14.71	103 59 23.33	4.92m (16.14ft)	
	F31	01 21 13.87	103 59 25.30	4.91m (16.11ft)	
	F32	01 21 13.03	103 59 27.26	4.85m (15.91ft)	
F33	01 21 11.30	103 59 28.54	4.91m (16.11ft)		
F34	01 21 08.98	103 59 28.96	4.92m (16.14ft)		
F35	01 21 06.28	103 59 29.29	4.90m (16.08ft)		
F36	01 21 04.34	103 59 29.67	4.82m (15.81ft)		

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

LOCATION	STAND NR	NORTH LAT	EAST LONG	ELEVATION	
T2 SOUTH APRON	F37	01 20 59.83	103 59 27.87	4.75m (15.58ft)	
	F40	01 21 05.62	103 59 25.34	4.85m (15.91ft)	
	F41	01 21 03.19	103 59 25.58	4.82m (15.81ft)	
	F42	01 21 00.61	103 59 25.96	4.72m (15.49ft)	
	F50	01 21 10.69	103 59 21.32	5.03m (16.50ft)	
	F52	01 21 08.51	103 59 20.40	5.11m (16.77ft)	
	F52L	01 21 07.82	103 59 20.11	5.16m (16.93ft)	
	F52R	01 21 09.04	103 59 20.62	5.08m (16.67ft)	
	F54	01 21 06.14	103 59 19.40	5.22m (17.13ft)	
	F56	01 21 03.96	103 59 18.48	5.30m (17.39ft)	
	F56L	01 21 03.27	103 59 18.18	5.42m (17.78ft)	
	F56R	01 21 04.49	103 59 18.70	5.34m (17.52ft)	
	F58	01 21 01.58	103 59 17.47	5.49m (18.01ft)	
F59	01 20 59.41	103 59 16.55	5.64m (18.50ft)		
F59L	01 20 58.72	103 59 16.26	5.67m (18.60ft)		
F59R	01 20 59.93	103 59 16.78	5.60m (18.37ft)		
F60	01 20 56.91	103 59 15.50	5.77m (18.93ft)		
EAST REMOTE APRON	200	01 20 47.83	103 59 11.67	6.23m (20.44ft)	
	200L	01 20 46.91	103 59 11.92	6.29m (20.64ft)	
	200R	01 20 48.35	103 59 11.89	6.18m (20.28ft)	
	201	01 20 49.99	103 59 12.62	5.96m (19.55ft)	
	202	01 20 52.34	103 59 13.57	5.94m (19.49ft)	
	202L	01 20 51.65	103 59 13.28	5.76m (18.90ft)	
	202R	01 20 52.87	103 59 13.79	5.73m (18.80ft)	
	203	01 20 54.52	103 59 14.47	5.92m (19.42ft)	
	SOUTH-EAST REMOTE APRON	101	01 20 34.88	103 59 04.05	4.49m (14.73ft)
		101L	01 20 34.60	103 59 04.70	4.60m (15.09ft)
		101R	01 20 35.11	103 59 03.50	4.53m (14.86ft)
		102	01 20 33.76	103 59 06.65	4.49m (14.73ft)
		102L	01 20 33.53	103 59 07.33	4.62m (15.16ft)
102R		01 20 34.00	103 59 06.10	4.60m (15.09ft)	
103		01 20 32.88	103 59 09.35	4.67m (15.32ft)	
104		01 20 31.77	103 59 11.96	4.39m (14.40ft)	
205		01 20 43.91	103 59 17.06	4.77m (15.65ft)	
206		01 20 46.08	103 59 17.98	4.76m (15.62ft)	
207		01 20 47.91	103 59 18.88	4.74m (15.55ft)	
208		01 20 49.48	103 59 19.54	4.74m (15.55ft)	
209		01 20 51.06	103 59 20.21	4.75m (15.58ft)	
NORTH REMOTE APRON	300	01 22 06.95	103 59 22.67	4.53m (14.86ft)	
	301	01 22 06.41	103 59 24.69	4.93m (16.17ft)	
	302	01 22 05.21	103 59 26.75	4.97m (16.31ft)	
	303	01 22 03.55	103 59 31.40	5.32m (17.45ft)	
	304	01 22 02.84	103 59 33.06	5.35m (17.55ft)	
	305	01 22 02.14	103 59 34.71	5.30m (17.39ft)	
	306	01 22 01.41	103 59 36.42	5.16m (16.93ft)	
	307	01 21 59.39	103 59 40.36	5.16m (16.93ft)	
	308	01 21 58.96	103 59 41.35	5.10m (16.73ft)	
	309	01 21 58.52	103 59 43.17	5.09m (16.60ft)	
	310	01 21 57.42	103 59 44.96	4.74m (15.55ft)	
	NORTH-EAST REMOTE APRON	400	01 21 38.71	103 59 40.14	4.31m (14.14ft)
		401	01 21 40.98	103 59 41.10	4.31m (14.14ft)
402		01 21 42.85	103 59 41.89	4.30m (14.11ft)	
403		01 21 44.44	103 59 42.56	4.29m (14.07ft)	
404		01 21 45.63	103 59 43.44	4.16m (13.65ft)	
WEST CARGO APRON		502	01 22 22.23	103 59 31.62	4.35m (14.27ft)
	503	01 22 24.98	103 59 32.76	4.29m (14.07ft)	
	504	01 22 27.26	103 59 33.74	4.29m (14.07ft)	
	505	01 22 29.54	103 59 34.70	4.32m (14.17ft)	
	506	01 22 31.81	103 59 35.66	4.38m (14.37ft)	
	507	01 22 34.11	103 59 36.64	4.36m (14.30ft)	
	508	01 22 36.41	103 59 37.61	4.29m (14.07ft)	
	509	01 22 39.12	103 59 38.76	4.09m (13.42ft)	
	EAST CARGO APRON	601	01 22 16.52	103 59 49.27	4.27m (14.01ft)
		602	01 22 18.80	103 59 50.23	4.30m (14.11ft)
603		01 22 21.15	103 59 51.02	4.29m (14.07ft)	
604		01 22 23.46	103 59 51.99	4.31m (14.14ft)	
EAST SERVICE APRON		606	01 22 09.09	103 59 53.22	2.70m (8.86ft)
	607	01 22 08.12	103 59 55.49	2.82m (9.25ft)	
	609	01 22 12.19	103 59 54.57	3.01m (9.88ft)	
ACEHUB	611	01 22 22.14	104 00 02.87	4.01m (13.16ft)	
	612	01 22 24.50	104 00 02.87	3.91m (12.83ft)	
BUDGET TERMINAL APRON	1	01 20 28.69	103 59 10.05	3.97m (13.02ft)	
	2	01 20 27.39	103 59 09.51	4.04m (13.25ft)	
	3	01 20 26.09	103 59 08.96	3.90m (12.80ft)	
	4	01 20 24.80	103 59 08.41	3.86m (12.66ft)	
	5	01 20 23.50	103 59 07.86	3.85m (12.63ft)	
	6	01 20 22.20	103 59 07.32	3.86m (12.66ft)	
	7	01 20 20.90	103 59 06.77	3.83m (12.57ft)	
	8	01 20 19.60	103 59 06.22	3.84m (12.60ft)	
	9	01 20 18.31	103 59 05.67	3.83m (12.57ft)	
	10	01 20 17.03	103 59 05.07	3.85m (12.63ft)	
	11	01 20 15.77	103 59 04.43	3.90m (12.80ft)	
	12	01 20 14.50	103 59 03.89	3.94m (12.93ft)	
	13	01 20 12.78	103 59 03.16	3.99m (13.09ft)	
	14	01 20 11.48	103 59 02.62	4.01m (13.16ft)	
	15	01 20 10.33	103 59 01.72	4.60m (15.09ft)	
	16	01 20 09.03	103 59 01.17	4.60m (15.09ft)	
	17	01 20 07.74	103 59 00.62	4.60m (15.09ft)	
701	01 20 08.81	103 59 06.24	5.03m (16.50ft)		
702	01 20 07.51	103 59 05.69	5.03m (16.50ft)		

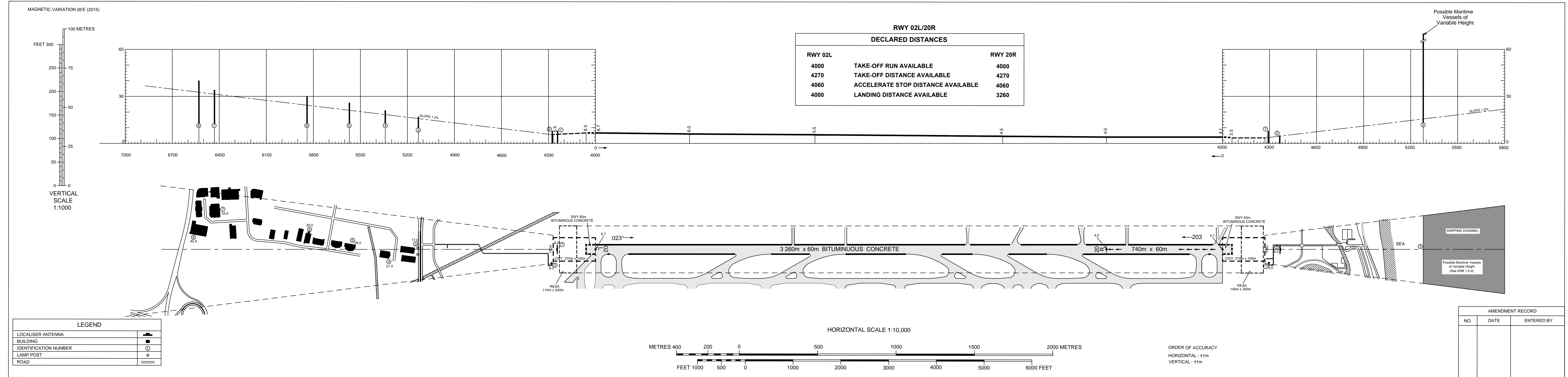
RESTRICTIONS ON TAXIWAYS

- Pilots are advised to apply minimum thrust when
  - turning into TWY A1, A3, A4 and Taxilane A5 while taxiing either northwards or southwards on Taxilane A6, and
  - thereafter when taxiing along TWY A1 up to and including the TWY A7/A1 junction.
 This is in view of apron activities at aircraft stands D40, D41, D47, D48, D49, E22, E24, E27 and E28.
- TWY A2 is a one-way taxiway for aircraft taxiing from TWY EP to TWY A7 only. No-entry signs have been mounted on either side of TWY A2 along TWY A7. Taxiway centreline lights along TWY A2 have been shielded to provide guidance only from TWY EP in the direction of TWY A7.
- TWY WC centreline behind aircraft stands 506, 507 and 508 diverted 32m westward. Pilots to follow the TWY centreline while taxiing along TWY WC.
- Pilots operating aircraft with wheelbase longer than B747 or 26m shall take note that judgemental oversteering may be required when manoeuvring round taxiway turns.
- TWY NC3 (between TWY WA and TWY A6) is a TWY with reduced minimum separation distances between the TWY centreline and object. Due to the reduced minimum separation distances, pilots are advised to adhere strictly to the TWY centreline and to slow down the taxi speed accordingly. TWY NC3 (between TWY WA and TWY A6) can only be used by aircraft with maximum wingspan 65m.
- Taxiway centreline along TWY EP between TWY B1 and B3 offset eastward by 2.5m away from aircraft stands E7 and F36.
- Pilots are advised to apply minimum thrust when turning into taxiway WA from taxilane V6.
- Taxilane U4 (behind aircraft stands A18 to A21) can only be used by aircraft with maximum wingspan 61m.
- TWY N1 (behind aircraft stands C16 to C19 and between TWY NC2 and TWY NC3), TWY N2 and TWY N3 (behind aircraft stands D35 to D38 and between TWY NC2 and TWY NC3) can only be used by aircraft with maximum wingspan 65m.
- Taxilane A6 (behind aircraft stands E20 to E24) and Taxilane C6 (behind aircraft stands F50 to F54) can only be used by aircraft with maximum wingspan 65m (towing and pushback exempted).
- TWY L5 can only be used by aircraft with maximum wingspan 36m.
- TWY L8, L9 and L10 can only be used by aircraft with maximum wingspan 65m.
- Pilots are advised to exercise caution when taxiing near TWY L5, L8, L9 and L10.
- Pilots are advised to apply speed limit of 20 knots when taxiing along TWY SOUTH CROSS 1 and SOUTH CROSS 2.
- Pilots turning aircraft into aircraft stand A2 or aircraft stand B2 are advised to wait for any aircraft holding at Taxilane V6, at the inner cul-de-sac portion of the terminal building to vacate this portion before turning into aircraft stand A2 or aircraft stand B2.
- TWY SA is a one-way live TWY which can only be used by aircraft with maximum wingspan 65m to taxi into SASCO hangar via RWY 02L. Only tow-out operation is allowed from the SASCO hangar into TWY SA and RWY 02L.
- TWY M4 and M5 are solely for use by Republic of Singapore Air Force (RSAF) aircraft.

DIMENSIONS AND ELEVATIONS IN METRES

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

SINGAPORE/Singapore Changi



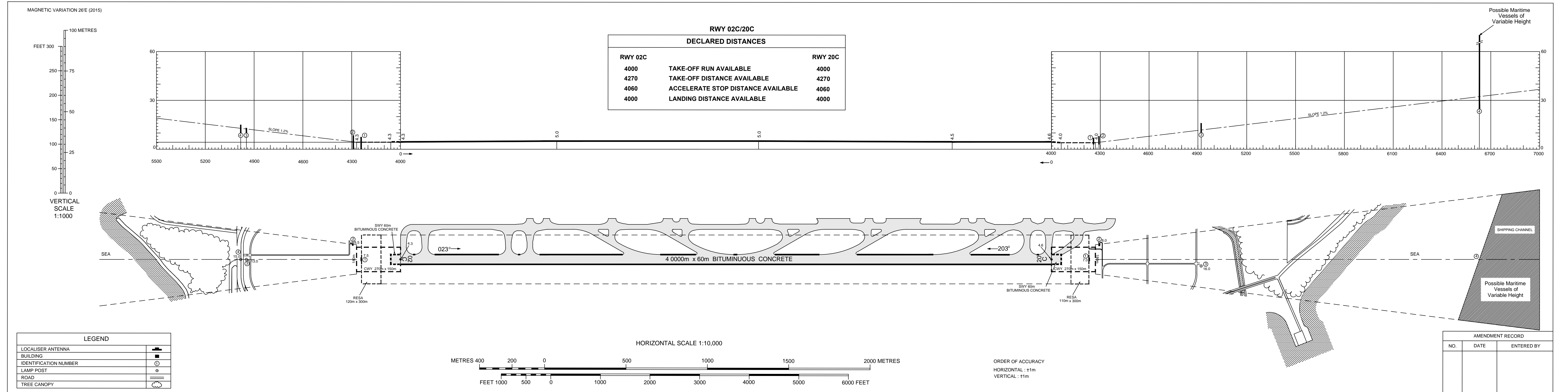




DIMENSIONS AND ELEVATIONS IN METRES

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

SINGAPORE/Singapore Changi



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

LEGEND	
LOCALISER ANTENNA	⬮
BUILDING	■
IDENTIFICATION NUMBER	①
LAMP POST	⊙
ROAD	══
TREE CANOPY	☁



### AERODROME OBSTACLE CHART - ICAO TYPE B

SINGAPORE / Singapore Changi





**RNAV<sub>(GNSS)</sub> SIDS AND STARS**

**1. INTRODUCTION**

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

**2. ARRIVALS**

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

ATS Route	Transition	Transition Route	RNAV STAR
B469 (southbound to Singapore) L642 N892	BIKTA VEPLI MABAL	BIKTA-PIBAP-PASPU VEPLI-VINIL-PIBAP-PASPU MABAL-KILOT-VINIL-PIBAP-PASPU	PASPU ARRIVAL
A464 (southbound to Singapore) A576 (southbound to Singapore) R469	ARAMA REKOP no transition	ARAMA-BOBAG REKOP-BOBAG no transition	BOBAG ARRIVAL
G579	no transition	no transition	REMES ARRIVAL
L504 M635 M774	OBDOS SURGA OBDOS	OBDOS-IKAGO-IKIMA-IBULA-LAVAX SURGA-IKAGO-IKIMA-IBULA-LAVAX OBDOS-IKAGO-IKIMA-IBULA-LAVAX	LAVAX ARRIVAL
M767 / G580 M646 / G580 G580	TOMAN	TOMAN-KARTO-KEXAS-LAVAX	

Note: Aircraft landing at Singapore Changi Airport operating on N891, M753 and L642 shall flight plan only on L642 after ENREP.

- 2.4 Additional elements on the STAR chart include the following:
- a) *Vertical restrictions*, designed to contain aircraft in controlled airspace and to separate aircraft from obstacles and to avoid, to the degree possible, conflict with departing traffic.
  - b) *Speed restrictions*, designed for flow control purposes.
  - c) *Minimum safe altitude (MSA)* within 25NM of VTK and SJ DVOR/DME. The MSA provides a minimum of 1000ft vertical clearance within 5NM of any obstacle.
- 2.5 Arrivals to Singapore Changi Airport can expect radar vectors to intercept the localizer for an ILS approach after the initial approach fix on the RNAV STARS.
- 2.6 STARS shall be issued by ATC in the following order:
- a) ARRIVAL identifier;
  - b) TRANSITION identifier;
  - c) Runway-in-use;
  - d) An assigned level

Example:

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

**3. DEPARTURES**

- 3.1 All departing aircraft will be cleared on the appropriate RNAV<sub>(GNSS)</sub> SID and shall climb initially to 3,000ft.
- 3.2 Operators are to note that RNAV<sub>(GNSS)</sub> SIDs VENPA 1A and 1B will be assigned to departures from Singapore Changi Airport that flight plan to destinations south of Singapore on L504, M635 and M774.

There will be 3 Transitions as shown below:

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

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

Example:

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

**CONTINUOUS DESCENT OPERATION (CDO) FOR ARRIVALS INTO SINGAPORE CHANGI AP**

**1. INTRODUCTION**

- 1.1 CDO is an aircraft operating technique which enables the pilot to execute an optimised arrival descend profile utilising the onboard capability of the aircraft. CDO is facilitated by appropriate instrument flight procedure design and ATC procedures.
- 1.2 The vertical profile of CDO takes the form of a continuously descending path with minimum level flight segments to enable smooth aircraft deceleration and configuration prior to an ILS approach. New CDO RNAV STARs have been constructed in accordance to ICAO Doc 9931 CDO Manual and ICAO Doc 8168 Procedures for Air Navigation, Aircraft Operations, to facilitate CDO into Singapore Changi Airport.

**2. CONDITIONS FOR CONDUCTING A CDO**

- 2.1 Pilots shall adhere to the instructions as depicted on the CDO RNAV STARs and the conditions for ILS procedures into Changi. In addition, the following conditions must be met:
  - i) Changi RWY 02L/20R is open for landing;
  - ii) ILS for the intended RWY of landing into Changi is in operation;
  - iii) Visibility  $\geq$  800m;
  - iv) RVR  $\geq$  550m for RWY-in-use; and
  - v) No other system degradation that may affect a GNSS or ILS operation.

**3. REQUIREMENTS FOR INDIVIDUAL FLIGHTS**

- 3.1 Flights that fulfill the following requirements can be allowed to conduct a CDO subject to ATC and real-time traffic condition:

- i) Flight enters Singapore FIR via one of the following waypoints and ATS routes:

→ ATETI (G580)	KADAR (M774)	TAROS (R469)
BAVUS (L504)	KAMIN (M646)	TEGID (M767)
ESPOB (L642)	MELAS (N892)	VPK (B469)
IGARI (N891)	PARDI (G579)	
IPRIX (M753)	SURGA (M635)	

- ii) RNAV-equipped aircraft with FMC capable of:
  - ♦ LNAV and VNAV;
  - ♦ flying Changi RNAV STARs and to abide by all speed and altitude restrictions depicted on the charts;
  - ♦ continuing on planned vertical path from RNAV STAR onto ILS of intended RWY of landing.

#### 4. PREPARATIONS FOR CDO

4.1 To ensure that the CDO procedures can be effectively carried out, pilots are advised to abide by the following:

- i) Check if conditions for conducting the CDO are met;
- ii) Check if flight meets requirement for executing a CDO; and
- iii) Plan the lateral route in your FMC as shown below based on FIR entry point and landing RWY-in-use. The landing RWY-in-use is available from D-ATIS (128.6MHz).

FIR Entry Point	RWY	STAR	TRANSITION
ESPOB IPRIX IGARI	02L	PASPU 1K	VEPLI
	20R	PASPU 1L	
MELAS	02L	PASPU 1K	MABAL
	20R	PASPU 1L	
VPK	02L	PASPU 1K	BIKTA
	20R	PASPU 1L	
TEGID KAMIN AGOBA	02L	LAVAX 1K	TOMAN
	20R	LAVAX 1L	
KADAR BAVUS	02L	LAVAX 1K	OBDOS
	20R	LAVAX 1L	
SURGA	02L	LAVAX 1K	SURGA
	20R	LAVAX 1L	
PARDI	02L	REMES 1K	-
	20R	REMES 1L	
TAROS	02L	BOBAG1K	-
	20R	BOBAG 1L	

#### 5. CDO EXECUTION

5.1 On first contact with Singapore Radar, use the following when requesting for a CDO:

**“Request C-D-O”** [read as See-Dee-Oh]

- ♦ Depending on the situation, Singapore ATC will make an early assessment to approve/disapprove your request accordingly. When it is obvious to ATC that the conduct of CDO flight will not reap any operational benefit, ATC shall disapprove your request and inform you accordingly.

5.2 If CDO is approved, Singapore ATC shall reply using the following phraseology:

“[flight callsign], **expect C-D-O** [read as See-Dee-Oh] and cleared to Singapore via [STAR] Arrival, [transition, if any] transition, Runway [runway-in-use]. Maintain [cruising altitude], report ready for descent”

- ♦ On receipt of this clearance from Singapore ATC, pilot shall plan the arrival route using FMC and to report estimated time/distance for Top Of Descent (TOD) once the information is available. CDO RNAV STARs have been designed for arrivals into RWY 02L or RWY 20R and linking up to the ILS of these respective runways. As such, please refrain from requesting for a change in landing runway (i.e. 02C or 20C).



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

TWR 118.6 / 118.25  
APP 120.3 / 124.05  
ACC 134.4

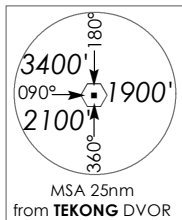
TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02L/20R  
ANITO DEPARTURES  
ANI 5E (R02L), ANI 4F (R20R)  
RNAV<sub>(GNSS)</sub>**

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

DISTANCES IN NM



**NOTE:** RADAR REQUIRED

**NOTE:** REFER TO BACK PAGE FOR  
A) CONVENTIONAL  
PROCEDURES  
B) RADIO COM FAILURE  
PROCEDURES  
C) CROSS REFERENCE  
FROM NAVAID

**GENERAL INFORMATION**

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

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

**RWY 02L**

MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

**RWY 20R**

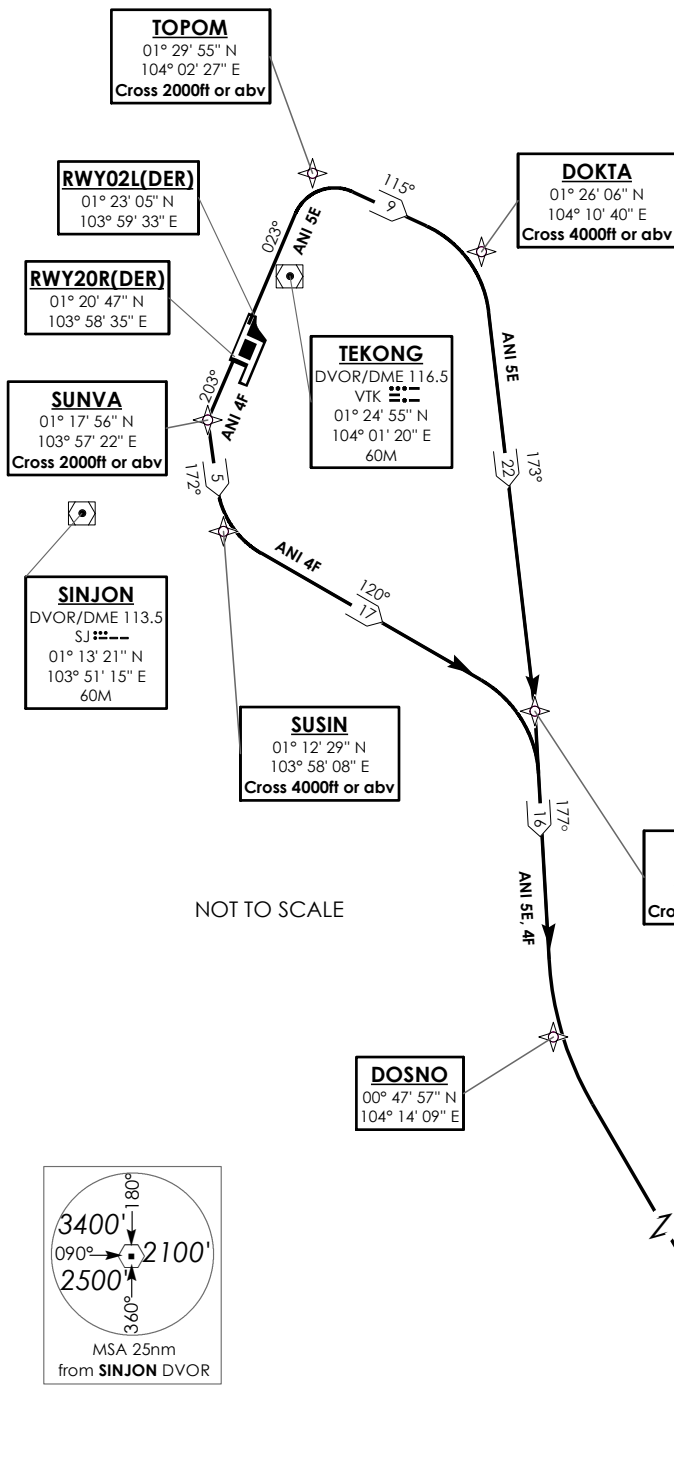
MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%  
UNTIL REACHING OR PASSING 400FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

THE RESTRICTION TO CROSS SUNVA AT OR ABOVE  
2000FT IS APPLICABLE BETWEEN 2301/1100 UTC.

ALL DEPARTURE AIRCRAFT ON RWY 20R ISSUED WITH HEADING  
INSTRUCTIONS BY ATC SHALL ALSO CROSS 8 DME VTK AT OR  
ABOVE 2000FT BTN 2301/1100 UTC.

IF THE HEIGHT RESTRICTION CANNOT BE COMPLIED WITH, THE  
PILOT-IN-COMMAND OF AN AIRCRAFT DEPARTURE ON RWY 20R  
SHALL INFORM ATC DURING THE TIME WHEN THE AIRCRAFT  
COMMENCES TAXIING TO THE HOLDING POINT FOR DEPARTURE.



**(A) BASIC RNAV DEPARTURES**

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

**ANITO DEPARTURES**

STANDARD DEPARTURE INSTRUMENT (SID)	RUNWAY	TAKE OFF INSTRUCTIONS	DEPARTURE INSTRUCTIONS
<b>ANITO FIVE ECHO DEPARTURE (ANI 5E)</b>	<b>02L</b>	CLIMB STRAIGHT AHEAD TO TOPOM. CROSS TOPOM AT OR ABOVE 2000FT. AT TOPOM TURN RIGHT AND TRACK 115° TO DOKTA THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT DOKTA TURN RIGHT AND TRACK 173° TO DOBLU. CROSS DOKTA AT OR ABOVE 4 000FT. CROSS DOBLU AT OR BELOW 6 000FT OR AS DIRECTED BY ATC. AT DOBLU TRACK 177° TO DOSNO THEN TURN LEFT AND TRACK 150° TO ANITO AND JOIN ATS ROUTE B470.
<b>ANITO FOUR FOXTROT DEPARTURE (ANI 4F)</b>	<b>20R</b>	CLIMB STRAIGHT AHEAD TO SUNVA. AT SUNVA TURN LEFT AND TRACK 172° TO SUSIN. CROSS SUNVA AT OR ABOVE 2 000FT. CROSS SUSIN AT OR ABOVE 4 000FT, THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT SUSIN TURN LEFT AND TRACK 120° TO DOBLU. CROSS DOBLU AT OR BELOW 6 000 FT OR AS DIRECTED BY ATC. AT DOBLU, TURN RIGHT AND TRACK 177° TO DOSNO THEN TURN LEFT AND TRACK 150° TO ANITO AND JOIN ATS ROUTE B470.

**(B) RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

**(C) RADIAL AND DME FROM VOR/DME**

WAY POINTS	VTK VOR/DME	SJ VOR/DME
ANITO	VTK R-153.4/D113.4	SJ R-146.0/D108.6
DOBLU	VTK R-150.4/D24.2	SJ R-113.4/D24.0
DOKTA	VTK R-083/D9.4	SJ R-057/R23.2
DOSNO	VTK R-160.8/D39.0	SJ R-137.8/D34.1
SUNVA	VTK R-209.7/D8.0	SJ R-053.3/D7.6
SUSIN	VTK R-194.5/D12.8	SJ R-097.2/D6.9
TOPOM	VTK R-012.8/D5.1	SJ R-034.2/D20.0

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

TWR 118.6 / 118.25  
APP 120.3 / 124.05  
ACC 134.4

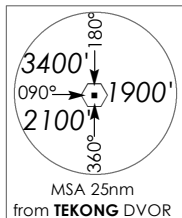
TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02C/20C  
ANITO DEPARTURES  
ANI 5A (R02C), ANI 4B (R20C)  
RNAV(GNSS)**

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

DISTANCES IN NM



**NOTE:** RADAR REQUIRED

- NOTE:** REFER TO BACK PAGE FOR
- A) CONVENTIONAL PROCEDURES
  - B) RADIO COM FAILURE PROCEDURES
  - C) CROSS REFERENCE FROM NAVAID

**GENERAL INFORMATION**

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

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

**RWY 02C**

MAX IAS 220KTS UNTIL PASSING 4000FT AND MAX IAS 250KTS UNTIL PASSING 10000FT. CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF BY SINGAPORE RADAR. SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

**RWY 20C**

MAX IAS 220KTS UNTIL PASSING 4000FT AND MAX IAS 250KTS UNTIL PASSING 10000FT. CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF BY SINGAPORE RADAR. DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5% UNTIL REACHING OR PASSING 400FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

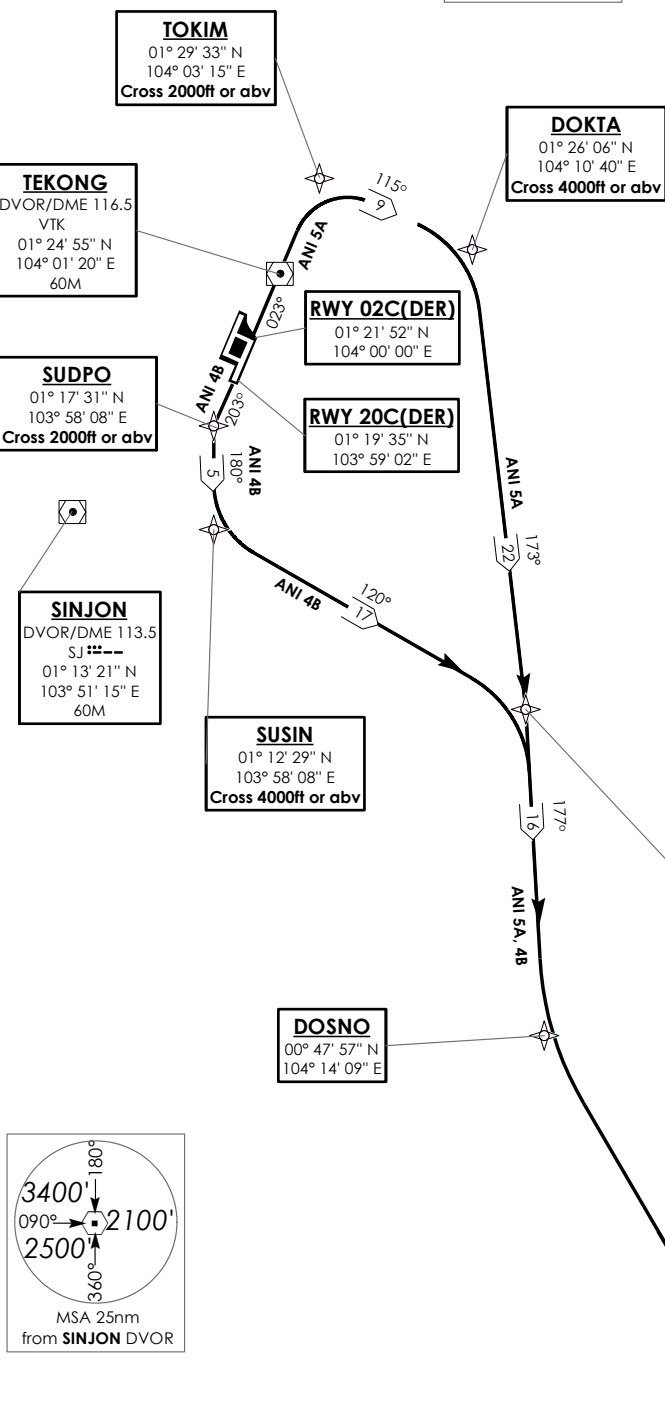
THE RESTRICTION TO CROSS SUDPO AT OR ABOVE 2000FT IS APPLICABLE BETWEEN 2301/1100 UTC.

ALL DEPARTURE AIRCRAFT ON RWY 20C ISSUED WITH HEADING INSTRUCTIONS BY ATC SHALL ALSO CROSS 8 DME VTK AT OR ABOVE 2000FT BTN 2301/1100 UTC.

IF THE HEIGHT RESTRICTION CANNOT BE COMPLIED WITH, THE PILOT-IN-COMMAND OF AN AIRCRAFT DEPARTURE ON RWY 20C SHALL INFORM ATC DURING THE TIME WHEN THE AIRCRAFT COMMENCES TAXIING TO THE HOLDING POINT FOR DEPARTURE.

**DOBLU**  
01° 03' 47" N  
104° 13' 15" E  
Cross 6000ft or blw

NOT TO SCALE





### (A) BASIC RNAV DEPARTURES

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

#### ANITO DEPARTURES

STANDARD DEPARTURE INSTRUMENT (SID)	RUNWAY	TAKE OFF INSTRUCTIONS	DEPARTURE INSTRUCTIONS
<b>ANITO FIVE ALPHA DEPARTURE (ANI 5A)</b>	<b>02C</b>	CLIMB STRAIGHT AHEAD TO TOKIM. CROSS TOKIM AT OR ABOVE 2000FT. AT TOKIM TURN RIGHT AND TRACK 115° TO DOKTA THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT DOKTA TURN RIGHT AND TRACK 173° TO DOBLU. CROSS DOKTA AT OR ABOVE 4 000FT. CROSS DOBLU AT OR BELOW 6 000FT OR AS DIRECTED BY ATC. AT DOBLU TRACK 177° TO DOSNO THEN TURN LEFT AND TRACK 150° TO ANITO AND JOIN ATS ROUTE B470.
<b>ANITO FOUR BRAVO DEPARTURE (ANI 4B)</b>	<b>20C</b>	CLIMB STRAIGHT AHEAD TO SUDPO. AT SUDPO TURN LEFT AND TRACK 180° TO SUSIN. CROSS SUDPO AT OR ABOVE 2 000FT. CROSS SUSIN AT OR ABOVE 4 000FT, THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT SUSIN TURN LEFT AND TRACK 120° TO DOBLU. CROSS DOBLU AT OR BELOW 6 000 FT OR AS DIRECTED BY ATC. AT DOBLU, TURN RIGHT AND TRACK 177° TO DOSNO THEN TURN LEFT AND TRACK 150° TO ANITO AND JOIN ATS ROUTE B470.

### (B) RADIO COMMUNICATIONS FAILURE PROCEDURE

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

### (C) RADIAL AND DME FROM VOR/DME

WAY POINTS	VTK VOR/DME	SJ VOR/DME
ANITO	VTK R-153.4/D113.4	SJ R-146.0/D108.6
DOBLU	VTK R-150.4/D24.2	SJ R-113.4/D24.0
DOKTA	VTK R-083/D9.4	SJ R-057/R23.2
DOSNO	VTK R-160.8/D39.0	SJ R-137.8/D34.1
SUDPO	VTK R-203.4/D8.0	SJ R-059.0/D8.0
SUSIN	VTK R-194.5/D12.8	SJ R-097.2/D6.9
TOKIM	VTK R-022.7/D5.0	SJ R-036.7/D20.1

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

TWR 118.6 / 118.25  
APP 120.3 / 124.05  
ACC 133.25

TRANSITION ALTITUDE  
11 000ft

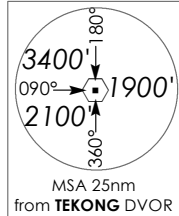
D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02L/20R**

**BOBAG DEPARTURES  
BOG 1E (R02L), BOG 1F (R20R)  
RNAV(GNSS)**

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

DISTANCES IN NM



**NOTE:** RADAR REQUIRED

**NOTE:** REFER TO BACK PAGE FOR  
A) CONVENTIONAL PROCEDURES  
B) RADIO COM FAILURE PROCEDURES  
C) CROSS REFERENCE FROM NAVAID

**GENERAL INFORMATION**

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

**RWY 02L**

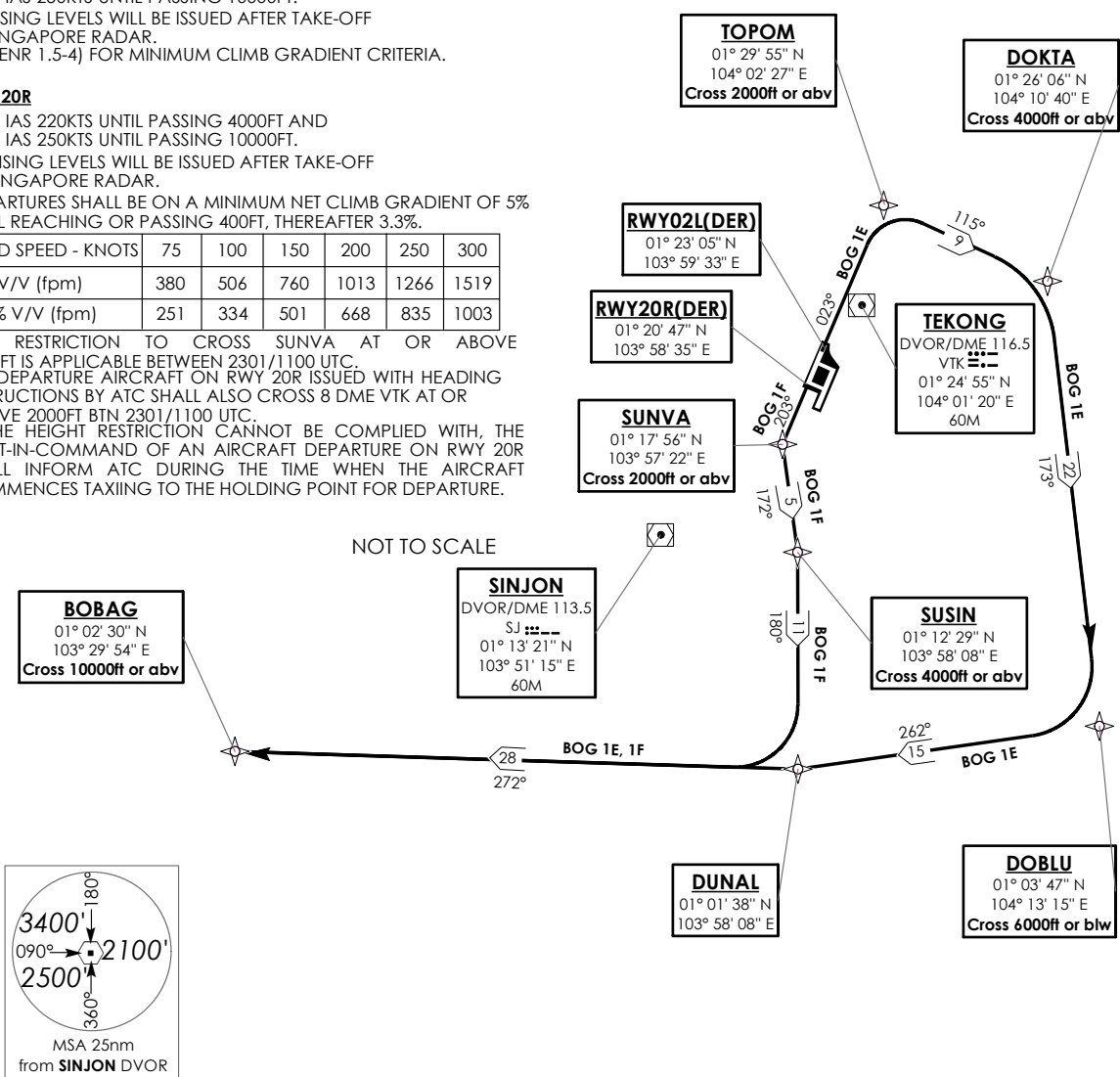
MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

**RWY 20R**

MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%  
UNTIL REACHING OR PASSING 400FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

THE RESTRICTION TO CROSS SUNVA AT OR ABOVE  
2000FT IS APPLICABLE BETWEEN 2301/1100 UTC.  
ALL DEPARTURE AIRCRAFT ON RWY 20R ISSUED WITH HEADING  
INSTRUCTIONS BY ATC SHALL ALSO CROSS 8 DME VTK AT OR  
ABOVE 2000FT BTN 2301/1100 UTC.  
IF THE HEIGHT RESTRICTION CANNOT BE COMPLIED WITH, THE  
PILOT-IN-COMMAND OF AN AIRCRAFT DEPARTURE ON RWY 20R  
SHALL INFORM ATC DURING THE TIME WHEN THE AIRCRAFT  
COMMENCES TAXIING TO THE HOLDING POINT FOR DEPARTURE.



### (A) BASIC RNAV DEPARTURES

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

#### BOBAG DEPARTURES

STANDARD DEPARTURE INSTRUMENT (SID)	RUNWAY	TAKE OFF INSTRUCTIONS	DEPARTURE INSTRUCTIONS
<b>BOBAG ONE ECHO DEPARTURE (BOG 1E)</b>	<b>02L</b>	CLIMB STRAIGHT AHEAD TO TOPOM. CROSS TOPOM AT OR ABOVE 2000FT. AT TOPOM TURN RIGHT AND TRACK 115° TO DOKTA THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT DOKTA TURN RIGHT AND TRACK 173° TO DOBLU. CROSS DOKTA AT OR ABOVE 4 000FT. CROSS DOBLU AT OR BELOW 6 000FT OR AS DIRECTED BY ATC. AT DOBLU TURN RIGHT AND TRACK 262° TO DUNAL, THEN TRACK 272° TO BOBAG AND JOIN ATS ROUTE R469. CROSS BOBAG AT OR ABOVE 10 000FT
<b>BOBAG ONE FOXTROT DEPARTURE (BOG 1F)</b>	<b>20R</b>	CLIMB STRAIGHT AHEAD TO SUNVA. AT SUNVA TURN LEFT AND TRACK 172° TO SUSIN. CROSS SUNVA AT OR ABOVE 2 000FT. CROSS SUSIN AT OR ABOVE 4 000FT, THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT SUSIN TRACK 180° TO DUNAL THEN TURN RIGHT AND TRACK 272° TO BOBAG AND JOIN ATS ROUTE R469. CROSS BOBAG AT OR ABOVE 10 000FT

### (B) RADIO COMMUNICATIONS FAILURE PROCEDURE

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

### (C) RADIAL AND DME FROM VOR/DME

WAY POINTS	VTK VOR/DME	SJ VOR/DME
BOBAG	VTK R-234.7/D38.6	SJ R-243.2/D24.0
DOBLU	VTK R-150.4/D24.2	SJ R-113.4/D24.0
DOKTA	VTK R-083/D9.4	SJ R-057/R23.2
DUNAL	VTK R-187.9/D23.4	SJ R-149.4/D13.5
SUNVA	VTK R-209.7/D8.0	SJ R-053.3/D7.6
SUSIN	VTK R-194.5/D12.8	SJ R-097.2/D6.9
TOPOM	VTK R-012.8/D5.1	SJ R-034.2/D20.0

**STANDARD DEPARTURE CHART -  
INSTRUMENT**

TWR 118.6 / 118.25  
APP 120.3 / 124.05  
ACC 133.25

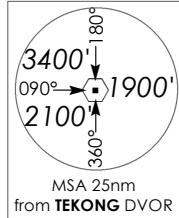
TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02C/20C  
BOBAG DEPARTURES  
BOG 1A (R02C), BOG 1B (R20C)  
RNAV(GNSS)**

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

DISTANCES IN NM



**NOTE:** RADAR REQUIRED

**NOTE:** REFER TO BACK PAGE FOR  
A) CONVENTIONAL PROCEDURES  
B) RADIO COM FAILURE PROCEDURES  
C) CROSS REFERENCE FROM NAVAID

**GENERAL INFORMATION**

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

**RWY 02C**

MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

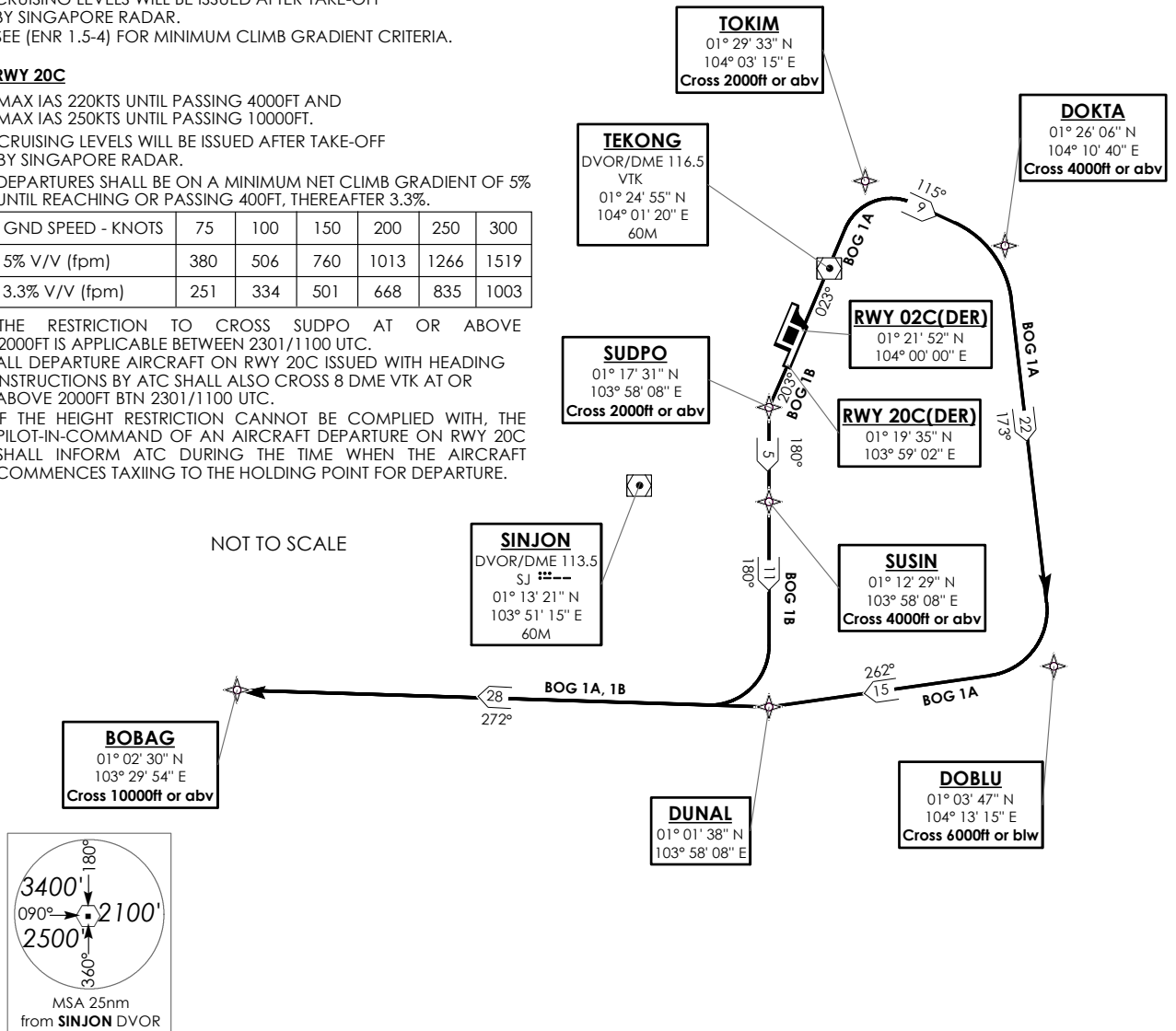
**RWY 20C**

MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%  
UNTIL REACHING OR PASSING 4000FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

THE RESTRICTION TO CROSS SUDPO AT OR ABOVE  
20000FT IS APPLICABLE BETWEEN 2301/1100 UTC.  
ALL DEPARTURE AIRCRAFT ON RWY 20C ISSUED WITH HEADING  
INSTRUCTIONS BY ATC SHALL ALSO CROSS 8 DME VTK AT OR  
ABOVE 20000FT BTN 2301/1100 UTC.  
IF THE HEIGHT RESTRICTION CANNOT BE COMPLIED WITH, THE  
PILOT-IN-COMMAND OF AN AIRCRAFT DEPARTURE ON RWY 20C  
SHALL INFORM ATC DURING THE TIME WHEN THE AIRCRAFT  
COMMENCES TAXIING TO THE HOLDING POINT FOR DEPARTURE.

NOT TO SCALE





**(A) BASIC RNAV DEPARTURES**

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

**BOBAG DEPARTURES**

STANDARD DEPARTURE INSTRUMENT (SID)	RUNWAY	TAKE OFF INSTRUCTIONS	DEPARTURE INSTRUCTIONS
<b>BOBAG ONE ALPHA DEPARTURE (BOG 1A)</b>	<b>02C</b>	CLIMB STRAIGHT AHEAD TO TOKIM. CROSS TOKIM AT OR ABOVE 2000FT. AT TOKIM TURN RIGHT AND TRACK 115° TO DOKTA THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT DOKTA TURN RIGHT AND TRACK 173° TO DOBLU. CROSS DOKTA AT OR ABOVE 4 000FT. CROSS DOBLU AT OR BELOW 6 000FT OR AS DIRECTED BY ATC. AT DOBLU TURN RIGHT AND TRACK 262° TO DUNAL, THEN TRACK 272° TO BOBAG AND JOIN ATS ROUTE R469. CROSS BOBAG AT OR ABOVE 10 000FT
<b>BOBAG ONE BRAVO DEPARTURE (BOG 1B)</b>	<b>20C</b>	CLIMB STRAIGHT AHEAD TO SUDPO. AT SUDPO TURN LEFT AND TRACK 180° TO SUSIN. CROSS SUDPO AT OR ABOVE 2 000FT. CROSS SUSIN AT OR ABOVE 4 000FT. THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT SUSIN TRACK 180° TO DUNAL THEN TURN RIGHT AND TRACK 272° TO BOBAG AND JOIN ATS ROUTE R469. CROSS BOBAG AT OR ABOVE 10 000FT

**(B) RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

**(C) RADIAL AND DME FROM VOR/DME**

WAY POINTS	VTK VOR/DME	SJ VOR/DME
BOBAG	VTK R-234.7/D38.6	SJ R-243.2/D24.0
DOBLU	VTK R-150.4/D24.2	SJ R-113.4/D24.0
DOKTA	VTK R-083/D9.4	SJ R-057/R23.2
DUNAL	VTK R-187.9/D23.4	SJ R-149.4/D13.5
SUDPO	VTK R-203.4/D8.0	SJ R-059.0/D8.0
SUSIN	VTK R-194.5/D12.8	SJ R-097.2/D6.9
TOKIM	VTK R-022.7/D5.0	SJ R-036.7/D20.1



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

TWR 118.6 / 118.25  
APP 120.3 / 124.05  
ACC 134.2

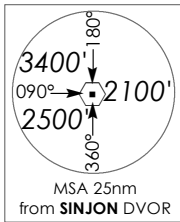
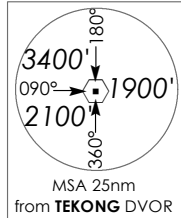
TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02L/20R  
TOMAN DEPARTURES  
TOM 1E (R02L), TOM 1F (R20R)  
RNAV(GNSS)**

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

DISTANCES IN NM



**GENERAL INFORMATION**

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

ALL SID'S INCLUDE NOISE PREFERENTIAL ROUTES.

**RWY 02L**

MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

**RWY 20R**

MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%  
UNTIL REACHING OR PASSING 400FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

THE RESTRICTION TO CROSS SUNVA AT OR ABOVE  
2000FT IS APPLICABLE BETWEEN 2301/1100 UTC.

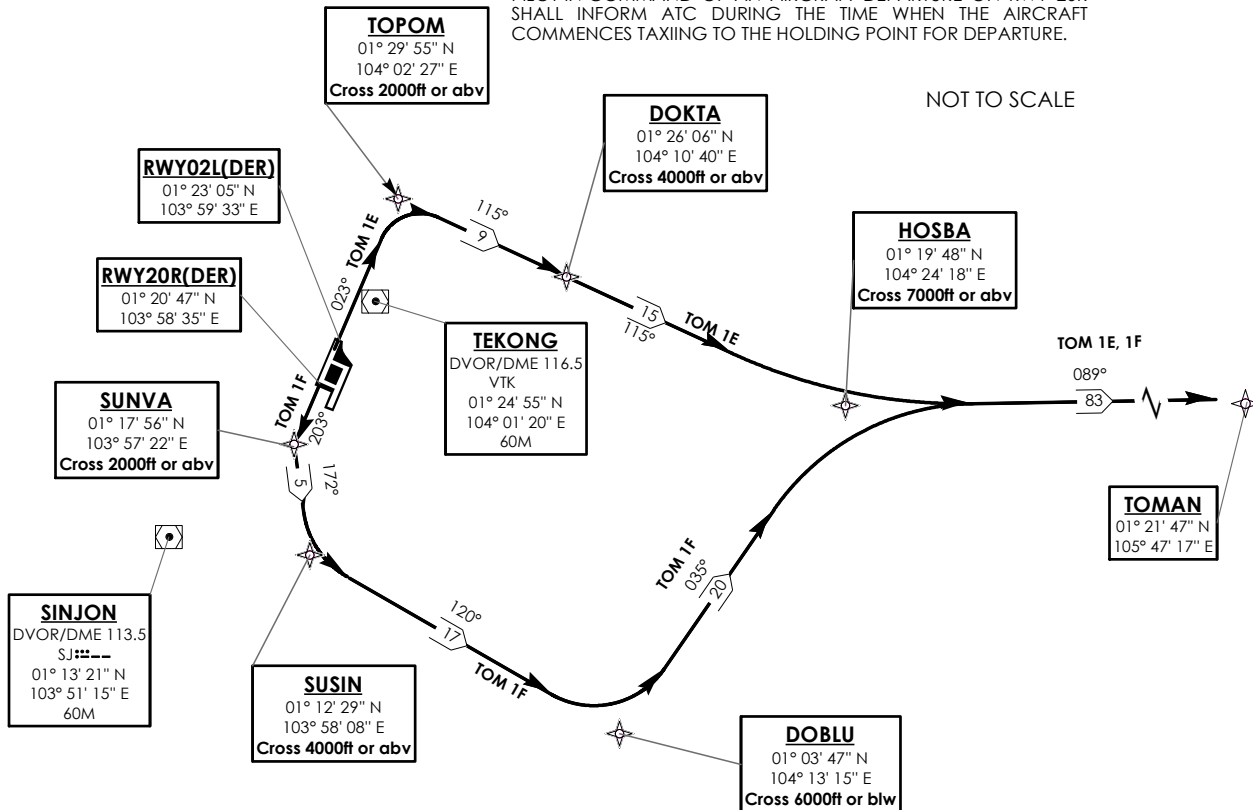
ALL DEPARTURE AIRCRAFT ON RWY 20R ISSUED WITH HEADING  
INSTRUCTIONS BY ATC SHALL ALSO CROSS 8 DME VTK AT OR  
ABOVE 2000FT BTN 2301/1100 UTC.

IF THE HEIGHT RESTRICTION CANNOT BE COMPLIED WITH, THE  
PILOT-IN-COMMAND OF AN AIRCRAFT DEPARTURE ON RWY 20R  
SHALL INFORM ATC DURING THE TIME WHEN THE AIRCRAFT  
COMMENCES TAXIING TO THE HOLDING POINT FOR DEPARTURE.

**NOTE: RADAR REQUIRED**

**NOTE: REFER TO BACK PAGE FOR**  
A) CONVENTIONAL  
PROCEDURES  
B) RADIO COM FAILURE  
PROCEDURES  
C) CROSS REFERENCE  
FROM NAVAID

NOT TO SCALE



## (A) BASIC RNAV DEPARTURES

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

### TOMAN DEPARTURES

STANDARD DEPARTURE INSTRUMENT (SID)	RUNWAY	TAKE OFF INSTRUCTIONS	DEPARTURE INSTRUCTIONS
TOMAN ONE ECHO DEPARTURE (TOM 1E)	02L	CLIMB STRAIGHT AHEAD TO TOPOM. CROSS TOPOM AT OR ABOVE 2000FT. AT TOPOM TURN RIGHT AND TRACK 115° TO DOKTA THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT DOKTA TRACK 115° TO HOSBA THEN TURN LEFT AND TRACK 089° TO TOMAN. CROSS DOKTA AT OR ABOVE 4 000FT. CROSS HOSBA AT OR ABOVE 7 000FT.
TOMAN ONE FOXTROT DEPARTURE (TOM 1F)	20R	CLIMB STRAIGHT AHEAD TO SUNVA. AT SUNVA TURN LEFT AND TRACK 172° TO SUSIN. CROSS SUNVA AT OR ABOVE 2 000FT. CROSS SUSIN AT OR ABOVE 4 000FT, THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT SUSIN TURN LEFT AND TRACK 120° TO DOBLU. CROSS DOBLU AT OR BELOW 6 000FT OR AS DIRECTED BY ATC. AT DOBLU TURN LEFT AND TRACK 035° TO HOSBA THEN TURN RIGHT AND TRACK 089° TO TOMAN. CROSS HOSBA AT OR ABOVE 7 000FT.

## (B) RADIO COMMUNICATIONS FAILURE PROCEDURE

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

## (C) RADIAL AND DME FROM VOR/DME

WAY POINTS	VTK VOR/DME	SJ VOR/DME
DOBLU	VTK R-150.4/D24.2	SJ R-113.4/D24.0
DOKTA	VTK R-083/D9.4	SJ R-057/R23.2
HOSBA	VTK R-102.5/D23.6	SJ R-079.0/D33.7
SUNVA	VTK R-209.7/D8.0	SJ R-053.3/D7.6
SUSIN	VTK R-194.5/D12.8	SJ R-097.2/D6.9
TOMAN	VTK R-091.7/D106.2	SJ R-085.9/D116.5
TOPOM	VTK R-012.8/D5.1	SJ R-034.2/D20.0

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

TWR 118.6 / 118.25  
APP 120.3 / 124.05  
ACC 134.2

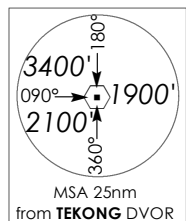
TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

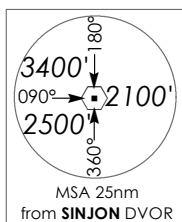
**SINGAPORE/Singapore Changi  
RWY 02C/20C  
TOMAN DEPARTURES  
TOM 1A (R02C), TOM 1B (R20C)  
RNAV(GNSS)**

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

DISTANCES IN NM



NOT TO SCALE



**GENERAL INFORMATION**

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

**RWY 02C**

MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.

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

**RWY 20C**

MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.

CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.

DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%  
UNTIL REACHING OR PASSING 400FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

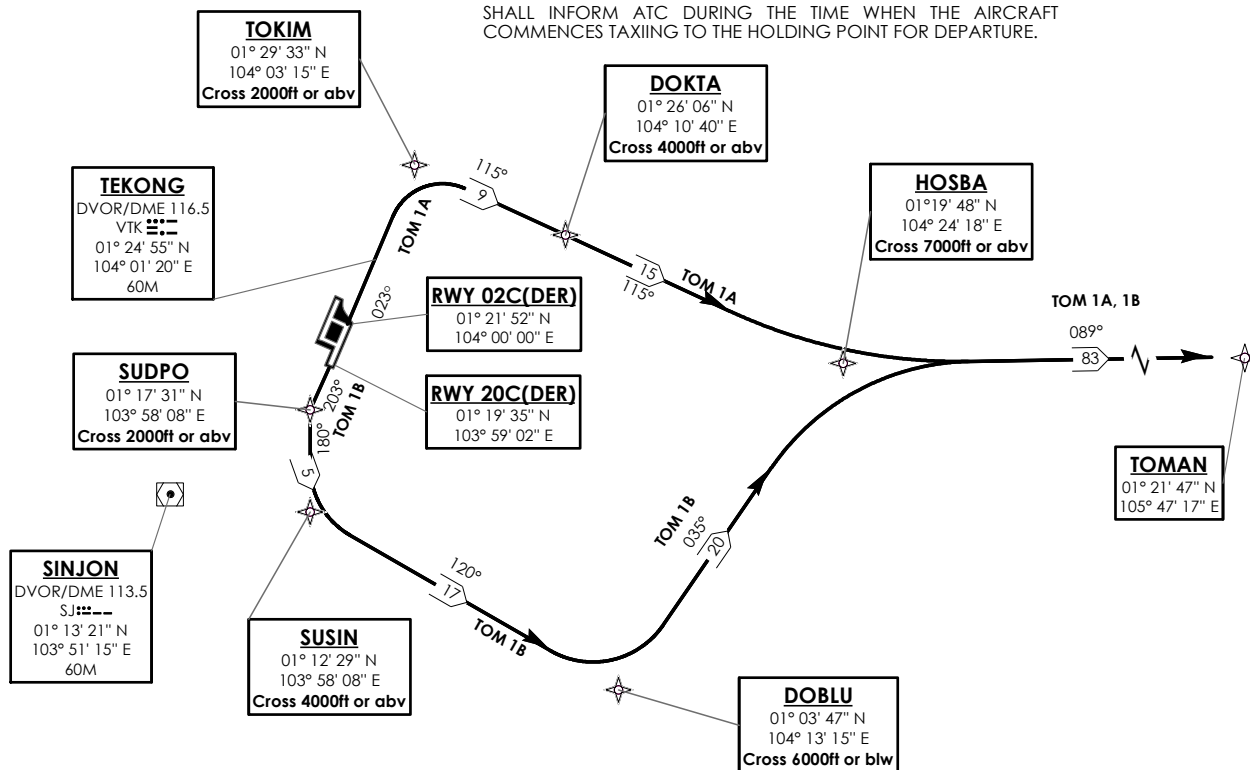
THE RESTRICTION TO CROSS SUDPO AT OR ABOVE  
2000FT IS APPLICABLE BETWEEN 2301/1100 UTC.

ALL DEPARTURE AIRCRAFT ON RWY 20C ISSUED WITH HEADING  
INSTRUCTIONS BY ATC SHALL ALSO CROSS 8 DME VTK AT OR  
ABOVE 2000FT BTN 2301/1100 UTC.

IF THE HEIGHT RESTRICTION CANNOT BE COMPLIED WITH, THE  
PILOT-IN-COMMAND OF AN AIRCRAFT DEPARTURE ON RWY 20C  
SHALL INFORM ATC DURING THE TIME WHEN THE AIRCRAFT  
COMMENCES TAXIING TO THE HOLDING POINT FOR DEPARTURE.

**NOTE: RADAR REQUIRED**

**NOTE: REFER TO BACK PAGE FOR**  
A) CONVENTIONAL  
PROCEDURES  
B) RADIO COM FAILURE  
PROCEDURES  
C) CROSS REFERENCE  
FROM NAVAID



### (A) BASIC RNAV DEPARTURES

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

#### TOMAN DEPARTURES

STANDARD DEPARTURE INSTRUMENT (SID)	RUNWAY	TAKE OFF INSTRUCTIONS	DEPARTURE INSTRUCTIONS
TOMAN ONE ALPHA DEPARTURE (TOM 1A)	02C	CLIMB STRAIGHT AHEAD TO TOKIM. CROSS TOKIM AT OR ABOVE 2000FT. AT TOKIM TURN RIGHT AND TRACK 115° TO DOKTA THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT DOKTA TRACK 115° TO HOSBA THEN TURN LEFT AND TRACK 089° TO TOMAN. CROSS DOKTA AT OR ABOVE 4 000FT. CROSS HOSBA AT OR ABOVE 7 000FT.
TOMAN ONE BRAVO DEPARTURE (TOM 1B)	20C	CLIMB STRAIGHT AHEAD TO SUDPO. AT SUDPO TURN LEFT AND TRACK 180° TO SUSIN. CROSS SUDPO AT OR ABOVE 2 000FT. CROSS SUSIN AT OR ABOVE 4 000FT, THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT SUSIN TURN LEFT AND TRACK 120° TO DOBLU. CROSS DOBLU AT OR BELOW 6 000FT OR AS DIRECTED BY ATC. AT DOBLU TURN LEFT AND TRACK 035° TO HOSBA THEN TURN RIGHT AND TRACK 089° TO TOMAN. CROSS HOSBA AT OR ABOVE 7 000FT.

### (B) RADIO COMMUNICATIONS FAILURE PROCEDURE

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

### (C) RADIAL AND DME FROM VOR/DME

WAY POINTS	VTK VOR/DME	SJ VOR/DME
DOBLU	VTK R-150.4/D24.2	SJ R-113.4/D24.0
DOKTA	VTK R-083/D9.4	SJ R-057/R23.2
HOSBA	VTK R-102.5/D23.6	SJ R-079.0/D33.7
SUDPO	VTK R-203.4/D8.0	SJ R-059.0/D8.0
SUSIN	VTK R-194.5/D12.8	SJ R-097.2/D6.9
TOKIM	VTK R-022.7/D5.0	SJ R-036.7/D20.1
TOMAN	VTK R-091.7/D106.2	SJ R-085.9/D116.5

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

TWR 118.6 / 118.25  
APP 120.3 / 124.05  
ACC 134.4

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02L/20R  
VENPA DEPARTURES  
VENPA 1E (R02L), VENPA 1F (R20R)  
RNAV(GNSS)**

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

DISTANCES IN NM

**TOPOM**  
01° 29' 55" N  
104° 02' 27" E  
Cross 2000ft or abv

**RWY02L(DER)**  
01° 23' 05" N  
103° 59' 33" E

**RWY20R(DER)**  
01° 20' 47" N  
103° 58' 35" E

**TEKONG**  
DVOR/DME 116.5  
VTK  
01° 24' 55" N  
104° 01' 20" E  
60M

**SUNVA**  
01° 17' 56" N  
103° 57' 22" E  
Cross 2000ft or abv

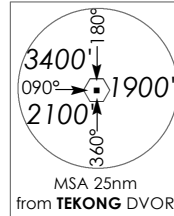
**SINJON**  
DVOR/DME 113.5  
SJ  
01° 13' 21" N  
103° 51' 15" E  
60M

**SUSIN**  
01° 12' 29" N  
103° 58' 08" E  
Cross 4000ft or abv

**DOBLU**  
01° 03' 47" N  
104° 13' 15" E  
Cross 6000ft or blw

**DOSNO**  
00° 47' 57" N  
104° 14' 09" E

**DOKTA**  
01° 26' 06" N  
104° 10' 40" E  
Cross 4000ft or abv



**GENERAL INFORMATION**

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

**RWY 02L**

MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

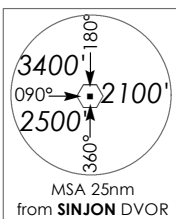
**RWY 20R**

MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%  
UNTIL REACHING OR PASSING 4000FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

THE RESTRICTION TO CROSS SUNVA AT OR ABOVE  
2000FT IS APPLICABLE BETWEEN 2301/1100 UTC.  
ALL DEPARTURE AIRCRAFT ON RWY 20R ISSUED WITH HEADING  
INSTRUCTIONS BY ATC SHALL ALSO CROSS 8 DME VTK AT OR  
ABOVE 2000FT BTN 2301/1100 UTC.  
IF THE HEIGHT RESTRICTION CANNOT BE COMPLIED WITH, THE  
PILOT-IN-COMMAND OF AN AIRCRAFT DEPARTURE ON RWY 20R  
SHALL INFORM ATC DURING THE TIME WHEN THE AIRCRAFT  
COMMENCES TAXIING TO THE HOLDING POINT FOR DEPARTURE.

NOT TO SCALE



**VENPA**  
00° 21' 41" N  
104° 49' 55" E

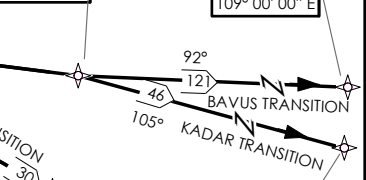
**VENIX**  
00° 21' 56" S  
106° 05' 21" E

**SURGA**  
00° 36' 57" S  
106° 31' 19" E

**ATKAX**  
00° 05' 12" N  
106° 59' 46" E

**BAVUS**  
00° 00' 00" N  
109° 00' 00" E

**KADAR**  
00° 06' 47" S  
107° 43' 42" E



**NOTE: RADAR REQUIRED**  
**NOTE: REFER TO BACK PAGE FOR**  
A) CONVENTIONAL PROCEDURES  
B) RADIO COM FAILURE PROCEDURES  
C) CROSS REFERENCE FROM NAVAID

### (A) BASIC RNAV DEPARTURES

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

#### VENPA DEPARTURES

STANDARD DEPARTURE INSTRUMENT (SID)	RUNWAY	TAKE OFF INSTRUCTIONS	DEPARTURE INSTRUCTIONS
VENPA ONE ECHO DEPARTURE (VENPA 1E)	02L	CLIMB STRAIGHT AHEAD TO TOPOM. CROSS TOPOM AT OR ABOVE 2000FT. AT TOPOM TURN RIGHT AND TRACK 115° TO DOKTA THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT DOKTA TURN RIGHT AND TRACK 173° TO DOBLU. CROSS DOKTA AT OR ABOVE 4 000FT. CROSS DOBLU AT OR BELOW 6 000FT OR AS DIRECTED BY ATC. AT DOBLU TRACK 177° TO DOSNO THEN TURN LEFT AND TRACK 126° TO VENPA. FROM VENPA, FOLLOW THE APPROPRIATE TRANSITION ROUTE TO JOIN THE ATS ROUTE.
VENPA ONE FOXTROT DEPARTURE (VENPA 1F)	20R	CLIMB STRAIGHT AHEAD TO SUNVA. AT SUNVA TURN LEFT AND TRACK 172° TO SUSIN. CROSS SUNVA AT OR ABOVE 2 000FT. CROSS SUSIN AT OR ABOVE 4 000FT, THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT SUSIN TURN LEFT AND TRACK 120° TO DOBLU. CROSS DOBLU AT OR BELOW 6 000 FT OR AS DIRECTED BY ATC. AT DOBLU, TURN RIGHT AND TRACK 177° TO DOSNO THEN TURN LEFT AND TRACK 126° TO VENPA. FROM VENPA, FOLLOW THE APPROPRIATE TRANSITION ROUTE TO JOIN THE ATS ROUTE.

### (B) RADIO COMMUNICATIONS FAILURE PROCEDURE

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

### (C) RADIAL AND DME FROM VOR/DME

WAY POINTS	VTK VOR/DME	SJ VOR/DME
DOBLU	VTK R-150.4/D24.2	SJ R-113.4/D24.0
DOKTA	VTK R-083/D9.4	SJ R-057/R23.2
DOSNO	VTK R-160.8/D39.0	SJ R-137.8/D34.1
SUNVA	VTK R-209.7/D8.0	SJ R-053.3/D7.6
SUSIN	VTK R-194.5/D12.8	SJ R-097.2/D6.9
TOPOM	VTK R-012.8/D5.1	SJ R-034.2/D20.0
VENPA	VTK R-142.3/D79.6	SJ R-131.2/D78.1
VENIX	VTK R-130.6/D163.5	SJ R-125.3/D164.3
ATKAX	VTK R-113.9/D195.5	SJ R-109.7/D200.6

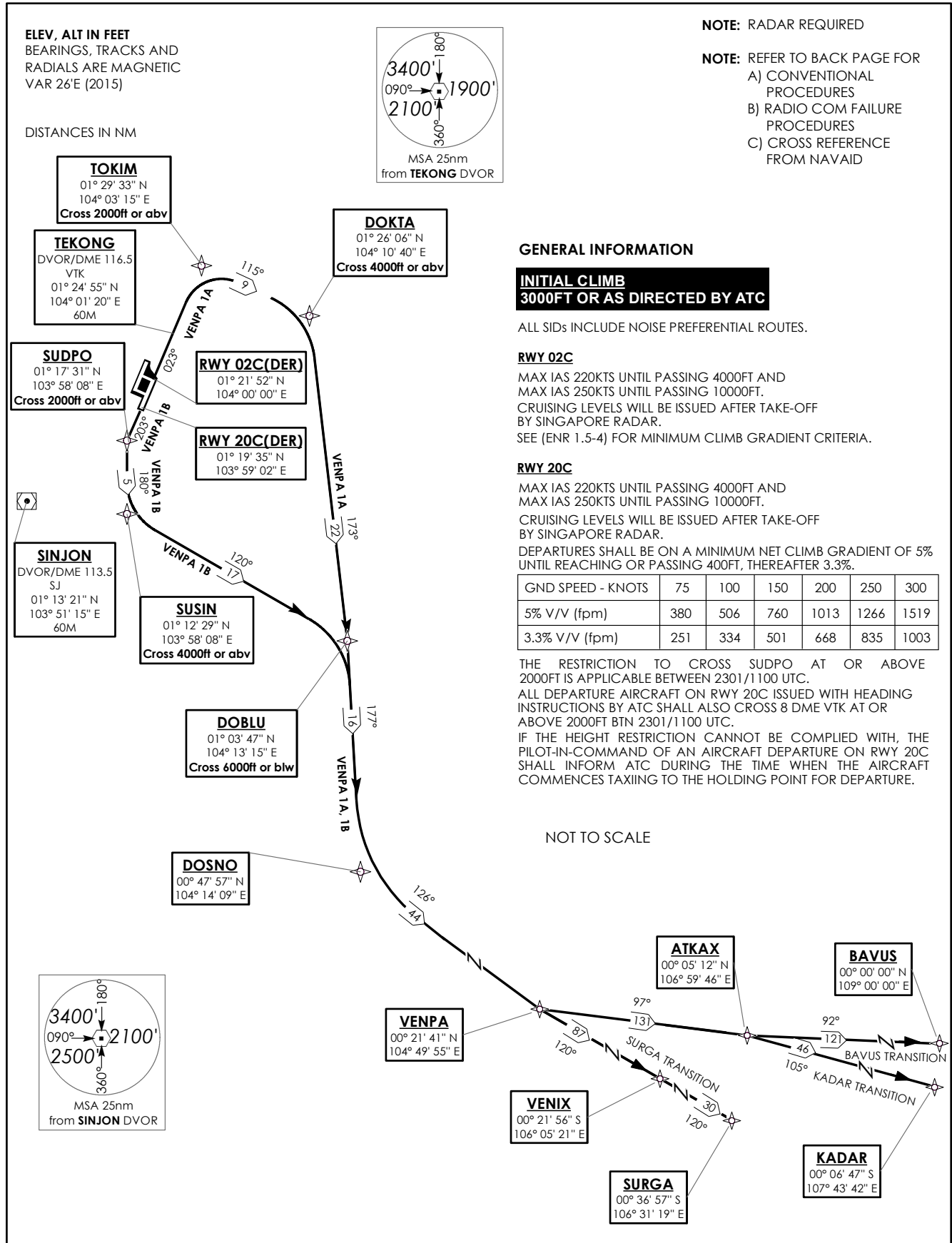
**STANDARD DEPARTURE CHART -  
INSTRUMENT (SID)**

TWR 118.6 / 118.25  
APP 120.3 / 124.05  
ACC 134.4

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02C/20C  
VENPA DEPARTURES  
VENPA 1A (R02C), VENPA 1B (R20C)  
RNAV(GNSS)**



### (A) BASIC RNAV DEPARTURES

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

#### VENPA DEPARTURES

STANDARD DEPARTURE INSTRUMENT (SID)	RUNWAY	TAKE OFF INSTRUCTIONS	DEPARTURE INSTRUCTIONS
VENPA ONE ALPHA DEPARTURE (VENPA 1A)	02C	CLIMB STRAIGHT AHEAD TO TOKIM. CROSS TOKIM AT OR ABOVE 2000FT. AT TOKIM TURN RIGHT AND TRACK 115° TO DOKTA THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT DOKTA TURN RIGHT AND TRACK 173° TO DOBLU. CROSS DOKTA AT OR ABOVE 4 000FT. CROSS DOBLU AT OR BELOW 6 000FT OR AS DIRECTED BY ATC. AT DOBLU TRACK 177° TO DOSNO THEN TURN LEFT AND TRACK 126° TO VENPA. FROM VENPA, FOLLOW THE APPROPRIATE TRANSITION ROUTE TO JOIN THE ATS ROUTE.
VENPA ONE BRAVO DEPARTURE (VENPA 1B)	20C	CLIMB STRAIGHT AHEAD TO SUDPO. AT SUDPO TURN LEFT AND TRACK 180° TO SUSIN. CROSS SUDPO AT OR ABOVE 2 000FT. CROSS SUSIN AT OR ABOVE 4 000FT, THEN FOLLOW DEPARTURE INSTRUCTIONS.	AT SUSIN TURN LEFT AND TRACK 120° TO DOBLU. CROSS DOBLU AT OR BELOW 6 000 FT OR AS DIRECTED BY ATC. AT DOBLU, TURN RIGHT AND TRACK 177° TO DOSNO THEN TURN LEFT AND TRACK 126° TO VENPA. FROM VENPA, FOLLOW THE APPROPRIATE TRANSITION ROUTE TO JOIN THE ATS ROUTE.

### (B) RADIO COMMUNICATIONS FAILURE PROCEDURE

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

### (C) RADIAL AND DME FROM VOR/DME

WAY POINTS	VTK VOR/DME	SJ VOR/DME
DOBLU	VTK R-150.4/D24.2	SJ R-113.4/D24.0
DOKTA	VTK R-083/D9.4	SJ R-057/R23.2
DOSNO	VTK R-160.8/D39.0	SJ R-137.8/D34.1
SUDPO	VTK R-203.4/D8.0	SJ R-059.0/D8.0
SUSIN	VTK R-194.5/D12.8	SJ R-097.2/D6.9
TOKIM	VTK R-022.7/D5.0	SJ R-036.7/D20.1
VENPA	VTK R-142.3/D79.6	SJ R-131.2/D78.1
VENIX	VTK R-130.6/D163.5	SJ R-125.3/D164.3
ATKAX	VTK R-113.9/D195.5	SJ R-109.7/D200.6



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

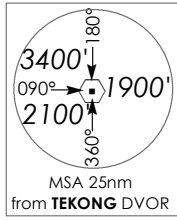
TWR 118.6 / 118.25  
APP 120.3 / 124.05  
ACC 133.25

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

**SINGAPORE/Singapore Changi  
RWY 02L/20R  
AROSO DEPARTURES  
ARO 1E (R02L), ARO 1F (R20R)  
RNAV(GNSS)**

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

DISTANCES IN NM



**AROSO**  
02° 08' 46" N  
103° 24' 21" E

**NOTE: RADAR REQUIRED**

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

**NOTE: REFER TO BACK PAGE FOR  
RADIO COM FAILURE  
PROCEDURES**

NOT TO SCALE

**GENERAL INFORMATION**

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

**RWY 02L**

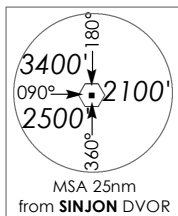
MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

**RWY 20R**

MAX IAS 220KTS UNTIL SAKIN AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%  
UNTIL REACHING OR PASSING 400FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

THE RESTRICTION TO CROSS SUNVA AT OR ABOVE  
2000FT IS APPLICABLE BETWEEN 2301/1100 UTC.  
ALL DEPARTURE AIRCRAFT ON RWY 20R ISSUED WITH HEADING  
INSTRUCTIONS BY ATC SHALL ALSO CROSS 8 DME VTK AT OR  
ABOVE 2000FT BTN 2301/1100 UTC.  
IF THE HEIGHT RESTRICTION CANNOT BE COMPLIED WITH, THE  
PILOT-IN-COMMAND OF AN AIRCRAFT DEPARTURE ON RWY 20R  
SHALL INFORM ATC DURING THE TIME WHEN THE AIRCRAFT  
COMMENCES TAXIING TO THE HOLDING POINT FOR DEPARTURE.



**SINJON**  
DVOR/DME 113.5  
SJ :--  
01° 13' 21" N  
103° 51' 15" E  
60M

**SUSIN**  
01° 12' 29" N  
103° 58' 08" E

**RWY02L (DER)**  
01° 23' 05" N  
103° 59' 33" E

**RWY20R (DER)**  
01° 20' 47" N  
103° 58' 35" E

**SUNVA**  
01° 17' 56" N  
103° 57' 22" E  
A020

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

**TEKONG**  
DVOR/DME 116.5  
VTK :--  
01° 24' 55" N  
104° 01' 20" E  
60M  
A070

**SULUG**  
01° 15' 33" N  
104° 04' 21" E

**SAKIN**  
01° 11' 57" N  
104° 02' 37" E  
A040

**AKMET**  
01° 53' 55" N  
103° 43' 39" E  
A110

**AKOMA**  
01° 45' 22" N  
103° 54' 43" E  
A070  
For ARO 1E only

**AROSO 1E (RWY 02L) RNAV SID – DESCRIPTIONS****Formal & Abbreviated Descriptions**

Formal Description (AROSO 1E)	Abbreviated Description	Expected Path Terminator	Flyover required
To TOPOM on course 023°M, at A020 minimum, IAS 220kts maximum	TOPOM [M023, A020+, K220-]	CF	-
To AKOMA at A070 minimum	AKOMA [A070+]	TF	-
To AKMET at A110 minimum	AKMET [A110+]	TF	-
To AROSO	AROSO	TF	-

**Tabular Description (AROSO 1E)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical Angle	Navigation Performance
CF	TOPOM	-	023 (022.5)	-	A020+	K220-	-0.5	-	RNAV1
TF	AKOMA	-	332 (331.5)	L	A070+	-	-0.5	-	RNAV1
TF	AKMET	-	308 (307.5)	L	A110+	-	-0.5	-	RNAV1
TF	AROSO	-	308 (307.5)	-	-	-	-0.5	-	RNAV1

**AROSO 1F (RWY 20R) RNAV SID – DESCRIPTIONS****Formal & Abbreviated Descriptions**

Formal Description (AROSO 1F)	Abbreviated Description	Expected Path Terminator	Flyover required
To SUNVA on course 203°M, at A020 minimum, IAS 220kts maximum	SUNVA [M023, A020+, K220-]	CF	-
To SUSIN, IAS 220kts maximum	SUSIN [K220-]	TF	-
To SAKIN at A040 minimum, IAS 220kts maximum	SAKIN [A40+, K220-]	TF	-
To SULUG	SULUG	TF	-
To VTK at A070 minimum	VTK [A070+]	TF	-
To AKOMA	AKOMA	TF	-
To AKMET at A110 minimum	AKMET [A110+]	TF	-
To AROSO	AROSO	TF	-

**Tabular Description (AROSO 1F)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical Angle	Navigation Performance
CF	SUNVA	-	203 (202.5)	-	A020+	K220-	-0.5	-	RNAV1
TF	SUSIN	-	172 (171.5)	L	-	K220-	-0.5	-	RNAV1
TF	SAKIN	-	097 (096.5)	L	A040+	K220-	-0.5	-	RNAV1
TF	SULUG	-	026 (025.5)	L	-	-	-0.5	-	RNAV1
TF	VTK	-	342 (341.5)	L	A070+	-	-0.5	-	RNAV1
TF	AKOMA	-	342 (341.5)	-	-	-	-0.5	-	RNAV1
TF	AKMET	-	308 (307.5)	L	A110+	-	-0.5	-	RNAV1
TF	AROSO	-	308 (307.5)	-	-	-	-0.5	-	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

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

TWR 118.6 / 118.25  
APP 120.3 / 124.05  
ACC 133.25

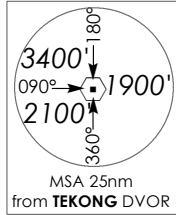
TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02L/20R  
MASBO DEPARTURES  
MAS 1E (R02L), MAS 1F (R20R)  
RNAV(GNSS)**

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

DISTANCES IN NM



**NOTE:** RADAR REQUIRED

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

**NOTE:** REFER TO BACK PAGE FOR  
RADIO COM FAILURE  
PROCEDURES

**MASBO**  
02° 02' 48" N  
102° 52' 51" E

**SABKA**  
01° 50' 51" N  
103° 17' 13" E

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

**AKOMA**  
01° 45' 22" N  
103° 54' 43" E  
**A070**  
For MAS 1E only

**GENERAL INFORMATION**

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

NOT TO SCALE

**RWY 02L**

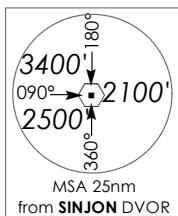
MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

**RWY 20R**

MAX IAS 220KTS UNTIL SAKIN AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%  
UNTIL REACHING OR PASSING 400FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

THE RESTRICTION TO CROSS SUNVA AT OR ABOVE  
2000FT IS APPLICABLE BETWEEN 2301/1100 UTC.  
ALL DEPARTURE AIRCRAFT ON RWY 20R ISSUED WITH HEADING  
INSTRUCTIONS BY ATC SHALL ALSO CROSS 8 DME VTK AT OR  
ABOVE 2000FT BTN 2301/1100 UTC.  
IF THE HEIGHT RESTRICTION CANNOT BE COMPLIED WITH, THE  
PILOT-IN-COMMAND OF AN AIRCRAFT DEPARTURE ON RWY 20R  
SHALL INFORM ATC DURING THE TIME WHEN THE AIRCRAFT  
COMMENCES TAXIING TO THE HOLDING POINT FOR DEPARTURE.



**RWY02L (DER)**  
01° 23' 05" N  
103° 59' 33" E

**RWY20R (DER)**  
01° 20' 47" N  
103° 58' 35" E

**SUNVA**  
01° 17' 56" N  
103° 57' 22" E  
**A020**

**SINJON**  
DVOR/DME 113.5  
SJ ---  
01° 13' 21" N  
103° 51' 15" E  
60M

**SUSIN**  
01° 12' 29" N  
103° 58' 08" E

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

**TEKONG**  
DVOR/DME 116.5  
VTK ---  
01° 24' 55" N  
104° 01' 20" E  
60M  
**A070**  
For MAS 1F only

**SULUG**  
01° 15' 33" N  
104° 04' 21" E

**SAKIN**  
01° 11' 57" N  
104° 02' 37" E  
**A040**

### **MASBO 1E (RWY 02L) RNAV SID – DESCRIPTIONS**

#### **Formal & Abbreviated Descriptions**

<b>Formal Description (MASBO 1E)</b>	<b>Abbreviated Description</b>	<b>Expected Path Terminator</b>	<b>Flyover required</b>
To TOPOM on course 023°M, at A020 minimum, IAS 220kts maximum	TOPOM [M023, A020+, K220-]	CF	-
To AKOMA at A070 minimum	AKOMA [A070+]	TF	-
To AGVAR at A110 minimum	AGVAR [A110+]	TF	-
To SABKA	SABKA	TF	-
To MASBO	MASBO	TF	-

#### **Tabular Description (MASBO 1E)**

<b>Path Term</b>	<b>Waypoint Name</b>	<b>Flyover</b>	<b>Course °M (°T)</b>	<b>Turn Direction</b>	<b>Altitude</b>	<b>Speed Limit</b>	<b>Magnetic Variation</b>	<b>Vertical Angle</b>	<b>Navigation Performance</b>
CF	TOPOM	-	023 (022.5)	-	A020+	K220-	-0.5	-	RNAV1
TF	AKOMA	-	333 (332.5)	L	A070+	-	-0.5	-	RNAV1
TF	AGVAR	-	278 (277.5)	L	A110+	-	-0.5	-	RNAV1
TF	SABKA	-	278 (277.5)	-	-	-	-0.5	-	RNAV1
TF	MASBO	-	296 (295.5)	R	-	-	-0.5	-	RNAV1

### **MASBO 1F (RWY 20R) RNAV SID – DESCRIPTIONS**

#### **Formal & Abbreviated Descriptions**

<b>Formal Description (MASBO 1F)</b>	<b>Abbreviated Description</b>	<b>Expected Path Terminator</b>	<b>Flyover required</b>
To SUNVA on course 203°M, at A020 minimum, IAS 220kts maximum	SUNVA [M023, A020+, K220-]	CF	-
To SUSIN, IAS 220kts maximum	SUSIN [K220-]	TF	-
To SAKIN at A040 minimum, IAS 220kts maximum	SAKIN [A40+, K220-]	TF	-
To SULUG	SULUG	TF	-
To VTK at A070 minimum	VTK [A070+]	TF	-
To AKOMA	AKOMA	TF	-
To AGVAR at A110 minimum	AGVAR [A110+]	TF	-
To SABKA	SABKA	TF	-
To MASBO	MASBO	TF	-

#### **Tabular Description (MASBO 1F)**

<b>Path Term</b>	<b>Waypoint Name</b>	<b>Flyover</b>	<b>Course °M (°T)</b>	<b>Turn Direction</b>	<b>Altitude</b>	<b>Speed Limit</b>	<b>Magnetic Variation</b>	<b>Vertical Angle</b>	<b>Navigation Performance</b>
CF	SUNVA	-	203 (202.5)	-	A020+	K220-	-0.5	-	RNAV1
TF	SUSIN	-	172 (171.5)	L	-	K220-	-0.5	-	RNAV1
TF	SAKIN	-	097 (096.5)	L	A040+	K220-	-0.5	-	RNAV1
TF	SULUG	-	026 (025.5)	L	-	-	-0.5	-	RNAV1
TF	VTK	-	342 (341.5)	L	A070+	-	-0.5	-	RNAV1
TF	AKOMA	-	342 (341.5)	-	-	-	-0.5	-	RNAV1
TF	AGVAR	-	278 (277.5)	L	A110+	-	-0.5	-	RNAV1
TF	SABKA	-	278 (277.5)	-	-	-	-0.5	-	RNAV1
TF	MASBO	-	296 (295.5)	R	-	-	-0.5	-	RNAV1

### **RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

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

TWR 118.6 / 118.25  
APP 120.3 / 124.05  
ACC 133.25

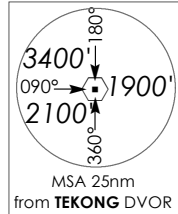
TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02C/20C  
AROSO DEPARTURES  
ARO 1A (R02C), ARO 1B (R20C)  
RNAV(GNSS)**

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

DISTANCES IN NM

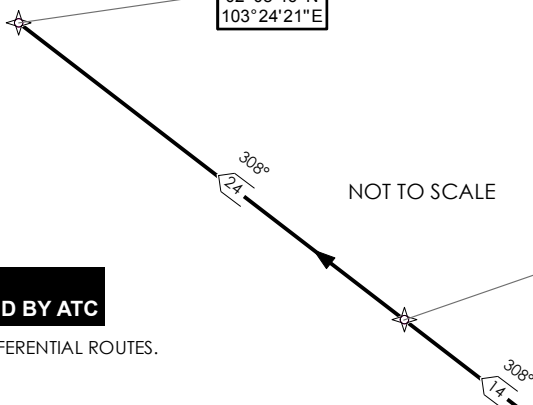


**NOTE:** RADAR REQUIRED

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

**NOTE:** REFER TO BACK PAGE FOR  
RADIO COM FAILURE  
PROCEDURES

**AROSO**  
02° 08' 46" N  
103° 24' 21" E



**GENERAL INFORMATION**

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

**RWY 02C**

MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

**RWY 20C**

MAX IAS 220KTS UNTIL SAKIN AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%  
UNTIL REACHING OR PASSING 400FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

THE RESTRICTION TO CROSS SUDPO AT OR ABOVE  
2000FT IS APPLICABLE BETWEEN 2301/1100 UTC.  
ALL DEPARTURE AIRCRAFT ON RWY 20C ISSUED WITH HEADING  
INSTRUCTIONS BY ATC SHALL ALSO CROSS 8 DME VTK AT OR  
ABOVE 2000FT BTN 2301/1100 UTC.  
IF THE HEIGHT RESTRICTION CANNOT BE COMPLIED WITH, THE  
PILOT-IN-COMMAND OF AN AIRCRAFT DEPARTURE ON RWY 20C  
SHALL INFORM ATC DURING THE TIME WHEN THE AIRCRAFT  
COMMENCES TAXIING TO THE HOLDING POINT FOR DEPARTURE.

**AKMET**  
01° 53' 55" N  
103° 43' 39" E  
A110

**AKOMA**  
01° 45' 22" N  
103° 54' 43" E  
A070  
For ARO 1A only

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

**RWY 02C (DER)**  
01° 21' 52" N  
104° 00' 00" E

**RWY 20C (DER)**  
01° 19' 35" N  
103° 59' 02" E

**TEKONG**  
DVOR/DME 116.5  
VTK  
01° 24' 55" N  
104° 01' 20" E  
60M  
A070  
For ARO 1B only

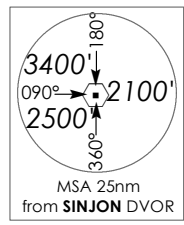
**SUDPO**  
01° 17' 31" N  
103° 58' 08" E  
A020

**SULUG**  
01° 15' 33" N  
104° 04' 21" E

**SINJON**  
DVOR/DME 113.5  
SJ  
01° 13' 21" N  
103° 51' 15" E  
60M

**SUSIN**  
01° 12' 29" N  
103° 58' 08" E

**SAKIN**  
01° 11' 57" N  
104° 02' 37" E  
A040



**AROSO 1A (RWY 02C) RNAV SID – DESCRIPTIONS****Formal & Abbreviated Descriptions**

Formal Description (AROSO 1A)	Abbreviated Description	Expected Path Terminator	Flyover required
To TOKIM on course 023°M, at A020 minimum, IAS 220kts maximum	TOKIM [M023, A020+, K220-]	CF	-
To AKOMA at A070 minimum	AKOMA [A070+]	TF	-
To AKMET at A110 minimum	AKMET [A110+]	TF	-
To AROSO	AROSO	TF	-

**Tabular Description (AROSO 1A)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical Angle	Navigation Performance
CF	TOKIM	-	023 (022.5)	-	A020+	K220-	-0.5	-	RNAV1
TF	AKOMA	-	332 (331.5)	L	A070+	-	-0.5	-	RNAV1
TF	AKMET	-	308 (307.5)	L	A110+	-	-0.5	-	RNAV1
TF	AROSO	-	308 (307.5)	-	-	-	-0.5	-	RNAV1

**AROSO 1B (RWY 20C) RNAV SID – DESCRIPTIONS****Formal & Abbreviated Descriptions**

Formal Description (AROSO 1B)	Abbreviated Description	Expected Path Terminator	Flyover required
To SUDPO on course 203°M, at A020 minimum, IAS 220kts maximum	SUDPO [M023, A020+, K220-]	CF	-
To SUSIN, IAS 220kts maximum	SUSIN [K220-]	TF	-
To SAKIN at A040 minimum, IAS 220kts maximum	SAKIN [A40+, K220-]	TF	-
To SULUG	SULUG	TF	-
To VTK at A070 minimum	VTK [A070+]	TF	-
To AKOMA	AKOMA	TF	-
To AKMET at A110 minimum	AKMET [A110+]	TF	-
To AROSO	AROSO	TF	-

**Tabular Description (AROSO 1B)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical Angle	Navigation Performance
CF	SUDPO	-	203 (202.5)	-	A020+	K220-	-0.5	-	RNAV1
TF	SUSIN	-	180 (179.5)	L	-	K220-	-0.5	-	RNAV1
TF	SAKIN	-	097 (096.5)	L	A040+	K220-	-0.5	-	RNAV1
TF	SULUG	-	026 (025.5)	L	-	-	-0.5	-	RNAV1
TF	VTK	-	342 (341.5)	L	A070+	-	-0.5	-	RNAV1
TF	AKOMA	-	342 (341.5)	-	-	-	-0.5	-	RNAV1
TF	AKMET	-	308 (307.5)	L	A110+	-	-0.5	-	RNAV1
TF	AROSO	-	308 (307.5)	-	-	-	-0.5	-	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

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

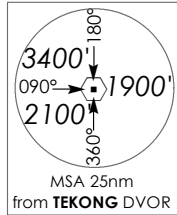
TWR 118.6 / 118.25 APP 120.3 / 124.05 ACC 133.25	TRANSITION ALTITUDE 11 000ft
D-ATIS AP ID-WSSS 128.6	

**SINGAPORE/Singapore Changi  
RWY 02C/20C**

**MASBO DEPARTURES  
MAS 1A (R02C), MAS 1B (R20C)  
RNAV(GNSS)**

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

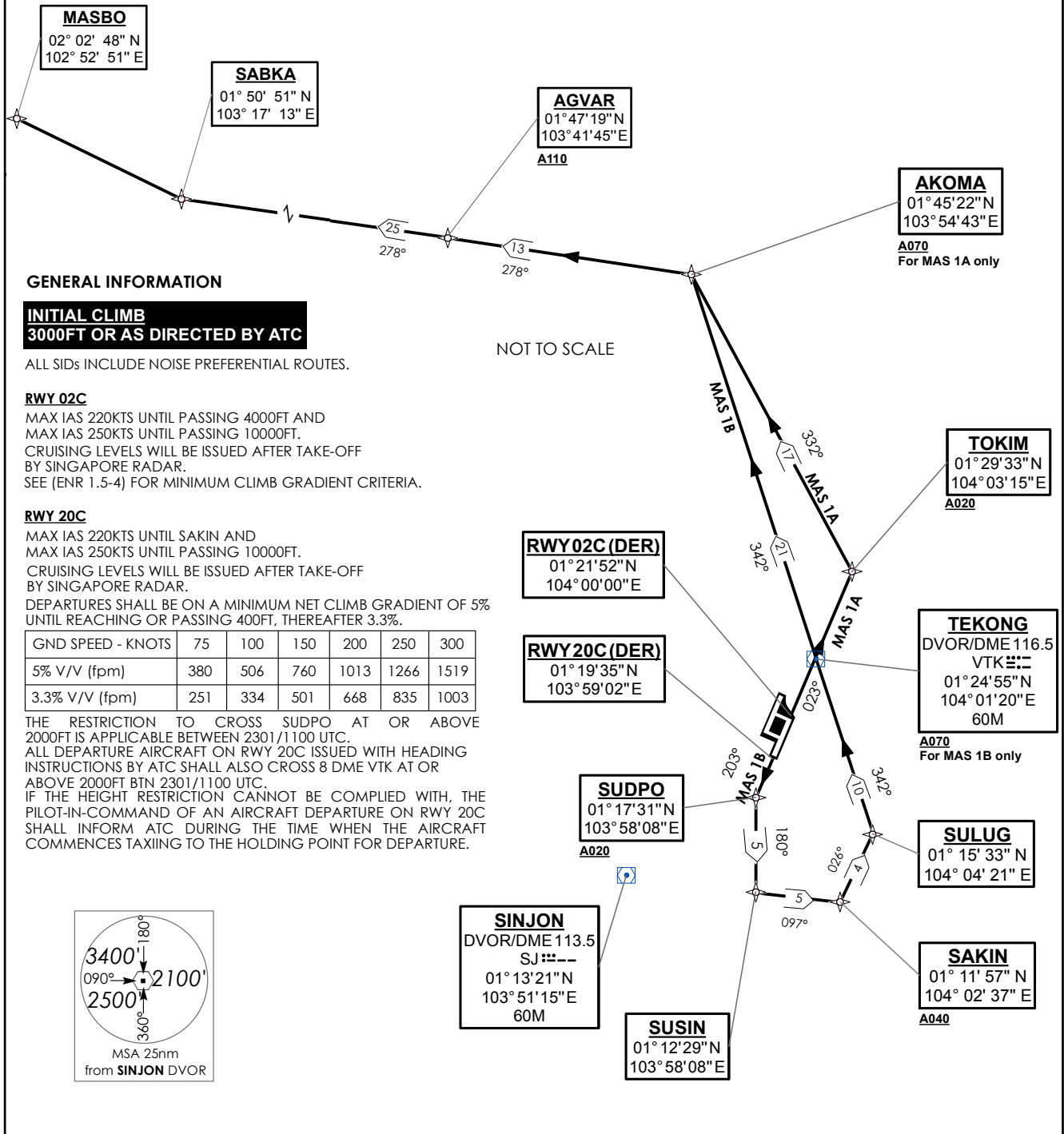
DISTANCES IN NM



**NOTE:** RADAR REQUIRED

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

**NOTE:** REFER TO BACK PAGE FOR  
RADIO COM FAILURE  
PROCEDURES



**GENERAL INFORMATION**

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

**RWY 02C**

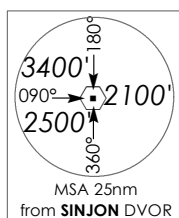
MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

**RWY 20C**

MAX IAS 220KTS UNTIL SAKIN AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%  
UNTIL REACHING OR PASSING 400FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

THE RESTRICTION TO CROSS SUDPO AT OR ABOVE  
2000FT IS APPLICABLE BETWEEN 2301/1100 UTC.  
ALL DEPARTURE AIRCRAFT ON RWY 20C ISSUED WITH HEADING  
INSTRUCTIONS BY ATC SHALL ALSO CROSS 8 DME VTK AT OR  
ABOVE 2000FT BTN 2301/1100 UTC.  
IF THE HEIGHT RESTRICTION CANNOT BE COMPLIED WITH, THE  
PILOT-IN-COMMAND OF AN AIRCRAFT DEPARTURE ON RWY 20C  
SHALL INFORM ATC DURING THE TIME WHEN THE AIRCRAFT  
COMMENCES TAXIING TO THE HOLDING POINT FOR DEPARTURE.



### **MASBO 1A (RWY 02C) RNAV SID – DESCRIPTIONS**

#### **Formal & Abbreviated Descriptions**

<b>Formal Description (MASBO 1A)</b>	<b>Abbreviated Description</b>	<b>Expected Path Terminator</b>	<b>Flyover required</b>
To TOKIM on course 023°M, at A020 minimum, IAS 220kts maximum	TOKIM [M023, A020+, K220-]	CF	-
To AKOMA at A070 minimum	AKOMA [A070+]	TF	-
To AGVAR at A110 minimum	AGVAR [A110+]	TF	-
To SABKA	SABKA	TF	-
To MASBO	MASBO	TF	-

#### **Tabular Description (MASBO 1A)**

<b>Path Term</b>	<b>Waypoint Name</b>	<b>Flyover</b>	<b>Course °M (°T)</b>	<b>Turn Direction</b>	<b>Altitude</b>	<b>Speed Limit</b>	<b>Magnetic Variation</b>	<b>Vertical Angle</b>	<b>Navigation Performance</b>
CF	TOKIM	-	023 (022.5)	-	A020+	K220-	-0.5	-	RNAV1
TF	AKOMA	-	332 (331.5)	L	A070+	-	-0.5	-	RNAV1
TF	AGVAR	-	278 (277.5)	L	A110+	-	-0.5	-	RNAV1
TF	SABKA	-	278 (277.5)	-	-	-	-0.5	-	RNAV1
TF	MASBO	-	296 (295.5)	R	-	-	-0.5	-	RNAV1

### **MASBO 1B (RWY 20C) RNAV SID – DESCRIPTIONS**

#### **Formal & Abbreviated Descriptions**

<b>Formal Description (MASBO 1B)</b>	<b>Abbreviated Description</b>	<b>Expected Path Terminator</b>	<b>Flyover required</b>
To SUDPO on course 203°M, at A020 minimum, IAS 220kts maximum	SUDPO [M023, A020+, K220-]	CF	-
To SUSIN, IAS 220kts maximum	SUSIN [K220-]	TF	-
To SAKIN at A040 minimum, IAS 220kts maximum	SAKIN [A40+, K220-]	TF	-
To SULUG	SULUG	TF	-
To VTK at A070 minimum	VTK [A070+]	TF	-
To AKOMA	AKOMA	TF	-
To AGVAR at A110 minimum	AGVAR [A110+]	TF	-
To SABKA	SABKA	TF	-
To MASBO	MASBO	TF	-

#### **Tabular Description (MASBO 1B)**

<b>Path Term</b>	<b>Waypoint Name</b>	<b>Flyover</b>	<b>Course °M (°T)</b>	<b>Turn Direction</b>	<b>Altitude</b>	<b>Speed Limit</b>	<b>Magnetic Variation</b>	<b>Vertical Angle</b>	<b>Navigation Performance</b>
CF	SUDPO	-	203 (202.5)	-	A020+	K220-	-0.5	-	RNAV1
TF	SUSIN	-	180 (179.5)	L	-	K220-	-0.5	-	RNAV1
TF	SAKIN	-	097 (096.5)	L	A040+	K220-	-0.5	-	RNAV1
TF	SULUG	-	026 (025.5)	L	-	-	-0.5	-	RNAV1
TF	VTK	-	342 (341.5)	L	A070+	-	-0.5	-	RNAV1
TF	AKOMA	-	342 (341.5)	-	-	-	-0.5	-	RNAV1
TF	AGVAR	-	278 (277.5)	L	A110+	-	-0.5	-	RNAV1
TF	SABKA	-	278 (277.5)	-	-	-	-0.5	-	RNAV1
TF	MASBO	-	296 (295.5)	R	-	-	-0.5	-	RNAV1

### **RADIO COMMUNICATIONS FAILURE PROCEDURE**

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



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

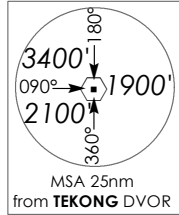
TWR 118.6 / 118.25  
APP 120.3 / 124.05  
ACC 133.25

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02L/20R  
MERSING DEPARTURES  
VMR 4E (R02L), VMR 5F (R20R)  
RNAV<sub>(GNSS)</sub>  
(VMR 4E WILL ALSO BE ASSIGNED  
DURING AIR DEFENCE EXERCISES)**

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



DISTANCES IN NM

**NOTE:** RADAR REQUIRED

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

**NOTE:** REFER TO BACK PAGE FOR  
RADIO COM FAILURE  
PROCEDURES

**GENERAL INFORMATION**

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

**RWY 02L**

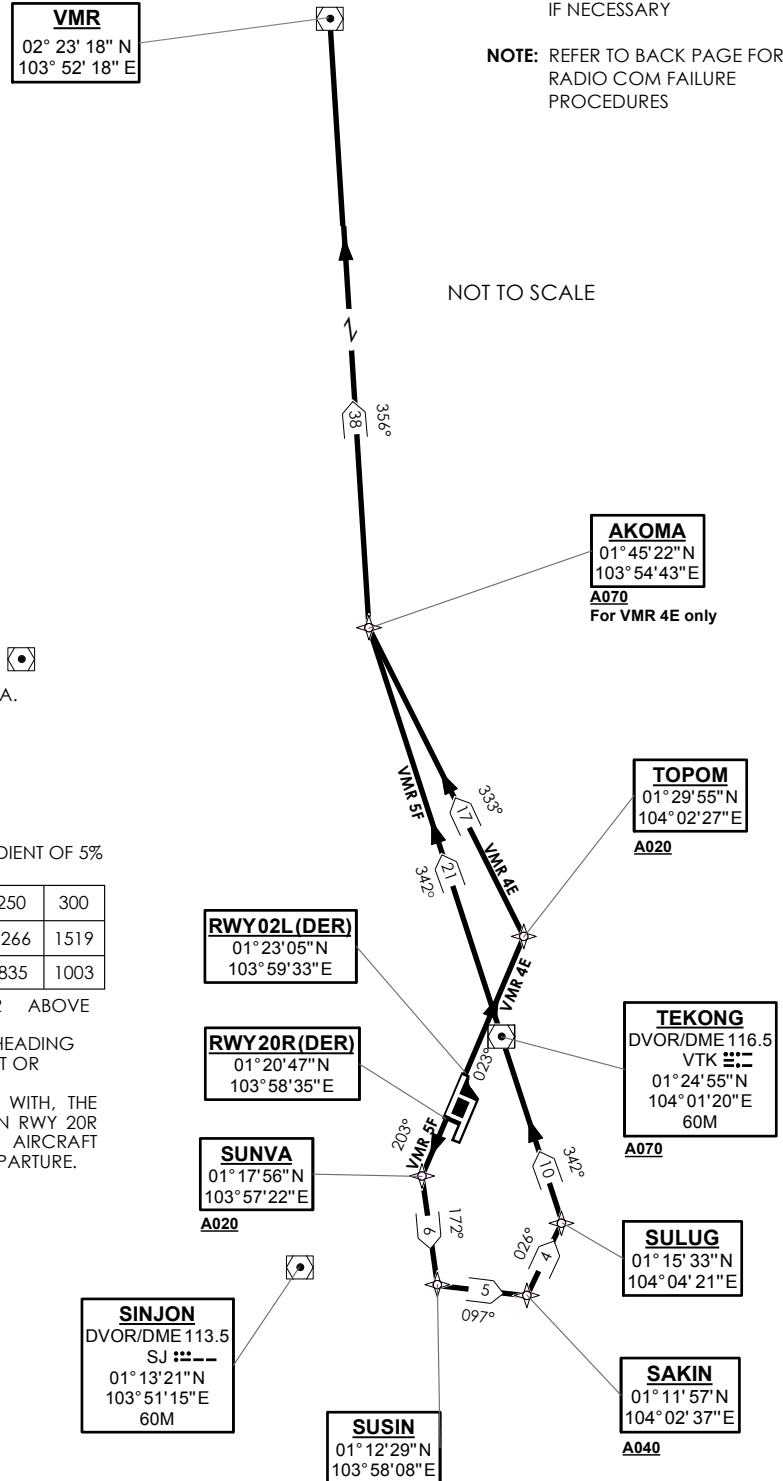
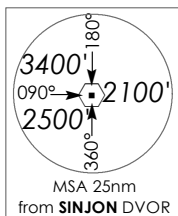
MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

**RWY 20R**

MAX IAS 220KTS UNTIL SAKIN AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%  
UNTIL REACHING OR PASSING 4000FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

THE RESTRICTION TO CROSS SUNVA AT OR ABOVE  
2000FT IS APPLICABLE BETWEEN 2301/1100 UTC.  
ALL DEPARTURE AIRCRAFT ON RWY 20R ISSUED WITH HEADING  
INSTRUCTIONS BY ATC SHALL ALSO CROSS 8 DME VTK AT OR  
ABOVE 2000FT BTN 2301/1100 UTC.  
IF THE HEIGHT RESTRICTION CANNOT BE COMPLIED WITH, THE  
PILOT-IN-COMMAND OF AN AIRCRAFT DEPARTURE ON RWY 20R  
SHALL INFORM ATC DURING THE TIME WHEN THE AIRCRAFT  
COMMENCES TAXIING TO THE HOLDING POINT FOR DEPARTURE.



**VMR 4E (RWY 02L) RNAV SID – DESCRIPTIONS****Formal & Abbreviated Descriptions**

Formal Description (VMR 4E)	Abbreviated Description	Expected Path Terminator	Flyover required
To TOPOM on course 023°M, at A020 minimum, IAS 220kts maximum	TOPOM [M023, A020+, K220-]	CF	-
To AKOMA at A070 minimum	AKOMA [A070+]	TF	-
To VMR	VMR	TF	-

**Tabular Description (VMR 4E)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical Angle	Navigation Performance
CF	TOPOM	-	023 (022.5)	-	A020+	K220-	-0.5	-	RNAV1
TF	AKOMA	-	332 (331.5)	L	A070+	-	-0.5	-	RNAV1
TF	VMR	-	356 (355.5)	L	-	-	-0.5	-	RNAV1

**VMR 5F (RWY 20R) RNAV SID – DESCRIPTIONS****Formal & Abbreviated Descriptions**

Formal Description (VMR 5F)	Abbreviated Description	Expected Path Terminator	Flyover required
To SUNVA on course 203°M, at A020 minimum, IAS 220kts maximum	SUNVA [M023, A020+, K220-]	CF	-
To SUSIN, IAS 220kts maximum	SUSIN [K220-]	TF	-
To SAKIN at A040 minimum, IAS 220kts maximum	SAKIN [A40+, K220-]	TF	-
To SULUG	SULUG	TF	-
To VTK at A070 minimum	VTK [A070+]	TF	-
To AKOMA	AKOMA	TF	-
To VMR	VMR	TF	-

**Tabular Description (VMR 5F)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical Angle	Navigation Performance
CF	SUNVA	-	203 (202.5)	-	A020+	K220-	-0.5	-	RNAV1
TF	SUSIN	-	172 (171.5)	L	-	K220-	-0.5	-	RNAV1
TF	SAKIN	-	097 (096.5)	L	A040+	K220-	-0.5	-	RNAV1
TF	SULUG	-	026 (025.5)	L	-	-	-0.5	-	RNAV1
TF	VTK	-	342 (341.5)	L	A070+	-	-0.5	-	RNAV1
TF	AKOMA	-	342 (341.5)	-	-	-	-0.5	-	RNAV1
TF	VMR	-	356 (355.5)	R	-	-	-0.5	-	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

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

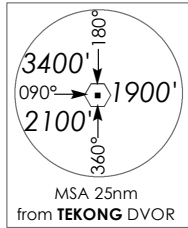
TWR 118.6 / 118.25  
APP 120.3 / 124.05  
ACC 133.25

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02C/20C  
MERSING DEPARTURES  
VMR 4A (R02C), VMR 5B (R20C)  
RNAV<sub>(GNSS)</sub>  
(VMR 4A WILL ALSO BE ASSIGNED  
DURING AIR DEFENCE EXERCISES)**

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



DISTANCES IN NM

**NOTE:** RADAR REQUIRED

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

**NOTE:** REFER TO BACK PAGE FOR  
RADIO COM FAILURE  
PROCEDURES

**GENERAL INFORMATION**

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

ALL SIDs INCLUDE NOISE PREFERENTIAL ROUTES.

**RWY 02C**

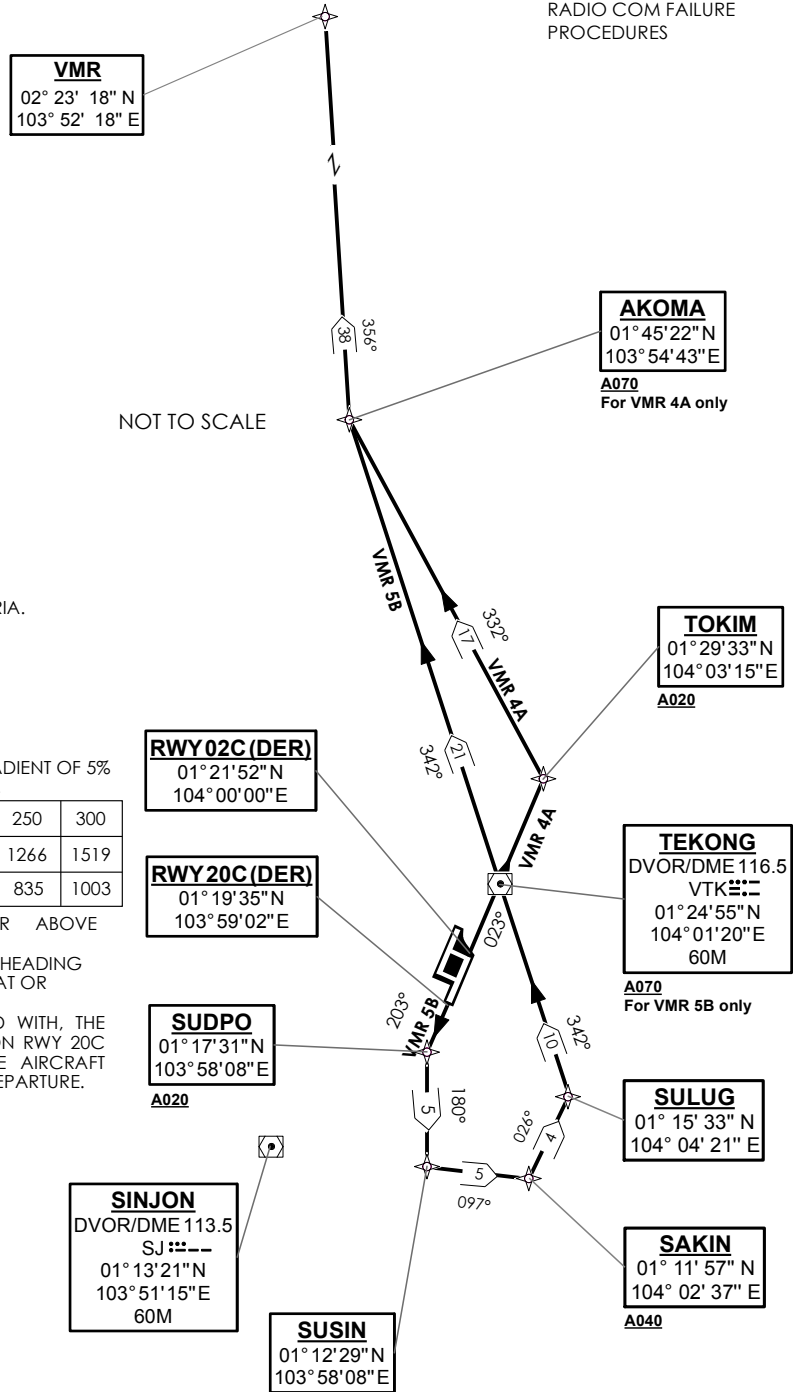
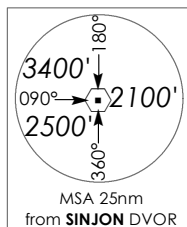
MAX IAS 220KTS UNTIL PASSING 4000FT AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
SEE (ENR 1.5-4) FOR MINIMUM CLIMB GRADIENT CRITERIA.

**RWY 20C**

MAX IAS 220KTS UNTIL SAKIN AND  
MAX IAS 250KTS UNTIL PASSING 10000FT.  
CRUISING LEVELS WILL BE ISSUED AFTER TAKE-OFF  
BY SINGAPORE RADAR.  
DEPARTURES SHALL BE ON A MINIMUM NET CLIMB GRADIENT OF 5%  
UNTIL REACHING OR PASSING 400FT, THEREAFTER 3.3%.

GND SPEED - KNOTS	75	100	150	200	250	300
5% V/V (fpm)	380	506	760	1013	1266	1519
3.3% V/V (fpm)	251	334	501	668	835	1003

THE RESTRICTION TO CROSS SUDPO AT OR ABOVE  
2000FT IS APPLICABLE BETWEEN 2301/1100 UTC.  
ALL DEPARTURE AIRCRAFT ON RWY 20C ISSUED WITH HEADING  
INSTRUCTIONS BY ATC SHALL ALSO CROSS 8 DME VTK AT OR  
ABOVE 2000FT BTN 2301/1100 UTC.  
IF THE HEIGHT RESTRICTION CANNOT BE COMPLIED WITH, THE  
PILOT-IN-COMMAND OF AN AIRCRAFT DEPARTURE ON RWY 20C  
SHALL INFORM ATC DURING THE TIME WHEN THE AIRCRAFT  
COMMENCES TAXIING TO THE HOLDING POINT FOR DEPARTURE.



**VMR 4A (RWY 02C) RNAV SID – DESCRIPTIONS****Formal & Abbreviated Descriptions**

Formal Description (VMR 4A)	Abbreviated Description	Expected Path Terminator	Flyover required
To TOKIM on course 023°M, at A020 minimum, IAS 220kts maximum	TOKIM [M023, A020+, K220-]	CF	-
To AKOMA at A070 minimum	AKOMA [A070+]	TF	-
To VMR	VMR	TF	-

**Tabular Description (VMR 4A)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical Angle	Navigation Performance
CF	TOKIM	-	023 (022.5)	-	A020+	K220-	-0.5	-	RNAV1
TF	AKOMA	-	332 (331.5)	L	A070+	-	-0.5	-	RNAV1
TF	VMR	-	356 (355.5)	R	-	-	-0.5	-	RNAV1

**VMR 5B (RWY 20C) RNAV SID – DESCRIPTIONS****Formal & Abbreviated Descriptions**

Formal Description (VMR 5B)	Abbreviated Description	Expected Path Terminator	Flyover required
To SUDPO on course 203°M, at A020 minimum, IAS 220kts maximum	SUDPO [M023, A020+, K220-]	CF	-
To SUSIN, IAS 220kts maximum	SUSIN [K220-]	TF	-
To SAKIN at A040 minimum, IAS 220kts maximum	SAKIN [A40+, K220-]	TF	-
To SULUG	SULUG	TF	-
To VTK at A070 minimum	VTK [A070+]	TF	-
To AKOMA	AKOMA	TF	-
To VMR	VMR	TF	-

**Tabular Description (VMR 5B)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical Angle	Navigation Performance
CF	SUDPO	-	203 (202.5)	-	A020+	K220-	-0.5	-	RNAV1
TF	SUSIN	-	180 (179.5)	L	-	K220-	-0.5	-	RNAV1
TF	SAKIN	-	097 (096.5)	L	A040+	K220-	-0.5	-	RNAV1
TF	SULUG	-	026 (025.5)	L	-	-	-	-	RNAV1
TF	VTK	-	342 (341.5)	L	A070+	-	-0.5	-	RNAV1
TF	AKOMA	-	342 (341.5)	-	-	-	-0.5	-	RNAV1
TF	VMR	-	356 (355.5)	L	-	-	-0.5	-	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

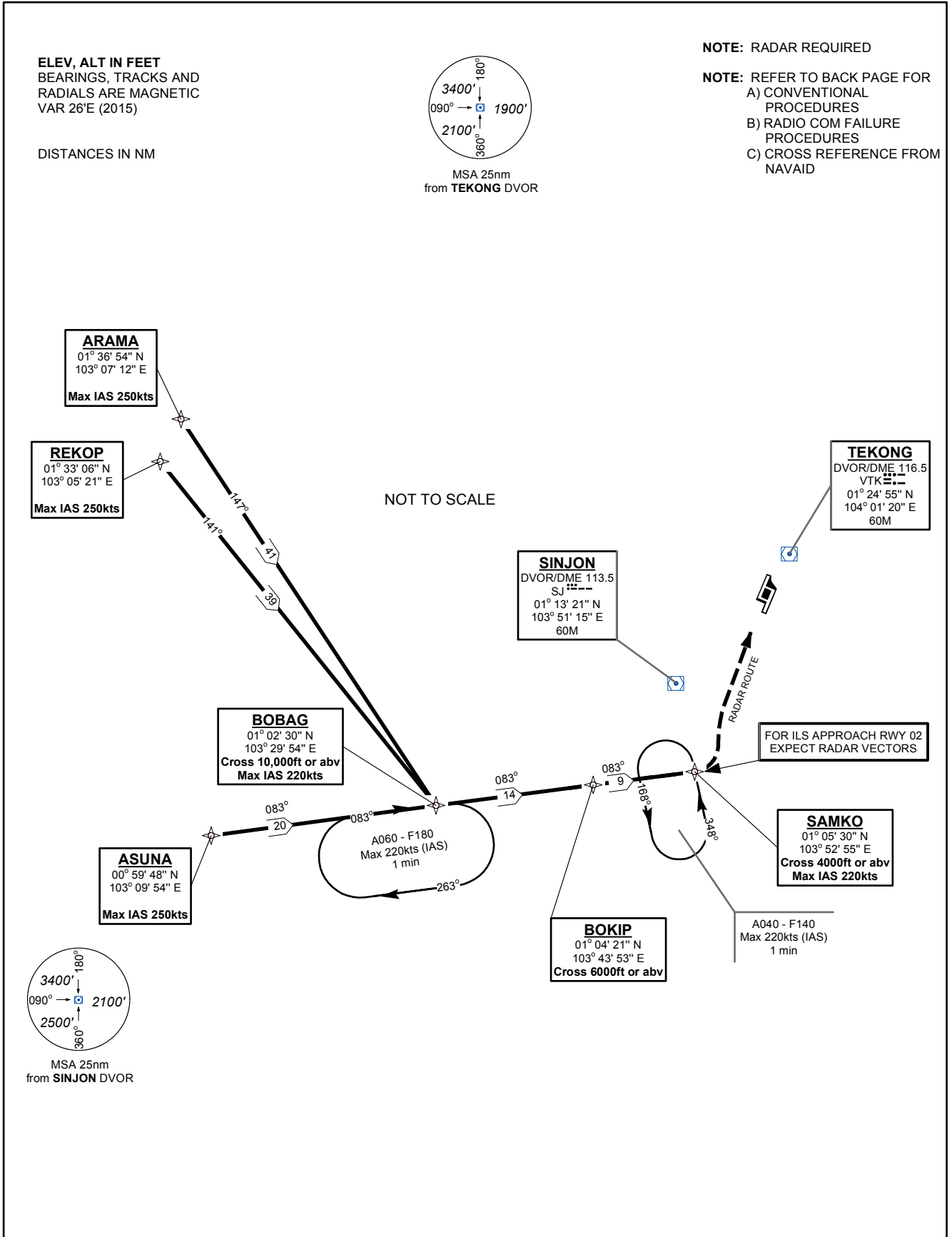
**STANDARD ARRIVAL CHART -  
INSTRUMENT (STAR)**

ACC 133.25  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02L/C  
BOBAG ONE ALPHA ARRIVAL  
BOBAG 1A  
RNAV<sub>(GNSS)</sub>**



**(A) BASIC RNAV ARRIVAL**

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

TRANSITIONS/ROUTE	BOBAG ONE ALPHA ARRIVAL (BOBAG 1A)
<b>ARAMA:</b> FROM ARAMA TO BOBAG <b>(A464)</b> FROM ARAMA TRACK 147° TO BOBAG. THEN FOLLOW THE APPROPRIATE BOBAG ARRIVAL.	AT BOBAG TRACK 083° TO BOKIP THEN TO SAMKO. CROSS BOBAG AT OR ABOVE 10 000FT AT MAX IAS 220 KTS. CROSS BOKIP AT OR ABOVE 6 000FT. CROSS SAMKO AT OR ABOVE 4 000FT AT MAX IAS 220KTS. FROM SAMKO, EXPECT RADAR VECTORS FOR ILS APPROACH RUNWAY 02.
<b>REKOP:</b> FROM REKOP TO BOBAG <b>(A576)</b> FROM REKOP TRACK 141° TO BOBAG. THEN FOLLOW THE APPROPRIATE BOBAG ARRIVAL.	
<b>R469</b>	

**(B) RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

**(C) RADIAL AND DME FROM VOR/DME**

WAY POINTS	VTK VOR/DME	SJ VOR/DME
ARAMA	VTK R-282.4/D55.5	SJ R-298.0/D50.0
ASUNA	VTK R-244.1/D57.3	SJ R-252.0/D43.6
BOBAG	VTK R-234.7/D38.6	SJ R-243.2/D24.0
BOKIP	VTK R-220.5/D27.0	SJ R-219.5/D11.6
REKOP	VTK R-278.3/D56.6	SJ R-293.1/D50.0
SAMKO	VTK R-203.5/D21.1	SJ R-168.0/D8.0

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

ACC 134.4  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02L  
BOBAG ONE KILO ARRIVAL  
BOBAG 1K  
RNAV<sub>(GNSS)</sub> CDO**

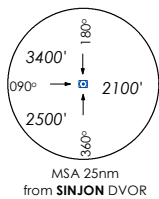
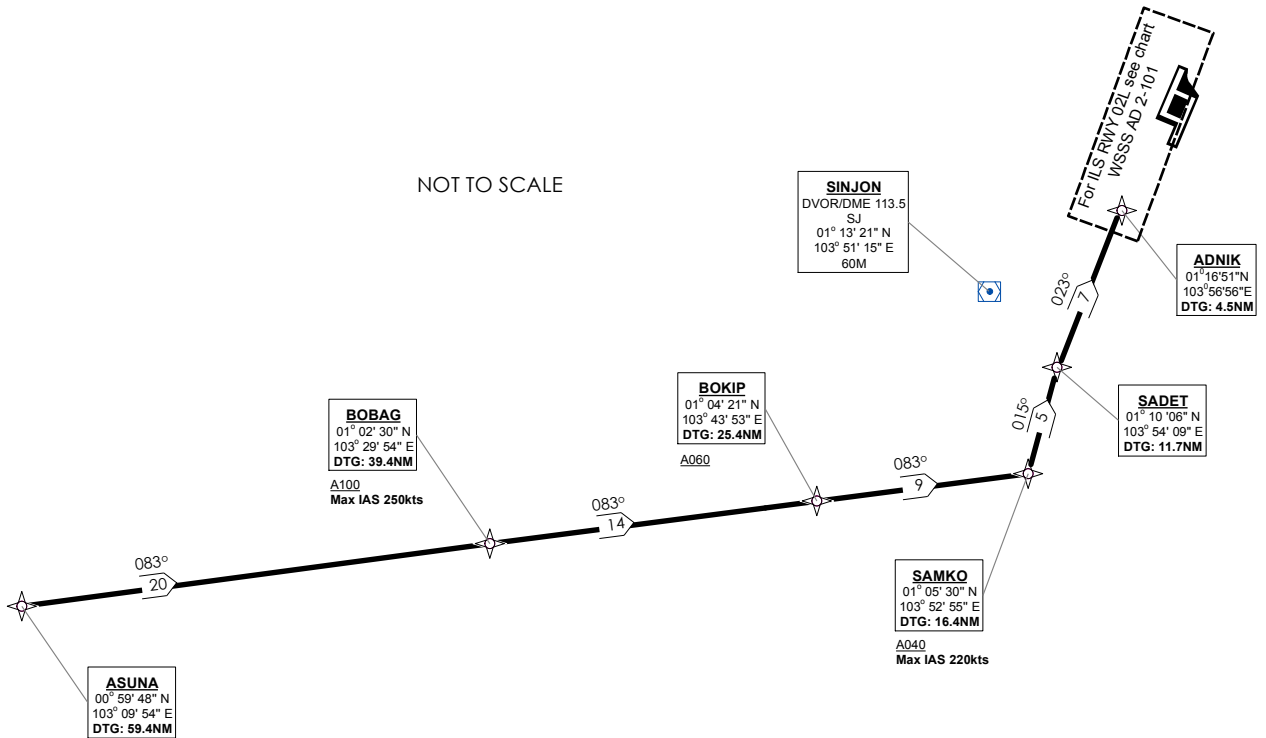
ELEV, ALT IN FEET  
BEARINGS, TRACKS AND  
RADIALS ARE MAGNETIC  
VAR 26'E (2015)

DISTANCES IN NM

NOTE: RADAR REQUIRED

NOTE: REFER TO BACK PAGE FOR  
A) FORMAL AND TEXTUAL DESCRIPTIONS  
B) RADIO COMMUNICATIONS FAILURE  
PROCEDURE

NOT TO SCALE



**BOBAG 1K (RWY 02L) CDO RNAV STAR – DESCRIPTIONS**

**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Expected Path Terminator	Flyover required
To ASUNA	ASUNA	TF	-
To BOBAG at A100 minimum; IAS 250kts maximum	BOBAG[A100+]; K250-	TF	-
To BOKIP at A060 minimum	BOKIP[A060+]	TF	-
To SAMKO at A040 minimum; IAS 220kts maximum	SAMKO[A040+]; K220-	TF	-
To SADET	SADET	TF	-
To ADNIK	ADNIK	TF	-

**Tabular Description**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	ASUNA	-	083(082.5)	-	-	-	-0.5	-	RNAV1
TF	BOBAG	-	083(082.5)	-	A100+	K250-	-0.5	-	RNAV1
TF	BOKIP	-	083(082.5)	-	A060+	-	-0.5	-	RNAV1
TF	SAMKO	-	015(014.5)	L	A040+	K220-	-0.5	-	RNAV1
TF	SADET	-	022(21.5)	R	-	-	-0.5	-	RNAV1
TF	ADNIK	-	022(21.5)	-	-	-	-0.5	-	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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





### (A) BASIC RNAV ARRIVAL

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

TRANSITIONS/ROUTE	BOBAG ONE BRAVO ARRIVAL (BOBAG 1B)
<b>ARAMA:</b> <u>FROM ARAMA TO BOBAG</u> <b>(A464)</b> FROM ARAMA TRACK 147° TO BOBAG. THEN FOLLOW THE APPROPRIATE BOBAG ARRIVAL.	AT BOBAG TRACK 083° TO BOKIP THEN TO SAMKO. CROSS BOBAG AT OR ABOVE 10 000FT. AT SAMKO TURN LEFT AND TRACK 080° TO BTM DVOR/DME. AT BTM DVOR/DME TURN LEFT AND TRACK 023° TO DOVAN. CROSS BTM DVOR/DME AT OR ABOVE 7 000FT AT MAX IAS 220KTS OR AS DIRECTED BY ATC. AT DOVAN TURN LEFT AND TRACK 348° TO BIPOP. CROSS DOVAN AT OR ABOVE 4 000FT. CROSS BIPOP AT OR ABOVE 3 000FT AT MAX IAS 220KTS. FROM BIPOP, EXPECT RADAR VECTORS FOR ILS APPROACH RWY 20.
<b>REKOP:</b> <u>FROM REKOP TO BOBAG</u> <b>(A576)</b> FROM REKOP TRACK 141° TO BOBAG. THEN FOLLOW THE APPROPRIATE BOBAG ARRIVAL.	
<b>R469</b>	

### (B) RADIO COMMUNICATIONS FAILURE PROCEDURE

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

### (C) RADIAL AND DME FROM VOR/DME

WAY POINTS	VTK VOR/DME	SJ VOR/DME
ARAMA	VTK R-282.4/D55.5	SJ R-298.0/D50.0
ASUNA	VTK R-244.1/D57.3	SJ R-252.0/D43.6
BOBAG	VTK R-234.7/D38.6	SJ R-243.2/D24.0
BOKIP	VTK R-220.5/D27.0	SJ R-219.5/D11.6
BIPOP	VTK R-054.5/D11.0	SJ R-046.8/D26.2
BTM	VTK R-158.2/D17.9	SJ R-107.0/D17.5
DOVAN	VTK R-114.6/D12.7	SJ R-073.9/D22.5
NYLON	VTK R-023.0/D13.0	SJ R-032.9/D30.0
REKOP	VTK R-278.3/D56.6	SJ R-293.1/D50.0
SAMKO	VTK R-203.5/D21.1	SJ R-168.0/D8.0

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

ACC 134.4  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

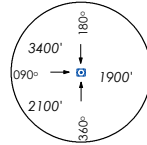
TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 20R  
BOBAG ONE LIMA ARRIVAL  
BOBAG 1L  
RNAV(GNSS) CDO**

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

DISTANCES IN NM

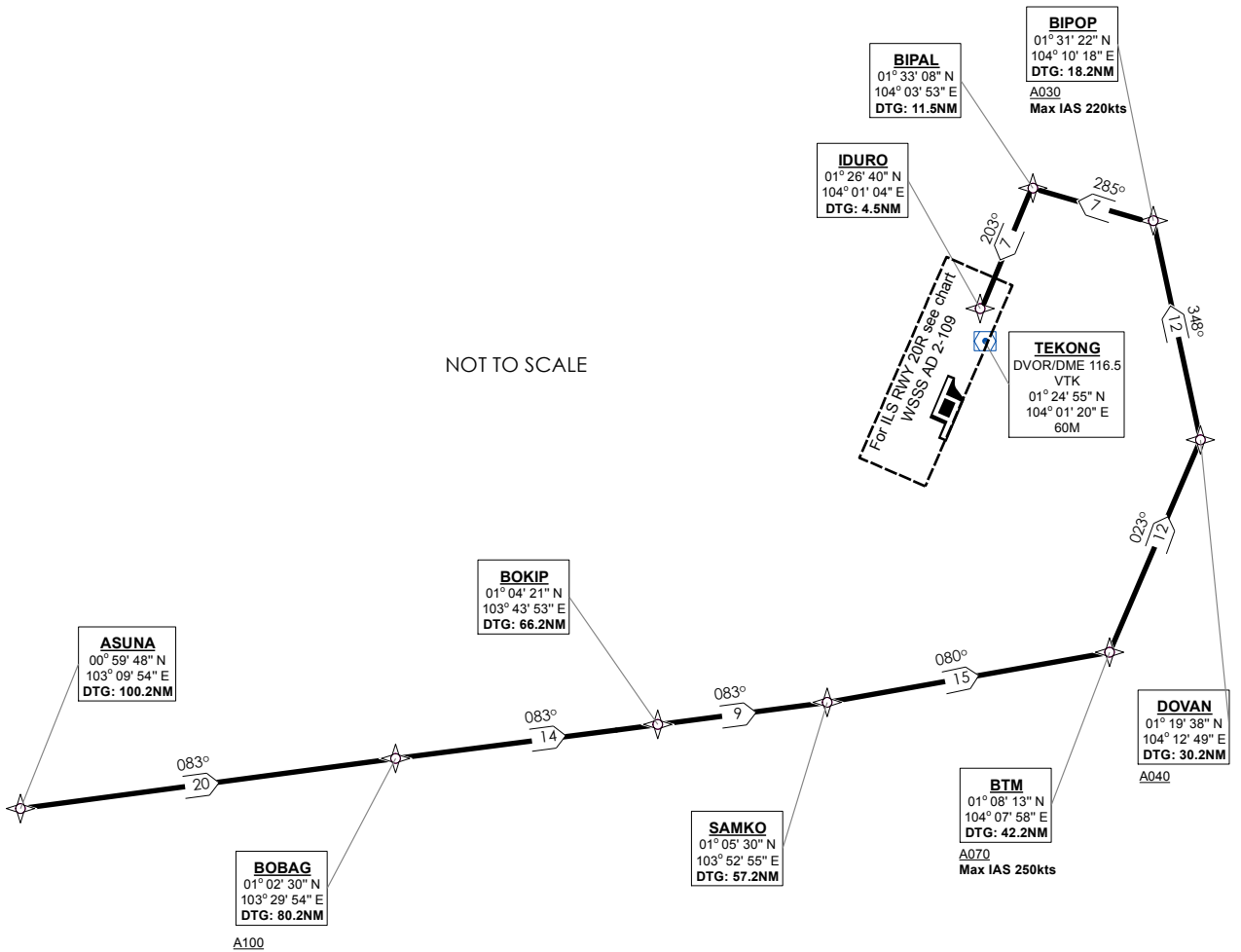


MSA 25nm  
from **TEKONG** DVOR

**NOTE: RADAR REQUIRED**

**NOTE: REFER TO BACK PAGE FOR**  
A) FORMAL AND TEXTUAL DESCRIPTIONS  
B) RADIO COMMUNICATIONS FAILURE  
PROCEDURE

NOT TO SCALE



**BOBAG 1L (RWY 20R) CDO RNAV STAR – DESCRIPTIONS**

**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Expected Path Terminator	Flyover required
To ASUNA	ASUNA	TF	-
To BOBAG at A100 minimum	BOBAG[A100+]	TF	-
To BOKIP	BOKIP	TF	-
To SAMKO	SAMKO	TF	-
To BTM at A070 minimum; IAS 250kts maximum	BTM[A070+]; K250-	TF	-
To DOVAN at A040 minimum	DOVAN[A040+]	TF	-
To BIPOP at A030 minimum; IAS 220kts maximum	BIPOP[A030+]; K220-	TF	-
To BIPAL	BIPAL	TF	-
To IDURO	IDURO	TF	-

**Tabular Description**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	ASUNA	-	083(082.5)	-	-	-	-0.5	-	RNAV1
TF	BOBAG	-	083(082.5)	-	A100+	-	-0.5	-	RNAV1
TF	BOKIP	-	083(082.5)	-	-	-	-0.5	-	RNAV1
TF	SAMKO	-	080(079.5)	L	-	-	-0.5	-	RNAV1
TF	BTM	-	023(022.5)	L	A070+	K250-	-0.5	-	RNAV1
TF	DOVAN	-	348(347.5)	L	A040+	-	-0.5	-	RNAV1
TF	BIPOP	-	285(284.5)	L	A030+	K220-	-0.5	-	RNAV1
TF	BIPAL	-	203(202.5)	L	-	-	-0.5	-	RNAV1
TF	IDURO	-	203(202.5)	-	-	-	-0.5	-	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

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

**SINGAPORE/Singapore Changi**  
**RWY 02L/C**  
**LAVAX ONE ALPHA ARRIVAL**  
**LAVAX 1A**  
**RNAV(GNSS)**

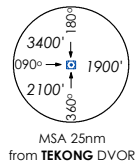
ACC 134.2 / 134.4  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

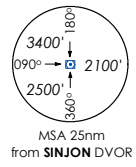
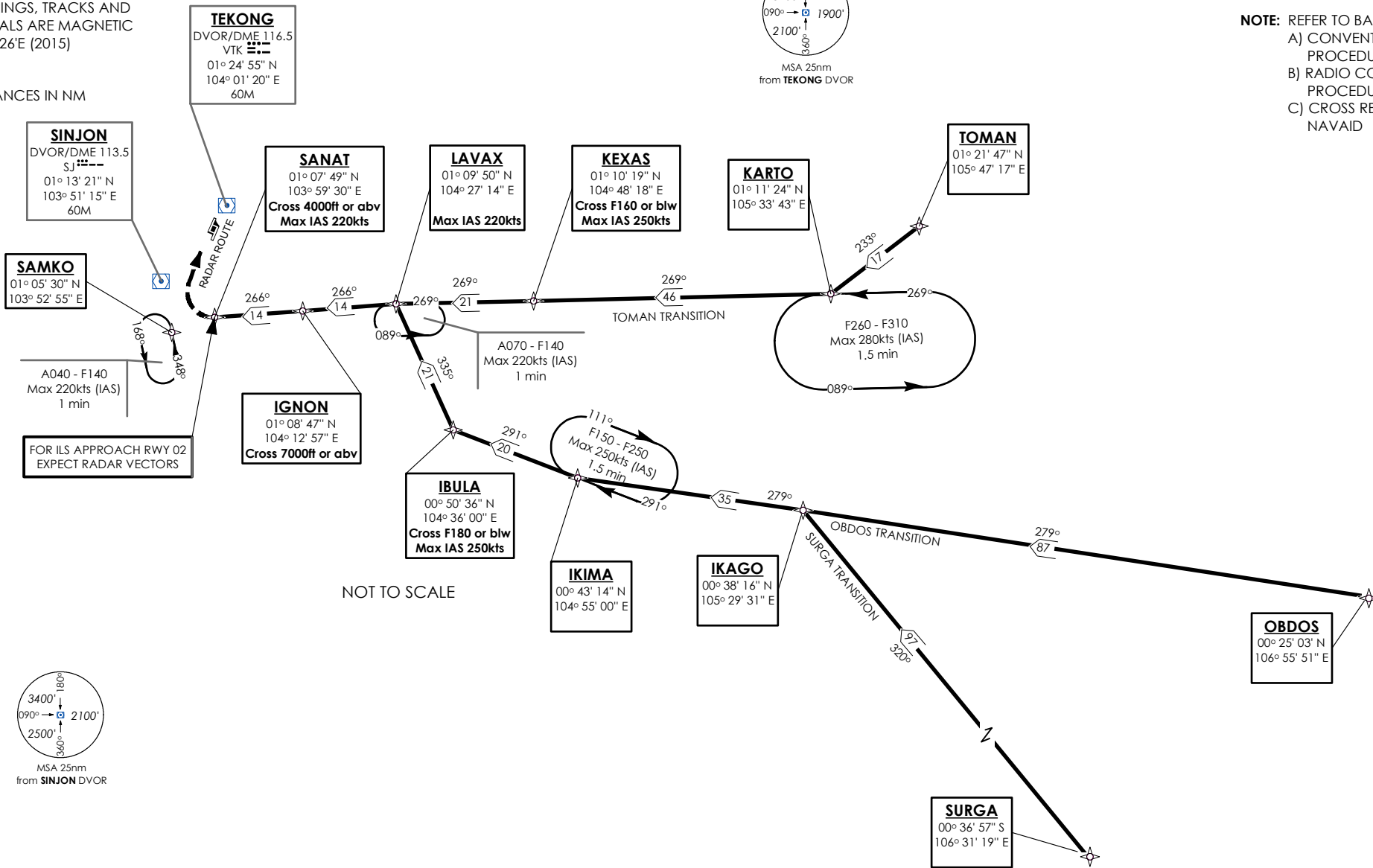
ELEV, ALT IN FEET  
BEARINGS, TRACKS AND  
RADIALS ARE MAGNETIC  
VAR 26°E (2015)

DISTANCES IN NM



**NOTE: RADAR REQUIRED**

**NOTE: REFER TO BACK PAGE FOR**  
A) CONVENTIONAL  
PROCEDURES  
B) RADIO COM FAILURE  
PROCEDURES  
C) CROSS REFERENCE FROM  
NAVAID



**(A) BASIC RNAV ARRIVAL**

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

TRANSITIONS/ROUTE		LAVAX ONE ALPHA ARRIVAL (LAVAX 1A)
<b>OBDOS: (L504/M774)</b>	<u>FROM OBDOS TO LAVAX</u> TRACK 279° FROM OBDOS TO IKAGO, THEN TRACK 279° TO IKIMA. THEN TRACK 291° TO IBULA. CROSS IBULA AT OR BELOW F180. AT IBULA, TRACK 335° TO LAVAX. CROSS LAVAX AT MAX IAS 220KTS THEN FOLLOW APPROPRIATE LAVAX ARRIVAL.	AT LAVAX TRACK 266° TO IGNON AND THEN TO SANAT. CROSS IGNON AT OR ABOVE 7 00FT OR AS DIRECTED BY ATC. CROSS SANAT AT OR ABOVE 4 000FT AT MAX IAS 220KTS. FROM SANAT, EXPECT RADAR VECTORS FOR ILS APPROACH RWY02.
<b>SURGA: (M635)</b>	<u>FROM SURGA TO LAVAX</u> TRACK 320° FROM SURGA TO IKAGO, THEN TRACK 279° TO IKIMA. THEN TRACK 291° TO IBULA. CROSS IBULA AT OR BELOW F180. AT IBULA, TRACK 335° TO LAVAX. CROSS LAVAX AT MAX IAS 220KTS THEN FOLLOW APPROPRIATE LAVAX ARRIVAL.	
<b>TOMAN:</b>	<u>FROM TOMAN TO LAVAX</u> TRACK 233° FROM TOMAN TO KARTO. AT KARTO, TURN RIGHT TRACK 269° TO KEXAS THEN TO LAVAX. CROSS KEXAS AT OR BELOW F160 THEN FOLLOW APPROPRIATE LAVAX ARRIVAL.	

**(B) RADIO COMMUNICATIONS FAILURE PROCEDURE**

<b>1</b>	<b>SET TRANSPONDER TO MODE A/C CODE 7600</b>
<b>2</b>	<b>When cleared via LAVAX 1A by Singapore ATC</b> <ul style="list-style-type: none"> <li>(a) Maintain last assigned flight level or altitude and proceed on LAVAX 1A to SANAT, then direct to SAMKO</li> <li>(b) From SAMKO commence descent and carry out appropriate landing procedure for RWY 02 as close as possible to EAT or ETA</li> <li>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</li> </ul>
<b>3</b>	<b>No clearance or instruction received from Singapore ATC</b> - refer to Singapore AIP for radio communications failure procedure

**(C) RADIAL AND DME FROM VOR/DME**

WAY POINTS	VTK VOR/DME	SJ VOR/DME
SURGA	VTK R-128.9/D193.1	SJ R-124.4/D194.3
IKAGO	VTK R-117.7/D99.8	SJ R-109.5/D104.4
OBDOS	VTK R-108.8/D184.7	SJ R-104.6/D191.0
IBULA	VTK R-134.5/D48.7	SJ R-116.8/D50.2
IGNON	VTK R-144.1/D19.8	SJ R-101.8/D22.2
IKIMA	VTK R-127.6/D67.9	SJ R-115.1/D70.5
KARTO	VTK R-098.3/D93.5	SJ R-091.1/D102.6
KEXAS	VTK R-107.2/D49.2	SJ R-093.0/D57.2
LAVAX	VTK R-120.1/D30.0	SJ R-095.5/D36.2
SAMKO	VTK R-203.5/D21.1	SJ R-168.0/D8.0
SANAT	VTK R-186.1/D17.1	SJ R-123.7/D9.9
TOMAN	VTK R-091.7/D106.2	SJ R-085.9/D116.5



**LAVAX 1K (RWY 02L) CDO RNAV STAR – DESCRIPTIONS**

**Formal & Abbreviated Descriptions**

Formal Description (transition OBDOS)	Abbreviated Description	Expected Path Terminator	Flyover required
To OBDOS	OBDOS	TF	-
To IKAGO	IKAGO	TF	-
To IKIMA	IKIMA	TF	-
To IBULA	IBULA	TF	-
<i>Please refer to LAVAX 1K descriptions</i>			
Formal Description (transition SURGA)			
To SURGA	SURGA	TF	-
To IKAGO	IKAGO	TF	-
To IKIMA	IKIMA	TF	-
To IBULA	IBULA	TF	-
<i>Please refer to LAVAX 1K descriptions</i>			
Formal Description (transition TOMAN)			
To TOMAN	TOMAN	TF	-
To KARTO	KARTO	TF	-
To KEXAS	KEXAS	TF	-
<i>Please refer to LAVAX 1K descriptions</i>			
Formal Description (LAVAX 1K)			
To LAVAX at FL140 maximum; IAS 250kts maximum	LAVAX[FL140-]; K250-	TF	-
To IGNON at A070 minimum	IGNON[A070+]	TF	-
To SANAT at A040 minimum; IAS 220kts maximum	SANAT[A040+]; K220-	TF	-
To SADET	SADET	TF	-
To ADNIK	ADNIK	TF	-

**Tabular Description (OBDOS transition)**

Path Term	Waypoint Name	Flyover	Course <sup>0</sup> M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	OBDOS	-	279(278.5)	-	-	-	-0.5	-	RNAV1
TF	IKAGO	-	279(278.5)	-	-	-	-0.5	-	RNAV1
TF	IKIMA	-	291(290.5)	L	-	-	-0.5	-	RNAV1
TF	IBULA	-	335(334.5)	R	-	-	-0.5	-	RNAV1
<i>Please refer to LAVAX 1K descriptions</i>									

**Tabular Description (SURGA transition)**

Path Term	Waypoint Name	Flyover	Course <sup>0</sup> M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	SURGA	-	320(319.5)	-	--	-	-0.5	-	RNAV1
TF	IKAGO	-	279(278.5)	L	-	-	-0.5	-	RNAV1
TF	IKIMA	-	291(290.5)	L	-	-	-0.5	-	RNAV1
TF	IBULA	-	335(334.5)	R	-	-	-0.5	-	RNAV1
<i>Please refer to LAVAX 1K descriptions</i>									



**Tabular Description (TOMAN transition)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	TOMAN	-	233(232.5)	-	-	-	-0.5	-	RNAV1
TF	KARTO	-	269(268.5)	R	-	-	-0.5	-	RNAV1
TF	KEXAS	-	269(268.5)	-	-	-	-0.5	-	RNAV1

*Please refer to LAVAX 1K descriptions*

**Tabular Description (LAVAX 1K)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	LAVAX	-	266(265.5)	-	FL140-	K250-	-0.5	-	RNAV1
TF	IGNON	-	266(265.5)	-	A70+	-	-0.5	-	RNAV1
TF	SANAT	-	293(292.5)	R	A040+	K220-	-0.5	-	RNAV1
TF	SADET	-	022(021.5)	R	-	-	-0.5	-	RNAV1
TF	ADNIK	-	022(021.5)	-	-	-	-0.5	-	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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



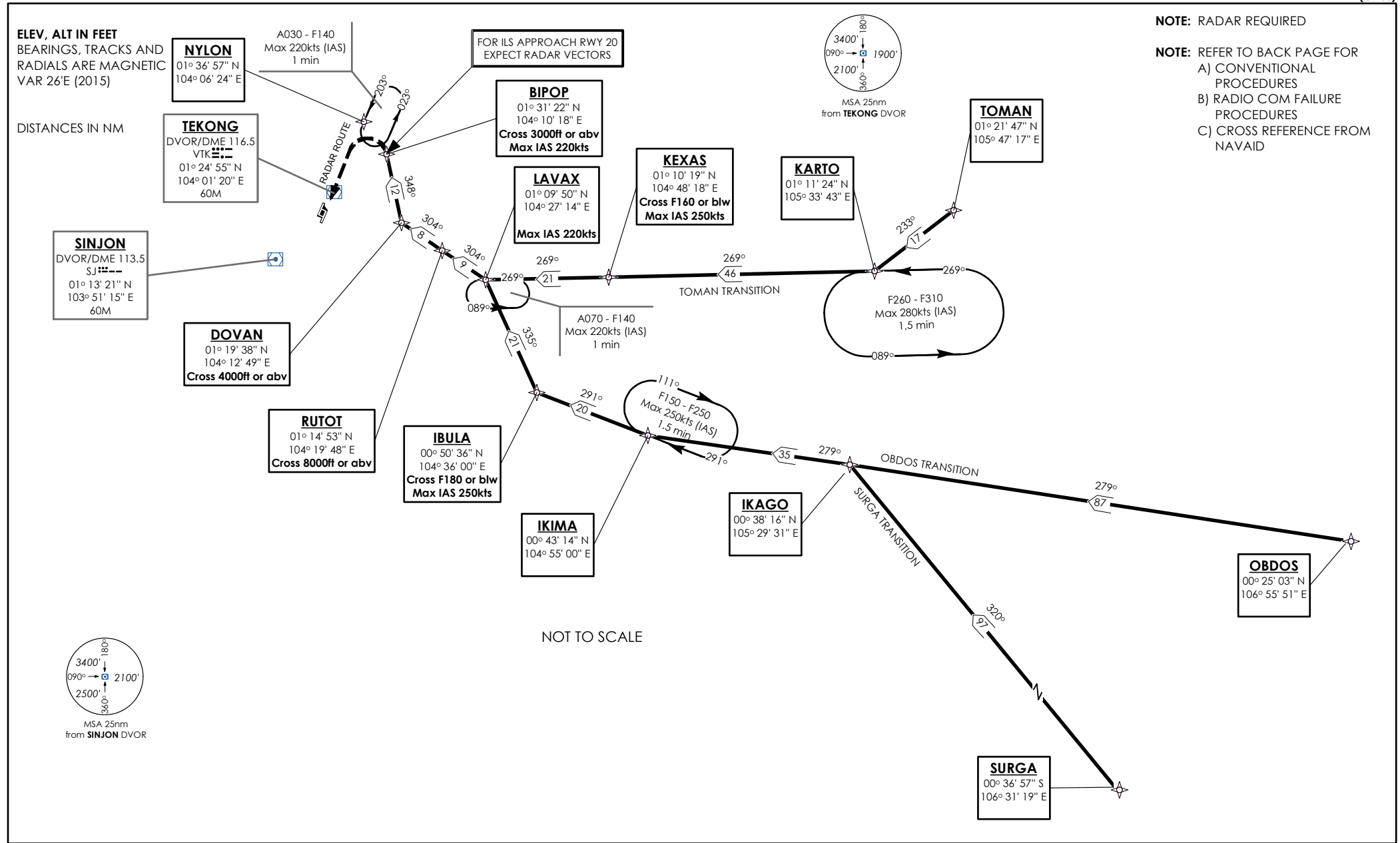
**STANDARD ARRIVAL CHART -  
INSTRUMENT (STAR)**

**SINGAPORE/Singapore Changi  
RWY 20R/C  
LAVAX ONE BRAVO ARRIVAL  
LAVAX 1B  
RNAV(GNSS)**

ACC 134.2 / 134.4  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6



### (A) BASIC RNAV ARRIVAL

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

TRANSITIONS/ROUTE	LAVAX ONE BRAVO ARRIVAL (LAVAX 1B)
<p><b>OBDOS:</b> FROM OBDOS TO LAVAX (L504/M774) TRACK 279° FROM OBDOS TO IKAGO, THEN TRACK 279° TO IKIMA. THEN TRACK 291° TO IBULA. CROSS IBULA AT OR BELOW F180. AT IBULA, TRACK 335° TO LAVAX. CROSS LAVAX AT MAX IAS 220KTS THEN FOLLOW APPROPRIATE LAVAX ARRIVAL.</p>	<p>AT LAVAX TRACK 304° TO RUTOT AND THEN TO DOVAN. CROSS RUTOT AT OR ABOVE 8 000FT OR AS DIRECTED BY ATC. CROSS DOVAN AT OR ABOVE 4 000FT. FROM DOVAN, TRACK 348° TO BIPOP. CROSS BIPOP AT OR ABOVE 3 000FT AT MAX IAS 220KTS. FROM BIPOP, EXPECT RADAR VECTORS FOR ILS APPROACH RWY 20.</p>
<p><b>SURGA:</b> FROM SURGA TO LAVAX (M635) TRACK 320° FROM SURGA TO IKAGO, THEN TRACK 279° TO IKIMA. THEN TRACK 291° TO IBULA. CROSS IBULA AT OR BELOW F180. AT IBULA, TRACK 335° TO LAVAX. CROSS LAVAX AT MAX IAS 220KTS THEN FOLLOW APPROPRIATE LAVAX ARRIVAL.</p>	
<p><b>TOMAN:</b> FROM TOMAN TO LAVAX TRACK 233° FROM TOMAN TO KARTO. AT KARTO, TURN RIGHT TRACK 269° TO KEXAS THEN TO LAVAX. CROSS KEXAS AT OR BELOW F160 THEN FOLLOW APPROPRIATE LAVAX ARRIVAL.</p>	

### (B) RADIO COMMUNICATIONS FAILURE PROCEDURE

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

### (C) RADIAL AND DME FROM VOR/DME

WAY POINTS	VTK VOR/DME	SJ VOR/DME
SURGA	VTK R-128.9/D193.1	SJ R-124.4/D194.3
IKAGO	VTK R-117.7/D99.8	SJ R-109.5/D104.4
BIPOP	VTK R-054.5/D11.0	SJ R-046.8/D26.2
DOVAN	VTK R-114.6/D12.7	SJ R-073.9/D22.5
OBDOS	VTK R-108.8/D184.7	SJ R-104.6/D191.0
IBULA	VTK R-134.5/D48.7	SJ R-116.8/D50.2
IKIMA	VTK R-127.6/D67.9	SJ R-115.1/D70.5
KARTO	VTK R-098.3/D93.5	SJ R-091.1/D102.6
KEXAS	VTK R-107.2/D49.2	SJ R-093.0/D57.2
LAVAX	VTK R-120.1/D30.0	SJ R-095.5/D36.2
NYLON	VTK R-023.0/D13.0	SJ R-032.9/D30.0
RUTOT	VTK R-118.4/D21.0	SJ R-087.0/D28.6
TOMAN	VTK R-091.7/D106.2	SJ R-085.9/D116.5

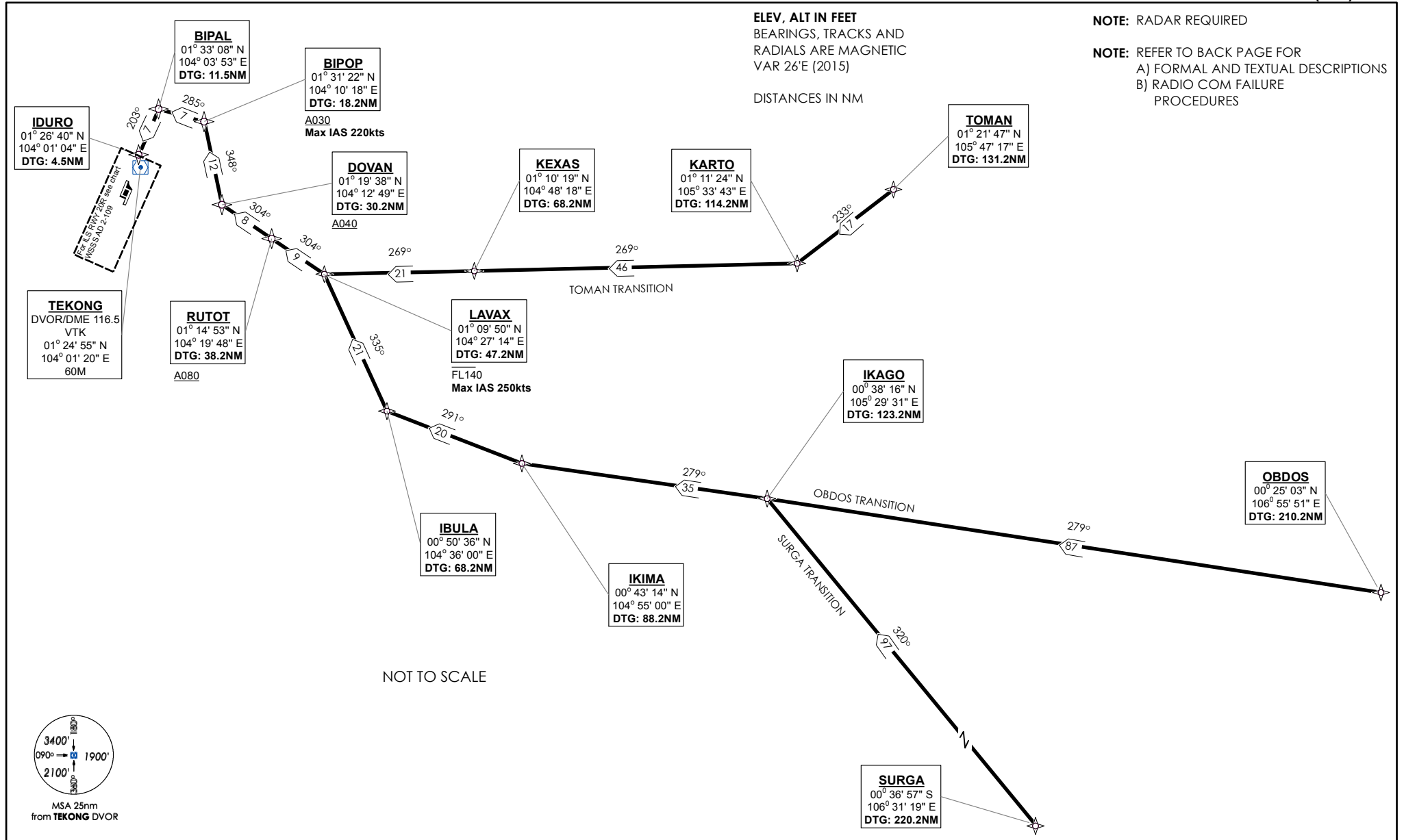
**RNAV STAR CDO  
STANDARD ARRIVAL CHART -  
INSTRUMENT (STAR)**

ACC 134.4  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 20R  
LAVAX ONE LIMA ARRIVAL  
LAVAX 1L  
RNAV(GNSS) CDO**



**LAVAX 1L (RWY 20R) CDO RNAV STAR – DESCRIPTIONS**

**Formal & Abbreviated Descriptions**

Formal Description (transition OBDOS)	Abbreviated Description	Expected Path Terminator	Flyover required
To OBDOS	OBDOS	TF	-
To IKAGO	IKAGO	TF	-
To IKIMA	IKIMA	TF	-
To IBULA	IBULA	TF	-
<i>Please refer to LAVAX 1L descriptions</i>			
Formal Description (transition SURGA)			
To SURGA	SURGA	TF	-
To IKAGO	IKAGO	TF	-
To IKIMA	IKIMA	TF	-
To IBULA	IBULA	TF	-
<i>Please refer to LAVAX 1L descriptions</i>			
Formal Description (transition TOMAN)			
To TOMAN	TOMAN	TF	-
To KARTO	KARTO	TF	-
To KEXAS	KEXAS	TF	-
<i>Please refer to LAVAX 1L descriptions</i>			
Formal Description (LAVAX 1L)			
To LAVAX at FL140 maximum; IAS 250kts maximum	LAVAX[FL140-]; K250-	TF	-
To RUTOT at A080 minimum	RUTOT[A080+]	TF	-
To DOVAN at A040 minimum	DOVAN[A040+]	TF	-
To BIPOP at A030 minimum; IAS 220kts maximum	BIPOP[A030+]; K220-	TF	-
To BIPAL	BIPAL	TF	-
To IDURO	IDURO	TF	-

**Tabular Description (OBDOS transition)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	OBDOS	-	279(278.5)	-	-	-	-0.5	-	RNAV1
TF	IKAGO	-	279(278.5)	-	-	-	-0.5	-	RNAV1
TF	IKIMA	-	291(290.5)	L	-	-	-0.5	-	RNAV1
TF	IBULA	-	335(334.5)	R	-	-	-0.5	-	RNAV1
<i>Please refer to LAVAX 1L descriptions</i>									

**Tabular Description (SURGA transition)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	SURGA	-	320(319.5)	-	--	-	-0.5	-	RNAV1
TF	IKAGO	-	279(278.5)	L	-	-	-0.5	-	RNAV1
TF	IKIMA	-	291(290.5)	L	-	-	-0.5	-	RNAV1
TF	IBULA	-	335(334.5)	R	-	-	-0.5	-	RNAV1
<i>Please refer to LAVAX 1L descriptions</i>									

**Tabular Description (TOMAN transition)**

Path Term	Waypoint Name	Flyover	Course <sup>0</sup> M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	TOMAN	-	233(232.5)	-	-	-	-0.5	-	RNAV1
TF	KARTO	-	269(268.5)	R	-	-	-0.5	-	RNAV1
TF	KEXAS	-	269(268.5)	-	-	-	-0.5	-	RNAV1

*Please refer to LAVAX 1L descriptions*

**Tabular Description (LAVAX 1L)**

Path Term	Waypoint Name	Flyover	Course <sup>0</sup> M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	LAVAX	-	304(303.5)	-	FL140-	K250-	-0.5	-	RNAV1
TF	RUTOT	-	304(303.5)	-	A080+	-	-0.5	-	RNAV1
TF	DOVAN	-	348(347.5)	R	A040+	-	-0.5	-	RNAV1
TF	BIPOP	-	285(284.5)	L	A030+	K220-	-0.5	-	RNAV1
TF	BIPAL	-	204(203.5)	L	-	-	-0.5	-	RNAV1
TF	IDURO	-	204(203.5)	-	-	-	-0.5	-	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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





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

ACC 133.25  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

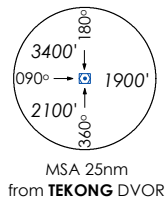
TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 20R/C  
LELIB TWO BRAVO ARRIVAL  
LELIB 2B  
RNAV(GNSS)**

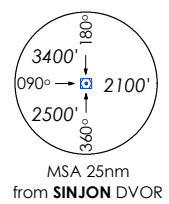
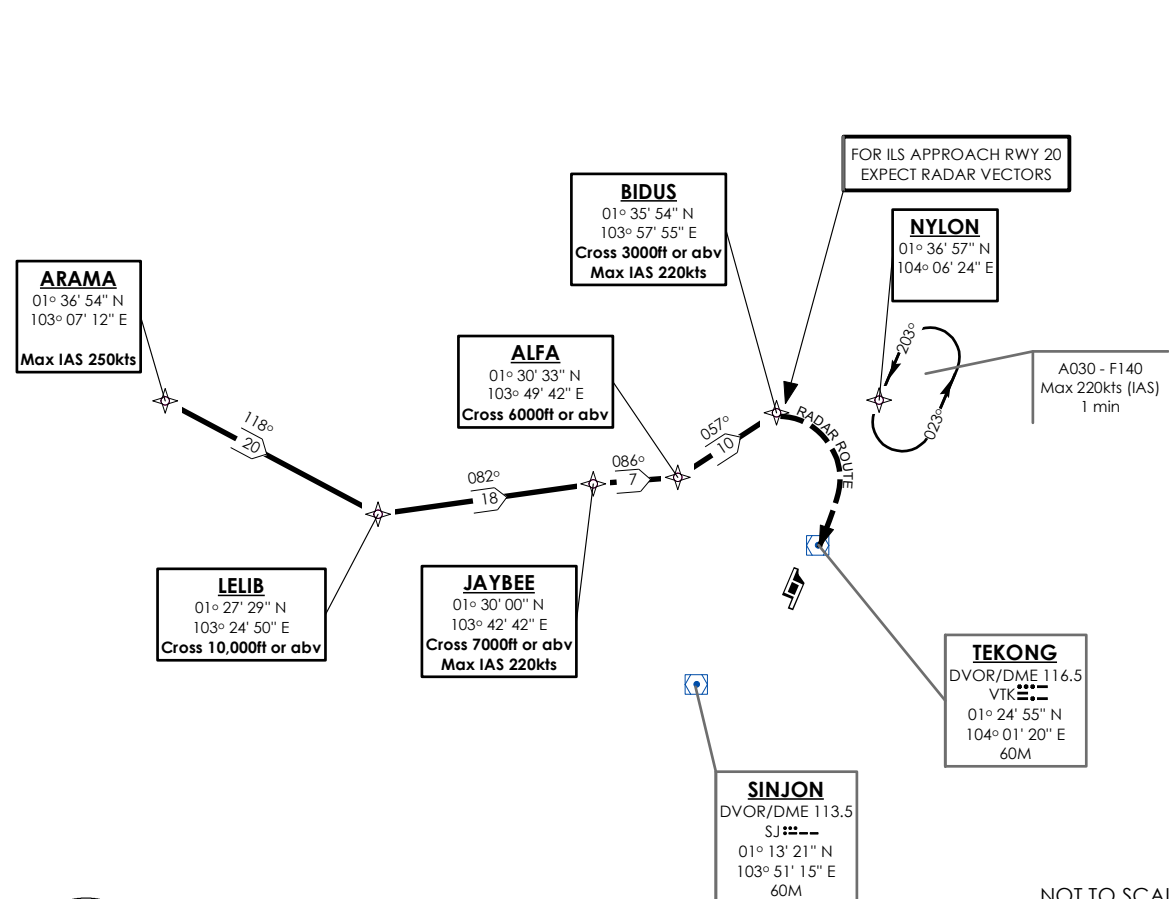
ELEV, ALT IN FEET  
BEARINGS, TRACKS AND  
RADIALS ARE MAGNETIC  
VAR 26°E (2015)

DISTANCES IN NM



NOTE: RADAR REQUIRED

NOTE: REFER TO BACK PAGE FOR  
A) CONVENTIONAL  
PROCEDURES  
B) RADIO COM FAILURE  
PROCEDURES  
C) CROSS REFERENCE FROM  
NAVAID



NOT TO SCALE

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 freq 135.8MHz when RWY in use is 20 and within 120 DME SJ. Flight shall still remain under the control of WMKK ATC.

**(A) BASIC RNAV ARRIVAL**

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

TRANSITIONS/ROUTE	LELIB TWO BRAVO ARRIVAL (LELIB 2B)
A464	AT LELIB, TURN LEFT AND TRACK 082° TO JB (JAYBEE) NDB. CROSS LELIB AT OR ABOVE 10 000FT. CROSS JB (JAYBEE) NDB AT OR ABOVE 7 000FT AT MAX IAS 220KTS. FROM JB (JAYBEE) NDB TRACK 086° TO ALFA. AT ALFA, TURN LEFT AND TRACK 057° TO BIDUS. CROSS ALFA 6 000FT OR ABOVE. CROSS BIDUS 3 000FT OR ABOVE AT MAX IAS 220KTS. FROM BIDUS, EXPECT RADAR VECTORS FOR ILS APPROACH RWY 20.

**(B) RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

**(C) RADIAL AND DME FROM VOR/DME**

WAY POINTS	VTK VOR/DME	SJ VOR/DME
ALFA	VTK R-295.7/D12.9	SJ R-354.8/D17.2
ARAMA	VTK R-282.4/D55.5	SJ R-298.0/D50.0
BIDUS	VTK R-326.0/D13.2	SJ R-6.9/D22.6
JB (JAYBEE)	VTK R-285.1/D19.3	SJ R-332.6/D18.6
LELIB	VTK R-274.0/D36.6	SJ R-298.0/D30.0
NYLON	VTK R-023.0/D13.0	SJ R-032.9/D30.0

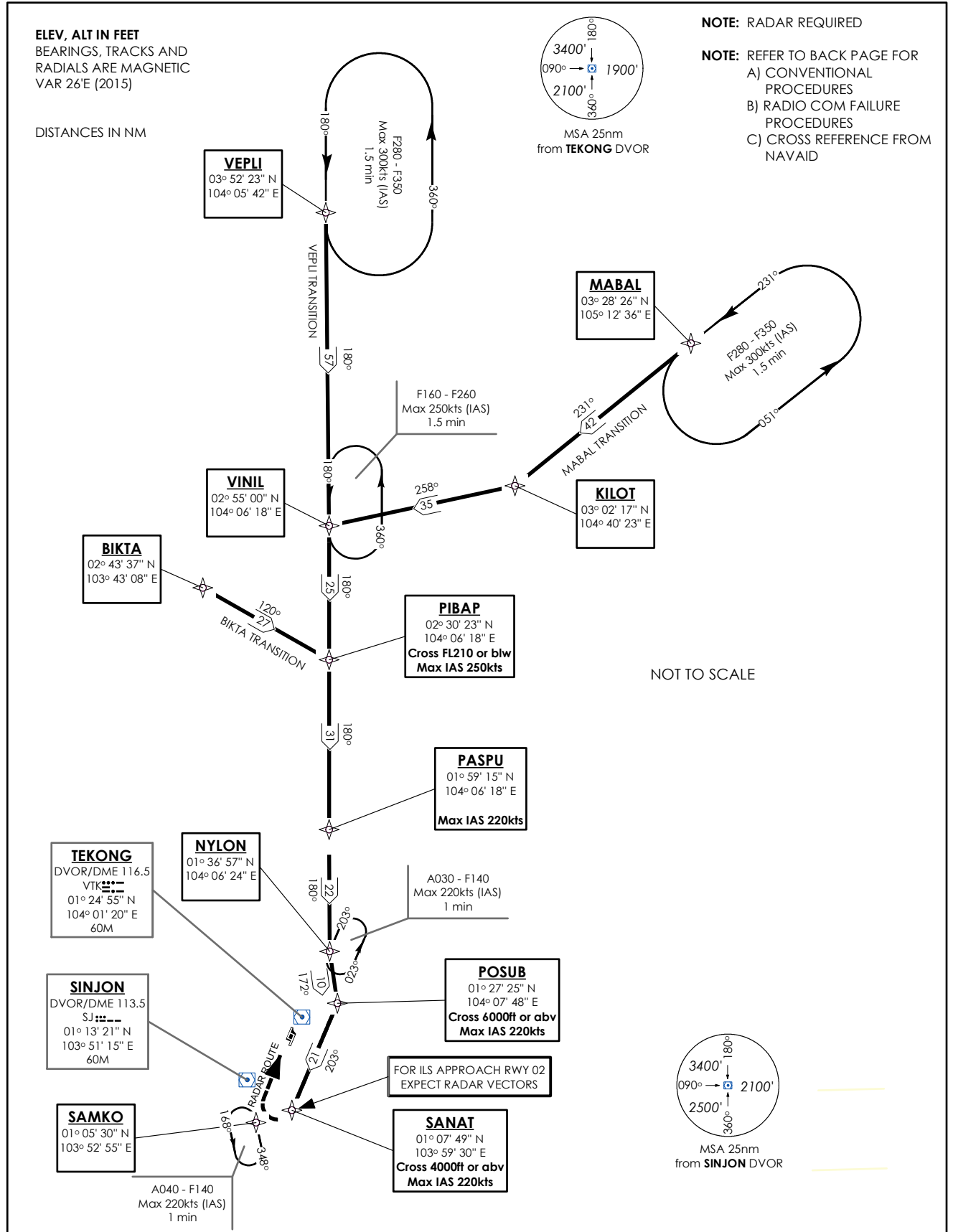
**STANDARD ARRIVAL CHART -  
INSTRUMENT (STAR)**

ACC 133.8 / 123.7  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02L/C  
PASPU ONE ALPHA ARRIVAL  
PASPU 1A  
RNAV(GNSS)**



### (A) BASIC RNAV ARRIVAL

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

TRANSITIONS/ROUTE	PASPU ONE ALPHA ARRIVAL (PASPU 1A)
<p><b>BIKTA (M751/B469):</b> FROM BIKTA TO PASPU AT BIKTA TRACK 120° TO PIBAP THEN TURN RIGHT AND TRACK 180° TO PASPU. CROSS PIBAP AT OR BELOW FL210. THEN FOLLOW THE APPROPRIATE PASPU ARRIVAL.</p>	<p>AT PASPU TRACK 180° TO NYLON. FROM NYLON TRACK 172° TO POSUB. AT POSUB, TURN RIGHT AND TRACK 203° TO SANAT, CROSS POSUB AT OR ABOVE 6 000FT AT MAX IAS 220KTS, OR AS DIRECTED BY ATC. CROSS SANAT AT OR ABOVE 4 000FT AT MAX IAS 220KT. FROM SANAT, EXPECT RADAR VECTORS FOR ILS APPROACH RWY02.</p>
<p><b>VEPLI(L642):</b> FROM VEPLI TO PASPU AT VEPLI TRACK 180° TO PIBAP THEN TO PASPU. CROSS PIBAP AT OR BELOW FL210. THEN FOLLOW THE APPROPRIATE PASPU ARRIVAL.</p>	
<p><b>MABAL(N892):</b> FROM MABAL TO PASPU AT MABAL TRACK 231° TO KILOT THEN TURN RIGHT TO TRACK 258° TO VINIL. FROM VINIL TURN LEFT TRACK 180° TO PIBAP THEN TO PASPU. CROSS PIBAP AT OR BELOW FL210. THEN FOLLOW THE APPROPRIATE PASPU ARRIVAL.</p>	

### (B) RADIO COMMUNICATIONS FAILURE PROCEDURE

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

### (C) RADIAL AND DME FROM VOR/DME

WAY POINTS	VTK VOR/DME	SJ VOR/DME
BIKTA	VTK R-346.9/D80.4	SJ R-355.0/D90.2
KILOT	VTK R-022.0/D104.5	SJ R-024.4/D119.0
MABAL	VTK R-030.1/D142.1	SJ R-031.2/D157.2
NYLON	VTK R-023.0/D13.0	SJ R-032.9/D30.0
PASPU	VTK R-008.3/D34.5	SJ R-018.3/D48.1
PIBAP	VTK R-004.4/D65.3	SJ R-011.1/D78.1
POSUB	VTK R-069.0/D6.9	SJ R-049.8/D21.7
SAMKO	VTK R-203.5/D21.1	SJ R-168.0/D8.0
SANAT	VTK R-186.1/D17.1	SJ R-123.7/D9.9
VEPLI	VTK R-001.7/D146.8	SJ R-005.2/D158.9
VINIL	VTK R-003.2/D89.8	SJ R-008.5/D102.3

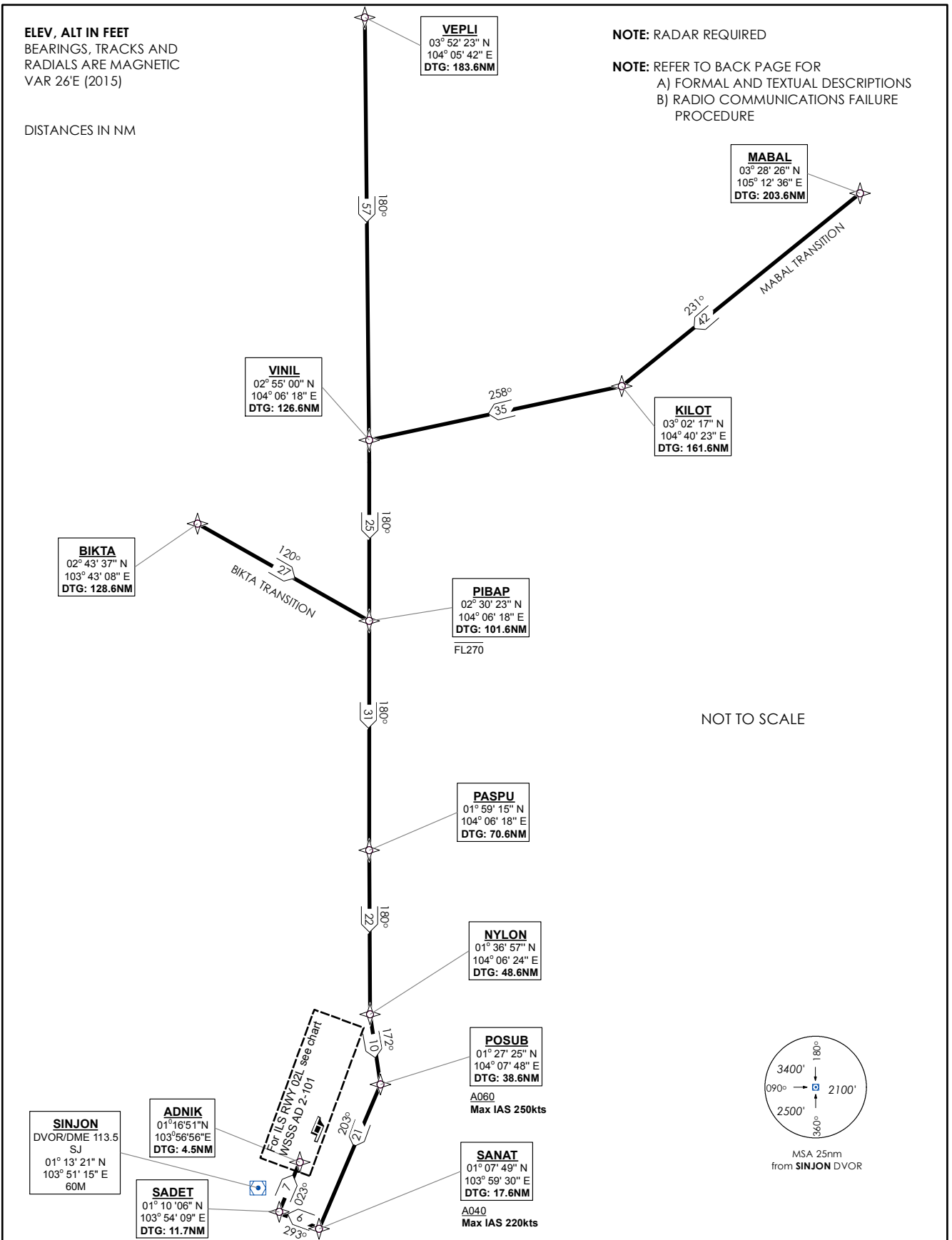
**RNAV STAR CDO  
STANDARD ARRIVAL CHART -  
INSTRUMENT (STAR)**

ACC 134.4  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02L  
PASPU ONE KILO ARRIVAL  
PASPU 1K  
RNAV(GNSS) CDO**



**PASPU 1K (RWY 02L) CDO RNAV STAR – DESCRIPTIONS**

**Formal & Abbreviated Descriptions**

Formal Description (transition BIKTA)	Abbreviated Description	Expected Path Terminator	Flyover required
To BIKTA	BIKTA	TF	-
To PIBAP at FL270 maximum	PIBAP[FL270-]	TF	-
<i>Refer to PASPU 1K for descriptions</i>			
Formal Description (transition VEPLI)			
To VEPLI	VEPLI	TF	-
To VINIL	VINIL	TF	-
To PIBAP at FL270 maximum	PIBAP[FL270-]	TF	-
<i>Refer to PASPU 1K for descriptions</i>			
Formal Description (transition MABAL)			
To MABAL	MABAL	TF	-
To KILOT	KILOT	TF	-
To VINIL	VINIL	TF	-
To PIBAP at FL270 maximum	PIBAP[FL270-]	TF	-
<i>Refer to PASPU 1K for descriptions</i>			
Formal Description (PASPU 1K)			
To PASPU	PASPU	TF	-
To NYLON	NYLON	TF	-
To POSUB at A060 minimum; IAS 250kts maximum	POSUB[A060+]; K250-	TF	-
To SANAT at A040 minimum; IAS 220kts maximum	SANAT[A040+]; K220-	TF	-
To SADET	SADET	TF	-
To ADNIK	ADNIK	TF	-

**Tabular Description (BIKTA transition)**

Path Term	Waypoint Name	Flyover	Course <sup>0</sup> M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	BIKTA	-	120(119.5)	-	-	-	-0.5	-	RNAV1
TF	PIBAP	-	180(179.5)	-	FL270-	-	-0.5	-	RNAV1
<i>Refer to PASPU 1K for descriptions</i>									

**Tabular Description (VEPLI transition)**

Path Term	Waypoint Name	Flyover	Course <sup>0</sup> M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	VEPLI	-	180(179.5)	-	--	-	-0.5	-	RNAV1
TF	VINIL	-	180(179.5)	-	-	-	-0.5	-	RNAV1
TF	PIBAP	-	180(179.5)	-	FL270-	-	-0.5	-	RNAV1
<i>Refer to PASPU 1K for descriptions</i>									

**Tabular Description (MABAL transition)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	MABAL	-	231(230.5)	-	-	-	-0.5	-	RNAV1
TF	KILOT	-	258(257.5)	R	-	-	-0.5	-	RNAV1
TF	VINIL	-	180(179.5)	L	-	-	-0.5	-	RNAV1
TF	PIBAP	-	180(179.5)	-	FL270-	-	-0.5	-	RNAV1
<i>Refer to PASPU 1K for descriptions</i>									

**Tabular Description (PASPU 1K)**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	PASPU	-	180(179.5)	-	-	-	-0.5	-	RNAV1
TF	NYLON	-	172(171.5)	L	-	-	-0.5	-	RNAV1
TF	POSUB	-	203(202.5)	R	A60+	K250-	-0.5	-	RNAV1
TF	SANAT	-	293(292.5)	R	A040+	K220-	-0.5	-	RNAV1
TF	SADET	-	023(022.5)	R	-	-	-0.5	-	RNAV1
TF	ADNIK	-	023(022.5)	-	-	-	-0.5	-	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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





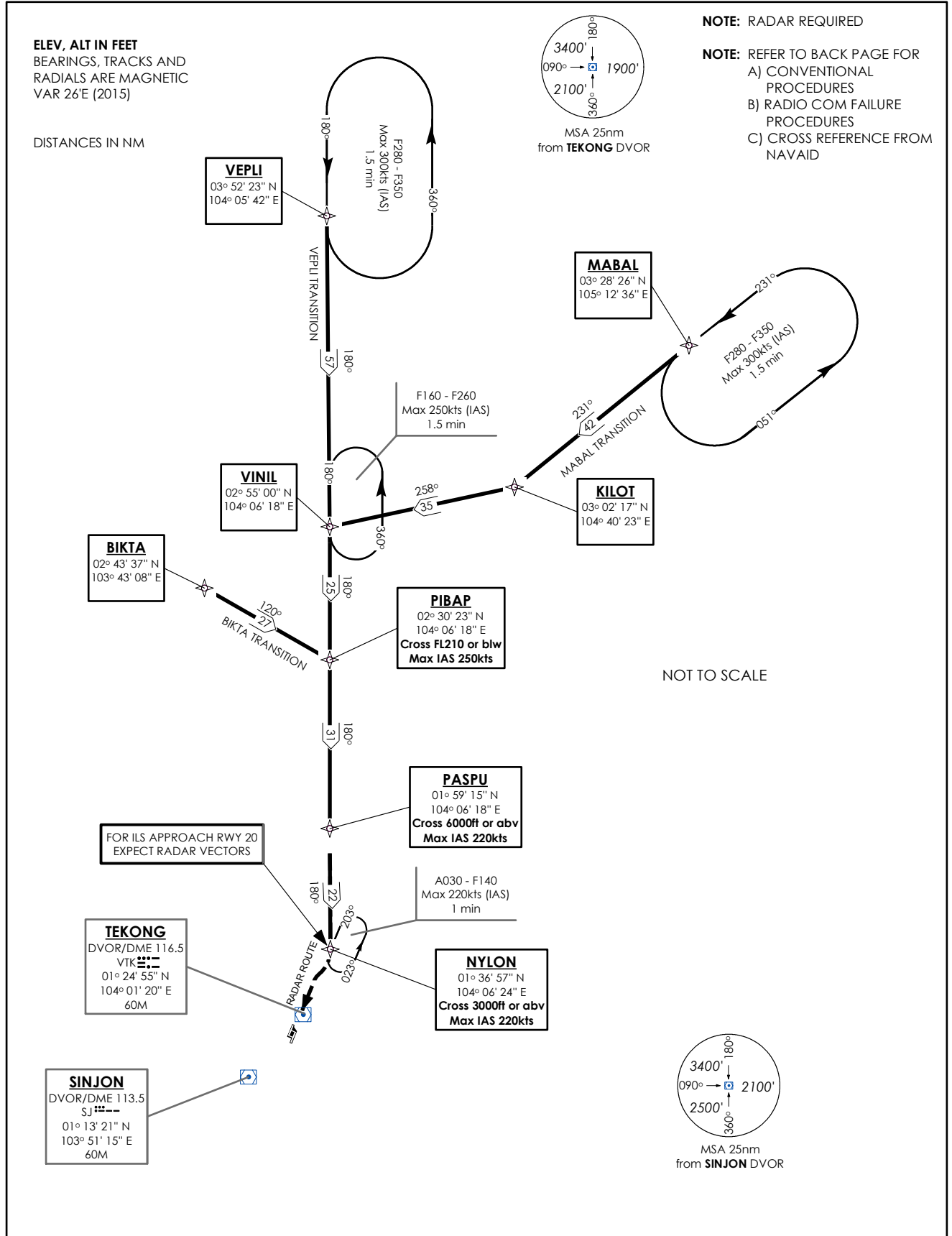
**STANDARD ARRIVAL CHART - INSTRUMENT (STAR)**

ACC 133.8 / 127.3  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 20R/C  
PASPU ONE BRAVO ARRIVAL  
PASPU 1B  
RNAV(GNSS)**



### (A) BASIC RNAV ARRIVAL

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

TRANSITIONS/ROUTE	PASPU ONE BRAVO ARRIVAL (PASPU 1B)
<p><b>BIKTA (M751/B469):</b> <u>FROM BIKTA TO PASPU</u> AT BIKTA TRACK 120° TO PIBAP THEN TURN RIGHT AND TRACK 180° TO PASPU. CROSS PIBAP AT OR BELOW FL210. CROSS PASPU AT OR ABOVE 6 000FT AT MAX IAS 220KTS. THEN FOLLOW THE APPROPRIATE PASPU ARRIVAL.</p>	<p>AT PASPU TRACK 180° TO NYLON. CROSS NYLON AT OR ABOVE 3 000FT AT MAX IAS 220KTS, OR AS DIRECTED BY ATC. FROM NYLON, EXPECT RADAR VECTORS FOR ILS APPROACH RUNWAY 20.</p>
<p><b>VEPLI(L642):</b> <u>FROM VEPLI TO PASPU</u> AT VEPLI TRACK 180° TO PIBAP THEN TO PASPU. CROSS PIBAP AT OR BELOW FL210. CROSS PASPU AT OR ABOVE 6 000FT AT MAX IAS 220KTS. THEN FOLLOW THE APPROPRIATE PASPU ARRIVAL.</p>	
<p><b>MABAL(N892):</b> <u>FROM MABAL TO PASPU</u> AT MABAL TRACK 231° TO KILOT THEN TURN RIGHT TO TRACK 258° TO VINIL. AT VINIL TURN LEFT TRACK 180° TO PIBAP THEN TO PASPU. CROSS PIBAP AT OR BELOW FL210. CROSS PASPU AT OR ABOVE 6 000FT AT MAX IAS 220KTS. THEN FOLLOW THE APPROPRIATE PASPU ARRIVAL.</p>	

### (B) RADIO COMMUNICATIONS FAILURE PROCEDURE

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

### (C) RADIAL AND DME FROM VOR/DME

WAY POINTS	VTK VOR/DME	SJ VOR/DME
BIKTA	VTK R-346.9/D80.4	SJ R-355.0/D90.2
KILOT	VTK R-022.0/D104.5	SJ R-024.4/D119.0
MABAL	VTK R-030.1/D142.1	SJ R-031.2/D157.2
NYLON	VTK R-023.0/D13.0	SJ R-032.9/D30.0
PASPU	VTK R-008.3/D34.5	SJ R-018.3/D48.1
PIBAP	VTK R-004.4/D65.3	SJ R-011.1/D78.1
VEPLI	VTK R-001.7/D146.8	SJ R-005.2/D158.9
VINIL	VTK R-003.2/D89.8	SJ R-008.5/D102.3



**PASPU 1L (RWY 20R) CDO RNAV STAR – DESCRIPTIONS**

**Formal & Abbreviated Descriptions**

Formal Description (transition BIKTA)	Abbreviated Description	Expected Path Terminator	Flyover required
To BIKTA	BIKTA	TF	-
To PIBAP at FL250 maximum	PIBAP[FL250-]	TF	-
<i>Refer to PASPU 1L for descriptions</i>			
Formal Description (transition VEPLI)			
To VEPLI	VEPLI	TF	-
To VINIL	VINIL	TF	-
To PIBAP at FL250 maximum	PIBAP[FL250-]	TF	-
<i>Refer to PASPU 1L for descriptions</i>			
Formal Description (transition MABAL)			
To MABAL	MABAL	TF	-
To KILOT	KILOT	TF	-
To VINIL	VINIL	TF	-
To PIBAP at FL250 maximum	PIBAP[FL250-]	TF	-
<i>Refer to PASPU 1L for descriptions</i>			
Formal Description (PASPU 1L)			
To PASPU at A060 minimum; IAS 250kts maximum	PASPU[A060+]; K250-	TF	-
To NYLON at A030 minimum; IAS 220kts maximum	NYLON[A030+]; K220-	TF	-
To BIPAL	BIPAL	TF	-
To IDURO	IDURO	TF	-

**Tabular Description (BIKTA transition)**

Path Term	Waypoint Name	Flyover	Course <sup>0</sup> M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	BIKTA	-	120(119.5)	-	-	-	-0.5	-	RNAV1
TF	PIBAP	-	180(179.5)	R	FL250-	-	-0.5	-	RNAV1
<i>Refer to PASPU 1L for descriptions</i>									

**Tabular Description (VEPLI transition)**

Path Term	Waypoint Name	Flyover	Course <sup>0</sup> M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	VEPLI	-	180(179.5)	-	--	-	-0.5	-	RNAV1
TF	VINIL	-	180(179.5)	-	-	-	-0.5	-	RNAV1
TF	PIBAP	-	180(179.5)	-	FL250-	-	-0.5	-	RNAV1
<i>Refer to PASPU 1L for descriptions</i>									

**Tabular Description (MABAL transition)**

Path Term	Waypoint Name	Flyover	Course <sup>0</sup> M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	MABAL	-	231(230.5)	-	-	-	-0.5	-	RNAV1
TF	KILOT	-	258(257.5)	R	-	-	-0.5	-	RNAV1
TF	VINIL	-	180(179.5)	L	-	-	-0.5	-	RNAV1
TF	PIBAP	-	180(179.5)	-	FL250-	-	-0.5	-	RNAV1
<i>Refer to PASPU 1L for descriptions</i>									

**Tabular Description (PASPU 1L)**

Path Term	Waypoint Name	Flyover	Course <sup>0</sup> M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	PASPU	-	180(179.5)	-	A060+	K250-	-0.5	-	RNAV1
TF	NYLON	-	214(213.5)	R	A030+	K220-	-0.5	-	RNAV1
TF	BIPAL	-	203(202.5)	L	-	-	-0.5	-	RNAV1
TF	IDURO	-	203(202.5)	-	-	-	-0.5	-	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

<b>1</b>	<b>SET TRANSPONDER TO MODE A/C CODE 7600</b>
<b>2</b>	<p><b>When cleared via PASPU 1L by Singapore ATC</b></p> <ul style="list-style-type: none"> <li>(a) Maintain last assigned flight level or altitude and proceed on PASPU 1L to IDURO</li> <li>(b) From IDURO commence descent and carry out appropriate landing procedure for RWY 20R as close as possible to EAT or ETA</li> <li>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</li> </ul>
<b>3</b>	<p><b>No clearance or instruction received from Singapore ATC</b></p> <p>- refer to Singapore AIP for radio communications failure procedure</p>



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

ACC 134.4  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

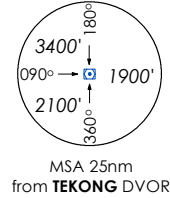
TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02L/C  
REMES FIVE ALPHA ARRIVAL  
REMES 5A  
RNAV(GNSS)**

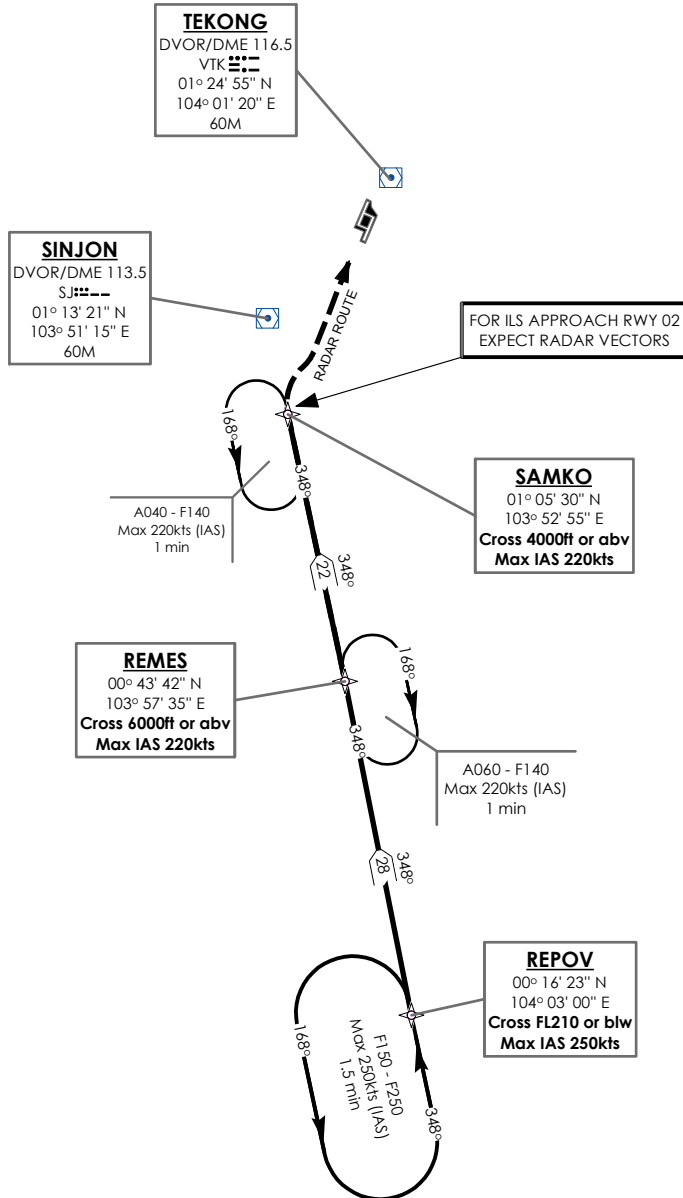
**ELEV, ALT IN FEET**  
BEARINGS, TRACKS AND  
RADIALS ARE MAGNETIC  
VAR 26°E (2015)

DISTANCES IN NM

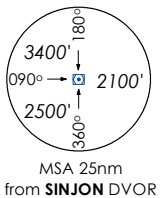


**NOTE:** RADAR REQUIRED

**NOTE:** REFER TO BACK PAGE FOR  
A) CONVENTIONAL  
PROCEDURES  
B) RADIO COM FAILURE  
PROCEDURES  
C) CROSS REFERENCE FROM  
NAVAID



NOT TO SCALE



**(A) BASIC RNAV ARRIVAL**

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

TRANSITIONS/ROUTE	REMES FIVE ALPHA ARRIVAL (REMES 5A)
<b>G579</b>	AT PARDI TRACK 348° TO REPOV * THEN TO REMES THEN TO SAMKO. CROSS REPOV * AT OR BELOW FL210. CROSS REMES AT OR ABOVE 6 000FT AT MAX IAS 220KTS. CROSS SAMKO AT OR ABOVE 4 000FT AT MAX IAS 220KTS. FROM SAMKO, EXPECT RADAR VECTORS FOR ILS APPROACH RUNWAY 02.

\* REPOV IS A HOLDING POINT ON ATS ROUTE G579

**(B) RADIO COMMUNICATIONS FAILURE PROCEDURE**

<b>1</b>	<b>SET TRANSPONDER TO MODE A/C CODE 7600</b>
<b>2</b>	<b>When cleared via REMES 5A by Singapore ATC</b> (a) Maintain last assigned flight level or altitude and proceed on REMES 5A to SAMKO (b) From SAMKO commence descent and carry out appropriate landing procedure for RWY 02 as close as possible to EAT or ETA (c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure
<b>3</b>	<b>No clearance or instruction received from Singapore ATC</b> - refer to Singapore AIP for radio communications failure procedure

**(C) RADIAL AND DME FROM VOR/DME**

WAY POINTS	VTK VOR/DME	SJ VOR/DME
REMES	VTK R-185.2/D41.2	SJ R-167.9/D30.2
REPOV	VTK R-178.6/D68.2	SJ R-168.3/D57.9
SAMKO	VTK R-203.5/D21.1	SJ R-168.0/D8.0



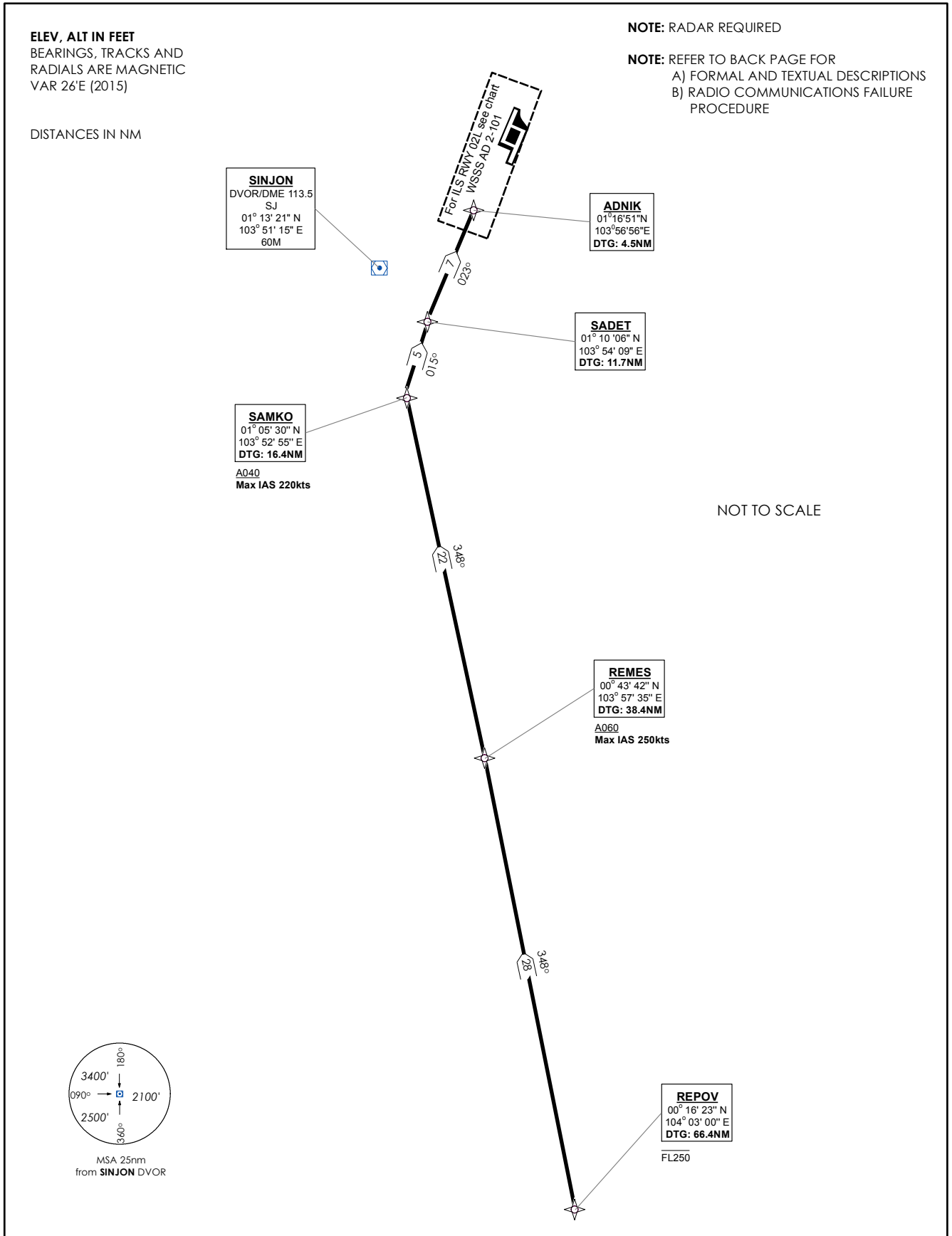
**RNAV STAR CDO  
STANDARD ARRIVAL CHART -  
INSTRUMENT (STAR)**

ACC 134.4  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 02L  
REMES ONE KILO ARRIVAL  
REMES 1K  
RNAV<sub>(GNSS)</sub> CDO**



**REMES 1K (RWY 02L) CDO RNAV STAR – DESCRIPTIONS**

**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Expected Path Terminator	Flyover required
To REPOV at FL250 maximum	REPOV[FL250-]	TF	-
To REMES at A060 minimum; IAS 250kts maximum	REMES[A060+]; K250-	TF	-
To SAMKO at A040 minimum; IAS 220kts maximum	SAMKO[A040+]; K220-	TF	-
To SADET	SADET	TF	-
To ADNIK	ADNIK	TF	-

**Tabular Description**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	REPOV	-	348(347.5)	-	FL250-	-	-0.5	-	RNAV1
TF	REMES	-	348(347.5)	-	A060+	K250-	-0.5	-	RNAV1
TF	SAMKO	-	015(014.5)	R	A040+	K220-	-0.5	-	RNAV1
TF	SADET	-	022(021.5)	R	-	-	-0.5	-	RNAV1
TF	ADNIK	-	022(021.5)	-	-	-	-0.5	-	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

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

ACC 134.4  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

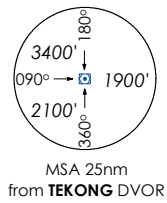
TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 20R/C  
REMES SIX BRAVO ARRIVAL  
REMES 6B  
RNAV(GNSS)**

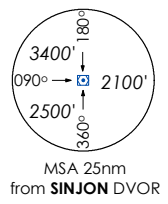
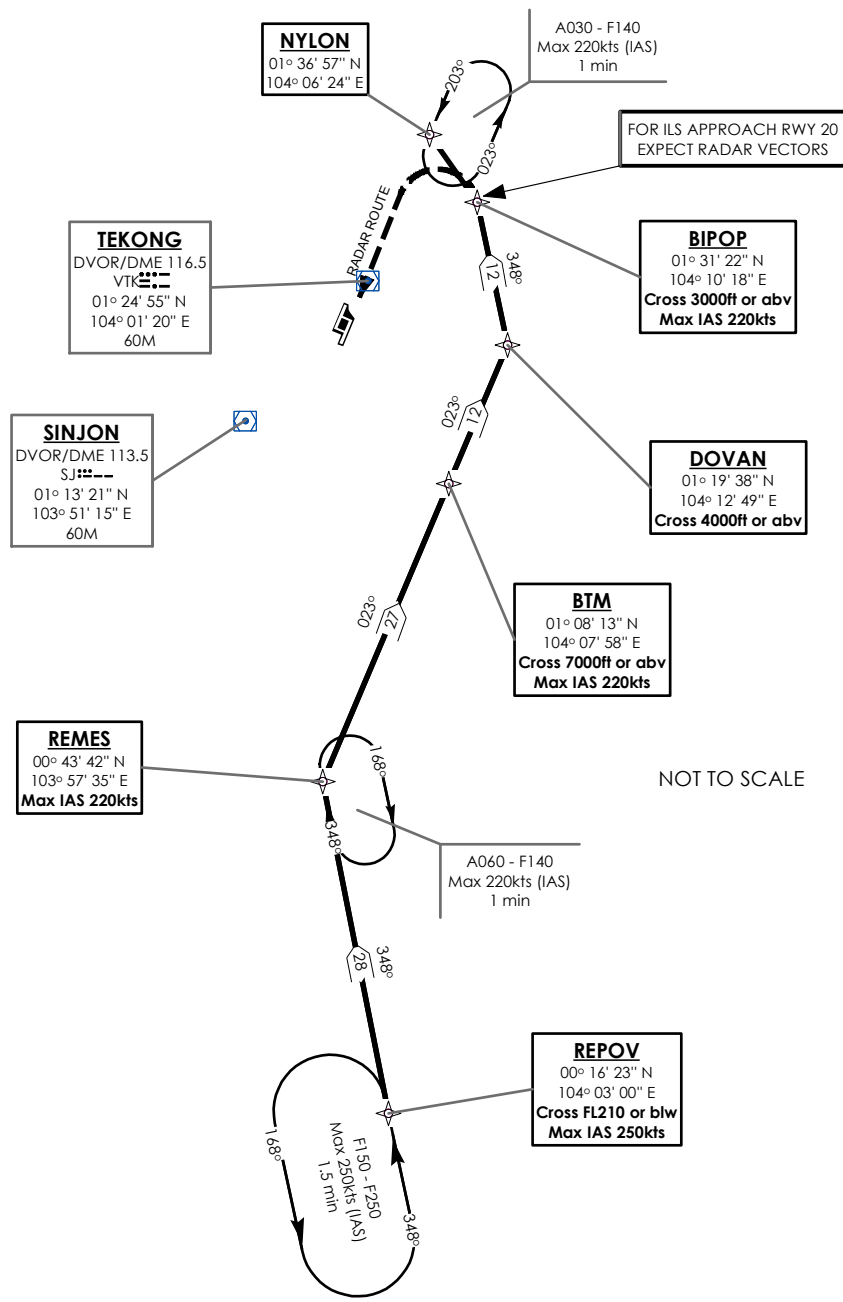
**ELEV, ALT IN FEET**  
BEARINGS, TRACKS AND  
RADIALS ARE MAGNETIC  
VAR 26°E (2015)

DISTANCES IN NM



**NOTE: RADAR REQUIRED**

**NOTE: REFER TO BACK PAGE FOR**  
A) CONVENTIONAL  
PROCEDURES  
B) RADIO COM FAILURE  
PROCEDURES  
C) CROSS REFERENCE FROM  
NAVAID



### (A) BASIC RNAV ARRIVAL

For non-RNP1/P-RNAV approved aircraft or whose RNP1/P-RNAV capability have been degraded

TRANSITIONS/ROUTE	REMES SIX BRAVO ARRIVAL
G579	AT PARDI TRACK 348° TO REPOV * THEN TO REMES. CROSS REPOV* AT OR BELOW FL210. AT REMES TURN RIGHT AND TRACK 023° TO BTM DVOR/DME THEN TO DOVAN. CROSS BTM DVOR/DME AT OR ABOVE 7 000FT AT MAX IAS 220KTS OR AS DIRECTED BY ATC. CROSS DOVAN AT OR ABOVE 4 000FT. AT DOVAN, TURN LEFT AND TRACK 348° TO BIPOP. CROSS BIPOP AT OR ABOVE 3000FT AT MAX IAS 220KTS. FROM BIPOP, EXPECT RADAR VECTORS FOR ILS APPROACH RWY 20.

\* REPOV IS A HOLDING POINT ON ATS ROUTE G579

### (B) RADIO COMMUNICATIONS FAILURE PROCEDURE

1	SET TRANSPONDER TO MODE A/C CODE 7600
2	<p><b>When cleared via REMES 6B by Singapore ATC</b></p> <p>(a) Maintain last assigned flight level or altitude and proceed on REMES 6B to BIPOP, then direct to NYLON</p> <p>(b) From NYLON commence descent and carry out appropriate landing procedure for RWY 20 as close as possible to EAT or ETA</p> <p>(c) If unable to effect a landing, refer to Singapore AIP for missed approach procedure</p>
3	<p><b>No clearance or instruction received from Singapore ATC</b></p> <p>- refer to Singapore AIP for radio communications failure procedure</p>

### (C) RADIAL AND DME FROM VOR/DME

WAY POINTS	VTK VOR/DME	SJ VOR/DME
BIPOP	VTK R-054.5/D11.0	SJ R-046.8/D26.2
BTM	VTK R-158.2/D17.9	SJ R-107.0/D17.5
DOVAN	VTK R-114.6/D12.7	SJ R-073.9/D22.5
NYLON	VTK R-023.0/D13.0	SJ R-032.9/D30.0
REMES	VTK R-185.2/D41.2	SJ R-167.9/D30.2
REPOV	VTK R-178.6/D68.2	SJ R-168.3/D57.9

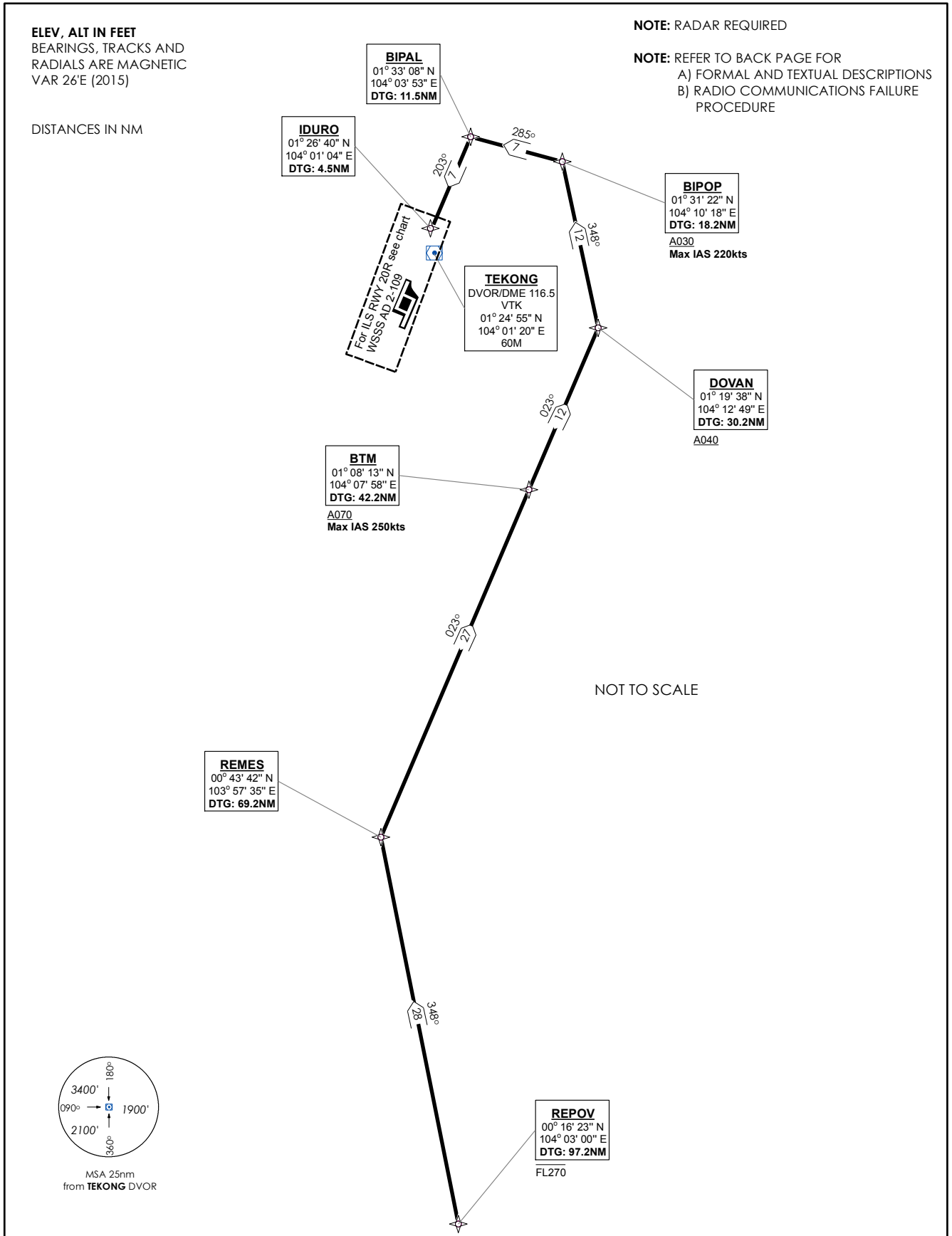
**RNAV STAR CDO  
STANDARD ARRIVAL CHART -  
INSTRUMENT (STAR)**

ACC 134.4  
APP 124.05 / 120.3  
ARR 119.3  
TWR 118.6 / 118.25

TRANSITION ALTITUDE  
11 000ft

D-ATIS AP ID-WSSS  
128.6

**SINGAPORE/Singapore Changi  
RWY 20R  
REMES ONE LIMA ARRIVAL  
REMES 1L  
RNAV<sub>(GNSS)</sub> CDO**



**REMES 1L (RWY 20R) CDO RNAV STAR – DESCRIPTIONS**

**Formal & Abbreviated Descriptions**

Formal Description	Abbreviated Description	Expected Path Terminator	Flyover required
To REPOV at FL270 maximum	REPOV[FL270-]	TF	
To REMES	REMES	TF	-
To BTM at A070 minimum; IAS 250kts maximum	BTM[A070+]; K250-	TF	-
To DOVAN at A040 minimum	DOVAN[A040+]	TF	
To BIPOP at A030 minimum; IAS 220kts maximum	BIPOP[A030]; K220-	TF	-
To BIPAL	BIPAL	TF	-
To IDURO	IDURO	TF	-

**Tabular Description**

Path Term	Waypoint Name	Flyover	Course °M (°T)	Turn Direction	Altitude	Speed Limit	Magnetic Variation	Vertical angle	Navigation Performance
TF	REPOV	-	348(347.5)		FL270-	-	-0.5	-	RNAV1
TF	REMES	-	023(22.5)	R	-	-	-0.5	-	RNAV1
TF	BTM	-	023(22.5)	-	A070+	K250-	-0.5	-	RNAV1
TF	DOVAN	-	348(347.5)	L	A040+	-	-0.5	-	RNAV1
TF	BIPOP	-	285(284.5)	L	A030+	K220-	-0.5	-	RNAV1
TF	BIPAL	-	203(202.5)	L	-	-	-0.5	-	RNAV1
TF	IDURO	-	203(202.5)	-	-	-	-0.5	-	RNAV1

**RADIO COMMUNICATIONS FAILURE PROCEDURE**

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

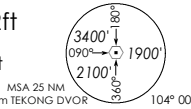






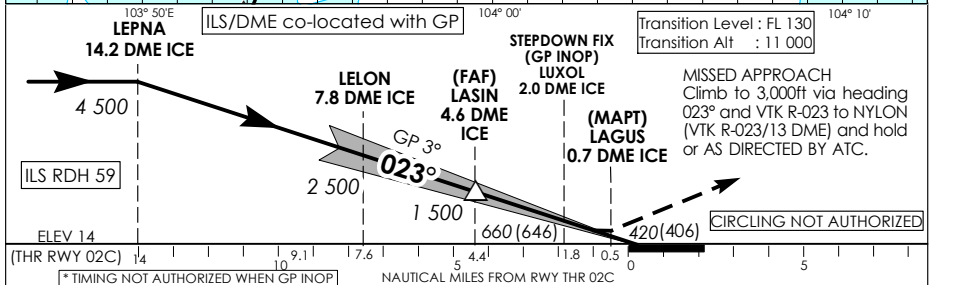
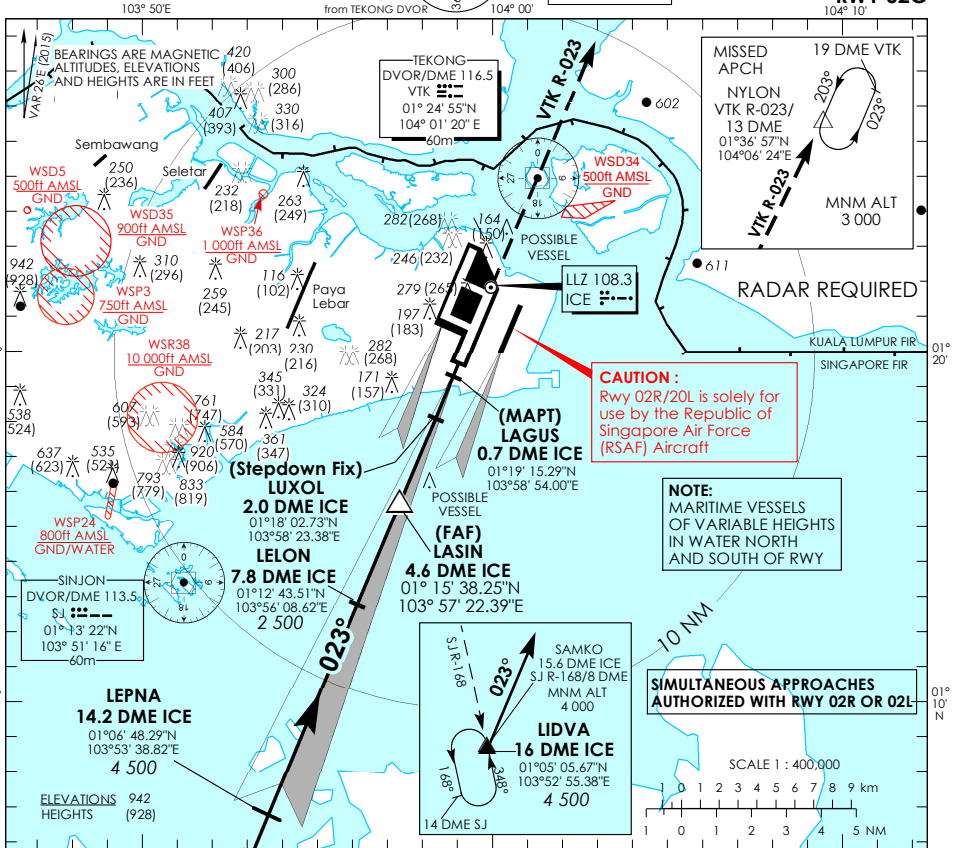
**INSTRUMENT  
APPROACH  
CHART**

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



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

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



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





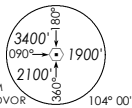






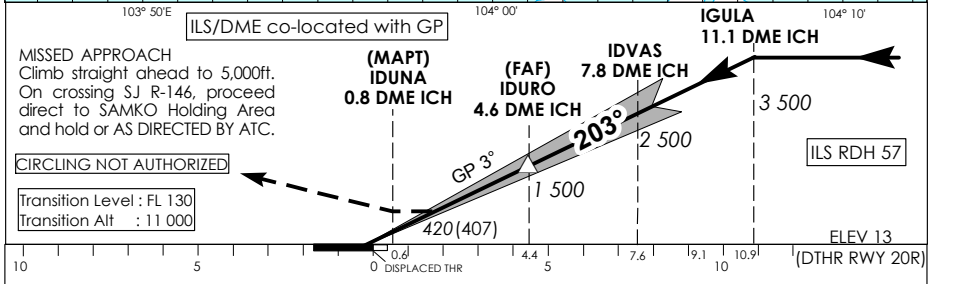
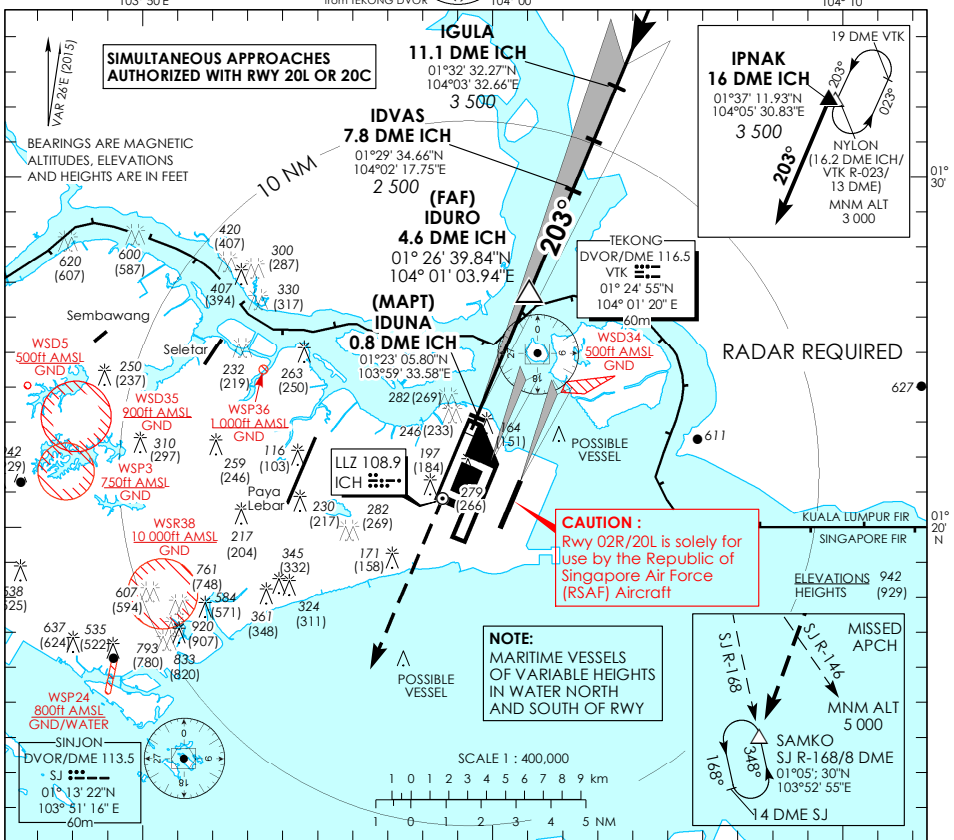
**INSTRUMENT APPROACH CHART**

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



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

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



\* TIMING NOT AUTHORIZED WHEN GP INOP

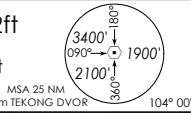
Category of Aircraft	OCA (ICH)				
	A	B	C	D	D <sub>L</sub>
Straight-in	CAT I ILS 152 (139)	159 (146)	179 (166)	192 (179)	195 (182)
	GP INOP		420 (407)		
Distance	4 DME		3 DME		2 DME
Altitude (Height)	1290 (1277)		970 (957)		650 (637)
Speed	knots	70	120	150	185
FAF - MAPT 3.9nm	min : s *	3 : 21	1 : 57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





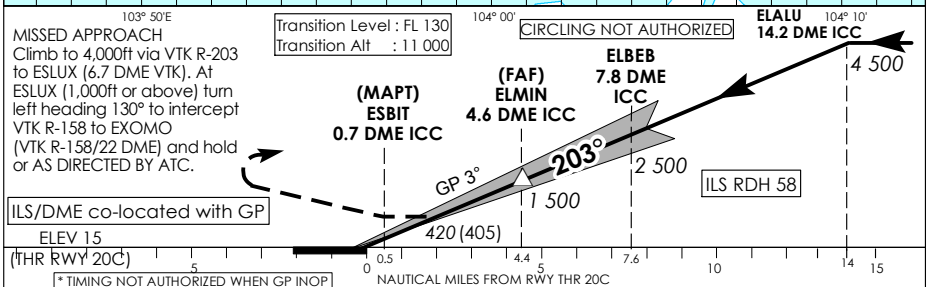
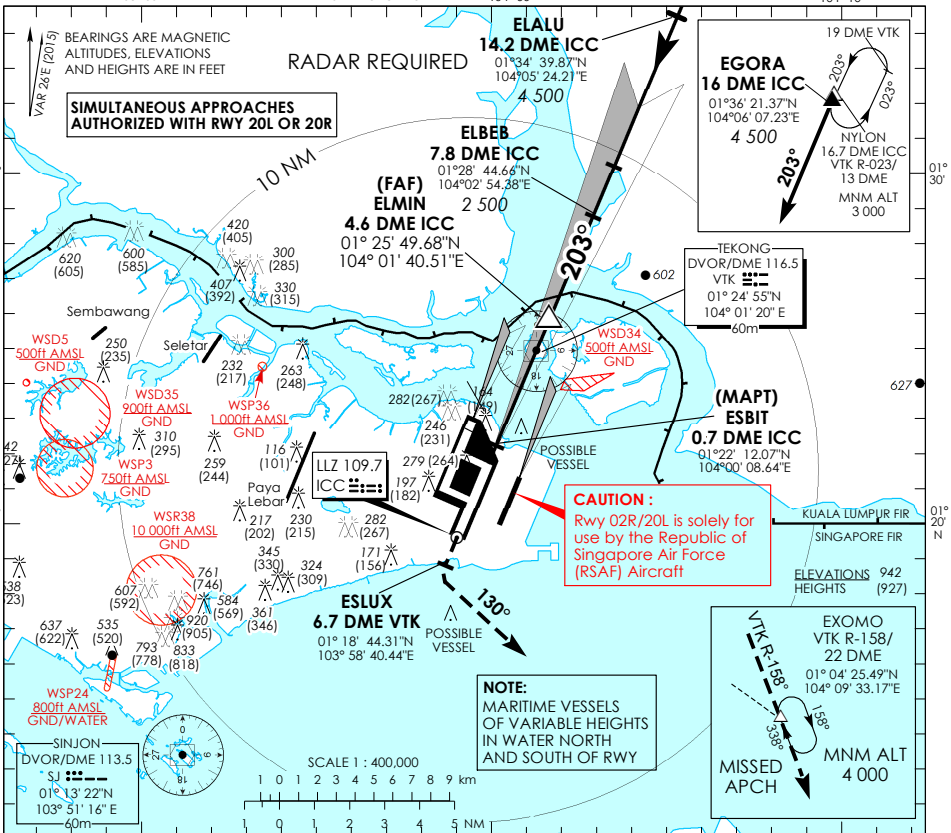
**INSTRUMENT  
APPROACH  
CHART**

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



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

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



\* TIMING NOT AUTHORIZED WHEN GP INOP

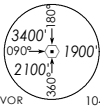
OCA (OCH)						
Category of Aircraft	A	B	C	D	D <sub>L</sub>	
Straight-in	CAT I ILS	166 (151)	180 (165)	196 (181)	209 (194)	212 (197)
	CAT II ILS	71 (56)	78 (63)	91 (76)	101 (86)	107 (92)
	GP INOP	420 (405)				

Distance	4 DME	3 DME	2 DME		
Altitude (Height)	1290 (1275)	970 (955)	650 (635)		
Speed	knots 70	120	150		
	185				
FAF - MAPT 3.9nm	min : s *	3 : 21	1 : 57	1 : 34	1 : 16
Rate of descent/GS	ft/min 370	635	795	980	



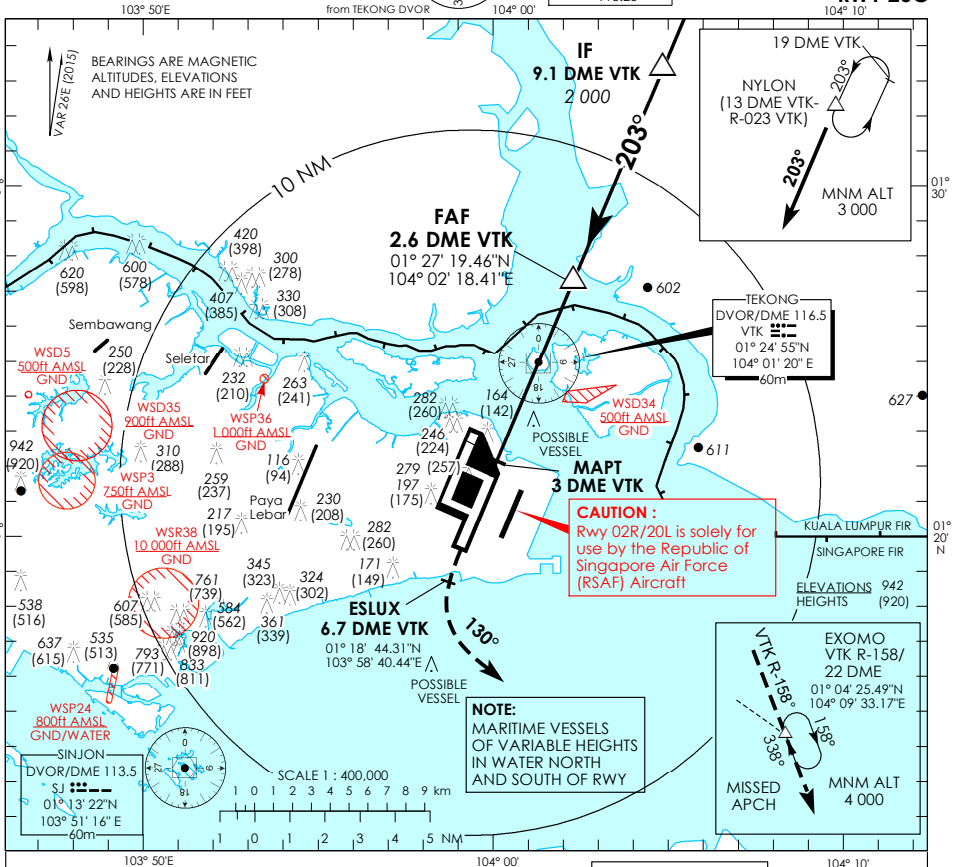
**INSTRUMENT  
APPROACH  
CHART - ICAO**

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

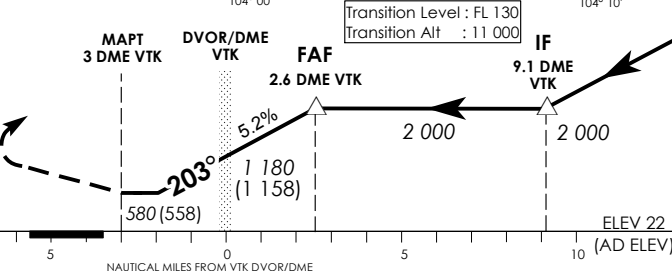


D-ATIS AP ID WSSS	128.6
APP	120.3
TWR	119.3
	118.6
	118.25

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



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



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

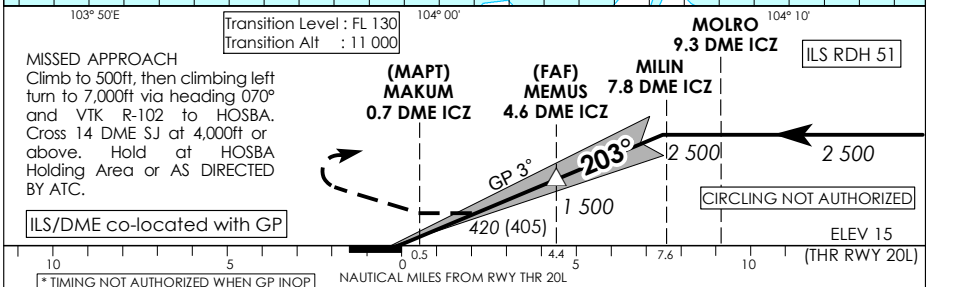
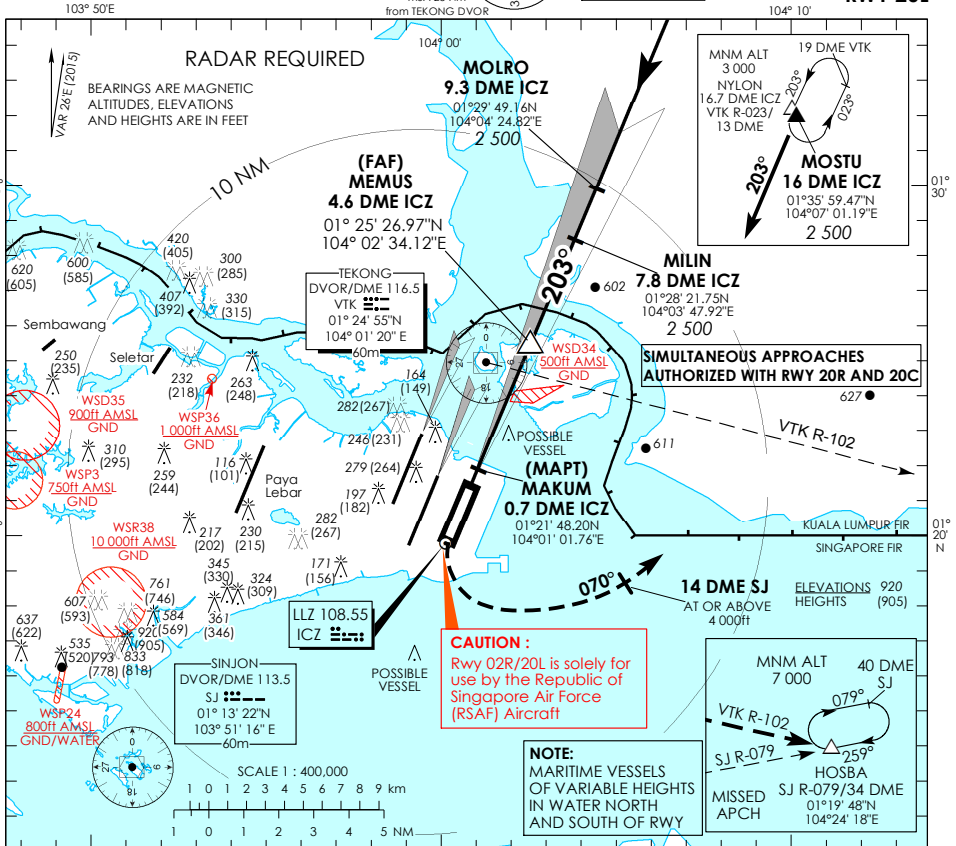


**INSTRUMENT APPROACH CHART**

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

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

**SINGAPORE/ SINGAPORE CHANGI ICZ ILS/DME RWY 20L**



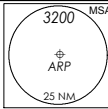
\* TIMING NOT AUTHORIZED WHEN GP INOP

OCA (OCH)				
Category of Aircraft	A	B	C	D
Straight-in	420 (405)			
Distance	4 DME	3 DME	2 DME	
Altitude (Height)	1290 (1275)	970 (955)	650 (635)	
Speed	knots 70	120	150	185
FAF - MAPT 3.9nm	min : s *	3 : 21	1 : 57	1 : 34
Rate of descent/GS	ft/min 370	635	795	980



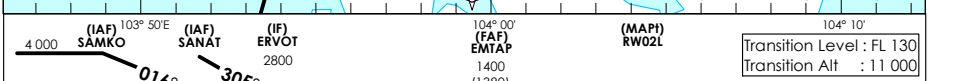
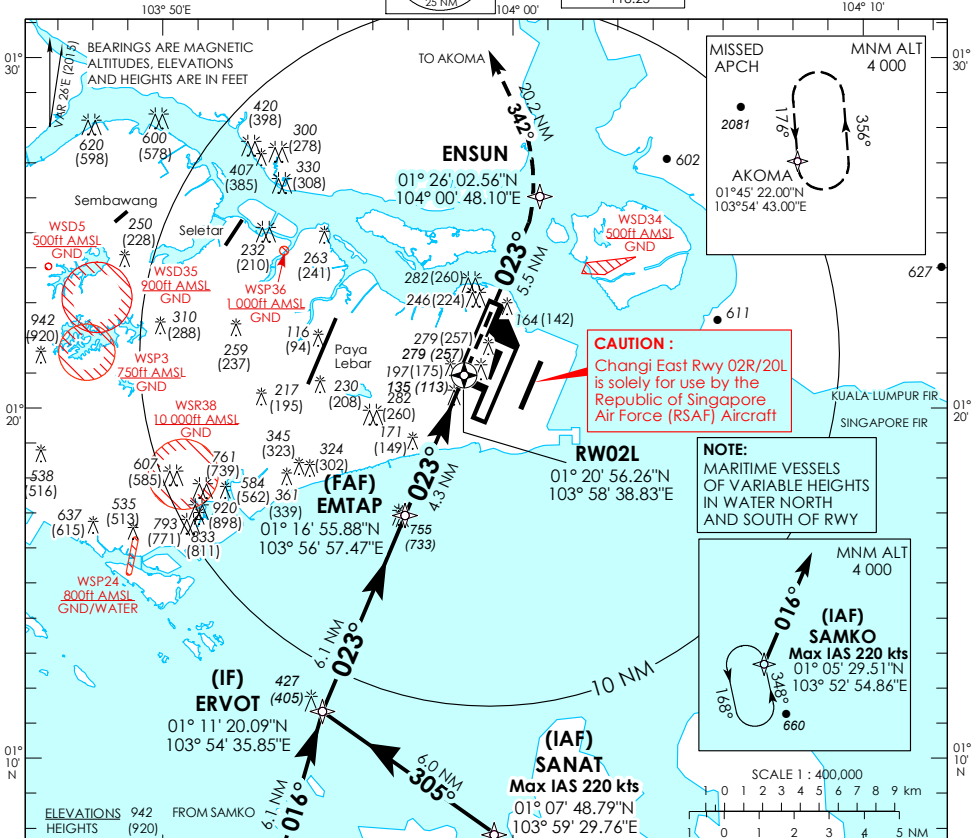
**INSTRUMENT  
APPROACH  
CHART**

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



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

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



**CIRCLING NOT AUTHORIZED**

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

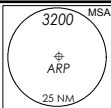
ELEV 22 (THR RWY 02L)		NAUTICAL MILES FROM THR RWY 02L						
		OCA (OCH)						
Category of Aircraft		A	B	C	D			
LNAV/VNAV	2.5%	450 (430)						
LNAV	2.5%	540 (520)						
Fix		SAMKO	SANAT	ERVOT	EMTAP	RW02L	ENSUN	AKOMA
Altitude (Height)		4000 (3978)	4000 (3978)	2800 (2778)	1400 (1378)	540 (518)	880 (858)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





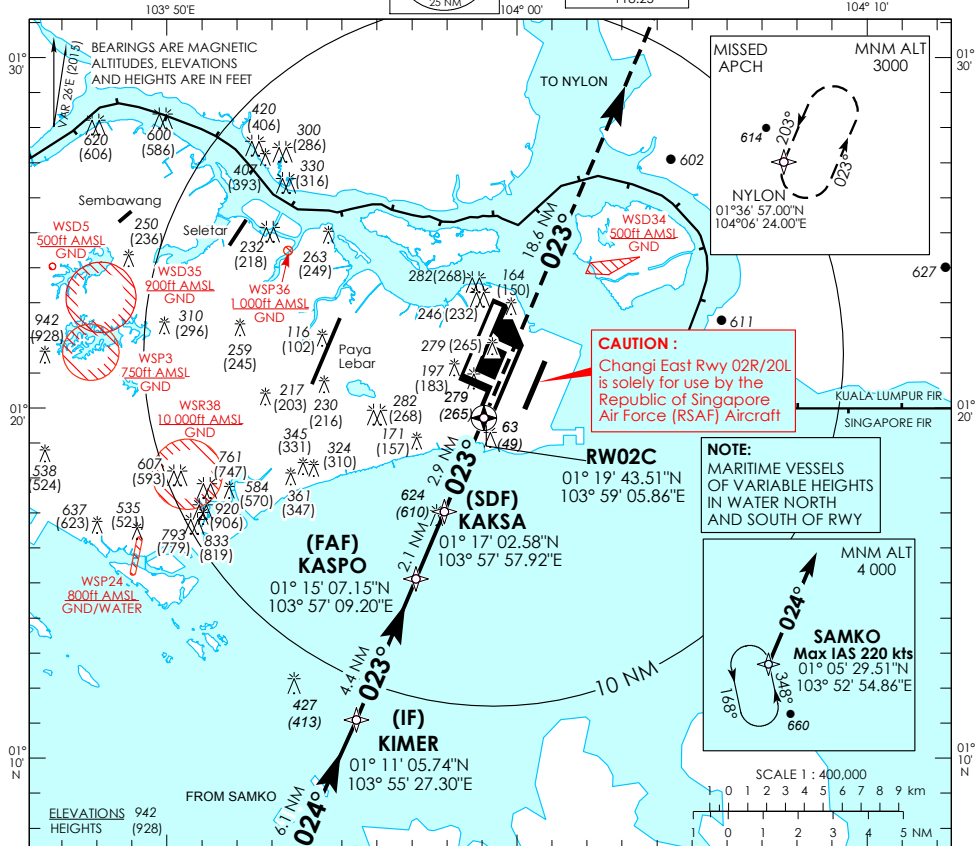
**INSTRUMENT APPROACH CHART**

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



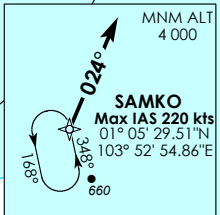
D-ATIS AP ID	WSSS
APP	128.6
TWR	120.3
	119.3
	118.6
	118.25

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



**CAUTION :**  
Changi East Rwy 02R/20L is solely for use by the Republic of Singapore Air Force (RSAF) Aircraft

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



Transition Level : FL 130  
Transition Alt : 11 000

MISSED APPROACH:  
CLIMB DIRECT TO NYLON TO JOIN THE HOLDING AT 3000FT OR ABOVE OR AS DIRECTED BY ATC.

MINIMUM TEMPERATURE FOR BARO-VNAV APPROACHES: 5°C

ELEV 14 (THR RWY 02C)

NAUTICAL MILES FROM THR RWY 02C				
Category of Aircraft	A	B	C	D
LNAV	2.5%	<b>490 (480)</b>	OCA (OCH)	
LNAV without SDF	2.5%	<b>890 (880)</b>	OCA (OCH)	
LNAV/VNAV	2.5%	<b>360 (350)</b>	OCA (OCH)	

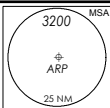
  

Fix	SAMKO	KIMR	KASPO	KAKSA	RW02C	NYLON
Altitude (Height)	<b>4000 (3986)</b>	<b>2000 (1986)</b>	<b>1600 (1586)</b>	<b>990 (976)</b>	<b>490 (476)</b>	<b>3000 (2986)</b>
Speed	80	100	120	140	160	180
FAF - MAP1 5nm	min : s <b>3 : 45</b>	<b>3 : 00</b>	<b>2 : 30</b>	<b>2 : 09</b>	<b>1 : 53</b>	<b>1 : 40</b>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



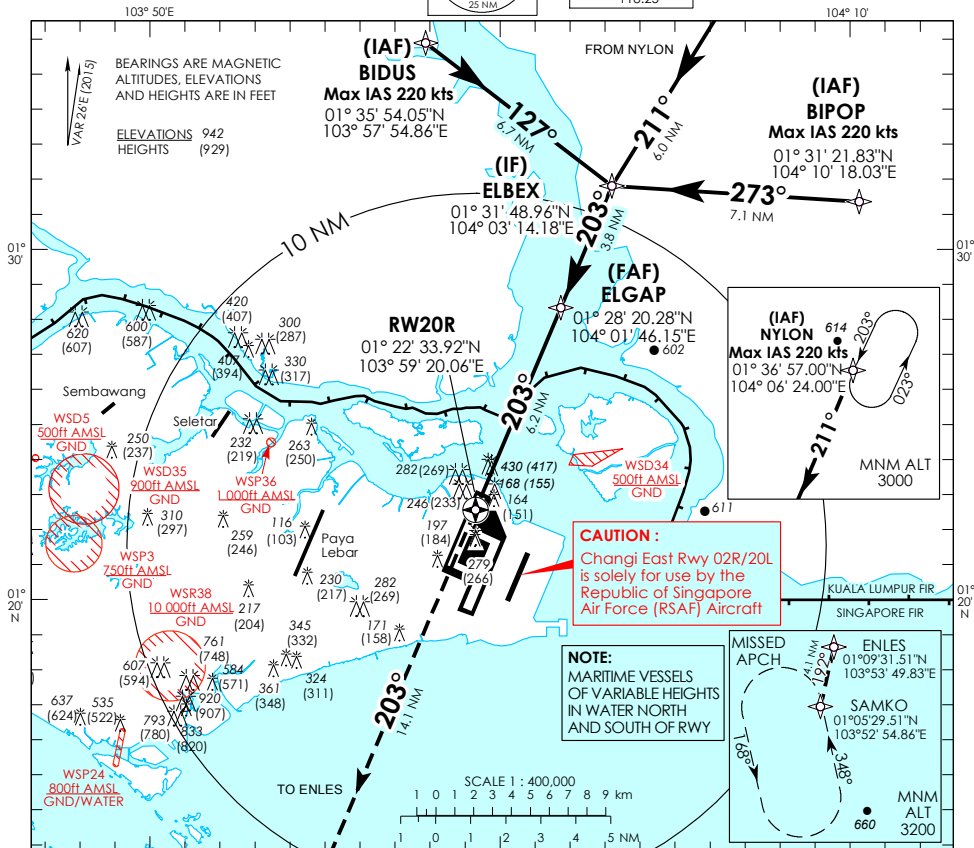
**INSTRUMENT APPROACH CHART - ICAO**

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



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

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



**CAUTION :**  
Changi East Rwy 02R/20L is solely for use by the Republic of Singapore Air Force (RSAF) Aircraft

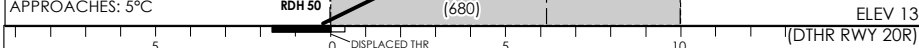
**NOTE:**  
MARITIME VESSELS OF VARIABLE HEIGHTS IN WATER NORTH AND SOUTH OF RWY

Transition Level : FL 130  
Transition Alt : 11 000

MISSED APPROACH:  
CLIMB DIRECT TO ENLES.  
TURN LEFT TO SAMKO TO JOIN THE HOLDING AT 3200FT OR ABOVE OR AS DIRECTED BY ATC.

MINIMUM TEMPERATURE FOR BARO-VNAV APPROACHES: 5°C

(MAP) RW20R	(FAF) ELGAP	(IF) ELBEX	(IAF) BIDUS	(IAF) BIPOP	(IAF) NYLON
2 000 (1990)	2 000 (1990)	2 000	3 400	3 000	3 000

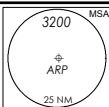


Category of Aircraft	OCA (OCH)							
	A	B	C	D				
RNAV/VNAV	690 (680)							
RNAV	690 (680)							
Fix	BIDUS	NYLON	BIPOP	ELBEX	ELGAP	RW20R	ENLES	SAMKO
Altitude (Height)	3400 (3387)	3000 (2987)	3000 (2987)	2000 (1987)	2000 (1987)	690 (680)	2180 (2167)	3200 (3187)
Speed	knots	80	100	120	140	160	180	
FAF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



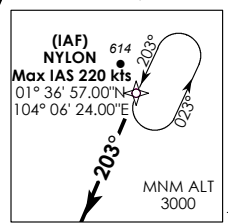
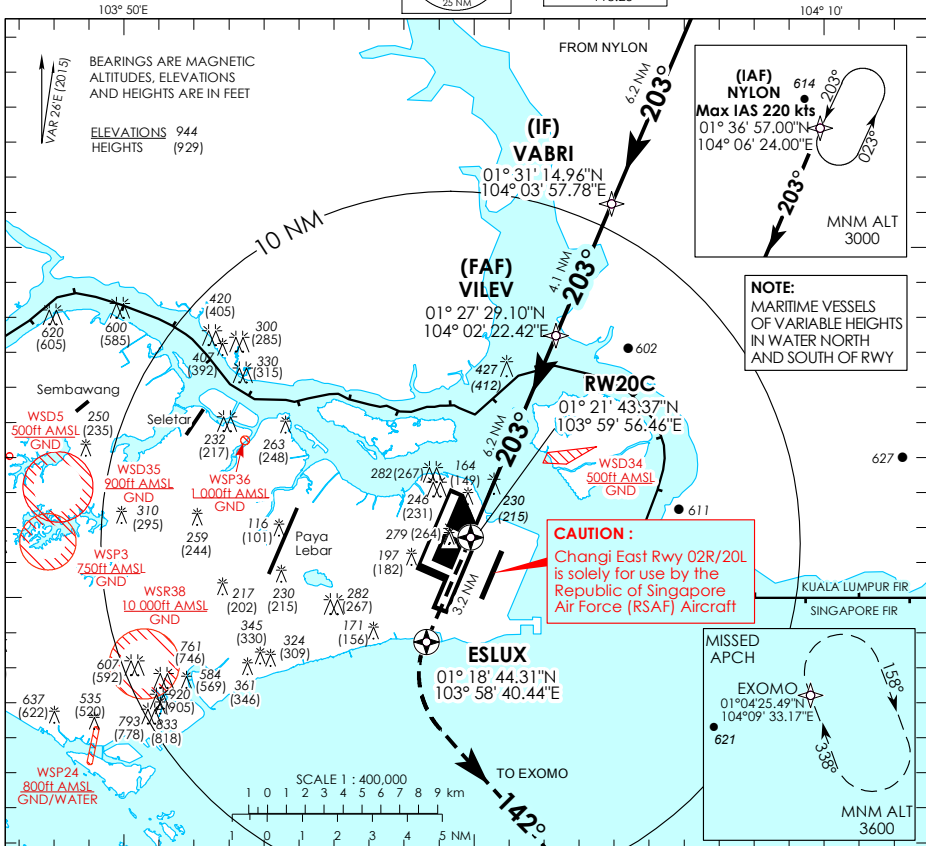
**INSTRUMENT APPROACH CHART - ICAO**

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



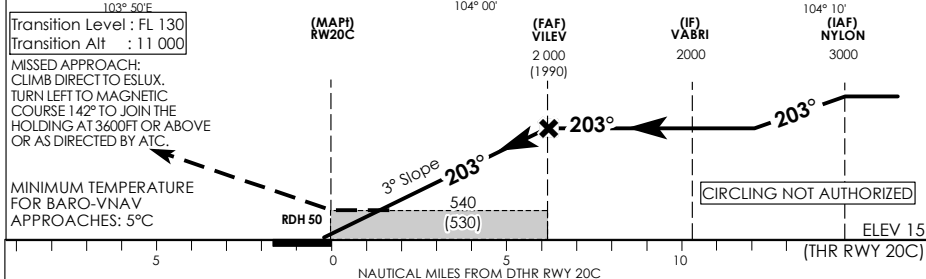
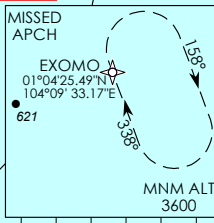
D-ATIS	AP ID	WSSS
APP	128.6	
TWR	120.3	
	119.3	
	118.6	
	118.25	

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



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

**CAUTION :**  
Changi East Rwy 02R/20L  
is solely for use by the  
Republic of Singapore  
Air Force (RSAF) Aircraft



Transition Level : FL 130 Transition Alt : 11 000		(MAP) RW20C	(FAF) VILEV	(IF) VABRI	(IAF) NYLON		
MISSED APPROACH: CLIMB DIRECT TO ESLUX. TURN LEFT TO MAGNETIC COURSE 142° TO JOIN THE HOLDING AT 3600FT OR ABOVE OR AS DIRECTED BY ATIS.			2 000 (1 990)	2 000	3 000		
MINIMUM TEMPERATURE FOR BARO-VNAV APPROACHES: 5°C							
		RDH 50	540 (530)		ELEV 15		
		NAUTICAL MILES FROM DTHR RWY 20C					
		OCA (OCH)					
Category of Aircraft		A	B	C	D		
LNAV/VNAV	2.5%			490 (480)			
LNAV	2.5%			540 (530)			
Fix		NYLON	VABRI	VILEV	RW20C	ESLUX	EXOMO
Altitude (Height)		3000 (2985)	2000 (1985)	2000 (1985)	540 (525)	540 (525)	3600 (3585)
Speed	knots	80	100	120	140	160	180
FAF - MAP 6.2 nm	min : s	4 : 39	3 : 44	3 : 06	2 : 40	2 : 20	2 : 04
Rate of descent/GS	ft/min	425	531	637	743	849	955





<b>PAPI 3° (MEHT)*</b>				
<b>Pilot's eye height over the threshold when the following PAPI lights come into view.</b>	<b>RUNWAY</b>			
	02L	20R	02C	20C
2 White lights and 2 Red lights	20.6m	20.0m	20.4m	20.4m
3 White lights and 1 Red light	23.1m	22.6m	23.1m	23.1m
4 White lights	25.6m	25.0m	25.5m	25.5m
<p>*MEHT : Minimum Eye Height Over the Threshold  Note : Aircraft with eye-to-wheel height greater than 8 metres are advised to fly with 2 white lights and 2 red lights visible so as to achieve sufficient wheel clearance.</p>				



## AD 2 - AERODROMES

WSSL AD 2.1 AERODROME LOCATION INDICATOR AND NAME
WSSL - SINGAPORE / Seletar

WSSL AD 2.2 AERODROME GEOGRAPHICAL AND ADMINISTRATIVE DATA		
1	<i>ARP Coordinates and Site at AD</i>	012501.03N 1035203.52E
2	<i>Direction and Distance from (city)</i>	006°, 14.6km from city centre (The Fullerton, Singapore)
3	<i>Elevation/Reference Temperature</i>	14m (46ft) / 33.5°C
4	<i>Geoid Undulation</i>	9.78m
5	<i>MAG VAR</i>	27'E (2010)
6	<i>AD Administration, Address, Telephone, Telefax, AFS</i>	<p>Address: Changi AirportGroup (S) Pte Ltd Seletar Airport Building 556, West Camp Singapore 797794</p> <p>TEL: (65)64810017, FAX: (65)64811190 (Airport Manager) TEL: (65)64812909, FAX: (65)64833044 (AIS) TEL: (65)64812893, FAX: (65)64831656 (Control Tower) TEL: (65)64815077, 97533361 FAX: (65)64831754 (Airside Operations Unit)</p> <p>AFS: WSSLYDYX</p>
7	<i>Types of Traffic Permitted</i>	IFR and VFR
8	<i>Remarks</i>	<p>a) Scheduled Closure Periods for RWY 03/21: see AIP page WSSL AD 2-5.</p> <p>b) PPR for aircraft not equipped with RTF.</p> <p>c) 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.</p> <p>d) Direct transit area. Overnight transit in Singapore city.</p> <p>e) All arriving and departing aircraft are required to appoint a licensed Ground Handling Agent (GHA). List of Seletar GHAs can be downloaded from URL - <a href="http://www.seletarairport.com/ground-handling-agents-at-seletar-airport.html">http://www.seletarairport.com/ground-handling-agents-at-seletar-airport.html</a></p>

WSSL AD 2.3 OPERATIONAL HOURS						
1	<i>Aerodrome Administration</i>	H24		5	<i>ATS Reporting Office</i>	H24
2	<i>Customs and Immigration</i>	H24		6	<i>MET Briefing Office</i>	H24
3	<i>Health and Sanitation</i>	H24		7	<i>Air Traffic Services</i>	H24
4	<i>AIS Self-Briefing Office</i>	H24		8	<i>Apron Control Office</i>	H24

<b>WSSL AD 2.4 HANDLING SERVICES AND FACILITIES</b>		
1	<i>Cargo Handling Facilities</i>	Provided by handling agent
2	<i>Fuel / Oil Types</i>	AVGAS 100LL and JET A1
3	<i>Fuelling Facilities / Capacity</i>	MON to FRI BTN 0030-1030; SAT, SUN and Public holidays BTN 0030-0930 Contact during operating hours: TEL: (65)64811522 or (65)64846681 FAX: (65)64812159 Contact after operating hours: HP: (65)91294161 or (65)91284143
4	<i>Hangar space for visiting aircraft</i>	By arrangement with handling agent.
5	<i>Repair facilities for visiting aircraft</i>	By arrangement with handling agent.
6	<i>Remarks</i>	Nil

<b>WSSL AD 2.5 PASSENGER FACILITIES</b>		
1	<i>Hotels</i>	Nil
2	<i>Restaurants</i>	Nil
3	<i>Transportation</i>	Handling agent provides its own transport service for passengers and crew between airport and city. Public buses and private hired taxis are available at airport terminal.
4	<i>Medical Facilities</i>	Nil
5	<i>Banks and Post Offices</i>	Nil
6	<i>Tourist Office</i>	Nil
7	<i>Remarks</i>	Nil

<b>WSSL AD 2.6 RESCUE AND FIRE FIGHTING SERVICES</b>		
1	<i>AD category for fire fighting</i>	CAT 7 (No facilities for foaming of runway).
2	<i>Rescue equipment</i>	Adequately provided as recommended by ICAO.
3	<i>Capability for removal of disabled aircraft</i>	Up to B757-200. Contact Seletar Airside Operations at: +65 64815077 or +65 97533361
4	<i>Remarks</i>	All Airport Emergency Service personnel are trained in rescue and fire-fighting as well as medical first-aid.

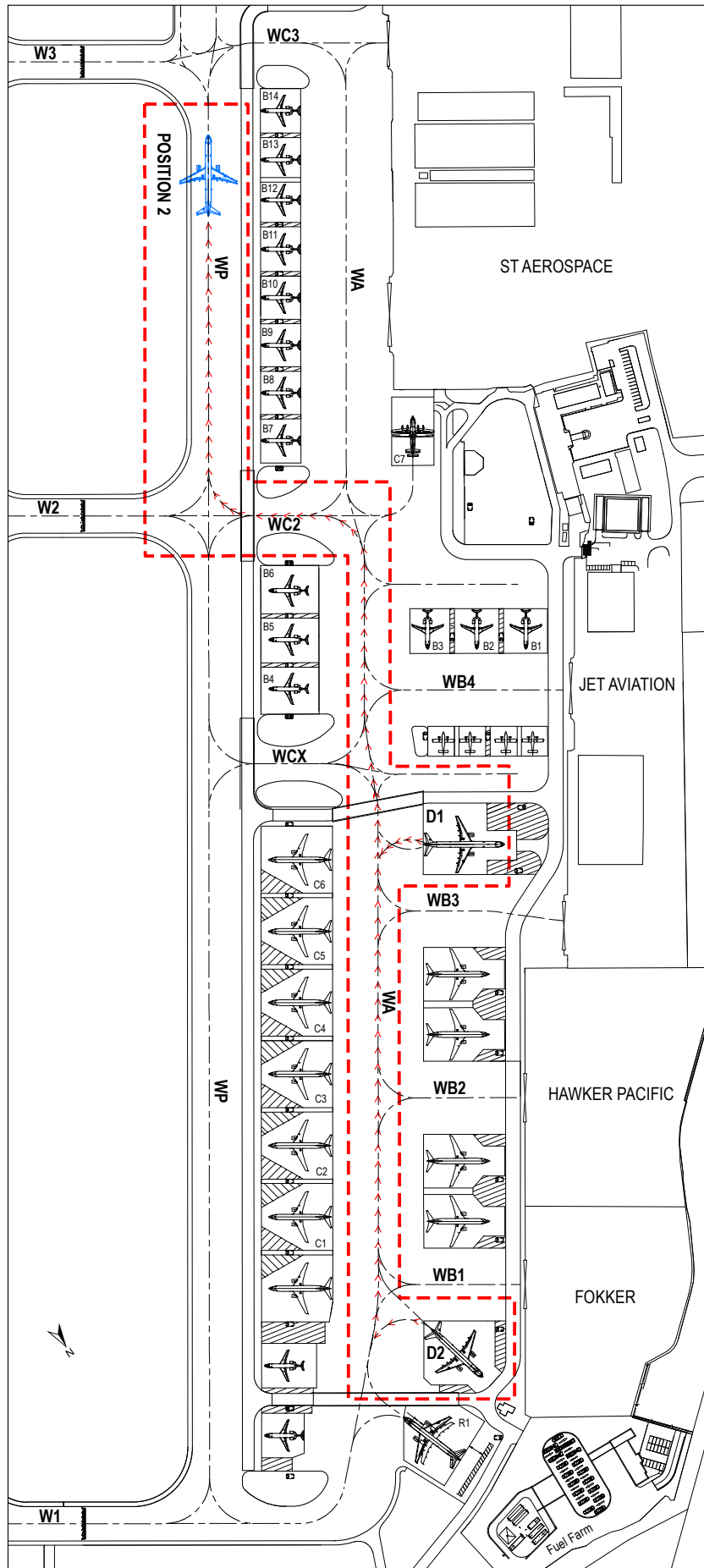
<b>WSSL AD 2.7 SEASONAL AVAILABILITY - CLEARING</b>		
The aerodrome is available throughout the year		

<b>WSSL AD 2.8 APRONS, TAXIWAYS AND CHECK LOCATIONS/POSITIONS DATA</b>		
1	<i>Apron surface and strength</i>	Surface: Bituminous concrete (aircraft stand C7) Strength: PCN47/F/C/X/U Surface: Concrete (all other aircraft stands) Strength: PCN45/R/C/W/U
2	<i>Taxiway width, surface and strength</i>	Width: 23m (75.5ft), 18m (59.1ft) TWY EC4 8m (26.2ft) TWY WS1 and WS2 Surface: Bituminous concrete Strength: PCN47/F/C/X/U
3	<i>Remarks</i>	

<b>WSSL AD 2.9 SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS</b>		
1	<i>Use of aircraft stand ID signs, TWY guidelines and visual docking/parking guidance system of aircraft stands</i>	Taxiing guidance signs at all intersections with TWY and RWY at all holding positions. Guidelines at apron. Nose-in guidance at aircraft stands.
2	<i>RWY and TWY markings and LGT</i>	
<p><u>RWY LGT:</u> refer to page WSSL AD 2-5 for details. RWY Turn Pad LGT / Markings: Only AVBL at THR RWY 03. Yellow turnpad centreline.</p> <p><u>TWY LGT:</u> TWY Edge LGT: Blue LGT, inset, elevated and omni-directional. TWY markings: Yellow TWY centreline.</p> <p><u>MARKING AIDS:</u> Threshold, touchdown zone, centre line stripes and RWY designation. RWY width outline from bituminous concrete surface by white lines.</p> <p><u>AIMING POINT MARKINGS:</u> RWY 03: coincident with PAPI origin located 311.6m from THR respectively. RWY 21: coincident with PAPI origin located 232.8m from THR respectively.</p>		
3	<p><i>Stop Bars: Red LGT across taxiways W1, W2, W3, E2, E3 and E4, flushed with TWY surface.</i> <i>Crash Alarm Stop Bars: Red LGT across junctions of EP, EC4 and EH2 TWY, flushed with TWY surface.</i> <i>(Note to pilots and tow-crew: Slow down when taxiing / towing on TWY EP between TWY EC4 and abeam the Control Tower. Keep a lookout for emergency vehicles that may cross the taxiway to respond to emergency on the RWY.)</i></p>	

<b>WSSL AD 2.9 SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM AND MARKINGS</b>	
<b>4</b>	<b>Remarks</b>
	<p>a) Aircraft operators/ground handlers shall be responsible for the safe and smooth operations of aircraft at the aircraft stands.</p> <p>b) To enhance airside safety, all aircraft larger than Code A (i.e. up to but not including 15m wingspan) shall be marshalled into the aircraft stands.</p> <p>c) Arriving aircraft will be assigned an aircraft stand. A ground handler shall marshal the aircraft into the aircraft stand.</p> <p>d) A ground handler shall be at the aircraft stand when the aircraft is ready to depart. When the pilot signals that he is ready to taxi, the ground handler shall ensure that the area around the aircraft is clear before marshalling the aircraft out of the aircraft stand.</p> <p>e) Only Code A aircraft, Code B aircraft, aircraft type Global Express, Global 5000, Global Express XRS, Fokker 50, Fokker 100, Gulfstream 500, Gulfstream 550, ATR 72-500, DASH 7 and Falcon 7X are allowed to self-power out from aircraft stands C1, C2, C3, C4, C5 and C6.</p> <p>f) Aircraft at stand C1 shall self-power out towards the north only.</p> <p>g) Aircraft at stand C6 shall self-power towards the south only.</p> <p>h) Aircraft at stands C2, C3, C4 and C5 are allowed to self-power out towards the south or the north.</p> <p>i) Aircraft can self-power in from the north as well as the south via TWY WA.</p> <p>j) All personnel, tow tugs and equipment shall be cleared from the aircraft stand and red chevron markings on the adjacent aircraft stands before self-power out can commence.</p> <p>k) Aircraft with wingspan larger than 28.35m are not allowed to park at aircraft stand C7. Refuelling will not be allowed at aircraft stand C7.</p>

### PROCEDURES FOR PUSHBACK OF AIRCRAFT FROM AIRCRAFT STANDS D1/D2 AND TOW FORWARD TO TWY WP POSITION 2 TO FACE SOUTH



<b>WSSL AD 2.10 AERODROME OBSTACLES</b>				
<b>IN APPROACH / TKOF AREAS</b>			<b>IN CIRCLING AREA AND AT AD</b>	
<i>RWY/Area affected</i>	<i>Obstacle type Elevation Markings/LGT</i>	<i>Coordinates</i>	<i>Obstacle type Elevation Markings/LGT</i>	<i>Coordinates</i>
a	b	c	a	b
RWY 03 TKOF  RWY 21 APCH	1) Mast HGT ranging from 98ft AMSL and above in shipping channel	Approximately 1525m from THR RWY 21	1) Power station chimney 407ft AMSL	012656.8N1035251.7E
	2) Steel structure 300ft AMSL	012709.78N1035318.74E	2) Radio masts 237ft AMSL	within 500m radius of 012337N1035144E
	3) Chimney 276ft AMSL	012700.18N1035321.93E	3) Radio mast 217ft AMSL	012258.8N1035113.8E
	4) Chimney 273ft AMSL	012651.81N1035330.23E	4) Surface Wind Direction Sleeves	located at the northern and southern ends of RWY.
	5) Chimney 286ft AMSL	012646.99N1035331.46E	5) Radio masts 232ft AMSL	within 100m radius of 012454N 1035259E
	6) Mobile cranes 330ft AMSL	within area bounded by 012627.24N1035313.00E 012607.79N1035333.95E 012614.23N1035337.07E 012623.93N1035316.02E	6) Radar tower 177ft AMSL marked/LGTD	012537.79N1035306.74E (reclaimed land north of RWY)
			7) Mobile cranes 420ft AMSL	within area bounded by 012711.78N1035223.74E 012729.78N1035223.74E 012729.78N1035247.74E 012656.78N1035247.74E
			8) Orange frangible poles 2ft AMSL	at the airside turf area 90m fm both sides of RWY to demarcate the boundary for grass cutting and other maint activities.

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

<b>WSSL AD 2.11 METEOROLOGICAL INFORMATION PROVIDED</b>		
1	<i>Associated MET Office</i>	Seletar
2	<i>Hours of service</i>	H24
3	<i>Office responsible for TAF preparation, Periods of validity</i>	Singapore Changi 9 hours
4	<i>Type of landing forecast, Interval of issuance</i>	METAR, SPECI BTN 2100-1500 and 1500-2100 (on request). AD warning of adverse weather (H24)
5	<i>Briefing/consultation provided</i>	NIL
6	<i>Flight documentation, Language(s) used</i>	Tabular forms, English
7	<i>Charts/other information available for briefing or consultation</i>	NIL
8	<i>Supplementary equipment available for providing information</i>	MDWR (Met Doppler Weather Radar) MAINT Period: Second WED of every month BTN 0200-0900. Incase of bad WX, THU following the second WED BTN 0200-0900.
9	<i>ATS units provided with information</i>	NIL
10	<i>Additional information</i>	TEL: 64815978 (MET Office)

WSSL AD 2.18 ATS COMMUNICATION FACILITIES				
Service Designation	Call Sign	Frequency P-Pri S-Sec	Hours of operation	Remarks
TWR	Seletar Tower	P118.45 MHz S130.2 MHz 270.4 MHz	H24	* for vehicular movements
	Seletar Ground	121.6 MHz * 122.9 MHz		
ACC	Singapore Radar	P123.7 MHz S127.3 MHz	0000-1430	For AWY B469, G334, R208, L625, L629, L635, L642, M751, M753, M758, M761, M763, M771, N884, N891 and N892
		133.8 MHz		
		P133.25 MHz S135.8 MHz	H24	
	P134.2 MHz S133.35 MHz	For AWY G580, M646 and M767		
	P134.4 MHz S128.1 MHz 255.4 MHz	For AWY A464, A576, G579 (all southbound), B470, G220, N875 and in area in the immediate vicinity of Singapore		
		Radar MAINT Period: Monthly - every third SAT BTN 1601-2359		
	Singapore Radio	6 556 KHz 11 297 KHz		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	

WSSL AD 2.19 RADIO NAVIGATION AND LANDING AIDS					
Type of Aid and Variation	IDENT	Frequency	OPR HR	Coordinates	DME Elevation/Remarks
1	2	3	4	5	6
Jaybee NDB	JB	400 KHz (80w)	H24	012959.77N 1034241.82E	BRG 298° DIST 19.6km from ARP Seletar. Coverage 50NM. Unusable 270°-060° beyond 20NM. EM: A0/A2
Kong Kong NDB	KK	286 KHz (70w)	H24	013117.76N 1035923.69E	BRG 049° DIST 17.7km from ARP Seletar. Coverage 50NM. Unusable 270°-010° beyond 30NM. EM: A0/A2
Seletar NDB	SEL	220 KHz	H24	012448.50N 1035210.16E	BRG 152° DIST 0.44km from ARP Seletar. Coverage 50NM. EM: A0/A2

## WSSL AD 2.20 LOCAL TRAFFIC REGULATIONS

### 1. LOCAL FLYING RESTRICTIONS:

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

### 2. TEST/TRAINING FLIGHTS

- 2.1 Flight notification shall be given prior to departure. Flight notification by means of RTF should be avoided.
- 2.2 For circuits and landings or flights to Light Aircraft Training Areas A, B and C, locally based operators shall submit details of their flight by electronic mail using a standard format. Submission procedure can be found in the following webpage:  
  
[http://www.caas.gov.sg/caasWeb2010/export/sites/caas/en/eServices\\_Forms/Aeronautical\\_Information\\_Services.html?\\_locale=en](http://www.caas.gov.sg/caasWeb2010/export/sites/caas/en/eServices_Forms/Aeronautical_Information_Services.html?_locale=en)
- 2.3 For test/currency maintenance flight in the fixed-wing circuit, the operator shall contact Seletar Tower Manager, giving at least 2 days' advance notice from the date of flight. The Tower Manager will then liaise with the host slot-time operator during which the test/currency maintenance flight is to be conducted. The advance notice will enable the host slot-time operator to adjust its training programme to accommodate the flight.
- 2.4 Flight details should contain the following information:
  - a) Aircraft identification;
  - b) Name and contact number of pilot;
  - c) Number of persons on board;
  - d) ETD;
  - e) Flight duration;
  - f) Total endurance;
  - g) Area of flight (Light Aircraft Training Areas A, B or C)
- 2.5 For flights other than those classified in para 2.2 and 2.3 above, a flight plan shall be filed.
- 2.6 Light aircraft engaged in flying training shall maintain VHF communication.
- 2.7 Light aircraft flying on airways shall, in addition to radio communication apparatus, be equipped with a radio compass.
- 2.8 All fixed-wing aircraft are to use the runway for take-off and landing. After landing, the pilot-in-command shall vacate the runway as soon as possible via TWY W1, W2 or W3, or in accordance with instructions from Aerodrome Control.
- 2.9 Fixed-wing circuit patterns are left hand for RWY 03 and right hand for RWY 21 (arrival and departure).
- 2.10 All light aircraft training flights shall not descend below 200ft on Seletar QNH when on final approach to land or for a touch-and-go landing unless a landing/touch-and-go clearance has been obtained from ATC. If no such clearance has been obtained from ATC by 200ft the aircraft shall break-off its approach and carry out a go-around procedure.

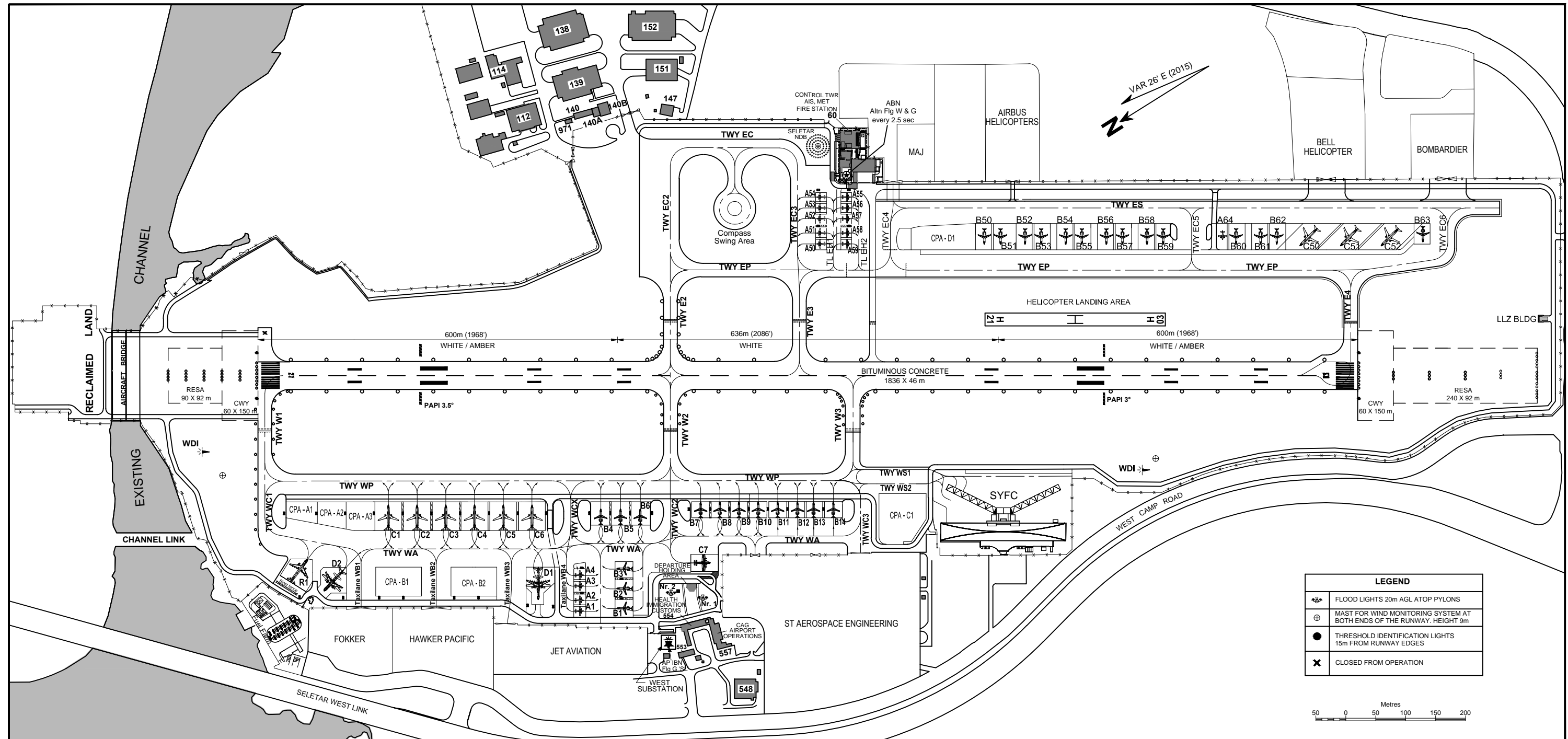




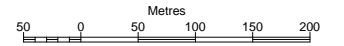
## INS COORDINATES FOR AIRCRAFT STANDS

STAND NR	NORTH LATITUDE	EAST LONGITUDE	ELEVATION
A1	01 25 13.102	103 51 56.167	6.181m (20.280ft)
A2	01 25 12.779	103 51 56.653	6.338m (20.795ft)
A3	01 25 12.350	103 51 57.301	6.586m (21.609ft)
A4	01 25 12.029	103 51 57.787	6.761m (22.183ft)
A50	01 24 51.431	103 52 05.765	7.807m (25.615ft)
A51	01 24 51.110	103 52 06.251	7.948m (26.077ft)
A52	01 24 50.681	103 52 06.900	8.105m (26.593ft)
A53	01 24 50.358	103 52 07.387	8.211m (26.940ft)
A54	01 24 50.036	103 52 07.874	8.337m (27.354ft)
A55	01 24 48.591	103 52 06.930	8.750m (28.709ft)
A56	01 24 48.913	103 52 06.443	8.587m (28.174ft)
A57	01 24 49.236	103 52 05.957	8.402m (27.567ft)
A58	01 24 49.665	103 52 05.309	8.179m (26.835ft)
A59	01 24 49.987	103 52 04.822	8.014m (26.294ft)
B1	01 25 11.401	103 51 55.231	6.301m (20.674ft)
B2	01 25 10.817	103 51 56.116	6.639m (21.783ft)
B3	01 25 10.221	103 51 57.014	6.967m (22.859ft)
B4	01 25 09.180	103 52 00.361	7.703m (25.274ft)
B5	01 25 08.258	103 51 59.758	7.933m (26.028ft)
B6	01 25 07.348	103 51 59.163	8.163m (26.783ft)
B7	01 25 04.505	103 51 57.519	8.442m (27.698ft)
B8	01 25 03.635	103 51 56.951	8.406m (27.580ft)
B9	01 25 02.765	103 51 56.382	8.396m (27.547ft)
B10	01 25 01.893	103 51 55.814	8.383m (27.505ft)
B11	01 25 01.006	103 51 55.237	8.330m (27.331ft)
B12	01 25 00.109	103 51 54.650	8.449m (27.721ft)
B13	01 24 59.374	103 51 54.170	8.571m (28.121ft)
B14	01 24 58.477	103 51 53.582	8.578m (28.144ft)
B50	01 24 43.887	103 52 00.875	8.753m (28.719ft)
B51	01 24 43.153	103 52 00.394	8.847m (29.027ft)
B52	01 24 42.063	103 51 59.681	8.988m (29.490ft)
B53	01 24 41.328	103 51 59.202	9.183m (30.129ft)
B54	01 24 40.154	103 51 58.435	9.358m (30.704ft)
B55	01 24 39.420	103 51 57.954	9.434m (30.953ft)
B56	01 24 38.347	103 51 57.253	9.592m (31.471ft)
B57	01 24 37.614	103 51 56.774	9.679m (31.757ft)
B58	01 24 36.462	103 51 56.021	9.806m (32.172ft)
B59	01 24 35.728	103 51 55.541	9.930m (32.580ft)
B60	01 24 32.416	103 51 53.376	10.020m (32.874ft)
B61	01 24 31.265	103 51 52.624	10.177m (33.389ft)
B62	01 24 30.529	103 51 52.144	10.246m (33.617ft)
B63	01 24 23.858	103 51 47.937	10.639m (34.907ft)
C1	01 25 18.803	103 52 06.627	5.105m (16.750ft)
C2	01 25 17.498	103 52 05.773	5.423m (17.793ft)
C3	01 25 16.192	103 52 04.921	5.759m (18.895ft)
C4	01 25 14.887	103 52 04.067	6.256m (20.526ft)
C5	01 25 13.581	103 52 03.214	6.824m (22.390ft)
C6	01 25 12.275	103 52 02.360	7.304m (23.964ft)
C7	01 25 06.582	103 51 55.017	7.247m (23.777ft)
C50	01 24 29.476	103 51 51.396	10.381m (34.060ft)
C51	01 24 27.626	103 51 50.188	10.589m (34.743ft)
C52	01 24 25.781	103 51 48.979	10.770m (35.335ft)
D1	01 25 14.663	103 51 58.151	6.408m (21.025ft)
D2	01 25 24.033	103 52 04.804	3.471m (11.388ft)

### SELETAR AERODROME LAYOUT OF SIGNIFICANT AERODROME BUILDINGS AND APRON FACILITIES



LEGEND	
	FLOOD LIGHTS 20m AGL ATOP PYLONS
	MAST FOR WIND MONITORING SYSTEM AT BOTH ENDS OF THE RUNWAY, HEIGHT 9m
	THRESHOLD IDENTIFICATION LIGHTS 15m FROM RUNWAY EDGES
	CLOSED FROM OPERATION

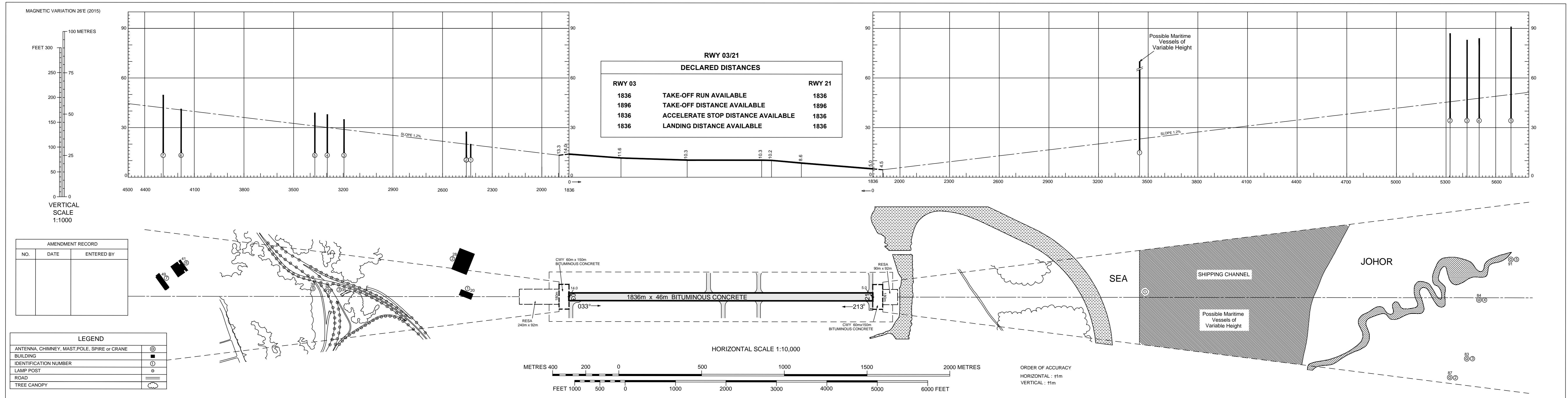




DIMENSIONS AND ELEVATIONS IN METRES

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

SINGAPORE/Singapore Seletar











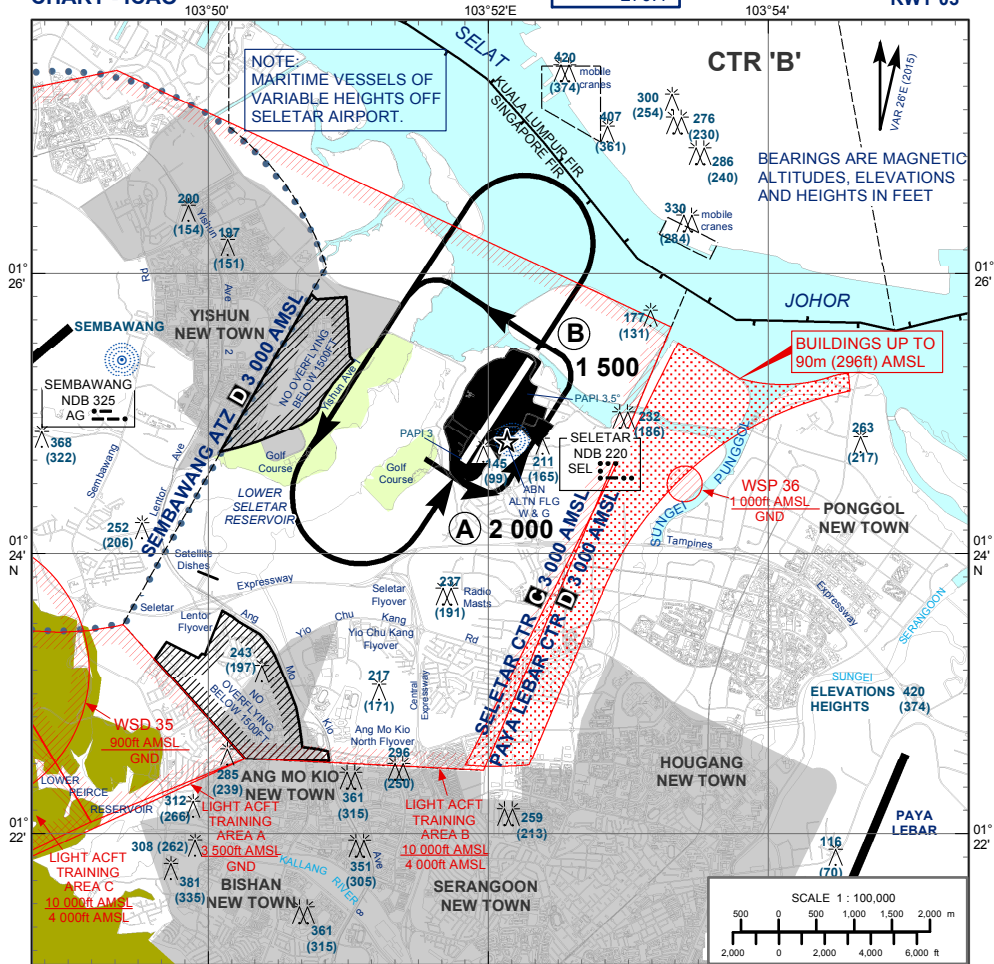
**VISUAL  
APPROACH  
CHART - ICAO**

**AD ELEV 46 ft  
HEIGHTS RELATED  
TO AD ELEV**

APP 120.3  
TWR 118.45  
270.4

**SINGAPORE/SELETAR**

**RWY 03**



**JOINING PROCEDURE - RWY 03**

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

**CAUTION**

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



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

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

\*MEHT : Minimum Eye Height Over the Threshold.

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

Note:

- 1) Pilots are to be advised of the steel structure 91m (300ft) AMSL 2nm north of the airfield.
- 2) Pilots are required to keep their turns within Seletar Control Zone.
- 3) Pilots are required to keep clear of Semabawang CTR and Paya Lebar CTR.



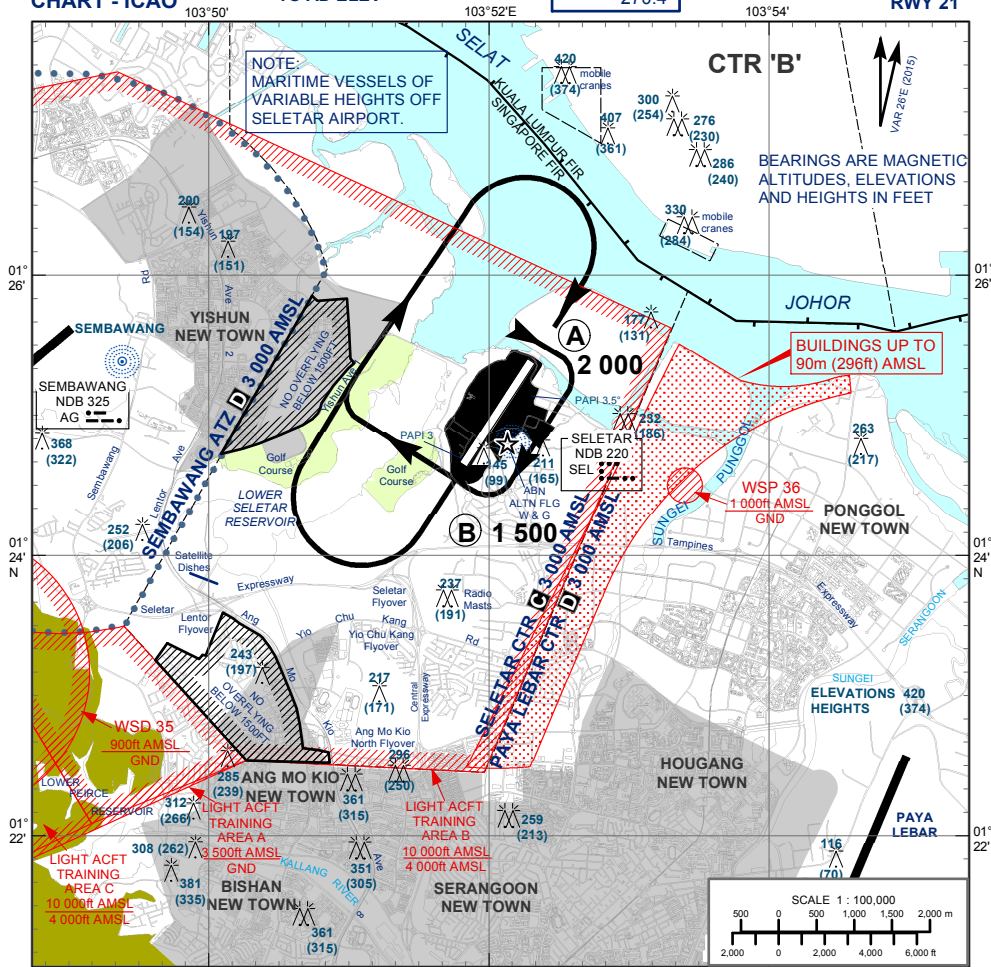
**VISUAL APPROACH CHART - ICAO**

**AD ELEV 46 ft  
HEIGHTS RELATED TO AD ELEV**

APP	120.3
TWR	118.45
	270.4

**SINGAPORE/SELETAR**

**RWY 21**



**JOINING PROCEDURE - RWY 21**

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

**CAUTION**

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



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

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

\*MEHT : Minimum Eye Height Over the Threshold.

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

Note:

- 1) Pilots are to be advised of the steel structure 91m (300ft) AMSL 2m north of the airfield.
- 2) Pilots are required to keep their turns within Seletar Control Zone.
- 3) Pilots are required to keep clear of Semabawang CTR and Paya Lebar CTR.

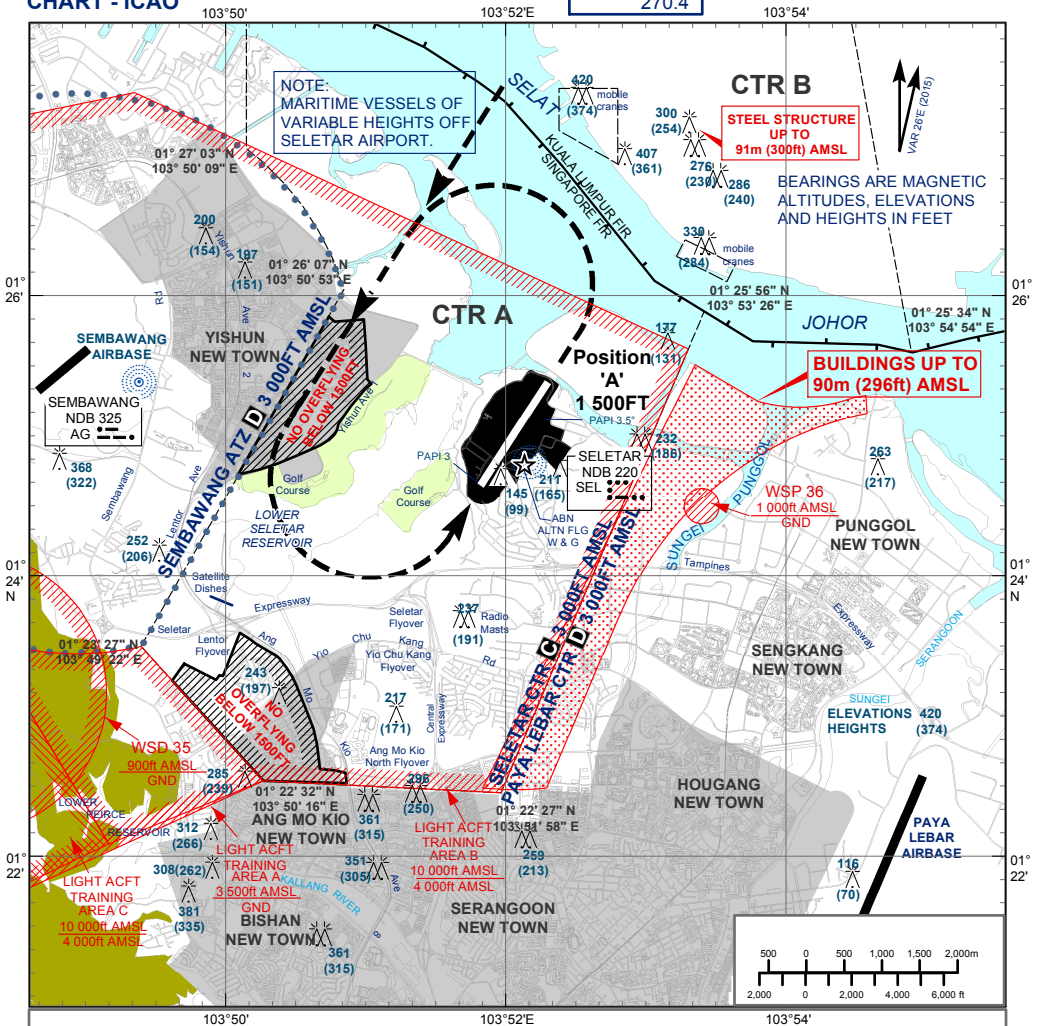


**VISUAL  
APPROACH  
CHART - ICAO**

AD ELEV 46 ft  
HEIGHTS RELATED  
TO AD ELEV

APP TWR 120.3  
118.45  
270.4

**SINGAPORE/SELETAR  
RWY 03**



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


**Straight-in Approach**

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

**Circling Approach**

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

**CAUTION**

- a) Pilots are required to keep clear of Sembawang ATZ and Paya Lebar CTR. Turns should therefore be kept within Seletar CTR.
- b) Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 90m (296ft) AMSL there. Pilots should have all relevant obstructions in sight, including steel structure 91m (300ft) AMSL 2nm north of the airfield.
- c)  Built-up residential areas - No overflying below 1 500ft (458m). Aircraft types which are unable to safely manoeuvre clear of the restricted areas are not allowed to operate at Seletar Airport.

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

\*MEHT: Minimum Eye Height Over the Threshold.

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





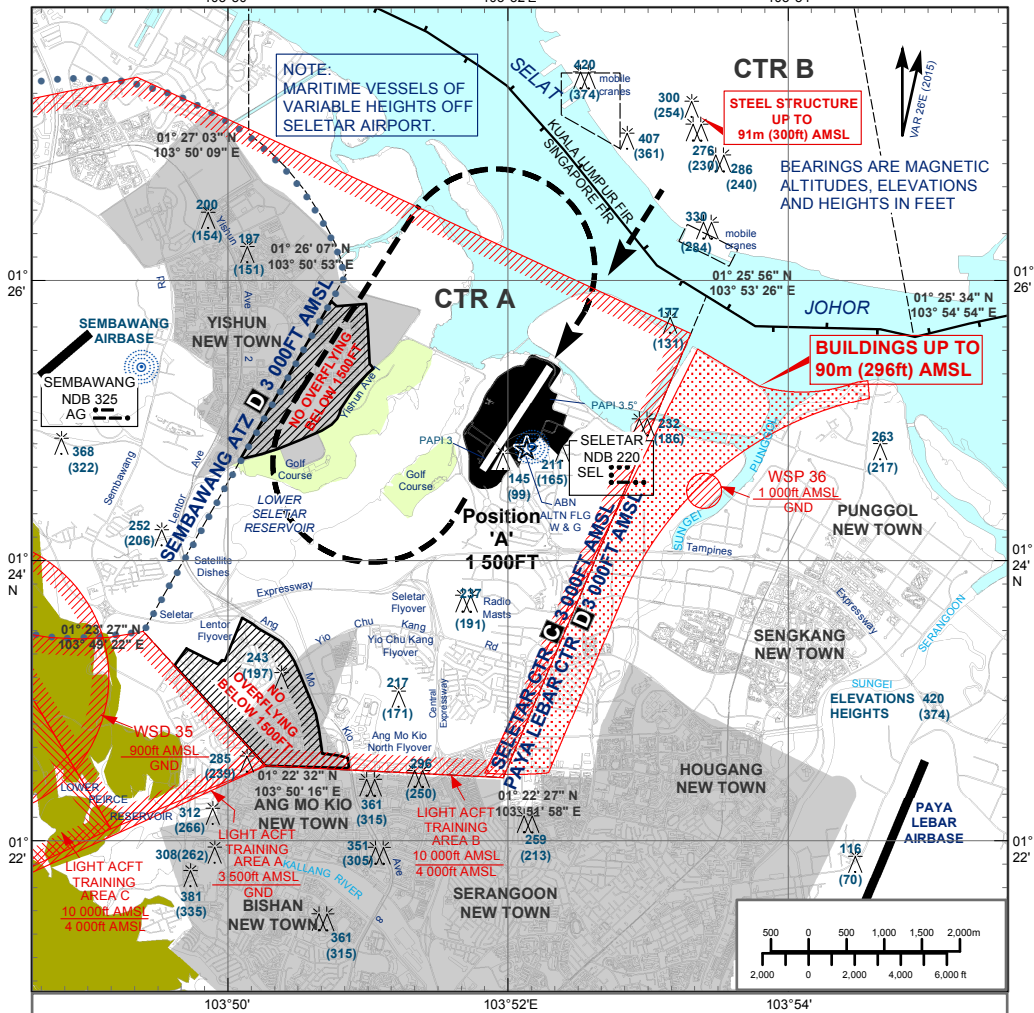
**VISUAL APPROACH CHART - ICAO**

**AD ELEV 46 ft  
HEIGHTS RELATED TO AD ELEV**

APP TWR	120.3
	118.45
	270.4

**SINGAPORE/SELETAR**

**RWY 21**



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


**Straight-in Approach**

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

**Circling Approach**

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

**CAUTION**

- a) Pilots are required to keep clear of Sembawang ATZ and Paya Lebar CTR. Turns should therefore be kept within Seletar CTR.
- b) Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 90m (296ft) AMSL there. Pilots should have all relevant obstructions in sight, including steel structure 91m (300ft) AMSL 2nm north of the airfield.
- c)  Built-up residential areas - No overflying below 1 500ft (458m). Aircraft types which are unable to safely manoeuvre clear of the restricted areas are not allowed to operate at Seletar Airport.

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

\*MEHT : Minimum Eye Height Over the Threshold

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





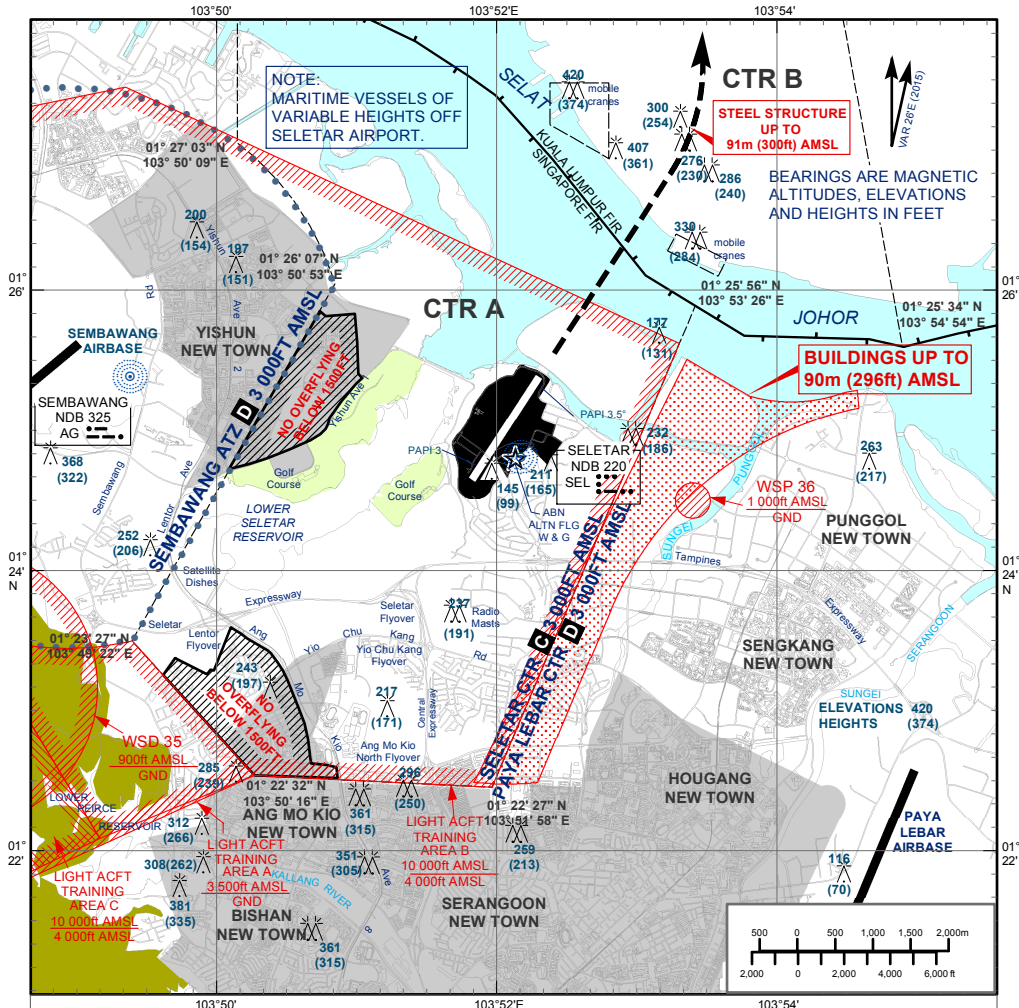
**VISUAL  
DEPARTURE  
CHART**

**AD ELEV 46 ft  
HEIGHTS RELATED  
TO AD ELEV**

**TWR 118.45  
270.4**

**SINGAPORE/SELETAR**


**RWY 03**



**ADVISORY DEPARTURE PROCEDURE FOR RUNWAY 03**

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

**CAUTION**

- a) Pilots are required to keep clear of Sembawang ATZ and Paya Lebar CTR. Turns should therefore be kept within Seletar CTR.
- b) Pilots should not fly to the east of the runway. This is to keep clear of tall buildings up to 90m (296ft) AMSL there. Pilots should have all relevant obstructions in sight, including steel structure 91m (300ft) AMSL 2nm north of the airfield.
- c)  Built-up residential areas - No overflying below 1 500ft (458m)  
Aircraft types which are unable to safely manoeuvre clear of the restricted areas are not allowed to operate at Seletar Airport.



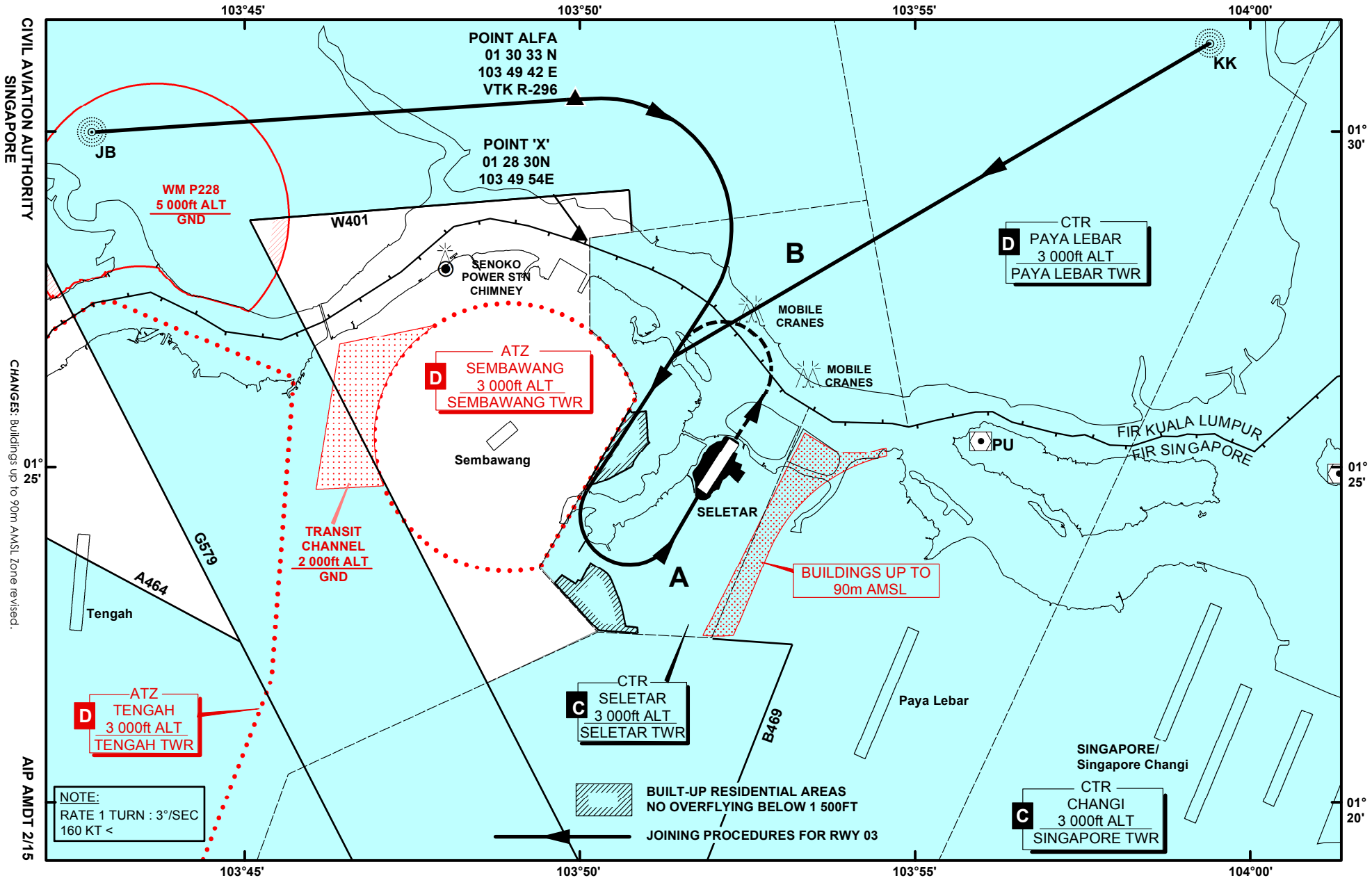








# SELETAR AERODROME JOINING PROCEDURE (IFR FLIGHTS) FROM JB AND KK - RUNWAY 03



CIVIL AVIATION AUTHORITY SINGAPORE

CHANGES: Buildings up to 90m AMSL Zone revised.

AIP AMDT 2/15

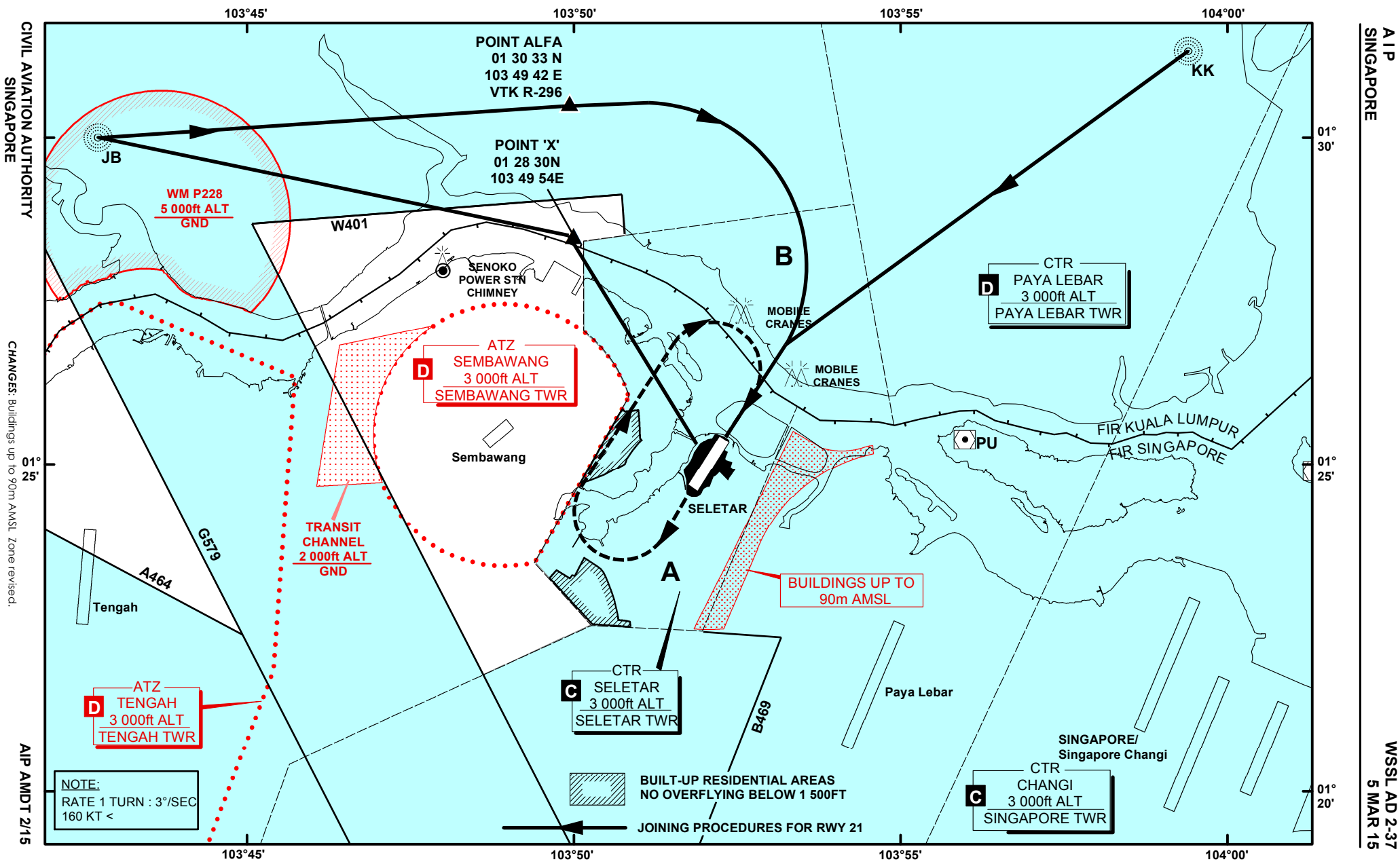
AIP SINGAPORE

WSSL AD 2-35  
5 MAR 15





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



CIVIL AVIATION AUTHORITY SINGAPORE

CHANGES: Buildings up to 90m AMSL Zone revised.

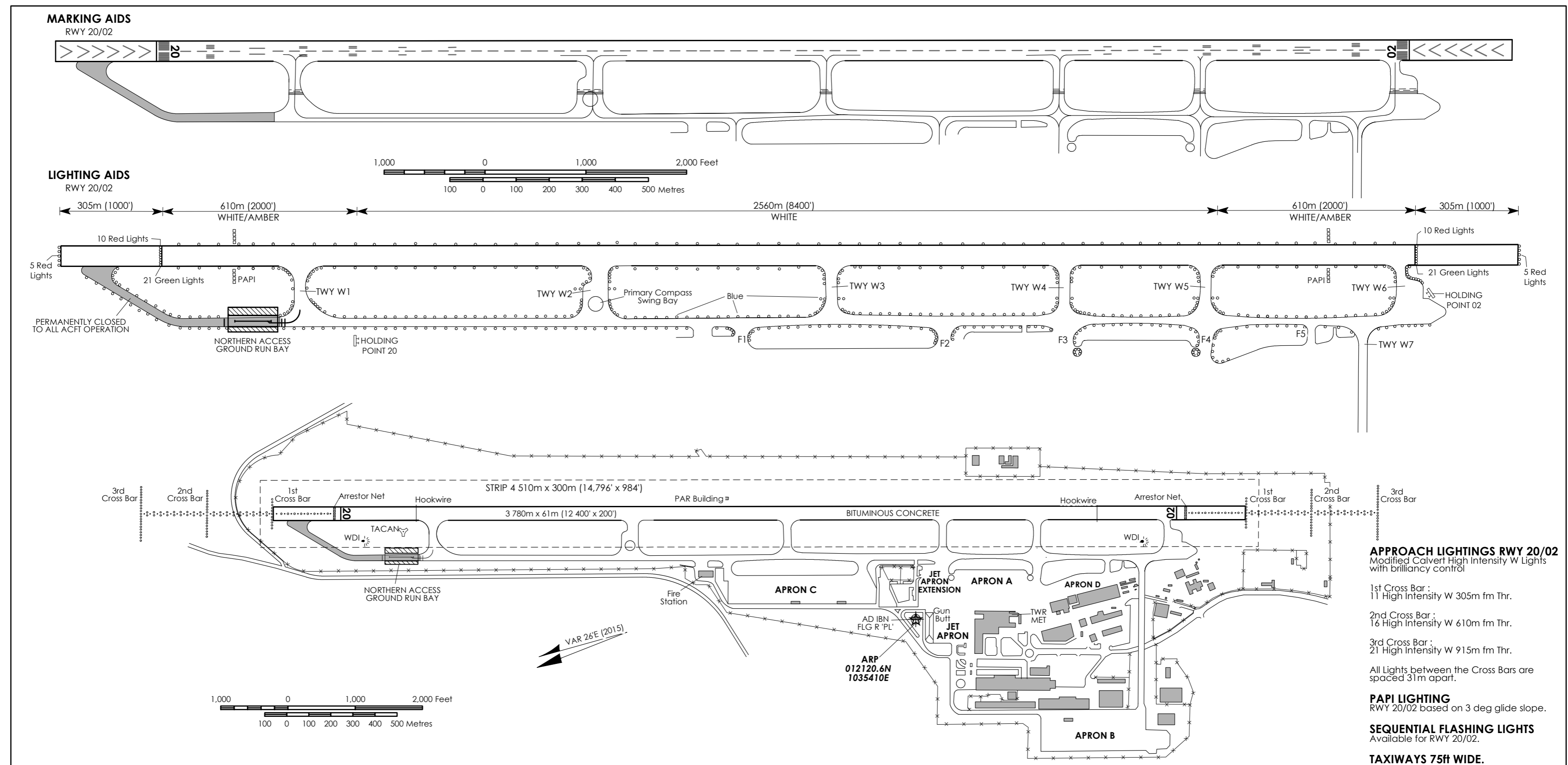
AIP AMDT 2/15

AIP SINGAPORE

WSSA AD 2-37  
5 MAR 15

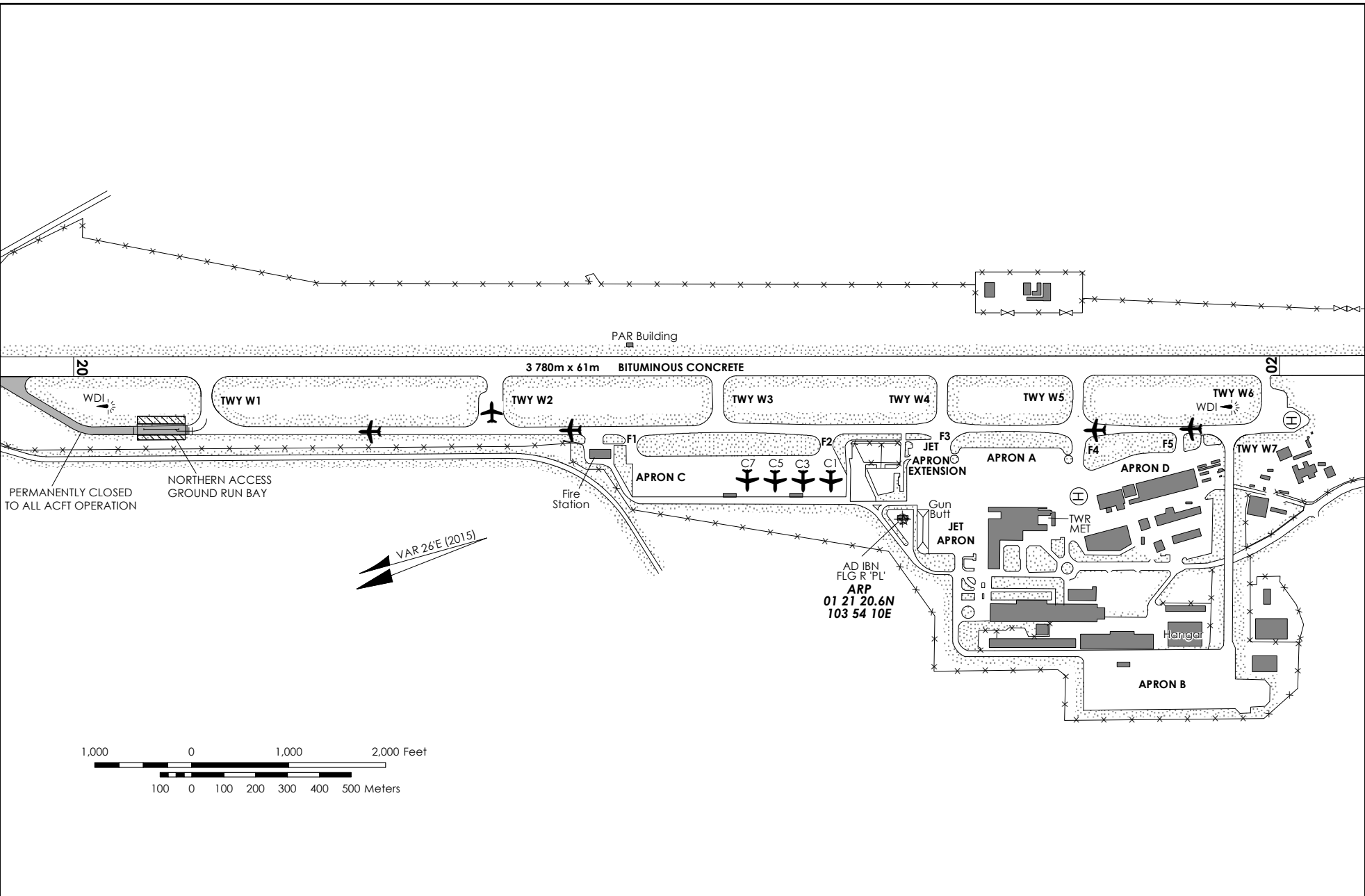


# AERODROME CHART - PAYA LEBAR AIRPORT





LOCATION OF AIRCRAFT STANDS FOR CIVIL AIRCRAFT  
AT PAYA LEBAR AIRPORT

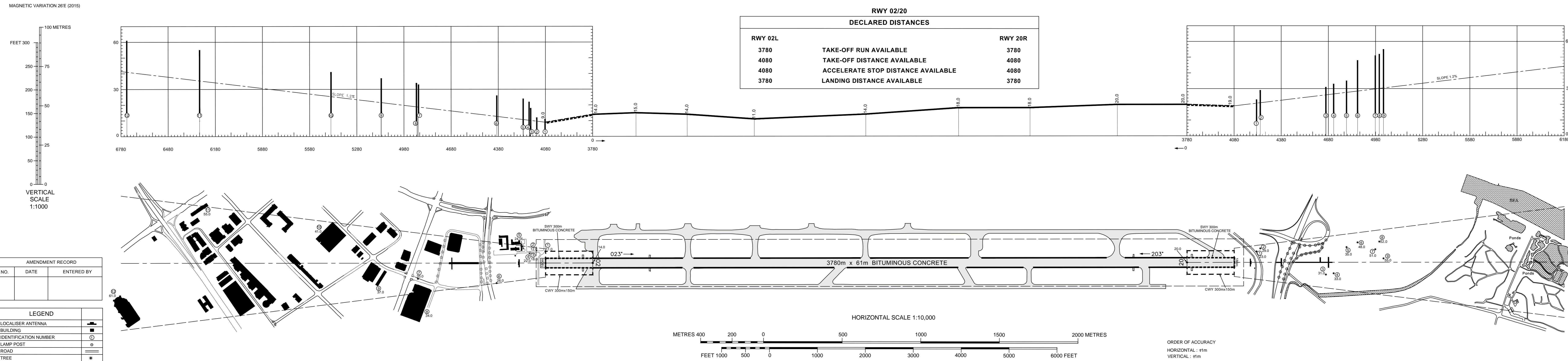




DIMENSIONS AND ELEVATIONS IN METRES

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

SINGAPORE/Paya Lebar Airport

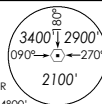






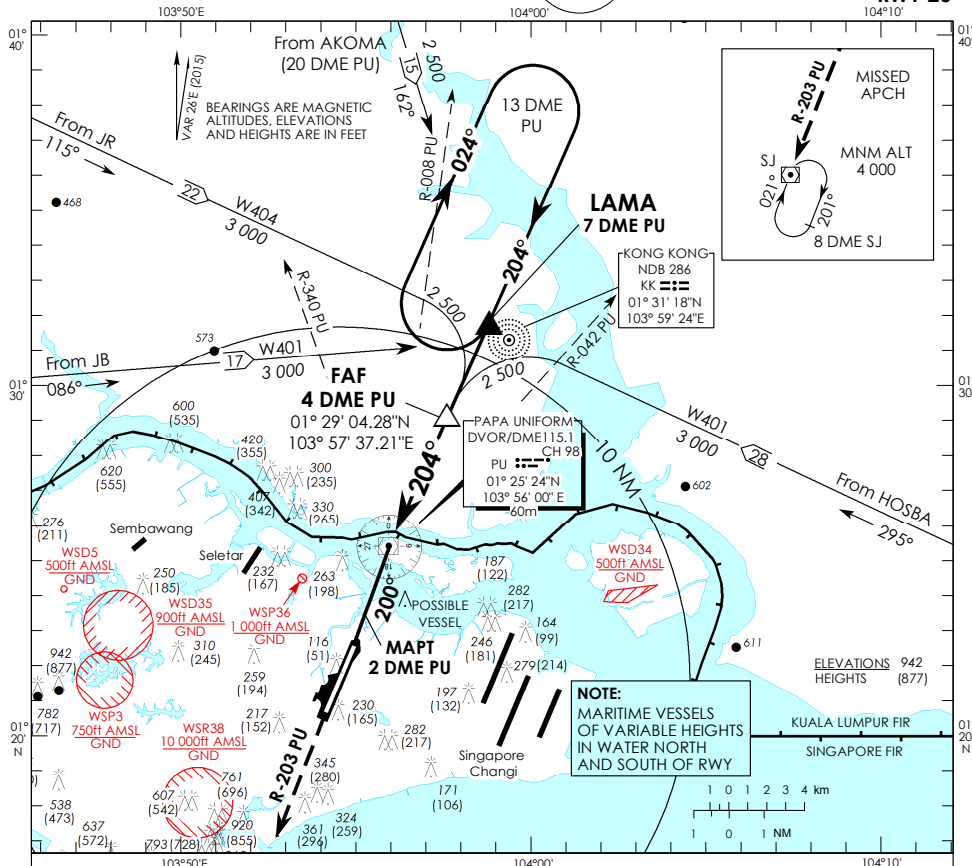
**INSTRUMENT  
APPROACH  
CHART**

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



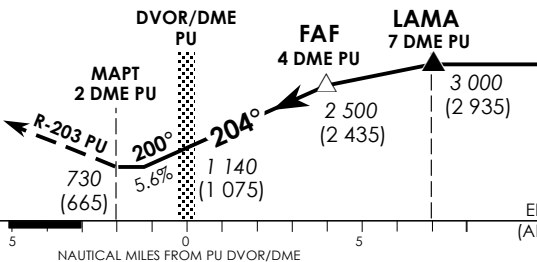
APP 120.3  
119.9  
TWR 118.05

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



Transition Level : FL 130  
Transition Alt : 11 000

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

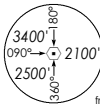


OCA (OCH)				
Category of Aircraft	A	B	C	D
Straight-in	730 (665)			
Distance	3 DME	2 DME	1 DME	PU DVOR/DME
Altitude (Height)	2160 (2095)	1820 (1755)	1480 (1415)	1140 (1075) 800 (735)
Speed	knots	70	120	150 185
FAF - MAPT 6nm	min : s	5 : 09	3 : 00	2 : 24 1 : 57
Rate of descent/GS	ft/min	370	635	795 980



**INSTRUMENT APPROACH CHART**

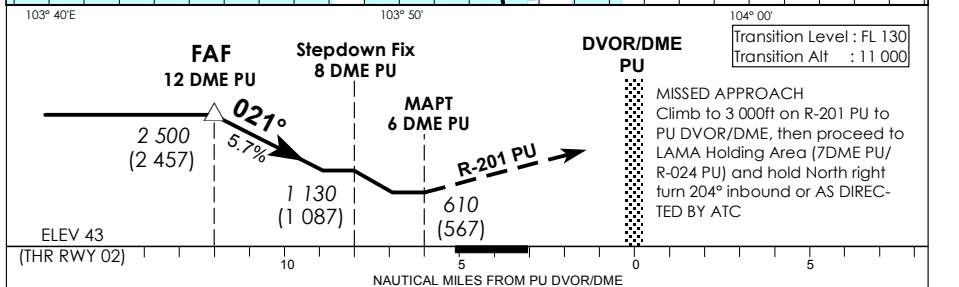
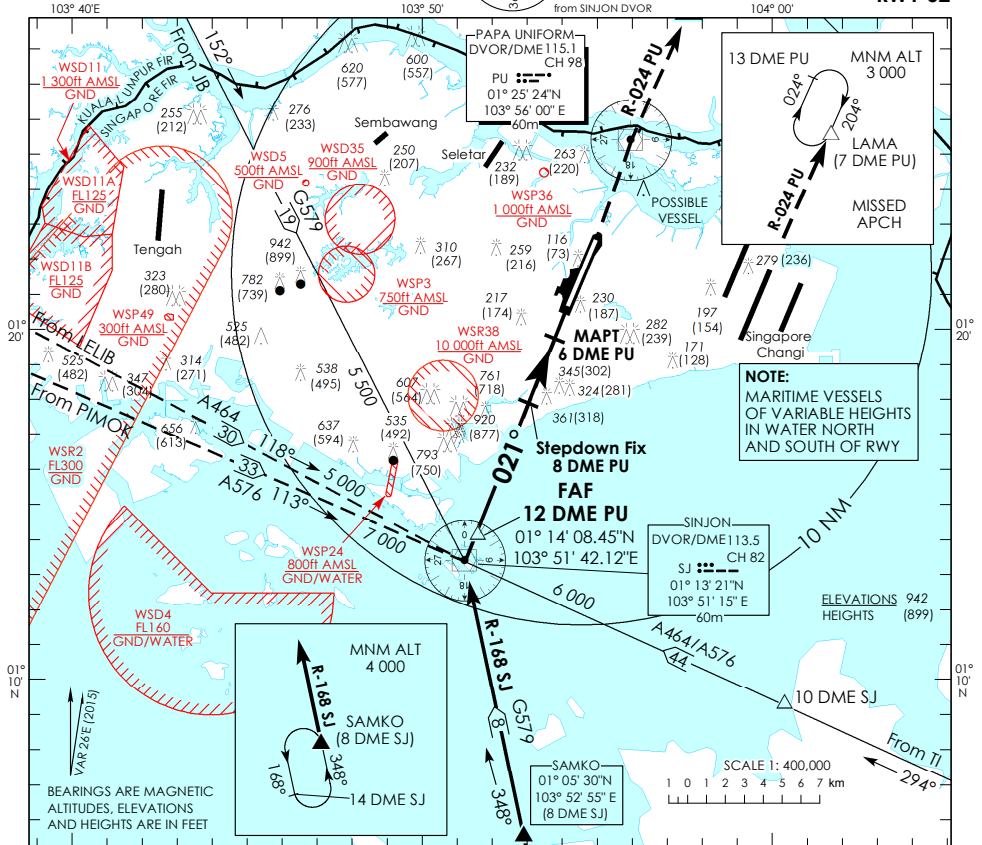
AERODROME ELEV 65ft  
HEIGHT RELATED TO  
THR RWY 02 - ELEV 43ft



APP 120.3  
119.9  
TWR 118.05

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

MSA 25 NM  
from SINJON DVOR

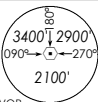


OCA (OCH)					
Category of Aircraft	A	B	C	D	
Straight-in (with stepdown fix)	610 (567)				
Straight-in (without stepdown fix)	1130 (1087)				
Distance	11 DME	10 DME	9 DME	8 DME	7 DME
Altitude (Height)	2170 (2127)	1820 (1777)	1470 (1427)	1130 (1087)	780 (737)
Speed	knots	70	120	150	185
FAF - MAPT 6nm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



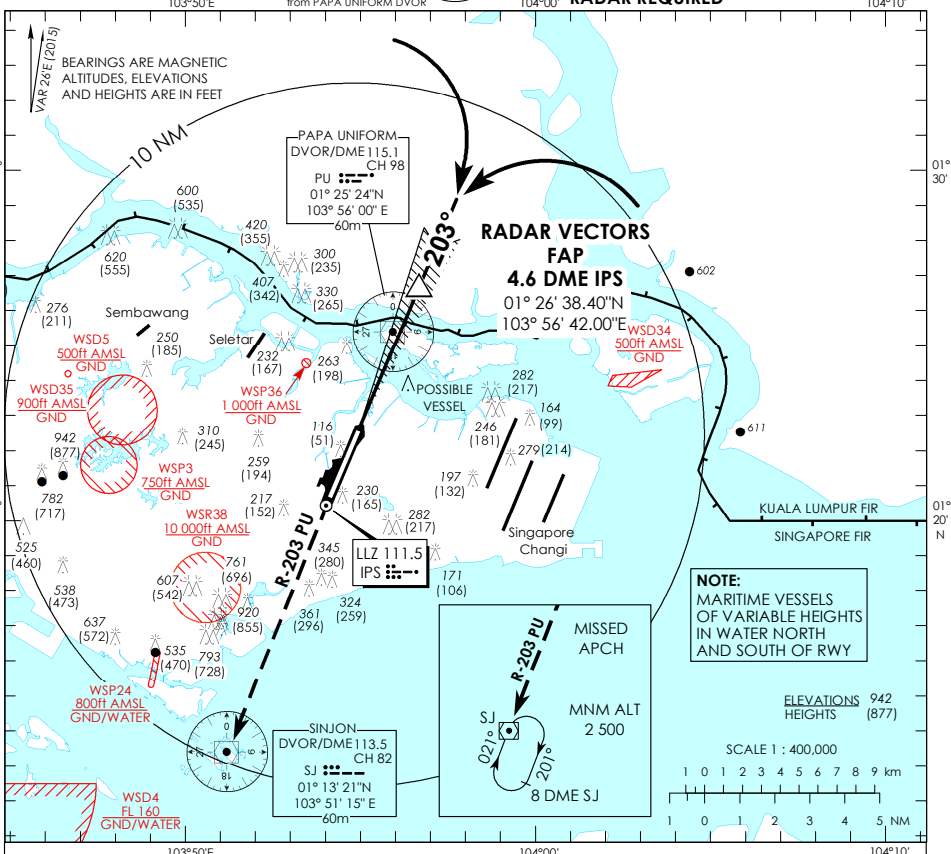
**INSTRUMENT  
APPROACH  
CHART**

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



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

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



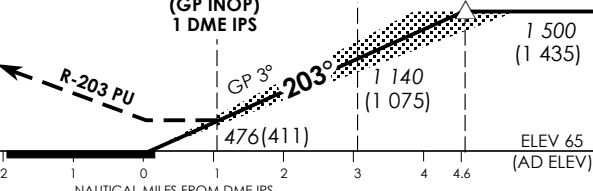
Transition Level : FL 130  
Transition Alt : 11 000

ILS/DME co-located with GP

ILS RDH 55

**MISSED APPROACH**  
Climb to 3000ft on R-203 PU to SJ DVOR/DME and hold South right turn 021° inbound or AS DIRECTED BY ATC

**Stepdown Fix (GP INOP) 3 DME IPS FAP 4.6 DME IPS**



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



**INSTRUMENT  
APPROACH  
CHART**

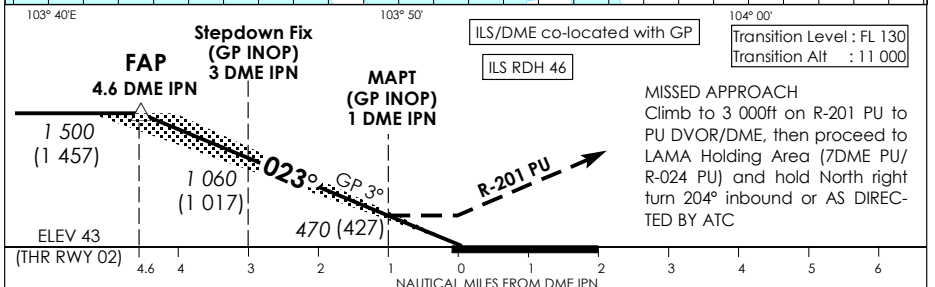
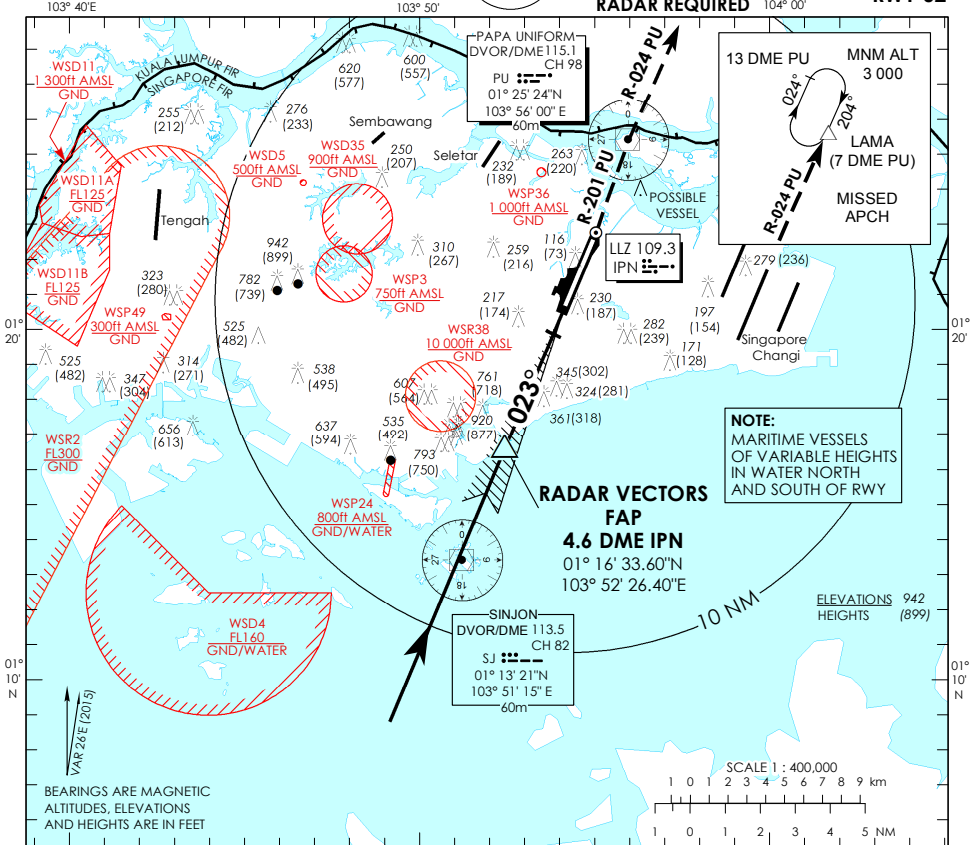
**AERODROME ELEV 65ft**  
HEIGHT RELATED TO  
**THR RWY 02 - ELEV 43ft**  
MSA 25 NM  
from PAPA UNIFORM DVOR



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

**SINGAPORE/  
PAYA LEBAR  
IPN ILS/DME  
RWY 02**

**RADAR REQUIRED**



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









**AD 2 - AERODROMES**

<b>WIDN AD 2.1 AERODROME LOCATION INDICATOR AND NAME</b>	
WIDN - TANJUNG PINANG / Raja Haji Fisabilillah (Indonesia)	

<b>WIDN AD 2.17 ATS AIRSPACE</b>		
1	<i>Designation and Lateral Limits</i>	<b>Raja Haji Fisabilillah ATZ</b> A circle of radius 10NM centred at TI NDB (005511.02N 1043134.21E)
2	<i>Vertical Limits</i>	SFC to 1,500ft
3	<i>Airspace Classification</i>	C
4	<i>ATS Unit Callsign Language(s)</i>	Raja Tower English
5	<i>Transition Altitude</i>	11,000ft ALT (3,350m)
→	6	<i>Remarks</i> Operating Hours: 0000-1200 daily  Controlling Authority: Raja Tower  Local Traffic Regulations: Due to obstacle (hill), TKOF shall use RWY 22 and LDG shall use RWY 04.

<b>WIDN AD 2.18 ATS COMMUNICATION FACILITIES</b>				
<i>Service Designation</i>	<i>Callsign</i>	<i>Frequency</i>	<i>Hours of operation</i>	<i>Remarks</i>
→	TWR	Raja Tower	118.95 MHz	0000-1200 daily Operating Authority: Directorate-General of Civil Aviation, Indonesia
→	APP	Tanjung Pinang Approach	130.2 MHz	0000-1200 daily Radar Operation.

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