AIP SUPPLEMENT

TEL: 91-11-24632950 Extn: 2219/2233 AFS: VIDDYXAX FAX: 91-11-24615508 E_mail:- gmais@aai.aero	AERONAUTICAL INFORMATION SERVICES AIRPORTS AUTHORITY OF INDIA RAJIV GANDHI BHAVAN SAFDARJUNG AIRPORT NEW DELHI - 110003	11/2008 **18 JANUARY 2008**

File No. AAI/NAD/09-09/03/AIP-SUPP (Part-AIS)

Following supplement is issued for information, guidance and necessary action.

K. RAMALINGAM
CHAIRMAN
AIRPORTS AUTHORITY OF INDIA

[Effective from 0803280001]

STANDARD INSTRUMENT DEPARTURE PROCEDURES (SIDs) – BIAL

RNAV (VOR / DME)

1. GENERAL

(i) The SIDs are designed for Rwy 09/27 based on the provisions of DOC 8168, Volume II for aircraft equipped with RNAV capability.

(ii) The SIDs shall be applicable under radar control environment only. In case of non-availability of radar, the NON RNAV SIDs shall be applicable.

(iii) The way points have been designated with reference to BIAL VOR/DME (13°12'23.39"N 077° 43' 51.25" E). The coordinates have been specified in WGS-84 system.

(iv) Turn points have been designated for each runway and thereafter tracks specified for aircraft to follow to a particular way point to join the designated ATS route. The coordinates of turn points are specified below :-

Rwy 09	BL 103 *R-092/4.5	13 12 21.93 N 077 48 30.18 E	Turn point for North.
Rwy 09	BL 104 *R-092/11.0	13 12 18.28 N 077 55 9.91 E	Turn point for South.
Rwy 27	BL 108 *R-282/9.6	13 14 04.52 N 077 34 6.80 E	Turn point for North.
Rwy 27	BL 107 *R-283/14	13 15 13.67 N 077 29 51.91 E	Turn point for South.
Rwy 27	BL 109 *R-272/3.6	13 12 26.30 N 77 40 8.33 E	Ist Turn point for RWY 27

* Bearing and Distances are from VOR (112.3 BIA).
The turn points are FLY BY.

(v) SIDs terminate at the point where the SID designator joins the filed flight plan ATS route. All aircraft on completion of SIDs shall join the flight plan route.

(vi) Pilots are required to fly tracks specified in SIDs by taking into account for known estimated wind conditions.

(vii) The nominal procedure design gradient 3.3% has not been mentioned in the text of SIDs.

(viii) The following way points have been designated for development of SIDs.

Sl.No.	Name	Track and Distances (NM)	WGS-84 Coordinates	Remarks
1.	BL 101	R-012/29	13° 41'6.27" N 77° 48' 45.82" E	ANIRO 3, LATID 3, LATID 4, OLREB 4 , GUNAS 4,
2	BL 102	R-048/23	13° 28' 27.77" N 78° 0' 47.65" E	ANIRO 4
3	BL 105	R-131/14.2	13° 03' 15.99" N 77° 55'5.06" E	OMUKA 4, APGUN 4, MANGALORE 4
4.	BL 106	R-252/17.0	13° 06' 31.11" N 77° 27' 23.95" E	OMUKA 3, APGUN 3, TEBAM 3

5.	BL 110	R-294/32	13° 24' 7.11" N 77° 13' 18.28" E	GUNAS 4,
6.	BL 111	R-338/16.2	13° 27' 13.58" N 77° 37' 2.29" E	ANIRO 3, LATID 3, OLREB 3, GUNAS 3A

(NOTE : All the way points are FLY BY)

(ix) For designing the SIDs the following additional significant way points have also been designated.

S.NO	NAME	RADIAL/ DISTANCE (NM) VOR DME (BIA)	WGS-84 COORDIANTES	ATS ROUTES
1.	*LATID	R-012/77	**14° 28'34.6" N 77° 56' 55.5" E	W57N/W71N
2.	*ANIRO	R-048/71	**14° 02' 09.8" N 78° 36' 30.2" E	W47N
3.	*TEBAM	R-111/45	**12° 57' 58.1" N 78° 27'51.3" E	W116
4.	TRICHY VOR DME	-	**10° 45' 44.7" N 78° 42' 48.2" E	W42S
5.	COIMBATORE VOR DME	-	**11° 02' 01.6" N 77° 02' 53.0" E	W118S/W43S
6.	*MANGALORE VOR DME	-	**12° 57' 43.0" N 74° 55' 17.9" E	W81
7.	*GUNAS	R-294/137	**14° 02' 4.7" N 75° 32' 56.6" E	W101W
8.	OPAMO	R-338/91	**14° 35' 34.6" N 77° 05' 25.9" E	W56N
9.	*OMUKA	R-190/40	12° 32' 32.35" N 77° 38' 41.31" E	W43S/W118S W42S
10.	*OLREB	R-338/50	13° 58' 10.17" N 77° 22' 46.30" E	W56N
11.	*APGUN	R-190/69	12° 03' 39.94" N 77° 34' 57.76" E	W42S, W43S/W118S

(NOTE : All the way points are FLY BY)

* **Designated as SID designators.**

** The coordinates have been published in AIP, INDIA.

(x) The entire ATC clearance including the departure instructions in the form of SID shall be passed to aircraft prior to commencement of push-back/start-up.

(xi) Pilots unable to fly the RNAV SIDs may request for alternate clearance. The Non-RNAV SIDs may be used for such a aircraft. Radar separation shall be maintained between the aircraft following the RNAV and Non-RNAV SIDs.

(xii) After airborne pilot shall advise SID designator, level vacated rounded off to the nearest of 100 feet and SSR code to radar controller.

(xiii) SID should not be cancelled by Radar controller until the aircraft reaches the minimum vectoring altitude 5500 feet or 5900 feet as applicable.

(xiv) Cancellation of SID is pre-requisite for radar vectoring. Radar controller may at his own discretion amend the flight path of the departing aircraft in order to expedite the un-interrupted climb and descent of the traffic. On completion of vectoring aircraft shall not be re-cleared to intercept SID. However, the aircraft may be cleared to proceed direct to way point of the flight plan route.

(xv) Aircraft shall not climb above the level specified for each SID unless authorized by ATC.

(xvi) **Radio Communication Failure Procedures**

If the Communication Failure occurs during the departure phase of flight while either on radar vectors or on pilot navigations, the procedure to be implemented by the pilot must ensure that the aircraft remains in the controlled airspace and has the required obstacle clearance. It must also provide the ATC with sufficient time, upon recognition of the failure, to clear the other traffic from the climb out route expected to be followed by aircraft experiencing the failure. Therefore, the following communications failure procedures shall be followed :-

a) **Transponder equipped aircraft shall squak 7600.**

b) **Pilot Navigation SIDs**

On the recognition of communication failure maintain 7000ft or the level assigned by ATC, whichever is higher until 25 DME (BIA). Thereafter, climb to flight plan level and continue to follow the SID until termination point. If the communication failure takes place beyond 25DME continue to follow the SID, maintain the last assigned level by ATC, if any, or FL85, whichever is higher, for 2 minutes and then climb to flight plan level.

c) **When under Radar Vector**

On the recognition of failure proceed as follows :-

- inside 15 DME (BIA) maintain last assigned heading until 20 DME, climb to 7000 feet or the level assigned by ATC whichever is higher. After 20 DME climb to FL85 or the last level assigned by ATC whichever is higher and proceed directly to intercept the flight plan route.

- at or beyond 15DME (BIA) maintain last assigned heading for 2 minute, climbing to FL85 or the last level assigned by ATC whichever is higher. Then proceed directly to intercept the flight plan route.

- five minutes after recognition of failure commence climb to flight plan level

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2. Standard Instrument Departure Procedure Rwy 27 – BIAL (RNAV)

NOTE

(i) All aircraft shall climb initially to 7000 feet.

(ii) Climb above 7000 feet shall be authorized by ATC.

(iii) Minimum climb gradient 7.25% (440 ft/NM) until 7000 feet due traffic operating at Yelahanka Airfield.

S.No.	ATS ROUTES	SID DESIGNATOR	SID DESCRIPTION	REMARKS
(i)	W 116	TEBAM 3	Climb straight ahead until BL109, then on track 285 Deg M to BL107. Then turn left on track 197 Deg M to BL106. Then turn left on track 100 Deg M to TEBAM to join W116 outbound.	Cross 7D (BIA) at 5000 feet or below.
(ii)	W 42S	APGUN 3	Climb straight ahead until BL109, then on track 285 Deg M to BL107. Then turn left on track 197 Deg M to BL106. Then turn left on track 164 Deg M to UGABA.. Then on track 190 Deg M to APGUN, then on track 142 Deg M Trichy VOR (TTR) to join W42S outbound.	Cross 7D (BIA) at 5000 feet or below.
(iii)	W43S/W118S	OMUKA 3	Climb straight ahead until BL109, then on track 285 Deg M to BL107. Then turn left on track 197 Deg M to BL106. Then turn left on track 164 Deg M to OMUKA to join W43S/W118S outbound.	Cross 7D (BIA) at 5000 feet or below. From OMUKA proceed via APGUN to COMBATORE VOR.
(iv)	a) W101W	GUNAS 3	Climb straight ahead until BL109, then on track 285 Deg M to BL107. Then turn right track 300 Deg M to BL112 to intercept R-294 (BIA) to GUNAS to join W101W outbound.	Cross 7D (BIA) at 5000 feet or below. Availability subject to clearance from ATC Yelahanka.

	b) W101W	GUNAS 3A	Climb straight ahead until BL109, then on track 285 Deg M to BL108. Then turn right track 014 Deg M to BL111 to intercept R-338 (BIA) to OLREB. Then on track 274 Deg to GUNAS to join W101W outbound.	Cross 7D (BIA) at 5000 feet or below.
(v)	W56N	OLREB 3	Climb straight ahead until BL109, then on track 285 Deg M to BL108. Then turn right track 014 Deg M to BL111 to intercept R-338 (BIA) to OLREB to join W56N outbound.	Cross 7D (BIA) at 5000 feet or below. From OLREB proceed to OPAMO.
(vi)	W57N	LATID 3	Climb straight ahead until BL109, then on track 285 Deg M to BL108. Then turn right track 014 Deg M to BL111. Then on track 041 Deg M to BL101 to intercept R-012 (BIA) to LATID to join W57N outbound.	Cross 7D (BIA) at 5000 feet or below.
(vii)	W47N	ANIRO 3	Climb straight ahead until BL109, then on track 285 Deg M to BL108. Then turn right track 014 Deg M to BL111. Then on track 041 Deg M to BL101. Then on track 067 Deg M to ANIRO to join W47N outbound.	Cross 7D (BIA) at 5000 feet or below.
(viii)	W81	MANGALORE 3A	Climb straight ahead until BL109, then on track 285 Deg M to BL107. Then turn left on track 265 Deg M to MANGALORE VOR (MML) to join W81 outbound.	Cross 7D (BIA) at 5000 feet or below. Availability subject to clearance from ATC Yelahanka.

3. Standard Instrument Departure Procedure Rwy 09 – BIAL (RNAV)

NOTE

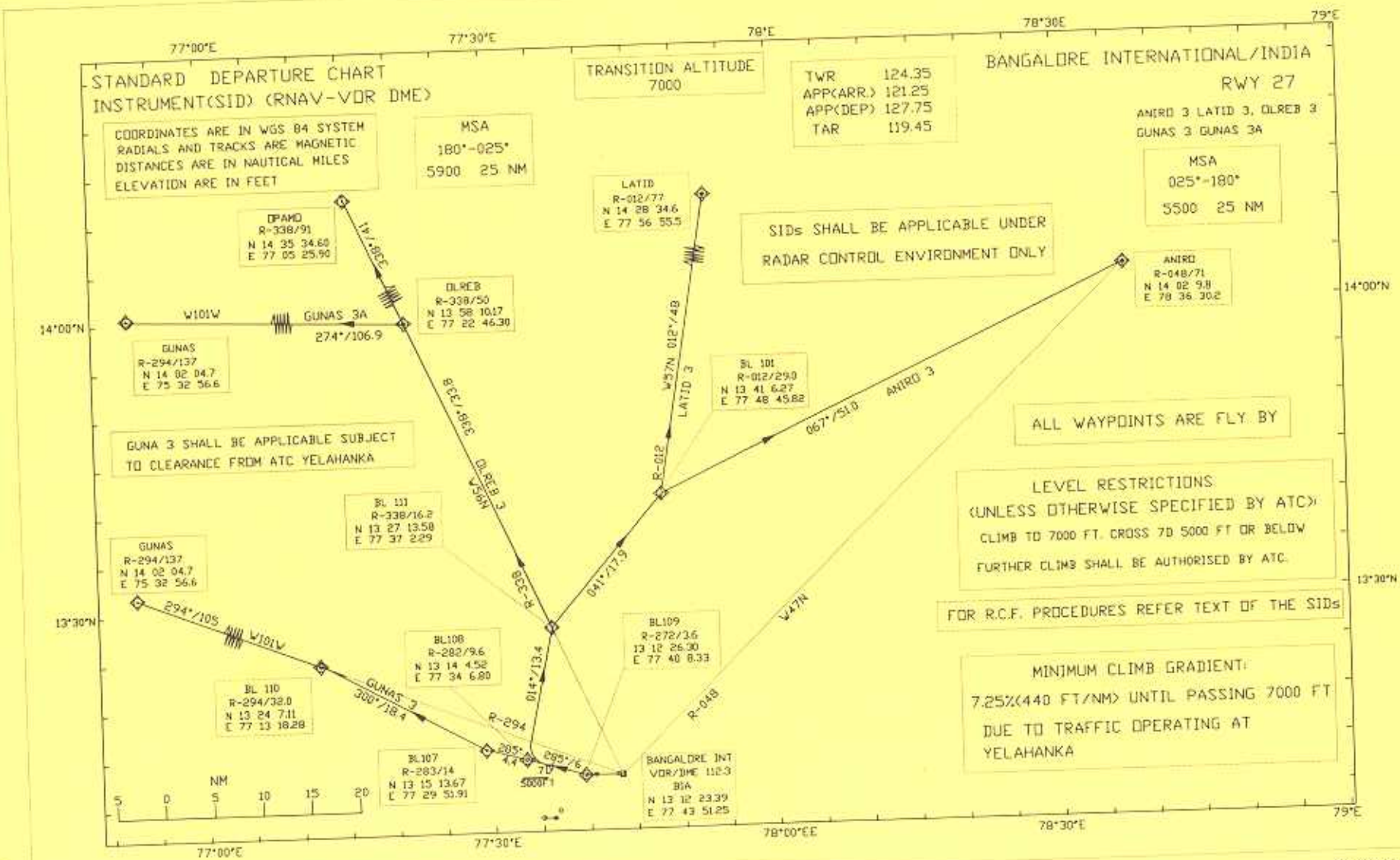
(i) All aircraft shall climb initially to 7000 feet.

(ii) Climb above 7000 feet shall be authorized by ATC.

(iv) Minimum climb gradient 7.25% (440 ft/NM) until 7000 feet due traffic operating at Yelahanka Airfield.

S.No.	ATS ROUTES	SID DESIGNATOR	SID DESCRIPTION	REMARKS
(i)	W 116	TEBAM 4	Climb on track 092 Deg M to BL104.Then turn right on track 116 Deg M to TEBAM to join W116 outbound.	
(ii)	W 42S	APGUN 4	Climb on track 092 Deg M to BL104. Then turn right on track 182 Deg M to BL105. Then on track 220 Deg M to UGABA. Then on track 190 Deg M to APGUN. Then on track 142 Deg M to Trichy VOR (TTR) to join W42S outbound.	
(iii)	W43S/W118S	OMUKA 4	Climb on track 092 Deg M to BL104. Then turn right on track 182 Deg M to BL105. Then on track 220 Deg M to OMUKA to join W43S/W118S outbound.	From OMUKA proceed via APGUN to COIMBATORE VOR.
(iv)	W101W	GUNAS 4	Climb on track 092 Deg M to BL103. Then turn left on track 002 Deg M to BL101. Then turn left track 281 Deg M to GUNAS to join W101W outbound.	
(v)	W56N	OLREB 4	Climb on track 092 Deg M to BL103. Then turn left on track 002 Deg M to BL101. Then turn left track 306 Deg M to OLREB to join W56N outbound.	From OLREB proceed to OPAMO.

(vii)	W47N	ANIRO 4	Climb on track 092 Deg M to BL103. Then turn left on track 038 Deg M to BL101 to intercept R-048(BIA) to ANIRO to join W47N outbound.	
(vi)	W57N	LATID 4	Climb on track 092 Deg M to BL103. Then turn left on track 002 Deg M to BL101 to intercept R-012(BIA) to LATID to join W57N outbound.	
(viii)	W81	MANGALORE 4	Climb on track 092 Deg M to BL104, turn right track 182 Deg M to BL105. Then turn right track 247 Deg M to VOR (BBG). Then on track to 272 Deg M (R-272 BBG) to MANGALORE VOR (MML) to join W81 outbound.	


STANDARD DEPARTURE CHART
INSTRUMENT(SID) (RNAV-VOR DME)
COORDINATES ARE IN WGS 84 SYSTEM
RADIALS AND TRACKS ARE MAGNETIC
DISTANCES ARE IN NAUTICAL MILES
ELEVATION ARE IN FEET
MSA
180°-025°
5900 25 NM
TRANSITION ALTITUDE
7000
TWR 124.35
APP(ARR.) 121.25
APP(DEP) 127.75
TAR 119.45
BANGALORE INTERNATIONAL/INDIA
RWY 27
ANIRO 3 LATID 3, OLREB 3
GUNAS 3 GUNAS 3A
MSA
025°-180°
5500 25 NM
SIDs SHALL BE APPLICABLE UNDER
RADAR CONTROL ENVIRONMENT ONLY
ALL WAYPOINTS ARE FLY BY
LEVEL RESTRICTIONS
(UNLESS OTHERWISE SPECIFIED BY ATC)
CLIMB TO 7000 FT. CROSS 7D 5000 FT OR BELOW
FURTHER CLIMB SHALL BE AUTHORISED BY ATC.
FOR R.C.F. PROCEDURES REFER TEXT OF THE SIDs
MINIMUM CLIMB GRADIENT:
7.25%(440 FT/NM) UNTIL PASSING 7000 FT
DUE TO TRAFFIC OPERATING AT
YELAHANKA
GUNA 3 SHALL BE APPLICABLE SUBJECT
TO CLEARANCE FROM ATC YELAHANKA
DPAMO
R-338/91
N 14 35 34.60
E 77 05 25.90
OLREB
R-338/50
N 13 58 10.17
E 77 22 46.30
GUNAS
R-294/137
N 14 02 04.7
E 75 32 56.6
LATID
R-012/77
N 14 28 34.6
E 77 56 55.5
ANIRO
R-048/71
N 14 02 9.8
E 78 36 30.2
BL 101
R-012/29.0
N 13 41 6.27
E 77 48 49.82
BL 111
R-338/16.2
N 13 27 13.50
E 77 37 2.29
BL108
R-282/9.6
N 13 14 4.52
E 77 34 6.80
BL109
R-272/3.6
13 12 26.30
E 77 40 8.33
BL 110
R-294/32.0
N 13 24 7.11
E 77 13 18.28
BL107
R-283/14
N 13 15 13.67
E 77 29 51.91
BANGALORE INT
VOR/DME 112.3
BIA
N 13 12 23.39
E 77 43 51.25
W101W
GUNAS 3A
274°/106.9
W101V
294°/105
GUNAS 3
300°/18.4
W57N 012°/48
LATID 3
R-012
041°/17.9
067°/51.0
ANIRO 3
W47N
R-048
R-294
014°/13.4
R-338
OLREB 3
W57N
339°/33.8
295°/4.4
095°/6
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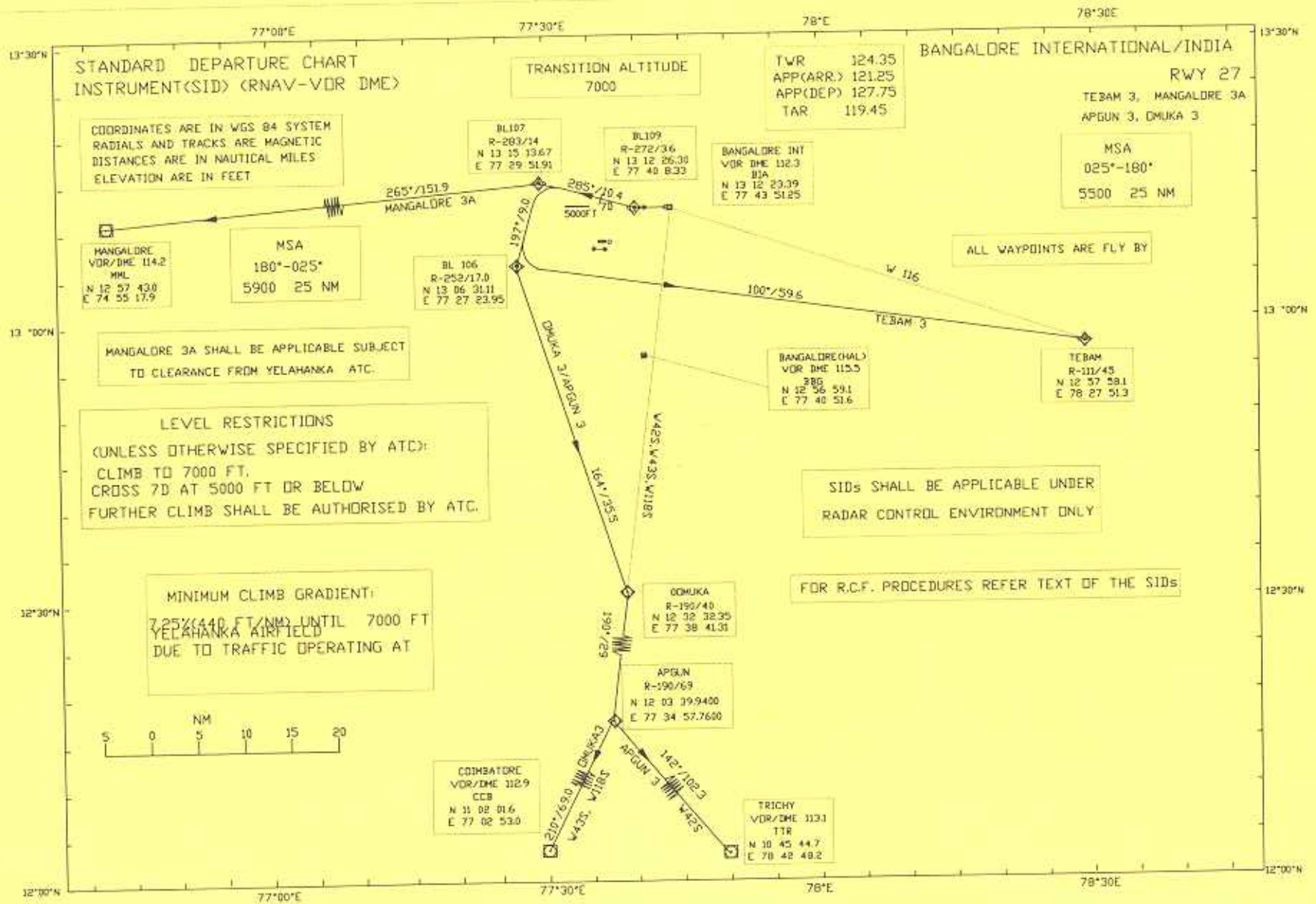
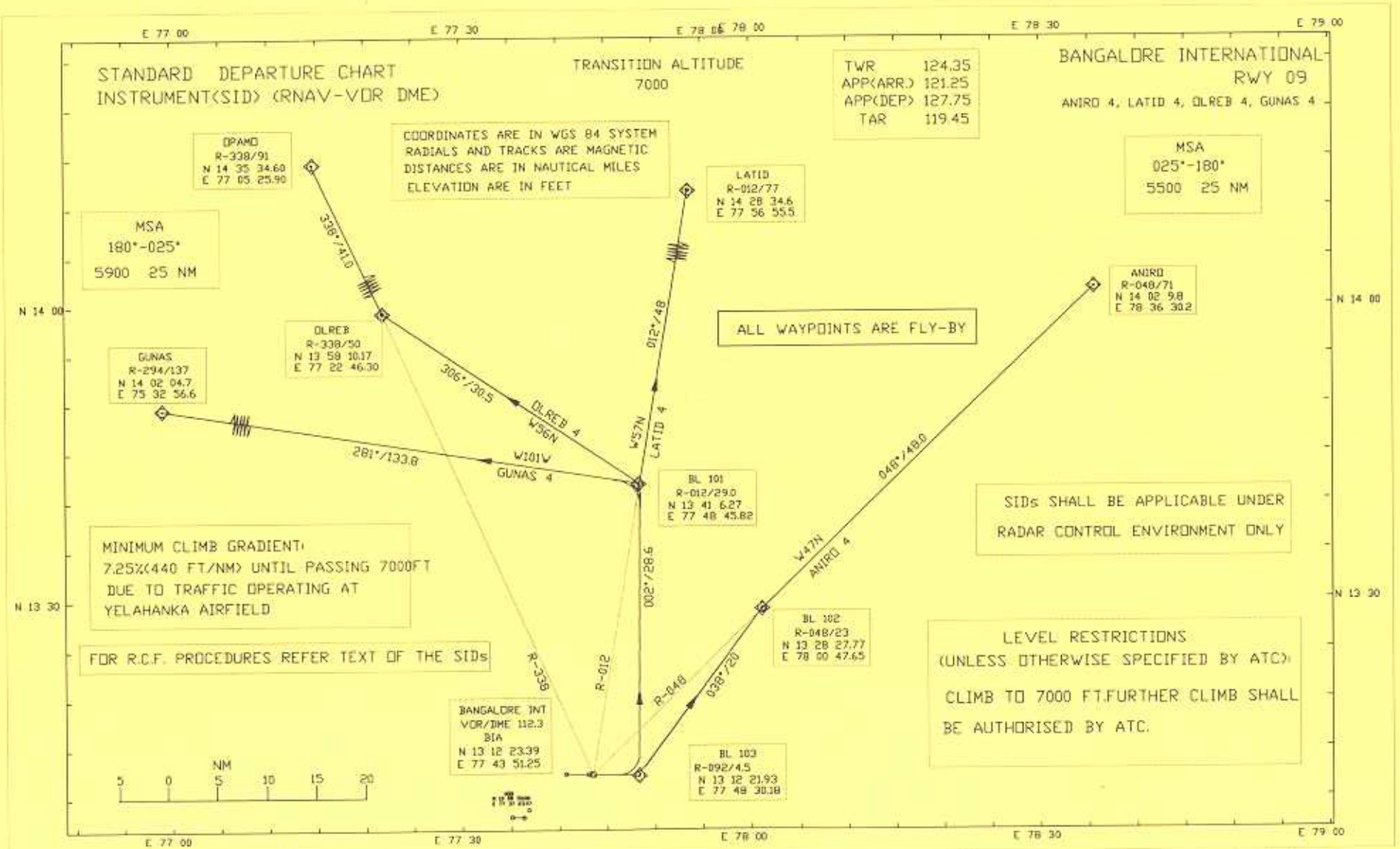
77°30'E
78°E
78°30E
79°E
14°00'N
13°30'N


STANDARD DEPARTURE CHART
INSTRUMENT(SID) (RNAV-VOR DME)
TRANSITION ALTITUDE
7000
TWR 124.35
APP(ARR.) 121.25
APP(DEP) 127.75
TAR 119.45
BANGALORE INTERNATIONAL/INDIA
RWY 27
TEBAM 3, MANGALORE 3A
APGUN 3, OMUKA 3
COORDINATES ARE IN WGS 84 SYSTEM
RADIALS AND TRACKS ARE MAGNETIC
DISTANCES ARE IN NAUTICAL MILES
ELEVATION ARE IN FEET
MSA
025°-180°
5500 25 NM
MANGALORE
VOR/DME 114.2
MNL
N 12 57 43.0
E 74 55 17.9
MSA
180°-025°
5900 25 NM
BL107
R-283/14
N 13 15 13.67
E 77 29 51.91
BL109
R-272/36
N 13 12 26.38
E 77 40 8.33
BANGALORE INT
VOR DME 112.3
BIA
N 13 12 23.39
E 77 43 51.25
BL 106
R-252/17.0
N 13 06 31.11
E 77 27 23.95
ALL WAYPOINTS ARE FLY BY
MANGALORE 3A SHALL BE APPLICABLE SUBJECT
TO CLEARANCE FROM YELAHANKA ATC.
BANGALORE(HAL)
VOR DME 115.5
BRG
N 12 56 59.1
E 77 40 51.6
TEBAM
R-111/45
N 12 57 58.1
E 78 27 51.3
LEVEL RESTRICTIONS
(UNLESS OTHERWISE SPECIFIED BY ATC):
CLIMB TO 7000 FT.
CROSS 7D AT 5000 FT OR BELOW
FURTHER CLIMB SHALL BE AUTHORISED BY ATC.
SIDs SHALL BE APPLICABLE UNDER
RADAR CONTROL ENVIRONMENT ONLY
FOR R.C.F. PROCEDURES REFER TEXT OF THE SIDs
MINIMUM CLIMB GRADIENT:
7.25%(440 FT/NM) UNTIL 7000 FT
YELAHANKA AIRFIELD
DUE TO TRAFFIC OPERATING AT
OMUKA
R-190/40
N 12 52 32.35
E 77 38 41.31
APGUN
R-190/69
N 12 03 39.9400
E 77 34 57.7600
COIMBATORE
VOR/DME 112.9
CCB
N 11 02 01.6
E 77 02 53.0
TRICHY
VOR/DME 113.1
TTR
N 10 45 44.7
E 78 42 48.2
265°/151.9
MANGALORE 3A
285°/10.4
5000FT
197°/9.0
100°/59.6
TEBAM 3
OMUKA 3/APGUN 3
164°/35.5
V425,W435,W185
62°/19.1
OMUKA3
W185
W435
APGUN 3
142°/102.3
W425
210°/69.0
W 116
NM
5 0 5 10 15 20
13°30'N
13°00'N
12°30'N
12°00'N
77°00'E
77°30'E
78°E
78°30E


STANDARD DEPARTURE CHART
INSTRUMENT(SID) (RNAV-VOR DME)
TRANSITION ALTITUDE
7000
TWR 124.35
APP(ARR.) 121.25
APP(DEP) 127.75
TAR 119.45
BANGALORE INTERNATIONAL
RWY 09
ANIRD 4, LATID 4, OLREB 4, GUNAS 4
COORDINATES ARE IN WGS 84 SYSTEM
RADIALS AND TRACKS ARE MAGNETIC
DISTANCES ARE IN NAUTICAL MILES
ELEVATION ARE IN FEET
MSA
180°-025°
5900 25 NM
MSA
025°-180°
5500 25 NM
ALL WAYPOINTS ARE FLY-BY
SIDs SHALL BE APPLICABLE UNDER
RADAR CONTROL ENVIRONMENT ONLY
MINIMUM CLIMB GRADIENT
7.25%(440 FT/NM) UNTIL PASSING 7000FT
DUE TO TRAFFIC OPERATING AT
YELAHANKA AIRFIELD
FOR R.C.F. PROCEDURES REFER TEXT OF THE SIDs
LEVEL RESTRICTIONS
(UNLESS OTHERWISE SPECIFIED BY ATC)
CLIMB TO 7000 FT.FURTHER CLIMB SHALL
BE AUTHORISED BY ATC.
DPAMD
R-338/91
N 14 35 34.60
E 77 05 25.90
LATID
R-012/77
N 14 28 34.6
E 77 56 55.5
ANIRD
R-048/71
N 14 02 9.8
E 78 36 30.2
OLREB
R-338/50
N 13 59 10.17
E 77 22 46.30
GUNAS
R-294/137
N 14 02 04.7
E 75 32 56.6
BL 101
R-012/29.0
N 13 41 6.27
E 77 48 45.82
BL 102
R-048/23
N 13 28 27.77
E 78 00 47.65
BL 103
R-092/4.5
N 13 12 21.93
E 77 49 30.18
BANGALORE INT
VOR/DME 112.3
BIA
N 13 12 23.39
E 77 43 51.25
338°/41.0
306°/30.5
OLREB 4
W56N
281°/133.8
W101V
GUNAS 4
012°/48
W57N
LATID 4
002°/28.6
R-012
R-338
R-048
038°/20
W47N
ANIRD 4
048°/48.0
NM
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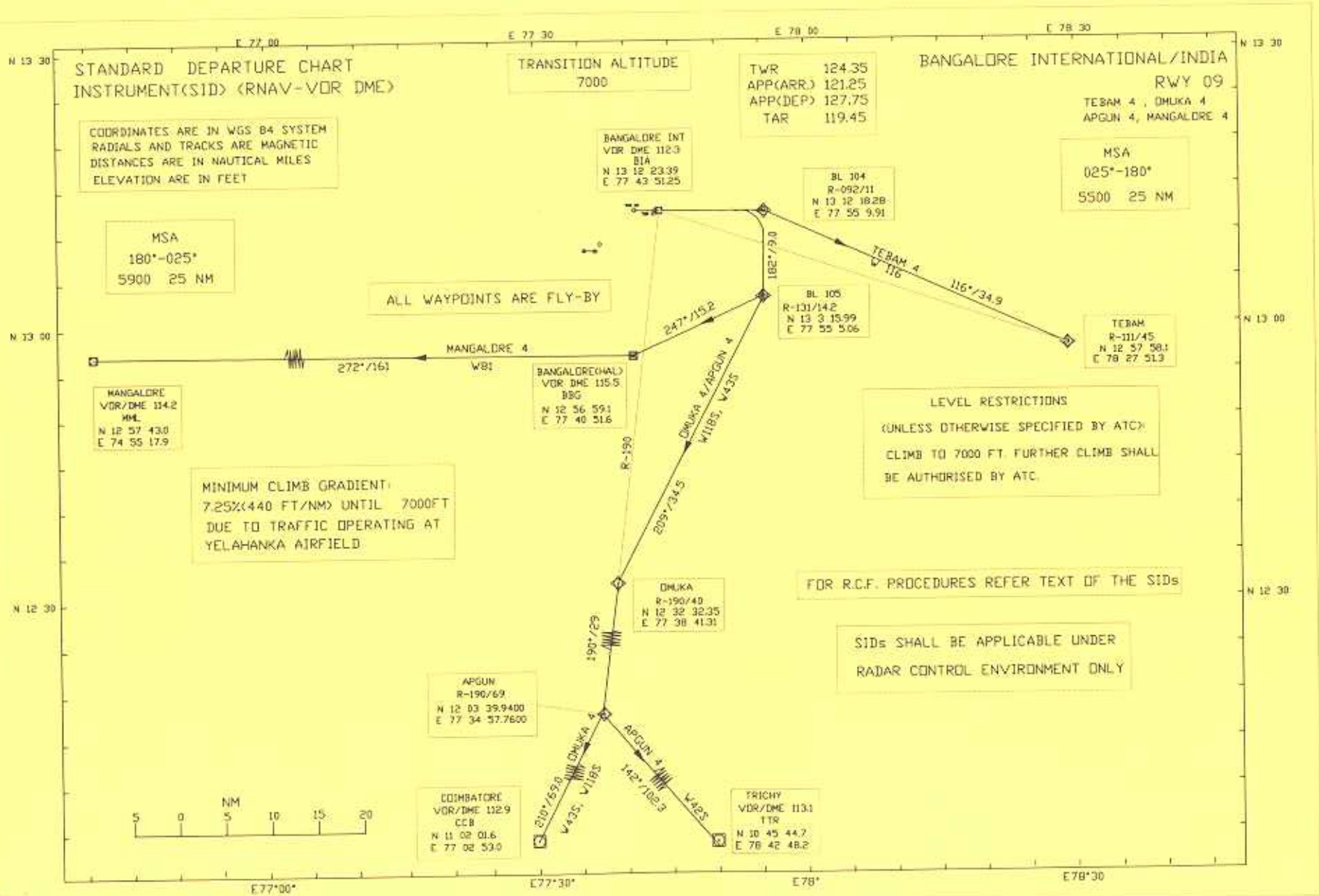
E 77 00
E 77 30
E 78 00
E 78 30
E 79 00
N 14 00
N 13 30


STANDARD DEPARTURE CHART
INSTRUMENT(SID) (RNAV-VOR DME)
TRANSITION ALTITUDE
7000
TWR 124.35
APP(ARR.) 121.25
APP(DEP) 127.75
TAR 119.45
BANGALORE INTERNATIONAL/INDIA
RWY 09
TEBAM 4 , OMUKA 4
APGUN 4, MANGALORE 4
COORDINATES ARE IN WGS 84 SYSTEM
RADIALS AND TRACKS ARE MAGNETIC
DISTANCES ARE IN NAUTICAL MILES
ELEVATION ARE IN FEET
MSA
180°-025°
5900 25 NM
MSA
025°-180°
5500 25 NM
ALL WAYPOINTS ARE FLY-BY
BANGALORE INT
VOR DME 112.3
BIA
N 13 12 23.39
E 77 43 51.25
BL 104
R-092/11
N 13 12 18.28
E 77 55 9.91
BL 105
R-131/14.2
N 13 3 15.99
E 77 55 5.06
TEBAM
R-111/45
N 12 57 58.1
E 78 27 51.3
MANGALORE
VOR/DME 114.2
MML
N 12 57 43.0
E 74 55 17.9
BANGALORE(HAL)
VOR DME 115.5
BBG
N 12 56 59.1
E 77 40 51.6
MANGALORE 4
W81
272°/16.1
247°/15.2
182°/9.0
TEBAM 4
W116
116°/34.9
OMUKA 4/APGUN 4
W185, W435
R-190
209°/34.5
OMUKA
R-190/40
N 12 32 32.35
E 77 38 41.31
190°/29
APGUN
R-190/69
N 12 03 39.9400
E 77 34 57.7600
OMUKA 4
W185
210°/65.0
W435, W185
APGUN 4
142°/102.3
W425
COIMBATORE
VOR/DME 112.9
CCB
N 11 02 01.6
E 77 02 53.0
TRICHY
VOR/DME 113.1
TTR
N 10 45 44.7
E 78 42 48.2
LEVEL RESTRICTIONS
(UNLESS OTHERWISE SPECIFIED BY ATC)
CLIMB TO 7000 FT. FURTHER CLIMB SHALL
BE AUTHORISED BY ATC.
MINIMUM CLIMB GRADIENT:
7.25%(440 FT/NM) UNTIL 7000FT
DUE TO TRAFFIC OPERATING AT
YELAHANKA AIRFIELD
FOR R.C.F. PROCEDURES REFER TEXT OF THE SIDs
SIDs SHALL BE APPLICABLE UNDER
RADAR CONTROL ENVIRONMENT ONLY
NM
5 0 5 10 15 20
E 77 00
E 77 30
E 78 00
E 78 30
N 13 30
N 13 00
N 12 30
E77°00'
E77°30'
E78°
E78°30