International Civil Aviation Organization
South American Regional Office
Twenty Third Workshop/Meeting of the SAM Implementation Group (SAM/IG/23) - Regional Project RLA/06/901
(Lima, Peru, 20 to 24 May 2019)

SAM/IG/23-IP/24
13/05/2019

Agenda Item 2: Optimization of the SAM airspace

a) PBN regional implementation
b) Actions to standardize the longitudinal separations of en-route aircraft
c) analysis of the SAM route network, Version 5, and CAR interfaces

PBN IMPLEMENTATION WITHIN THE TIMEHRI TMA

(Presented by Guyana)

SUMMARY

This working paper presents a report on PBN implementation and associated activities related to the Georgetown FIR. These activities are in keeping with aspects of the SAM Regional Air Navigation Plan related to airspace optimisation and is an update of previous reports including Information Papers submitted by Guyana, most recently to SAM/IG/22.

References:

- SAM/IG meetings
- ATSRO meetings
- PANS-OPS workshops
- GREPECAS/18 meeting

ICAO strategic objectives:	*A – Safety* *E – Environmental protection*

1. Introduction

1.1 The SAM/IG/20 meeting reviewed, inter alia, the status of implementation of PBN with respect to the optimisation of SID/STAR routes, terminal areas, PBN approach procedures, pursuant to the goals of the Declaration of Bogota, which were to be attained in December 2016. Guyana's Airspace Concept including a PBN Implementation Plan was developed in 2015.

2. Analysis

Coordination of SAM route network – Version 4

2.1 The implementation of PBN en-route is strategized through regional collaboration at ATS/RO meetings, based on route network versions aimed at optimizing the regional route network, ATSRO 9 meeting concluded on the implementation of Version 4 which included three (3) new RNAV 5

route segments within the Georgetown FIR. A report on the successful implementation of these route segments were contained in IP19 submitted by Guyana to SAMIG 22. To date Guyana has implemented a total of eight (8) RNAV5 route segments which represents approximately sixty percent (60%) of the enroute structure within the Georgetown FIR. The remaining Conventional ATS Routes will be deleted or converted to RNAV 5 Routes in a phased process through consultation and collaboration with states having jurisdiction over adjacent FIRs. **(See attachment A)**

Actions to standardise longitudinal separation of aircraft en-route.

2.2 Georgetown ACC has completed the implementation of 40NM In-trail longitudinal separation minimum for the transfer of control with all adjacent FIRs (Piarco, Paramaribo, Amazonica, and Maiquetia). In addition, all Letters of Agreement have been updated accordingly and signed.

2.3 Georgetown has commenced preliminary discussions with adjacent states regarding the commencement of trials and possible implementation of **20NM In-trail**, however, challenges are as follows:

a. Piarco – Piarco has expressed concern that the longitudinal separation Minimum in place for the transfer of control with San Juan is 10 minutes with Mack Number Technique. In addition, they have recently had cause to implement Flow Management Measures on several occasions due to staff shortage.

b. Paramaribo – There is significant concerns by both Georgetown and Paramaribo ACCs as it relates to Amazonica ACC to accept or recognise that traffic on the UL776 at TIRIOS and the UL452 at ACARI are laterally separated. These two RNAV 5 routes were included in the Proposals for Amendment (PFA 1) developed and approved by the CAR/NAM/SAM PBN implementation meetings. In addition, these two routes are used by the main traffic flows traversing the Georgetown and Paramaribo FIRs.

c. Amazonica – Georgetown is in a state of readiness. An exchange visit which will include two Brazilian ATS staff visiting Georgetown which is plan for June 2019. It is expected that the implementation of 20NM In-trail separation and other matters of the LOA will be discussed and agreed upon.

d. Maiquetia – Georgetown is in a state of readiness, however, discussions between Georgetown and Maiquetia has not commenced.

PBN TMA

2.4 The process of PBN redesign of the main SAM TMAs was promoted through implementation workshops under the sponsorship of Regional Project RLA/06/901. The Guyana PBN implementation Plan was conceptualised in July 2015 with an estimated duration of sixteen (16) months. The plan contained a total of fifteen elements divided into four components (Planning, Design, Validation, and Implementation. Components one and two have been completed, however, the completion of components three and four have been revised to July 31th, 2019. This delay was mainly due to the lack of PANS OPS training for the design team.

2.5 In recognition of the need for trained Procedure Designers, the Guyana Civil Aviation Authority secured a contractual arrangement with COSESNA for the training of twelve persons (ten from Guyana, one from Trinidad and Tobago, and one from Jamaica) in PANS OPS – Basic and Advance. This

training, including Labs was completed in March 2019. As a result, Guyana is now better equipped and scheduled to complete the validation and implementation of its PBN TMA by July 31st, 2019.

2.6 The NAV specs for the redesigned Timehri TMA will be RNAV 1 and consist of Standard Arrival and Departure Routes supporting Continuous Climb and Descend Operations for Cheddi Jagan Int'l and RNAV Visual Arrival and departures for Eugene F. Correia Int'l. (**See Attachment B**)

Progress made in ATS contingency plans

2.7 Georgetown has developed and published an updated ATS Contingency plan. The plan was developed at the SAM ATS contingency meeting hosted by the SAM regional office in LIMA in March 2018. **(See Attachment C)**

3. **Suggested Action**

3.1 It is suggested that the meeting take note of the information contained in this paper.

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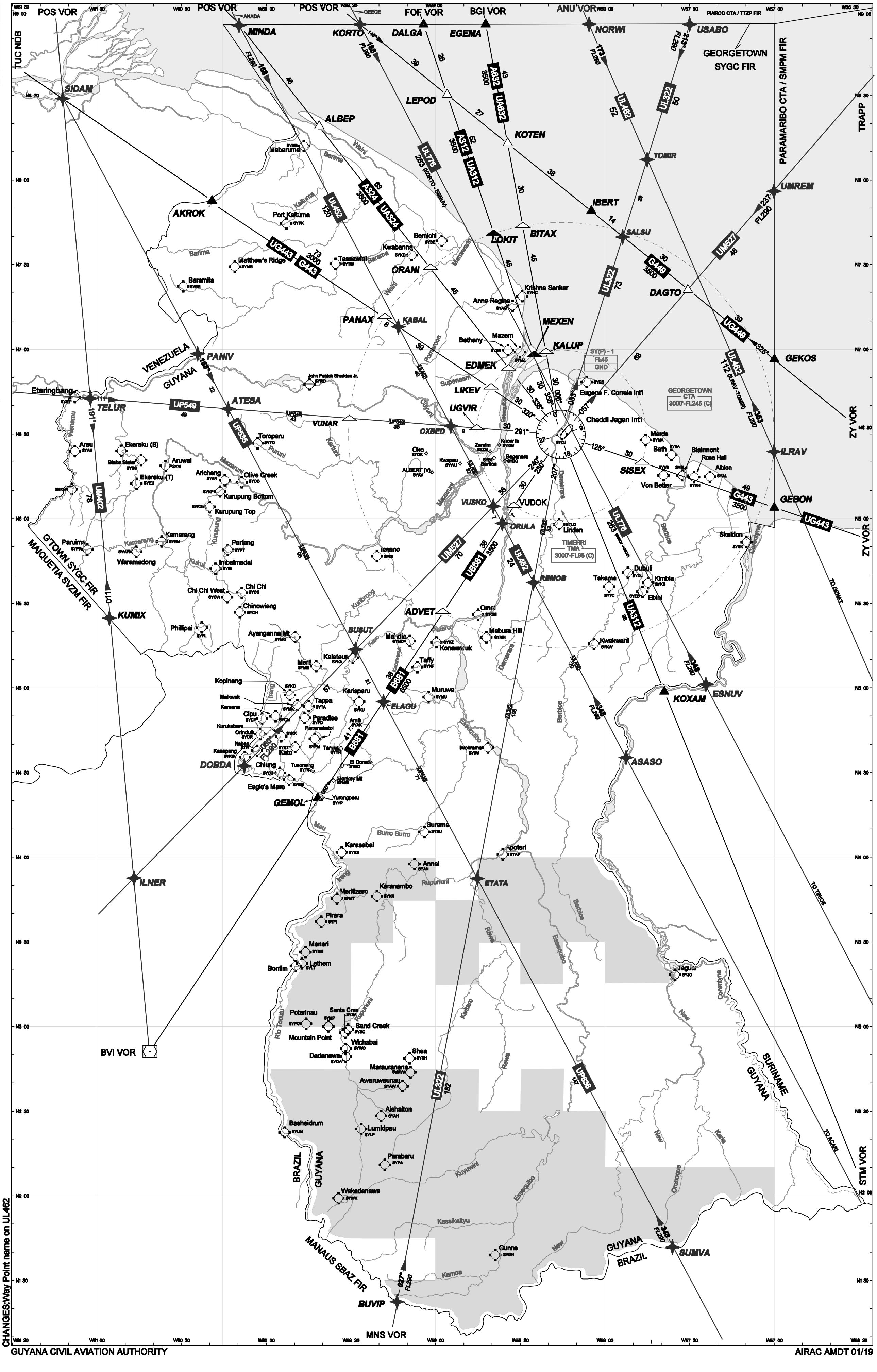
GUYANA ENROUTE CHART



CHANGES:Way Point name on UL462

AREA CHART - ICAO
TMA TIMEHRI

SHOWING;

SYCJ - RWY06 STAR - LIKEV 1 and SISEX 1; VUDOK1

SYCJ RWY06 SID - LIKEV 1;EDMEK 1;MEXEN 1; KALUP 1; TIM 1: LITOL 1

SYEC RWY07 RNAV VFR ARR. KALUP 1; MEXEN 1A; DABEX 1 UGVIR 1A; AKSIN 1A; SISEX 1A;

SYEC RWY07 RNAV VFR DEP. LITOL 1; AKSIN 1; MEXEN 1B; UGVIR 1; UGVIR 1B; LIKEV 1B.

NAV SPEC.

1. SYCJ RWY06 - SID and STAR RNAV 1 - GNSS REQUIRED

2. SYEC - RWY07 RNAV VFR DEP; SYEC RWY07 RNAV ARR. Basic GNSS receiver required.

See Guyana AIP ENR 4.1.

COM FAILURE

Set transponder code 7600

Maintain last assigned speed and LVL, or MNM FLT ALT, if higher for 7 MIN following time of:

a) reaching last assigned LVL or MNM FLT ALT; or

b) Setting Transponder code 7600; or

c) failure to REP over compulsory REP; whichever is later. Thereafter adjust LVL and speed according to FPL.

COMMUNICATION

Cheddi Jagan Int'l / Timehri (SYCJ)	
Ground	121.7
Tower	118.3
Approach	118.3, 119.4
Eugene F. Correia Int'l Airport (SYEC)	
Ground	121.9
Tower	118.55

ALT and ELEV in feet,
BRG. are MAG.,
Dist. in NM
VAR. 16° W

RESTRICTED

SY(P) - 1
FL45
GND
R - 3NM

CTR OGLE
3000' AMSL
SCF
118.55

CTR TIMEHRI
3000' AMSL
SCF
118.3

TMA TIMEHRI
FL95
3000' AMSL
118.3

TIMEHRI
VOR/DME 113.5
TIM
N06 29 47
W058 15 36

Cheddi Jagan Int'l
7446' 98°

TEXTUAL DESCRIPTION OF SYEC RWY07 RNAV VFR ARR.	
KALUP 1A	Arrivals via A/UA632, proceed direct KALUP when cleared by ATC, descend to clear FL, KALUP track 181° to EC120, descend A2000 commence APP.
MEXEN 1A	Arrivals via A/UA312, proceed direct MEXEN when cleared by ATC, descend to clear FL, MEXEN track 163° to EC120, descend A2000 commence APP.
DABIX 1	Arrivals from SYMB, SYPK, SYMR,SYBR, SYTW, proceed direct DABIX when cleared by ATC, descend to clear FL, DABIX track 138° to EC120, descend A2000, commence APP.
UGVIR 1A	Arrivals from west SYIB to SYET, at CTA proceed direct UGVIR when cleared by ATC, descend to clear FL, UGVIR track 065° to EC100, descend to clear FL, cross EC100 A1500 commence APP.
SYBG 1	Arrivals from Southwest SYCW to SYMG, at CTA proceed direct SYBG when cleared by ATC, descend to clear FL, SYBG track 060° to EC110, descend to clear FL, cross EC110 A2000 commence APP.
AKSIN 1A	Arrivals from SSW and S. SYKO to SYAP, at CTA proceed direct AKSIN when cleared by ATC, descend to clear FL, AKSIN track 040° to EC110, descend to clear FL, cross EC110 A2000 commence APP.
SISEX 1A	Arrivals via G443 (E), at SISEX track 333° to EC100 when cleared by ATC, descend to clear FL, cross EC100 A1500 commence APP.
	TEXTUAL DESCRIPTION OF SYEC RWY07 RNAV VFR DEP.
UGVIR 1	DEP. to the west; climb RWY heading (069°) to EC200, RIGHT turn track 159° to EC230 RIGHT turn track 249° to cross EC250 at A3000 or above, track 277° to EC91, track 265° to UGVIR DCT.
LITOL 1	DEP. to the South; climb RWY heading (069°) to EC200, RIGHT turn track 159° to EC230 RIGHT turn track 196° to DABUM, track 241° to cross KABRA F050, track 241°LITOL DCT.
AKSIN 1	DEP. to the South; climb RWY heading (069°) to EC200, LEFT turn track 317° to cross EC240 at A3000, LEFT turn track 220° to EC110, track 220° to cross SANTA F080, track 220° AKSIN DCT.
UGVIR 1B	DEP. to the West; climb RWY heading (069°) to EC200, LEFT turn track 317° to cross EC240 at A3000, LEFT turn track 256°, climb to clear FL to UGVIR, DCT.
LIKEV 1B	DEP. to the West; climb RWY heading (069°) to EC200, LEFT turn track 317° to cross EC420 at F040, LEFT turn track 270°, climb to clear FL to LIKEV, DCT.
MEXEN 1B	DEP. to the NorthWest; climb RWY heading (069°) to EC200, LEFT turn track 317° to cross EC420 at F040, LEFT turn track 302°, climb to clear FL to MEXEN, DCT.
EC320 1A	DEP. to the Stabroek Block; climb RWY heading (069°) to EC200, LEFT turn track 035° to EC320 climb to clear FL, then DCT DEST.

TEXTUAL DESCRIPTION STAR - SYCJ RWY06	
LIKEV 1	Arrival via UG443 (W)/UA324/312/632, proceed direct LIKEV when cleared by ATC. Cross LIKEV F100 Track 165° to GATUX descend F040, commence APP as cleared by ATC.
VUDOK 1	Arrival via UB681/UL322/UM527(W) proceed direct VUDOK when cleared by ATC. Cross VUDOK F070 Track 043° to AKSIN descend A3000, commence APP as cleared by ATC.
SISEX 1	Arrival via UG443 (E)/ WP KOXAM/ASASO proceed direct SISEX when cleared by ATC. Cross SISEX F100 Track 281° to LITOL descend F040, commence APP as cleared by ATC.
EXCEPT when instructed specifically by ATC to disregard the published Altitude restriction.	

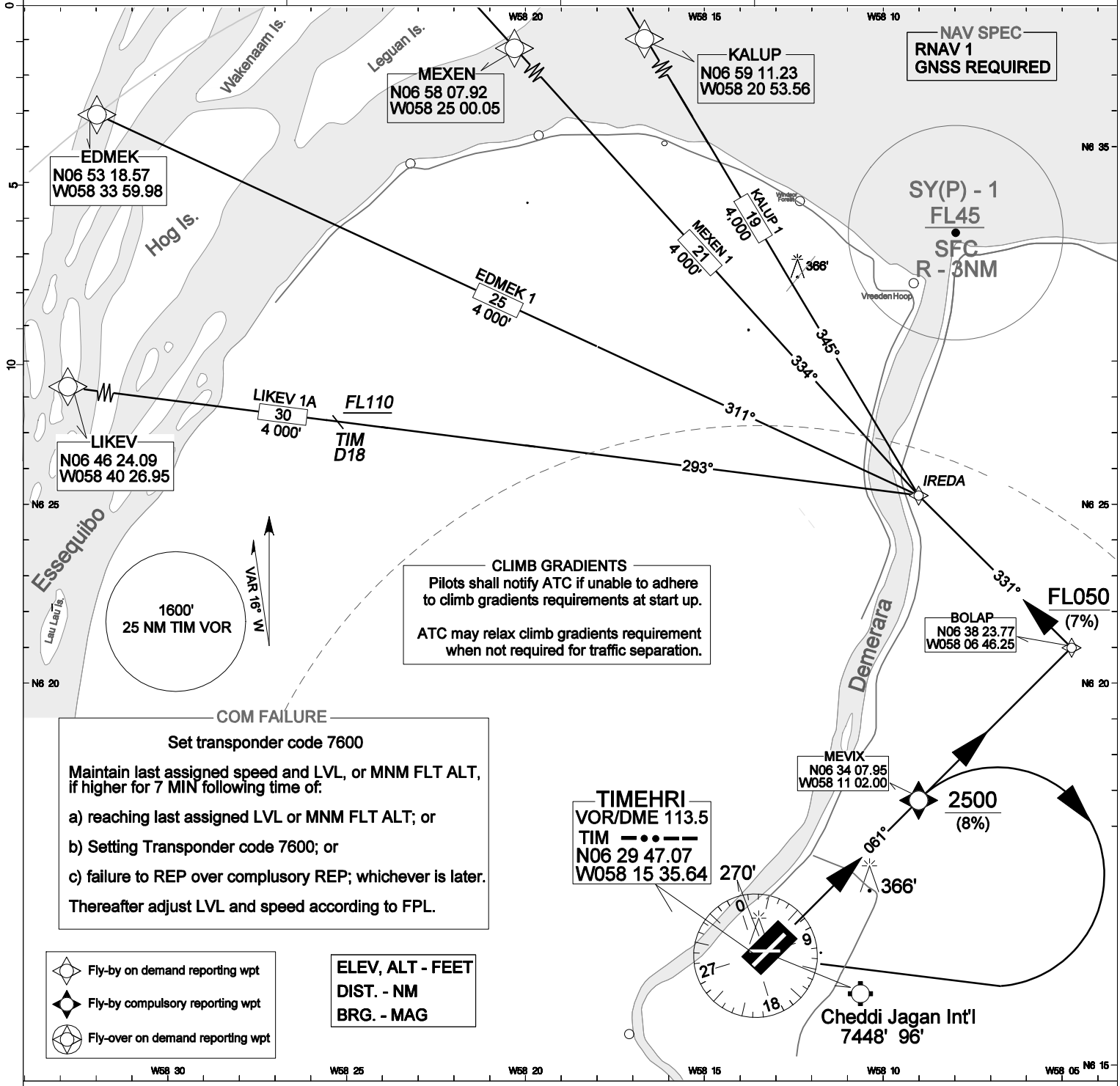
TEXTUAL DESCRIPTION SID - SYCJ RWY06	
LIKEV 1A	Climb RWY heading (061°) to MEVIX A2500 or above, continue climb to cross BOLAP FL50 or above. LEFT turn track 331° to IREDA, LEFT turn track 293°, cross TIM D18, F110 or above to LIKEV.
EDMEK 1	Climb RWY heading (061°) to MEVIX A2500 or above, continue climb to cross BOLAP F050 or above. LEFT turn track 331° to IREDA, LEFT turn track 311°, to EDMEK.
MEXEN 1	Climb RWY heading (061°) to MEVIX A2500 or above, continue climb to cross BOLAP F050 or above. LEFT turn track 331° to IREDA, RIGHT turn track 334°, to MEXEN.
KALUP 1	Climb RWY heading (061°) to MEVIX A2500 or above, continue climb to cross BOLAP F050 or above LEFT turn track 331° to IREDA, RIGHT turn track 345°, to KALUP.
TIM 1	Climb RWY heading (061°) to MEVIX A2500 or above RIGHT turn to cross TIM VOR as cleared by ATC , join cleared route.

LEGEND

- Lighted obstacle
- On demand reporting fix
- Compulsory reporting fix
- On demand reporting low alt fix
- Compulsory reporting low alt fix
- On demand reporting waypoint
- Compulsory reporting waypoint
- Compulsory fly-over waypoint
- Highest point on chart
- 1080' Spot elevation
- Airport
- City & Buildings
- TMA / CTR boundary
- 30.0 Segment length NM
- C713 Route designator
- 3500' Min. flight ALT.
- SYEC RWY07 RNAV VFR DEP.
- SYEC RWY07 RNAV VFR ARR
- SID route -SYCJ
- STAR -SYCJ

CHANGES: New SID, STAR and RNAV VFR ARR & DEP for SYCJ and SYEC.

STANDARD DEPARTURE CHART INSTRUMENT (SID) - ICAO	TRANSITION LEVEL: BY ATC TRANSITION ALTITUDE: 3000' AERODROME ELEVATION: 96'	APPROACH 118.3, 119.4 TOWER 118.3 GROUND 121.7	GEORGETOWN CHEDDI JAGAN INT'L (SYCJ) RWY06 LIKEV 1A; EDMEK 1; MEXEN 1; KALUP 1; TIM 1



TEXTUAL DESCRIPTION SID- SYCJ RWY06

LIKEV 1A	Climb RWY heading (061°) to MEVIX A2500 or above, continue climb, to cross BOLAP FL50 or above LEFT turn track 331° to IREDA LEFT turn track 293°, cross TIM D18, F110 or above to LIKEV.	EXCEPT when instructed specifically by ATC to disregard the published Altitude restriction.
EDMEK 1	Climb RWY heading (061°) to MEVIX A2500 or above continue climb to cross BOLAP F050 or above LEFT turn track 331° to IREDA, LEFT turn track 311°, to EDMEK.	
MEXEN 1	Climb RWY heading (061°) to MEVIX A2500 or above, continue climb ATC cleared FL cross BOLAP F050 or above LEFT turn track 331° to IREDA, LEFT turn track 334°, to MEXEN, A/UA312.	
KALUP 1	Climb RWY heading (061°) to MEVIX A2500 or above, continue climb to cross BOLAP F050 or above LEFT turn track 331° to IREDA, RIGHT turn track 345°, to KALUP.	
TIM 1	Climb RWY heading (061°) to MEVIX A2500 or above, RIGHT turn to cross TIM VOR as cleared by ATC join cleared route.	

STANDARD ARRIVAL CHART INSTRUMENT (STAR) - ICAO	TRANSITION LEVEL: BY ATC TRANSITION ALTITUDE: 3000' AERODROME ELEVATION: 96'	APPROACH 118.3, 119.4 TOWER 118.3 GROUND 121.7	GEORGETOWN CHEDDI JAGAN INT'L (SYCJ) RWY06 LIKEV 1; SISEX 1; VUDOK 1

ELEV, ALT - FEET
DIST. - NM
BRG. - MAG

COM FAILURE
Set transponder code 7600
Proceed to AKSIN at last received or acknowledged EAT
or if no EAT has been received or acknowledged,
at FPL ETA, descend in AKSIN HLDG pattern to A3000',
carry out Standard Instrument APP to RWY06,
if needed followed by a circling to RWY 24

NAV SPEC
RNAV 1
GNSS REQUIRED

LIKEV
FL100
N06 46 24.09
W058 40 26.95
165°
LIKEV 1
24.0
4000'

TIMEHRI
VOR/DME 113.5
TIM
N06 29 47
W058 15 36
124'

Cheddi Jagan Int'l
7448' 96'
270'
366'
055°
VAR 16° W 2014

IAF GATUX
FL040
6.0
151°
3000'

FAF OLVIK

IF/IAF AKSIN
3 000
061°
241°
4 nm
1

IAF LITOL
FL040
6.0
331°
3000'

1600'
25 NM TIM VOR

SISEX 1
32.4
4000'
281°
FL100

SISEX
N06 19 56.30
W057 46 53.84

VUDOK 1
19.0
3000'
043°

VUDOK
N06 04 30.89
W058 32 15.84
FL070

Fly-by on demand reporting wpt
Fly-by compulsory reporting wpt
Fly-over on demand reporting wpt

Demerara
Sand Hills
Soesdyke-Linden Hwy
Makouria

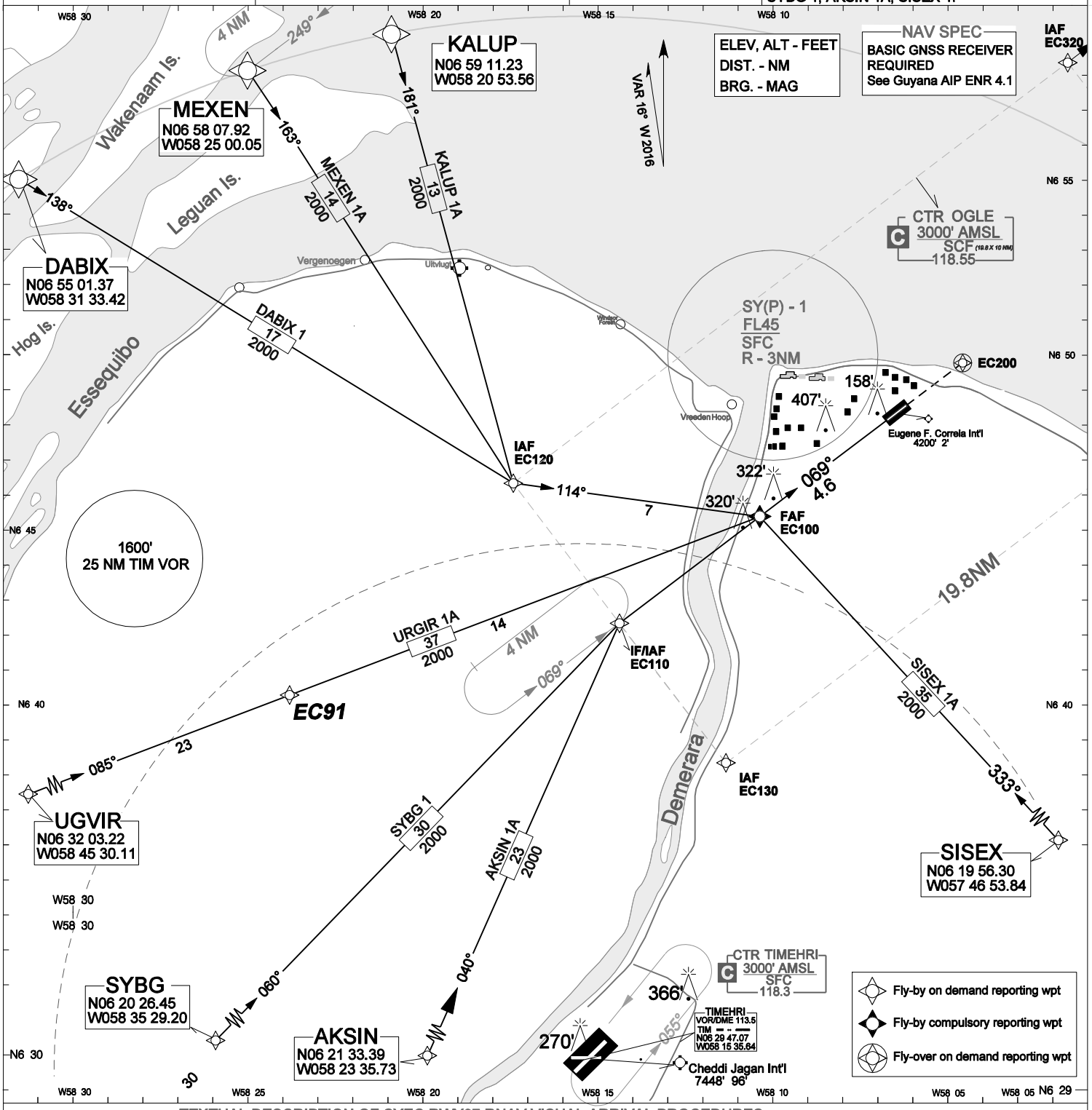
TEXTUAL DESCRIPTION STAR - SYCJ RWY06

LIKEV 1	Arrival via UG443 (W)/UA324/312/632, proceed direct LIKEV when cleared by ATC. Cross LIKEV F100 Track 165° to GATUX descend F040, commence APP as cleared by ATC.
VUDOK 1	Arrival via UB681/UL322/UM527(W) proceed direct VUDOK when cleared by ATC. Cross VUDOK F070 Track 043° to AKSIN descend A3000', commence APP as cleared by ATC.
SISEX 1	Arrival via UG443 (E)/ WP KOXAM/ASASO proceed direct SISEX when cleared by ATC. Cross SISEX F100 Track 281° to LITOL descend F040, commence APP as cleared by ATC.

EXCEPT when instructed specifically by ATC to disregard the published Altitude restriction.

CHANGES: NEW CHART.

STANDARD VISUAL RNAV ARRIVAL RWY 07	TRANSITION LEVEL: BY ATC TRANSITION ALTITUDE: 3000' AERODROME ELEVATION: 2'	APPROACH 118.3, 119.4 TOWER 118.55 GROUND 121.9	GEORGETOWN EUGENE F. CORREIA INT'L (SYEC) RWY 07 KALUP 1A; MEXEN 1A; DABIX 1; UGVIR 1A; SYBG 1; AKSIN 1A; SISEX 1.

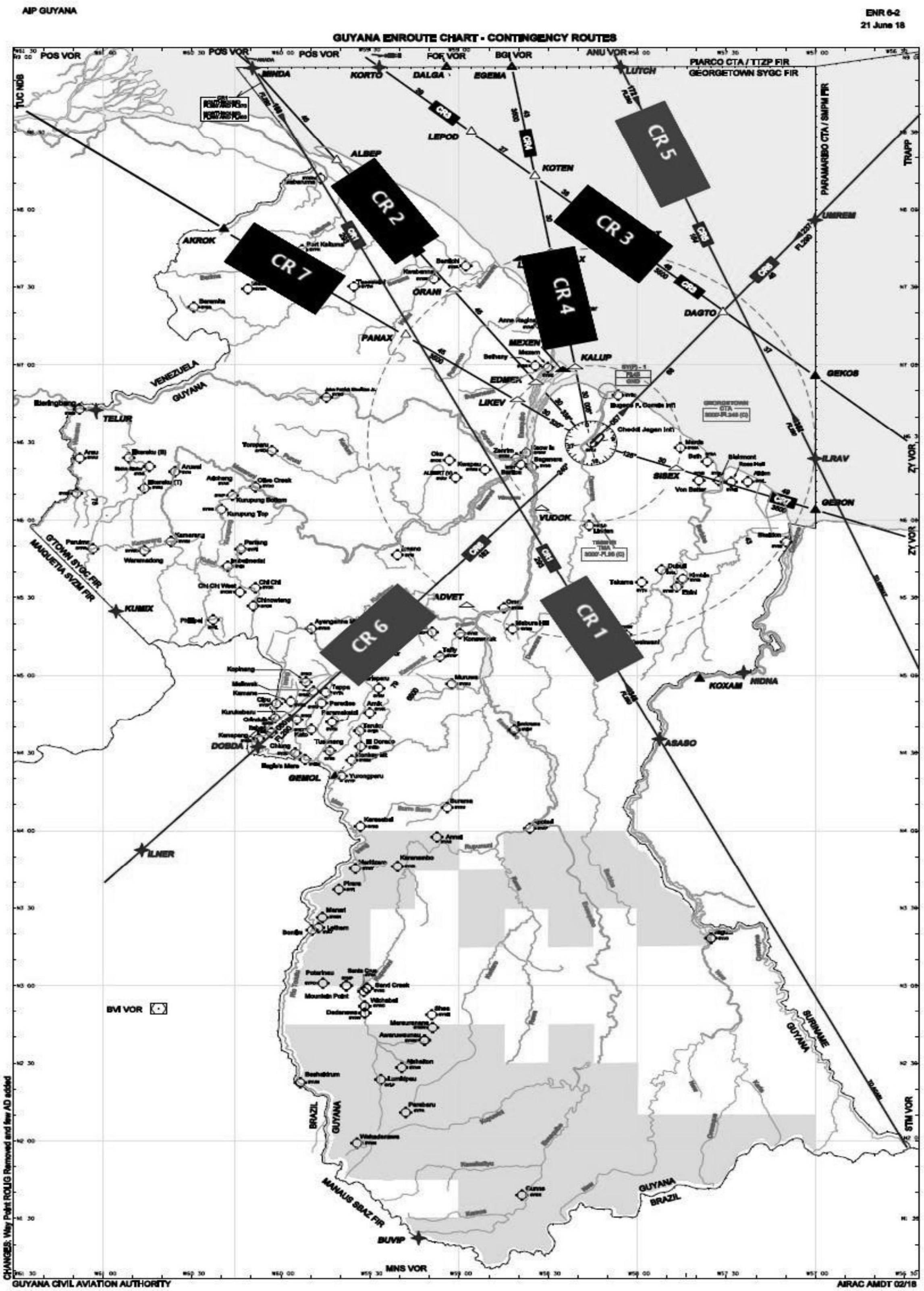


TEXTUAL DESCRIPTION OF SYEC RWY07 RNAV VISUAL ARRIVAL PROCEDURES.

KALUP 1A	ARR. via A/UA632, proceed direct KALUP when cleared by ATC, descend to clear FL, at KALUP track 181° to EC120, descend A2000 commence APP.
MEXEN 1A	ARR. via A/UA312, proceed direct MEXEN when cleared by ATC, descend to clear FL, at MEXEN track 163° to EC120, descend A2000 commence APP.
DABIX 1	ARR from SYMB, SYPK, SYMR,SYBR, SYTW, proceed direct DABIX when cleared by ATC, descend to clear FL, at DABIX track 138° to EC120, descend A2000, commence APP
UGVIR 1A	ARR from west SYIB to SYET, at CTA proceed direct UGVIR when cleared by ATC, descend to clear FL, at UGVIR track 085° to EC100, descend to clear FL, cross EC100 A1500.
SYBG 1	ARR from SW- SYCW to SYMG, at CTA proceed direct SYBG when cleared by ATC, descend to clear FL, SYBG track 060° to EC110, descend to clear FL, cross EC110 A2000.
AKSIN 1A	ARR from SSW and S, SYKO to SYAP, at CTA proceed direct AKSIN when cleared by ATC, descend to clear FL, AKSIN track 040° to EC110, descend to clear FL,
SISEX 1A	ARR via G443 (E), at SISEX track 333° to EC100 when cleared by ATC, descend to clear FL, cross EC100 A1500.

CHANGES: NEW CHART.

EXCEPT when instructed specifically by ATC to disregard the published Altitude restriction.


AIP GUYANA
ENR 6-2
21 June 18
GUYANA ENROUTE CHART - CONTINGENCY ROUTES
CR 1
CR 2
CR 3
CR 4
CR 5
CR 6
CR 7
PIARCO CTA / TTZP FIR
GEORGETOWN SYGC FIR
PARAMARIBO CTA / SMPM FIR
GTOWN SYGC FIR
MAIQUETIA SVZM FIR
MANAUS SBAZ FIR
VENEZUELA
GUYANA
SURINAME
BRAZIL
Cheddi Jagan Int'l
BVI VOR
MNS VOR
GUYANA CIVIL AVIATION AUTHORITY
AIRAC AMDT 02/18