Cartas Aeronauticas

Taller NAM/CAR de Gestión de Conjunto de datos y
Cartas aeronáuticas electrónicas (eCharts)

ACERCA DE NOSOTROS

Nuestra Misión

AIM for Safer Skies
(Apuntando a Cielos Seguros)

Permitir que los AIS de los Estados incluyendo el personal AIM puedan alcanzar sus metas operacionales proveyendo Software, Servicios, Entrenamiento y Soporte en el campo de la Gestión de la Información Aeronáutica.

ACTIVIDADES M-AIS

SOFTWARE

M-AIS ofrece una serie efectiva de soluciones de Publicación de Información Aeronáutica y Gestión de datos AIXM

SERVICIOS

Proveemos muchos servicios a la medida a nuestros clientes que permiten una transición fluida y la migración al AIM

ENTRENAMIENTO

Nuestros especialistas en instrucción comparten sus propias experiencias y conocimiento para asegurar una capacitación eficaz

SOPORTE Y MANTENIMIENTO

Las relaciones con nuestros clientes son vitales en todo lo que hacemos. Mantenemos un equipo completo de soporte para atender cualquier duda

NUESTRO TRABAJO CON DATOS AERONÁUTICOS

EAD

Integración de datos para FrameAPS / eAIP y DITA para mas de 12 actualizaciones y 4 cambios del modelo AIXM

UK NATS

Suite de creación de AIXM 4.5 and AIXM 5.1 para la gestión y publicación de todos los datos aeronáuticos para Reino Unido de 2006 al 2019

THALES France

Desarrollo de tecnología AIXM en forma conjunta del 2005 al 2011. Múltiples países utilizando este software de manera exitosa en Joint Venture.

Base de Clientes Globales

Clientes eAIP para Software, Servicios, Entrenamiento y Soporte de AIXM 4.5/AIXM 5.1 eAIP. Actualmente en un contrato de revisión exhaustivo de tablas para un cliente del área central de Europa

Proyectos Mundiales

Implementaciones en el Mundo y Entrenamiento para AIXM

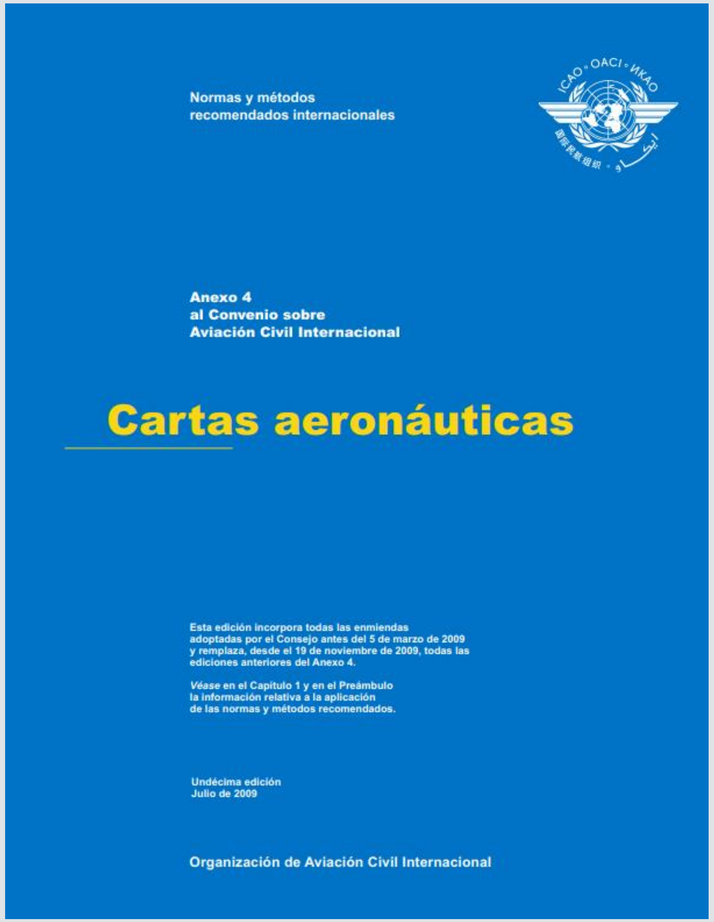
- M-AIS provee entrenamiento para AIXM 5.1, Datasets y PANS AIM así como consultorías para una clientela global
    - **Software** – AIXM Data Management Suite y FrameAPS
    - **Servicios** – Migración de datos eAIP y AIXM
    - **Entrenamiento** - AIM, AIXM, Cartografía, eAIP y Codificación y Visualización de datos PBN
    - **Soporte y Mantenimiento-** Múltiples contratos de mantenimiento en AIXM y eAIP

Antonio Locandro

- Experto Diseño de Procedimientos PANS OPS y PBN
- Experto en Información Aeronáutica
  - +16 Años de experiencia en la industria
  - Experto GIS y en Cartografía Aeronáutica
  - Instructor AIM y Diseño PANS OPS
  - Participante en ICAO AIXM CCB y asesor para IFAIMA para ICAO AIM WG-A
  - Participado en proyectos de Cooperación Técnica de la OACI para Superficies Limitadoras de Obstáculos y Plan Maestro de Aeropuertos

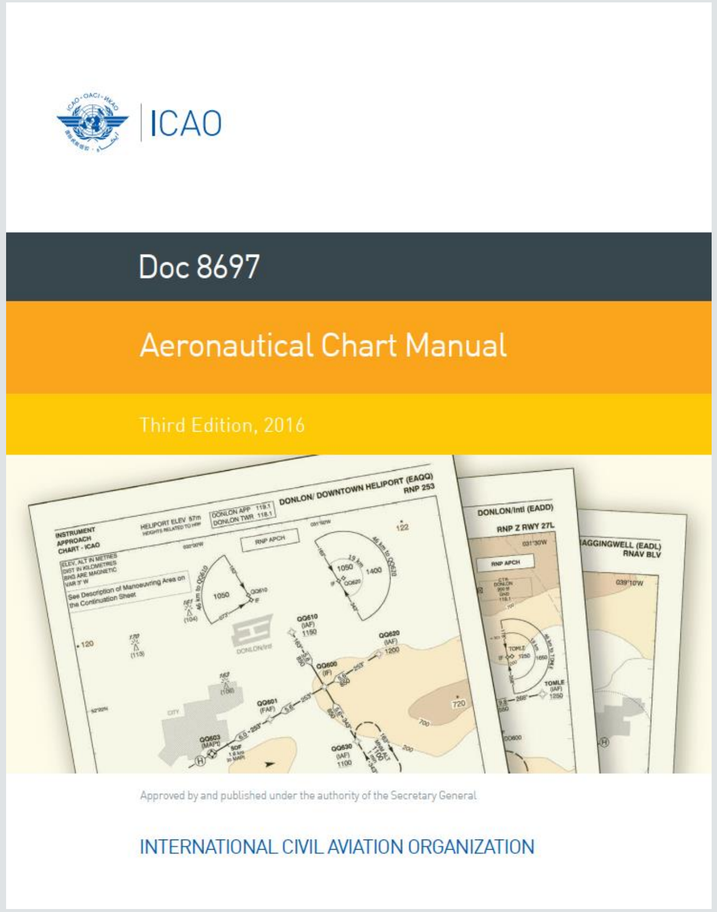
Introducción

Anexo 4 y Doc 8697



59	Second meeting of the Operational Data Link Panel (OPLINKP/2); and twelfth meeting of the Instrument Flight Procedure Panel (IFPP/12)	Provisions concerning satellite voice communications (SATVOICE); visual segment surface (VSS) penetrations charting requirements; and update of the provisions relating to publication depiction and functionality requirements of fly-by and fly-over significant points, area minimum altitude (AMA), CAT H procedures and en-route airway directional use restrictions.	22 February 2016 11 July 2016 10 November 2016
60	Twelfth meeting of the Aeronautical Information Service (AIS) to Aeronautical Information Management (AIM) Study Group (AIS-AIMSG/12) and the thirteenth meeting of the Instrument Flight Procedures Panel (IFPP/13)	Amendments as a result of the review and restructure of Annex 15 — *Aeronautical Information Services* and the introduction of PANS-AIM concerning data quality requirements and performance-based data error detection requirements; and amendments as a result of the revised definition and description of "procedure altitude/height" in the *Procedures for Air Navigation Services — Aircraft Operations*, Volume I — *Flight Procedures* and Volume II — *Construction of Visual and Instrument Flight Procedures* (Doc 8168).	9 March 2018 16 July 2018 8 November 2018
61	Third meeting of the Aerodromes Panel (ADOP/3) and the fourteenth meeting of the Instrument Flight Procedures Panel (IFPP/14)	a) Consequential amendment as a result of the incorporation of folding wing tips (FWT); and b) consequential amendments as a result of charting conventional navigation aids on PBN procedures, visual segment surface, simultaneous operations on parallel and near parallel runways and charted altitudes and flight levels.	9 March 2020 20 July 2020 4 November 2021

Anexo 4 y Doc 8697



AMENDMENTS

Amendments are announced in the supplements to the *Products and Services Catalogue;* the Catalogue and its supplements are available on the ICAO website at www.icao.int. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

AMENDMENTS		
No.	Date	Entered by

CORRIGENDA		
No.	Date	Entered by
1	10.6.16	ICAO

ICAO AIM WG-A
Grupo Focal Cartas Aeronauticas

Dentro del Panel de Gestión de la información (IMP) de la OACI y del Grupo de trabajo AIM WG-A, el grupo focal de cartas aeronáuticas es un ente especializado que tiene la intención de:

- Revisar las actuales cartas aeronáuticas
- Proponer cambios a la documentación actual de la OACI, incluyendo la posibilidad de eliminar la producción de ciertas cartas
- Permitir la transición a un ambiente completamente digital para la producción de cartas

Lo anterior es un proceso largo que tiene un horizonte para el 2028

ICAO AIM WG-A
Grupo Focal Cartas Aeronauticas

- Una revisión de las necesidades reales de los usuarios
- Toma conciencia que el manual vigente no esta actualizado y que debe ser revisado
- Los datos y el conjunto de datos son mencionados para la presentación futura de información en lugar de vistas “estáticas”

La información esta siendo analizada para revisar que cambios serán incorporados

International Civil Aviation Organization | Organisation de l'aviation civile internationale | Organización de Aviación Civil Internacional | Международная организация гражданской авиации | منظمة الطيران المدني الدولي | 国际民用航空组织

Tel.: +1 514-954-8219 ext. 5872

11 February 2020

Ref.: AN 2/19-20/10

Subject: Aeronautical Chart Review questionnaire

Action required: Complete online Aeronautical Chart Review questionnaire by 20 March 2020

Sir/Madam,

The International Civil Aviation Organization (ICAO) originally published Annex 4 — *Aeronautical Charts* in March 1949 during a time when aeronautical charts, created by manual methods, were the main source of information for air navigation by airspace users. Since that time eleven editions of Annex 4 have been published, most recently the eleventh edition in July 2009.

Current aeronautical charts are still “static views” designed for human interpretation. In an age where aircraft performance is increasingly dependent on digital data and electronic information, it is evident that the functions, format, needs and design of the aeronautical charts in Annex 4, as well as those in the *Aeronautical Chart Manual* (Doc 8697), need revision. Data or data sets represent the future for data/information and provision of information, while digital or electronic charts will replace the need for paper charts. In order to implement these changes, there is a need to review existing Annex 4 content and determine which charts are still necessary, which should be replaced with digital data sets or electronic charts, and which can be discontinued.

Pursuant to the above, our initial step is to query Civil Aviation Authorities (CAAs) and Air Navigation Service Providers (ANSPs), which produce and distribute aeronautical charts, to determine both their current and future needs. Therefore, we would appreciate your assistance in completing the Aeronautical Chart Questionnaire for CAA and ANSP, available in English only, no later than **20 March 2020**.

Another questionnaire, intended for users of aeronautical charts, e.g. data houses, airlines etc., will be distributed shortly. The responses to both questionnaires will be analysed in order to determine the suitability of current Annex 4 charts.

Accept, Sir/Madam, the assurances of my highest consideration.

Fang Liu
Secretary General

999 Robert-Bourassa Boulevard
Montréal, Quebec
Canada H3C 5H7

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www.icao.int

Estándares de Cartografía Aeronáutica

Estándares de Cartografía Aeronáutica

- Los **<u>Estados</u>** deben cumplir con las Normas y Métodos recomendados y adoptar en la medida de lo posible el material guía
- Los ***Proveedores Comerciales*** tienen una serie diferente de requerimientos, esto debido a que ellos están orientados hacia el usuario final.

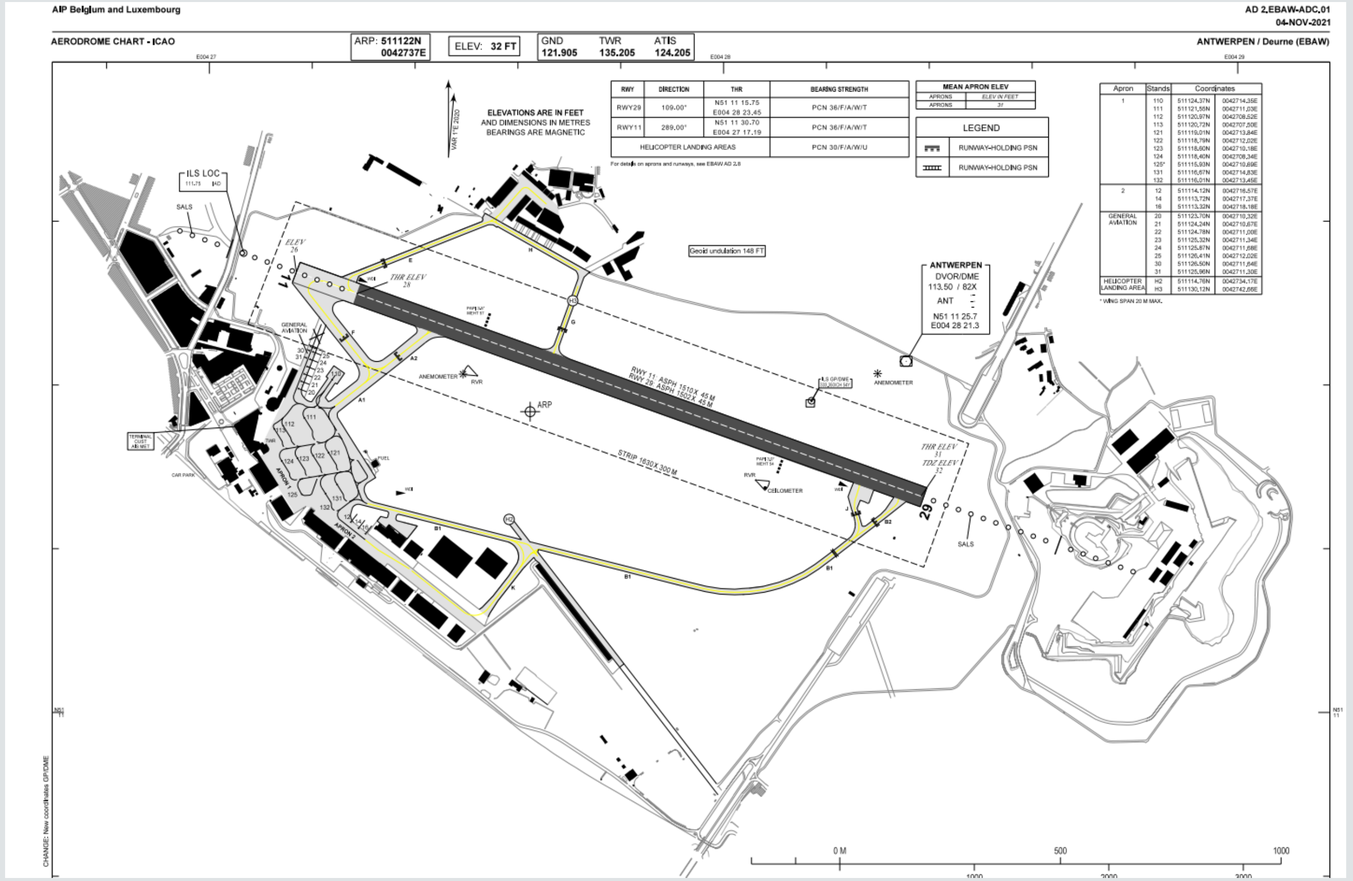
Tanto los Estados como los proveedores comerciales están satisfaciendo la producción de cartas aeronáuticas, pero desde diferentes perspectivas.

Cuando los Estados no están cumpliendo con los requerimientos OACI, estos deben notificar las diferencias o publicarlas en el AIP según la jerarquía de la documentación dependiendo si esta en un Norma y Método recomendado o en otra documentación.

Annex 4: Aeronautical Charts (11th Edition) (AMDT 59)				
ICAO Ref.	Category (Standard, Rec'd Practice, etc.)	Difference	Details of Difference	Comments/Status
C4 4.1 to 4.10.4	Standard	Less protective or partially implemented or not implemented	The UK does not produce an Aerodrome Obstacle Chart ICAO Type B.	A demand for this chart has not been identified in the UK. User requirement is satisfied by the current content of the AIP. There are no current plans to produce this chart.
C5 5.1 to 5.8.8	Standard	Less protective or partially implemented or not implemented	The UK does not produce an Aerodrome Terrain and Obstacle Chart - ICAO (Electronic).	Work is currently underway to identify the measures required to achieve compliance with this standard. If resolved, a resolution to this difference will be implemented within an as yet to be assessed time frame.
C7 7.1 to 7.9.4.2	Standard	Less protective or partially implemented or not implemented	The Enroute Chart is not produced by the UK.	Information is published in tabular format in UK AIP ENR 3. Similar charts produced by industry are more appropriate for use by aircraft operators.
C8 8.1 to 8.9.4.1.1	Standard	Less protective or partially implemented or not implemented	The Area Chart is not produced by the UK.	Requirement fulfilled by other means - SID and STAR charts, Approach charts and 1:500,000 charts.
C9 9.9.3.1	Standard	Different in character or other means of compliance	Only Area Minimum Altitude (AMA) is shown.	The extent of the Minimum Sector Altitude (MSA) does not sufficiently take account of the complete route.
C9 9.9.4.2	Recommendation	Different in character or other means of compliance	The communication failure procedure is not shown.	Communication failure procedures are shown on ATC Surveillance Minimum Altitude Chart. No immediate plans to eradicate this difference.
C10 10.9.3.1	Standard	Different in character or other means of compliance	Only Area Minimum Altitude (AMA) is shown.	The extent of the Minimum Sector Altitude (MSA) does not sufficiently take account of the complete route.
C10 10.9.4.2	Recommendation	Different in character or other means of compliance	The communication failure procedure is not shown.	Communication failure procedures are shown on ATC Surveillance Minimum Altitude Chart. No immediate plans to eradicate this difference.
C11 11.4	Recommendation	More exacting or exceeds	In the UK the basic sheet size of the charts is 297 MM x 210 MM (A4).	Reduction in sheet size would reduce the area of coverage and the amount of data published. No immediate plans to eradicate this difference.

Estándares de Cartografía Aeronáutica

1.3.3 Los Estados contratantes tomarán todas las medidas razonables para garantizar que la información que proporcionan y las cartas aeronáuticas facilitadas son adecuadas y exactas, y que se mantienen al día mediante un adecuado servicio de revisión.



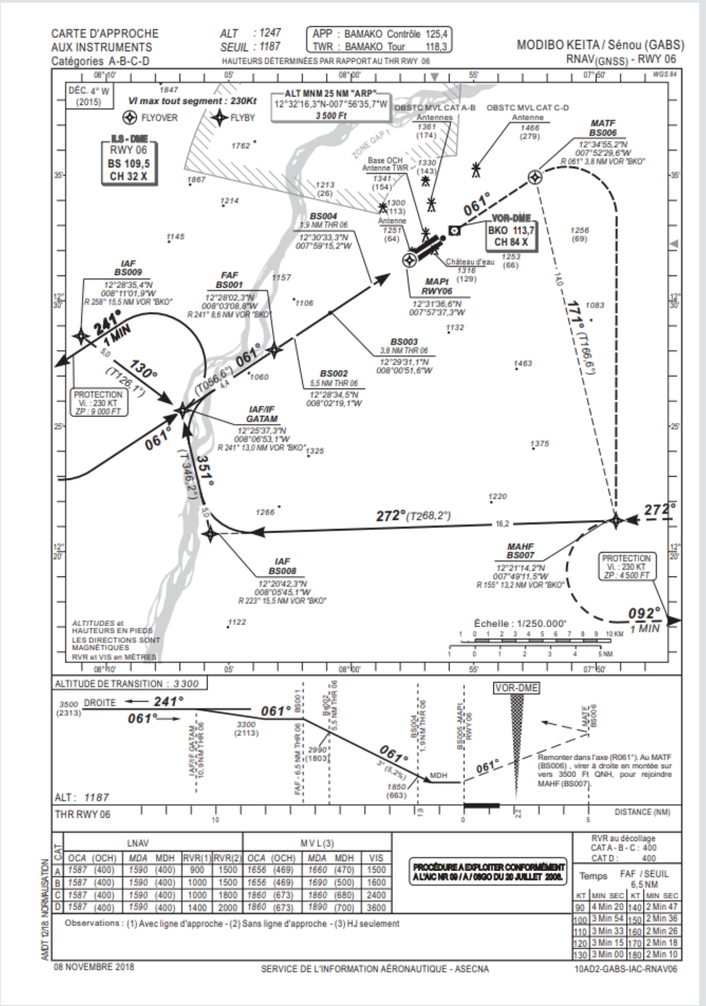
Aeronautical Charting Standards

1.3.2.1 Respecto a toda carta o una sola hoja de una serie de cartas que comprendan por completo el territorio de un Estado contratante, el Estado que tenga jurisdicción sobre dicho territorio:

a) preparará la carta u hoja por sí mismo; o

b) dispondrá que se prepare por otro Estado contratante o por un organismo; o

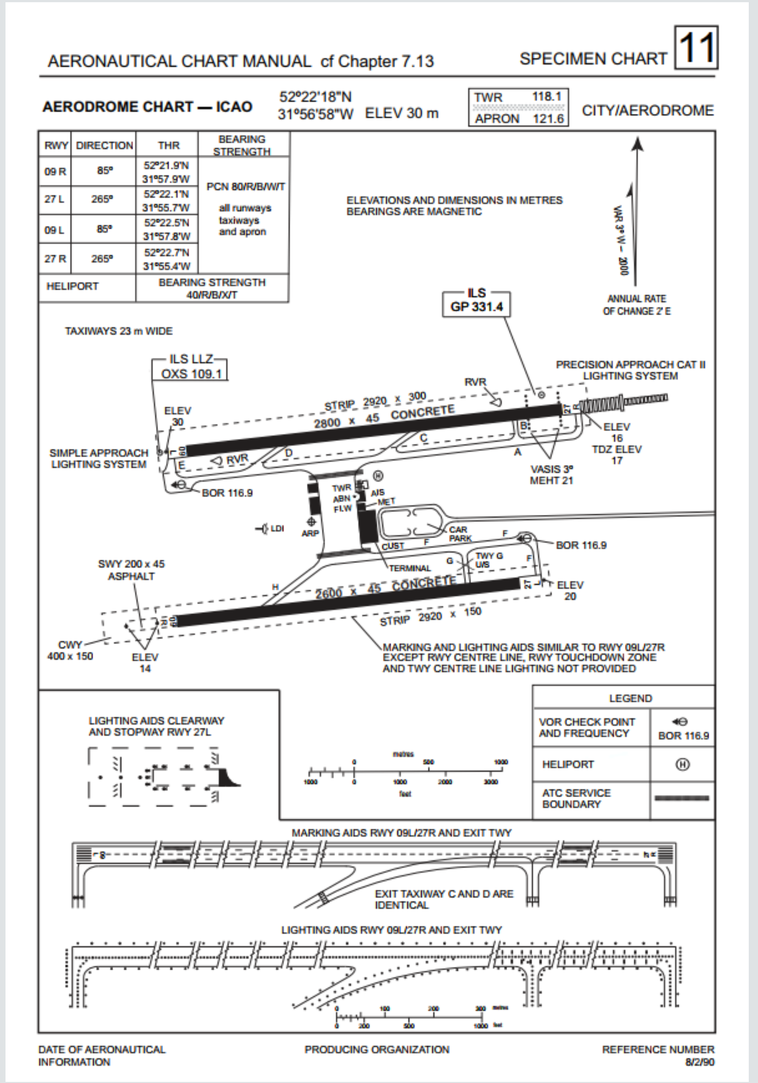
c) proporcionará al otro Estado contratante, que esté dispuesto a aceptar la obligación de preparar la carta u hoja, los datos necesarios para su preparación.

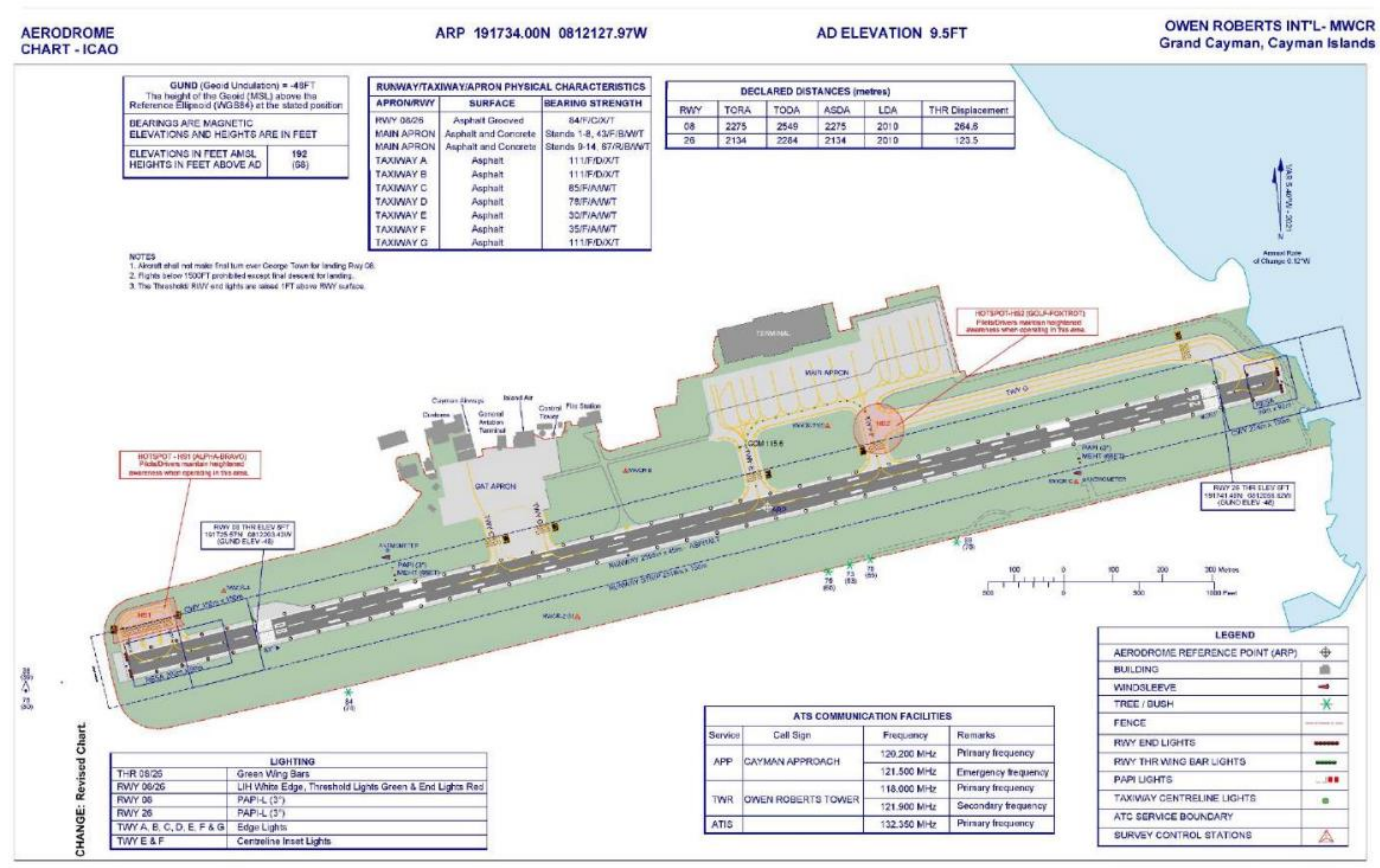


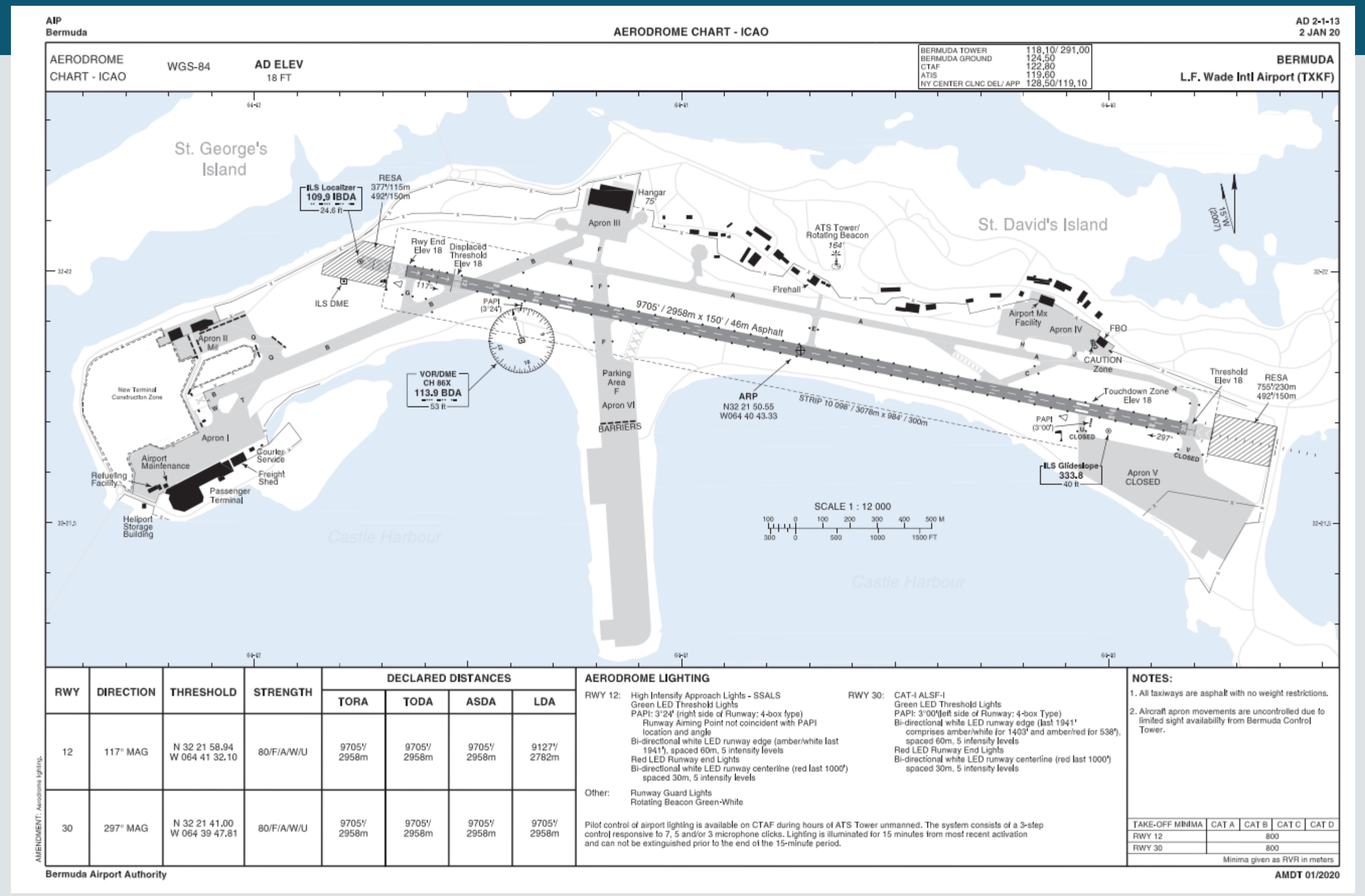
Ejemplo de diferencias

Carta Espécimen OACI

Carta de Aeródromo- ICAO




AERODROME CHART - ICAO
ARP 191734.00N 0812127.97W
AD ELEVATION 9.5FT
OWEN ROBERTS INT'L- MWCR
Grand Cayman, Cayman Islands
GUND (Geoid Undulation) = -48FT
The height of the Geoid (MSL) above the Reference Ellipsoid (WGS84) at the stated position
BEARINGS ARE MAGNETIC
ELEVATIONS AND HEIGHTS ARE IN FEET
ELEVATIONS IN FEET AMSL 192
HEIGHTS IN FEET ABOVE AD (68)
RUNWAY/TAXIWAY/APRON PHYSICAL CHARACTERISTICS
APRON/RWY | SURFACE | BEARING STRENGTH
RWY 08/26 | Asphalt Grooved | 84/F/C/X/T
MAIN APRON | Asphalt and Concrete | Stands 1-8, 43/F/B/W/T
MAIN APRON | Asphalt and Concrete | Stands 9-14, 87/R/B/W/T
TAXIWAY A | Asphalt | 111/F/D/X/T
TAXIWAY B | Asphalt | 111/F/D/X/T
TAXIWAY C | Asphalt | 85/F/A/W/T
TAXIWAY D | Asphalt | 78/F/A/W/T
TAXIWAY E | Asphalt | 30/F/A/W/T
TAXIWAY F | Asphalt | 35/F/A/W/T
TAXIWAY G | Asphalt | 111/F/D/X/T
DECLARED DISTANCES (metres)
RWY | TORA | TODA | ASDA | LDA | THR Displacement
08 | 2275 | 2549 | 2275 | 2010 | 264.6
26 | 2134 | 2284 | 2134 | 2010 | 123.5
NOTES
1. Aircraft shall not make final turn over George Town for landing Rwy 08.
2. Flights below 1500FT prohibited except final descent for landing.
3. The Threshold/ RWY end lights are raised 1FT above RWY surface.
TERMINAL
MAIN APRON
TWY G
GAT APRON
HOTSPOT-HS2 (GOLF-FOXTROT)
HOTSPOT - HS1 (ALPHA-BRAVO)
Annual Rate of Change 0.12°W
CHANGE: Revised Chart.
LIGHTING
THR 08/26 | Green Wing Bars
RWY 08/26 | LIH White Edge, Threshold Lights Green & End Lights Red
RWY 08 | PAPI-L (3°)
RWY 26 | PAPI-L (3°)
TWY A, B, C, D, E, F & G | Edge Lights
TWY E & F | Centreline Inset Lights
ATS COMMUNICATION FACILITIES
Service | Call Sign | Frequency | Remarks
APP | CAYMAN APPROACH | 120.200 MHz | Primary frequency
121.500 MHz | Emergency frequency
TWR | OWEN ROBERTS TOWER | 118.000 MHz | Primary frequency
121.900 MHz | Secondary frequency
ATIS | | 132.350 MHz | Primary frequency
100 0 100 200 300 Metres
0 500 1000 Feet
LEGEND
AERODROME REFERENCE POINT (ARP)
BUILDING
WINDSLEEVE
TREE / BUSH
FENCE
RWY END LIGHTS
RWY THR WING BAR LIGHTS
PAPI LIGHTS
TAXIWAY CENTRELINE LIGHTS
ATC SERVICE BOUNDARY
SURVEY CONTROL STATIONS



RWY	DIRECTION	THRESHOLD	STRENGTH	DECLARED DISTANCES			
				TORA	TODA	ASDA	LDA
12	117° MAG	N 32 21 58.94 W 064 41 32.10	80/F/A/W/U	9705'/ 2958m	9705'/ 2958m	9705'/ 2958m	9127'/ 2782m
30	297° MAG	N 32 21 41.00 W 064 39 47.81	80/F/A/W/U	9705'/ 2958m	9705'/ 2958m	9705'/ 2958m	9705'/ 2958m

AERODROME LIGHTING

RWY 12: High Intensity Approach Lights - SSALS
Green LED Threshold Lights
PAPI: 3°24' (right side of Runway; 4-box type)
Runway Aiming Point not coincident with PAPI location and angle
Bi-directional white LED runway edge (amber/white last 1941'), spaced 60m, 5 intensity levels
Red LED Runway end Lights
Bi-directional white LED runway centerline (red last 1000') spaced 30m, 5 intensity levels

RWY 30: CAT-I ALSF-I
Green LED Threshold Lights
PAPI: 3°00'(left side of Runway; 4-box Type)
Bi-directional white LED runway edge (last 1941' comprises amber/white for 1403' and amber/red for 538'), spaced 60m, 5 intensity levels
Red LED Runway End Lights
Bi-directional white LED runway centerline (red last 1000') spaced 30m, 5 intensity levels

Other: Runway Guard Lights
Rotating Beacon Green-White

Pilot control of airport lighting is available on CTAF during hours of ATS Tower unmanned. The system consists of a 3-step control responsive to 7, 5 and/or 3 microphone clicks. Lighting is illuminated for 15 minutes from most recent activation and can not be extinguished prior to the end of the 15-minute period.

NOTES:

1. All taxiways are asphalt with no weight restrictions.
2. Aircraft apron movements are uncontrolled due to limited sight availability from Bermuda Control Tower.

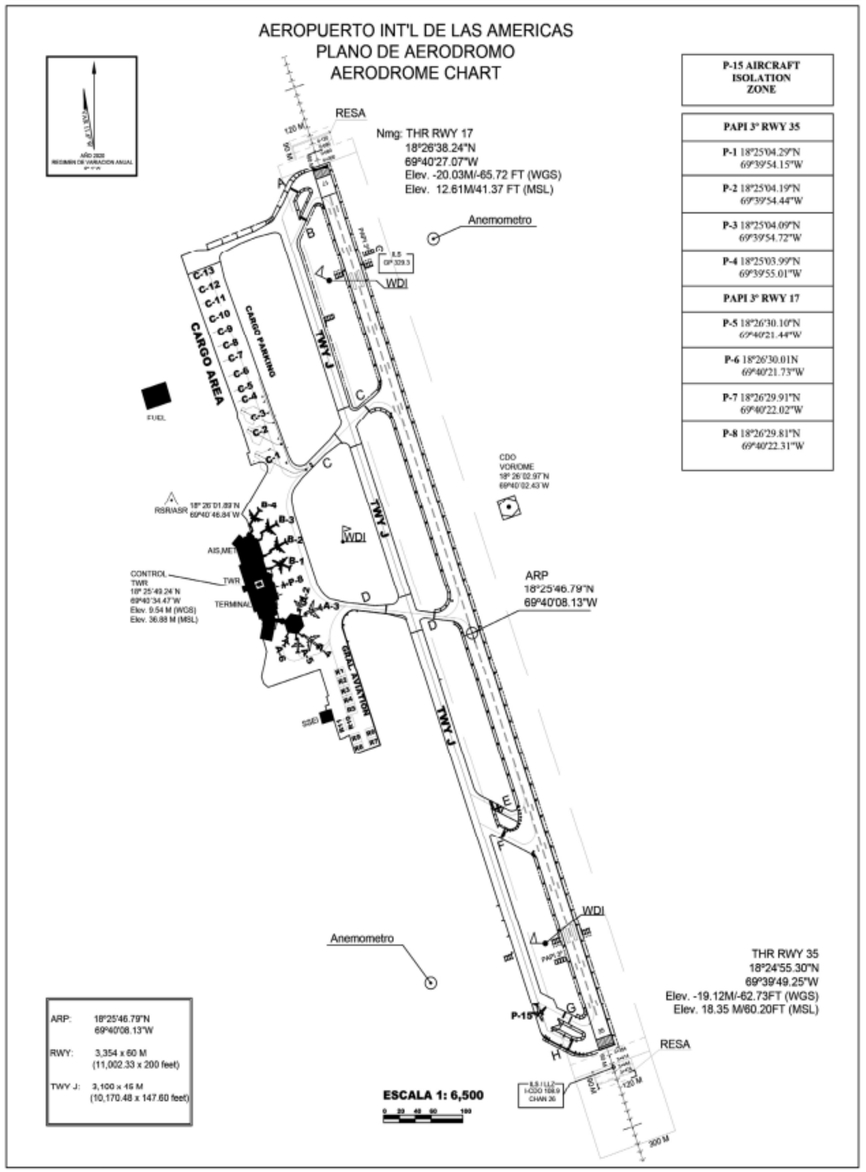
TAKE-OFF MINIMA	CAT A	CAT B	CAT C	CAT D
RWY 12	800			
RWY 30	800			

Minima given as RVR in meters

AMENDMENT: Aerodrome lighting.

Bermuda Airport Authority

AMDT 01/2020

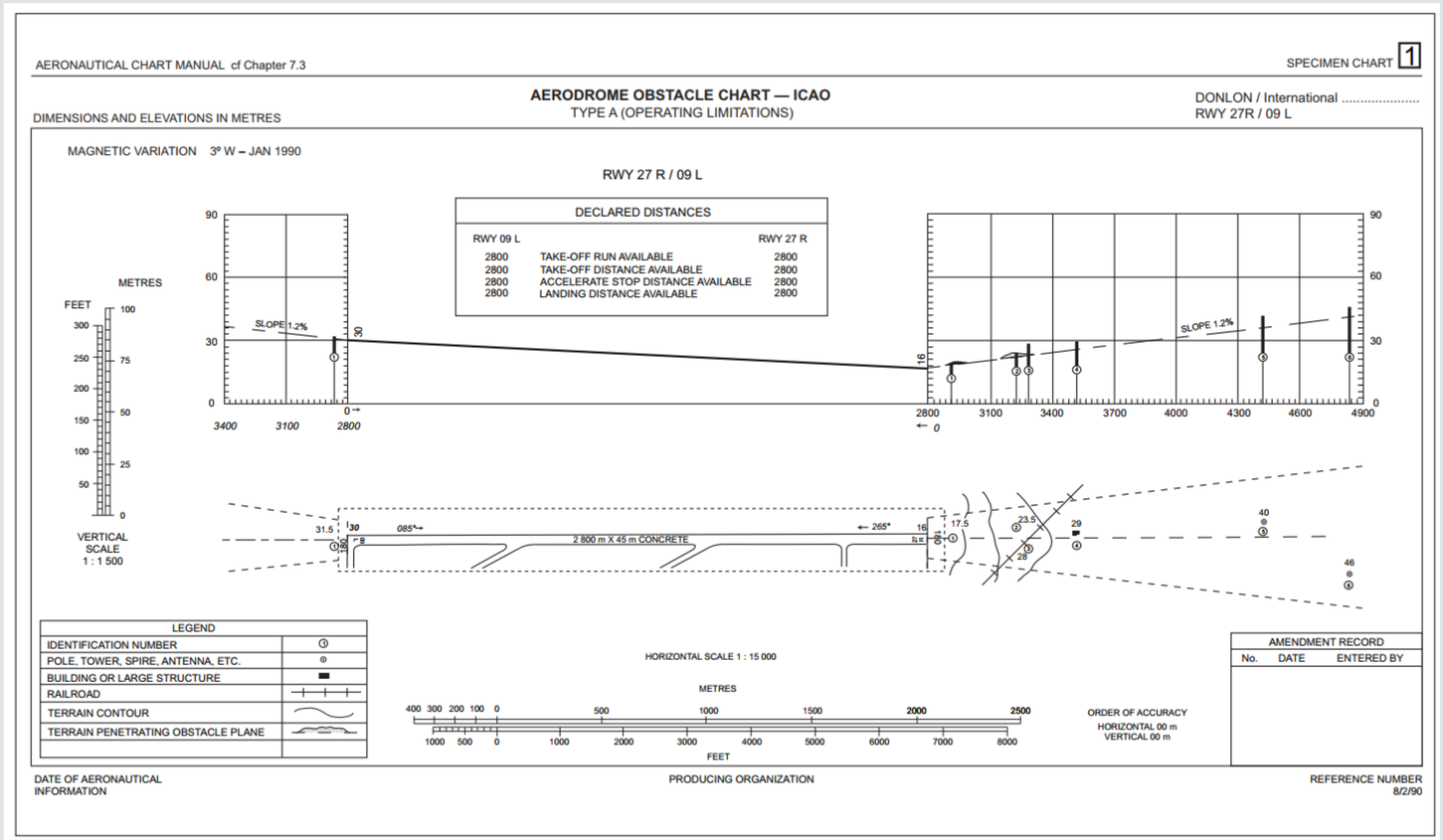

AEROPUERTO INT'L DE LAS AMERICAS
PLANO DE AERODROMO
AERODROME CHART
P-15 AIRCRAFT ISOLATION ZONE
PAPI 3° RWY 35
P-1 18°25'04.29"N 69°39'54.15"W
P-2 18°25'04.19"N 69°39'54.44"W
P-3 18°25'04.09"N 69°39'54.72"W
P-4 18°25'03.99"N 69°39'55.01"W
PAPI 3° RWY 17
P-5 18°26'30.10"N 69°40'21.44"W
P-6 18°26'30.01N 69°40'21.73"W
P-7 18°26'29.91"N 69°40'22.02"W
P-8 18°26'29.81"N 69°40'22.31"W
RESA
Nmg: THR RWY 17
18°26'38.24"N
69°40'27.07"W
Elev. -20.03M/-65.72 FT (WGS)
Elev. 12.61M/41.37 FT (MSL)
Anemometro
WDI
CARGO AREA
CARGO PARKING
FUEL
RSR/ASR 18° 26' 01.89 N 69°40' 46.84 W
CDO VOR/DME 18° 26' 02.97 N 69°40' 02.43 W
AIS,MET
CONTROL TWR 18° 25' 49.24' N 69°40' 34.47' W Elev. 9.54 M (WGS) Elev. 36.88 M (MSL)
TWR
TERMINAL
TWY J
ARP
18°25'46.79"N
69°40'08.13"W
GRACE AVIATION
Anemometro
WDI
THR RWY 35
18°24'55.30"N
69°39'49.25"W
Elev. -19.12M/-62.73FT (WGS)
Elev. 18.35 M/60.20FT (MSL)
RESA
ARP: 18°25'46.79"N 69°40'08.13"W
RWY: 3,354 x 60 M (11,002.33 x 200 feet)
TWY J: 3,100 x 46 M (10,170.48 x 147.60 feet)
ESCALA 1: 6,500

Ejemplo de diferencias

Carta Espécimen OACI

Carta de Obstáculos de Aeródromo (OACI)

Tipo A (Limitación de Operaciones)

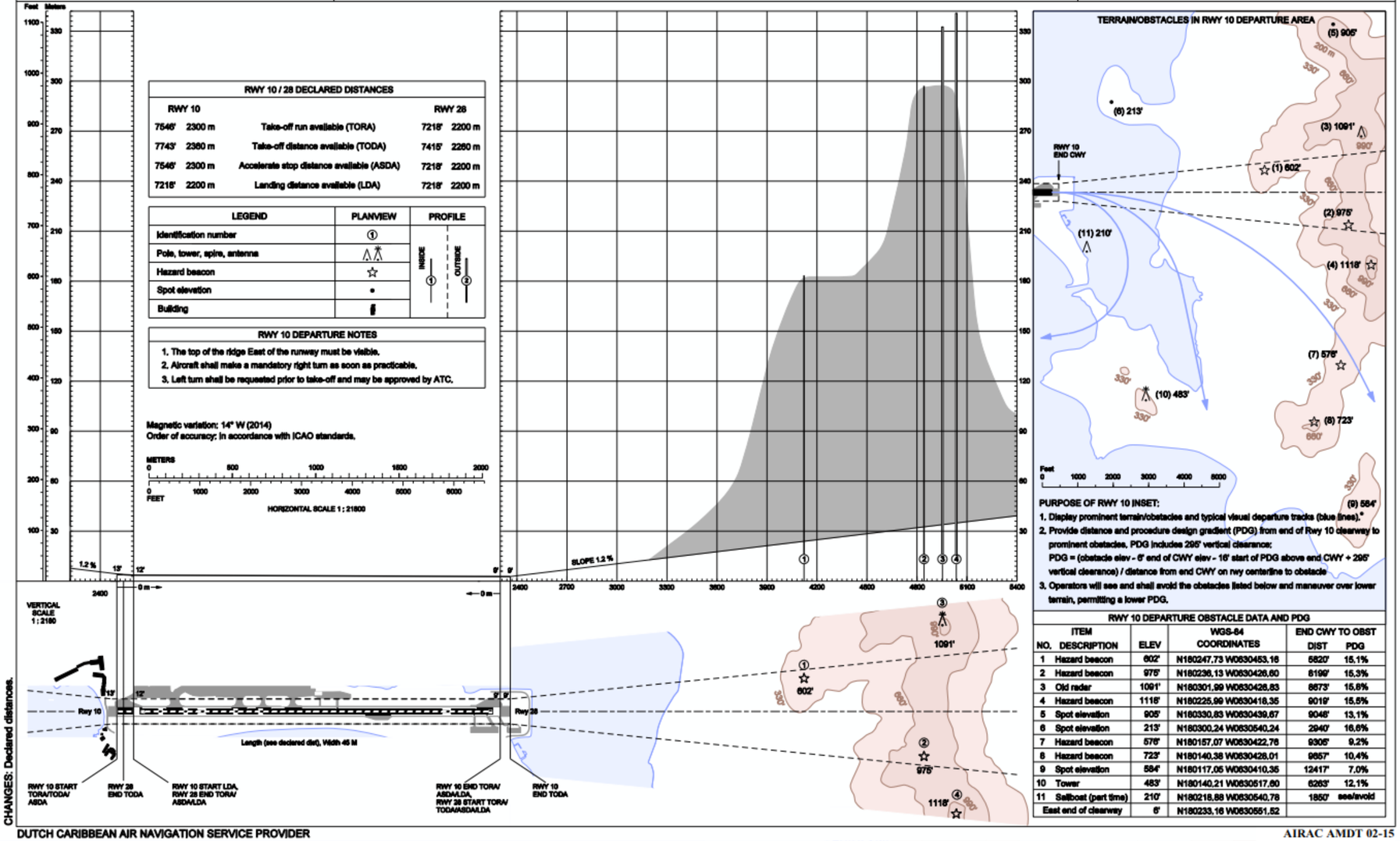


AIP DUTCH CARIBBEAN

DIMENSIONS IN FEET / METERS
ELEVATIONS IN FEET

AERODROME OBSTACLE CHART - ICAO TYPE A (OPERATING LIMITATIONS)

PRINCESS JULIANA INT'L (TNCM)
PHILIPSBURG, NETHERLANDS ANTILLES



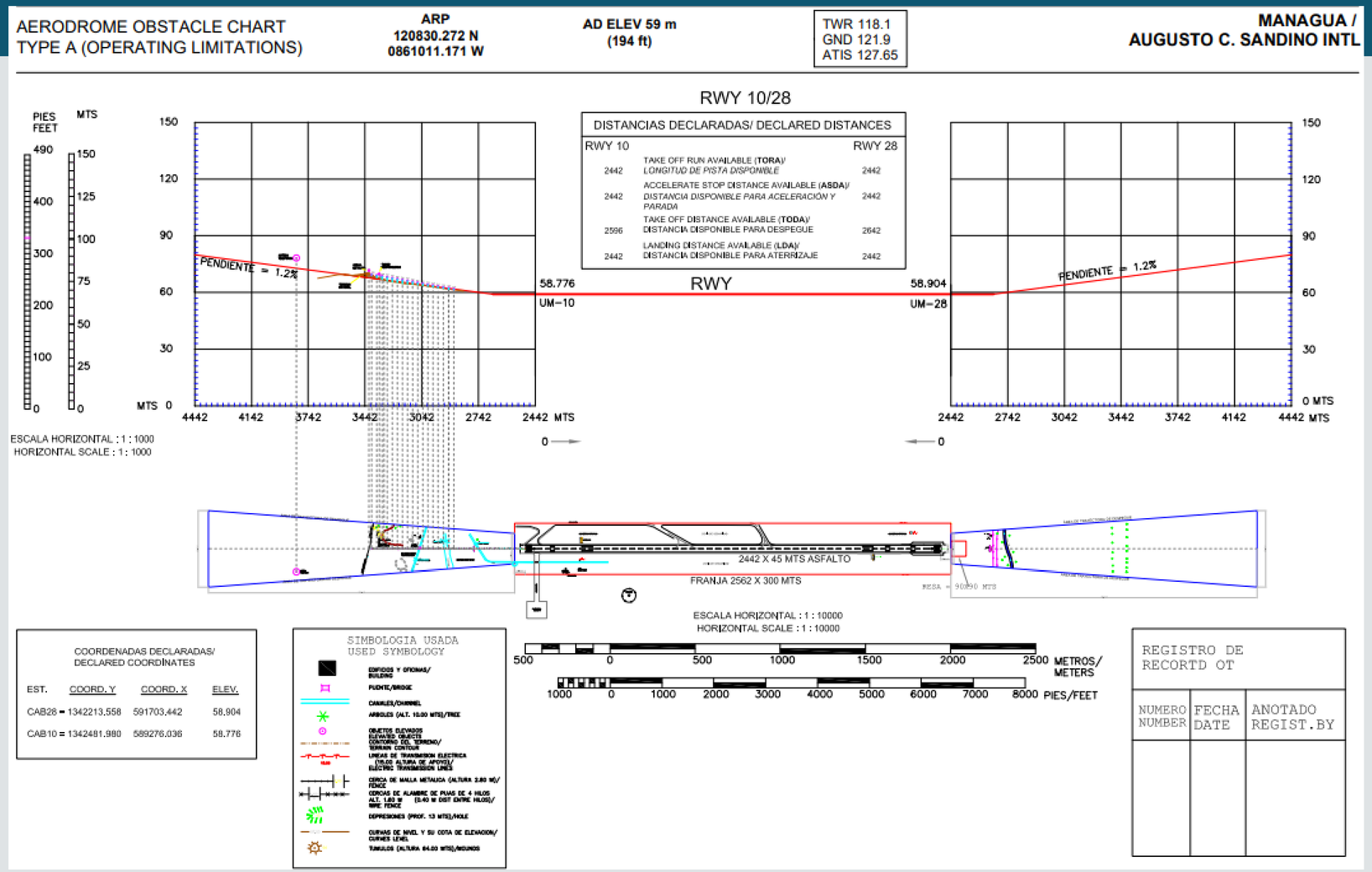
RWY 10 DEPARTURE OBSTACLE DATA AND PDG

ITEM NO.	DESCRIPTION	ELEV	WGS-84 COORDINATES	END CWY TO OBST DIST	PDG
1	Hazard beacon	602'	N180247.73 W0630453.16	5820'	15.1%
2	Hazard beacon	975'	N180236.13 W0630426.60	6199'	15.3%
3	Old radar	1091'	N180301.99 W0630426.83	6673'	15.8%
4	Hazard beacon	1116'	N180225.99 W0630418.35	9019'	15.5%
5	Spot elevation	905'	N180330.83 W0630439.67	9046'	13.1%
6	Spot elevation	213'	N180300.24 W0630540.24	2940'	16.6%
7	Hazard beacon	576'	N180157.07 W0630422.78	9305'	9.2%
8	Hazard beacon	723'	N180140.38 W0630426.01	9857'	10.4%
9	Spot elevation	584'	N180117.05 W0630410.35	12417'	7.0%
10	Tower	483'	N180140.21 W0630517.60	6263'	12.1%
11	Sailboat (part time)	210'	N180218.88 W0630540.78	1850'	see/avoid
	East end of clearway	6'	N180233.16 W0630551.52		

CHANGES: Declared distances.

DUTCH CARIBBEAN AIR NAVIGATION SERVICE PROVIDER

AIRAC AMDT 02-15


AERODROME OBSTACLE CHART
TYPE A (OPERATING LIMITATIONS)
ARP
120830.272 N
0861011.171 W
AD ELEV 59 m
(194 ft)
TWR 118.1
GND 121.9
ATIS 127.65
MANAGUA /
AUGUSTO C. SANDINO INTL
RWY 10/28
DISTANCIAS DECLARADAS/ DECLARED DISTANCES
RWY 10
RWY 28
TAKE OFF RUN AVAILABLE (TORA)/
LONGITUD DE PISTA DISPONIBLE
2442
2442
ACCELERATE STOP DISTANCE AVAILABLE (ASDA)/
DISTANCIA DISPONIBLE PARA ACELERACIÓN Y PARADA
2442
2442
TAKE OFF DISTANCE AVAILABLE (TODA)/
DISTANCIA DISPONIBLE PARA DESPEGUE
2596
2642
LANDING DISTANCE AVAILABLE (LDA)/
DISTANCIA DISPONIBLE PARA ATERRIZAJE
2442
2442
PIES
FEET
MTS
PENDIENTE = 1.2%
58.776
UM-10
RWY
58.904
UM-28
PENDIENTE = 1.2%
4442 4142 3742 3442 3042 2742 2442 MTS
2442 2742 3042 3442 3742 4142 4442 MTS
ESCALA HORIZONTAL : 1 : 1000
HORIZONTAL SCALE : 1 : 1000
2442 X 45 MTS ASFALTO
FRANJA 2562 X 300 MTS
ESCALA HORIZONTAL : 1 : 10000
HORIZONTAL SCALE : 1 : 10000
METROS/
METERS
PIES/FEET
COORDENADAS DECLARADAS/
DECLARED COORDINATES
EST.
COORD. Y
COORD. X
ELEV.
CAB28 = 1342213.558
591703.442
58.904
CAB10 = 1342481.980
589276.036
58.776
SIMBOLOGIA USADA
USED SYMBOLOGY
REGISTRO DE
RECORTD OT
NUMERO
NUMBER
FECHA
DATE
ANOTADO
REGIST.BY

Estándares de Cartografía Aeronáutica

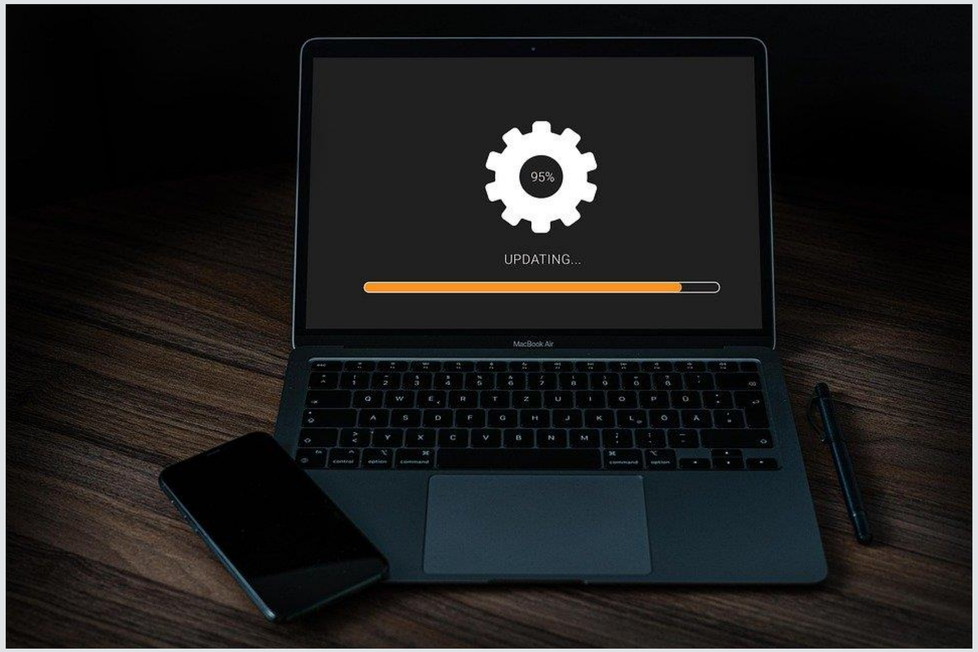
Todas las cartas anteriores mostraban la información requerida en cada una de las cartas, pero diferencias en la presentación con respecto al espécimen OACI son notables.

¿Por qué sucede lo anterior?

Posibles razones para las diferencias

- Las normas y métodos recomendados no están al día y contienen técnicas viejas que no son relevantes con la llegada del dibujo asistido por computadora (CAD) y los sistemas de información geográfica (GIS)
- Falta entrenamiento en los fundamentos de cartografía
  - Proyecciones, Tipografía, teoría del color, técnicas cartográficas
- Falta entrenamiento especifico en cartografía aeronáutica y recurrentes sean probablemente necesarios
- Se requiere mas vigilancia por parte del regulador del Estado

Actualización y Mantenimiento



Especificaciones del producto de datos cartográficos

5.8.1 Se suministrará una amplia exposición de los conjuntos de datos que contiene el plano en forma de especificaciones de datos en las cuales podrán basarse los usuarios de la navegación aérea para evaluar el producto de datos cartográficos y determinar si cumple con los requisitos del uso para el que está destinado (aplicación).

Updates and Maintenance

5.8.6 Las especificaciones del producto de datos cartográficos incluirán una declaración de la recopilación de los datos que será una descripción general de las fuentes y de los procedimientos aplicados para recopilar los datos cartográficos.

Los principios y criterios aplicados para el mantenimiento de la carta también se suministrarán en las especificaciones de los datos cartográficos, *incluso la frecuencia con la que se actualiza el plano.*

De particular importancia será la información sobre el mantenimiento de los conjuntos de datos sobre los obstáculos incluidos en la carta y una indicación de los principios, métodos y criterios aplicados para el mantenimiento de los datos sobre obstáculos.

Anexo 4
Cartas Aeronauticas

Cartas Obligatorias, No obligatorios y Condicionales

Name	Anexo 4	DOC 8697	Clasificación
Plano de Obstaculos de Aerodromo - OACI Tipo A	3	7.3	Obligatorio
Plano de Obstaculos de Aerodromo - OACI Tipo B	4	7.4	No Obligatorio
Plano Topografico y de Obstaculos de Aerodromo - OACI (Electronico)	5	7.5	
Carta Topografica para Aproximaciones de Precision - OACI	6	7.6	Obligatorio
Carta de Navegacion en Ruta - OACI	7	7.7	Obligatorio
Carta de Area - OACI	8	7.8	Condicional
Carta de Salida Normalizada - Vuelo por Instrumentos (SID) - OACI	9	7.9	Condicional
Carta de Llegada Normalizada - Vuelo por Instrumentos (STAR) - OACI	10	7.10	Condicional
Carta de Aproximacion por Instrumentos - OACI	11	7.11	Obligatorio
Carta de Aproximacion Visual - OACI	12	7.12	Condicional
Plano de Aerodromo / Helipuerto - OACI	13	7.13	Obligatorio
Plano de Aerodromo para Moviemitno en Tierra - OACI	14	7.14	No Obligatorio
Plano de Estacionamiento y Atraque de Aeronaves - OACI	15	7.15	No Obligatorio
Carta Aeronautica Mundial - OACI 1:1 000 000	16	7.16	Obligatorio
Carta Aeronautica - OACI 1: 500 000	17	7.17	No Obligatorio
Carta Aeronautica de Navegacion - Escala pequeña	18	7.18	No Obligatorio
Carta de Posicion - OACI	19	7.19	No Obligatorio
Carta Aeronautica Electronica - OACI	20	7.20	
Carta de Altitud Minima de Vigilancia ATC - OACI	21	7.21	

Obligatorias

Name	Anexo 4	DOC 8697	Clasificación
Plano de Obstaculos de Aerodromo - OACI Tipo A	3	7.3	Obligatorio
Carta Topografica para Aproximaciones de Precision - OACI	6	7.6	Obligatorio
Carta de Navegacion en Ruta - OACI	7	7.7	Obligatorio
Carta de Aproximacion por Instrumentos - OACI	11	7.11	Obligatorio
Plano de Aerodromo / Helipuerto - OACI	13	7.13	Obligatorio
Carta Aeronautica Mundial - OACI 1:1 000 000	16	7.16	Obligatorio

AERONAUTICAL CHART MANUAL cf Chapter 7.3

SPECIMEN CHART 1

AERODROME OBSTACLE CHART — ICAO
TYPE A (OPERATING LIMITATIONS)

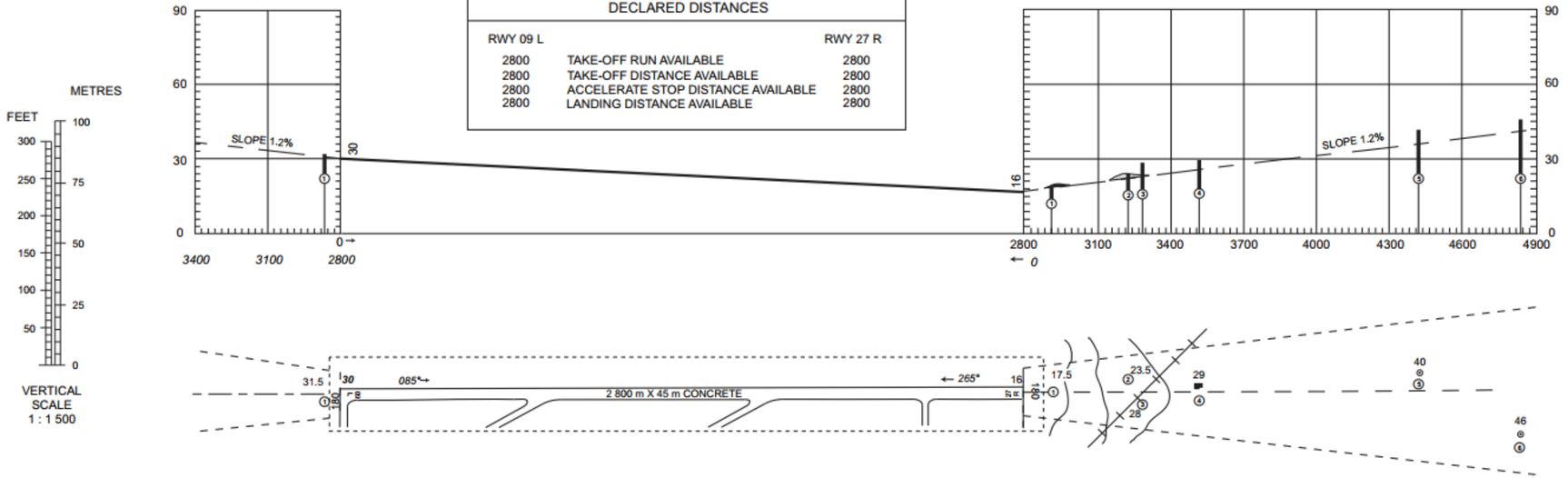
DONLON / International .....
RWY 27R / 09 L

DIMENSIONS AND ELEVATIONS IN METRES

MAGNETIC VARIATION 3° W – JAN 1990

RWY 27 R / 09 L

DECLARED DISTANCES		
RWY 09 L		RWY 27 R
2800	TAKE-OFF RUN AVAILABLE	2800
2800	TAKE-OFF DISTANCE AVAILABLE	2800
2800	ACCELERATE STOP DISTANCE AVAILABLE	2800
2800	LANDING DISTANCE AVAILABLE	2800



LEGEND	
IDENTIFICATION NUMBER	①
POLE, TOWER, SPIRE, ANTENNA, ETC.	⊙
BUILDING OR LARGE STRUCTURE	■
RAILROAD	
TERRAIN CONTOUR	
TERRAIN PENETRATING OBSTACLE PLANE	

HORIZONTAL SCALE 1 : 15 000

METRES 400 300 200 100 0 500 1000 1500 2000 2500

FEET 1000 500 0 1000 2000 3000 4000 5000 6000 7000 8000

ORDER OF ACCURACY
HORIZONTAL 00 m
VERTICAL 00 m

AMENDMENT RECORD		
No.	DATE	ENTERED BY

DATE OF AERONAUTICAL INFORMATION

PRODUCING ORGANIZATION

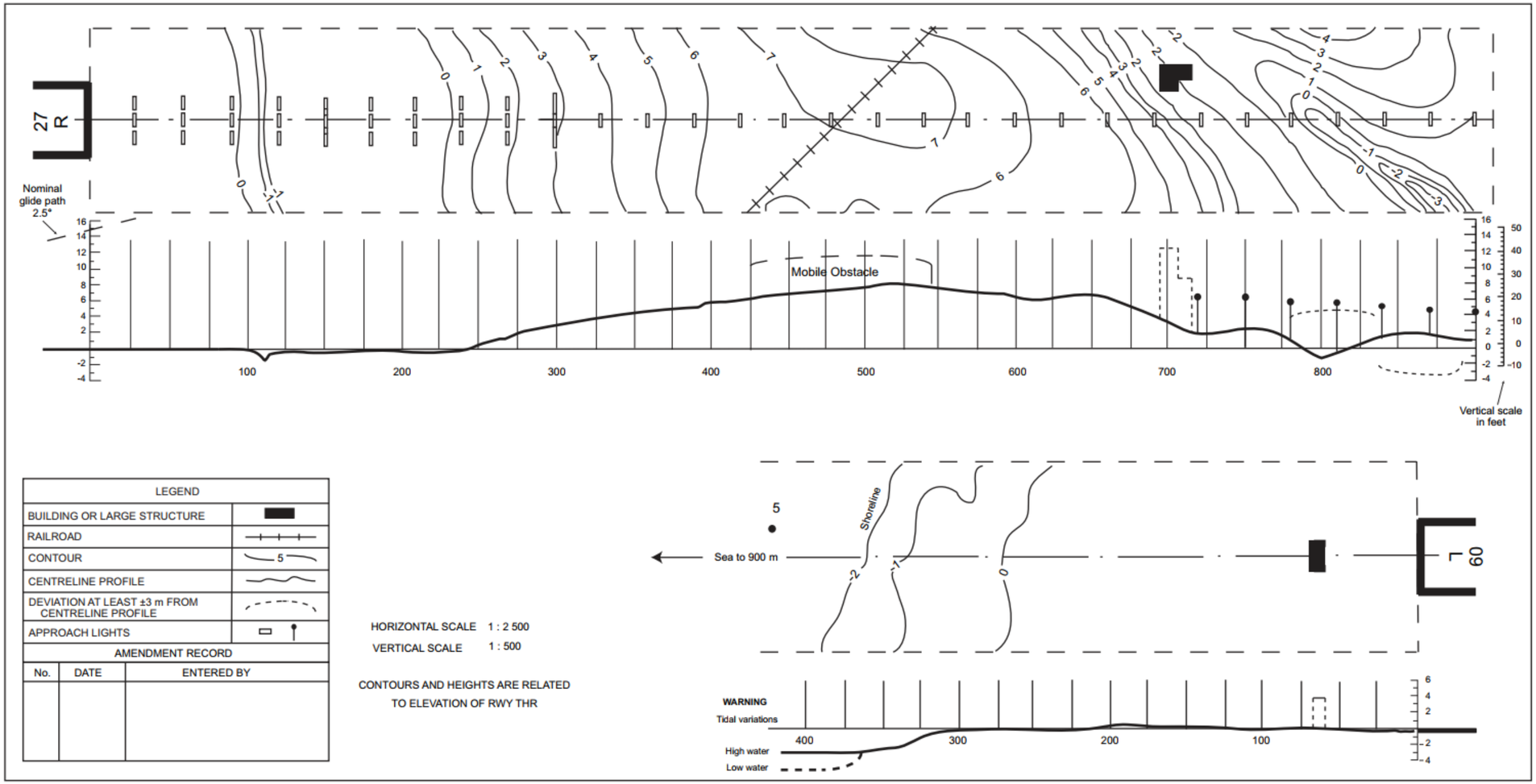
REFERENCE NUMBER
8/2/90

DISTANCES AND HEIGHT IN METRES

PRECISION APPROACH TERRAIN CHART — ICAO

CITY/AERODROME

RWY 27 R/09 L



LEGEND	
BUILDING OR LARGE STRUCTURE	
RAILROAD	
CONTOUR	5
CENTRELINE PROFILE	
DEVIATION AT LEAST ±3 m FROM CENTRELINE PROFILE	
APPROACH LIGHTS	

AMENDMENT RECORD

No.	DATE	ENTERED BY

HORIZONTAL SCALE 1 : 2 500

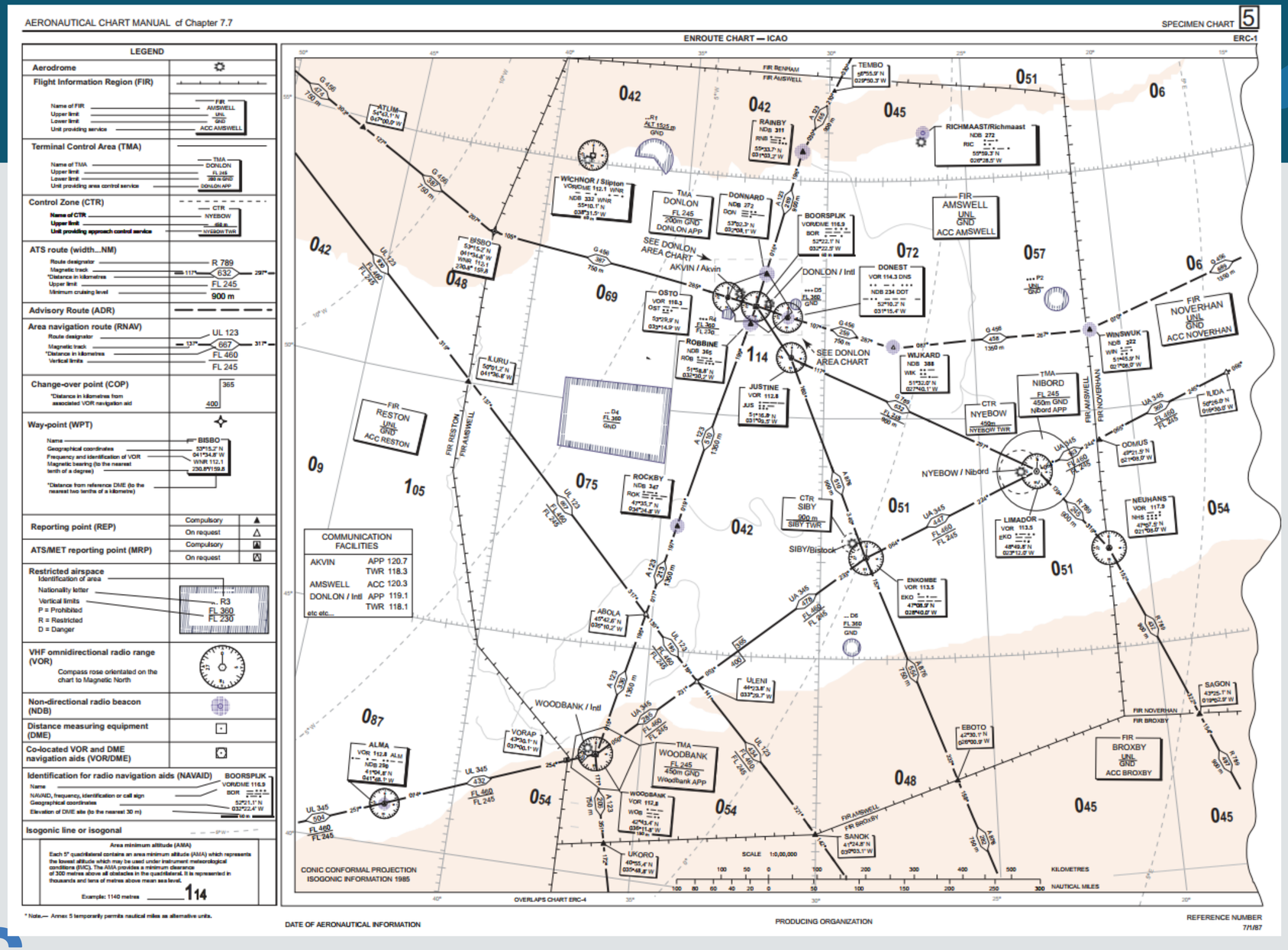
VERTICAL SCALE 1 : 500

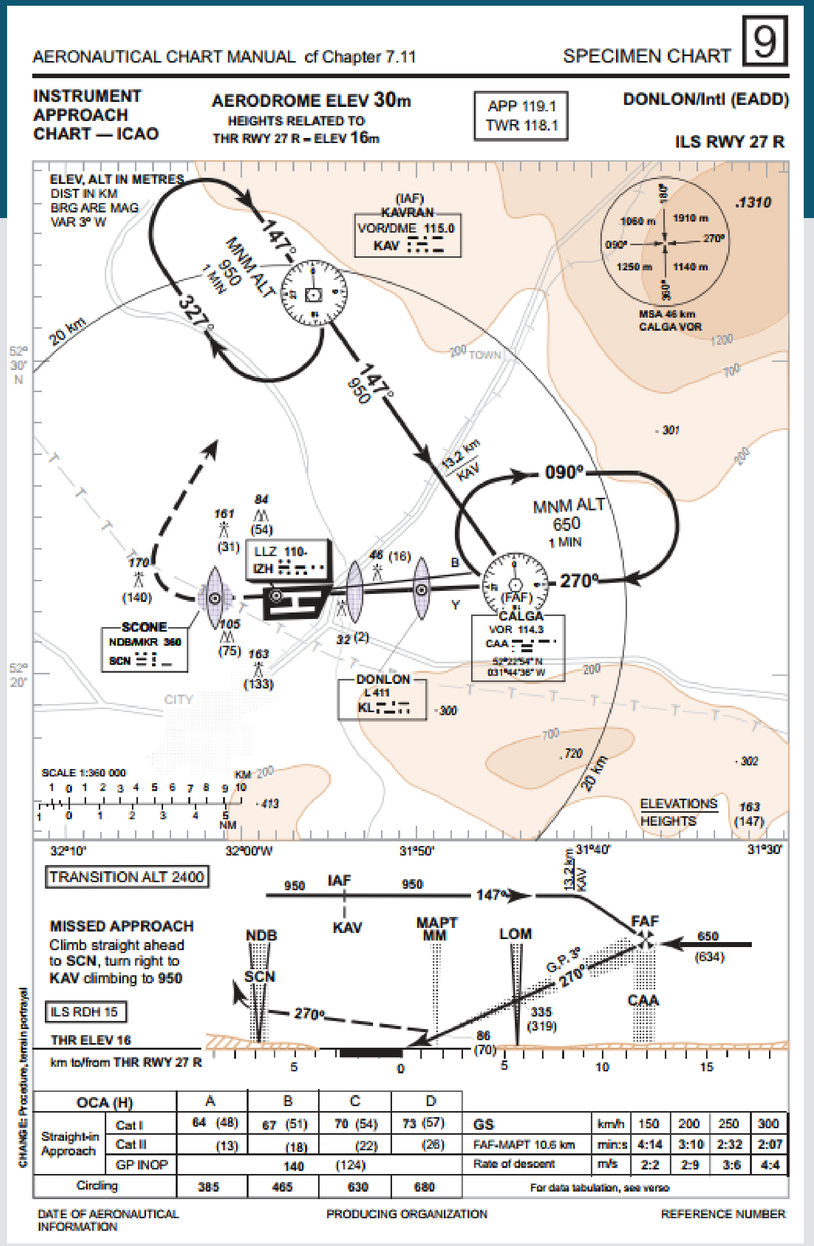
CONTOURS AND HEIGHTS ARE RELATED TO ELEVATION OF RWY THR

DATE OF AERONAUTICAL INFORMATION

PRODUCING ORGANIZATION

REFERENCE NUMBER 7/1/67


ENROUTE CHART — ICAO
ERC-1
LEGEND
Aerodrome
Flight Information Region (FIR)
Terminal Control Area (TMA)
Control Zone (CTR)
ATS route (width...NM)
Advisory Route (ADR)
Area navigation route (RNAV)
Change-over point (COP)
Way-point (WPT)
Reporting point (REP)
ATS/MET reporting point (MRP)
Restricted airspace
VHF omnidirectional radio range (VOR)
Non-directional radio beacon (NDB)
Distance measuring equipment (DME)
Co-located VOR and DME navigation aids (VOR/DME)
Identification for radio navigation aids (NAVAID)
Isogonic line or isogonal
Area minimum altitude (AMA)
COMMUNICATION FACILITIES
AKVIN APP 120.7 TWR 118.3
AMSWELL ACC 120.3
DONLON / Intl APP 119.1 TWR 118.1
etc etc...
FIR AMSWELL UNL GND ACC AMSWELL
TMA DONLON FL 245 200m GND DONLON APP
CTR NYEBOW 450m NYEBOW TWR
FIR RESTON UNL GND ACC RESTON
TMA NIBORD FL 245 450m GND Nibord APP
FIR NOVERHAN UNL GND ACC NOVERHAN
FIR BROXBY UNL GND ACC BROXBY
TMA WOODBANK FL 245 450m GND Woodbank APP
CTR SIBY 900m SIBY TWR
AKVIN / Akvin
DONLON / Intl
NYEBOW / Nibord
SIBY/Bistock
WOODBANK / Intl
SEE DONLON AREA CHART
RICHMAAST/Richmaast
WICHNOR / Slipton
BOORSPIJK
DONNARD
RAINBY
TEMBO
DONEST
WIJKARD
JUSTINE
ROBBINE
ROCKBY
OSTO
BISBO
ILURU
ATLIM
WINSWUK
ILIDA
ODMUS
NEUHANS
LIMADOR
ENKOMBE
EBOTO
SAGON
ULENI
SANOK
UKORO
VORAP
ABOLA
ALMA
CONIC CONFORMAL PROJECTION
ISOGONIC INFORMATION 1985
SCALE 1:0,00,000
KILOMETRES
NAUTICAL MILES
OVERLAPS CHART ERC-4
DATE OF AERONAUTICAL INFORMATION
PRODUCING ORGANIZATION
REFERENCE NUMBER
7/1/87



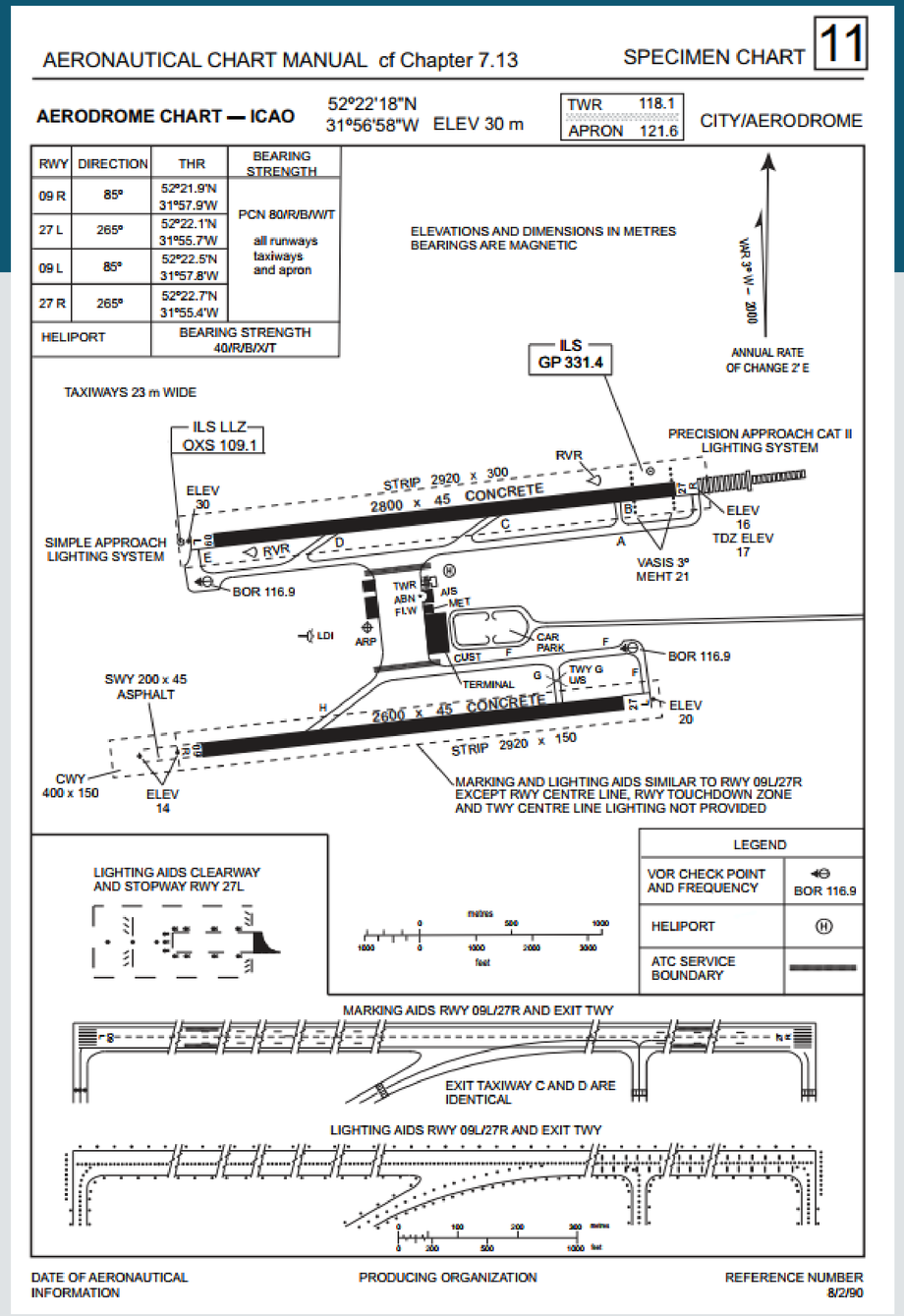
DONLON/Intl (EADD)

ILS RWY 27 R

AERONAUTICAL DATA TABULATION

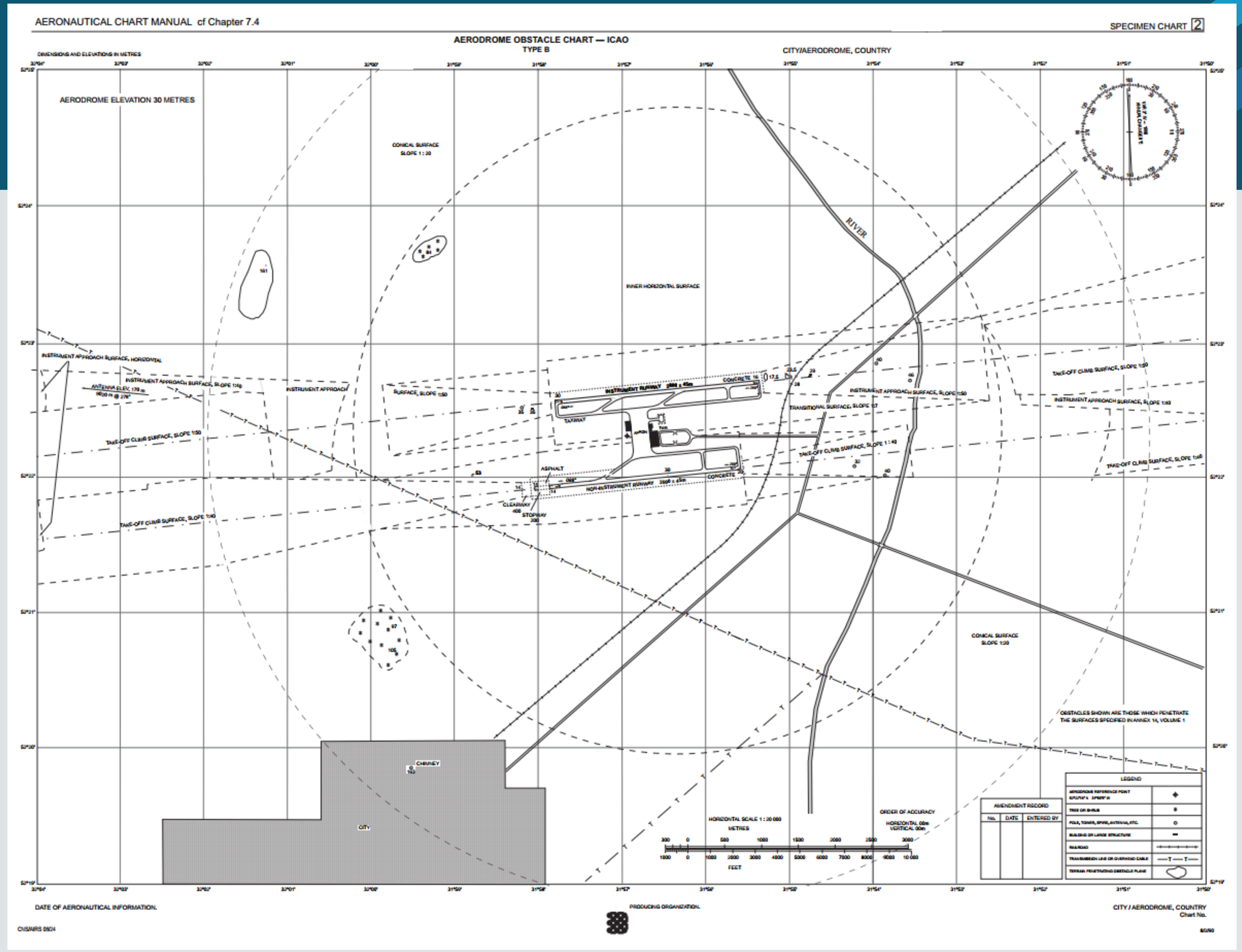
ILS approach to RWY 27R from KAV VOR/DME	
Fix/point	**Coordinates**
KAV VOR/DME (IAF)	52° 32'18.1"N 031°55'12.3"W
13.2 D KAV – BRG 147.05°/13.20 km KAV	52° 26'12.3"N 031°48'55.1"W
CAA VOR (FAF)	52° 22'54.2"N 031°44'36.1"W
KL L	52° 22'49.4"N 031°44'36.8"W
MM (MAPT) – BRG 270.03°/10.61 km CAA	52° 22'41.7"N 031°53'36.4"W
THR RWY 27R	52° 22'38.91"N 031°55'27.29"W
IZH LLZ	52° 22'38.0"N 031°58'00.9"W
SCN NDB/MKR	52° 22'22.4"N 031°01'40.2"W

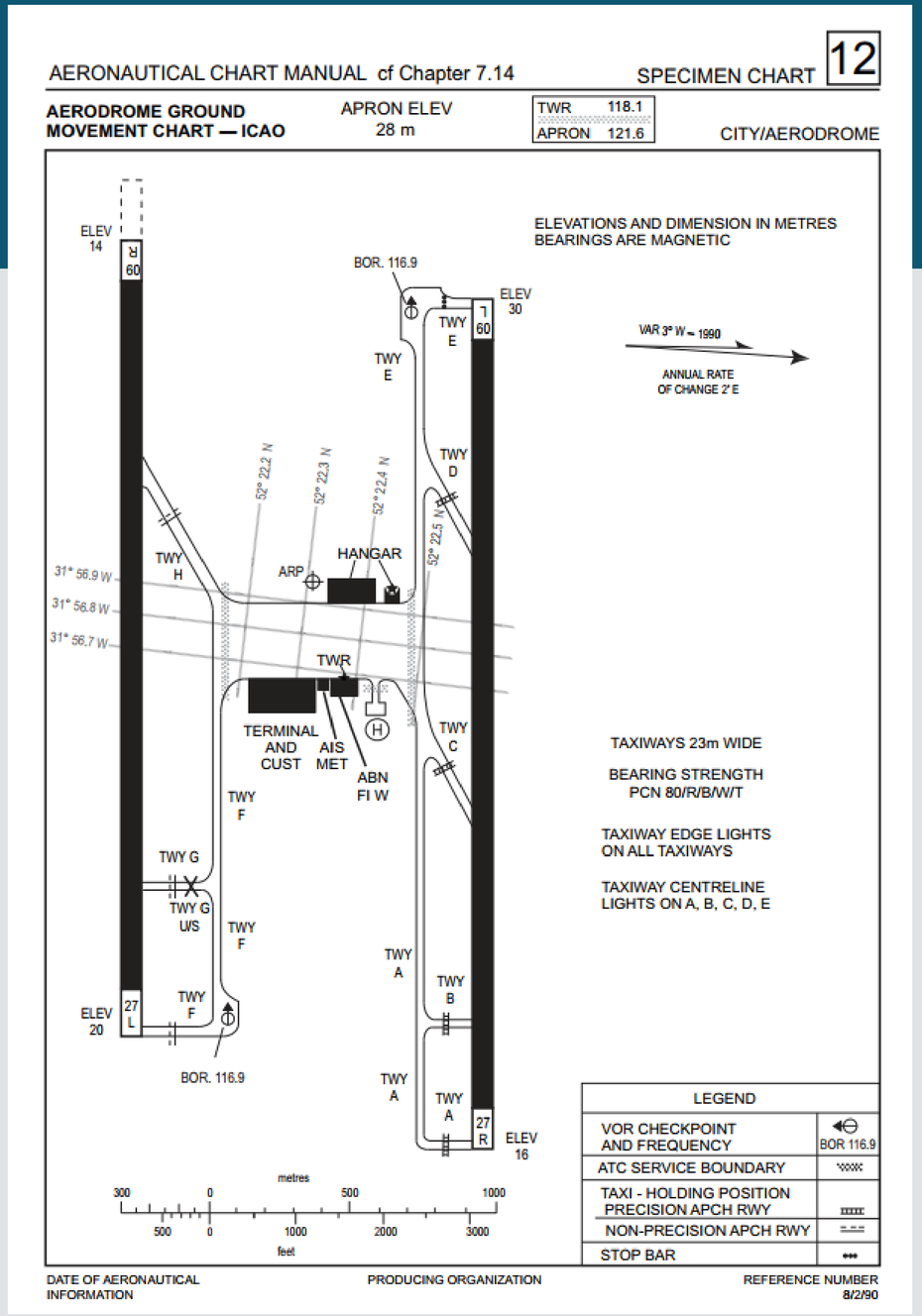
DATE OF AERONAUTICAL INFORMATION | PRODUCING ORGANIZATION | REFERENCE NUMBER


AERONAUTICAL CHART MANUAL cf Chapter 7.13
SPECIMEN CHART 11
AERODROME CHART — ICAO
52°22'18"N
31°56'58"W ELEV 30 m
TWR 118.1
APRON 121.6
CITY/AERODROME
RWY | DIRECTION | THR | BEARING STRENGTH
09 R | 85° | 52°21.9'N 31°57.9'W | PCN 80/R/B/W/T all runways taxiways and apron
27 L | 265° | 52°22.1'N 31°55.7'W
09 L | 85° | 52°22.5'N 31°57.8'W
27 R | 265° | 52°22.7'N 31°55.4'W
HELIPORT | BEARING STRENGTH 40/R/B/X/T
ELEVATIONS AND DIMENSIONS IN METRES
BEARINGS ARE MAGNETIC
VAR 9° W – 2000
ANNUAL RATE OF CHANGE 2' E
ILS GP 331.4
TAXIWAYS 23 m WIDE
ILS LLZ OXS 109.1
PRECISION APPROACH CAT II LIGHTING SYSTEM
RVR
STRIP 2920 x 300
ELEV 30
2800 x 45 CONCRETE
ELEV 16
TDZ ELEV 17
SIMPLE APPROACH LIGHTING SYSTEM
VASIS 3° MEHT 21
BOR 116.9
TWR ABN FLW
AIS
MET
LDI
ARP
CUST
CAR PARK
TERMINAL
TWY G U/S
SWY 200 x 45 ASPHALT
2600 x 45 CONCRETE
STRIP 2920 x 150
CWY 400 x 150
ELEV 14
MARKING AND LIGHTING AIDS SIMILAR TO RWY 09L/27R EXCEPT RWY CENTRE LINE, RWY TOUCHDOWN ZONE AND TWY CENTRE LINE LIGHTING NOT PROVIDED
LEGEND
VOR CHECK POINT AND FREQUENCY
HELIPORT
ATC SERVICE BOUNDARY
LIGHTING AIDS CLEARWAY AND STOPWAY RWY 27L
MARKING AIDS RWY 09L/27R AND EXIT TWY
EXIT TAXIWAY C AND D ARE IDENTICAL
LIGHTING AIDS RWY 09L/27R AND EXIT TWY
DATE OF AERONAUTICAL INFORMATION
PRODUCING ORGANIZATION
REFERENCE NUMBER 8/2/90

No Obligatorias

Name	Anexo 4	DOC 8697	Clasificación
Plano de Obstaculos de Aerodromo - OACI Tipo B	4	7.4	No Obligatorio
Plano de Aerodromo para Moviemitno en Tierra - OACI	14	7.14	No Obligatorio
Plano de Estacionamiento y Atraque de Aeronaves - OACI	15	7.15	No Obligatorio
Carta Aeronautica - OACI 1: 500 000	17	7.17	No Obligatorio
Carta Aeronautica de Navegacion - Escala pequeña	18	7.18	No Obligatorio
Carta de Posicion - OACI	19	7.19	No Obligatorio


AERODROME OBSTACLE CHART — ICAO
TYPE B
CITY/AERODROME, COUNTRY
DIMENSIONS AND ELEVATIONS IN METRES
AERODROME ELEVATION 30 METRES
CONICAL SURFACE SLOPE 1:20
INNER HORIZONTAL SURFACE
RIVER
INSTRUMENT APPROACH SURFACE, HORIZONTAL
INSTRUMENT APPROACH SURFACE, SLOPE 1:40
INSTRUMENT APPROACH
SURFACE, SLOPE 1:50
TAKE-OFF CLIMB SURFACE, SLOPE 1:50
TAKE-OFF CLIMB SURFACE, SLOPE 1:40
INSTRUMENT RUNWAY 2800 x 45m
CONCRETE
TAXIWAY
TRANSITIONAL SURFACE, SLOPE 1:7
INSTRUMENT APPROACH SURFACE, SLOPE 1:50
TAKE-OFF CLIMB SURFACE, SLOPE 1:40
INSTRUMENT APPROACH SURFACE, SLOPE 1:40
TAKE-OFF CLIMB SURFACE, SLOPE 1:50
ASPHALT
NON-INSTRUMENT RUNWAY 2500 x 45m
CONCRETE
CLEARWAY 400
STOPWAY 300
CONICAL SURFACE SLOPE 1:20
OBSTACLES SHOWN ARE THOSE WHICH PENETRATE THE SURFACES SPECIFIED IN ANNEX 14, VOLUME I
CHIMNEY
CITY
HORIZONTAL SCALE 1:20 000
METRES
FEET
ORDER OF ACCURACY
HORIZONTAL 60m
VERTICAL 60m
AMENDMENT RECORD
No. DATE ENTERED BY
LEGEND
AERODROME REFERENCE POINT
TREE OR SHRUB
POLE, TOWER, SPIRE, ANTENNA, ETC.
BUILDING OR LARGE STRUCTURE
RAILROAD
TRANSMISSION LINE OR OVERHEAD CABLE
TERRAIN PENETRATING OBSTACLE PLANE
DATE OF AERONAUTICAL INFORMATION.
PRODUCING ORGANIZATION.
CITY / AERODROME, COUNTRY
Chart No.
CASARS 0924


AERONAUTICAL CHART MANUAL cf Chapter 7.14
SPECIMEN CHART 12
AERODROME GROUND MOVEMENT CHART — ICAO
APRON ELEV 28 m
TWR 118.1
APRON 121.6
CITY/AERODROME
ELEVATIONS AND DIMENSION IN METRES
BEARINGS ARE MAGNETIC
VAR 3° W – 1990
ANNUAL RATE OF CHANGE 2' E
ELEV 14
R 60
BOR. 116.9
ELEV 30
L 60
TWY E
TWY D
TWY H
ARP
HANGAR
TWR
TERMINAL AND CUST
AIS MET
ABN FI W
TWY C
TWY F
TWY G
TWY G U/S
TWY A
TWY B
ELEV 20
27 L
27 R
ELEV 16
52° 22.2 N
52° 22.3 N
52° 22.4 N
52° 22.5 N
31° 56.9 W
31° 56.8 W
31° 56.7 W
TAXIWAYS 23m WIDE
BEARING STRENGTH PCN 80/R/B/W/T
TAXIWAY EDGE LIGHTS ON ALL TAXIWAYS
TAXIWAY CENTRELINE LIGHTS ON A, B, C, D, E
LEGEND
VOR CHECKPOINT AND FREQUENCY
BOR 116.9
ATC SERVICE BOUNDARY
TAXI - HOLDING POSITION PRECISION APCH RWY
NON-PRECISION APCH RWY
STOP BAR
metres
300 0 500 1000
500 0 1000 2000 3000
feet
DATE OF AERONAUTICAL INFORMATION
PRODUCING ORGANIZATION
REFERENCE NUMBER 8/2/90

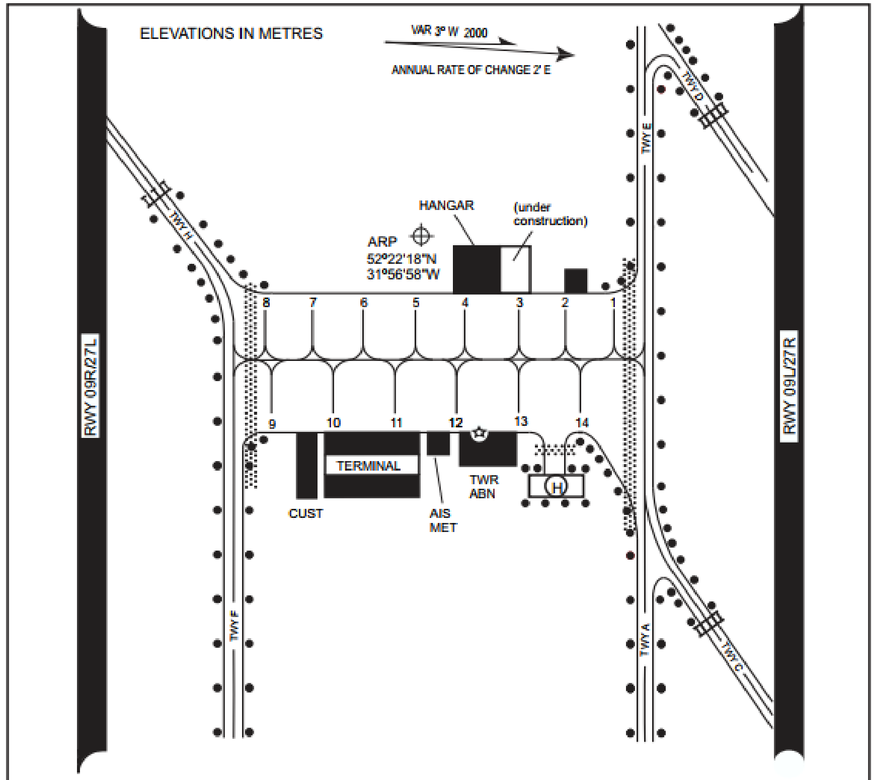
AERONAUTICAL CHART MANUAL cf Chapter 7.15 SPECIMEN CHART 13

AIRCRAFT PARKING/ DOCKING CHART — ICAO

APRON ELEV 28 m

TWR	118.1
APRON	121.6

CITY/AERODROME



LEGEND	
AIRCRAFT STAND	5
TAXIWAY LIGHT	•
ATC SERVICE BOUNDARY	
TAXI - HOLDING POSITION PRECISION APCH RWY	
NON - PRECISION APCH RWY	

metres
100 0 100 200 300 400 500
200 0 400 800 1200 1600
feet

TAXIWAYS 23 m WIDE

TAXIWAYS AND APPROACH BEARING STRENGTH PCN 80/R/B/W/T

AIRCRAFT STANDS 1 AND 8 NOT FOR B747

AIRCRAFT STANDS 10 TO 13 AGNIS EQUIPPED

INS COORDINATES FOR AIRCRAFT STANDS			
1	52°22.5'N 031°56.9'W	8	52°22.2'N 031°56.9'W
2,3	52°22.4'N 031°56.9'W	9,10	52°22.2'N 031°56.7'W
4,5	52°22.3'N 031°56.9'W	11,12	52°22.3'N 031°56.7'W
6,7	52°22.2'N 031°56.9'W	13,14	52°22.4'N 031°56.7'W

DATE OF AERONAUTICAL INFORMATION | PRODUCING ORGANIZATION | REFERENCE NUMBER 8/2/90

Condicionales

Name	Anexo 4	DOC 8697	Clasificación
Carta de Area - OACI	8	7.8	Condicional
Carta de Salida Normalizada - Vuelo por Instrumentos (SID) - OACI	9	7.9	Condicional
Carta de Llegada Normalizada - Vuelo por Instrumentos (STAR) - OACI	10	7.10	Condicional
Carta de Aproximacion Visual - OACI	12	7.12	Condicional

AREA CHART — ICAO

TMA DONLON

LEGEND		
CONTROL AREA	(TMA) (AWY)	
ADVISORY ROUTE	(ADR)	
CONTROL ZONE	(CTR)	
REPORTING POINT	(Compulsory)	▲
DEPARTURE/ARRIVAL ROUTING		DON 2A
DISTANCE IN KILOMETRES		57
MINIMUM FLIGHT ALTITUDE		1 500 m
MAGNETIC BEARING		340°
RADIO NAVIGATION AID	NAME	BOORSPIJK
	NAVAID TYPE AND FREQUENCY	VOR/DME 116.9
	IDENTIFICATION	BOR
	COORDINATES	52°22'06" N 032°22'30" W
	ELEVATION OF DME ANTENNA	60 m

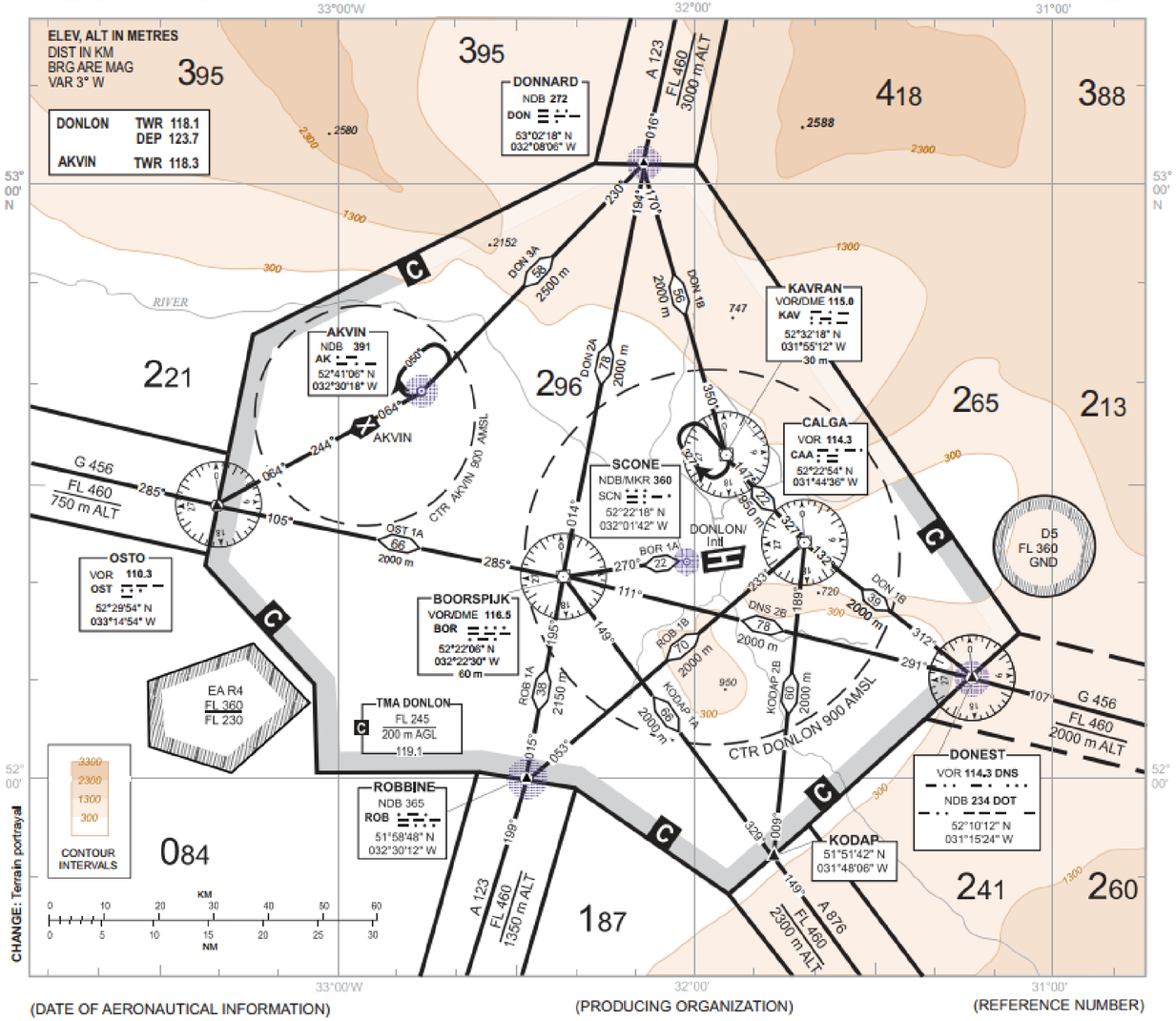
Area minimum altitude (AMA)

Each 1° 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 300 metres (600 m in mountainous areas) above all obstacles in the quadrilateral. It is represented in thousands and tens of metres above mean sea level.

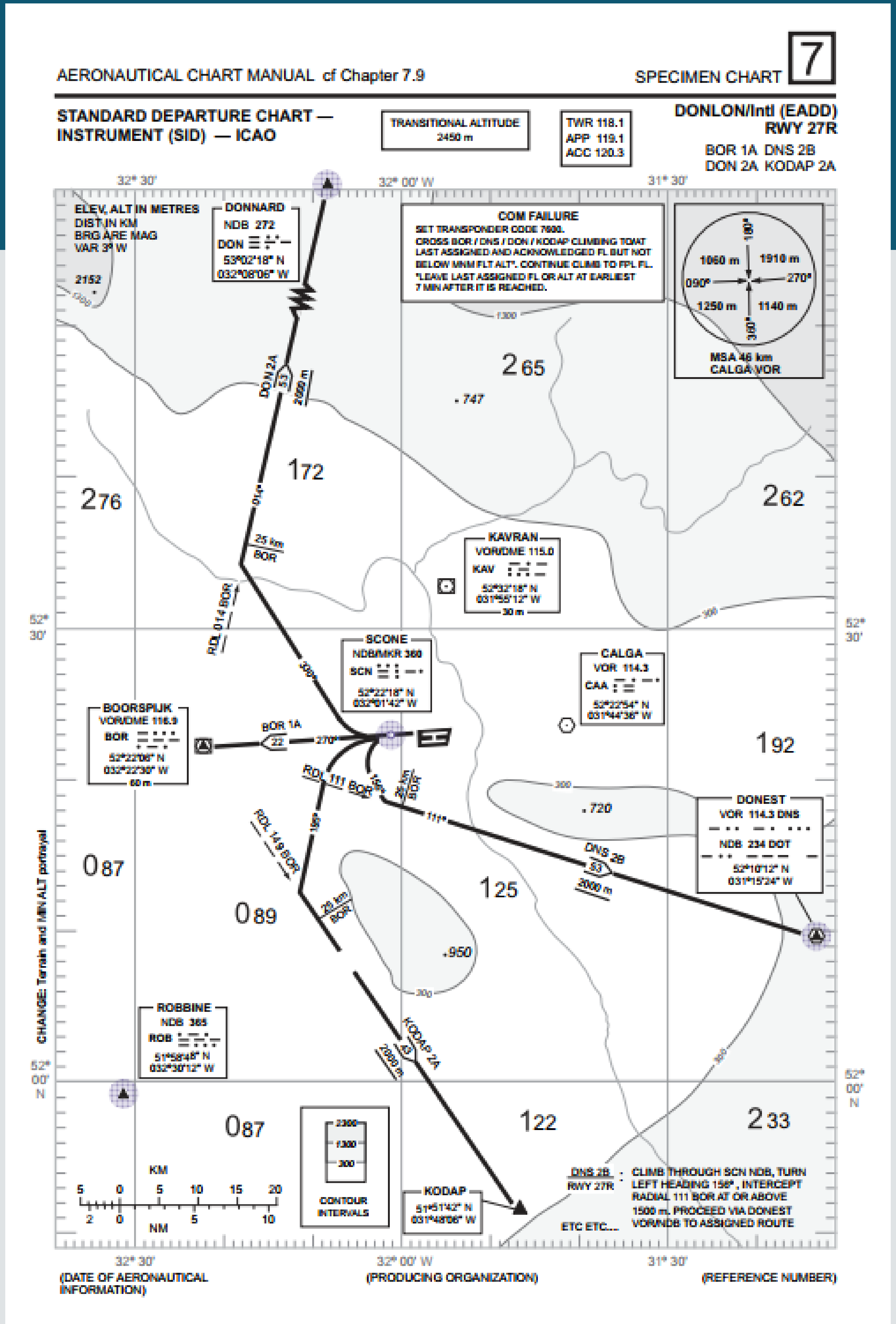
Example: 1140 metres 114

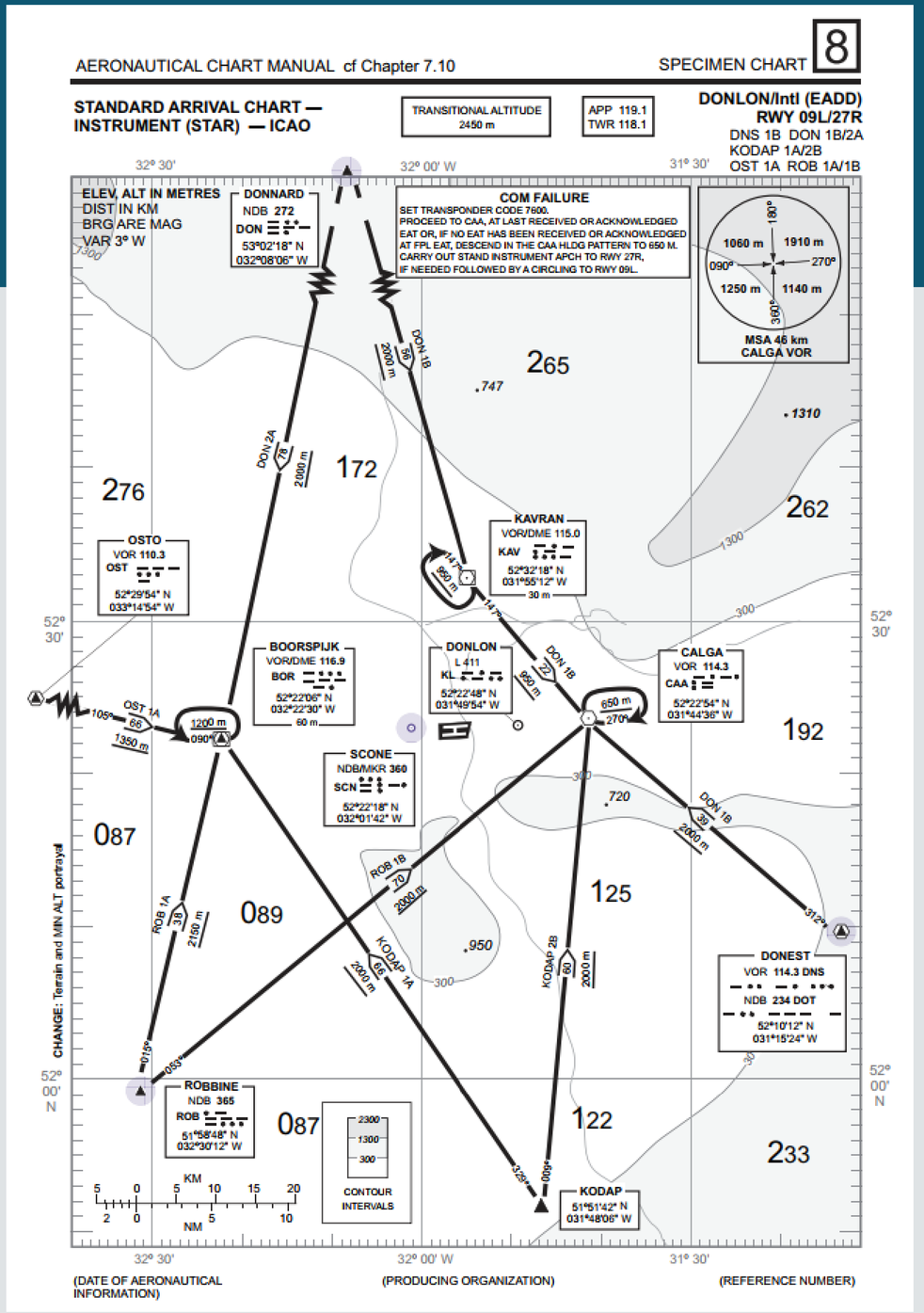
COM FAILURE

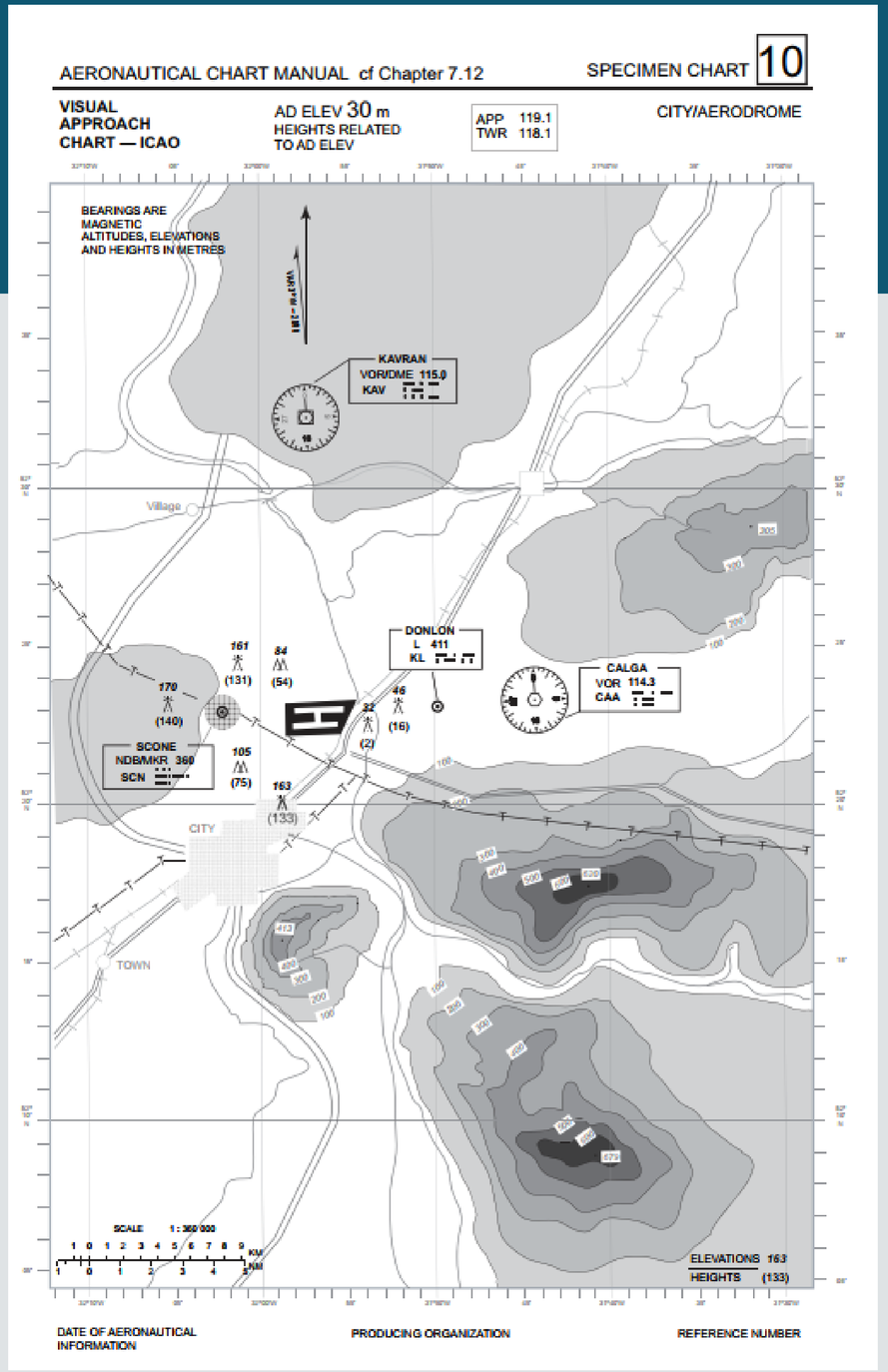
Set transponder code 7600
Maintain last assigned speed and LVL, or MNM FLT ALT, if higher for 7 MIN following time of:
a) reaching last assigned LVL or MNM FLT ALT; or
b) setting transponder code 7600; or
c) failure to REP over compulsory REP; whichever is later.
Thereafter adjust LVL and speed according to FPL.



(DATE OF AERONAUTICAL INFORMATION) (PRODUCING ORGANIZATION) (REFERENCE NUMBER)


AERONAUTICAL CHART MANUAL cf Chapter 7.9
SPECIMEN CHART
7
STANDARD DEPARTURE CHART — INSTRUMENT (SID) — ICAO
TRANSITIONAL ALTITUDE 2450 m
TWR 118.1
APP 119.1
ACC 120.3
DONLON/Intl (EADD)
RWY 27R
BOR 1A DNS 2B
DON 2A KODAP 2A
ELEV, ALT IN METRES
DIST IN KM
BRG ARE MAG
VAR 3° W
DONNARD
NDB 272
DON
53°02'18" N
032°08'06" W
COM FAILURE
MSA 46 km
CALGA VOR
KAVRAN
VOR/DME 115.0
KAV
SCONE
NDB/MKR 360
SCN
52°22'18" N
032°01'42" W
CALGA
VOR 114.3
CAA
BOORSPIJK
VOR/DME 116.9
BOR
52°22'06" N
032°22'30" W
BOR 1A
DONEST
VOR 114.3 DNS
NDB 234 DOT
52°10'12" N
031°15'24" W
DNS 2B
ROBBINE
NDB 365
ROB
KODAP 2A
KODAP
CONTOUR INTERVALS
KM
NM
DNS 2B RWY 27R : CLIMB THROUGH SCN NDB, TURN LEFT HEADING 156°, INTERCEPT RADIAL 111 BOR AT OR ABOVE 1500 m. PROCEED VIA DONEST VOR/NDB TO ASSIGNED ROUTE
ETC ETC...
CHANGE: Terrain and MIN ALT portrayal
(DATE OF AERONAUTICAL INFORMATION)
(PRODUCING ORGANIZATION)
(REFERENCE NUMBER)


STANDARD ARRIVAL CHART — INSTRUMENT (STAR) — ICAO
TRANSITIONAL ALTITUDE 2450 m
APP 119.1
TWR 118.1
DONLON/Intl (EADD)
RWY 09L/27R
DNS 1B DON 1B/2A
KODAP 1A/2B
OST 1A ROB 1A/1B
ELEV, ALT IN METRES
DIST IN KM
BRG ARE MAG
VAR 3° W
DONNARD
NDB 272
DON
53°02'18" N
032°08'06" W
COM FAILURE
SET TRANSPONDER CODE 7600.
PROCEED TO CAA, AT LAST RECEIVED OR ACKNOWLEDGED EAT OR, IF NO EAT HAS BEEN RECEIVED OR ACKNOWLEDGED AT FPL EAT, DESCEND IN THE CAA HLDG PATTERN TO 650 M. CARRY OUT STAND INSTRUMENT APCH TO RWY 27R, IF NEEDED FOLLOWED BY A CIRCLING TO RWY 09L.
1060 m
1910 m
1250 m
1140 m
MSA 46 km
CALGA VOR
OSTO
VOR 110.3
OST
52°29'54" N
033°14'54" W
KAVRAN
VOR/DME 115.0
KAV
52°32'18" N
031°55'12" W
30 m
BOORSPIJK
VOR/DME 116.9
BOR
52°22'06" N
032°22'30" W
60 m
DONLON
L 411
KL
52°22'48" N
031°49'54" W
CALGA
VOR 114.3
CAA
52°22'54" N
031°44'36" W
SCONE
NDB/MKR 360
SCN
52°22'18" N
032°01'42" W
DONEST
VOR 114.3 DNS
NDB 234 DOT
52°10'12" N
031°15'24" W
ROBBINE
NDB 365
ROB
51°58'48" N
032°30'12" W
KODAP
51°51'42" N
031°48'06" W
265
276
172
262
192
087
089
125
087
122
233
CONTOUR INTERVALS
CHANGE: Terrain and MIN ALT portrayal
32° 30'
32° 00' W
31° 30'
52° 30'
52° 00' N
(DATE OF AERONAUTICAL INFORMATION)
(PRODUCING ORGANIZATION)
(REFERENCE NUMBER)

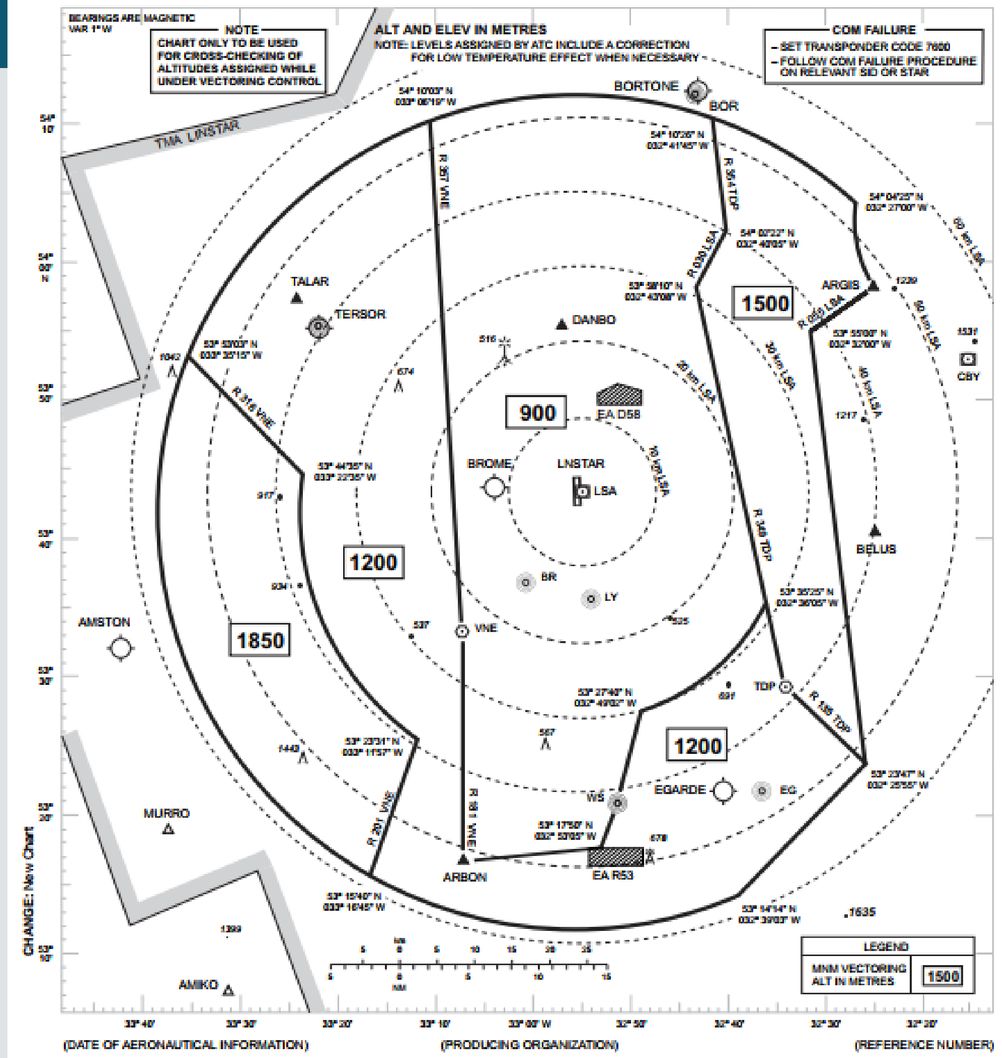

AERONAUTICAL CHART MANUAL cf Chapter 7.12
SPECIMEN CHART 10
VISUAL APPROACH CHART — ICAO
AD ELEV 30 m
HEIGHTS RELATED TO AD ELEV
APP 119.1
TWR 118.1
CITY/AERODROME
BEARINGS ARE MAGNETIC
ALTITUDES, ELEVATIONS AND HEIGHTS IN METRES
KAVRAN
VOR/DME 115.0
KAV
DONLON
L 411
KL
CALGA
VOR 114.3
CAA
SCONE
NDB/MKR 360
SCN
Village
CITY
TOWN
161 (131)
84 (54)
170 (140)
46 (16)
32 (2)
105 (75)
163 (133)
SCALE 1 : 360 000
ELEVATIONS 163
HEIGHTS (133)
DATE OF AERONAUTICAL INFORMATION
PRODUCING ORGANIZATION
REFERENCE NUMBER

Sin Clasificar

Name	Anexo 4	DOC 8697	Clasificación
Plano Topografico y de Obstaculos de Aerodromo - OACI (Electronico)	5	7.5	
Carta Aeronautica Electronica - OACI	20	7.20	
Carta de Altitud Minima de Vigilancia ATC - OACI	21	7.21	

AERONAUTICAL CHART MANUAL cf Chapter 7.21 SPECIMEN CHART 14

ATC SURVEILLANCE MINIMUM ALTITUDE CHART — ICAO | **AERODROME ELEV 250 m** **TRANSITION ALT 2150 m** | APP 119.8 | **LINSTAR/Intl (EADL)**



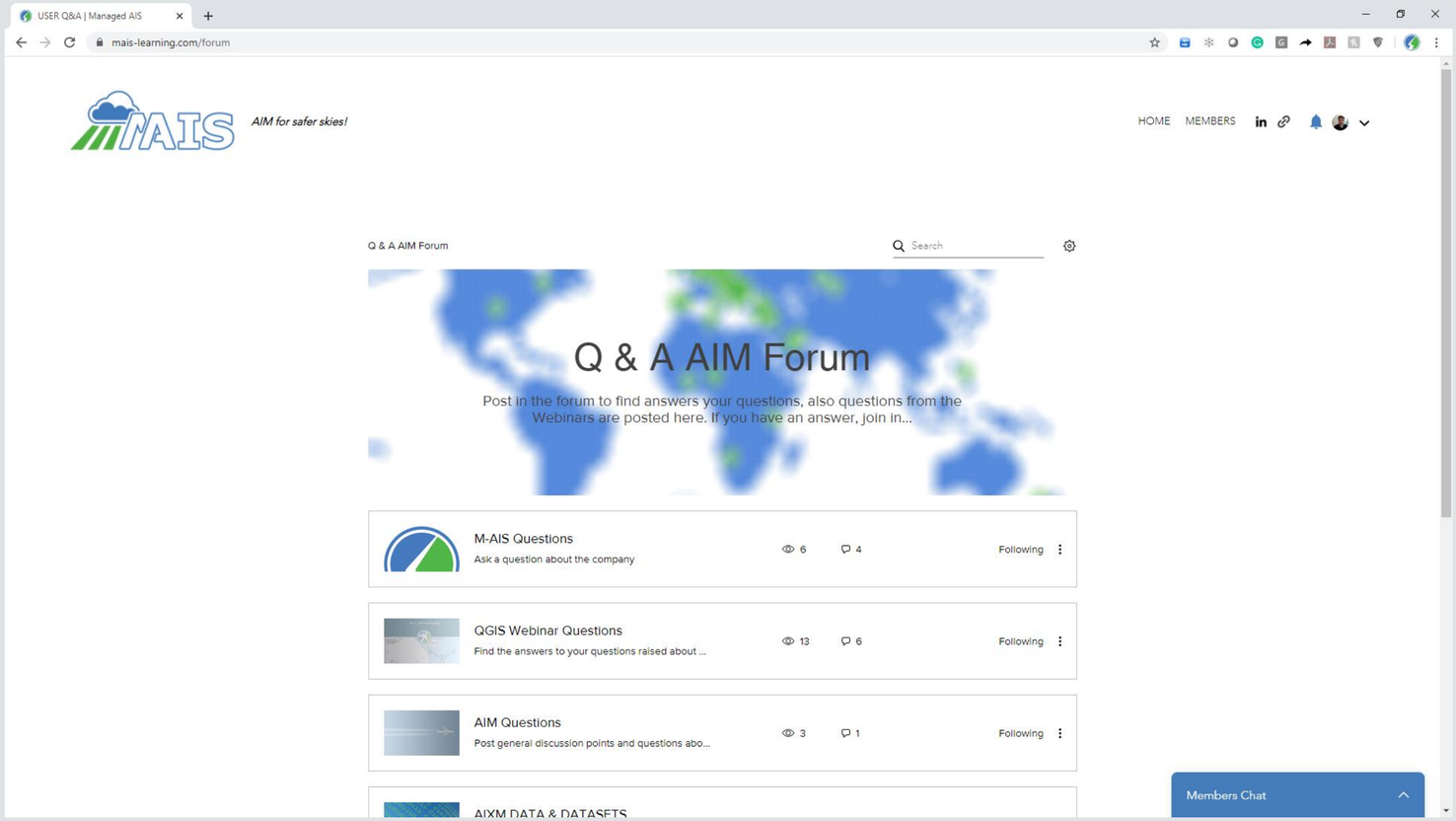
Conclusiones

Conclusiones

¿Qué podemos hacer?

- Estandarizar
- Actualizar y dar mantenimiento a las cartas
- Capacitación

Recursos Adicionales Foro de Preguntas y Respuestas



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