

Flight Maps and Charts

All Flights

**Mission Operations Directorate
Operations Division**

**Generic, Rev F
September 25, 2003**

NOTE

For STS-114 and subsequent flights

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



United Space Alliance

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MISSION OPERATIONS DIRECTORATE

FLIGHT MAPS AND CHARTS

GENERIC, REVISION F
September 25, 2003

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NOTES

The Maps and Charts document contains the following six items that are flown separately:

- Mercator and polar projection Star Charts (section 1)
- Mercator projection Earth Map with Earth observation areas and orbit overlay (section 2)
- Landing Site Videotape (section 2)
- Earth Observations Manual (section 2)
- World Atlas (section 2)
- Landing Site Charts (sections 3 and 4)

Page numbers assigned to sections 1 and 2 are for the convenience of ground users and do not appear in flight configuration.

The crew Landing Site Charts (sections 3 and 4) are organized as follows:

- General Information – Summary, Chart Legend, and World Map showing all sites
- Detailed Site Information – Runway and instrumentation data, area topographical map, aim point drawing, and aerial photo if available
- Postlanding Information

Originals for most maps and charts in this book were provided by the National Imagery and Mapping Agency (formerly Defense Mapping Agency).

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FLIGHT MAPS AND CHARTS

LIST OF EFFECTIVE PAGES

GENERIC 08/24/88
REV F 09/25/03

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ii.....*	ALL/GEN F	AML-A.....	ALL/GEN F
iii.....*	ALL/GEN F	AML-B.....	ALL/GEN F
iv.....*	ALL/GEN F	AML-C.....	ALL/GEN F
v.....*	ALL/GEN F	AML-D.....	ALL/GEN F
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ACY-6.....	ALL/GEN F	DOV-3.....Δ	ALL/GEN F
ACY-7.....	ALL/GEN F	DOV-4.....Δ	ALL/GEN F
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AML-2.....	ALL/GEN F	EDF-1.....	ALL/GEN F
AML-3.....	ALL/GEN F	EDF-2.....	ALL/GEN F

* – Omit from flight book

Δ – High inclination only

EDF-3.....	ALL/GEN F	GUA-2.....	ALL/GEN F
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FOK-4.....	ALL/GEN F	KBO-3.....Δ	ALL/GEN F
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GSA-4.....Δ	ALL/GEN F	KKI-1.....	ALL/GEN F
GUA-1.....	ALL/GEN F	KKI-2.....	ALL/GEN F

Δ – High inclination only

KKI-3	ALL/GEN F	NKT-B	Δ ALL/GEN F
KKI-4	ALL/GEN F	NKT-C	Δ ALL/GEN F
KSC-1	ALL/GEN F	NKT-D	Δ ALL/GEN F
KSC-2	ALL/GEN F	NOR-1	ALL/GEN F
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KSC-A	ALL/GEN F	NOR-4	ALL/GEN F
KSC-B	ALL/GEN F	NOR-5	ALL/GEN F
KSC-C	ALL/GEN F	NOR-6	ALL/GEN F
KSC-D	ALL/GEN F	NTU-1	Δ ALL/GEN F
LAJ-1	Δ ALL/GEN F	NTU-2	Δ ALL/GEN F
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LAJ-3	Δ ALL/GEN F	NTU-4	Δ ALL/GEN F
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MRN-C	ALL/GEN F	PTN-2	ALL/GEN F
MRN-D	ALL/GEN F	RCA-1	Δ ALL/GEN F
MUO-1	Δ ALL/GEN F	RCA-2	Δ ALL/GEN F
MUO-2	Δ ALL/GEN F	RCA-3	Δ ALL/GEN F
MUO-3	Δ ALL/GEN F	RCA-4	Δ ALL/GEN F
MUO-4	Δ ALL/GEN F	RCA-A	Δ ALL/GEN F
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NKT-3	Δ ALL/GEN F	WAL-6	ALL/GEN F
NKT-4	Δ ALL/GEN F	YHZ-1	ALL/GEN F
NKT-5	Δ ALL/GEN F	YHZ-2	ALL/GEN F
NKT-6	Δ ALL/GEN F	YHZ-3	ALL/GEN F
NKT-A	Δ ALL/GEN F	YHZ-4	ALL/GEN F

Δ – High inclination only

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YJT-2Δ	ALL/GEN F
YJT-3Δ	ALL/GEN F
YJT-4Δ	ALL/GEN F
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YNN-4	ALL/GEN F
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YQX-4Δ	ALL/GEN F
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YYT-BΔ	ALL/GEN F
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ZZA-BΔ	ALL/GEN F
ZZA-CΔ	ALL/GEN F
ZZA-DΔ	ALL/GEN F
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ZZA-FΔ	ALL/GEN F
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4-2	ALL/GEN F
4-3	ALL/GEN F
4-4	ALL/GEN F
4-5	ALL/GEN F
4-6	ALL/GEN F
4-7	ALL/GEN F
4-8	ALL/GEN F
4-9‡	ALL/GEN F
4-10‡	ALL/GEN F
Entry C/L pg†‡	
Entry C/L pg†‡	

Δ – High inclination only

‡ – Flight book only

† – Landing Site Data Chart from Entry C/L

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Tamanrasset, Algeria	<input type="checkbox"/> AAT-1
Atlantic City International, Atlantic City, New Jersey	ACY-1
Hoedspruit AFS, South Africa	AHS-1
Amberley, Australia	<input type="checkbox"/> AMB-1
Amilcar Cabral International, Republic of Cape Verde	AML-1
Bermuda International, St. David's Island, Bermuda	BDA-1
Beja, Portugal	BEJ-1
Ben Guerir, Morocco	BEN-1
Banjul International, Gambia	BYD-1
Dover AFB, Delaware	<input type="checkbox"/> DOV-1
Dyess AFB, Texas	DYS-1
Elmendorf AFB, Anchorage, Alaska	EDF-1
Edwards AFB, California	EDW-1
Mataverí International, Easter Island (Chile)	EIP-1
Esenboga, Turkey	<input type="checkbox"/> ESN-1
Fairford RAF, England	<input type="checkbox"/> FFA-1
Otis ANGB, Massachusetts	<input type="checkbox"/> FMH-1
Le Tube, Istres, France	FMI-1
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Las Palmas, Grand Canary Isle (Spain)	GDV-1
Souda, Crete (Greece)	<input type="checkbox"/> GSA-1
Andersen AFB, Guam	GUA-1
HAO Atoll, Tuamotu, French Polynesia	HAO-1
Ascension Aux AF, Ascension Island	HAW-1
Honolulu International, Hawaii	HNL-1
Wilmington International, Wilmington, North Carolina	ILM-1
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Köln/Bonn, Germany	<input type="checkbox"/> KBO-1
Kinshasa/N'Djili International, Zaire	KIN-1
King Khalid International, Riyadh, Saudi Arabia	KKI-1
Kennedy Space Center, Florida	KSC-1
Lajes AB, Azores	<input type="checkbox"/> LAJ-1
Lincoln Municipal, Nebraska	<input type="checkbox"/> LNK-1
Monrovia/Roberts International, Liberia	LRB-1
Orlando International, Florida	MCO-1
Moron AB, Spain	MRN-1
Mountain Home AFB, Idaho	<input type="checkbox"/> MUO-1

– High inclination site

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White Sands Space Harbor, New Mexico.....	NOR-1
Oceana NAS, Virginia.....	<input type="checkbox"/> NTU-1
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Ellsworth AFB, South Dakota	<input type="checkbox"/> RCA-1
Wake Island AAF, Wake Island	WAK-1
Wallops Flight Facility, Wallops Island, Virginia.....	WAL-1
Halifax International, Halifax, Nova Scotia, Canada	YHZ-1
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Nassau International, New Providence Island, Bahamas.....	YNN-1
Gander International, Newfoundland, Canada	<input type="checkbox"/> YQX-1
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St. John's International, Newfoundland, Canada.....	<input type="checkbox"/> YYT-1
Zaragoza AB, Spain	<input type="checkbox"/> ZZA-1

POSTLANDING PROCEDURES FOR EMERGENCY

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* – Previous name was Moses Lake

– High inclination site

STAR CHARTS

- 1.1 The flight version of Star Charts is fabricated with polar projections (page 1-4) on the back of the rectangular projection (page 1-3). Flight charts are produced with white overprint on a black background. A photograph of Star Charts in flight configuration is shown on page 1-2.
- 1.2 The rectangular chart is a Mean of 1950 (M50) mercator projection with coverage extending from the equator to 65° north and 70° south declination. Each polar projection covers the entire hemisphere. Both right ascension and declination are expressed in degrees. The charts depict 1466 stars, ranging in magnitude from -1 to +4. The first 50 nav stars are circled, named, and numbered, and the second 50 nav stars are circled and numbered. The ecliptic plane is indicated on the charts, as are the Milky Way and the large and small Magellanic clouds.
- 1.3 The baseline rectangular Star Chart is annotated for each specific flight by the addition of the Sun and planets (Venus, Mars, Jupiter, and Saturn) in their launch date positions. Moon symbols that show the various phases (new, first quarter, full, last quarter) are added for each day of the mission. Moon symbols are identified by calendar day starting at GMT.

STAR
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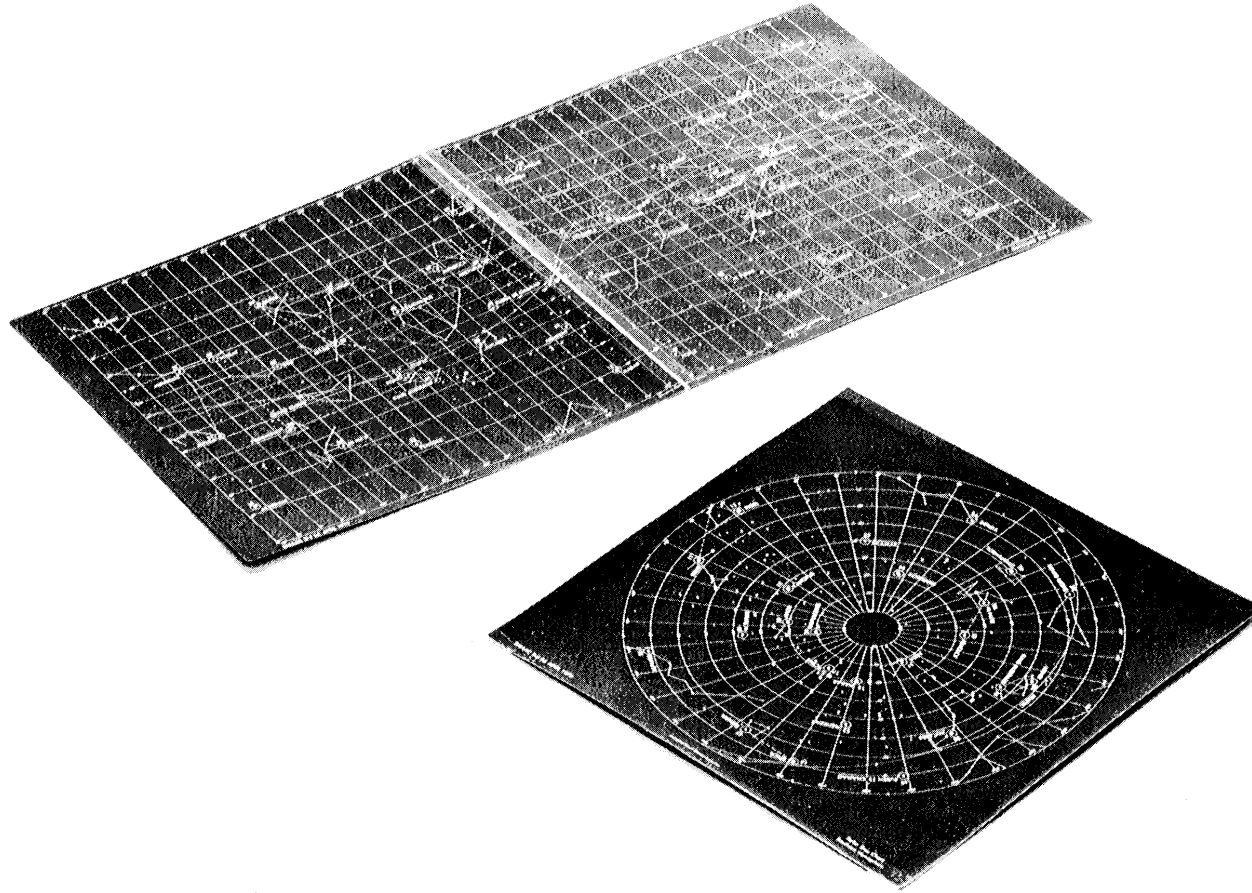
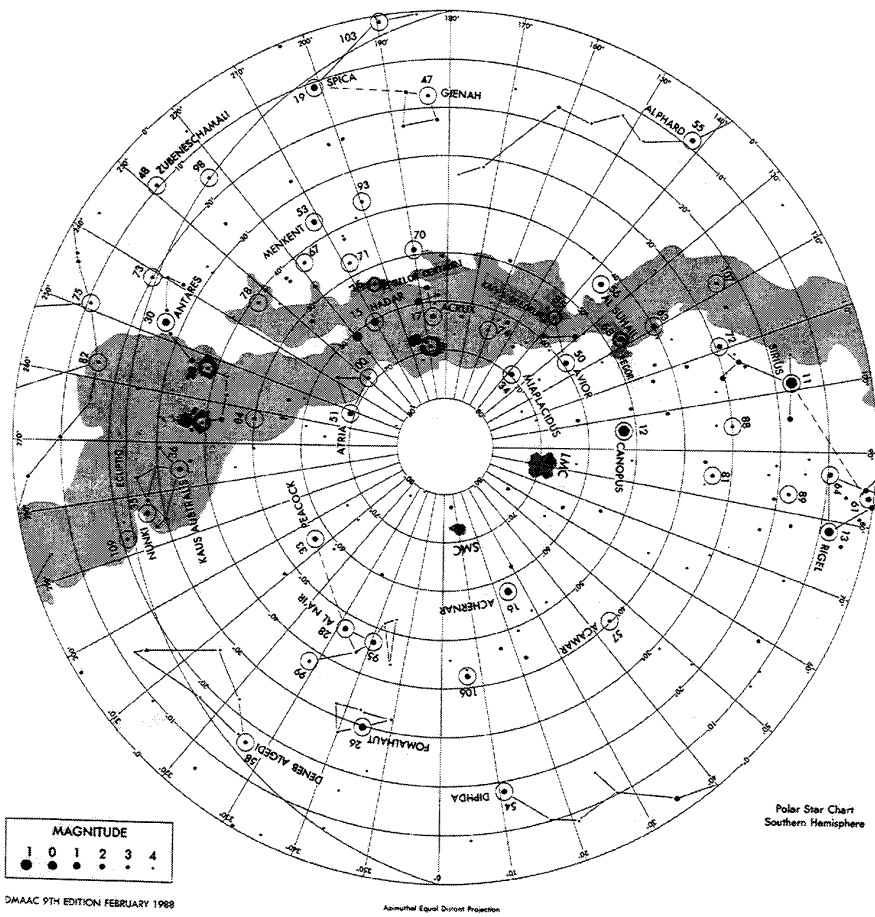
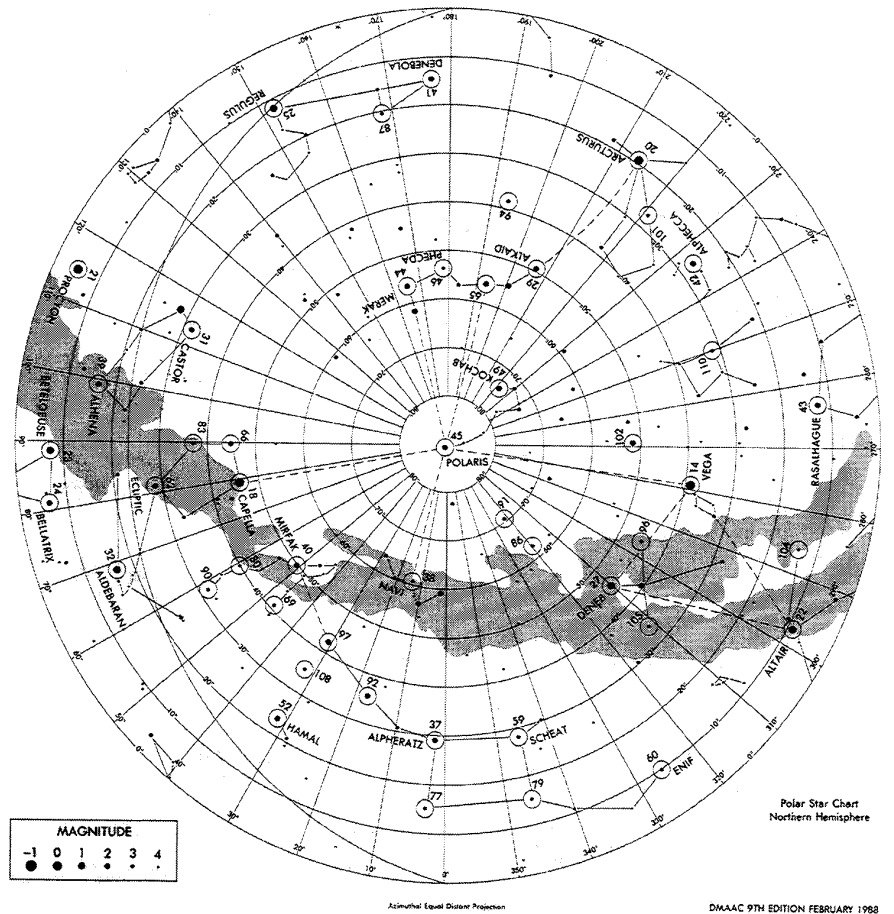


Figure 1-1.- Flight configuration Star Charts



Polar Star Chart
Southern Hemisphere



Polar Star Chart
Northern Hemisphere

Figure 1-3.- Star Chart polar projections

ORBIT MAP

- 2.1
- A. The flight version Orbit Map is produced in color at a scale of 1:52 million. The flight map is mounted in a frame with a groundtrack overlay. The map shown on page 2-4 is a reduced copy. An Orbit Map with overlay (flight configuration) is shown on page 2-5.
 - B. The overlay shows the groundtrack for three consecutive orbits and can be set to any desired ascending node. The overlay has time ticks at 1-min intervals along the groundtrack, with elapsed time callouts every 10 min. Elapsed time is measured from the initial ascending node. The overlay includes a map update block for recording MET and longitude of node for any given orbit.
 - C. The flight Orbit Map shows station coverage of STDN sites and TDRSS for the primary orbital altitude of each mission. Also shown are 750-nmi radius crossrange circles for shuttle landing sites and the South Atlantic Anomaly at the primary orbital altitude of each mission.
 - D. The baseline Orbit Map is annotated for each mission by adding photo targets, visual observation sites, or other areas of scientific or technical interest. When applicable, these subjects are documented as tabular listings and included with the flight crew World Atlas.

ORBIT
MAP

ORBIT
MAP

EARTH OBSERVATIONS MANUAL

- 2.2
- The Flight Science Support Office produces an Earth Observations Preflight Training Manual for each flight. It contains text, illustrations, and photos for information on mission overview, photographic techniques, Earth features, and sites of interest. The manual is used for flight-specific crew training and flown as mission weight and space constraints allow. An optional PGSC diskette containing the text of the manual is occasionally flown in place of the hard copy.

ORBIT
MAP

ORBIT
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ORBIT
MAP

LANDING SITE FDF VIDEOS

2.3 The Landing Site FD CD contains footage of approaches to various runways at several landing sites. The crew can view the CD on the orbiter PGSC as a visual reference tool in preparation for landing.

The Landing Site Mini DV also contains the same footage of approaches to various runways as the FDF CD. Mini DV consists of two cassettes; Volume I contains Kennedy Space Center landing sites. Volume II contains Edwards AFB and White Sands (Northrup) landing sites.

The following landing site video files are available to the crew.

Directory ...\\Landing Site Video

78ksc33_.mpg	63,713,284	1/21/1998	5:21:00	PM
81ksc33_.mpg	55,799,812	1/21/1998	6:05:46	PM
84ksc33_.mpg	56,684,548	1/21/1998	6:33:30	PM
86ksc15_.mpg	61,577,220	1/21/1998	7:03:38	PM
94ksc33_.mpg	57,972,740	1/21/1998	7:32:28	PM
AUTORUN.INF	104	3/23/2001	6:55:36	PM
EDW04a_.mpg	14,491,652	1/26/1998	3:54:42	PM
EDW15a_.mpg	19,644,420	1/26/1998	4:04:56	PM
EDW22a_.mpg	25,899,012	1/26/1998	4:18:28	PM
EDW33a_.mpg	16,846,852	1/26/1998	4:27:26	PM
edwards_.mpg	49,471,492	1/27/1998	3:14:22	PM
FDF.ICO	12,862	11/2/1998	5:36:58	PM
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ksc15b_.mpg	20,994,052	1/26/1998	4:47:36	PM
ksc33a_.mpg	24,502,276	1/26/1998	4:59:56	PM
ksc33b_.mpg	18,061,316	1/27/1998	12:28:48	PM
nor17a_.mpg	24,612,868	1/27/1998	12:40:53	PM
nor17b_.mpg	15,800,324	1/27/1998	12:48:42	PM
nor23a_.mpg	13,939,692	1/27/1998	12:55:38	PM
nor35a_.mpg	13,279,236	1/27/1998	1:02:14	PM
northrup_.mpg	32,651,268	1/27/1998	3:30:28	PM
SHELEXEC.EXE	18,944	4/29/1999	6:04:00	AM

Directory ...\\Landing Site Video\\Runway Data

Edwards-Map_g_e.pdf
Kennedy-Maps_g_e.pdf
Northrup-Maps_g_e.pdf

Links are provided to the individual videos through the following index:

NASA Space Shuttle Orbiter Landing Site Refresher

Runway Data: [Kennedy](#) [Edwards](#) [Northrup](#)

Video

Table 2-I.- Contents of file titled Index.htm

Mission/Vehicle	Turn	Glidepath	Aim point
KSC 15			
STS-86	--	-- degree	--
STA	Left	17 degree	Close
STA	Right	19 degree	Close
KSC 33			
STS-78	--	-- degree	--
STS-81	--	-- degree	--
STS-84	--	-- degree	--
STS-94	--	-- degree	--
STA	Left	19 degree	Close
STA	Right	19 degree	Nominal
EDW 04			
STA	Left	19 degree	Nominal
EDW 15			
STA	Left	17 degree	Nominal
EDW 22			
STA	Left	17 degree	Nominal
EDW 33			
STA	Right	19 degree	Close
NOR 17			
STA	Left	17 degree	Nominal
STA	Left	19 degree	Close
NOR 23			
STA	Left	19 degree	Nominal
NOR 35			
STA	Left	19 degree	Nominal

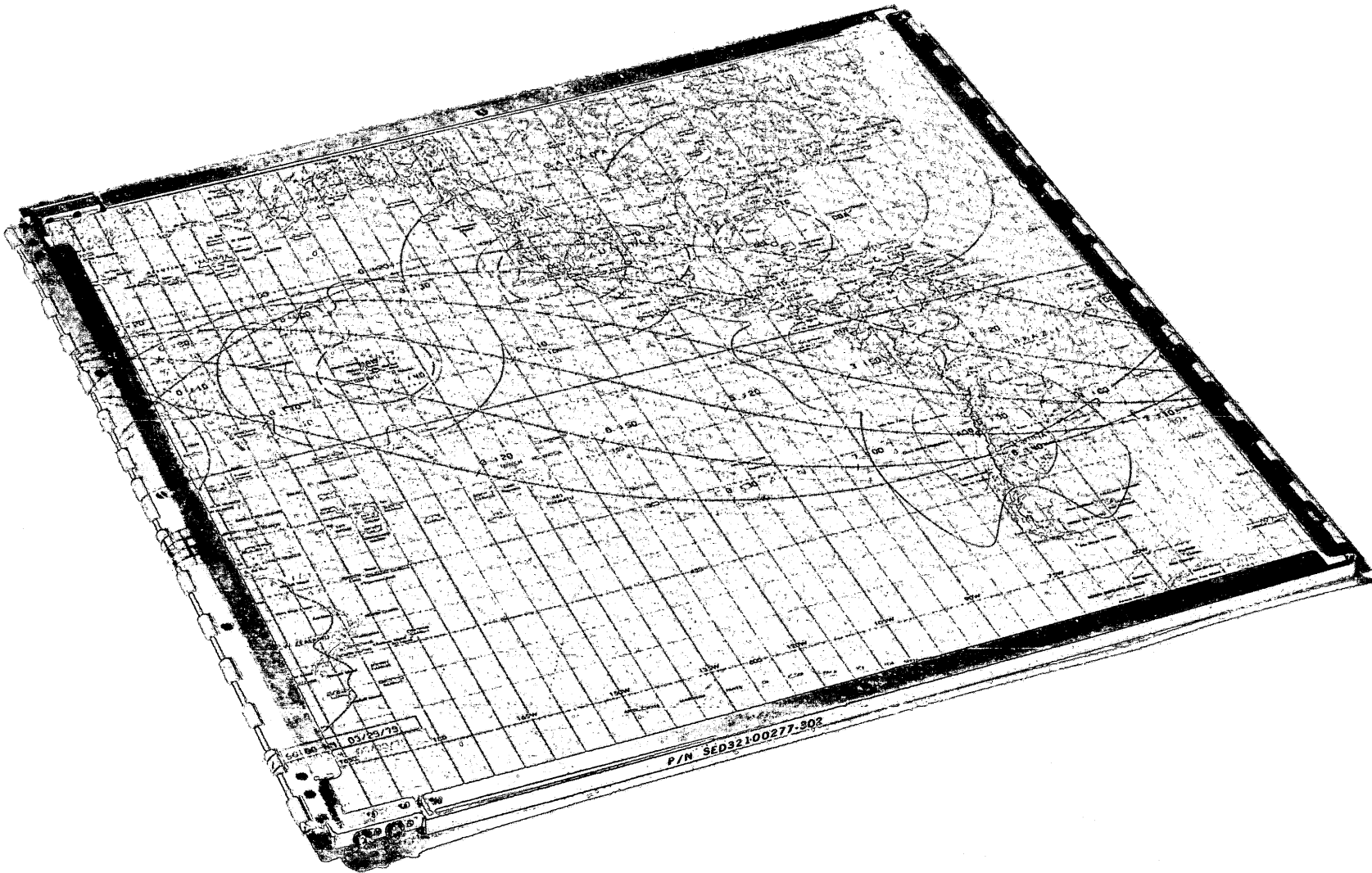
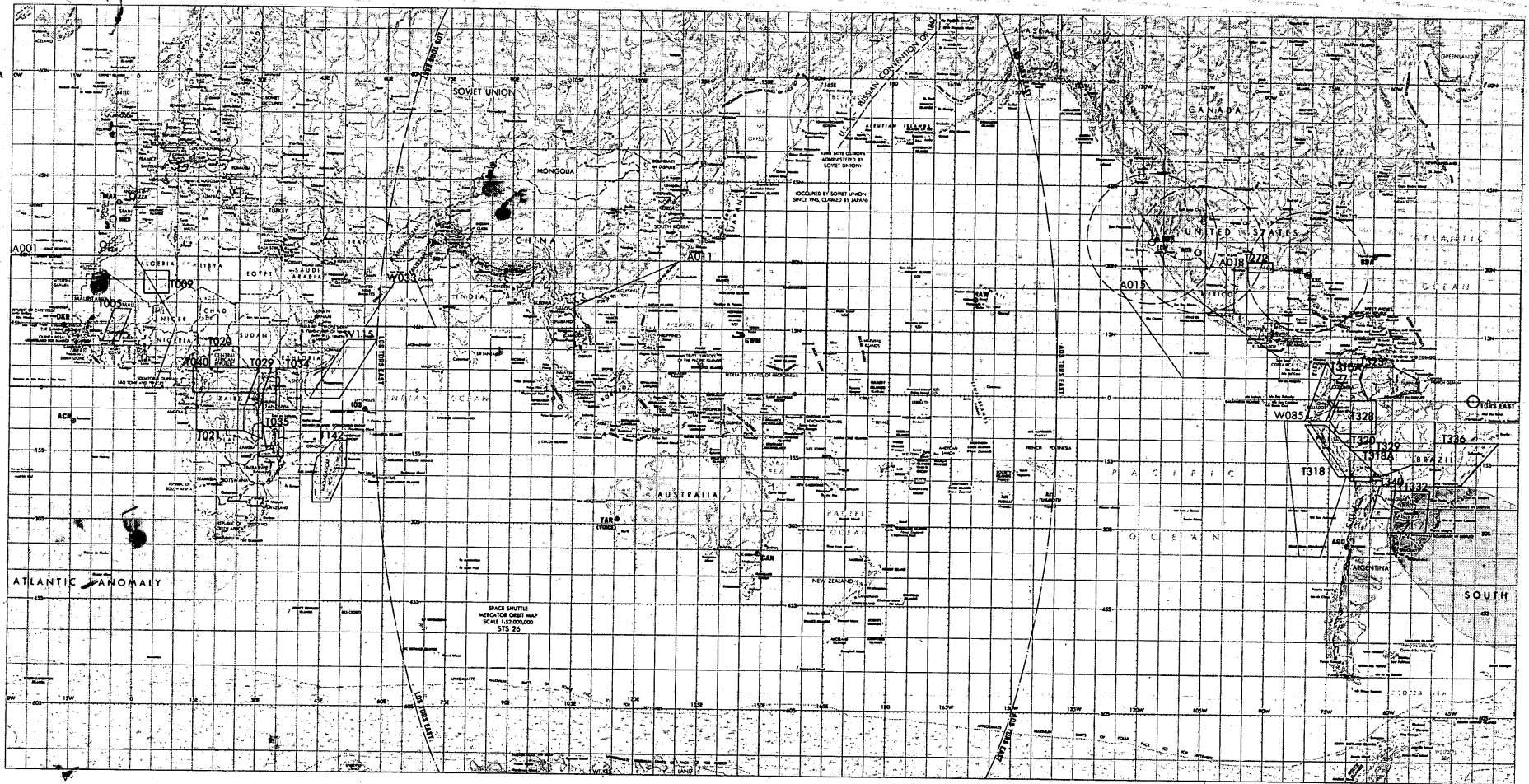


Figure 2-1.- Flight configuration Orbit Map



PREPARED AND PUBLISHED BY THE DEFENSE MAPPING AGENCY AERONAUTICS CENTER, 2900 SOUTH SECOND STREET, ST. LOUIS, MISSOURI, 63118-2099 FOR THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NOTE: The representation of boundaries is not necessarily authoritative. Definition of water boundaries presented with this map have been changed after the last edition. The United States Coast Guard has not authorized the representation for use of the United States and elsewhere in its latest edition.

LEGEND
 International boundaries
 Coastal lines
 Other lines
 Airfields
 Coverage limits for 730 n.m. South Atlantic Anomaly for 140 n.m. altitude

MERCATOR PROJECTION
 SCALE 1:50,000,000 AT THE EQUATOR

TRACKING AND DATA RELAY SATELLITE SYSTEM (TDRSS)
 AGLIOS
 Subsatellite point

SPACEFLIGHT TRACKING AND DATA NETWORK (STDN)
 Active flightline symbols and call letters
 Tracking beam (140 n.m. altitude)

EARTH OBSERVATION SITES LEGEND
 Formatted Date
 Atmospheric Date
 Oceanographic Date

SPACE SHUTTLE
 MERCATOR ORBIT MAP

Figure 2-2.- Orbit Map with overlay (flight configuration)

WORLD ATLAS

- 2.4 The flight version of the World Atlas (Space Shuttle Physiographic Atlas) is produced in color and provides worldwide coverage at a scale of 1:10 million. Its table of contents is shown on page 2-7.

CONTENTS

PAGE	GEOGRAPHIC COVERAGE	SOURCE MAP/CHART
1	Canada, Hudson Bay	GNC-2
2	United States	GNC-2
3	Eastern Canada, N. E. United States, and Hudson Bay	GNC-3
4	Southern Greenland, Iceland, and Ireland	GNC-3
5	Western Europe and W. Mediterranean Sea	GNC-4
6	Europe, Western Russia, and Turkey	GNC-4
7	Central Russia, Afghanistan, and N. W. China	GNC-5
8	Eastern Russia and Mongolia	GNC-5
9	Eastern Russia, Japan, and Manchuria	GNC-5
10	Alaska, Aleutian Islands, and N. E. Russia	GNC-6
11	Mexico and Baja California	GNC-8
12	Gulf of Mexico, Central America, and Cuba	GNC-9
13	Northern South America and Caribbean Sea	GNC-9
14	North Africa - West, Cape Verde, and Canary Islands	GNC-10
15	North Africa - Central	GNC-11
16	North Africa - East and Red Sea	GNC-11
17	Middle East, Persian Gulf, and Afghanistan	GNC-12
18	Arabian Sea and Gulf of Aden	GNC-12
19	India, Tibet Plateau, and Himalayan Mts.	GNC-12
20	China, Southeast Asia, and South China Sea	GNC-13
21	Japan, Korea, and Philippine Islands	GNC-13
22	Caroline and Mariana Islands	GNC-7
23	Gilbert and Marshall Islands	GNC-7
24	Hawaiian and Line Islands	GNC-7
25	Indonesia, S. E. Asia, and South China Sea	1142 Series
26	New Guinea and Northern Australia	1142 Series
26A	New Guinea, Bismark Archipelago, and Coral Sea	1142 Series
27	Australia and Timor Island	GNC-14
28	Australia, Tasmania, and Coral Sea	GNC-14
29	New Hebrides Islands and Fiji Islands	GNC-20
30	Polynesian Islands, Samoa and Cook Islands	GNC-20
31	Polynesian Islands and Society Islands	GNC-19
32	Polynesian Islands	GNC-19
33	Western South America	GNC-18
34	Eastern South America	GNC-18
35	South Atlantic Ocean	GNC-17
36	South Atlantic Ocean, Ascension Island, and St. Helena Island	GNC-17
37	Southwestern Africa	GNC-16
38	Southeastern Africa and Madagascar	GNC-16
39	Madagascar, Seychelles Islands, and Reunion Island	GNC-16
40	Indian Ocean and Chagos Archipelago	GNC-15
41	New Zealand, Tasmania, and South Pacific Islands	GNC-21
42	Southern South America and Falkland Islands	GNC-24
43	South Indian Ocean, Prince Edward and Crozet Islands	GNC-22
44	South Pole and Antarctic Peninsula	GNC-26
45	South Pole	GNC-26
46	North Pole, Northern Russia, and Beaufort Sea	GNC-1
47	North Pole, Greenland, Iceland, and Norway	GNC-1
48	Major Ocean Currents	

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LANDING SITE CHART SUMMARY

- 3.1 Landing Site Charts contain topographical information on designated shuttle landing sites. Flight versions are produced in color at the same size and scale as shown in this document.

There are two types of charts for each site:

- Area Chart - scale 1:2 million
- Runway Chart - scale 1:62,5000

One set of charts is shown for each landing site, and a site data sheet is included with each chart set.

- 3.2 Each chart set contains the following information.

Data Sheet

- Site elevation
- Table identifier*
- Runway length, width, and overruns
- Channel number and identifier for PRI and SEC TACAN selections
- Cochannel interference for each TACAN. Values listed indicate orbiter approach directions and altitudes above which TACAN interference may be caused by nearby TACAN stations using the same channel as the orbiter
- MLS channel numbers for appropriate runways
- Runways equipped with PAPI lighting
- Runways equipped with Ball Bar lighting
- UHF availability

Area Chart

- Range circles at 100-nmi intervals with intermediate ticks at 50-nmi intervals. Range is 'yardstick' distance to center of site
- Magnetic heading lines at 30° intervals with intermediate ticks at 10° intervals
- Area TACAN stations carried in onboard software tables
Note: No TACAN symbol used if station located at airfield
- All runways in the area at least 10,000 ft in length
- Airfield coordinates to nearest minute

Runway Chart

- Aim points
- Runway dimensions

- 3.3 To supplement the charts, oblique photographs are included where available. These photos approximate the view leaving the HAC on the steep glide slope

- 3.4 Section 4 contains crew procedures for postlanding at emergency airfields. A list of phone numbers is included only in flight books

*List of landing sites and TACAN data carried in software for use in contingency deorbits and landing

LANDING
SITES

LANDING
SITES

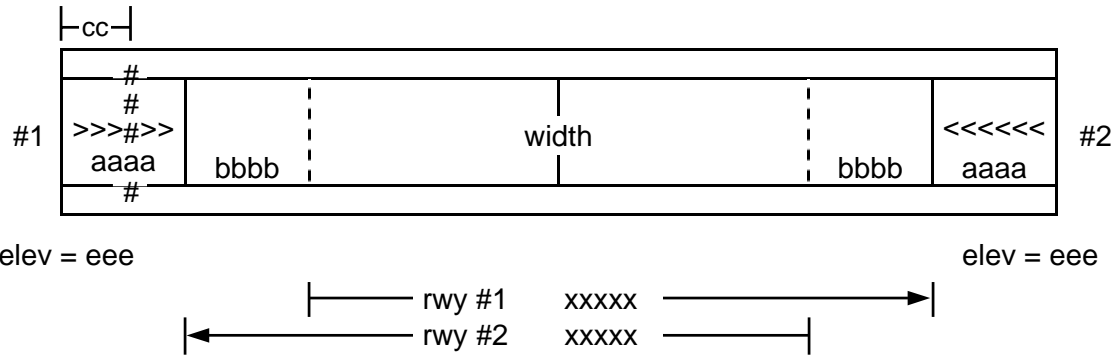
LANDING
SITES

LANDING
SITES

LANDING
SITES

3.5 Runway information is presented as follows:

LANDING
SITES



LANDING
SITES

Where

- #1, #2 = Runway number
- aaaa = Length of overrun
- bbbb = Length of shuttle artificially displaced threshold if reqd

NOTE

aaaa+bbbb = 1000 ft at each end of rwy

LANDING
SITES

- cc = Distance of barrier from end of usable surface (overrun) if reqd
- eee = Runway elevation at each end
- xxxxx = Length of each runway

NOTE

Length measured from shuttle threshold (actual or displaced) to end of rwy (with overrun to spare)

LANDING
SITES

- #

= Shuttle barrier >>>>>> = existing overrun/underrun

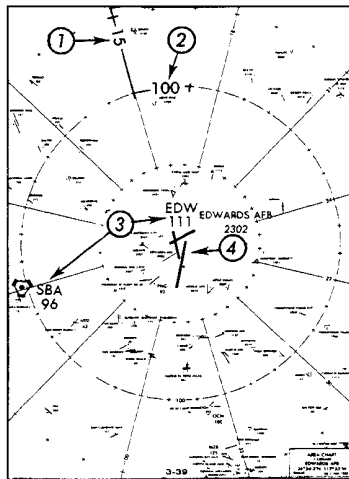
- - - = Shuttle displaced threshold

LANDING
SITES

OVERPRINT DATA LEGEND

LANDING SITE CHARTS

AREA CHART
Scale 1:2,000,000



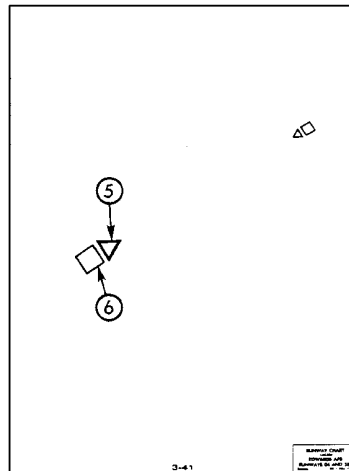
① Magnetic Heading to Land Site

② Distance to Landing Site (nautical miles)

③ NAVAIDS
(Location symbols are omitted when the antenna is located at the landing site)

④ Airfields

RUNWAY CHART
Scale 1:62,500



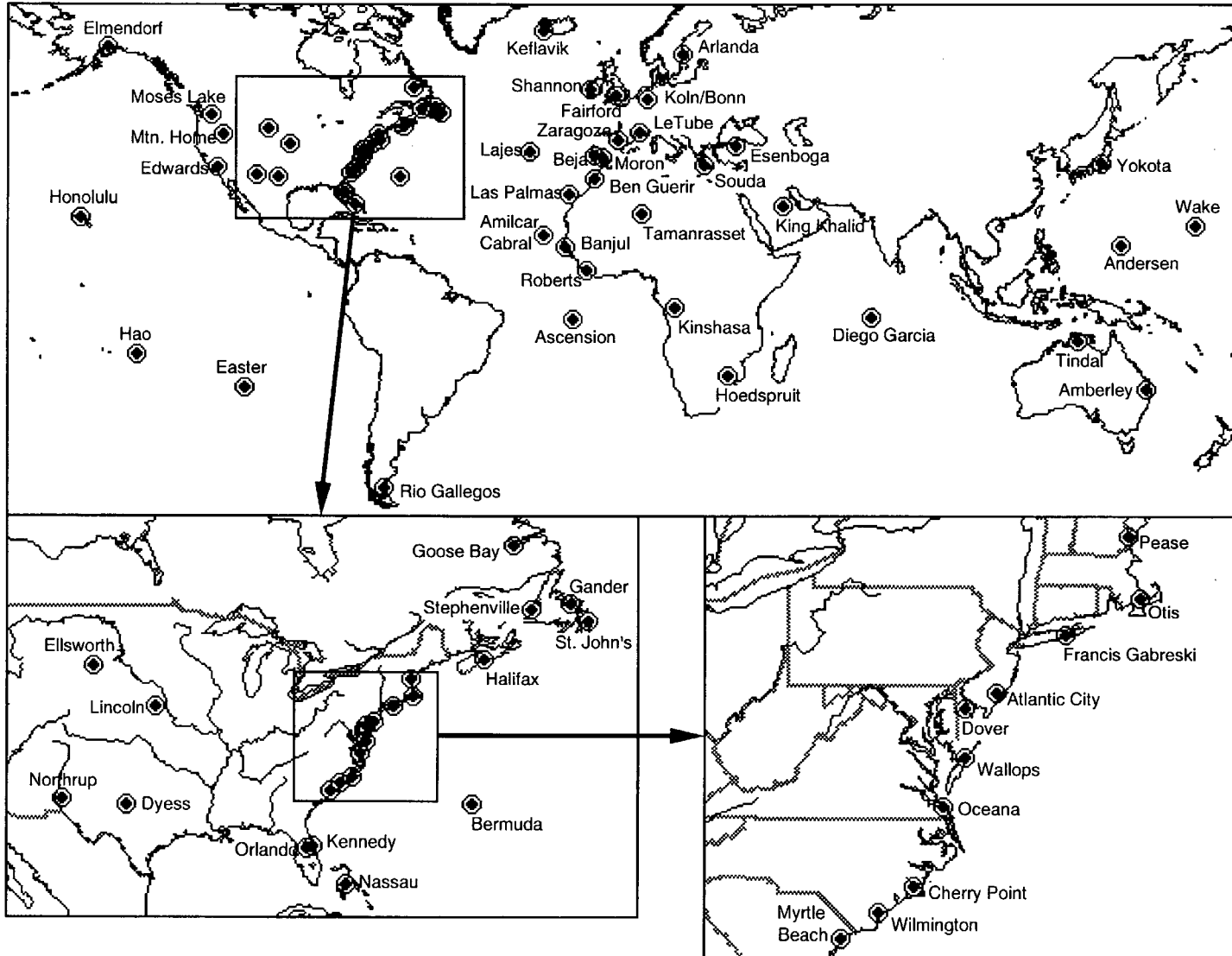
⑤ Highwind Aim Point

⑥ Nominal Aim Point

OVERPRINT DATA
LEGEND
LANDING SITE CHARTS
DMAAC ED. 3 Dec. 1988

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SPACE SHUTTLE PROGRAM APPROVED LANDING SITES

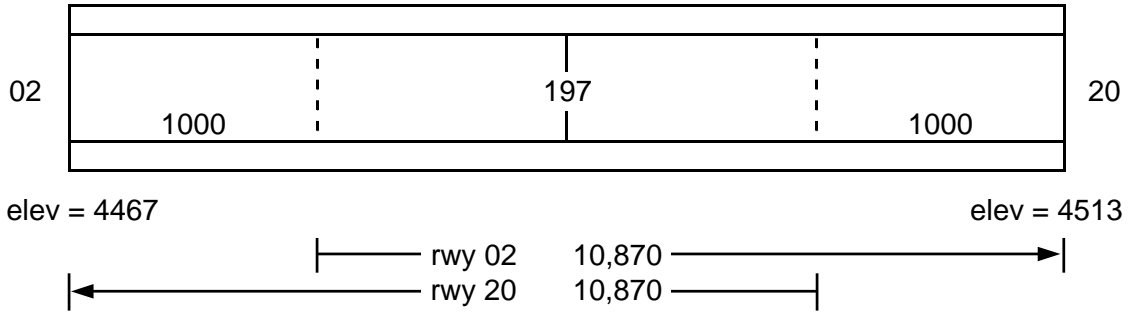


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Tamanrasset, Algeria

Table Identifier

AAT



TACAN: TMS-72x (Pri-DME)
I/F above: N:clear E:clear
S:142k W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: none

TAMANRASSET
AAT

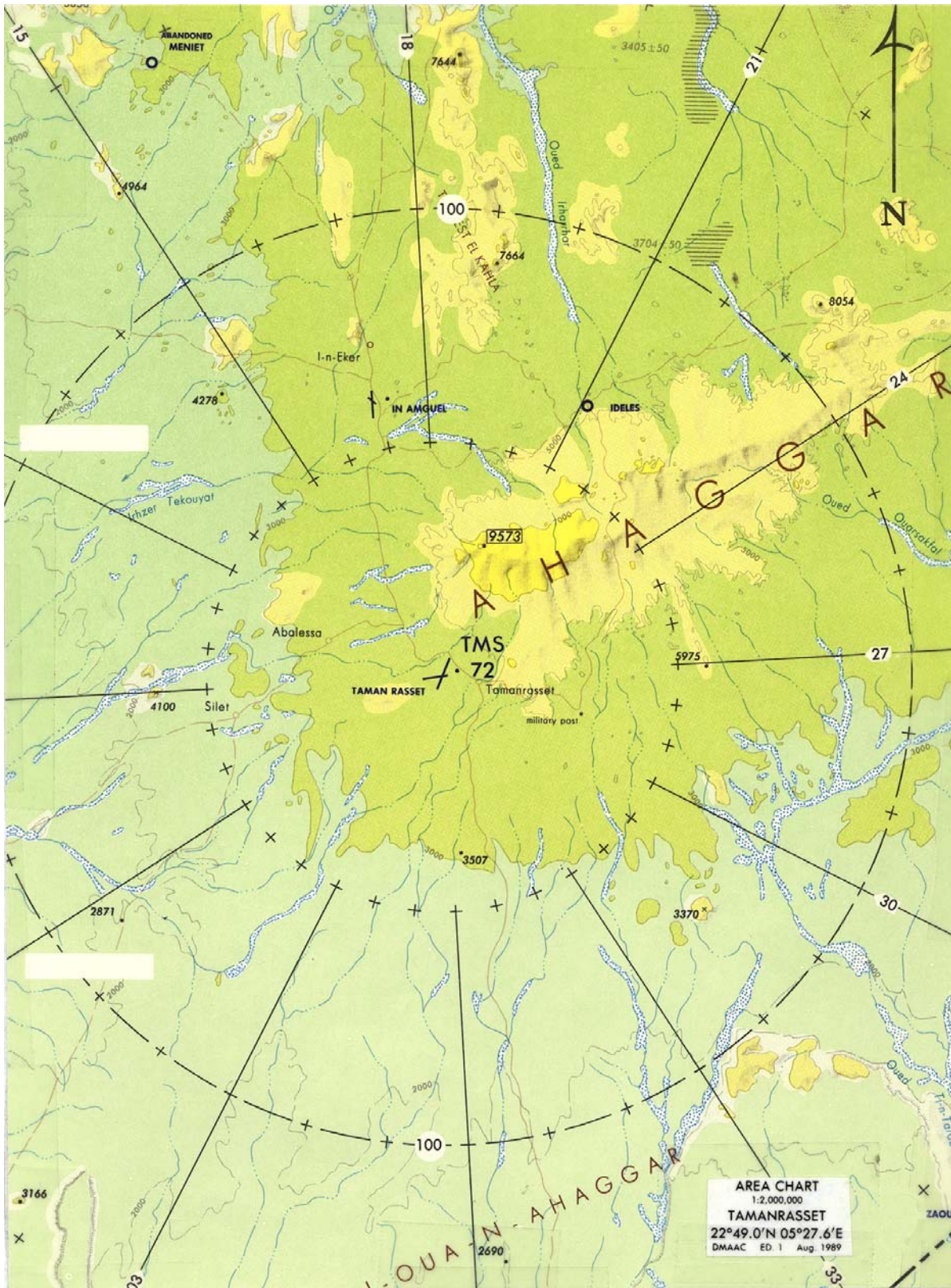
TAMANRASSET
AAT

TAMANRASSET
AAT

TAMANRASSET
AAT

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TAMANRASSET
AAT

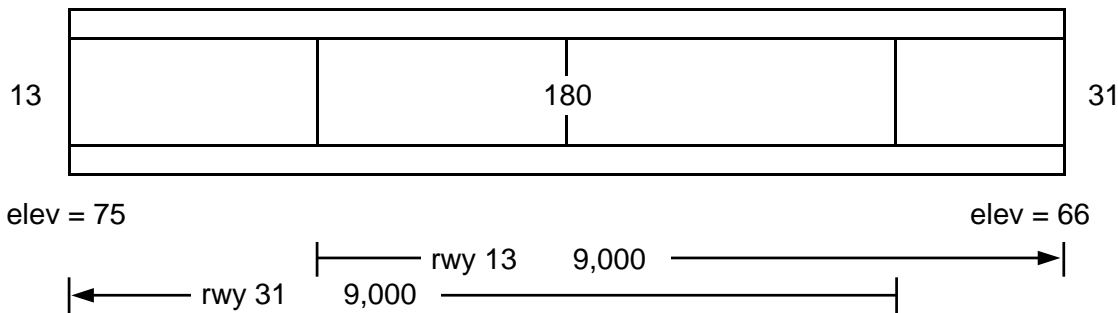


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Atlantic City International, Atlantic City, New Jersey

Table Identifier

ACY



TACAN: CYN-81x (Pri)
I/F above: N:110k E:clear
 S:125k W:90k

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

ATLANTA CITY
ACY

ATLANTA CITY
ACY

ATLANTA CITY
ACY

ATLANTA CITY
ACY

ATLANTA CITY
ACY

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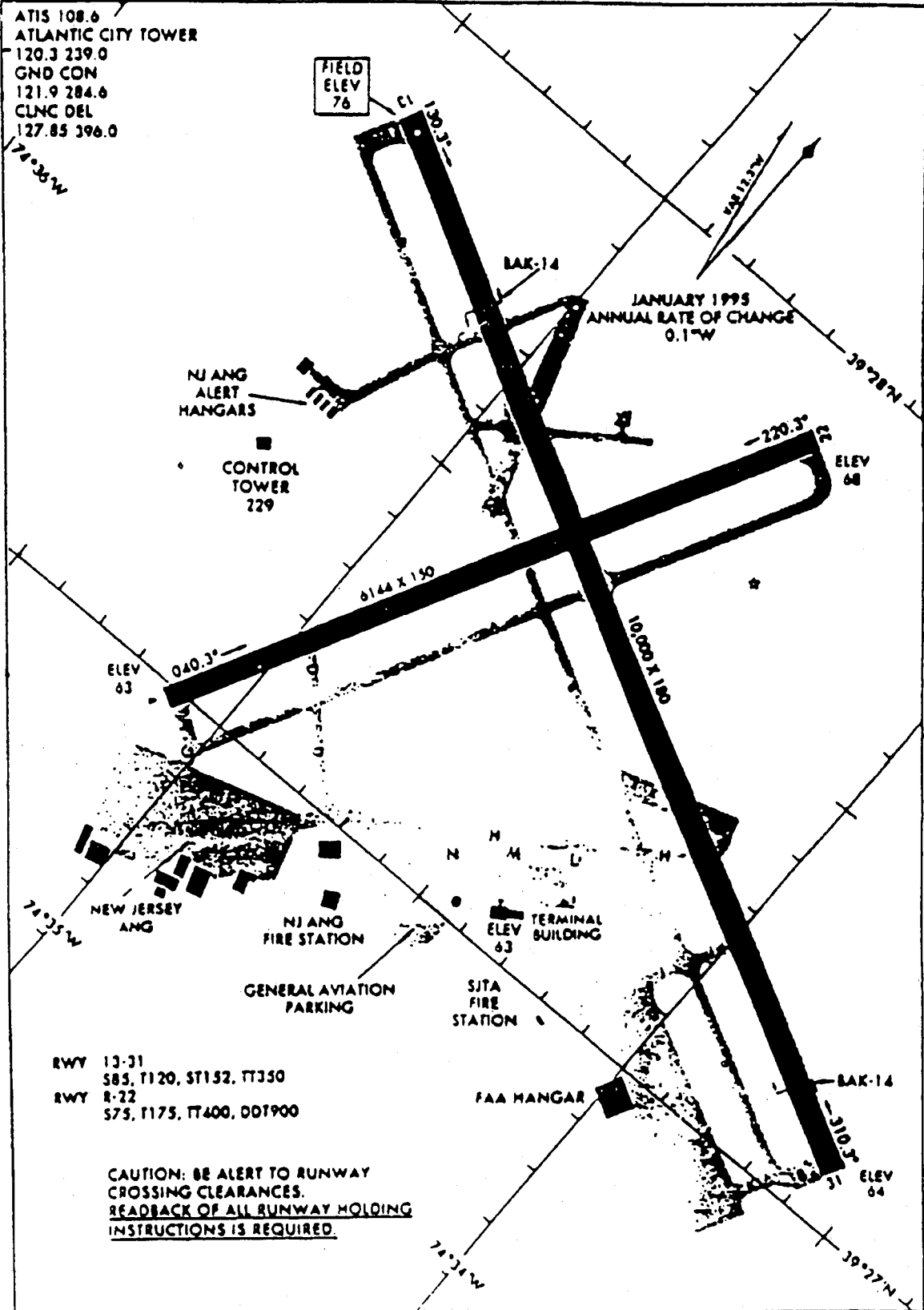
ATLANTIC CITY INTERNATIONAL AIRPORT DIAGRAM

98001

AIRPORT DIAGRAM

30
AL:669(FAA)

ATLANTIC CITY INTL (ACY)
ATLANTIC CITY, NEW JERSEY



AIRPORT DIAGRAM

98001

ATLANTIC CITY, NEW JERSEY
ATLANTIC CITY INTL (ACY)

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ATLANTIC CITY RWY ACY 13



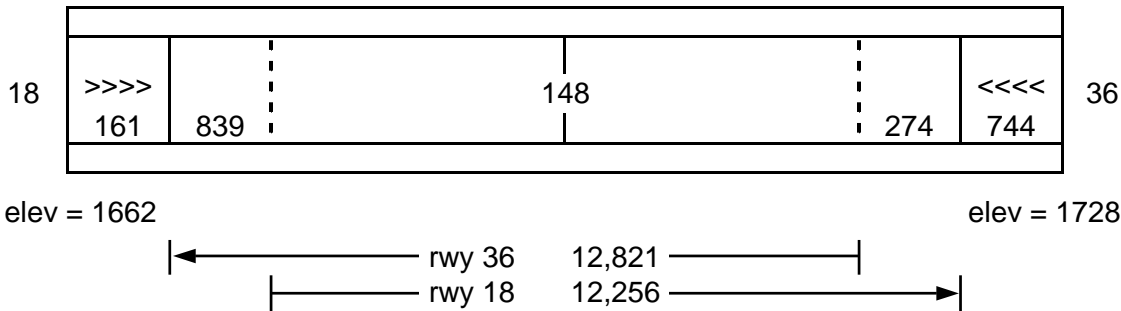
ATLANTIC CITY RWY ACY 31



ATLANTIC CITY RWY ACY 31



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TACAN: HSV-87x (Pri)
I/F above: N:clear E:clear
 S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: none

NOTE
 Previous site identifier was HDS

HOEDSPRUIT
AHS

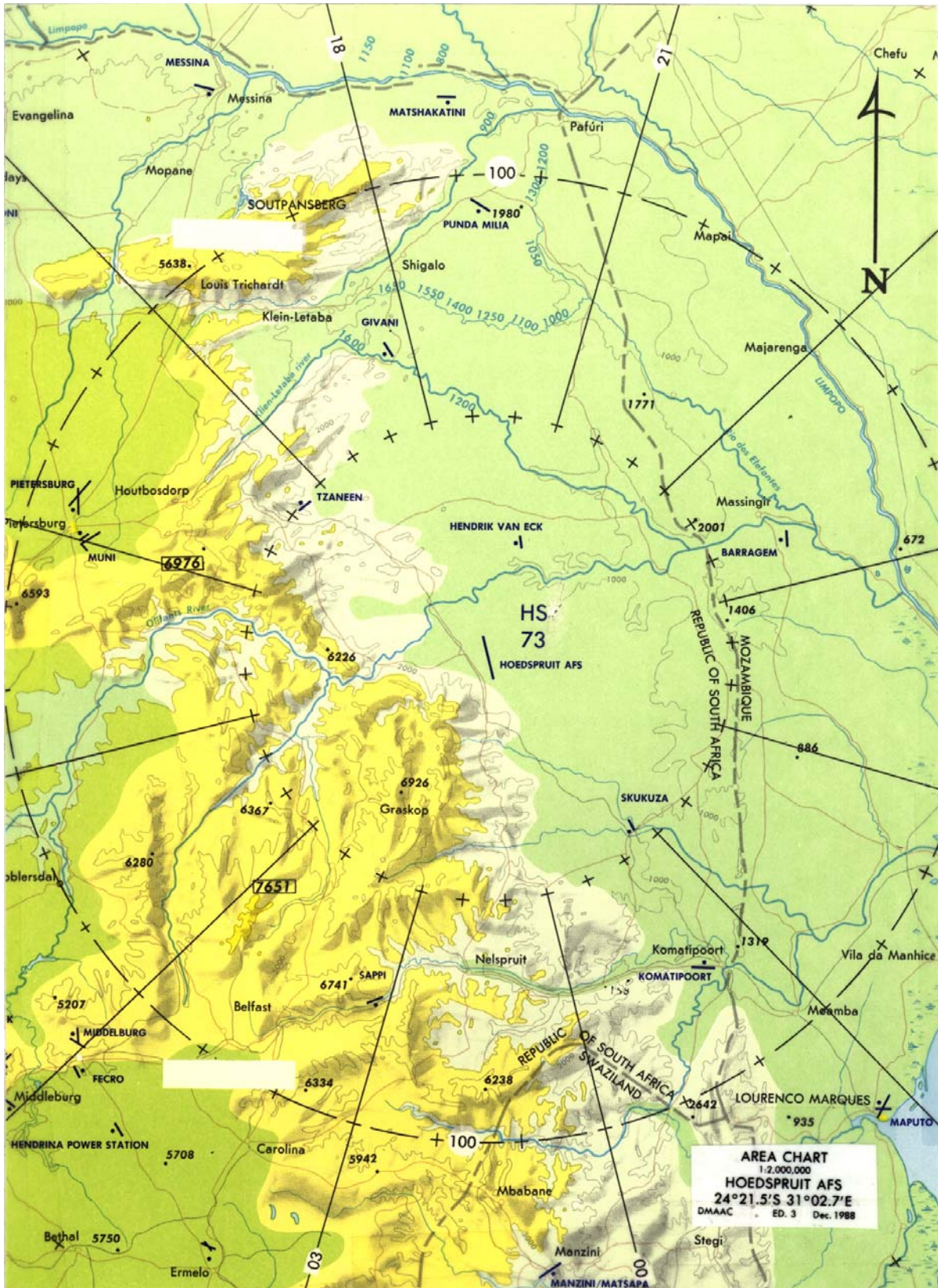
HOEDSPRUIT
AHS

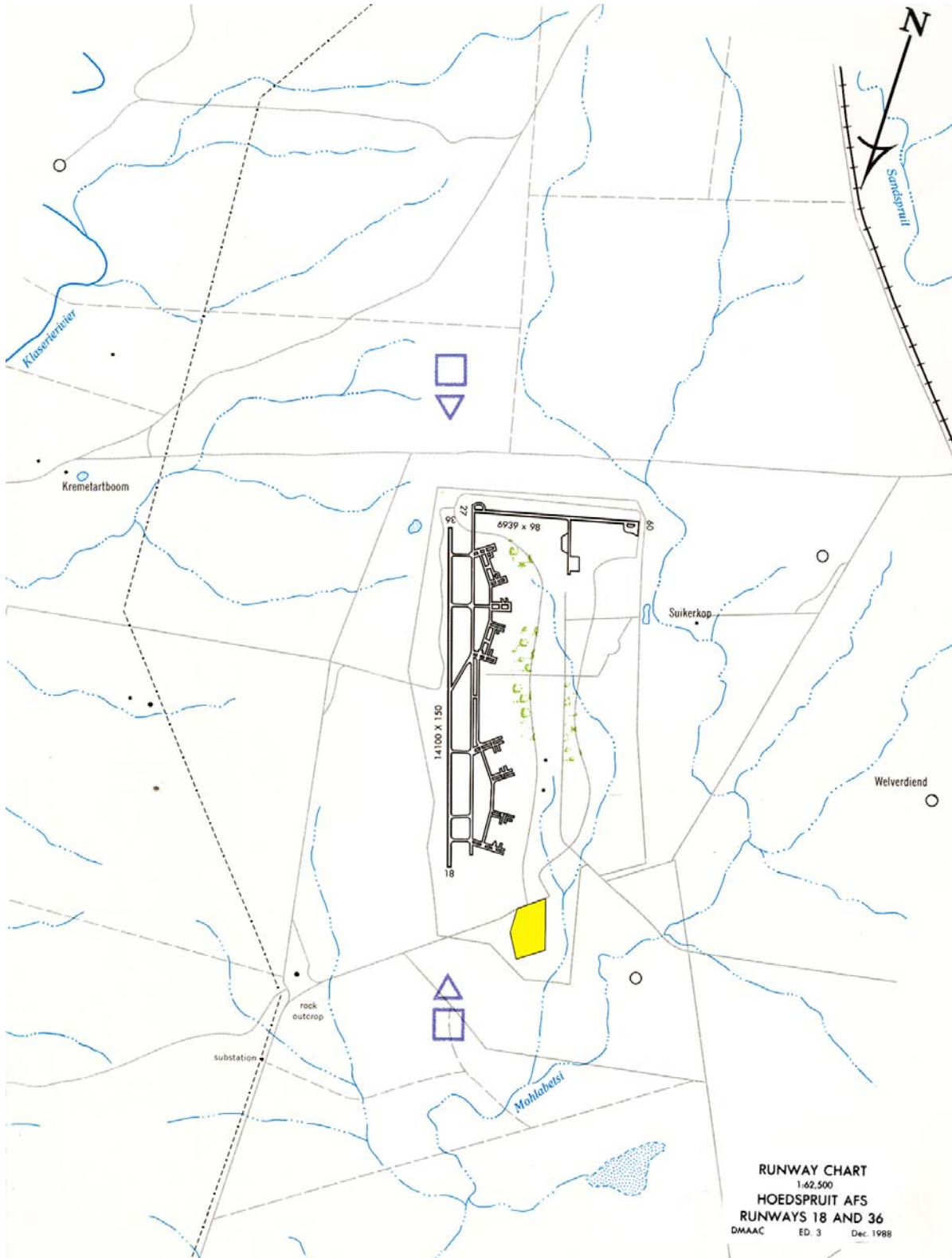
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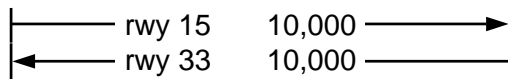
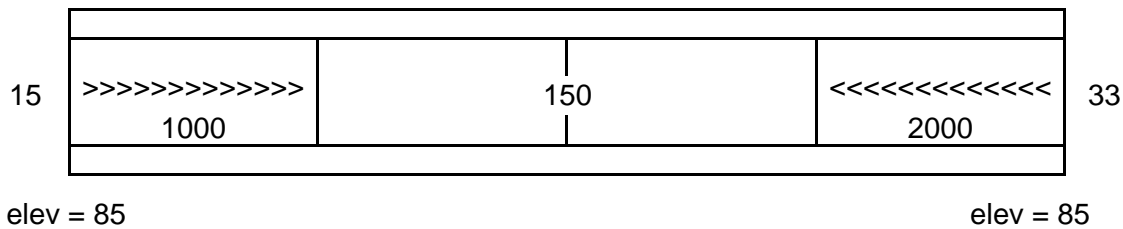
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TACAN: AMB-94x (Pri)
I/F above: N:clear E:clear
 S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

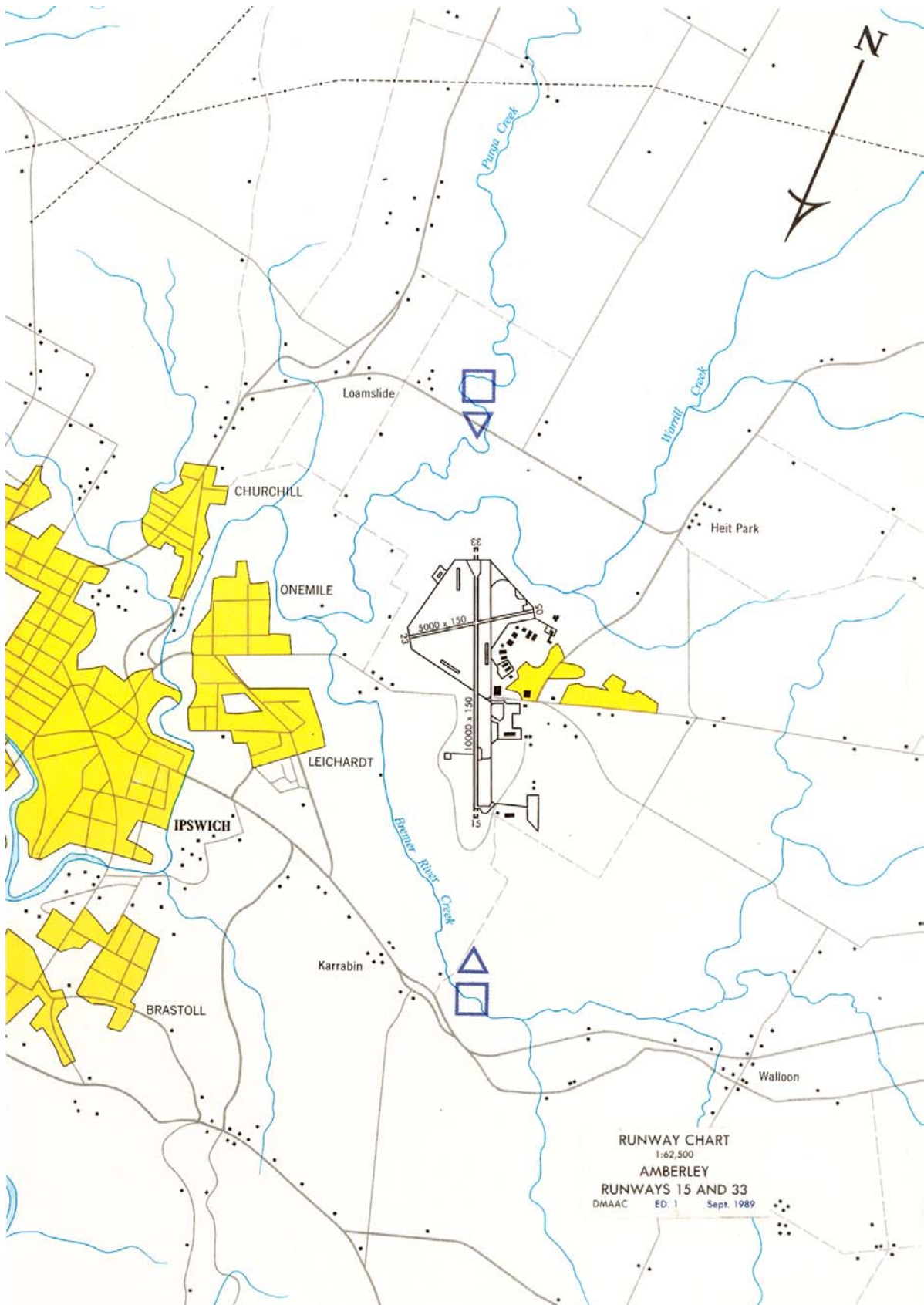
AMBERLEY
AMB

AMBERLEY
AMB

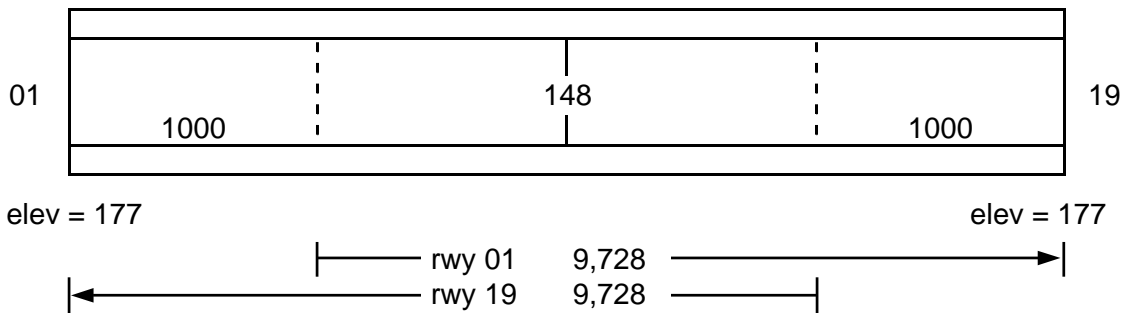
AMBERLEY
AMB

AMBERLEY
AMB

AMBERLEY
AMB



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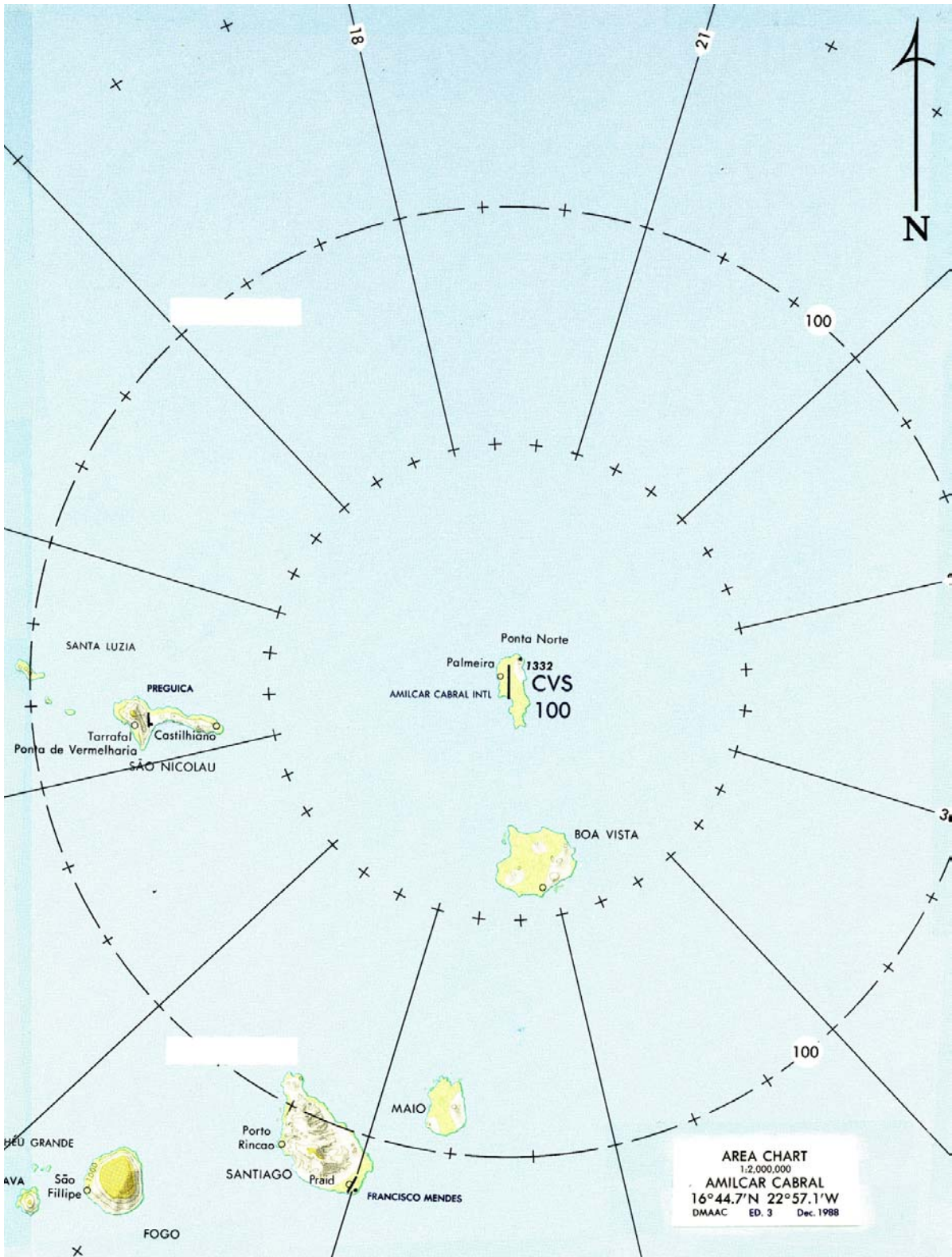
TACAN: CVS-100x (Pri-DME)
I/F above: N:clear E:clear
 S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: none

WARNING
 Expect poor visibility and crosswinds from the east
 Rwy 01 preferred, but terrain on approach is more than 30 ft lower than rwy

NOTE
 Language is Portuguese
 Total pavement width is 240 ft

AMILCAR CABRAL
 AML
 AMILCAR CABRAL
 AML
 AMILCAR CABRAL
 AML
 AMILCAR CABRAL
 AML



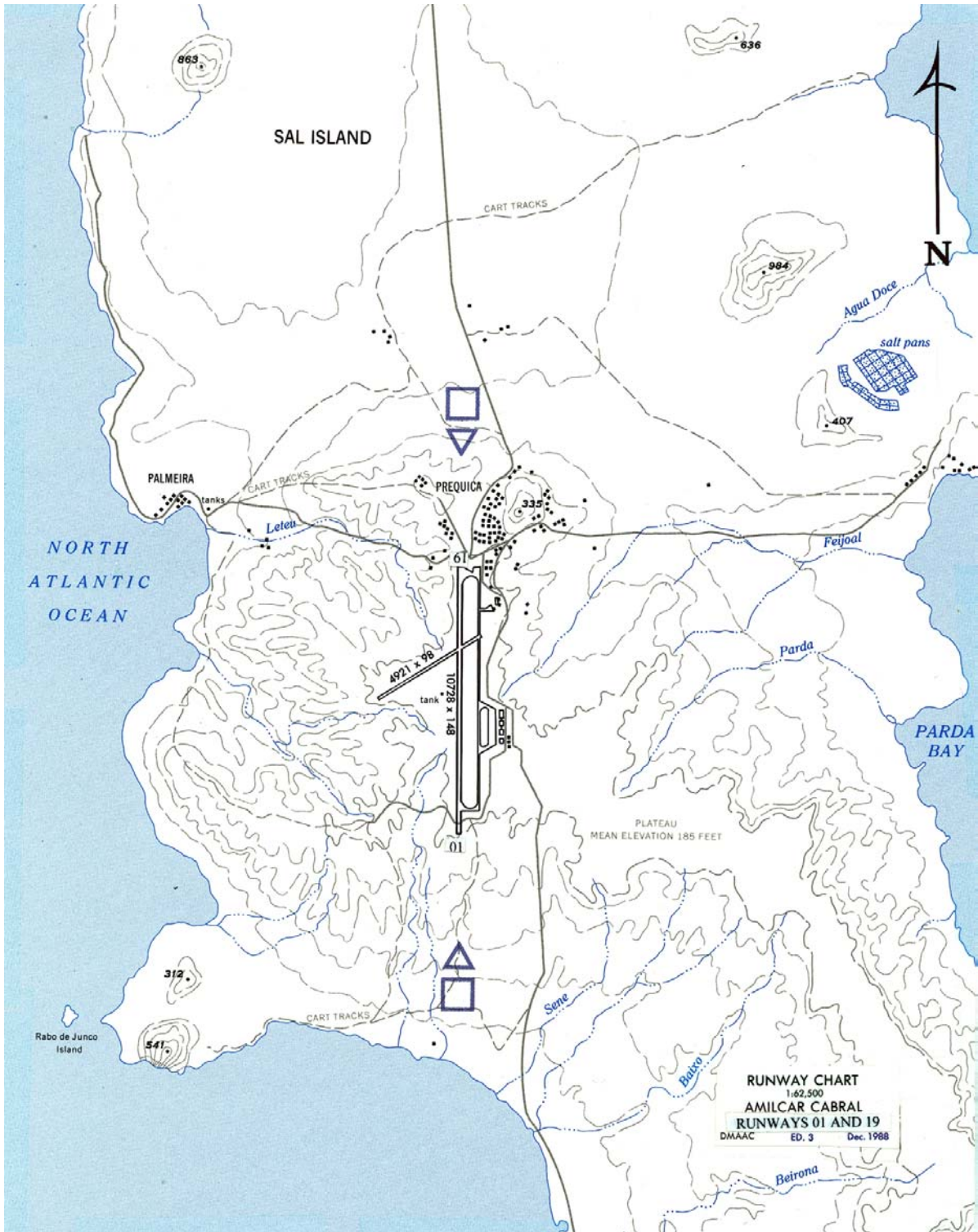
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AML

AMILCAR CABRAL
AML

AMILCAR CABRAL
AML

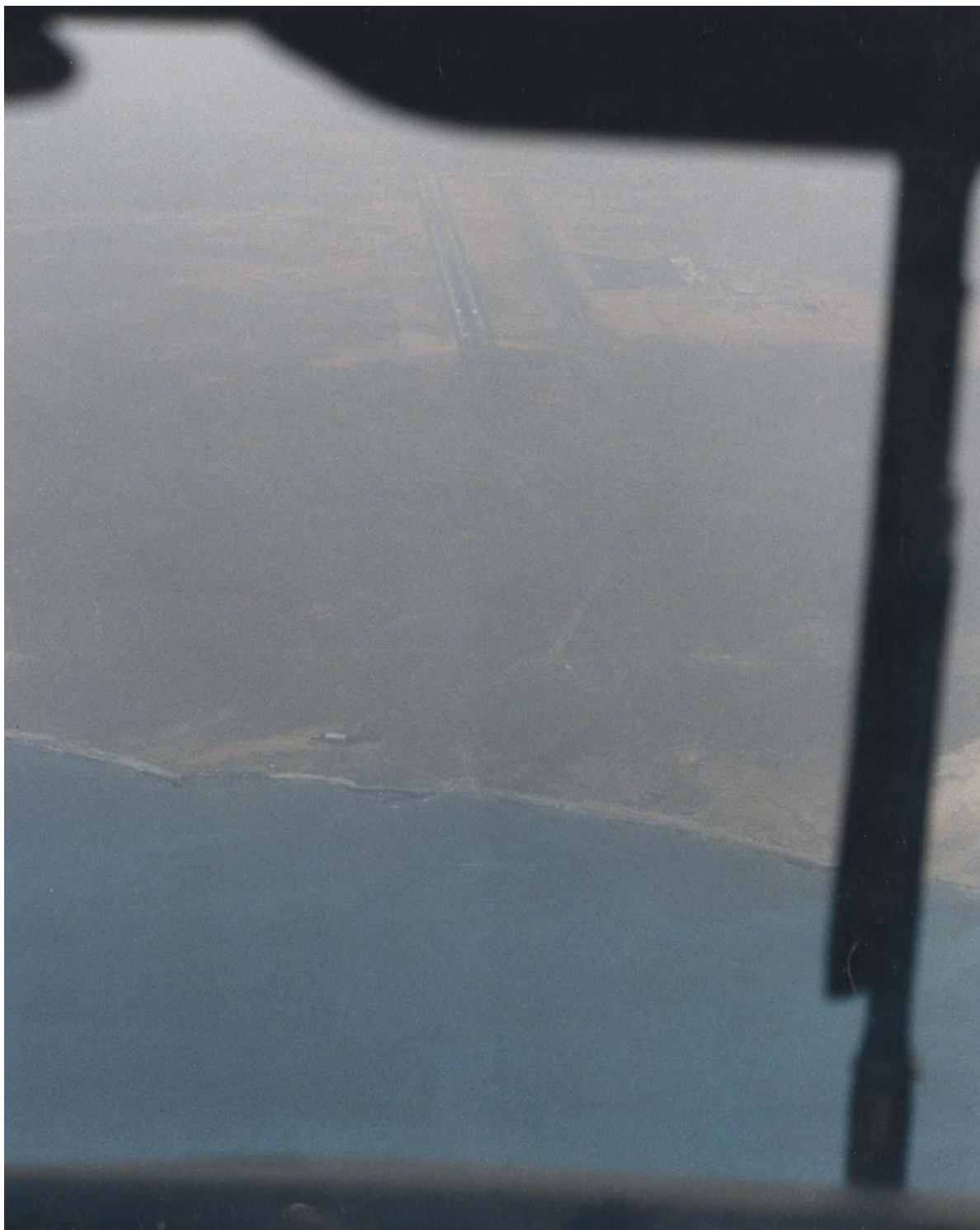
AMILCAR CABRAL
AML

AMILCAR CABRAL
AML



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AMILCAR CABRAL RWY AML 01



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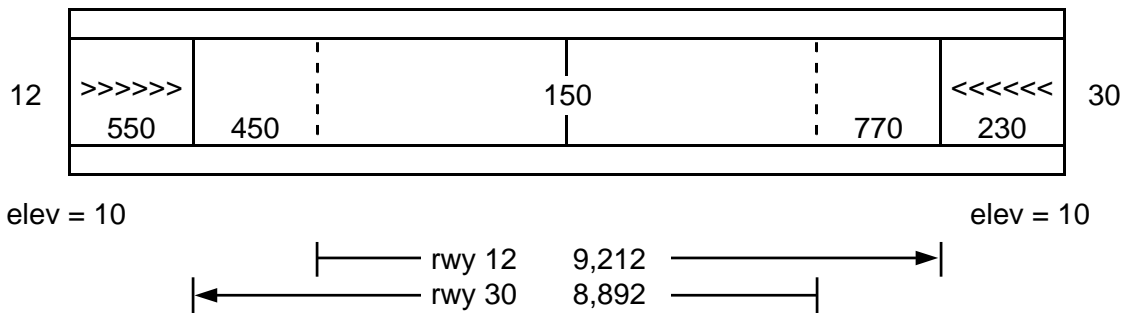
AMILCAR CABRAL RWY AML 19



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Bermuda International, St. David's Island, Bermuda

Table Identifier **BDA**



TACAN: BDA-86x (Pri-DME)
I/F above: N:clear E:clear
 S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

BERMUDA
BDA

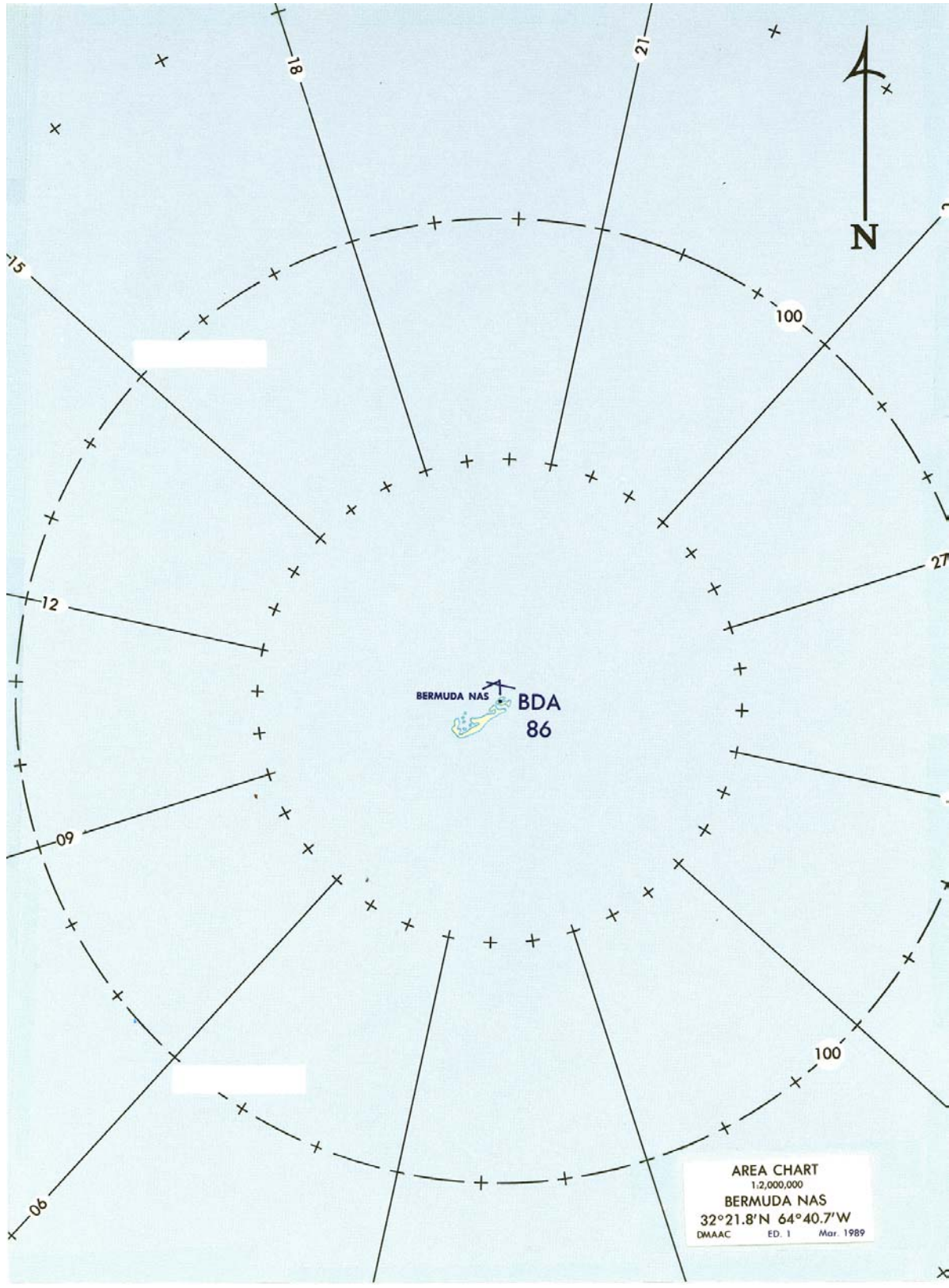
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BDA

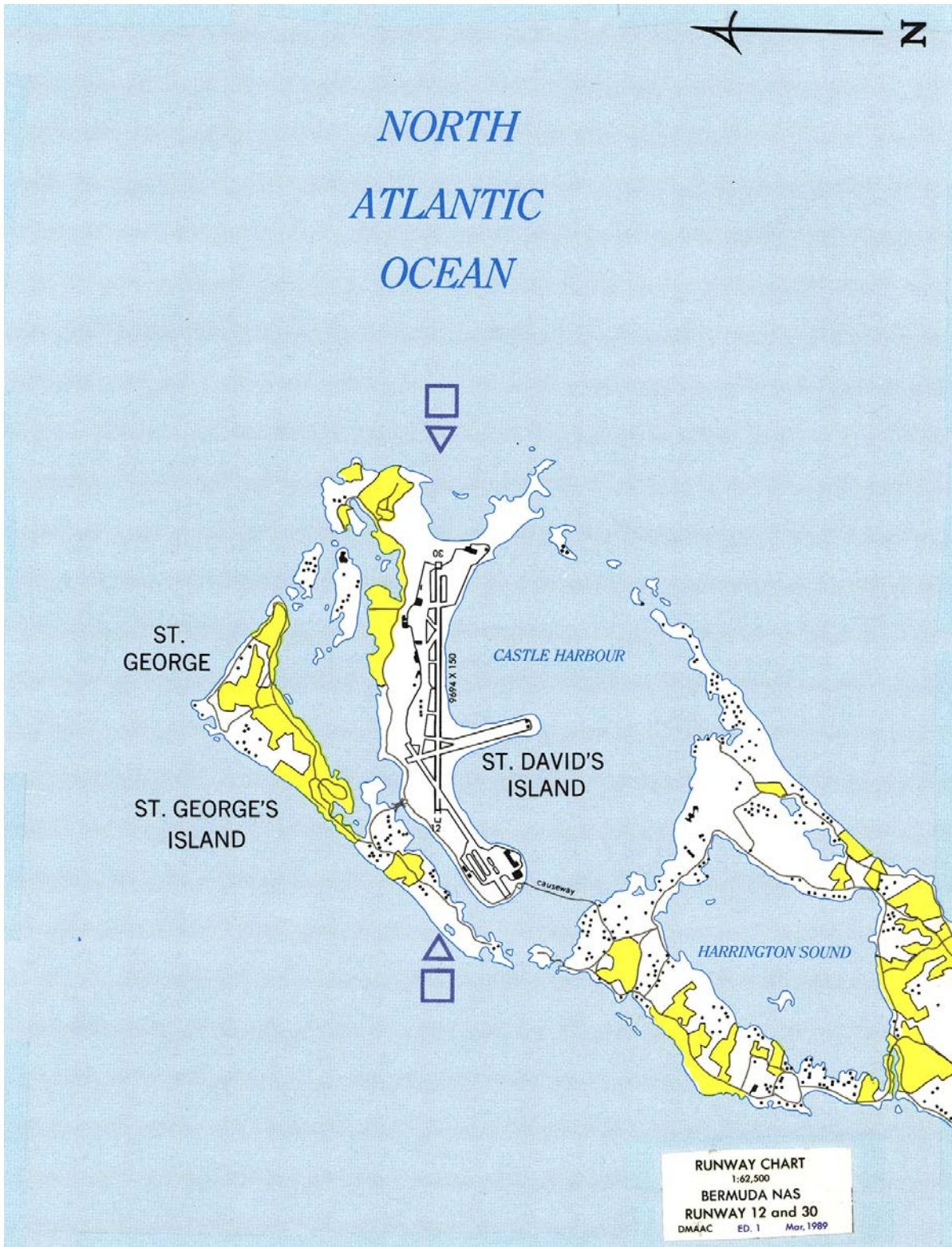
BERMUDA
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BERMUDA RWY BDA 12

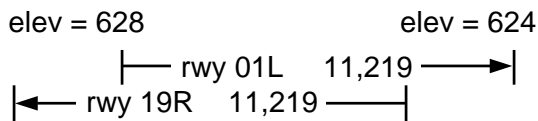
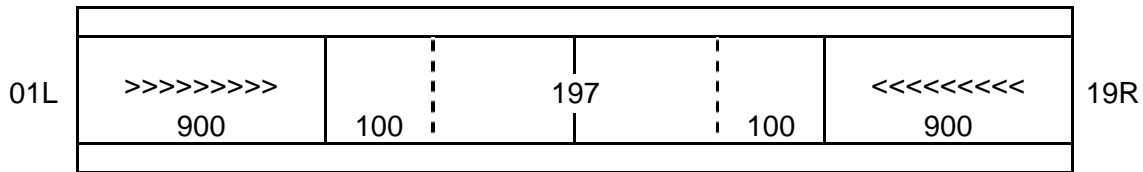


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BERMUDA RWY BDA 30



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TACAN: MOJ-37x (Pri)
I/F above: N:clear E:clear
 S:clear W:clear

BEJ-105x (Sec)
 N:<<80k E:<<80k
 S:<<80k W:<<80k

MLS: none
PAPI: none
Ball Bar: none
UHF: yes

BEJA
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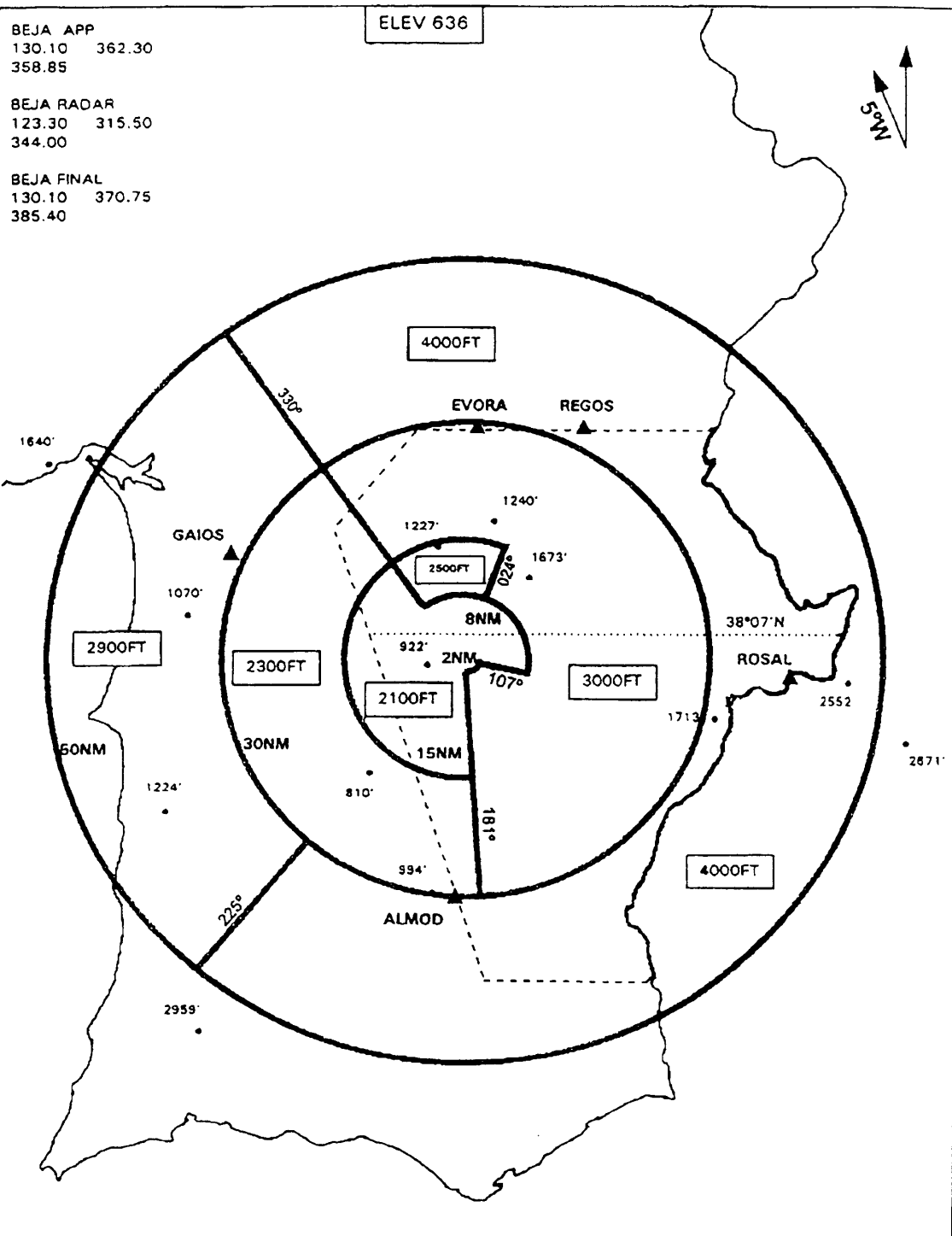
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BEJA INSTRUMENT CHART

MILITARY AIP - PORTUGAL
 PORTUGUESE AIR FORCE

WGS DATUM

MAP 4-9-1-1
 INSTRUMENT CHART



MINIMUM VECTORING ALTITUDE 38°04'44"N
 007°55'57"W

BEJA
 (LPBJ)

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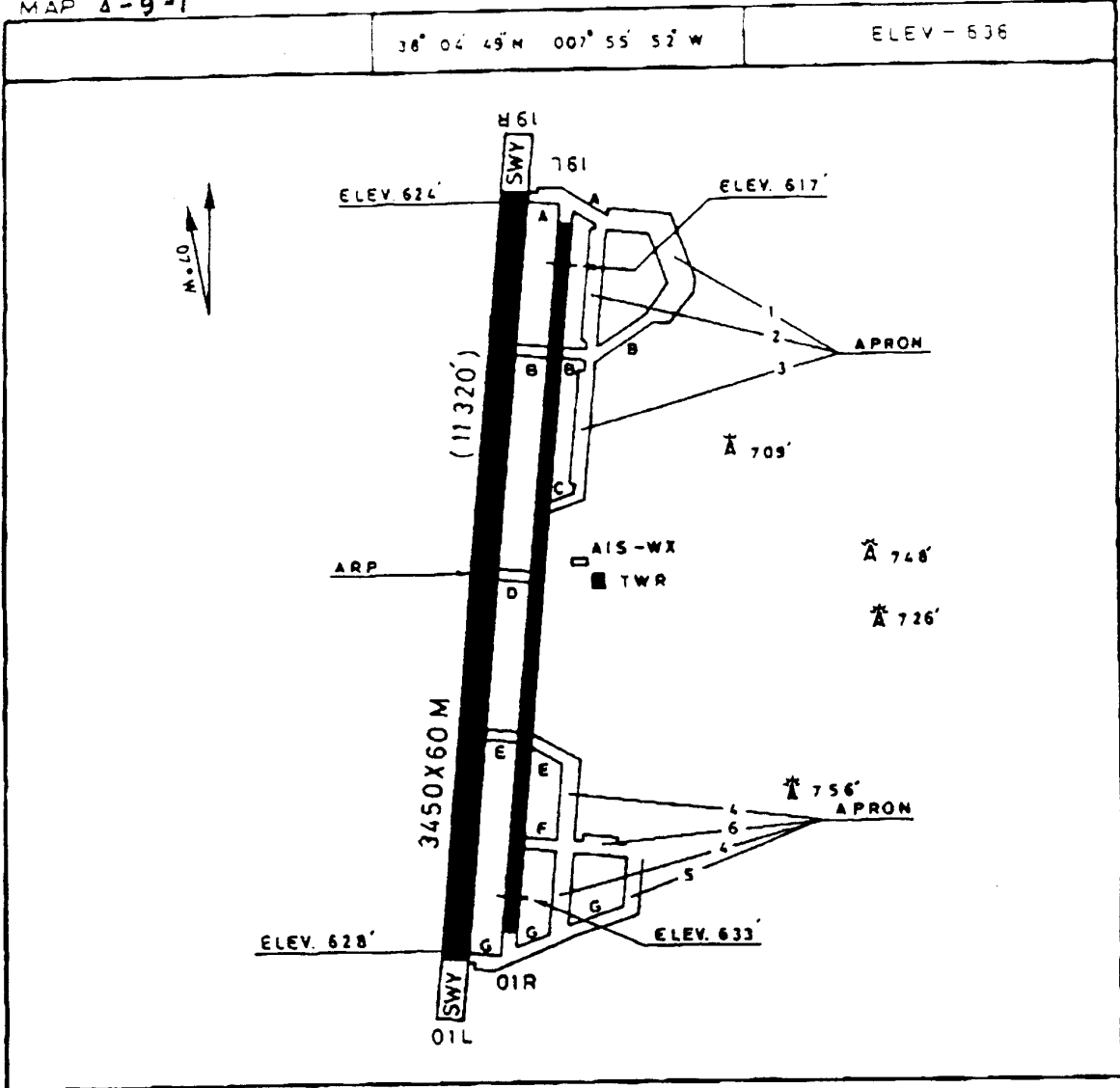
BEJA AIRPORT DIAGRAM

MILITARY AIR-PORTUGAL

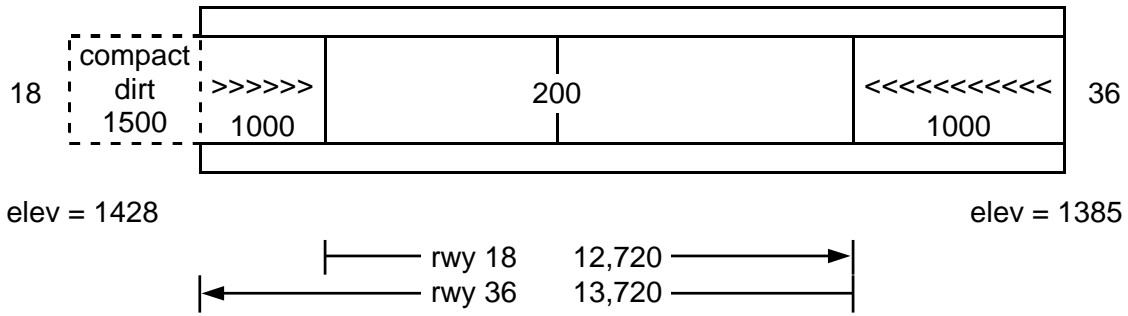
MAP 4-9-1

38° 04' 49" N 007° 55' 52" W

ELEV - 536



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TACAN:	BEN-108x (Pri)	MAK-80x (Sec-DME)
I/F above:	N:135k E:clear	N:115K E:clear
	S:clear W:clear	S:clear W:clear

MLS: (36-Sr) ch 6

PAPI: 18, 36

Ball Bar: 18, 36

UHF: none (UHF available only when NASA convoy present)

NOTE

Distance remaining markers count down to rwy threshold
 (i.e., Rwy 18: 0 marker is at beginning of concrete overrun;
 Rwy 36: 0 marker is at beginning of dirt overrun)

BEN-108x available only when NASA convoy present

BEN GUERIR
BEN

BEN GUERIR
BEN

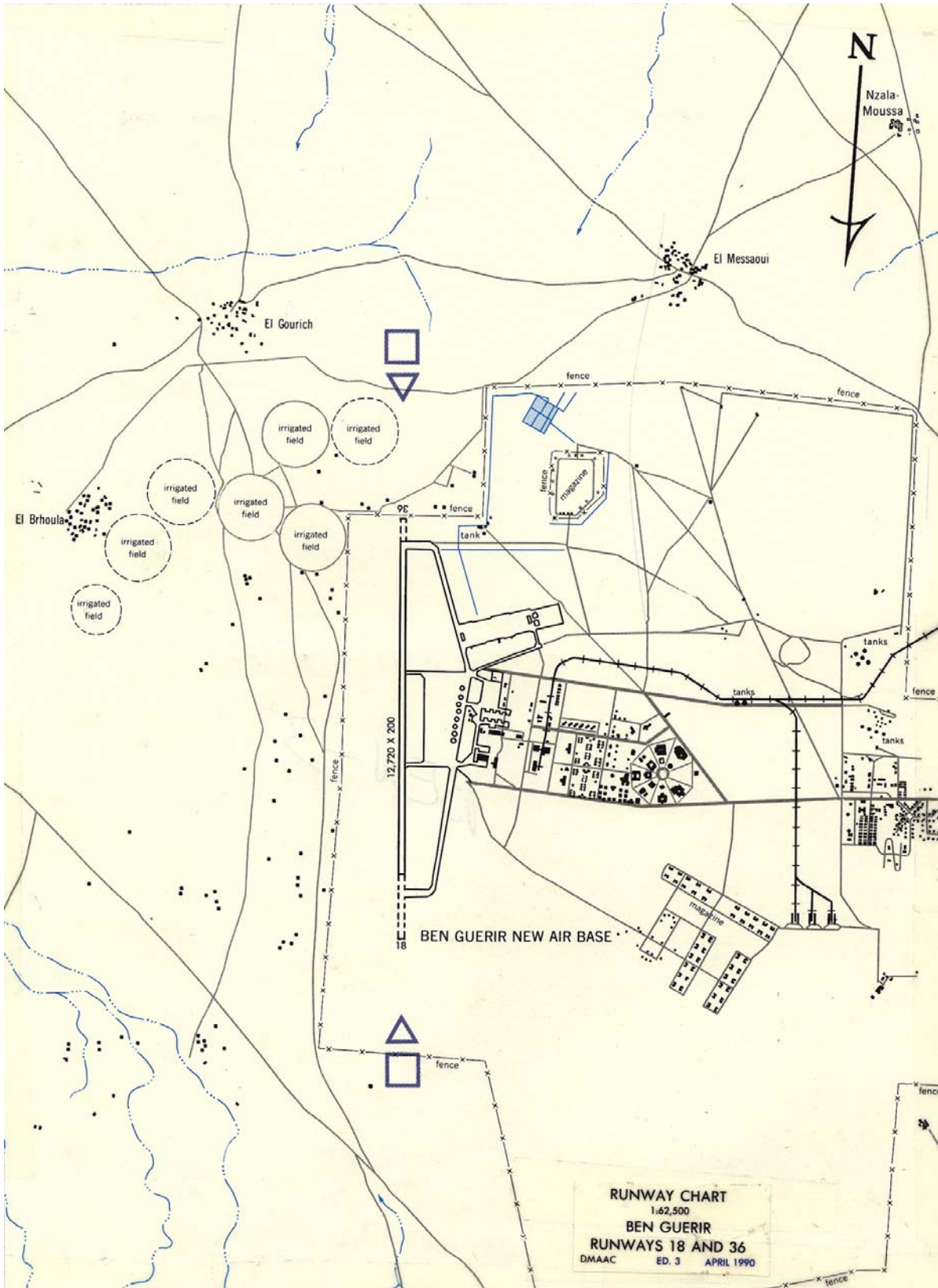
BEN GUERIR
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BEN GUERIR
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BEN GUERIR RWY BEN 36



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BANJUL
BYD

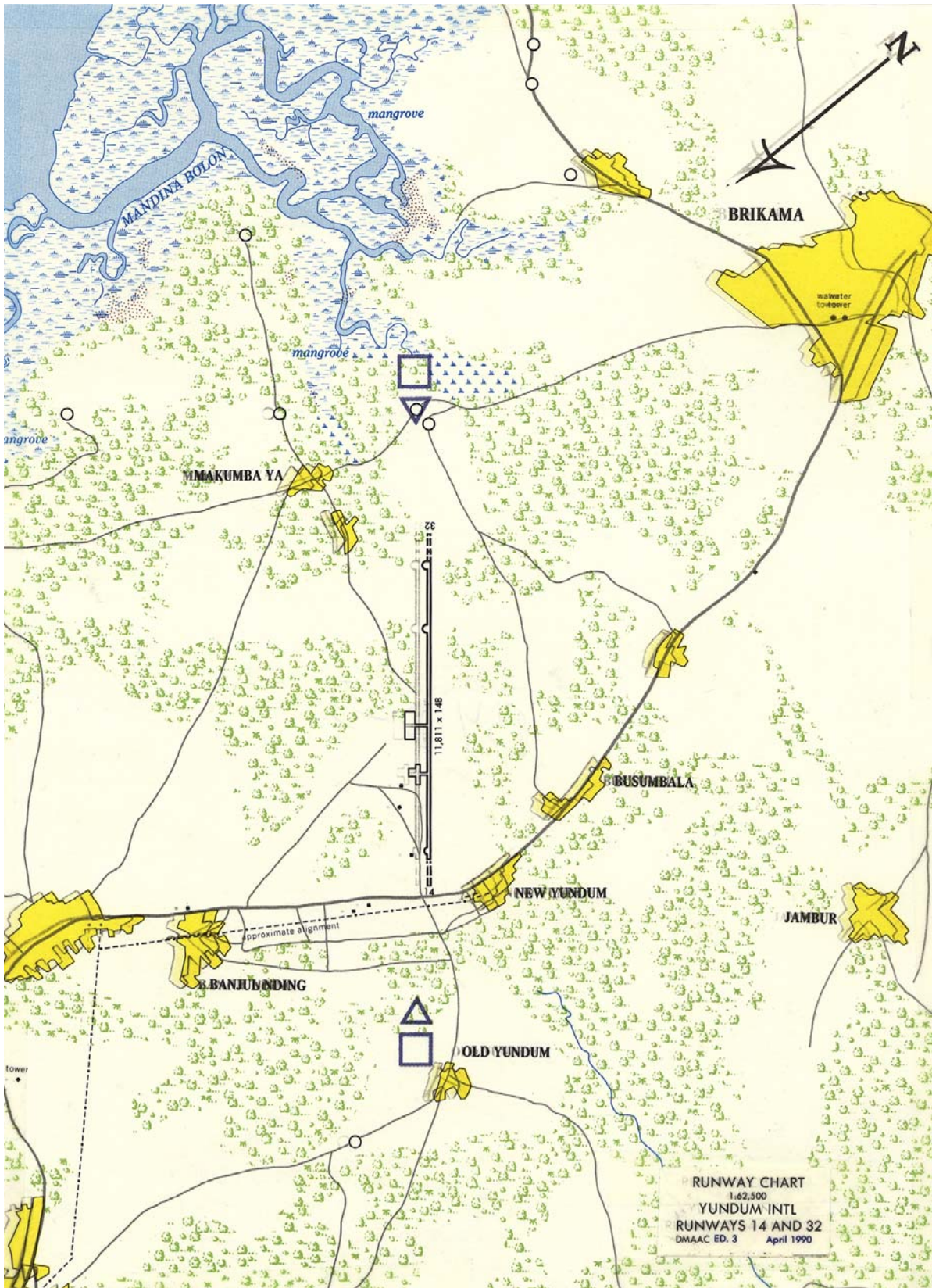
BANJUL
BYD

BANJUL
BYD

BANJUL
BYD

BANJUL
BYD





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BANJUL RWY BYD 14



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BANJUL RWY BYD 32
View 1



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BANJUL RWY BYD 32
View 2



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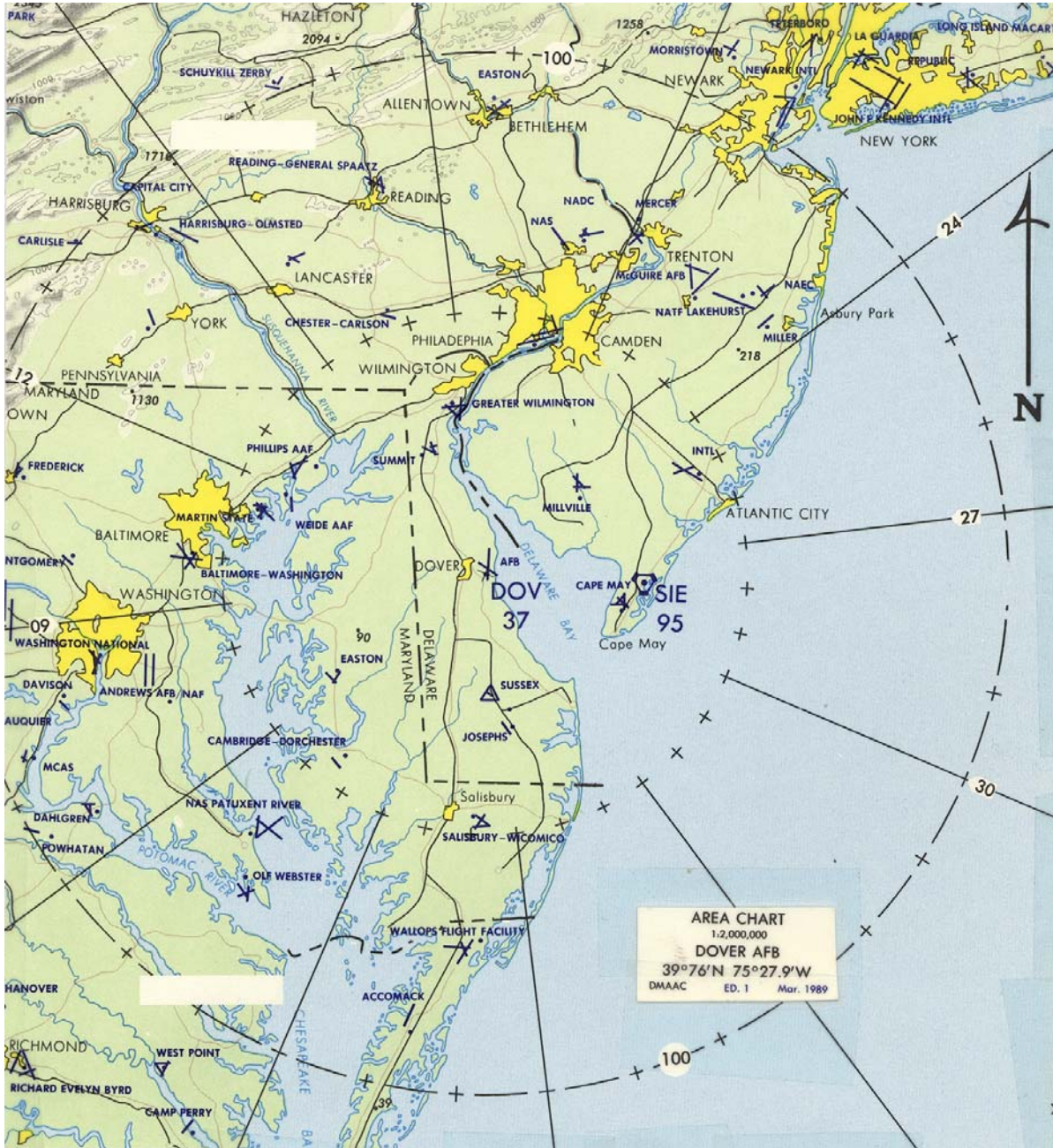
DOVER
DOV

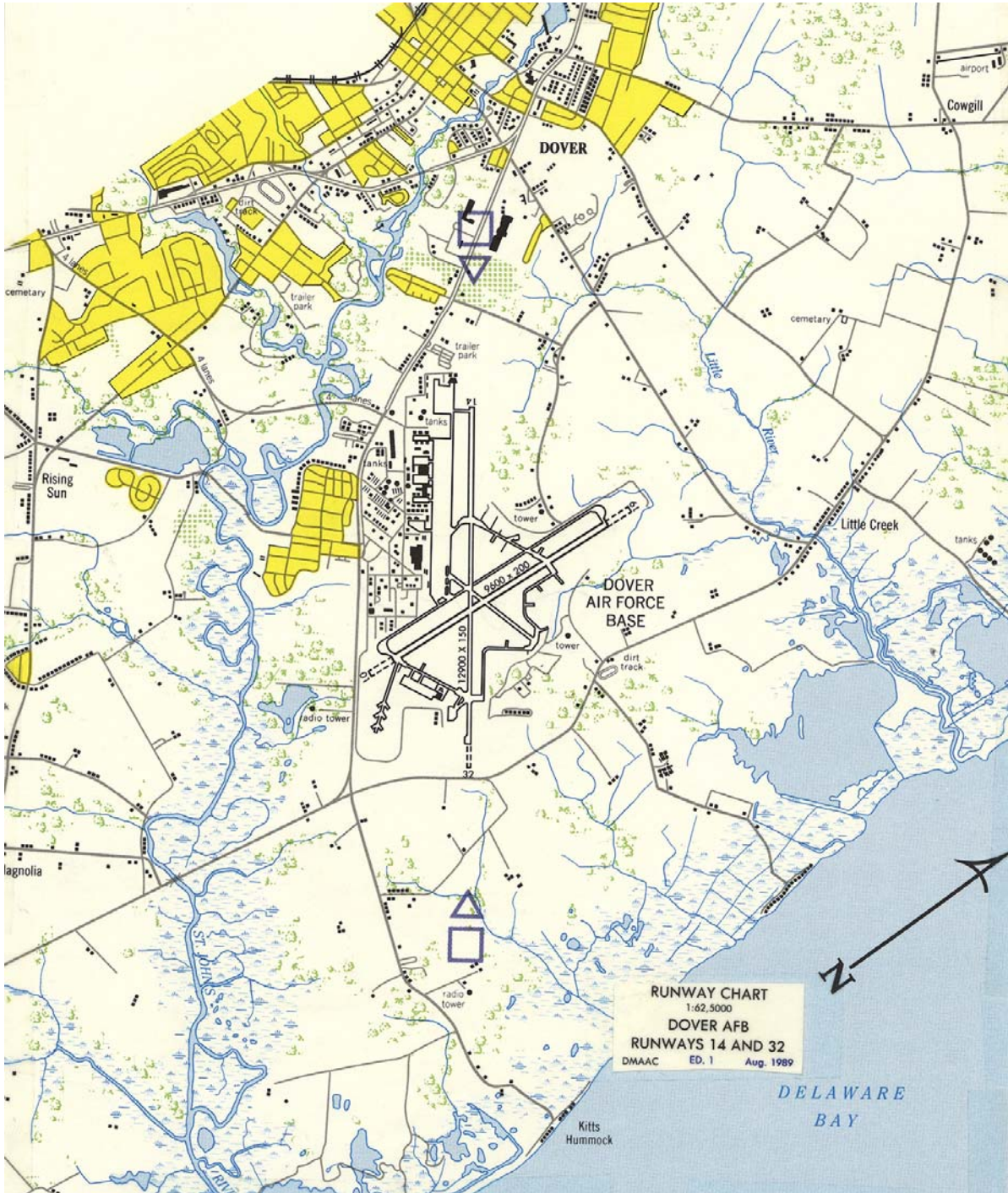
DOVER
DOV

DOVER
DOV

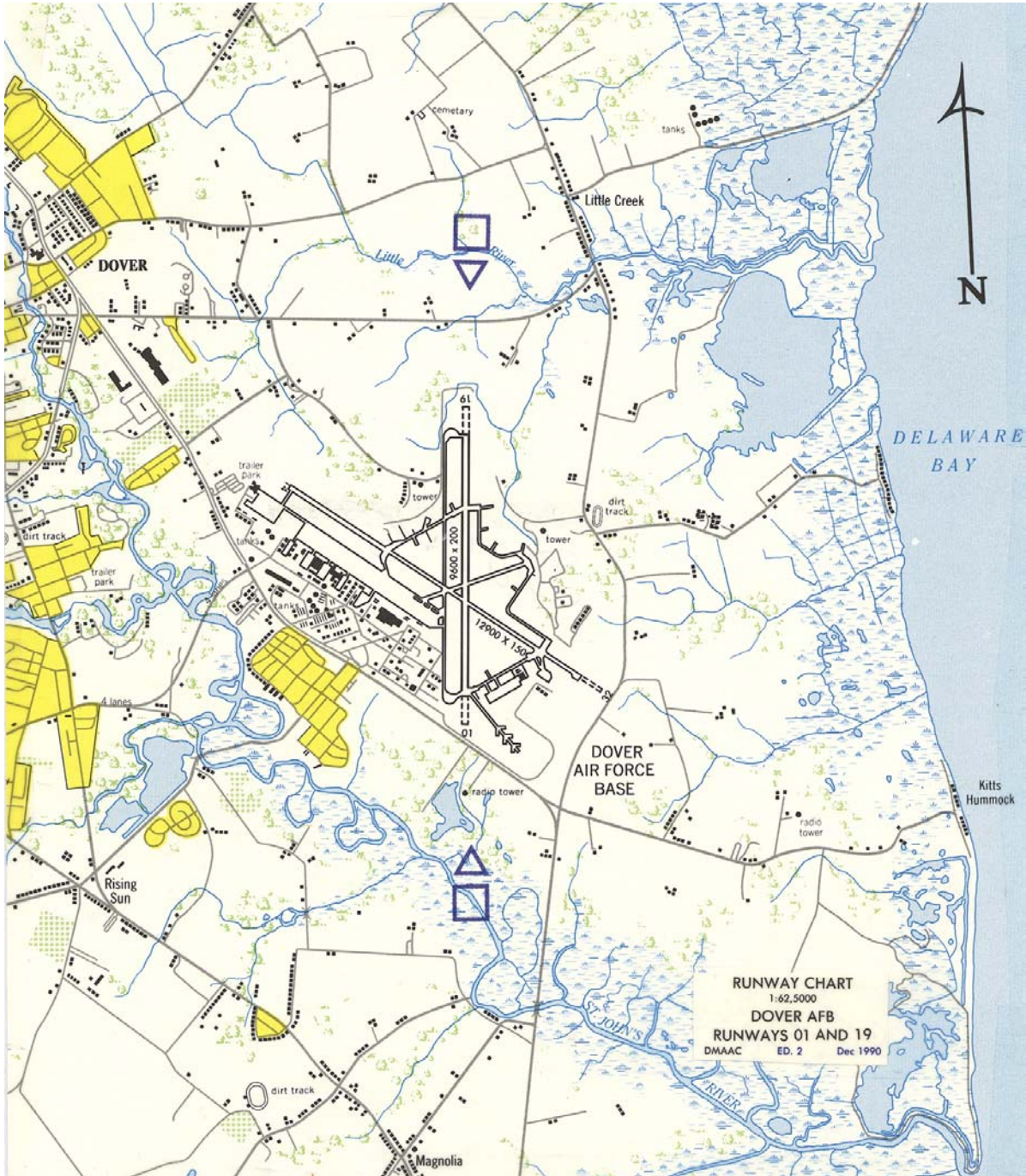
DOVER
DOV

DOVER
DOV





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DOVER RWY DOV 01

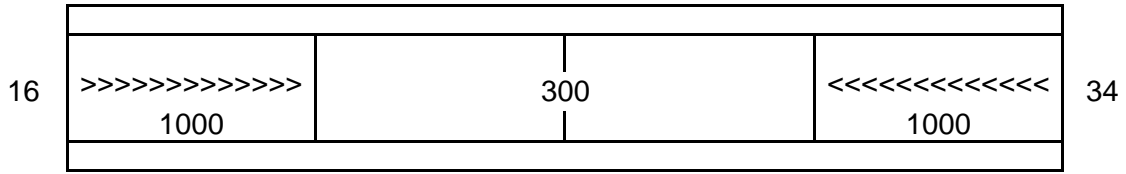


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DOVER RWY DOV 19

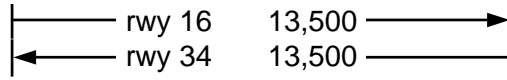


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elev = 1787

elev = 1785



TACAN: ABI-84x (Pri)

MQP-124x (Sec)

I/F above: N:85k E:clear

N:100k E:125k

S:115k W:140k

S:clear W:clear

MLS: none

PAPI: none

Ball Bar: none

UHF: yes (guard only)

DYESS
DYS

DYESS
DYS

DYESS
DYS

DYESS
DYS

DYESS
DYS

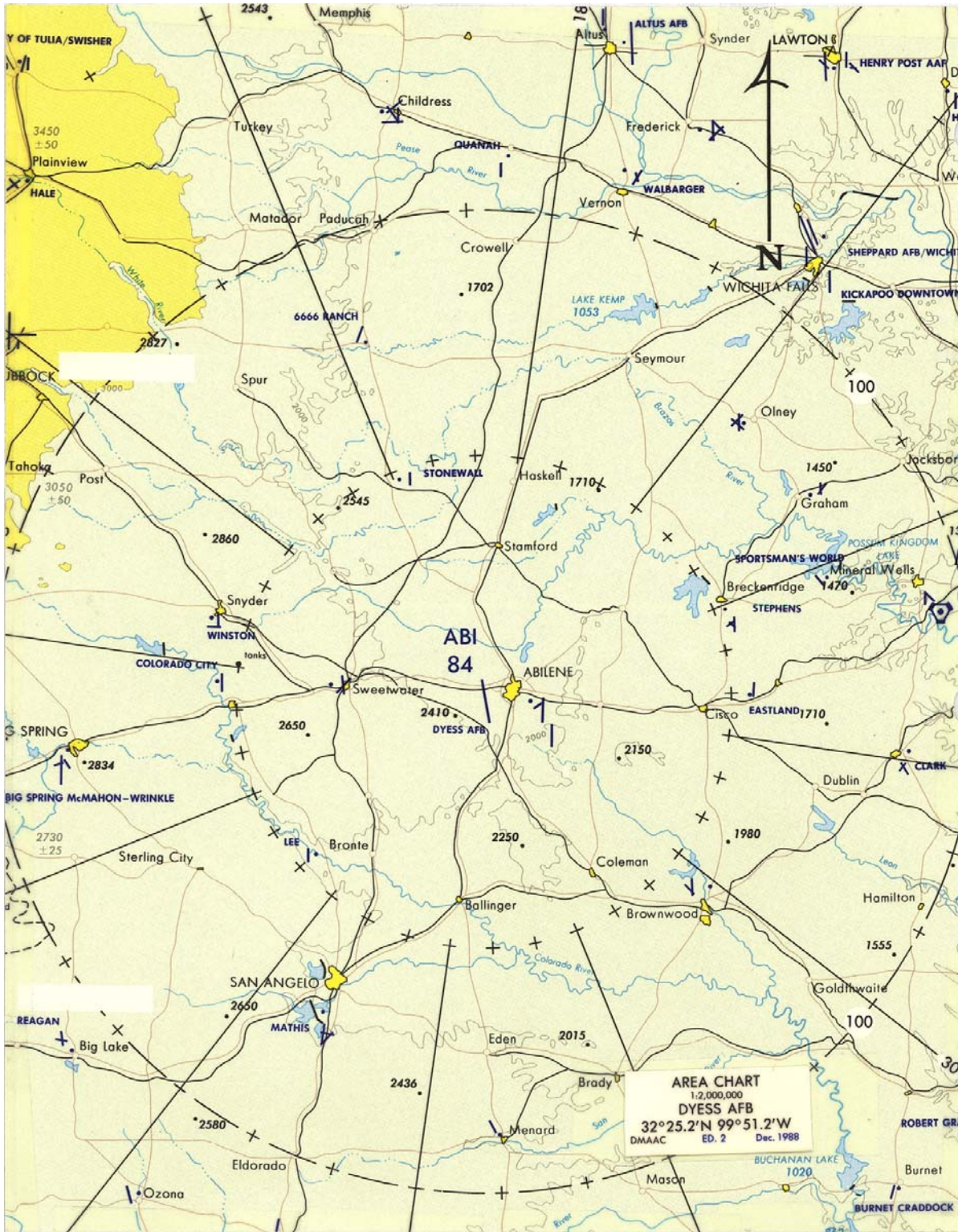
DYESS
DYS

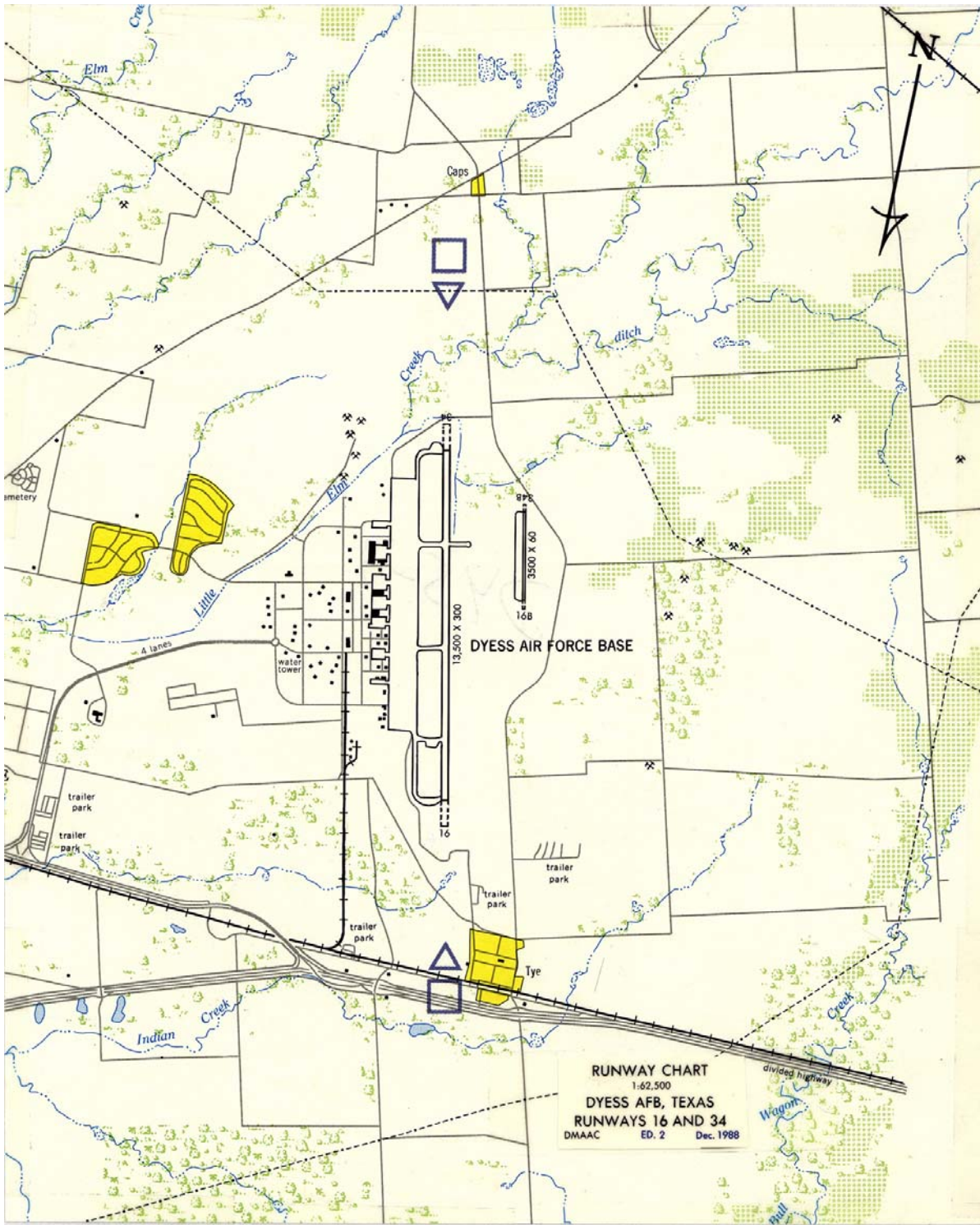
DYESS
DYS

DYESS
DYS

DYESS
DYS

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ELMENDORF
EDF

ELMENDORF
EDF

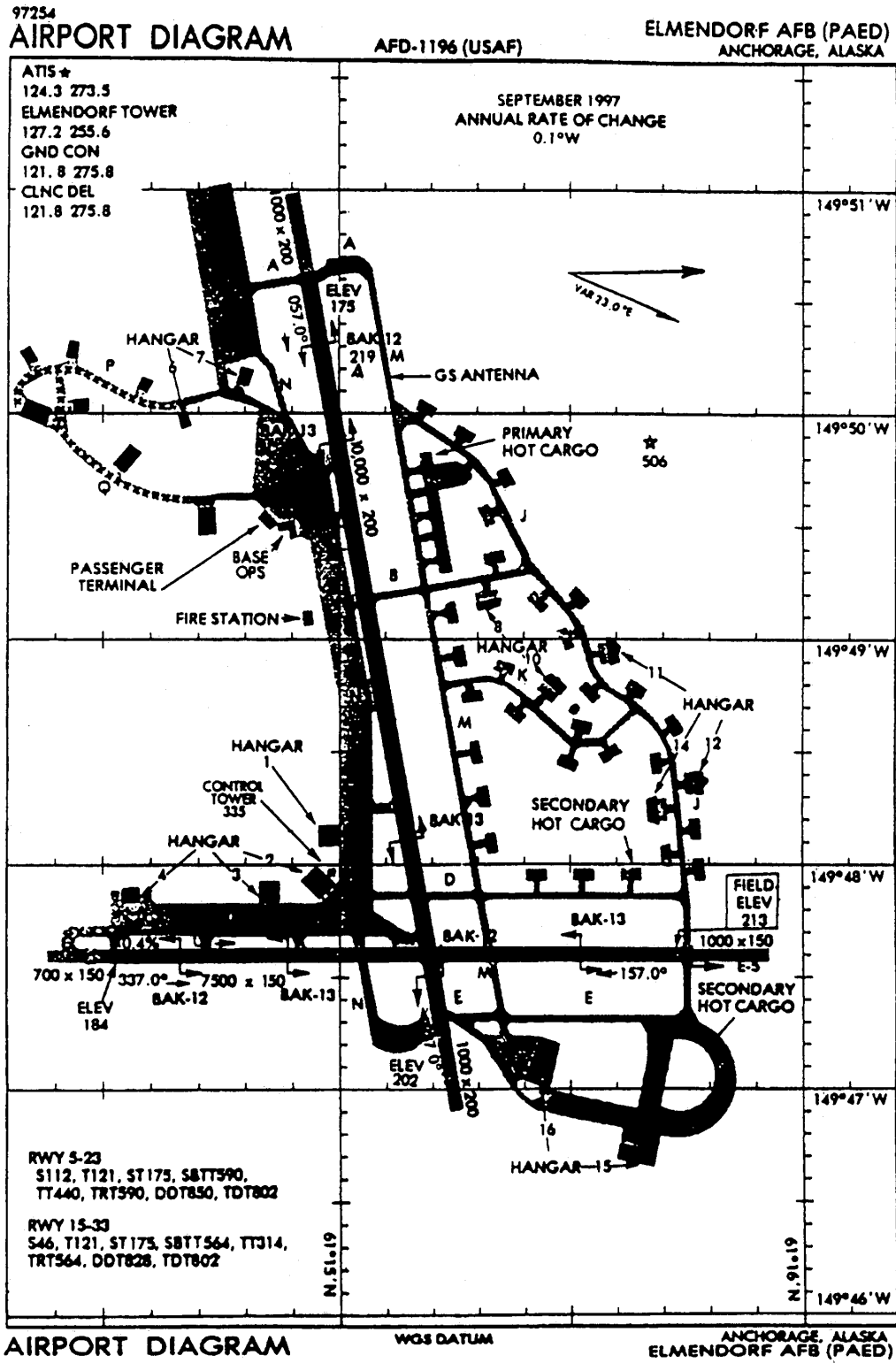
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ELMENDORF AIRPORT DIAGRAM



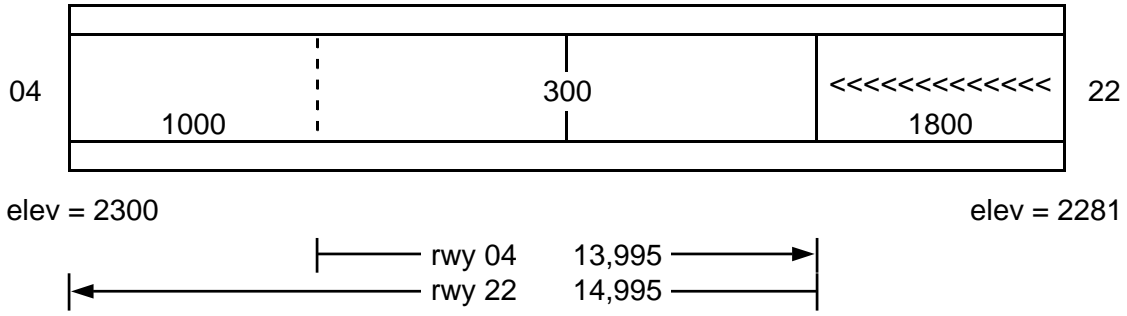
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ELMENDORF RWY EDF 05



ELMENDORF RWY EDF 05





TACAN: EDW-111x (Pri) LHS-21x (Sec)
I/F above: N:140k E:125k N:80k E:95k
 S:clear W:clear S:clear W:90k

MLS: (22-Sr) ch 8; 4 Jrs, ch 6*
PAPI: 22, all others**
Ball Bar: 22, all others**
UHF: yes

NOTE

All rwys have painted aim points at 6500 ft and 7500 ft except rwy 05R, which has only 6500-ft aim point

Rwy 35R not in onboard software but can be uplinked in OPS 3

Rwy 22 has no usable overrun

* Four trailer-mounted MLS-Jrs available for installation on rwys 04, 15, 17, 22, and 23. Ch 6 used for all lakebed rwys. If installed on rwy 22, ch 8 used

** With 24-hr notice, PAPI and Ball Bar lights can be moved and configured to meet mission requirements

EDWARDS
EDW

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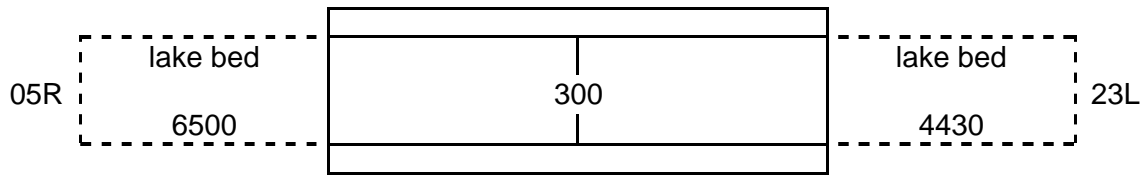
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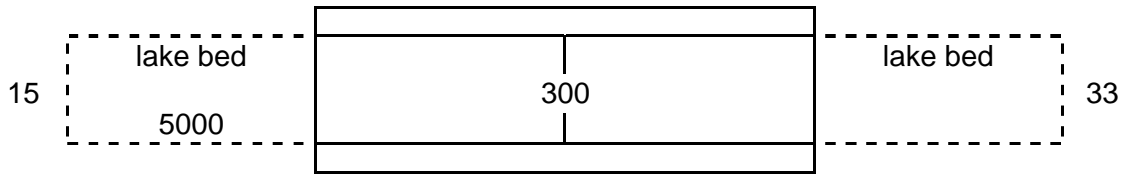
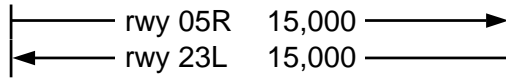
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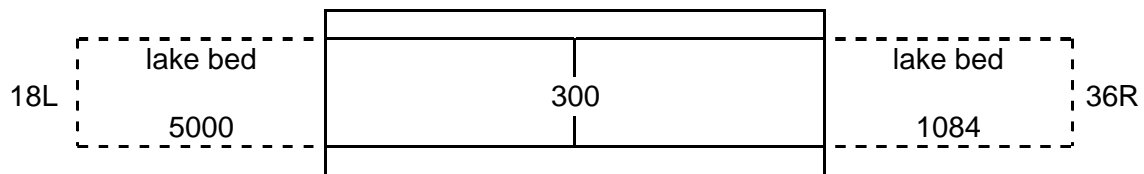
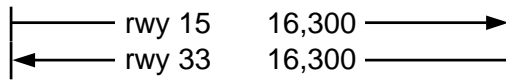
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elev = 2270



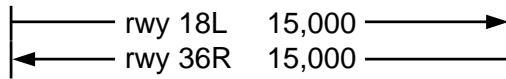
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elev = 2270



elev = 2269

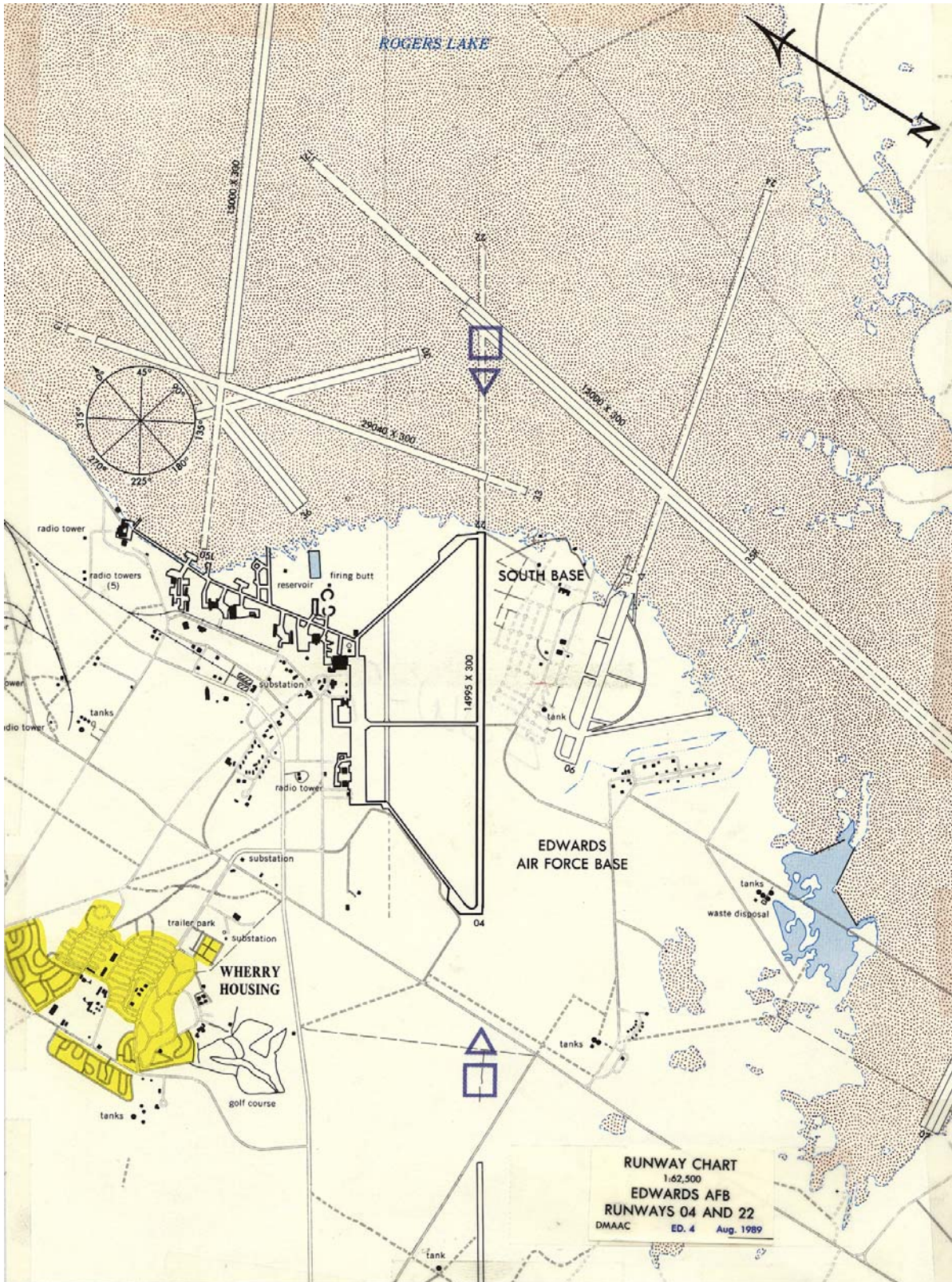
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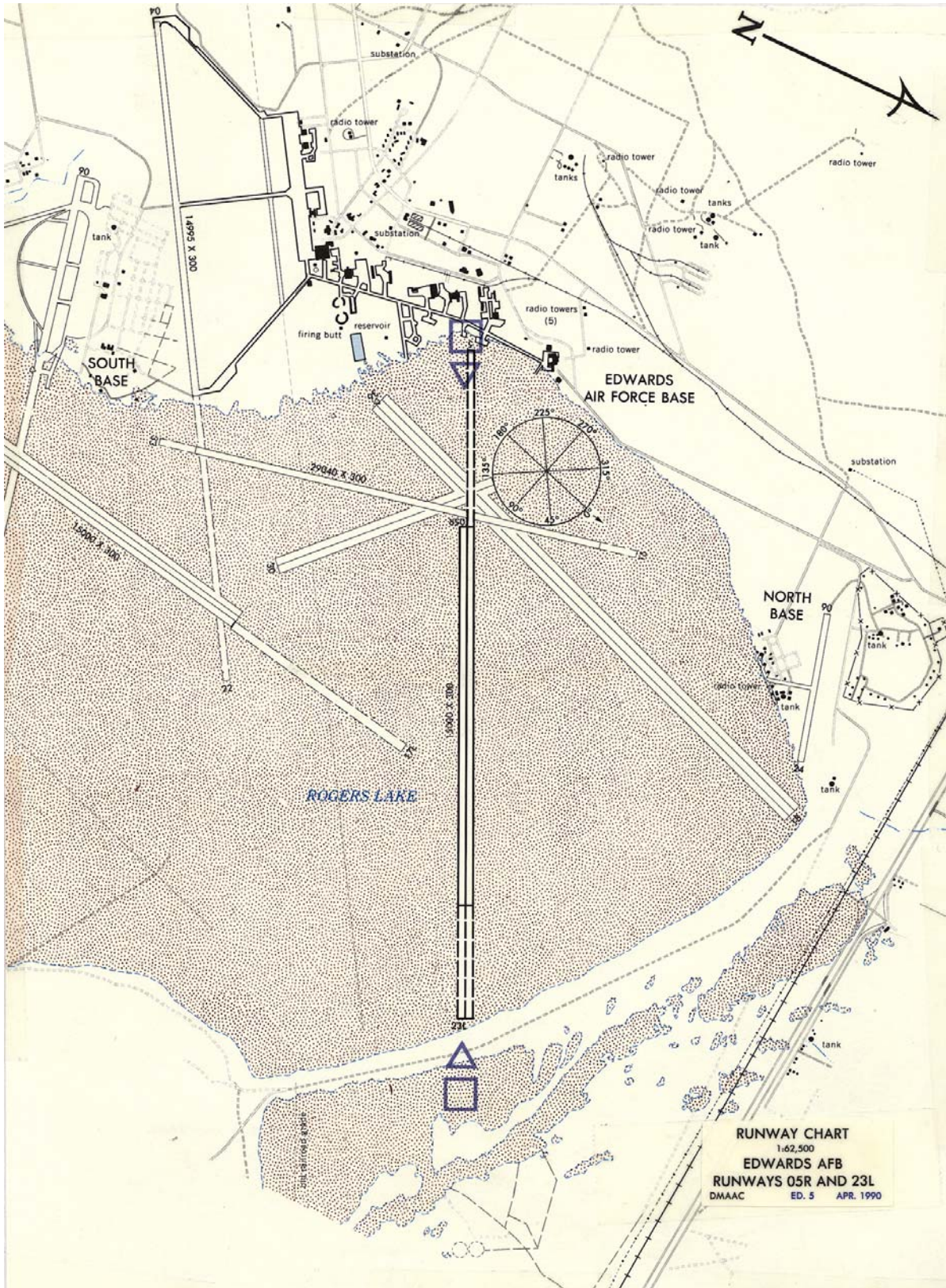
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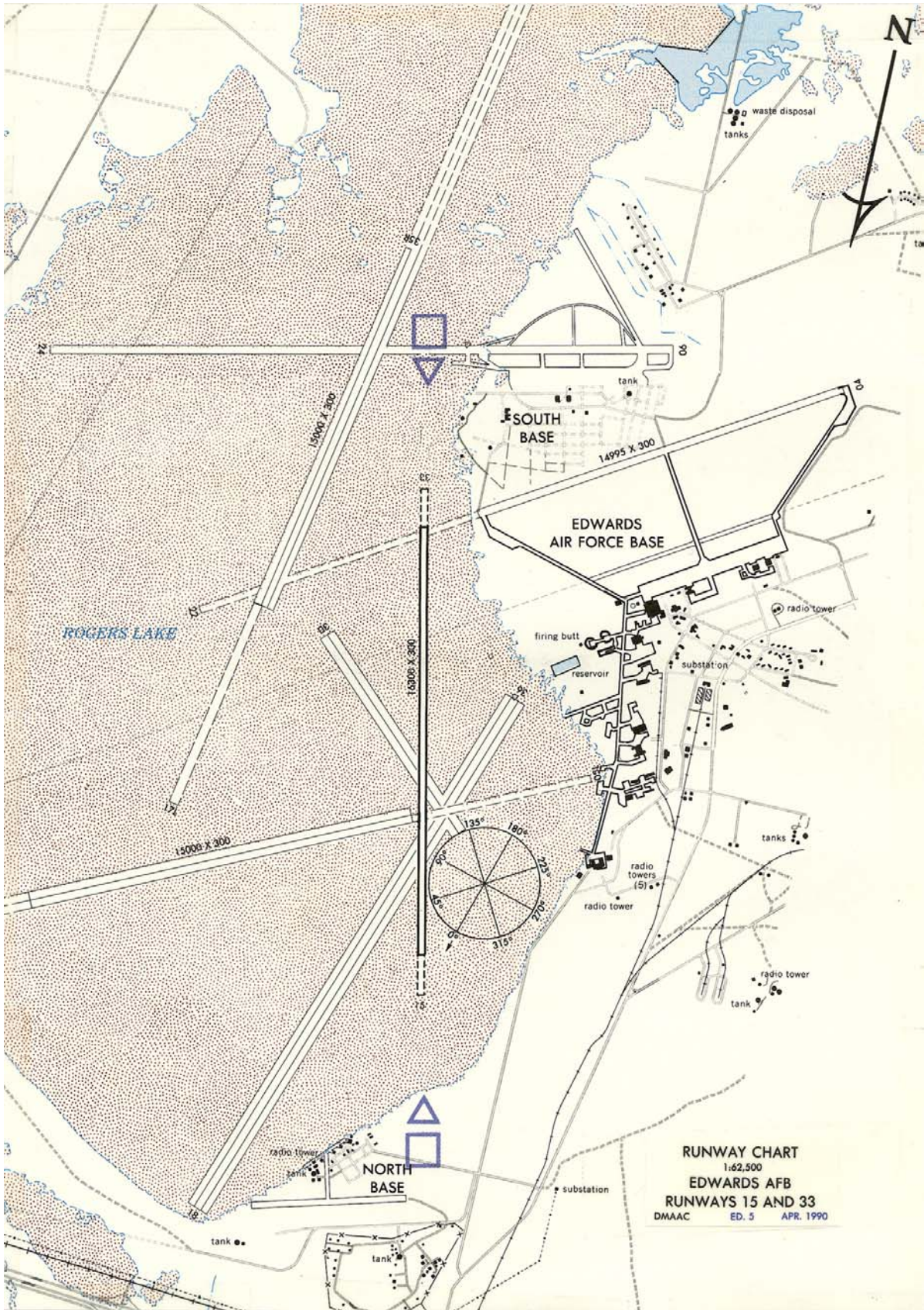
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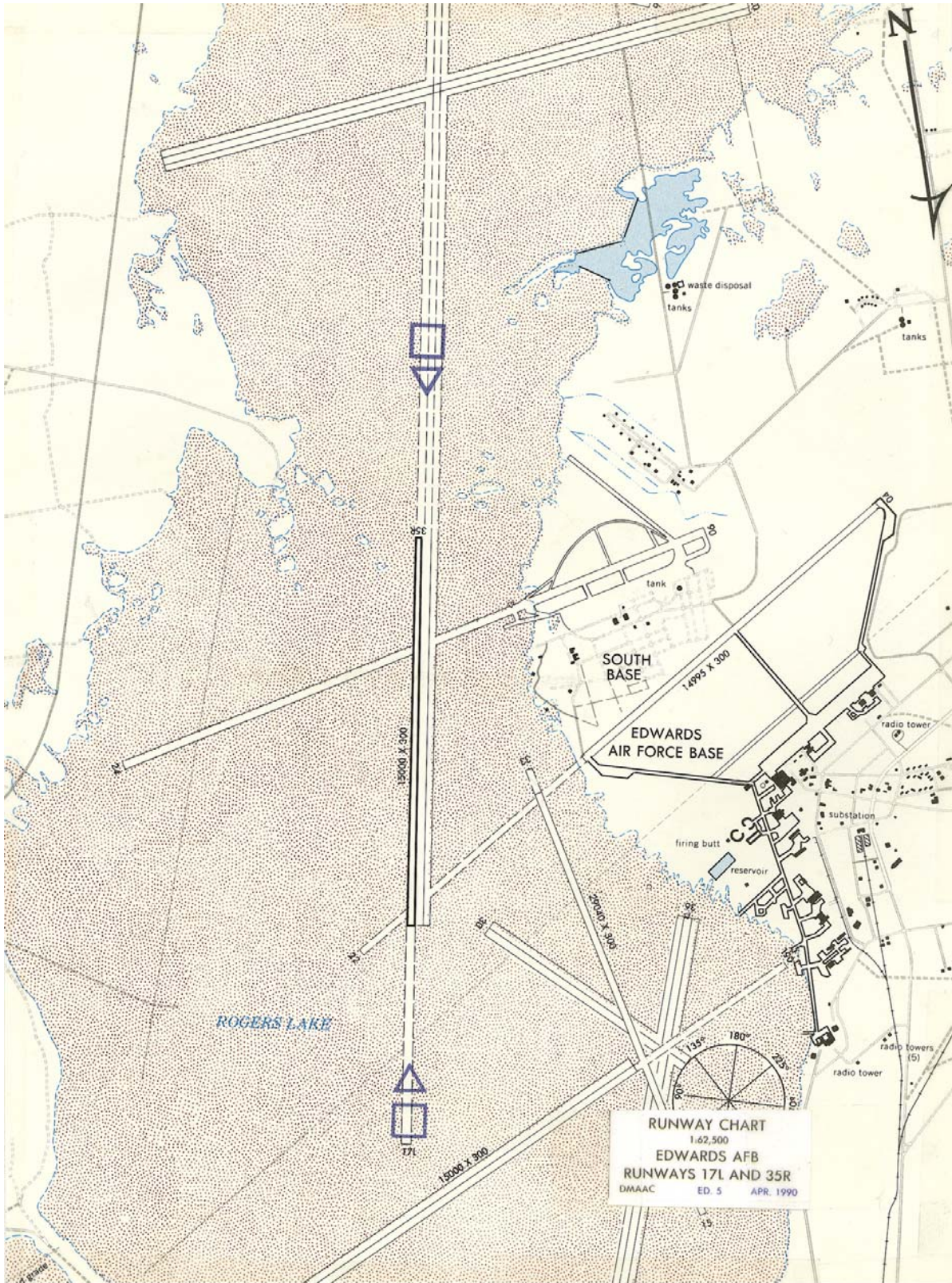
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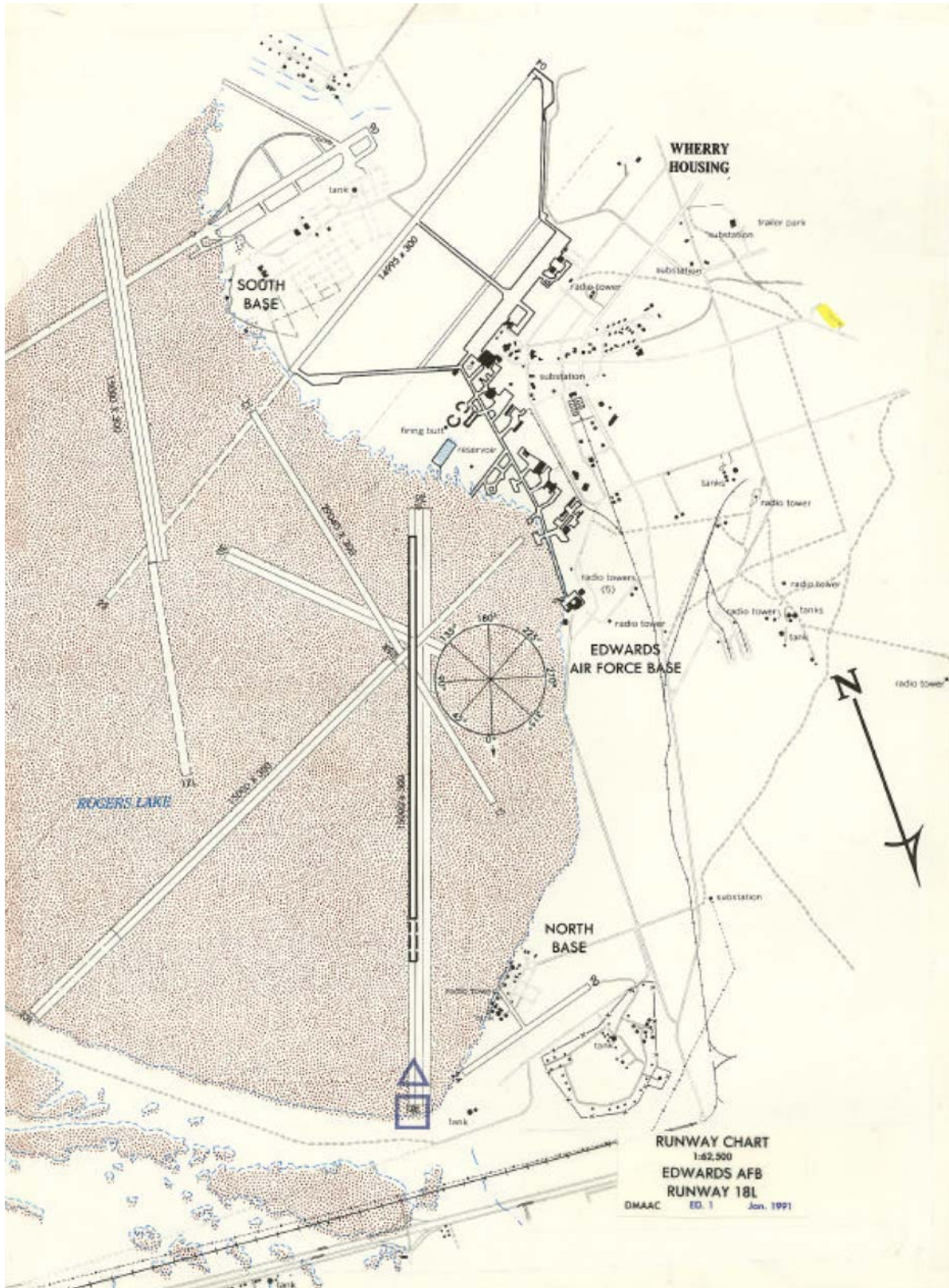
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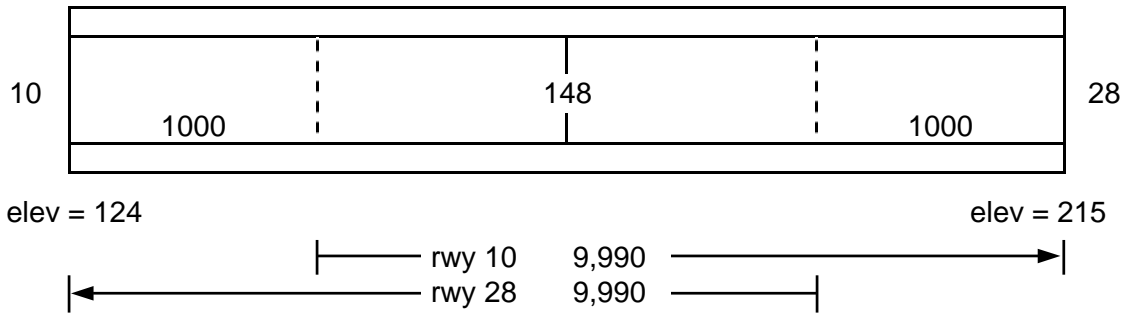


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Mataverí International, Easter Island (Chile)

Table Identifier

EIP



TACAN: IPA-118x (Pri-DME)
I/F above: N:clear E:clear
S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: none

MATAVERI
EIP

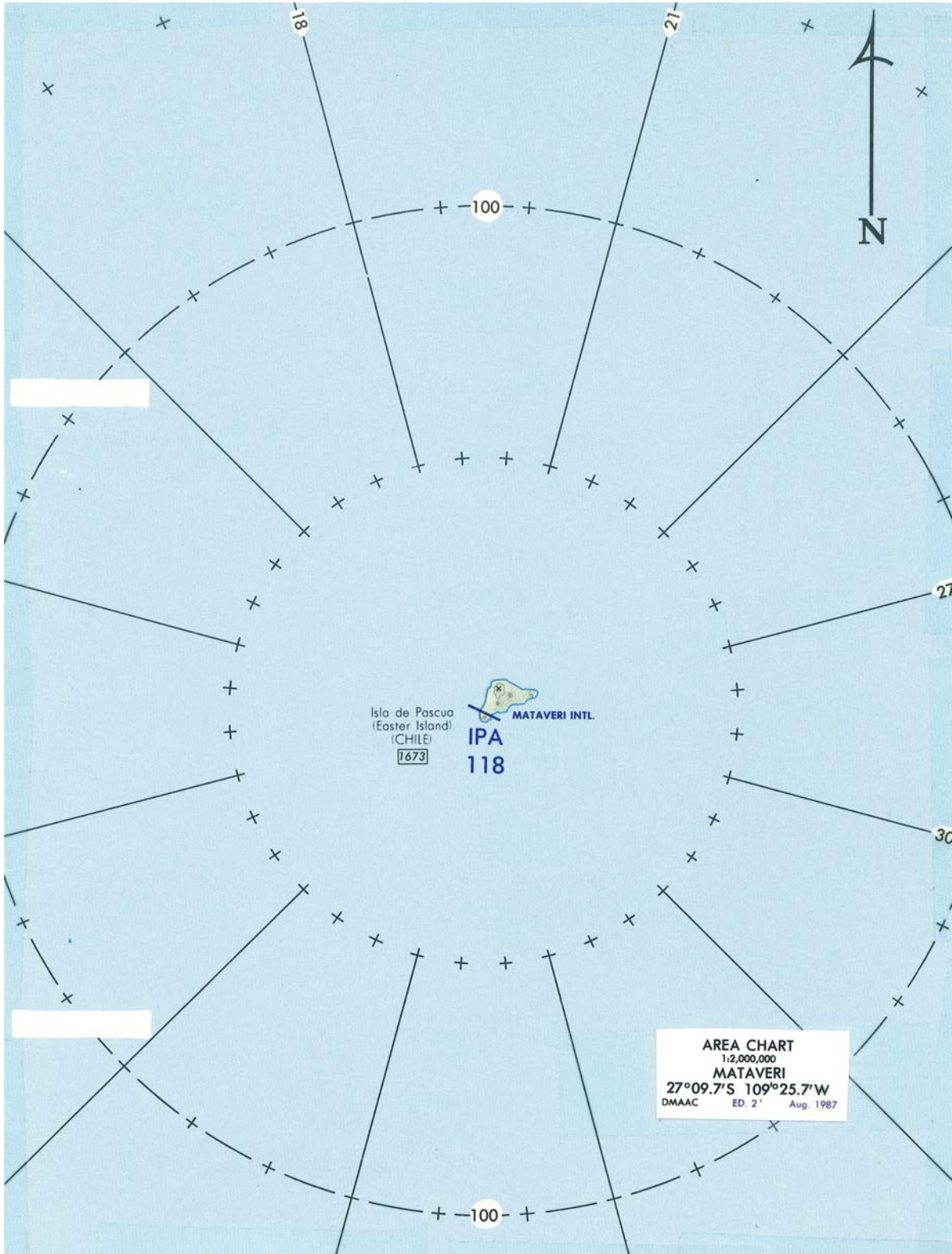
MATAVERI
EIP

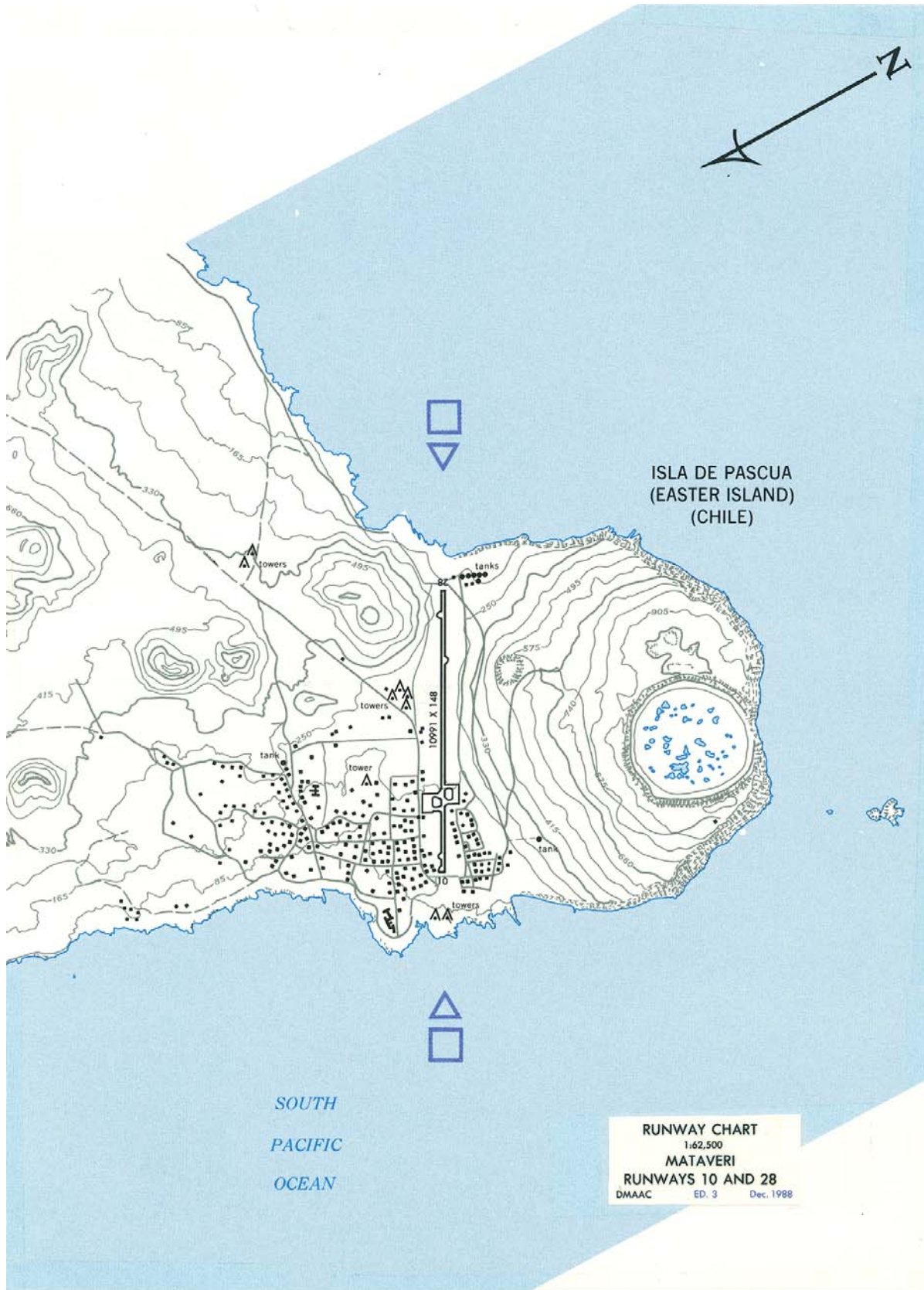
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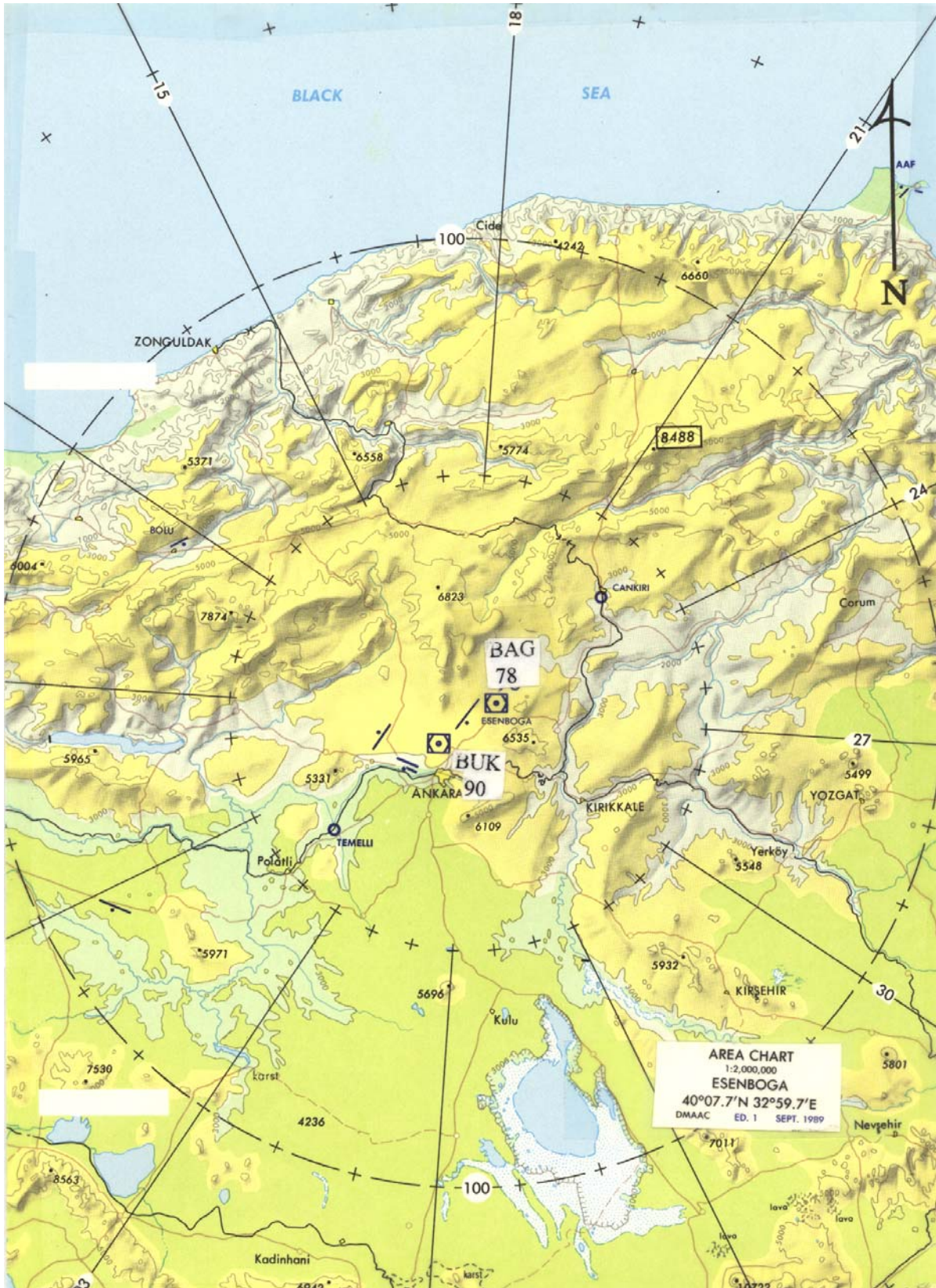
ESENBOGA
ESN

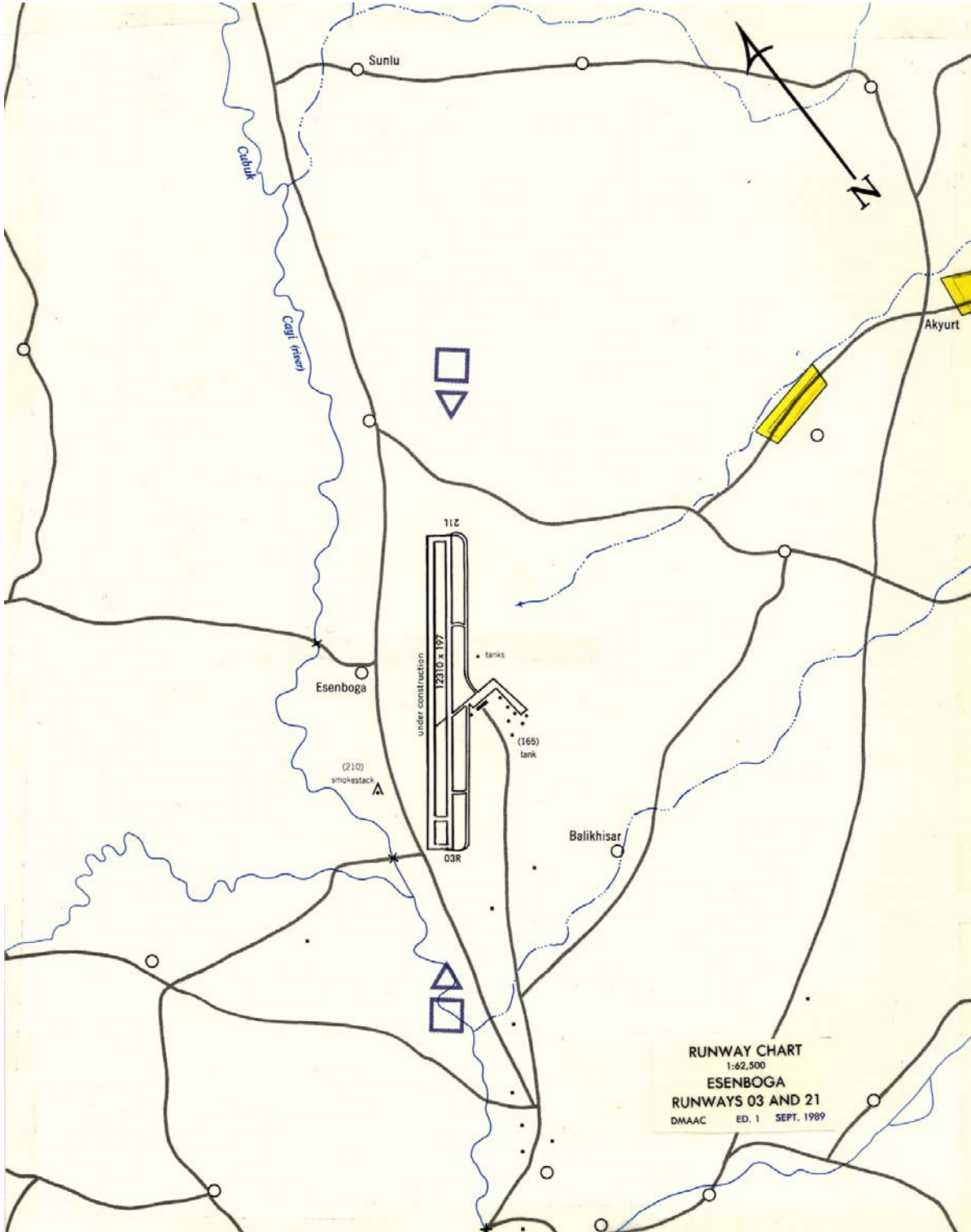
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ESN

ESENBOGA
ESN

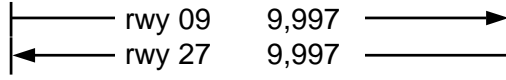
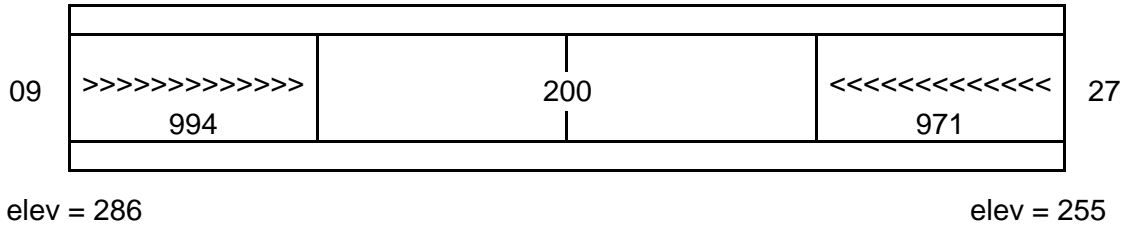
ESENBOGA
ESN

ESENBOGA
ESN





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TACAN: BZN-56x (Pri)
I/F above: N:clear E:clear
 S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

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FFA

FAIRFORD
FFA

FAIRFORD
FFA

FAIRFORD
FFA

FAIRFORD
FFA

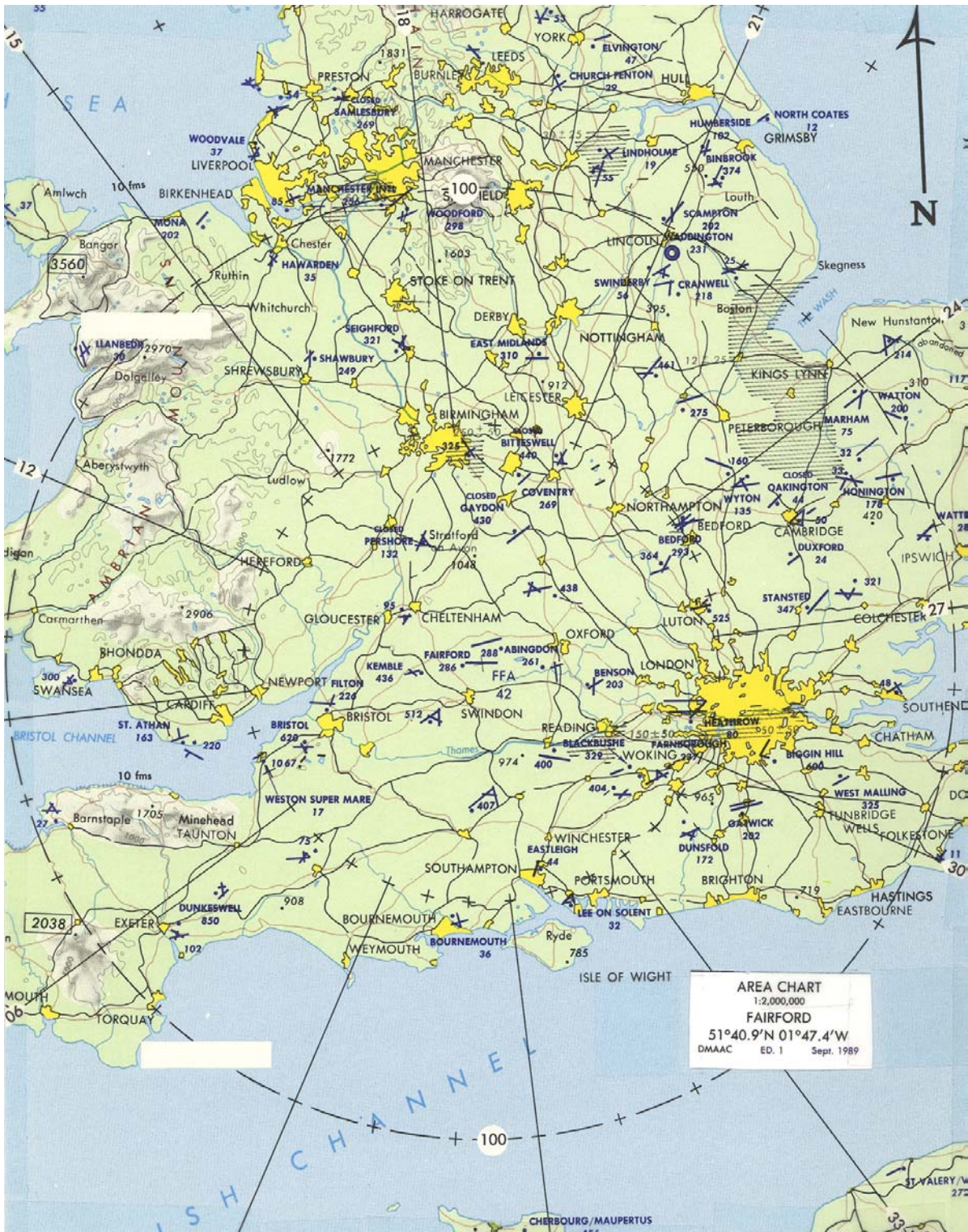
FAIRFORD
FFA

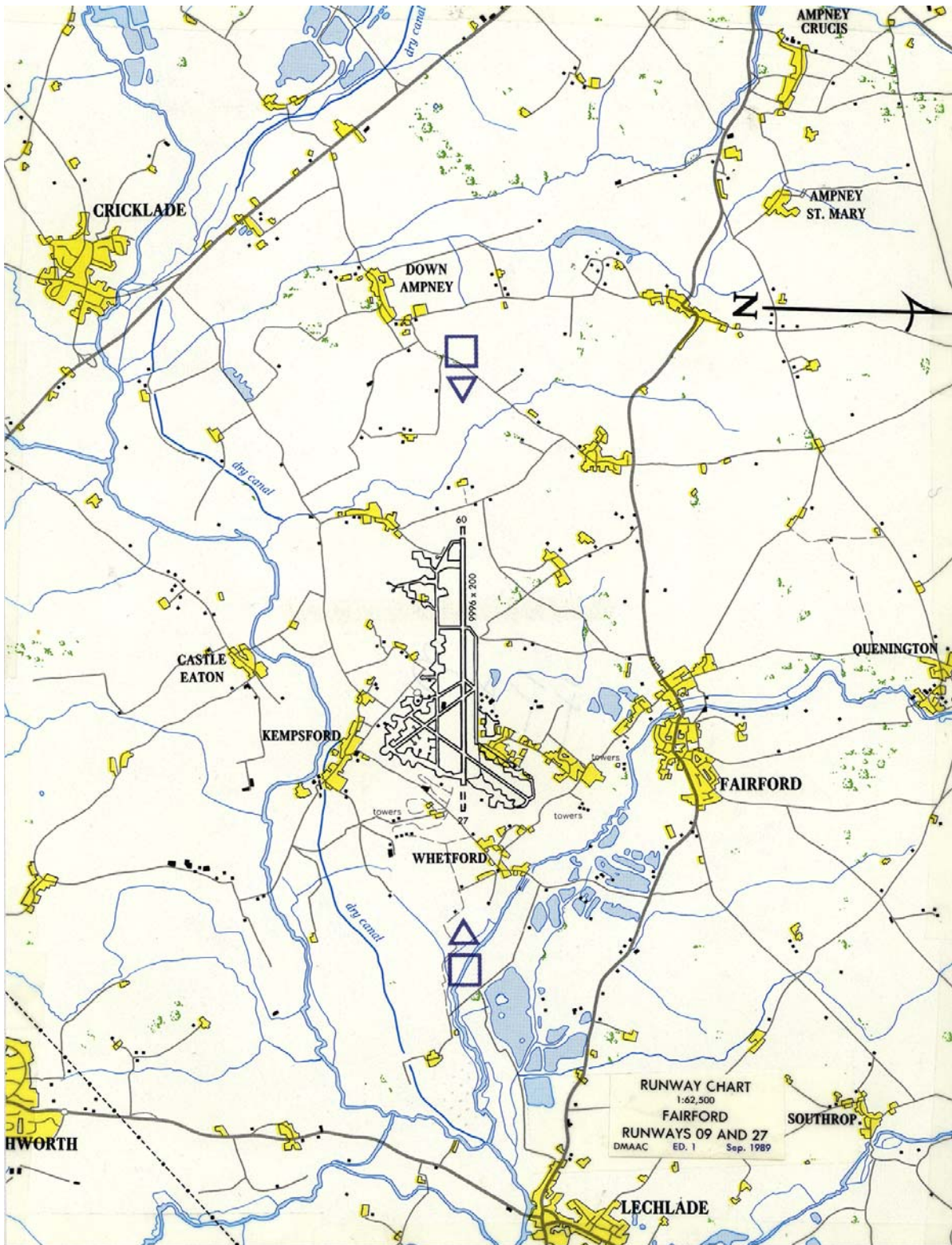
FAIRFORD
FFA

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FAIRFORD
FFA





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OTIS
FMH

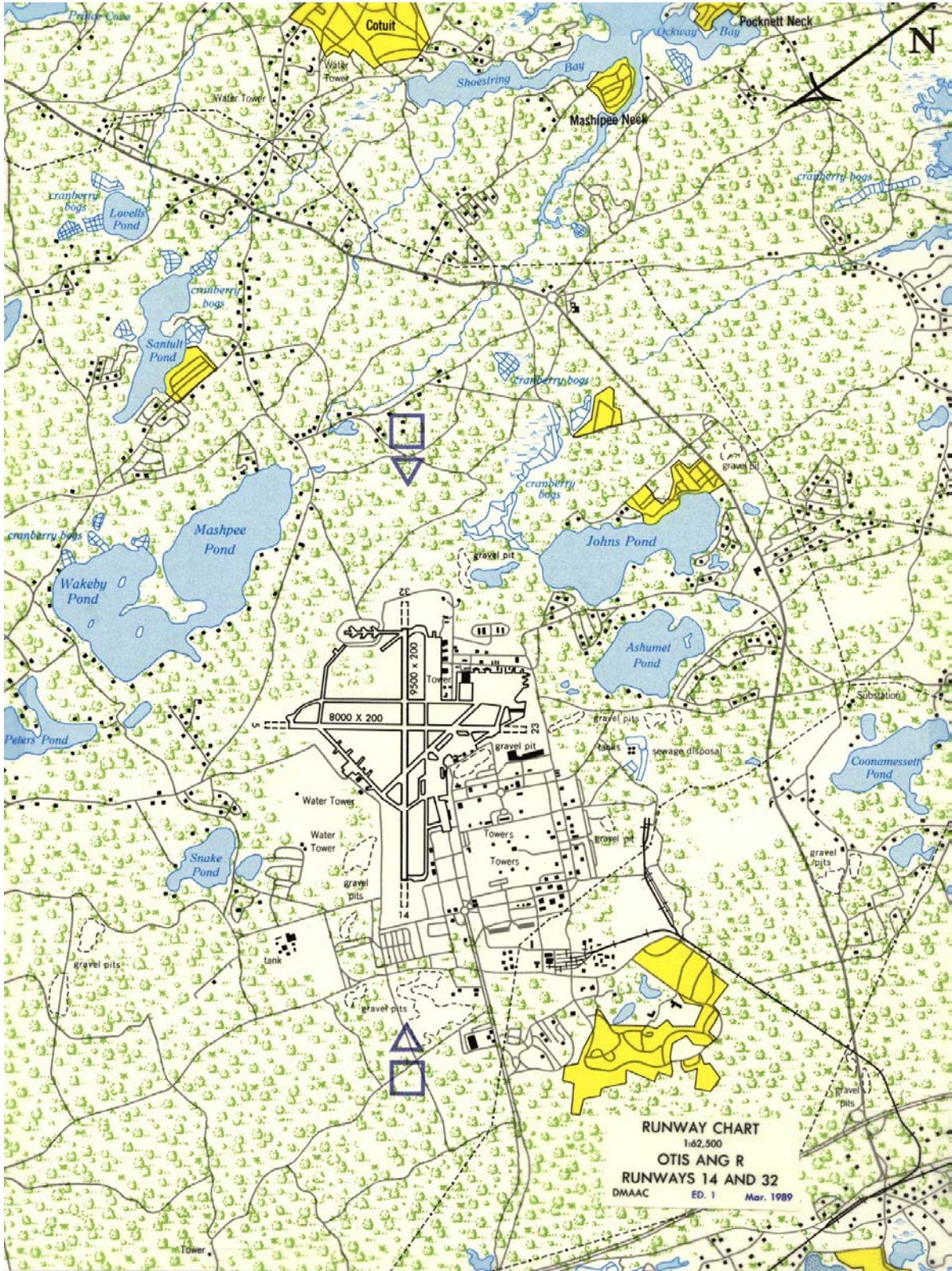
OTIS
FMH

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FMH

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FMH





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OTIS RWY FMH-14



FMH-A

MAPS/ALL/GEN F

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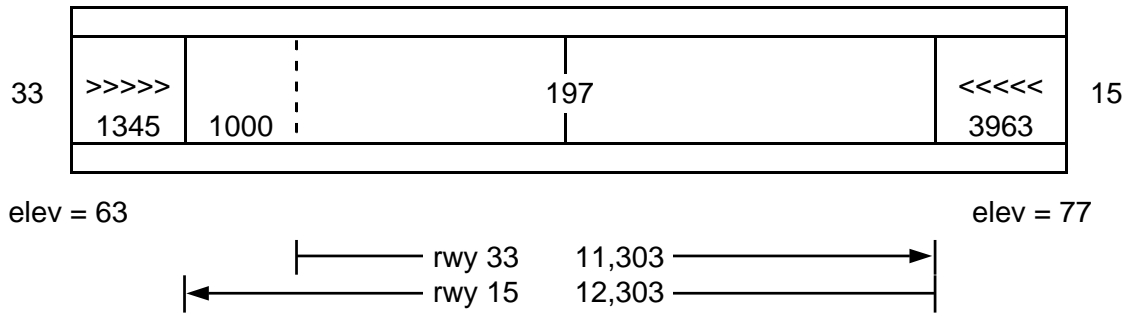
OTIS RWY FMH-32



FMH-C

MAPS/ALL/GEN F

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TACAN: NIM-53x (Pri) ITR-104x (Sec)
I/F above: N:clear E:127k N:85k E:105k
 S:150k W:clear S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

NOTE

Underrun for FMI 33 unusable

Underrun for FMI 15 unlit

Previous site identifier was ITR

ISTRES
FMI

ISTRES
FMI

ISTRES
FMI

ISTRES
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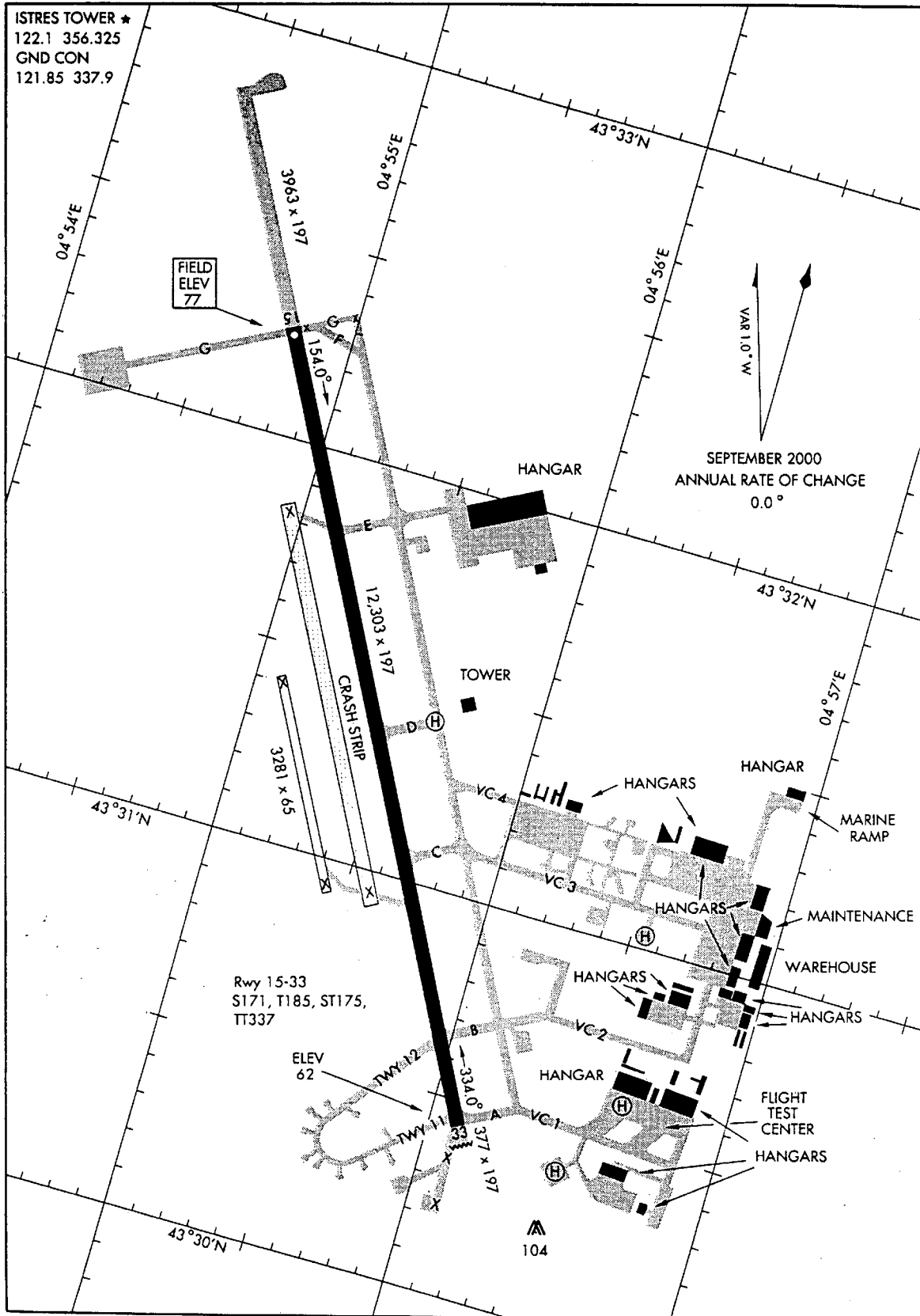
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LE TUBE AIRPORT DIAGRAM

AIRPORT DIAGRAM

102
[USAF] AFD-1936 [FAF]

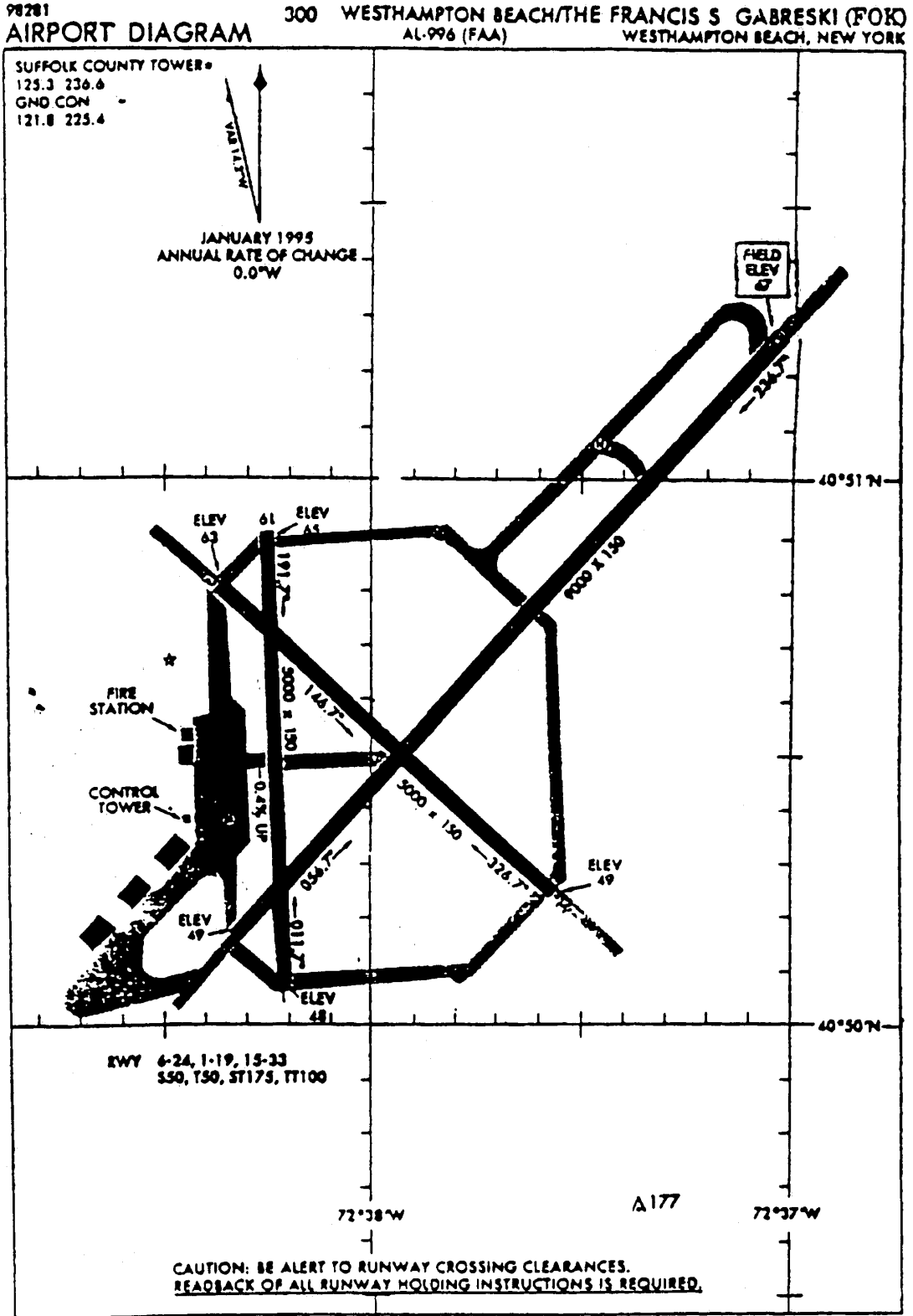
LE TUBE (LFMI)
ISTRES, FRANCE



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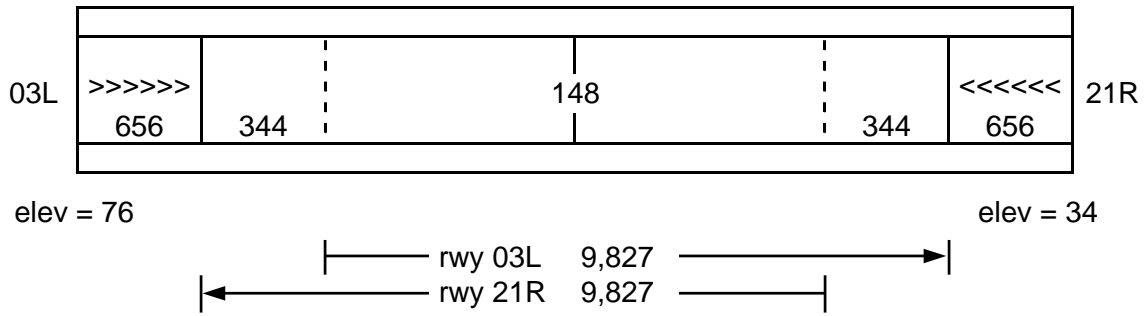
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FRANCIS S. GABRESKI AIRPORT DIAGRAM



AIRPORT DIAGRAM WESTHAMPTON BEACH, NEW YORK
 98281 WESTHAMPTON BEACH/THE FRANCIS S GABRESKI (FOK)

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TACAN: TGN-103x (Pri)
I/F above: N:clear E:clear
 S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

WARNING

Expect headwinds gusting 20 to 30 kt. Expect wind shear at 5000 ft where wind changes from northwesterly to 030

Terrain off end of rwys 03 L/R is hazardous

NOTE

Both rwys suitable. Plan on 03R because it has runway remaining markers and less traffic. Both rwys have 25-ft shoulders

LAS PALMAS
GDV

LAS PALMAS
GDV

LAS PALMAS
GDV

LAS PALMAS
GDV

LAS PALMAS
GDV

LAS PALMAS
GDV

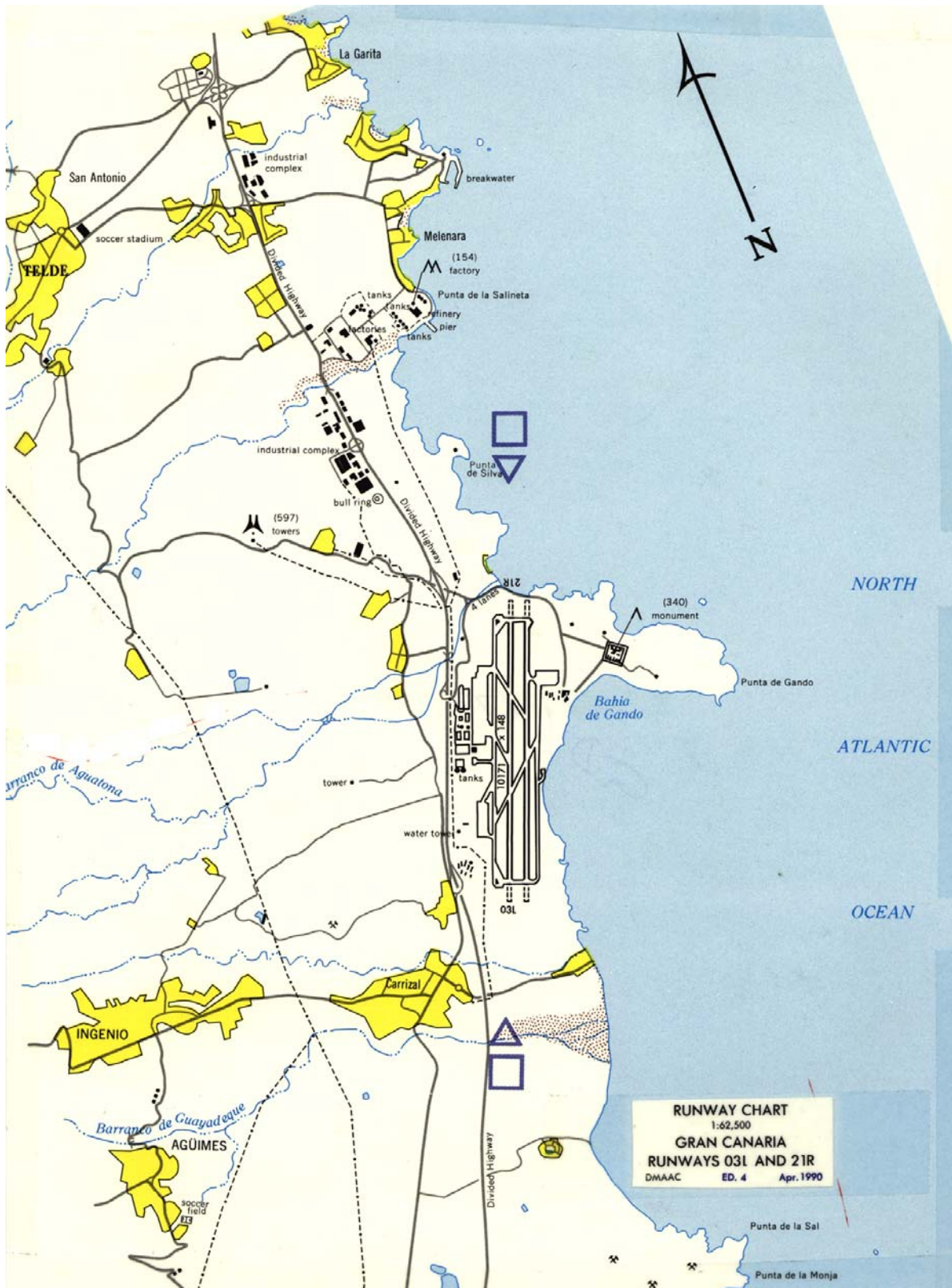
LAS PALMAS
GDV

LAS PALMAS
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LAS PALMAS
GDV

LAS PALMAS
GDV



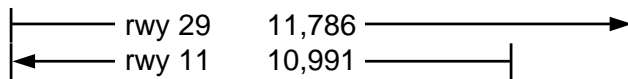
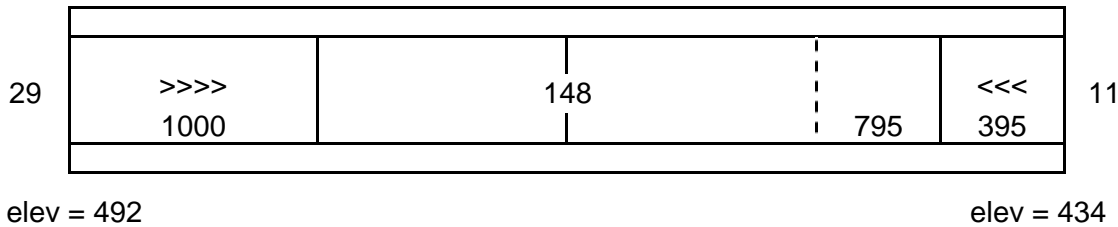


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LAS PALMAS RWY GDV 03L



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TACAN: RKL-20x (Pri) SUD-28x (Sec)
I/F above: N:clear E:clear N:clear E:clear
 S:clear W:clear S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

NOTE
 Previous site identifier was SUD
 This site usable only with 6 months prior notice

SOUDA
GSA

SOUDA
GSA

SOUDA
GSA

SOUDA
GSA

SOUDA
GSA

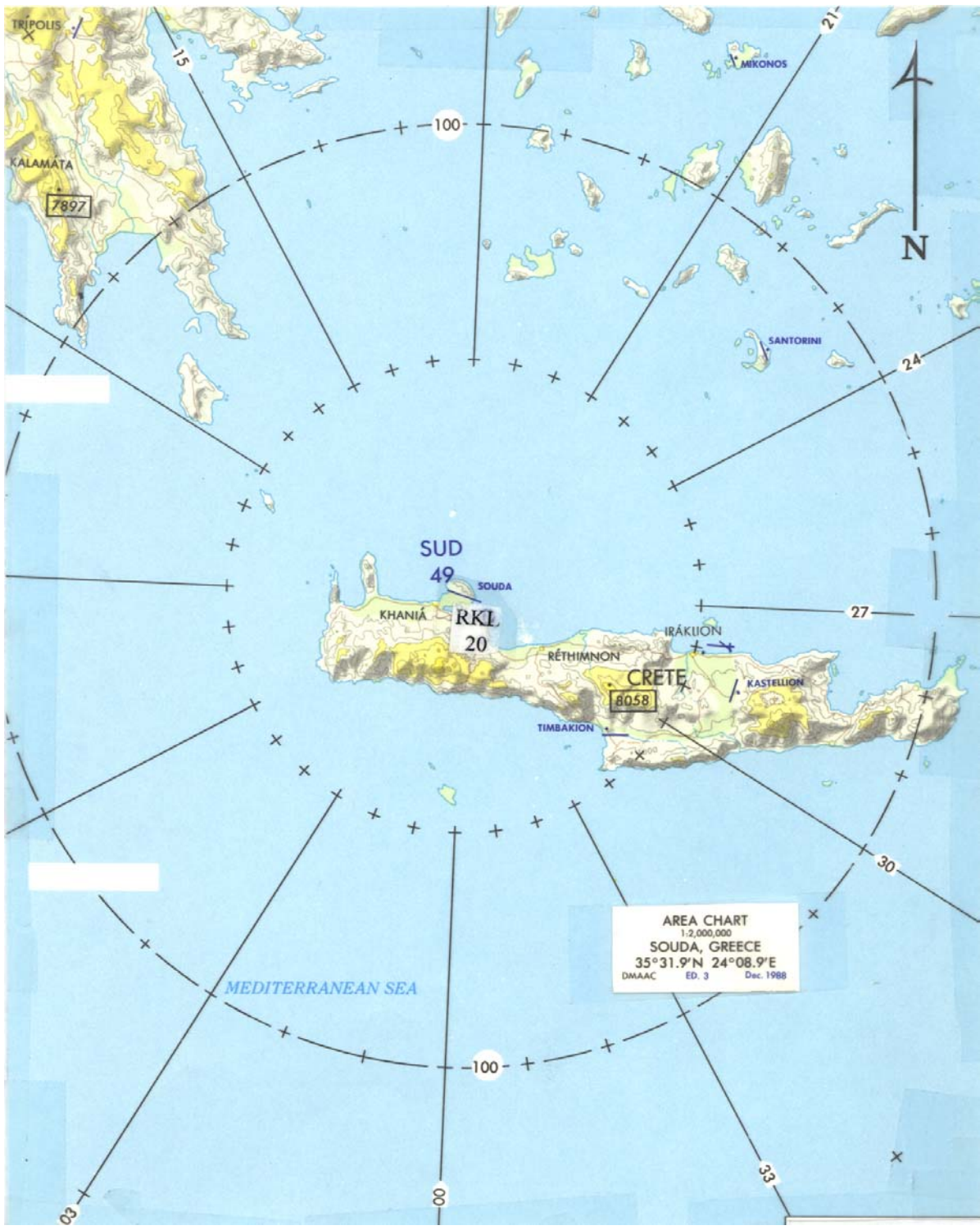
SOU
DA
GSA

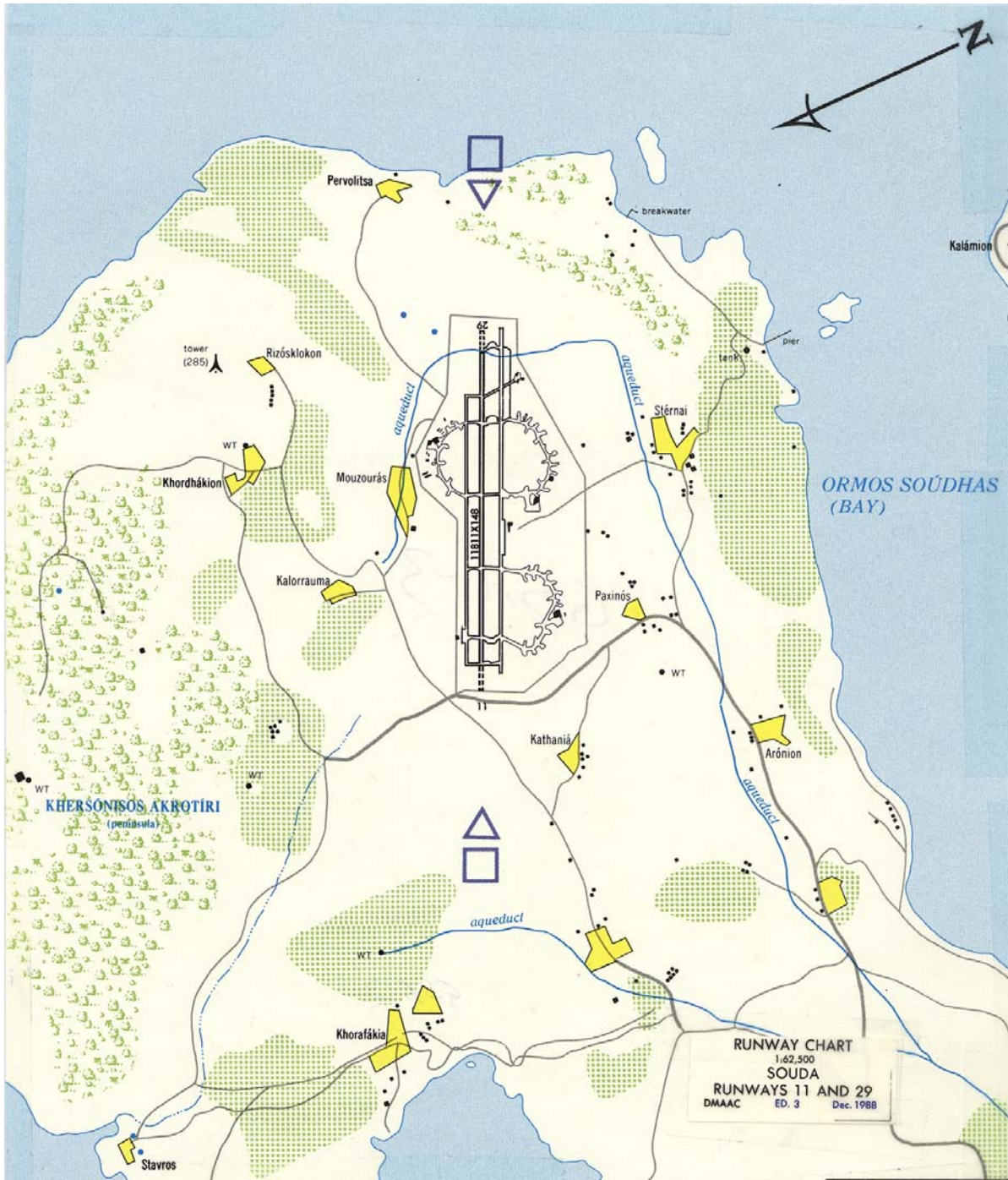
SOU
DA
GSA

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GSA

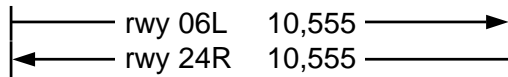
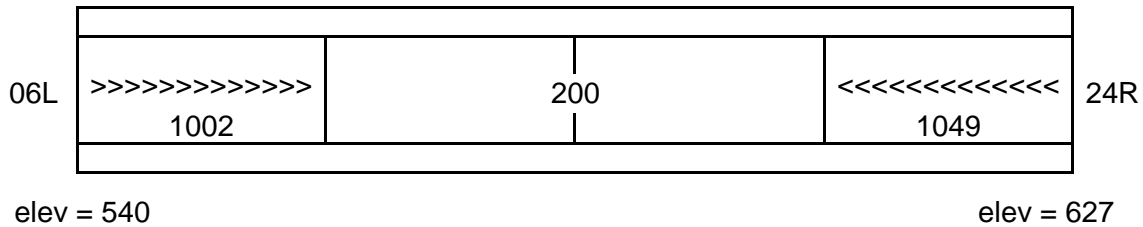
SOU
DA
GSA

SOU
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TACAN: UAM-54x (Pri) UNZ-100x (Sec)
I/F above: N:clear E:clear N:clear E:clear
 S:clear W:clear S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

ANDERSEN
GUA

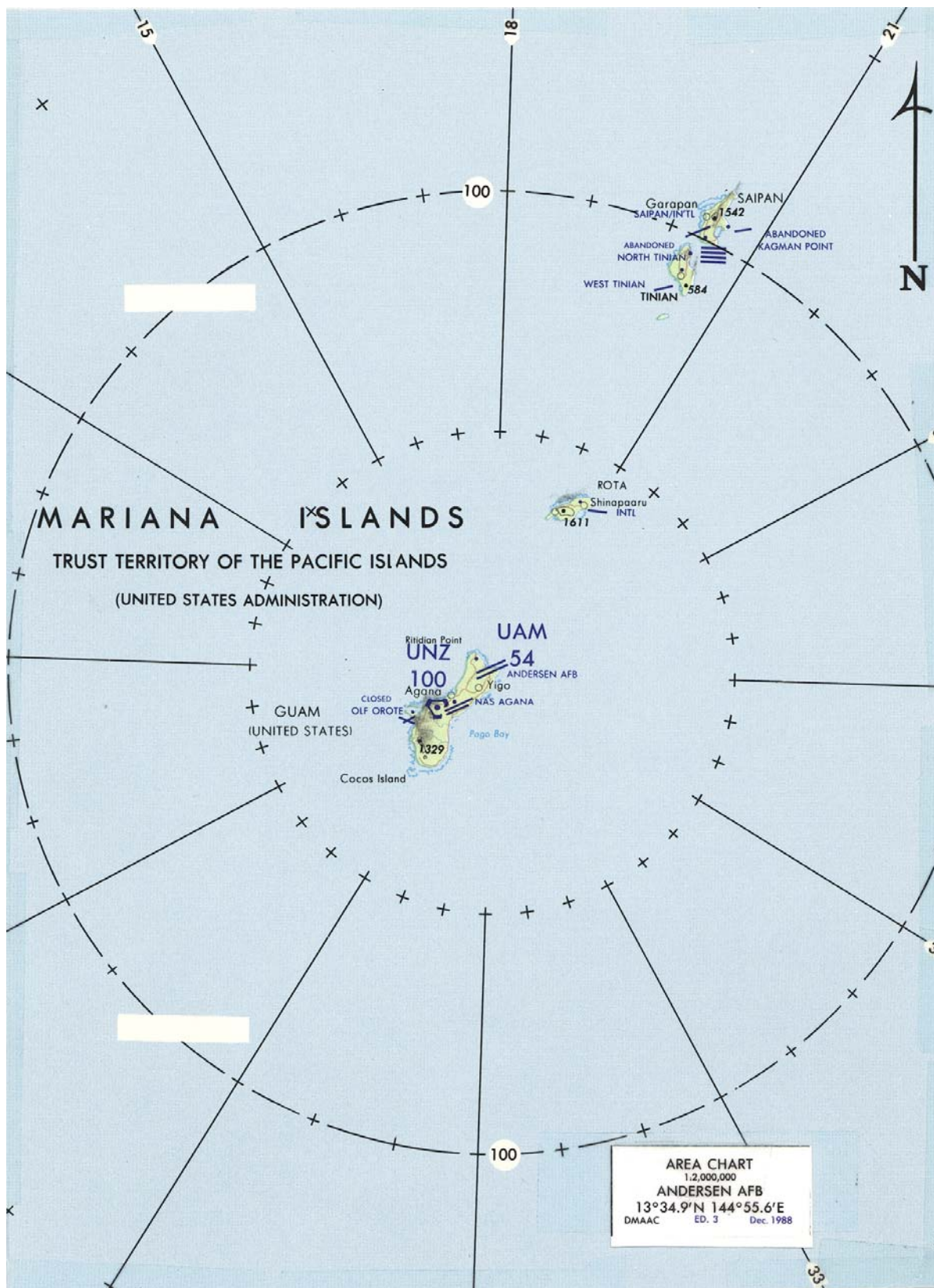
ANDERSEN
GUA

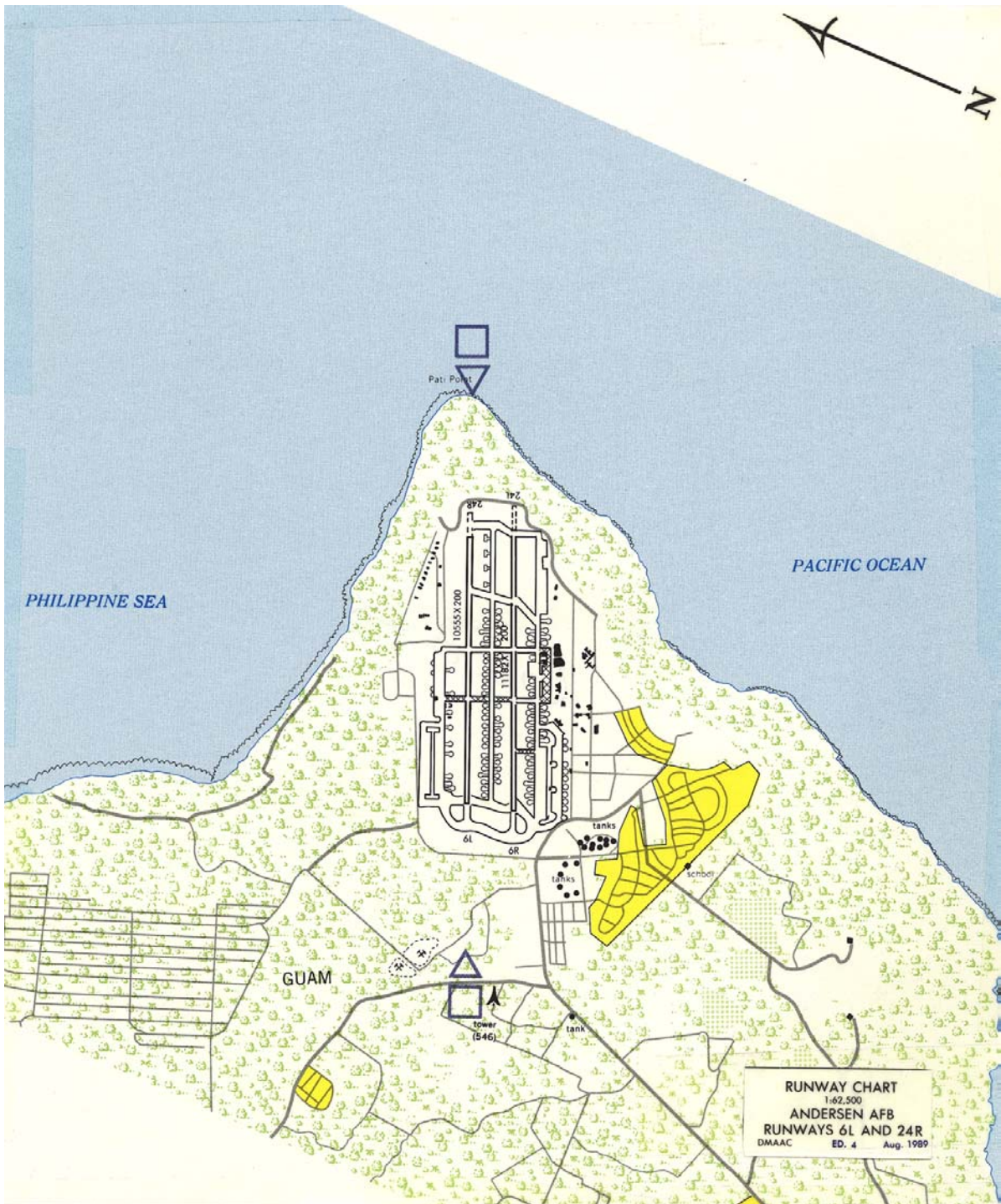
ANDERSEN
GUA

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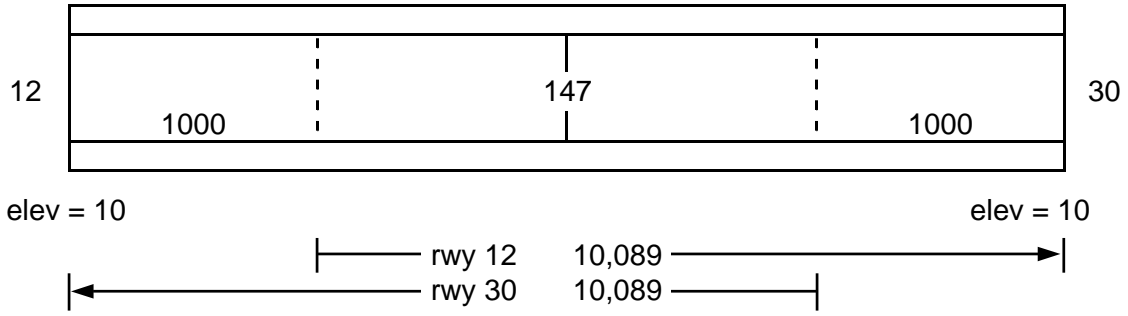


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Hao Atoll, Tuamotu, French Polynesia

Table Identifier

HAO



HAO
HAO

TACAN: HAO-85x (Pri-DME)
I/F above: N:clear E:clear
S:clear W:clear

HAO
HAO

MLS: none
PAPI: none
Ball Bar: none
UHF: none

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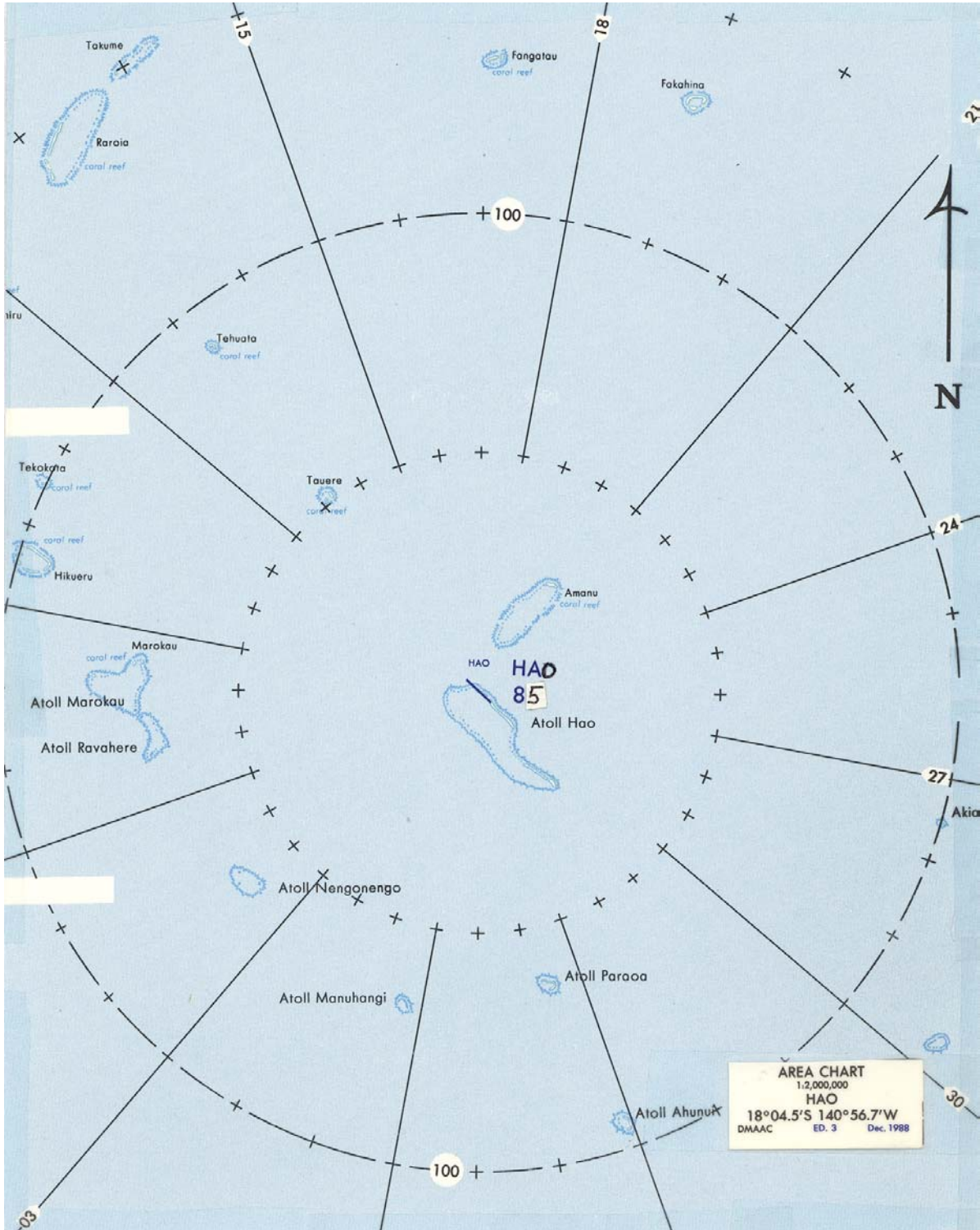
HAO
HAO

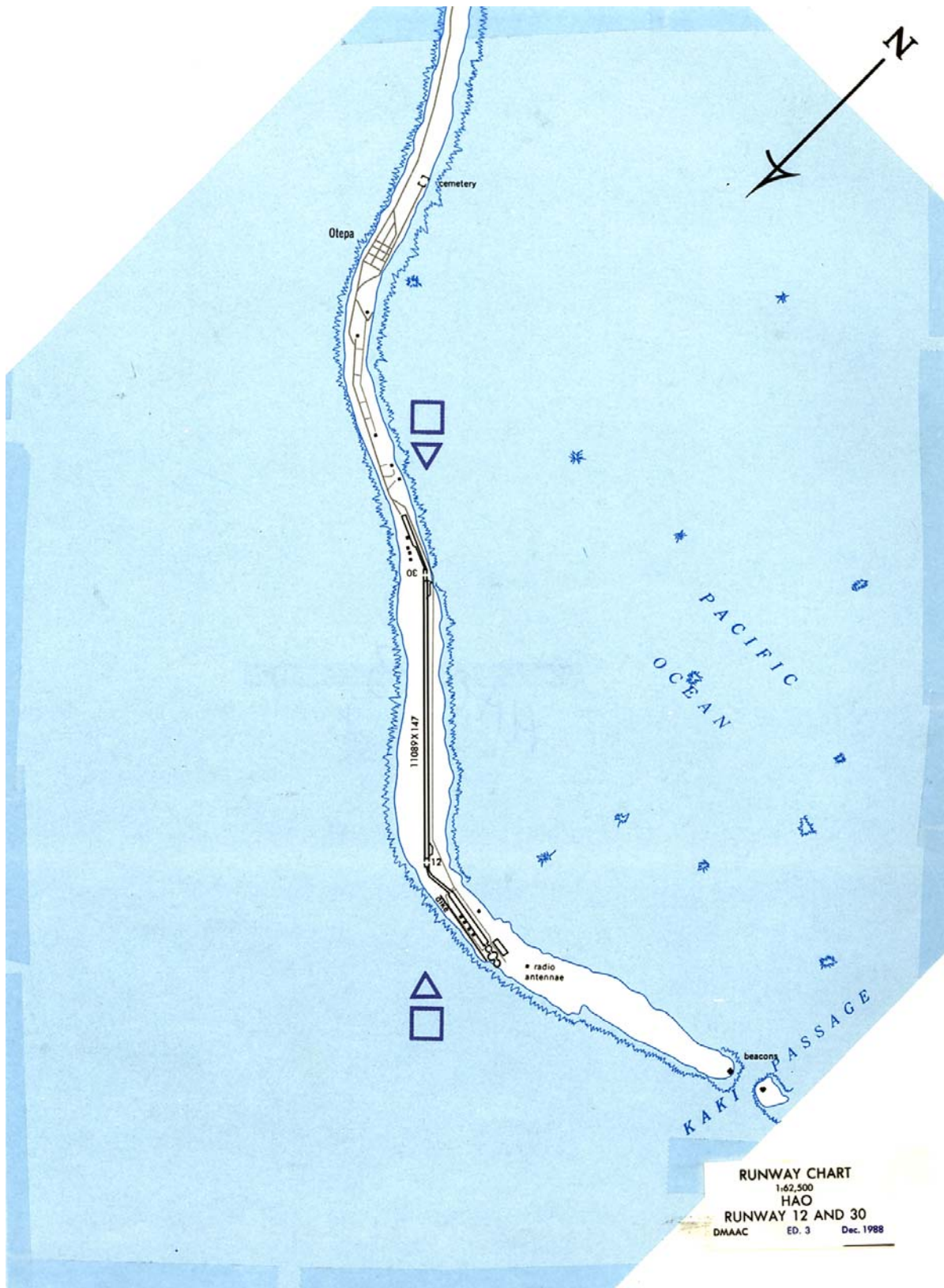
HAO
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HAO ATOLL RWY HAO 30

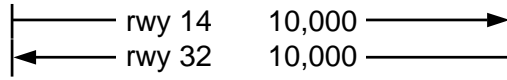
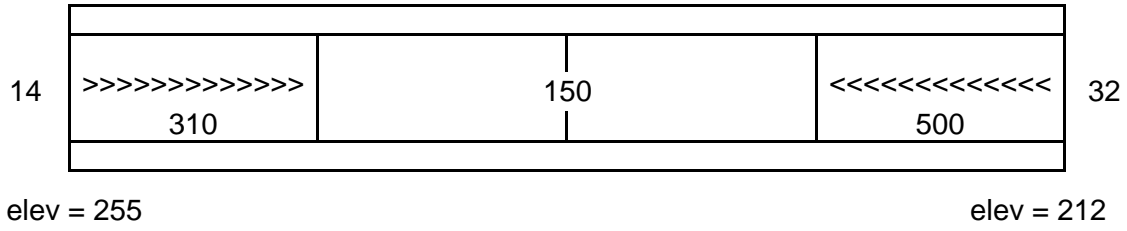


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Ascension Aux AF, Ascension Island

Table Identifier

HAW



TACAN: ASI-59x (Pri)
I/F above: N:clear E:clear
 S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

ASCENSION
HAW

ASCENSION
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ASCENSION
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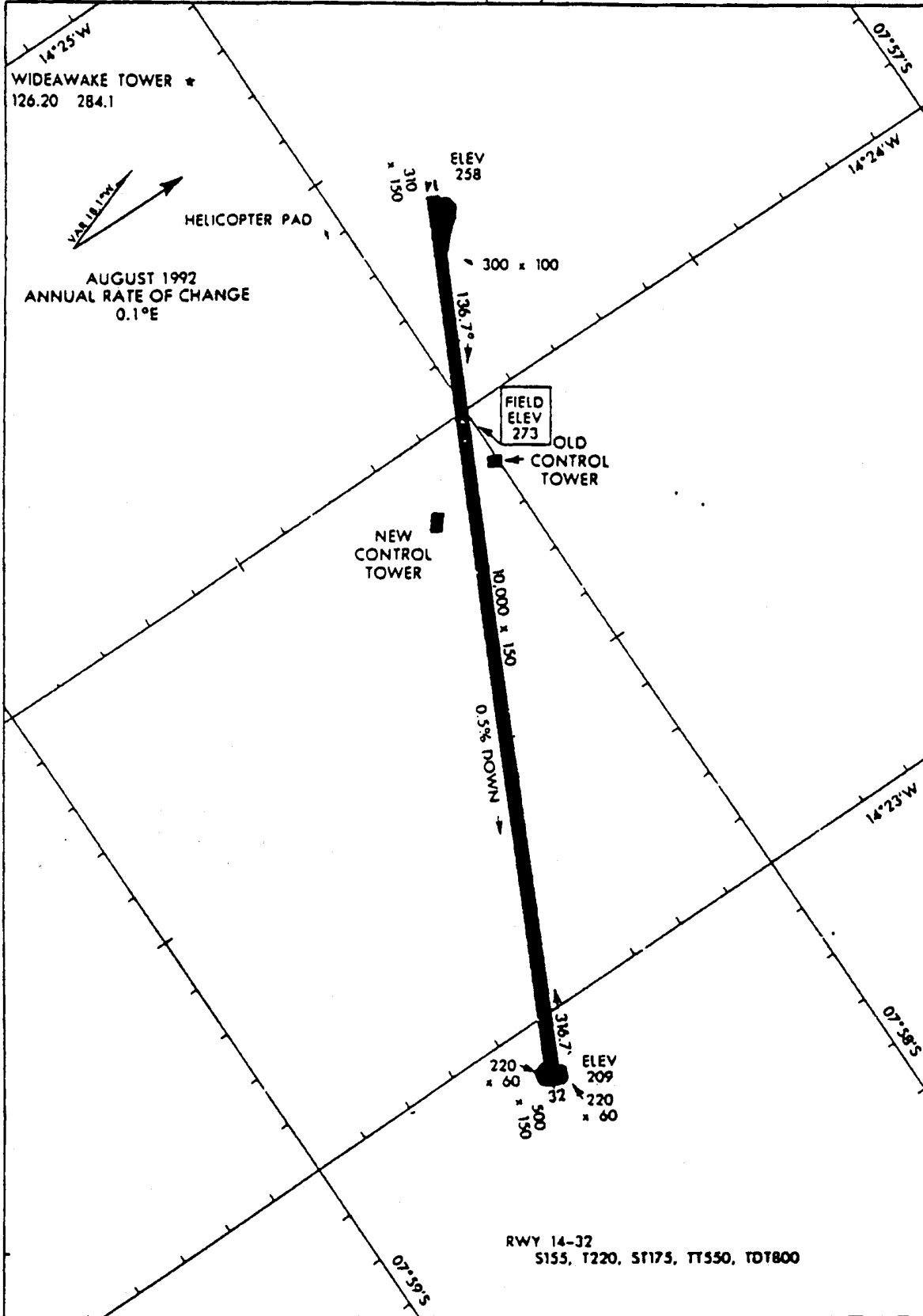
ASCENSION AIRPORT DIAGRAM

92233

AIRPORT DIAGRAM

AFD-1037 (USAF)

ASCENSION AUX AF (FHAW)
ASCENSION ISLAND



AIRPORT DIAGRAM

WGS DATUM

ASCENSION ISLAND
ASCENSION AUX AF (FHAW)

HAW-3

MAPS/ALL/GEN F

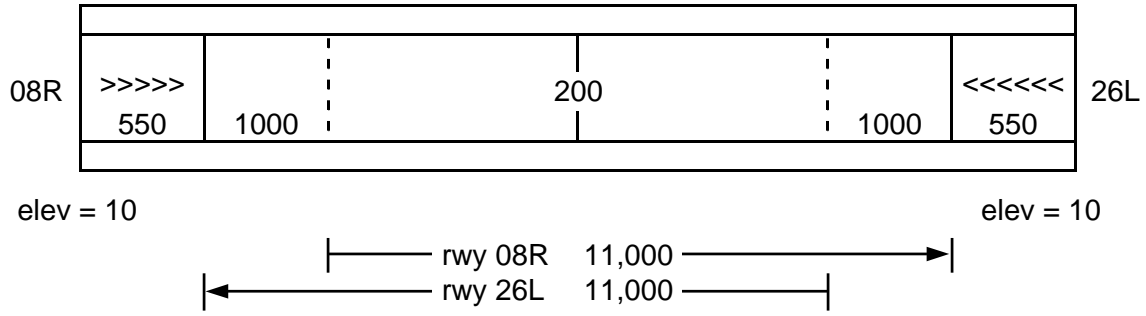
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ASCENSION RWY HAW 14



ASCENSION RWY HAW 14





TACAN: HNL-95x (Pri) CKH-86x (Sec)
I/F above: N:clear E:clear N:clear E:clear
 S:clear W:clear S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

HONOLULU
HNL

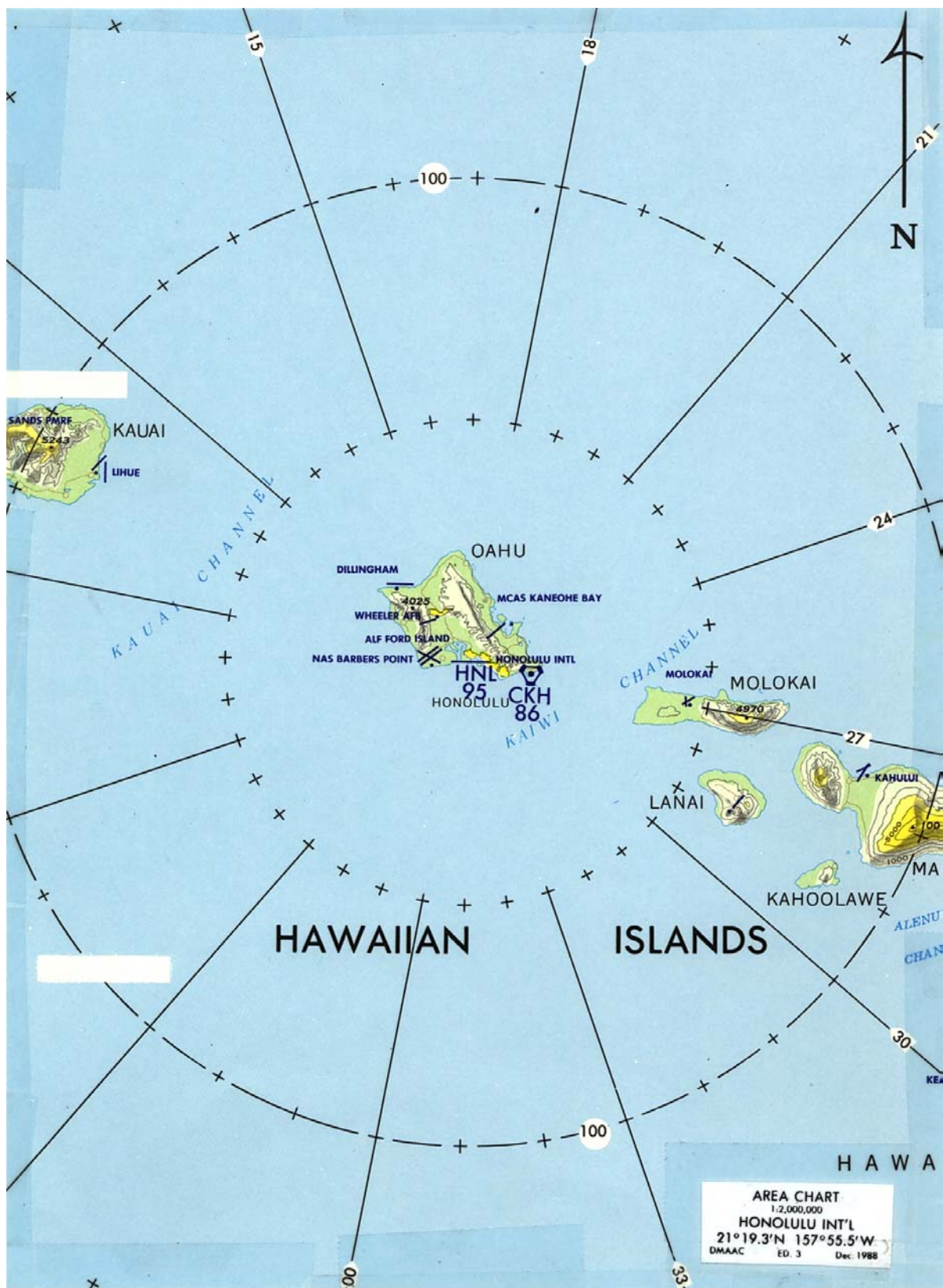
HONOLULU
HNL

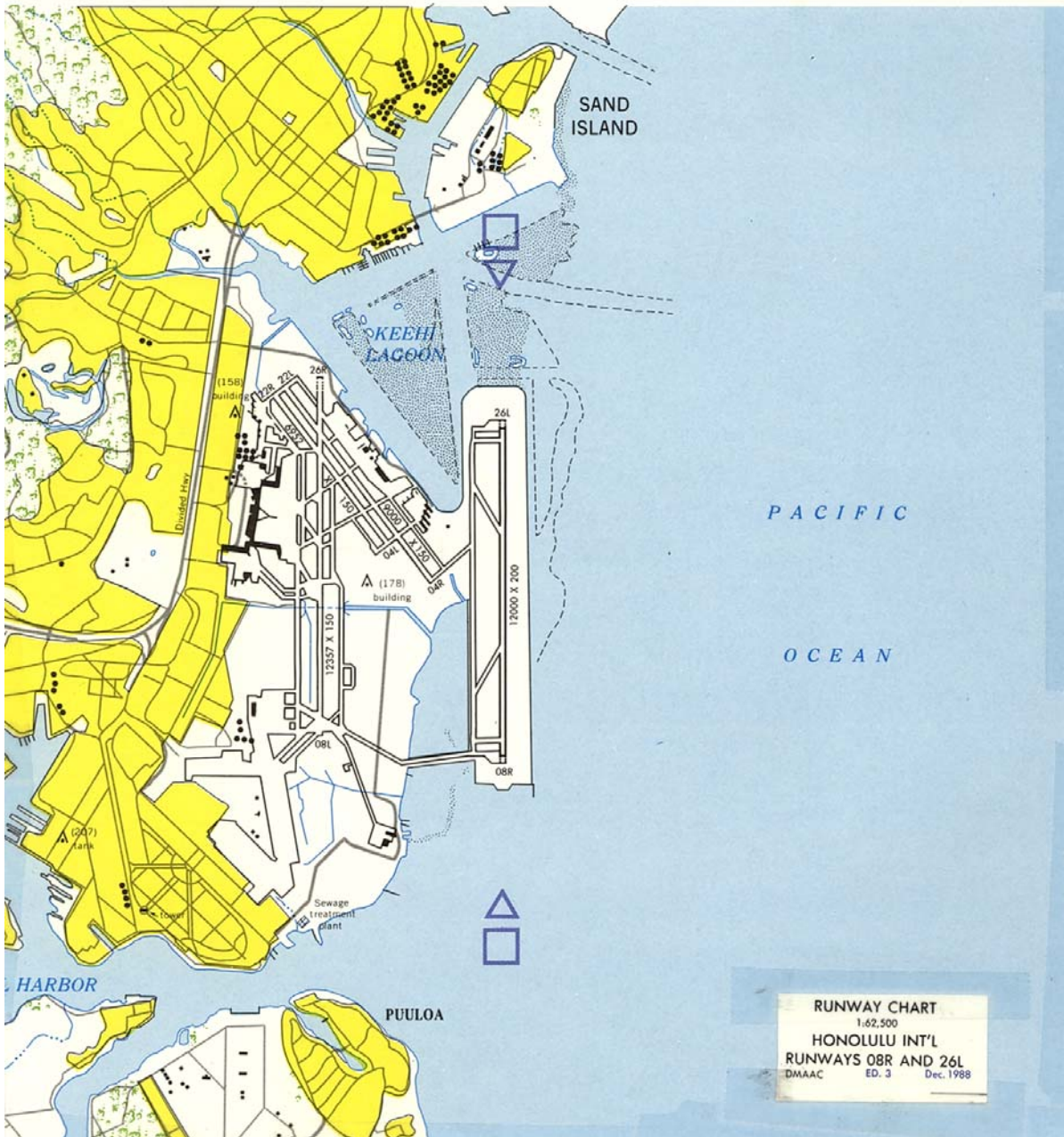
HONOLULU
HNL

HONOLULU
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HNL





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HONOLULU RWY HNL 08R



HNL-A

Honolulu 08R
1/15/82
S81-277144
EDITION 1-6/89
MAPS/ALL/GEN F

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HONOLULU RWY HNL 26L



Honolulu 26L
1/15/82
S81-277147
EDITION 1-6/89
MAPS/ALL/GEN F

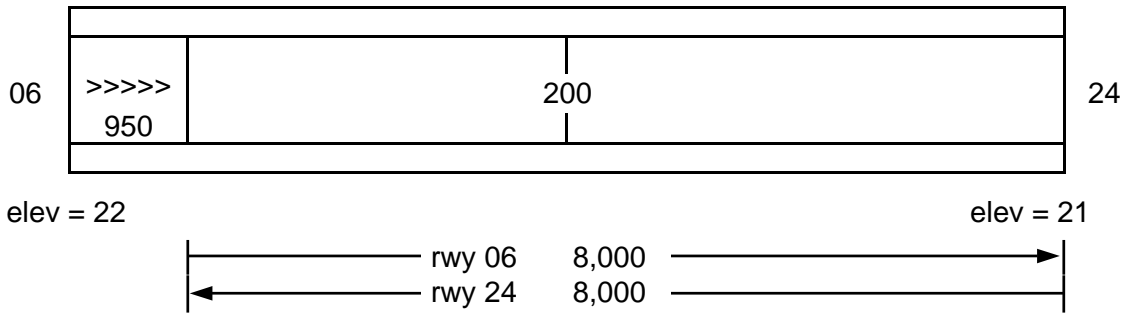
HNL-C

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Wilmington International, Wilmington, North Carolina

Table Identifier

ILM



TACAN:	ILM-117x (Pri)	NJM-67x (SEC)
I/F above:	N:90k E:clear	N:clear E:clear
	S:clear W:85k	S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

WILMINGTON
ILM

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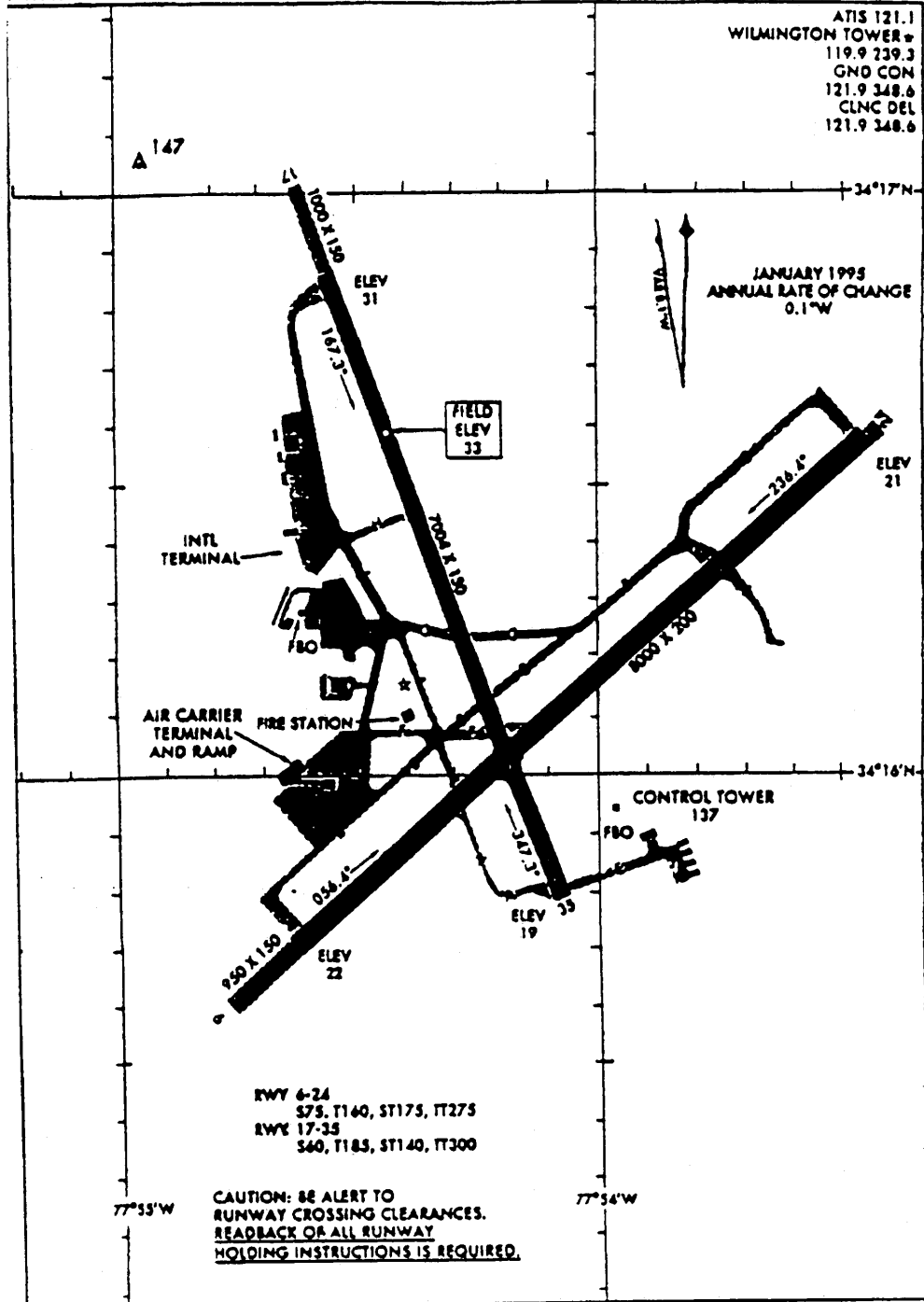
WILMINGTON AIRPORT DIAGRAM

99084

AIRPORT DIAGRAM

372
AL-439 (FAA)

WILMINGTON INTL (ILM)
WILMINGTON, NORTH CAROLINA

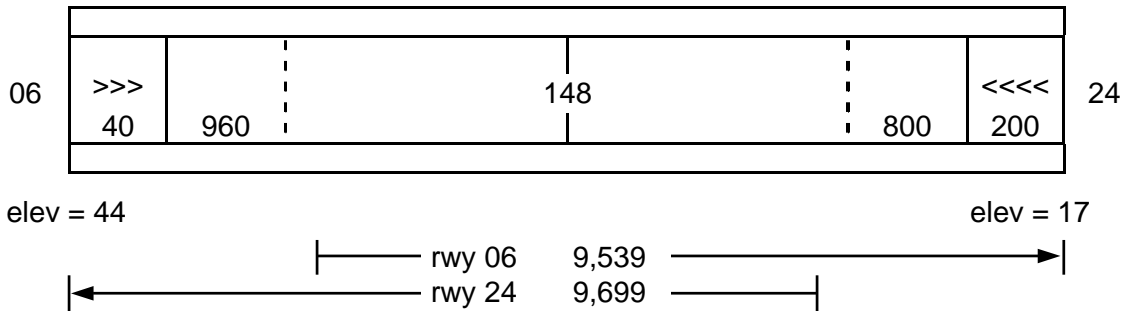


AIRPORT DIAGRAM

99084

WILMINGTON, NORTH CAROLINA
WILMINGTON INTL (ILM)

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TACAN: SHA-80x (Pri-DME) CRN-37x (Sec-DME)
I/F above: N:clear E:105k N:clear E:135k
 S:140k W:clear S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: none

SHANNON
INN

SHANNON
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SHANNON
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SHANNON AIRPORT DIAGRAM

SHANNON
INN

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SHANNON
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SHANNON
INN

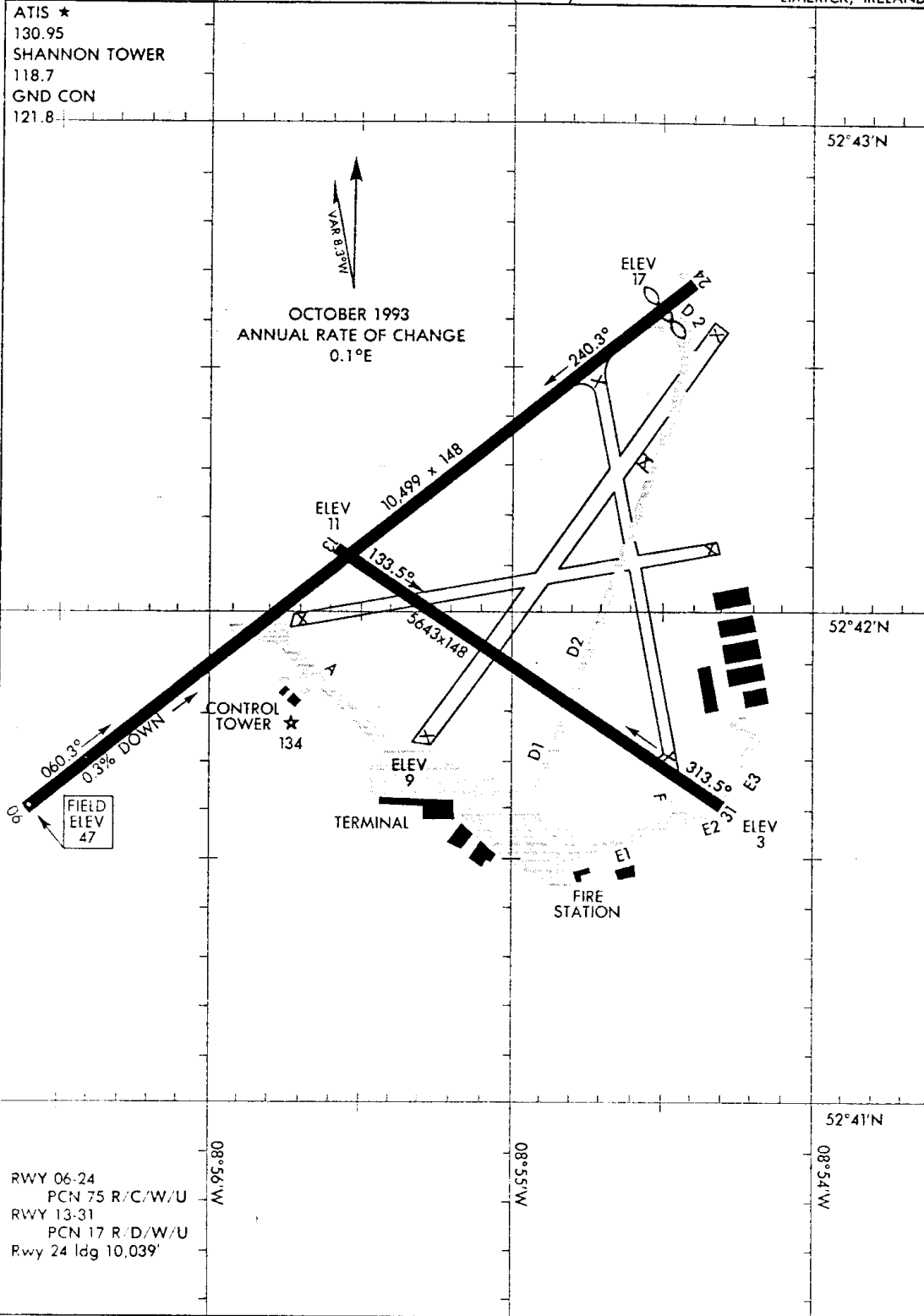
SHANNON
INN

93287

AIRPORT DIAGRAM

AFD-1151 (USAF)

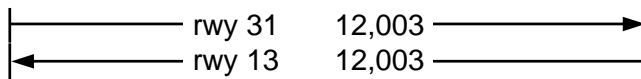
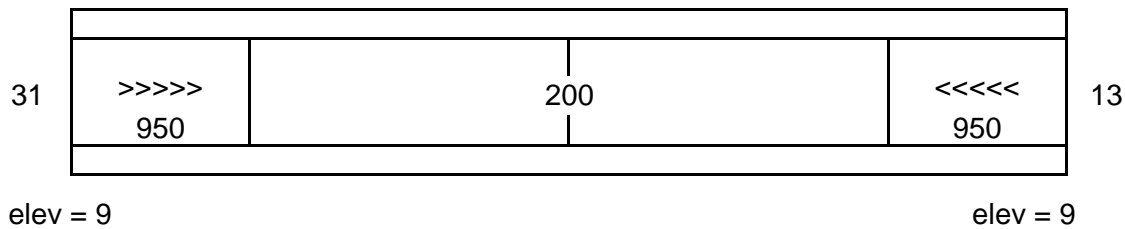
SHANNON (EINN)
LIMERICK, IRELAND



AIRPORT DIAGRAM

WGS DATUM
199

LIMERICK, IRELAND
SHANNON (EINN)



TACAN: NKW-57x (Pri)
I/F above: N:clear E:clear
 S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

DIEGO GARCIA
JDG

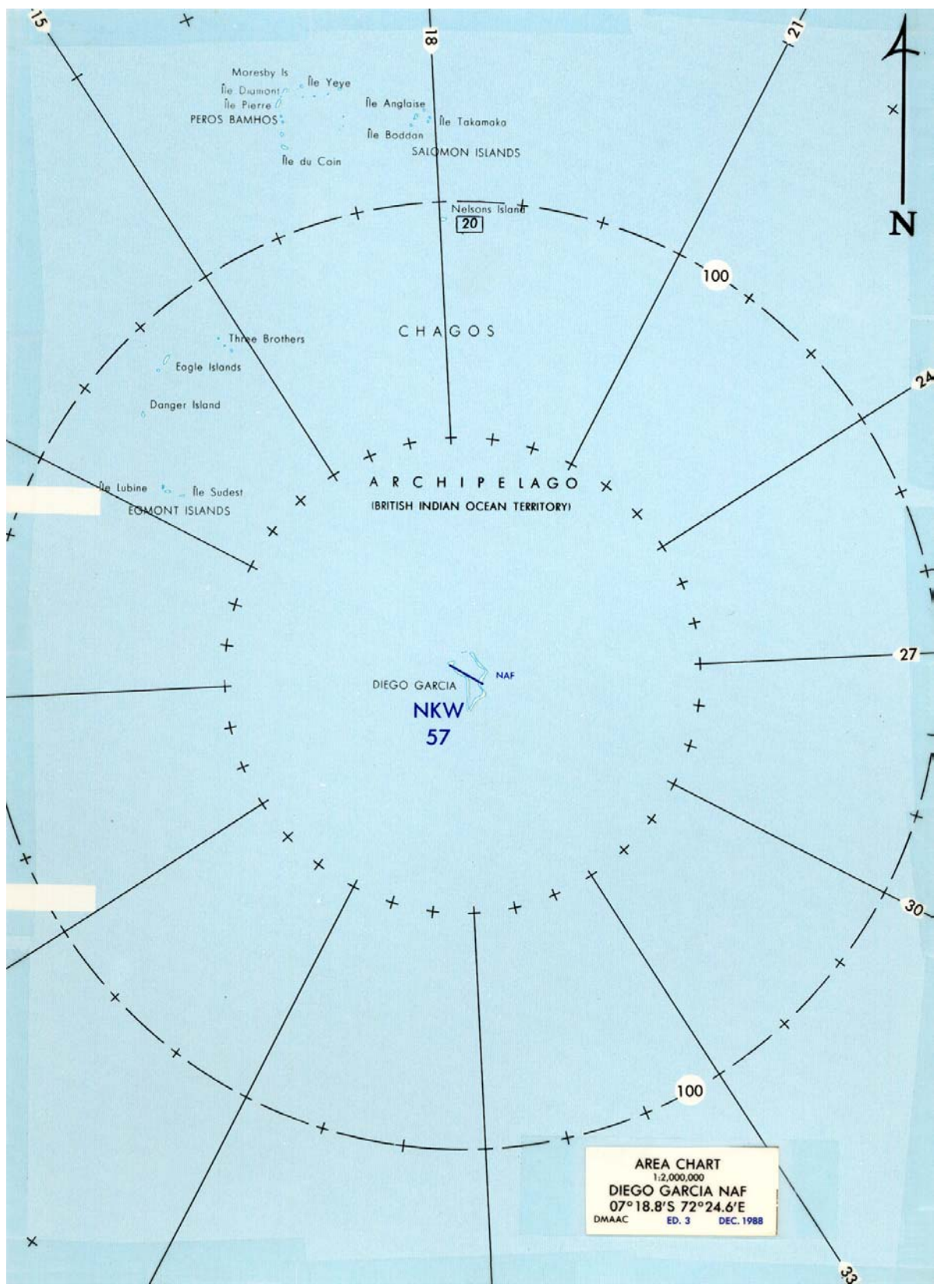
DIEGO GARCIA
JDG

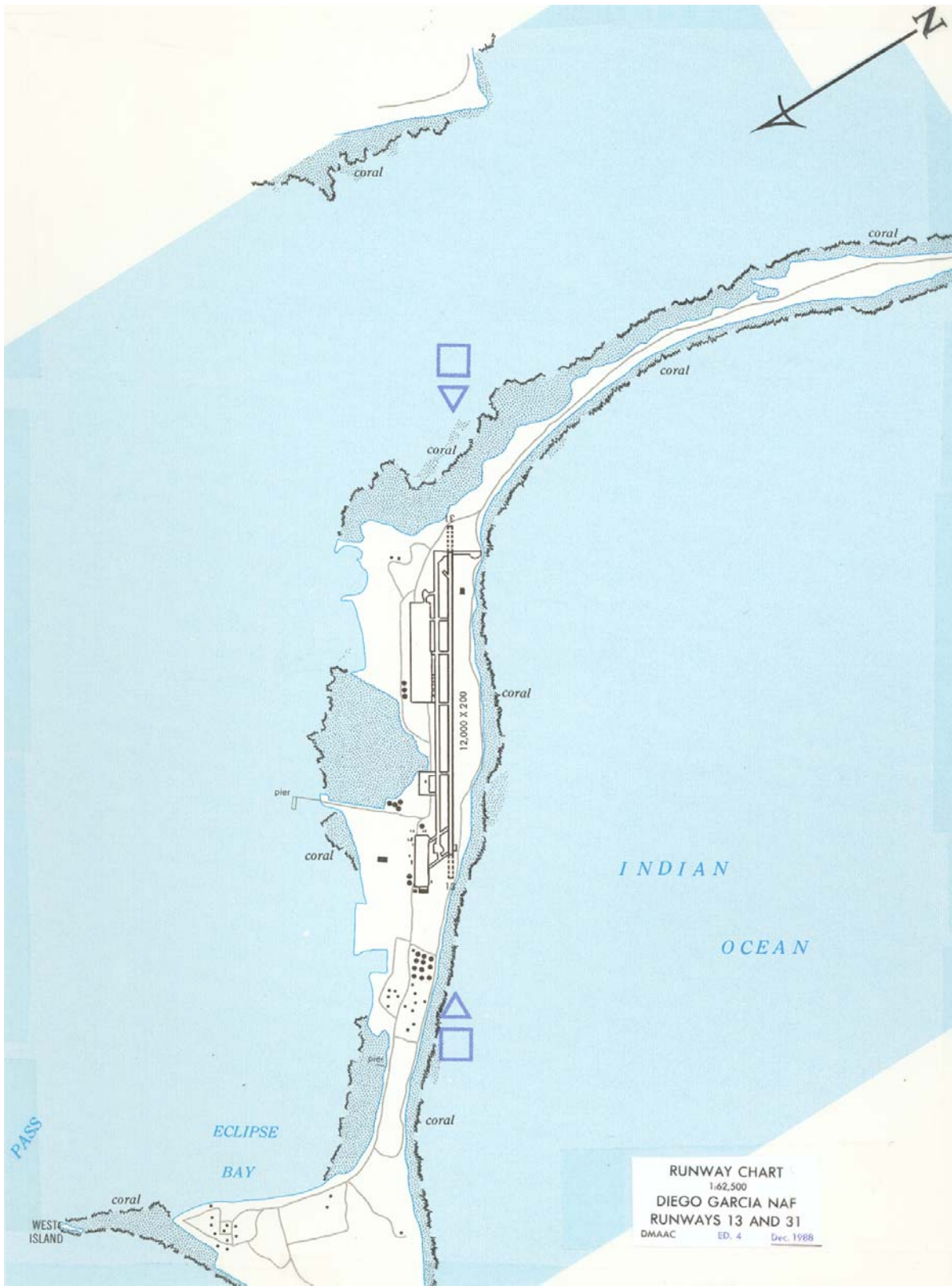
DIEGO GARCIA
JDG

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DIEGO GARCIA RWY JDG 13

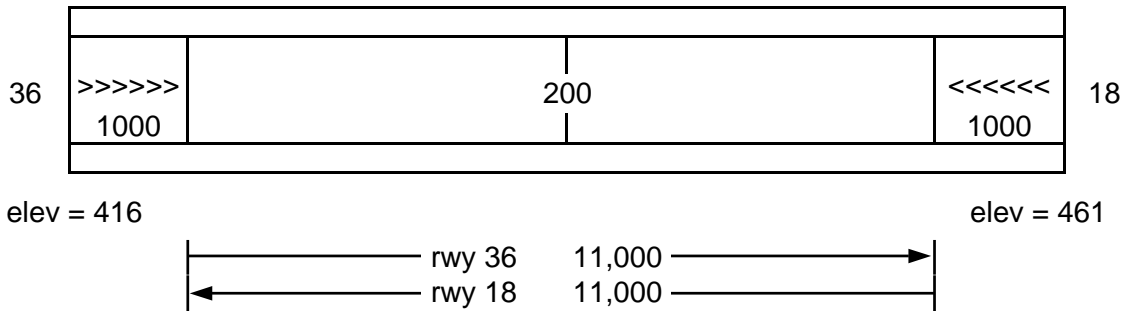


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DIEGO GARCIA RWY JDG 31



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TACAN: YOK-85x (Pri)
I/F above: N:clear E:clear
 S:125k W:110k

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

YOKOTA
JTY

YOKOTA
JTY

YOKOTA
JTY

YOKOTA
JTY

YOKOTA
JTY

YOKOTA
JTY

YOKOTA
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YOKOTA
JTY

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JTY

YOKOTA
JTY

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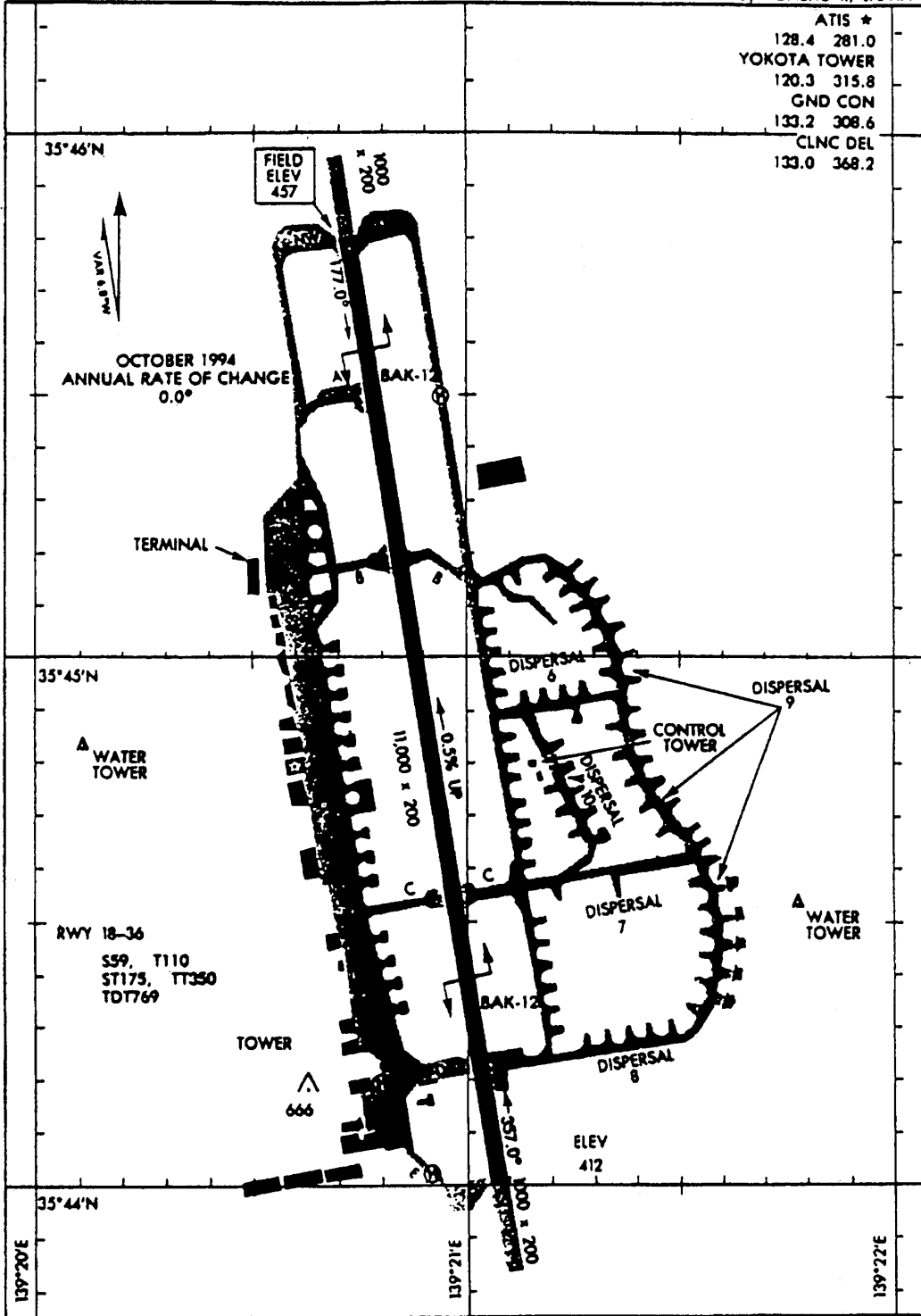
YOKOTA AIRPORT DIAGRAM

94286

AIRPORT DIAGRAM

AFD-1458 (USAF)

YOKOTA (RJTY)
TOKYO, HONSHU I., JAPAN



ATIS *	128.4	281.0
YOKOTA TOWER	120.3	315.8
GND CON	133.2	308.6
CLNC DEL	133.0	368.2

AIRPORT DIAGRAM

WGS DATUM

TOKYO, HONSHU I., JAPAN
YOKOTA (RJTY)

YOKOTA RWY JTY 18
View 1



YOKOTA RWY JTY 18
View 2



YOKOTA RWY JTY 36
View 1



JTY-6

MAPS/ALL/GEN F

YOKOTA RWY JTY 36
View 2



JTY-7

MAPS/ALL/GEN F

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KOLN/BONN
KBO

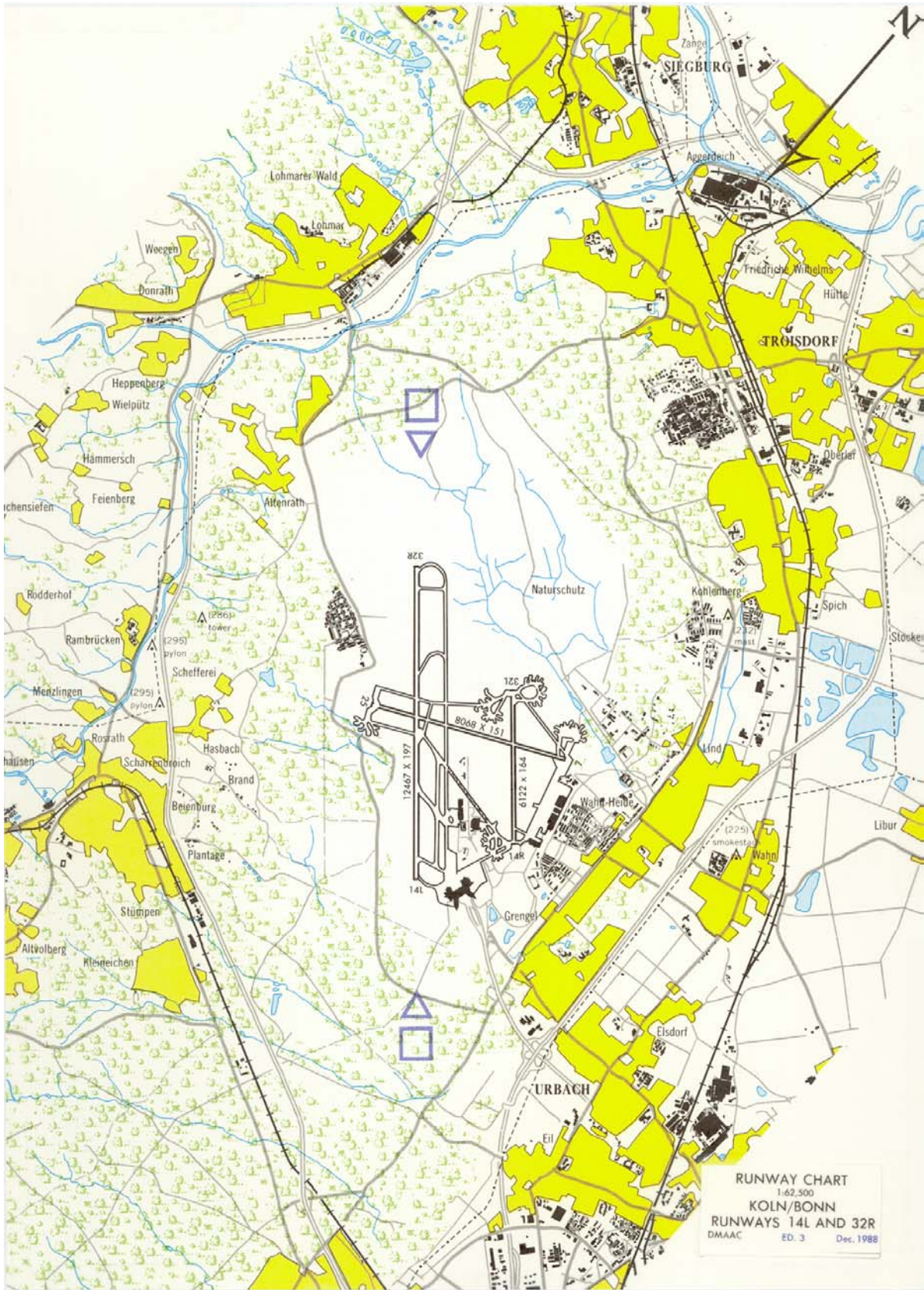
KOLN/BONN
KBO

KOLN/BONN
KBO

KOLN/BONN
KBO

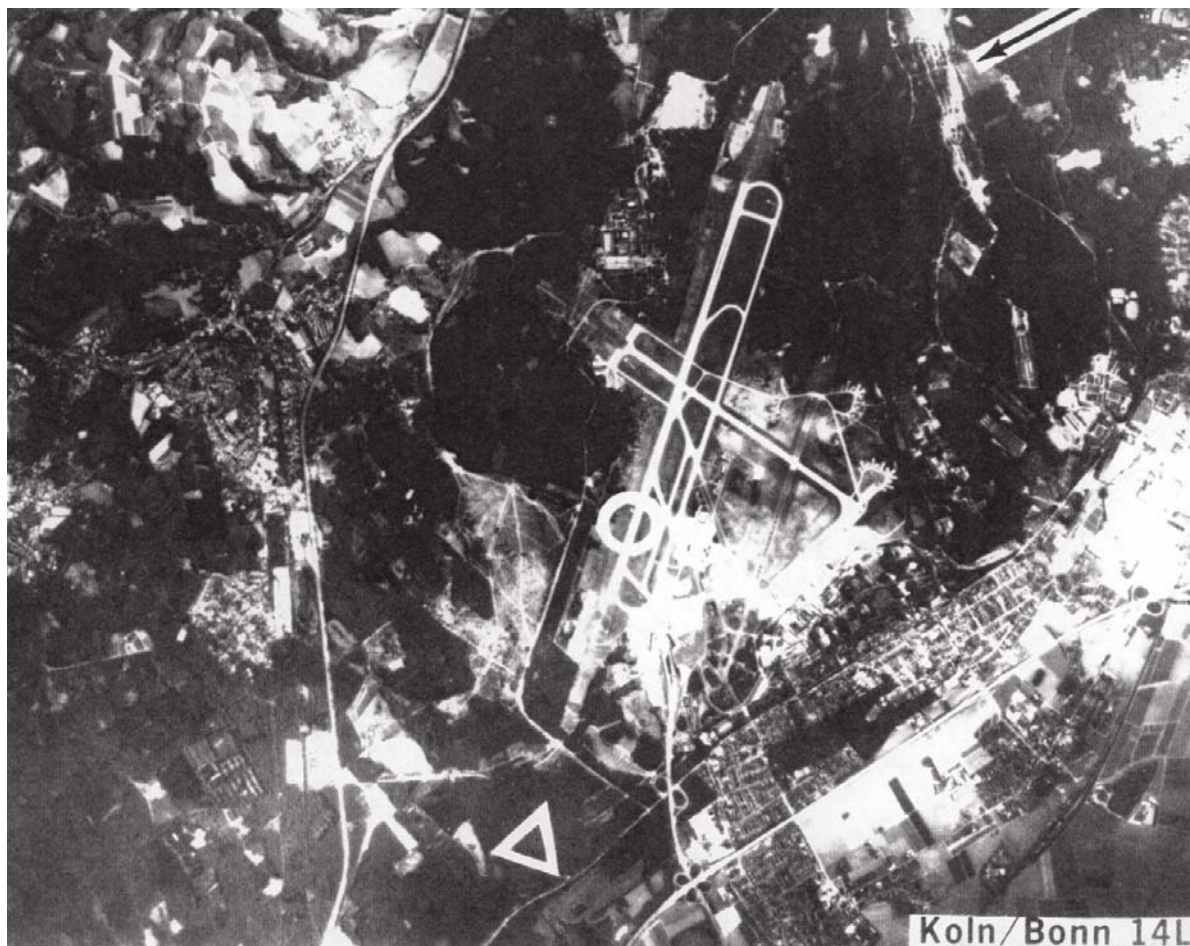
KOLN/BONN
KBO





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KOLN/BONN RWY KBO 14L

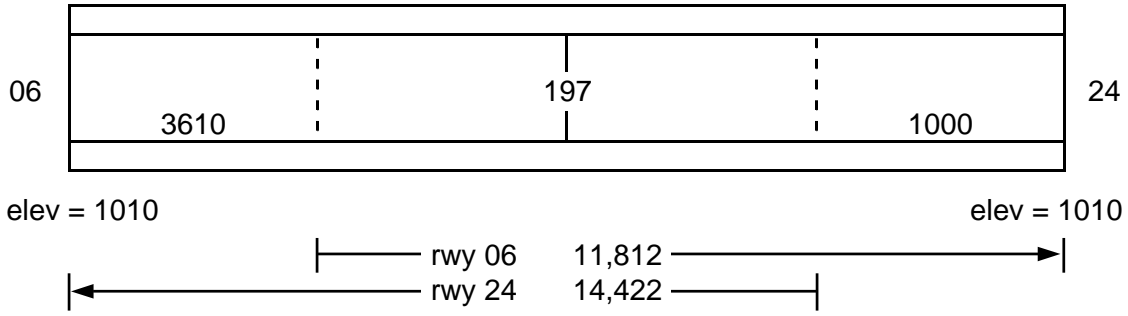


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KOLN/BONN RWY KBO 32R



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TACAN: BZ-78x (Pri-DME)
I/F above: N:clear E:clear
 S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: none

WARNING

Expect thundershowers from October through May. From June through September, expect visibility to be 3 nmi or less below 10,000 ft due to smoke and haze

This site not recommended for landing due to political concerns

KINSHASA
KIN

KINSHASA
KIN

KINSHASA
KIN

KINSHASA
KIN

KINSHASA
KIN

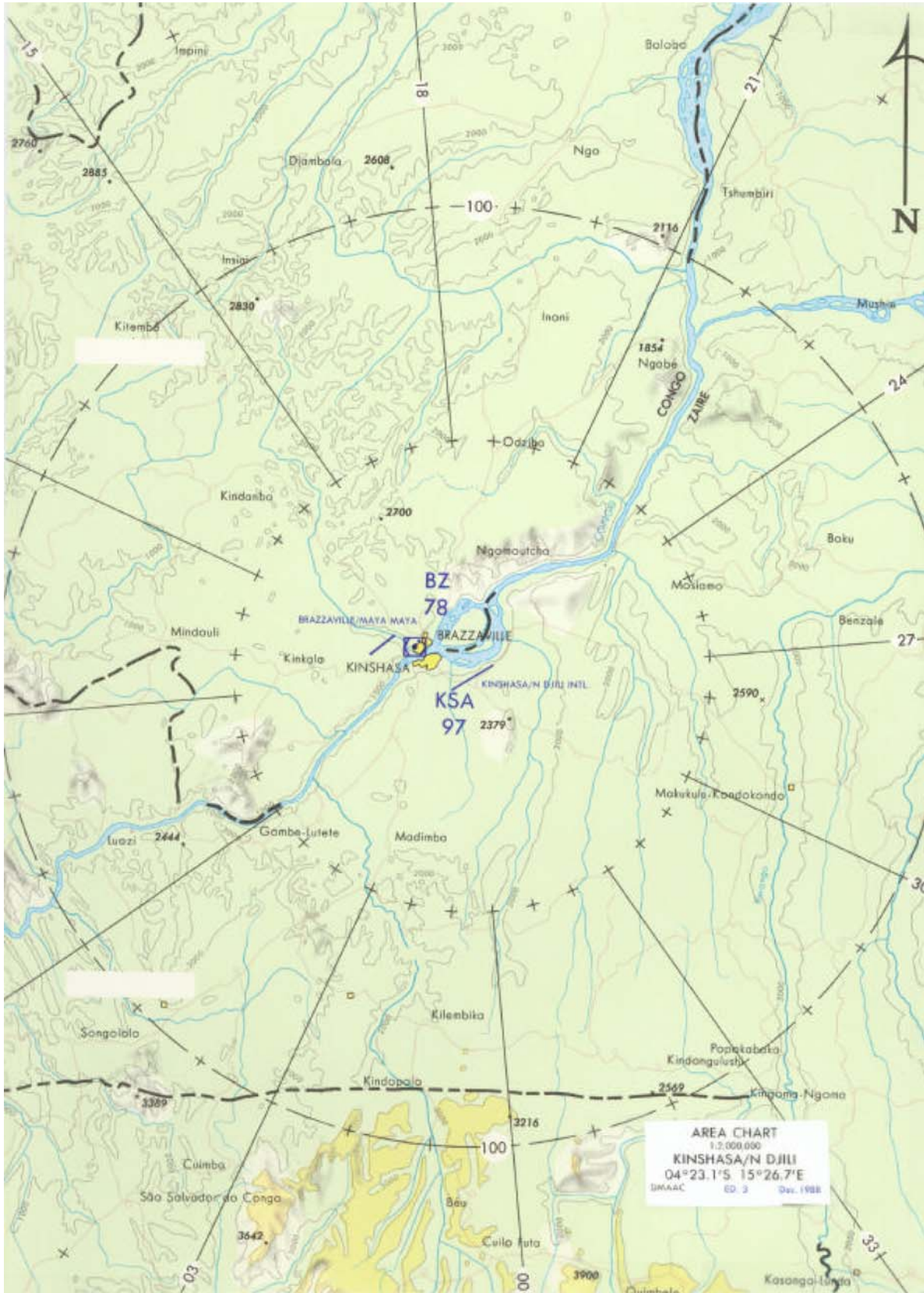
KINSHASA
KIN

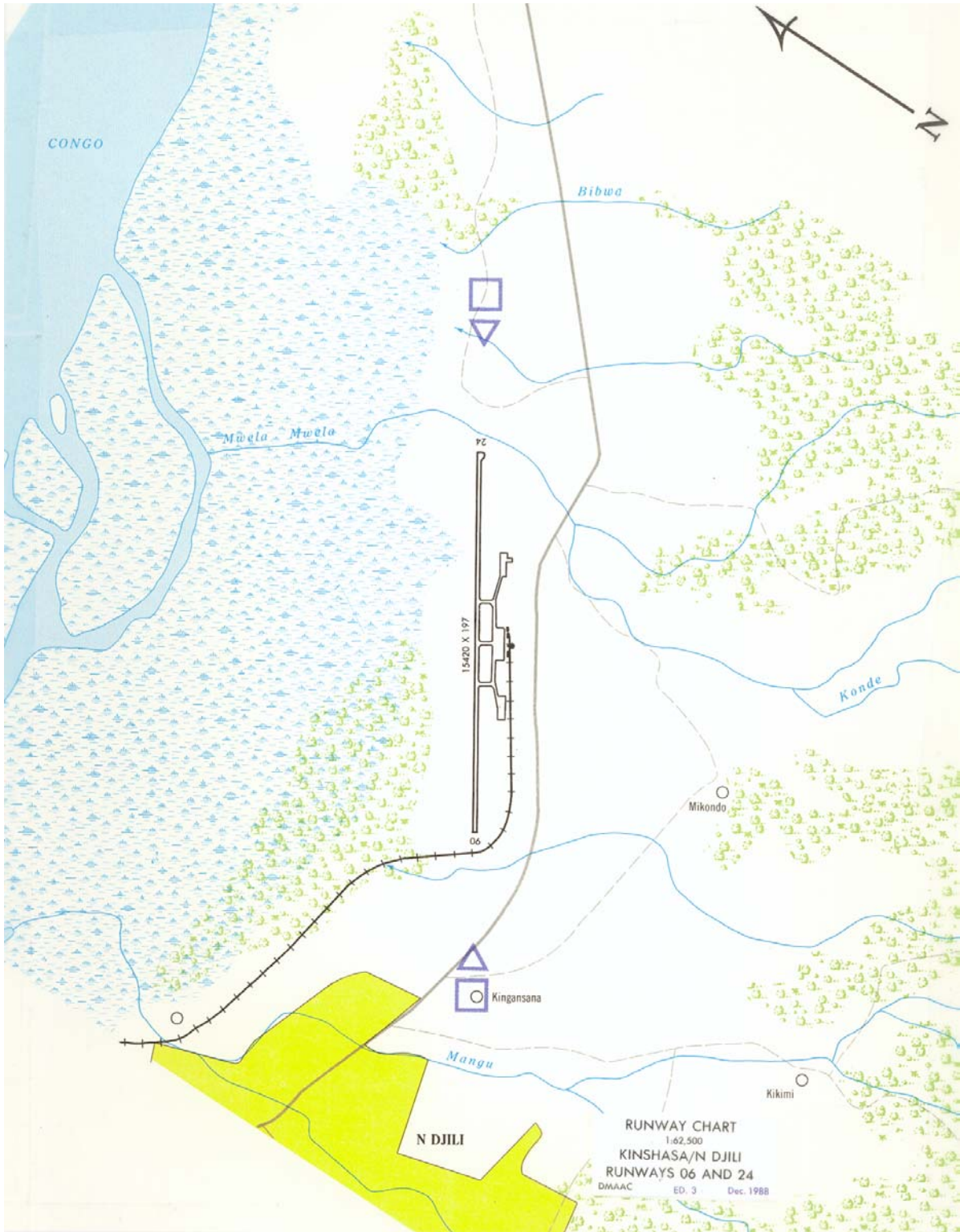
KINSHASA
KIN

KINSHASA
KIN

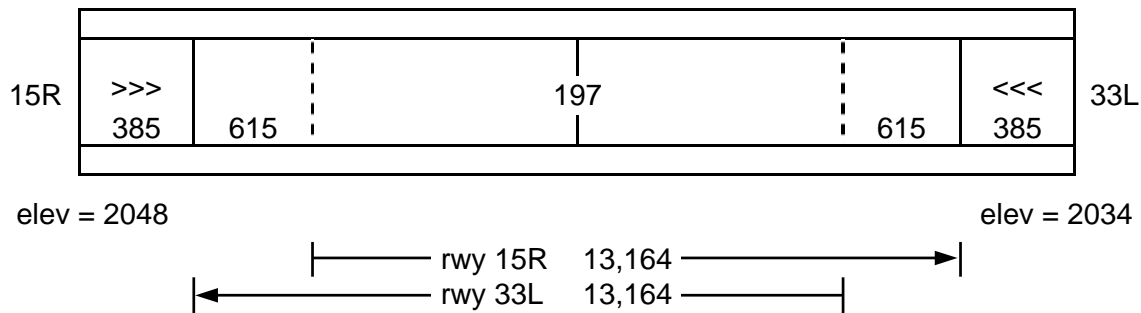
KINSHASA
KIN

KINSHASA
KIN





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TACAN:	RIY-92x (Pri)	KIA-80x (Sec)
I/F above:	N:<<80k E:<<80k	N:100k E:140k
	S:clear W:80k	S:105k W:110k

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

KING KHALID
KKI

KING KHALID
KKI

KING KHALID
KKI

KING KHALID
KKI

KING KHALID
KKI

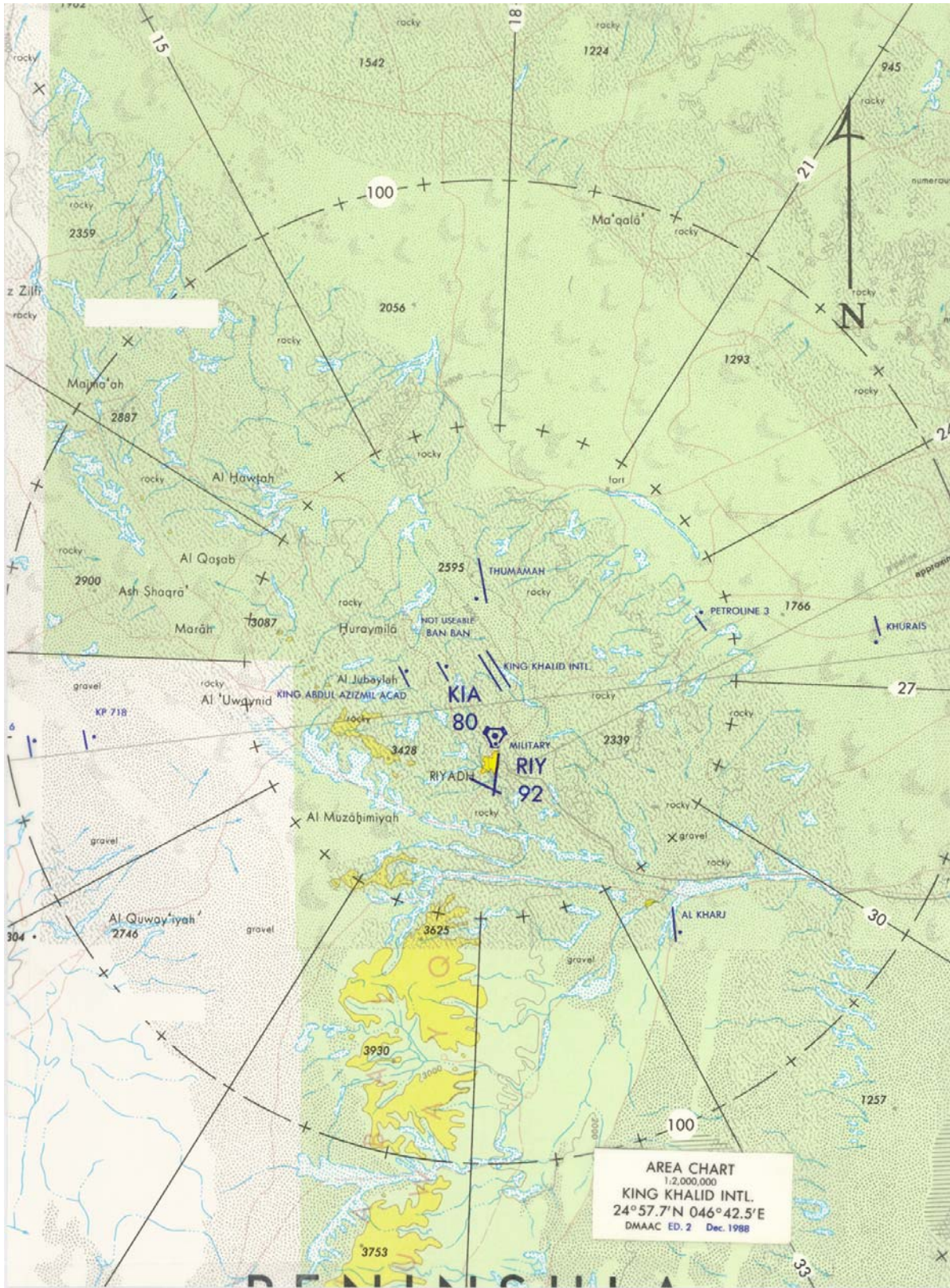
KING KHALID
KKI

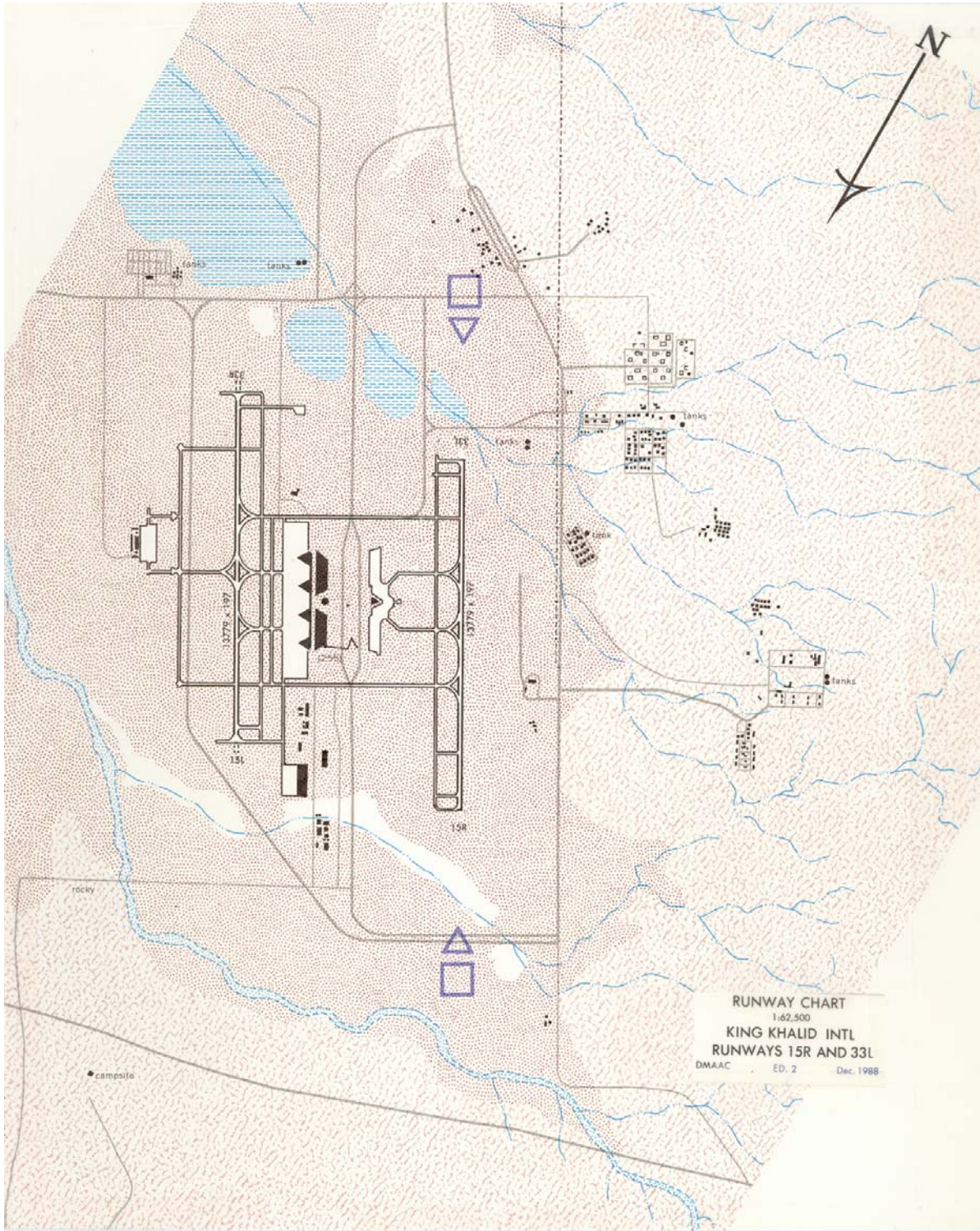
KING KHALID
KKI

KING KHALID
KKI

KING KHALID
KKI

KING KHALID
KKI





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KENNEDY
KSC

KENNEDY
KSC

KENNEDY
KSC

KENNEDY
KSC

KENNEDY
KSC





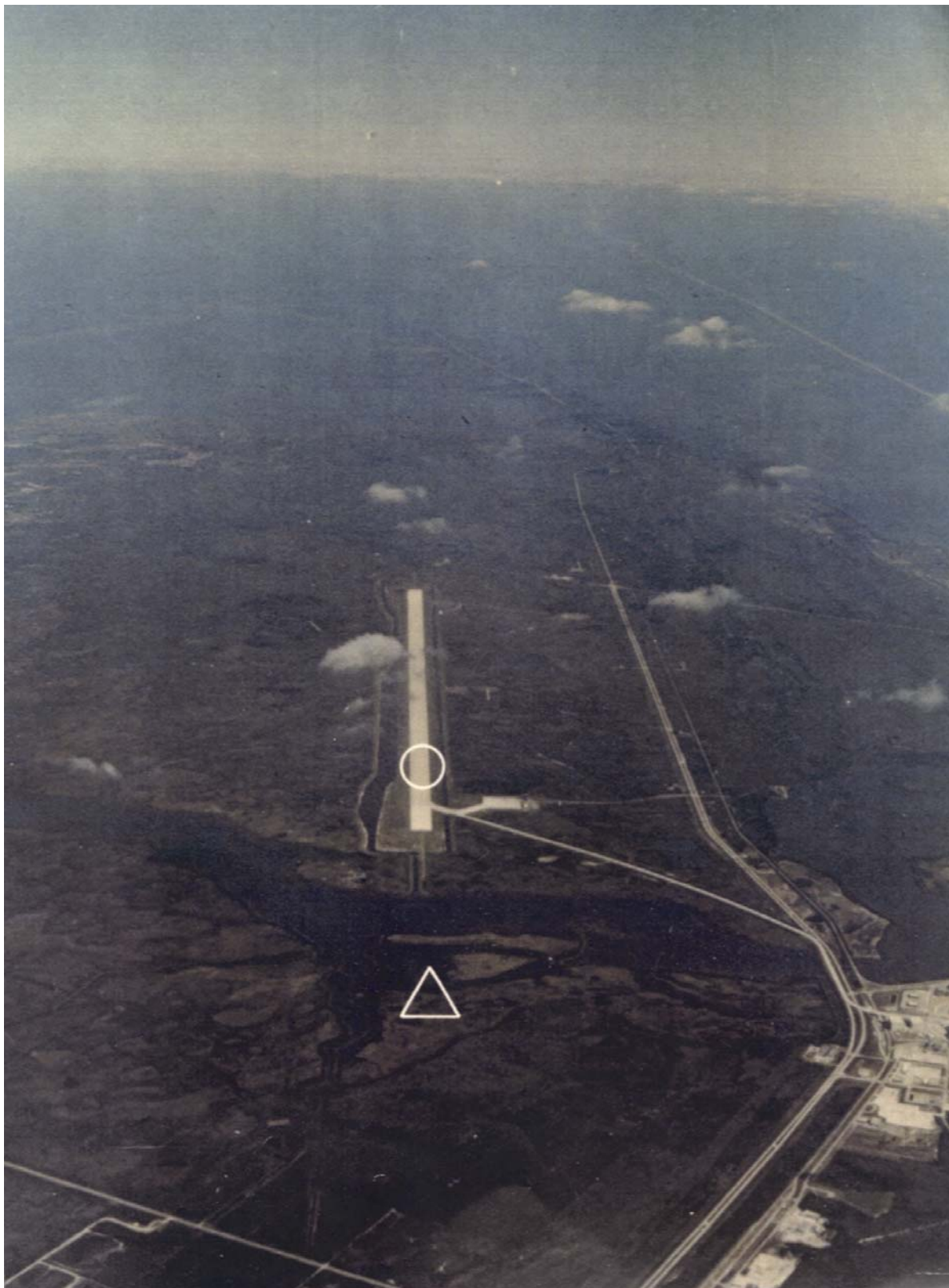
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KSC RWY 15



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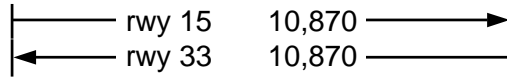
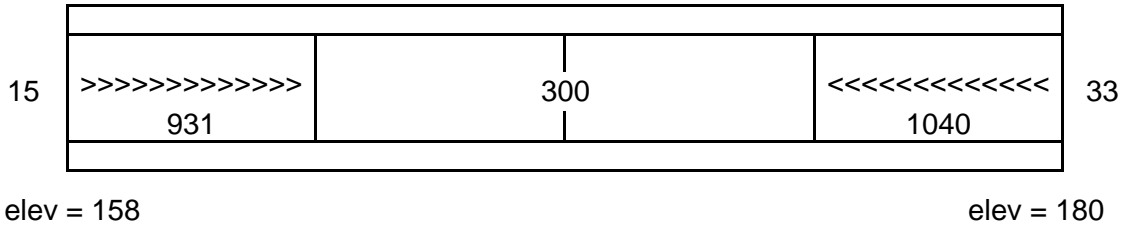
KSC RWY 33



KSC-C

KSC 33
1/15/82
S78-30186
EDITION 1-6/89
MAPS/ALL/GEN F

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TACAN: LAJ-45x (Pri) TRM-109x (Sec)*
I/F above: N:clear E:clear N:clear E:clear
 S:clear W:clear S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes

LAJES
LAI

LAJES
LAI

LAJES
LAI

LAJES
LAI

LAJES
LAI

*TRM-109x is mobile TACAN operational 24 hr/day

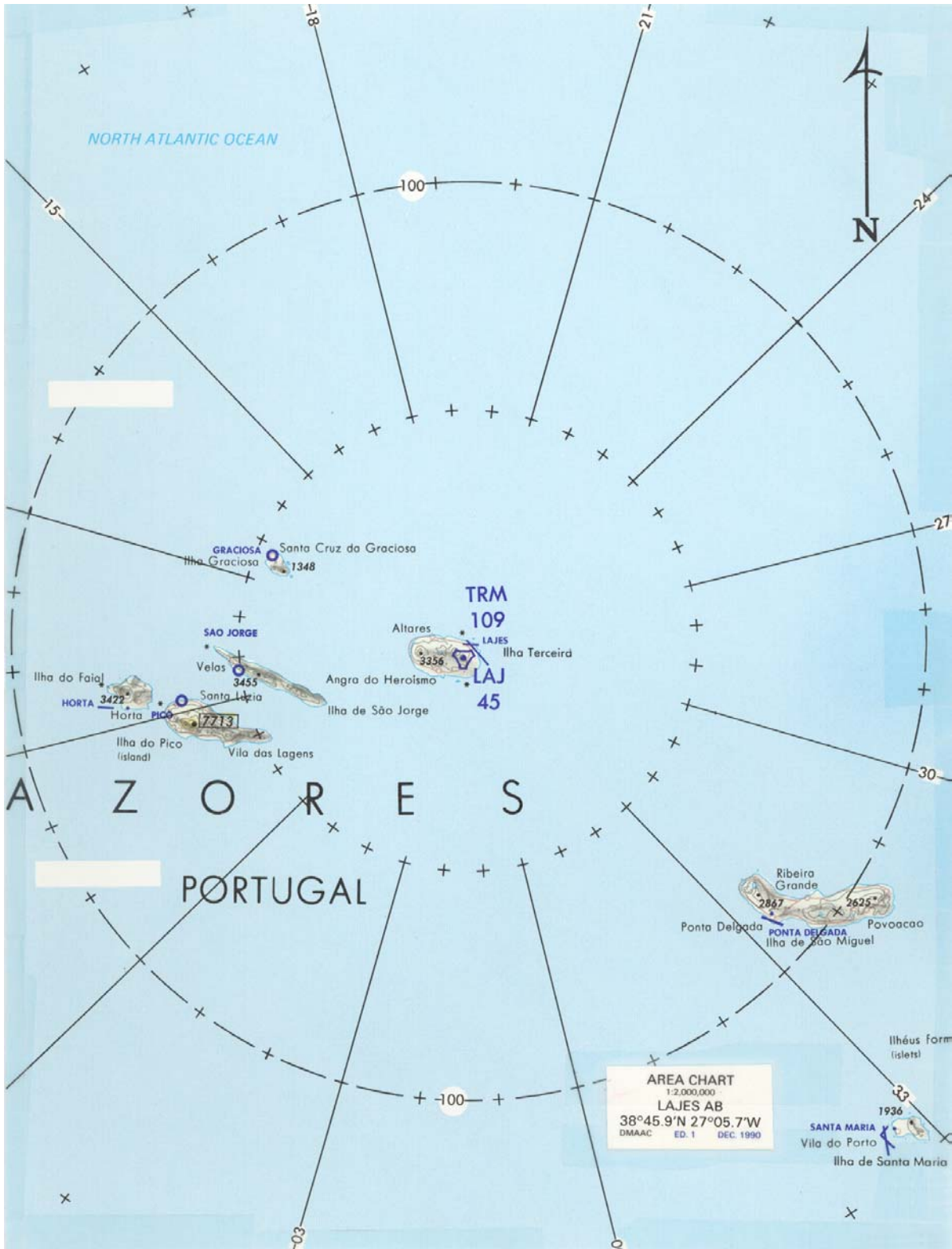
LAJES
LAJ

LAJES
LAJ

LAJES
LAJ

LAJES
LAJ

LAJES
LAJ





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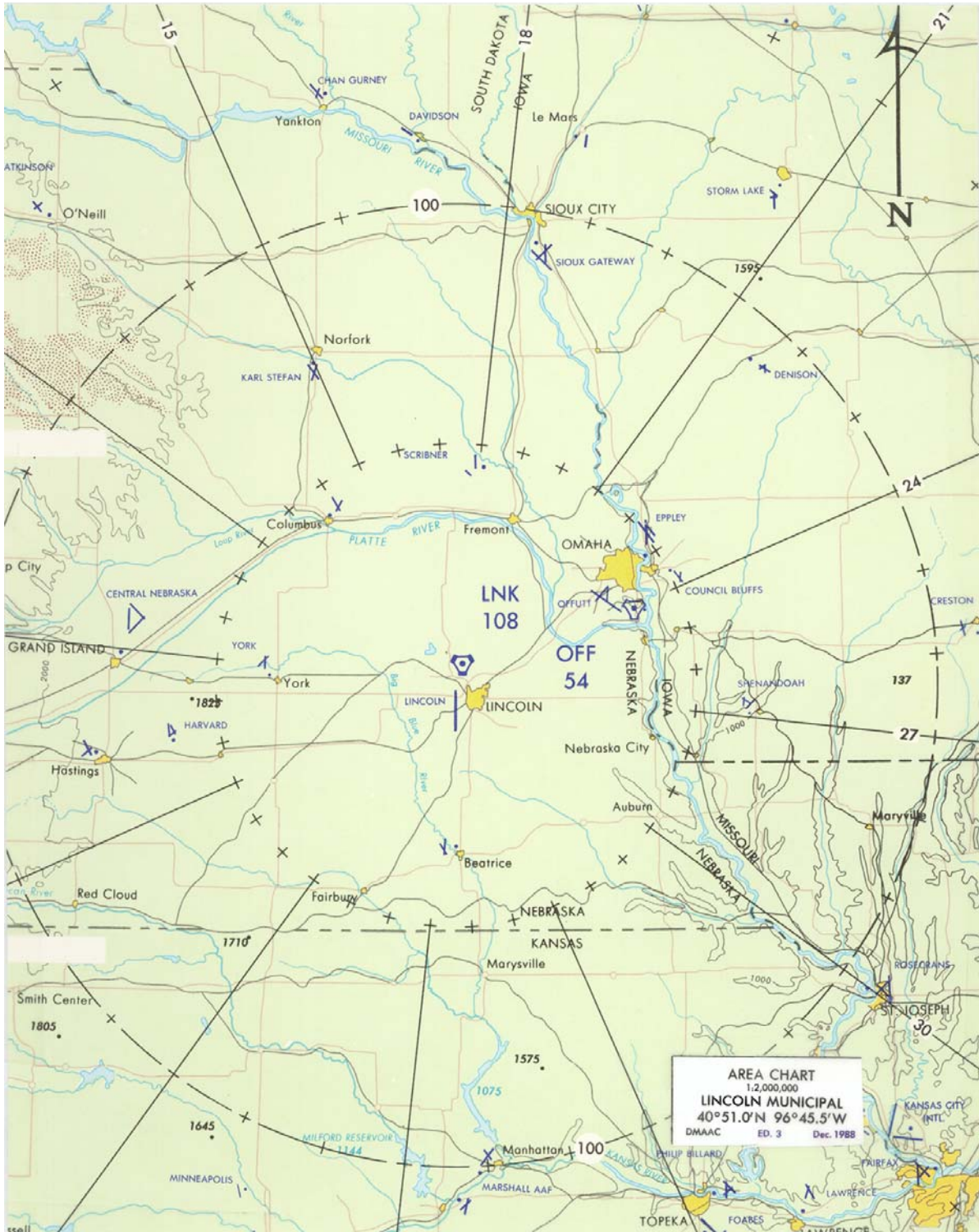
LINCOLN
LNK

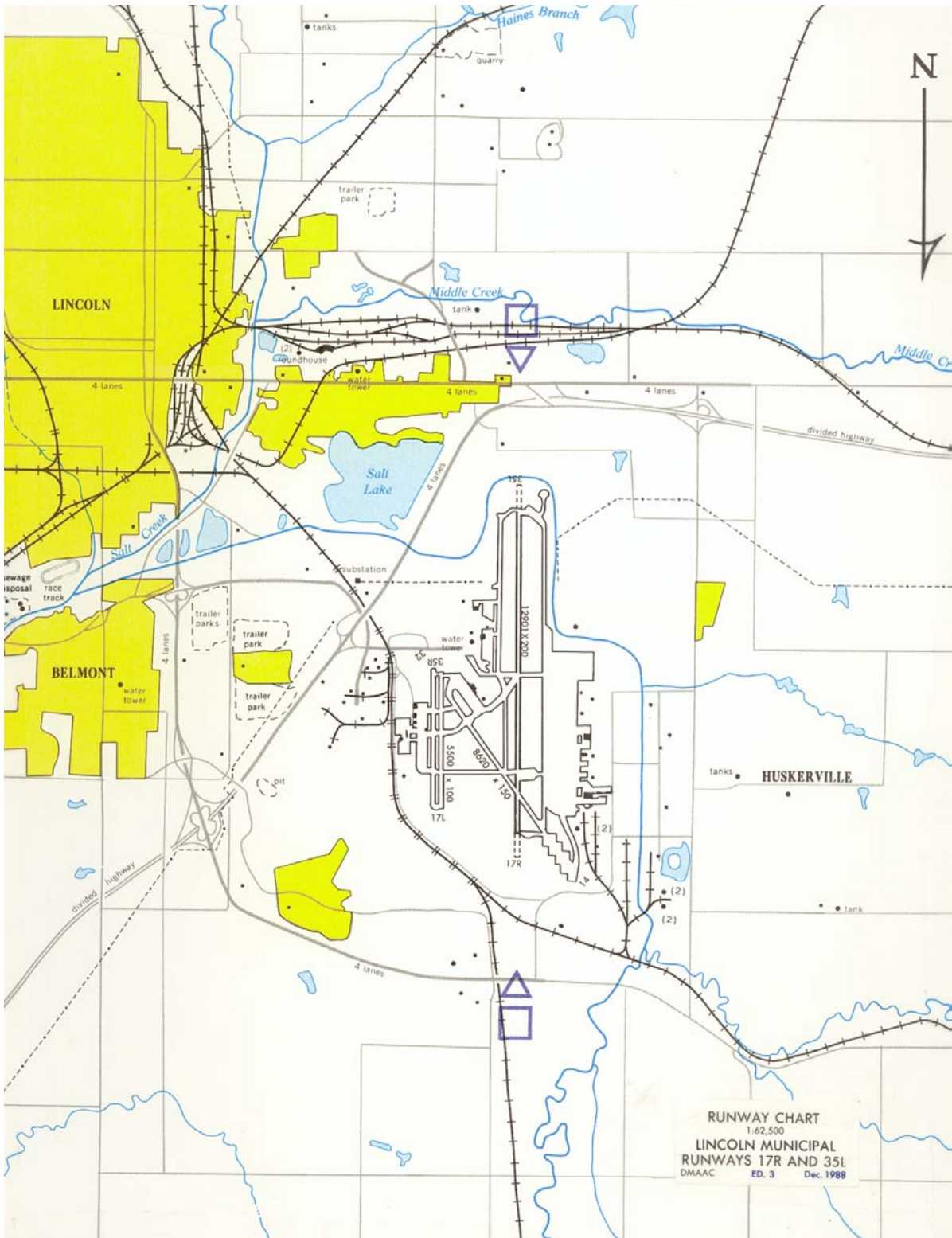
LINCOLN
LNK

LINCOLN
LNK

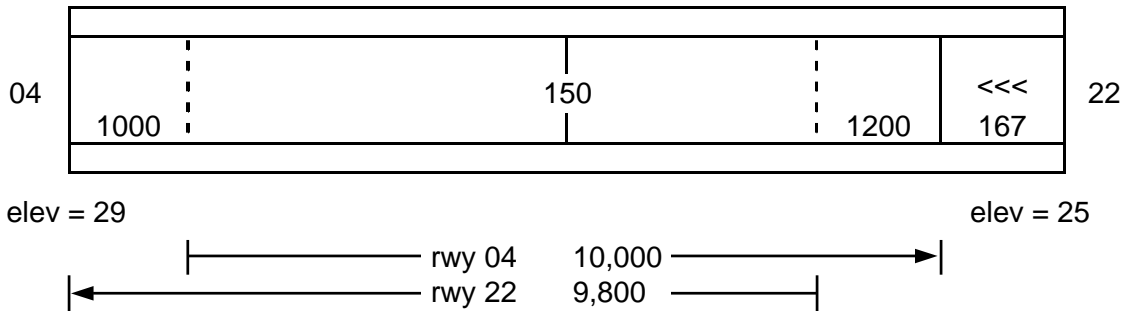
LINCOLN
LNK

LINCOLN
LNK





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TACAN: ROB-85x (Pri-DME)
I/F above: N:clear E:clear
 S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: none

<u>WARNING</u>	
Do not use rwy 22	
No overruns	
Expect thunderstorms, low clouds, and low visibility from May through November. Expect scattered low clouds other times	
Braking action poor	
This site not recommended for landing due to political concerns	

NOTE

- 25-ft shoulders
- Airport officials may be unaware of your purpose
- Language is English
- Previous site identifier was ROB

MONROVIA
LRB

MONROVIA
LRB

MONROVIA
LRB

MONROVIA
LRB

MONROVIA
LRB

MONROVIA
LRB

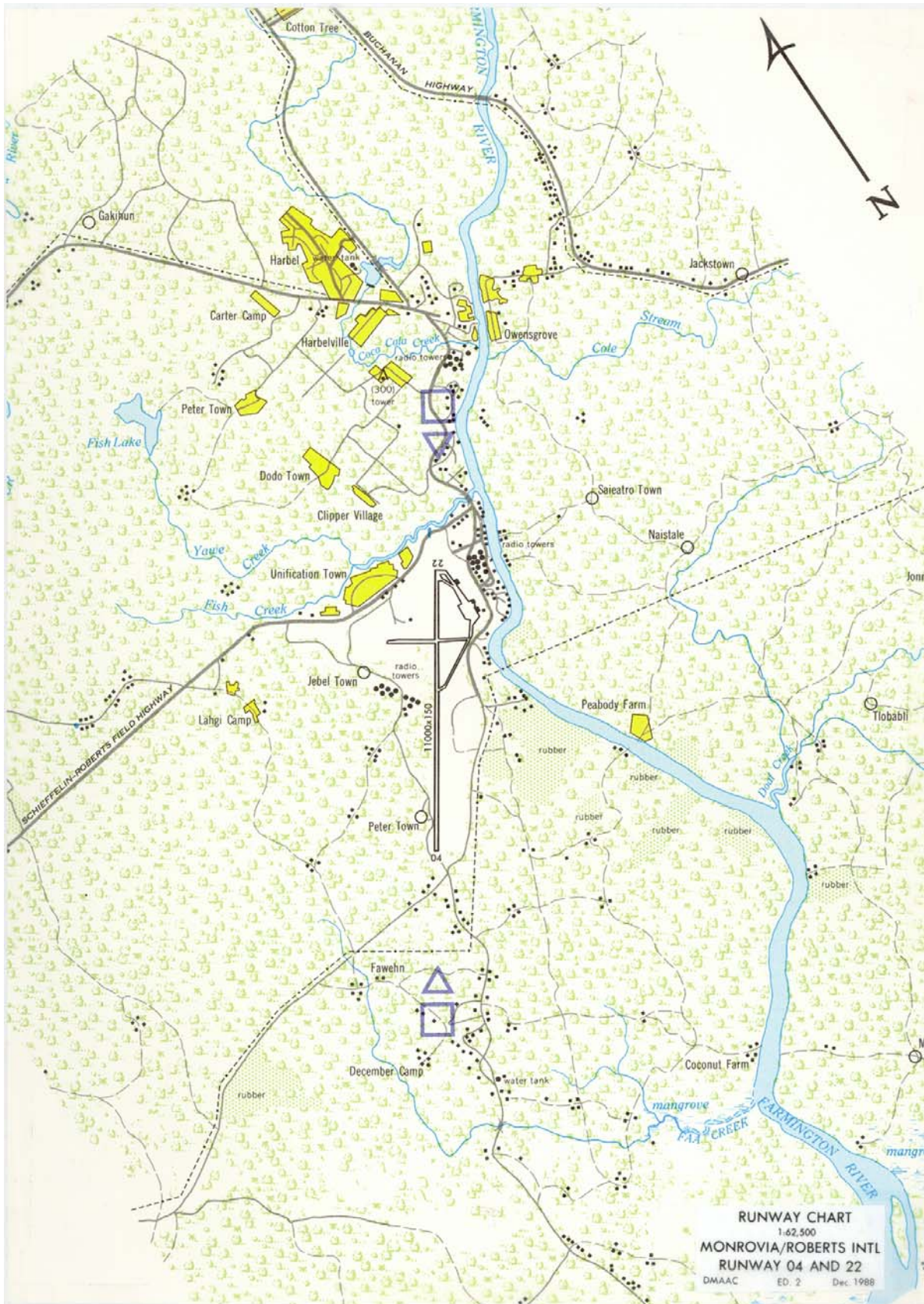
MONROVIA
LRB

MONROVIA
LRB

MONROVIA
LRB

MONROVIA
LRB



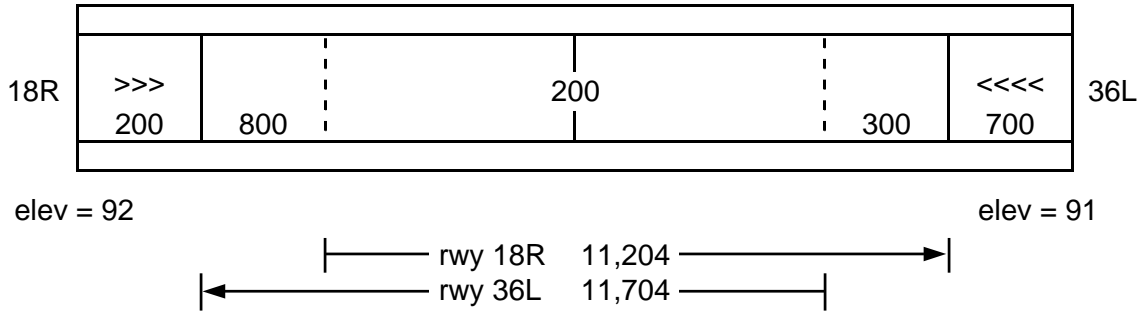


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MONROVIA/ROBERTS RWY LRB 04



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TACAN: TTS-59y (Pri) ORL-59x (Sec)
I/F above: N:clear E:clear N:85k E:85k
 S:clear W:clear S:85k W:95k

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

ORLANDO
MCO

ORLANDO
MCO

ORLANDO
MCO

ORLANDO
MCO

ORLANDO
MCO

ORLANDO
MCO

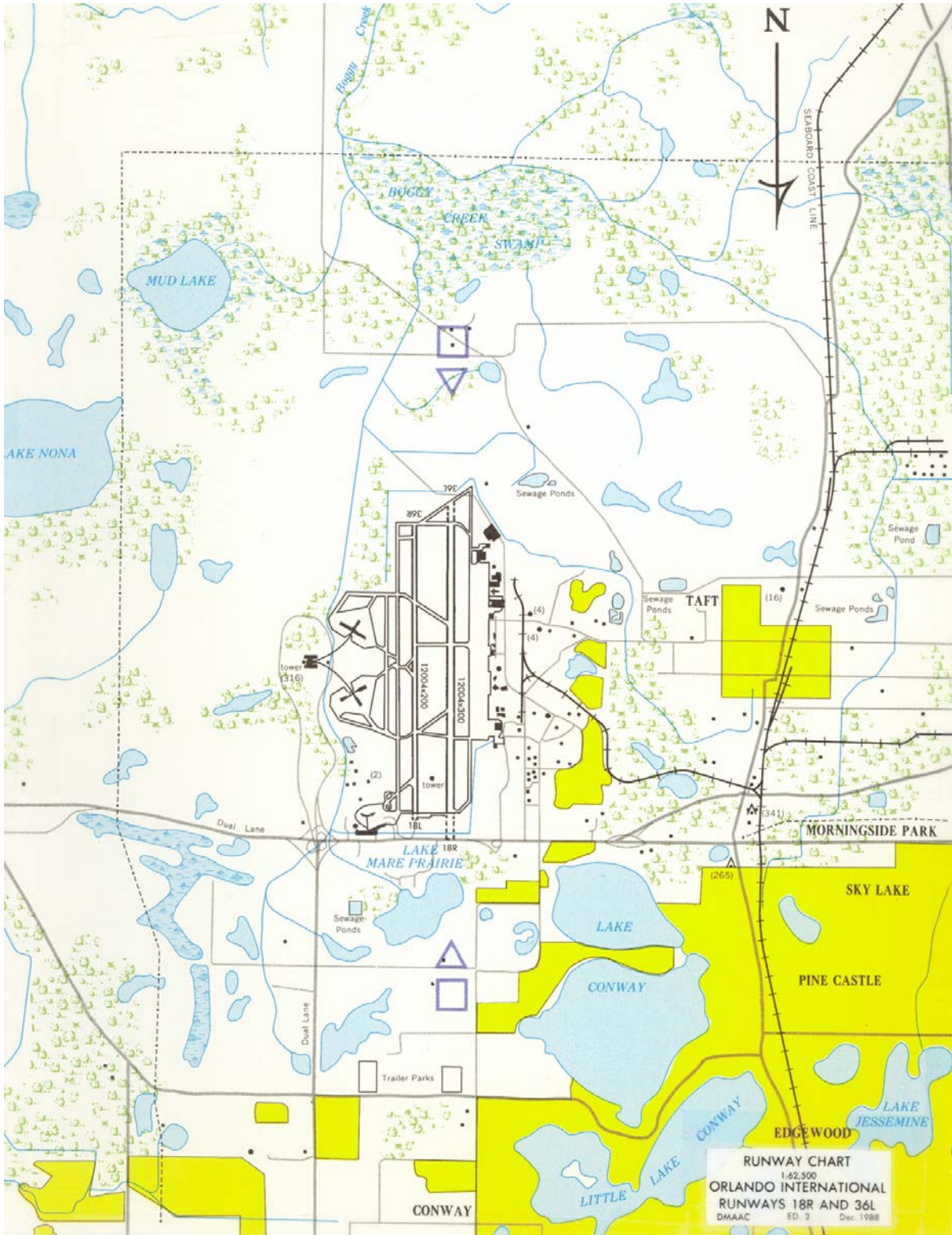
ORLANDO
MCO

ORLANDO
MCO

ORLANDO
MCO

ORLANDO
MCO





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MORON
MRN

MORON
MRN

MORON
MRN

MORON
MRN

MORON
MRN





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MORON RWY MRN 02



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MORON RWY MRN 20

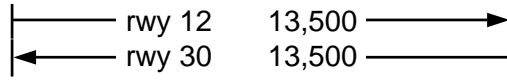
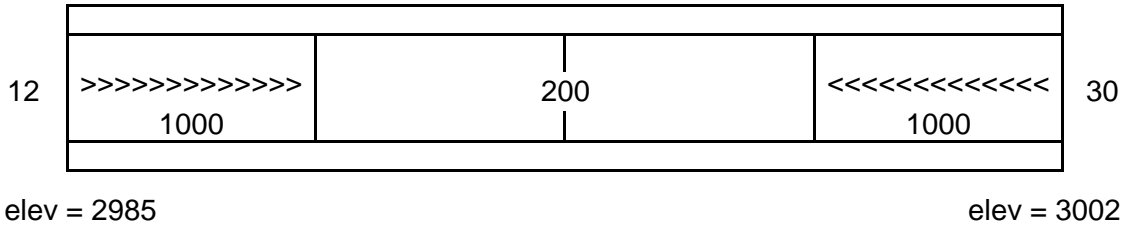


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Mountain Home AFB, Idaho

Table Identifier

MUO

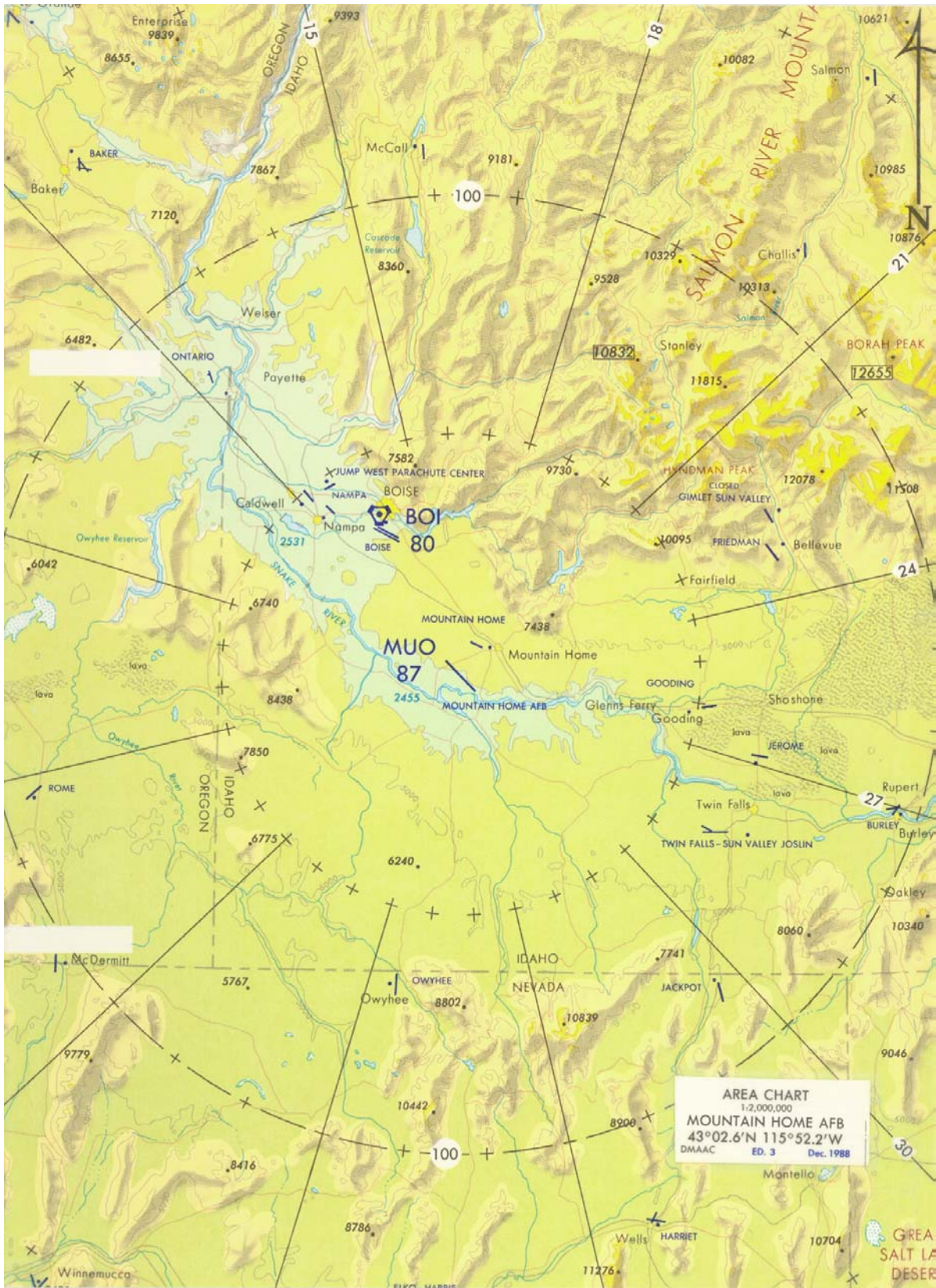


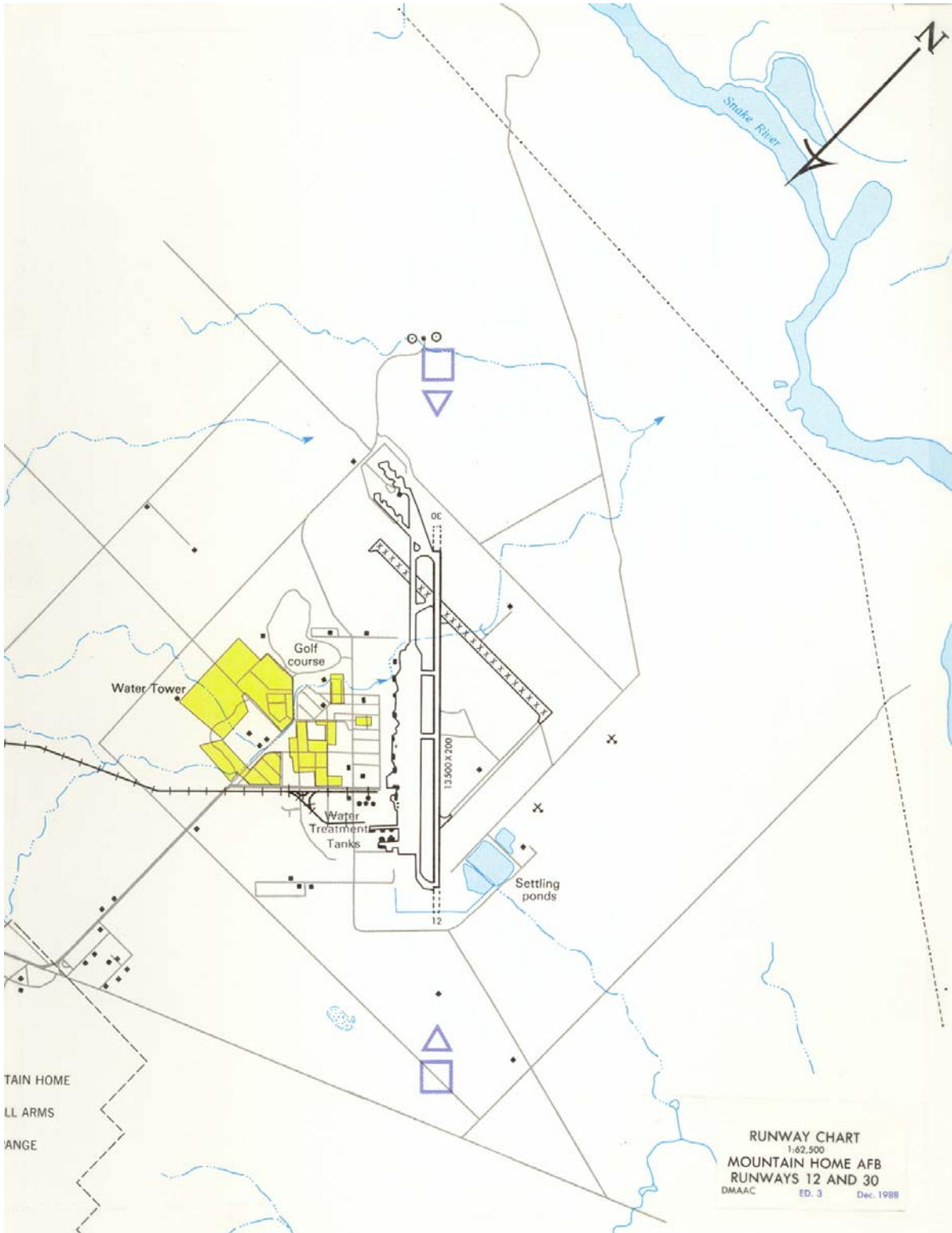
TACAN: MUO-87x (Pri) BOI-80x (Sec)
I/F above: N:80k E:clear N:clear E:145k
 S:100k W:80k S:95k W:110k

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

MOUNTAIN HOME MUO
 MOUNTAIN HOME MUO
 MOUNTAIN HOME MUO
 MOUNTAIN HOME MUO
 MOUNTAIN HOME MUO
 MOUNTAIN HOME MUO
 MOUNTAIN HOME MUO

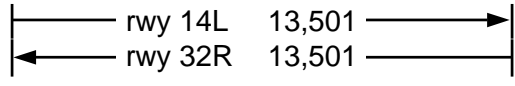
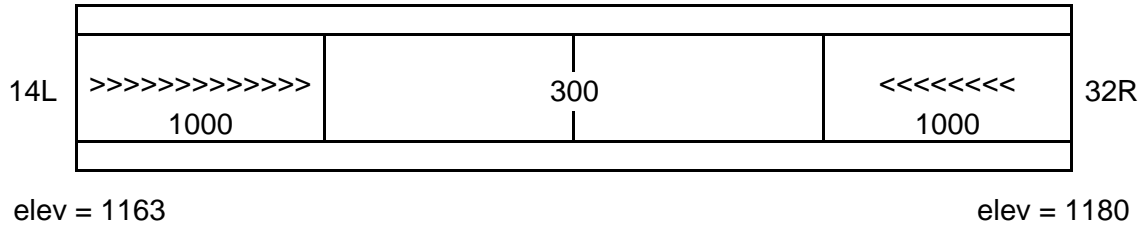
MOUNTAIN HOME MUO
MOUNTAIN HOME MUO
MOUNTAIN HOME MUO
MOUNTAIN HOME MUO
MOUNTAIN HOME MUO
MOUNTAIN HOME MUO





MOUNTAIN HOME
 ALL ARMS
 RANGE

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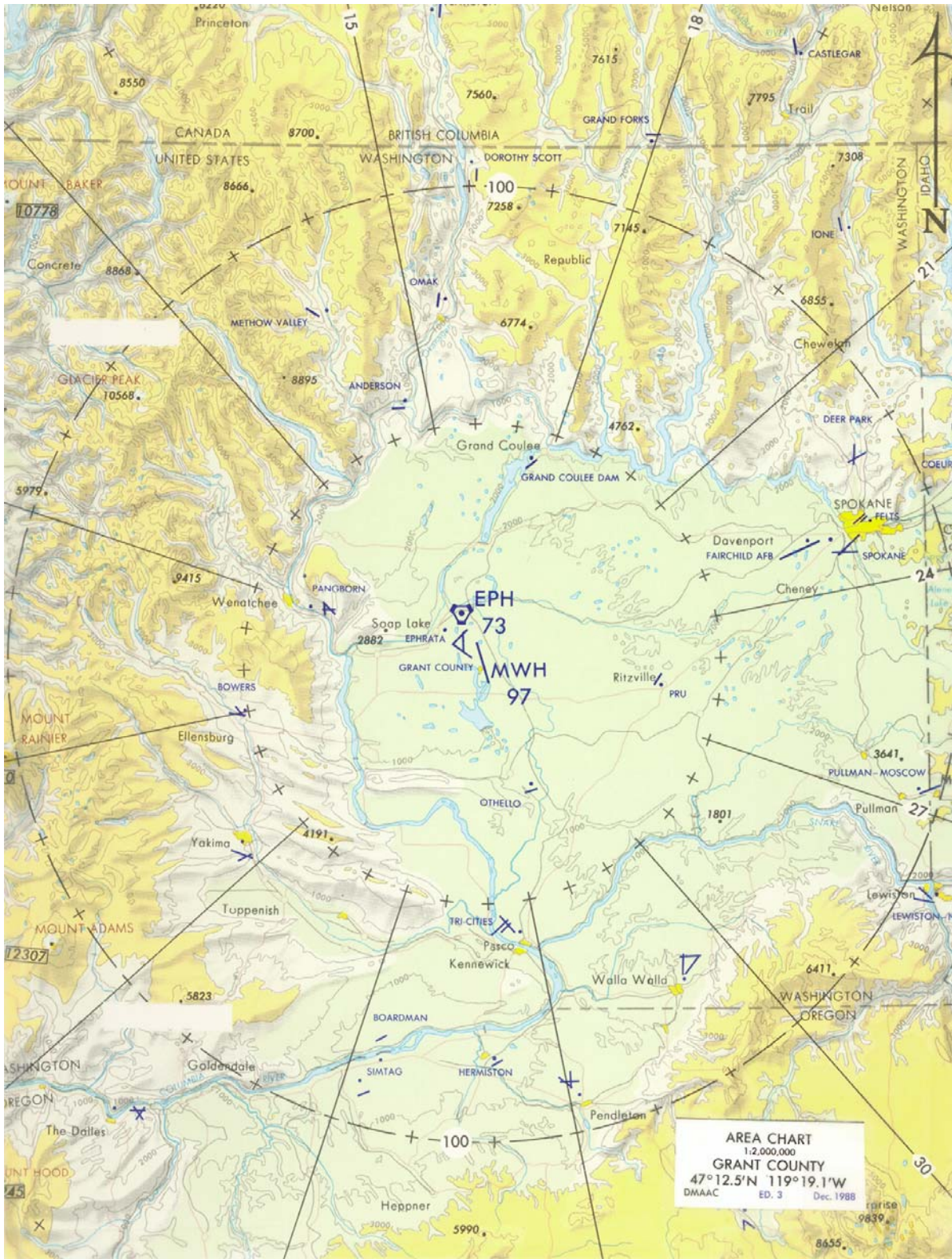
TACAN: EPH-73x (Pri) MWH-97x (Sec-DME)
I/F above: N:clear E:80k N:clear E:135k
 S:80k W:clear S:clear W:clear

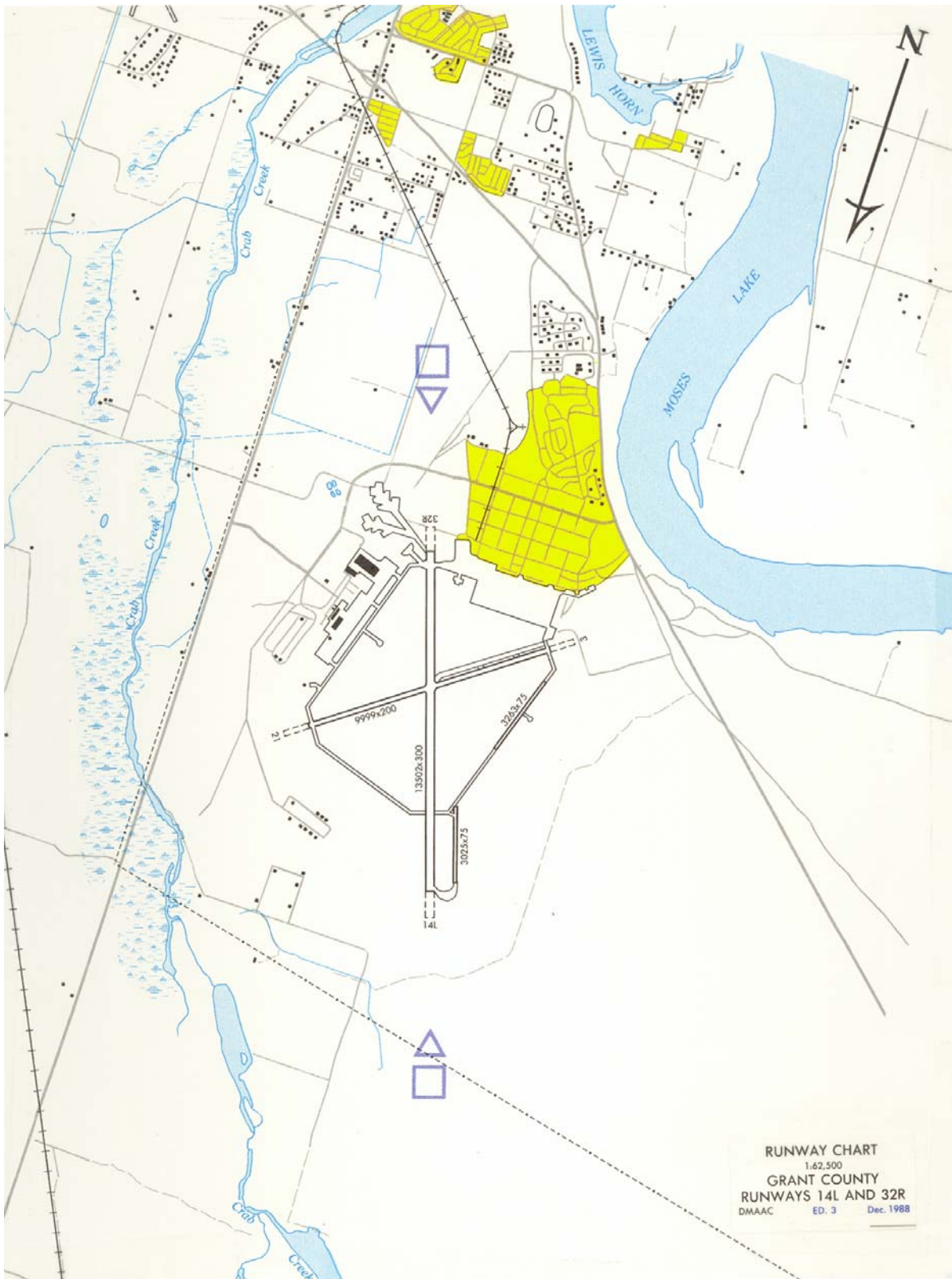
MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

GRANT COUNTY
MWH
 GRANT COUNTY
MWH
 GRANT COUNTY
MWH
 GRANT COUNTY
MWH
 GRANT COUNTY
MWH

*Previous name was Moses Lake

GRANT COUNTY MWH
GRANT COUNTY MWH
GRANT COUNTY MWH
GRANT COUNTY MWH
GRANT COUNTY MWH
GRANT COUNTY MWH
GRANT COUNTY MWH





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MYRTLE BEACH
MYR

MYRTLE BEACH
MYR

MYRTLE BEACH
MYR

MYRTLE BEACH
MYR

MYRTLE BEACH
MYR





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MYRTLE BEACH RWY MYR 17



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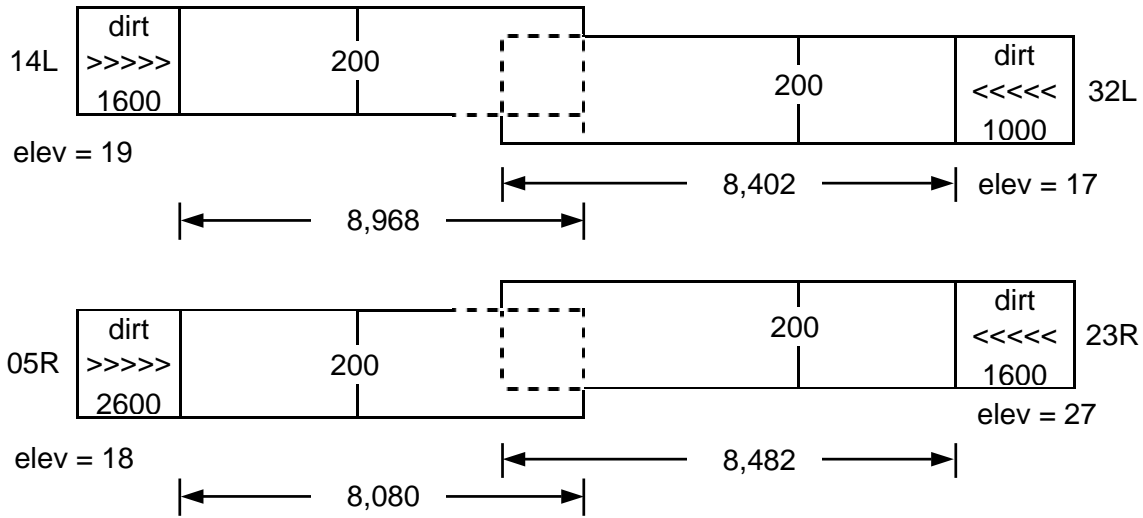
MYRTLE BEACH RWY MYR 35



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Cherry Point MCAS, North Carolina

Table Identifier **NKT**



TACAN: NKT-75x (Pri) EWN-83x (Sec-DME)
I/F above: N:<<80k E:<<80k N:90k E:95K
 S:<<80k W:<<80k S:clear W:110k

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

CHERRY POINT
NKT

CHERRY POINT
NKT

CHERRY POINT
NKT

CHERRY POINT
NKT

CHERRY POINT
NKT

CHERRY POINT
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CHERRY POINT
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CHERRY POINT
NKT



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CHERRY POINT RWY NKT 14L



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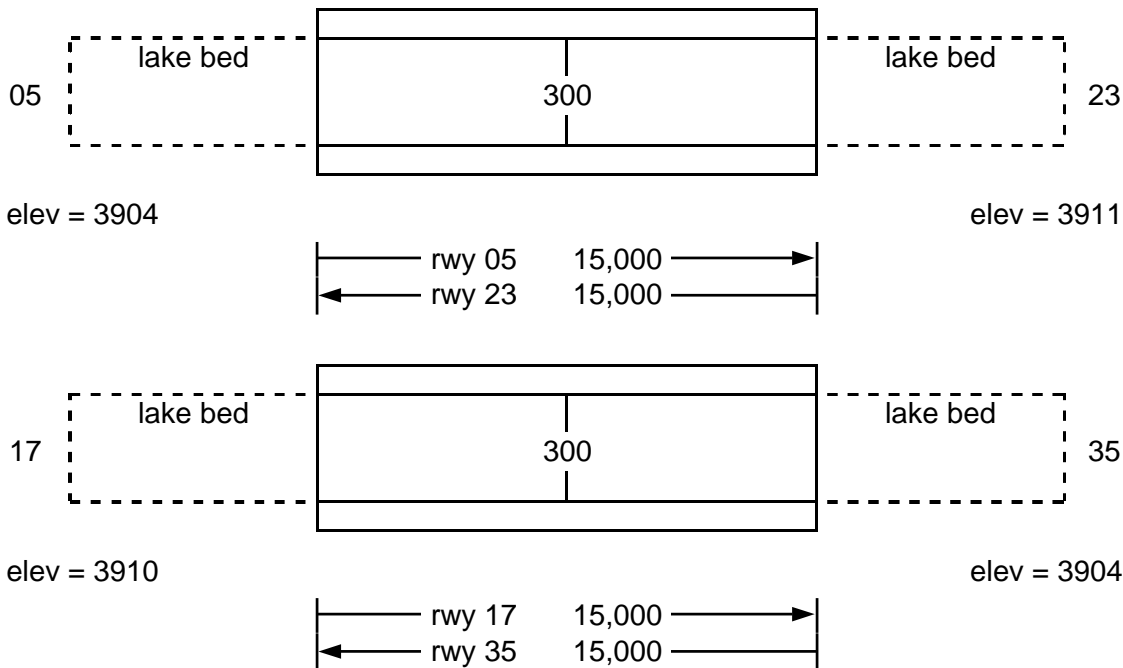
CHERRY POINT RWY NKT 32L



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White Sands Space Harbor, New Mexico

Table Identifier **NOR**



TACAN: SNG-121y (Pri) HMN-92x (Sec)
I/F above: N:clear E:clear N:<<80k E:<<80k
 S:clear W:clear S:<<80k W:120k

MLS: (17-JR) (23-JR) ch 6
PAPI: 17, 23, 35*
Ball Bar: 17, 23, 35
UHF: yes

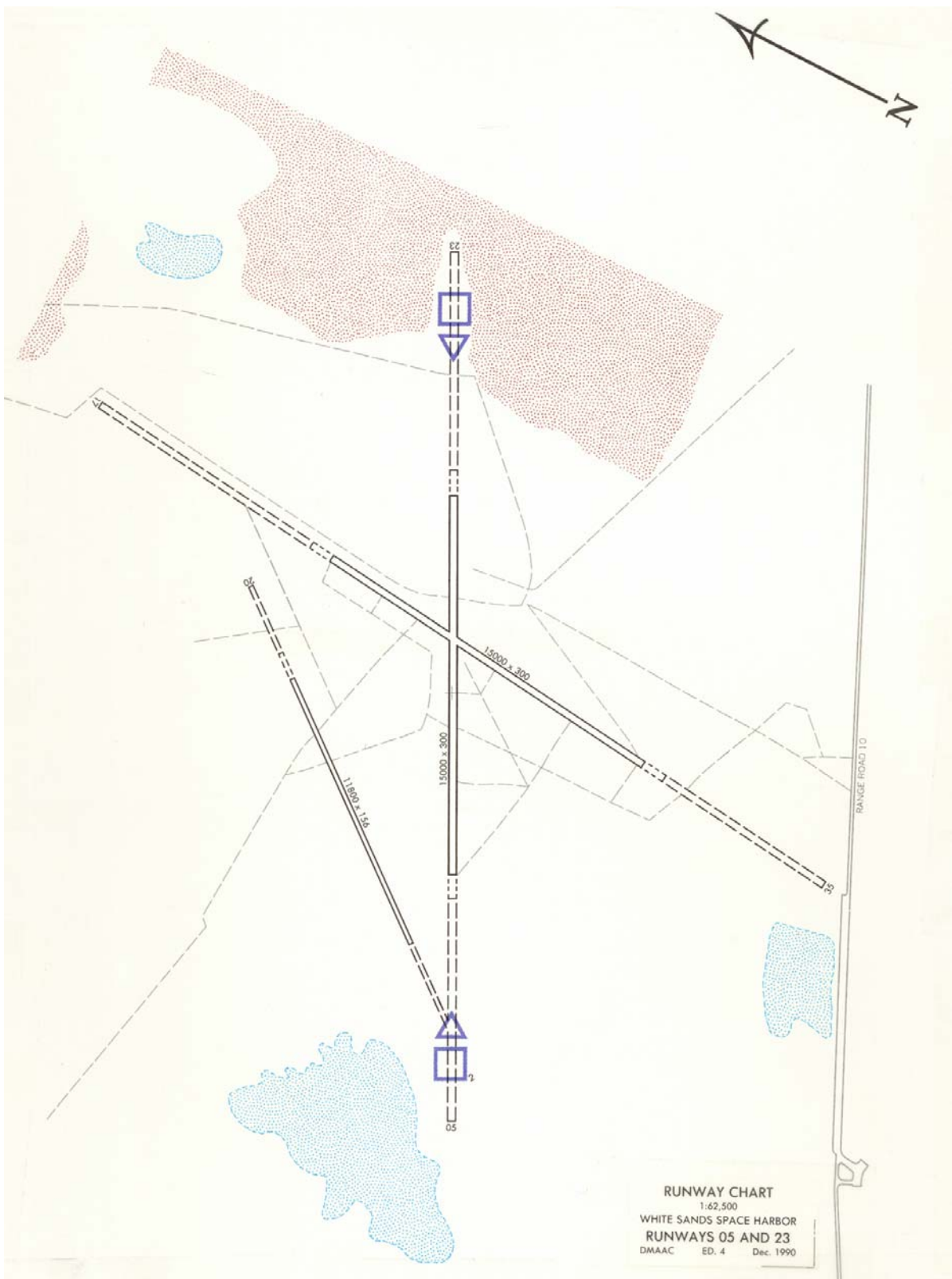
NOTE
 TAL training rwy 02/20 located in NW quadrant between rwys 05 and 17

*7500-ft aim point only

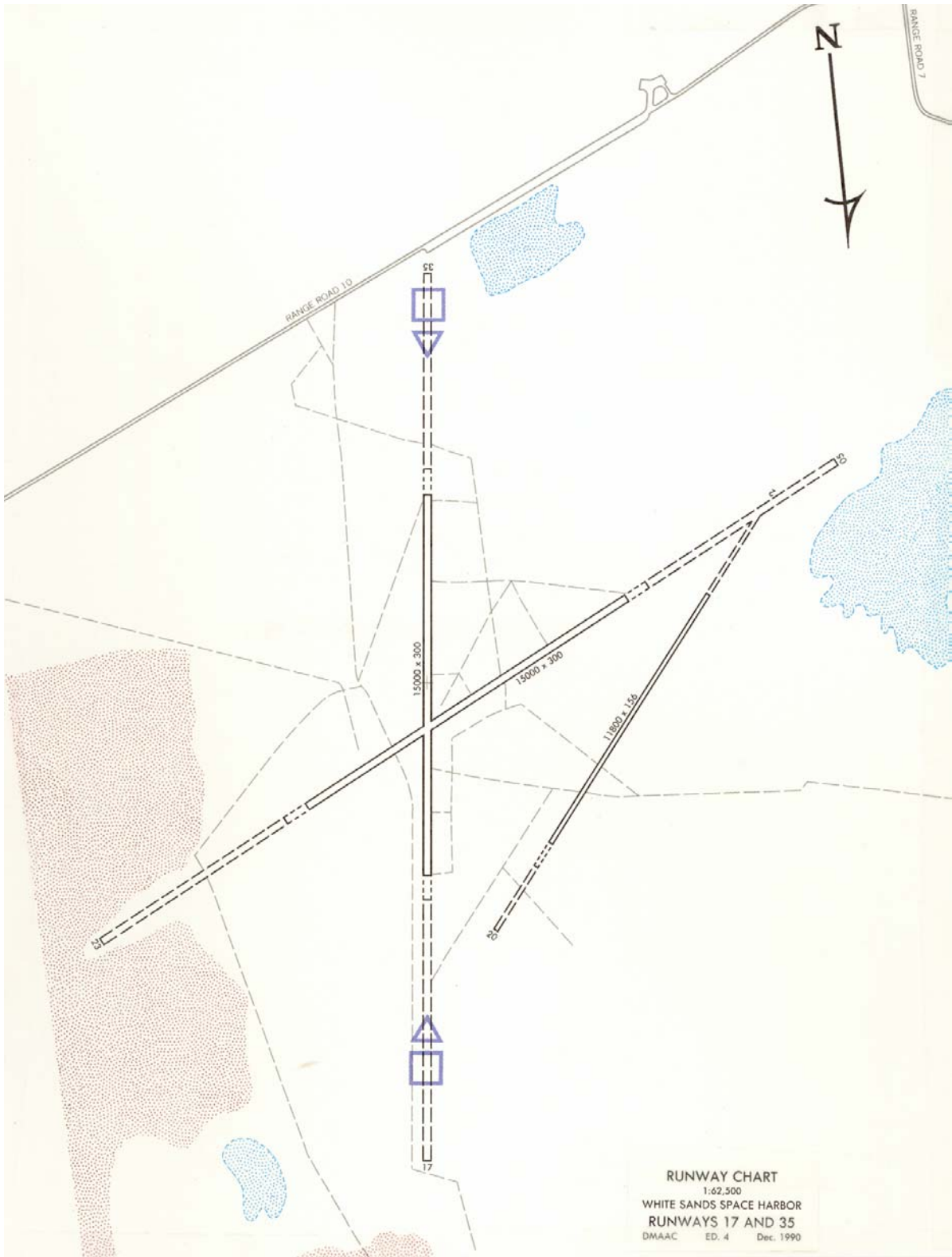
WHITE SANDS
 NOR
 WHITE SANDS
 NOR
 WHITE SANDS
 NOR
 WHITE SANDS
 NOR

WHITE SANDS NOR
WHITE SANDS NOR
WHITE SANDS NOR
WHITE SANDS NOR
WHITE SANDS NOR
WHITE SANDS NOR





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OCEANA
NTU

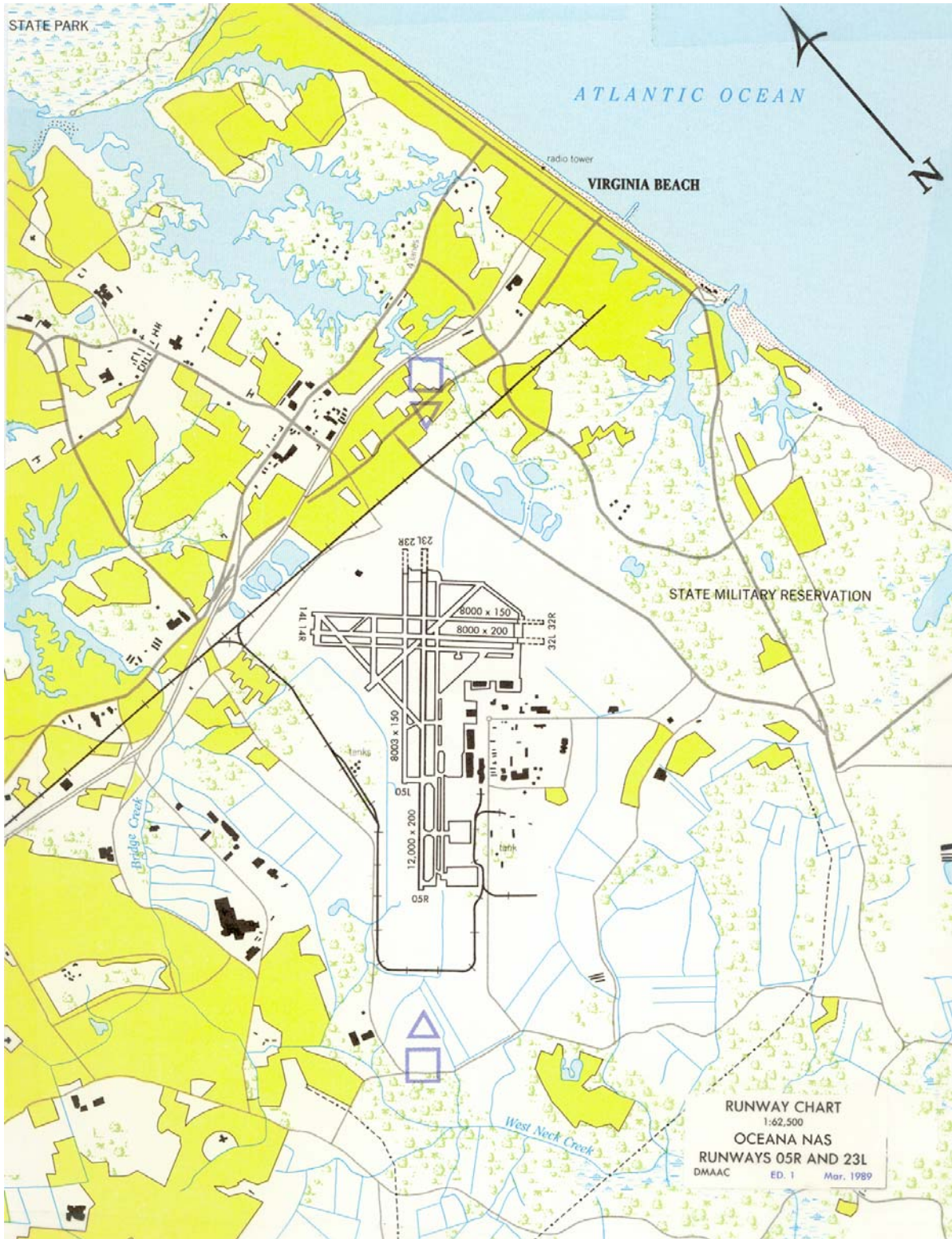
OCEANA
NTU

OCEANA
NTU

OCEANA
NTU

OCEANA
NTU





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OCEANA RWY NTU 05R
View 1



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OCEANA RWY NTU 05R
View 2

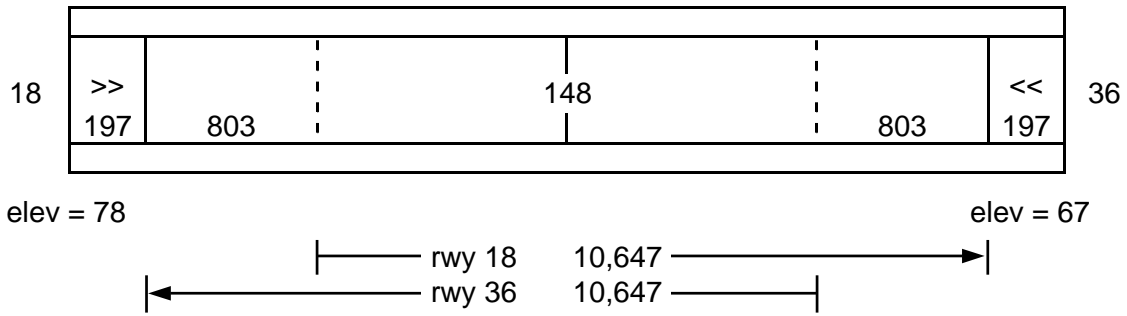


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OCEANA RWY NTU 23L



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TACAN: BYD-121x (Pri)* YF-78x (Sec-DME)
I/F above: N:clear E:clear N:clear E:clear
 S:clear W:clear S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: none

NOTE

- Sharp dropoff on approach end of rwy 18
- Hill on approach end of rwy 36
- Previous site identifier was YOF
- No current agreement for use of this site

*TACAN BYD-121x available only during ascent

DAKAR
OOY

DAKAR
OOY

DAKAR
OOY

DAKAR
OOY

DAKAR
OOY

DAKAR
OOY

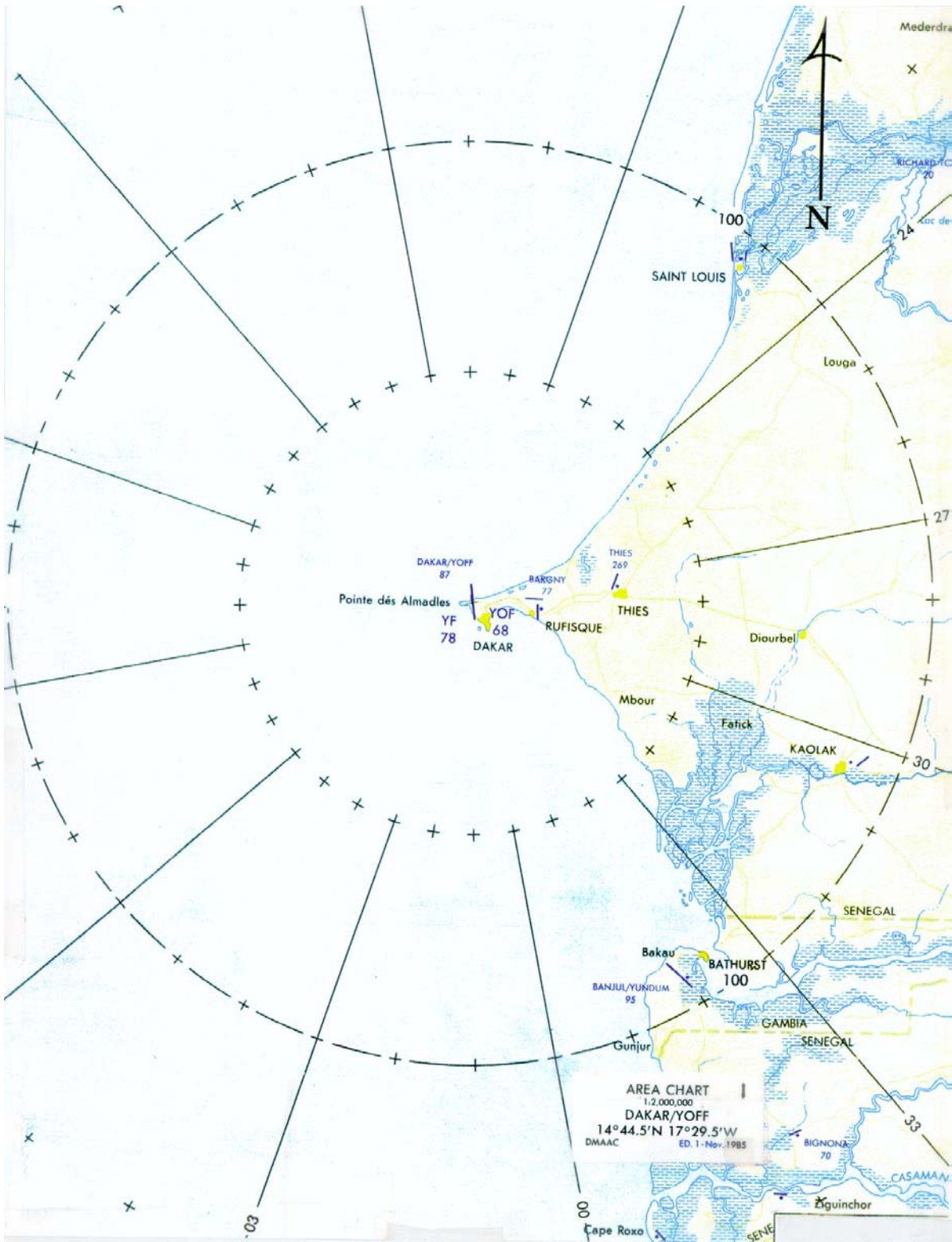
DAKAR
OOY

DAKAR
OOY

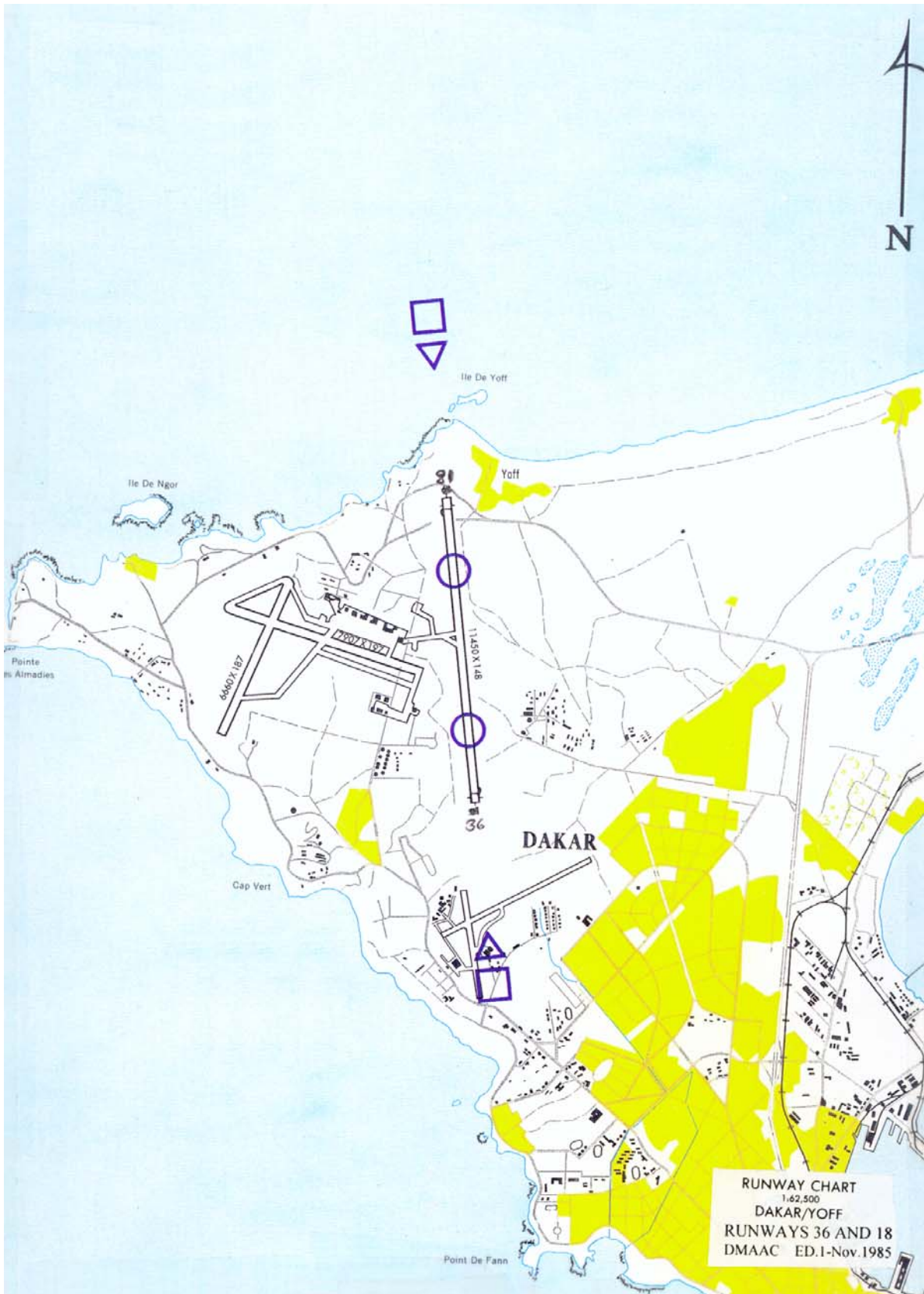
DAKAR
OOY

DAKAR
OOY

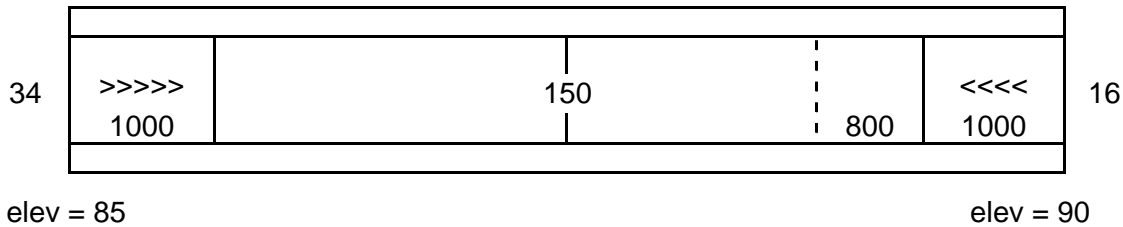
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TACAN: ENE-118x (Pri) PSM-112x (Sec)
I/F above: N:clear E:clear N:<<80k E:<<80k
 S:clear W:clear S:<<80k W:<<80k

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

PEASE
PSM

PEASE
PSM

PEASE
PSM

PEASE
PSM

PEASE
PSM

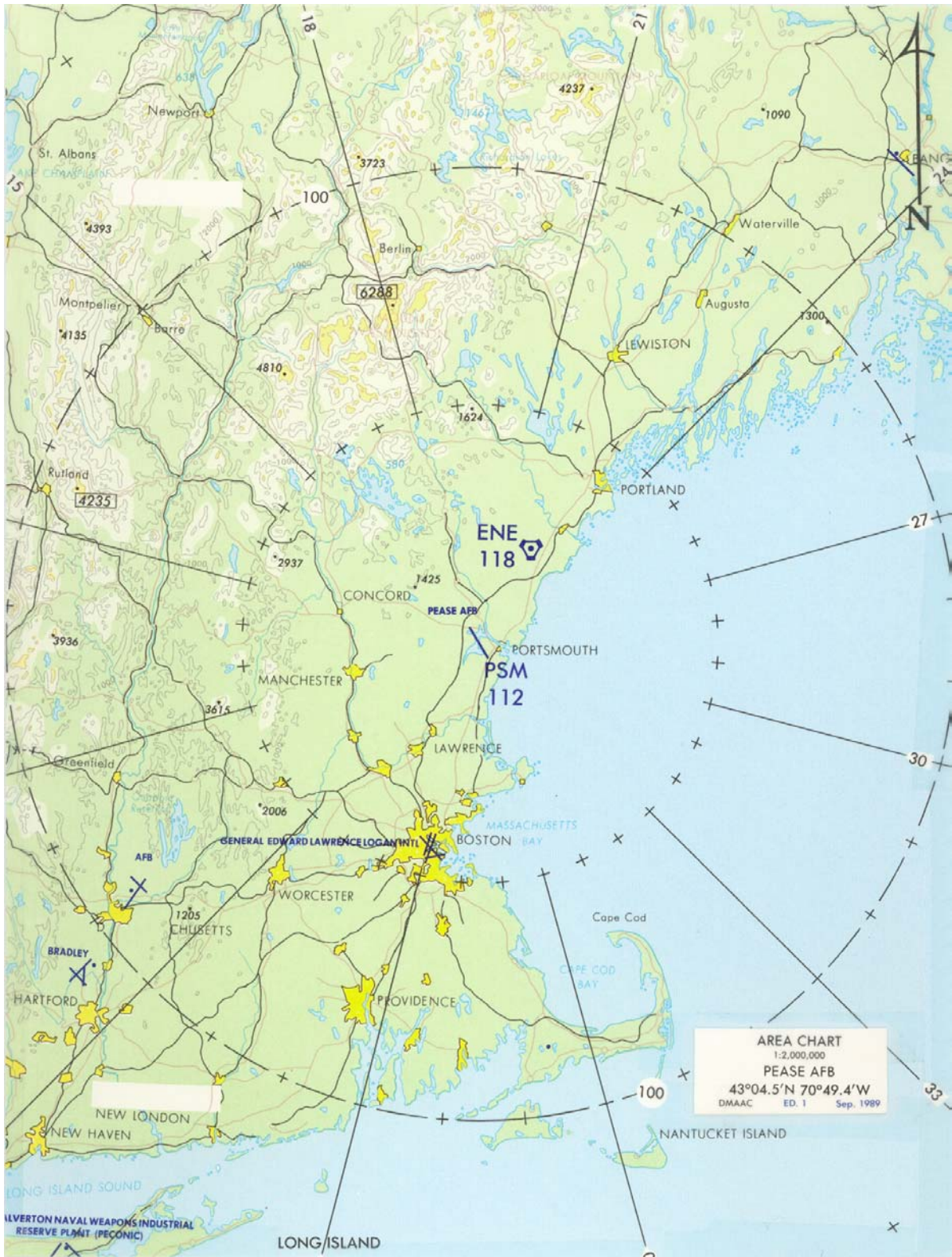
PEASE
PSM

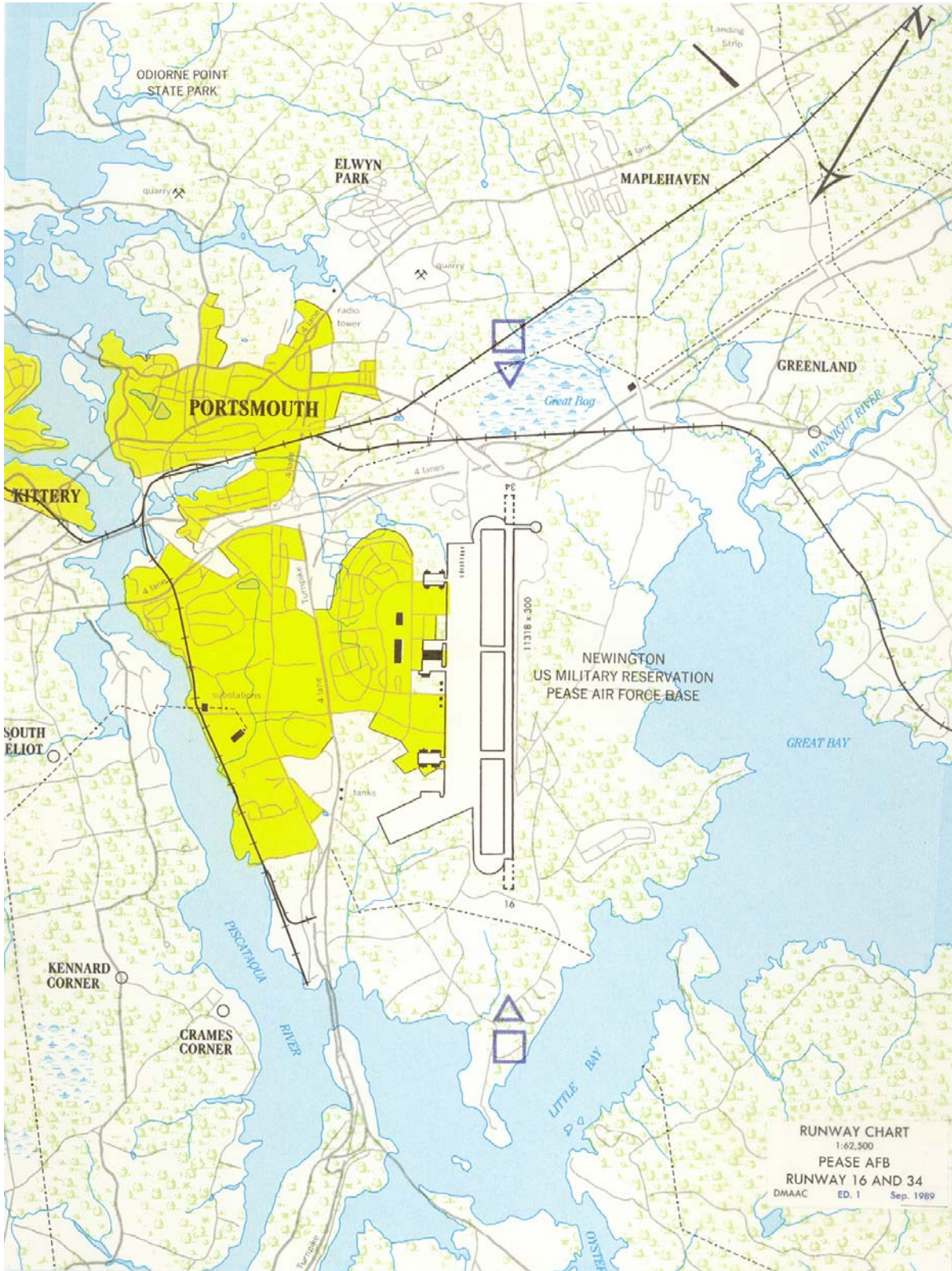
PEASE
PSM

PEASE
PSM

PEASE
PSM

PEASE
PSM





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PEASE RWY PSM 16



PSM-A

MAPS/ALL/GEN F

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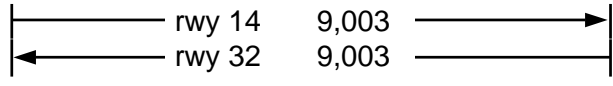
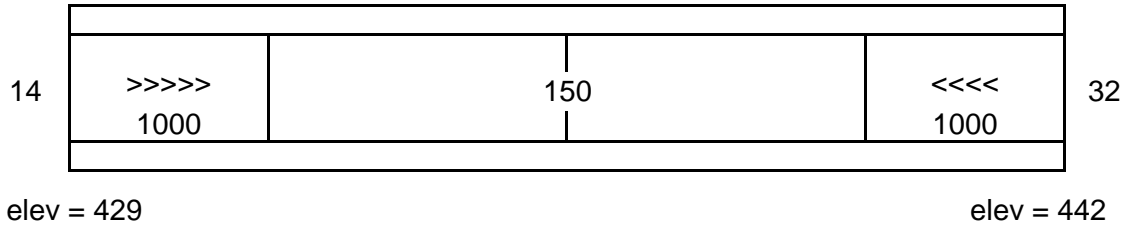
PEASE RWY PSM 34



PSM-C

MAPS/ALL/GEN F

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TACAN: TDL-70x (Pri)
I/F above: N:clear E:clear
 S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

TINDAL
PTN

TINDAL
PTN

TINDAL
PTN

TINDAL
PTN

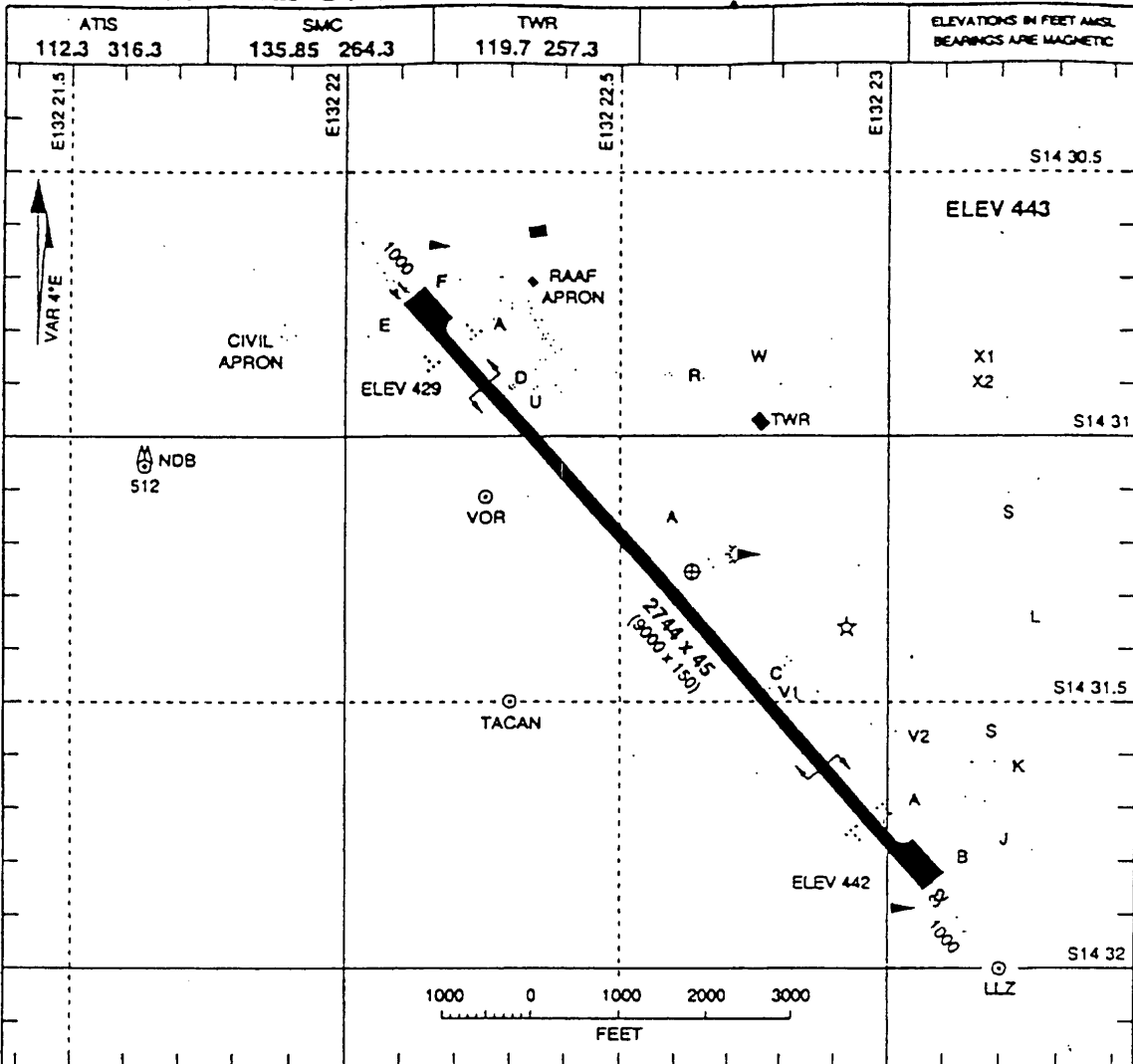
TINDAL
PTN

TINDAL AIRPORT DIAGRAM

AERODROME CHART

TINDAL-YPTN

RAAF AIS AUSTRALIA



LIGHTING				NOTES
RWY	APPROACH	THR	RUNWAY	
14 (135°)	T-VASIS 6 STAGE	TCH 51FT	3 STAGE	
32 (315°)		TCH 34FT		
ABN: ALT WG ILLUMINATED WIND INDICATOR TAXIWAY: CENTRELINE GREEN				

AERODROME CHART

S14 31.26 E132 22.67

(WGS 84)

15 JUN 00

AUSTRALIA

TINDAL-YPTN

TINDAL
PTN

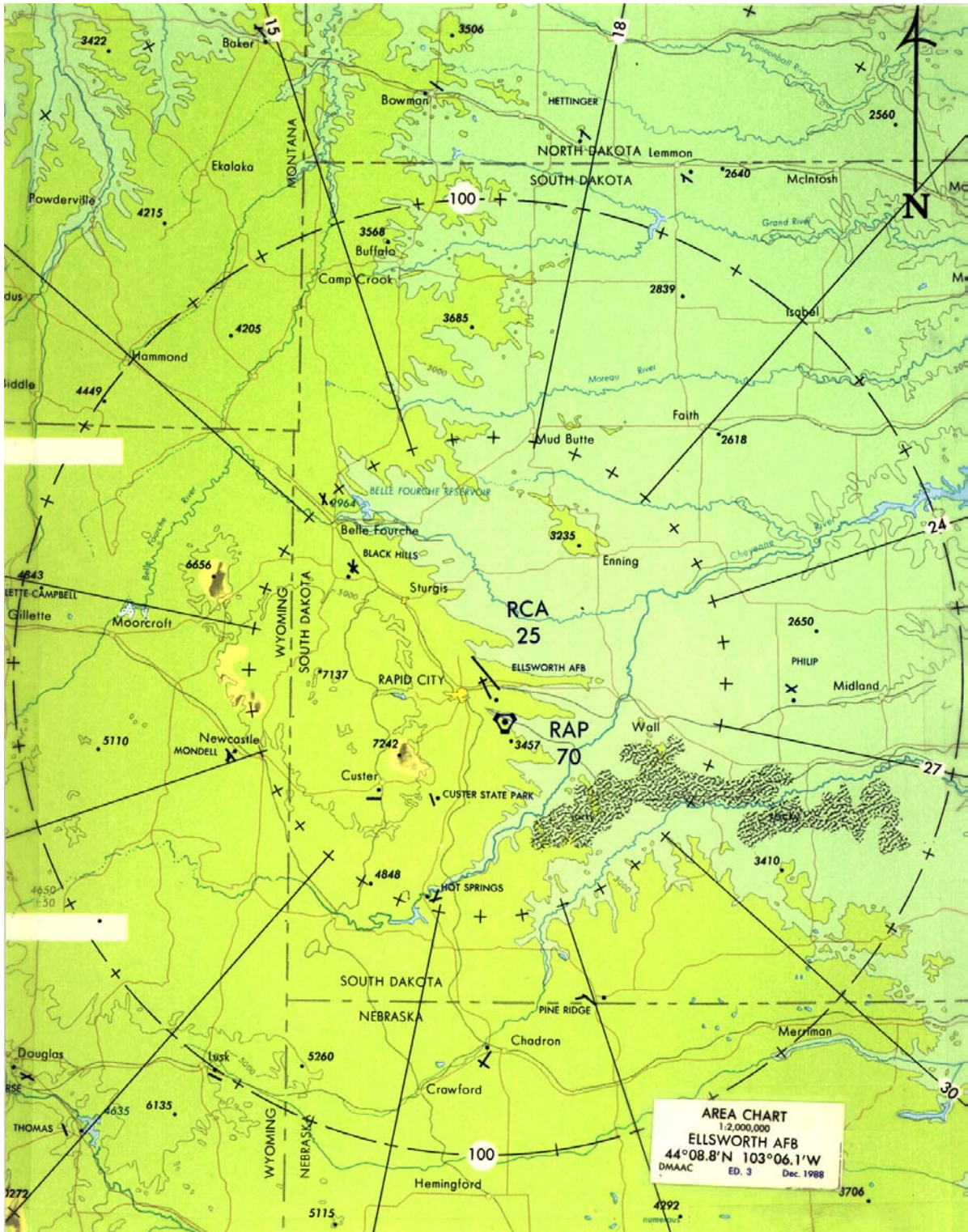
TINDAL
PTN

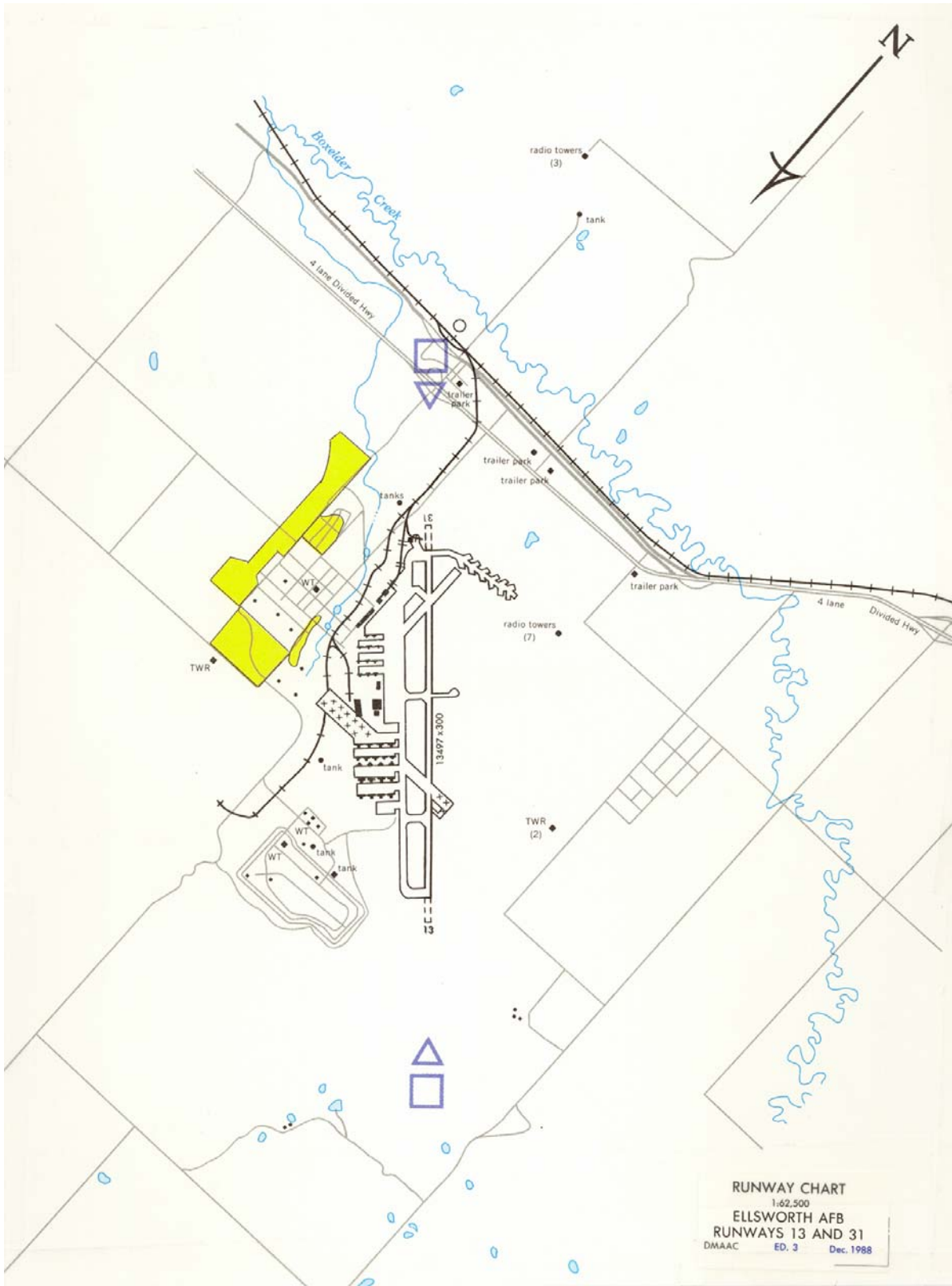
TINDAL
PTN

TINDAL
PTN

TINDAL
PTN

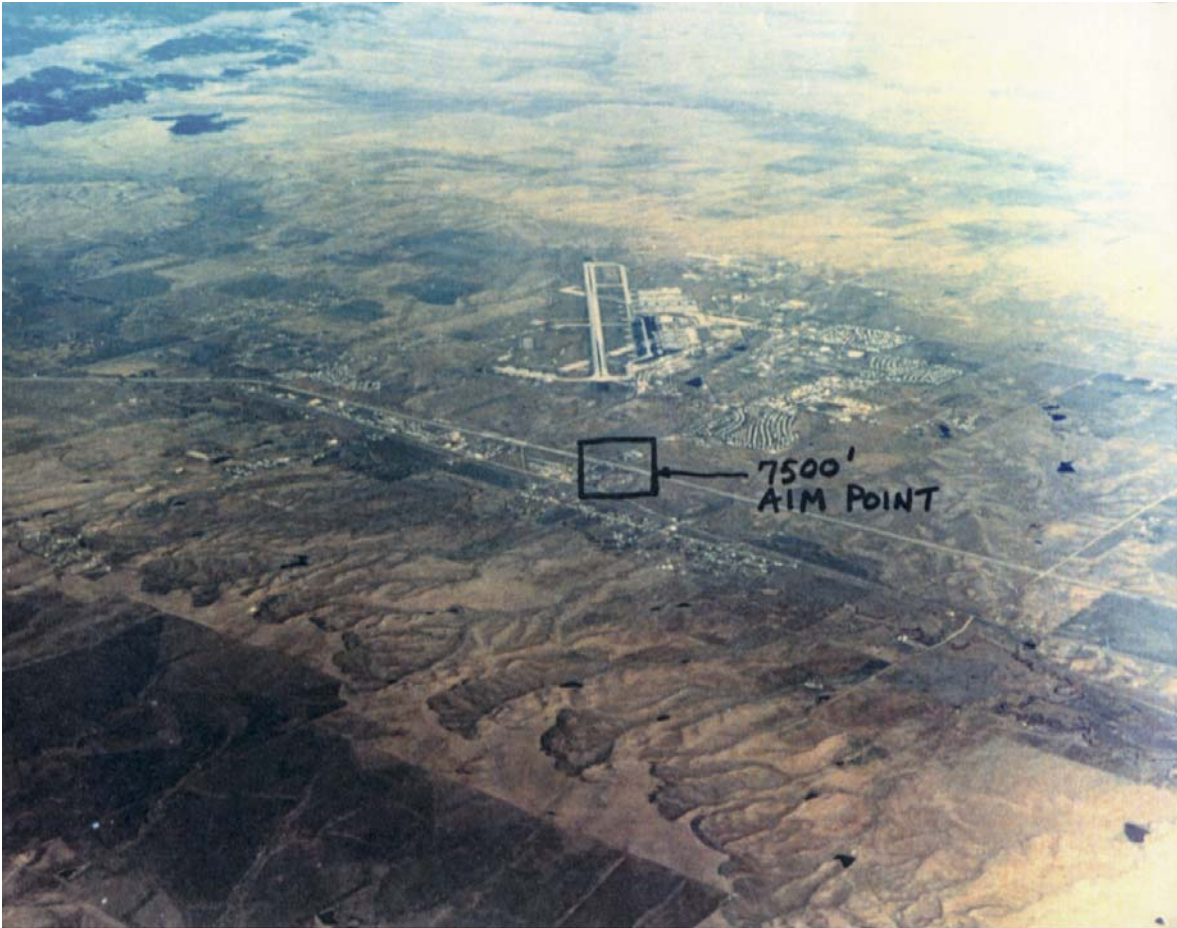
ELLSWORTH
RCA
ELLSWORTH
RCA
ELLSWORTH
RCA
ELLSWORTH
RCA
ELLSWORTH
RCA





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ELLSWORTH RWY RCA 31



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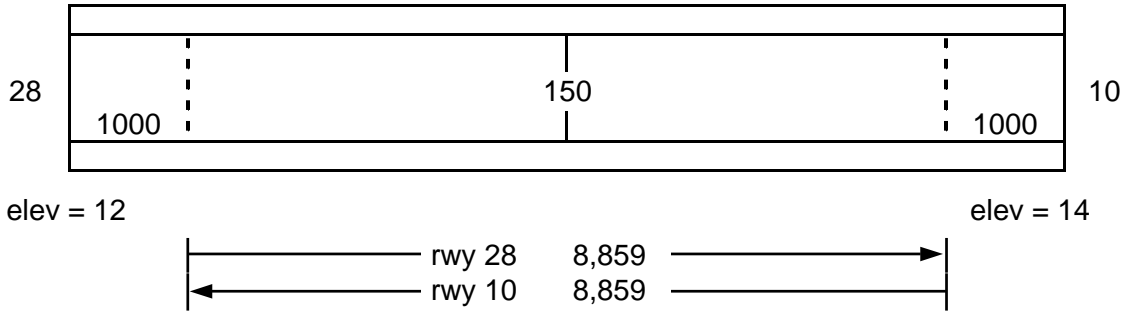
ELLSWORTH RWY RCA 13



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Wake Island AAF, Wake Island

Table Identifier **WAK**



TACAN: AWK-82x (Pri)
I/F above: N:clear E:clear
S:clear W:clear

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

WAKE ISLAND
WAK

WAKE ISLAND
WAK

WAKE ISLAND
WAK

WAKE ISLAND
WAK

WAKE ISLAND
WAK

WAKE ISLAND
WAK

WAKE ISLAND
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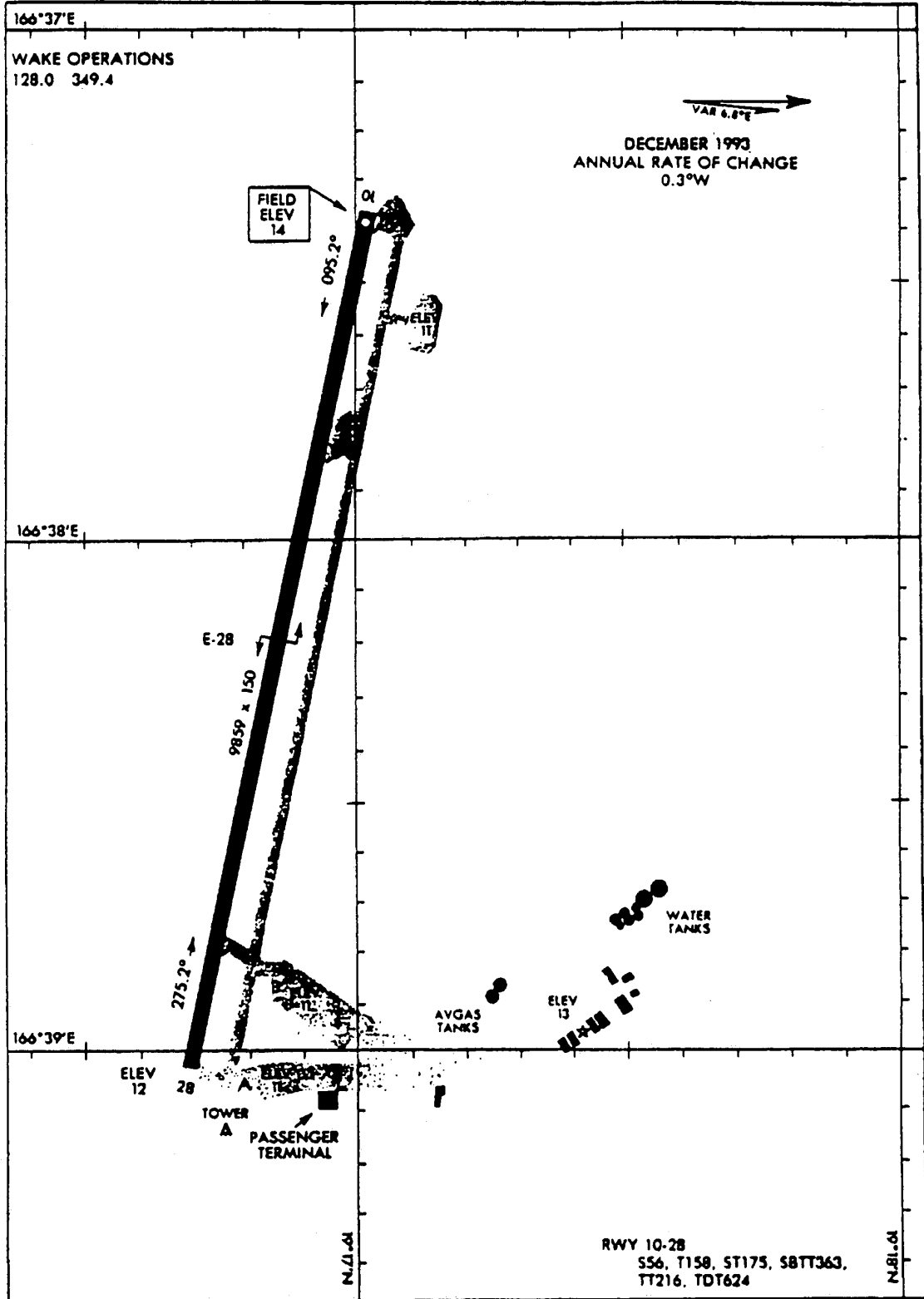
WAKE ISLAND AIRPORT DIAGRAM

95089

AIRPORT DIAGRAM

AFD-2162 (USAF)

WAKE ISLAND AAF (PWAK)
WAKE ISLAND



AIRPORT DIAGRAM

WGS DATUM

WAKE ISLAND AAF (PWAK)

WAKE ISLAND RWY WAK 28



WAKE ISLAND RWYS WAK 10 AND WAK 28

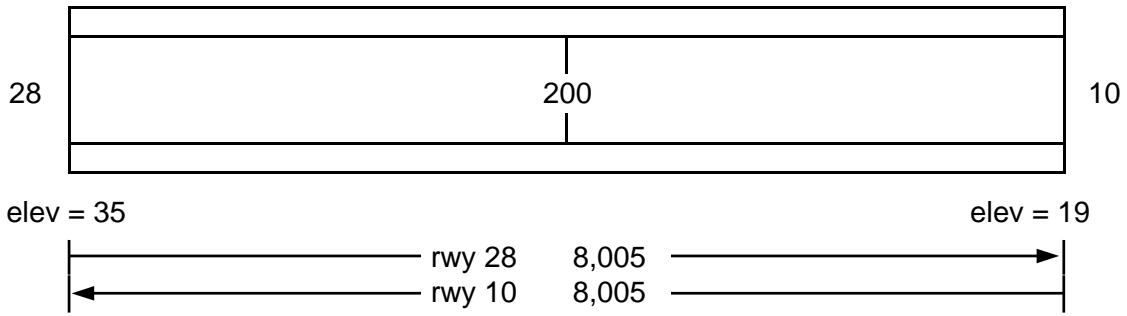


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Wallops Flight Facility, Wallops Island, Virginia

Table Identifier

WAL



TACAN: SBY-49x (Pri)
I/F above: N:<<80k E:<<80k
S:<<80k W:<<80k

MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

WALLOPS
WAL

WALLOPS
WAL

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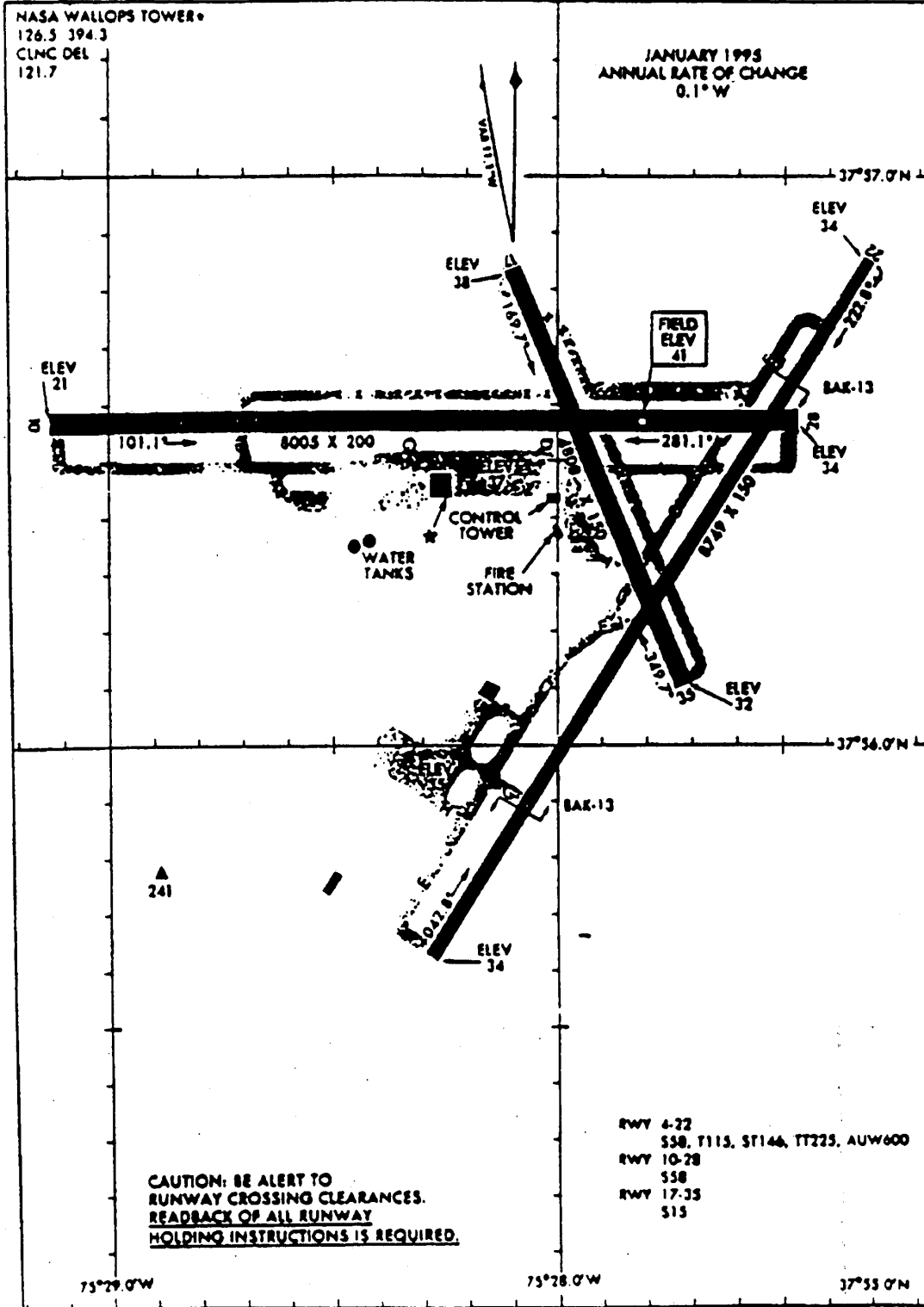
WALLOPS AIRPORT DIAGRAM

99196

AIRPORT DIAGRAM

358
AL-639 (FAA)

WALLOPS FLIGHT FACILITY (WAL)
WALLOPS ISLAND, VIRGINIA



AIRPORT DIAGRAM

99196

WALLOPS ISLAND, VIRGINIA
WALLOPS FLIGHT FACILITY (WAL)

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WALLOPS RWY WAL 10



WALLOPS RWY WAL 28



HALIFAX
YHZ

HALIFAX
YHZ

HALIFAX
YHZ

HALIFAX
YHZ

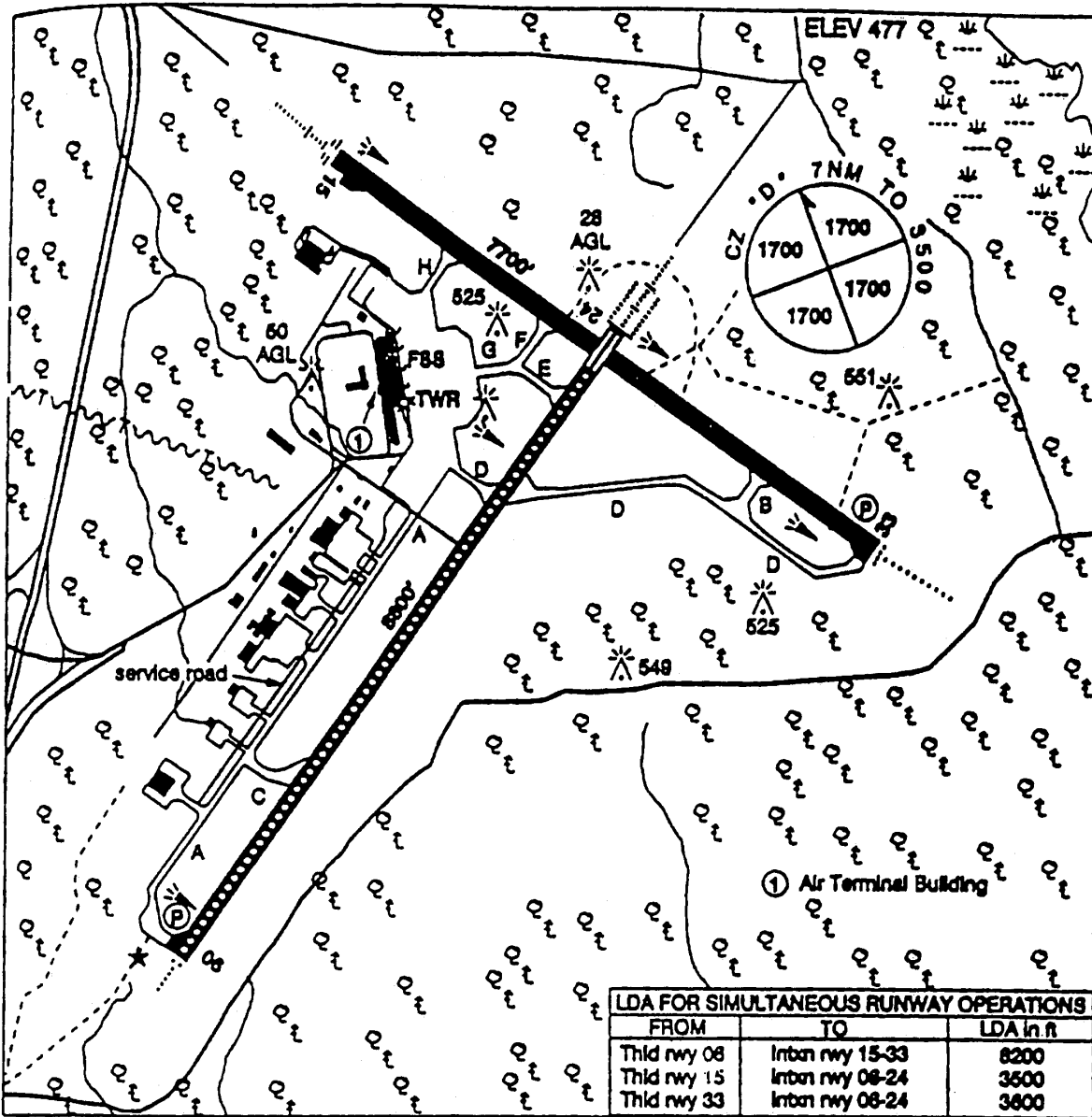
HALIFAX
YHZ

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HALIFAX AIRPORT DIAGRAM

HALIFAX INTL NS

CYHZ



LDA FOR SIMULTANEOUS RUNWAY OPERATIONS		
FROM	TO	LDA in ft
Thld rwy 08	Inbrn rwy 15-33	8200
Thld rwy 15	Inbrn rwy 08-24	3500
Thld rwy 33	Inbrn rwy 08-24	3600

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STEPHENVILLE
YJT

STEPHENVILLE
YJT

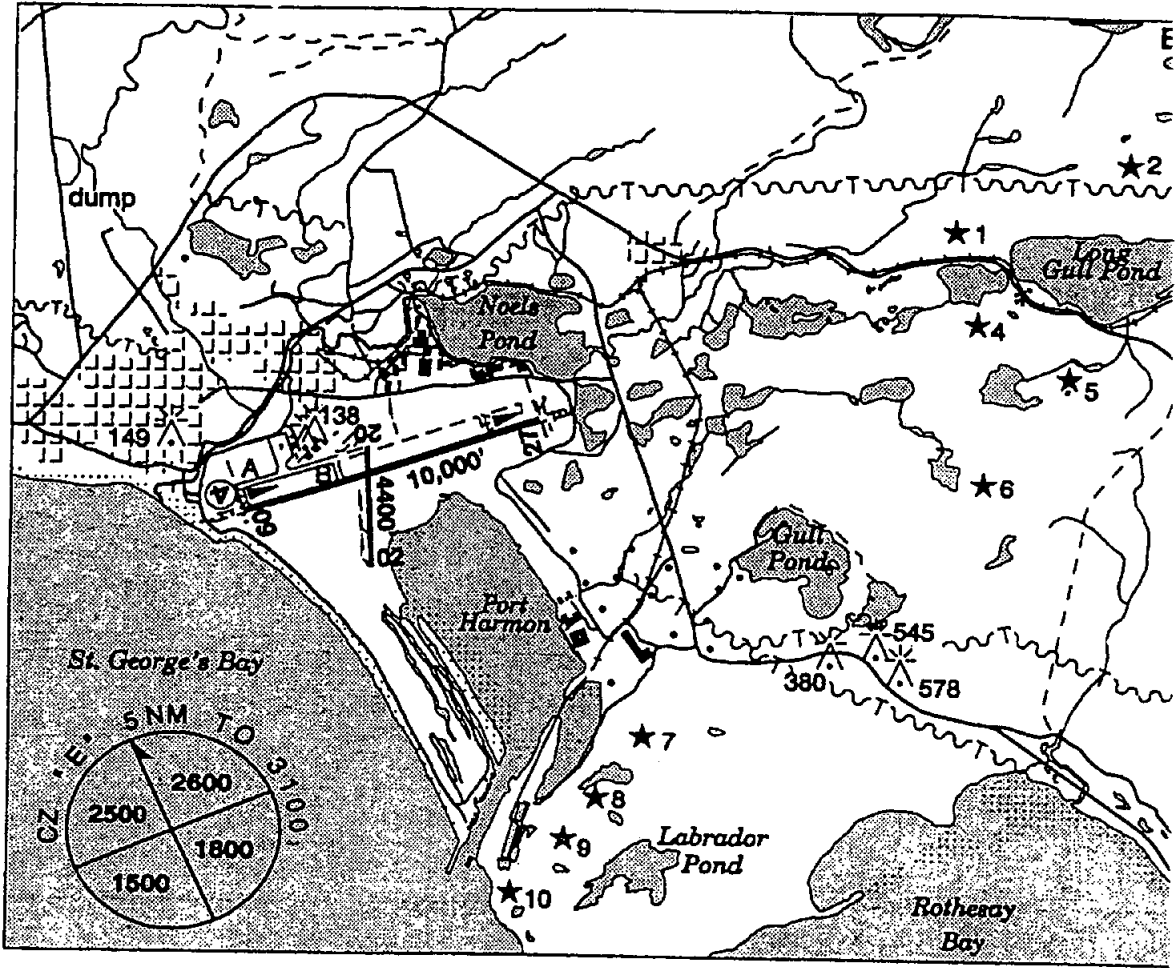
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YJT

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YJT

STEPHENVILLE
YJT

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STEPHENVILLE AIRPORT DIAGRAM



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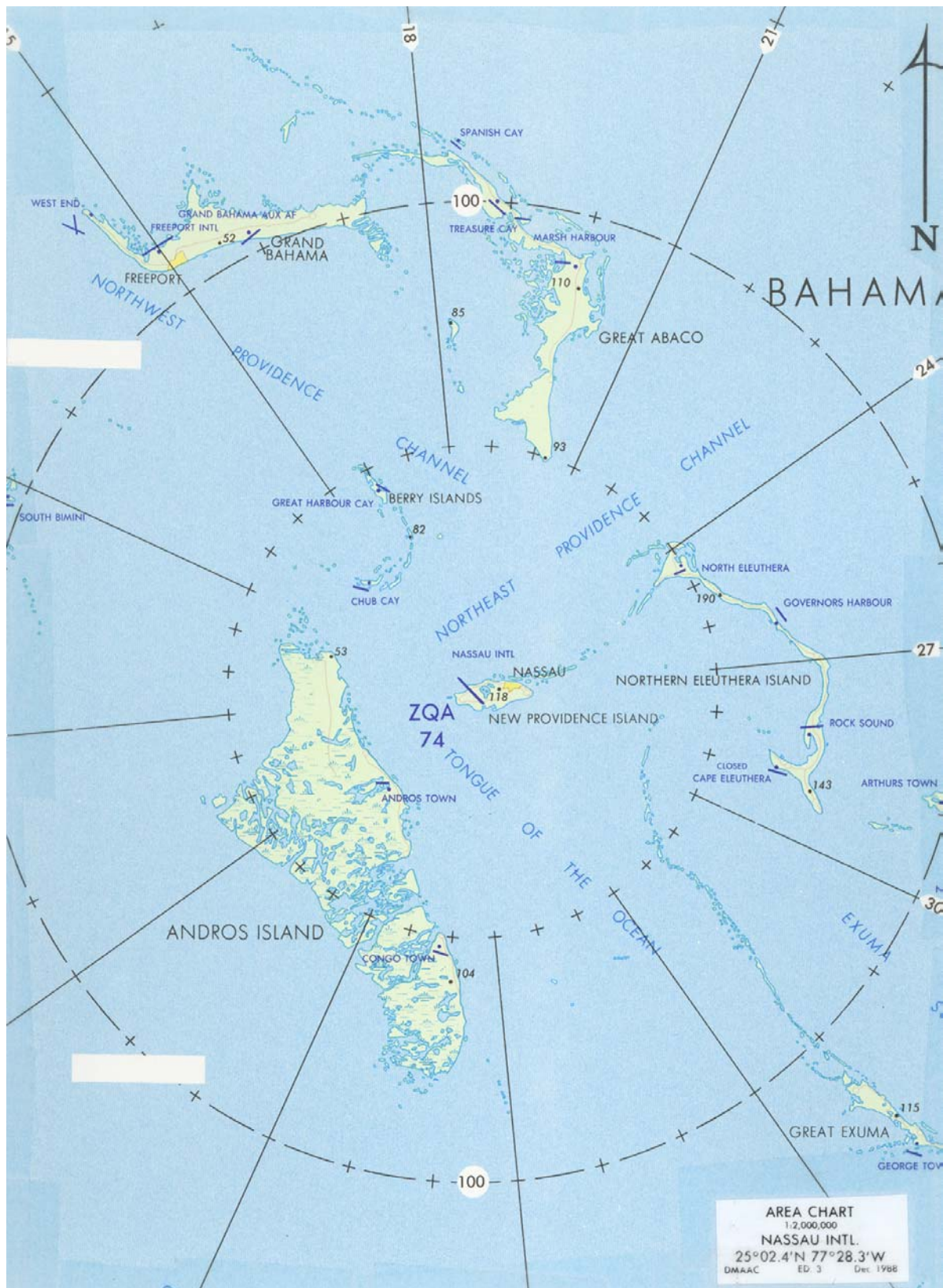
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YNN

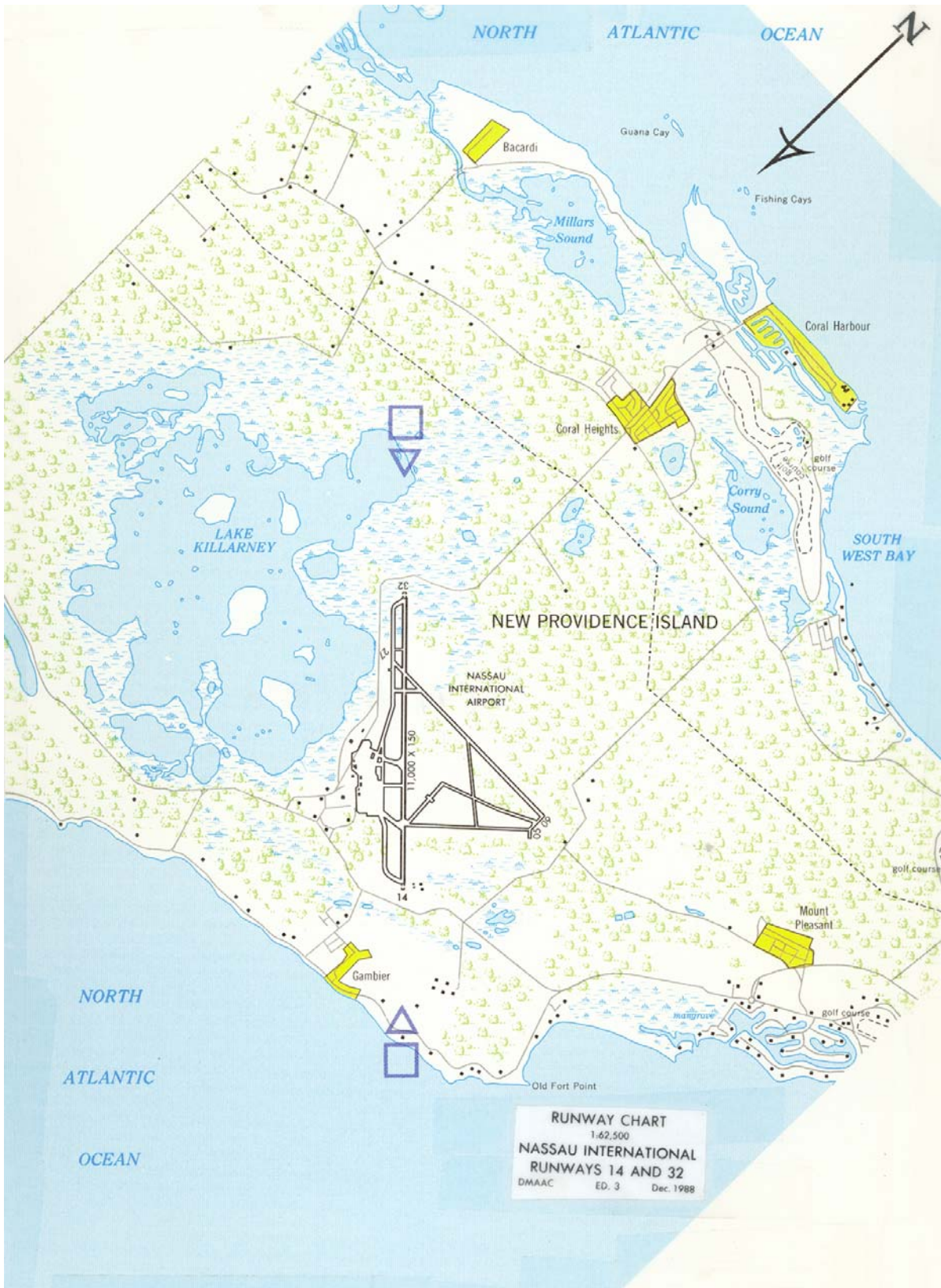
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YNN

NASSAU
YNN

NASSAU
YNN

NASSAU
YNN



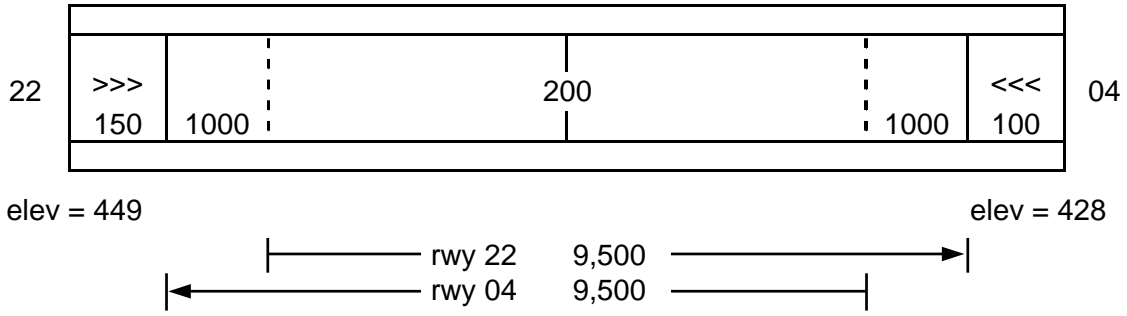


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NASSAU RWY YNN 14



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TACAN: YQX-74x (Pri) IQX-32x (Sec-DME)

I/F above: N:clear E:clear N:clear E:clear

S:clear W:150k S:clear W:100k

MLS: none

PAPI: none

Ball Bar: none

UHF: yes

GANDER
YQX

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YQX

GANDER
YQX

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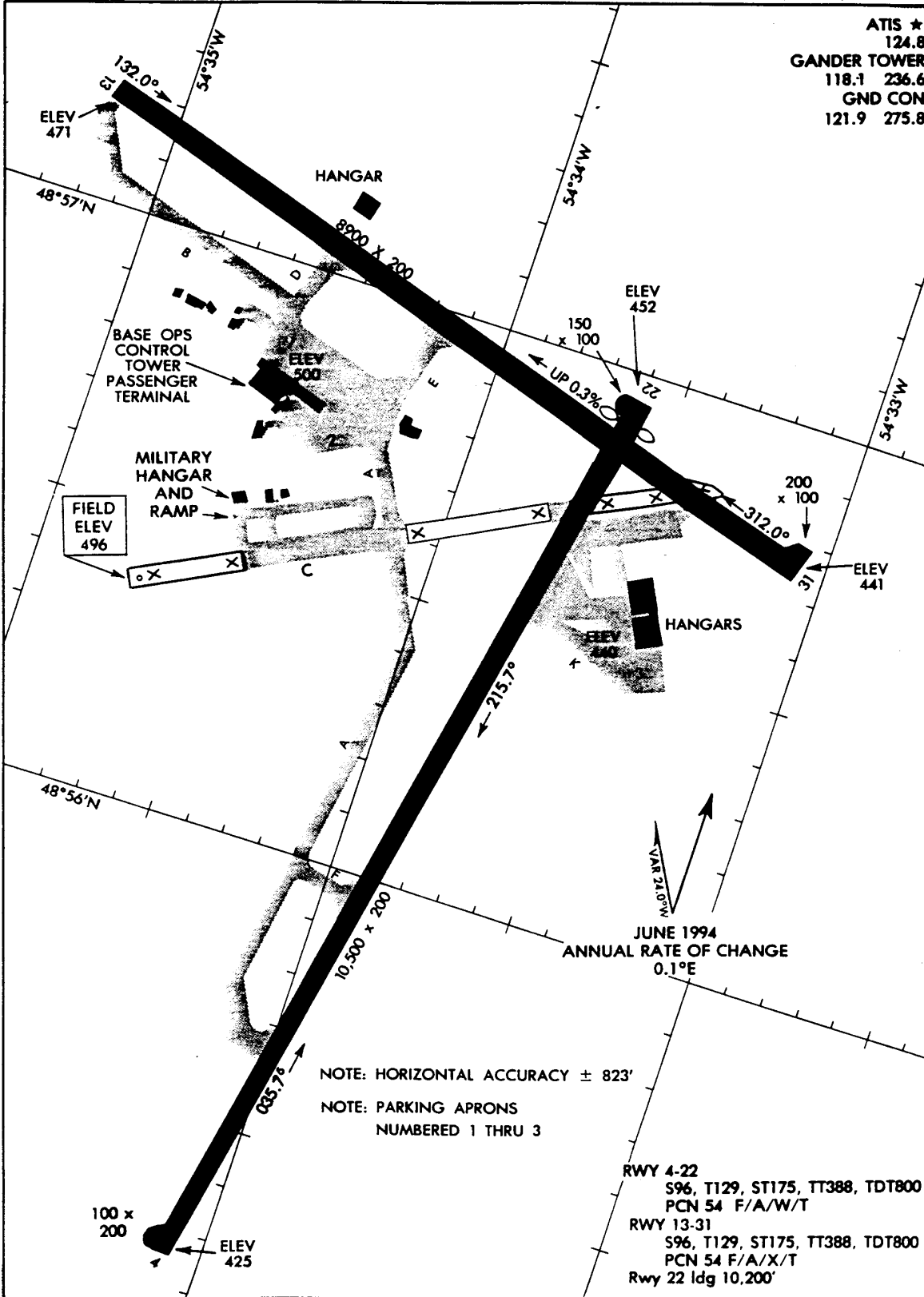
GANDER AIRPORT DIAGRAM

94174

AIRPORT DIAGRAM

58
AFD-1133 (USAF)

GANDER INTL (CYQX)
GANDER, NFD., CANADA

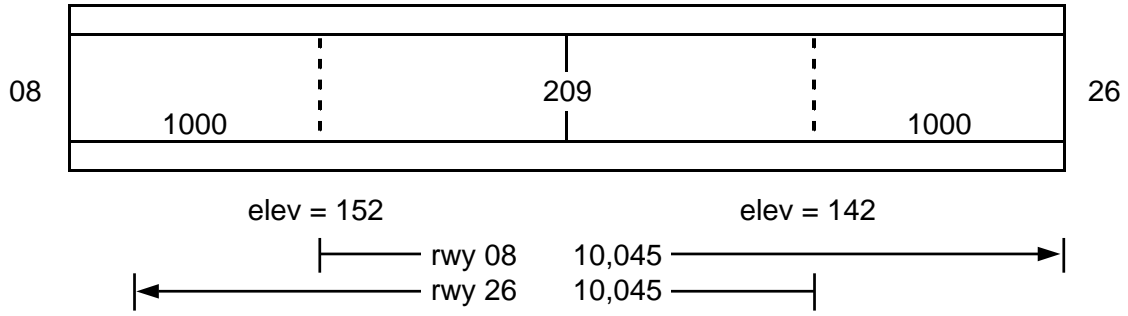


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GANDER RWYS YQX 04 AND YQX 22



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 S:clear W:120k

MLS: none
PAPI: none
Ball Bar: none
UHF: yes

GOOSE BAY
YYR

GOOSE BAY
YYR

GOOSE BAY
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GOOSE BAY RWYS YR 08 AND YR 26
View 1



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GOOSE BAY RWYS YR 08 AND YR 26
View 2



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ST JOHNS
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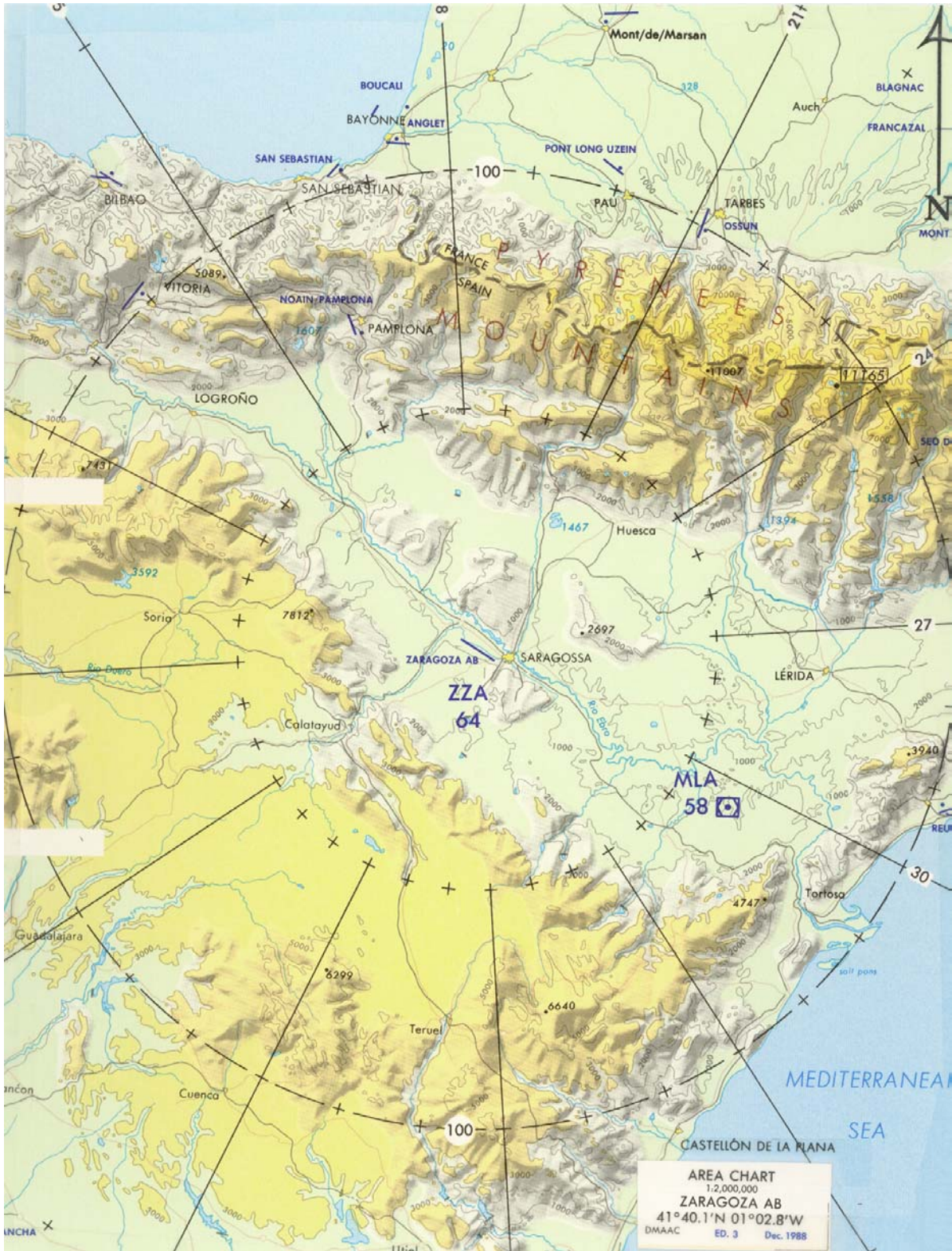
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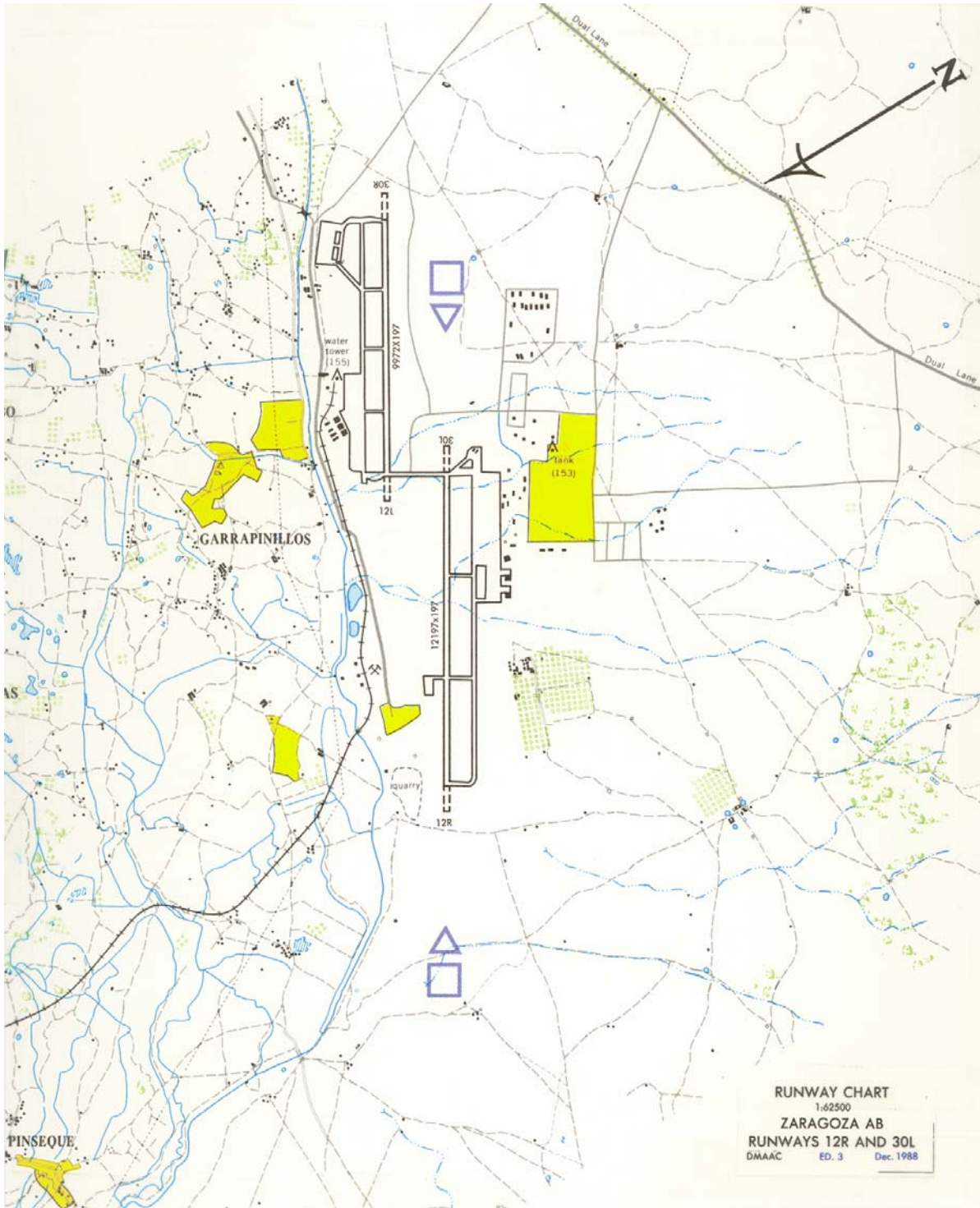
ST. JOHN'S RWYS YYT 11 AND YYT 29



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ZARAGOZA
ZZA
ZZA
ZZA
ZZA
ZZA
ZZA
ZZA





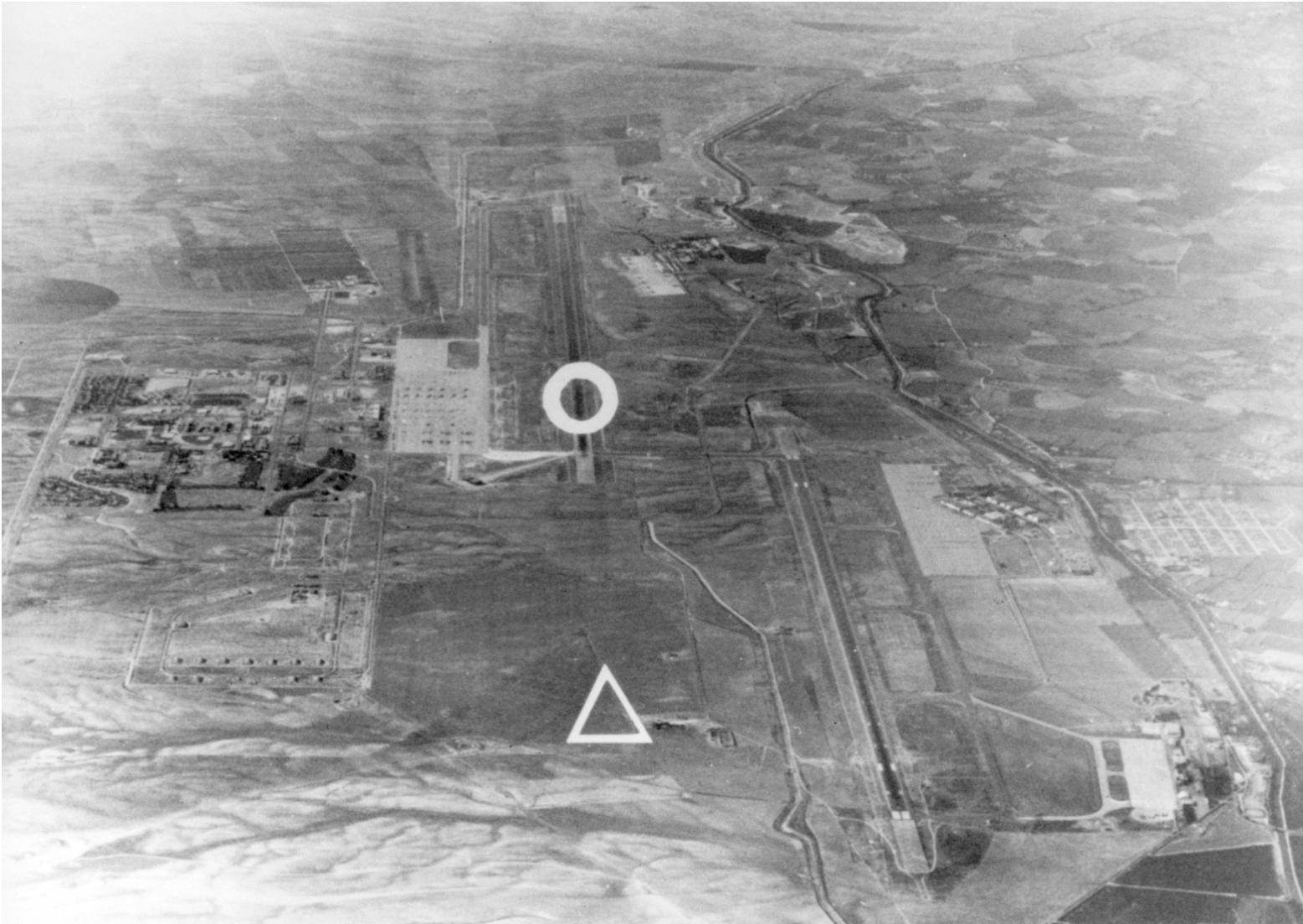
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ZARAGOZA RWY ZZA 12R



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ZARAGOZA RWY ZZA 30L
View 1

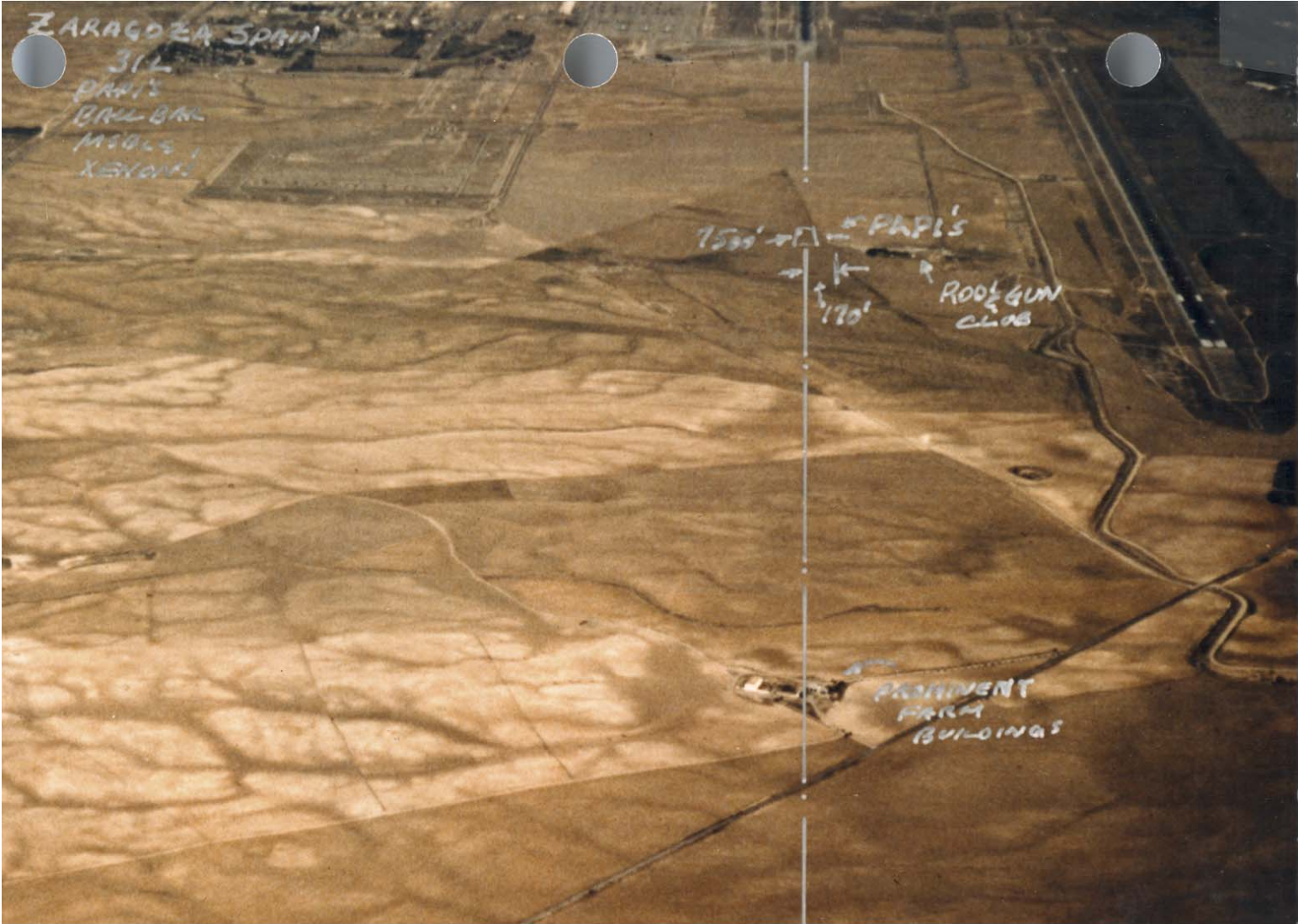


ZZA-C

EDITION 1-6/89
MAPS/ALL/GEN F

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ZARAGOZA RWY ZZA 30L
View 2



ZZA-E

EDITION 1-6/89
MAPS/ALL/GEN F

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POSTLANDING PROCEDURES
FOR EMERGENCY AIRFIELD
LANDING

POST ELS
PROCEDURES

POST ELS
PROCEDURES

POST ELS
PROCEDURES

POST ELS
PROCEDURES

POST ELS
PROCEDURES

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1. OVERSEAS AUGMENTED LANDING SITES

Augmented indicates that landing aids and NASA personnel are in place at prime and backup TAL sites.

- a. Evacuate to a distance of 1250 ft.
- b. The Commander will turn over responsibility for the orbiter to the senior NASA representative present.
- c. One hour after landing, a teleconferenced debriefing will be held to report the condition of the orbiter and record a press statement. The flight crew will then speak with their families.
- d. The flight crew will not meet with media representatives.
- e. The flight crew will brief local NASA representatives on orbiter status.
- f. The DOD will be responsible for treatment and transportation of injured flight crew. Uninjured flight crew may be evacuated by the DOD to the nearest U.S. military base (Rota, Spain). The local FCOD representative may go with the flight crew.
- g. NASA personnel should aid the flight crew in retrieving early return items to be transported with the flight crew.
- h. The flight crew will brief the Rapid Response Team and Mishap Investigation Team via telecon.
- i. The flight crew will return to JSC on the JSC KC-135 aircraft.
- j. For further information, see the Nonaugmented Non-U.S. Military Base guidelines.

2. U.S. MILITARY BASES

These guidelines are only deltas to instructions for Non-U.S. Military Bases, Nonaugmented landing sites. Please refer to them for full instructions.

- a. Evacuate the orbiter and turn it over to the senior military official responsible for the orbiter until arrival of the Rapid Response Team. The Commander will designate a crewmember to assist the DOD senior official in safing and guarding the orbiter.
- b. The flight crew will be escorted to the Command Post to contact MCC. They will make a recorded press statement and speak to their families through the DOD Support Operations Center.
- c. The flight crew will be escorted to appropriate facilities to await arrival of the Rapid Response Team. Meals should be available.
- d. The U.S. military will assume responsibility for treatment of flight crew injuries.
- e. The flight crew will not meet with media representatives.
- f. DOD has arranged to contact, train, and provide orbiter documentation to emergency and rescue forces who will therefore have preliminary knowledge of orbiter hazards and precautions.
- g. The JSC KC-135 aircraft will be dispatched to pick up the flight crew. Estimated arrival time is 14 hr.

3. NON-U.S. MILITARY BASES – NONAUGMENTED

- a. Evacuate to a distance of 1250 ft. Beware of toxic fumes and burning tires. Notify the tower that only firefighting and medical personnel should approach the orbiter.
- b. The Commander will retain responsibility for the flight crew and orbiter until either (1) the DOD evacuation team arrives to evacuate the flight crew, or (2) the Rapid Response Team arrives.
- c. A DOD Medivac aircraft and medical team will be dispatched to the landing site as soon as possible.
- d. The Commander or his representative will meet with local airfield officials and give them prepared onboard orbiter emergency guidelines (4. U.S. EMBASSY, p. 4-7). He will briefly advise them on vehicle hazards and safety requirements and inform them that towing should not be attempted. The State Department will inform local officials that the U.S. Government will reimburse all reasonable expenses.
- e. The Commander will have local officials contact the nearest U.S. Embassy so that a representative can immediately come to the landing site.
- f. The Commander will arrange with local officials to provide 24-hr security for the flight crew and orbiter. If a U.S. Embassy is nearby, these security forces would include at least one U.S. citizen each. The controlled access area should be a 2000-ft radius around the orbiter. The Commander will designate a crewmember to remain with the orbiter until a U.S. citizen with a secret clearance arrives.
- g. The Commander should designate a crewmember to maintain a log and enter local landing time and any pertinent observations of the orbiter and events leading up to the landing.
- h. The flight crew will establish communications with MCC as soon as possible. The MCC will record a press statement made by the flight crew and release it from JSC. The flight crew will not meet with media representatives.
- i. The Commander will contact MCC CAPCOM.
- j. After initial contact with MCC, each crewmember will be allowed to speak to family members on a NASA comm line.
- k. If there is a local U.S. Embassy, the flight crew may be escorted there to await transportation to the nearest U.S. military base.
- l. The Rapid Response Team will arrive in approximately 24 hr. Personnel will include, but are not limited to:

KSC Ground Operations Manager
KSC Convoy Commander
KSC Tow Team
KSC Logistics Team
JSC FCOD representative
Mishap Investigation Team
Payload representative
DDMS representative

- m. The JSC KC-135 will be deployed to pick up the flight crew. Estimated time of arrival is landing plus 14 hr. Flight crew passports will be carried onboard by the FCOD representative. Personnel on the KC-135 will include, but are not limited to:

- JSC FCOD Director or representative(s)
 - Flight Surgeon
 - PAO representative
 - Security representative

- n. The MCC may advise the Commander that the flight crew can approach the orbiter. This may include authorization to close the side hatch. The flight crew may then enter the orbiter and retrieve clean clothes or other needed articles including "Return to Houston" items.
- o. The flight crew will brief the Rapid Response Team and Mishap Investigation Team via telecon as reqd from the accident site and the evacuation site.
- p. The flight crew shall brief an FCOD or Rapid Response Team representative on location of early return items to be removed from the orbiter for return to JSC if they are unable to retrieve them before evacuation.
- q. If a DOD mission, security requires a U.S. citizen with a secret clearance to remain with the orbiter at all times and have the side hatch closed as soon as possible.

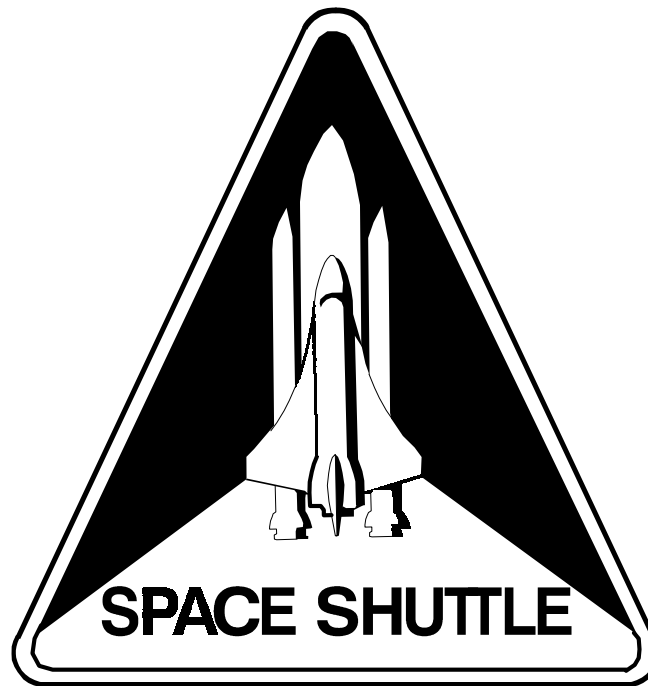
4. U.S. EMBASSY

- a. If medical attention is reqd for the flight crew, please have a U.S. citizen stay in contact with injured flight crew. Arrangements will be made with DOD to evacuate both injured and uninjured flight crew to the nearest U.S. military base.
- b. The flight crew will be retrieved by the Johnson Space Center KC-135 aircraft from their evacuation location.
- c. Due to the nature of hazards present, you should not approach the orbiter within 1250 ft. Stay upwind and avoid the forward and aft sections. Approaches can be safely made only from the 10, 2, 4, or 8 o'clock position, whichever direction is most upwind. The vehicle is considered hazardous for 24 hr. All smoking is prohibited.
- d. Contact NASA Kennedy Space Center, Mission Control Center, Landing and Recovery Director for questions concerning the orbiter.
- e. Contact NASA Johnson Space Center, Mission Control Center, CAPCOM for questions concerning flight crew.
- f. Provide U.S. citizen(s) with a secret clearance for 24-hr security of the orbiter and flight crew.
- g. Provide interpreters.
- h. Provide escorts, transportation, lodging, and meals as necessary for the flight crew until evacuation.
- i. The Rapid Response Team will arrive in approximately 24 hr. Personnel will include NASA management, orbiter tow team, Mishap Investigation Team, DOD and flight crew representatives.
- j. The flight crew will not meet with media representatives. The flight crew statement will be released from Johnson Space Center.
- k. Please contract a photographer to take photos of the orbiter, any debris, and anything unusual (e.g., fire, smoke, fumes).
- l. If any damage to the orbiter, please have debris left in its place with documentary photographs and location descriptions taken. Debris could be contaminated with hazardous substances. Handle with protective clothing and avoid debris having a fishy-ammonia, pungent-sweet, or ammonia-like smell. Seek immediate medical attention for irritation to the nose, throat, or eyes, or any coughing or difficulty breathing.
- m. Please record any pertinent observations, with time noted.
- n. Please arrange to have witnesses contacted. Obtain their names, addresses, and telephone numbers.
- o. Discourage towing of the orbiter until the RRT arrives. It cannot be towed or moved without special equipment. Contact Kennedy Space Center for further information if airfield officials insist.
- p. The U.S. Government will repay any reasonable expenses incurred.

- q. The Commander is responsible for the orbiter and flight crew. It will be necessary for him to stay in contact with the Mission Control Center in Houston, Texas. Please assist him in any way possible.
- r. Requests for public information should be referred to the National Aeronautics and Space Administration.

PROPRIETARY
INFORMATION

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**FLIGHT MAPS
AND CHARTS**

**STS
ALL**