19-11046

National Space Transportation System

FLIGHT DATA FILE

JSC-48029
(Supersedes JSC-17328)

c.383

Flight Maps and Charts

All Flights

Mission Operations Directorate
Operations Division

Generic, Rev B
August 28, 1991

NOTE
This Revision is for use on
STS-48
and subsequent flights

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MISSION OPERATIONS DIRECTORATE

FLIGHT MAPS AND CHARTS

GENERIC, REVISION B
August 28, 1991

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NOTES

1. The Maps and Charts document contains four major items which are all flown separately. The four items are:

   (a) Mercator and polar projection star charts (section 1)
   (b) Mercator projection Earth Map with Earth observation areas and orbit overlay (section 2)
   (c) Landing Site Charts
   (d) World Atlas (section 5)

2. The page numbers assigned to sections 1, 2, and 5 are for the convenience of the users of this document and do not appear on the items when in flight configuration.

3. The Landing Site Charts are organized as follows:
   - Section 3 - Summary and Chart Legend
   - Landing Sites - Alphabetized by software designator

4. The originals for all maps/charts presented in this document are prepared by the Defense Mapping Agency Aerospace Center, St. Louis, Missouri.

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GENERIC 08/24/88
REV B 08/28/91

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ii.....* ALL/GEN B
iii.....* ALL/GEN B
iv.....* ALL/GEN B
v.....* ALL/GEN B
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viii.....* ALL/GEN B
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1-4.....* ALL/GEN B
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3-i..... ALL/GEN B
3-ii..... ALL/GEN B
3-iii..... ED. 3-12/88
3-iv..... ALL/GEN B
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AML-3..... ED. 3-12/88
AML-4..... BLANK
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AML-C..... EDITION 1-6/89
AML-D..... BLANK
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(*) - Not Flown
(Δ) - Hi Inclination Only

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4-8..... ALL/GEN B
4-9.....† ALL/GEN B
4-10.....† ALL/GEN B
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5-ii.....* ALL/GEN B
5-1.....* ALL/GEN B
5-2.....* ALL/GEN B
5-3.....* ALL/GEN B
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(Δ) - Hi Inclination Only
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(*) - Not Flown

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5-49.....* ALL/GEN B
5-50.....* ALL/GEN B
(†) Landing Site Data
Chart from Entry C/L

(*) - Not Flown
(†) - Flt Book Only

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Ben Guerir, Morocco..... BEN-1
Banjul (Yundum International) Gambia..... BYD-1
Westover Air Force Base, Massachusetts.....Δ CEF-1
Darwin International, Australia..... DDN-1
Dover AFB, Delaware.....Δ DOV-1
Dyess Air Force Base, Texas..... DYS-1
Edwards Air Force Base, California..... EDW-1
Mataveri, Easter Island (Chile)..... EIP-1
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Fairford, England.....Δ FFA-1
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Diego Garcia Naval Air Facility, Indian Ocean..... JDG-1
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Kinshasa/N Djili International, Zaire..... KIN-1
King Khalid, Saudi Arabia..... KKI-1
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Lajes Air Base, Azores.....Δ LAJ-1
Lincoln Municipal, Nebraska.....Δ LNK-1
Moron Air Base, Spain..... MRN-1
Mountain Home Air Force Base, Idaho.....Δ MUO-1
Grant County, Washington.....Δ MWH-1
Myrtle Beach AFB, S. Carolina.....Δ MYR-1
Cherry Point MCAS, N. Carolina.....Δ NKT-1
White Sands Space Harbor, New Mexico..... NOR-1
Oceana NAS, Virginia.....Δ NTU-1
Orlando International, Florida..... ORL-1
Plattsburgh Air Force Base, New York.....Δ PBG-1
Pease AFB, New Hampshire.....Δ PSM-1
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STAR CHARTS

1.1 The flight version of the star charts is fabricated with the polar projections (page 1-4) on the back of the rectangular projection (page 1-3). The flight charts are produced with white overprint on a black background. A photograph of star charts in flight configuration is provided 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. The polar projections each cover 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 fifty nav stars are circled, named, and numbered, and the second fifty 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 which include phases are also added for each day of the mission.

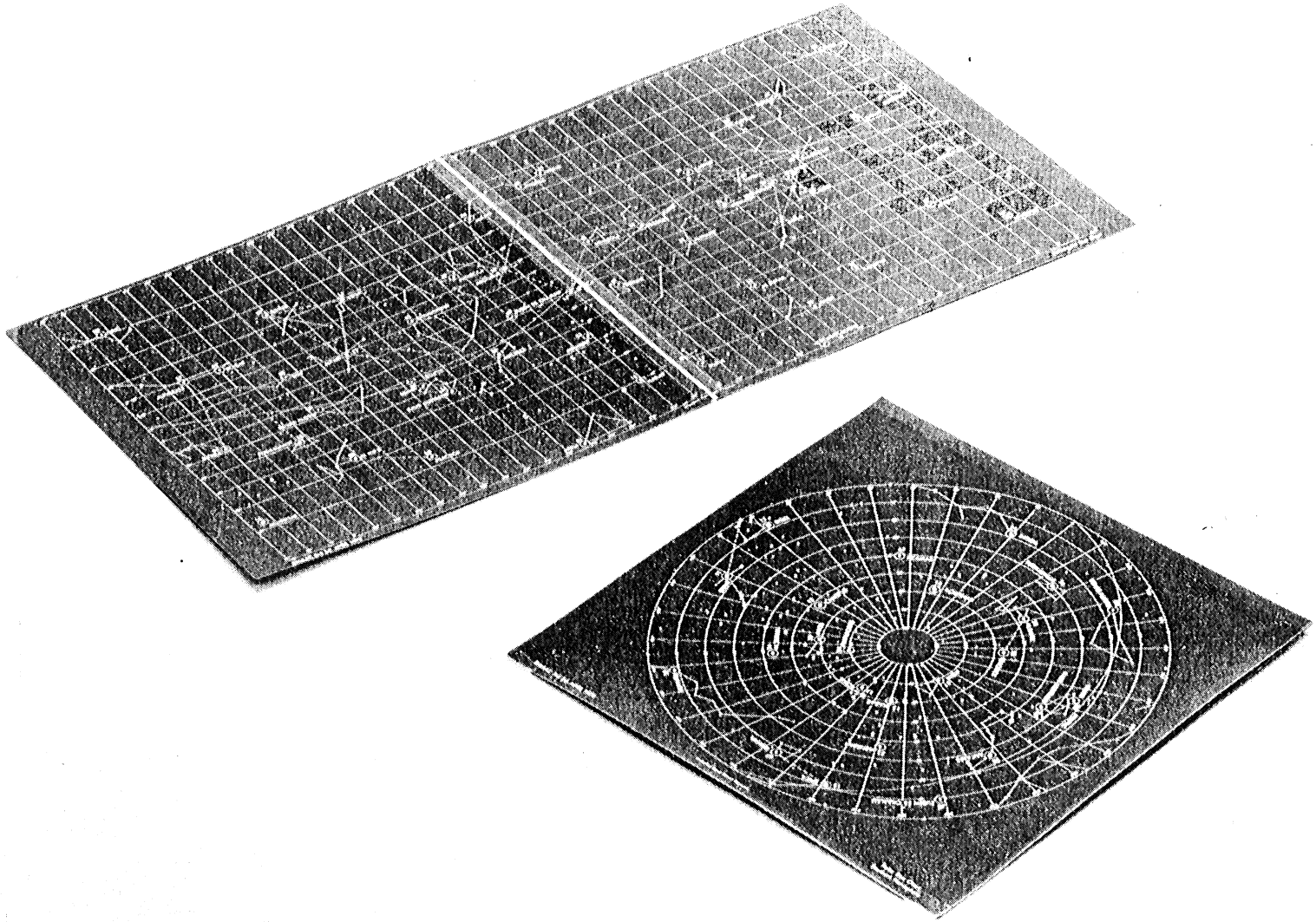
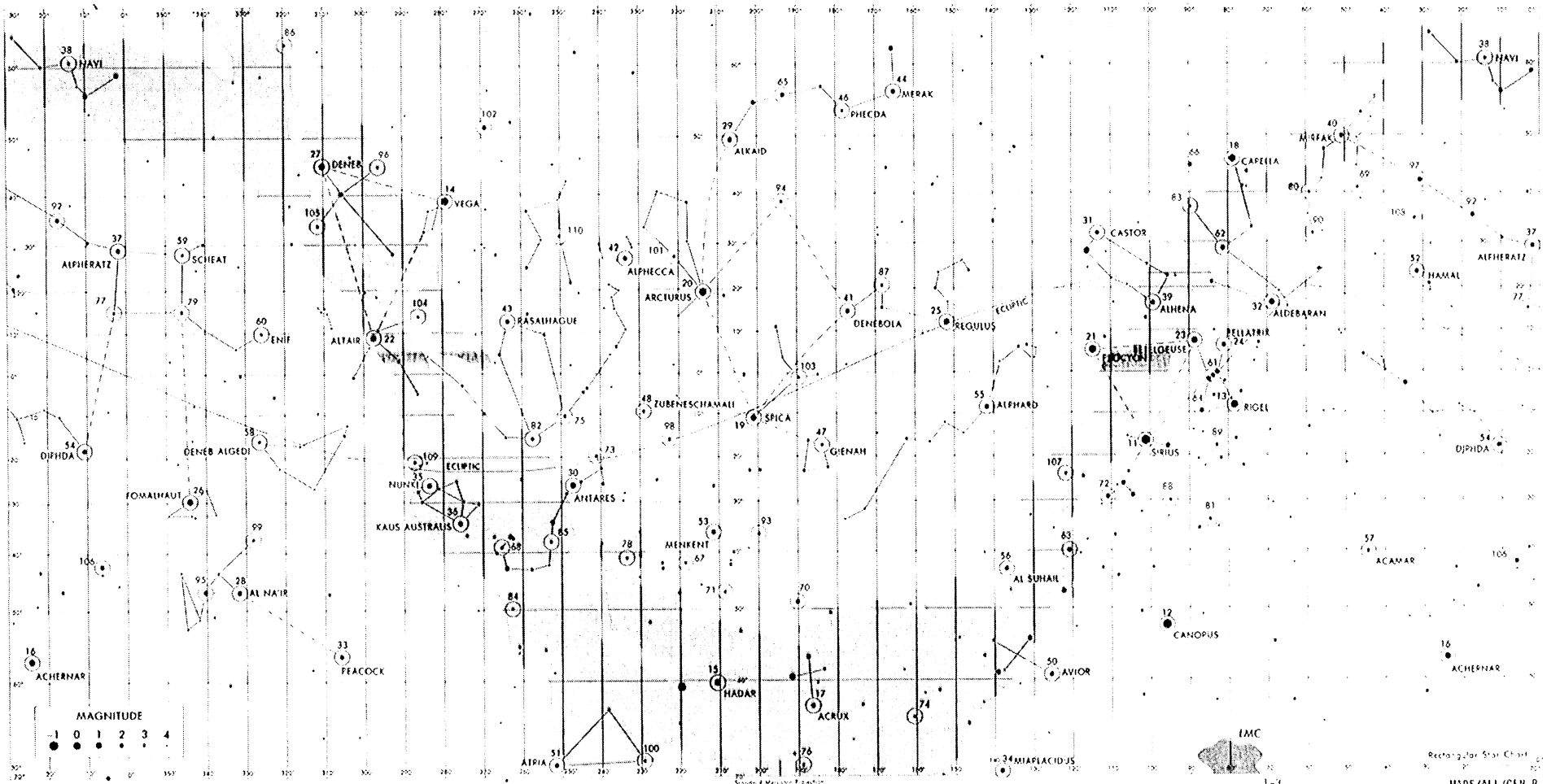


Figure 1-1.- Flight Configuration Star Charts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VEGA
ALPHERATZ
SCHEAT
ENIF
ALTAIR
RASALHAGUE
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ARCTURUS
ALKAID
PHECDA
MERAK
DENEBOLA
REGULUS
ECLIPTIC
ZUBENESCHAMALI
SPICA
GIENAH
ALFHARD
CASTOR
CAPELLA
ALHENA
ALDEBARAN
MENKALINAN
HAMAL
ALFERATZ
PROCYON
LOEUSE
BELLATRIX
RIGEL
SIRIUS
DIPHDA
DENEB ALGEDI
FOMALHAUT
NUNKI
KAUS AUSTRALIS
ANTARES
MENKENT
AL NA'IR
PEACOCK
ACHERNAR
ATRIA
HADAR
ACRUX
AL SUHAIL
CANOPUS
AVIOR
MIAPLACIDUS
ACAMAR
MAGNITUDE
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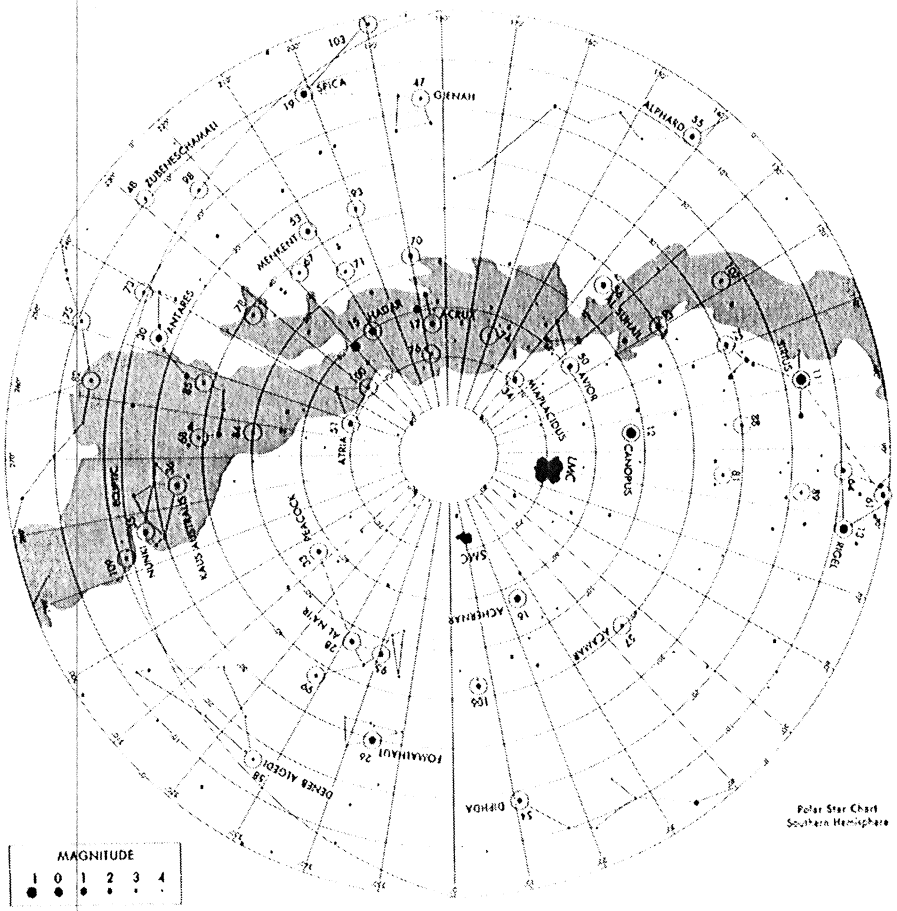
SMC
1-3
Rectangular Star Chart
MAPS/ALL/GEN B
DMAAC 9TH EDITION FEBRUARY 1988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VEGA
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ARCTURUS
ALPHECCA
ALTAIRO
ALGIEBA
REGULUS
POLLUX
CASTOR
POLARIS
DENEBRIOSE
ALGENIB
CAPELLA
MIRFAK
ACHERNAR
RIGEL
ALDEBARAN
RIGEL KENTAURUS
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MIMOSA
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ALPHARD
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SCHEAT
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ALGENIB
ACHERNAR
FOMALHAUT
DENEB ALGEDI
ALPHECCA
ALTAIR
VEGA
RASALHAGUE
Polar Star Chart
Northern Hemisphere
Polar Star Chart
Southern Hemisphere
DMAAC 9TH EDITION FEBRUARY 1988
MAPS/ALL/GEN B

ORBIT MAP

2.1 The flight version of the orbit map is at a scale of 1:52 million and is produced in color. The flight map is mounted in a frame which carries a groundtrack overlay. The map shown in this document (page 2-3) is a reduced copy. A photograph of an orbit map with overlay (flight configuration) is provided on page 2-2.

2.2 The overlay depicts the groundtrack for three consecutive orbits and can be set to any desired ascending node. The overlay has time ticks at one-minute intervals along the groundtrack, with elapsed time callouts every 10 minutes. The elapsed time is measured from the initial ascending node. The overlay carries a map update block for recording the MET and longitude of the node for any given orbit.

2.3 The flight orbit map shows the station coverage of the STDN sites and TDRSS for the primary orbital altitude of each mission. Also shown are 750-nm radius crossrange circles for the shuttle landing sites and the South Atlantic Anomaly at the primary orbital altitude of each mission.

2.4 The baseline orbit map is annotated for a specific flight by the addition of photo targets, visual observation sites, or other areas of scientific or technical interest. When applicable, these subjects are documented as tabular listings and are included with the flight crew's World Atlas.

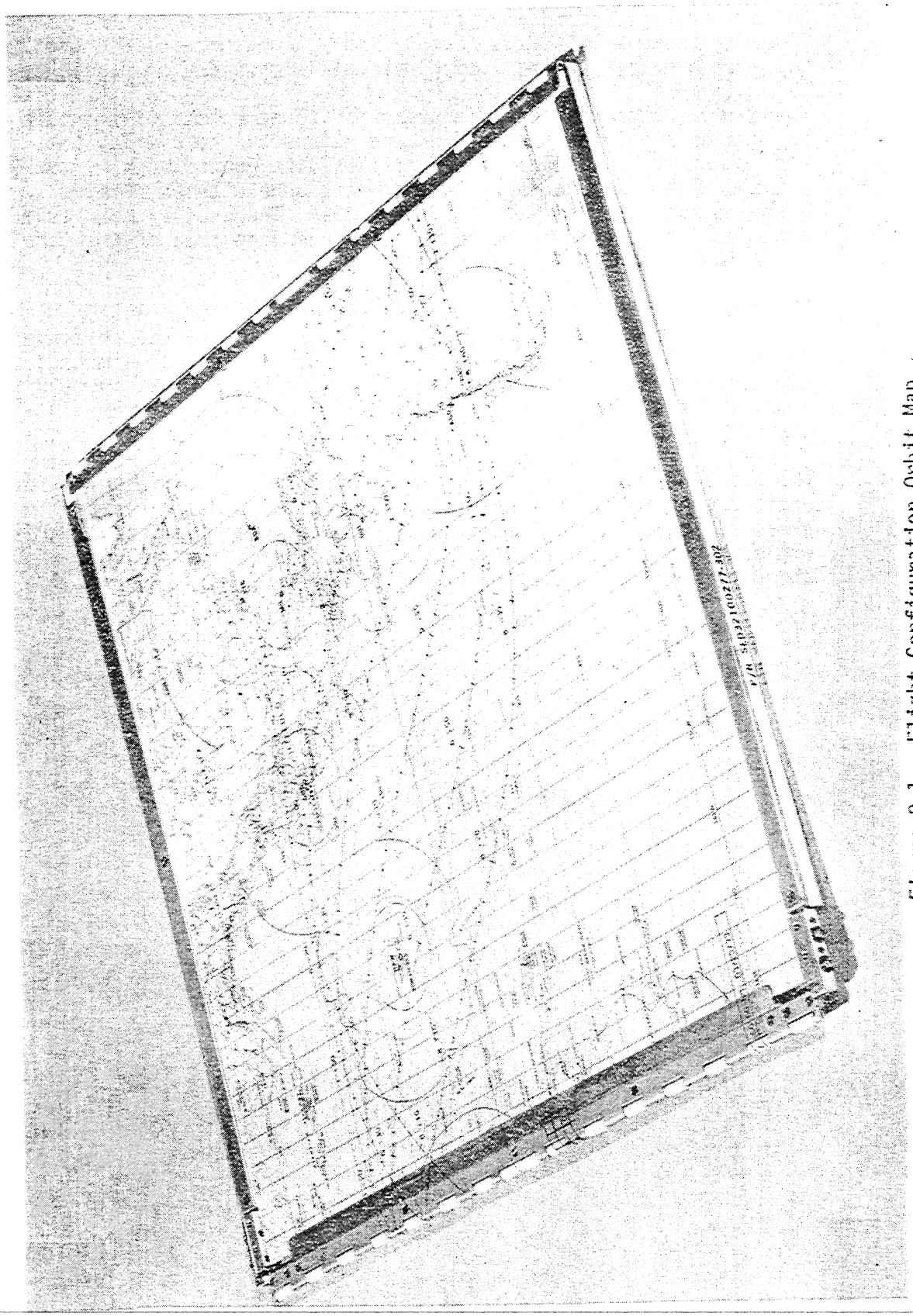
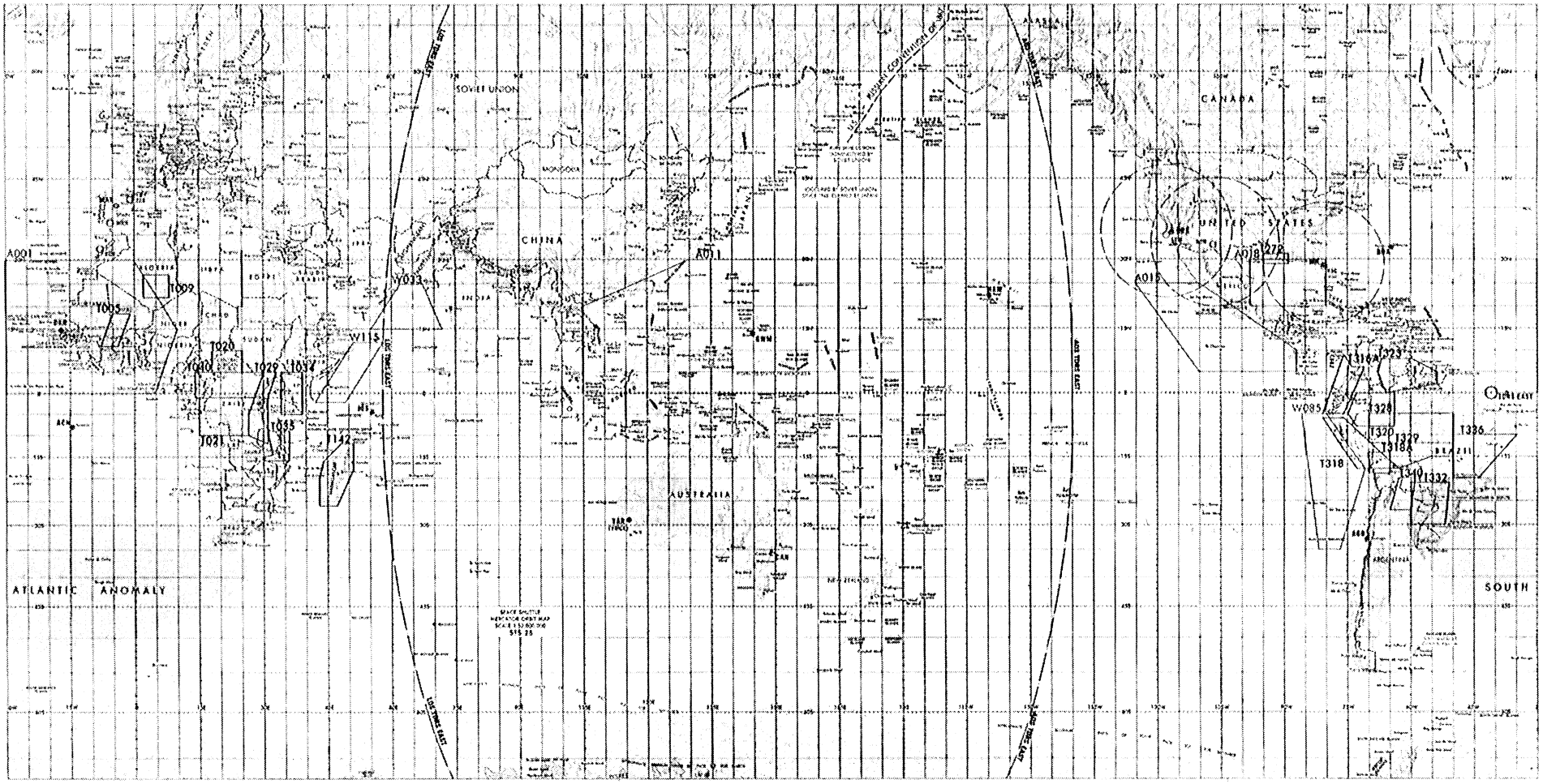


Figure 2-1.- Flight Configuration Orbit Map



SPACE SHUTTLE
MERCATOR ORBIT MAP

MAPS/ALLGEN B

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LANDING SITE CHARTS SUMMARY

3.1 The Landing Site Charts provide topographical information pertaining to the designated Shuttle Landing sites. The flight version of the charts is produced in color at the same scale and size as shown in this document.

There are two types of charts for each site:

- Area Chart - scale = 1:2 million
- Runway Chart - scale = 1:62,500

One set charts is provided for each landing site. A site data sheet is provided with each chart set.

3.2 The information presented on each chart is as follows:

Data Sheet
- Site elevation
- Table* identifier
- Runway length, width, and overruns
- Channel number and identifier for the PRI and SEC TACAN selections
- Cochannel interference for each TACAN. The values listed indicate the orbiter approach directions and altitudes above which there may be TACAN interference. This is due to other TACAN Stations in the vicinity with the same channel as those used by the orbiter
- MLS channel numbers for the appropriate runways
- Runways equipped with PAPI lighting
- Runways equipped with BALL BAR lighting
- UHF availability

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

Runway Chart
- Aim points
- Runway dimensions

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

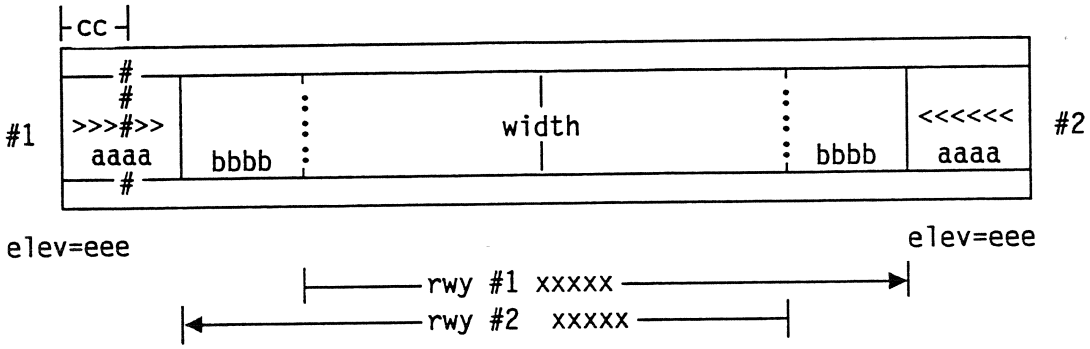
3.3 To supplement the charts, oblique photographs are provided where available.

These photos approximate the view when leaving the HAC on the steep glide slope.

3.4 Section 4 contains a set of procedures to instruct the crew on the proper actions to take following a landing at an emergency airfield.

A list of phone numbers is also included in the flight books only.

3.5 The runway information is presented as follows



Where

#1, #2 = runway numbers
aaaa = length of overruns
bbbb = length of shuttle artificially displaced threshold (if required)

NOTE

aaaa+bbbb = 1000 ft at each end of rwy

cc = distance of barrier from end of usable surface (overrun) (if required)
eee = elevation of runway at each end
xxxx = length of each runway

NOTE

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

= shuttle barrier

>>>>>> = existing overrun/underrun

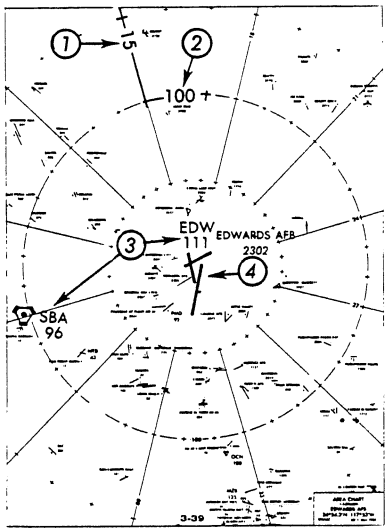
: = shuttle displaced threshold

OVERPRINT DATA

LEGEND

LANDING SITE CHARTS

AREA CHART
Scale 1:2,000,000



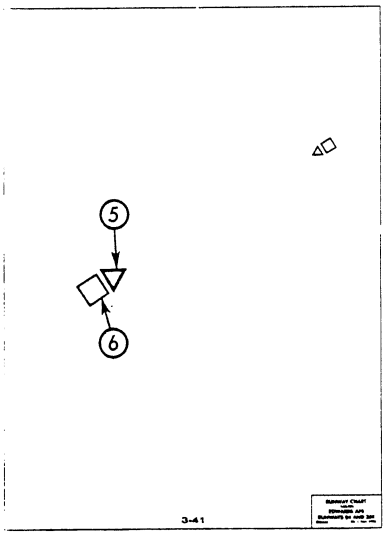
① *Magnetic Heading to Land Site*

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 1:62,5000



⑤ *Highwind Aim Point*

⑥ *Nominal Aim Point*

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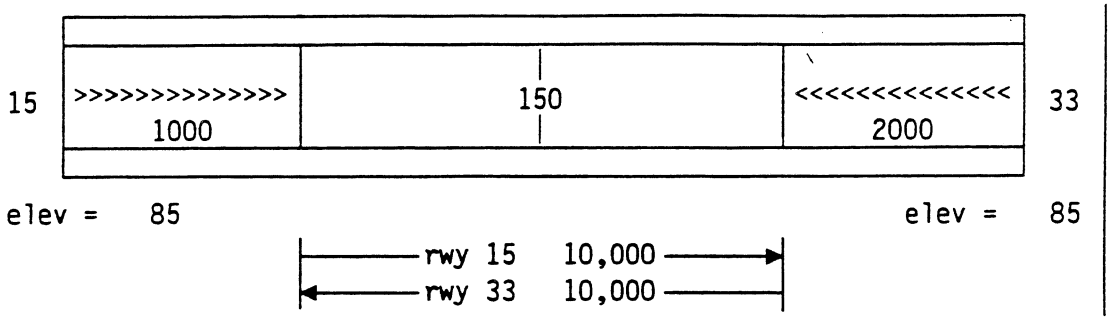
Amberley, Australia

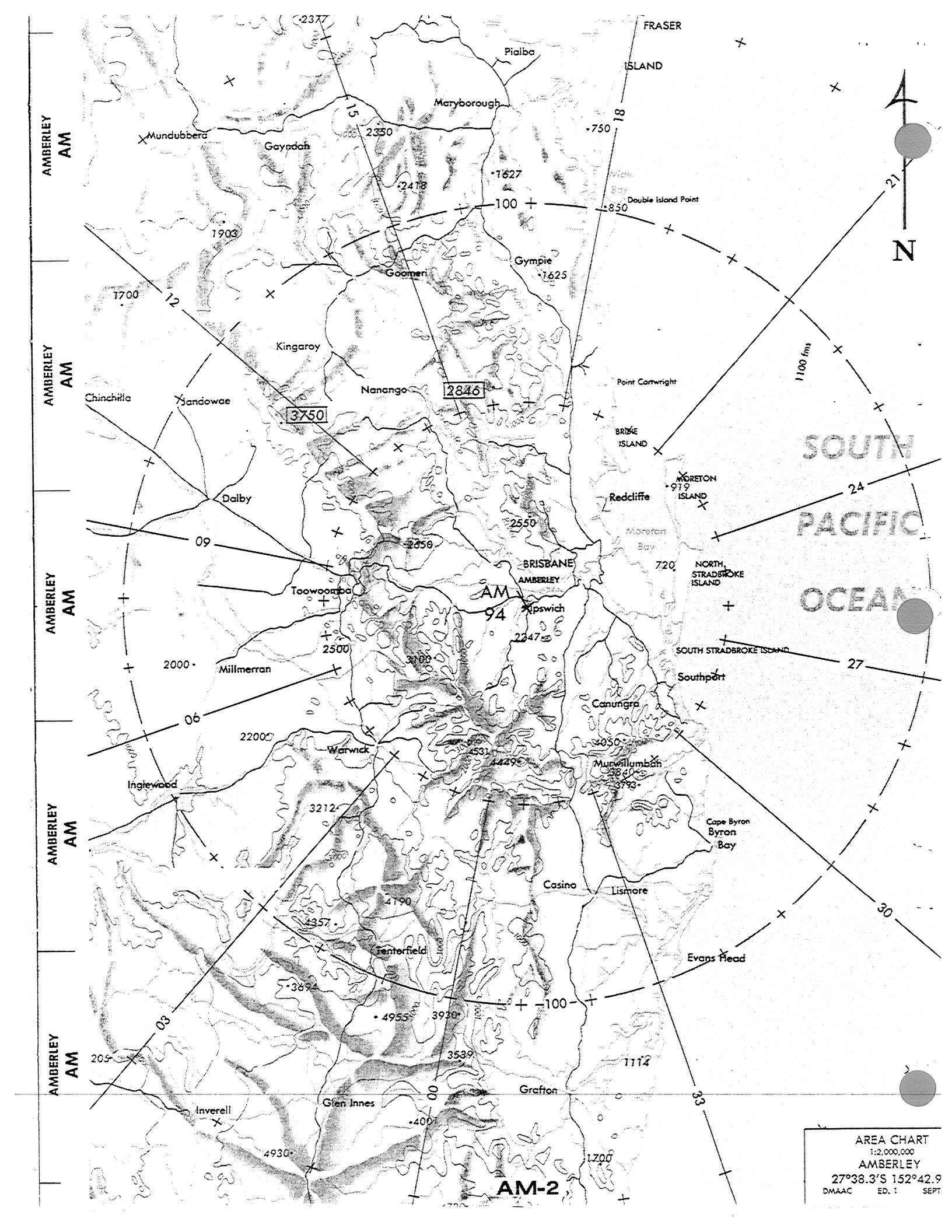
Table Identifier **AM**

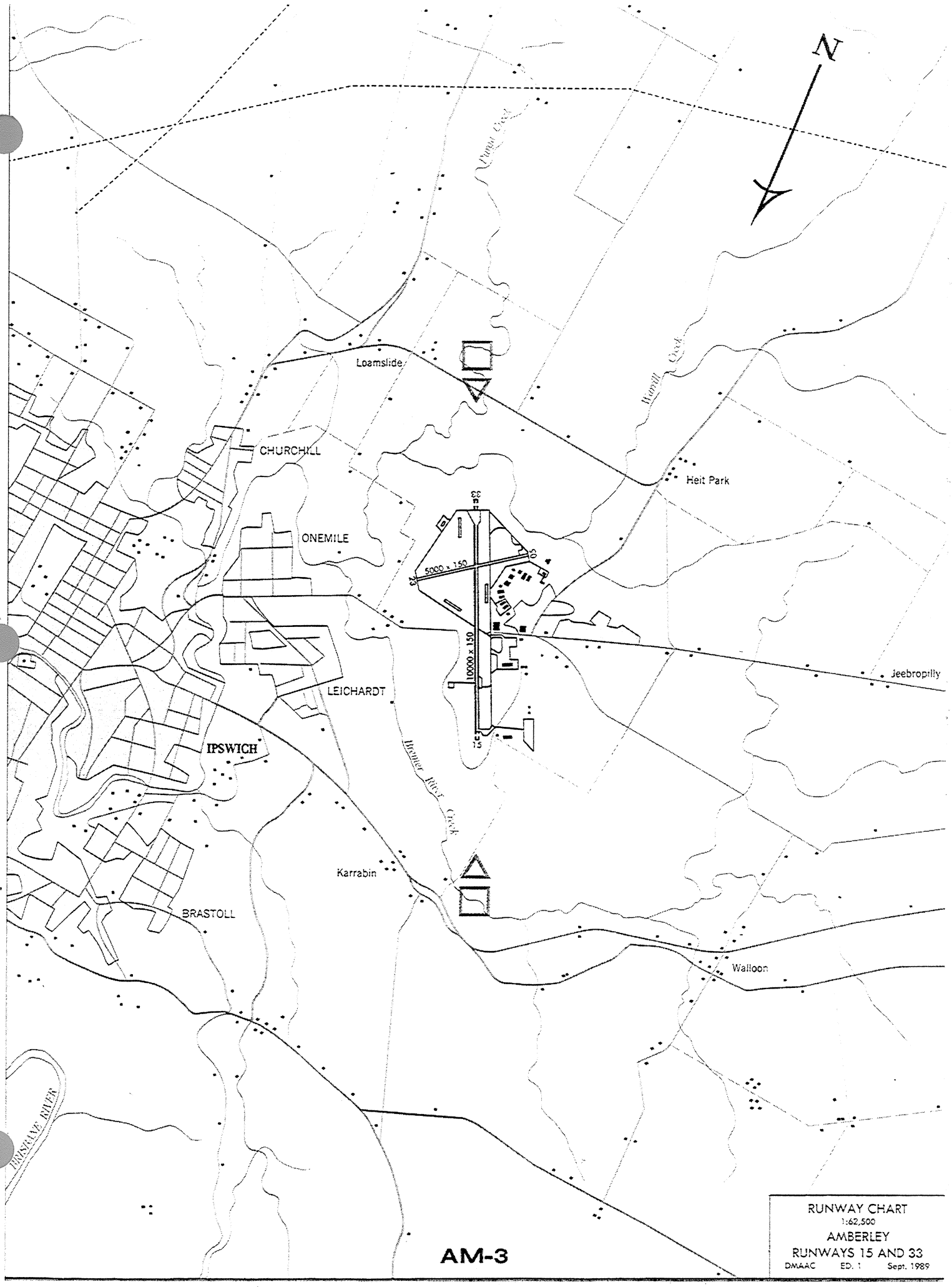


TACAN: AM-94x (Pri)
I/F above: N:clear E:clear
S:clear W:clear

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

AMBERLEY AM
AMBERLEY AM
AMBERLEY AM
AMBERLEY AM


AMBERLEY AM
AMBERLEY AM
AMBERLEY AM
AMBERLEY AM
AMBERLEY AM
FRASER ISLAND
Pialba
Maryborough
Mundubbera
Gayndah
Double Island Point
Gympie
Goomeri
Kingaroy
Nanango
Chinchilla
Dandowae
Dalby
Point Cartwright
BRIBIE ISLAND
MORETON ISLAND
Redcliffe
Moreton Bay
BRISBANE
AMBERLEY
Toowoomba
Ipswich
NORTH STRADBROKE ISLAND
SOUTH STRADBROKE ISLAND
Southport
Millmerran
Canungra
Warwick
Inglewood
Murwillumbah
Cape Byron
Byron Bay
Casino
Lismore
Tenterfield
Evans Head
Inverell
Glen Innes
Grafton
1100 fms
SOUTH PACIFIC OCEAN
N
AM 94
AM-2
AREA CHART
1:2,000,000
AMBERLEY
27°38.3'S 152°42.9
DMAAC ED. 1 SEPT



RUNWAY CHART
1:62,500
AMBERLEY
RUNWAYS 15 AND 33
DMAAC ED. 1 Sept. 1989

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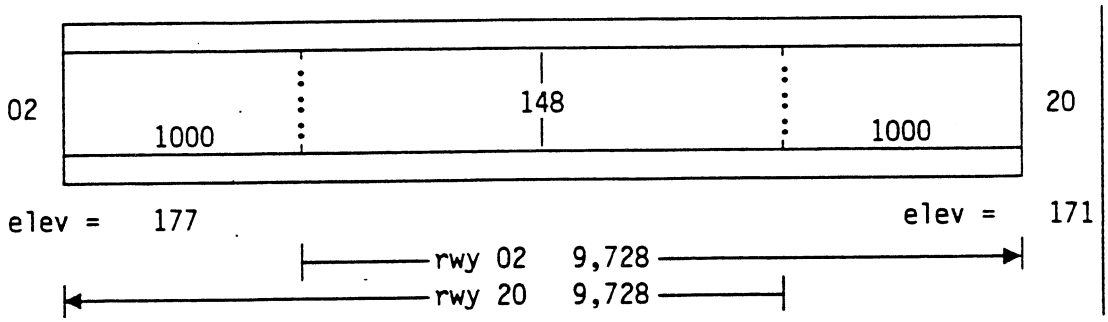


TACAN: CVS-100x (Pri-DME)
I/F above: N:clear E:clear
S:clear W:clear

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

WARNING

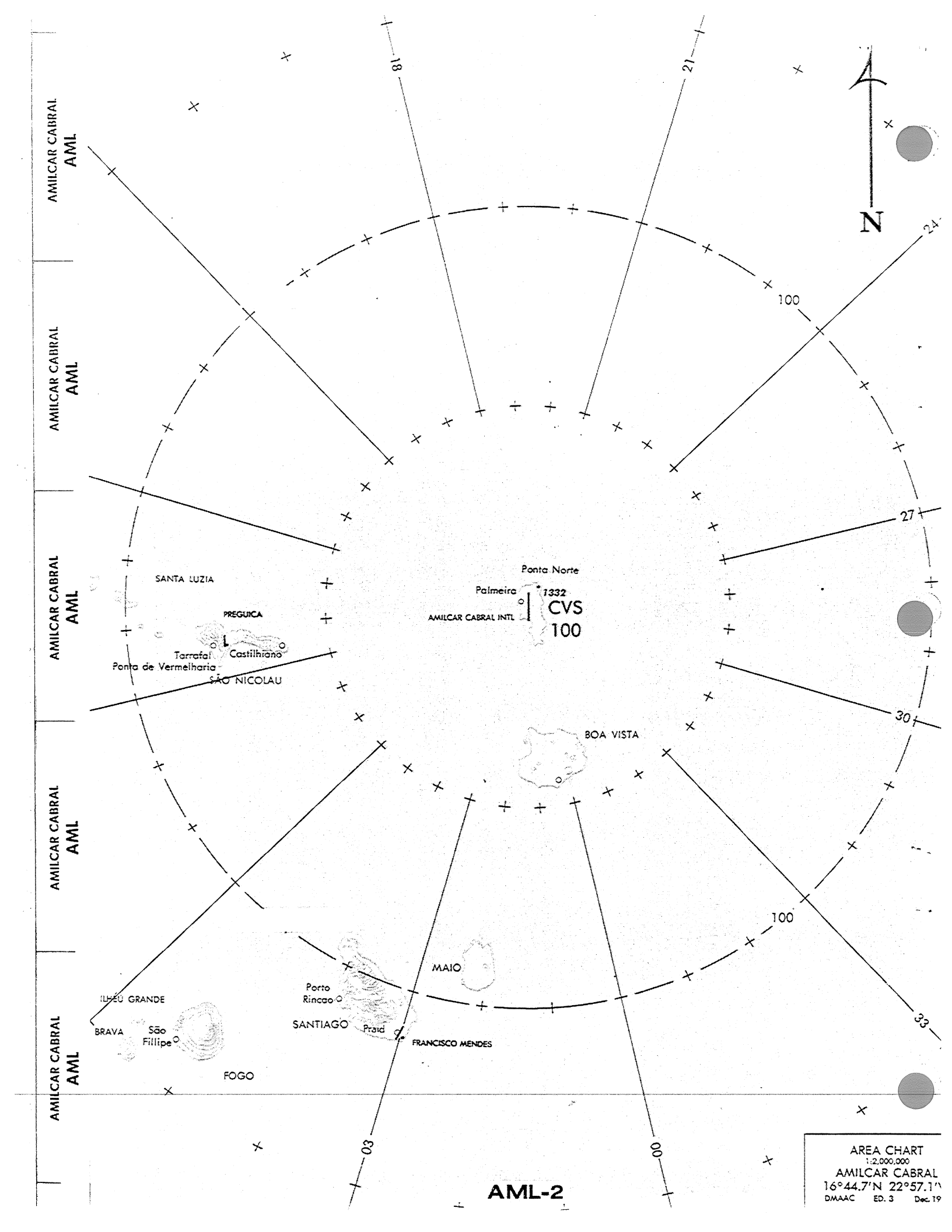
- Expect poor visibility and crosswinds from the east

- Rwy 02 is preferred, but the terrain on approach is more than 30 ft lower than the rwy

NOTE
- Language is Portuguese

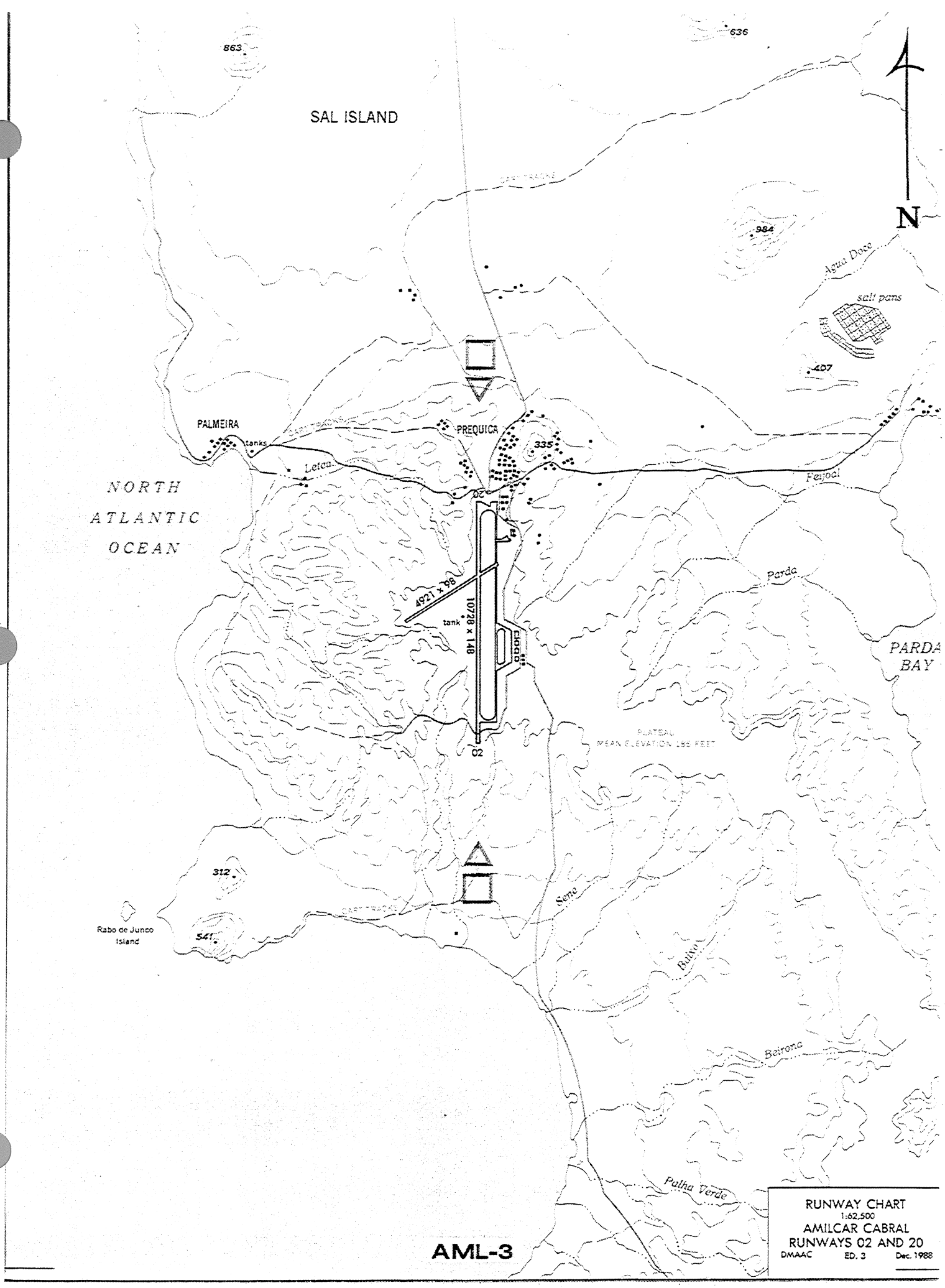
- The total pavement width is 240 ft

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



AML-2

AREA CHART
1:2,000,000
AMILCAR CABRAL
16°44.7'N 22°57.1'W
DMAAC ED. 3 Dec. 19



RUNWAY CHART
1:62,500
AMILCAR CABRAL
RUNWAYS 02 AND 20
DMAAC ED. 3 Dec. 1988

AML-3

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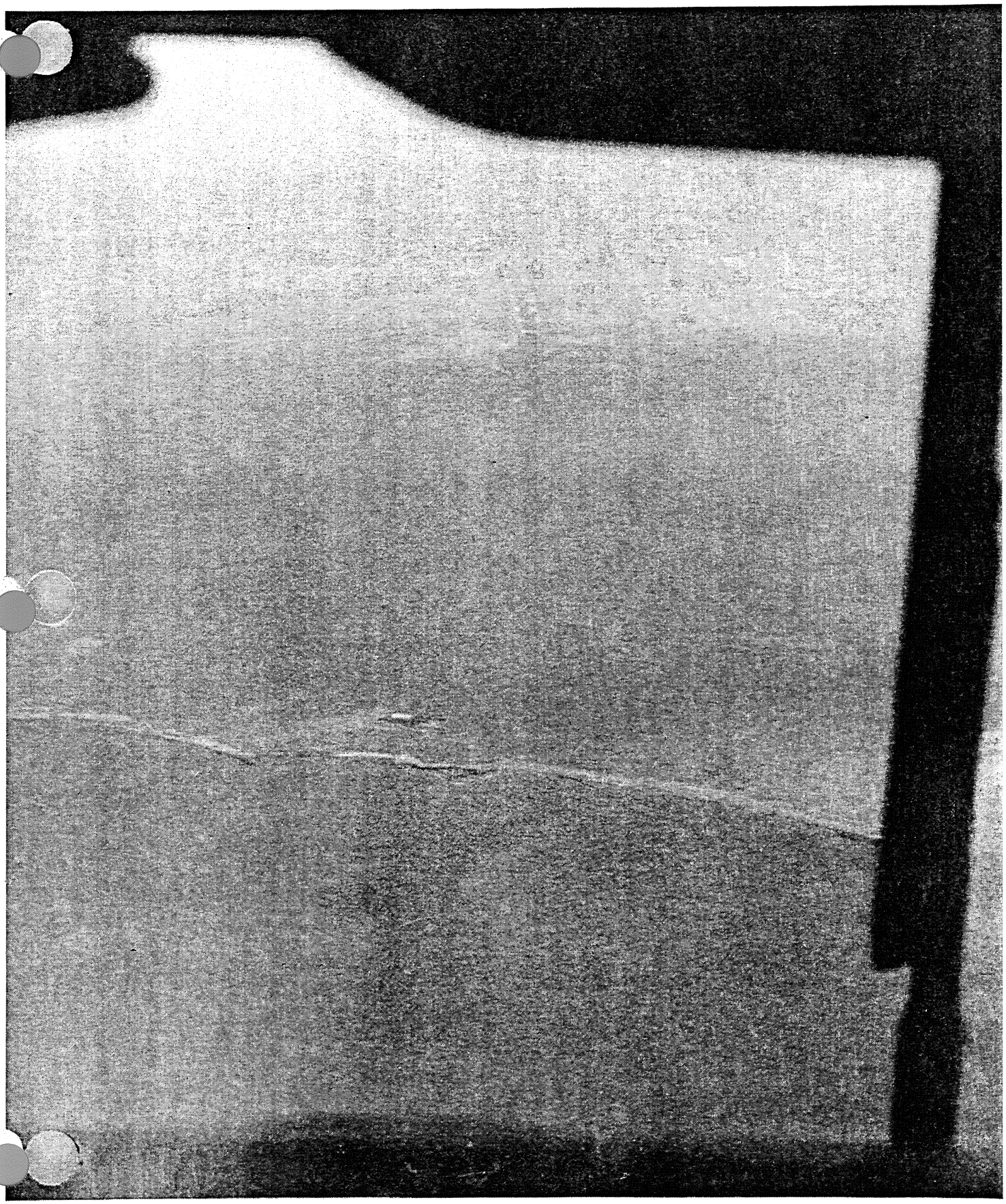

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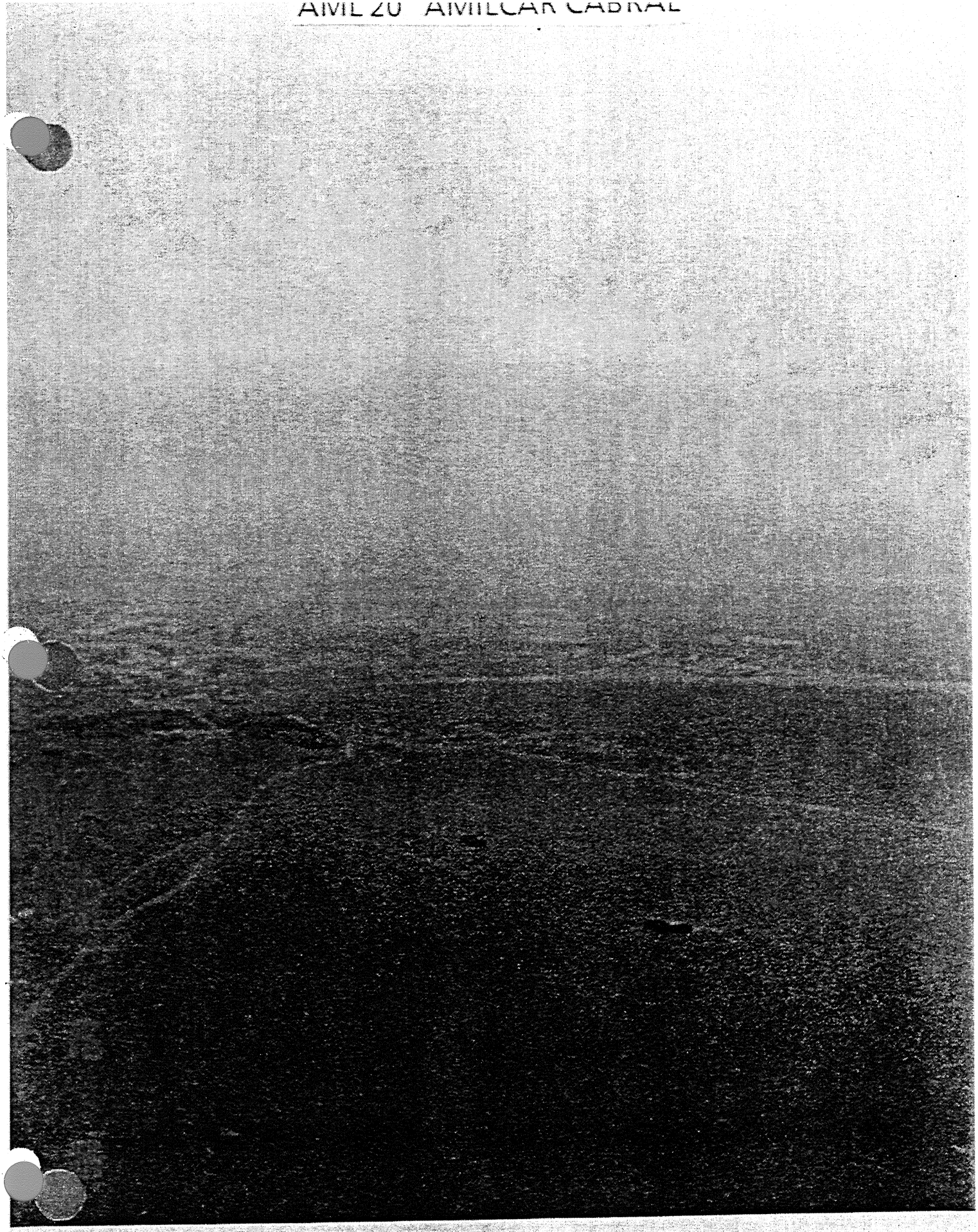

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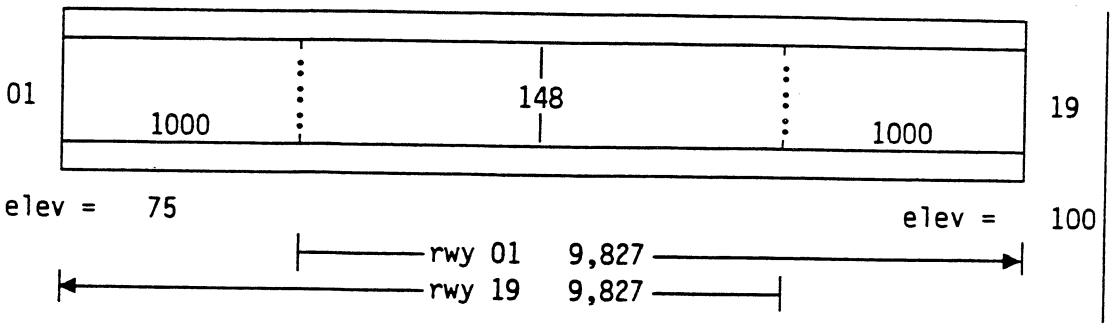
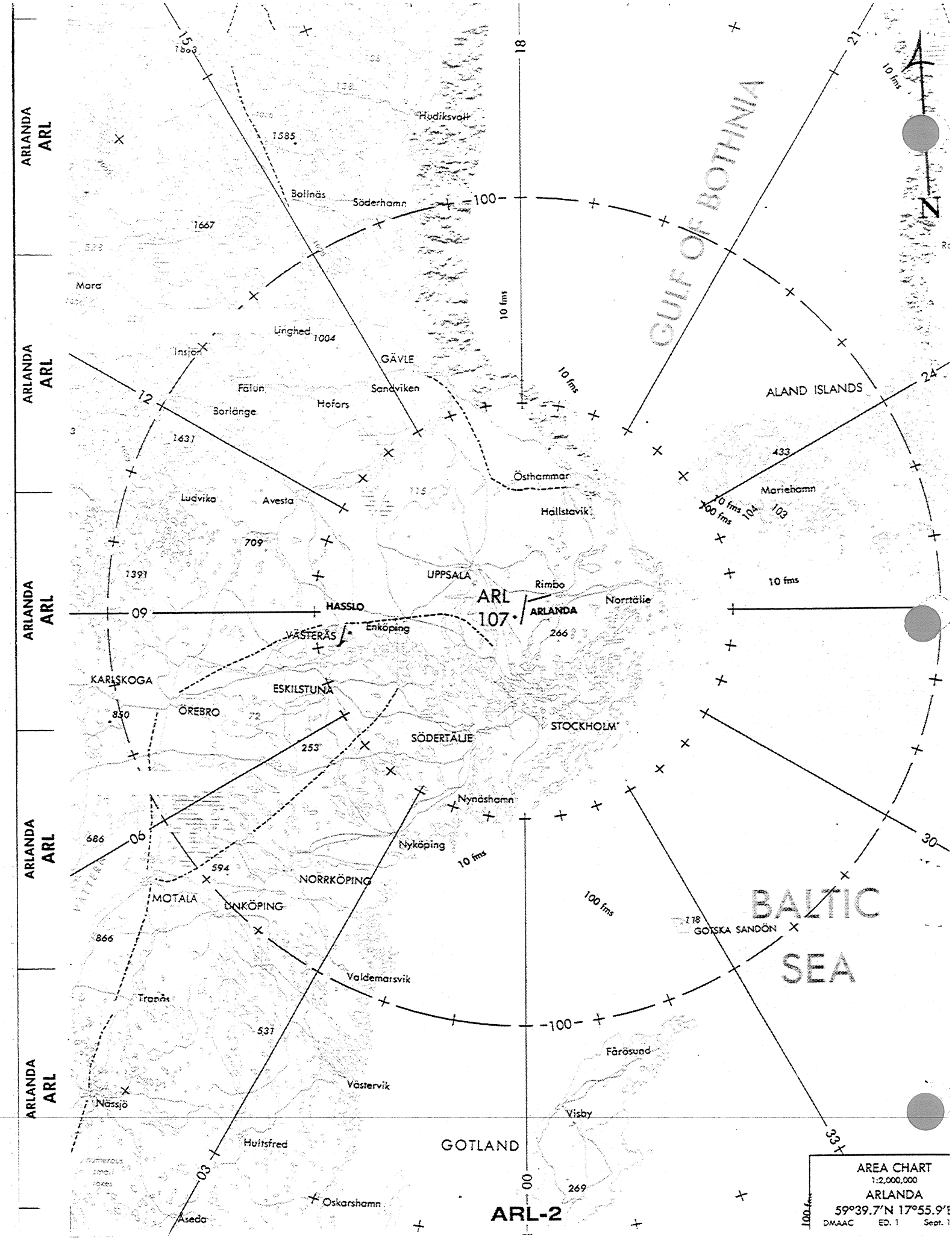
Arlanda, Sweden

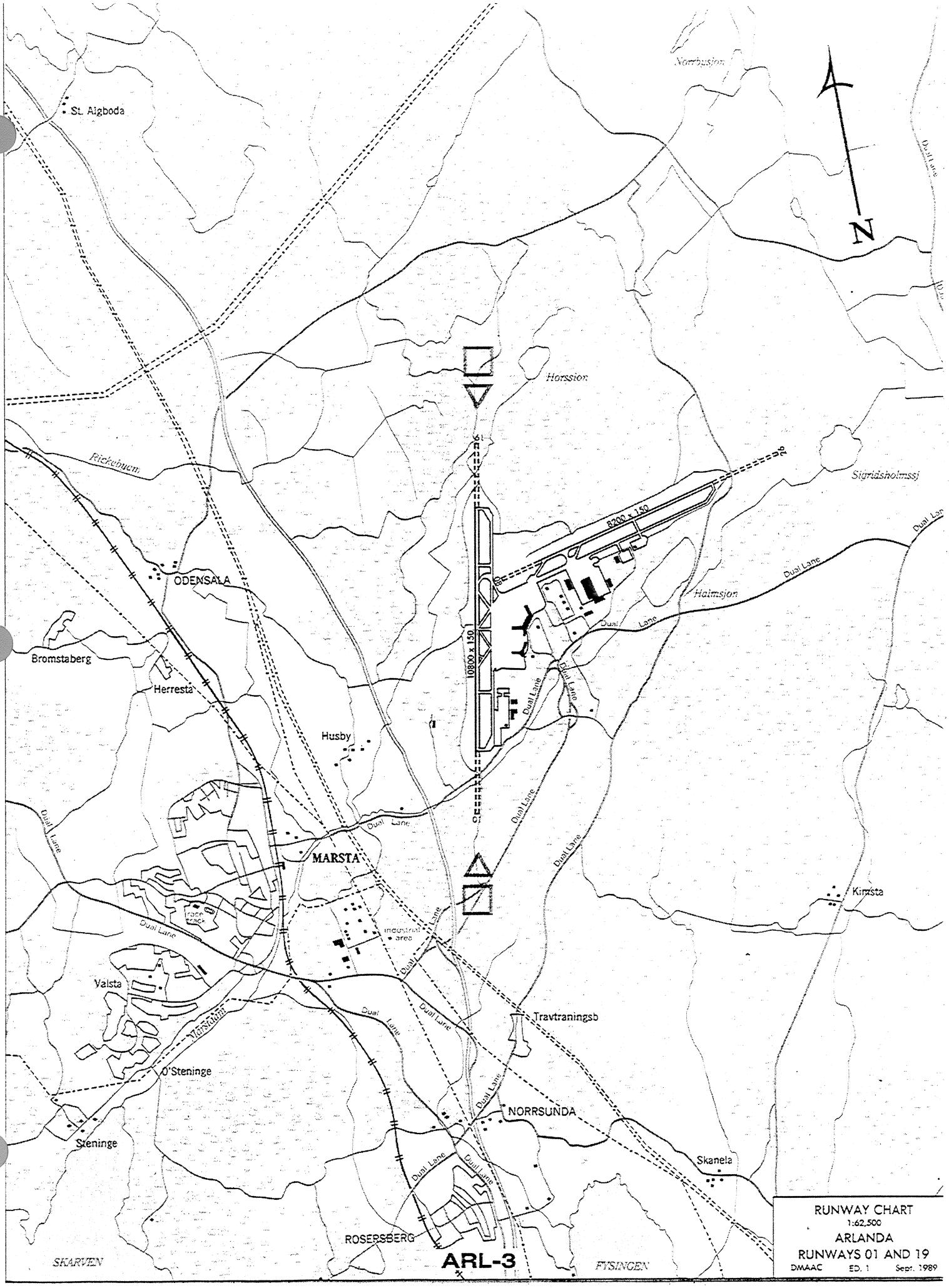
Table Identifier **ARL**



TACAN: ARL-107x (Pri-DME)
I/F above: N:clear E:clear
S:150k W:145k

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


ARLANDA ARL
ARLANDA ARL
ARLANDA ARL
ARLANDA ARL
ARLANDA ARL
GULF OF BOTHNIA
BALTIC SEA
GOTLAND
ALAND ISLANDS
Hudiksvall
Bollnäs
Söderhamn
Mora
Linghed
Insjön
GÄVLE
Falun
Sandviken
Borlänge
Hofors
Ludvika
Avesta
Östhammar
Hallstavik
Mariehamn
UPPSALA
Rimbo
Norrtälje
HASSLO
ARL 107
ARLANDA
VÄSTERÅS
Enköping
KARLSKOGA
ESKILSTUNA
ÖREBRO
SÖDERTÄLJE
STOCKHOLM
Nynäshamn
Nyköping
NORRKÖPING
MOTALA
LINKÖPING
GOTSKA SANDÖN
Valdemarsvik
Tranås
Färösund
Västervik
Visby
Nässjö
Hultsfred
Oskarshamn
Aseda
09
06
03
00
12
15
18
21
24
27
30
33
100
10 fms
100 fms
AREA CHART
1:2,000,000
ARLANDA
59°39.7'N 17°55.9'E
DMAAC ED. 1 Sept. 1
ARL-2



RUNWAY CHART
1:62,500
ARLANDA
RUNWAYS 01 AND 19
DMAAC ED. 1 Sept. 1989

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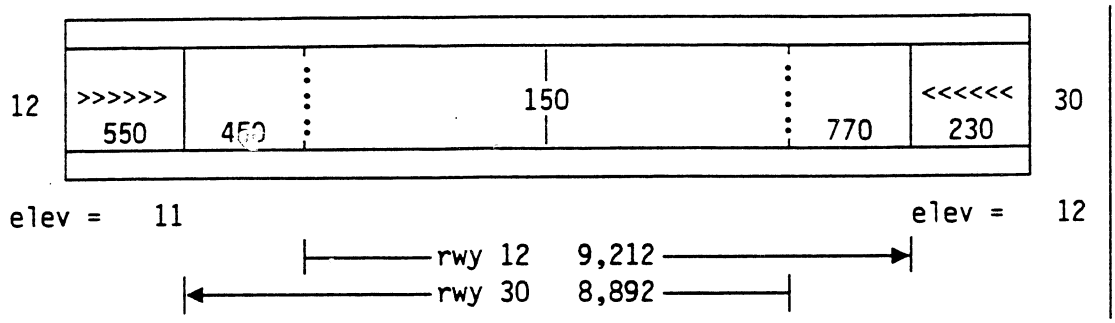
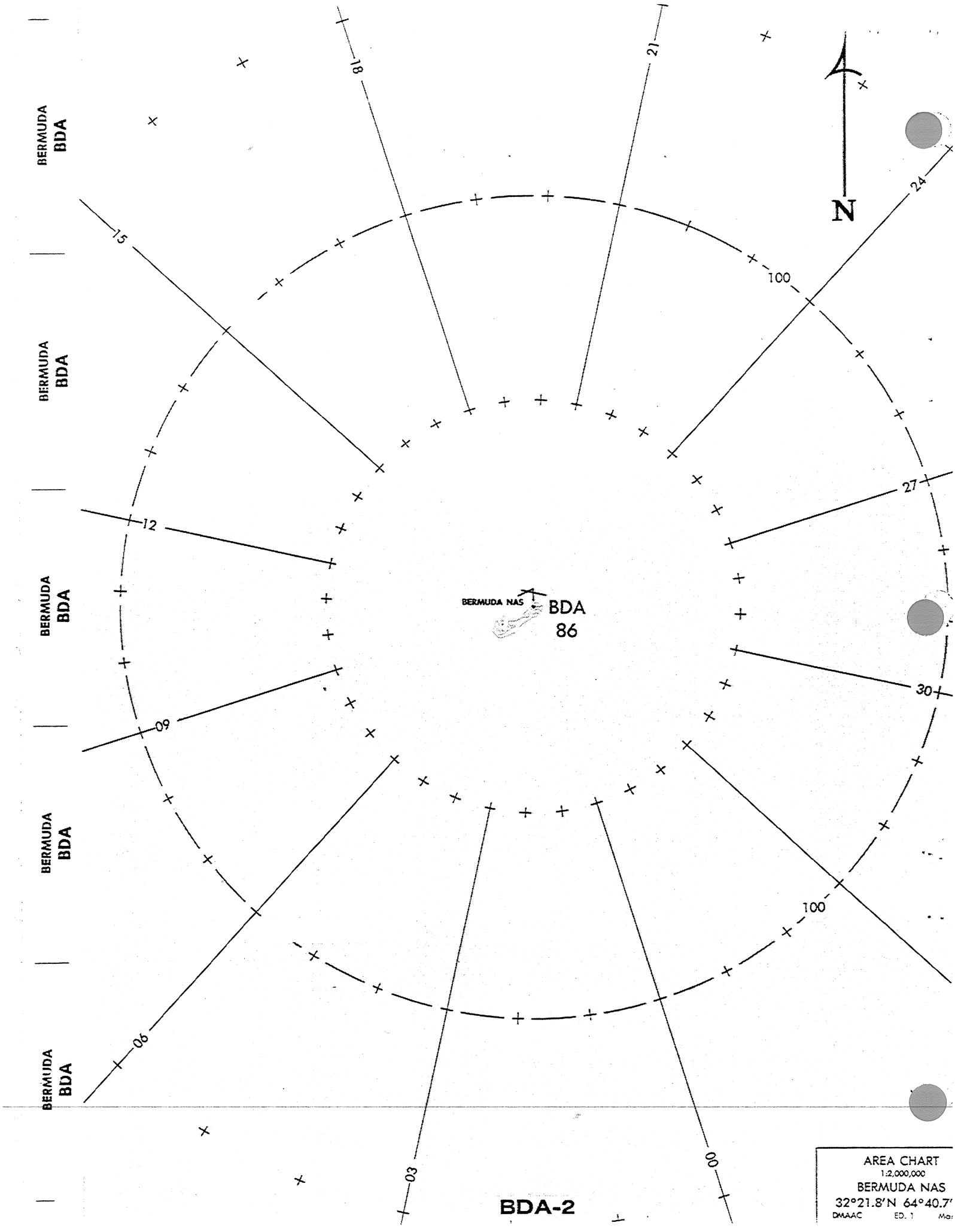
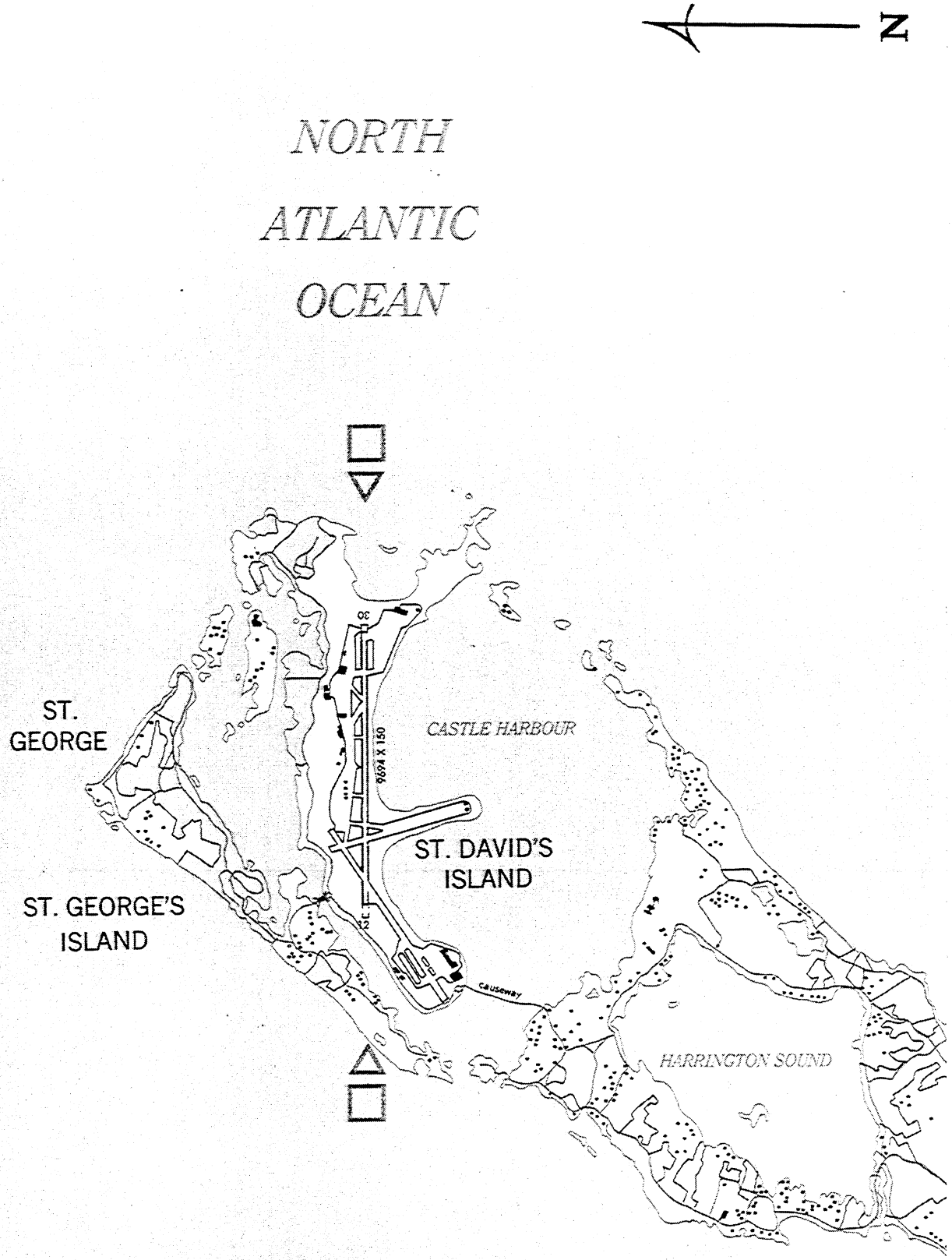


TACAN: BDA-86x (Pri)
I/F above: N:clear E:clear
S:clear W:clear

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

BERMUDA BDA
BERMUDA BDA
BERMUDA BDA
BERMUDA BDA


BERMUDA BDA
BERMUDA BDA
BERMUDA BDA
BERMUDA BDA
BERMUDA BDA
N
18
21
24
27
30
00
03
06
09
12
15
100
100
BERMUDA NAS
BDA
86
AREA CHART
1:2,000,000
BERMUDA NAS
32°21.8'N 64°40.7'
DMAAC ED. 1 Mar



RUNWAY CHART
1:62,500
BERMUDA NAS
RUNWAY 12 and 30
DMAAC ED. 1 Mar 1989

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BDA 12 BERMUDA

BDA-A

EDITION 1-6/89

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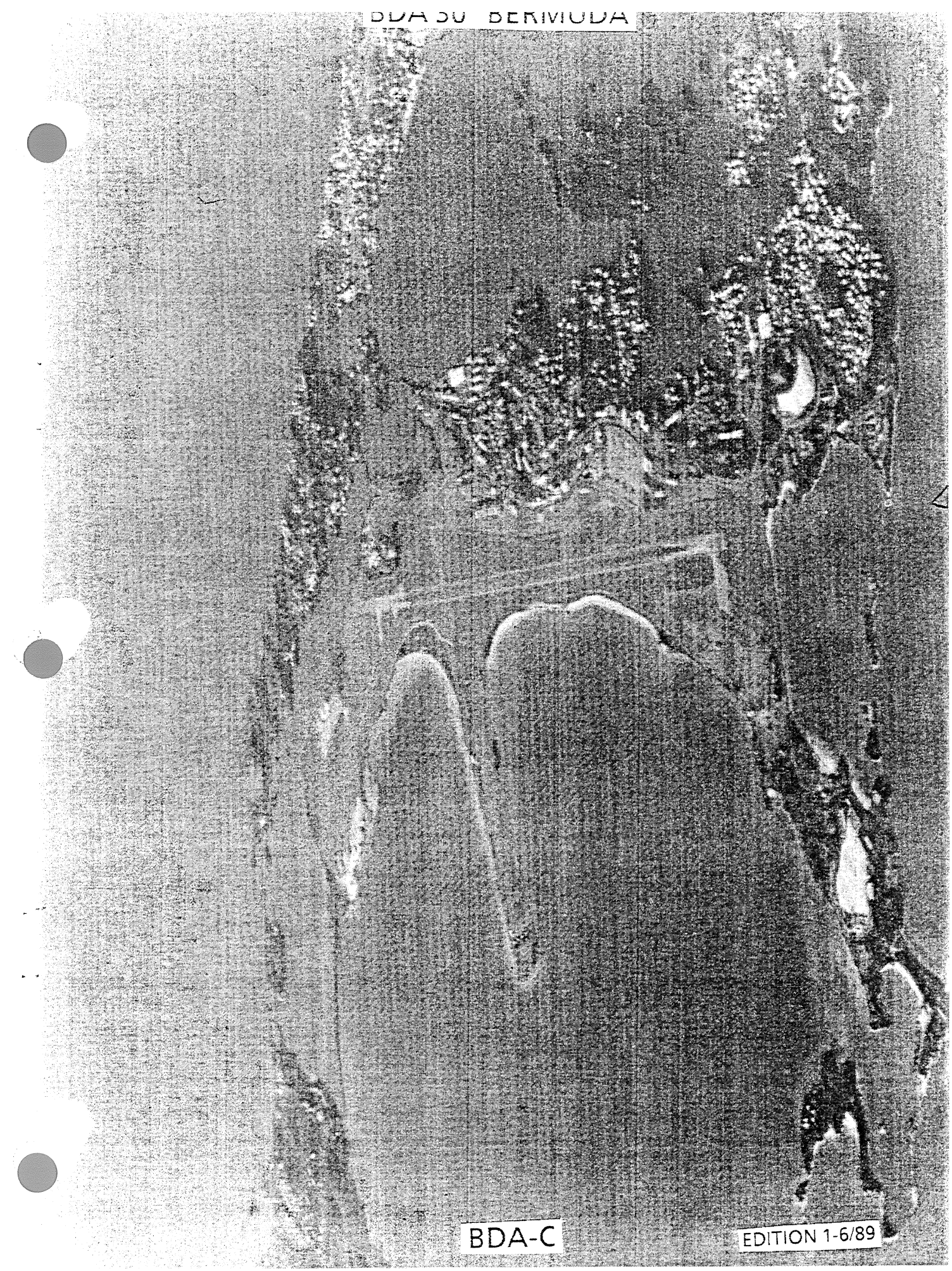

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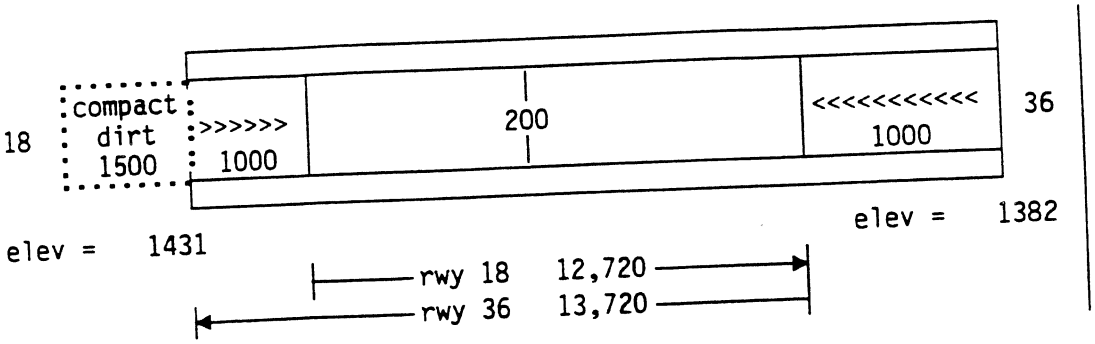
Ben Guerir, Morocco

Table Identifier **BEN**

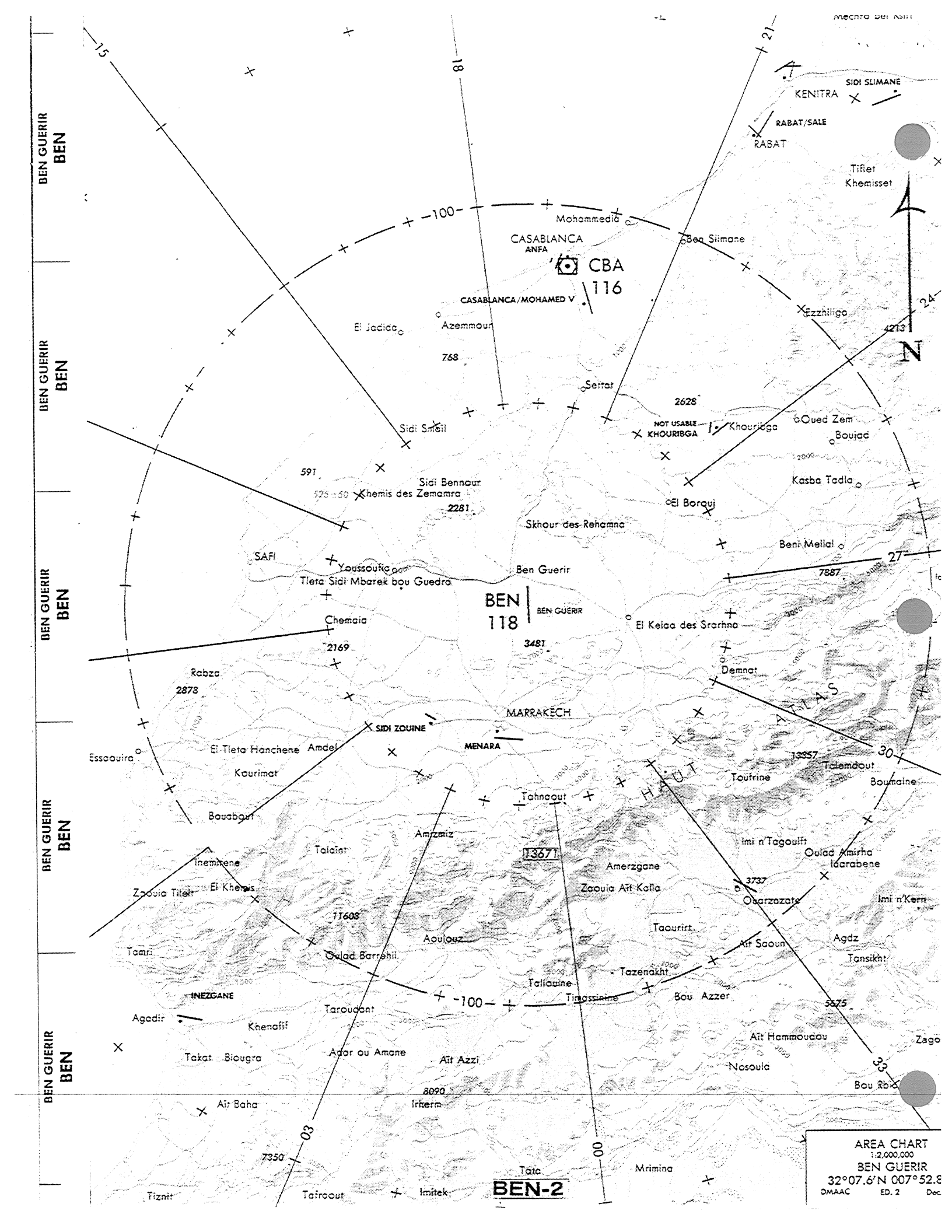


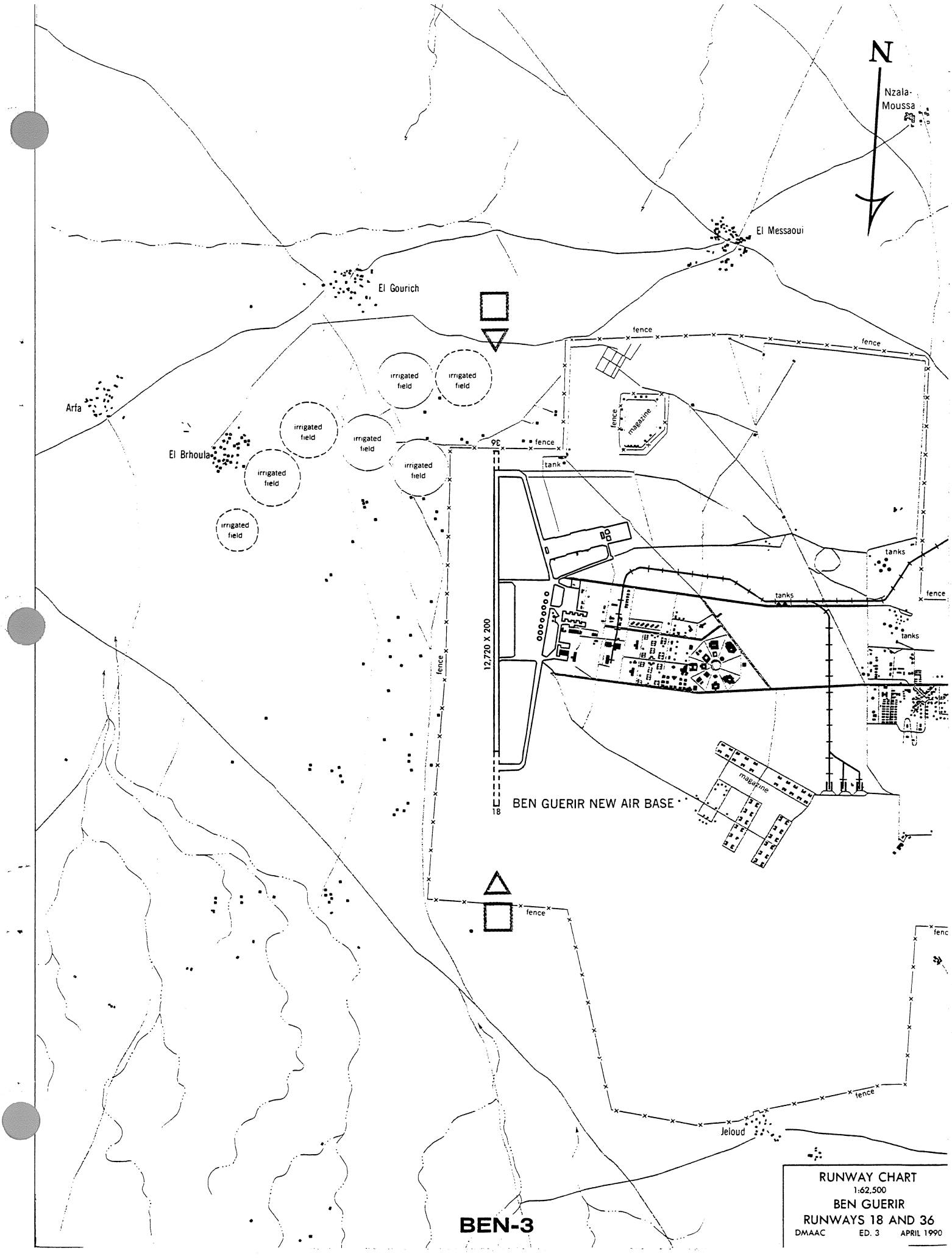
TACAN: BEN-118x (Pri)
I/F above: N:clear E:clear
S:clear W:clear

CBA-116x (Sec-DME)
N:clear E:clear
S:clear W:clear

MLS: (36-Sr) ch 6
PAPI: 18, 36
Ball Bar: 18, 36
UHF: yes (when NASA convoy is present)

BEN GUERIR BEN
BEN GUERIR BEN
BEN GUERIR BEN
BEN GUERIR BEN


BEN GUERIR
BEN
KENITRA
SIDI SLIMANE
RABAT/SALE
RABAT
Tiflet
Khemisset
Mohammedia
CASABLANCA
ANFA
CBA
116
Ben Slimane
CASABLANCA/MOHAMED V
El Jadida
Azemmour
768
Ezzhiliga
4213
Settat
2628
Sidi Smail
NOT USABLE
KHOURIBGA
Khouribga
Oued Zem
Boujad
591
Sidi Bennour
926
Khemis des Zemamra
2281
Kasba Tadla
El Boroui
Skhour des Rehamna
Beni Mellal
SAFI
Youssoufia
Ben Guerir
Tleta Sidi Mbarek bou Guedra
BEN
118
BEN GUERIR
7887
El Kelaa des Srarhna
Chemaia
2169
3481
Rabza
2878
Demnat
ATLAS
MARRAKECH
SIDI ZOUINE
MENARA
Essaouira
El Tleta Hanchene
Amdel
Kourimat
Bouabout
Toufrine
13357
Tiemdout
Boumaine
HAUT
Tahnaout
Amizmiz
13671
Talaint
Imi n'Tagoulft
Oulad Ximrha
Iacrabene
Inemirene
Amerzgane
Zaouia Tifelt
El Kheiss
Zaouia Ait Kalla
3737
Ouarzazate
Imi n'Kern
11608
Taourirt
Aoulouz
Ait Saoun
Agdz
Tamri
Oulad Barrehil
Tazenakht
Tansikht
Taliouine
INEZGANE
Tiouassinine
Bou Azzer
5675
Agadir
Tarroudant
Khenafif
Ait Hammoudou
Zago
Takat
Biougra
Aoar ou Amane
Ait Azzi
Nosoula
Bou Rb
8090
Ait Baha
Irherm
7350
Tata
Mrimina
Tiznit
Tafraout
Imitek
BEN-2
AREA CHART
1:2,000,000
BEN GUERIR
32°07.6'N 007°52.8
DMAAC
ED. 2
Dec.



RUNWAY CHART
1:62,500
BEN GUERIR
RUNWAYS 18 AND 36
DMAAC ED. 3 APRIL 1990

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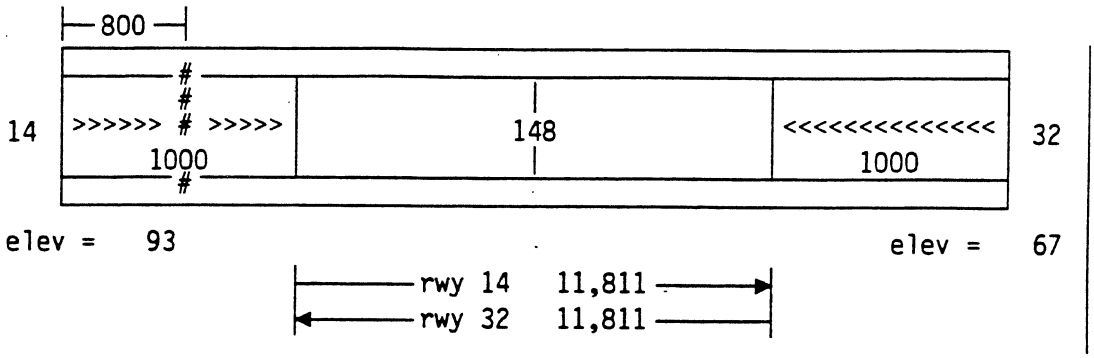
Yundum Intnl, Gambia (Banjul)

Table Identifier **BYD**



TACAN: BYD-121y (Pri) BJ-76x (Sec-DME)
I/F above: N:clear E:clear N:clear E:clear
S:clear W:clear S:clear W:clear

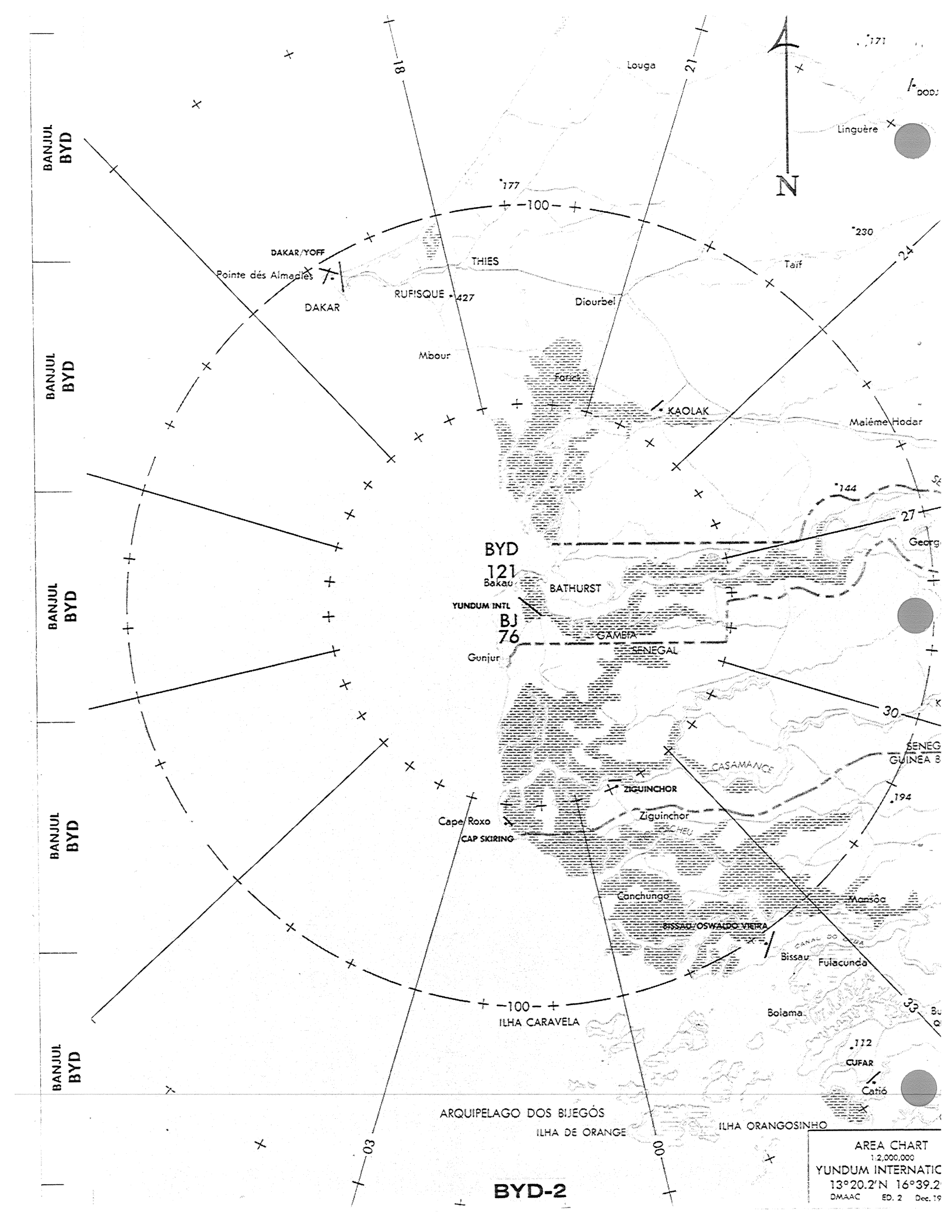
MLS: (32-2 Jr's) ch 6
PAPI: 32
Ball Bar: 32
UHF: none (UHF available when NASA convoy is present)

WARNING

- 40-ft palm trees 3200 ft from rwy 32

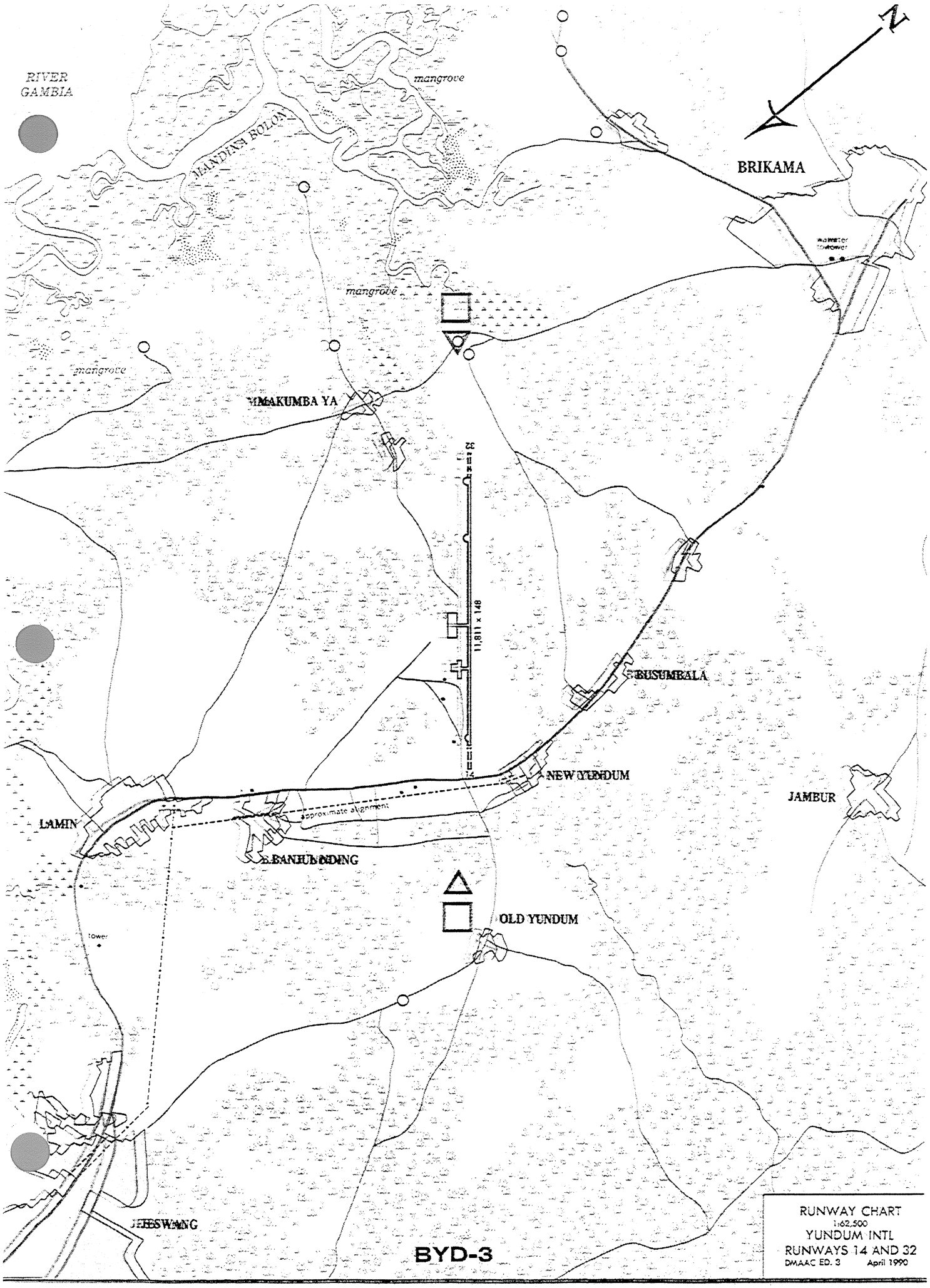
NOTE
- No MLS data available during rollout

BANJUL BYD
BANJUL BYD
BANJUL BYD
BANJUL BYD



AREA CHART
1:2,000,000
YUNDUM INTERNATIC
13°20.2'N 16°39.2
DMAAC ED. 2 Dec. 19

BYD-2


RIVER GAMBIA
mangrove
MANDIAN BOLON
BRIKAMA
mangrove
mangrove
MAKUMBA YA
32
11,811 x 148
BUSUMBALA
NEW YUNDUM
JAMBUR
approximate alignment
LAMIN
BANJULDING
OLD YUNDUM
tower
JESWANG
BYD-3
RUNWAY CHART
1:62,500
YUNDUM INTL
RUNWAYS 14 AND 32
DMAAC ED. 3
April 1990

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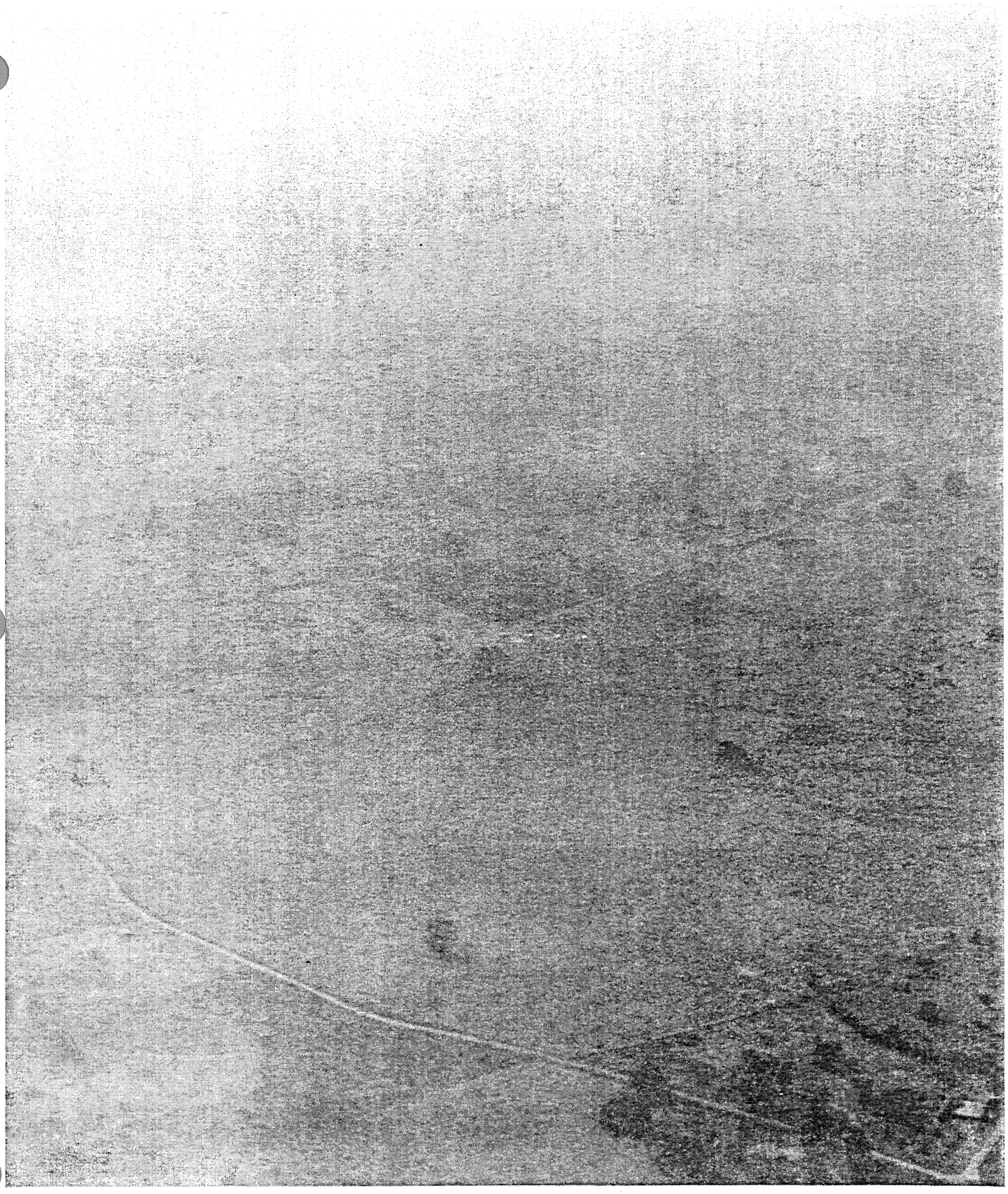
BYD 14 BANJUL



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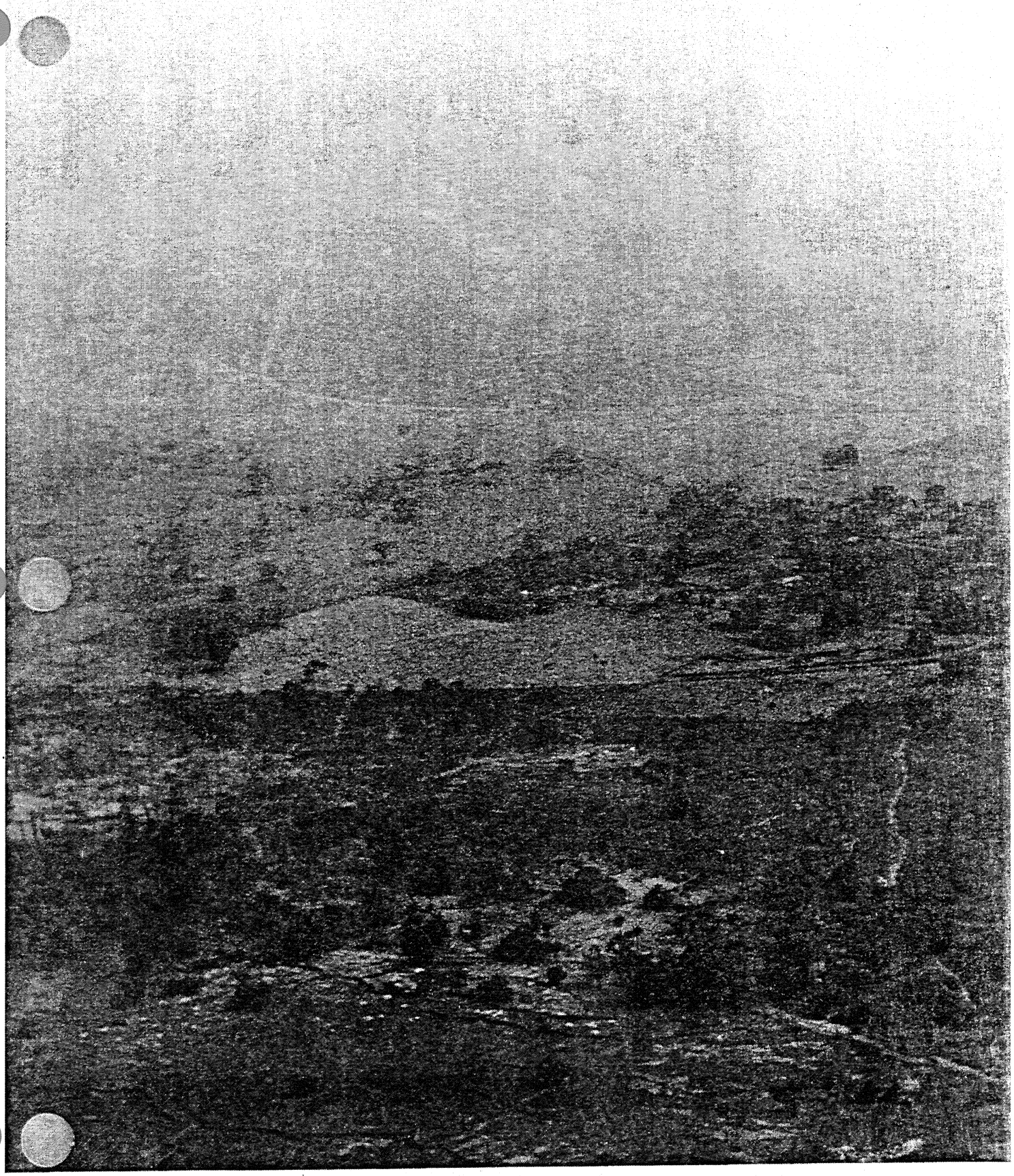
BYD 32 BANJUL view 1



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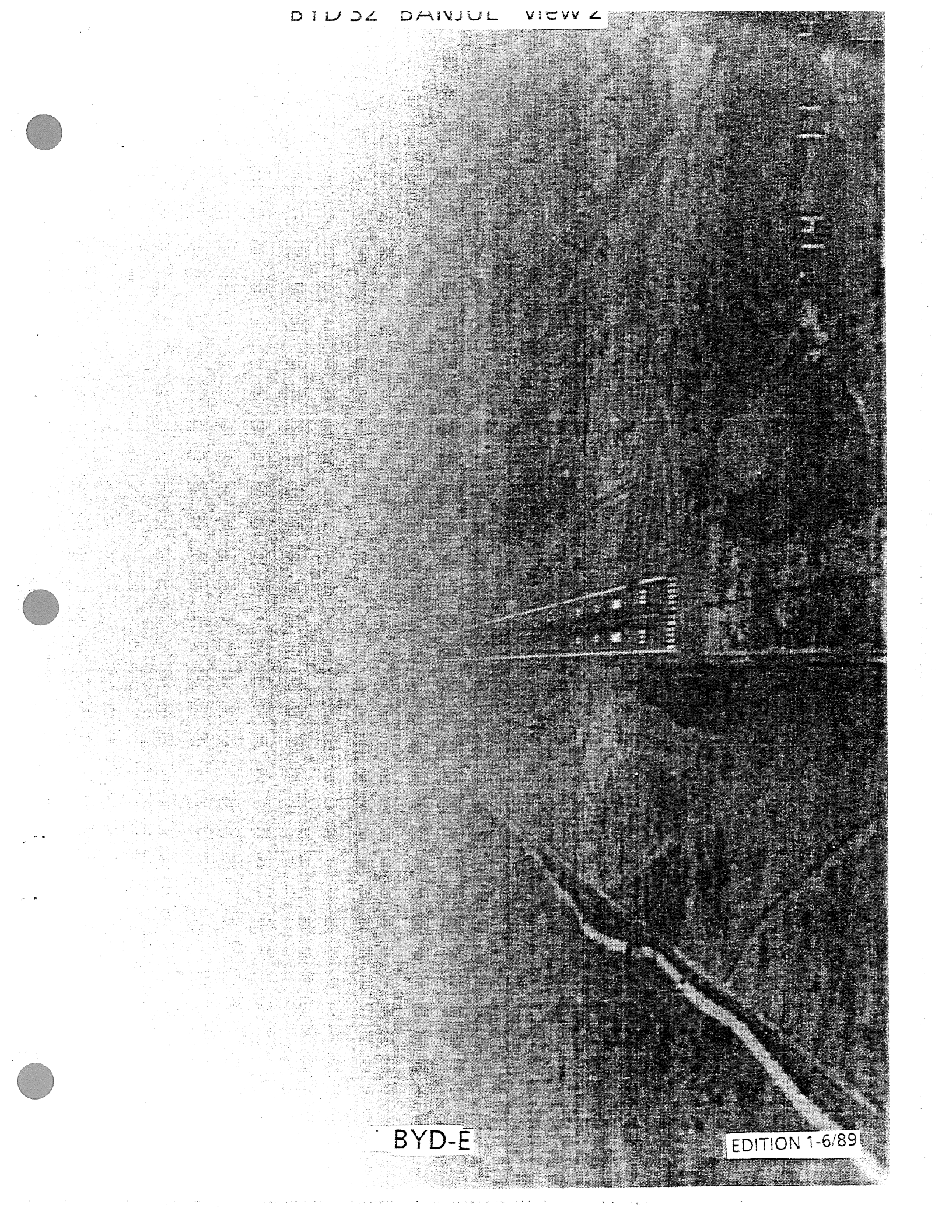
BYD 32 BANJUL View 2
BYD-E
EDITION 1-6/89

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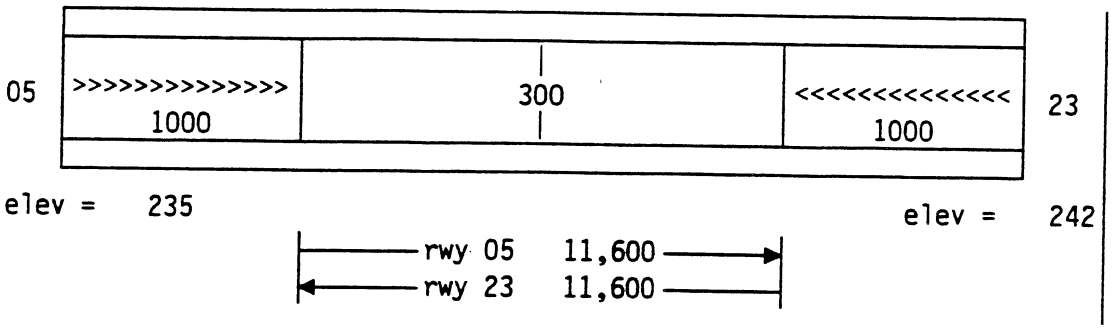
Westover AFB, Massachusetts

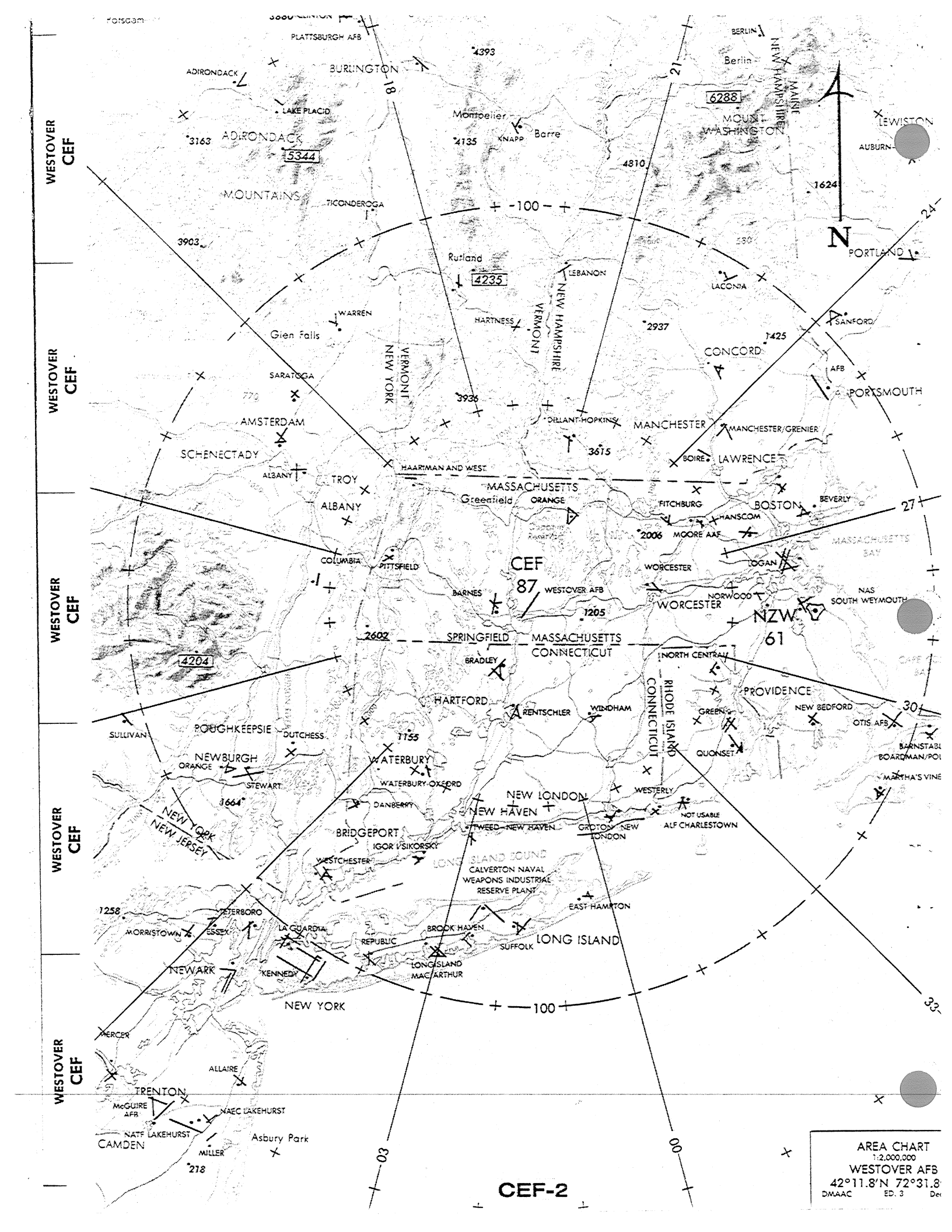
Table Identifier **CEF**

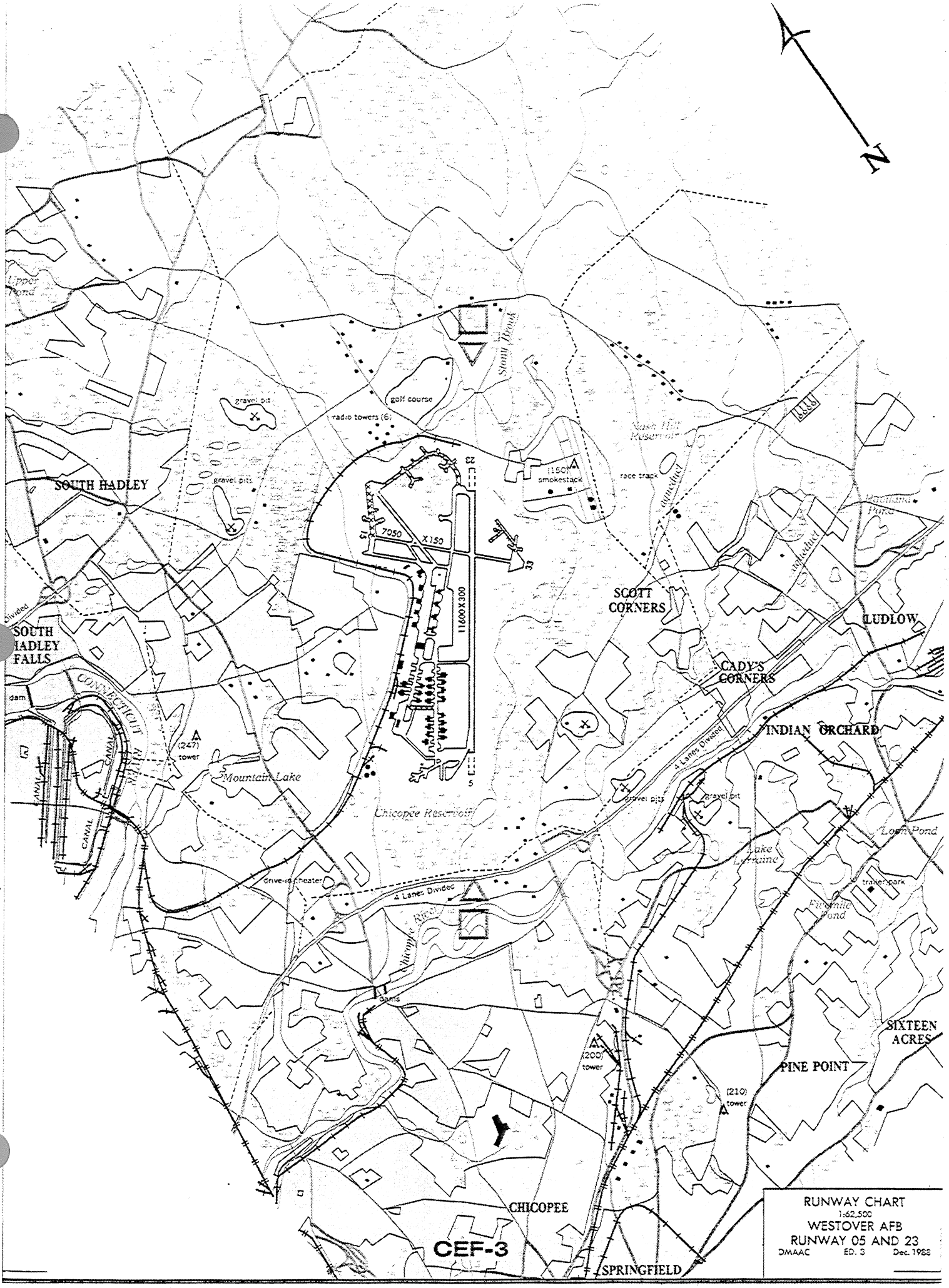


TACAN: CEF-87x (Pri) NZW-61x (Sec)
I/F above: N:<<80k E:<<80k N:clear E:clear
S:<<80k W:<<80k S:clear W:clear

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

WESTOVER CEF
WESTOVER CEF
WESTOVER CEF
WESTOVER CEF


WESTOVER CEF
WESTOVER CEF
WESTOVER CEF
WESTOVER CEF
WESTOVER CEF
PLATTSBURGH AFB
BURLINGTON
ADIRONDACK
LAKE PLACID
ADIRONDACK MOUNTAINS
5344
TICONDEROGA
Montpelier
Barre
KNAPP
4135
4393
3163
3903
Rutland
4235
LEBANON
NEW HAMPSHIRE
VERMONT
HARTNESS
WARREN
Glen Falls
NEW YORK
VERMONT
SARATOGA
AMSTERDAM
SCHENECTADY
ALBANY
TROY
ALBANY
HAARTMAN AND WEST
MASSACHUSETTS
Greenfield
ORANGE
COLUMBIA
PITTSFIELD
BARNES
WESTOVER AFB
CEF
87
SPRINGFIELD
MASSACHUSETTS
CONNECTICUT
BRADLEY
4204
2602
1205
HARTFORD
RENTSCHLER
WINDHAM
NEW LONDON
NEW HAVEN
TWEED-NEW HAVEN
GROTON-NEW LONDON
WESTERLY
NOT USABLE
ALF CHARLESTOWN
DANBERRY
WATERBURY-OXFORD
WATERBURY
NEWBURGH
ORANGE
STEWART
3664
1155
POUGHKEEPSIE
DUTCHESS
SULLIVAN
NEW YORK
NEW JERSEY
BRIDGEPORT
IGOR I SIKORSKY
WESTCHESTER
LONG ISLAND SOUND
CALVERTON NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
EAST HAMPTON
BROOK HAVEN
SUFFOLK
LONG ISLAND
REPUBLIC
LONG ISLAND MAC ARTHUR
1258
PETERBORO
MORRISTOWN
ESSEX
LA GUARDIA
NEWARK
KENNEDY
NEW YORK
MERCER
ALLAIRE
TRENTON
McGUIRE AFB
NAEC LAKEHURST
NAFF LAKEHURST
CAMDEN
MILLER
Asbury Park
218
BERLIN
Berlin
NEW HAMPSHIRE
MAINE
6288
MOUNT WASHINGTON
4810
1624
LEWISTON
AUBURN
PORTLAND
LACONIA
SANFORD
2937
1425
CONCORD
AFB
PORTSMOUTH
MANCHESTER
MANCHESTER/GRENIER
DILLANT-HOPKINS
3615
BOIRE
LAWRENCE
FITCHBURG
BOSTON
BEVERLY
HANSCOM
2006
MOORE AAF
WORCESTER
LOGAN
NORWOOD
NAS SOUTH WEYMOUTH
NZW
61
NORTH CENTRAL
CONNECTICUT
RHODE ISLAND
PROVIDENCE
GREEN
NEW BEDFORD
OTIS AFB
QUONSET
BARNSTABL
BOARDMAN/POL
MARTHA'S VINE
100
21
18
24
27
30
33
03
00
CEF-2
AREA CHART
1:2,000,000
WESTOVER AFB
42°11.8'N 72°31.8'
DMAAC
ED. 3



RUNWAY CHART
1:62,500
WESTOVER AFB
RUNWAY 05 AND 23
DMAAC ED. 3 Dec. 1988

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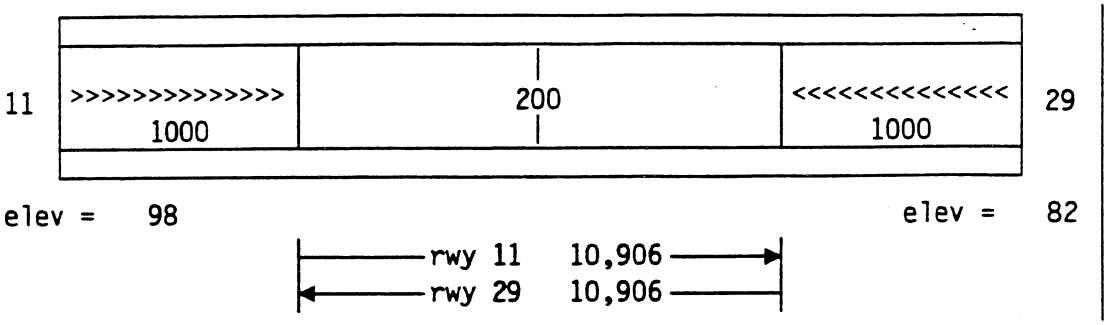
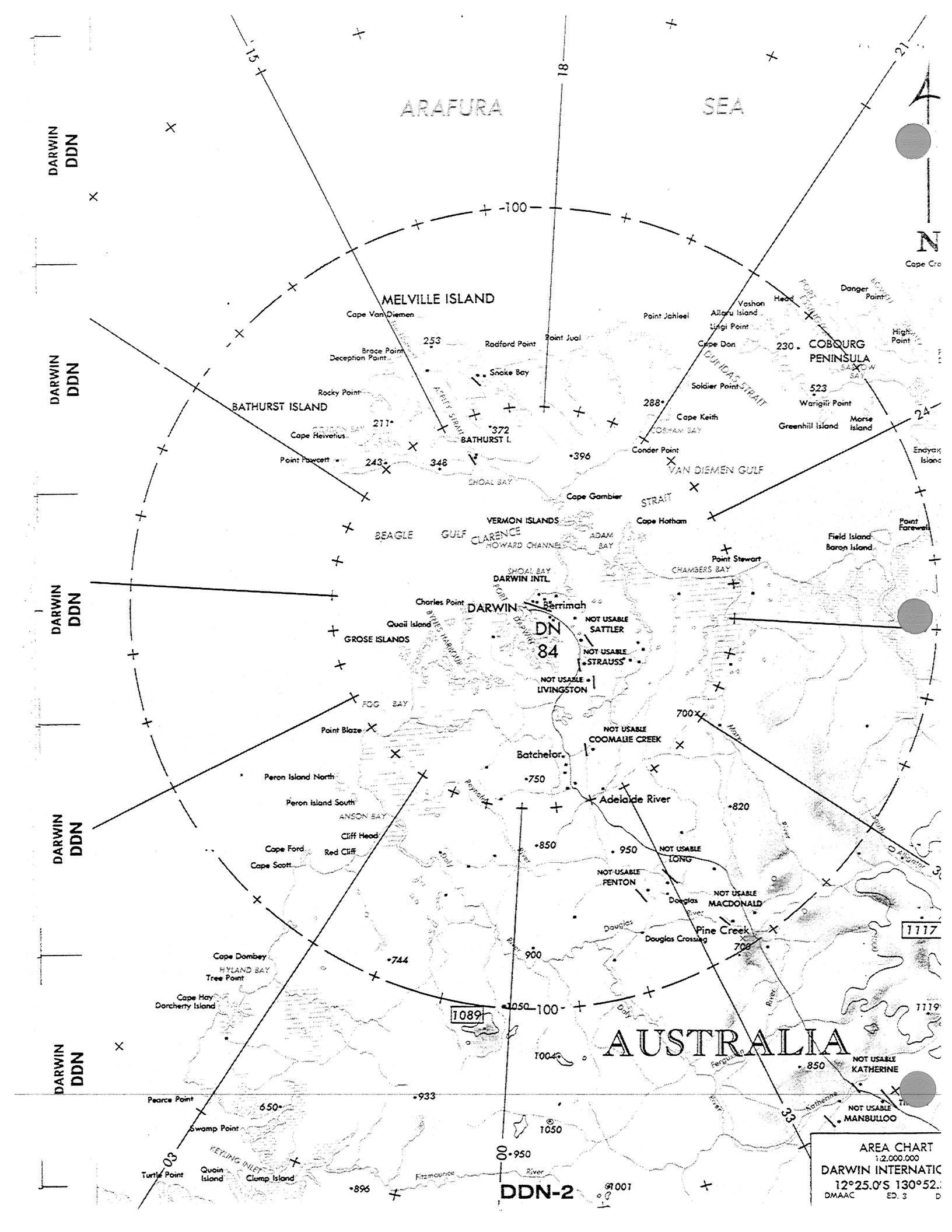


TACAN: DN-84x (Pri)
I/F above: N:clear E:clear
S:clear W:clear

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

DARWIN DDN
DARWIN DDN
DARWIN DDN
DARWIN DDN


ARAFURA SEA
MELVILLE ISLAND
BATHURST ISLAND
COBOURG PENINSULA
VAN DIEMEN GULF
BEAGLE GULF
CLARENCE STRAIT
DARWIN
DARWIN INTL.
Berrimah
DN 84
NOT USABLE SATTLER
NOT USABLE STRAUSS
NOT USABLE LIVINGSTON
NOT USABLE COOMALIE CREEK
NOT USABLE LONG
NOT USABLE PENTON
NOT USABLE MACDONALD
NOT USABLE KATHERINE
NOT USABLE MANBULLOO
Adelaide River
Batchelor
Pine Creek
Douglas Crossing
AUSTRALIA
Cape Van Diemen
Cape Don
Cape Keith
Cape Gambier
Cape Hotham
Point Stewart
Point Blaze
Peron Island North
Peron Island South
Cape Dombey
Cape Hay
Pearce Point
Swamp Point
Turtle Point
Quoin Island
Clump Island
Charles Point
Quail Island
GROSE ISLANDS
Point Pawcett
Cape Hevitus
Rocky Point
Deception Point
Brace Point
Radford Point
Point Jual
Snake Bay
Point Jahleel
Vashon Head
Danger Point
Soldier Point
Warigiji Point
Greenhill Island
Morse Island
Conder Point
Field Island
Baron Island
Point Farewell
Cape Ford
Cape Scott
Cliff Head
Red Cliff
Tree Point
Dorcherty Island
DARWIN DDN
DDN-2
AREA CHART
1:2,000,000
DARWIN INTERNATIC
12°25.0'S 130°52.
DMAAC ED. 3

RUNWAY CHART
1:62,500
DARWIN INTERNATIONAL
RUNWAYS 11 and 29
DMAAC ED. 3 Dec. 1988

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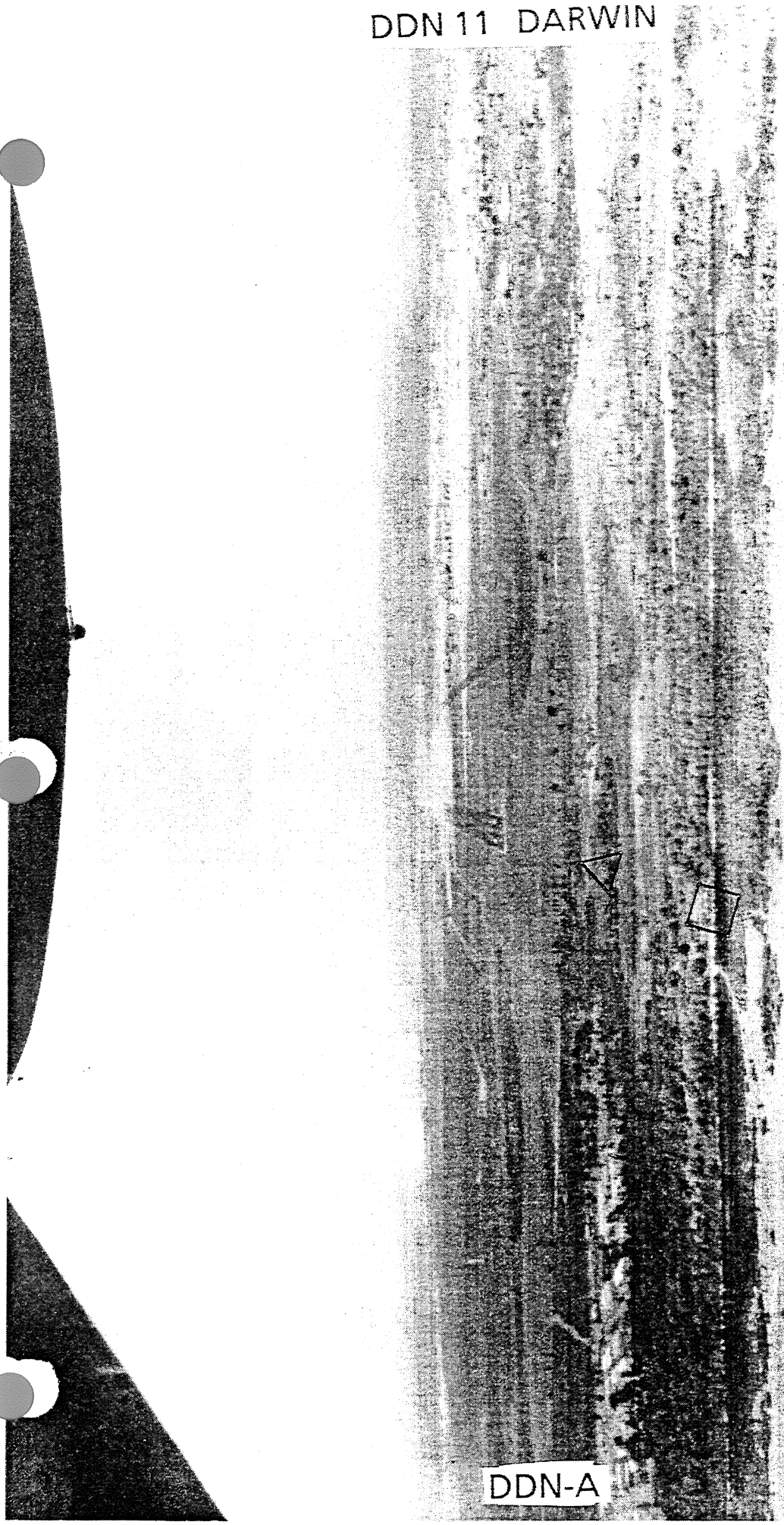
DDN 11 DARWIN



DDN-A

EDITION 1-6/89

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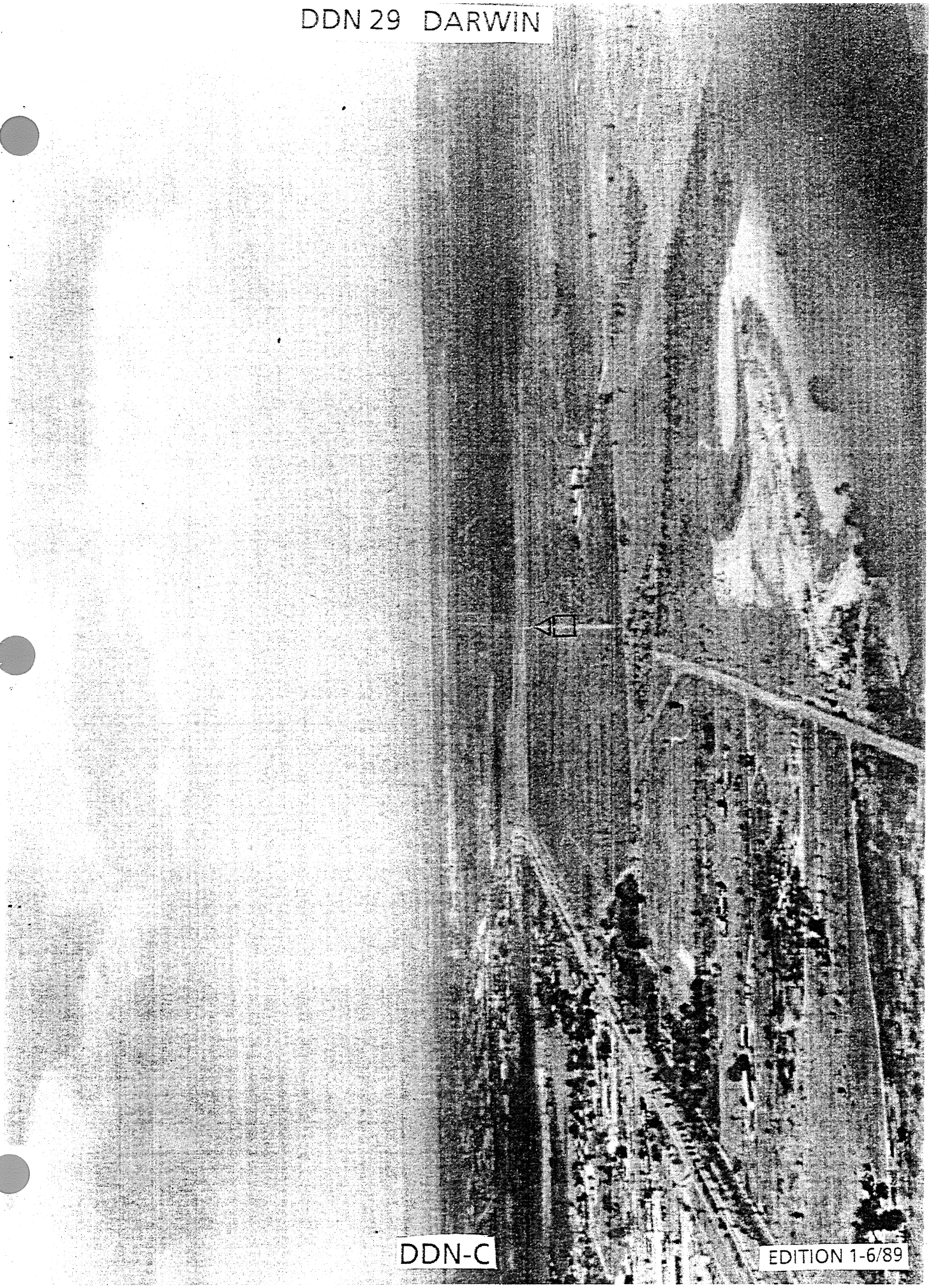
DDN 29 DARWIN



DDN-C

EDITION 1-6/89

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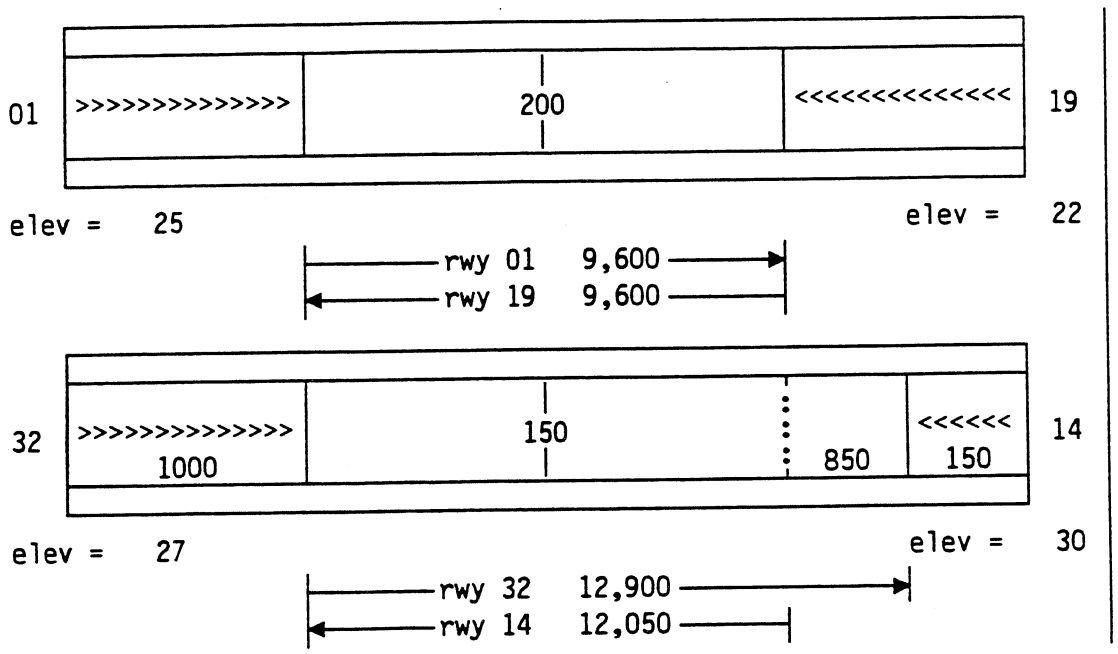
Dover AFB, Delaware

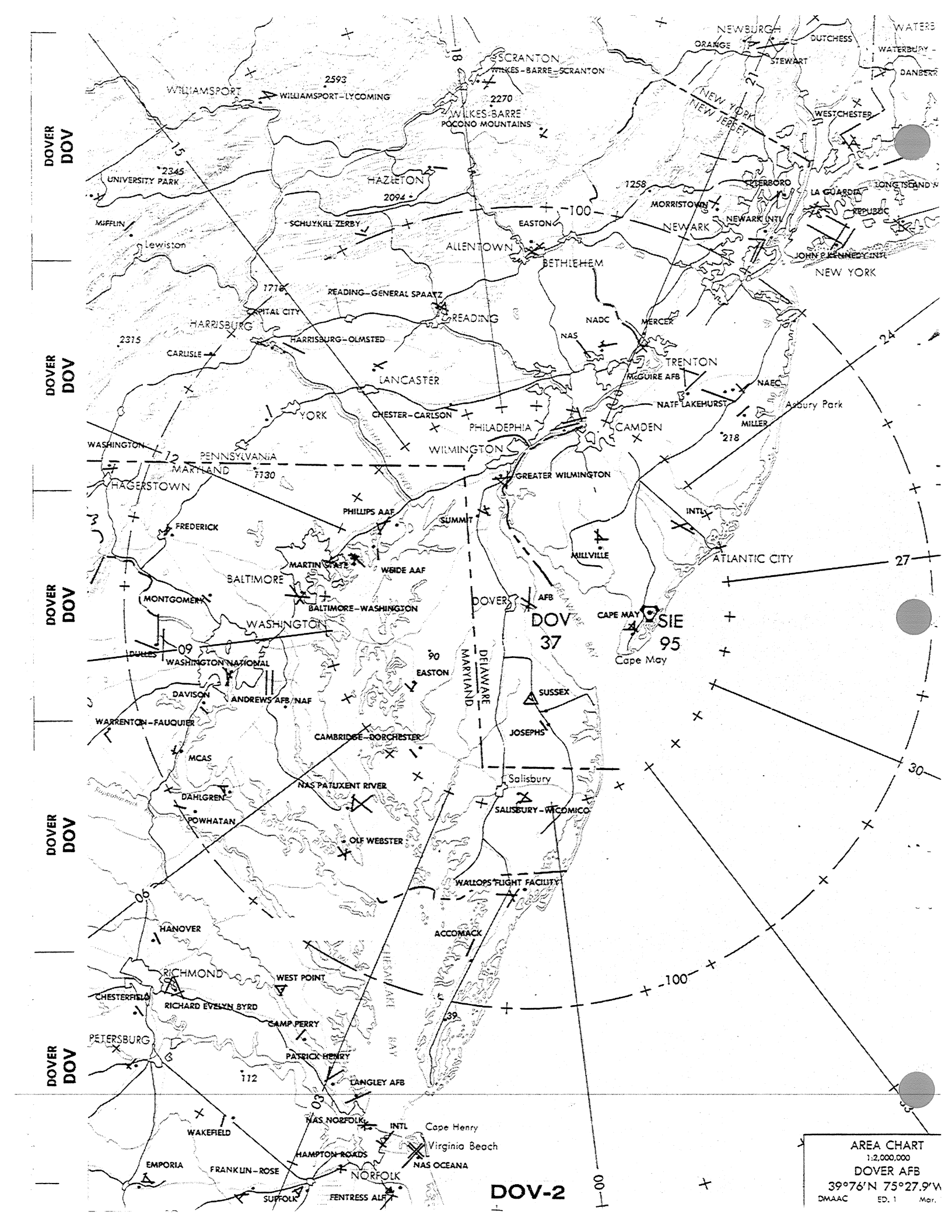
Table Identifier **DOV**

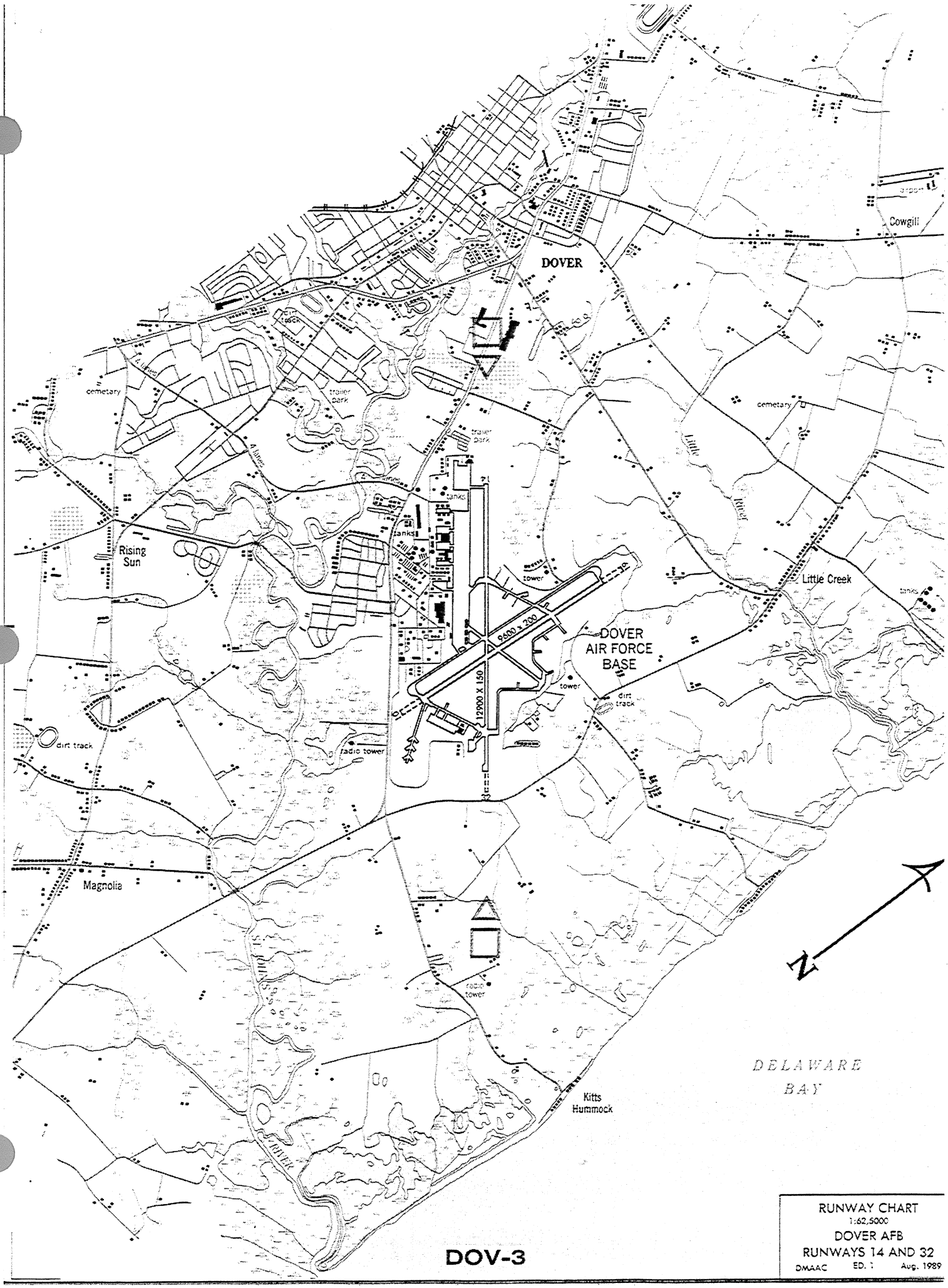


TACAN: DOV-37x (Pri) SIE-95x (Sec)
I/F above: N: 80k E: 90k N:100k E:105k
S:100k W:<80k S:160k W:105k

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

DOVER DOV
DOVER DOV
DOVER DOV
DOVER DOV
DOVER DOV


DOVER DOV
DOVER DOV
DOVER DOV
DOVER DOV
DOVER DOV
SCRANTON
WILKES-BARRE-SCRANTON
WILLIAMSPORT
WILLIAMSPORT-LYCOMING
2593
2270
WILKES-BARRE
POCONO MOUNTAINS
NEWBURGH
ORANGE
DUTCHESS
STEWART
WATERB
WATERBURY
DANBERR
NEW YORK
NEW JERSEY
WESTCHESTER
UNIVERSITY PARK
2345
HAZLETON
2094
1258
TETERBORO
LA GUARDIA
LONG ISLAND M
MORRISTOWN
REPUBLIC
MIFFLIN
Lewiston
SCHUYKILL
ZERBY
EASTON
NEWARK
NEWARK INTL
ALLENTOWN
BETHLEHEM
JOHN F KENNEDY INTL
NEW YORK
1776
READING-GENERAL SPAATZ
READING
CAPITAL CITY
HARRISBURG
HARRISBURG-OLMSTED
2315
CARLISLE
NADC
NAS
MERCER
TRENTON
McGUIRE AFB
NAEC
NATF LAKEHURST
Asbury Park
LANCASTER
YORK
CHESTER-CARLSON
PHILADEPHIA
CAMDEN
MILLER
218
WASHINGTON
PENNSYLVANIA
MARYLAND
7130
WILMINGTON
GREATER WILMINGTON
HAGERSTOWN
PHILLIPS AAF
SUMMIT
INTL
FREDERICK
MILLVILLE
ATLANTIC CITY
MARTIN STATE
WSIDE AAF
BALTIMORE
MONTGOMERY
BALTIMORE-WASHINGTON
DOVER AFB
DOV
37
CAPE MAY
SIE
95
Cape May
WASHINGTON
DULLES
WASHINGTON NATIONAL
EASTON
DELAWARE
MARYLAND
DAVISON
ANDREWS AFB/NAF
SUSSEX
WARRENTON-FAUQUIER
JOSEPHS
CAMBRIDGE-DORCHESTER
MCAS
Salisbury
NAS PATUXENT RIVER
DAHLGREN
SALISBURY-WICOMICO
POWHATAN
OLF WEBSTER
WALLOPS FLIGHT FACILITY
HANOVER
ACCOMACK
RICHMOND
WEST POINT
CHESTERFIELD
RICHARD EVELYN BYRD
CAMP PERRY
PETERSBURG
PATRICK HENRY
112
LANGLEY AFB
NAS NORFOLK
INTL
Cape Henry
WAKEFIELD
Virginia Beach
HAMPTON ROADS
NAS OCEANA
EMPORIA
FRANKLIN-ROSE
NORFOLK
SUFFOLK
FENTRESS AUF
DOV-2
AREA CHART
1:2,000,000
DOVER AFB
39°76'N 75°27.9'W
DMAAC
ED. 1
Mar.



RUNWAY CHART
1:62,5000
DOVER AFB
RUNWAYS 14 AND 32
DMAAC ED. 1 Aug. 1989

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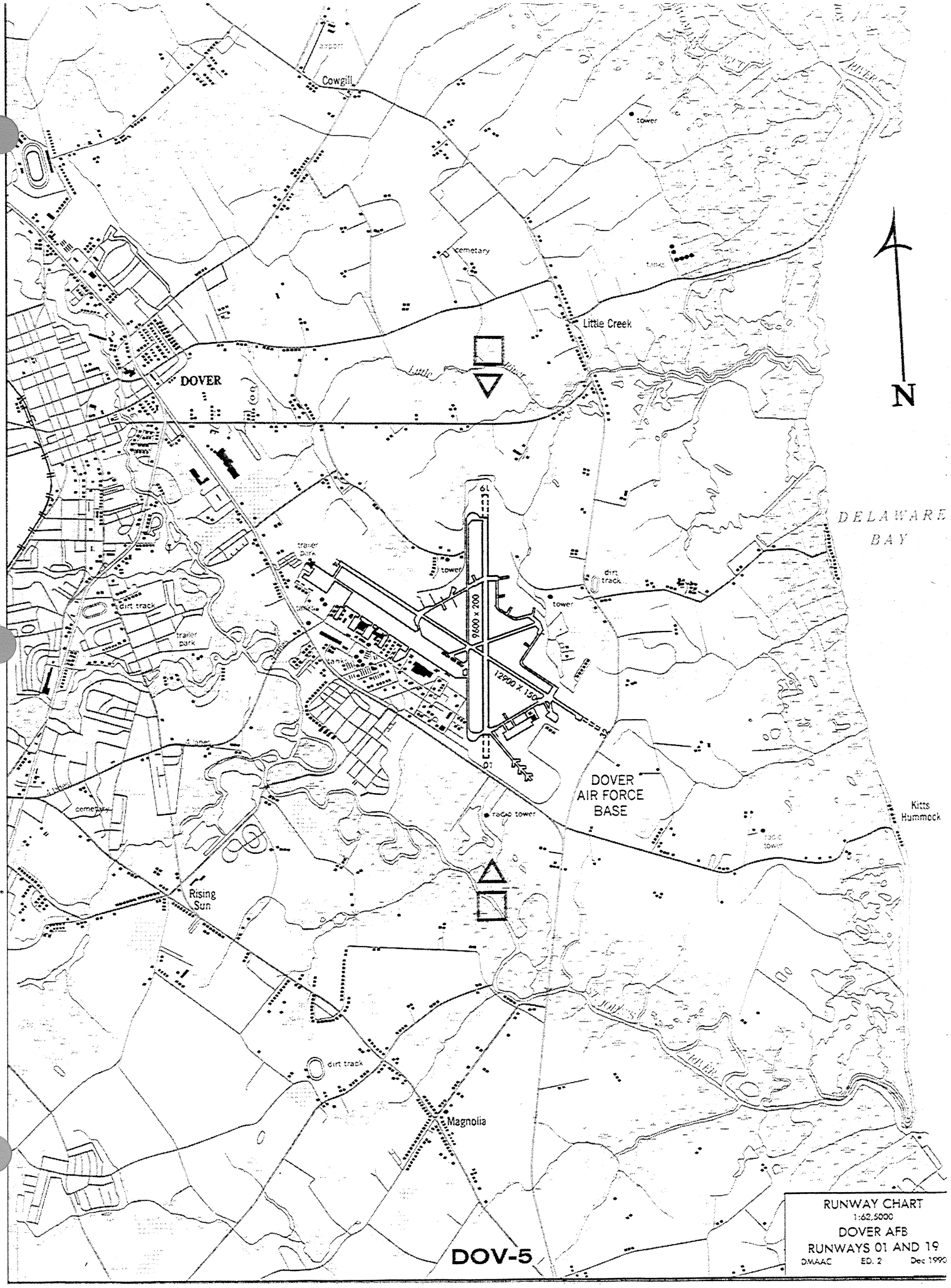

RUNWAY CHART
1:62,5000
DOVER AFB
RUNWAYS 01 AND 19
DMAAC ED. 2 Dec 1990

DOV-5

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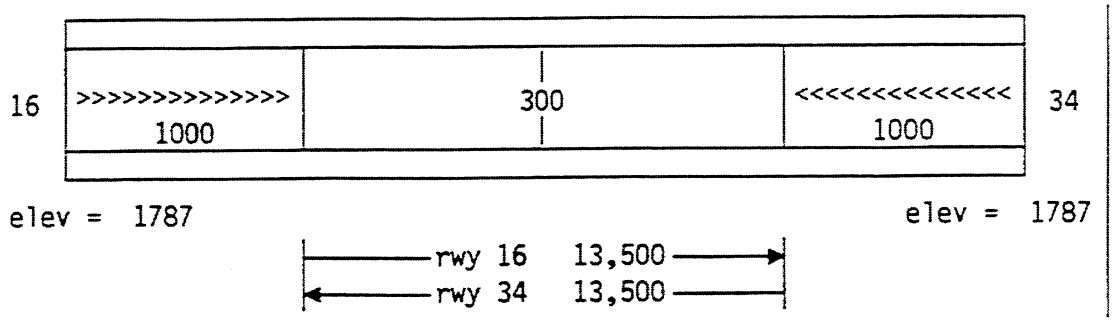
Dyess AFB, Texas

Table Identifier **DYS**



TACAN: ABI-84x (Pri) MQP-124x (Sec)
I/F above: N: 90k E:110k N:100k E:110k
S:120k W:100k S:clear W:clear

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

DYESS DYS

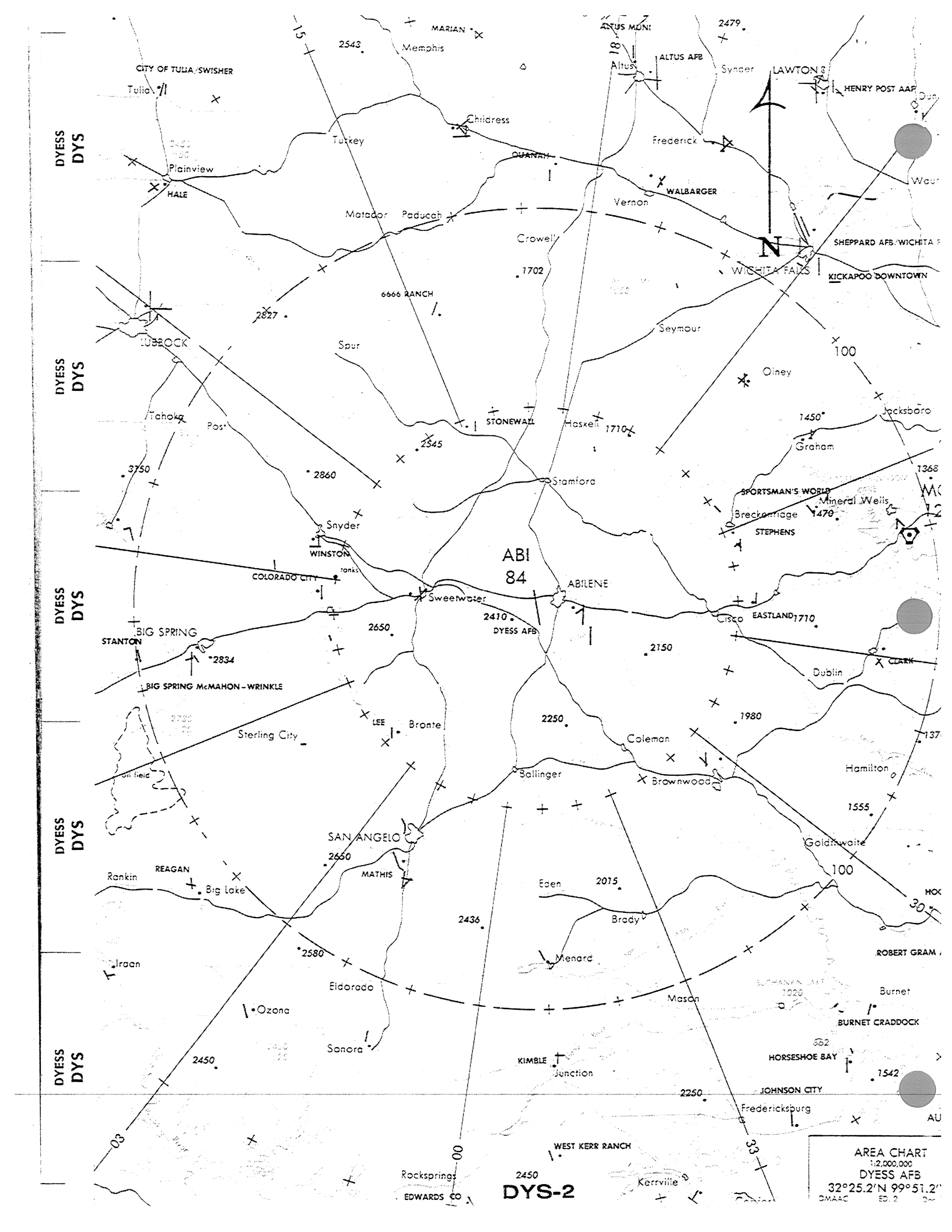
DYESS DYS

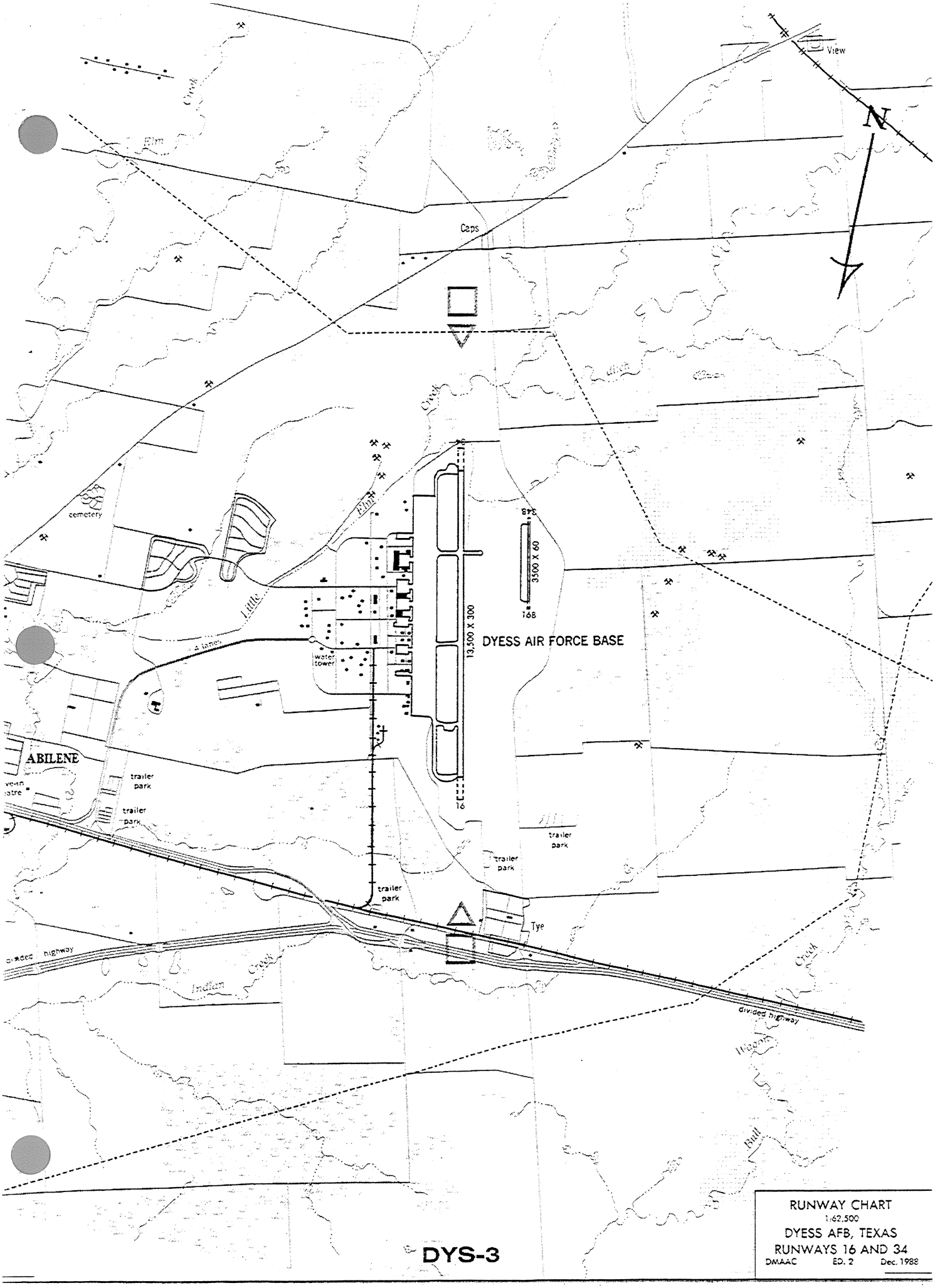
DYESS DYS

DYESS DYS

DYESS DYS

MAPS/ALL/GEN B


DYESS DYS
DYESS DYS
DYESS DYS
DYESS DYS
DYESS DYS
DYESS DYS
MARIAN
Memphis
2543
CITY OF TULIA/SWISHER
Tulia
Turkey
Childress
Plainview
HALE
QUANAH
Frederick
ALTUS MUNI
ALTUS AFB
Altus
Synder
LAWTON
HENRY POST AAF
WALBARGER
Vernon
Matador
Paducah
Crowell
1702
6666 RANCH
2827
LUBBOCK
Spur
Seymour
SHEPPARD AFB/WICHITA F
WICHITA FALLS
KICKAPOO DOWNTOWN
100
Olney
Jacksboro
1450
Graham
Tahoka
Post
STONEWALL
Haskell
1710
2545
3750
2860
Stamford
SPORTSMAN'S WORLD
Mineral Wells
Breckenridge
1470
STEPHENS
Snyder
WINSTON
tanks
COLORADO CITY
ABI
84
ABILENE
Sweetwater
2410
DYESS AFB
Cisco
EASTLAND
1710
BIG SPRING
STANTON
2834
2650
2150
CLARK
Dublin
BIG SPRING McMAHON-WRINKLE
Sterling City
LEE
Bronte
2250
1980
Coleman
Hamilton
Ballinger
Brownwood
oil field
SAN ANGELO
2650
MATHIS
1555
Goldthwaite
Rankin
REAGAN
Big Lake
Eden
2015
100
Brady
2436
Menard
ROBERT GRAM
Iraan
2580
Eldorado
Ozona
Mason
Burnet
BURNET CRADDOCK
Sonora
2450
KIMBLE
Junction
HORSESHOE BAY
1542
JOHNSON CITY
2250
Fredericksburg
WEST KERR RANCH
Rocksprings
EDWARDS CO
Kerrville
03
00
33
DYS-2
AREA CHART
1:2,000,000
DYESS AFB
32°25.2'N 99°51.2'
DMAAC



RUNWAY CHART
1:62,500
DYESS AFB, TEXAS
RUNWAYS 16 AND 34
DMAAC ED. 2 Dec. 1988

DYS-3

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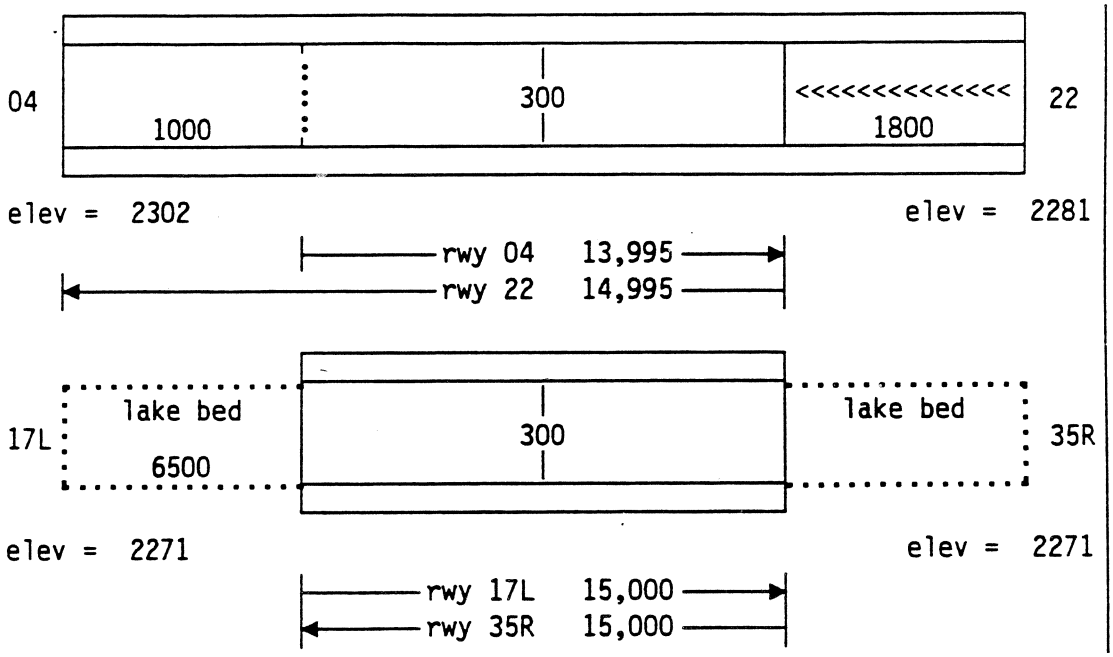

TACAN: EDW-111x (Pri) PMD-92x (Sec)
I/F above: N:140k E:130k N:<80k E:<80k
S:clear W:clear S:140k W: 80k

MLS: (22-Sr) ch 8; (17L-Jr) 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 05L which has 6500-ft aim point only

- Rwys 05L, 23L, 33, and 35R are not in onboard s/w but can be uplinked in OPS 3

*PAPI and Ball Bar lights can be moved with 24-hours notice and will be configured to meet mission requirements

EDWARDS EDW
EDWARDS EDW
EDWARDS EDW
EDWARDS EDW
EDWARDS EDW

EDWARDS
EDW

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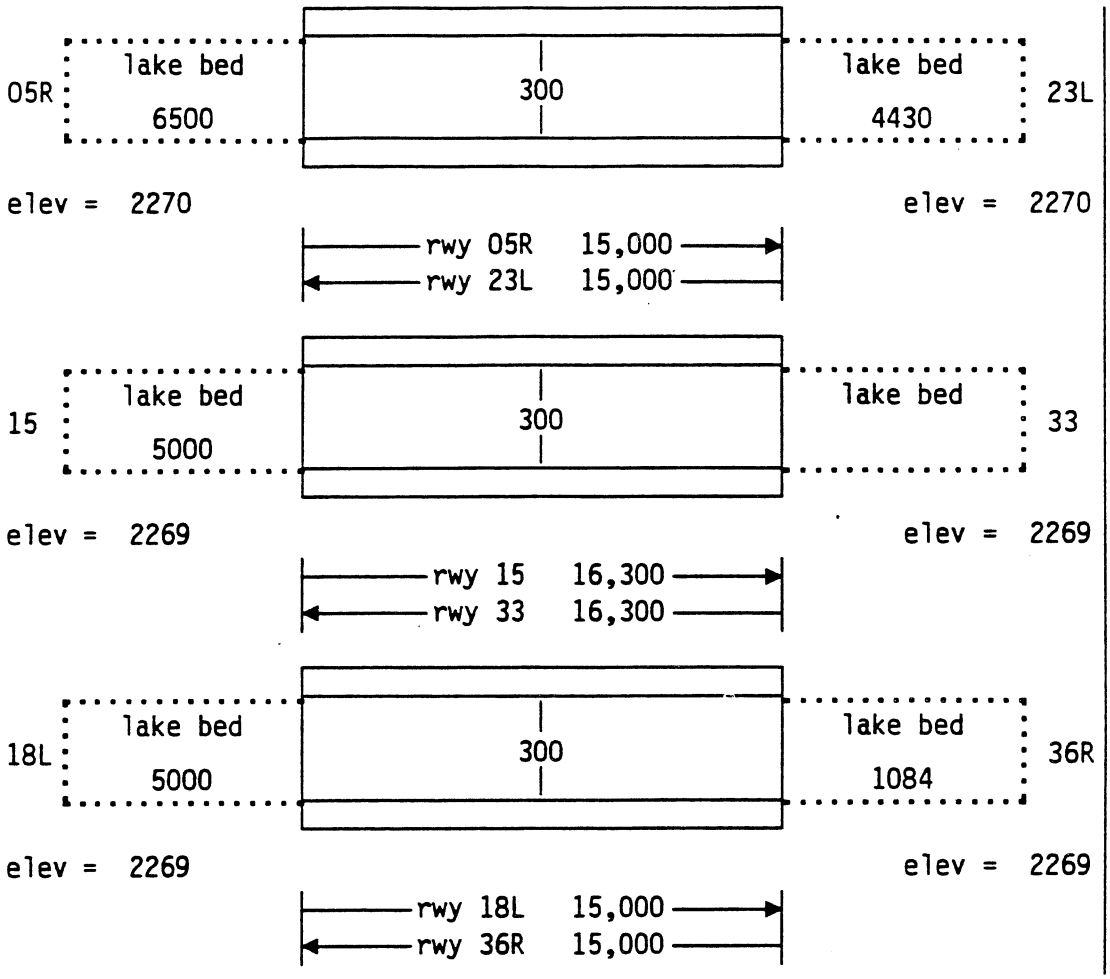


EDWARDS EDW

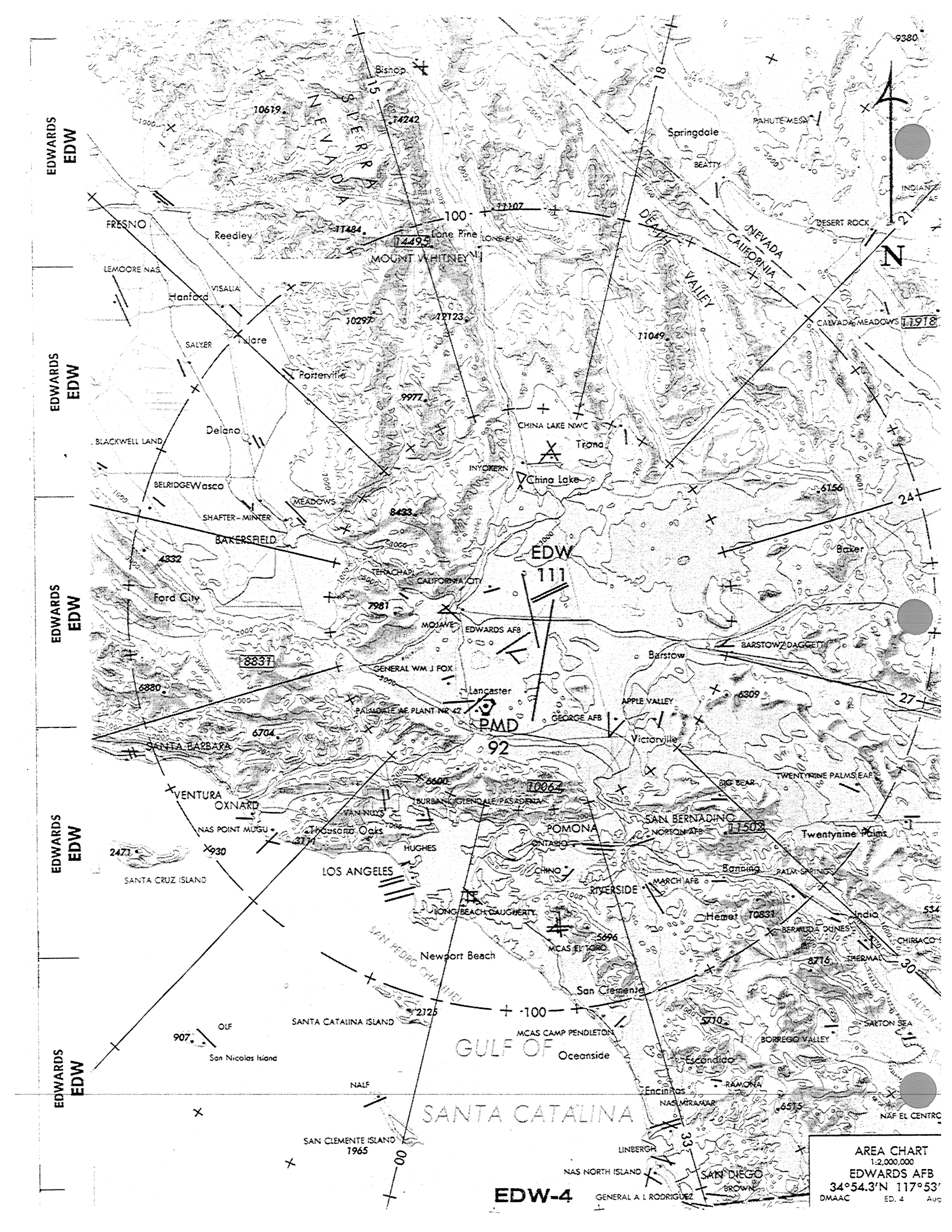
EDWARDS EDW

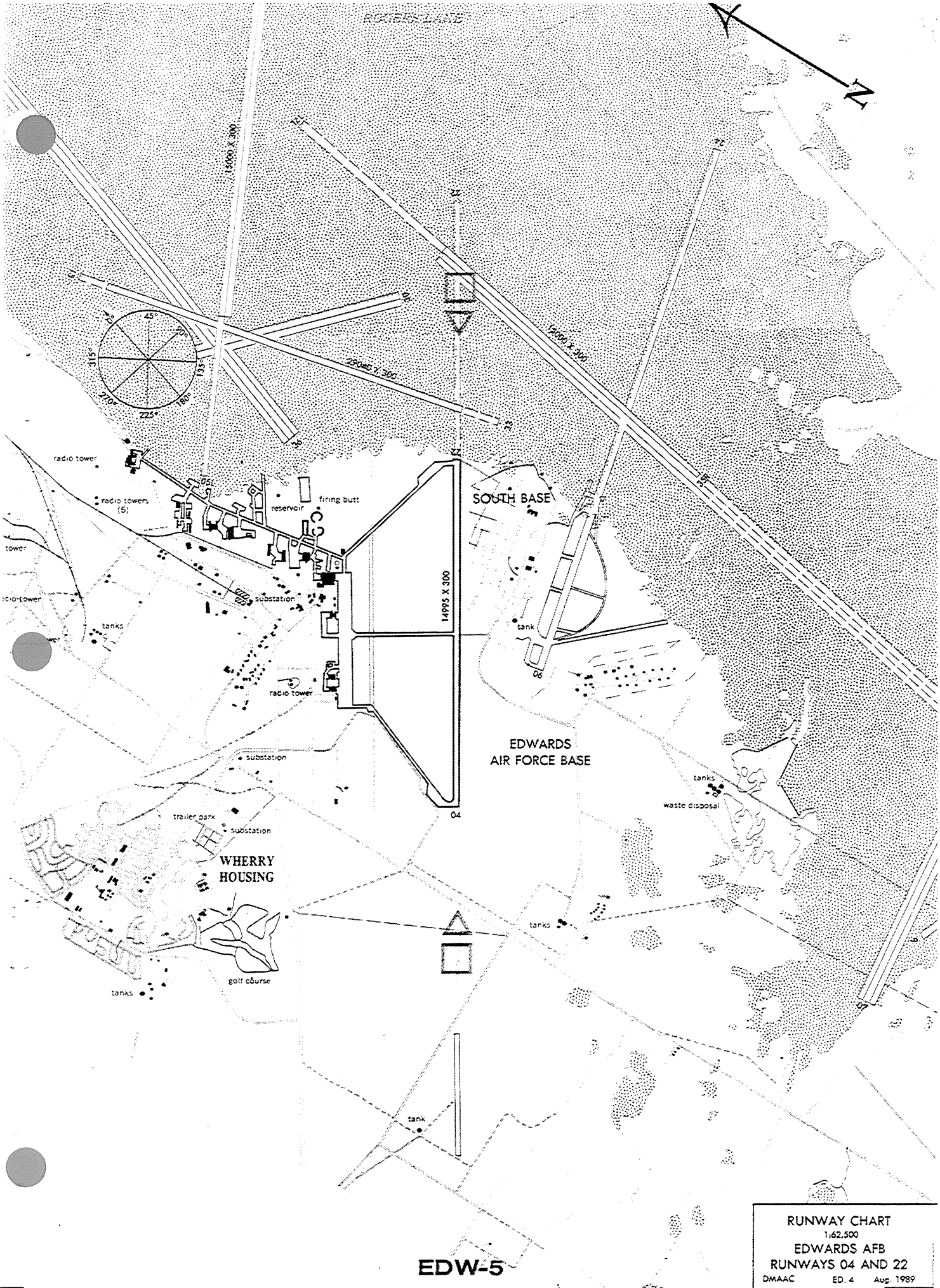
EDWARDS EDW

EDWARDS EDW

EDWARDS EDW

MAPS/ALL/GEN B


EDWARDS EDW
EDWARDS EDW
EDWARDS EDW
EDWARDS EDW
EDWARDS EDW
EDW 111
PMD 92
EDW-4
AREA CHART
1:2,000,000
EDWARDS AFB
34°54.3'N 117°53'
DMAAC ED. 4 Aug
SIERRA NEVADA
DEATH VALLEY
NEVADA CALIFORNIA
MOUNT WHITNEY
SANTA CATALINA
GULF OF
SAN PEDRO CHANNEL
SANTA CRUZ ISLAND
SANTA CATALINA ISLAND
San Nicolas Island
SAN CLEMENTE ISLAND
1965
Bishop
Reedley
Lone Pine
FRESNO
LEMOORE NAS
Hanford
VISALIA
Tulare
Porterville
Delano
BLACKWELL LAND
BELRIDGE
Wasco
SHAFTER-MINTER
BAKERSHELD
Ford City
TEHACHAPI
CALIFORNIA CITY
MOJAVE
EDWARDS AFB
GENERAL WM J FOX
Lancaster
PALMDALE AF PLANT NR 42
GEORGE AFB
Victorville
Barstow
BARSTOW/DAGGETT
Baker
Springdale
BEATTY
PAHUTE MESA
DESERT ROCK
CALVADA MEADOWS
CHINA LAKE NWC
Trona
INYOKERN
China Lake
SANTA BARBARA
VENTURA
OXNARD
VAN NUYS
BURBANK/GLENDALE/PASADENA
NAS POINT MUGU
Thousand Oaks
HUGHES
LOS ANGELES
POMONA
ONTARIO
CHINO
NORTON AFB
SAN BERNARDINO
BIG BEAR
TWENTYNINE PALMS EAF
Twentynine Palms
Banning
PALM SPRINGS
MARCH AFB
RIVERSIDE
Hemet
BERMUDA DUNES
India
LONG BEACH DAUGHERTY
MCAS EL TORO
Newport Beach
San Clemente
MCAS CAMP PENDLETON
Oceanside
Escondido
RAMONA
Encinitas
NAS MIRAMAR
SALTON SEA
BORREGO VALLEY
NAF EL CENTRO
NALF
OLF
LINBERGH
NAS NORTH ISLAND
SAN DIEGO
BROWN
GENERAL A L RODRIGUEZ
10619
14242
11484
14495
11107
10297
12123
11049
9977
8433
4332
7981
8831
6880
6704
6600
10064
6309
6156
11918
11503
10831
5696
8716
5770
6515
2125
2473
2171
930
907
24
27
30
33
00
-100
N



EDW-5

RUNWAY CHART
1:62,500
EDWARDS AFB
RUNWAYS 04 AND 22
DMAAC ED. 4 Aug. 1989

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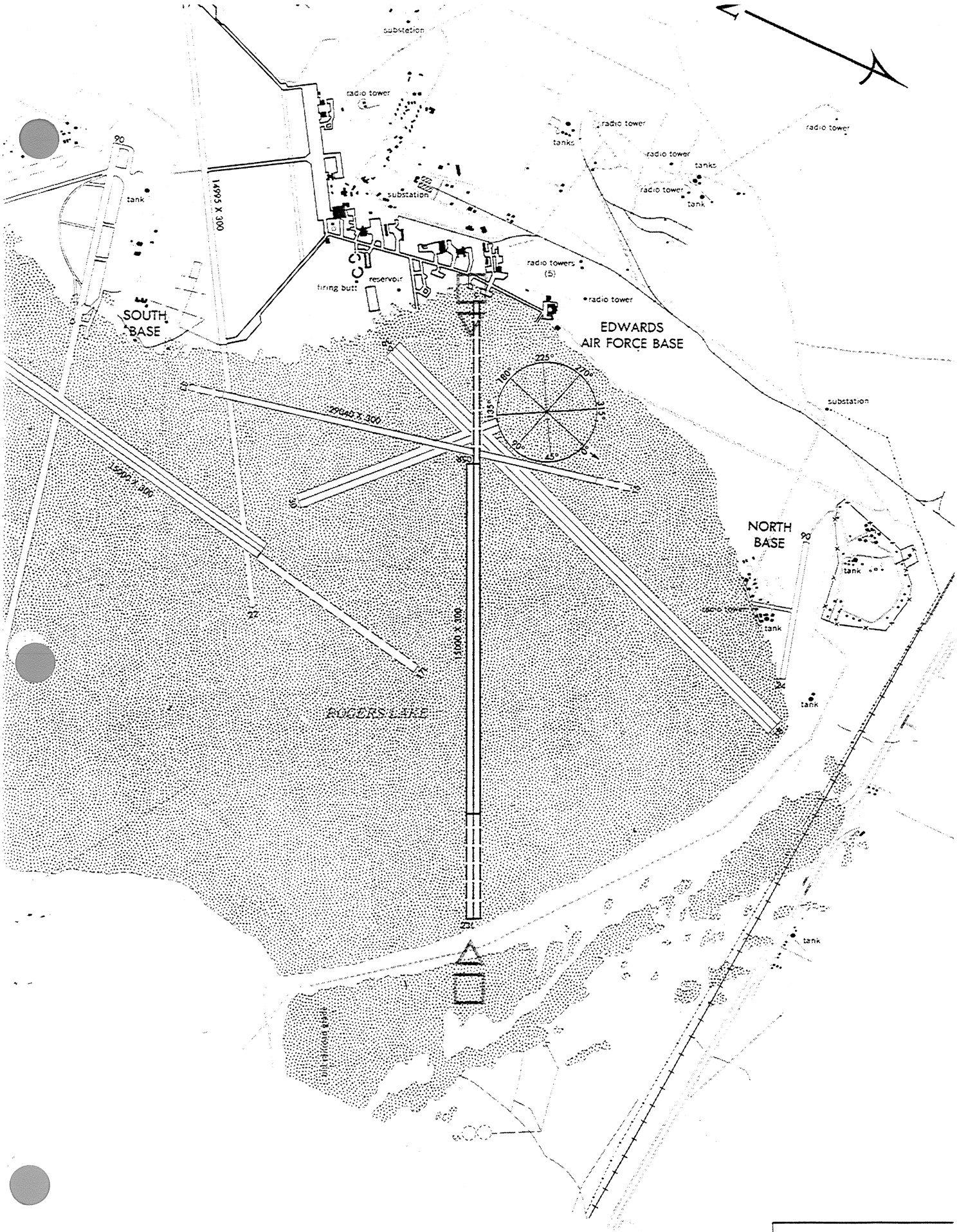

RUNWAY CHART
1:62,500
EDWARDS AFB
RUNWAYS 05R AND 23L
DMAAC ED. 5 APR. 1990

EDW-7

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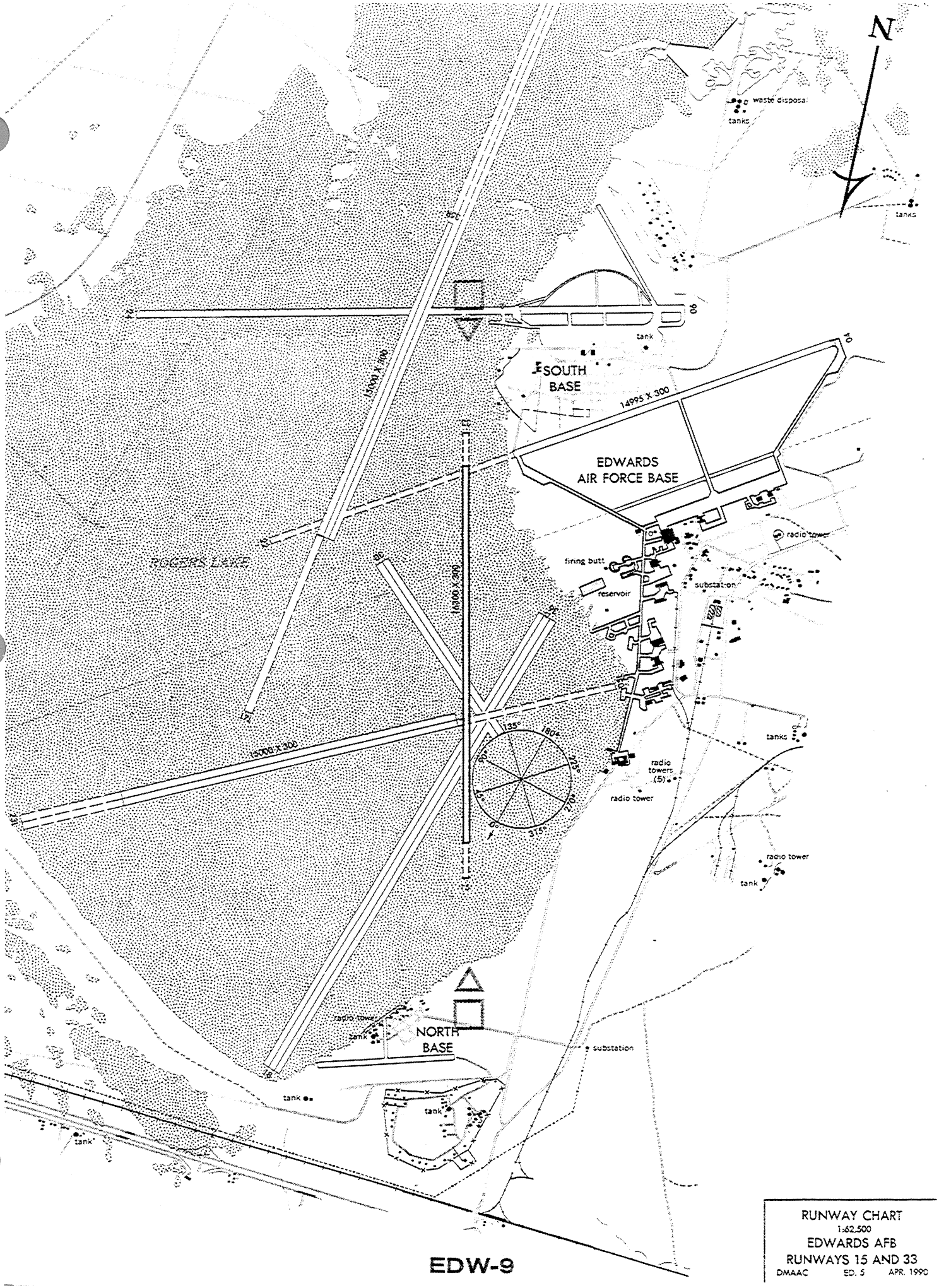

RUNWAY CHART
1:62,500
EDWARDS AFB
RUNWAYS 15 AND 33
DMAAC ED. 5 APR. 1990

EDW-9

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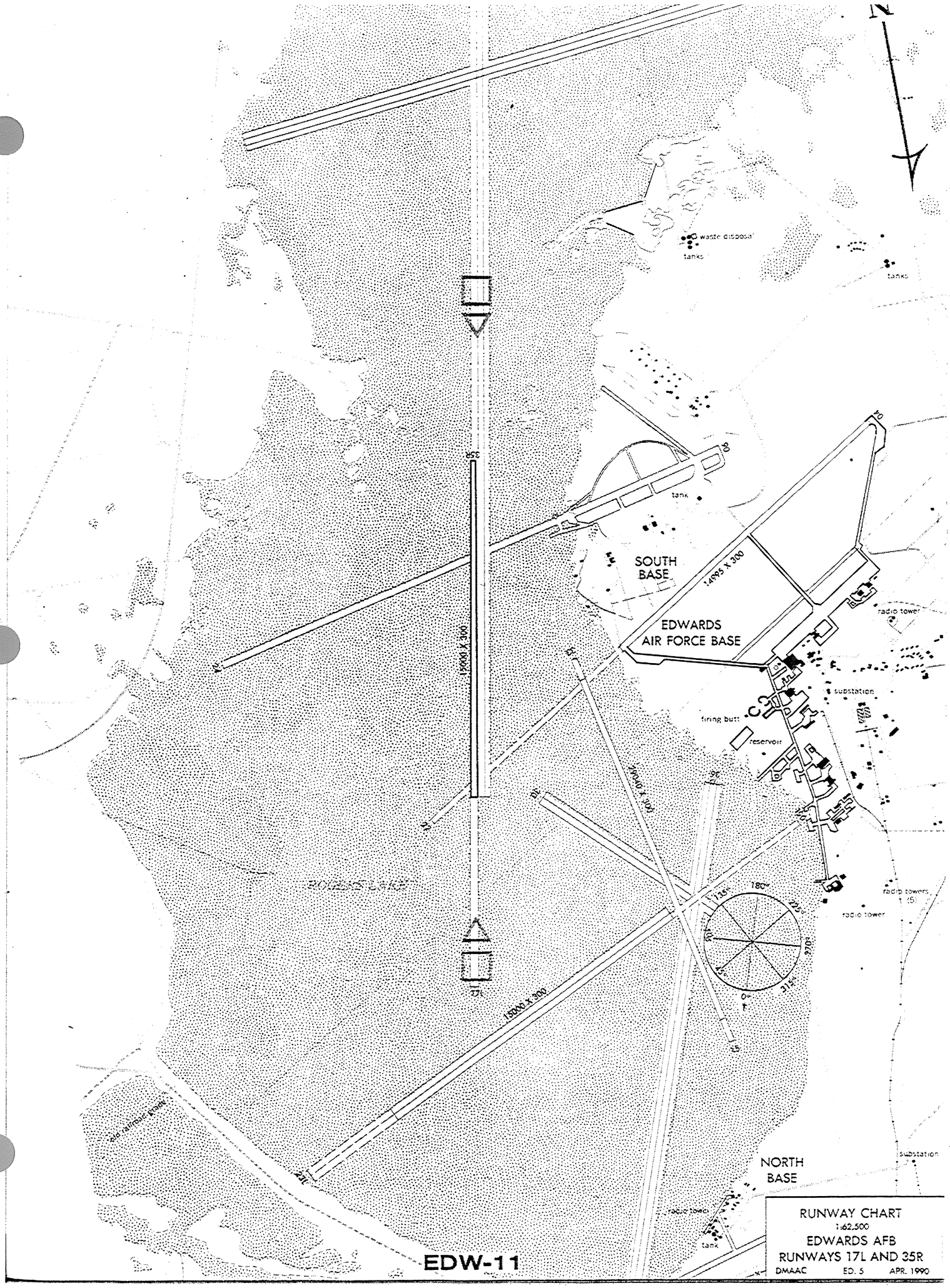
N
waste disposal
tanks
tanks
tank
SOUTH
BASE
14995 X 300
EDWARDS
AIR FORCE BASE
radio tower
substation
firing butt
reservoir
15000 X 300
radio towers (5)
radio tower
15000 X 300
15000 X 300
Rio Hamoic Road
NORTH
BASE
substation
radio tower
tank
RUNWAY CHART
1:62,500
EDWARDS AFB
RUNWAYS 17L AND 35R
DMAAC ED. 5 APR. 1990

EDW-11

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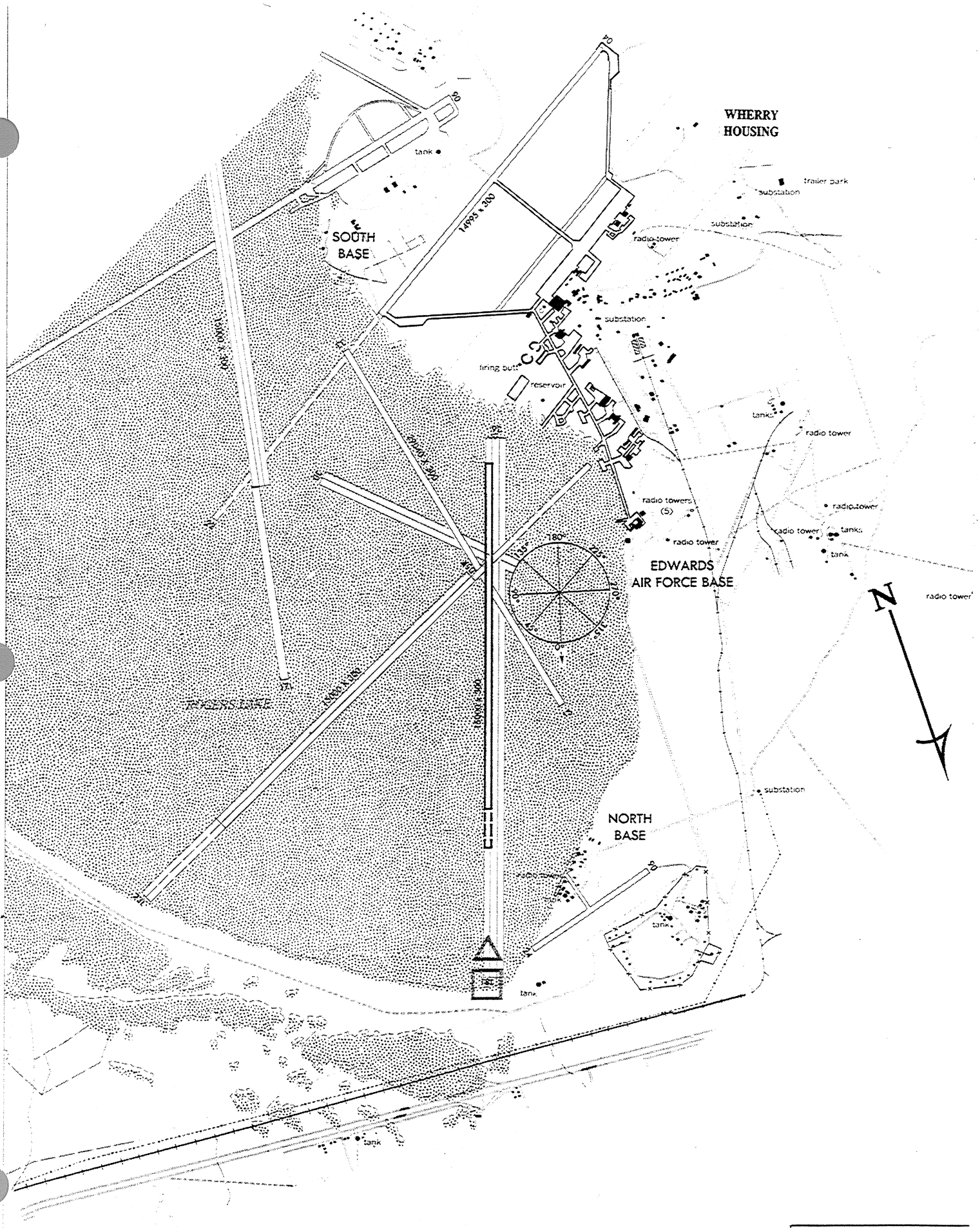

RUNWAY CHART
1:62,500
EDWARDS AFB
RUNWAY 18L
DMAAC ED. 1 Jan. 1991

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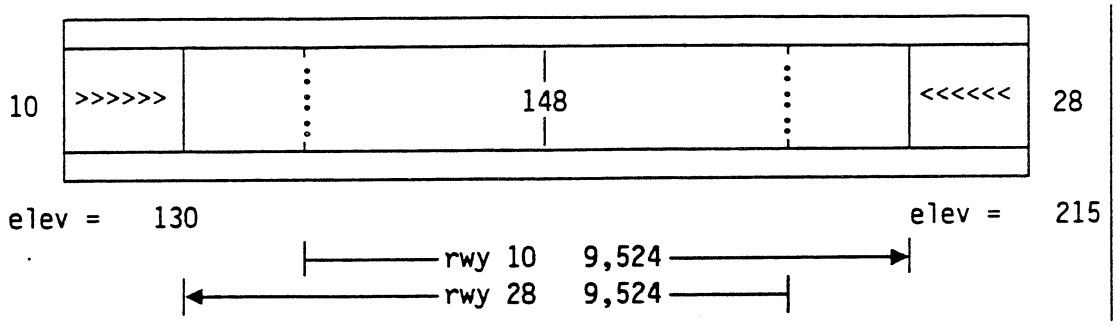
Mataveri, Easter Isle (Chile)

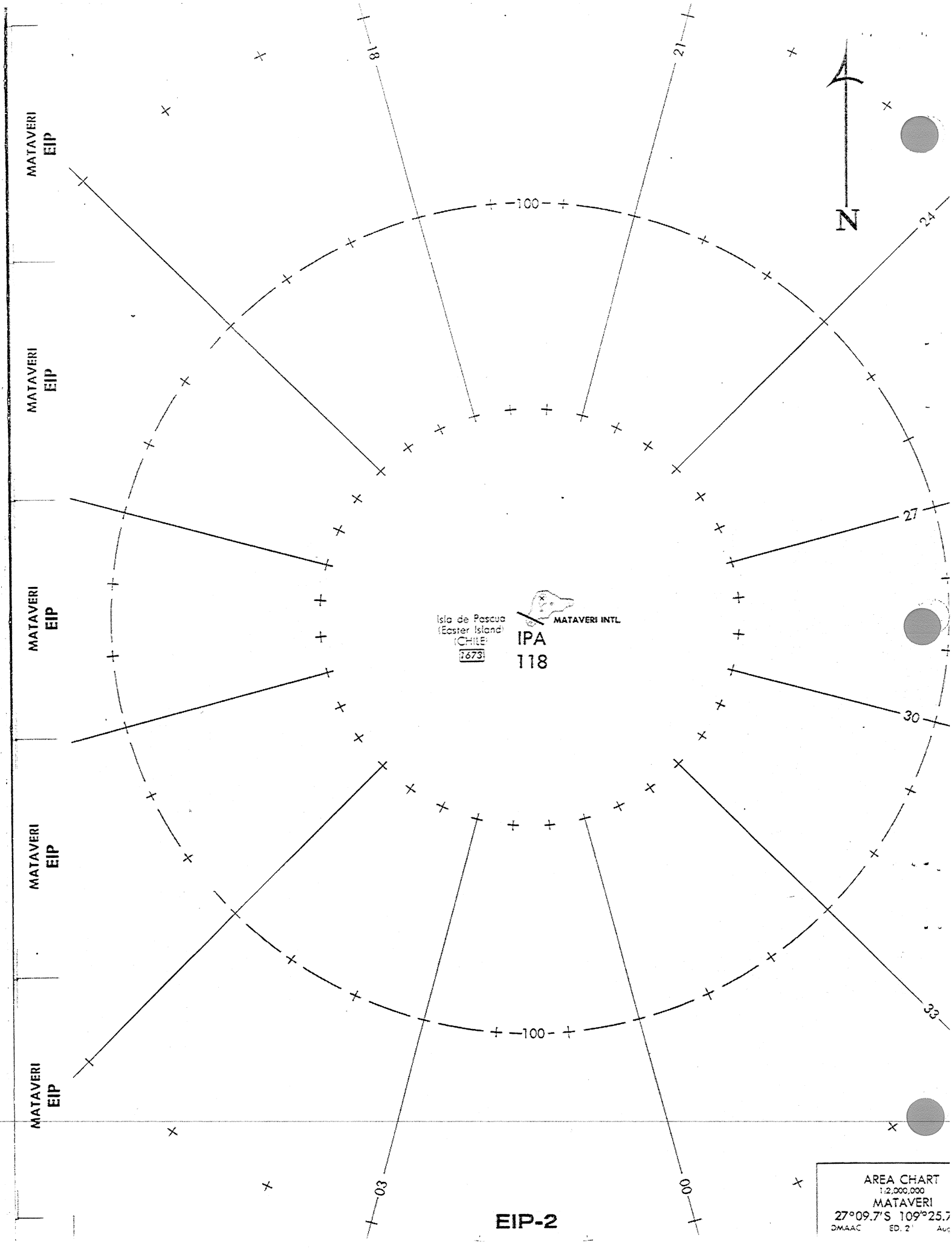
Table Identifier **EIP**



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

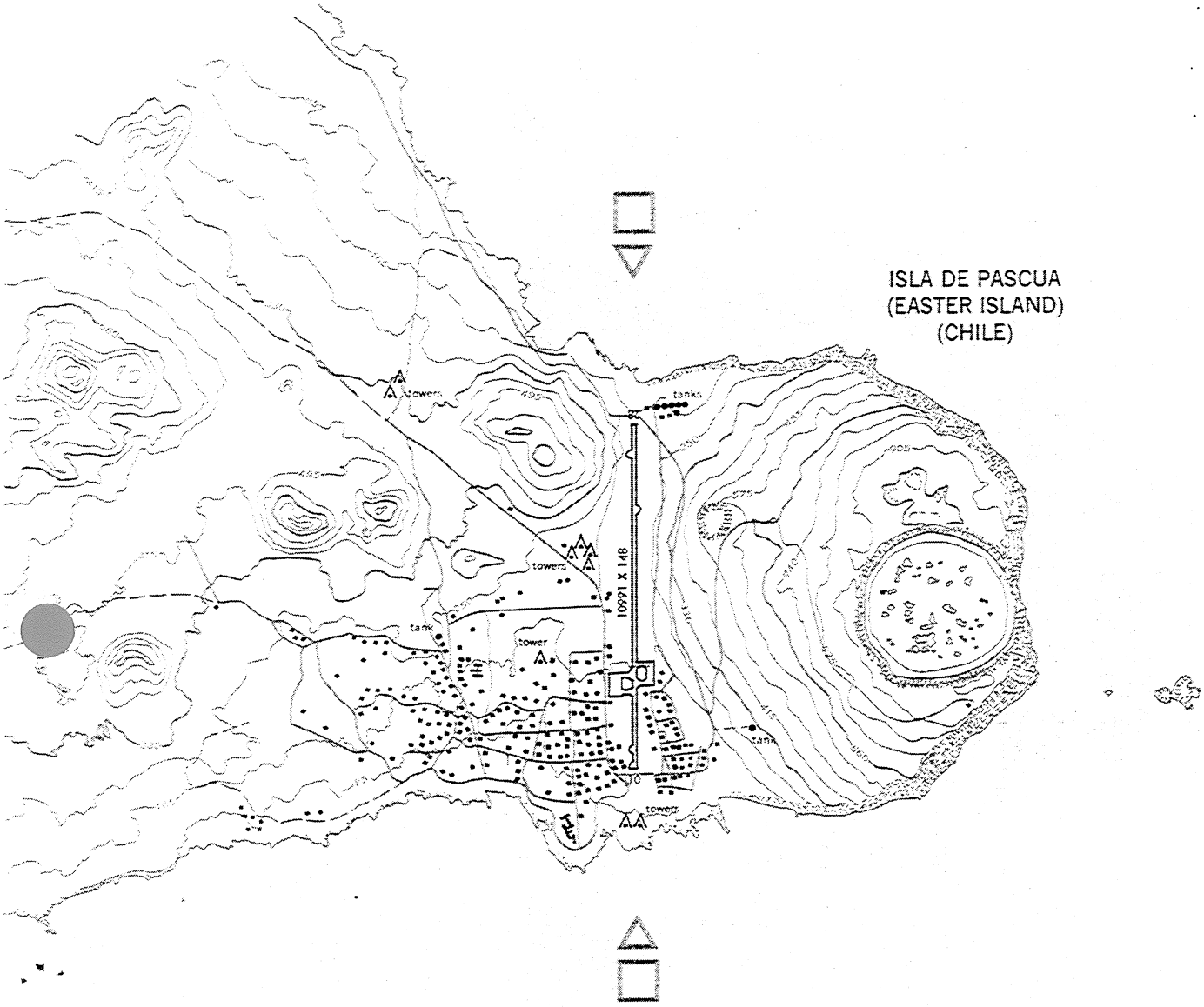
MLS: none
PAPI: none
Ball Bar: none
UHF: none

MATAVERI EIP
MATAVERI EIP
MATAVERI EIP
MATAVERI EIP



AREA CHART
1:2,000,000
MATAVERI
27°09.7'S 109°25.7
DMAAC ED. 2 Aug

EIP-2



RUNWAY CHART
1:62,500
MATAVERI
RUNWAYS 10 AND 28
DMAAC ED. 3 Dec. 1988

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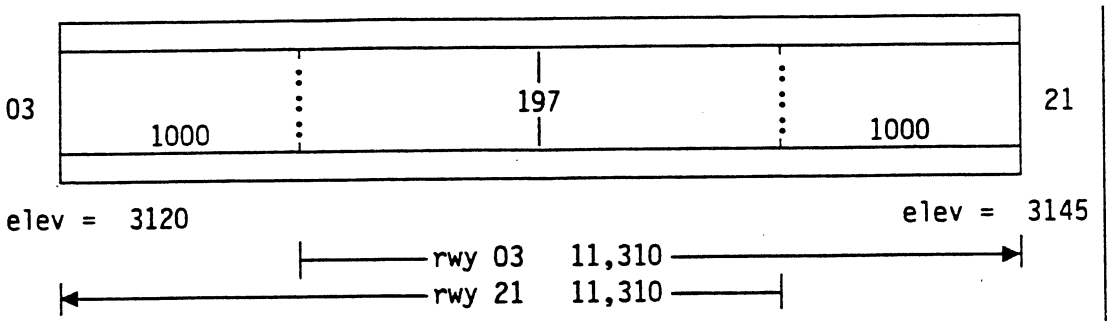
Esenboga, Turkey

Table Identifier **ESN**



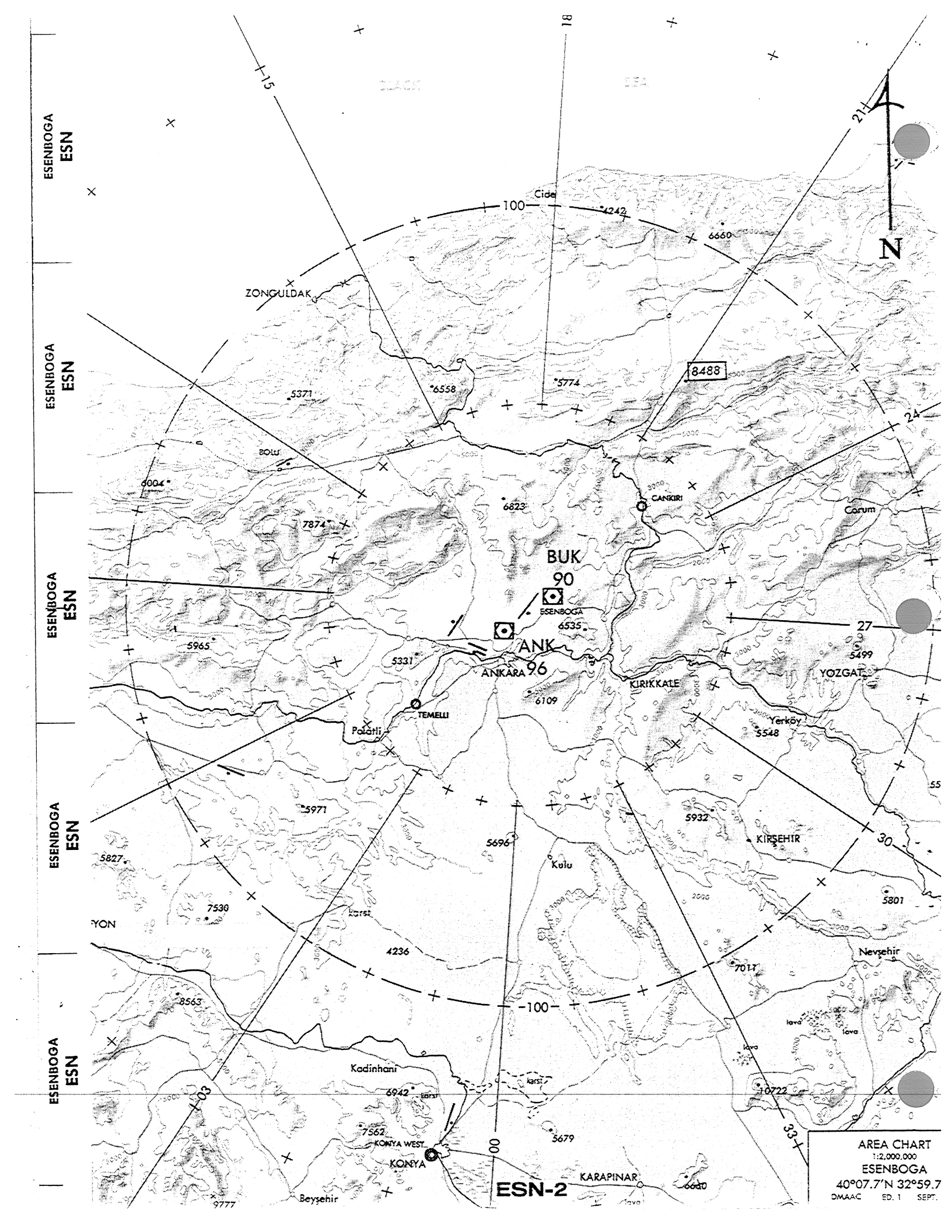
TACAN: BUK-90x (Pri-DME)
I/F above: N:90k* E:80K
S:clear W:80k

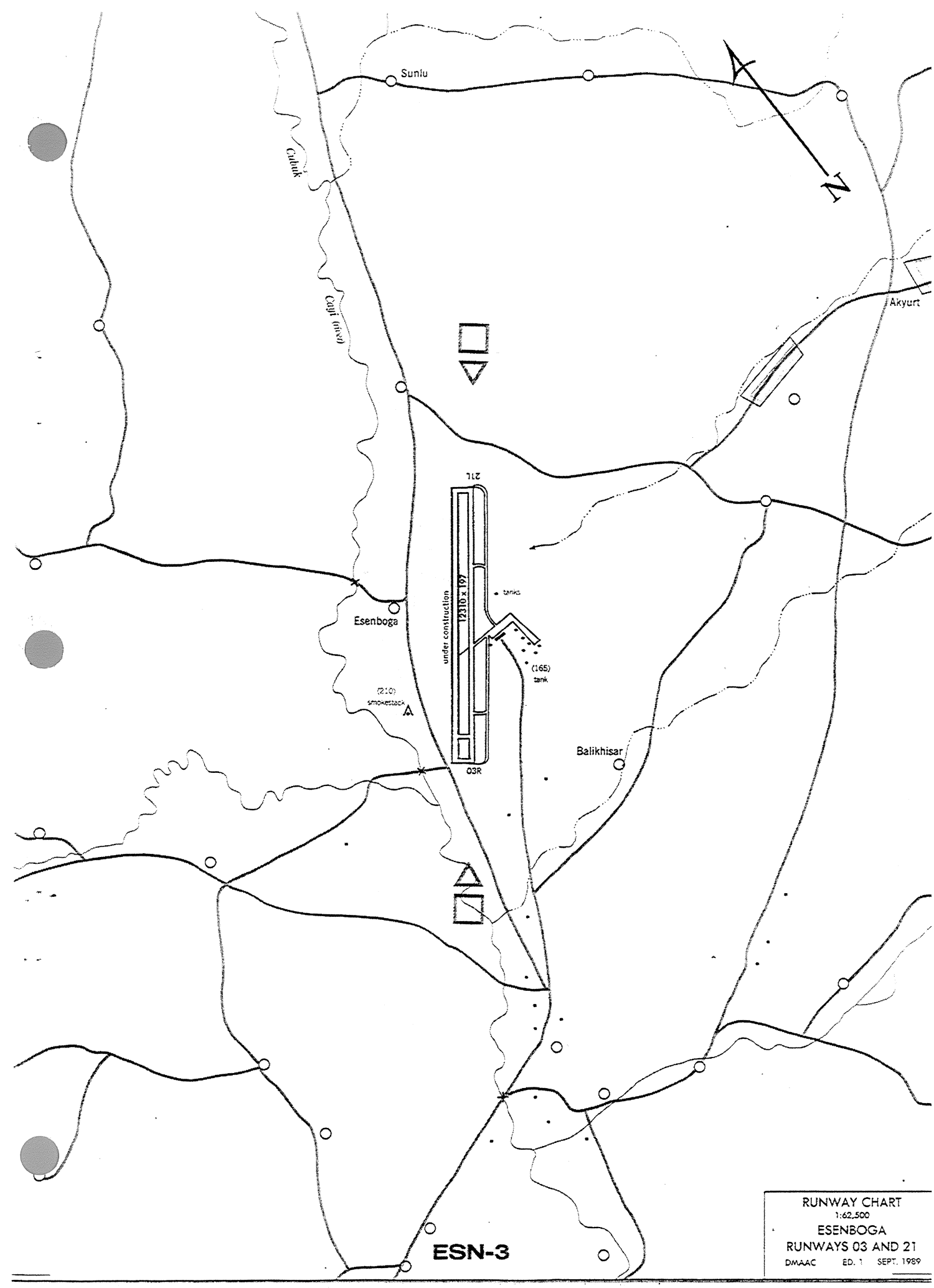
MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

---

* BUK-90 (DME) should be clear approx. 10° east of north

ESENBOGA ESN
ESENBOGA ESN
ESENBOGA ESN
ESENBOGA ESN


ESENBOGA
ESN
ESENBOGA
ESN
ESENBOGA
ESN
ESENBOGA
ESN
ESENBOGA
ESN
BLACK SEA
Cide
ZONGULDAK
8488
BOLU
CANKIRI
Corum
BUK
90
ESENBOGA
ANK
96
ANKARA
KIRIKKALE
YOZGAT
TEMELLI
Polatli
Yerköy
KIRŞEHIR
Kulu
Nevşehir
Kadinhani
KONYA WEST
KONYA
KARAPINAR
Beyşehir
ESN-2
N
AREA CHART
1:2,000,000
ESENBOGA
40°07.7'N 32°59.7
DMAAC ED. 1 SEPT.


Sunlu
Culuk
Cayli (river)
Akyurt
21L
12310 x 197
under construction
tanks
Esenboga
(165)
tank
(210)
smokestack
03R
Balikhisar
N
ESN-3
RUNWAY CHART
1:62,500
ESENBOGA
RUNWAYS 03 AND 21
DMAAC ED. 1 SEPT. 1989

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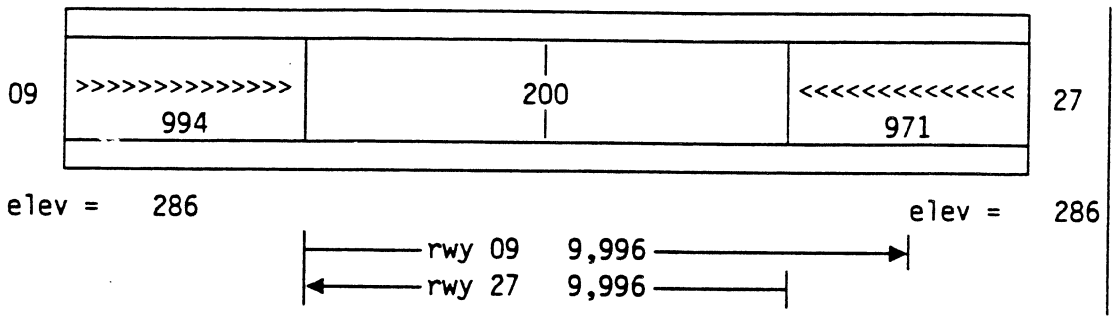
Fairford, England

Table Identifier **FFA**



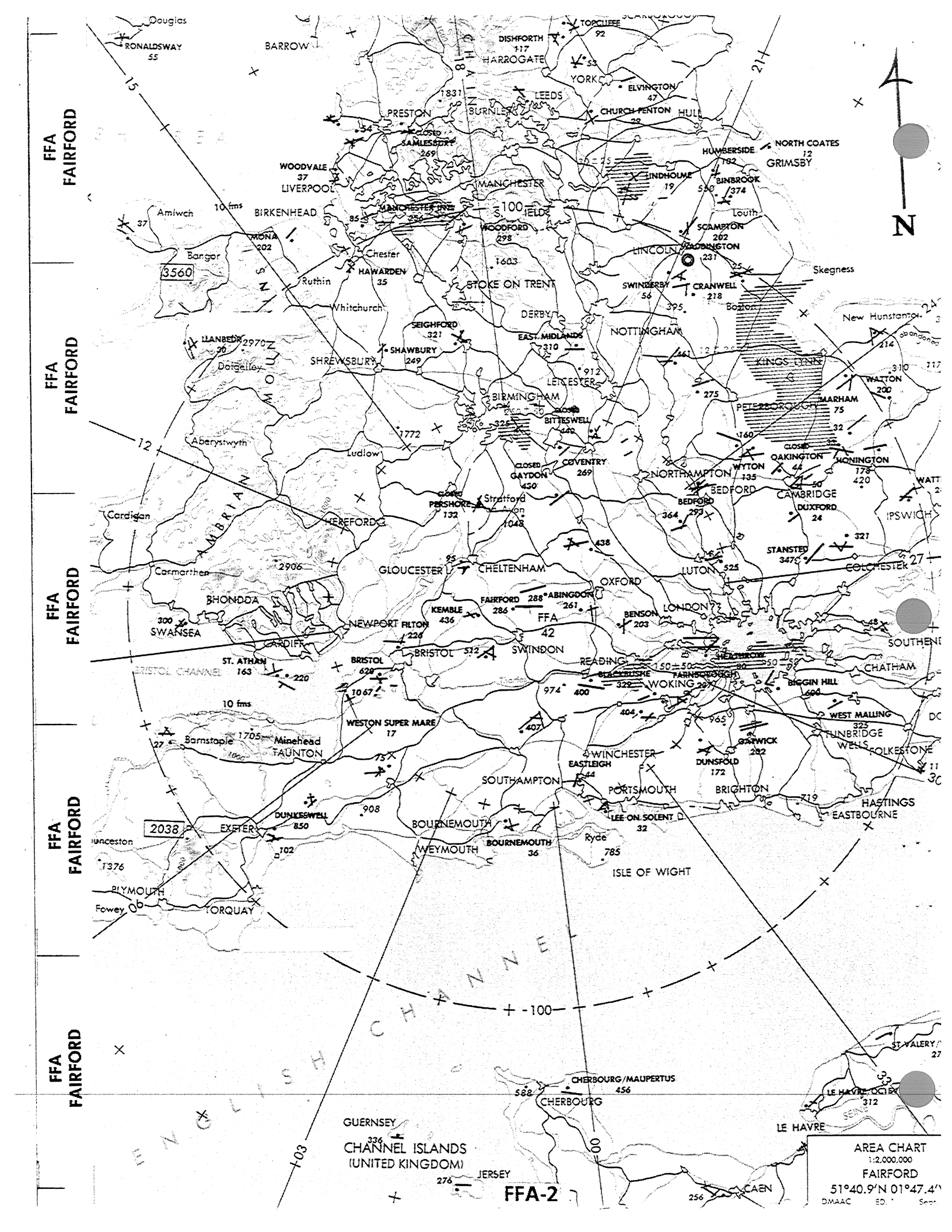
TACAN: BZN-56x (Pri)
I/F above: N:<80k E:<80k
S:<80k W:clear*

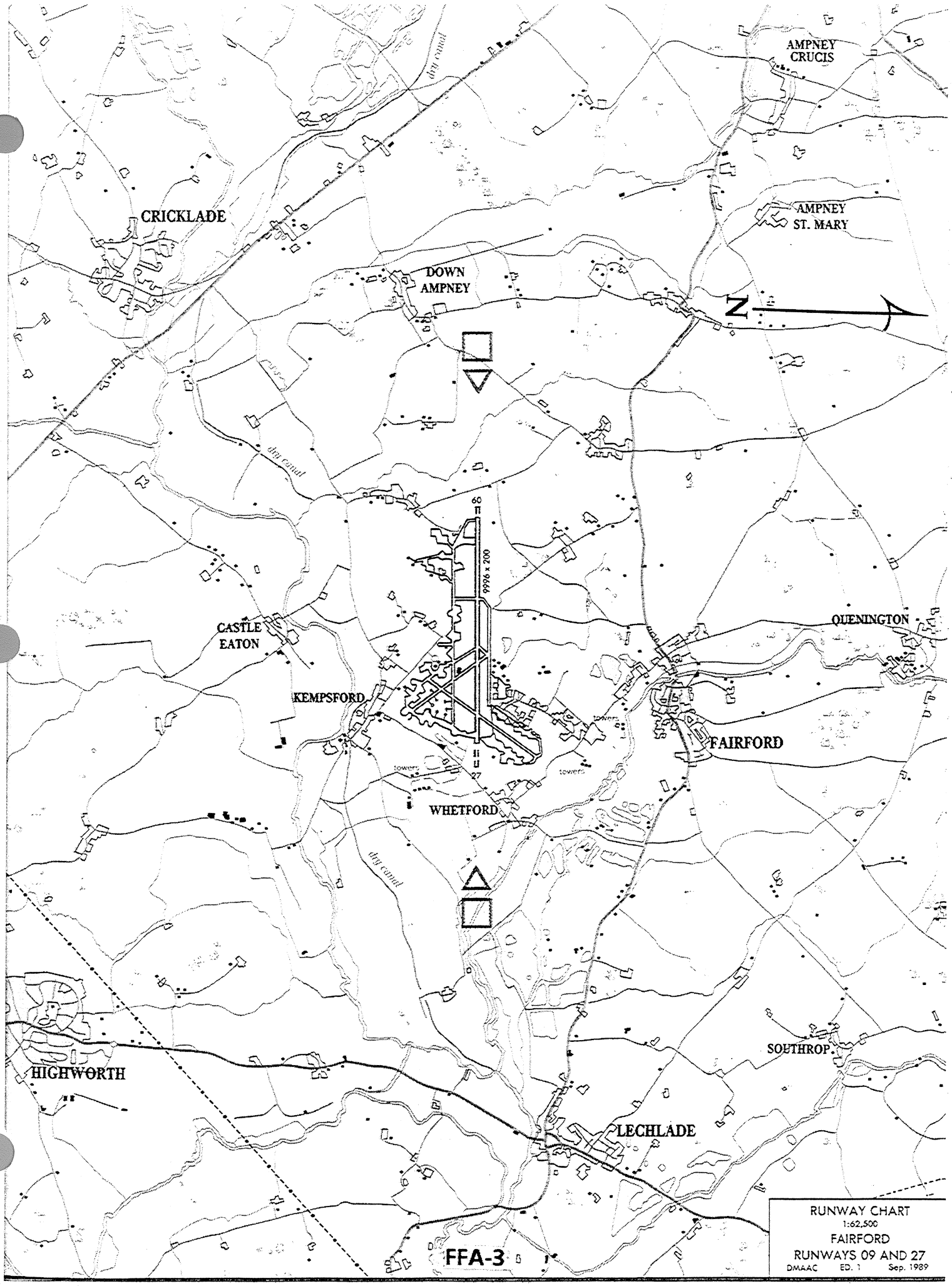
MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

---

*Cochannel I/F to the west occurs below 80K ft but the orbiter should lock onto BZN-56 due to proximity

FFA FAIRFORD
FFA FAIRFORD
FFA FAIRFORD
FFA FAIRFORD


FFA FAIRFORD
FFA FAIRFORD
FFA FAIRFORD
FFA FAIRFORD
FFA FAIRFORD
Douglas
RONALDSWAY
BARROW
DISHFORTH
HARROGATE
TOPCLIFFE
YORK
ELVINGTON
LEEDS
BURNLEY
PRESTON
CHURCH FENTON
HULL
NORTH COATES
GRIMSBY
HUMBERSIDE
LINDHOLME
BINBROOK
WOODVALE
LIVERPOOL
MANCHESTER
Amlwch
BIRKENHEAD
MANCHESTER INT
WOODFORD
Louth
SCAMPTON
LINCOLN
MONA
Bangor
Chester
HAWARDEN
Ruthin
Whitchurch
STOKE ON TRENT
SWINDERBY
CRANWELL
Skegness
Boston
DERBY
NOTTINGHAM
New Hunstanton
LLANBEDR
Dolgellau
SHREWSBURY
SHAWBURY
SEIGHFORD
EAST MIDLANDS
KINGS LYNN
LEICESTER
WATTON
BIRMINGHAM
PETERBOROUGH
MARHAM
BITTESWELL
Aberystwyth
Ludlow
OAKINGTON
WYTON
HONINGTON
COVENTRY
GAYDON
NORTHAMPTON
BEDFORD
CAMBRIDGE
DUXFORD
IPSWICH
PERSHORE
Stratford
Cardigan
HEREFORD
STANSTED
Carmarthen
GLOUCESTER
CHELTENHAM
LUTON
COLCHESTER
OXFORD
BHONDDA
SWANSEA
KEMBLE
FAIRFORD
ABINGDON
LONDON
BENSON
NEWPORT
FILTON
FFA 42
SOUTHEND
CARDIFF
SWINDON
BRISTOL
READING
ST. ATHAN
CHATHAM
BRISTOL CHANNEL
WOKING
BIGGIN HILL
WEST MALLING
WESTON SUPER MARE
TUNBRIDGE WELLS
Barnstaple
Minehead
TAUNTON
GATWICK
WINCHESTER
EASTLEIGH
DUNSFOLD
FOLKESTONE
SOUTHAMPTON
PORTSMOUTH
BRIGHTON
HASTINGS
EASTBOURNE
EXETER
DUNKESWELL
LEE ON SOLENT
BOURNEMOUTH
WEYMOUTH
Ryde
ISLE OF WIGHT
PLYMOUTH
Fowey
TORQUAY
ENGLISH CHANNEL
CHERBOURG/MAUPERTUS
CHERBOURG
ST VALERY
LE HAVRE
GUERNSEY
CHANNEL ISLANDS
(UNITED KINGDOM)
JERSEY
CAEN
N
AREA CHART
1:2,000,000
FAIRFORD
51°40.9'N 01°47.4'
DMAAC
FFA-2



RUNWAY CHART
1:62,500
FAIRFORD
RUNWAYS 09 AND 27
DMAAC ED. 1 Sep. 1989

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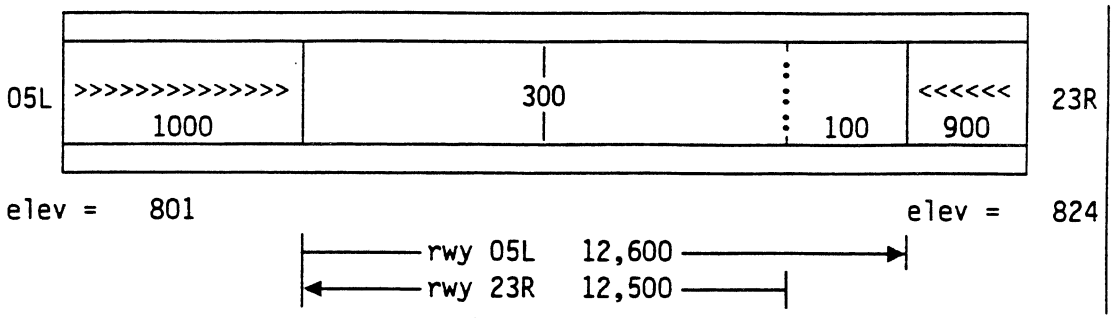
Wright-Patterson AFB, Ohio

Table Identifier **FFO**

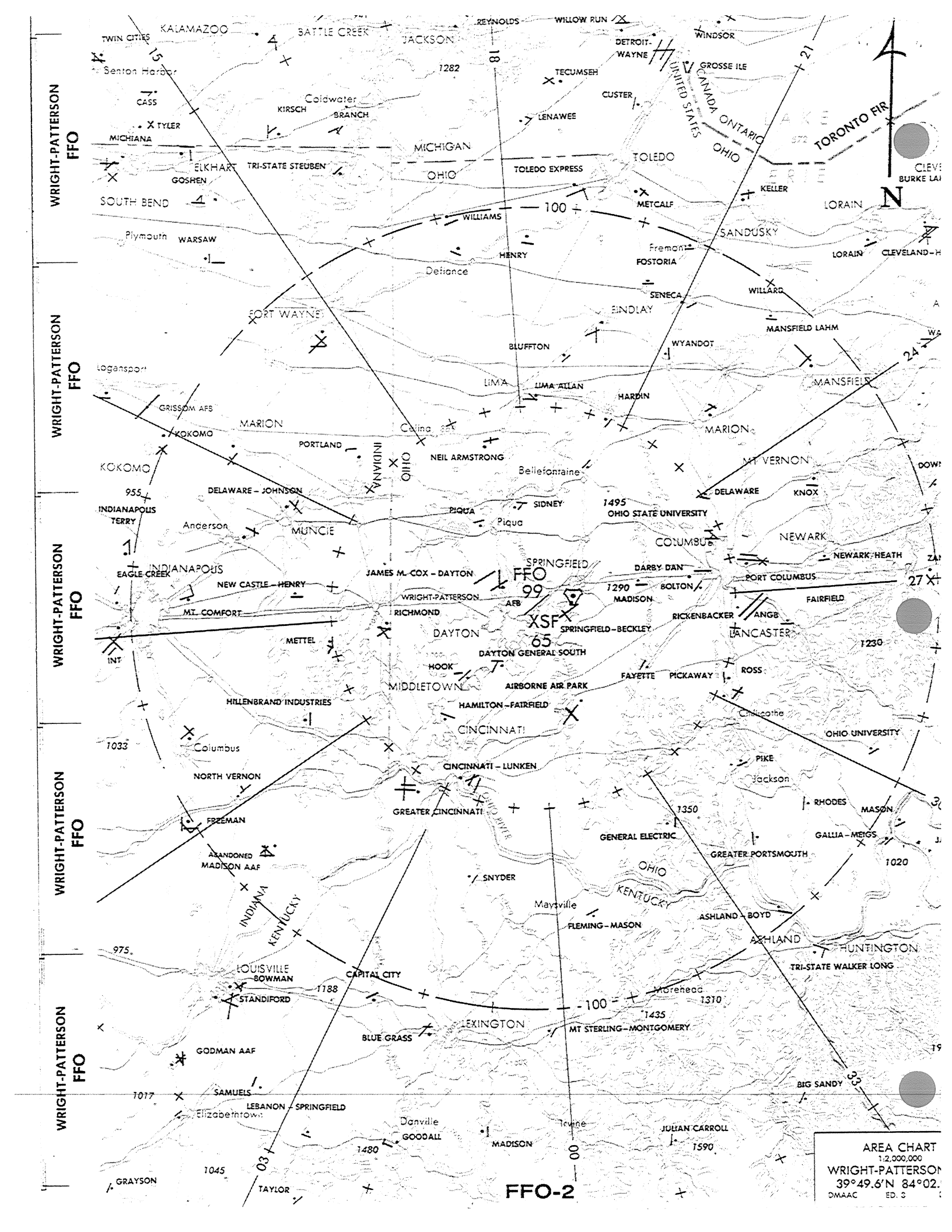


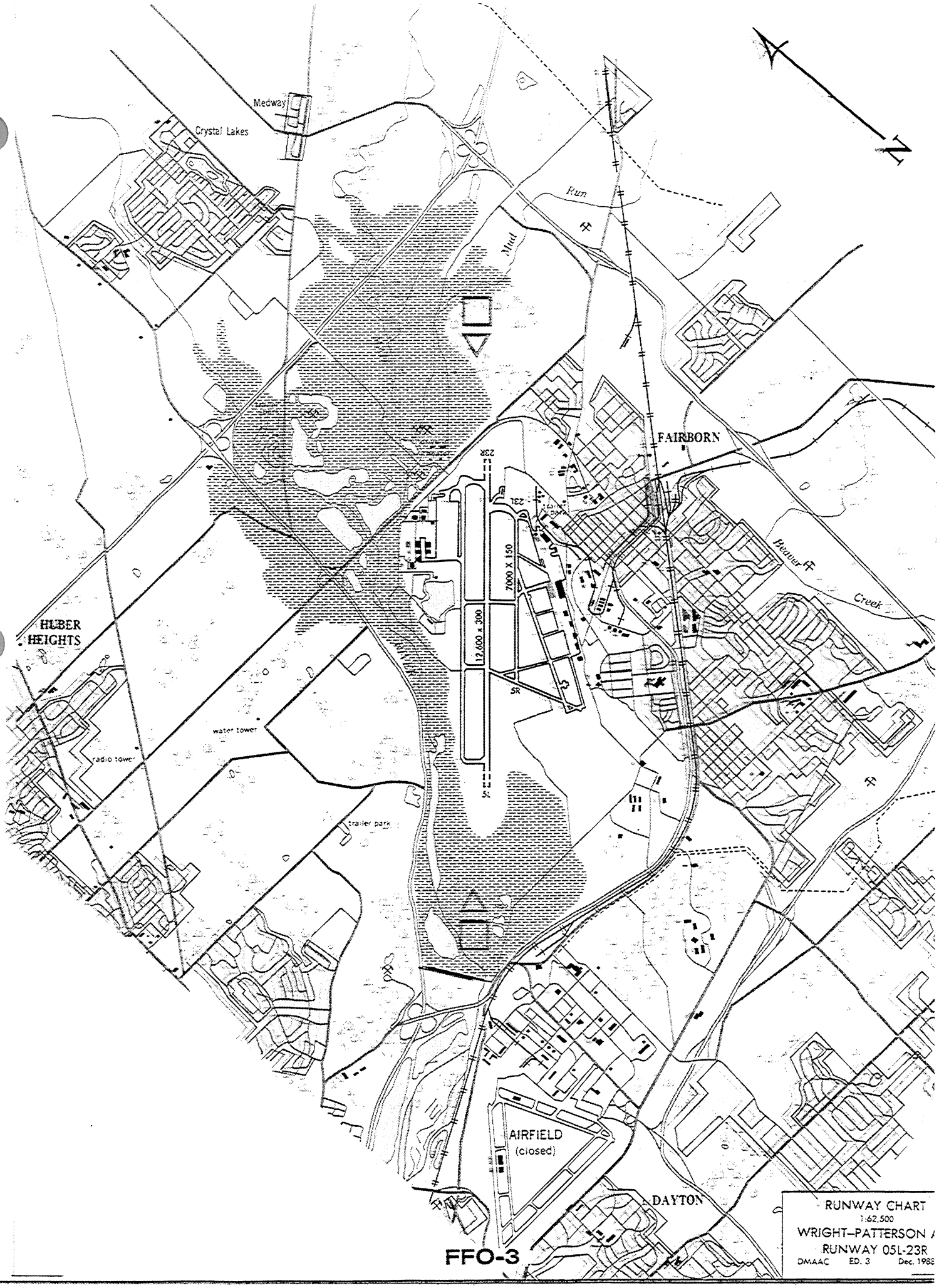
TACAN:	FFO-99x (Pri)	XSF-65x (Sec)
I/F above:	N:<<80k E:<<80k	N:clear E:clear
	S:<<80k W:<<80k	S:clear W:clear

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

MAPS/ALL/GEN B

WRIGHT-PATTERSON FFO
WRIGHT-PATTERSON FFO
WRIGHT-PATTERSON FFO
WRIGHT-PATTERSON FFO


WRIGHT-PATTERSON FFO
WRIGHT-PATTERSON FFO
WRIGHT-PATTERSON FFO
WRIGHT-PATTERSON FFO
WRIGHT-PATTERSON FFO
KALAMAZOO
BATTLE CREEK
JACKSON
REYNOLDS
WILLOW RUN
DETROIT-WAYNE
WINDSOR
TWIN CITIES
Senton Harbor
CASS
TYLER
MICHIANA
ELKHART
GOSHEN
SOUTH BEND
Coldwater
KIRSCH
BRANCH
TRI-STATE STEUBEN
MICHIGAN
OHIO
TECUMSEH
LENAWEE
CUSTER
TOLEDO EXPRESS
TOLEDO
UNITED STATES
CANADA ONTARIO
TORONTO FIR
GROSSE ILE
KELLER
METCALF
LORAIN
WILLIAMS
SANDUSKY
Plymouth
WARSAW
HENRY
Fremont
FOSTORIA
LORAIN
CLEVELAND-H
Defiance
SENECA
WILLARD
FINDLAY
FORT WAYNE
MANSFIELD LAHM
BLUFFTON
WYANDOT
Logansport
LIMA
LIMA ALLAN
HARDIN
MANSFIELD
GRISSOM AFB
MARION
KOKOMO
Celina
PORTLAND
INDIANA
OHIO
NEIL ARMSTRONG
Bellefontaine
MT VERNON
DELAWARE
KNOX
INDIANAPOLIS TERRY
DELAWARE - JOHNSON
PIQUA
SIDNEY
Piqua
OHIO STATE UNIVERSITY
Anderson
MUNCIE
COLUMBUS
NEWARK
INDIANAPOLIS
EAGLE CREEK
JAMES M. COX - DAYTON
SPRINGFIELD
DARBY DAN
NEWARK/HEATH
NEW CASTLE - HENRY
WRIGHT-PATTERSON AFB
MADISON
BOLTON
PORT COLUMBUS
MT. COMFORT
RICHMOND
FAIRFIELD
RICKENBACKER ANGB
DAYTON
SPRINGFIELD-BECKLEY
LANCASTER
METTEL
DAYTON GENERAL SOUTH
HOOK
FAYETTE
PICKAWAY
ROSS
MIDDLETOWN
AIRBORNE AIR PARK
HILLENBRAND INDUSTRIES
HAMILTON-FAIRFIELD
Chillicothe
CINCINNATI
OHIO UNIVERSITY
Columbus
NORTH VERNON
CINCINNATI-LUNKEN
PIKE
Jackson
GREATER CINCINNATI
RHODES
MASON
FREEMAN
GENERAL ELECTRIC
GALLIA-MEIGS
ABANDONED MADISON AAF
GREATER PORTSMOUTH
OHIO
SNYDER
KENTUCKY
Maysville
INDIANA
KENTUCKY
FLEMING-MASON
ASHLAND-BOYD
ASHLAND
HUNTINGTON
TRI-STATE WALKER LONG
LOUISVILLE BOWMAN
CAPITAL CITY
STANDIFORD
Morehead
LEXINGTON
MT STERLING-MONTGOMERY
BLUE GRASS
GODMAN AAF
BIG SANDY
SAMUELS
LEBANON-SPRINGFIELD
Elizabethtown
Danville
GOODALL
Irvine
JULIAN CARROLL
MADISON
GRAYSON
TAYLOR
FFO
99
XSF
65
100
1282
1495
1290
1230
1033
1350
1020
975
1188
1435
1310
1017
1480
1045
1590
15
18
21
24
27
33
03
00
N
AREA CHART
1:2,000,000
WRIGHT-PATTERSON
39°49.6'N 84°02.
DMAAC ED. 3
FFO-2


Medway
Crystal Lakes
Mud Run
FAIRBORN
23R
23L
7000 X 150
12,600 x 300
05R
05L
Beaver Creek
HUBER HEIGHTS
water tower
radio tower
trailer park
AIRFIELD
(ciosed)
DAYTON
RUNWAY CHART
1:62,500
WRIGHT–PATTERSON A
RUNWAY 05L-23R
DMAAC ED. 3 Dec. 1988

FFO-3

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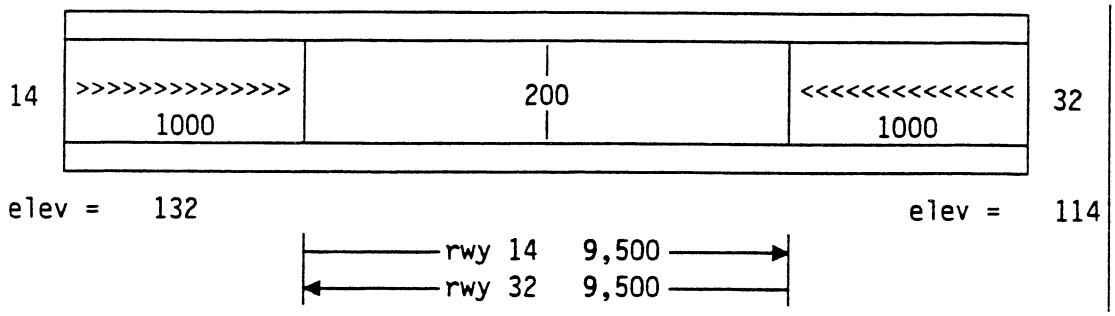
Otis ANGB, Massachusetts

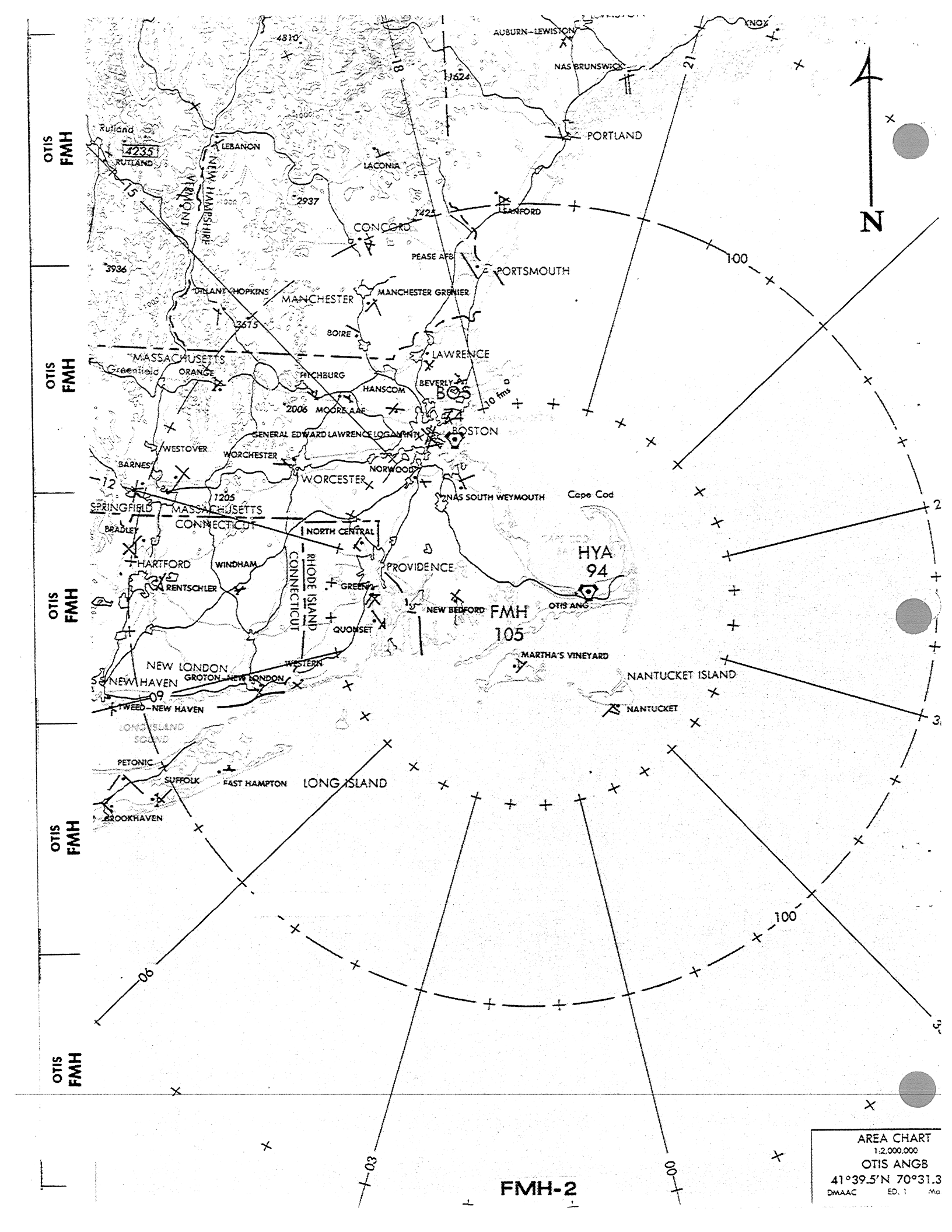
Table Identifier **FMH**



TACAN: FMH-105x (Pri) HYA-94x (Sec)
I/F above: N:<80k E:<80k N:120k E:clear
S:<80k W:<80k S:clear W: 80k

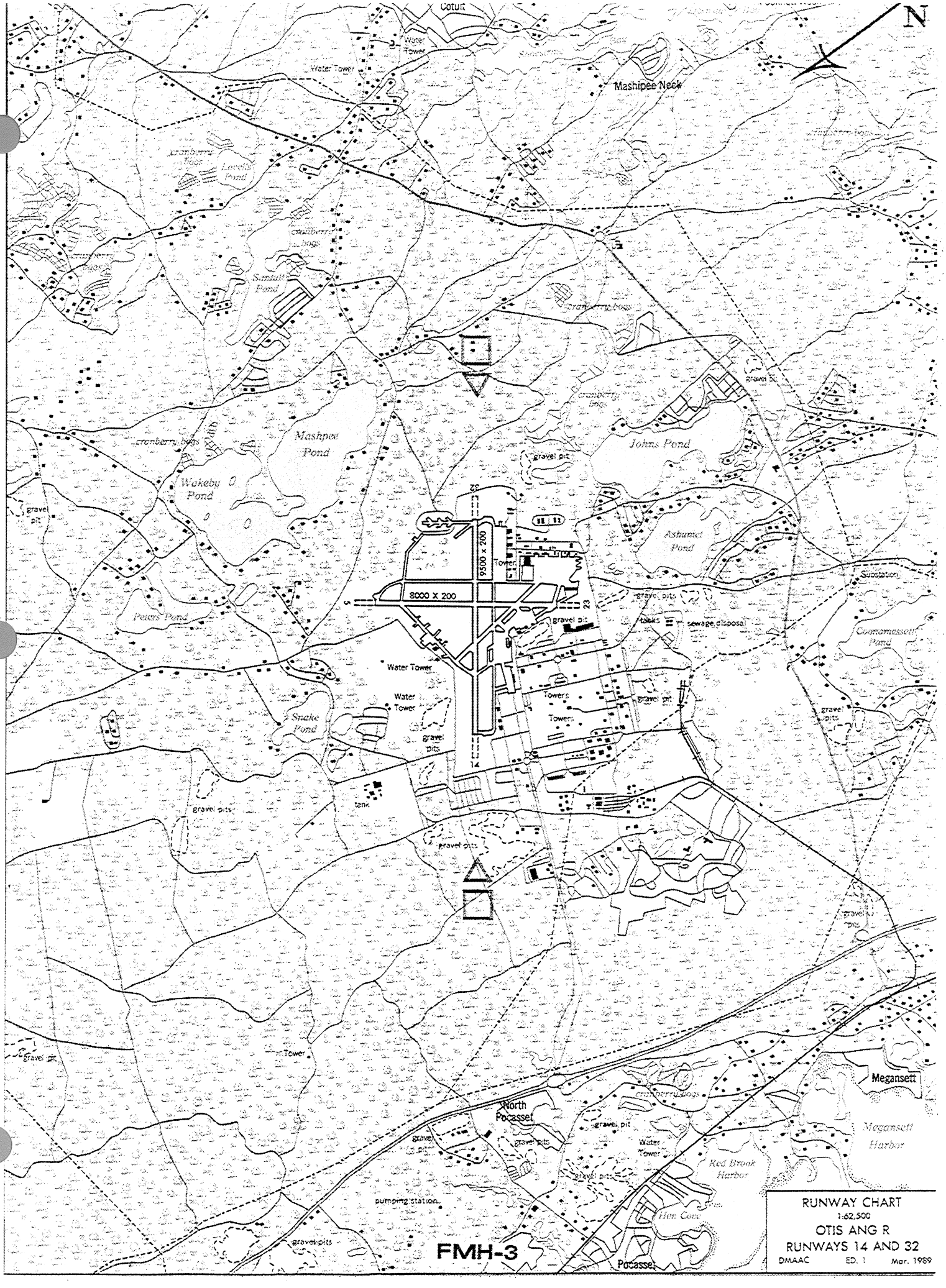
MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

OTIS FMH
OTIS FMH
OTIS FMH
OTIS FMH



FMH-2

AREA CHART
1:2,000,000
OTIS ANGB
41°39.5'N 70°31.3
DMAAC ED. 1 Ma


N
Coturt
Water Tower
Water Tower
Mashipee Neck
Cranberry Bogs
Lovells Pond
Cranberry Bogs
Sandhill Pond
Cranberry Bogs
Cranberry Bogs
Mashpee Pond
Wakeby Pond
Johns Pond
gravel pit
gravel pit
32
9500 x 200
Tower
8000 X 200
14
23
Ashumet Pond
Substation
gravel pits
Peters Pond
gravel pit
tanks
sewage disposal
Commonwealth Pond
Water Tower
Water Tower
Towers
Towers
gravel pit
gravel pits
gravel pits
Snake Pond
gravel pits
tank
gravel pits
gravel pits
gravel pits
gravel pit
Tower
Megansett
North Pocasset
Cranberry Bogs
gravel pit
gravel pits
gravel pits
Water Tower
Megansett Harbor
Red Brook Harbor
gravel pits
pumping station
Hen Cove
gravel pits
Pocasset
FMH-3
RUNWAY CHART
1:62,500
OTIS ANG R
RUNWAYS 14 AND 32
DMAAC ED. 1 Mar. 1989

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FMH-A
EDITION 1-6/89

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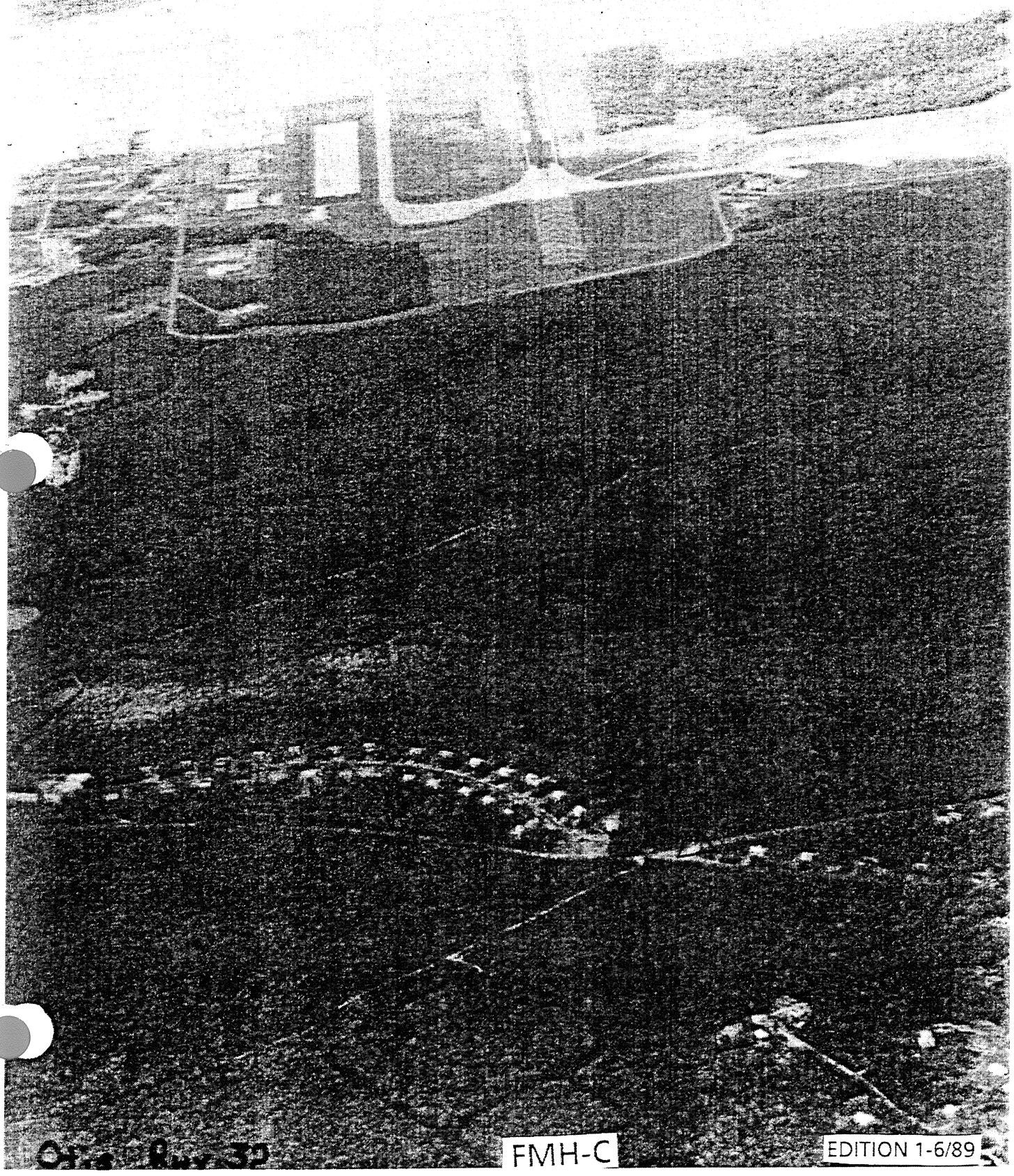

Otis Rwy 32

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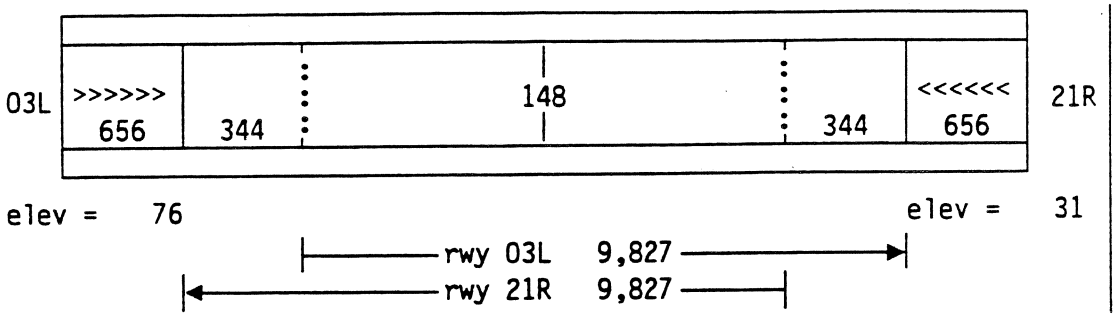
Las Palmas, Grand Canary Isle

Table Identifier **GDV**



TACAN: TGN-103x (Pri) GDV-76x (Sec-DME)
I/F above: N:clear E:clear N:clear E:clear
S:clear W:clear S:clear W:clear

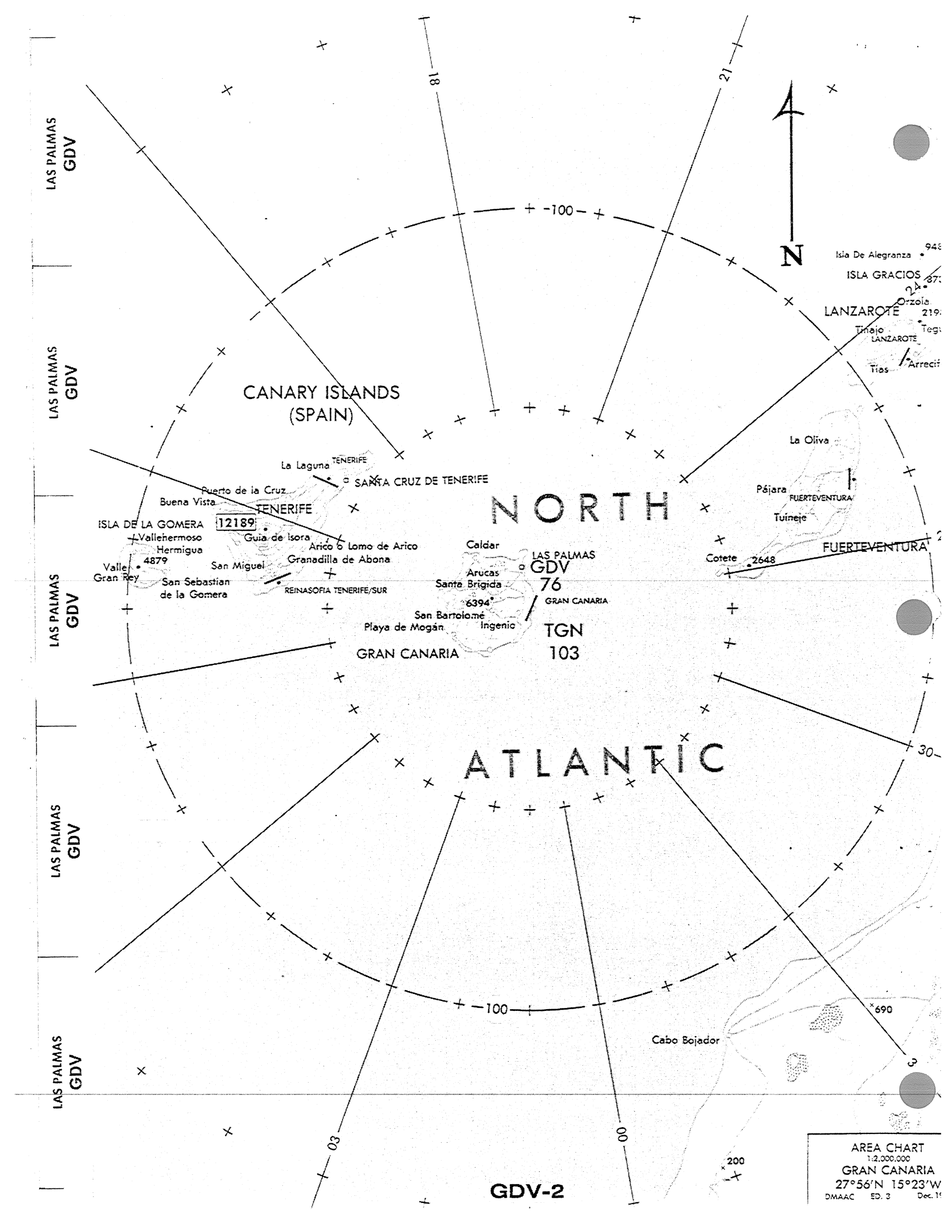
MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

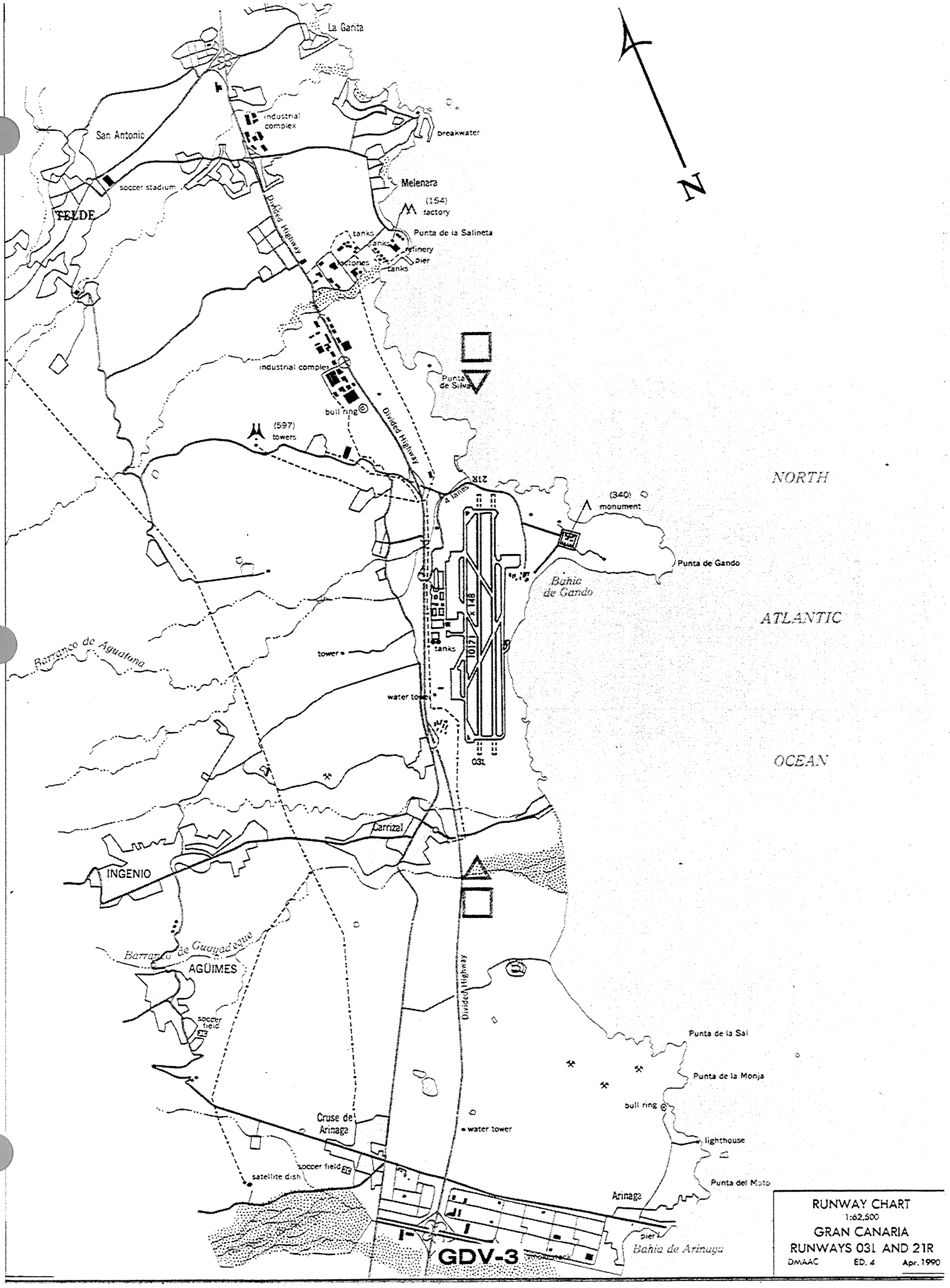
WARNING

- Expect headwinds gusting 20 to 30 knots. Expect a wind shear at 5000 ft where the wind changes from northwesterly to 030

- The terrain off the end of rwys 03 L/R is hazardous

NOTE
- Both rwys are 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
CANARY ISLANDS (SPAIN)
NORTH
ATLANTIC
N
18
21
100
30
100
03
00
La Laguna
TENERIFE
SANTA CRUZ DE TENERIFE
Puerto de la Cruz
Buena Vista
TENERIFE
12189
ISLA DE LA GOMERA
Vallehermoso
Hermigua
4879
Valle Gran Rey
San Sebastian de la Gomera
Guia de Isora
San Miguel
Arico o Lomo de Arico
Granadilla de Abona
REINASOFIA TENERIFE/SUR
Caldar
LAS PALMAS
GDV
76
Arucas
Santa Brigida
6394
GRAN CANARIA
San Bartolomé
Playa de Mogán
Ingenio
TGN
103
GRAN CANARIA
Isla De Alegranza
ISLA GRACIOS
Orzola
LANZAROTE
Tinajo
LANZAROTE
Tias
Arrecif
La Oliva
Pájara
FUERTEVENTURA
Tuineje
FUERTEVENTURA
Cotete
2648
690
Cabo Bojador
200
GDV-2
AREA CHART
1:2,000,000
GRAN CANARIA
27°56'N 15°23'W
DMAAC ED. 3



RUNWAY CHART
1:62,500
GRAN CANARIA
RUNWAYS 031 AND 21R
DMAAC ED. 4 Apr. 1990

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GDV 03L LAS PALMAS

EDITION 1-6/89

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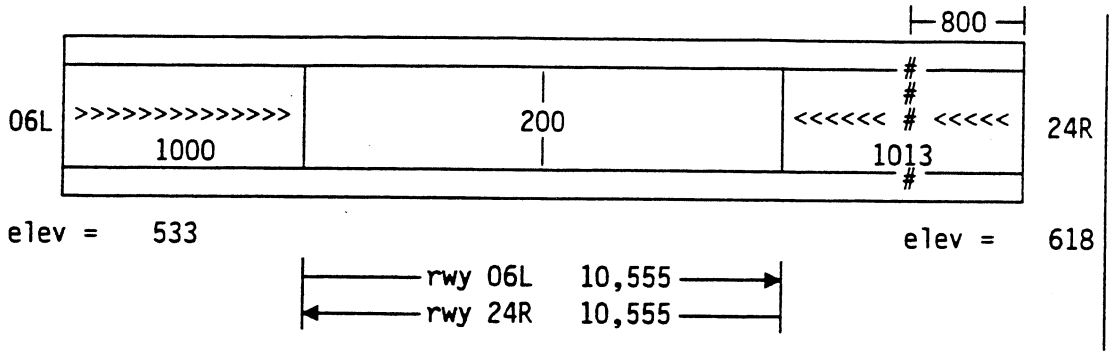
Andersen AFB, Guam

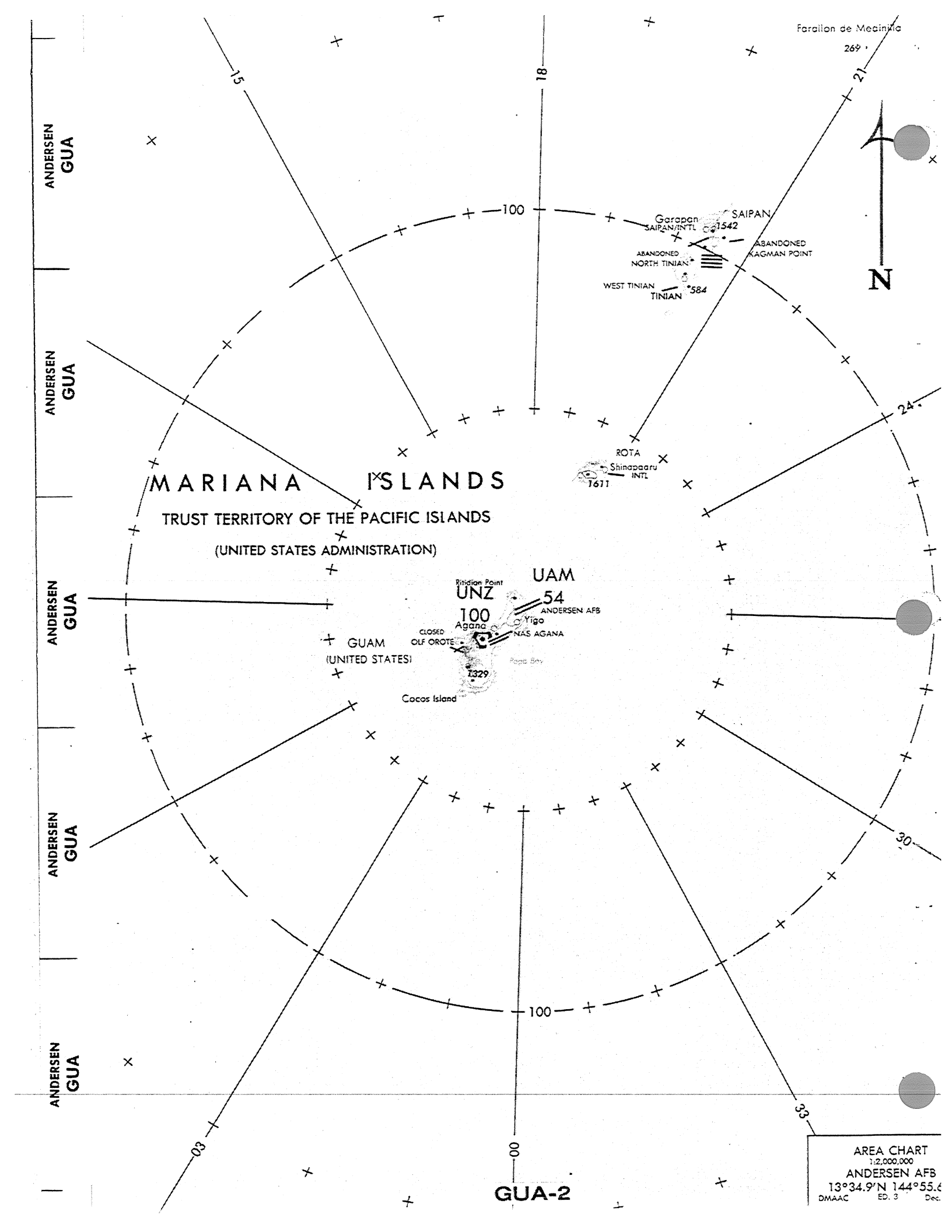
Table Identifier **GUA**

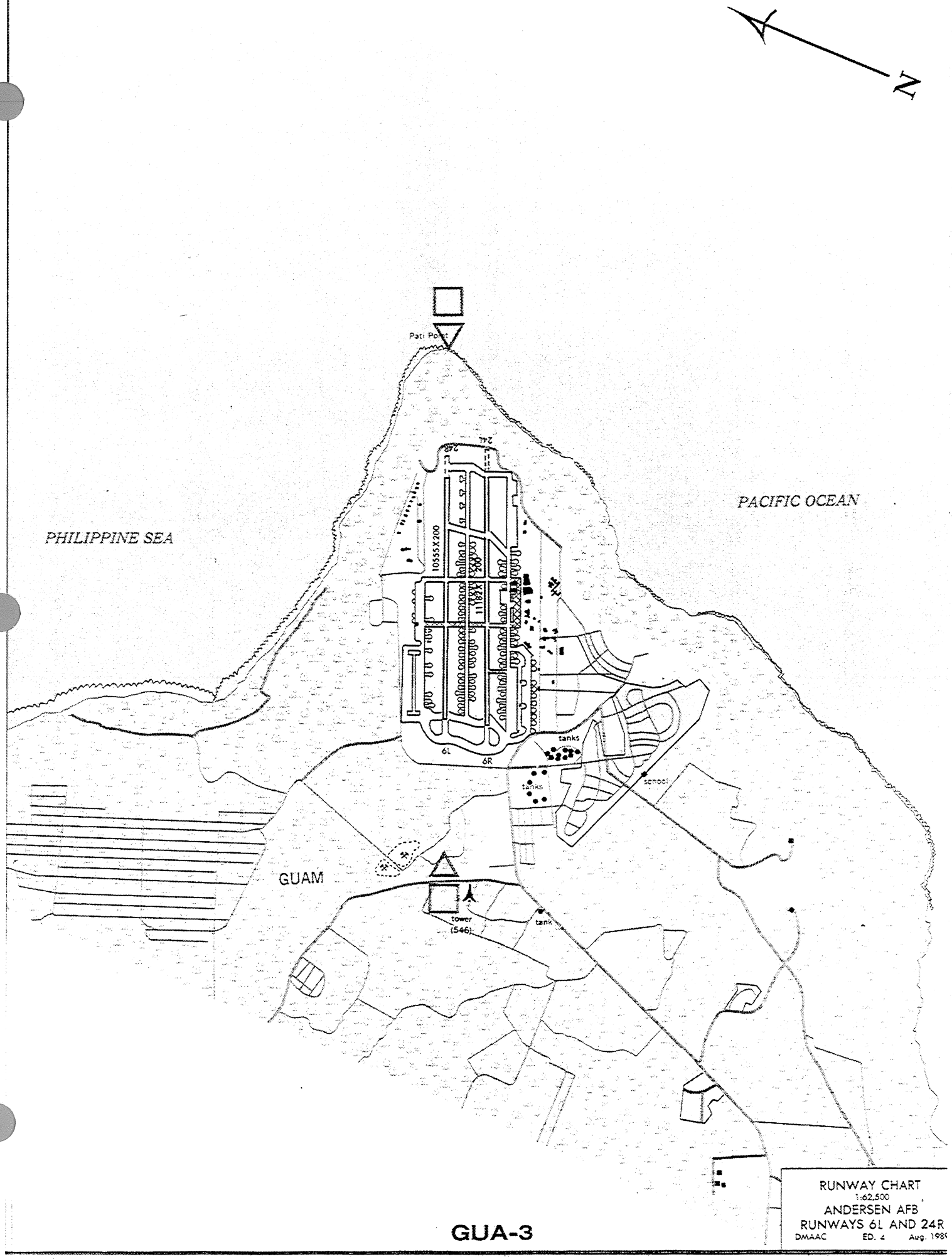


TACAN: UAM-54x (Pri) UNZ-100x (Sec)
I/F above: N:clear E:clear N:clear E:clear
S:clear W:clear S:clear W:clear

MLS: (06L-Jr) ch 6
PAPI: 06L (6500-ft point only)
Ball Bar: 06L
UHF: yes (guard only)

ANDERSEN GUA
ANDERSEN GUA
ANDERSEN GUA
ANDERSEN GUA


Farallon de Mecinilla
269°
15
18
21
24
27
30
33
00
03
100
100
N
ANDERSEN GUA
ANDERSEN GUA
ANDERSEN GUA
ANDERSEN GUA
ANDERSEN GUA
Garapan
SAIPAN/INTL
SAIPAN
1542
ABANDONED
KAGMAN POINT
ABANDONED
NORTH TINIAN
WEST TINIAN
TINIAN
584
ROTA
Shinapaaru
INTL
1611
MARIANA ISLANDS
TRUST TERRITORY OF THE PACIFIC ISLANDS
(UNITED STATES ADMINISTRATION)
Ritidian Point
UNZ
100
Agana
UAM
54
ANDERSEN AFB
Yigo
CLOSED
OLF OROTE
NAS AGANA
GUAM
(UNITED STATES)
1329
Cocos Island
AREA CHART
1:2,000,000
ANDERSEN AFB
13°34.9'N 144°55.6
DMAAC
ED. 3
Dec.
GUA-2


N
PACIFIC OCEAN
PHILIPPINE SEA
GUAM
Pati Point
24
6L
6R
tanks
tanks
school
tower
(546)
tank
RUNWAY CHART
1:62,500
ANDERSEN AFB
RUNWAYS 6L AND 24R
DMAAC ED. 4 Aug. 1985

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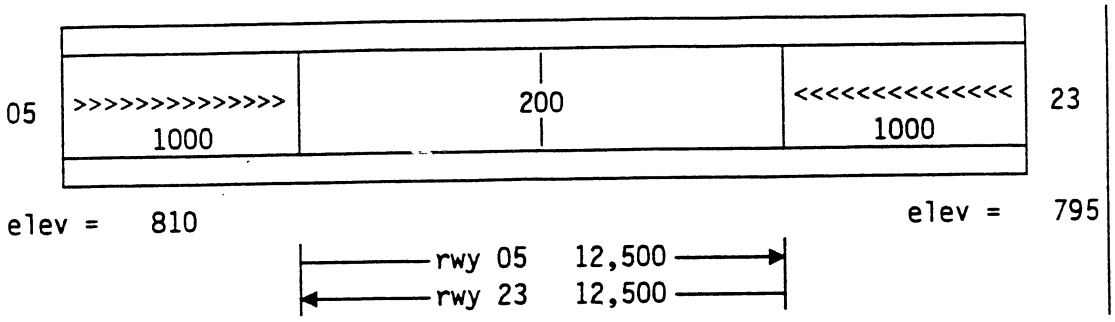

TACAN: GUS-112x (Pri) XSF-65x (Sec)
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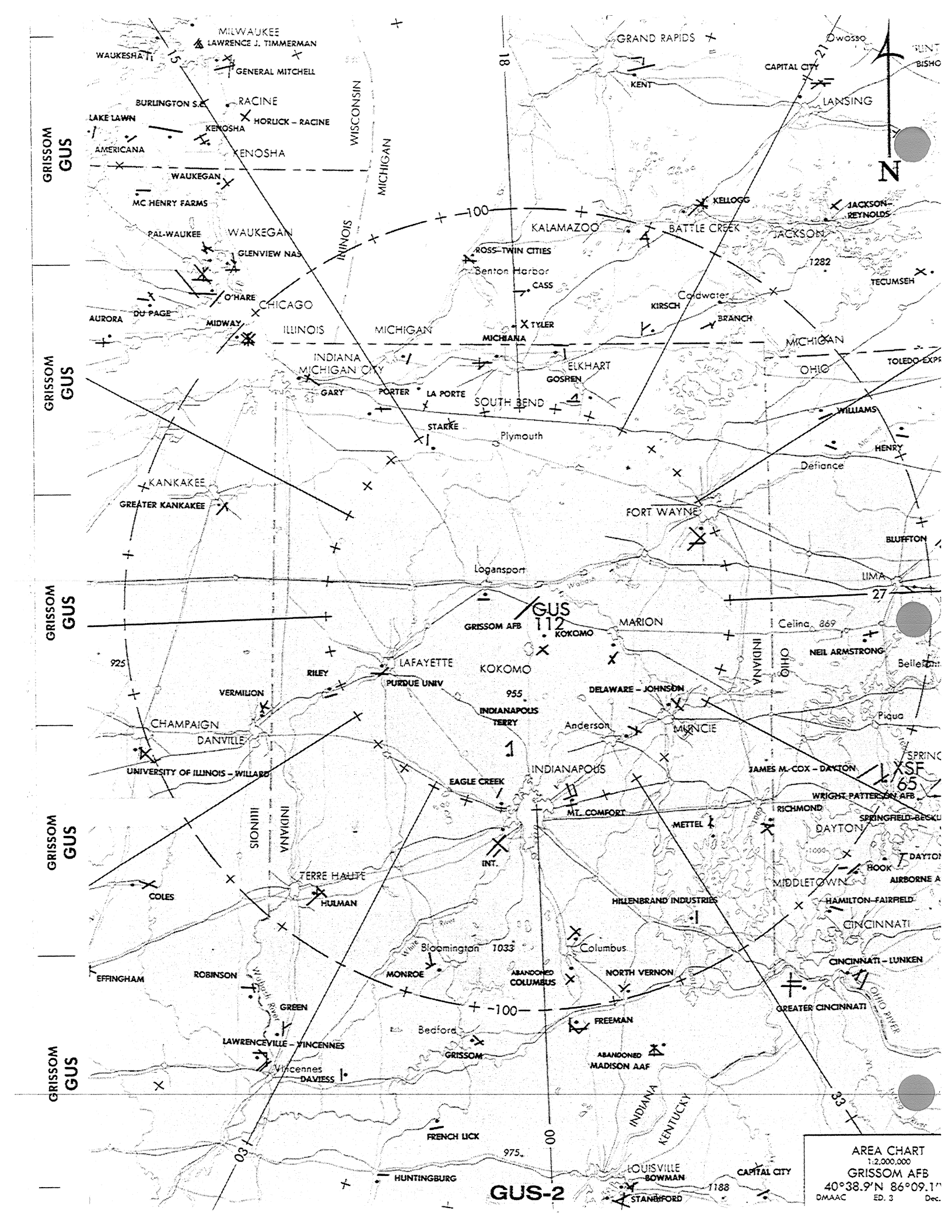
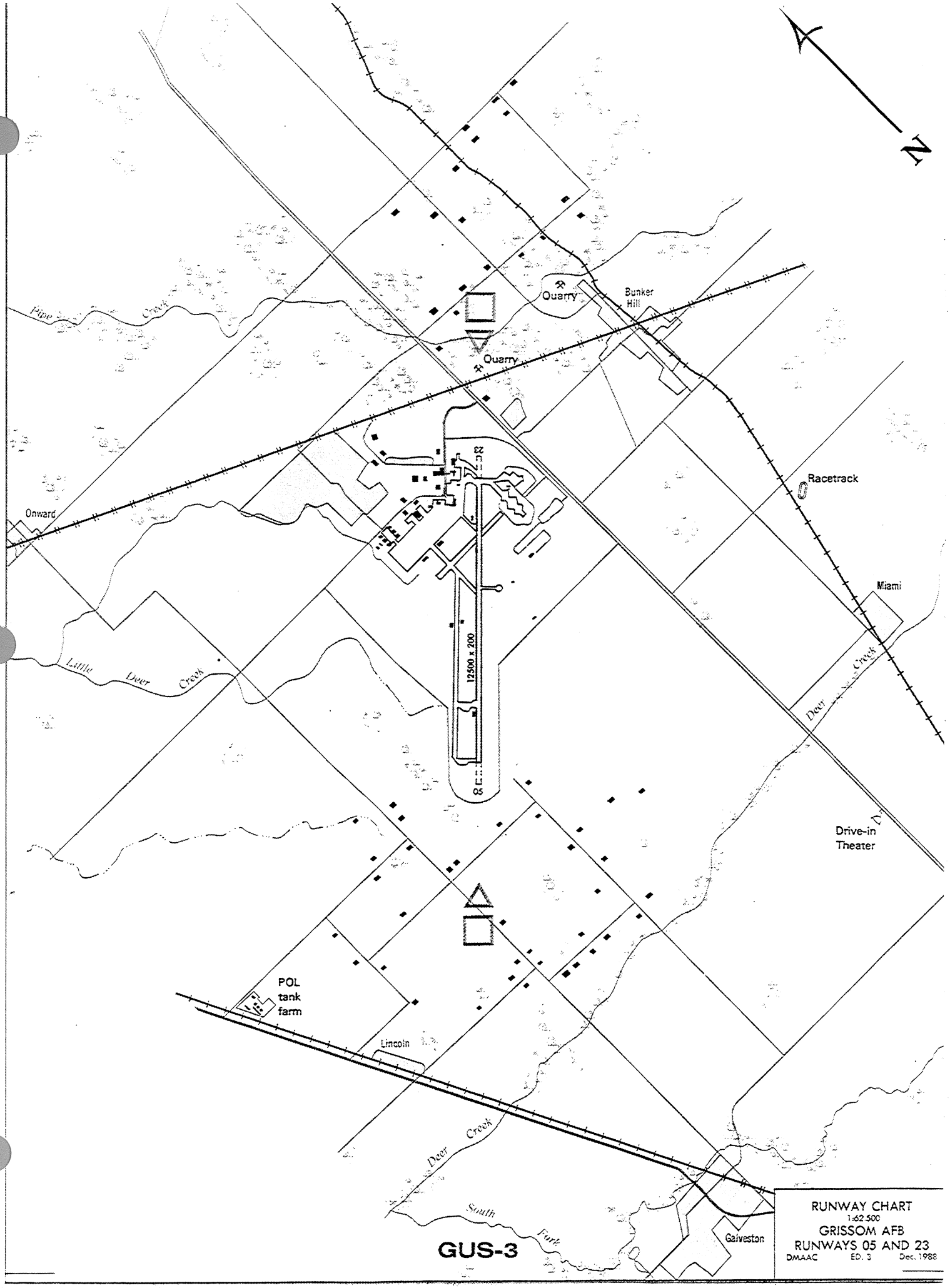
S:<<80k W:<<80k S:clear W:clear

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

GRISSOM GUS
GRISSOM GUS
GRISSOM GUS
GRISSOM GUS


GRISSOM GUS
MILWAUKEE
LAWRENCE J. TIMMERMAN
WAUKESHA
GENERAL MITCHELL
BURLINGTON S.C.
RACINE
LAKE LAWN
HORLICK – RACINE
KENOSHA
AMERICANA
KENOSHA
WISCONSIN
MICHIGAN
WAUKEGAN
MC HENRY FARMS
PAL-WAUKEE
WAUKEGAN
GLENVIEW NAS
ILLINOIS
O'HARE
CHICAGO
AURORA
DU PAGE
MIDWAY
ILLINOIS
MICHIGAN
INDIANA
MICHIGAN CITY
GARY
PORTER
LA PORTE
STARKE
Plymouth
KANKAKEE
GREATER KANKAKEE
GRAND RAPIDS
KENT
KELLOGG
KALAMAZOO
BATTLE CREEK
ROSS–TWIN CITIES
Benton Harbor
CASS
MICHIANA
TYLER
Owosso
CAPITAL CITY
LANSING
JACKSON–REYNOLDS
JACKSON
1282
TECUMSEH
Coldwater
KIRSCH
BRANCH
MICHIGAN
OHIO
TOLEDO EXPR
ELKHART
GOSHEN
SOUTH BEND
WILLIAMS
HENRY
Defiance
FORT WAYNE
BLUFFTON
Logansport
LIMA
GRISSOM AFB
GUS 112
KOKOMO
MARION
Celina 869
NEIL ARMSTRONG
LAFAYETTE
PURDUE UNIV
RILEY
KOKOMO
VERMILION
CHAMPAIGN
DANVILLE
UNIVERSITY OF ILLINOIS – WILLARD
INDIANAPOLIS TERRY
DELAWARE – JOHNSON
Anderson
MUNCIE
Piqua
INDIANAPOLIS
EAGLE CREEK
JAMES M. COX – DAYTON
XSF 65
WRIGHT PATTERSON AFB
RICHMOND
MT. COMFORT
METTEL
DAYTON
SPRINGFIELD–BECKL
HOOK
AIRBORNE A
MIDDLETOWN
HAMILTON–FAIRFIELD
HILLENBRAND INDUSTRIES
CINCINNATI
INT.
TERRE HAUTE
COLES
HULMAN
SIONIIII
INDIANA
Bloomington 1033
Columbus
CINCINNATI – LUNKEN
EFFINGHAM
ROBINSON
MONROE
ABANDONED COLUMBUS
NORTH VERNON
GREEN
GREATER CINCINNATI
OHIO RIVER
Bedford
FREEMAN
LAWRENCEVILLE – VINCENNES
GRISSOM
ABANDONED MADISON AAF
Vincennes
DAVIESS
INDIANA
KENTUCKY
FRENCH LICK
HUNTINGBURG
LOUISVILLE
BOWMAN
STANDIFORD
CAPITAL CITY
1188
975
925
955
1000
1100
15
18
21
27
33
00
03
100
N
AREA CHART
1:2,000,000
GRISSOM AFB
40°38.9'N 86°09.1'
DMAAC ED. 3 Dec.
GUS-2



RUNWAY CHART
1:62,500
GRISSOM AFB
RUNWAYS 05 AND 23
DMAAC ED. 3 Dec. 1988

GUS-3

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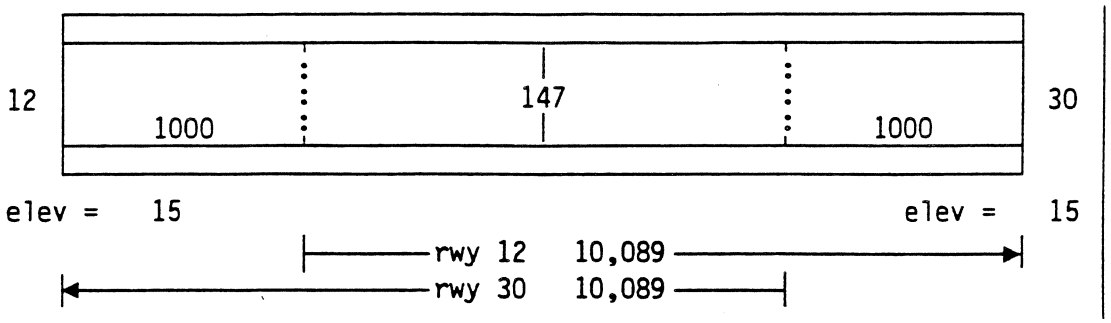
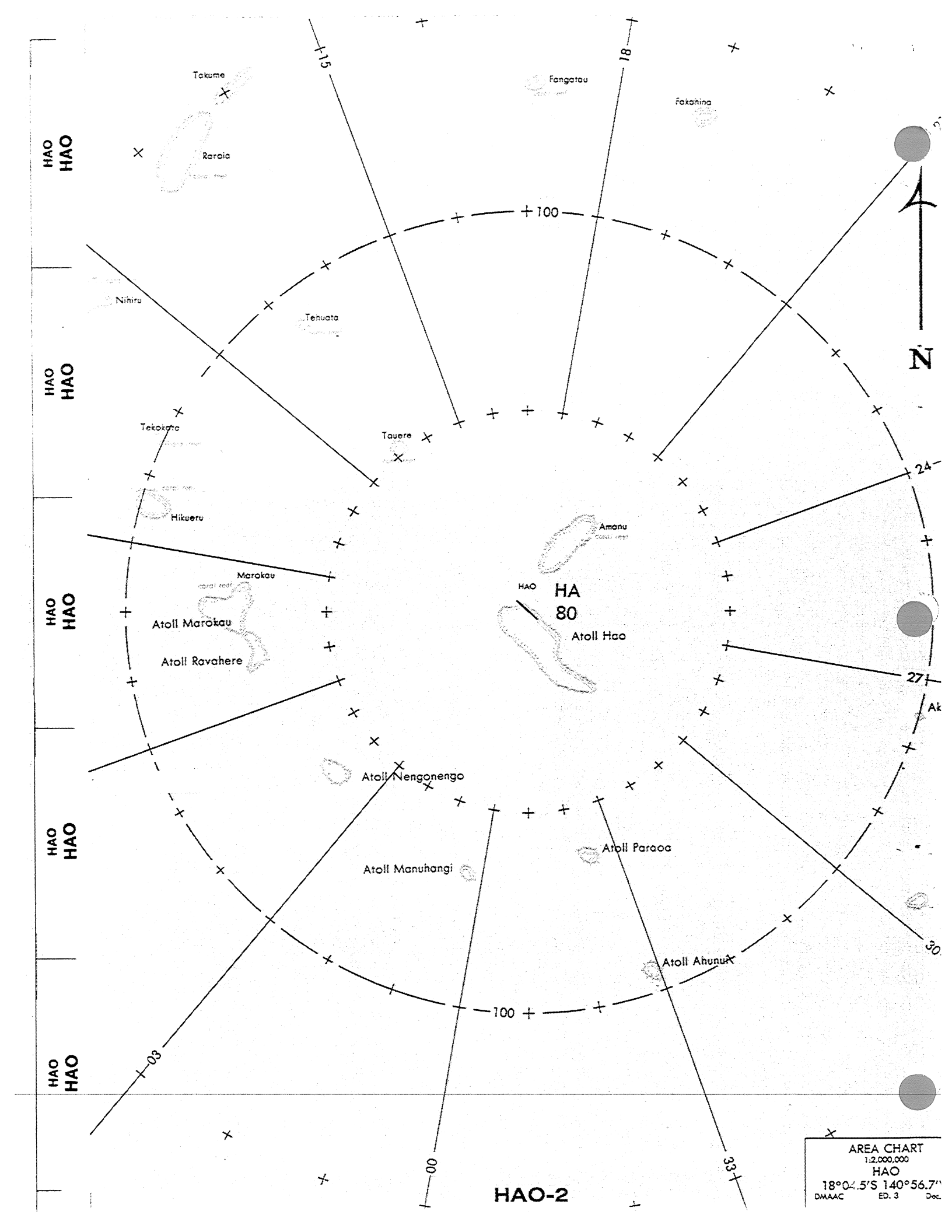
Hao, Tuamotu Isle, Fr Pol

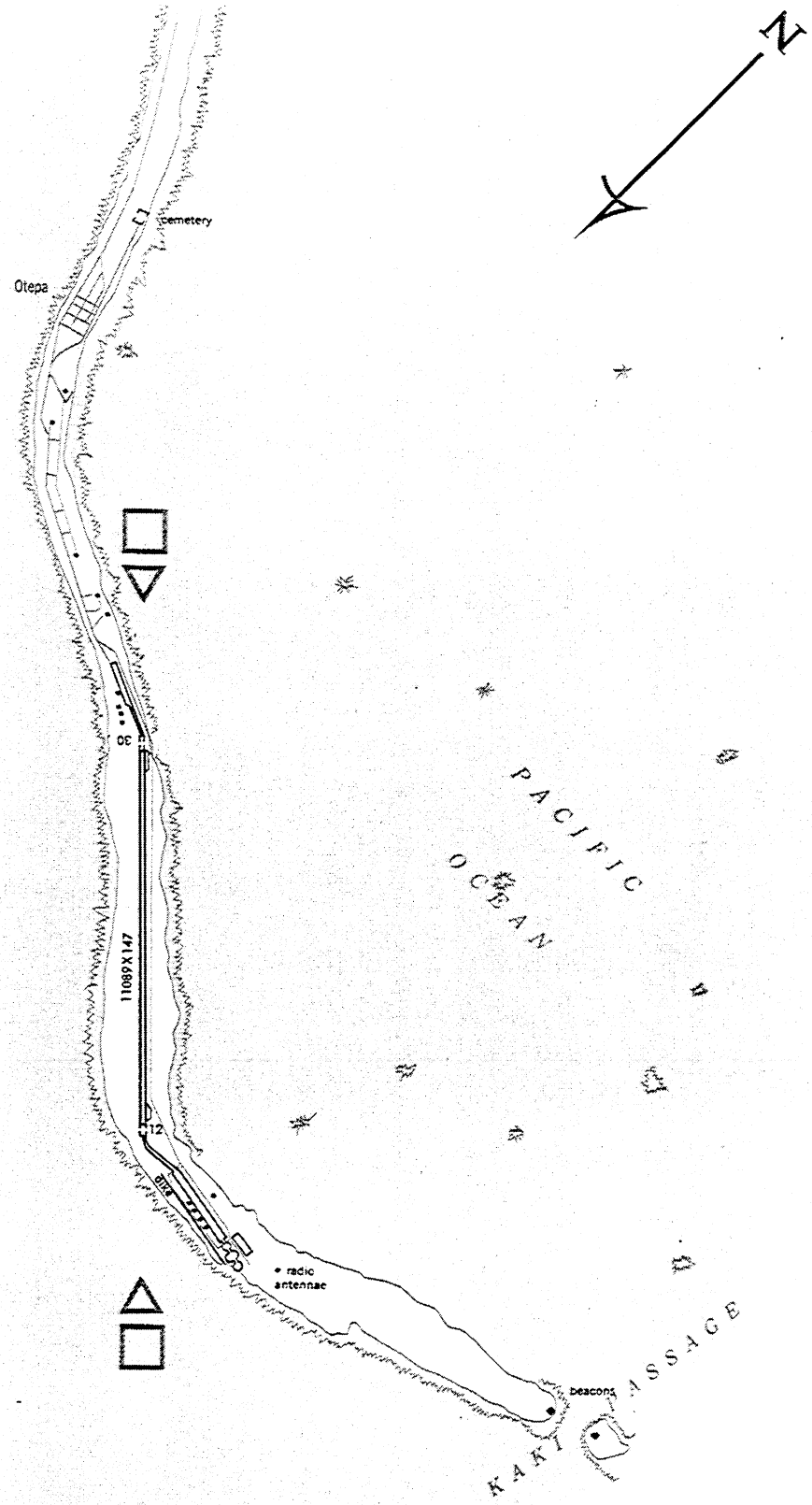
Table Identifier **HAO**



TACAN: HA-80x (Pri)
I/F above: N:clear E:clear
S:clear W:clear

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


HAO
HAO
HAO
HAO
HAO
HAO
HAO
HAO
Takume
Raraio
Fangatau
Fakahina
Nihiru
Tenuata
Tauere
Tekokota
Hikueru
Marokau
Atoll Marokau
Atoll Ravahere
Amanu
HAO
HA
80
Atoll Hao
Atoll Nengonengo
Atoll Manuhangi
Atoll Paraoa
Atoll Ahunui
Ak
N
100
15
18
24
27
30
33
00
03
100
HAO-2
AREA CHART
1:2,000,000
HAO
18°04.5'S 140°56.7'
DMAAC
ED. 3
Dec.



RUNWAY CHART
1:62,500
HAO
RUNWAY 12 AND 30
DMAAC ED. 3 Dec. 1988

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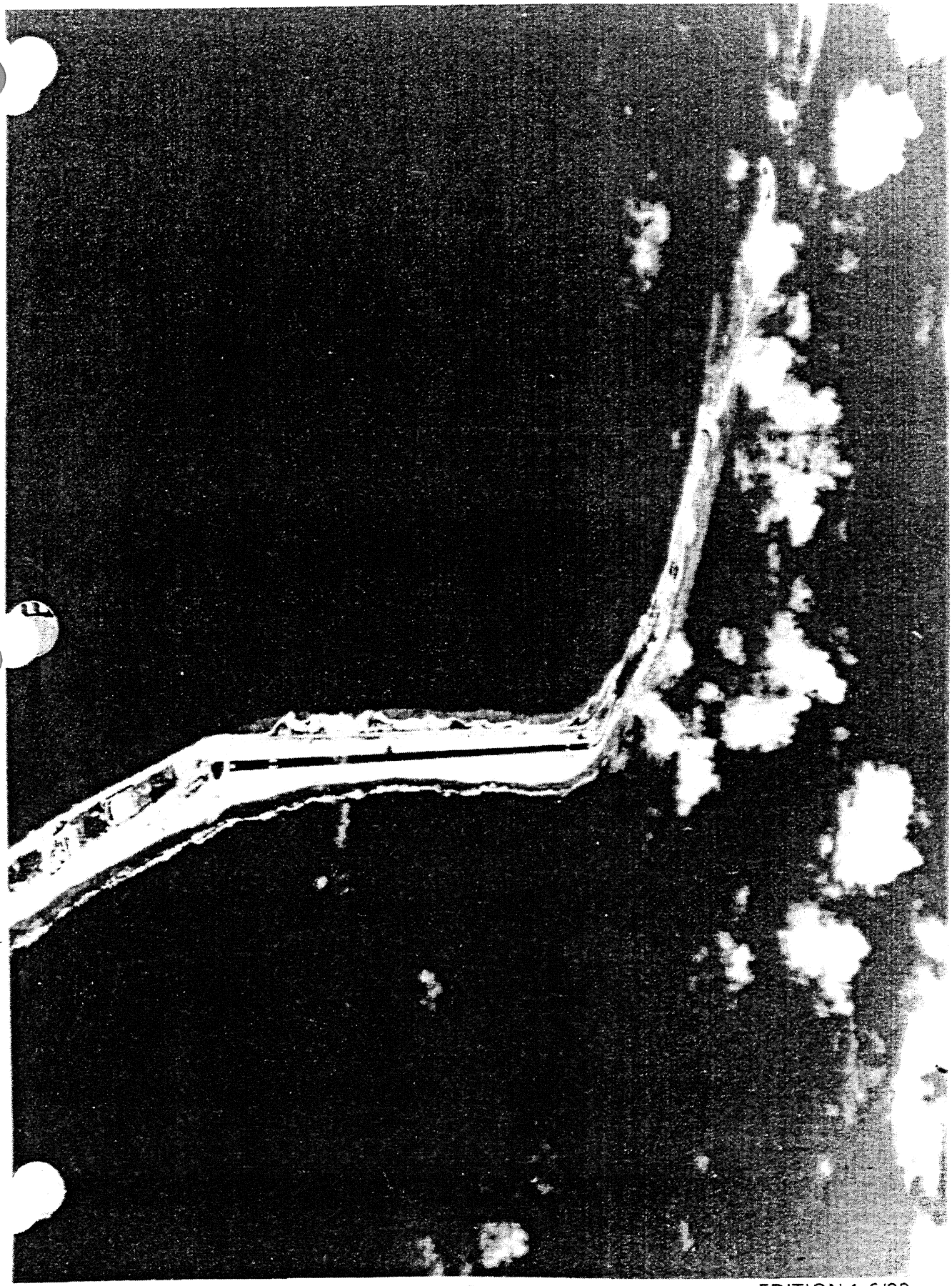

EDITION 1-6/89

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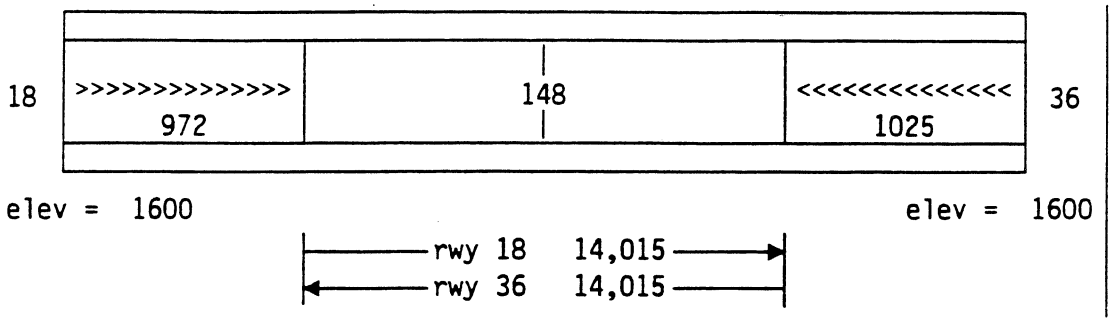
Hoedspruit AFS, S. Africa

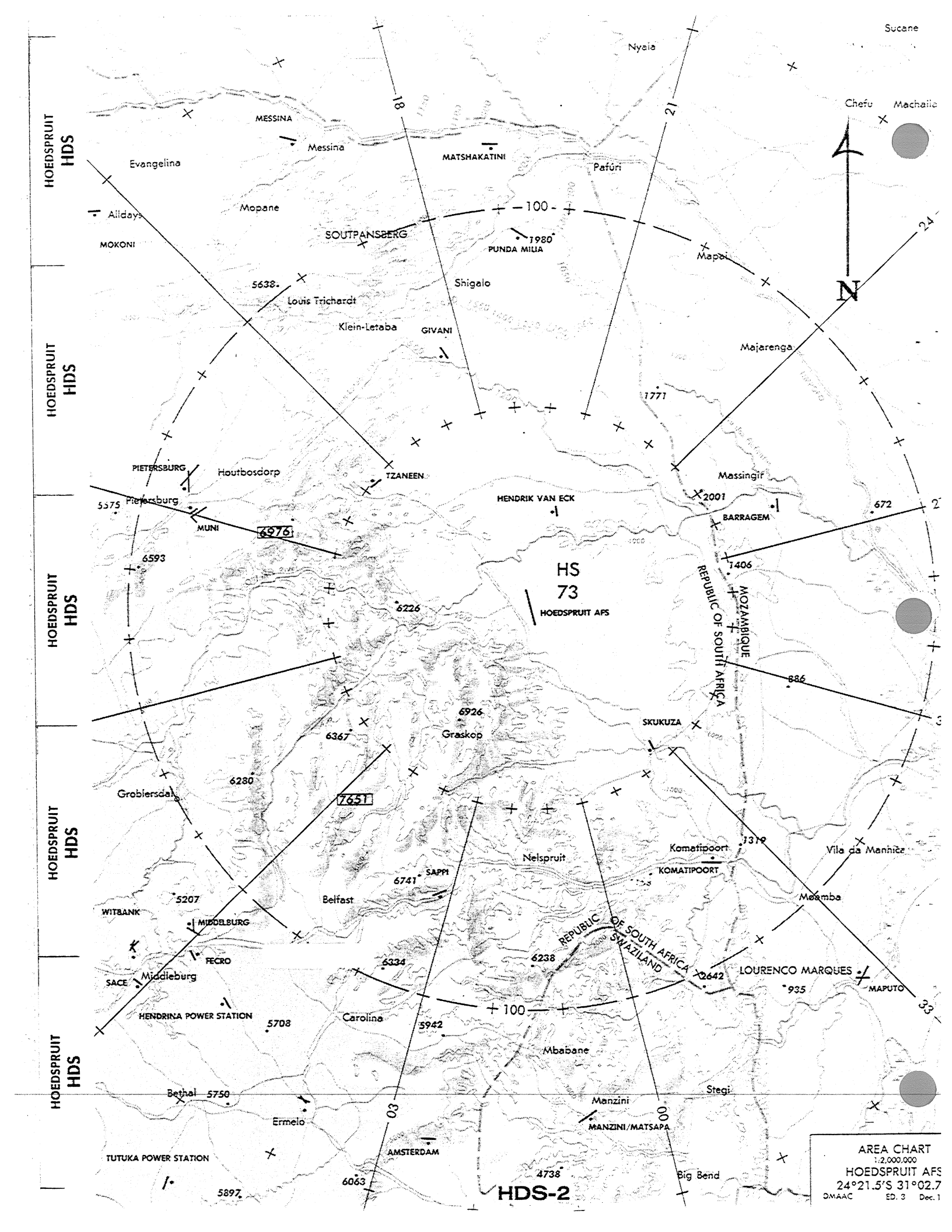
Table Identifier **HDS**

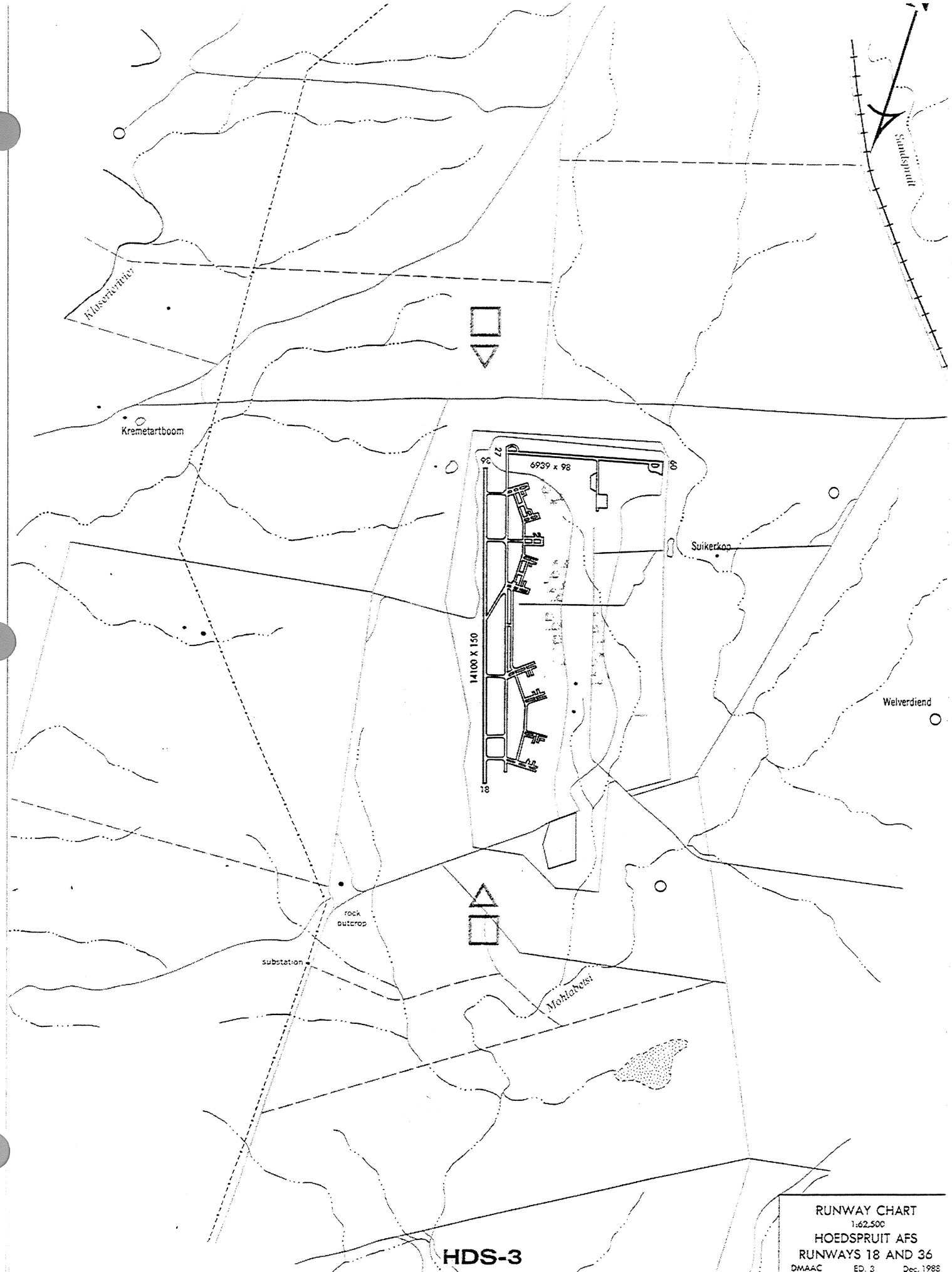


TACAN: HS-73x (Pri)
I/F above: N:clear E:clear
S:clear W:clear

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

HOEDSPRUIT HDS
HOEDSPRUIT HDS
HOEDSPRUIT HDS
HOEDSPRUIT HDS


HOEDSPRUIT HDS
HOEDSPRUIT HDS
HOEDSPRUIT HDS
HOEDSPRUIT HDS
HOEDSPRUIT HDS
Sucane
Nyala
Chefu
Machaila
MESSINA
Messina
Evangelina
MATSHAKATINI
Pafúri
Alldays
Mopane
MOKONI
SOUTPANSBERG
PUNDA MILIA
1980
Mapai
5638
Louis Trichardt
Shigalo
Klein-Letaba
GIVANI
Majarenga
1771
PIETERSBURG
Houtbosdorp
TZANEEN
Massingir
Pietersburg
5375
HENDRIK VAN ECK
2001
672
MUNI
6976
BARRAGEM
6593
1406
HS
73
HOEDSPRUIT AFS
6226
REPUBLIC OF SOUTH AFRICA
MOZAMBIQUE
886
6926
Graskop
SKUKUZA
6367
6280
Groblersdal
7651
Komatipoort
1319
Vila da Manhiça
Nelspruit
KOMATIPOORT
6741
SAPPI
Belfast
5207
Moamba
WITBANK
MIDDELBURG
REPUBLIC OF SOUTH AFRICA
SWAZILAND
FECRO
6334
6238
SACE
Middleburg
2642
LOURENCO MARQUES
935
MAPUTO
HENDRINA POWER STATION
5708
Carolina
5942
Mbabane
Bethal
5750
Stegi
Manzini
Ermelo
MANZINI/MATSAPA
AMSTERDAM
TUTUKA POWER STATION
6063
4738
Big Bend
5897
HDS-2
AREA CHART
1:2,000,000
HOEDSPRUIT AFS
24°21.5'S 31°02.7
DMAAC
ED. 3
Dec. 1



RUNWAY CHART
1:62,500
HOEDSPRUIT AFS
RUNWAYS 18 AND 36
DMAAC ED. 3 Dec. 1988

HDS-3

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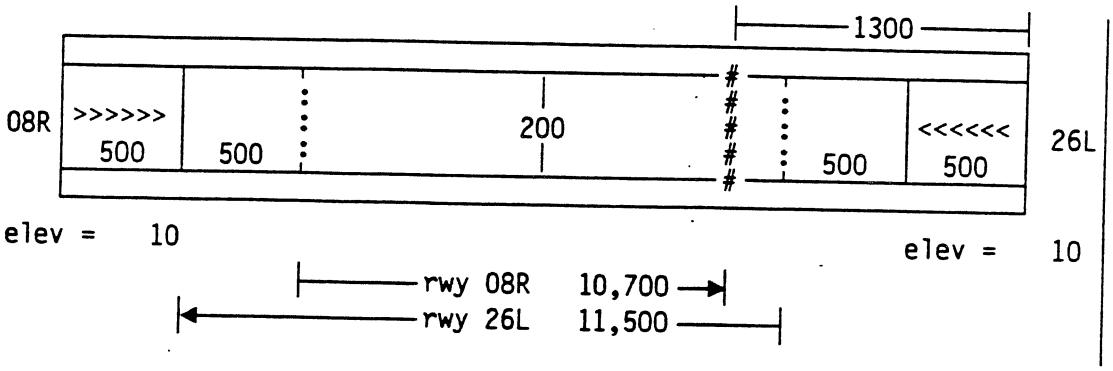
Hickam AFB, Hawaii

Table Identifier **HNL**

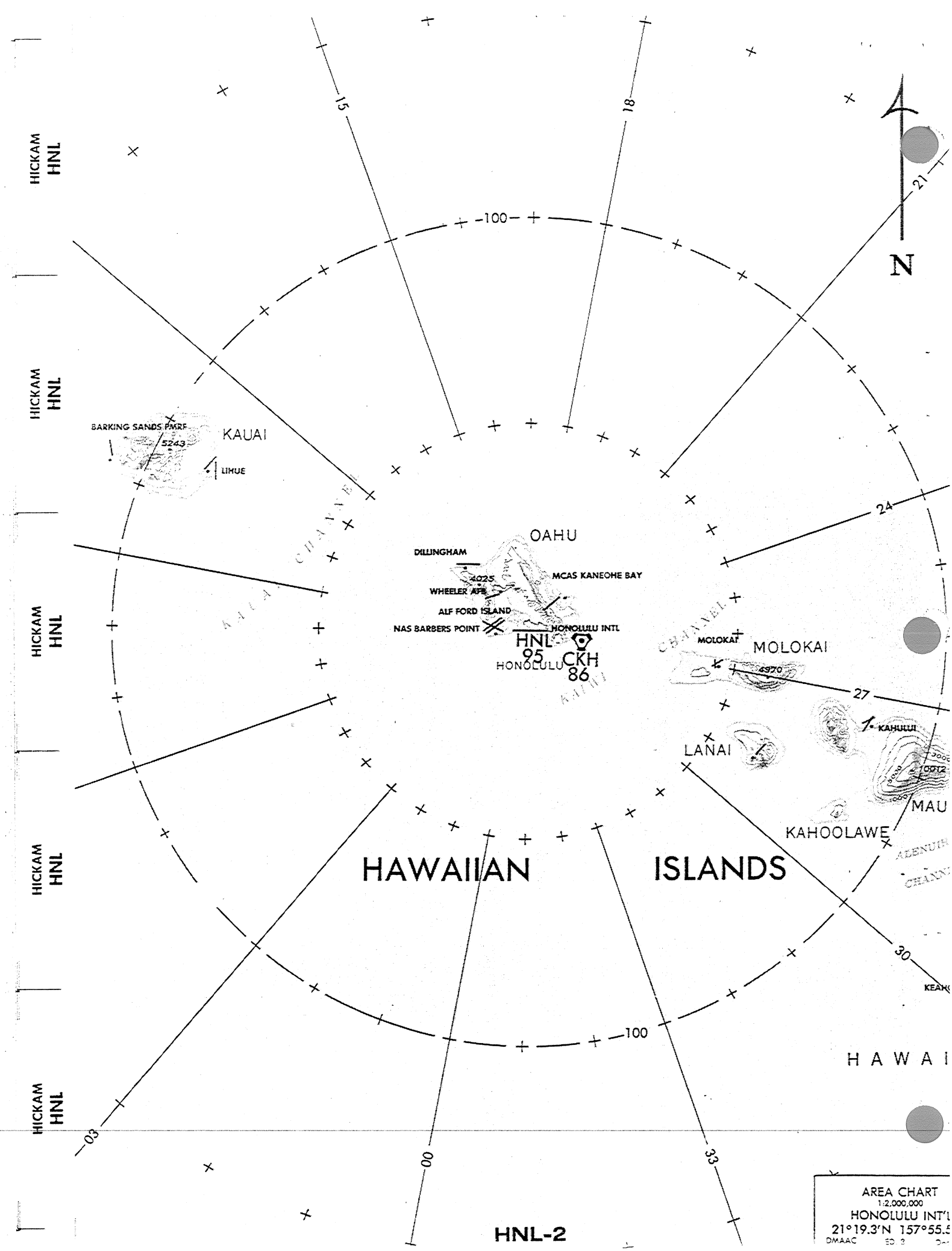


TACAN: HNL-95x (Pri) CKH-86x (Sec)
I/F above: N:clear E:clear N:clear E:clear
S:clear W:clear S:clear W:clear

MLS: (08R-Jr) ch 6
PAPI: none
Ball Bar: 08R
UHF: yes (guard only)

NOTE
- Flashing strobe lights on a barge 6500 ft from the threshold of rwy 08R

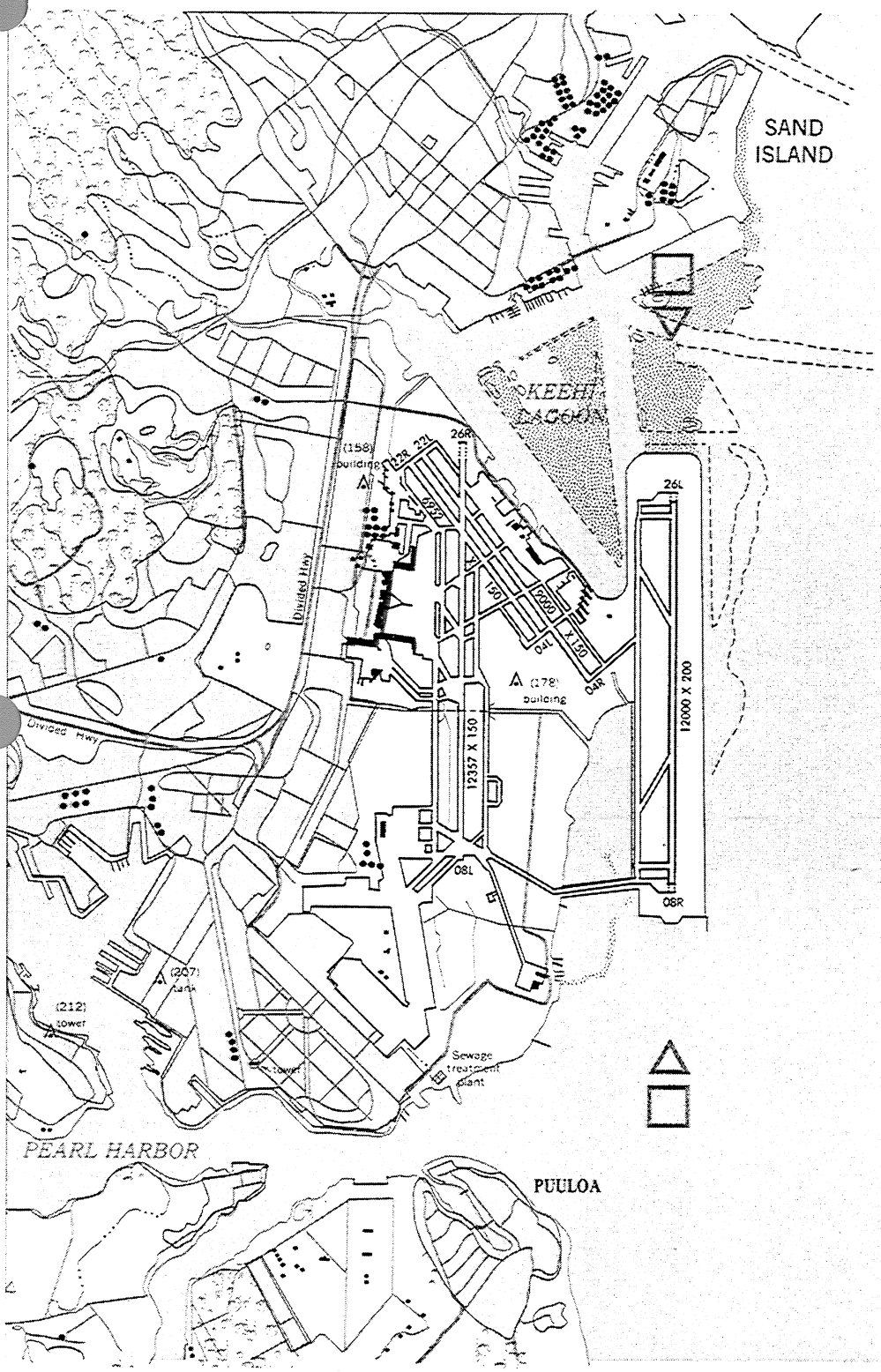
HICKAM HNL
HICKAM HNL
HICKAM HNL
HICKAM HNL



AREA CHART
1:2,000,000
HONOLULU INT'L
21°19.3'N 157°55.5

DMAAC

HNL-2



HNL-3

RUNWAY CHART
1:62,500
HONOLULU INT'L
RUNWAYS 08R AND 26L
DMAAC ED: 3 Dec. 1988

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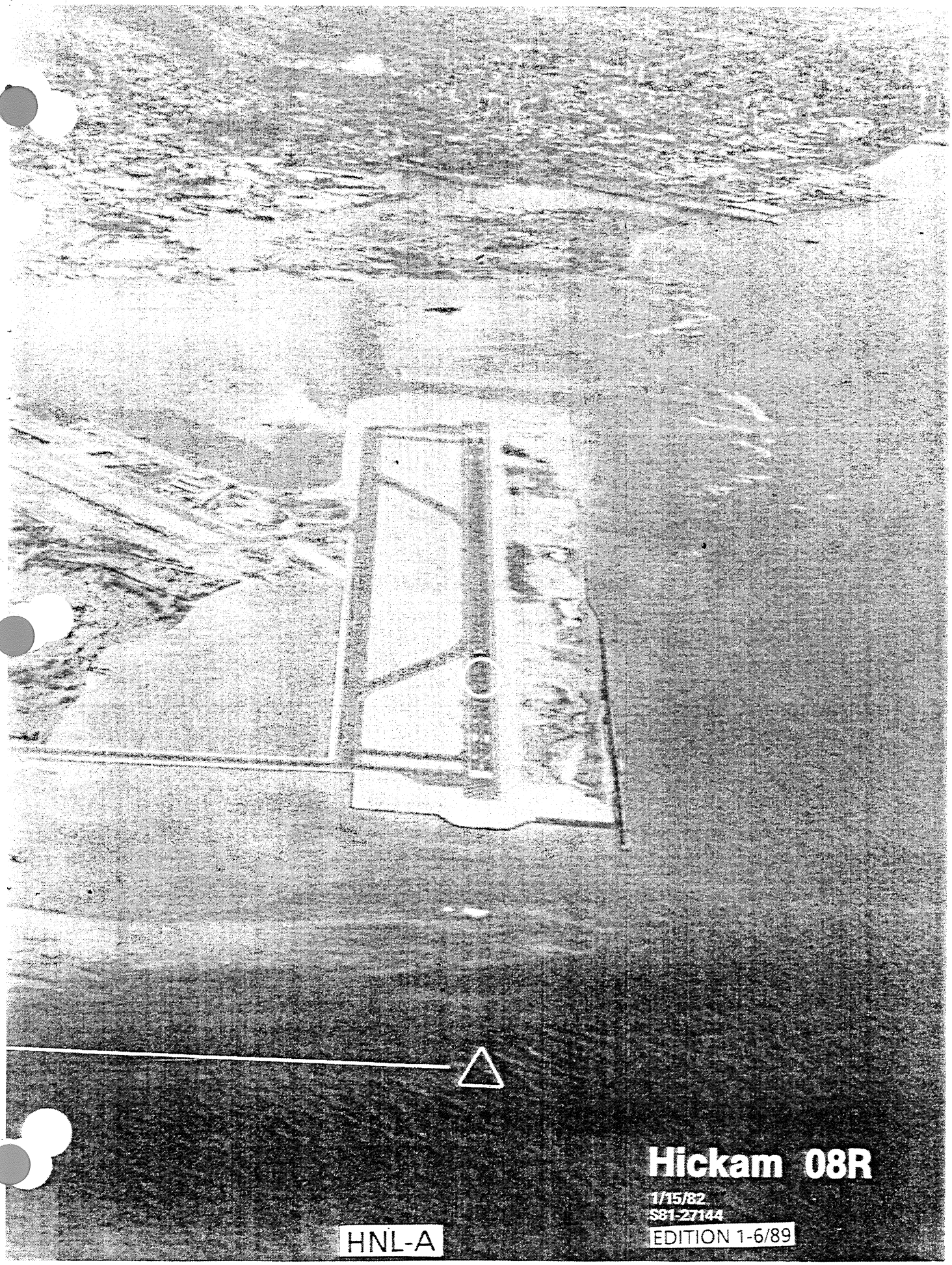

Hickam 08R

1/15/82
S81-27144
EDITION 1-6/89

HNL-A

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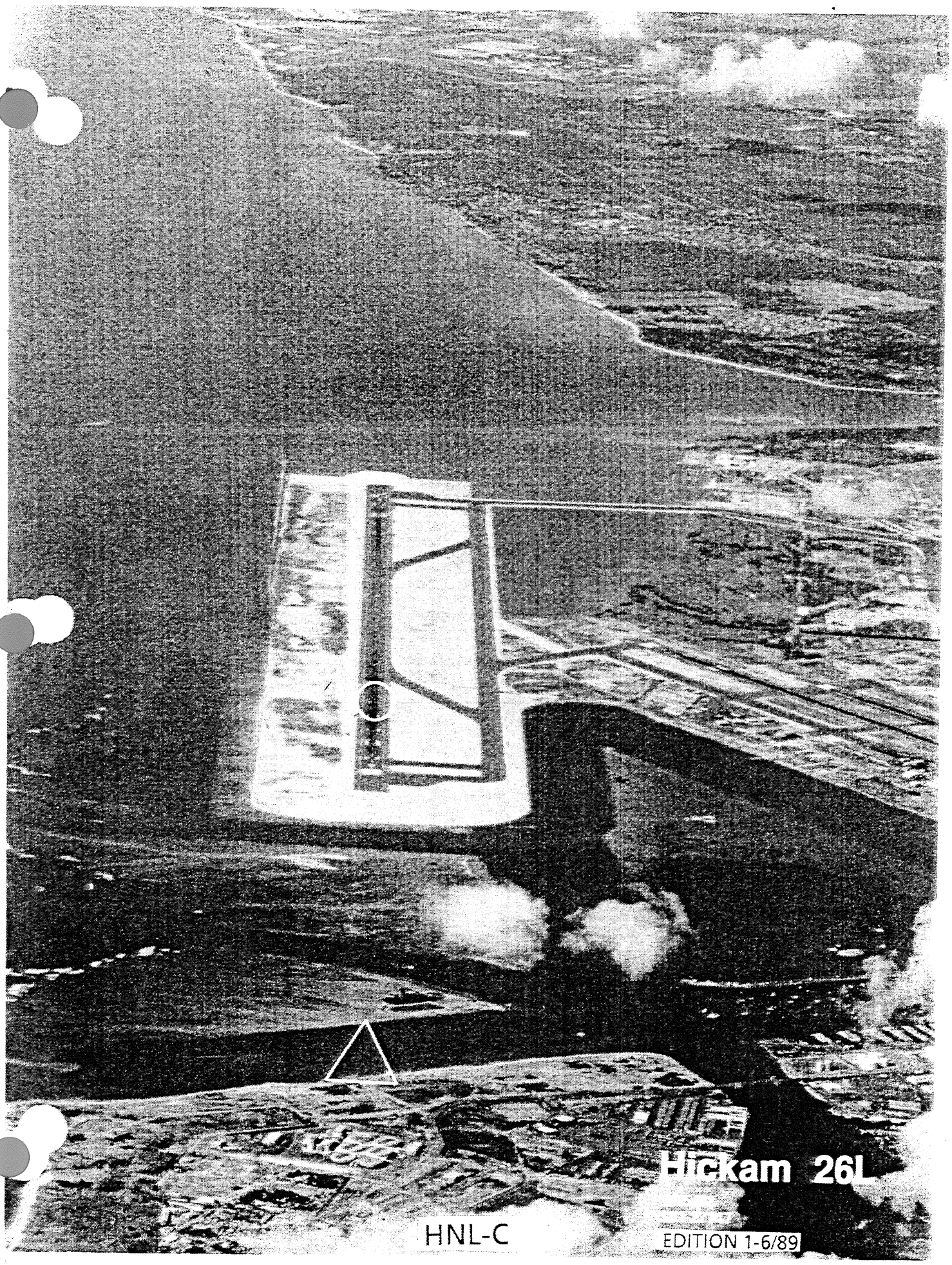

HNL-C

EDITION 1-6/89

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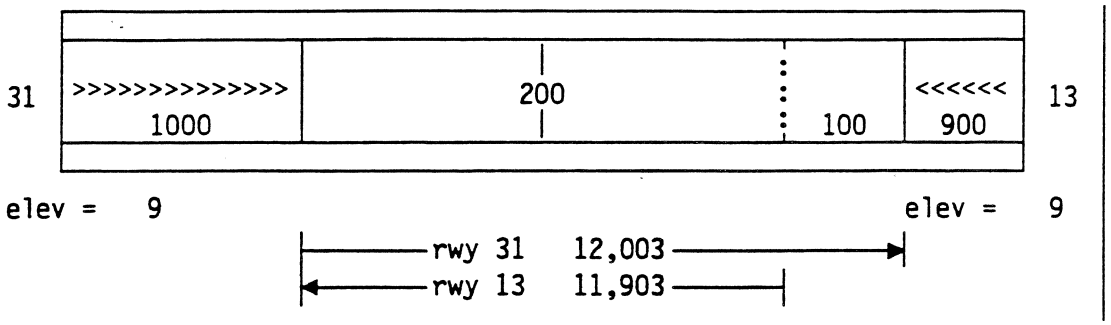
Diego Garcia NAF, Indian Ocean

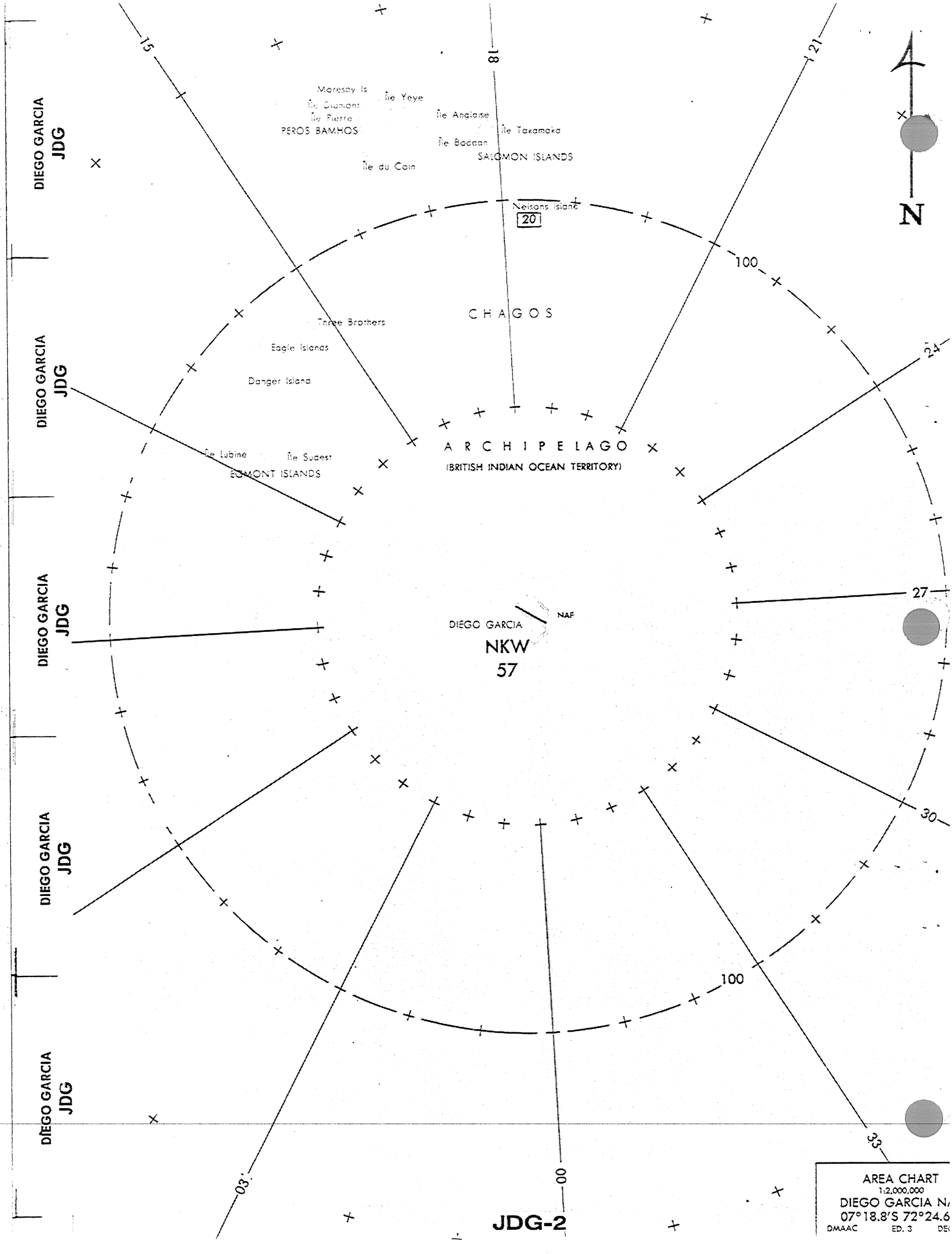
Table Identifier **JDG**

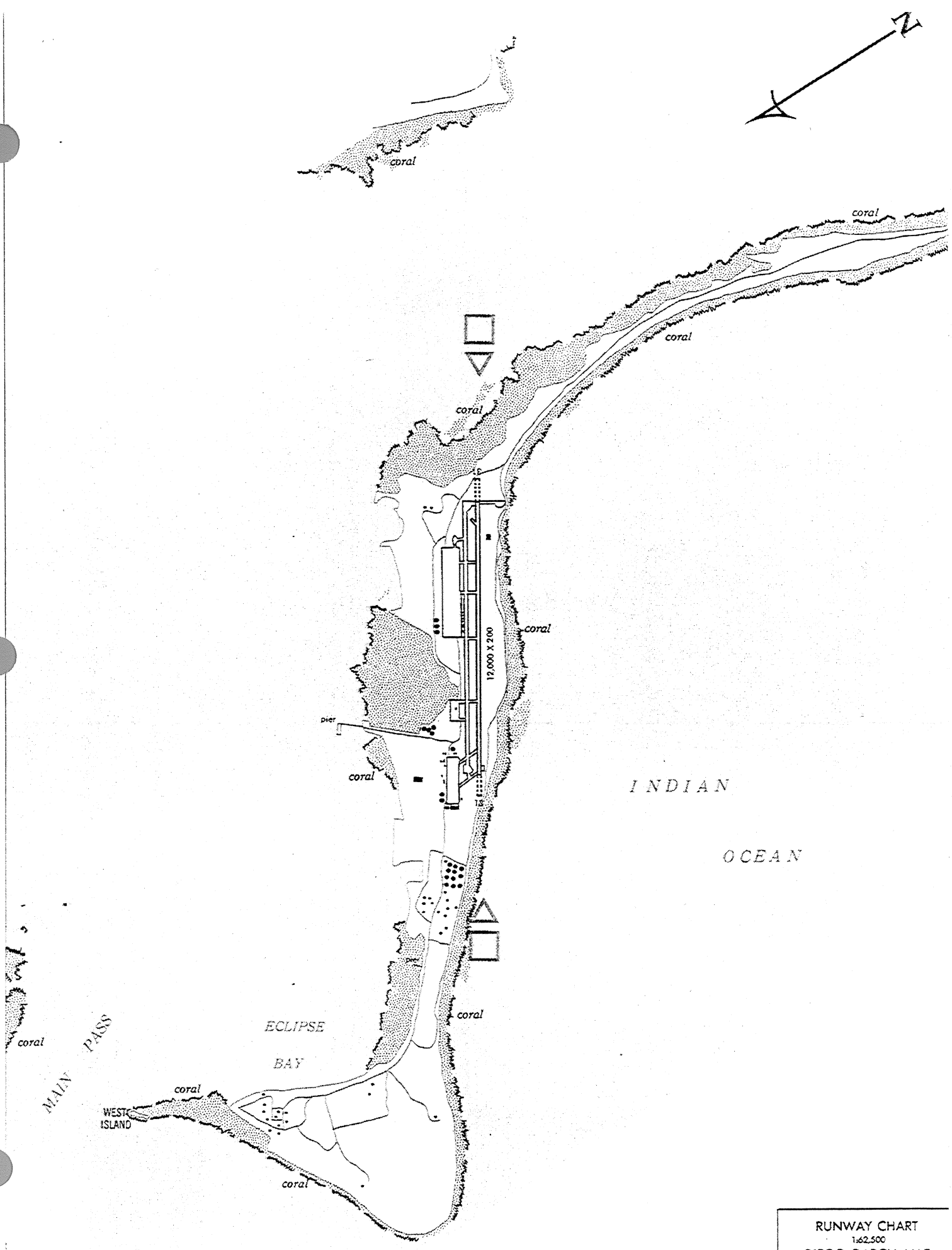


TACAN: NKW-57x (Pri)
I/F above: N:clear E:clear
S:clear W:clear

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

DIEGO GARCIA JDG
DIEGO GARCIA JDG
DIEGO GARCIA JDG
DIEGO GARCIA JDG


DIEGO GARCIA
JDG
DIEGO GARCIA
JDG
DIEGO GARCIA
JDG
DIEGO GARCIA
JDG
DIEGO GARCIA
JDG
Moresby Is
Île Yeye
Île Diamant
Île Pierre
PEROS BANHOS
Île Anglaise
Île Takamaka
Île Boddam
SALOMON ISLANDS
Île du Coin
Nelsons Island
20
CHAGOS
Three Brothers
Eagle Islands
Danger Island
ARCHIPELAGO
(BRITISH INDIAN OCEAN TERRITORY)
Île Lubine
Île Suest
EGMONT ISLANDS
DIEGO GARCIA
NAF
NKW
57
N
15
18
21
24
27
30
33
00
03
100
100
JDG-2
AREA CHART
1:2,000,000
DIEGO GARCIA N
07°18.8'S 72°24.6
DMAAC
ED. 3



JDG-3

RUNWAY CHART
1:62,500
DIEGO GARCIA NAF
RUNWAYS 13 AND 31
DMAAC ED. 4 Dec. 1988

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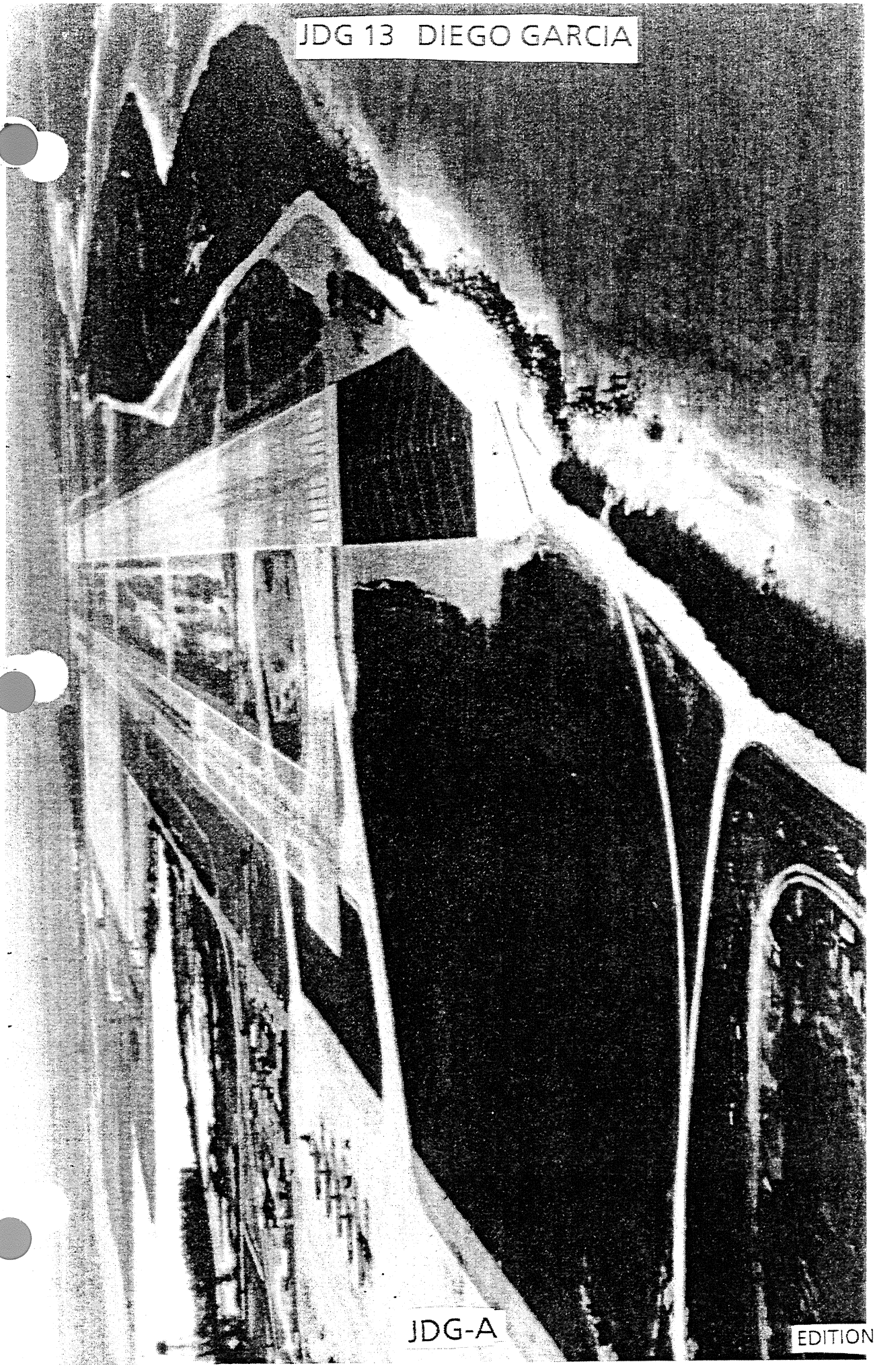

JDG-A

EDITION 1-6/89

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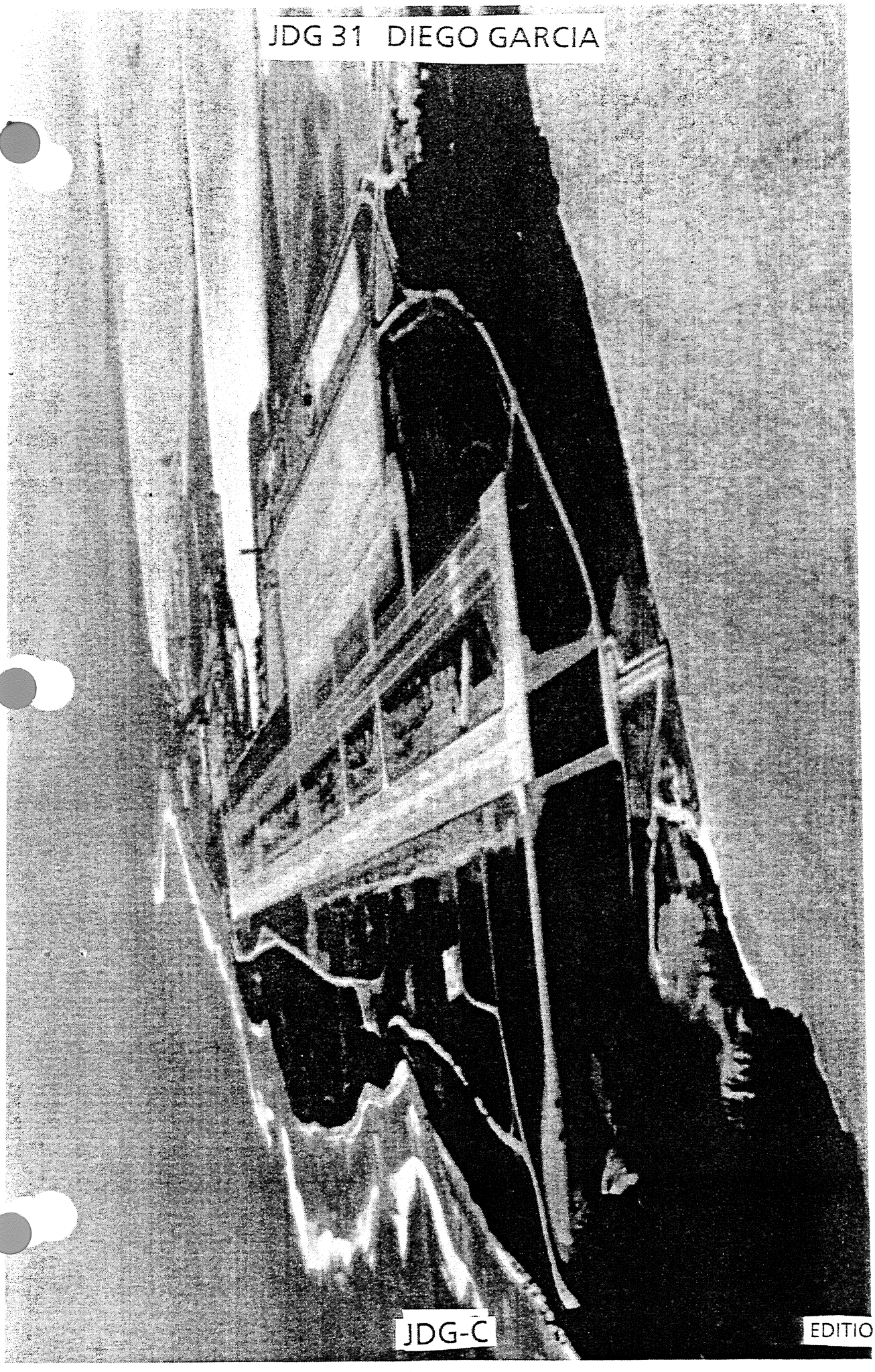
JDG 31 DIEGO GARCIA



JDG-C

EDITION 1-6/89

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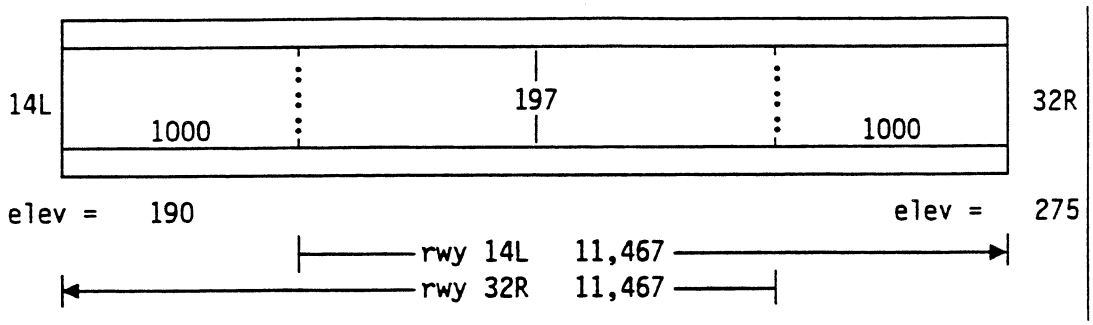
Koln/Bonn, West Germany

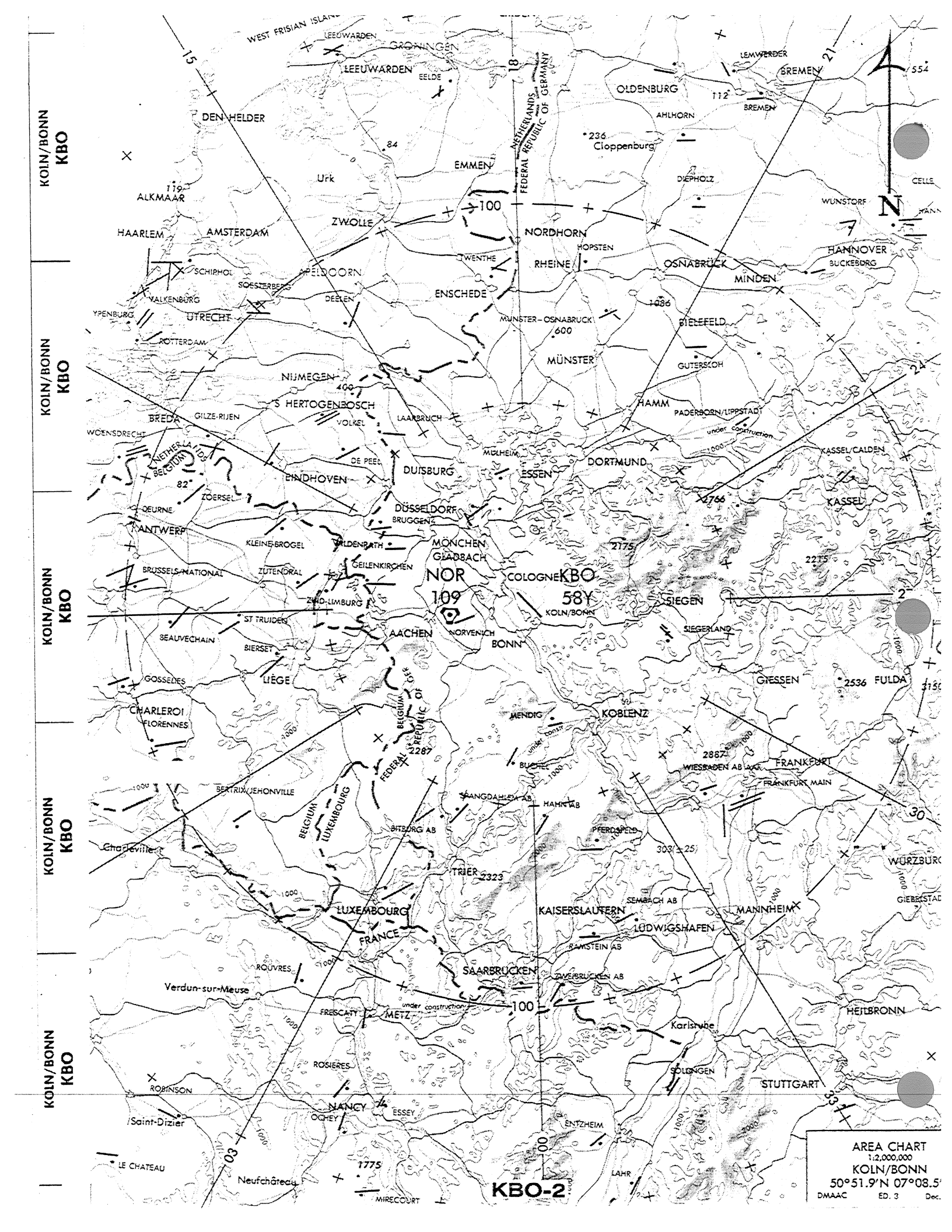
Table Identifier **KBO**

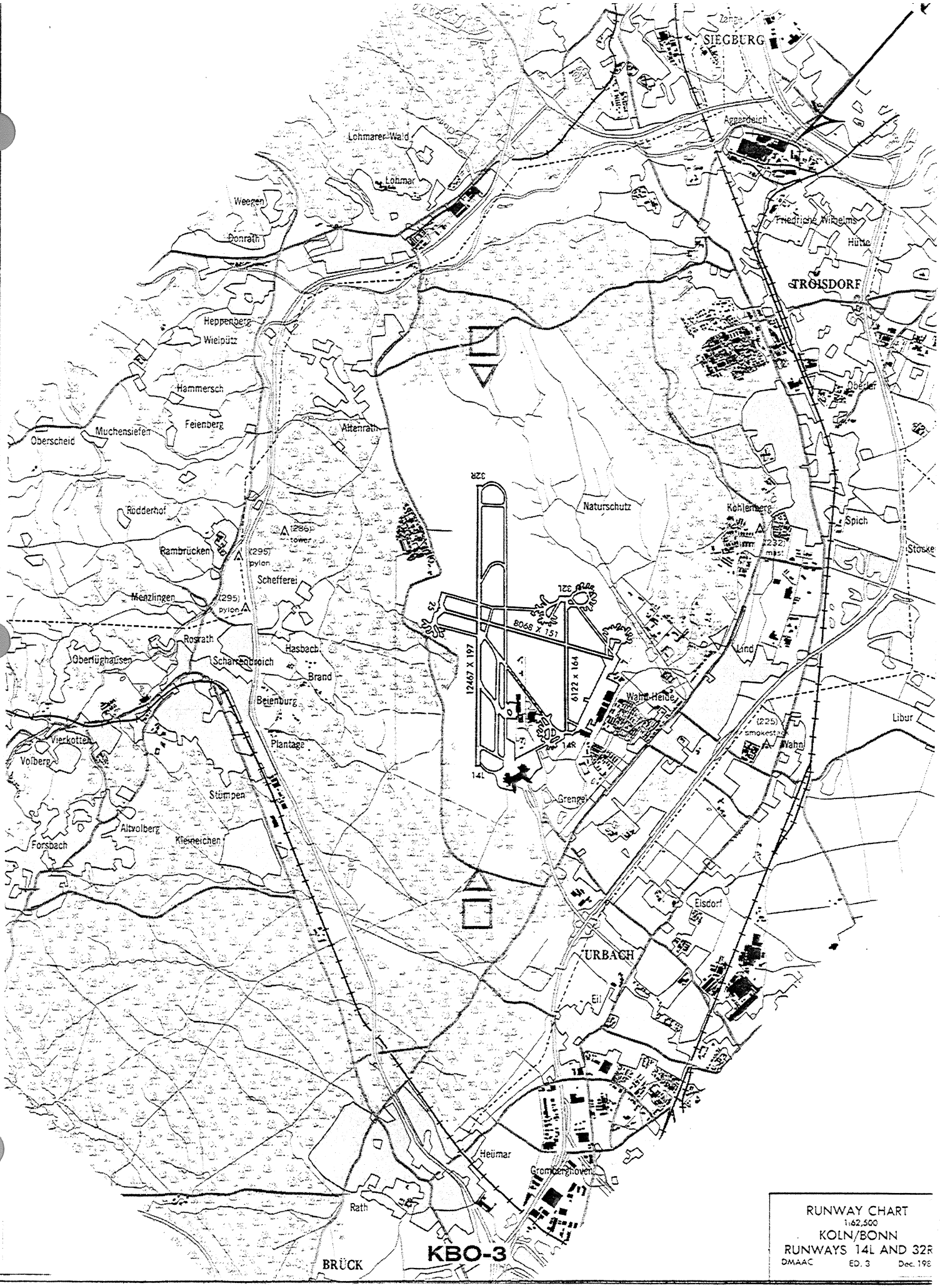


TACAN: NOR-109x (Pri) KBO-58y (Sec)
I/F above: N:clear E:80k N:clear E:clear
S:<80k W:80k S:clear W:clear

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

KOLN/BONN KBO
KOLN/BONN KBO
KOLN/BONN KBO
KOLN/BONN KBO
KOLN/BONN KBO


KOLN/BONN KBO
KOLN/BONN KBO
KOLN/BONN KBO
KOLN/BONN KBO
KOLN/BONN KBO
WEST FRISIAN ISLANDS
LEEUWARDEN
GRONINGEN
LEEUWARDEN
EELDE
DEN HELDER
ALKMAAR
HAARLEM
AMSTERDAM
SCHIPHOL
YPENBURG
VALKENBURG
UTRECHT
ROTTERDAM
SOESTERBERG
APELDOORN
DEELEN
ZWOLLE
Urk
EMMEN
ENSCHEDE
TWENTHE
NETHERLANDS
FEDERAL REPUBLIC OF GERMANY
LEMWERDER
BREMEN
OLDENBURG
AHLHORN
Cloppenburg
DIEPHOLZ
CELLE
WUNSTORF
HANNOVER
BUCKEBURG
NORDHORN
RHEINE
HOPSTEN
OSNABRÜCK
MINDEN
MÜNSTER-OSNABRUCK
BIELEFELD
GUTERSLOH
MÜNSTER
HAMM
PADERBORN/LIPPSTADT
under construction
NIJMEGEN
S HERTOGENBOSCH
VOLKEL
LAARBRUCH
BREDA
GILZE-RIJEN
WOENSDRECHT
NETHERLANDS
BELGIUM
EINDHOVEN
DE PEEL
MÜLHEIM
DUISBURG
ESSEN
DORTMUND
KASSEL/CALDEN
KASSEL
ZOERSEL
OEURNE
ANTWERP
DÜSSELDORF
BRUGGEN
KLEINE-BROGEL
WILDENRATH
MÖNCHEN GLADBACH
GEILENKIRCHEN
BRUSSELS-NATIONAL
ZUTENDAAL
NOR 109
COLOGNE KBO 58Y
KOLN/BONN
SIEGEN
SIEGERLAND
ZUID-LIMBURG
ST TRUIDEN
BEAUVECHAIN
AACHEN
NORVENICH
BONN
BIERSET
LIÈGE
GOSSELIES
GIESSEN
FULDA
CHARLEROI
FLORENNES
MENDIG
KOBLENZ
under constr
BUCHEL
WIESBADEN AB
FRANKFURT
FRANKFURT MAIN
BERTRIX-JEHONVILLE
BELGIUM
LUXEMBOURG
FEDERAL REPUBLIC OF
SPANGDAHLEM AB
HAHN AB
BITBURG AB
PFERDSFELD
Charleville
TRIER
2323
WÜRZBURG
SEMBACH AB
MANNHEIM
LUXEMBOURG
KAISERSLAUTERN
LUDWIGSHAFEN
FRANCE
RAMSTEIN AB
ROUVRES
SAARBRUCKEN
ZWEIBRUCKEN AB
Verdun-sur-Meuse
FRESCATY
METZ
under construction
HEILBRONN
Karlsruhe
ROSIERES
SOLINGEN
STUTTGART
ROBINSON
NANCY
ESSEY
OCHEY
Saint-Dizier
ENTZHEIM
LE CHATEAU
Neufchâteau
MIRECOURT
LAHR
KBO-2
AREA CHART
1:2,000,000
KOLN/BONN
50°51.9'N 07°08.5'
DMAAC ED. 3 Dec.



KBO-3

RUNWAY CHART
1:62,500
KOLN/BONN
RUNWAYS 14L AND 32R
DMAAC ED. 3 Dec. 198

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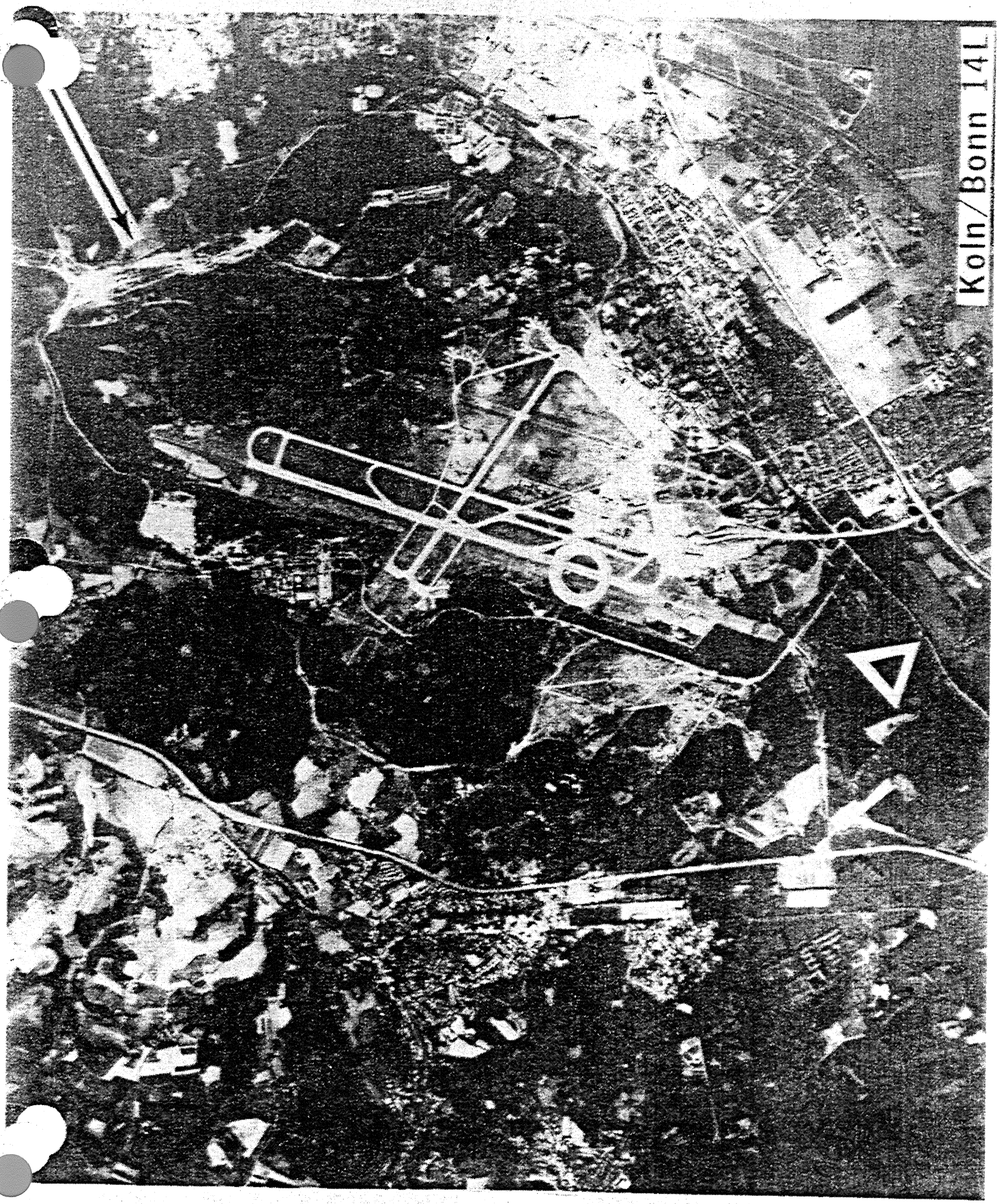
Koln/Bonn 14L

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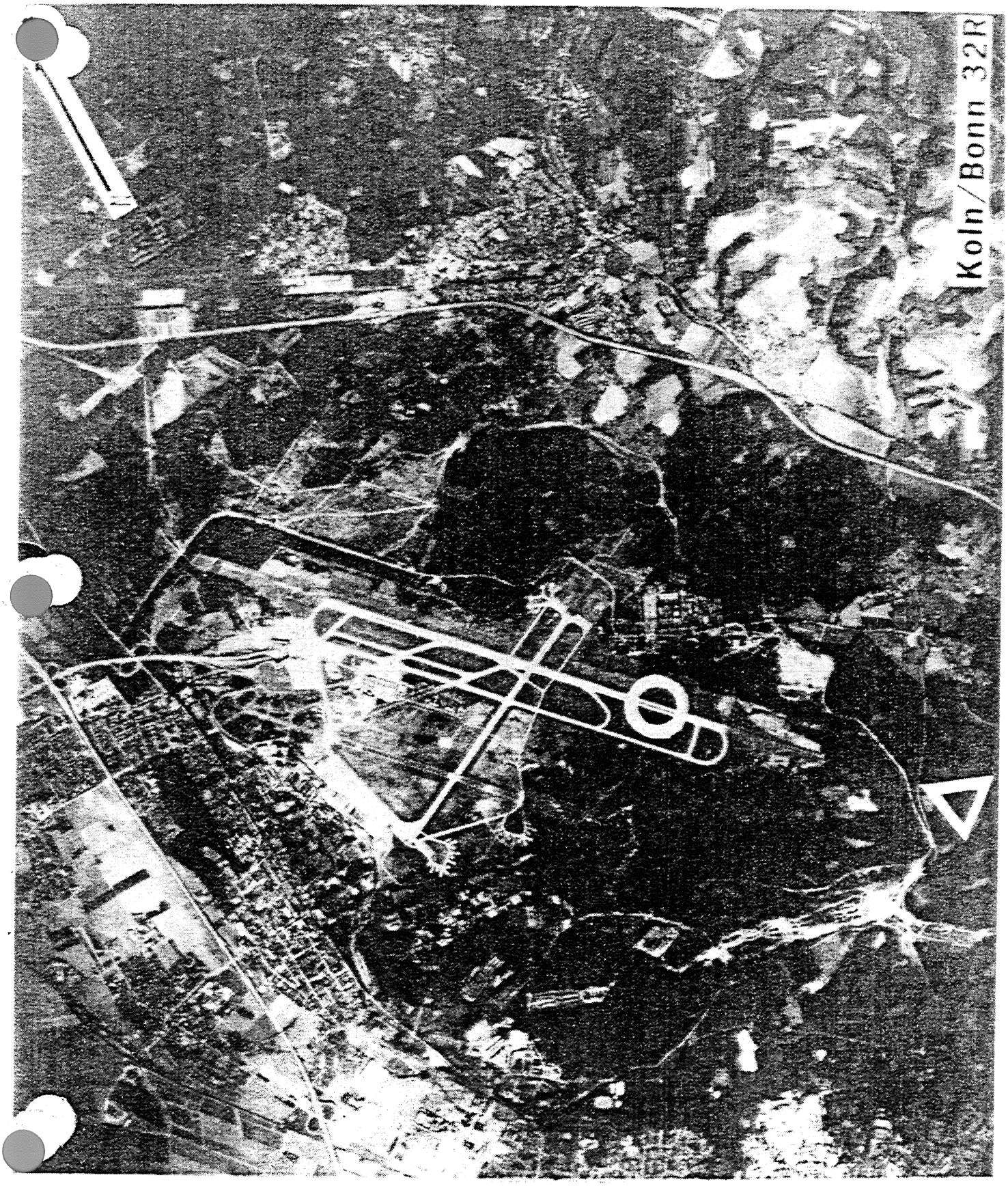
Koln/Bonn 32R

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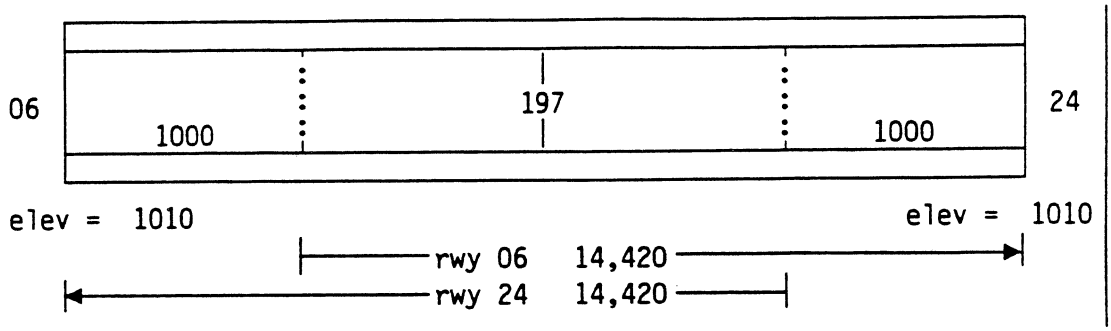


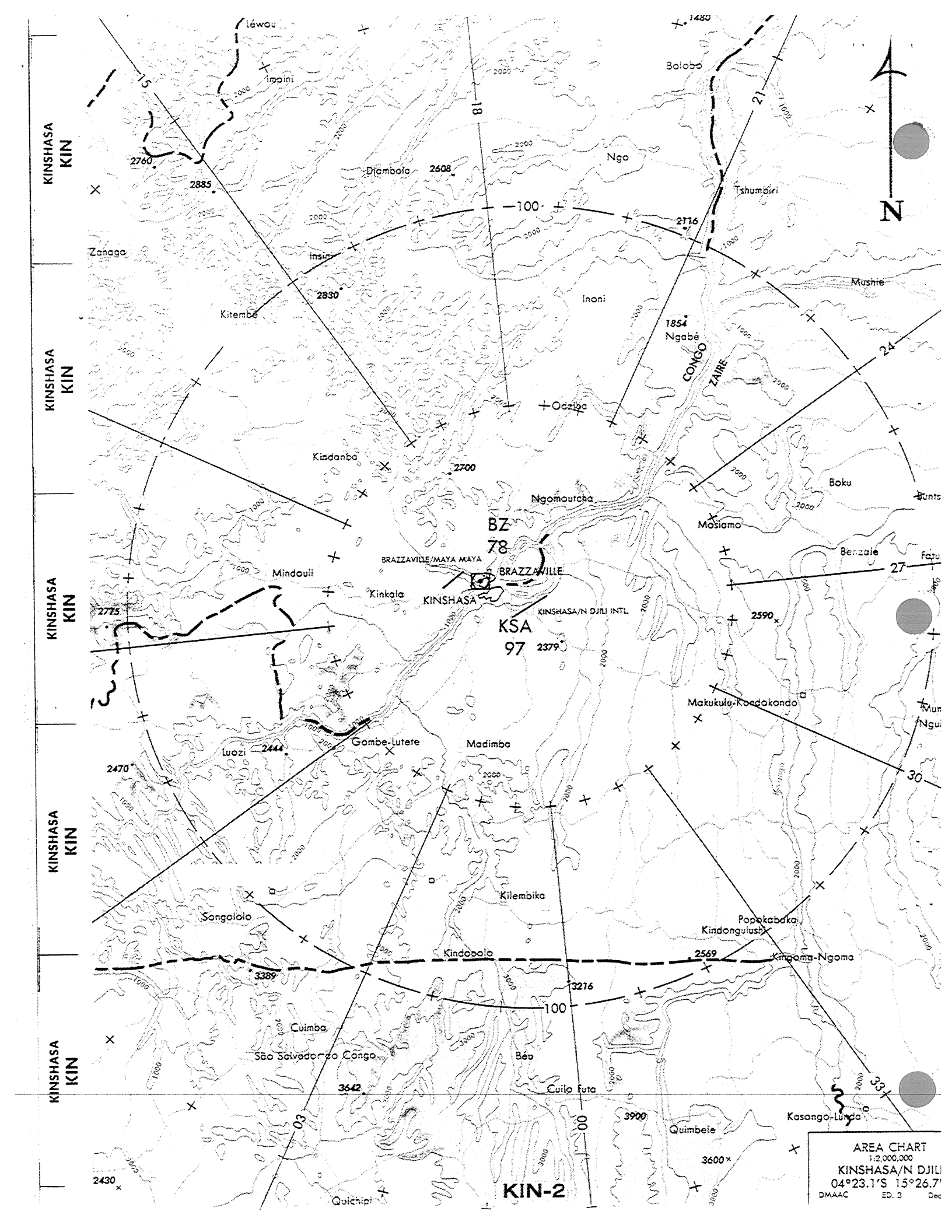
TACAN: BZ-78x (Pri-DME) KSA-97x (Sec-DME)
I/F above: N:clear E:clear N:clear E:clear
S:clear W:clear S:clear W:clear

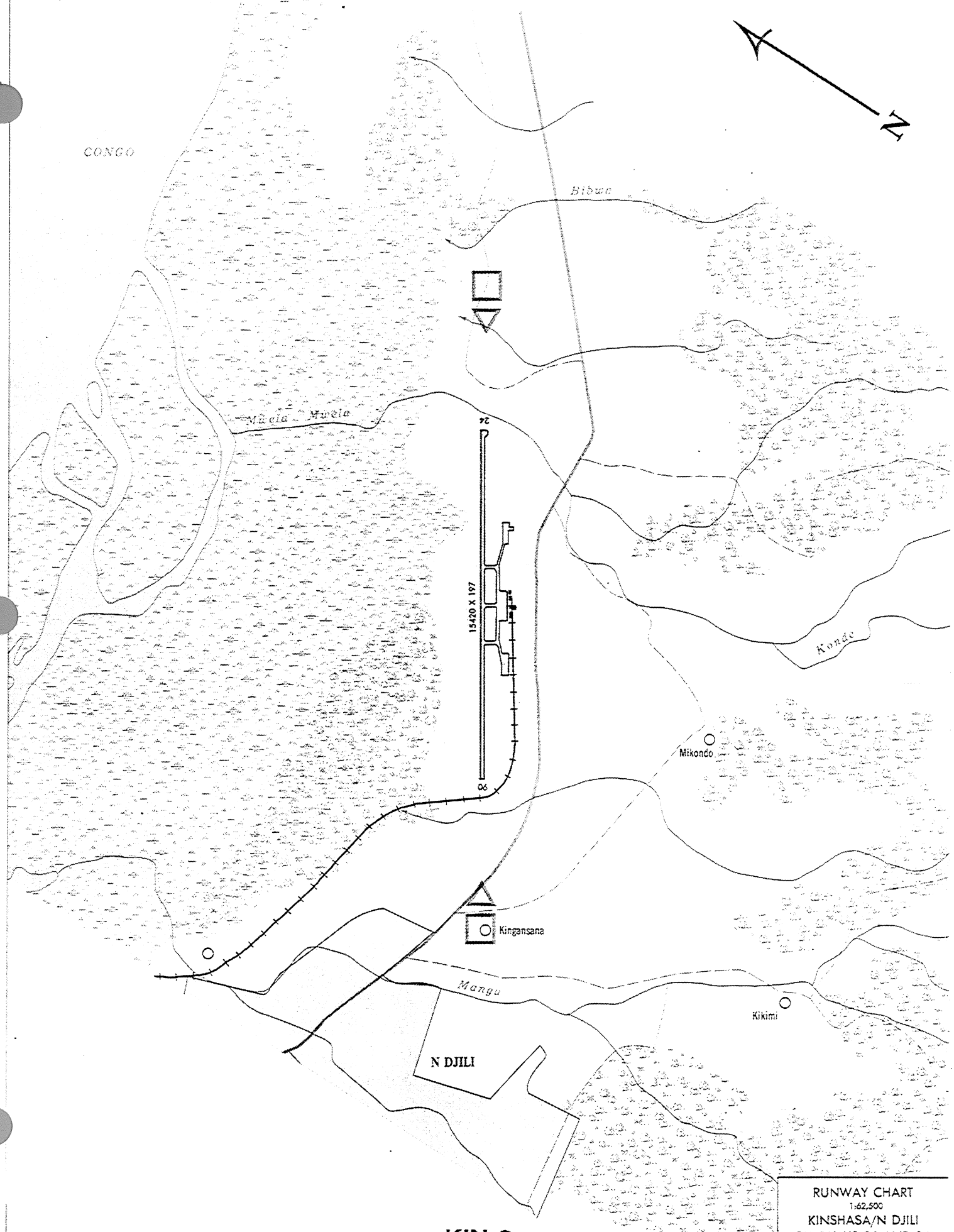
MLS: none
PAPI: none
Ball Bar: none
UHF: none

WARNING

- DME (Ch 97) is unreliable. Plan to use Brazzaville DME (Ch 78)
- Although there is a displaced threshold marked 4500 ft down rwy 06, the entire length is suitable for orbiter landings
- Expect thundershowers in the area from October through May. During June through September, expect visibility to be 3 n. mi. or less below 10,000 ft due to smoke and haze

KINSHASA KIN
KINSHASA KIN
KINSHASA KIN
KINSHASA KIN


KINSHASA KIN
KINSHASA KIN
KINSHASA KIN
KINSHASA KIN
KINSHASA KIN
Lewou
Impini
Bolobo
Djamboia
2608
Ngo
Tshumbiri
2116
Zanaga
Kitembé
2830
Inoni
Mushie
1854
Ngabé
CONGO
ZAIRE
Oczipa
Kimdanba
2700
Boku
Ngomoutcha
BZ
78
BRAZZAVILLE/MAYA MAYA
BRAZZAVILLE
Mosiamo
Benzale
Mindouli
Kinkala
KINSHASA
KINSHASA/N DJILI INTL
KSA
97
2379
2590
2775
Makukulu-Kocdokondo
Gombe-Lutete
Madimba
Luozi
2444
2470
Kilembika
Songololo
Popokabaka
Kindongulushy
Kindobolo
2569
Kingoma-Ngoma
3389
3276
Cuimba
São Salvedor do Congo
Bau
3642
Cuilo Futa
Kasongo-Lunda
3900
Quimbele
3600
2430
Quichipi
KIN-2
AREA CHART
1:2,000,000
KINSHASA/N DJILI
04°23.1'S 15°26.7'
DMAAC
ED. 3
Dec



RUNWAY CHART
1:62,500
KINSHASA/N DJILI
RUNWAYS 06 AND 24
DMAAC ED. 3 Dec. 1988

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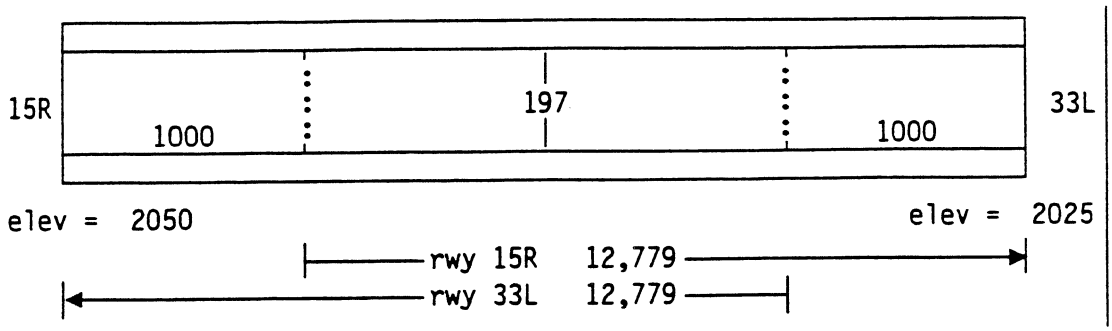
King Khalid, Saudi Arabia

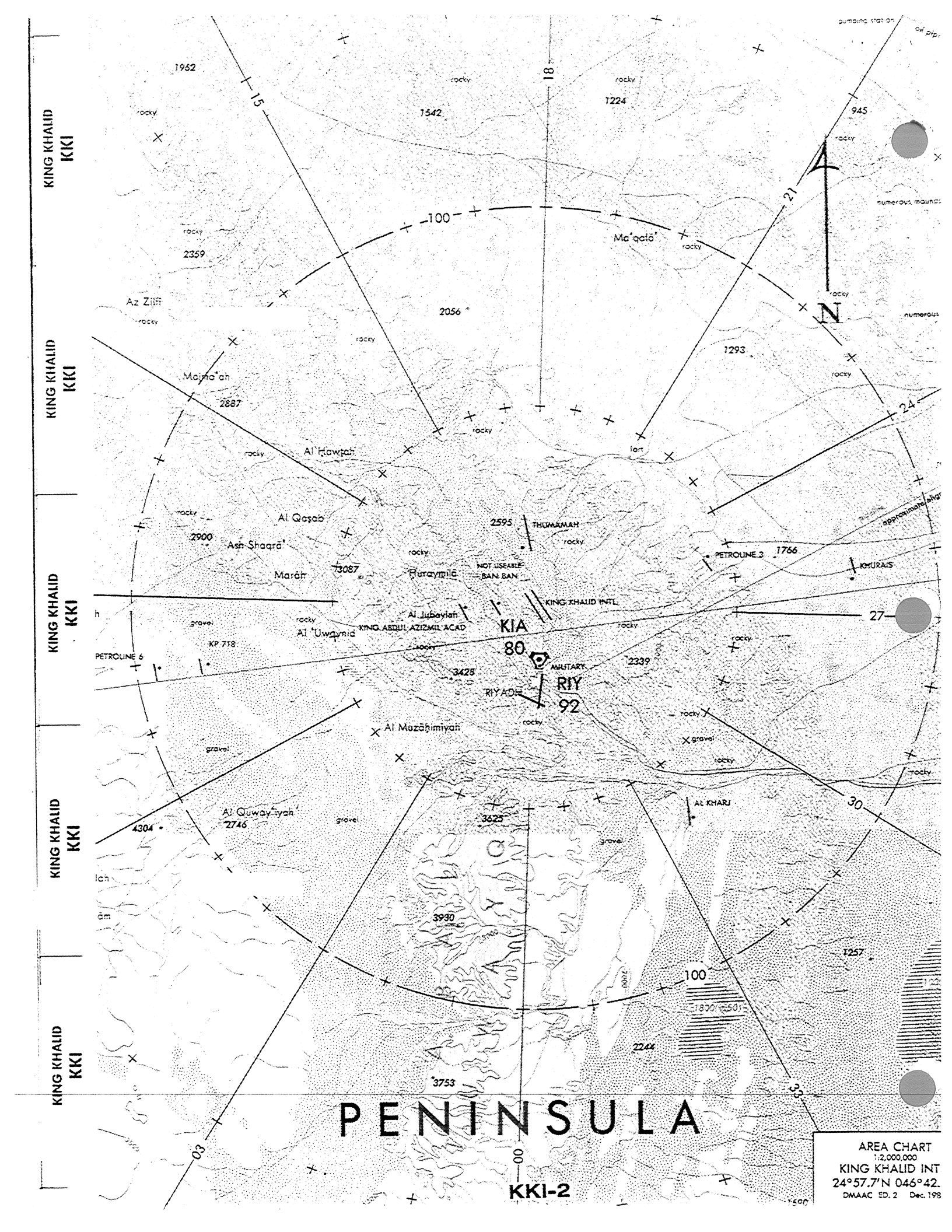
Table Identifier **KKI**

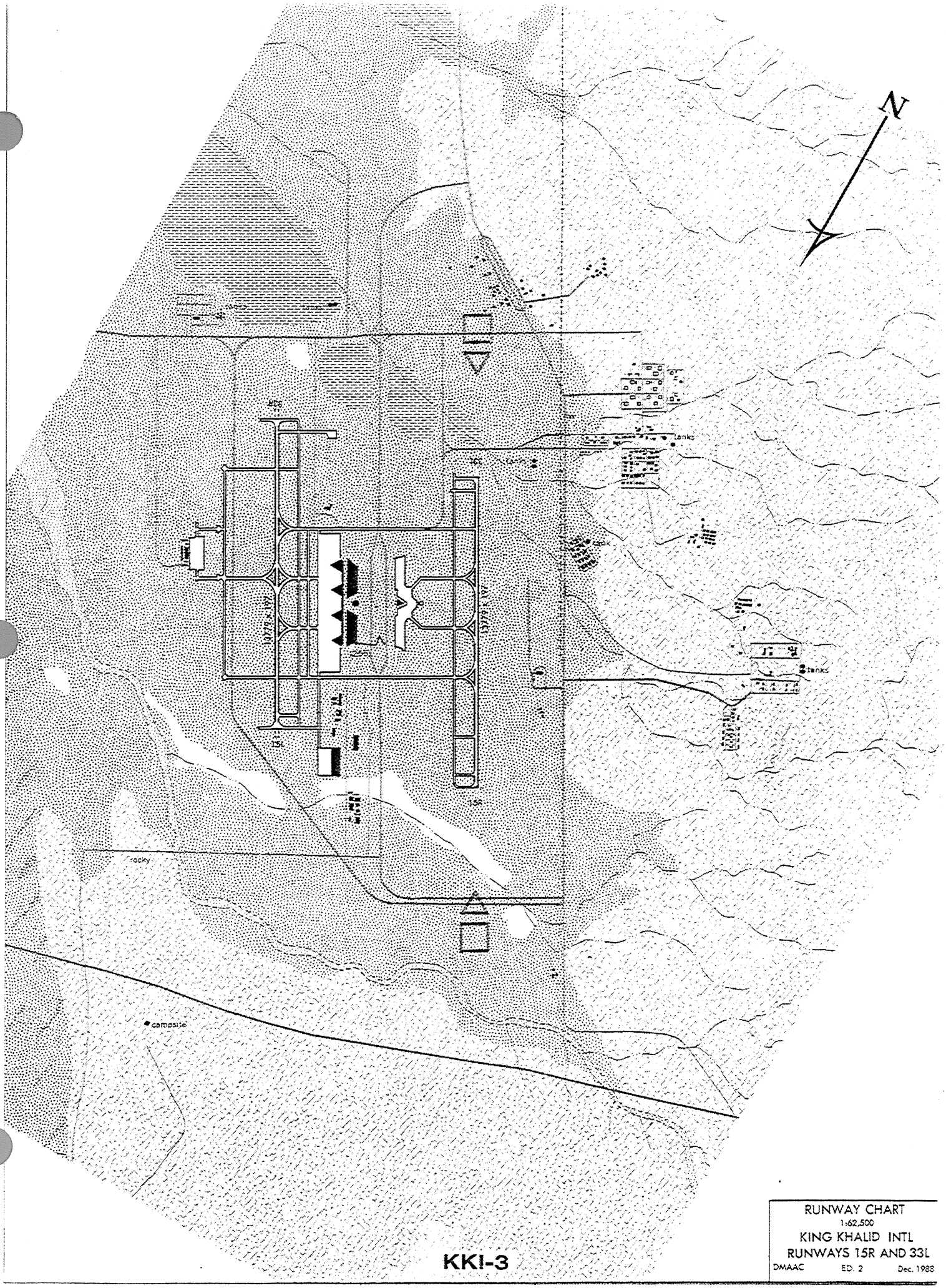


TACAN: RIY-92x (Pri) KIA-80x (Sec)
I/F above: N:clear E:clear N:120k E:120k
S:clear W:clear S: 95k W: 95k

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
PENINSULA
KKI-2
AREA CHART
1:2,000,000
KING KHALID INT
24°57.7'N 046°42.
DMAAC SD. 2 Dec. 198
KIA
80
MILITARY
RIY
92
RIYADH
KING KHALID INTL
KING ABDUL AZIZ MIL ACAD
PETROLINE 3
PETROLINE 6
KHURAIS
AL KHARJ
THUMAMAH
Az Zilfi
Majma'ah
Al Hawtah
Al Qaşab
Ash Shaqrā'
Marāt
Huraymilā
Al Jubaylah
Al 'Uwaynid
Al Muzāhimiyah
Al Quway'iyah
Ma'qalā'
NOT USEABLE
BAN BAN
KP 718
numerous mounds
approximate airgr
pumping station
oil pipe
rocky
gravel
fort
1962
1542
1224
945
2359
2056
1293
2887
2900
3087
2595
1766
3428
2339
4304
2746
3625
3930
1257
2244
3753
1800
1500
15
18
21
24
27
30
33
03
00
100



RUNWAY CHART
1:62,500
KING KHALID INTL
RUNWAYS 15R AND 33L
DMAAC ED. 2 Dec. 1988

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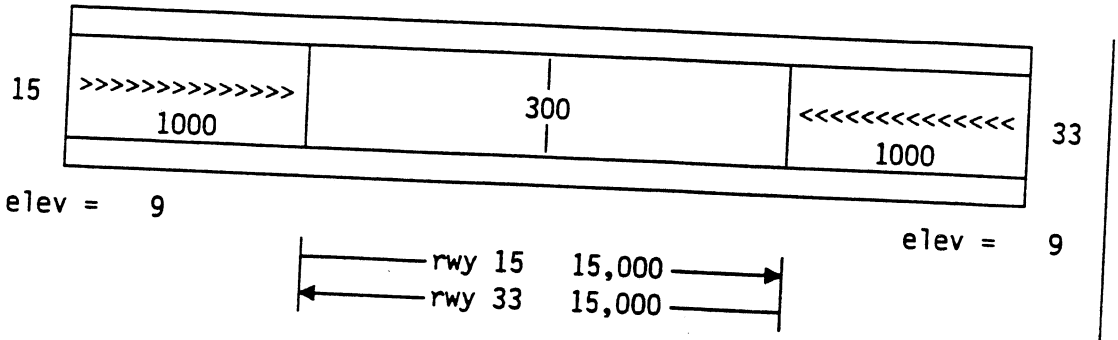
Kennedy Space Center, Florida

Table Identifier **KSC**



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

COF-97x (Sec)
N:135k E:clear
S:clear W:150k

RTLS I/F: N:clear E:clear
S:clear W:clear

N:160k E:clear
S:clear W:clear

MLS: (15-Sr) ch 8; (33-Sr) ch 6
PAPI: 15,33
Ball Bar: 15,33
UHF: yes

KENNEDY KSC

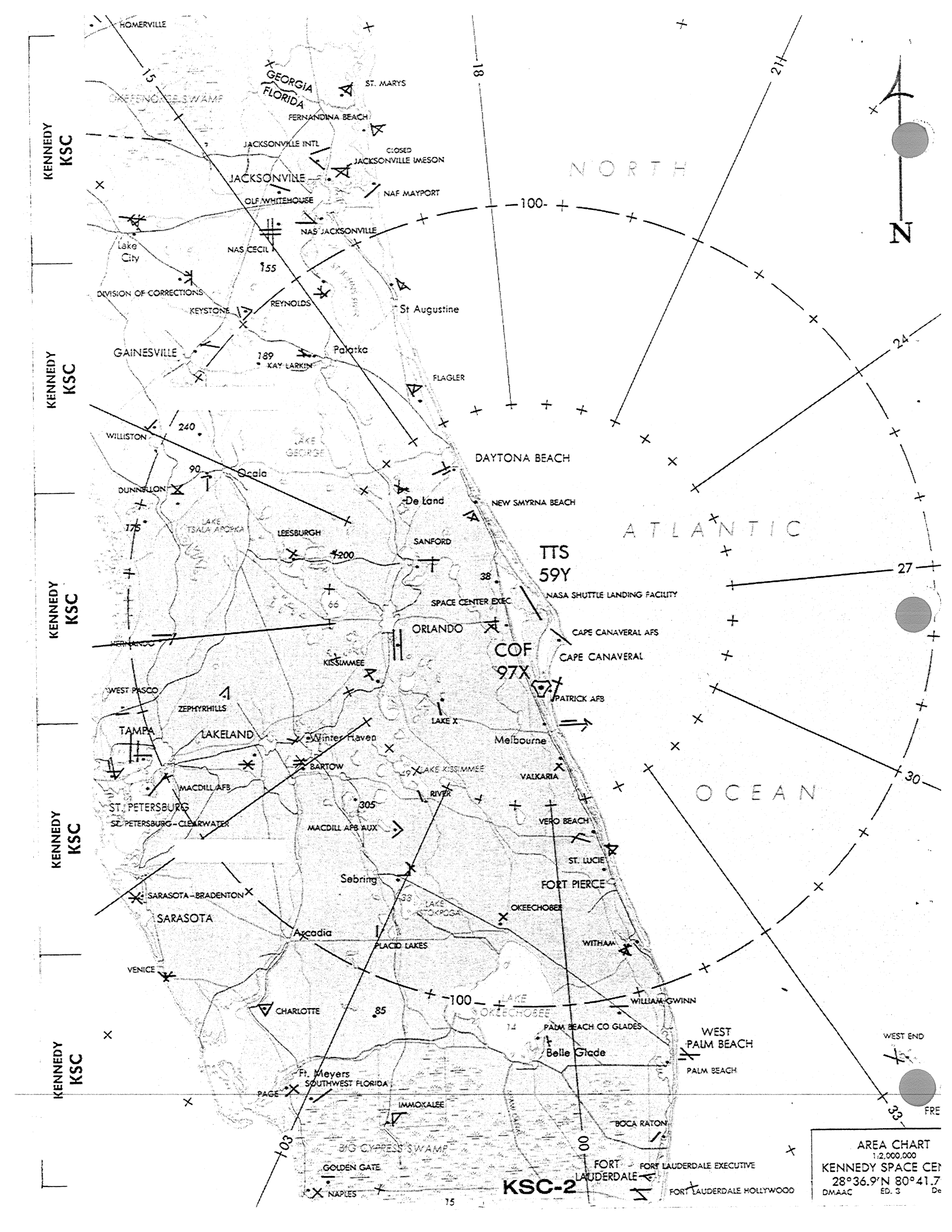
KENNEDY KSC

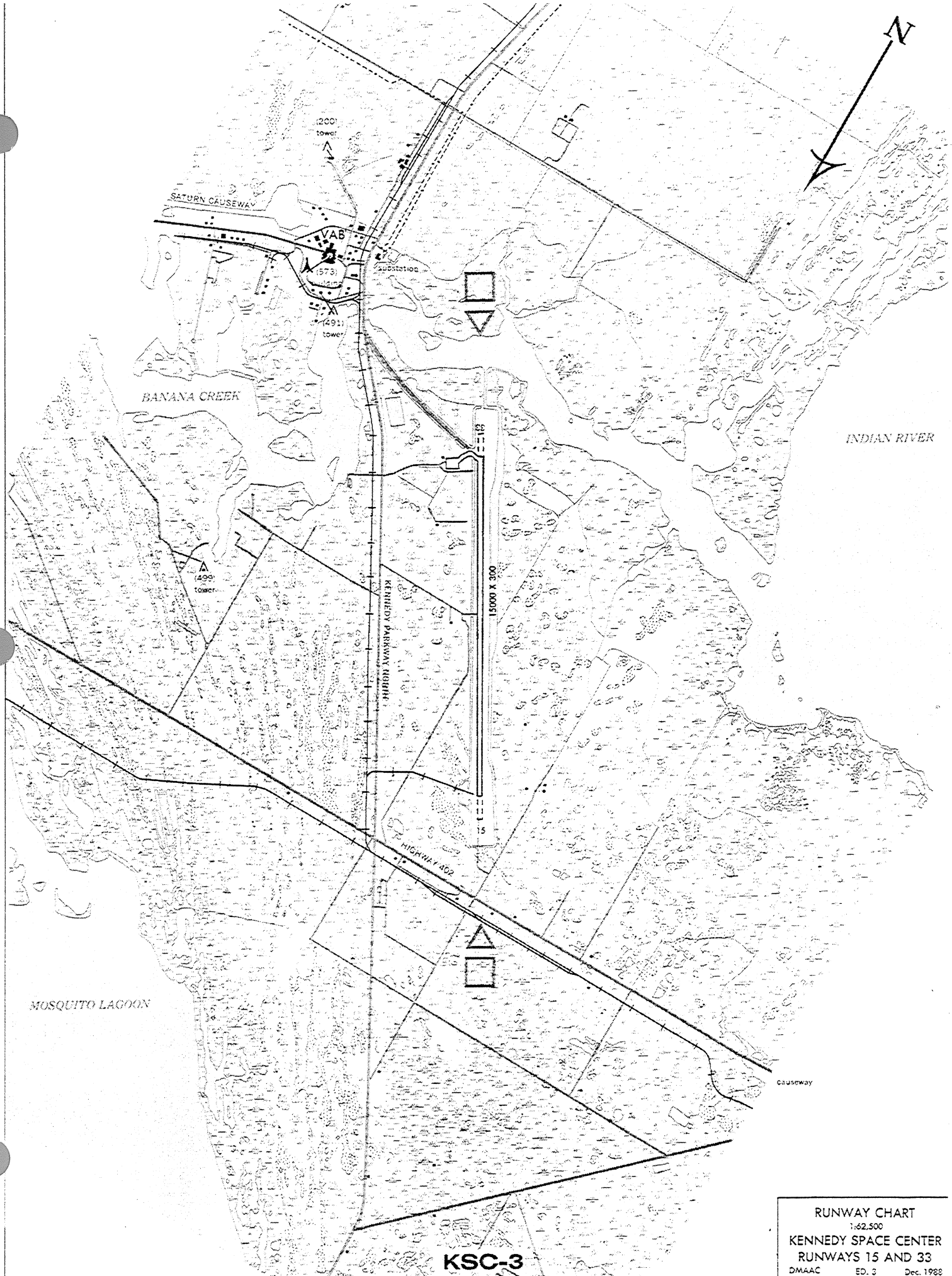
KENNEDY KSC

KENNEDY KSC

KENNEDY KSC

MAPS/ALL/GEN B


KENNEDY KSC
KENNEDY KSC
KENNEDY KSC
KENNEDY KSC
KENNEDY KSC
HOMERVILLE
GEORGIA
FLORIDA
ST. MARYS
OKEFENOKEE SWAMP
FERNANDINA BEACH
JACKSONVILLE INTL
CLOSED
JACKSONVILLE IMESON
JACKSONVILLE
NAF MAYPORT
OLF WHITEHOUSE
NAS JACKSONVILLE
NAS CECIL
Lake City
155
DIVISION OF CORRECTIONS
KEYSTONE
REYNOLDS
St Augustine
GAINESVILLE
189
KAY LARKIN
Palatka
FLAGLER
WILLISTON
240
LAKE GEORGE
DAYTONA BEACH
90
Ocala
DUNNELLON
De Land
NEW SMYRNA BEACH
175
LAKE TSALA APOPKA
LEESBURGH
SANFORD
200
ATLANTIC
TTS
59Y
38
NASA SHUTTLE LANDING FACILITY
SPACE CENTER EXEC
66
ORLANDO
CAPE CANAVERAL AFS
COF
97X
CAPE CANAVERAL
HERNANDO
KISSIMMEE
WEST PASCO
ZEPHYRHILLS
PATRICK AFB
LAKE X
TAMPA
LAKELAND
Winter Haven
Melbourne
BARTOW
LAKE KISSIMMEE
VALKARIA
MACDILL AFB
RIVER
OCEAN
ST. PETERSBURG
ST. PETERSBURG-CLEARWATER
305
MACDILL AFB AUX
VERO BEACH
ST. LUCIE
Sebring
FORT PIERCE
SARASOTA-BRADENTON
SARASOTA
LAKE OKEECHOBEE
OKEECHOBEE
Arcadia
PLACID LAKES
WITHAM
VENICE
CHARLOTTE
85
LAKE OKEECHOBEE
WILLIAM-GWINN
PALM BEACH CO GLADES
WEST PALM BEACH
Belle Glade
PALM BEACH
WEST END
Ft. Meyers
SOUTHWEST FLORIDA
PAGE
IMMOKALEE
BOCA RATON
BIG CYPRESS SWAMP
GOLDEN GATE
FORT LAUDERDALE
FORT LAUDERDALE EXECUTIVE
FORT LAUDERDALE HOLLYWOOD
NAPLES
KSC-2
NORTH
N
15
18
21
24
27
30
33
100
103
00
AREA CHART
1:2,000,000
KENNEDY SPACE CEN
28°36.9'N 80°41.7
DMAAC
ED. 3



RUNWAY CHART
1:62,500
KENNEDY SPACE CENTER
RUNWAYS 15 AND 33
DMAAC ED. 3 Dec. 1988

KSC-3

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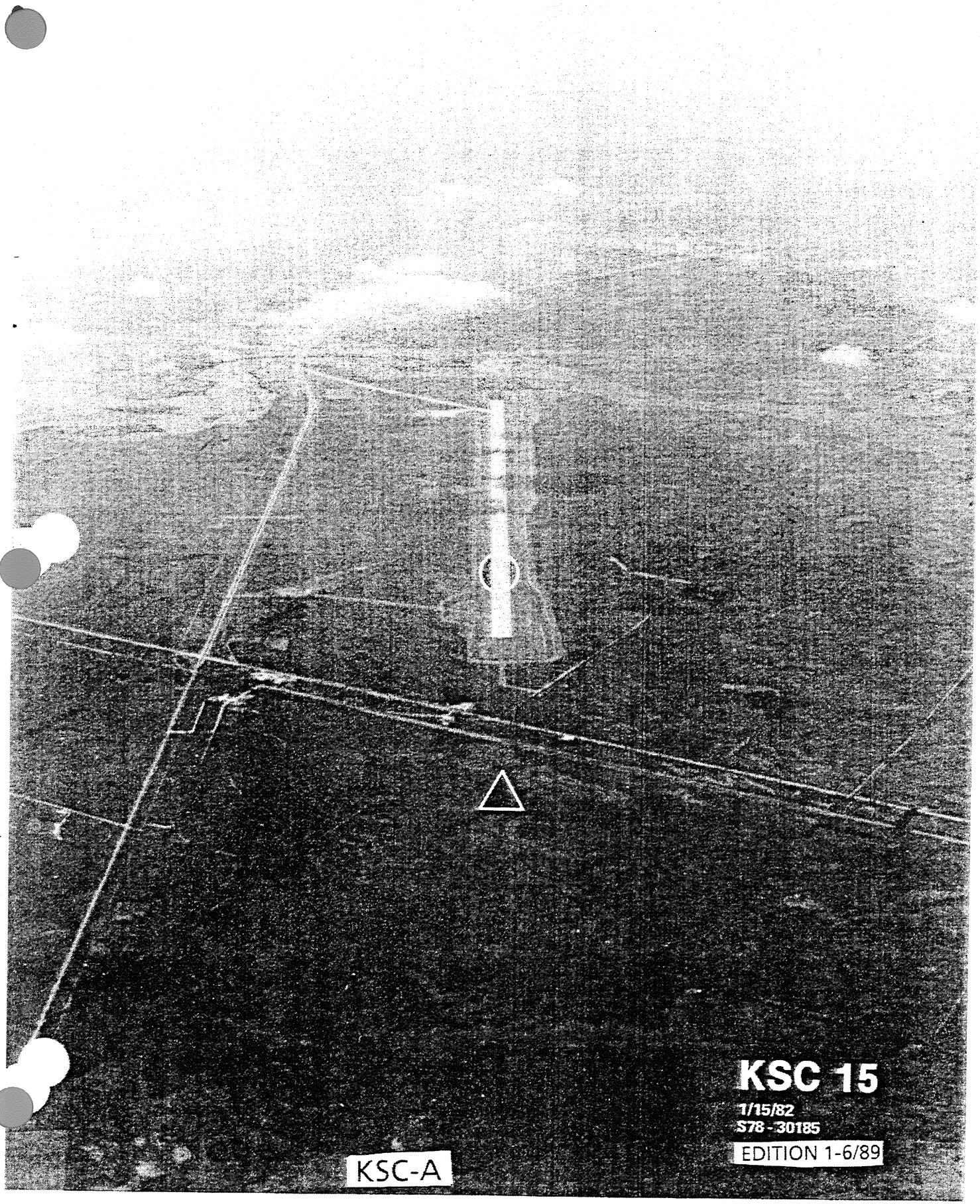

KSC 15

7/15/82
S78-30185

EDITION 1-6/89

KSC-A

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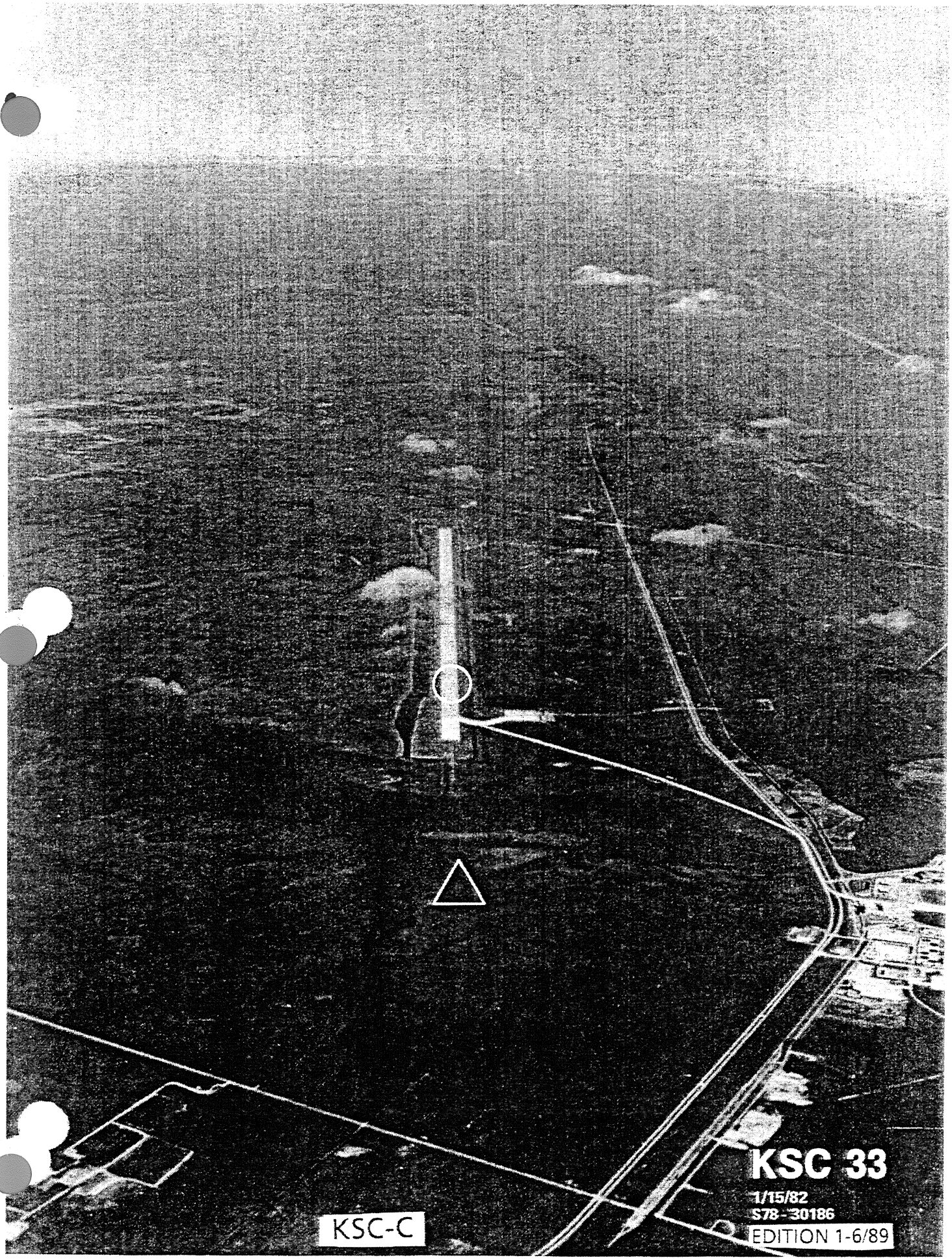

KSC 33

1/15/82
S78-30186
EDITION 1-6/89

KSC-C

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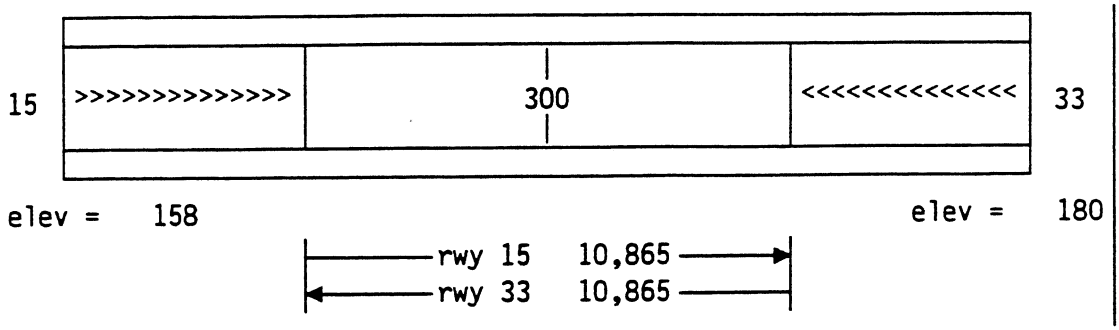
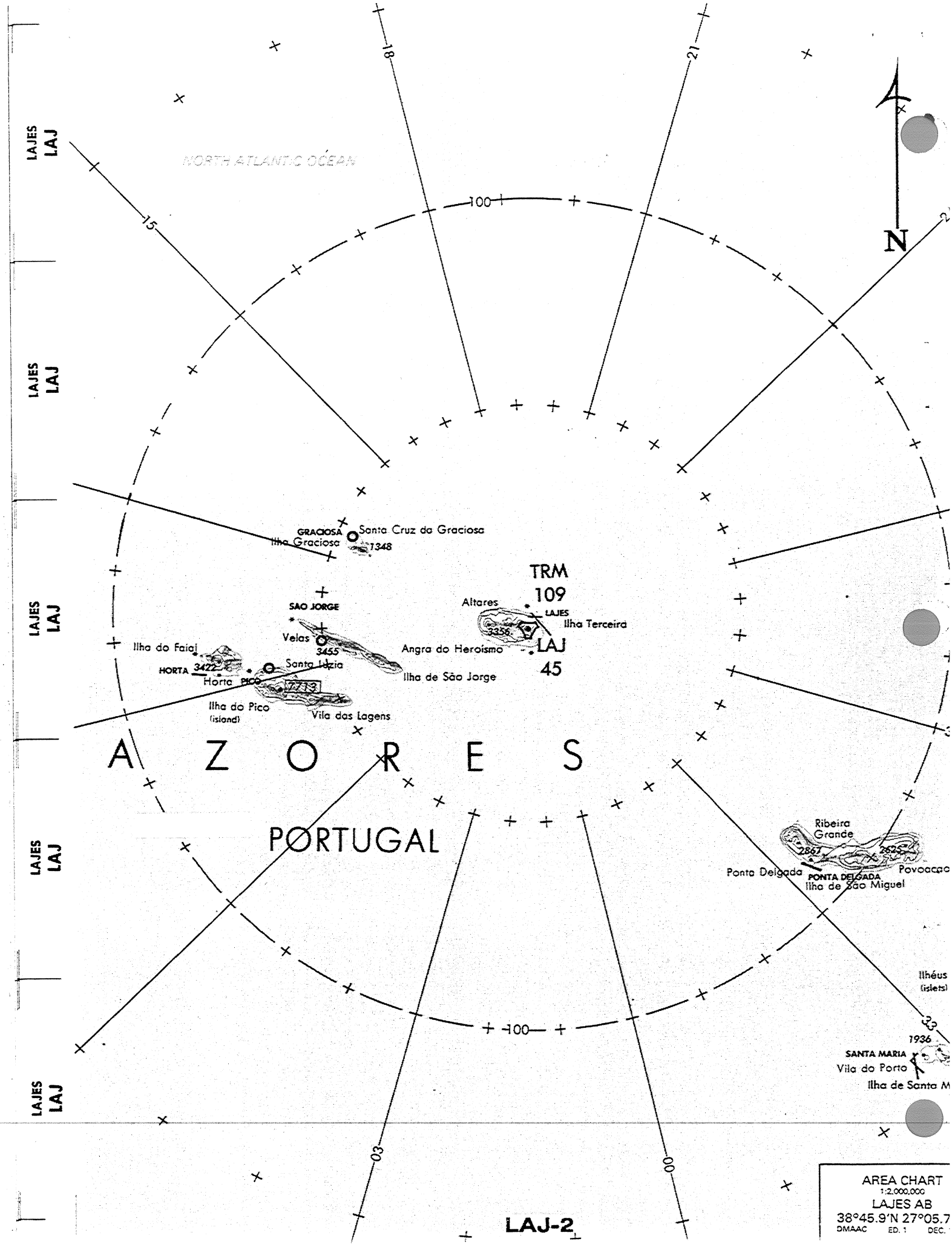
Lajes Air Base, Azores

Table Identifier **LAJ**

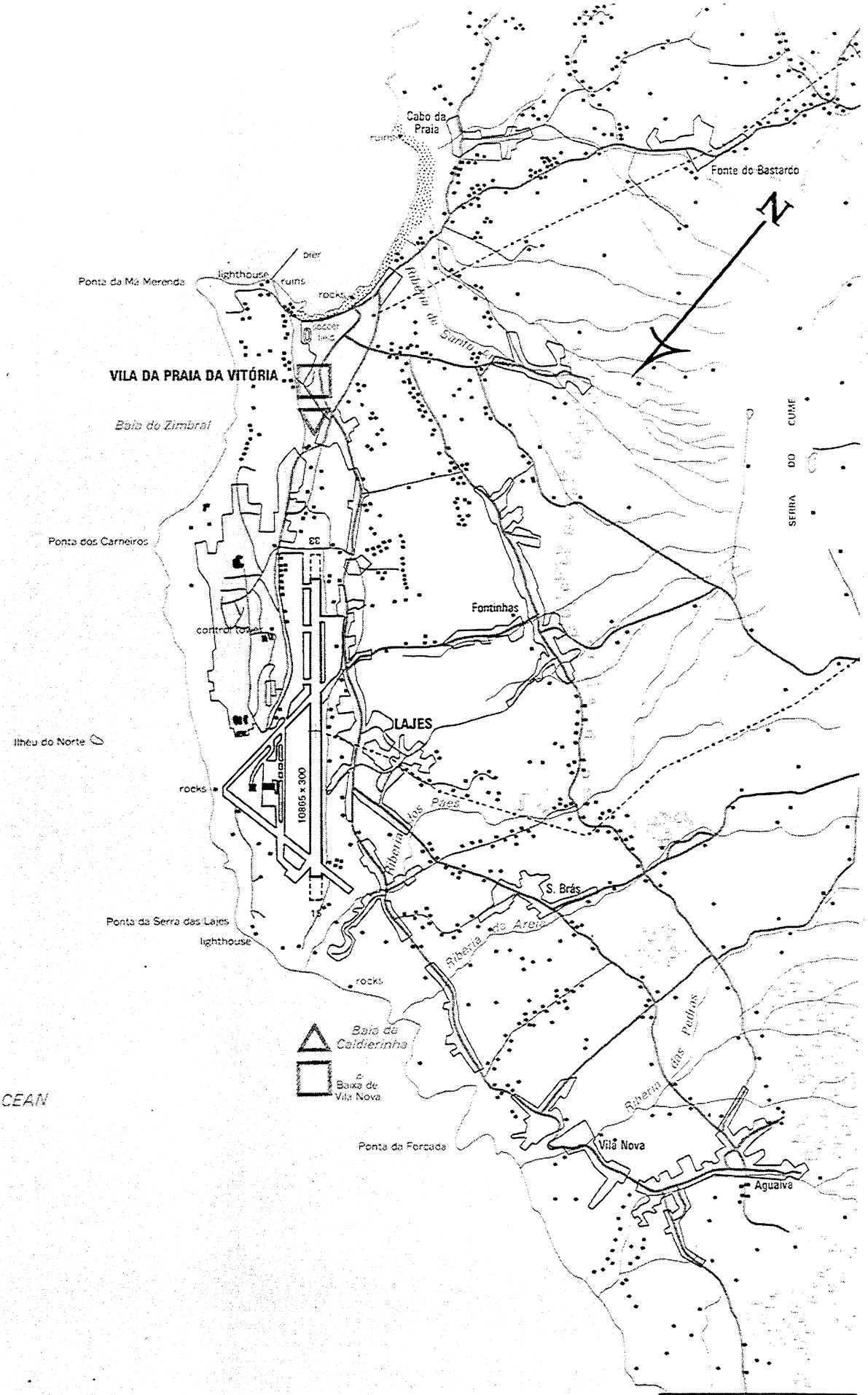


TACAN: LAJ-45x (Pri) TRM-109x (Sec)
I/F above: N:clear E:clear N:clear E:clear
S:clear W:clear S:clear W:clear

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



AREA CHART
1:2,000,000
LAJES AB
38°45.9'N 27°05.7
DMAAC ED. 1 DEC.



RUNWAY CHART
1:62,500
LAJES AB
RUNWAYS 15 AND 33
DMAAC ED 1 DEC 1990

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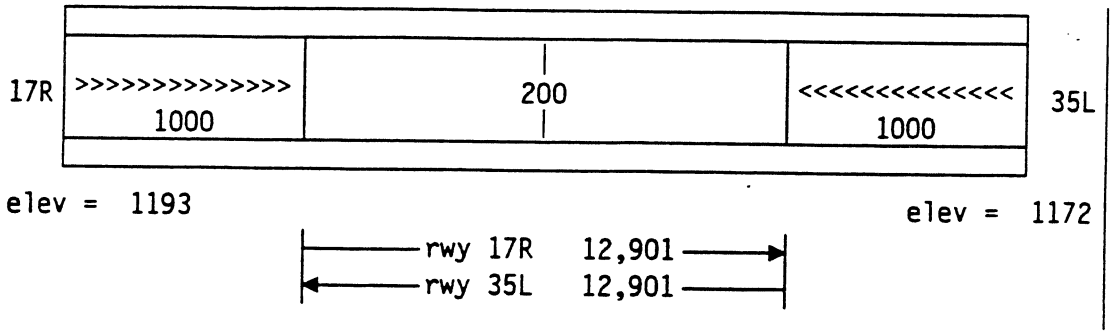
Lincoln Municipal, Nebraska

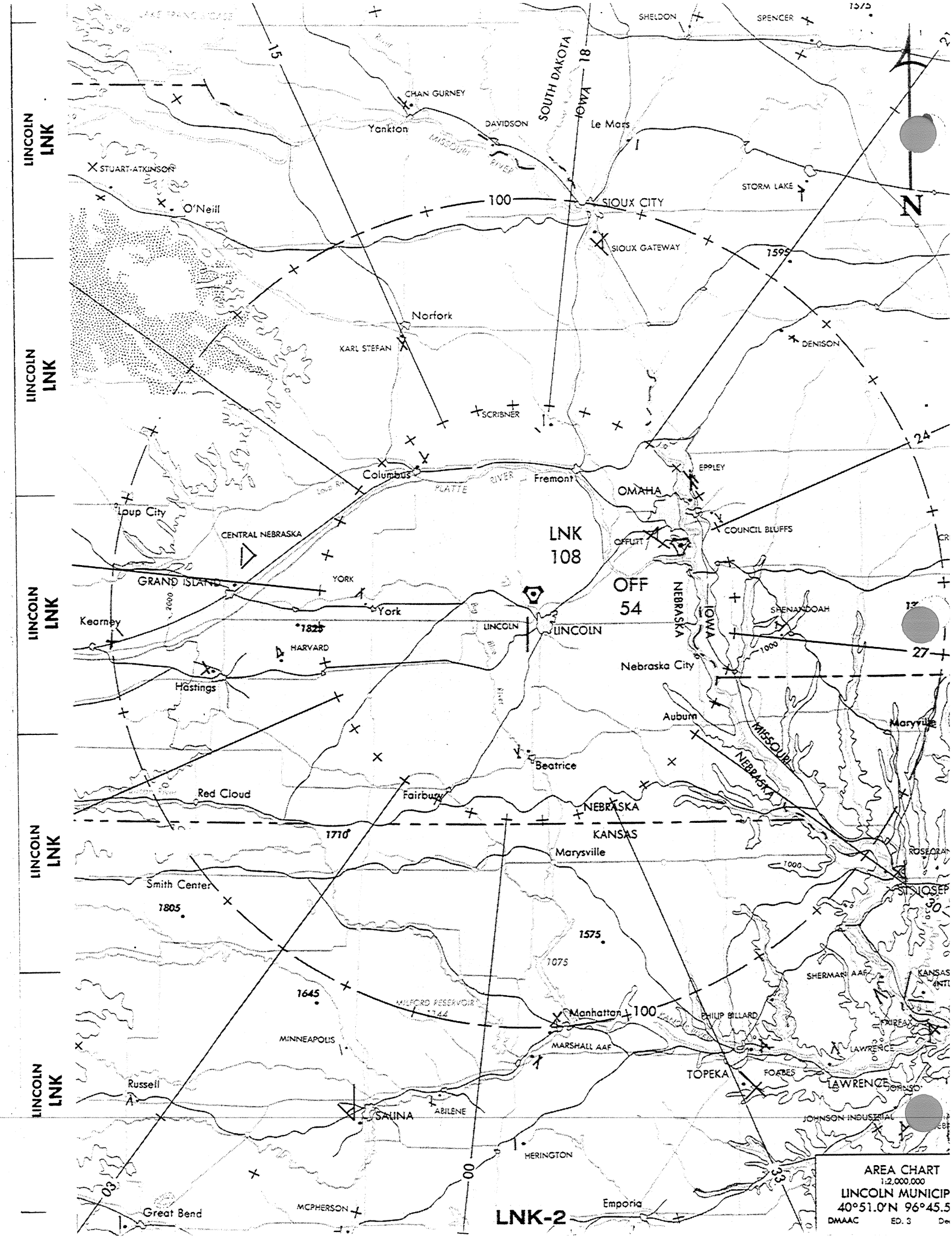
Table Identifier **LNK**

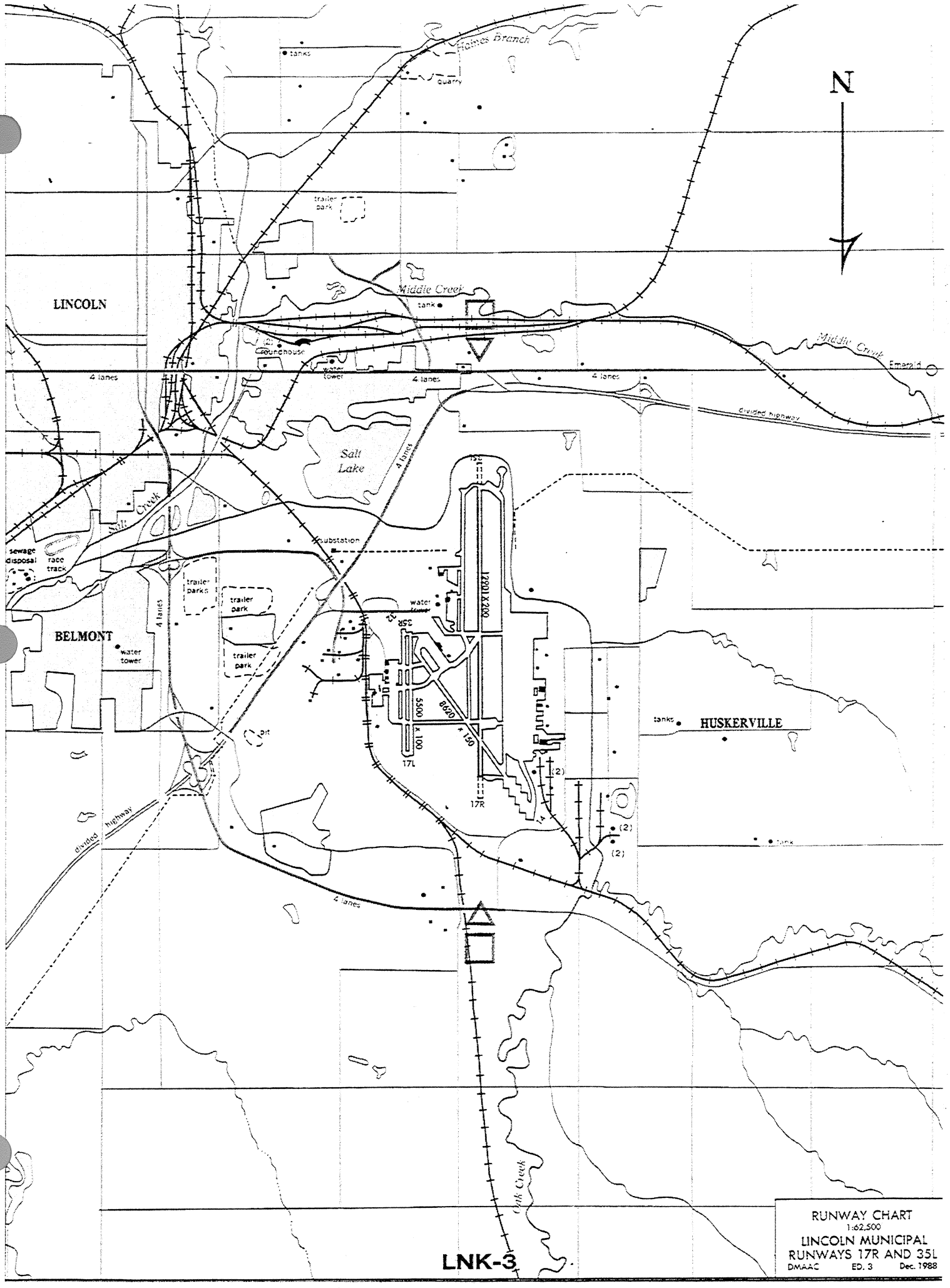


TACAN: LNK-108x (Pri) OFF-54x (Sec)
I/F above: N:130k E:120k N:clear E:clear
S:120k W:120k S:clear W:clear

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

LINCOLN LNK
LINCOLN LNK
LINCOLN LNK
LINCOLN LNK
LINCOLN LNK


LINCOLN LNK
LINCOLN LNK
LINCOLN LNK
LINCOLN LNK
LINCOLN LNK
LINCOLN LNK
SHELDON
SPENCER
SOUTH DAKOTA
IOWA
CHAN GURNEY
Yankton
DAVIDSON
Le Mars
MISSOURI RIVER
STUART-ATKINSON
O'Neill
SIOUX CITY
STORM LAKE
SIOUX GATEWAY
Norfork
KARL STEFAN
DENISON
SCRIBNER
Columbus
PLATTE RIVER
Fremont
EPPLEY
OMAHA
Loup City
CENTRAL NEBRASKA
LNK
108
OFF
54
COUNCIL BLUFFS
OFFUTT
GRAND ISLAND
YORK
York
LINCOLN
LINCOLN
NEBRASKA
IOWA
SHENANDOAH
Kearney
HARVARD
Nebraska City
Hastings
Auburn
Maryville
Beatrice
MISSOURI
NEBRASKA
Red Cloud
Fairbury
NEBRASKA
KANSAS
Marysville
Smith Center
ST JOSEPH
SHERMAN AAF
MILFORD RESERVOIR
Manhattan
PHILIP BILLARD
MINNEAPOLIS
MARSHALL AAF
TOPEKA
FORBES
LAWRENCE
Russell
SALINA
ABILENE
JOHNSON INDUSTRIAL
HERINGTON
Great Bend
MCPHERSON
Emporia
LNK-2
AREA CHART
1:2,000,000
LINCOLN MUNICIP
40°51.0'N 96°45.5
DMAAC
ED. 3


N
LINCOLN
BELMONT
HUSKERVILLE
Haines Branch
Middle Creek
Salt Creek
Salt Lake
Oak Creek
quarry
tanks
trailer park
trailer parks
water tower
4 lanes
divided highway
substation
sewage disposal
race track
pit
12001X200
35R
17L
17R
5500 X 100
6600 X 150
(2)
LNK-3
RUNWAY CHART
1:62,500
LINCOLN MUNICIPAL
RUNWAYS 17R AND 35L
DMAAC ED. 3 Dec. 1988

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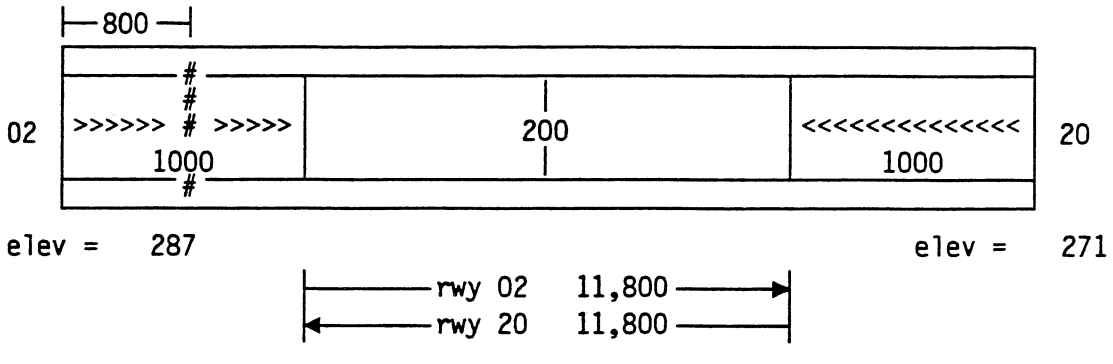


TACAN: MRN-100x (Pri) AOG-23x (Sec)
I/F above: N:120k E:130k N:clear E:clear
S:clear W:clear S:clear W:clear

MLS: (20-Sr) ch 6
PAPI: 20
Ball Bar: 20
UHF: yes (guard only after L/O)

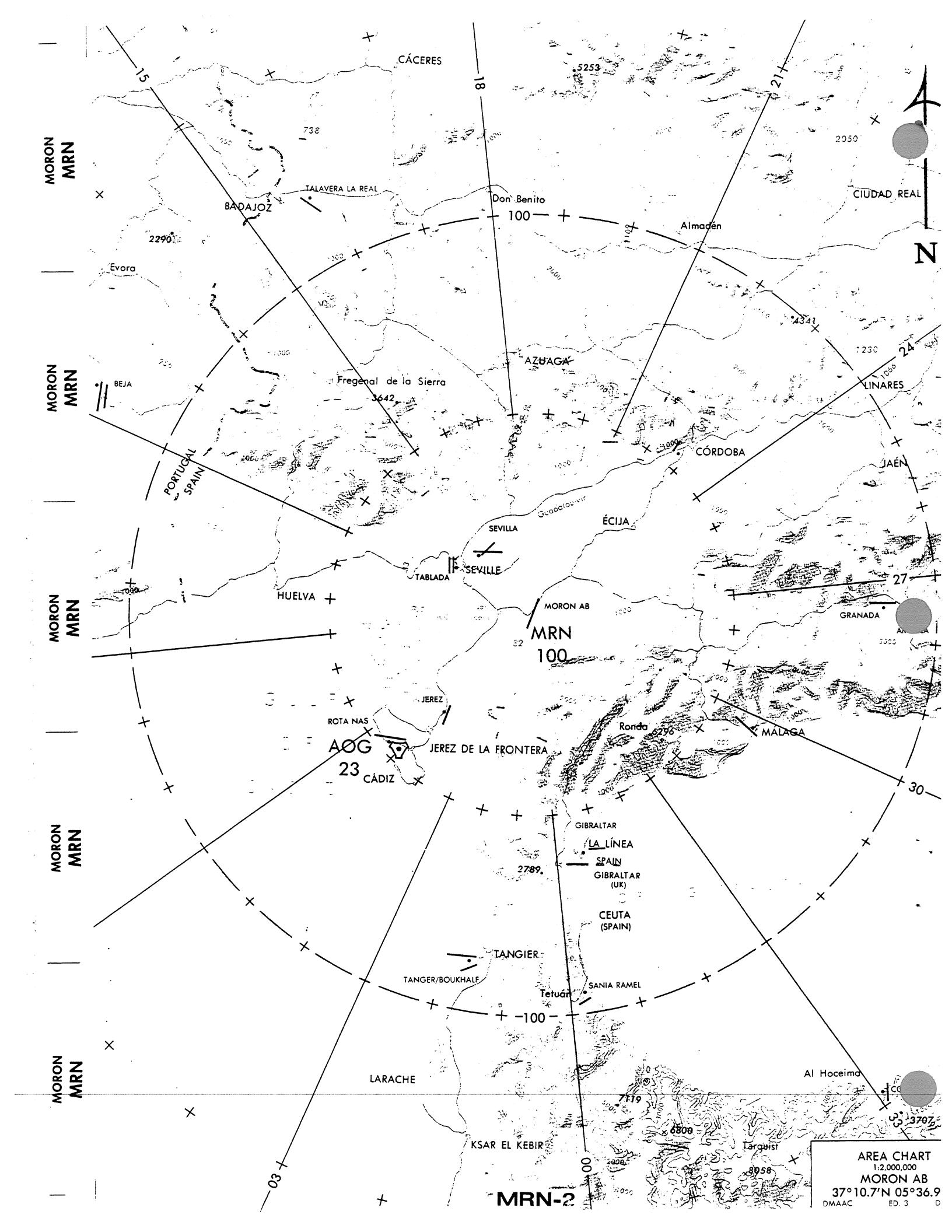
CAUTION

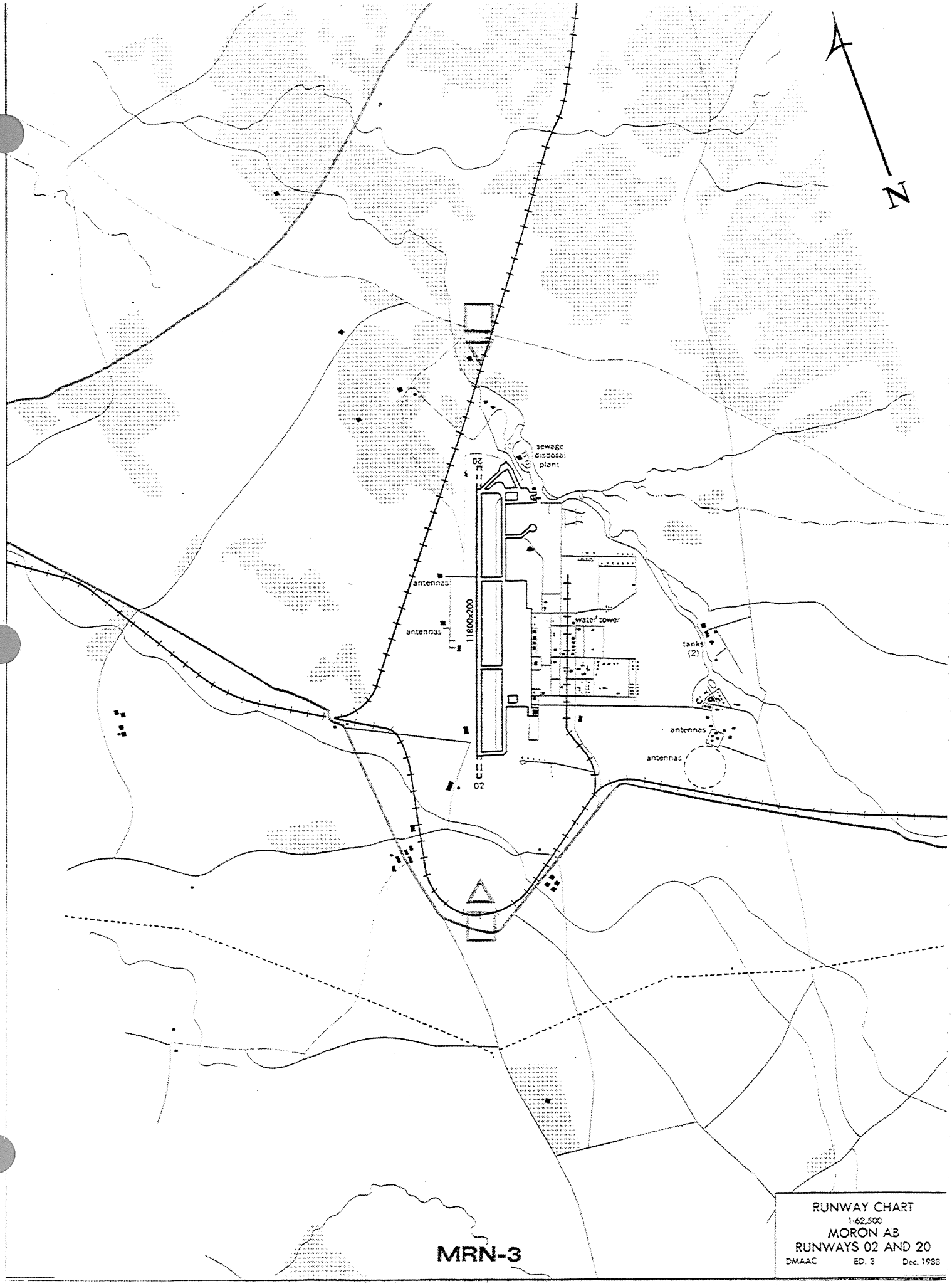
- The terrain on approach from either direction is 10 to 20 ft lower than the rwy

- Trees on the approach are not tall but can result in ground rush

NOTE
- The center 150 ft of the 200-ft wide rwy is resurfaced. The 50-ft shoulders give the visual perception of a 300-ft wide rwy

MORON MRN
MORON MRN
MORON MRN
MORON MRN
MORON MRN


MORON MRN
MORON MRN
MORON MRN
MORON MRN
MORON MRN
CÁCERES
5253
738
2050
TALAVERA LA REAL
BADAJOZ
Don Benito
CIUDAD REAL
Almadén
2290
Evora
N
4341
1230
AZUAGA
BEJA
Fregenal de la Sierra
3642
LINARES
PORTUGAL
SPAIN
CÓRDOBA
JAÉN
Guadalquivir
ÉCIJA
SEVILLA
SEVILLE
TABLADA
HUELVA
MORON AB
MRN
100
GRANADA
JEREZ
ROTA NAS
AOG
23
JEREZ DE LA FRONTERA
CÁDIZ
Ronda
6296
MÁLAGA
GIBRALTAR
LA LÍNEA
SPAIN
2789
GIBRALTAR
(UK)
CEUTA
(SPAIN)
TANGIER
TANGER/BOUKHALF
SANIA RAMEL
Tetuán
LARACHE
Al Hoceima
7119
3707
6800
KSAR EL KEBIR
Targuist
8058
15
18
21
24
27
30
33
03
00
100
-100
MRN-2
AREA CHART
1:2,000,000
MORON AB
37°10.7'N 05°36.9
DMAAC
ED. 3
D



RUNWAY CHART
1:62,500
MORON AB
RUNWAYS 02 AND 20
DMAAC ED. 3 Dec. 1988

MRN-3

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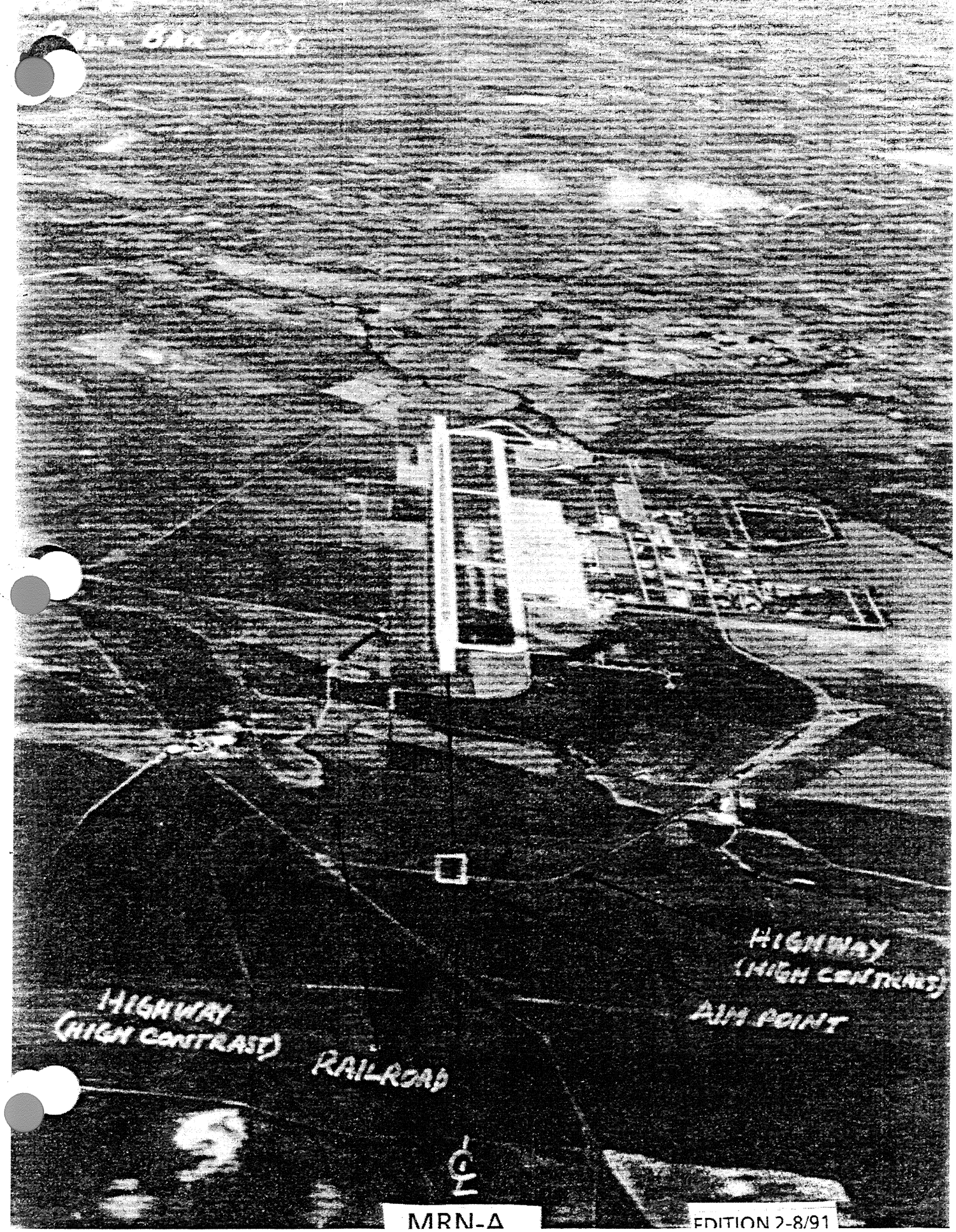
MRN 02 MORON


HIGHWAY
(HIGH CONTRAST)
RAILROAD
HIGHWAY
(HIGH CONTRAST)
AIM POINT

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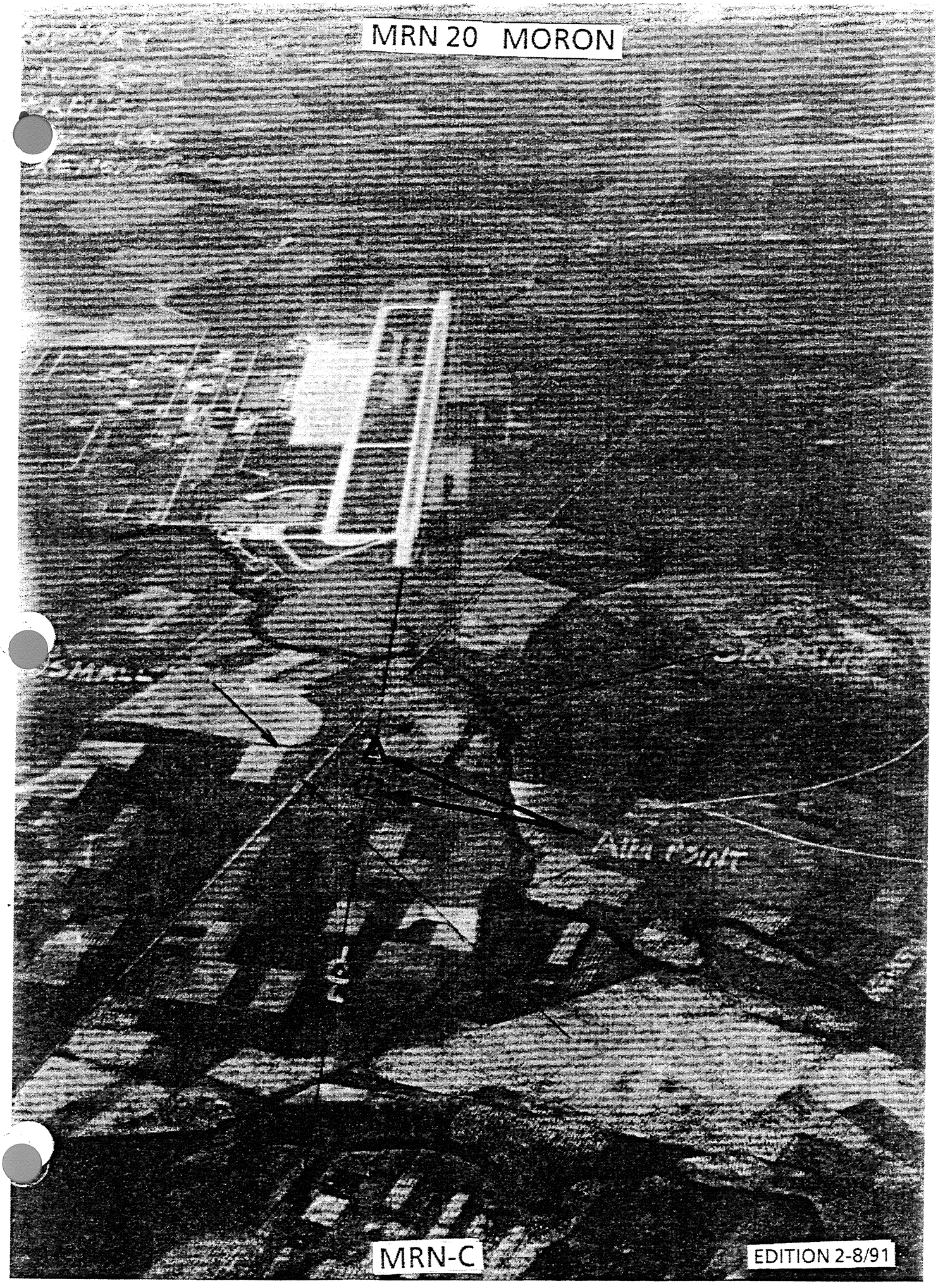
MRN 20 MORON
MRN-C
EDITION 2-8/91

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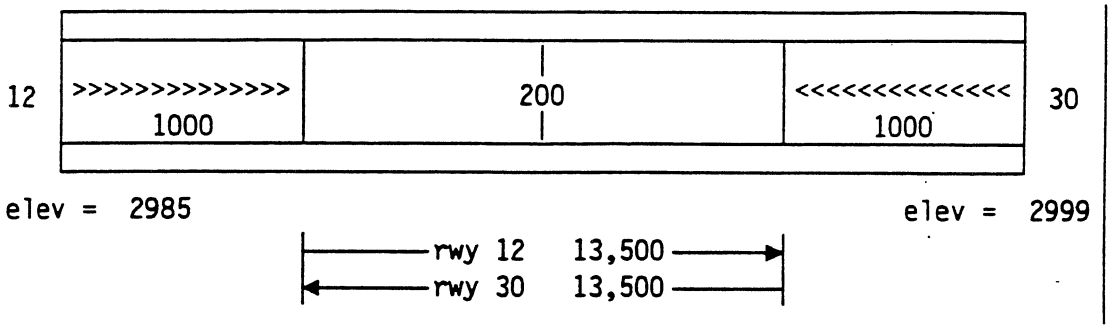
Mountain Home AFB, Idaho

Table Identifier **MUO**

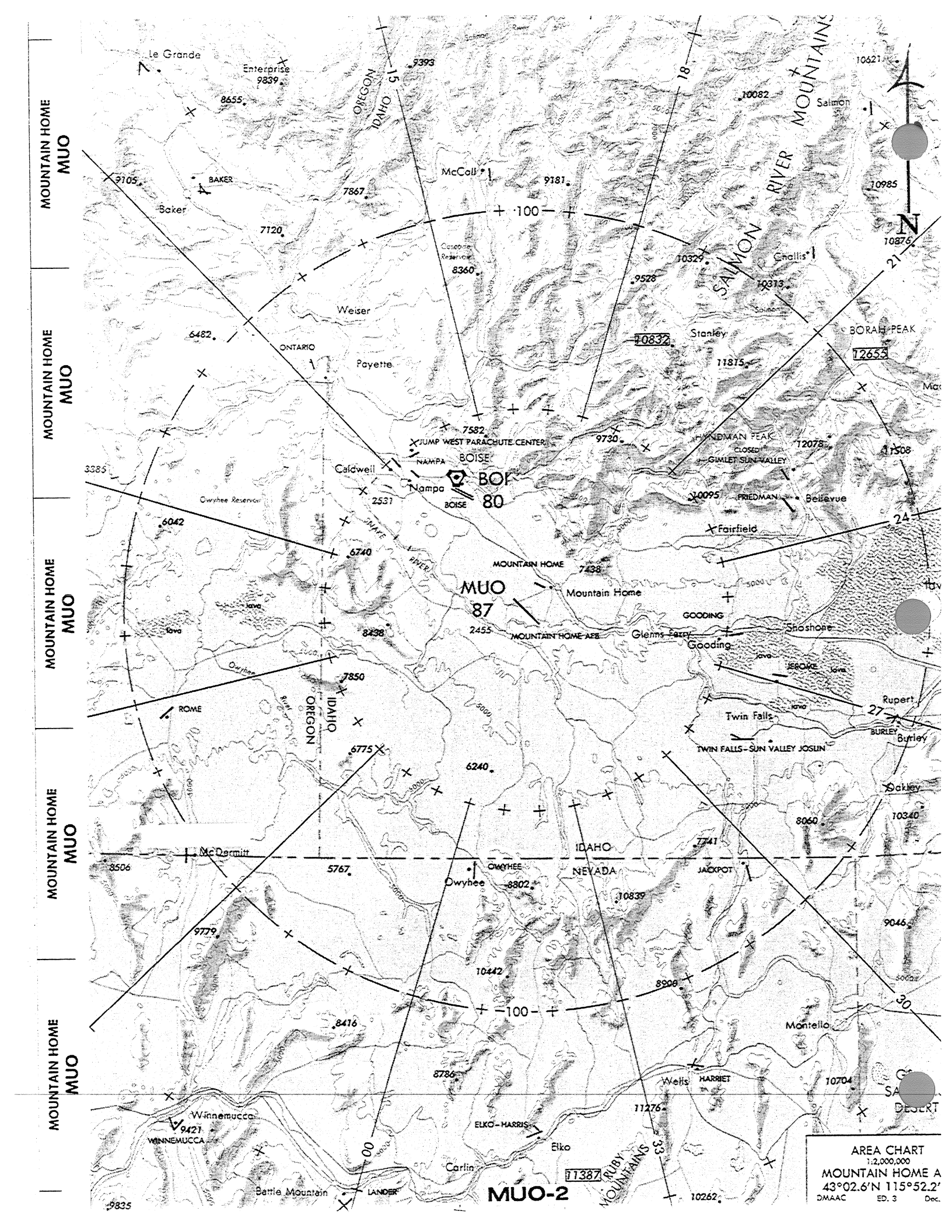


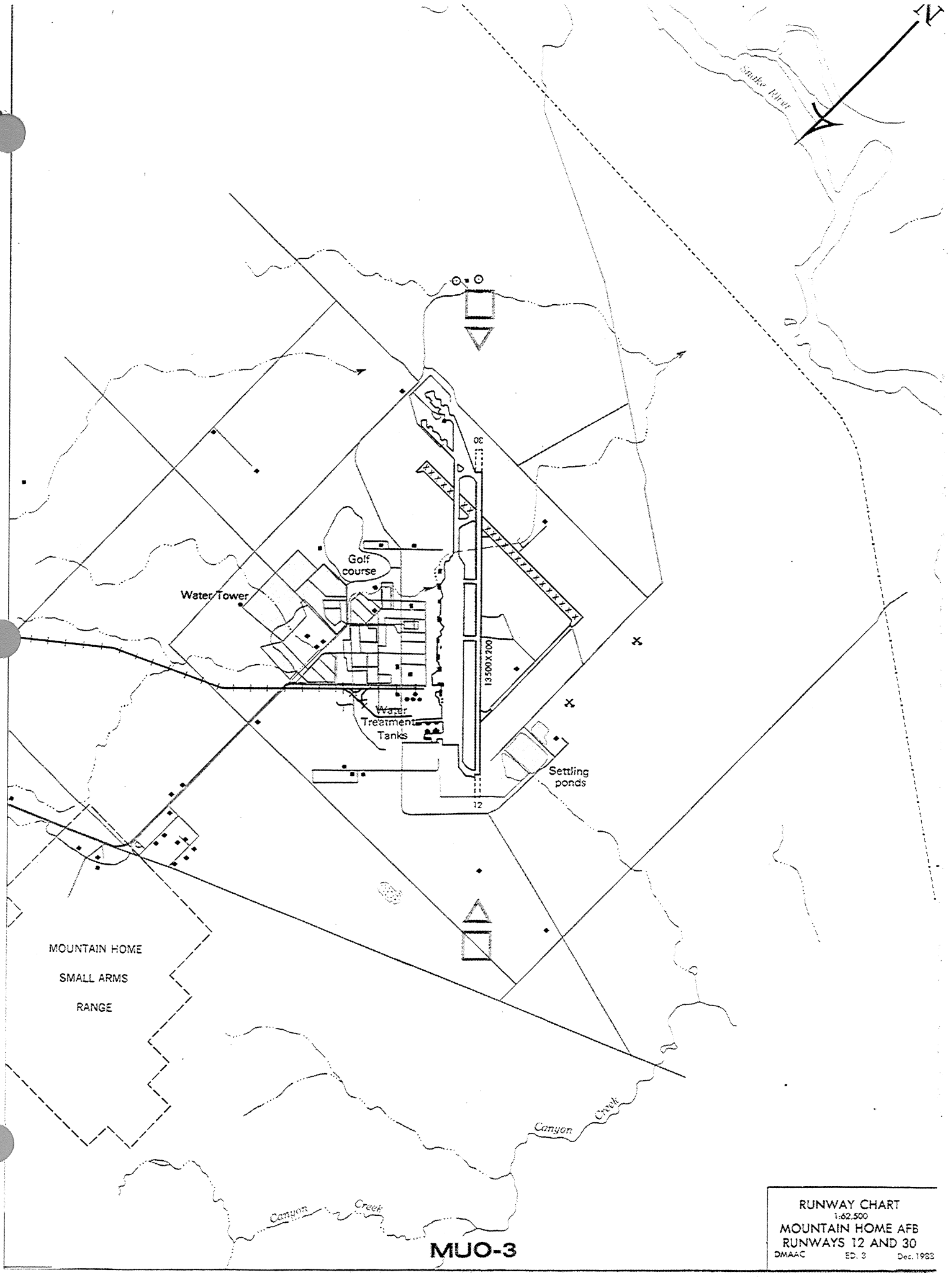
TACAN: MUO-87x (Pri) BOI-80x (Sec)
I/F above: N:80k E:clear N:clear E:140k
S:90k W:80k S:90k W:100k

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

MAPS/ALL/GEN B

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
La Grande
Enterprise
9839
8655
9393
OREGON
IDAHO
15
18
10621
10082
Salmon
SALMON RIVER MOUNTAINS
9105
BAKER
Baker
7867
McCall
9181
100
10985
7120
Cascade Reservoir
8360
10329
Challis
N
10876
9528
10313
21
Weiser
6482
ONTARIO
Payette
10832
Stanley
BORAH PEAK
12655
11815
7582
JUMP WEST PARACHUTE CENTER
9730
HYNDMAN PEAK
12078
11508
CLOSED
GIMLET SUN VALLEY
3385
NAMPA
BOISE
Caldwell
Nampa
BOI
80
10095
FRIEDMAN
Bellevue
Owyhee Reservoir
2531
6042
24
Fairfield
6740
SNAKE RIVER
MOUNTAIN HOME
7438
MUO
87
Mountain Home
2455
MOUNTAIN HOME AFB
GOODING
Glenns Ferry
Shoshone
Gooding
8438
Owyhee
7850
JEROME
Rupert
ROME
IDAHO
OREGON
Twin Falls
27
BURLEY
Burley
6775
6240
TWIN FALLS-SUN VALLEY JOSLIN
Oakley
10340
8060
McDermitt
IDAHO
7741
8506
5767
OWYHEE
NEVADA
JACKPOT
Owyhee
8802
10839
9779
9046
10442
8906
100
30
8416
Montello
8786
Wells
HARRIET
10704
Winnemucca
11276
9421
WINNEMUCCA
ELKO-HARRIS
Elko
00
33
Carlin
11387
RUBY MOUNTAINS
Battle Mountain
LANDER
9835
10262
MUO-2
AREA CHART
1:2,000,000
MOUNTAIN HOME A
43°02.6'N 115°52.2'
DMAAC
ED. 3
Dec.



MUO-3

RUNWAY CHART
1:62,500
MOUNTAIN HOME AFB
RUNWAYS 12 AND 30
DMAAC ED. 3 Dec. 1983

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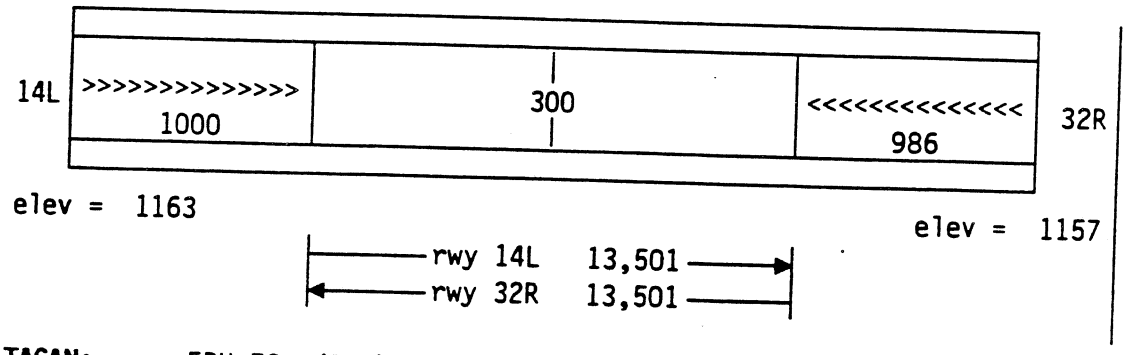
Grant County, Washington

Table Identifier **MWH**

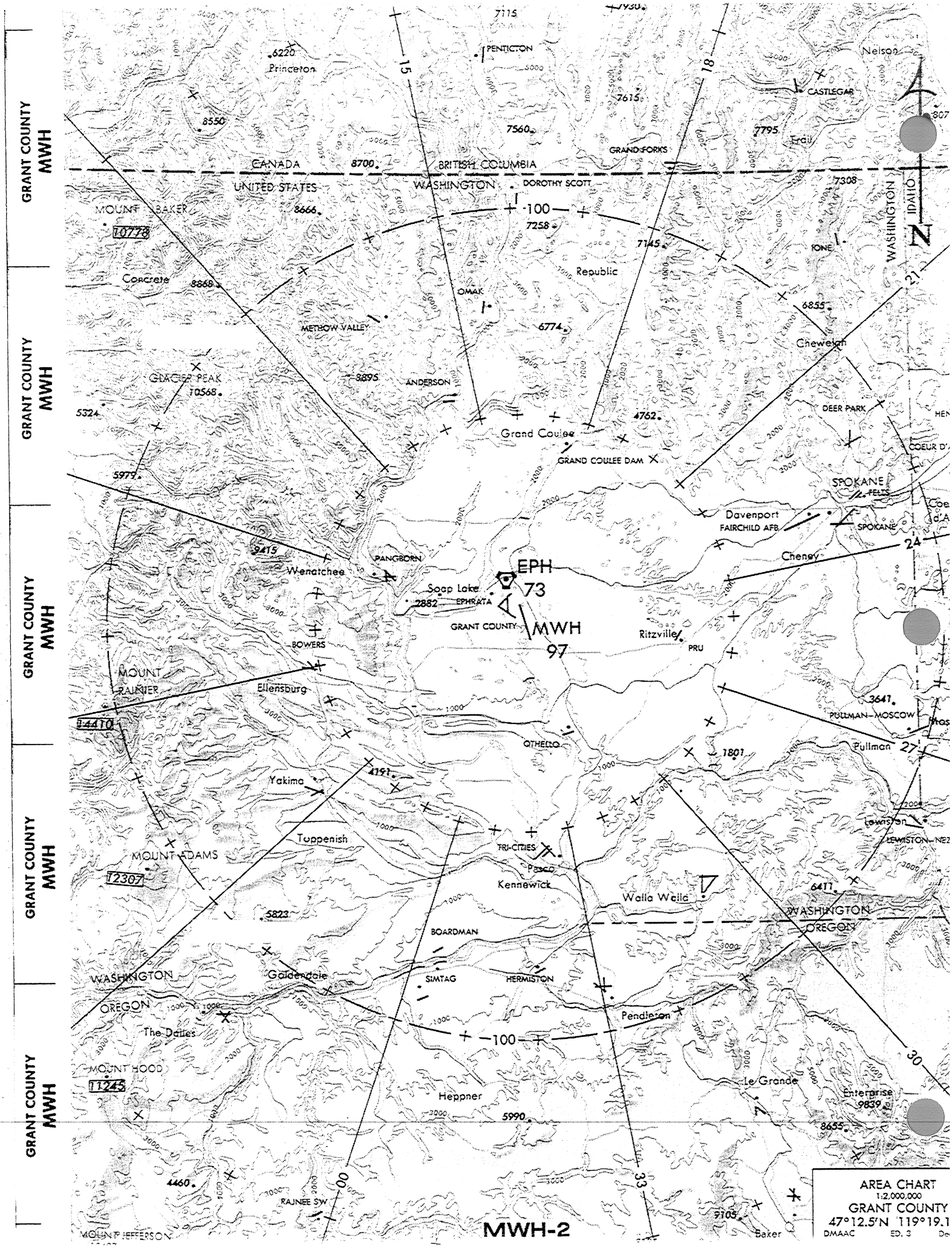


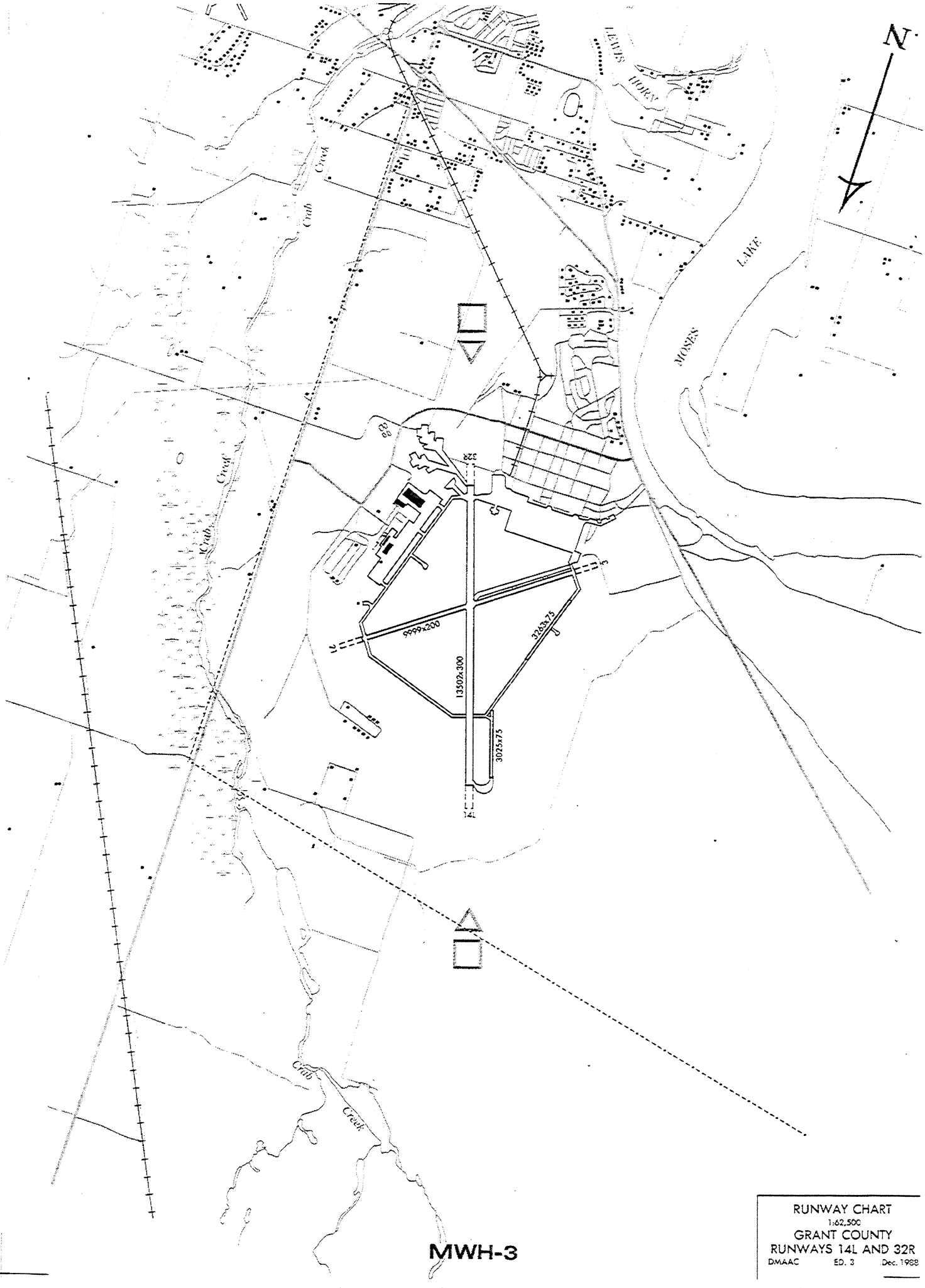
TACAN: EPH-73x (Pri)
I/F above: N:clear E:90k
S:90k W:clear

MWH-97x (Sec-DME)
N:clear E: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
GRANT COUNTY MWH
GRANT COUNTY MWH
GRANT COUNTY MWH
GRANT COUNTY MWH
CANADA
UNITED STATES
BRITISH COLUMBIA
WASHINGTON
OREGON
IDAHO
PENTICTON
Princeton
Nelson
CASTLEGAR
Trail
GRAND FORKS
DOROTHY SCOTT
MOUNT BAKER
10778
Concrete
METHOW VALLEY
OMAK
Republic
IONE
Chewelah
GLACIER PEAK
10568
ANDERSON
Grand Coulee
GRAND COULEE DAM
DEER PARK
SPOKANE
FELTS
Davenport
FAIRCHILD AFB
Cheney
PANGBORN
Wenatchee
Soap Lake
EPHRATA
GRANT COUNTY
EPH
73
MWH
97
Ritzville
PRU
BOWERS
MOUNT RAINIER
Ellensburg
14410
PULLMAN–MOSCOW
OTHELLO
Pullman
Yakima
Toppenish
MOUNT ADAMS
12307
TRI-CITIES
Pasco
Kennewick
Walla Walla
Lewiston
LEWISTON–NEZ
BOARDMAN
SIMTAG
HERMISTON
Goldendale
Pendleton
The Dalles
MOUNT HOOD
11245
Heppner
La Grande
Enterprise
RAINIER SW
MOUNT JEFFERSON
Baker
MWH-2
AREA CHART
1:2,000,000
GRANT COUNTY
47°12.5'N 119°19.1
DMAAC ED. 3



RUNWAY CHART
1:62,500
GRANT COUNTY
RUNWAYS 14L AND 32R
DMAAC ED. 3 Dec. 1988

MWH-3

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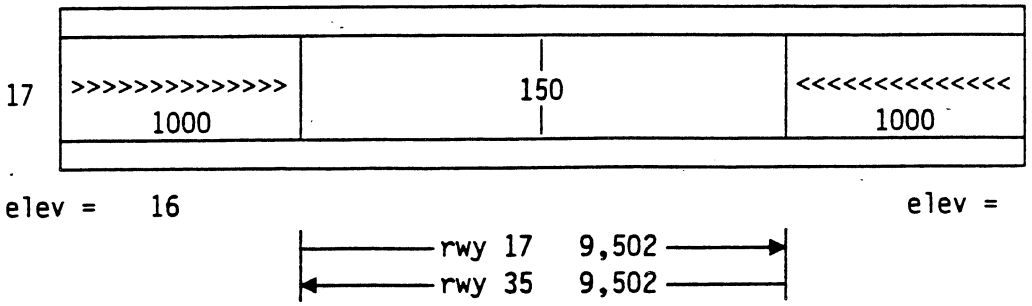
Myrtle Beach AFB, S. Carolina

Table Identifier **MYR**

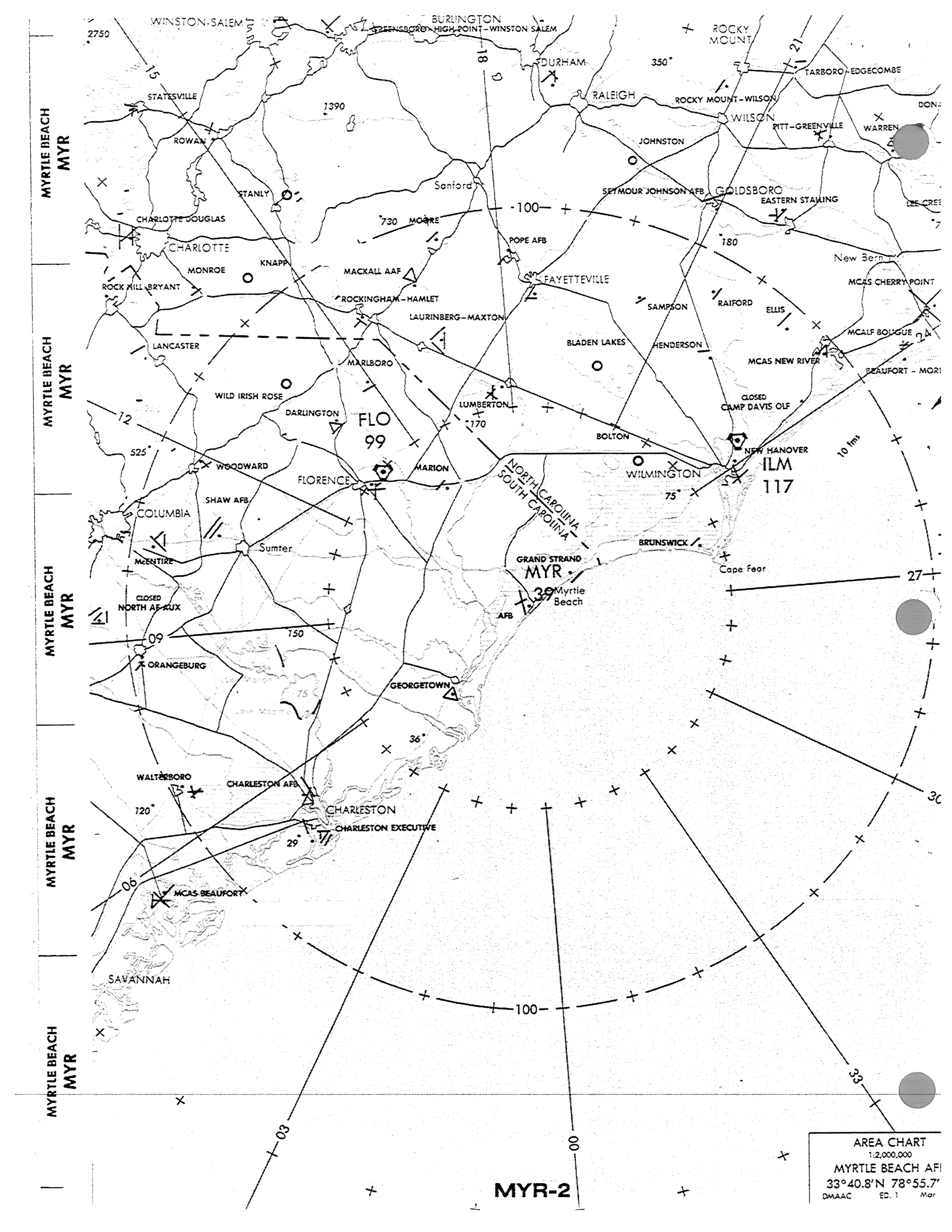


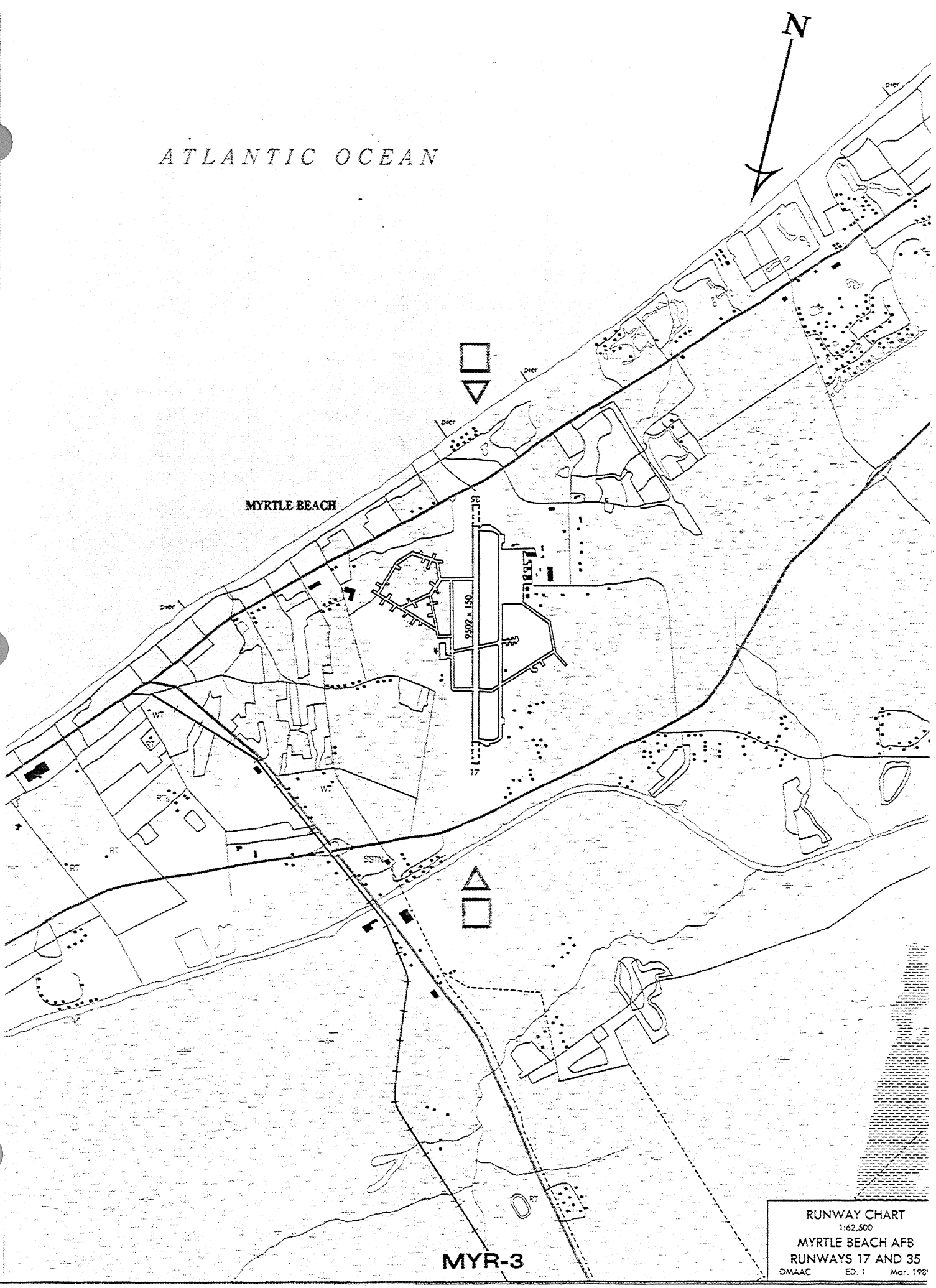
TACAN: MYR-39x (Pri) FLO-99x (Sec)
I/F above: N:<80k E:<80k N:80k E: 90k
S:<80k W:<80k S:90k W:100k

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

MAPS/ALL/GEN B

MYRTLE BEACH MYR
MYRTLE BEACH MYR
MYRTLE BEACH MYR
MYRTLE BEACH MYR


MYRTLE BEACH MYR
MYRTLE BEACH MYR
MYRTLE BEACH MYR
MYRTLE BEACH MYR
MYRTLE BEACH MYR
WINSTON-SALEM
BURLINGTON
GREENSBORO-HIGH POINT-WINSTON SALEM
DURHAM
ROCKY MOUNT
TARBORO-EDGECOMBE
STATESVILLE
ROWAN
RALEIGH
ROCKY MOUNT-WILSON
WILSON
PITT-GREENVILLE
WARREN
JOHNSTON
Sanford
SEYMOUR JOHNSON AFB
GOLDSBORO
EASTERN STAGLING
STANLY
CHARLOTTE DOUGLAS
CHARLOTTE
MOORE
POPE AFB
New Bern
KNAPP
MONROE
MACKALL AAF
FAYETTEVILLE
MCAS CHERRY POINT
ROCK HILL-BRYANT
ROCKINGHAM-HAMLET
SAMPSON
RAIFORD
ELLIS
LAURINBERG-MAXTON
LANCASTER
BLADEN LAKES
HENDERSON
MCALF BOUGUE
MCAS NEW RIVER
MARLBORO
WILD IRISH ROSE
LUMBERTON
CLOSED
CAMP DAVIS OLF
DARLINGTON
FLO
99
BOLTON
NEW HANOVER
ILM
117
10 fms
WOODWARD
MARION
FLORENCE
WILMINGTON
NORTH CAROLINA
SOUTH CAROLINA
SHAW AFB
COLUMBIA
Sumter
McENTIRE
BRUNSWICK
GRAND STRAND
MYR
39
Myrtle Beach
AFB
Cape Fear
CLOSED
NORTH AF-AUX
ORANGEBURG
GEORGETOWN
WALTERBORO
CHARLESTON AFB
CHARLESTON
CHARLESTON EXECUTIVE
MCAS BEAUFORT
SAVANNAH
AREA CHART
1:2,000,000
MYRTLE BEACH AFI
33°40.8'N 78°55.7'
DMAAC
ED. 1
Mar
MYR-2


N
ATLANTIC OCEAN
MYRTLE BEACH
Pier
Pier
Pier
Pier
35
17
9501 x 200
WT
WT
RT
RT
RT
RT
SSTN
RUNWAY CHART
1:62,500
MYRTLE BEACH AFB
RUNWAYS 17 AND 35
DMAAC ED. 1 Mar. 198

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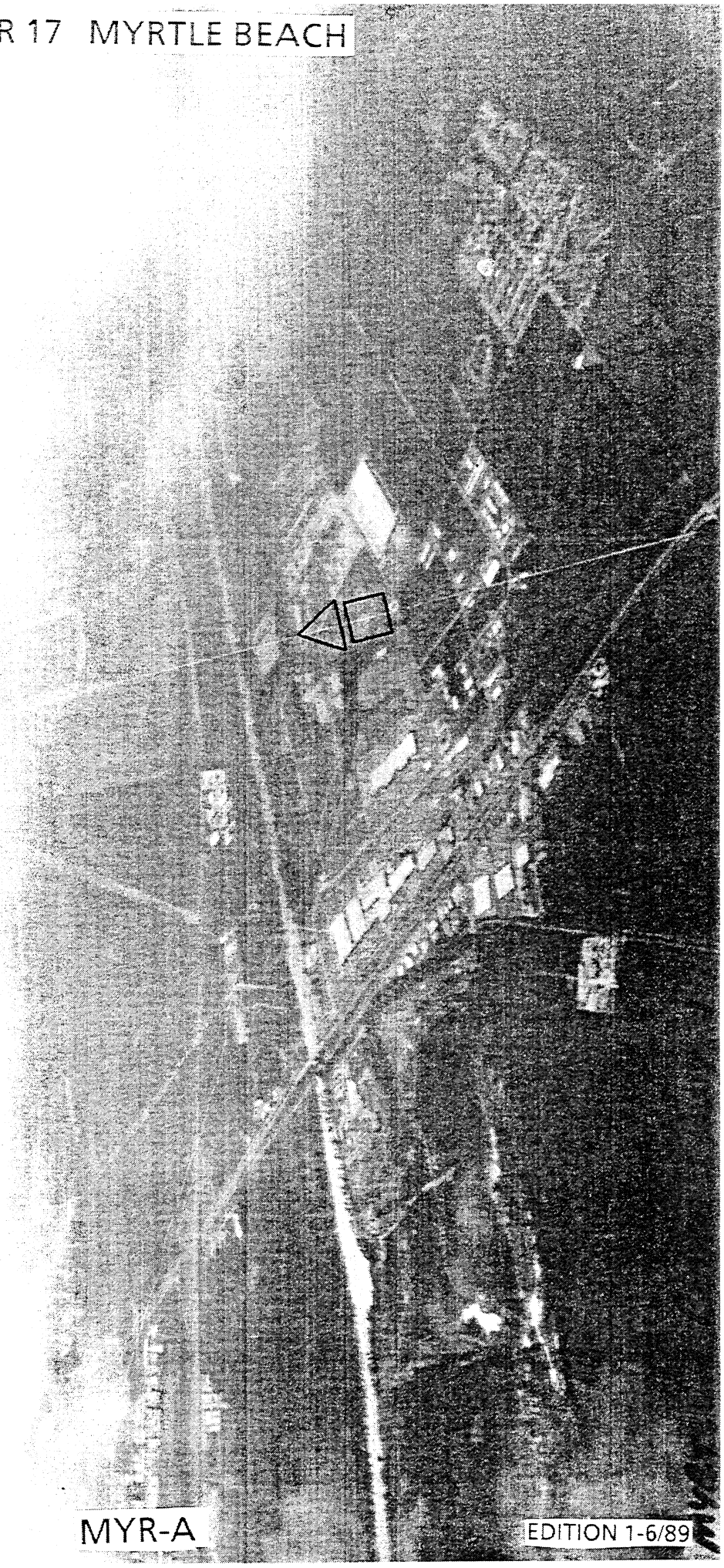
MYR 17 MYRTLE BEACH



MYR-A

EDITION 1-6/89

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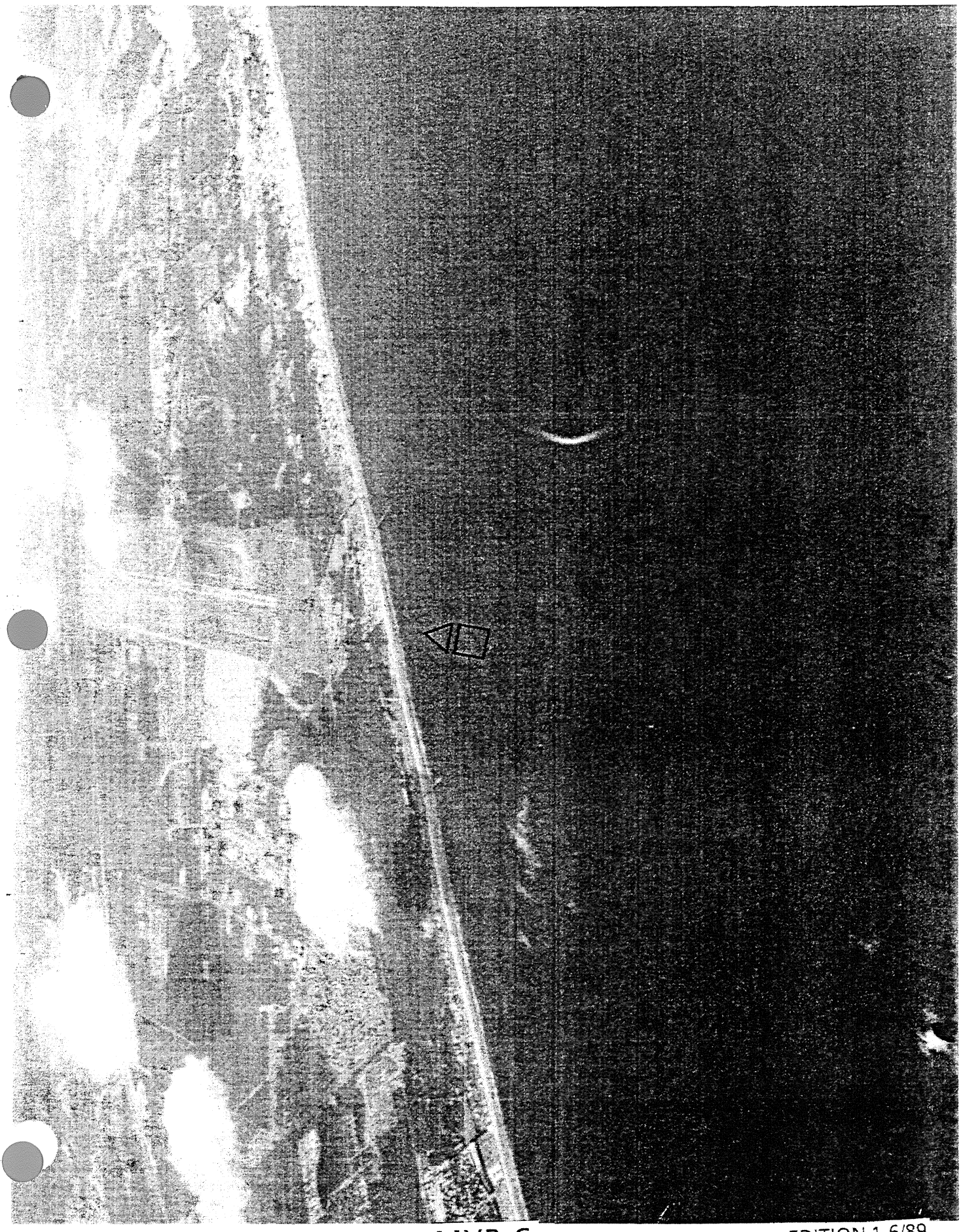
MYR 35 MYRTLE BEACH



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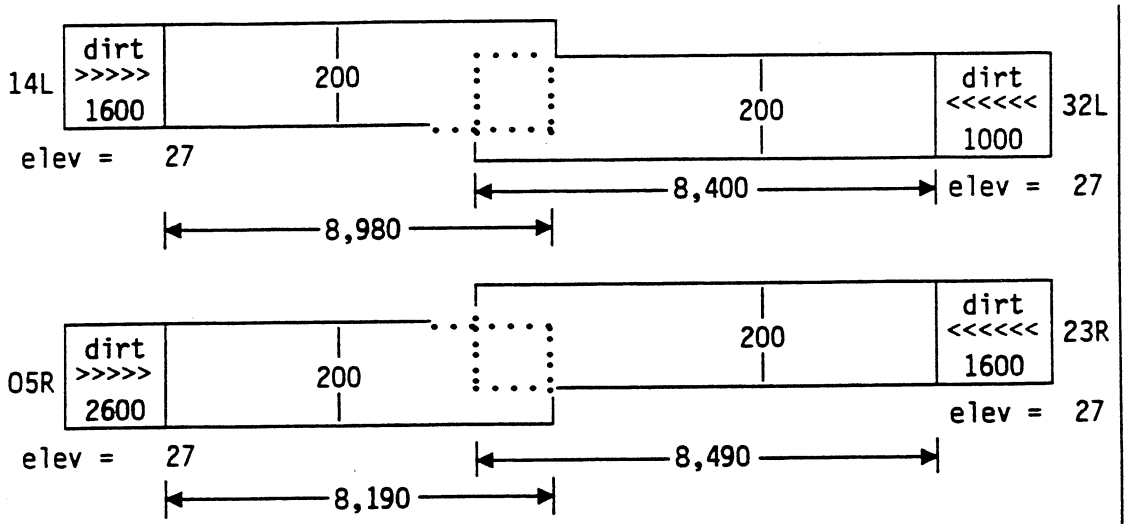
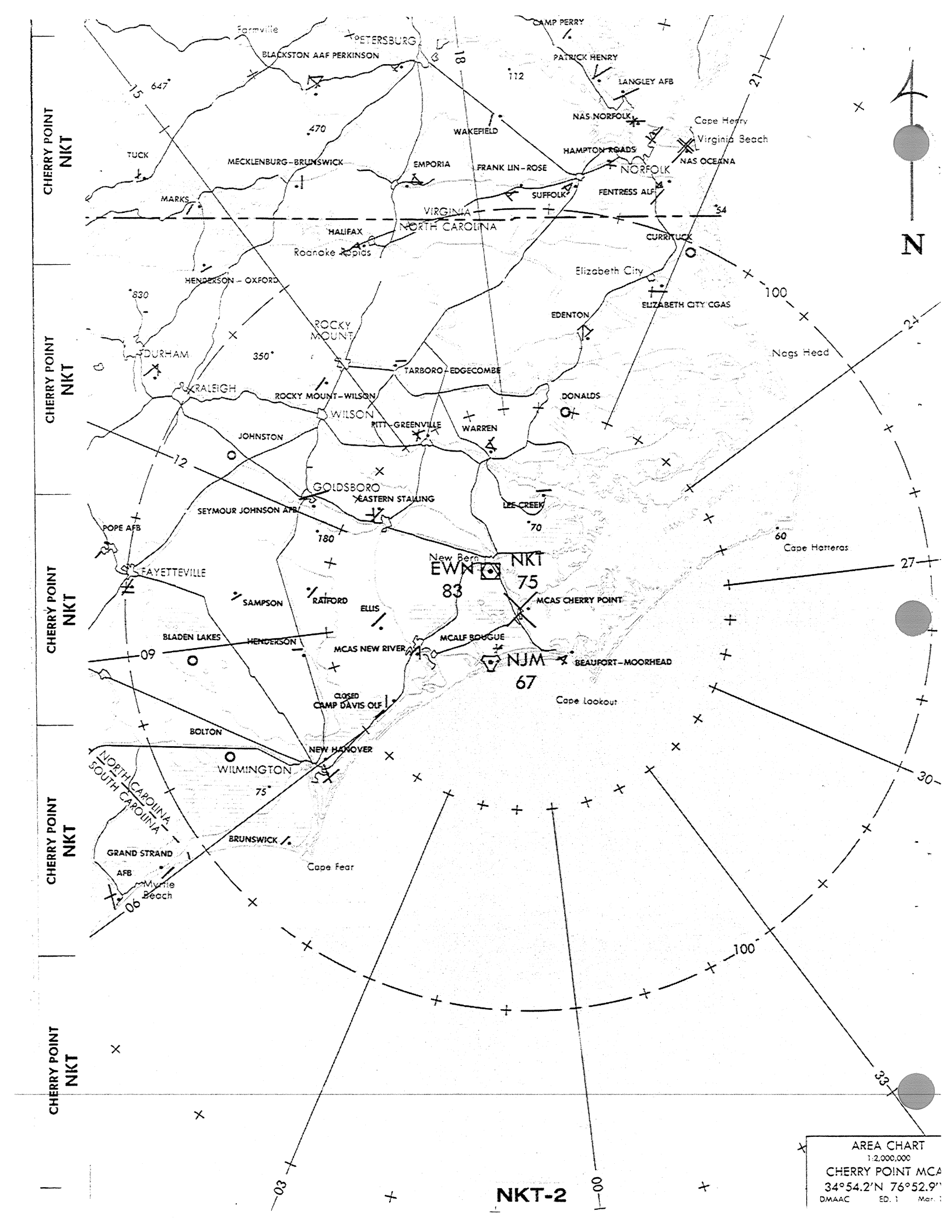
Cherry Point MCAS, N. Carolina

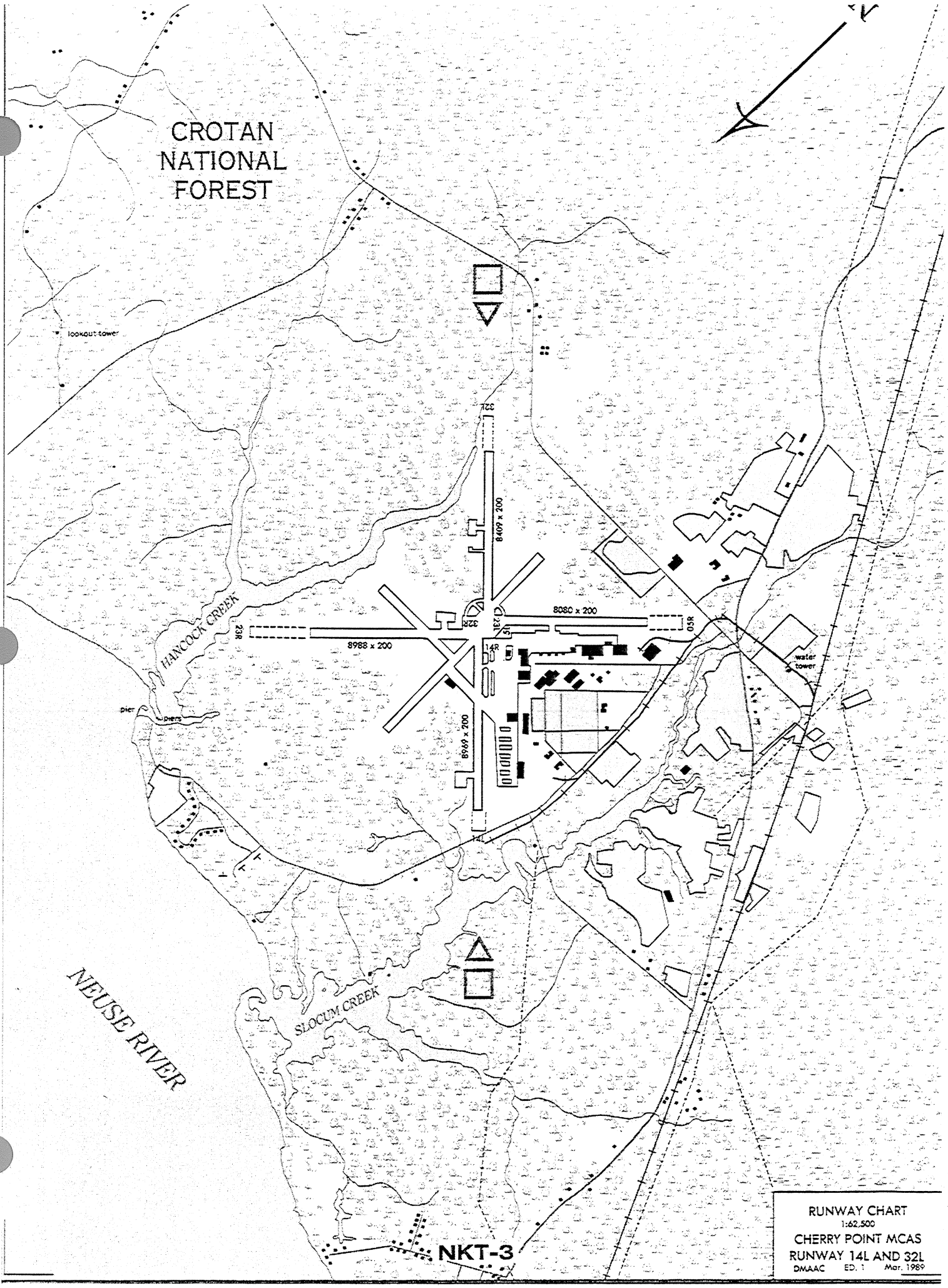
Table Identifier **NKT**



TACAN: NKT-75x (Pri) NJM-67x (Sec)
I/F above: N:125k E:<80k N:clear E:clear
S:<80k W:100k S:clear W:clear

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
Farmville
PETERSBURG
BLACKSTON AAF PERKINSON
CAMP PERRY
PATRICK HENRY
LANGLEY AFB
NAS NORFOLK
Cape Henry
Virginia Beach
NAS OCEANA
NORFOLK
HAMPTON ROADS
WAKEFIELD
TUCK
MECKLENBURG-BRUNSWICK
EMPORIA
FRANK LIN-ROSE
SUFFOLK
FENTRESS ALF
MARKS
VIRGINIA
NORTH CAROLINA
HALIFAX
Roanoke Rapids
CURRITUCK
Elizabeth City
ELIZABETH CITY CGAS
HENDERSON - OXFORD
EDENTON
ROCKY MOUNT
DURHAM
TARBORO-EDGECOMBE
Nags Head
RALEIGH
ROCKY MOUNT-WILSON
DONALDS
WILSON
PITT-GREENVILLE
WARREN
JOHNSTON
GOLDSBORO
EASTERN STAILING
LEE CREEK
SEYMOUR JOHNSON AFB
POPE AFB
New Bern
EWN
NKT
75
83
Cape Hatteras
FAYETTEVILLE
SAMPSON
RATFORD
ELLIS
MCAS CHERRY POINT
BLADEN LAKES
HENDERSON
MCAS NEW RIVER
MCALF BOUGUE
NJM
67
BEAUFORT-MOORHEAD
CLOSED
CAMP DAVIS OLF
Cape Lookout
BOLTON
NEW HANOVER
WILMINGTON
NORTH CAROLINA
SOUTH CAROLINA
BRUNSWICK
GRAND STRAND
AFB
Myrtle Beach
Cape Fear
N
NKT-2
AREA CHART
1:2,000,000
CHERRY POINT MCA
34°54.2'N 76°52.9'
DMAAC



RUNWAY CHART
1:62,500
CHERRY POINT MCAS
RUNWAY 14L AND 32L
DMAAC ED. 1 Mar. 1989

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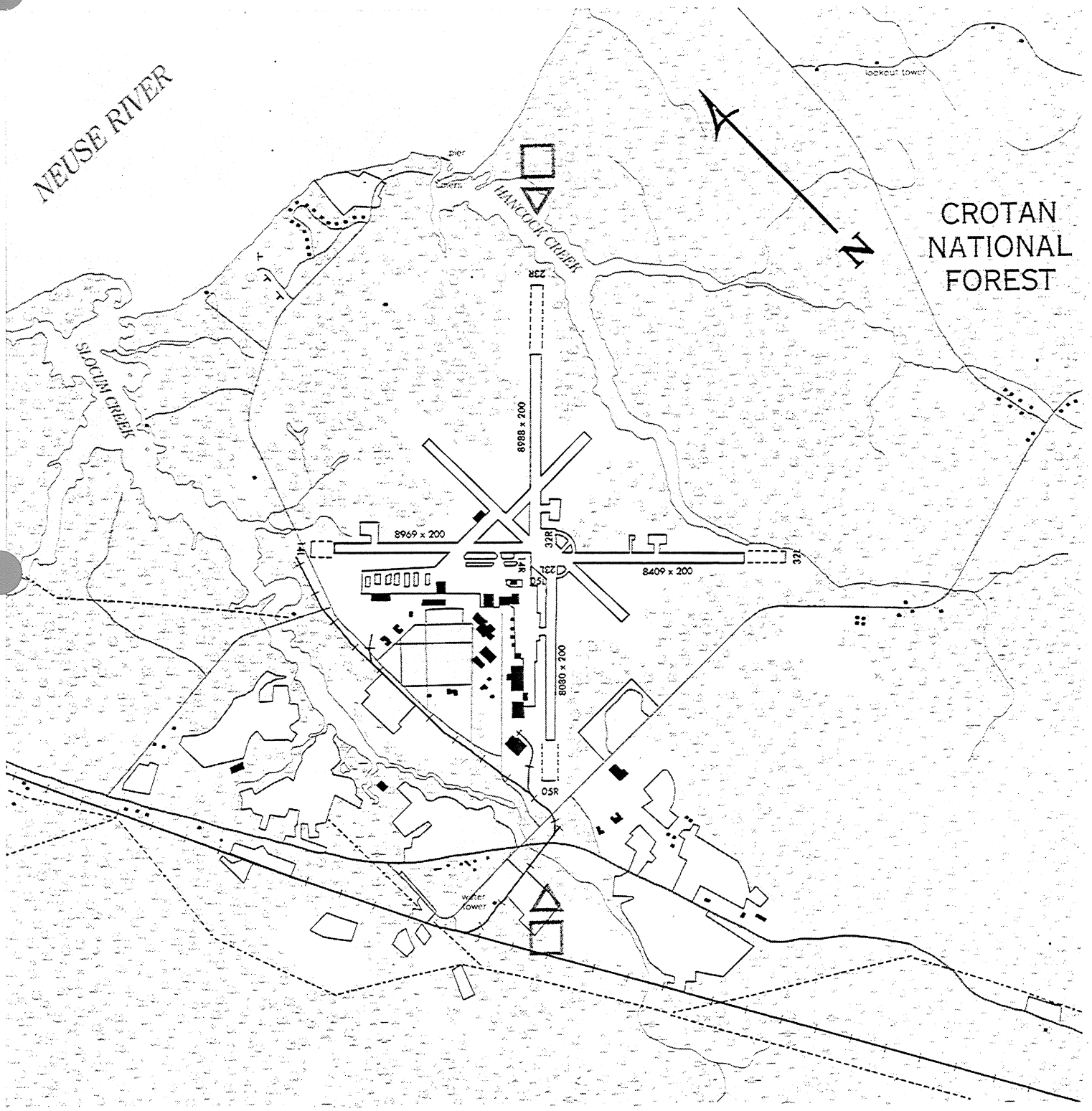

RUNWAY CHART
1:62,500
CHERRY POINT MCAS
RUNWAY 05R AND 23R
DMAAC ED. 1 Jan. 1991

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NKT 14L CHERRY POINT

NKT-A

EDITION 1-6/89

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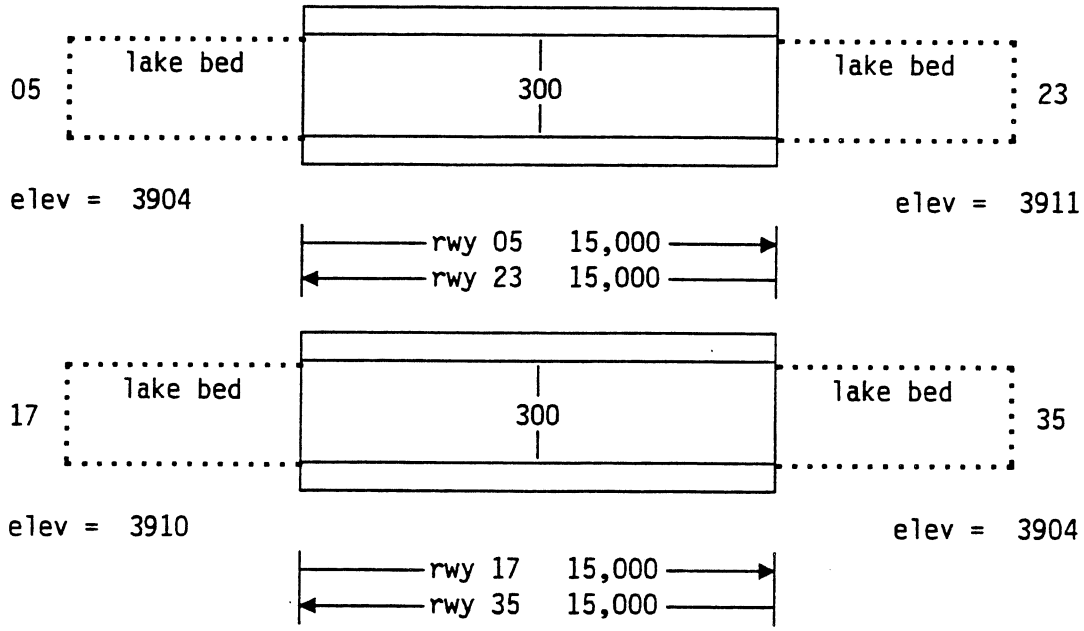
White Sands Space Harbor, NM

Table Identifier **NOR**



TACAN: SNG-69x (Pri)†
I/F above: N:clear E:clear S:clear W:clear

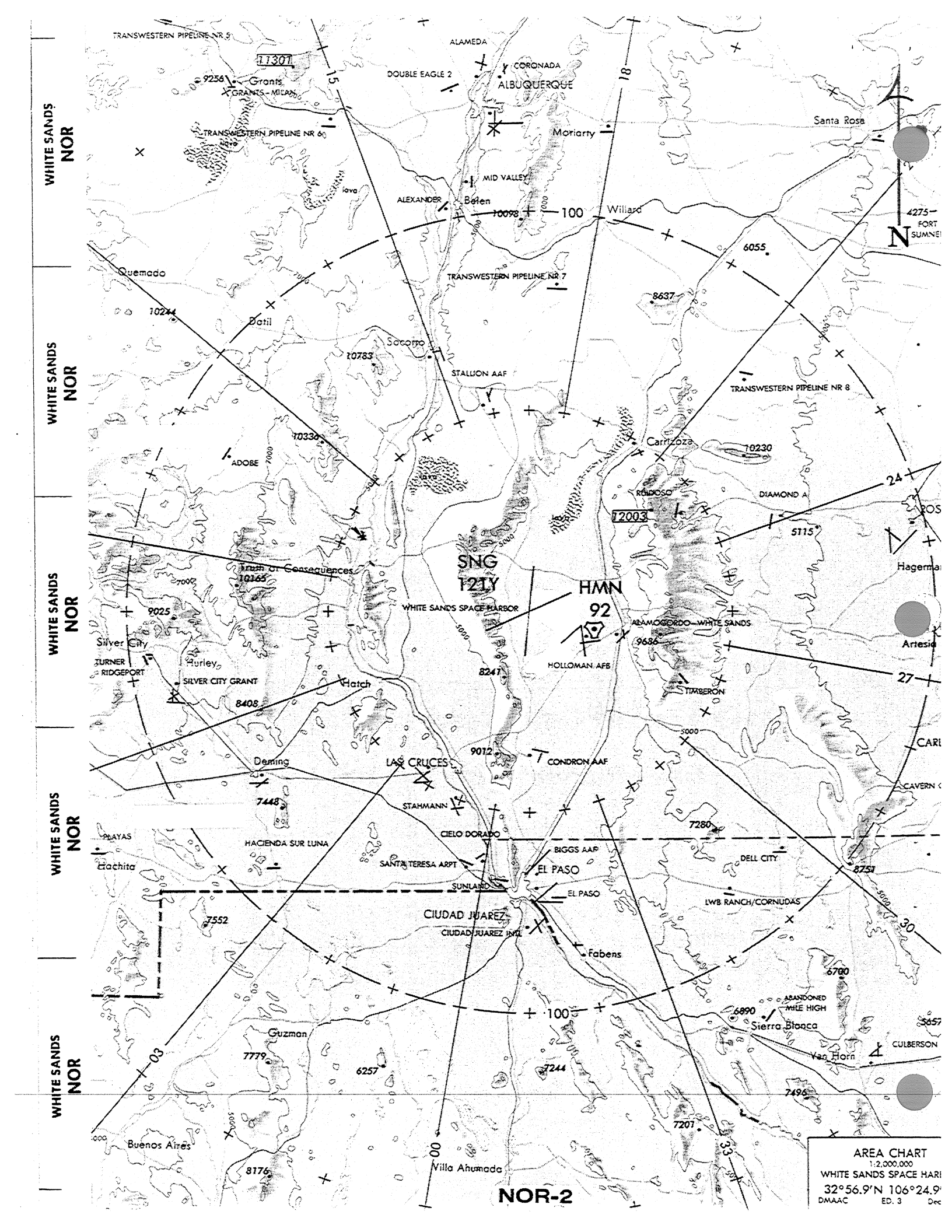
HMN-92x (Sec)
N:140k E:130k S:clear W:120k

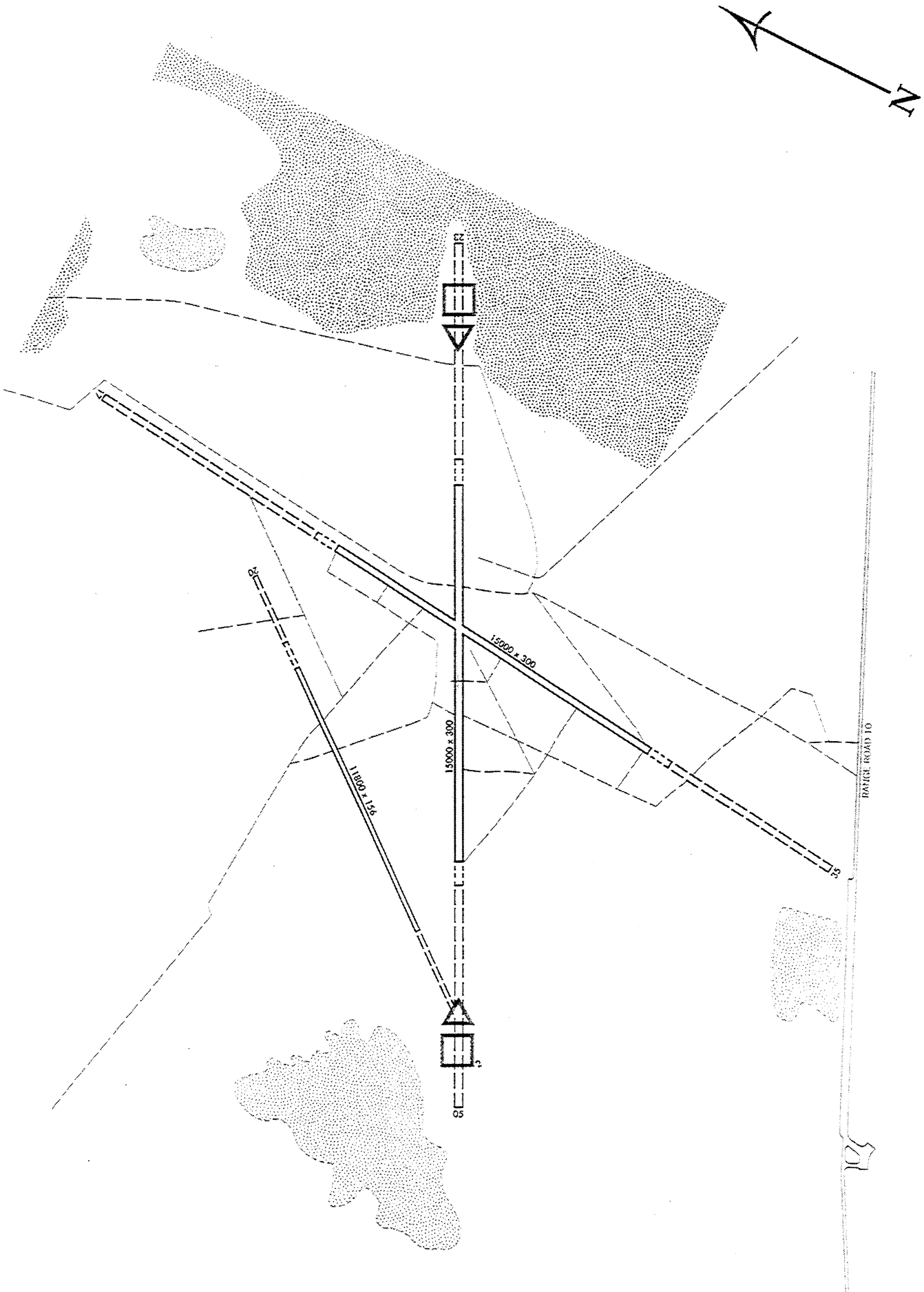
MLS: (17-Jr) ch 6
PAPI: 17,23,35*
Ball Bar: 17,23,35
UHF: yes

* 7500-ft aim point only

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

†SNG-121y will be in the software. SNG-69x must be uplinked for NOR landing


WHITE SANDS NOR
WHITE SANDS NOR
WHITE SANDS NOR
WHITE SANDS NOR
WHITE SANDS NOR
TRANSWESTERN PIPELINE NR 5
TRANSWESTERN PIPELINE NR 6
TRANSWESTERN PIPELINE NR 7
TRANSWESTERN PIPELINE NR 8
ALAMEDA
CORONADA
DOUBLE EAGLE 2
ALBUQUERQUE
Grants
GRANTS-MILAN
Moriarty
Santa Rosa
MID VALLEY
ALEXANDER
Belen
Willard
Quemado
Datil
Socorro
STALLION AAF
Carrizozo
ADOBE
RUIDOSO
DIAMOND A
Truth or Consequences
SNG
T21Y
WHITE SANDS SPACE HARBOR
HMN
92
ALAMOGORDO-WHITE SANDS
HOLLOMAN AFB
Silver City
TURNER
RIDGEPORT
Hurley
SILVER CITY GRANT
Hatch
TIMBERON
Artesia
Deming
LAS CRUCES
CONDRON AAF
STAHMANN
CAVERN
PLAYAS
Hachita
HACIENDA SUR LUNA
CIELO DORADO
SANTA TERESA ARPT
BIGGS AAF
EL PASO
SUNLAND
DELL CITY
LWB RANCH/CORNUDAS
CIUDAD JUAREZ
CIUDAD JUAREZ INTL
Fabens
ABANDONED MILE HIGH
Sierra Blanca
CULBERSON
Van Horn
Guzman
Buenos Aires
Villa Ahumada
AREA CHART
1:2,000,000
WHITE SANDS SPACE HARI
32°56.9'N 106°24.9'
DMAAC
ED. 3
Dec
NOR-2



RUNWAY CHART
1:62,500
WHITE SANDS SPACE HARBOR
RUNWAYS 05 AND 23
DMAAC ED. 4 Dec. 1990

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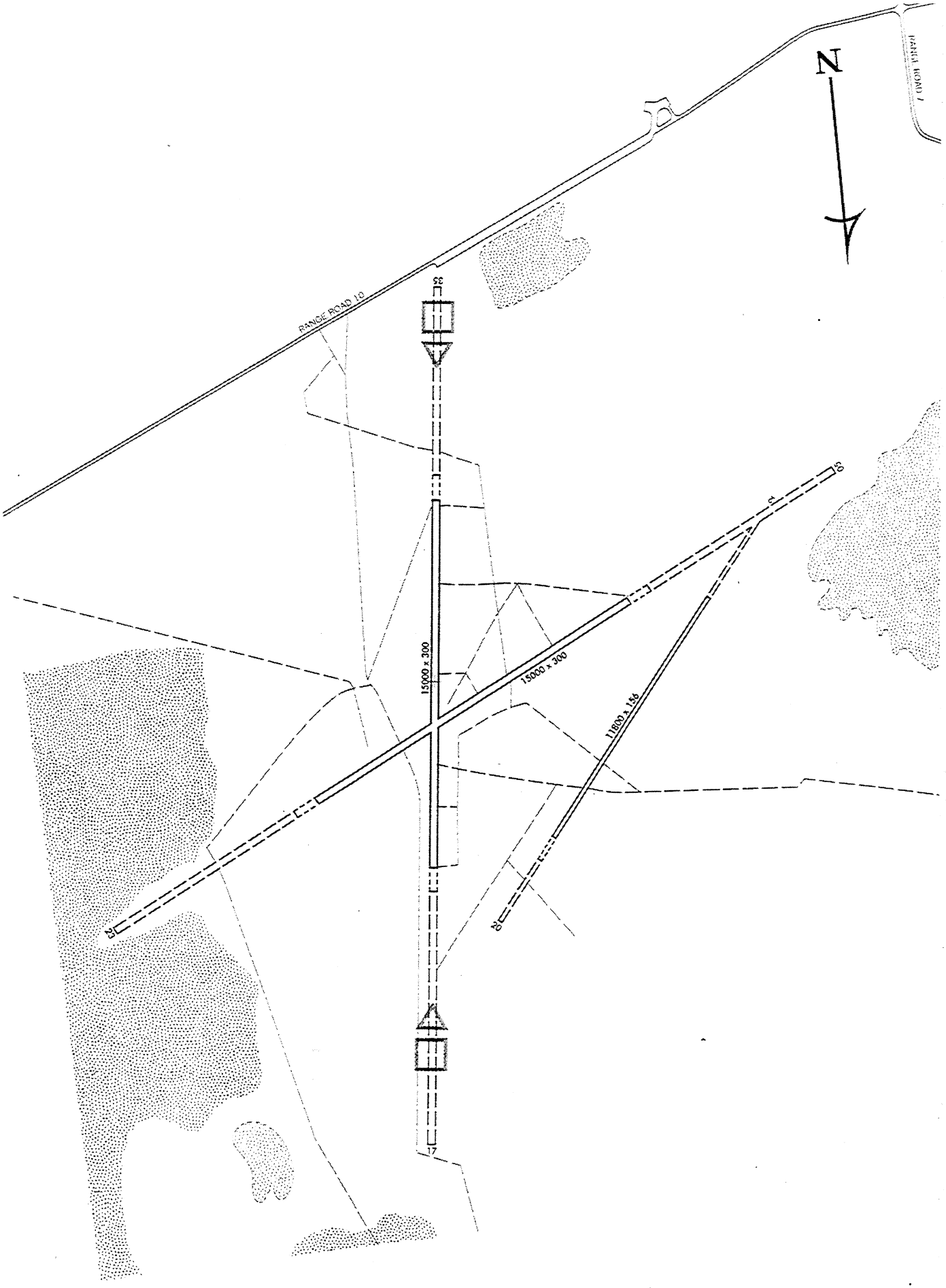

RUNWAY CHART
1:62,500
WHITE SANDS SPACE HARBOR
RUNWAYS 17 AND 35
DMAAC ED. 4 Dec. 1990

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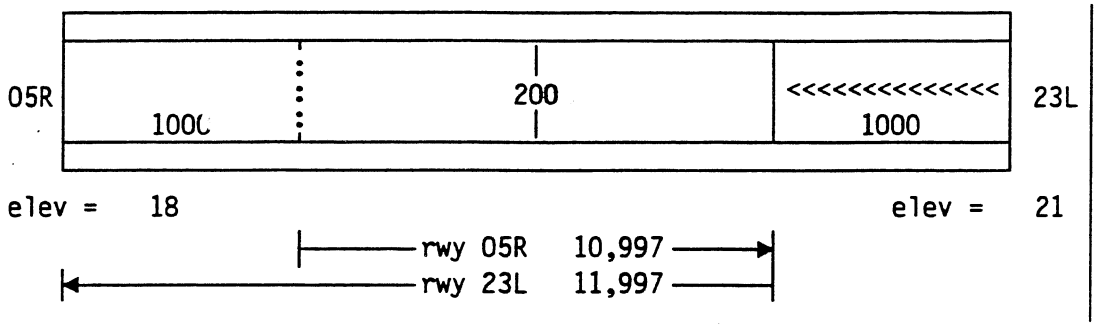
Oceana NAS, Virginia

Table Identifier **NTU**



TACAN:	NTU-113x (Pri)	NGU-48x (Sec)
I/F above:	N:115k E:90k	N:clear E:clear
	S:<80k W:80k	S:clear W:clear

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

OCEANA NTU

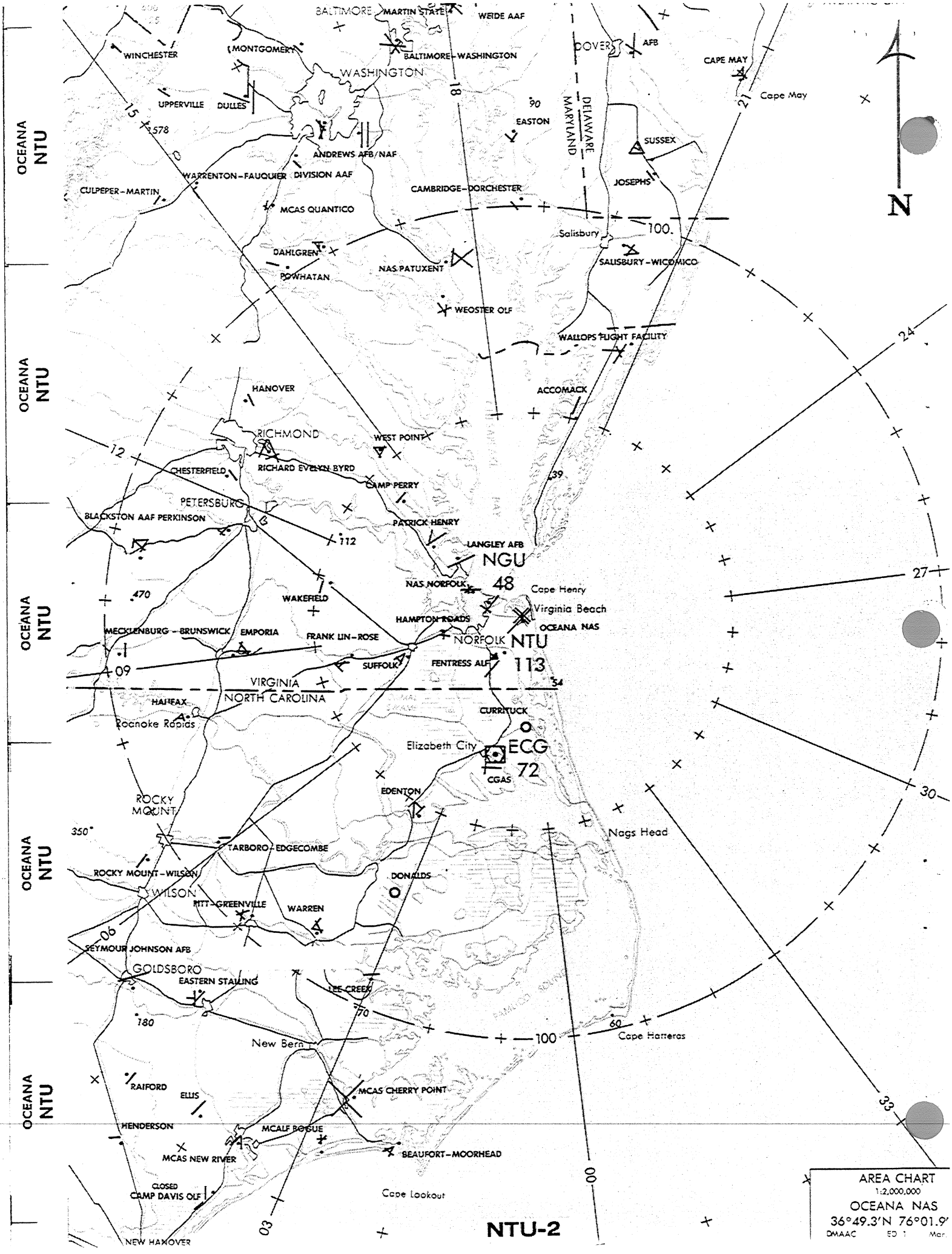
OCEANA NTU

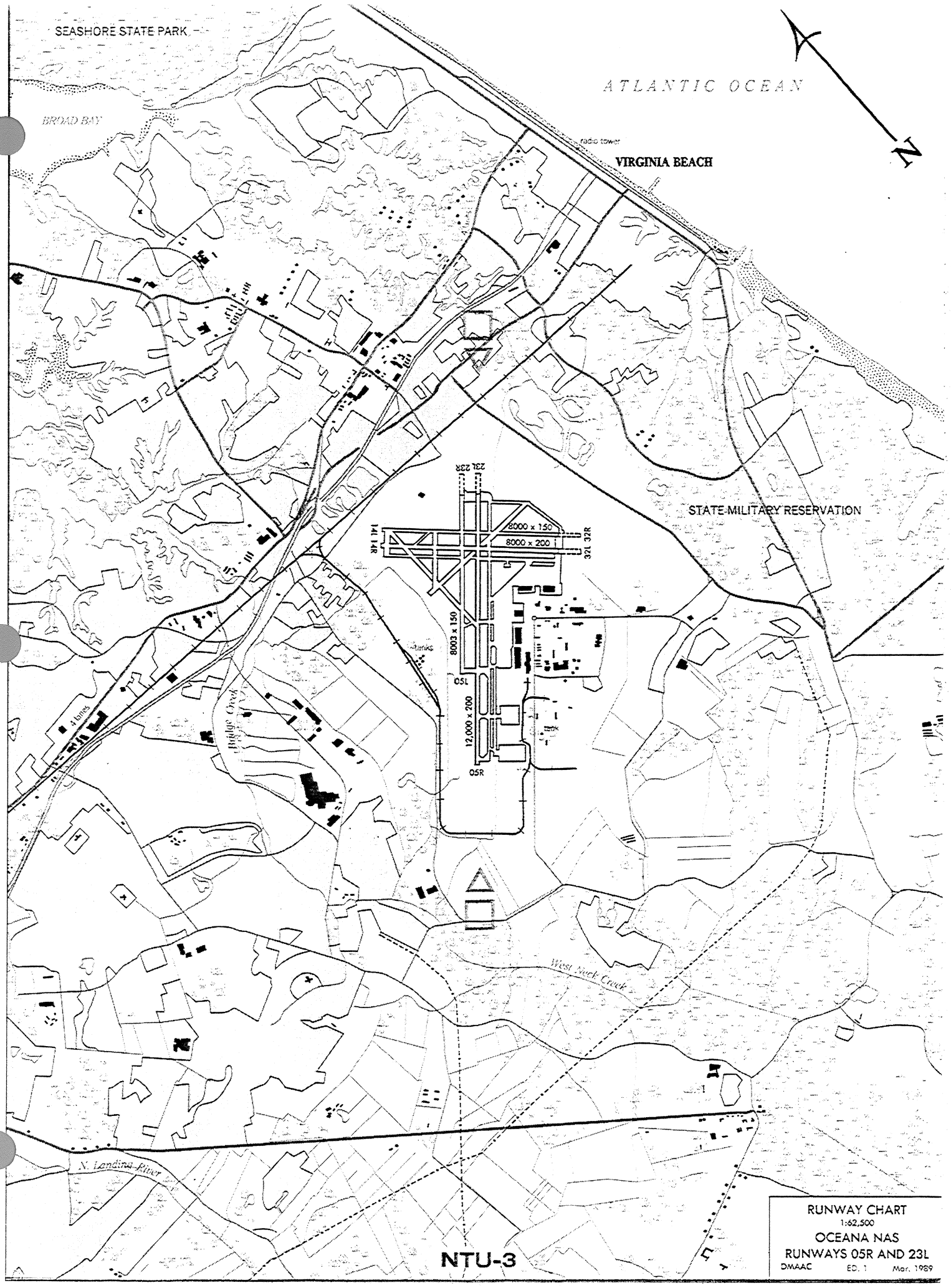
OCEANA NTU

OCEANA NTU

OCEANA NTU

MAPS/ALL/GEN B


OCEANA NTU
OCEANA NTU
OCEANA NTU
OCEANA NTU
OCEANA NTU
BALTIMORE
MARTIN STATE
WEIDE AAF
WINCHESTER
MONTGOMERY
BALTIMORE-WASHINGTON
WASHINGTON
DOVER AFB
CAPE MAY
Cape May
UPPERVILLE
DULLES
EASTON
DELAWARE
MARYLAND
SUSSEX
ANDREWS AFB/NAF
WARRENTON-FAUQUIER
DIVISION AAF
CULPEPER-MARTIN
CAMBRIDGE-DORCHESTER
JOSEPHS
MCAS QUANTICO
Salisbury
DAHLGREN
POWHATAN
NAS PATUXENT
SALISBURY-WICOMICO
WEOSTER OLF
WALLOPS FLIGHT FACILITY
HANOVER
ACCOMACK
RICHMOND
WEST POINT
CHESTERFIELD
RICHARD EVELYN BYRD
CAMP PERRY
PETERSBURG
BLACKSTON AAF PERKINSON
PATRICK HENRY
LANGLEY AFB
NGU
48
NAS NORFOLK
Cape Henry
WAKEFIELD
Virginia Beach
HAMPTON ROADS
OCEANA NAS
MECKLENBURG-BRUNSWICK
EMPORIA
FRANK LIN-ROSE
NORFOLK NTU
SUFFOLK
FENTRESS ALF
113
VIRGINIA
NORTH CAROLINA
HALIFAX
Roanoke Rapids
CURRITUCK
Elizabeth City
ECG
72
CGAS
EDENTON
ROCKY MOUNT
Nags Head
TARBORO-EDGECOMBE
ROCKY MOUNT-WILSON
DONALDS
WILSON
PITT-GREENVILLE
WARREN
SEYMOUR JOHNSON AFB
GOLDSBORO
EASTERN STAILING
LEE CREEK
New Bern
Cape Hatteras
RAIFORD
ELLIS
MCAS CHERRY POINT
HENDERSON
MCALF BOGUE
MCAS NEW RIVER
BEAUFORT-MOORHEAD
CLOSED
CAMP DAVIS OLF
Cape Lookout
NEW HANOVER
NTU-2
N
AREA CHART
1:2,000,000
OCEANA NAS
36°49.3'N 76°01.9'
DMAAC ED 1 Mar



RUNWAY CHART
1:62,500
OCEANA NAS
RUNWAYS 05R AND 23L
DMAAC ED. 1 Mar. 1989

NTU-3

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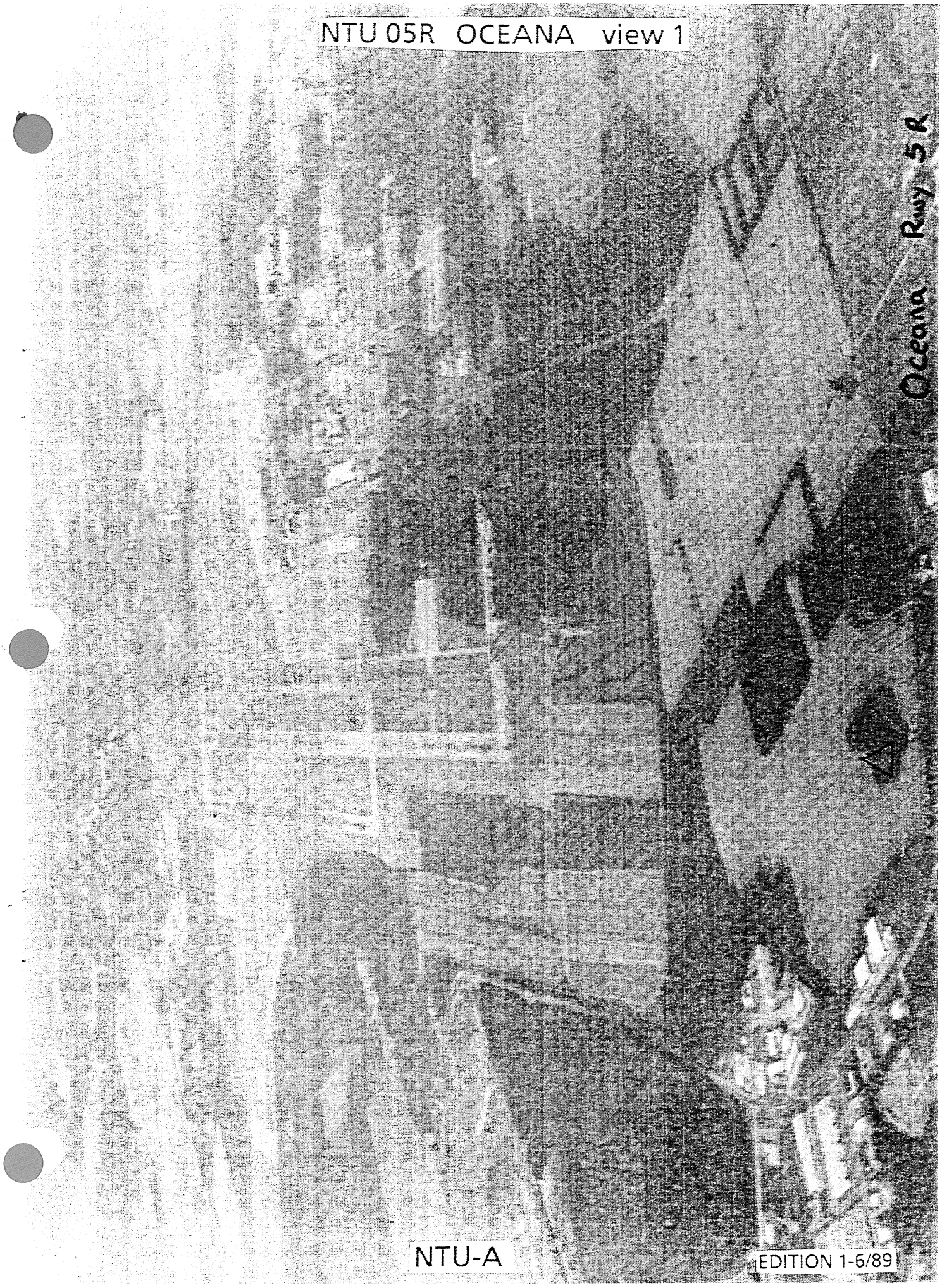
NTU 05R OCEANA view 1



NTU-A

EDITION 1-6/89

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NTU 05R OCEANA view 2
NTU-C
EDITION 1-6/89

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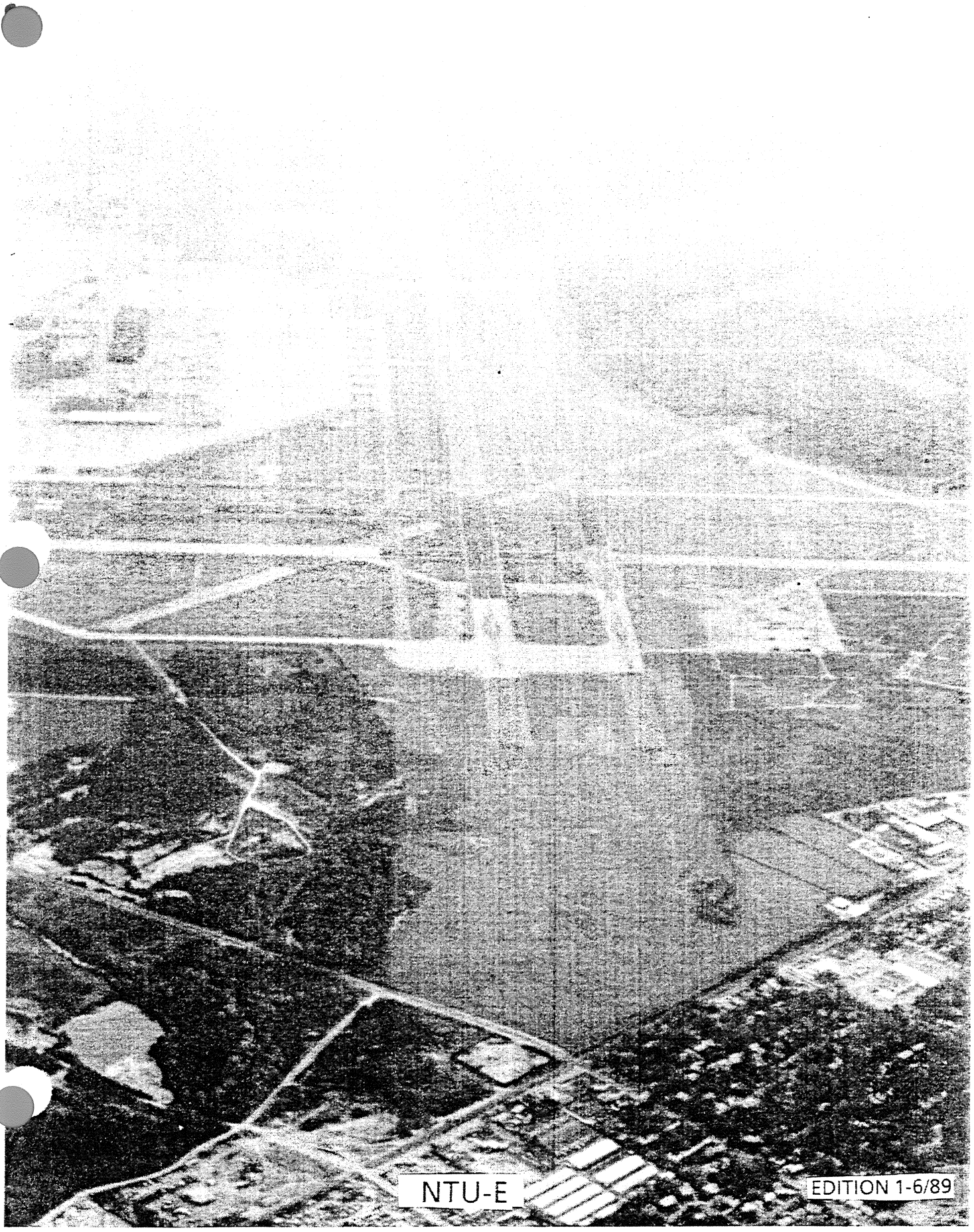
NTU 23L OCEANA



NTU-E

EDITION 1-6/89

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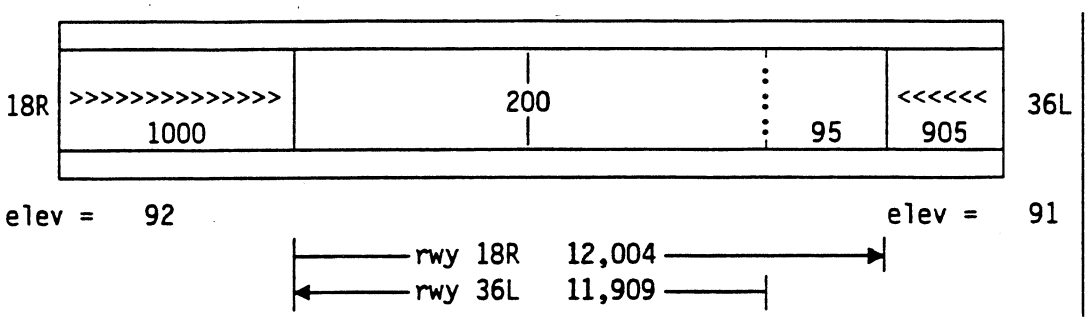
Orlando Intnl, Florida

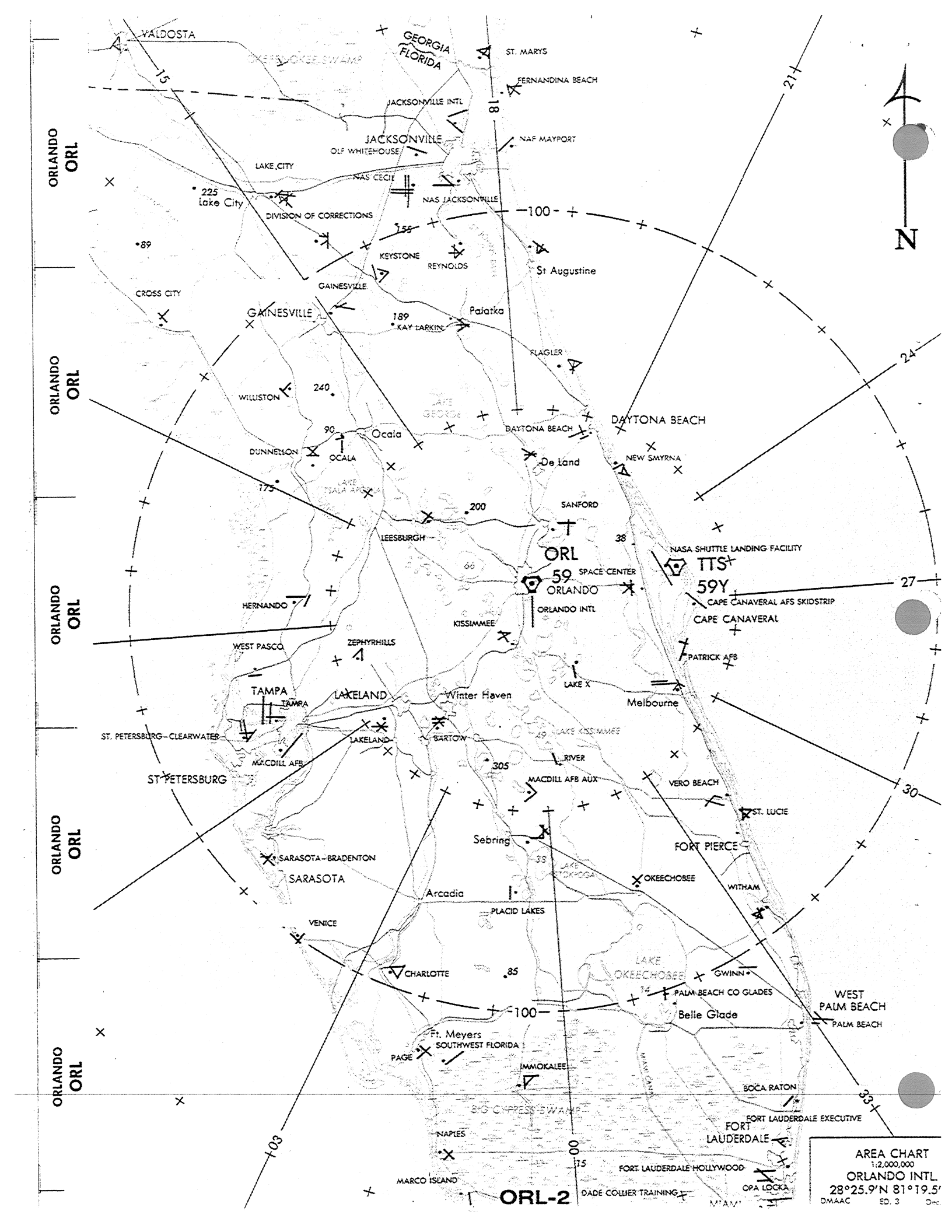
Table Identifier **ORL**

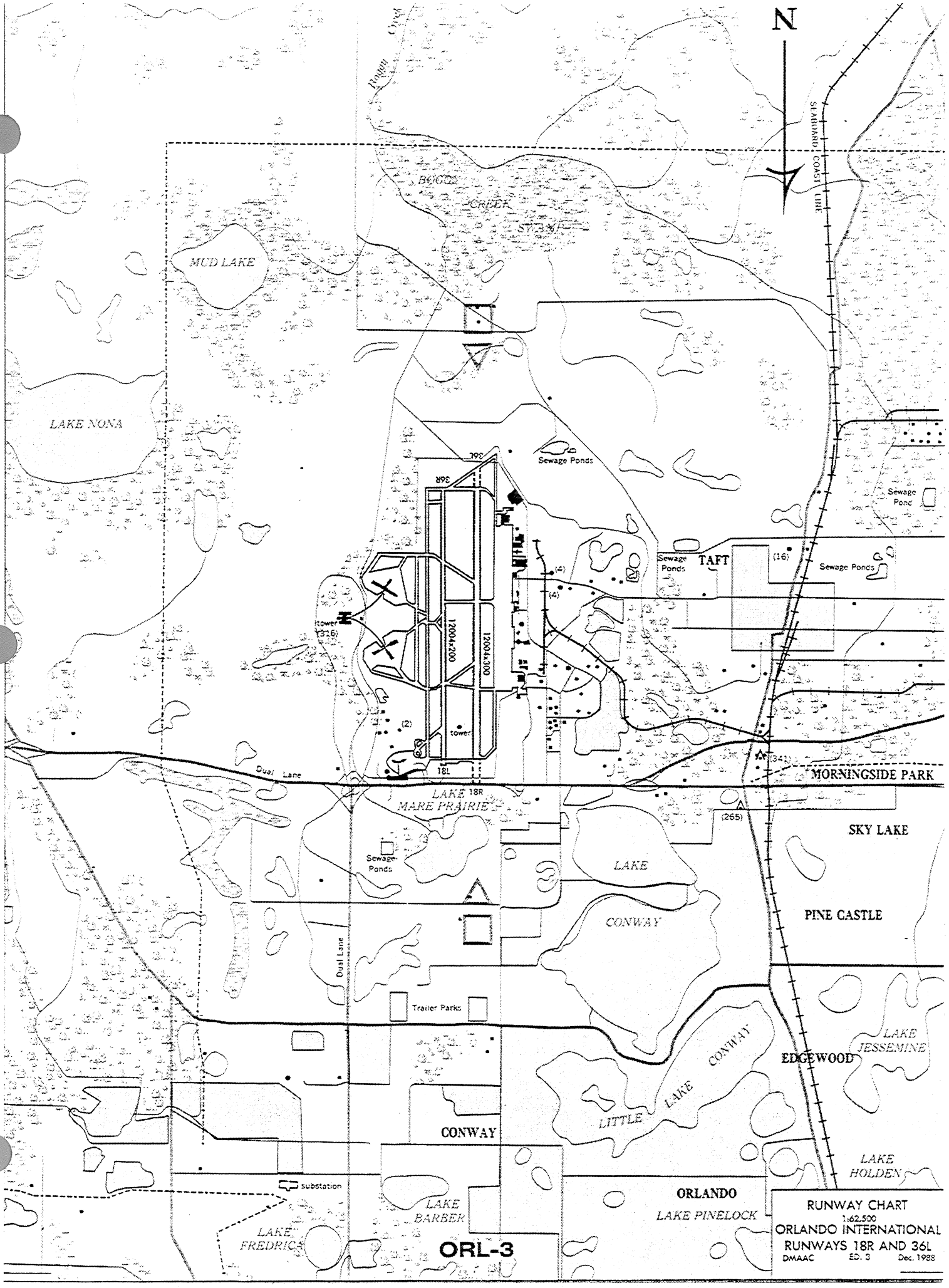


TACAN: ORL-59x (Pri) TTS-59y (Sec)
I/F above: N:90k E:110k N:clear E:clear
S:clear W: 90k S:clear W:clear

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

ORLANDO ORL
ORLANDO ORL
ORLANDO ORL
ORLANDO ORL


VALDOSTA
GEORGIA
FLORIDA
OKEFENOKEE SWAMP
ST. MARYS
FERNANDINA BEACH
JACKSONVILLE INTL
JACKSONVILLE
NAF MAYPORT
OLF WHITEHOUSE
LAKE CITY
NAS CECIL
225
Lake City
DIVISION OF CORRECTIONS
NAS JACKSONVILLE
155
89
KEYSTONE
REYNOLDS
St Augustine
GAINESVILLE
CROSS CITY
GAINESVILLE
189
KAY LARKIN
Palatka
FLAGLER
WILLISTON
240
90
Ocala
DUNNELLON
OCALA
DAYTONA BEACH
DAYTONA BEACH
De Land
NEW SMYRNA
175
200
SANFORD
LEESBURGH
38
ORL
59
ORLANDO
SPACE CENTER
NASA SHUTTLE LANDING FACILITY
TTS
59Y
CAPE CANAVERAL AFS SKIDSTRIP
CAPE CANAVERAL
HERNANDO
ORLANDO INTL
KISSIMMEE
WEST PASCO
ZEPHYRHILLS
PATRICK AFB
LAKE X
TAMPA
TAMPA
LAKELAND
Winter Haven
Melbourne
ST. PETERSBURG–CLEARWATER
LAKELAND
BARTOW
LAKE KISSIMMEE
MACDILL AFB
305
RIVER
ST PETERSBURG
MACDILL AFB AUX
VERO BEACH
ST. LUCIE
Sebring
FORT PIERCE
SARASOTA–BRADENTON
SARASOTA
OKEECHOBEE
WITHAM
Arcadia
PLACID LAKES
VENICE
CHARLOTTE
85
LAKE OKEECHOBEE
GWINN
PALM BEACH CO GLADES
WEST PALM BEACH
Belle Glade
PALM BEACH
Ft. Meyers
SOUTHWEST FLORIDA
PAGE
IMMOKALEE
BOCA RATON
BIG CYPRESS SWAMP
FORT LAUDERDALE EXECUTIVE
FORT LAUDERDALE
NAPLES
FORT LAUDERDALE HOLLYWOOD
MARCO ISLAND
OPA LOCKA
DADE COLLIER TRAINING
MIAMI
ORLANDO ORL
15
18
21
24
27
30
33
100
N
AREA CHART
1:2,000,000
ORLANDO INTL
28°25.9'N 81°19.5'
DMAAC ED. 3 Dec.
ORL-2


N
SEABOARD COAST LINE
BOGGY CREEK
MUD LAKE
LAKE NONA
Sewage Ponds
36L
36R
Sewage Pond
Sewage Ponds
TAFT
(16)
Sewage Ponds
(4)
(4)
Tower
(316)
12004-300
12004-300
(2)
tower
18L
Dual Lane
(341)
MORNINGSIDE PARK
LAKE 18R
MARE PRAIRIE
(265)
SKY LAKE
Sewage Ponds
LAKE
CONWAY
PINE CASTLE
Dual Lane
Trailer Parks
LAKE
JESSEMINE
EDGEWOOD
LAKE
CONWAY
LITTLE
LAKE
CONWAY
LAKE
HOLDEN
substation
LAKE
BARBER
ORLANDO
LAKE PINELOCK
LAKE
FREDRICA
ORL-3
RUNWAY CHART
1:62,500
ORLANDO INTERNATIONAL
RUNWAYS 18R AND 36L
DMAAC
ED. 3
Dec. 1988

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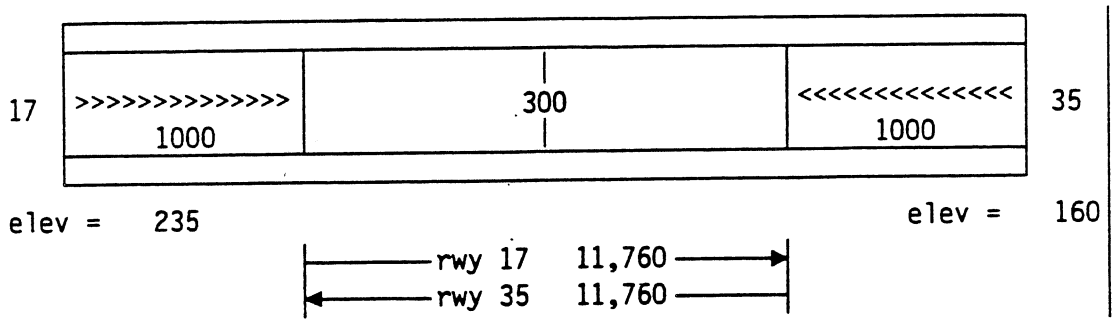
Plattsburgh AFB, New York

Table Identifier **PBG**

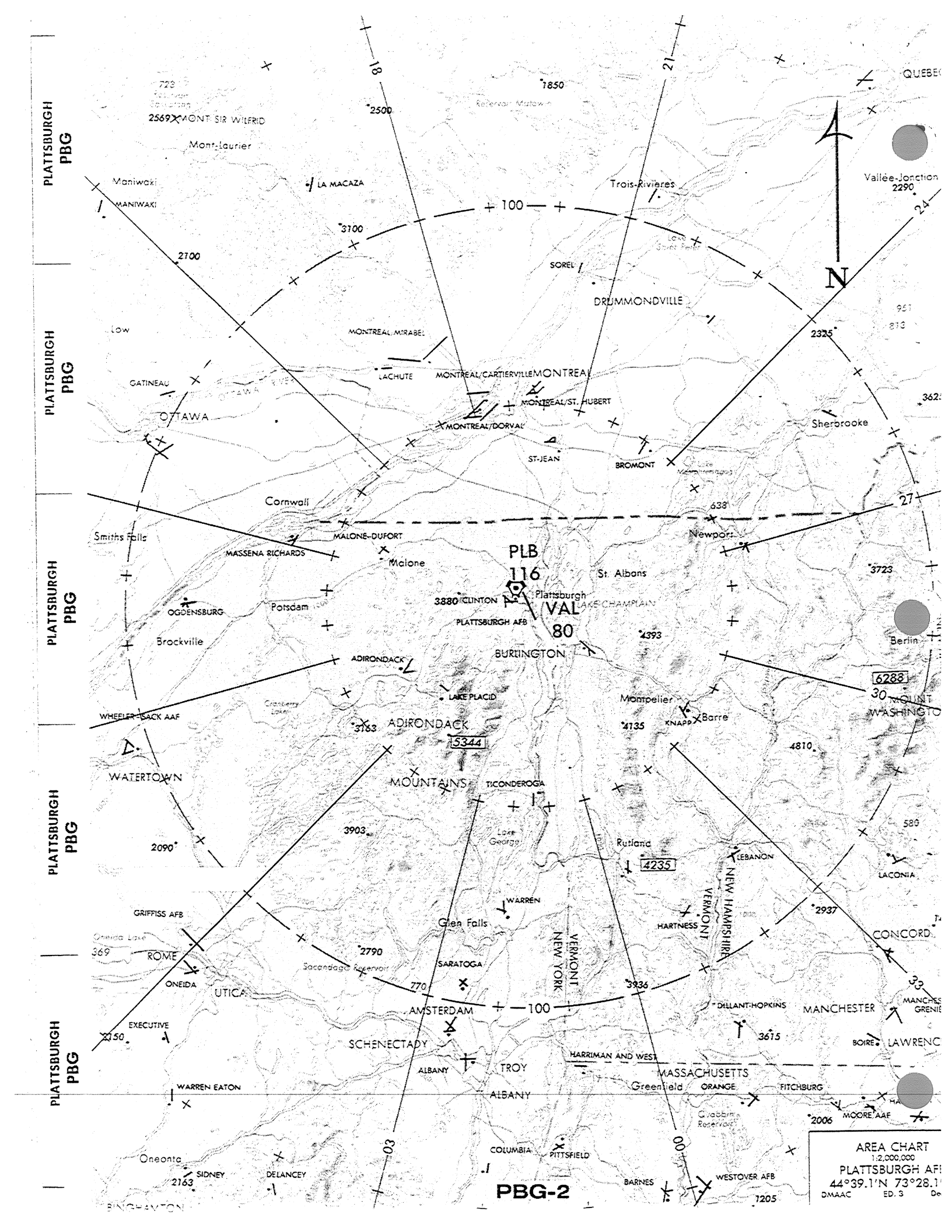


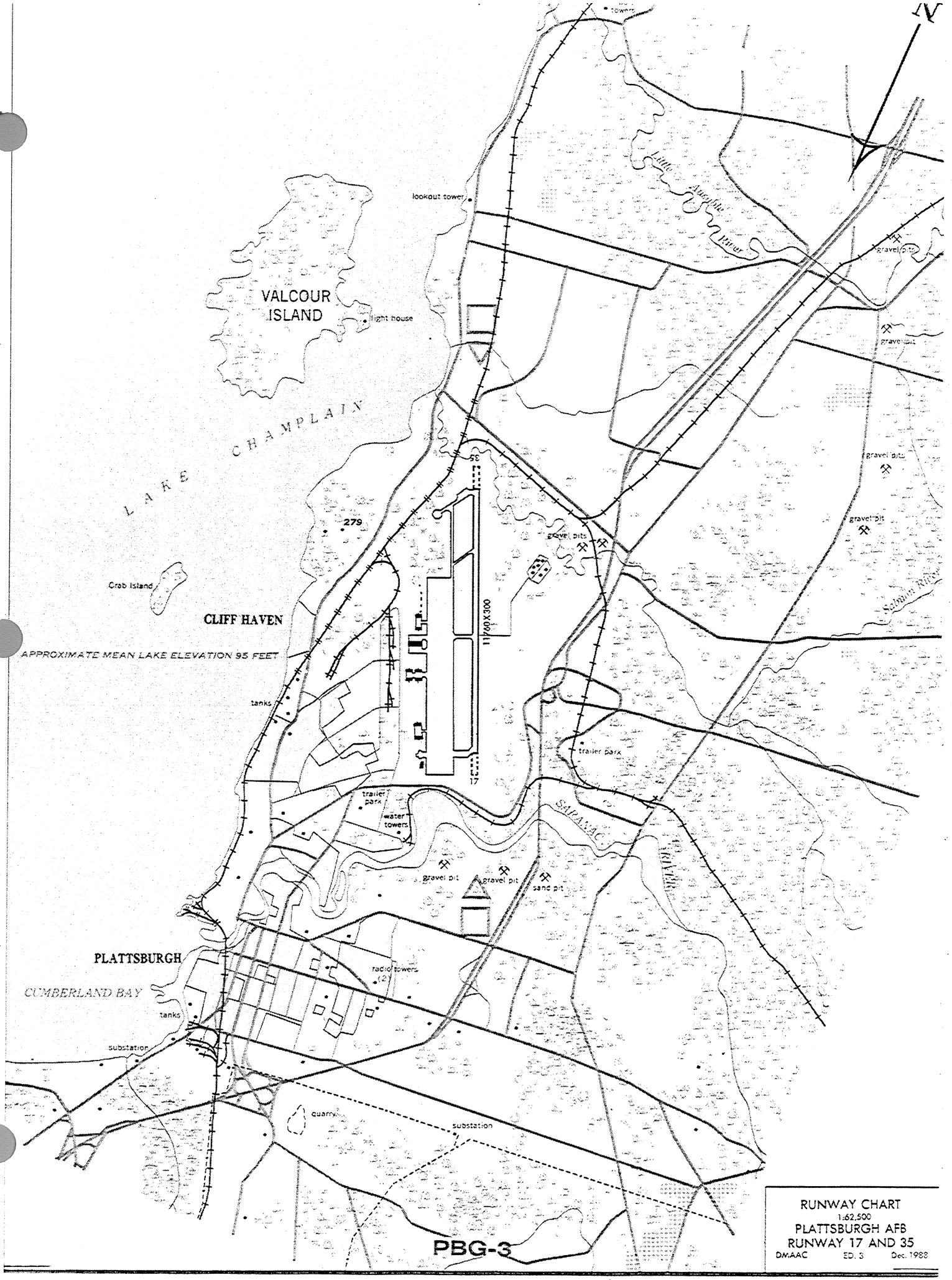
TACAN: VAL-80x (Pri) PLB-116x (Sec)
I/F above: N:<<80k E:<<80k N:clear E:clear
S:<<80k W:<<80k S:100k W:100k

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

MAPS/ALL/GEN B

PLATTSBURGH PBG
PLATTSBURGH PBG
PLATTSBURGH PBG
PLATTSBURGH PBG


PLATTSBURGH PBG
PLATTSBURGH PBG
PLATTSBURGH PBG
PLATTSBURGH PBG
PLATTSBURGH PBG
PLB
116
VAL
80
Plattsburgh
PLATTSBURGH AFB
LAKE CHAMPLAIN
MONTREAL
MONTREAL/CARTIERVILLE
MONTREAL/ST. HUBERT
MONTREAL/DORVAL
MONTREAL, MIRABEL
OTTAWA
GATINEAU
LACHUTE
SOREL
DRUMMONDVILLE
ST-JEAN
BROMONT
Sherbrooke
Trois-Rivieres
Vallée-Jonction
MONT SIR WILFRID
Mont-Laurier
LA MACAZA
Maniwaki
MANIWAKI
Cornwall
Smiths Falls
MASSENA RICHARDS
MALONE-DUFORT
Malone
Potsdam
OGDENSBURG
Brockville
CLINTON
St. Albans
Newport
Berlin
BURLINGTON
Montpelier
Barre
KNAPP
ADIRONDACK
LAKE PLACID
WHEELER-SACK AAF
WATERTOWN
ADIRONDACK MOUNTAINS
TICONDEROGA
Lake George
Rutland
LEBANON
LACONIA
CONCORD
NEW HAMPSHIRE
VERMONT
HARTNESS
GRIFFISS AFB
ROME
ONEIDA
UTICA
Glen Falls
WARREN
SARATOGA
Saccandaga Reservoir
NEW YORK
VERMONT
AMSTERDAM
SCHENECTADY
ALBANY
TROY
EXECUTIVE
WARREN EATON
DILLANT-HOPKINS
MANCHESTER
LAWRENC
HARRIMAN AND WEST
MASSACHUSETTS
Greenfield
ORANGE
FITCHBURG
MOORE AAF
Crabbins Reservoir
COLUMBIA
PITTSFIELD
Oneonta
SIDNEY
DELANCEY
BARNES
WESTOVER AFB
BINGHAMTON
18
21
24
27
30
33
03
00
100
N
PBG-2
AREA CHART
1:2,000,000
PLATTSBURGH AFI
44°39.1'N 73°28.1'
DMAAC
ED. 3



RUNWAY CHART
1:62,500
PLATTSBURGH AFB
RUNWAY 17 AND 35
DMAAC ED. 3 Dec. 1988

PBG-3

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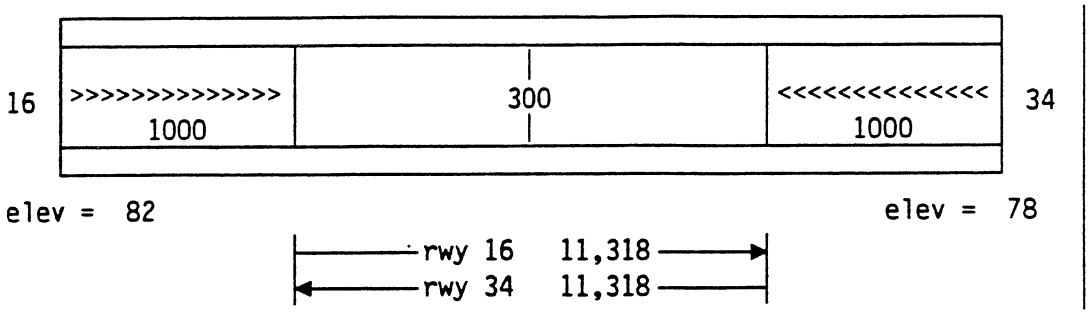
Pease AFB, New Hampshire

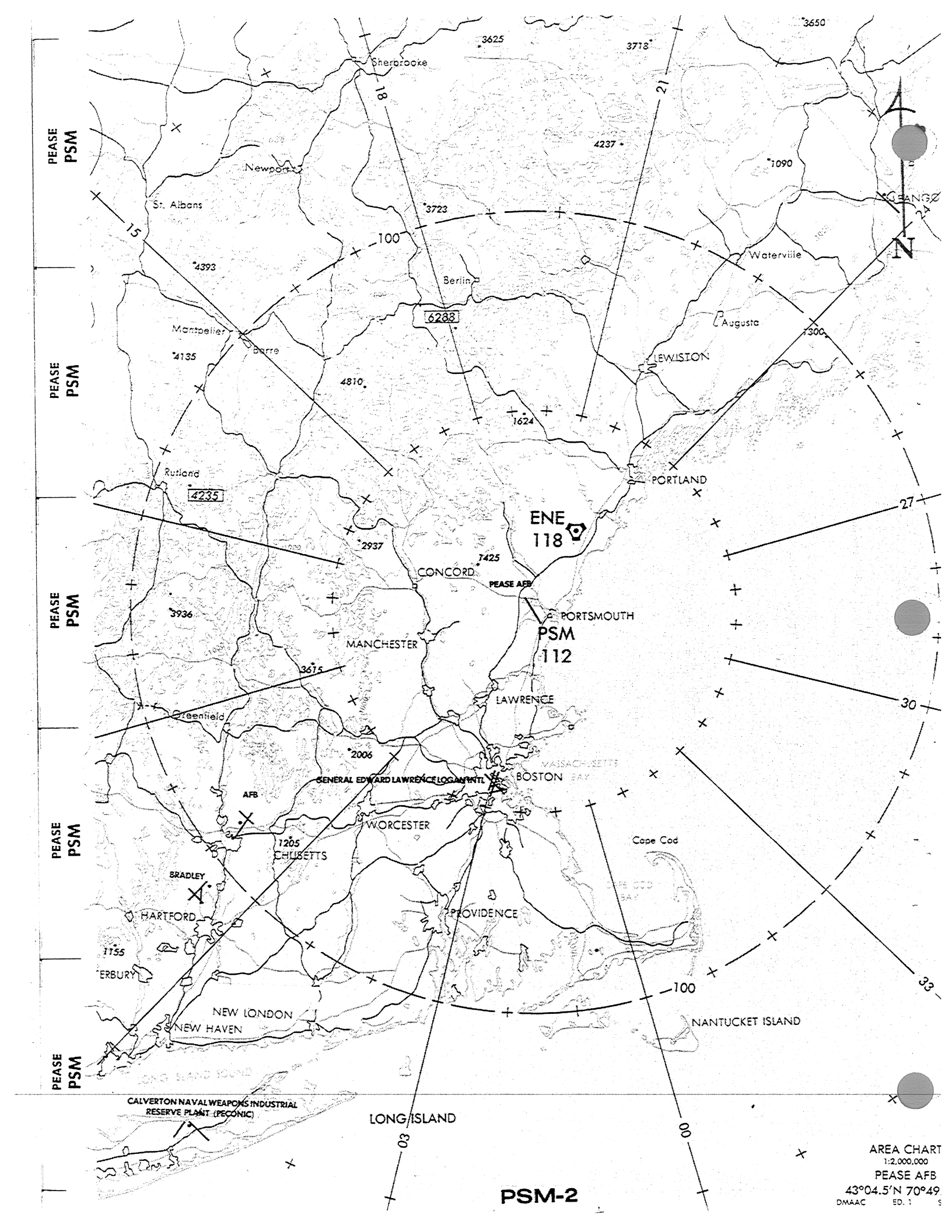
Table Identifier **PSM**



TACAN:	PSM-112x (Pri)	ENE-118x (Sec)
I/F above:	N:<<80k E:<<80k	N:clear E:clear
	S:<<80k W:<<80k	S:120k W:95k

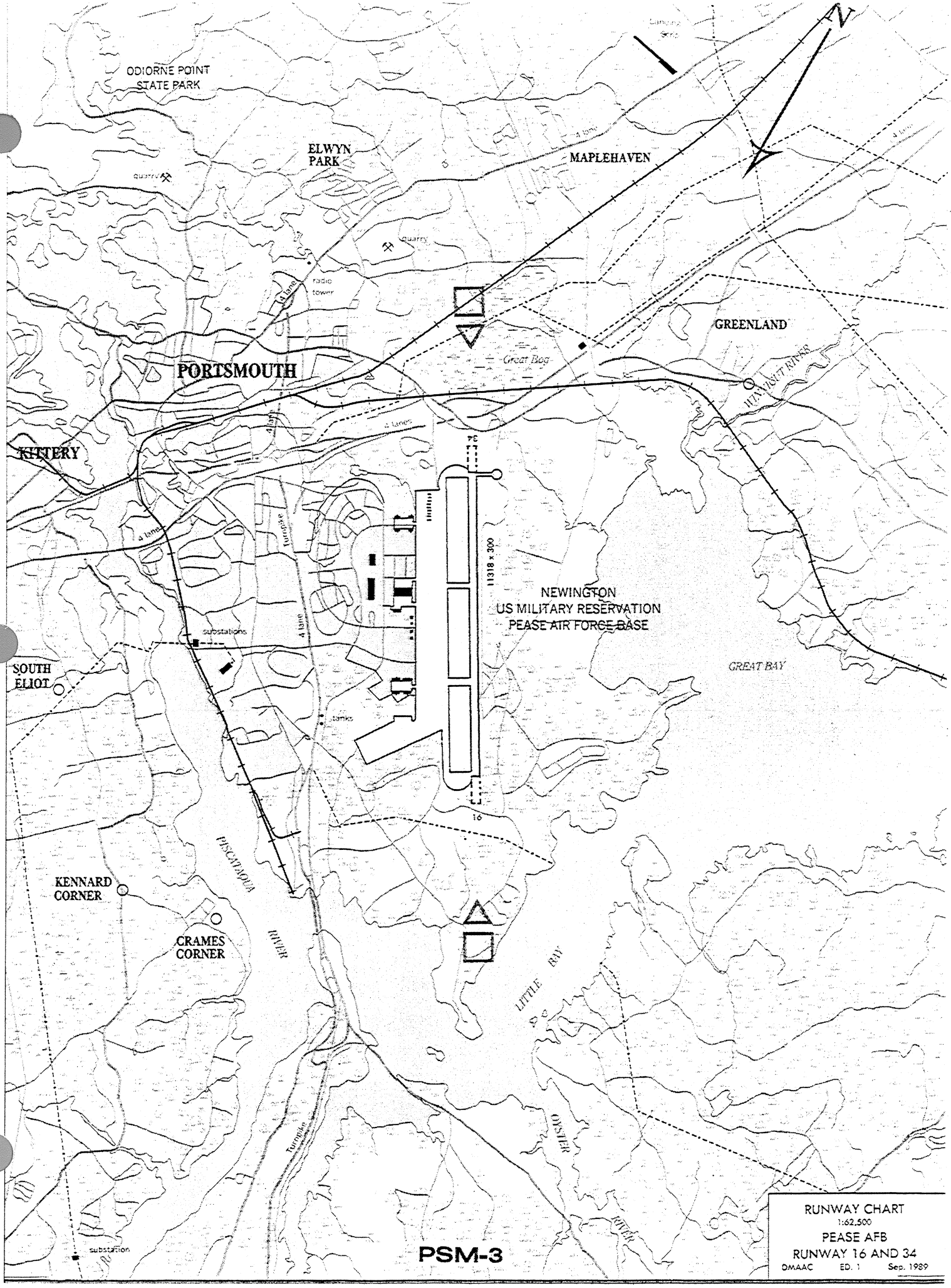
MLS: none
PAPI: none
Ball Bar: none
UHF: yes (guard only)

PEASE PSM
PEASE PSM
PEASE PSM
PEASE PSM



PSM-2

AREA CHART
1:2,000,000
PEASE AFB
43°04.5'N 70°49
DMAAC ED. 1 S



RUNWAY CHART
1:62,500
PEASE AFB
RUNWAY 16 AND 34
DMAAC ED. 1 Sep. 1989

PSM-3

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Pease AFB, Portsmouth, NH

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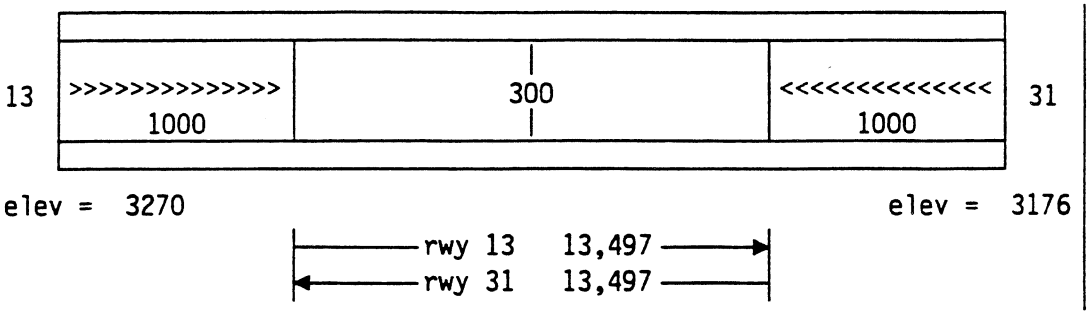
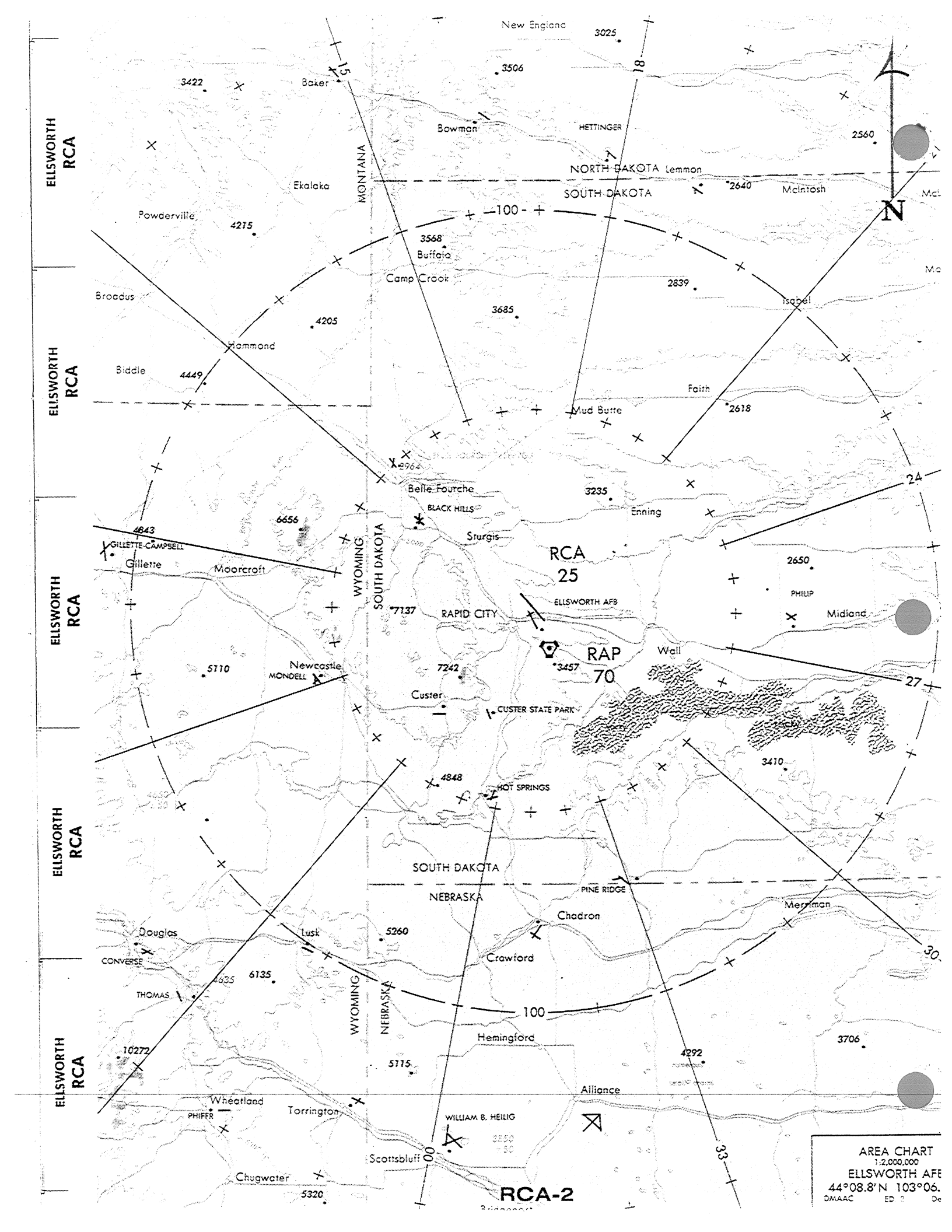
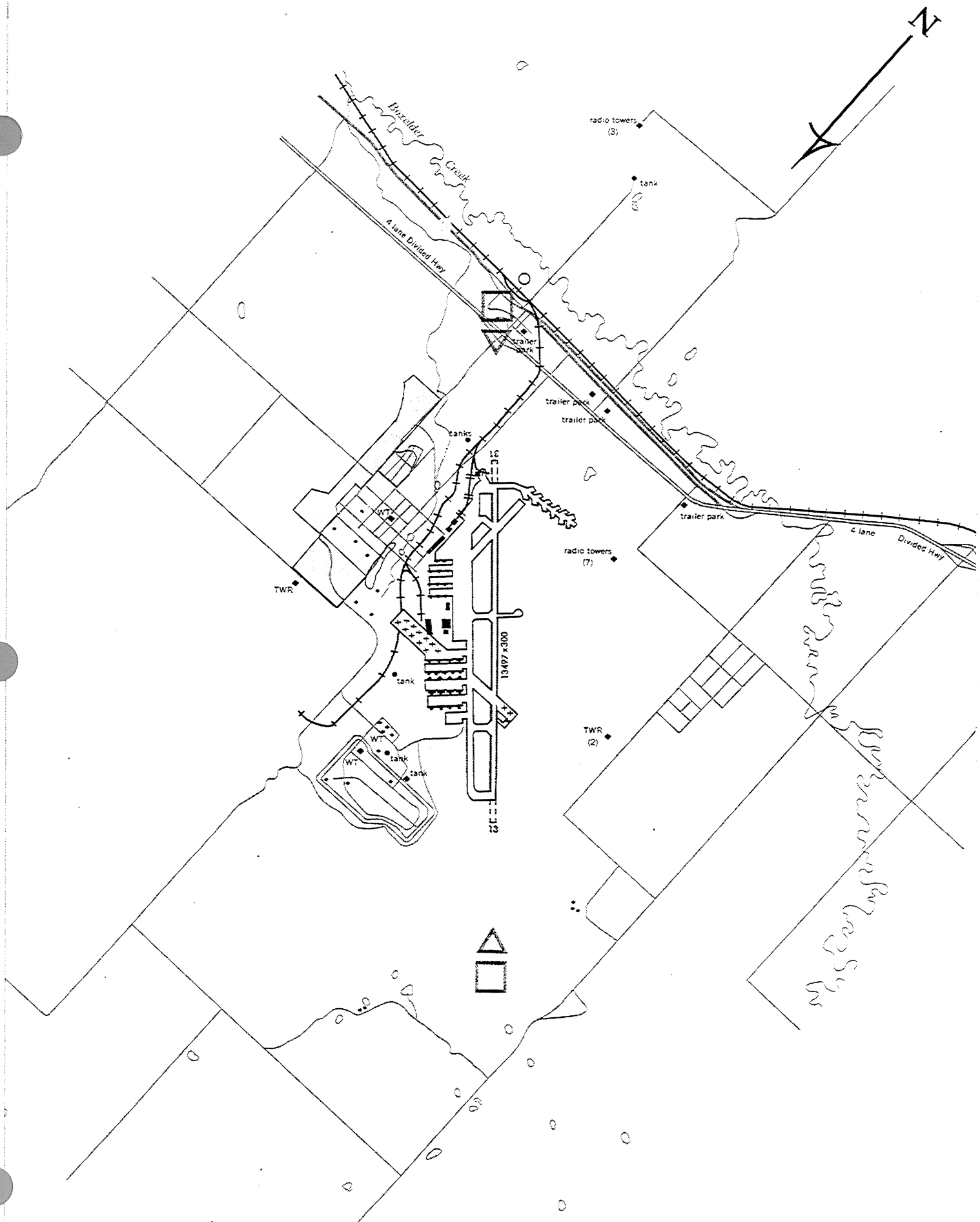


TACAN: RCA-25x (Pri) RAP-70x (Sec)
I/F above: N:<<80k E:<<80k N:140k E:100k
S:<<80k W:<<80k S: 90k W:110k

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


ELLSWORTH RCA
ELLSWORTH RCA
ELLSWORTH RCA
ELLSWORTH RCA
ELLSWORTH RCA
New England
3025
3506
3422
Baker
Bowman
HETTINGER
2560
MONTANA
NORTH DAKOTA Lemmon
SOUTH DAKOTA
2640
McIntosh
Ekalaka
Powderville
4215
100
3568
Buffalo
Camp Crook
2839
Isabel
Broadus
4205
3685
Hammond
Biddie
4449
Faith
Mud Butte
2618
2964
Belle Fourche
3235
Enning
BLACK HILLS
6656
4643
GILLETTE-CAMPBELL
Gillette
Moorcroft
Sturgis
RCA
25
2650
PHILIP
Midland
WYOMING
SOUTH DAKOTA
7137
RAPID CITY
ELLSWORTH AFB
RAP
70
3457
Wall
5110
Newcastle
MONDELL
7242
Custer
CUSTER STATE PARK
3410
4848
HOT SPRINGS
SOUTH DAKOTA
NEBRASKA
PINE RIDGE
Merriman
Chadron
Douglas
Tusk
5260
CONVERSE
Crawford
6135
THOMAS
WYOMING
NEBRASKA
100
Hemingford
3706
10272
5715
4292
Alliance
Wheatland
PHIFFR
Torrington
WILLIAM B. HEILIG
Scottsbluff
Chugwater
5320
RCA-2
AREA CHART
1:2,000,000
ELLSWORTH AFE
44°08.8'N 103°06.
DMAAC



RUNWAY CHART
1:62,500
ELLSWORTH AFB
RUNWAYS 13 AND 31
DMAAC ED. 3 Dec. 1988

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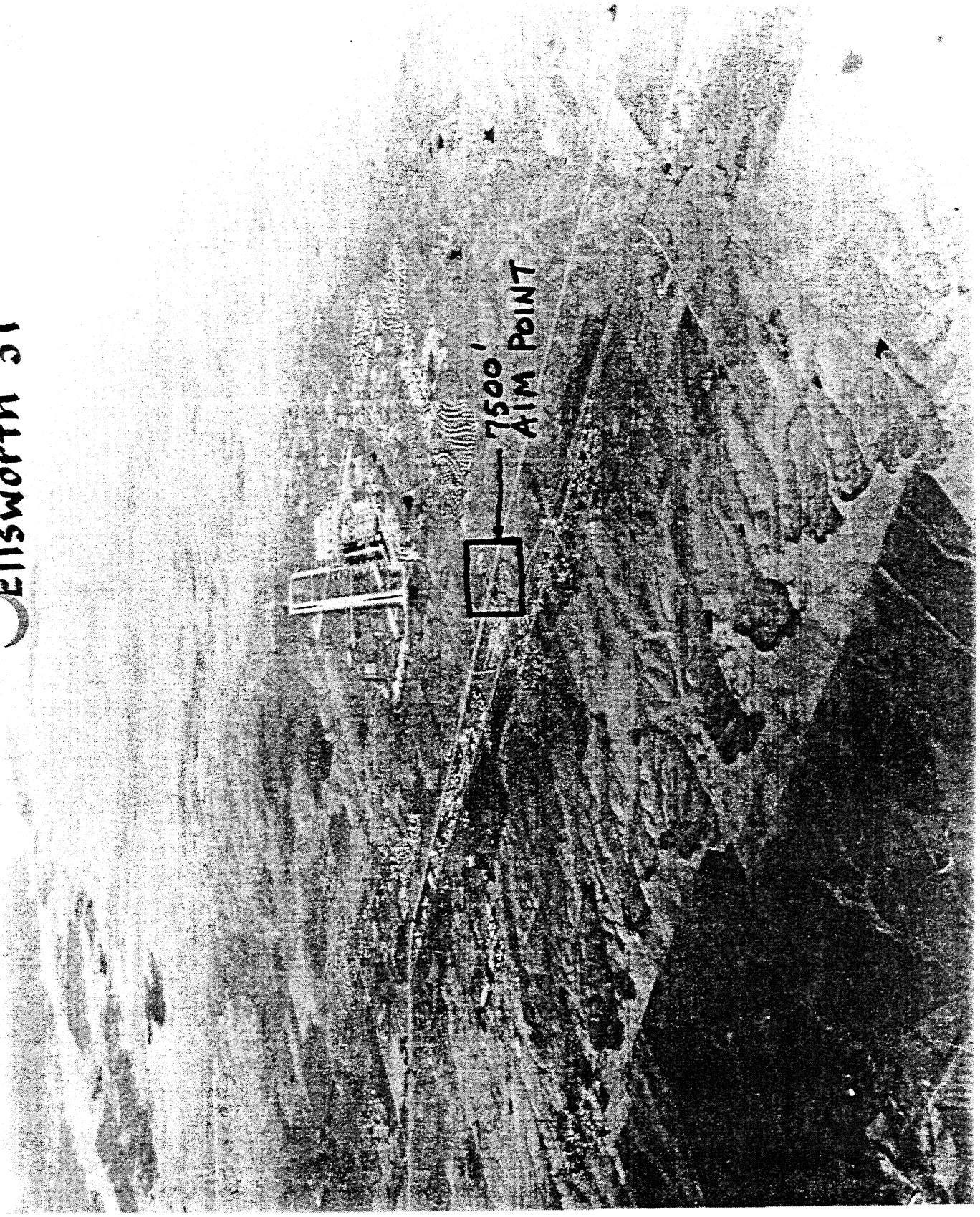
Ellsworth 31
7500'
AIM POINT

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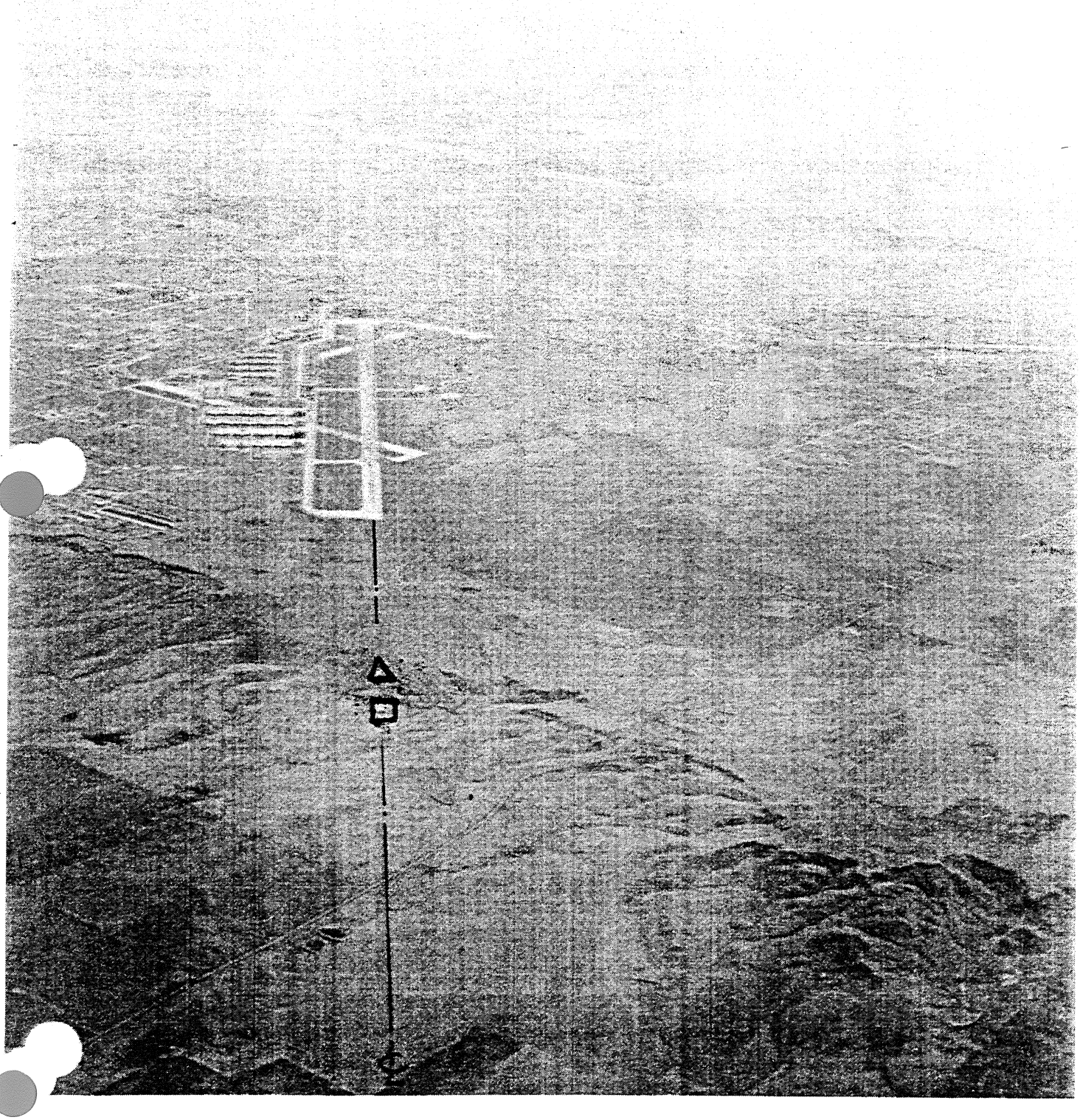
ELLSWORTH 13



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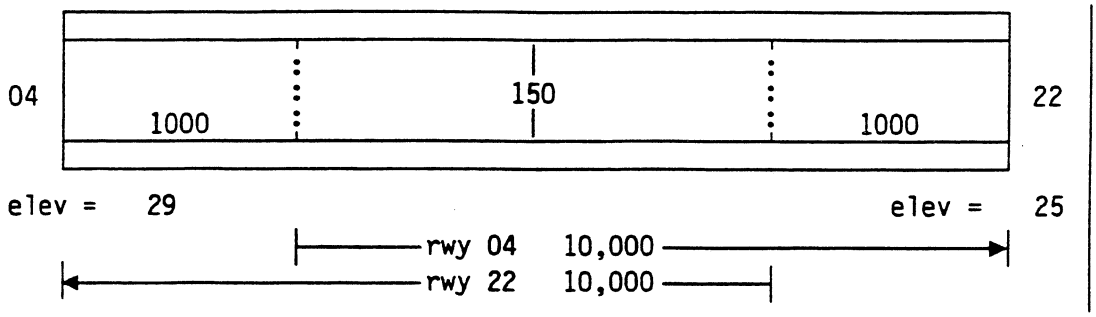
Roberts FIeld, Liberia

Table Identifier **ROB**



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

WARNING

- Do NOT use rwy 22

- No overruns

- Expect thunderstorms, low clouds, and low visibility May through November. Expect scattered low clouds other times

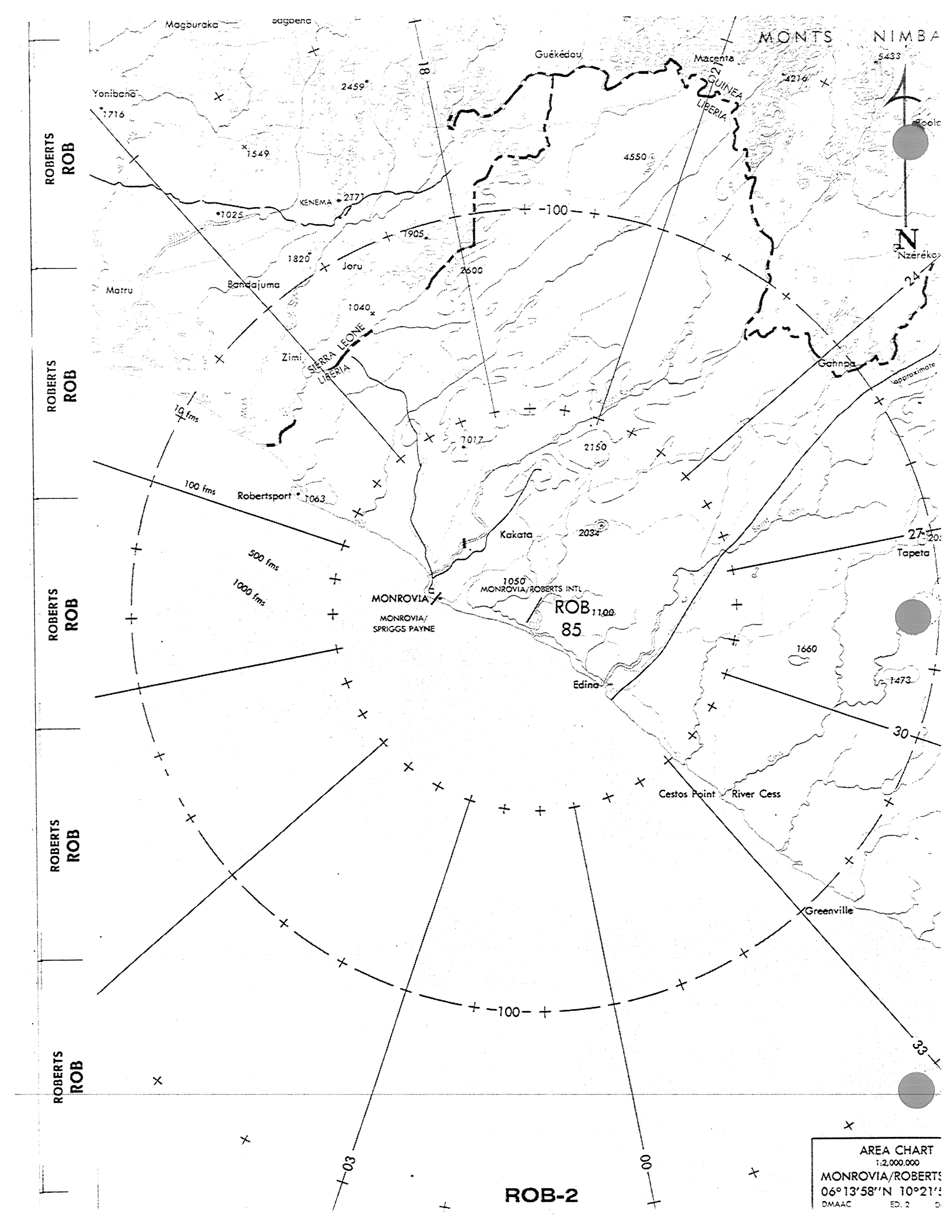
- Braking action is poor

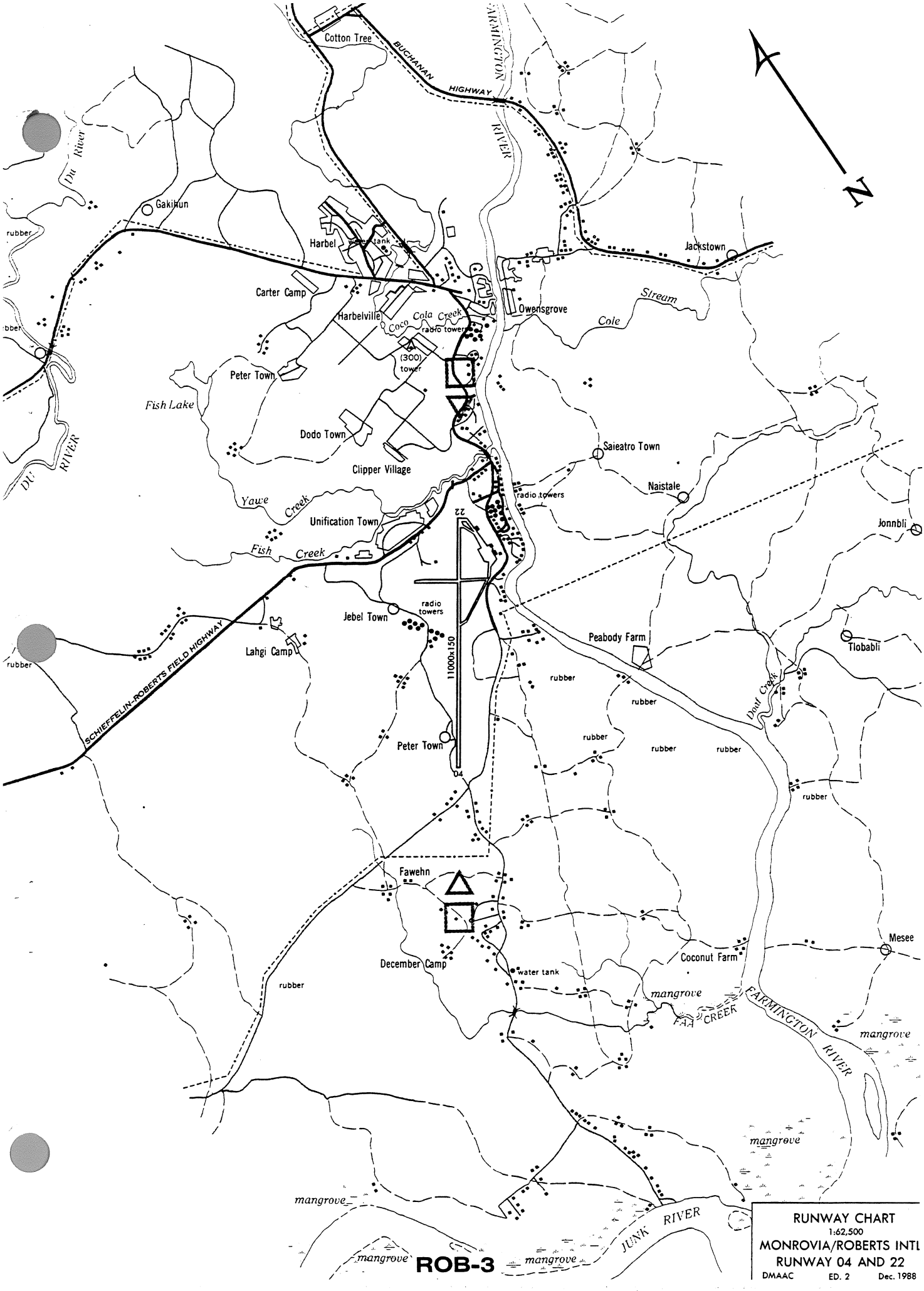
NOTE
- 25-ft shoulders

- Airport officials may not be aware of your purpose

- Official language is English

ROBERTS ROB
ROBERTS ROB
ROBERTS ROB
ROBERTS ROB


ROBERTS ROB
ROBERTS ROB
ROBERTS ROB
ROBERTS ROB
ROBERTS ROB
Magburaka
Bagbena
Yonibana
1716
2459
1549
KENEMA
2177
1025
1820
Joru
1905
2600
Matru
Bandajuma
1040
Zimi
SIERRA LEONE
LIBERIA
Guékédou
Macenta
GUINEA
LIBERIA
4216
5433
4550
MONTS NIMBA
Nzérékoré
Gahnpa
approximate
10 fms
100 fms
Robertsport
1063
7017
2150
Kakata
2032
500 fms
1000 fms
MONROVIA
MONROVIA/ SPRIGGS PAYNE
1050
MONROVIA/ROBERTS INTL
ROB 1100
85
Tapeta
1660
1473
Edina
Cestos Point
River Cess
Greenville
18
24
27
30
33
100
03
00
ROB-2
AREA CHART
1:2,000,000
MONROVIA/ROBERTS
06°13'58"N 10°21'
DMAAC ED. 2


Cotton Tree
BUCHANAN HIGHWAY
FARMINGTON RIVER
N
Du River
Gakihun
rubber
Harbel
water tank
Jackstown
Carter Camp
Harbelville
Coco Cola Creek
radio tower
Owensgrove
Stream
Cole
(300) tower
Peter Town
Fish Lake
Dodo Town
Clipper Village
DU RIVER
Saieatro Town
Naistale
radio towers
Yawe Creek
Unification Town
22
Jonnbli
Fish Creek
radio towers
Jebel Town
Peabody Farm
Tlobabli
Lahgi Camp
SCHIEFFELIN-ROBERTS FIELD HIGHWAY
11000x150
rubber
Doaf Creek
Peter Town
04
Fawehn
Mesee
December Camp
water tank
Coconut Farm
mangrove
FARMINGTON RIVER
FAA CREEK
mangrove
mangrove
mangrove
JUNK RIVER
mangrove
ROB-3
RUNWAY CHART
1:62,500
MONROVIA/ROBERTS INTL
RUNWAY 04 AND 22
DMAAC ED. 2 Dec. 1988

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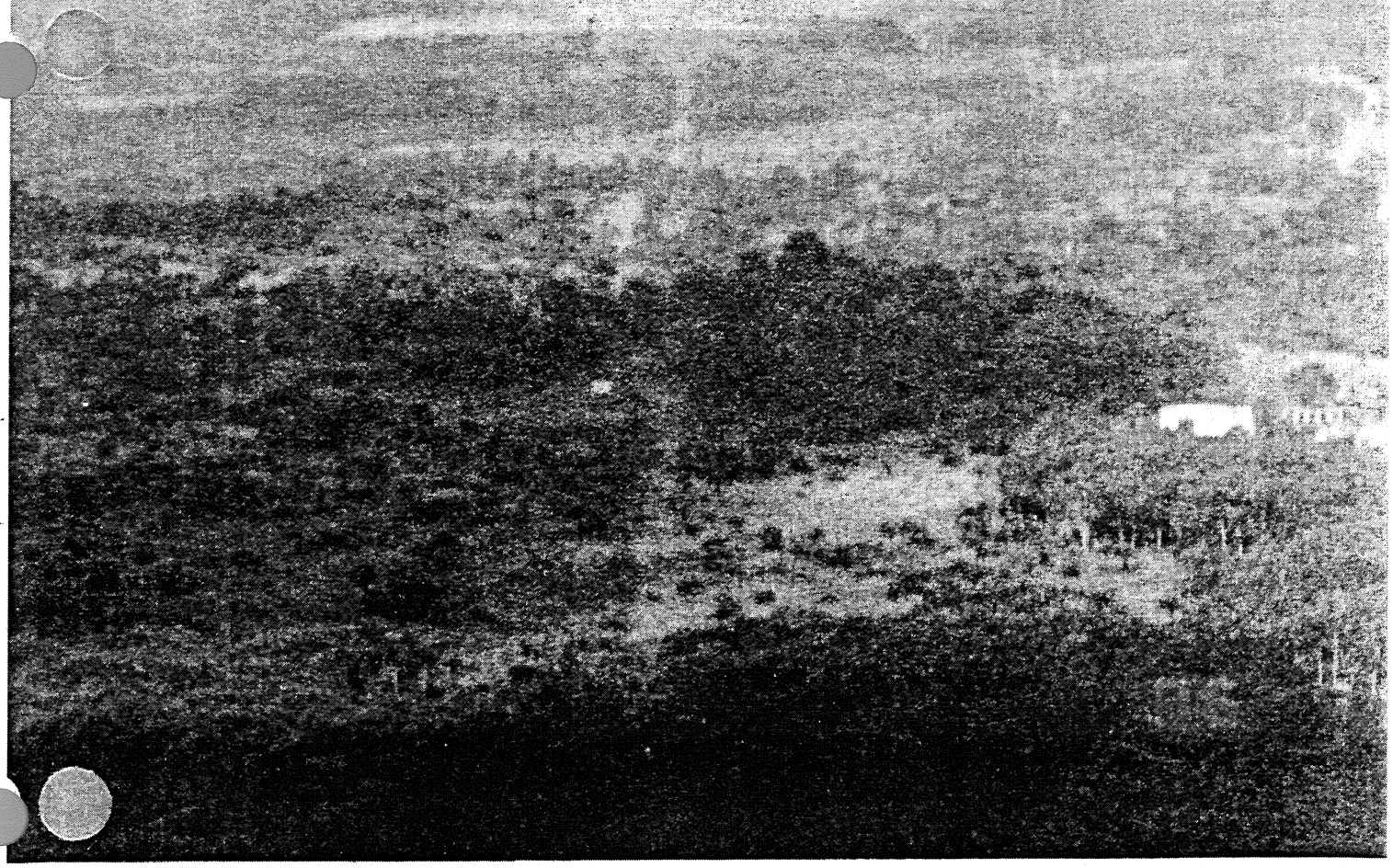

ROB-A

EDITION 1-6/89

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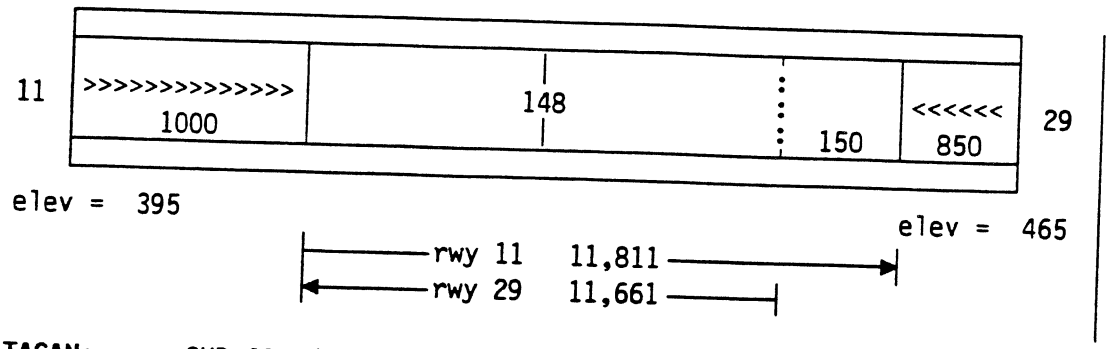
Souda, Crete (Greece)

Table Identifier **SUD**

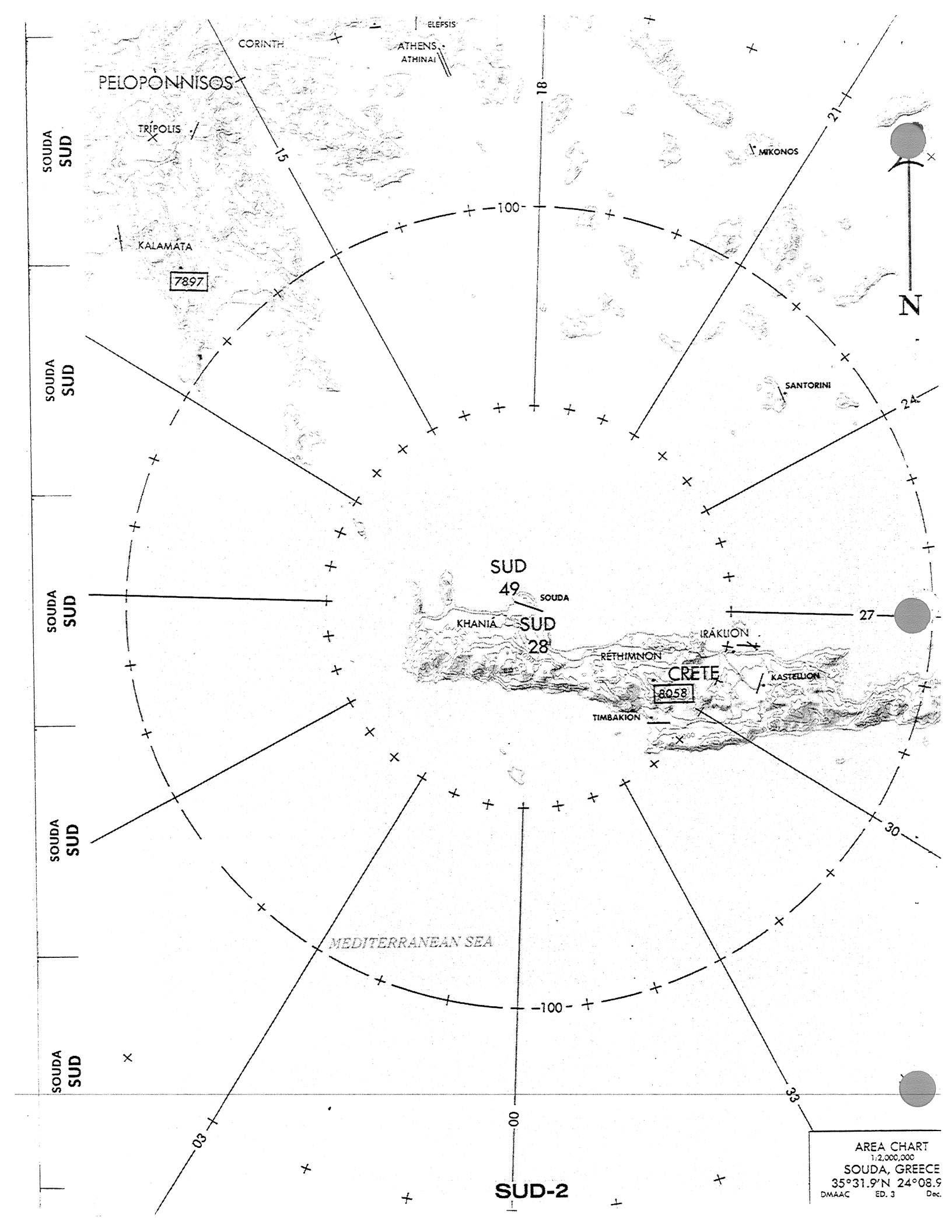


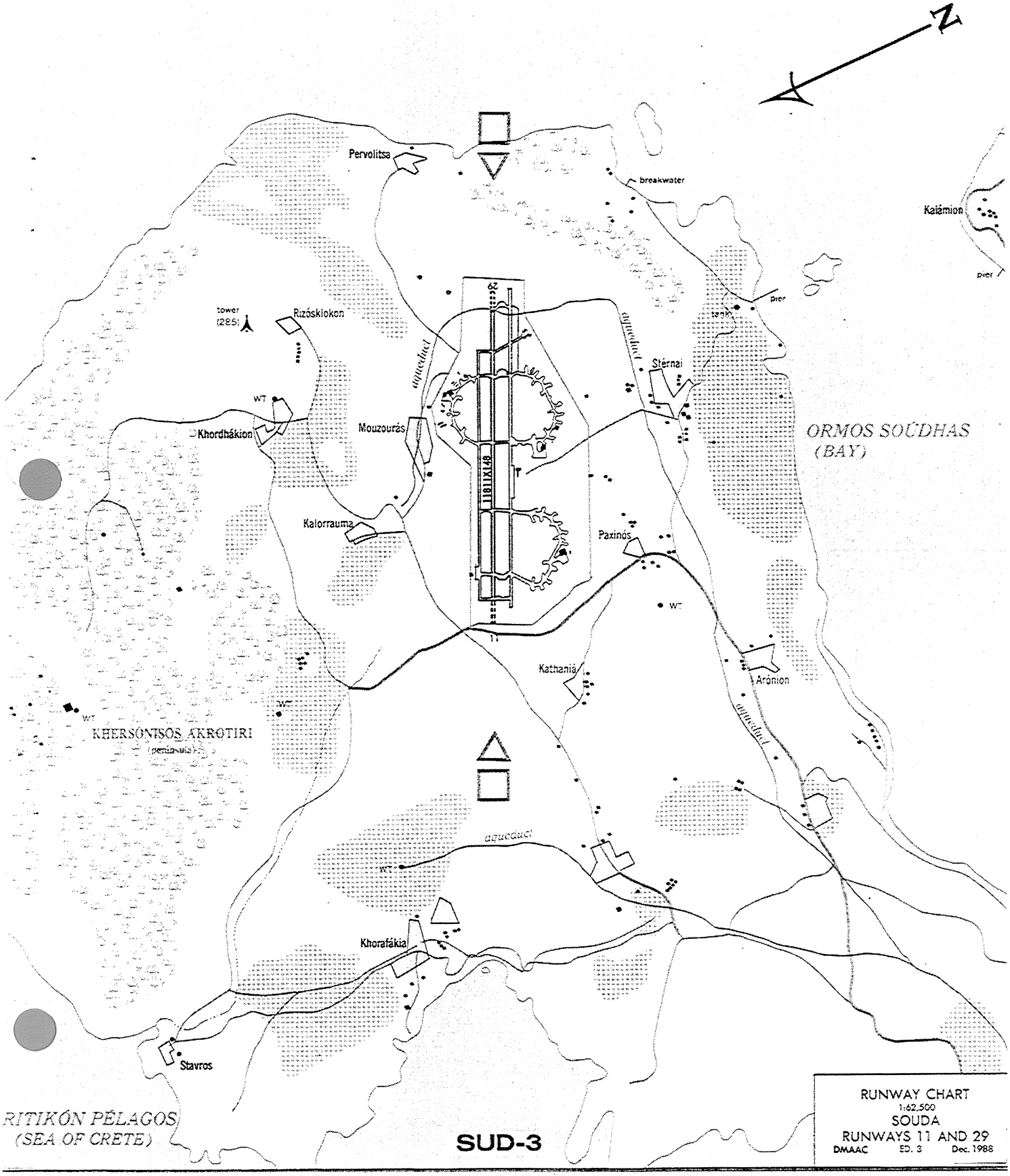
TACAN: SUD-28x (Pri)
I/F above: N:150k E:clear
S:clear W:150k

SUD-49x (Sec)
N:120k E:clear
S:clear W:100k

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

SOUDA SUD


ELEFSIS
CORINTH
ATHENS
ATHINAI
PELOPÓNNISOS
TRÍPOLIS
KALAMÁTA
7897
MÍKONOS
SANTORINI
N
SOUDA
SUD
SUD
49
SOUDA
KHANIÁ
SUD
28
RÉTHIMNON
IRÁKLION
CRETE
8058
KASTELLION
TIMBAKION
MEDITERRANEAN SEA
SUD-2
AREA CHART
1:2,000,000
SOUDA, GREECE
35°31.9'N 24°08.9
DMAAC
ED. 3
Dec.



SUD-3

RUNWAY CHART
1:62,500
SOUDA
RUNWAYS 11 AND 29
DMAAC ED. 3 Dec. 1988

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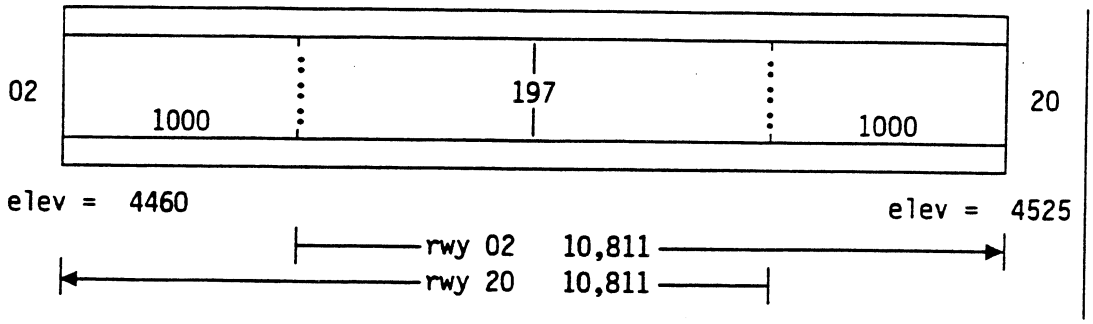
Tamanrasset, Algeria

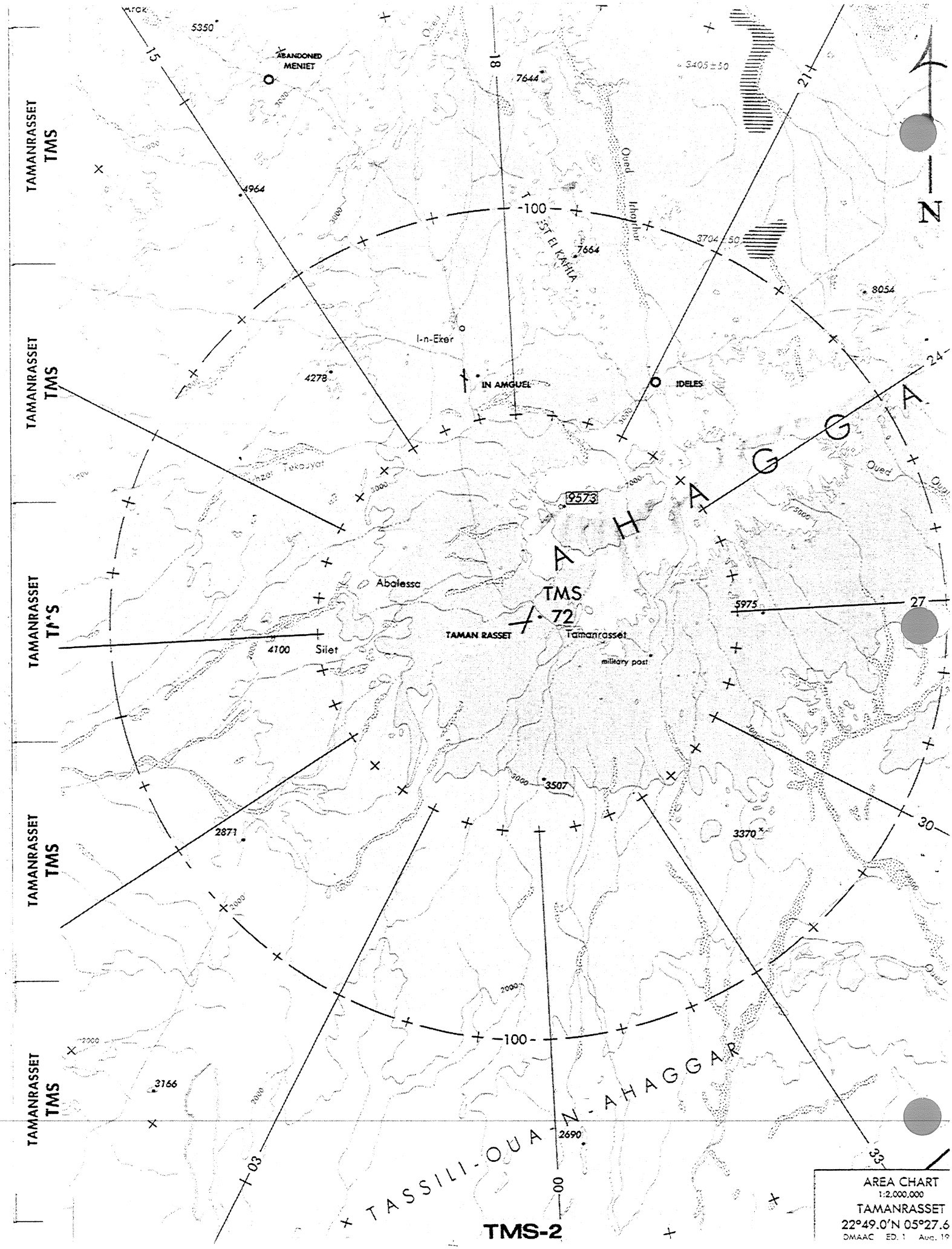
Table Identifier **TMS**

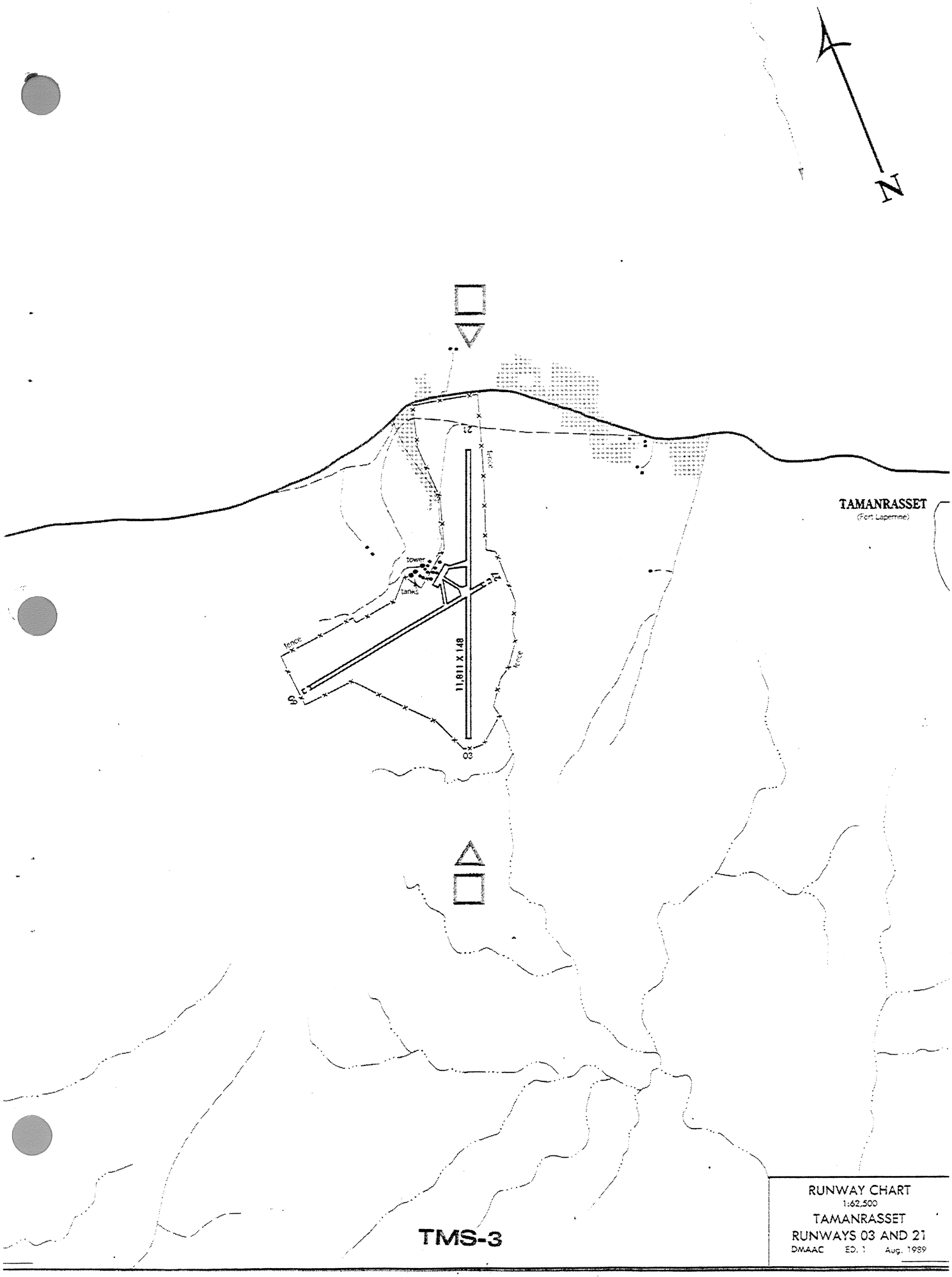


TACAN: TMS-72x (Pri-DME)
I/F above: N:clear E:clear
S:140k W:clear

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

TAMANRASSET TMS
TAMANRASSET TMS
TAMANRASSET TMS
TAMANRASSET TMS


TAMANRASSET TMS
TAMANRASSET TMS
TAMANRASSET TMS
TAMANRASSET TMS
TAMANRASSET TMS
ABANDONED MENIET
IN AMGUEL
IDELES
I-n-Eker
Abalessa
Silet
TAMAN RASSET
Tamanrasset
military post
TMS 72
9573
7644
7664
8054
4964
4278
4100
5975
3507
2871
3370
3166
2690
5350
3704
5405±50
Oued Ihrgharr
Oued Tekouyat
AHAGGAR
TASSILI-OUAN-AHAGGAR
TMS-2
AREA CHART
1:2,000,000
TAMANRASSET
22°49.0'N 05°27.6
DMAAC ED. 1 Aug. 19



RUNWAY CHART
1:62,500
TAMANRASSET
RUNWAYS 03 AND 21
DMAAC ED. 1 Aug. 1989

TMS-3

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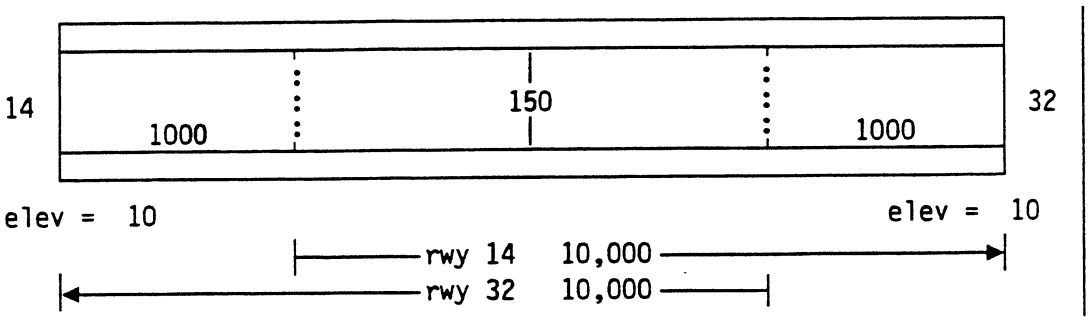
Nassau Intnl, Bahamas

Table Identifier **ZQA**



TACAN: ZQA-74x (Pri-DME)
I/F above: N:100k E:clear
S:clear W:100k

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

WARNING

- No overruns

NOTE
- 25-ft shoulders

- Plan on rwy 14

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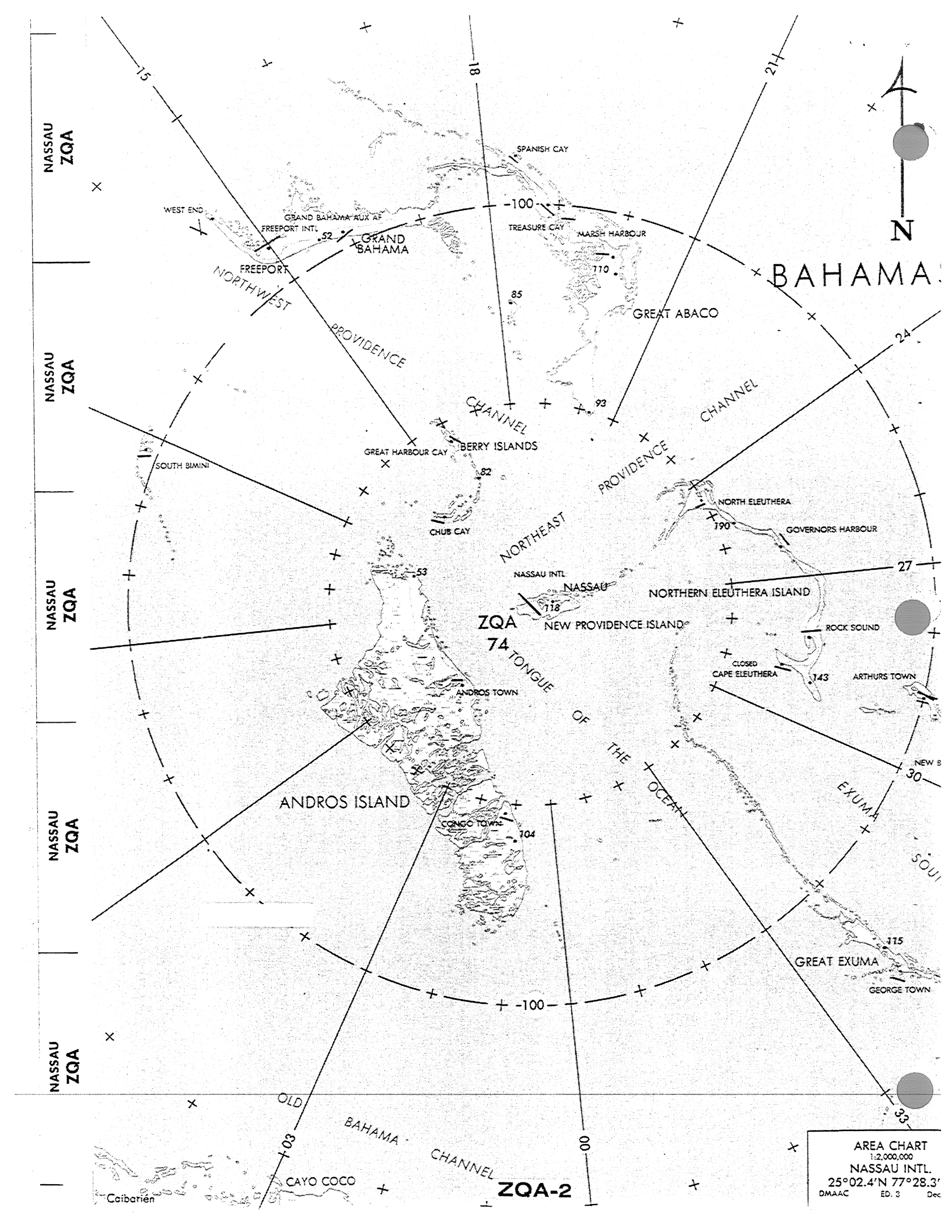
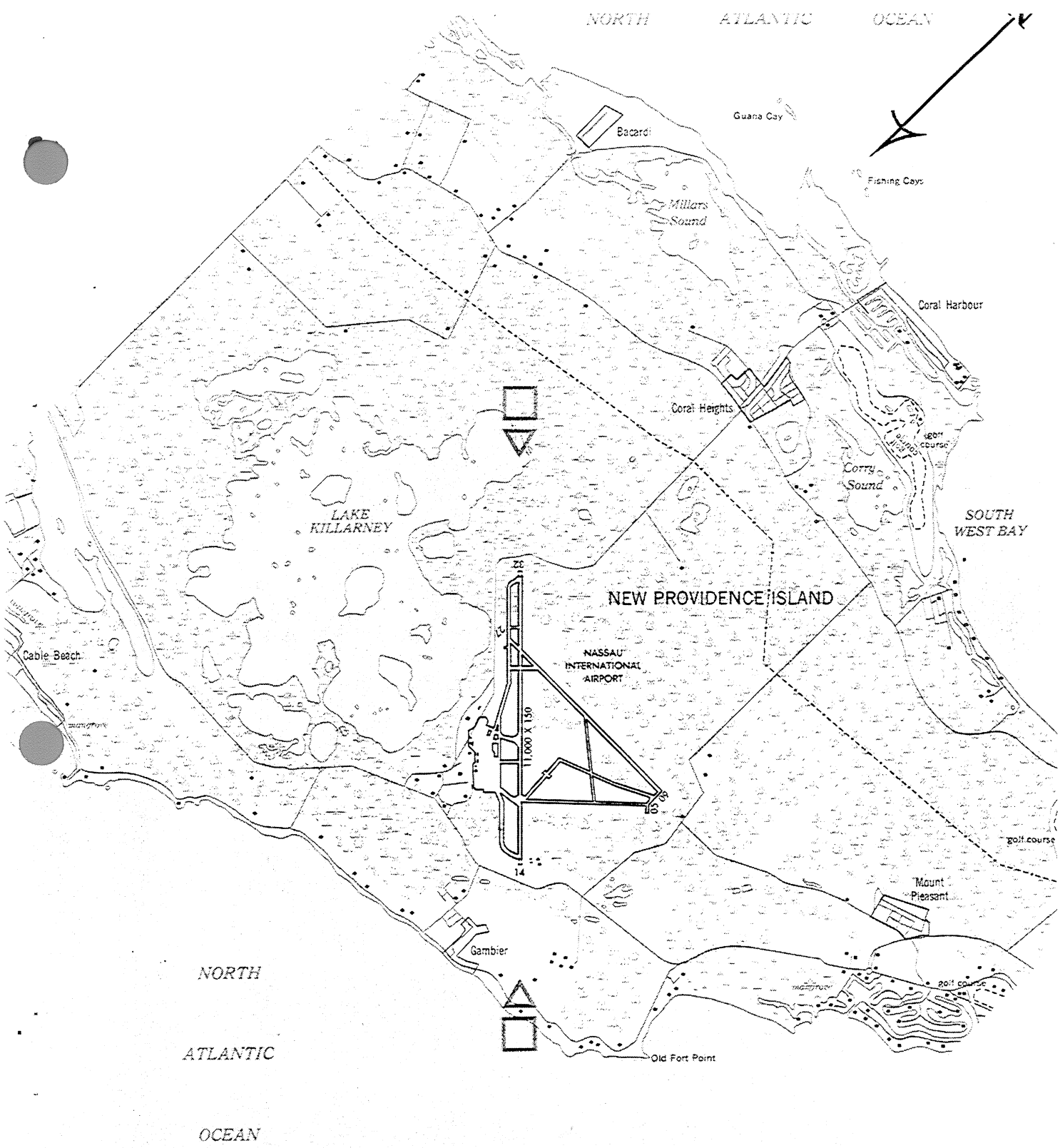
NASSAU ZQA
NASSAU ZQA
NASSAU ZQA



AREA CHART
1:2,000,000
NASSAU INTL.
25°02.4′N 77°28.3′
DMAAC ED. 3 Dec



RUNWAY CHART
1:62,500
NASSAU INTERNATIONAL
RUNWAYS 14 AND 32
DMAAC ED. 3 Dec. 1988

ZQA-3

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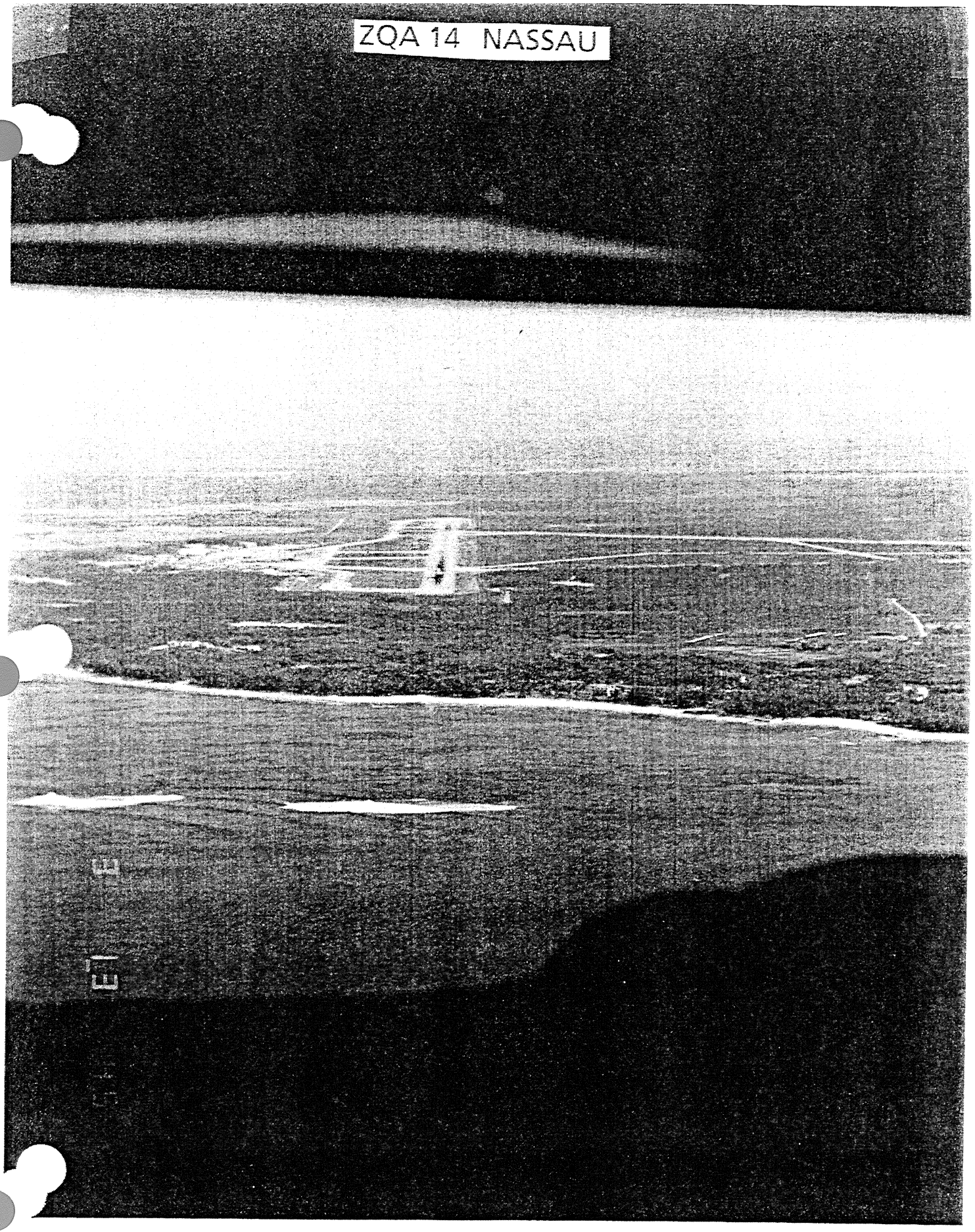
ZQA 14 NASSAU

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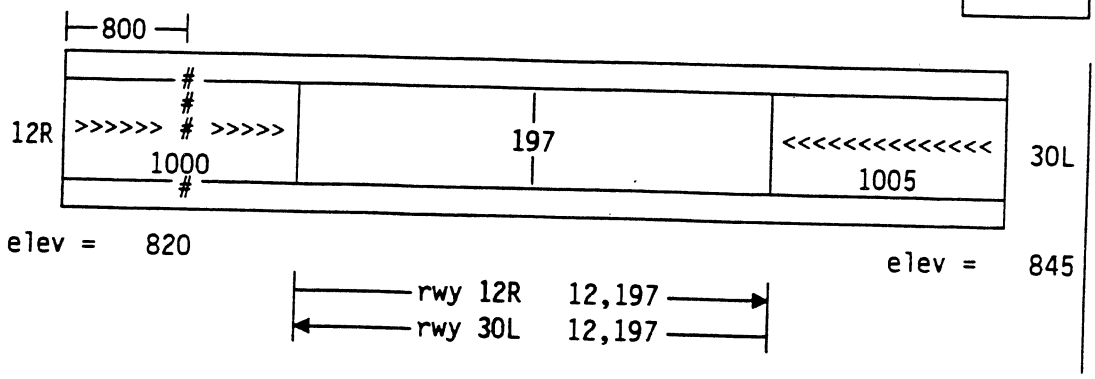
Zaragoza AB, Spain

Table Identifier **ZZA**



TACAN: ZZA-64x (Pri)
I/F above: N:clear E:clear
S:clear W:clear

MLA-58x (Sec-DME)
N:145k E:110k
S:100k W: 90k

MLS: (30L-Sr) ch 6
PAPI: 30L
Ball Bar: 30L
UHF: yes

Notes for 30L:

WARNING

- Do not line up on 30R - it may be seen first in reduced visibility

- PAPIs are offset 170 ft to right of centerline at standard distance to threshold

- Dip in rwy approximately 4000 ft from threshold - shows up dark in night TAL, but is illuminated

- Rwy slopes down slightly. Rollout end is approximately 30 ft lower than approach end

NOTE
- Prominent triangular shaped field is adjacent to and left of PAPIs. Apex points to rwy 30L

Notes for 12R:

CAUTION

- Do not fly high on IGS to avoid VOR bldg on final

- No visual landing aids

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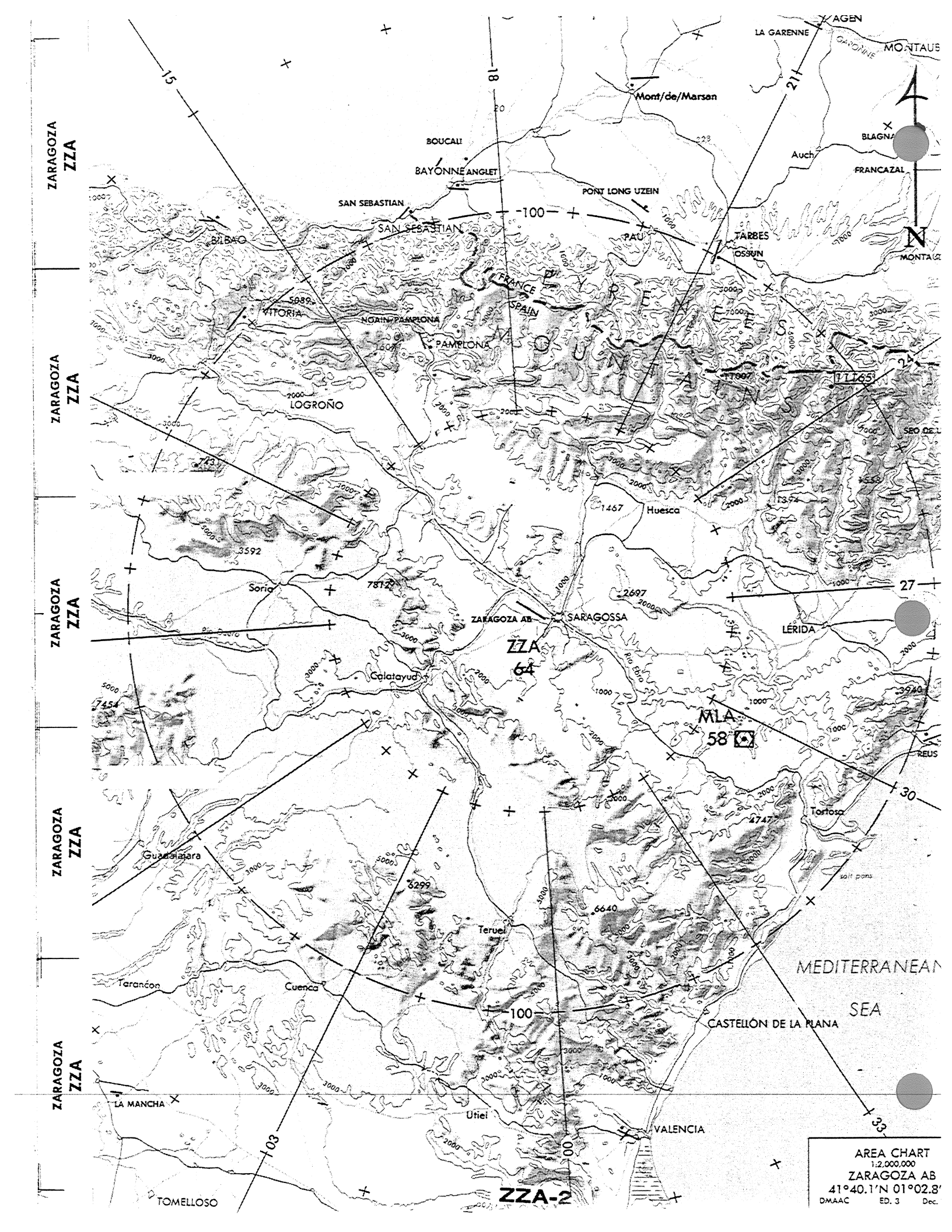
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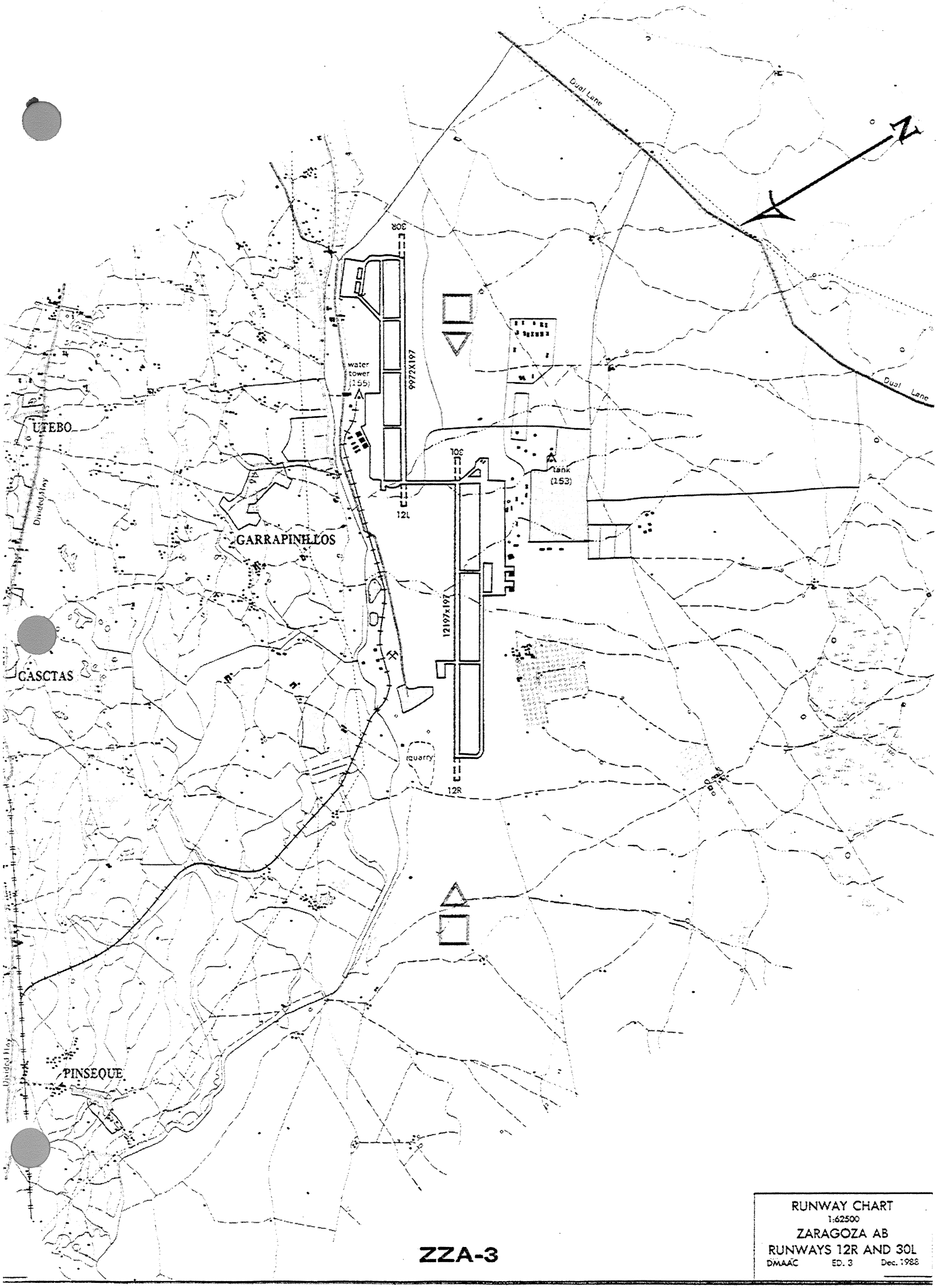
AGEN
LA GARENNE
MONTAUB
Mont/de/Marsan
BOUCAU
BAYONNE ANGLET
SAN SEBASTIAN
PONT LONG UZEIN
PAU
TARBES
OSSUN
Auch
FRANCAZAL
BILBAO
VITORIA
FRANCE
SPAIN
PYRENEES MOUNTAINS
PAMPLONA
LOGROÑO
Huesca
Soria
ZARAGOZA AB
SARAGOSSA
LÉRIDA
Calatayud
Río Ebro
MLA
58
REUS
Tortosa
Guadalajara
Teruel
Tarancón
Cuenca
MEDITERRANEAN SEA
CASTELLÓN DE LA PLANA
LA MANCHA
Utiel
VALENCIA
TOMELLOSO
ZZA 64
ZZA-2
AREA CHART
1:2,000,000
ZARAGOZA AB
41°40.1'N 01°02.8'
DMAAC ED. 3 Dec.



RUNWAY CHART
1:62500
ZARAGOZA AB
RUNWAYS 12R AND 30L
DMAAC ED. 3 Dec. 1988

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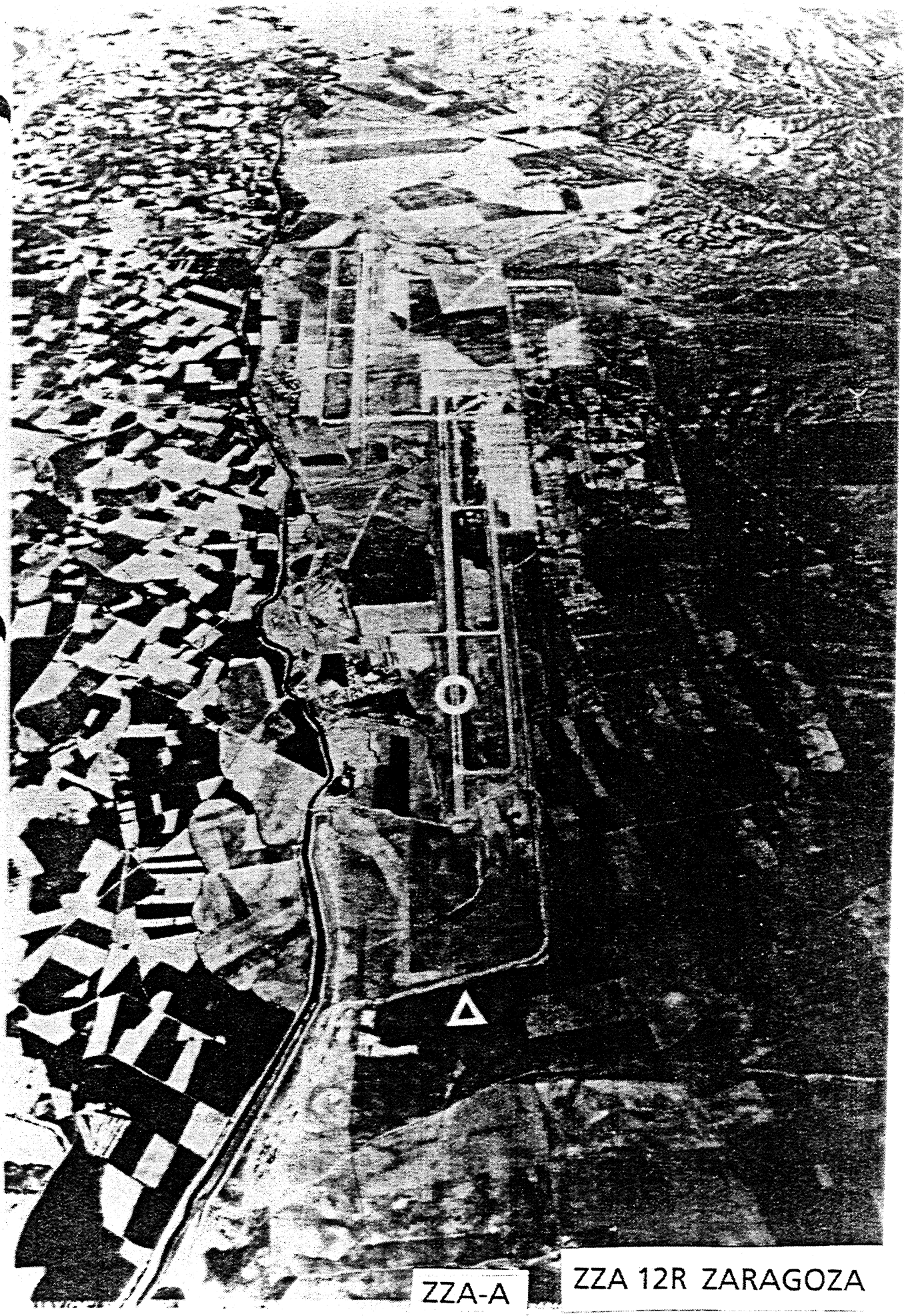

ZZA-A

ZZA 12R ZARAGOZA

EDITION 1-6/89

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ZZA 30L ZARAGOZA view 1

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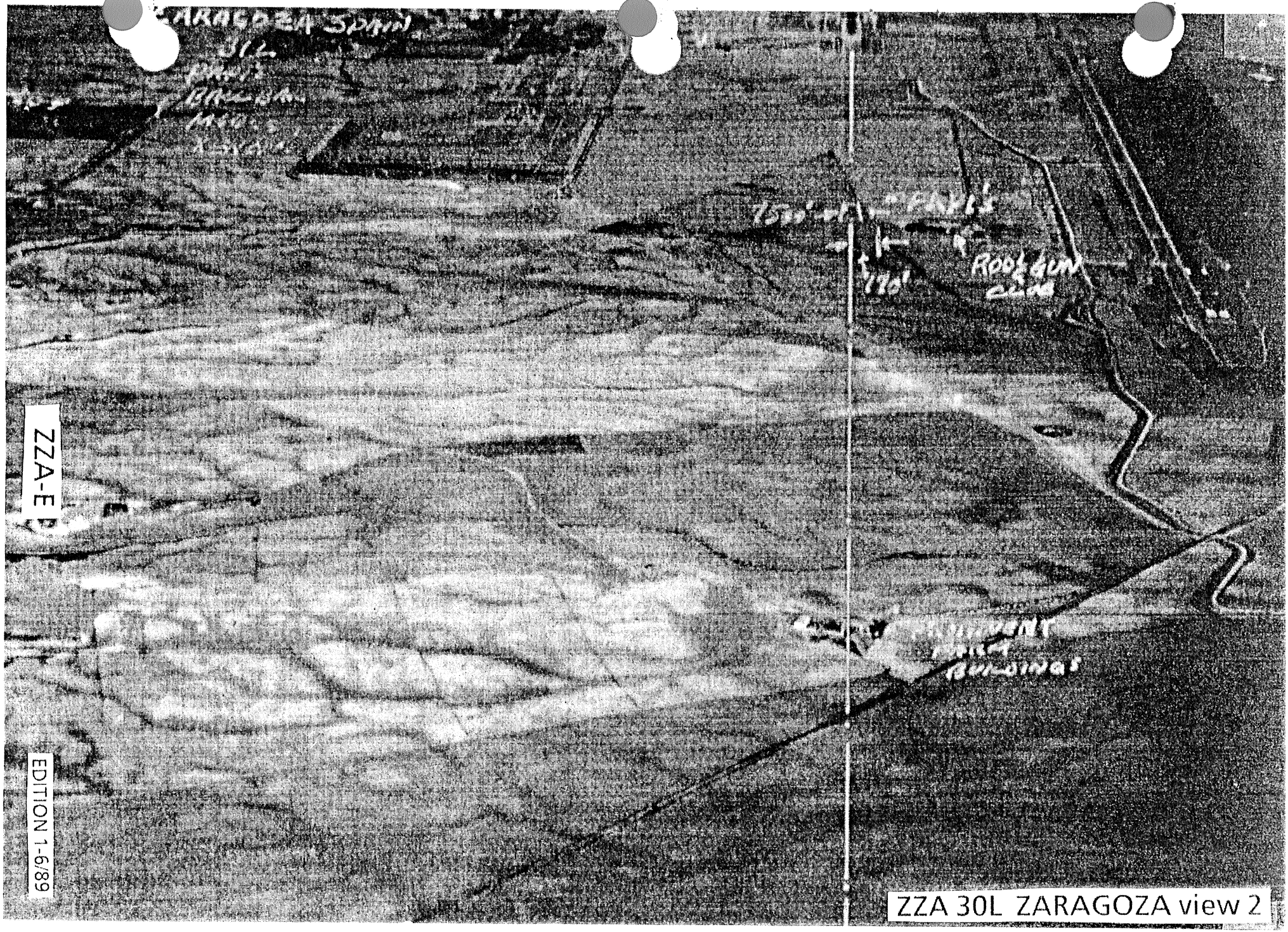

ZZA 30L ZARAGOZA view 2

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POST LANDING PROCEDURES FOR EMERGENCY AIRFIELD LANDING

POST ELS PROCEDURES
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1. OVERSEAS AUGMENTED LANDING SITES

Augmented refers to the fact that landing aides and NASA personnel are in place. This includes the prime and back-up TAL sites.

a. Evacuate to a distance of 1250 feet.

b. The Commander will turn over responsibility of the orbiter to the senior NASA representative on hand.

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 the local NASA representatives on the orbiter status.

f. The DOD will be responsible for the treatment and transportation of injured flight crewmembers. Uninjured flight crewmembers may be evacuated by DOD to the nearest U.S. military base (Rota, Spain). The local FCOD representative may go with the flight crew.

g. The 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.

k. For further information, see the Nonaugmented, Non-U.S. Military Bases guidelines.

2. U.S. MILITARY BASES

These guidelines only represent the deltas to the 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 who will be responsible for the orbiter until the arrival of the Rapid Response Team. The Commander will designate a crewmember to assist the DOD senior official in the safing and safeguarding of the orbiter.

b. The flight crew will be escorted to the Command Post to contact the 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 the arrival of the Rapid Response Team. Meals should be available.

d. The U.S. military will assume responsibility for treatment of injured flight crewmembers.

e. The flight crew will not meet with media representatives.

f. DOD has made previous arrangements to contact, train, and provide orbiter documentation to the emergency and rescue forces. They therefore have a 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 hours.

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

a. Evacuate to a distance of 1250 feet. Beware of toxic fumes and burning tires. Notify the tower that only fire fighting 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 with a medical team will be dispatched to the landing site as soon as possible.

d. The Commander or his representative will meet with the local air field officials and give them the prepared on-board orbiter emergency guidelines (4. U.S. Embassy - pg 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 the local officials that the U.S. Government will reimburse all reasonable expenses.

e. The Commander will have the 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 the local officials to have 24-hour security provided 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-feet 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. He should note the local landing time, and log any pertinent observations of the orbiter and the sequence of events leading up to the landing.

h. The flight crew will establish communications with the 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 the MCC CAPCOM.

j. After initial contact with the MCC, the flight crewmembers will each be allowed to speak to family members on a NASA established communication 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 hours. The 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 at their evacuation location. Estimated time of arrival is landing plus 14 hours. Flight crewmembers' passports will be carried by the FCOD representative on board. Personnel on the KC-135 will include, but are not limited to:

JSC FCOD Director, or his 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 any other needed articles. The flight crew should also retrieve the "Return to Houston" items at this time.

o. The flight crew will brief the Rapid Response Team and Mishap Investigation Team personnel via telecon as required, from both the accident site and evacuation site.

p. The flight crew shall brief a FCOD or Rapid Response Team representative on locations of early return items to be removed from the orbiter for return to JSC, if they are unable to retrieve them prior to evacuation.

q. If a DOD mission, security requires that a U.S. citizen with a secret clearance remain with the orbiter at all times, and to have the side hatch closed as soon as possible.

4. U.S. EMBASSY

a. If medical attention is required for the flight crew, please have a U.S. citizen stay in contact with injured crewmember(s). Arrangements will be made with DOD to evacuate both injured and uninjured personnel 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 feet. Stay upwind and avoid the forward and aft sections. Approaches can only be safely made from the 10, 2, 4, or 8 o'clock positions, whichever direction is most upwind. The vehicle is considered hazardous for 24 hours. 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-hour security of the orbiter and flight crew.

g. Provide interpreters.

h. Provide escorts, transportation, lodging and meals as necessary for the flight crew until they are evacuated.

i. The Rapid Response Team will arrive in approximately 24 hours. 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 crews' statement will be released from Johnson Space Center.

k. Please contract a photographer to take photos of the orbiter, any debris, and anything else that appears out of the ordinary (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-sweetish, or ammonia-like smell. Seek immediate medical attention for irritation to the nose, throat, or eyes, or coughing and difficult breathing.

m. Please record, with time indices, any pertinent observations.

n. Please arrange to have witness contacted. Obtain their names, addresses and telephone numbers.

o. Discourage towing of the orbiter until the RRT arrives. It cannot be towed/moved without special equipment. Contact Kennedy Space Center for further information if the airfield officials insist.

p. The U.S. Government will repay any reasonable expenses incurred.

q. The flight crew 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.

PHONE NUMBERS

MCC CAPCOM	(713) 483-5678 or 5649
MCC Flight Director	(713) 483-5669
MCC Surgeon	(713) 483-5662
Director, FCOD	(713) 483-3916
Aircraft Operations	(713) 483-7256
KSC Crew Quarters	(407) 867-2005
KSC Landing Recovery Director	(407) 867-5731
KSC NASA Test Director	(407) 867-6831
DOD Support Operations Center	(407) 867-9161

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WORLD ATLAS

5.1 The flight version of the World Atlas provides worldwide coverage at a scale of 1:10 million and is produced in color. The maps shown in this document are 60 percent flight size.

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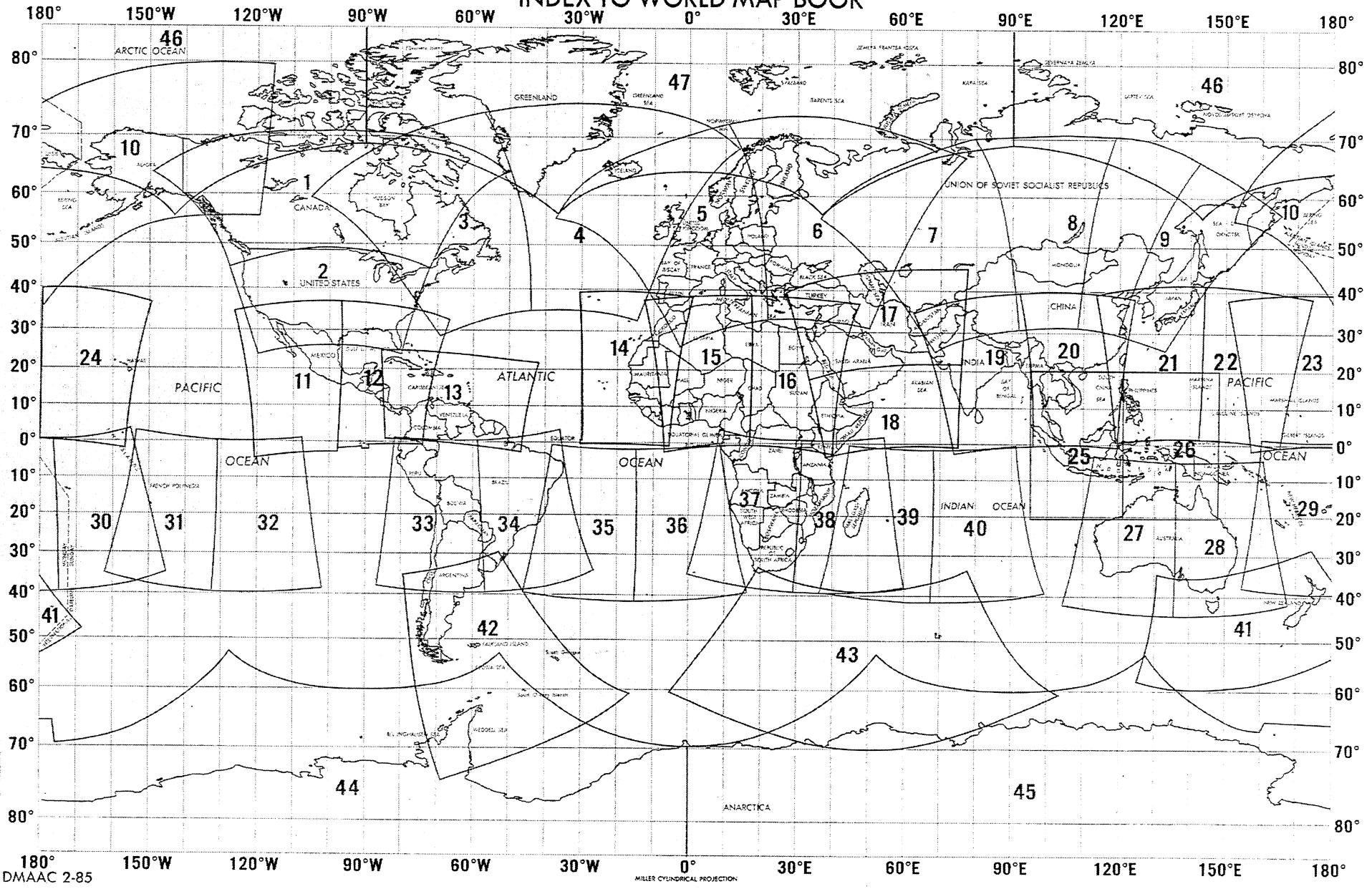
INDEX TO WORLD MAP BOOK

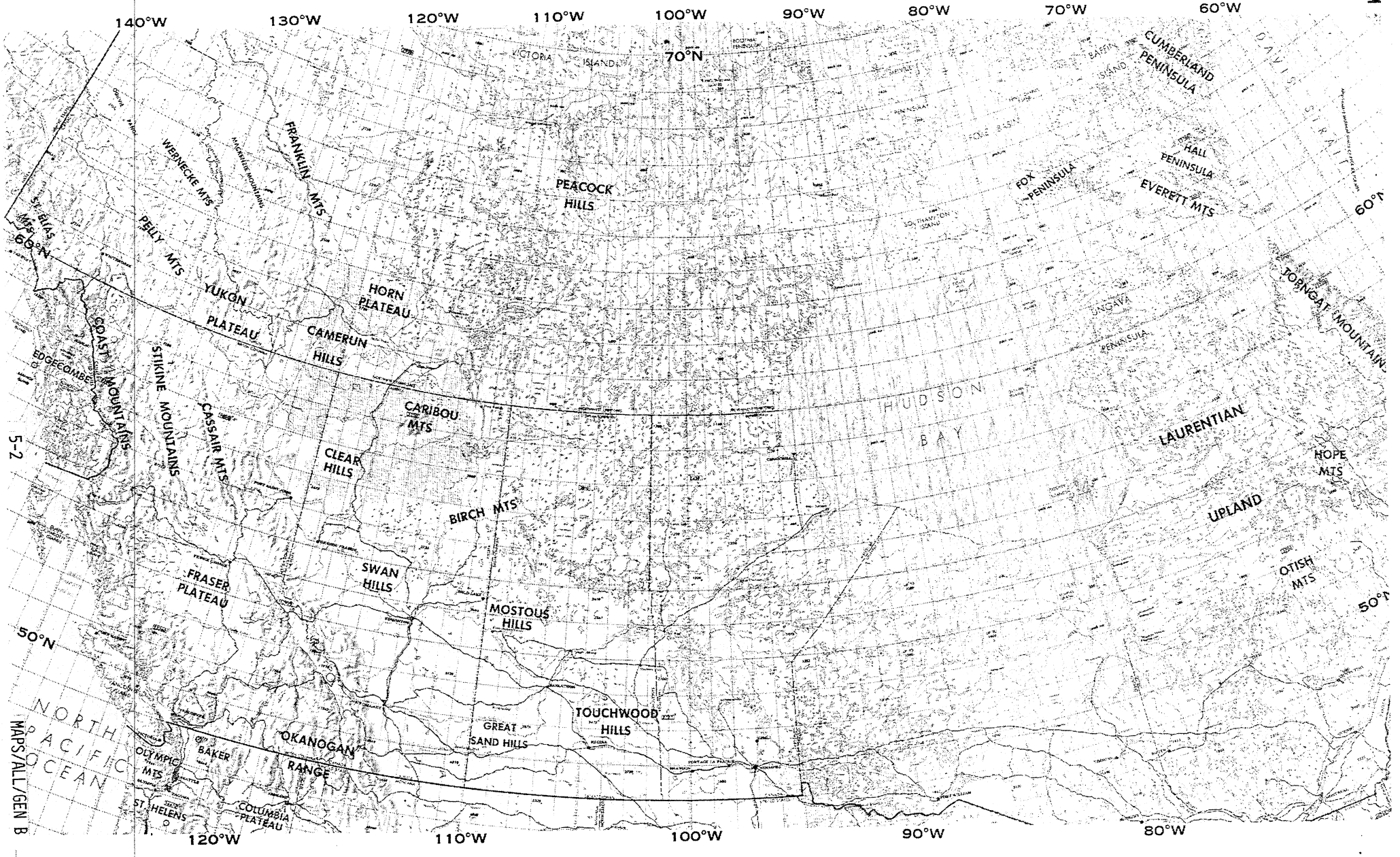


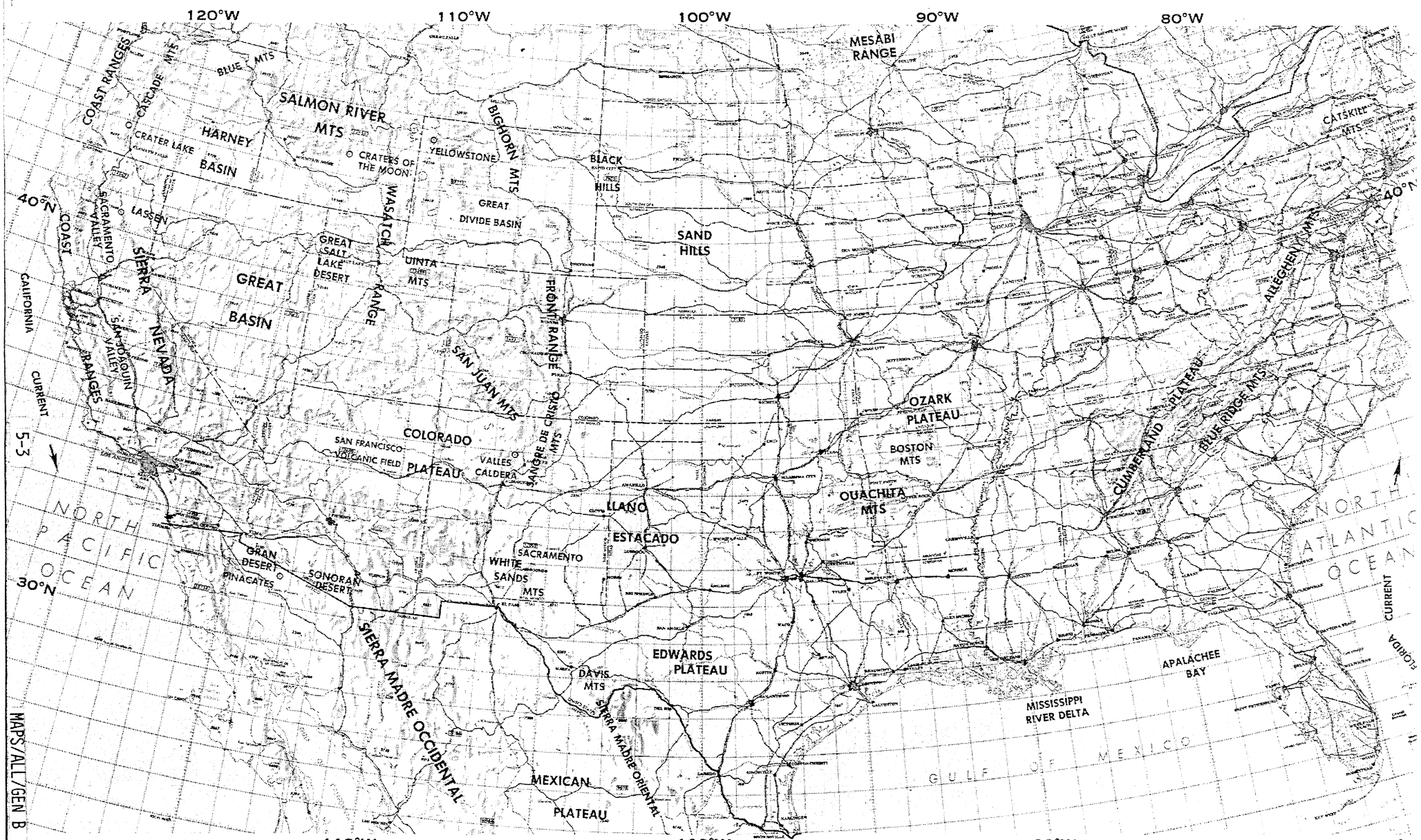
MILLER CYLINDRICAL PROJECTION

5-1

MAPS/ALL/GEN B

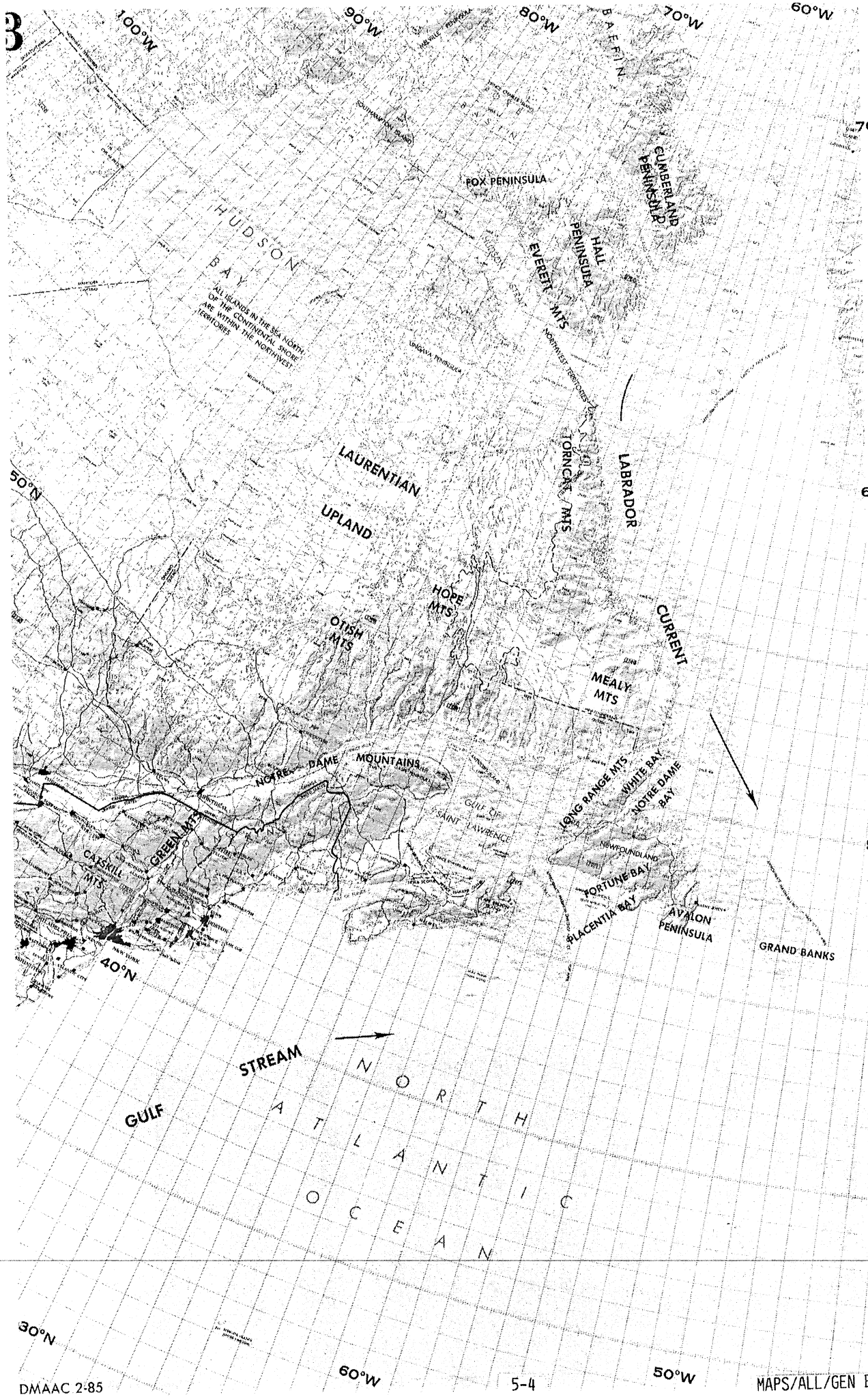
DMAAC 2-85


140°W
130°W
120°W
110°W
100°W
90°W
80°W
70°W
60°W
70°N
60°N
50°N
VICTORIA ISLAND
BAFFIN ISLAND
CUMBERLAND PENINSULA
DAVIS STRAIT
HALL PENINSULA
FOX PENINSULA
EVERETT MTS
SOUTHAMPTON ISLAND
FOXE BASIN
LANGAVA PENINSULA
TORNGAT MOUNTAINS
HUDSON BAY
ST. ELIAS MTS
WERNECKE MTS
MACKENZIE MOUNTAINS
FRANKLIN MTS
PELLY MTS
PEACOCK HILLS
YUKON PLATEAU
HORN PLATEAU
CAMERUN HILLS
COAST MOUNTAINS
EDGECOMBE
STIKINE MOUNTAINS
CASSIAR MTS
CARIBOU MTS
CLEAR HILLS
BIRCH MTS
LAURENTIAN UPLAND
HOPE MTS
OTISH MTS
FRASER PLATEAU
SWAN HILLS
MOSTOUS HILLS
TOUCHWOOD HILLS
GREAT SAND HILLS
OKANOGAN RANGE
OLYMPIC MTS
MT BAKER
MT ST HELENS
COLUMBIA PLATEAU
NORTH PACIFIC OCEAN


120°W
110°W
100°W
90°W
80°W
40°N
30°N
MESABI RANGE
CATSKILL MTS
ALLEGHENY MTS
COAST RANGES
CASCADE MTS
BLUE MTS
SALMON RIVER MTS
HARNEY BASIN
CRATER LAKE
CRATERS OF THE MOON
YELLOWSTONE
BIGHORN MTS
BLACK HILLS
GREAT DIVIDE BASIN
SAND HILLS
LASSEN
SACRAMENTO VALLEY
COAST RANGES
SIERRA NEVADA
GREAT SALT LAKE DESERT
WASATCH RANGE
UINTA MTS
FRONT RANGE
GREAT BASIN
SAN JOAQUIN VALLEY
SAN JUAN MTS
SANGRE DE CRISTO MTS
OZARK PLATEAU
CUMBERLAND PLATEAU
BLUE RIDGE MTS
COLORADO PLATEAU
SAN FRANCISCO VOLCANIC FIELD
VALLES CALDERA
BOSTON MTS
OUACHITA MTS
LLANO ESTACADO
SACRAMENTO MTS
WHITE SANDS
GRAN DESERT
PINACATES
SONORAN DESERT
SIERRA MADRE OCCIDENTAL
EDWARDS PLATEAU
DAVIS MTS
SIERRA MADRE ORIENTAL
APALACHEE BAY
MISSISSIPPI RIVER DELTA
MEXICAN PLATEAU
GULF OF MEXICO
NORTH PACIFIC OCEAN
NORTH ATLANTIC OCEAN
CALIFORNIA CURRENT
FLORIDA CURRENT
5-3
MAPS/ALL/GEN B

DMAAC 2-85

2


B
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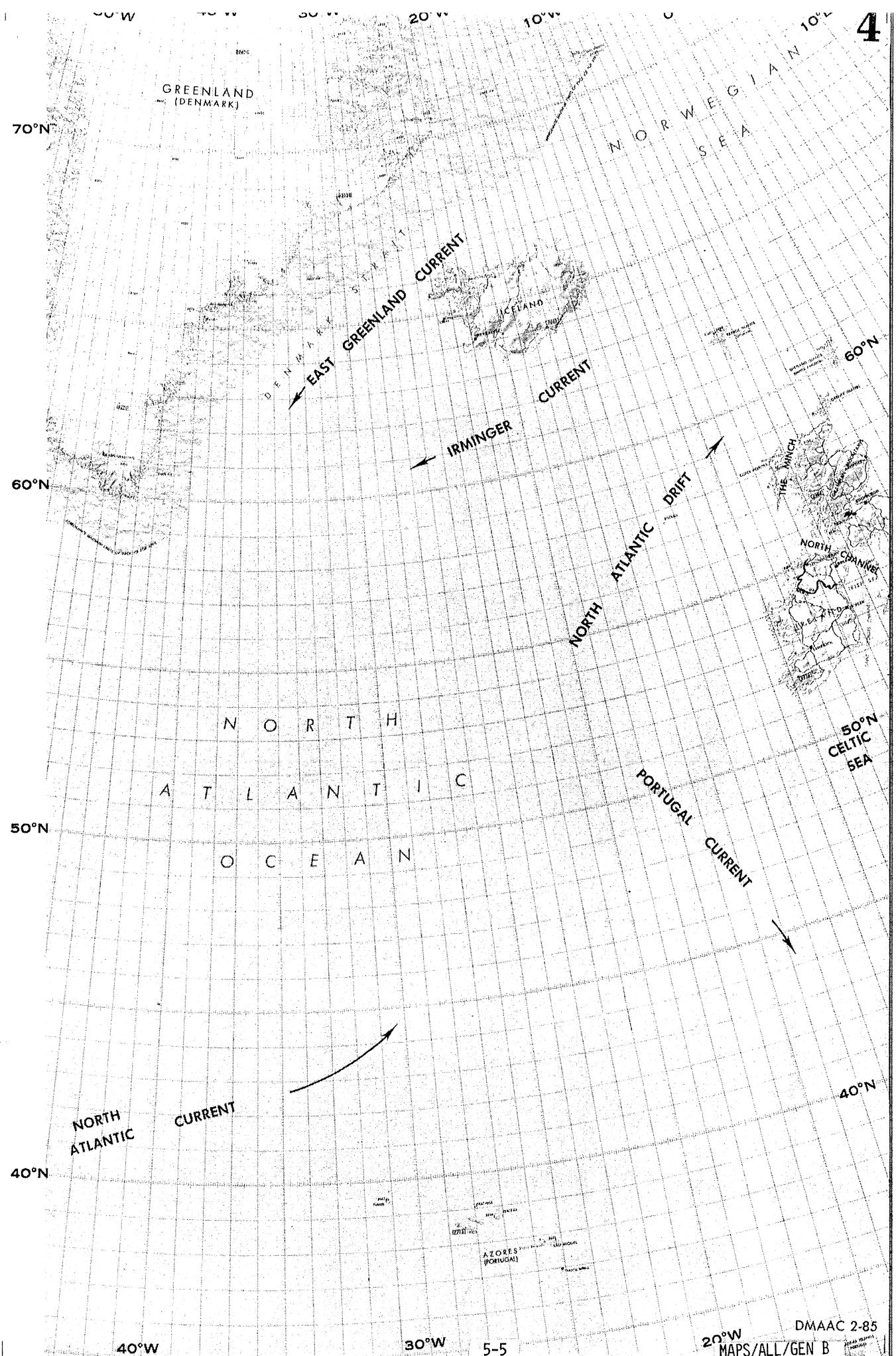
60°N
50°N
40°N
30°N
60°W
50°W
BAFFIN
FOX PENINSULA
CUMBERLAND PENINSULA
HALL PENINSULA
EVERETT MTS
HUDSON BAY
ALL ISLANDS IN THE SEA NORTH OF THE CONTINENTAL SHORE ARE WITHIN THE NORTHWEST TERRITORIES
LAURENTIAN UPLAND
TORNGAT MTS
LABRADOR
HOPE MTS
OTISH MTS
CURRENT
MEALY MTS
NOTRE DAME MOUNTAINS
LONG RANGE MTS
WHITE BAY
NOTRE DAME BAY
GULF OF SAINT LAWRENCE
NEWFOUNDLAND
FORTUNE BAY
PLACENTIA BAY
AVALON PENINSULA
GRAND BANKS
CATSKILL MTS
GREEN MTS
GULF STREAM
NORTH ATLANTIC OCEAN


GREENLAND
(DENMARK)
NORWEGIAN SEA
DENMARK STRAIT
ICELAND
EAST GREENLAND CURRENT
IRMINGER CURRENT
NORTH ATLANTIC DRIFT
THE MINCH
NORTH CHANNEL
NORTH ATLANTIC OCEAN
PORTUGAL CURRENT
CELTIC SEA
NORTH ATLANTIC CURRENT
AZORES (PORTUGAL)
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60°N
50°N
40°N
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40°W
30°W
20°W
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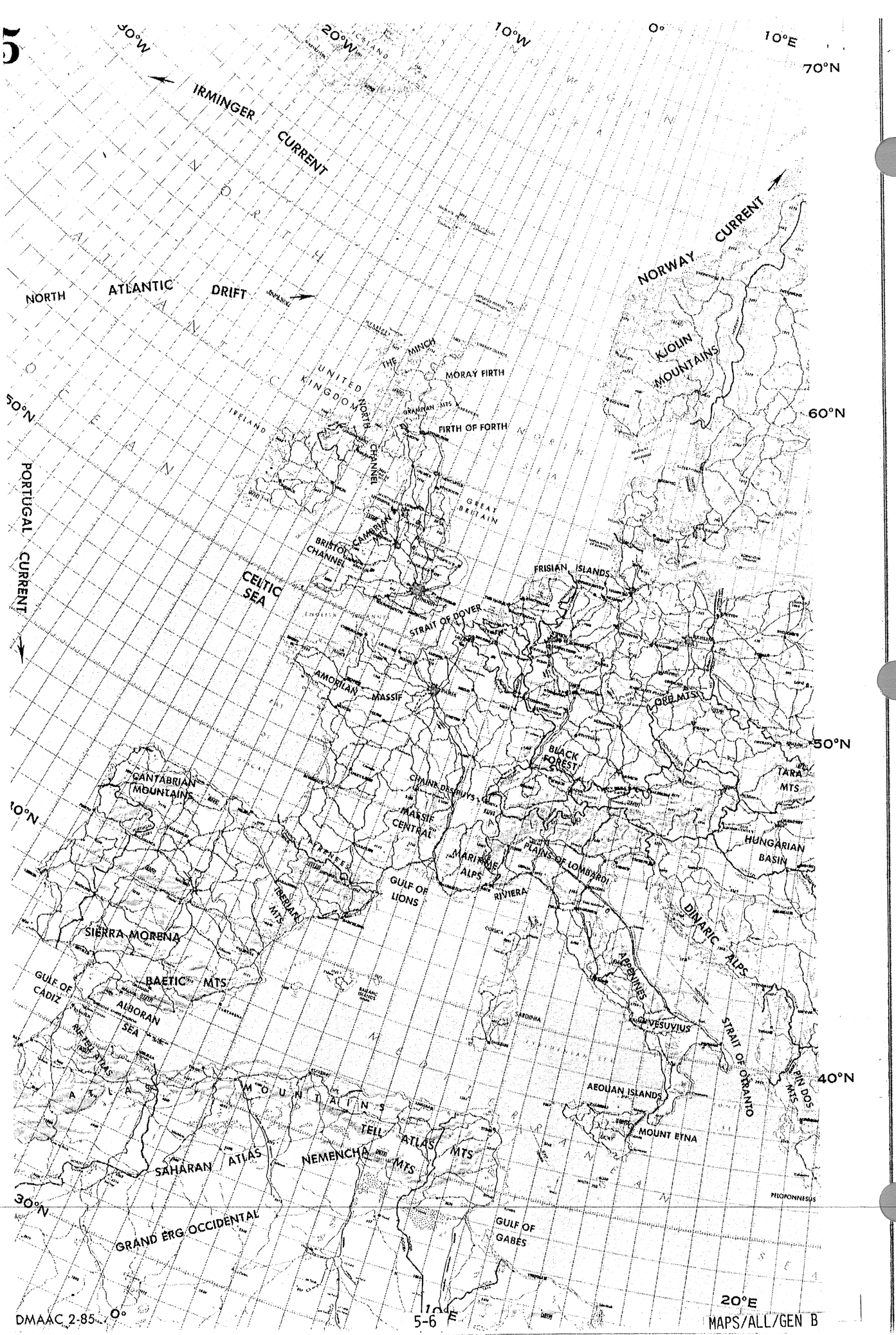
10°E


30°W
20°W
10°W
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10°E
70°N
60°N
50°N
40°N
30°N
20°E
IRMINGER CURRENT
NORTH ATLANTIC DRIFT
NORWAY CURRENT
PORTUGAL CURRENT
NORTH ATLANTIC OCEAN
NORTH SEA
ICELAND
IRELAND
UNITED KINGDOM
GREAT BRITAIN
THE MINCH
MORAY FIRTH
GRAMPIAN MTS
FIRTH OF FORTH
NORTH CHANNEL
CAMBRIAN MTS
BRISTOL CHANNEL
CELTIC SEA
KJOLIN MOUNTAINS
FRISIAN ISLANDS
STRAIT OF DOVER
AMORICAN MASSIF
ORE MTS
BLACK FOREST
TARA MTS
HUNGARIAN BASIN
CANTABRIAN MOUNTAINS
CHAINE DES PUYS
MASSIF CENTRAL
PYRENEES
MARITIME ALPS
PLAINS OF LOMBARDI
RIVIERA
GULF OF LIONS
TRERIARY MTS
SIERRA MORENA
BAETIC MTS
GULF OF CADIZ
ALBORAN SEA
DINARIC ALPS
APENNINES
VESUVIUS
STRAIT OF ORANTO
PIN DOS MTS
AEOLIAN ISLANDS
MOUNT ETNA
PELOPONNESUS
ATLAS MOUNTAINS
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SAHARAN ATLAS
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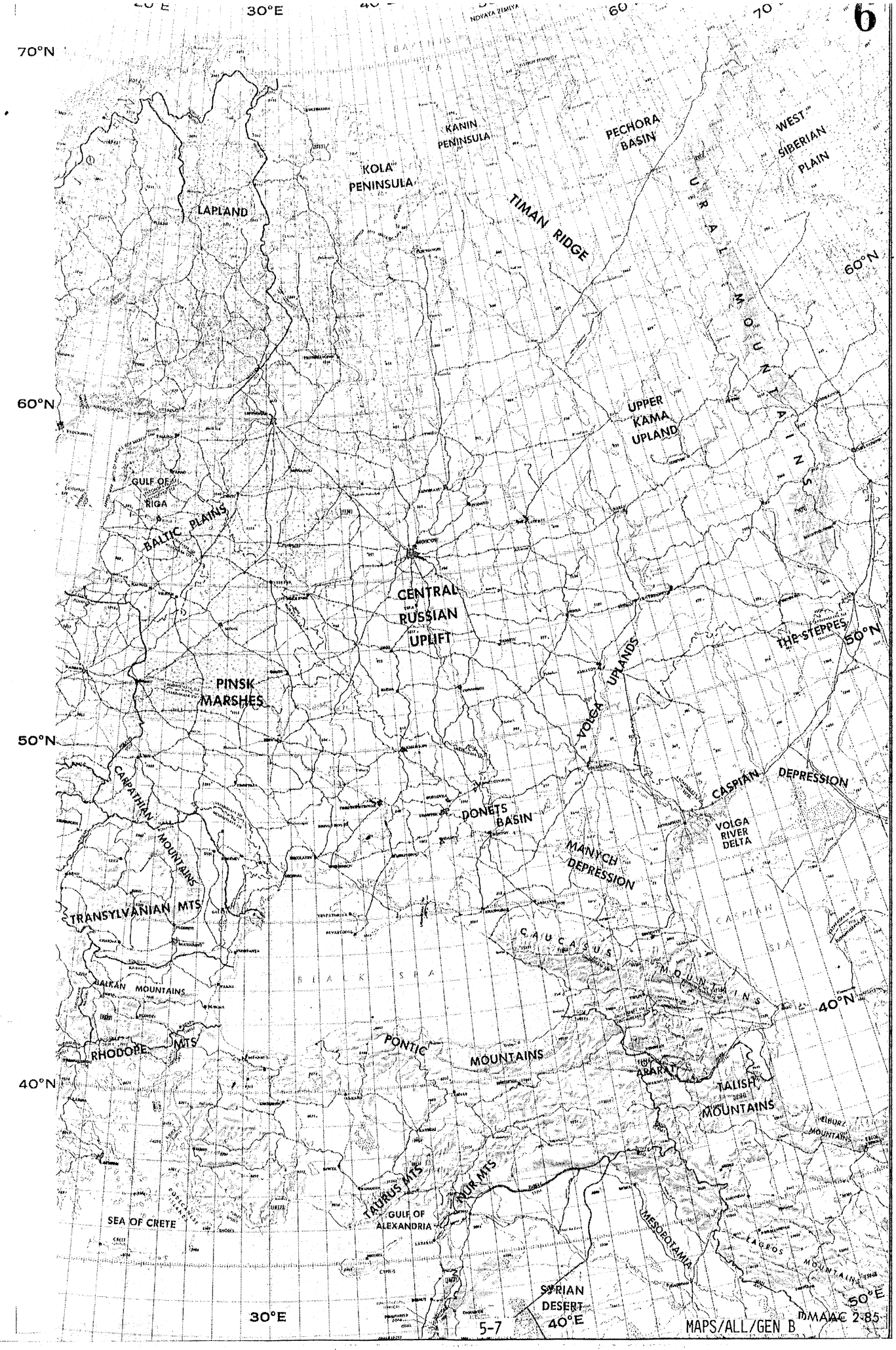
GULF OF GABES
MEDITERRANEAN SEA


30°E
70°N
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40°N
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40°E
50°E
NOVAYA ZEMLYA
KANIN PENINSULA
PECHORA BASIN
WEST SIBERIAN PLAIN
KOLA PENINSULA
LAPLAND
TIMAN RIDGE
URAL MOUNTAINS
UPPER KAMA UPLAND
GULF OF RIGA
BALTIC PLAINS
CENTRAL RUSSIAN UPLIFT
THE STEPPES
VOLGA UPLANDS
PINSK MARSHES
CARPATHIAN MOUNTAINS
DONETS BASIN
CASPIAN DEPRESSION
VOLGA RIVER DELTA
MANYCH DEPRESSION
TRANSYLVANIAN MTS
CAUCASUS MOUNTAINS
BALKAN MOUNTAINS
RHODOPE MTS
PONTIC MOUNTAINS
ARARAT
TALISH MOUNTAINS
ELBURZ MOUNTAINS
TAURUS MTS
NUR MTS
SEA OF CRETE
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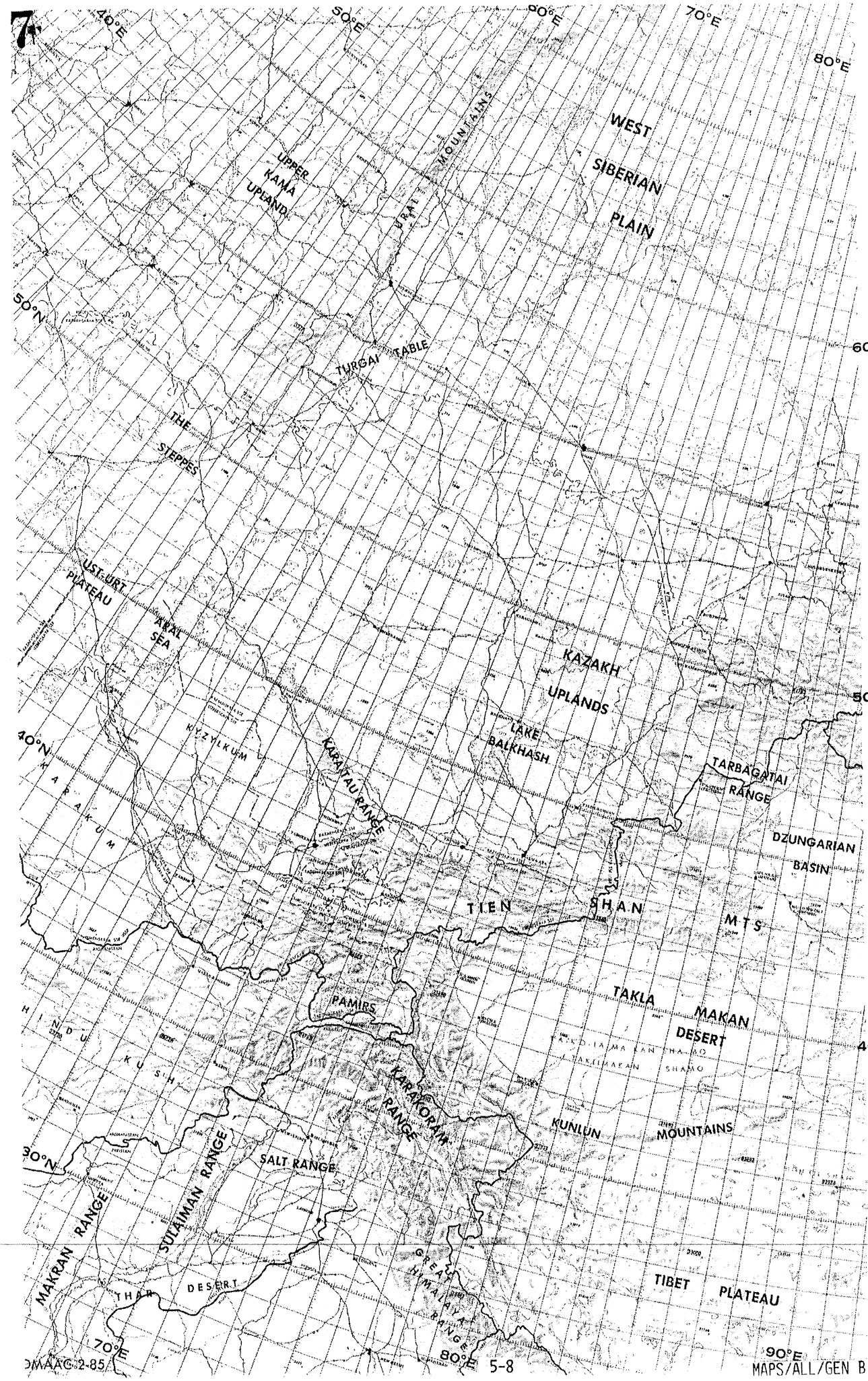
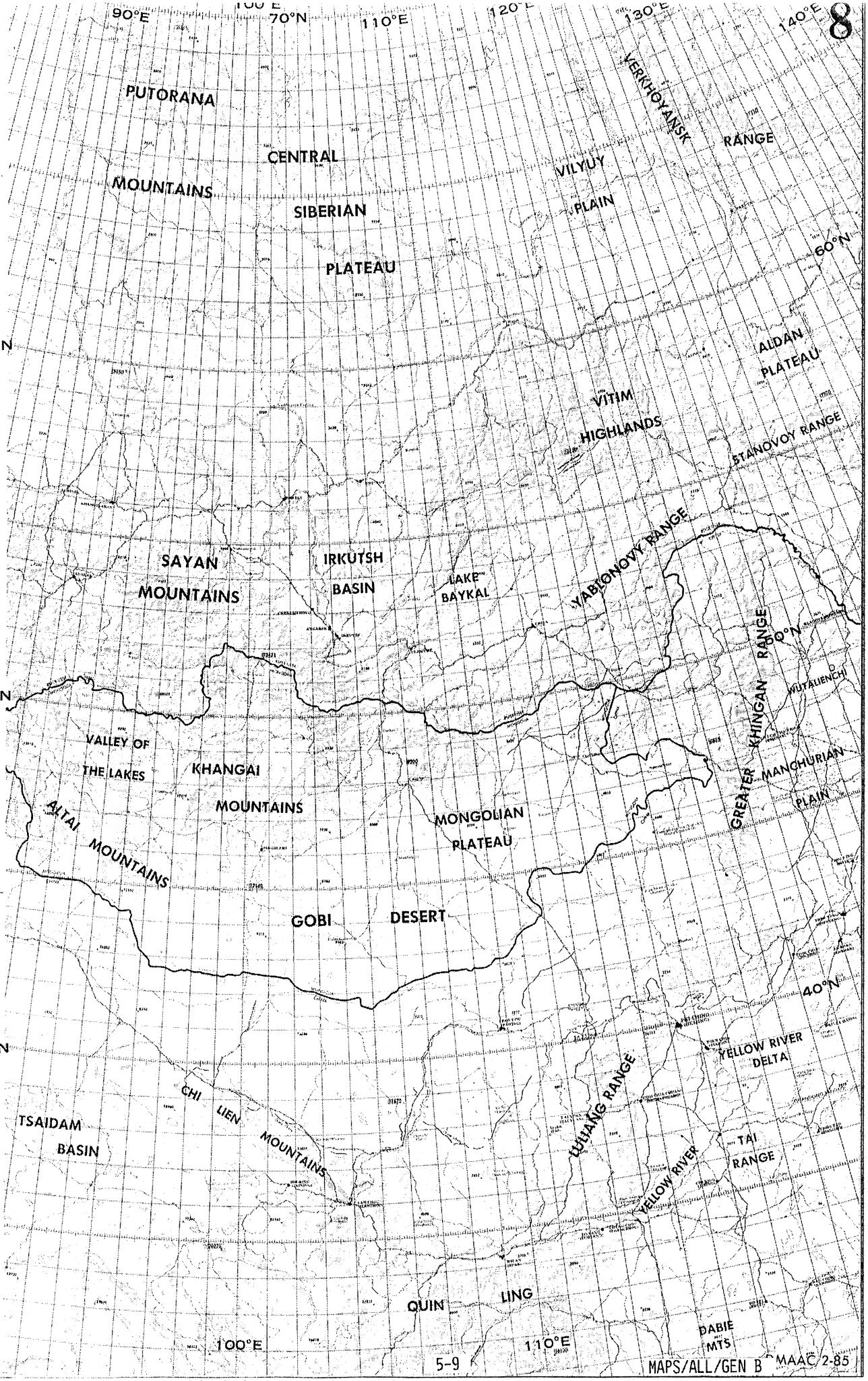
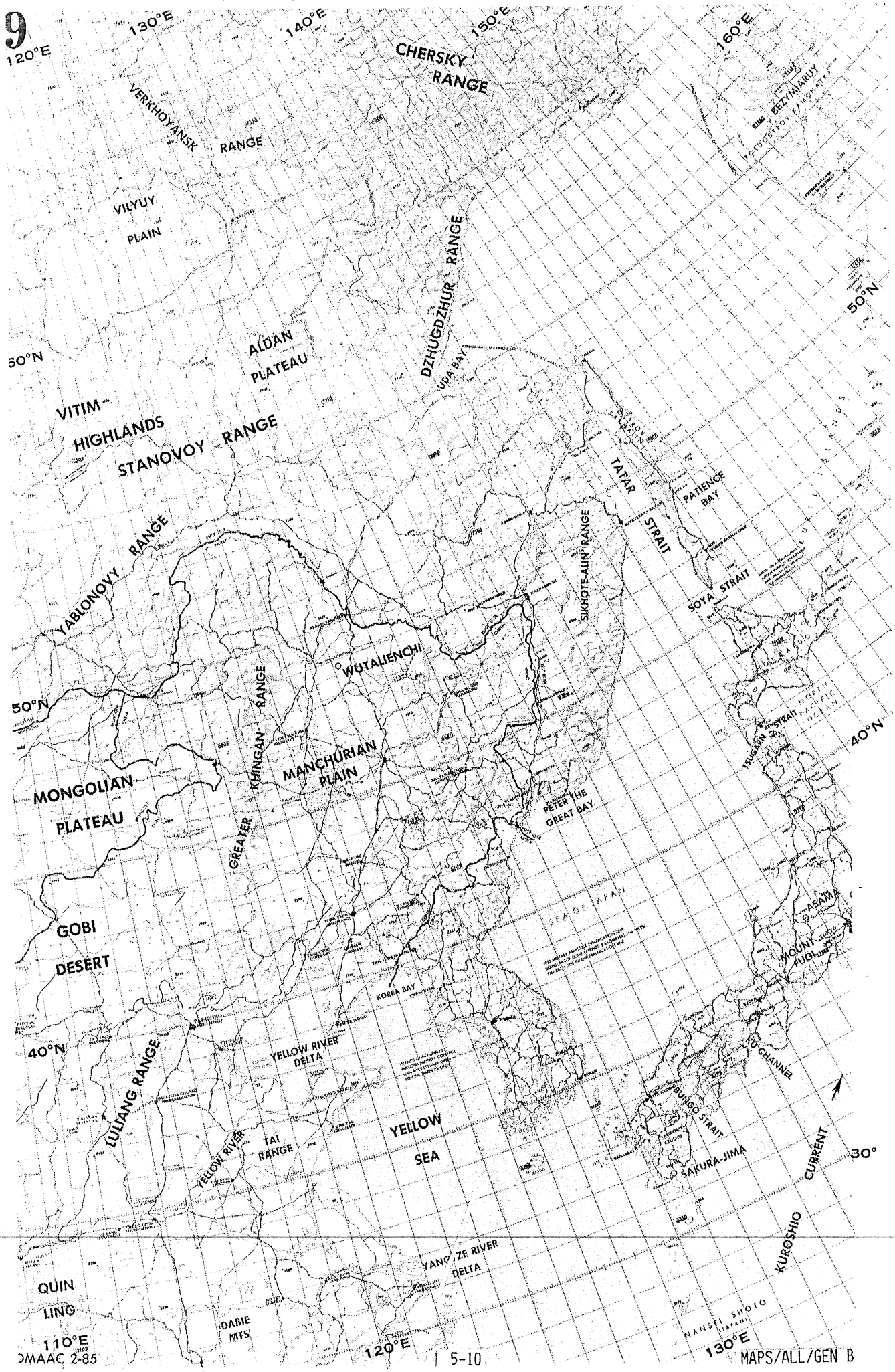
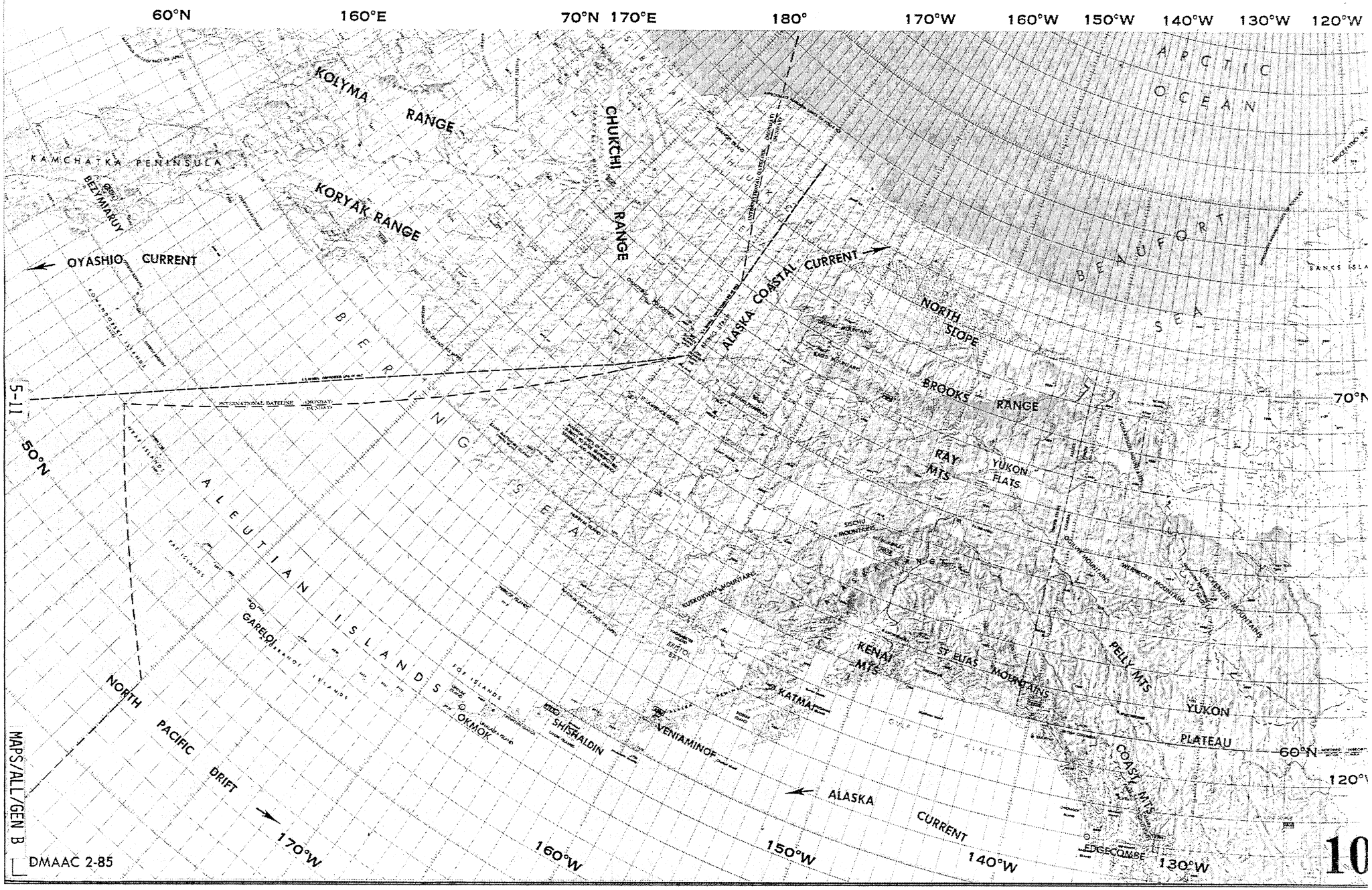
SYRIAN DESERT
CYPRUS
CRETE
RHODES


40°E
50°E
60°E
70°E
80°E
WEST SIBERIAN PLAIN
UPPER KAMA UPLAND
URAL MOUNTAINS
50°N
60°N
TURGAI TABLE
THE STEPPES
UST URT PLATEAU
ARAL SEA
KYZYLKUM
KARATAU RANGE
KAZAKH UPLANDS
LAKE BALKHASH
TARBAGATAI RANGE
DZUNGARIAN BASIN
40°N
KARAKUM
TIEN SHAN MTS
PAMIRS
TAKLA MAKAN DESERT
HINDU KUSH
KARAKORAM RANGE
KUNLUN MOUNTAINS
30°N
SALT RANGE
SULAIMAN RANGE
MAKRAN RANGE
THAR DESERT
GREAT HIMALAYA RANGE
TIBET PLATEAU
70°E
80°E
90°E


90°E
70°N
110°E
120°E
130°E
140°E
PUTORANA
CENTRAL
SIBERIAN
PLATEAU
MOUNTAINS
VERKHOYANSK
RANGE
VILYUY
PLAIN
60°N
ALDAN
PLATEAU
VITIM
HIGHLANDS
STANOVOY RANGE
YABLONOVY RANGE
SAYAN
MOUNTAINS
IRKUTSH
BASIN
LAKE
BAYKAL
50°N
WUTALIENCHI
KHINGAN RANGE
VALLEY OF
THE LAKES
KHANGAI
MOUNTAINS
GREATER MANCHURIAN
PLAIN
ALTAI
MOUNTAINS
MONGOLIAN
PLATEAU
GOBI
DESERT
40°N
YELLOW RIVER
DELTA
CHI
LIEN
MOUNTAINS
TSAIDAM
BASIN
LUHANG RANGE
TAI
RANGE
YELLOW RIVER
QUIN
LING
DABIE
MTS
100°E
110°E


120°E
130°E
140°E
150°E
160°E
CHERSKY RANGE
VERKHOYANSK RANGE
VILYUY PLAIN
BEZYMIANUY
DZHUGDZHUR RANGE
50°N
ALDAN PLATEAU
UDA BAY
VITIM HIGHLANDS
STANOVOY RANGE
TATAR STRAIT
PATIENCE BAY
SIKHOTE-ALIN RANGE
YABLONOVY RANGE
SOYA STRAIT
WUTALIENCHI
KHINGAN RANGE
MANCHURIAN PLAIN
TSUGARU STRAIT
40°N
MONGOLIAN PLATEAU
GREATER
PETER THE GREAT BAY
SEA OF JAPAN
ASAMA
MOUNT FUJI
GOBI DESERT
KOREA BAY
YELLOW RIVER DELTA
KII CHANNEL
LULIANG RANGE
BUNGO STRAIT
YELLOW SEA
YELLOW RIVER
TAI RANGE
SAKURA-JIMA
30°
KUROSHIO CURRENT
YANG'ZE RIVER DELTA
QUIN LING
DABIE MTS
NANSEI SHOTO
110°E
120°E
130°E



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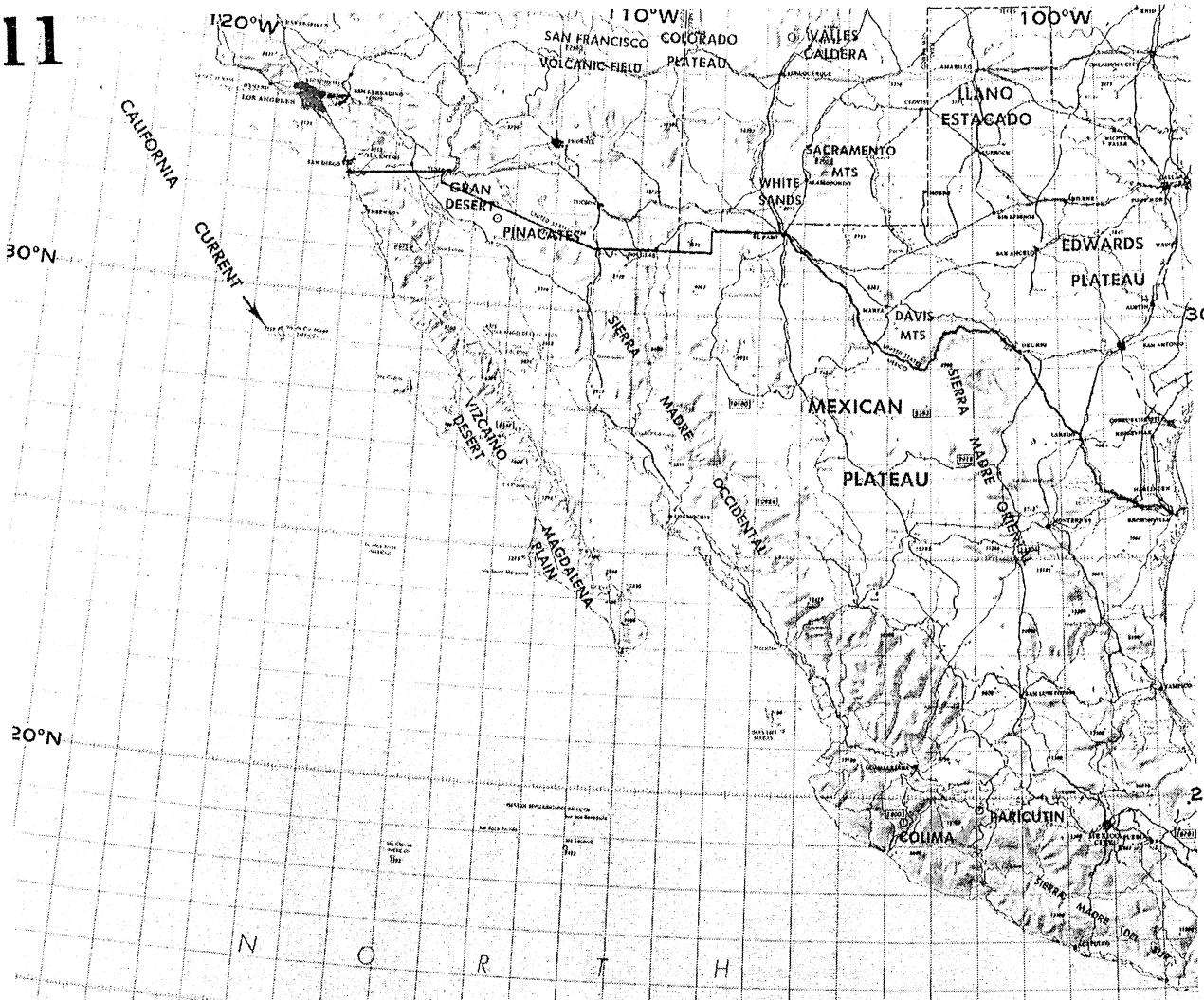
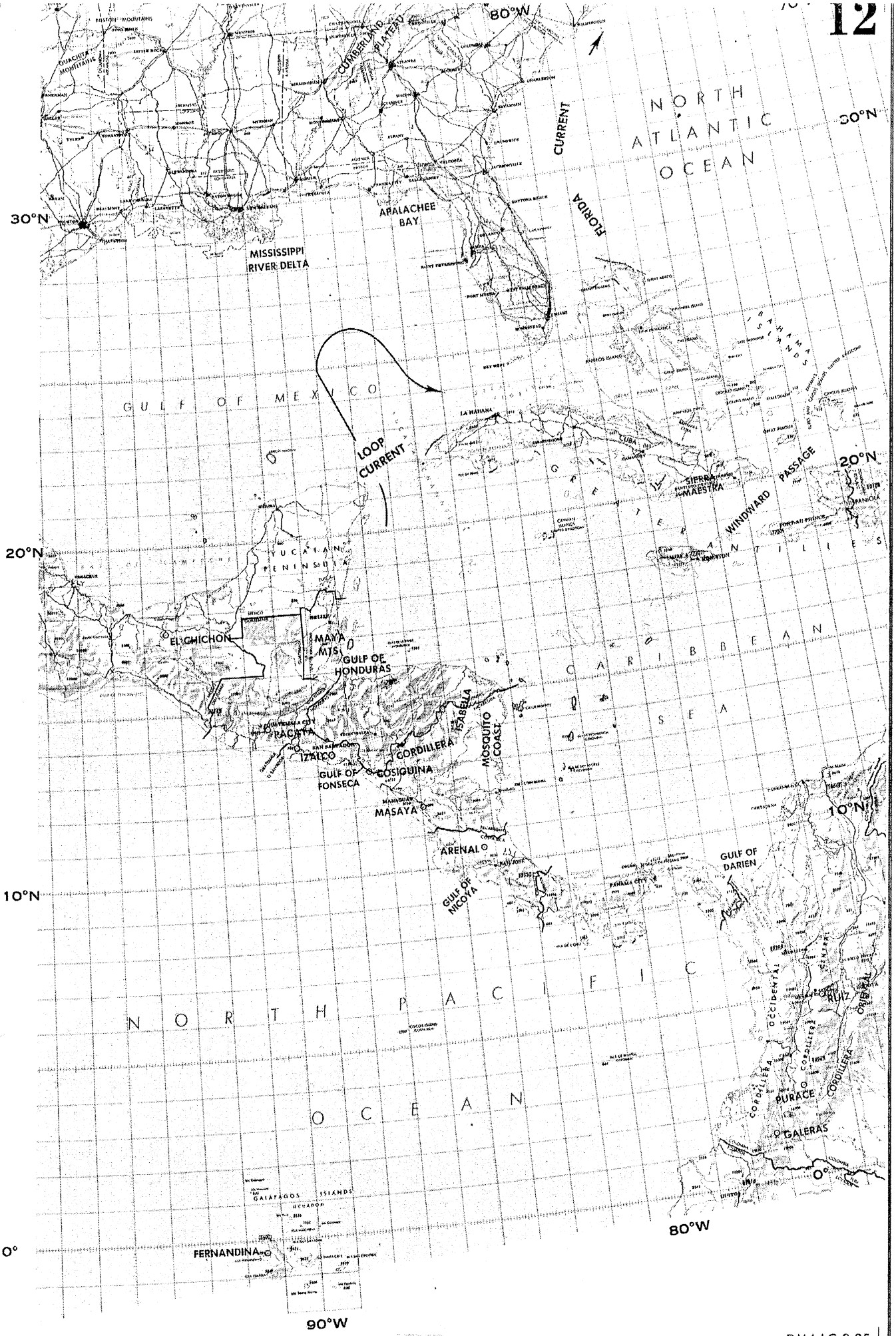
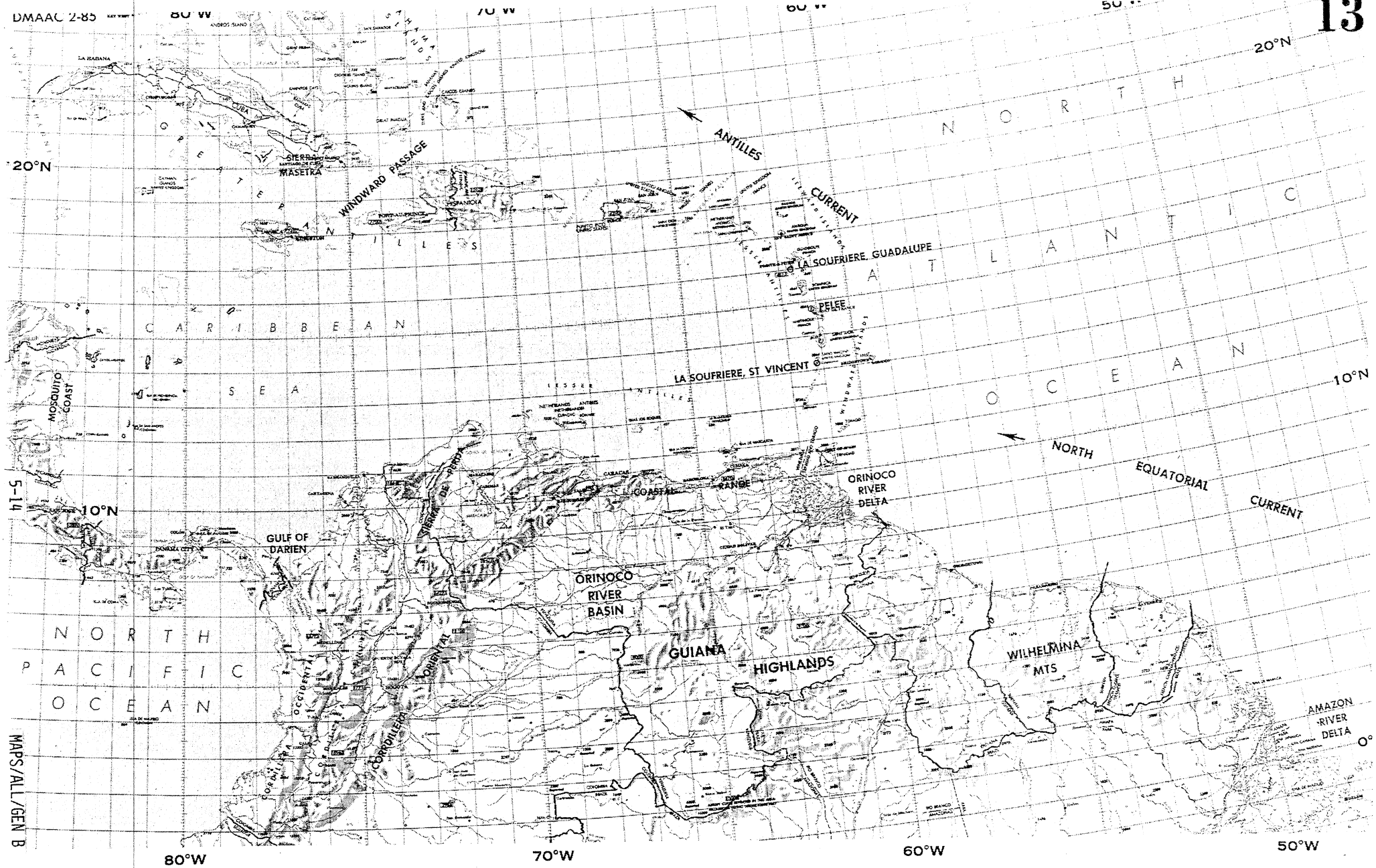
MAPS/ALL/GEN B

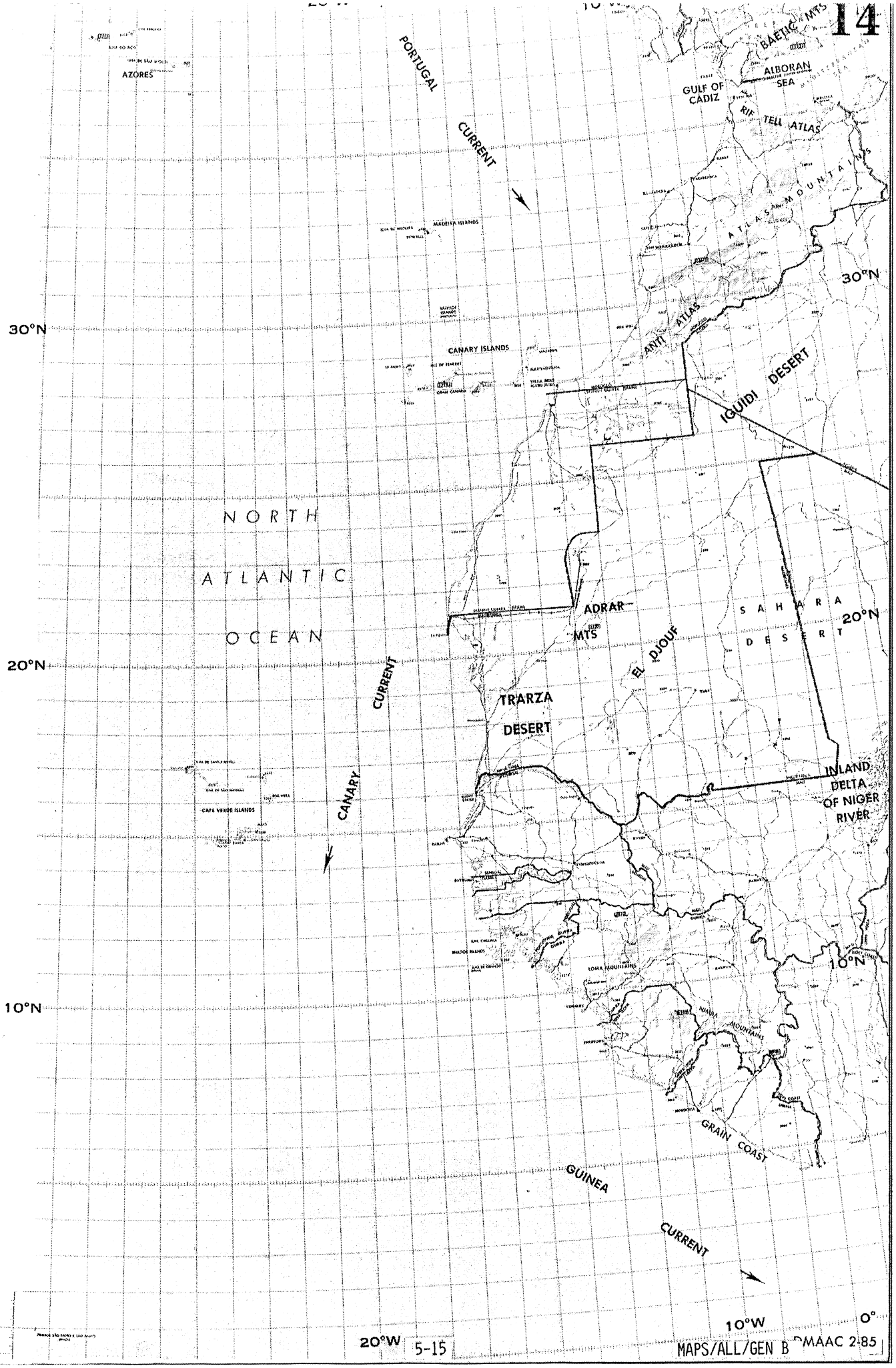
DMAAC 2-85

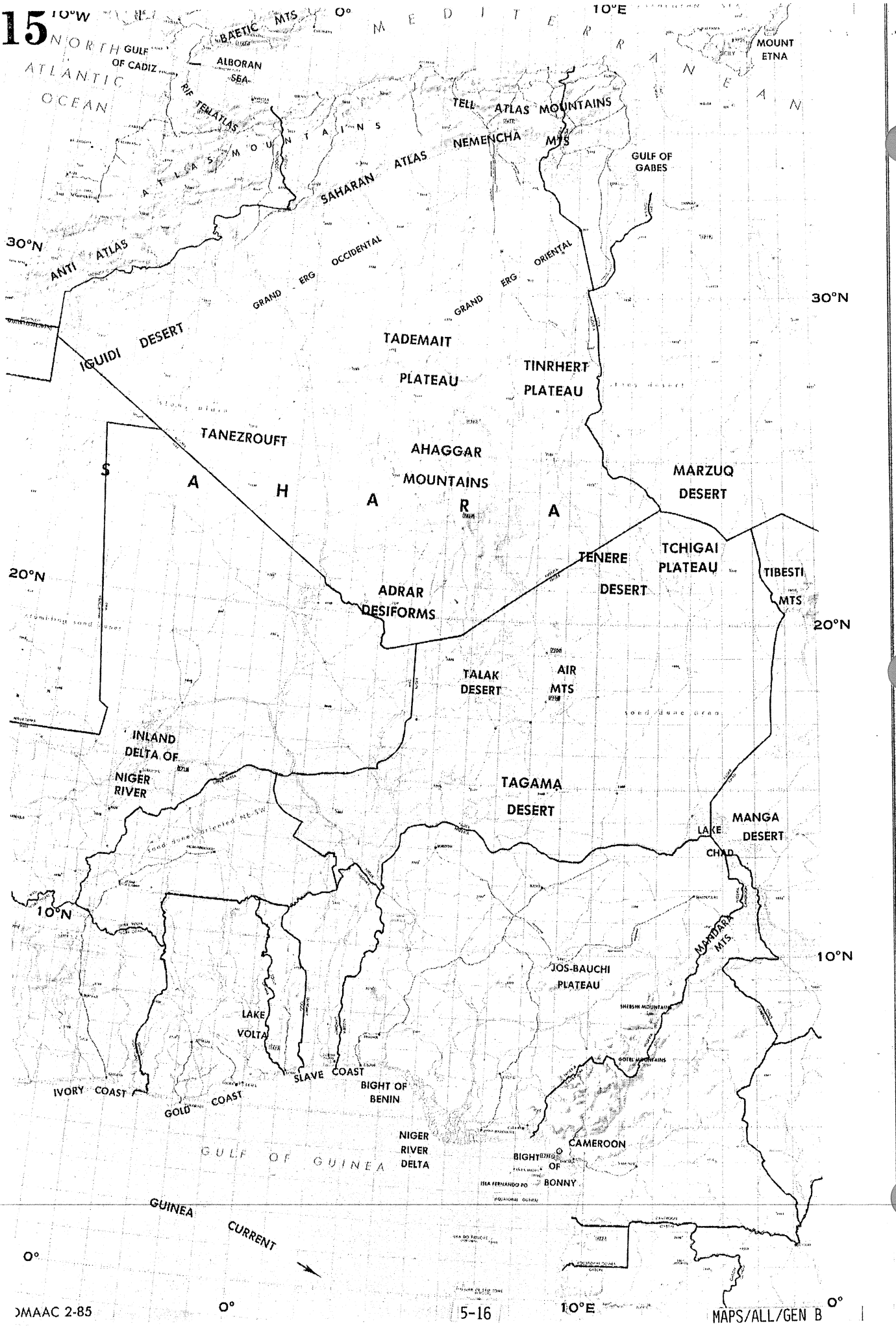
10

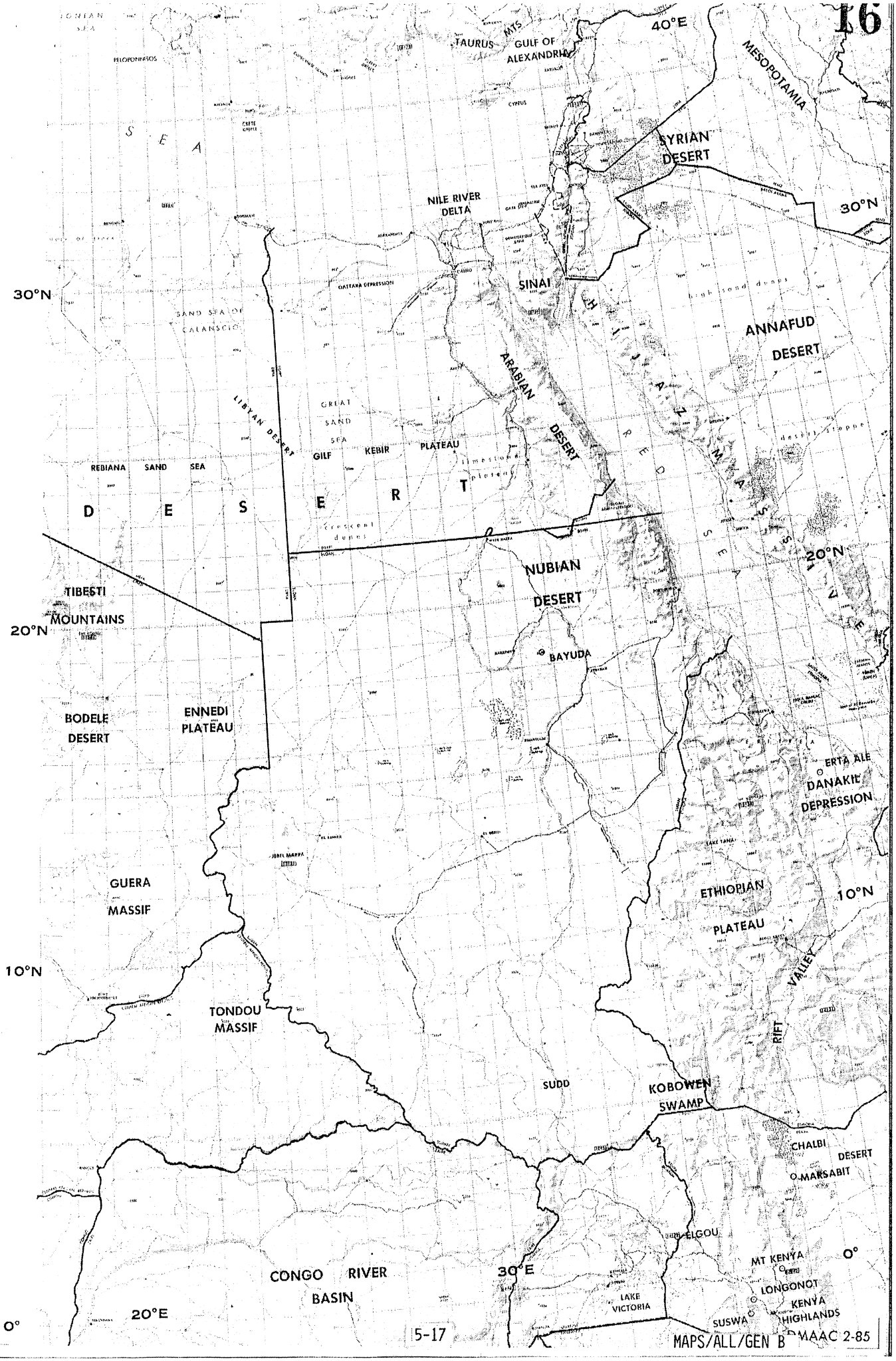

120°W
110°W
100°W
SAN FRANCISCO VOLCANIC FIELD
COLORADO PLATEAU
VALLES CALDERA
LLANO ESTACADO
SACRAMENTO MTS
WHITE SANDS
GRAN DESERT PINACATE
EDWARDS PLATEAU
DAVIS MTS
SIERRA MADRE OCCIDENTAL
MEXICAN PLATEAU
SIERRA MADRE ORIENTAL
VIZCAINO DESERT
MAGDALENA PLAIN
COLIMA
PARICUTIN
CALIFORNIA CURRENT
30°N
20°N
10°N
0°N
0°
N O R T H
P A C I F I C
O C E A N
NORTH EQUATORIAL CURRENT
EQUATORIAL COUNTER CURRENT
S O U T H P A C I F I C O C E A N

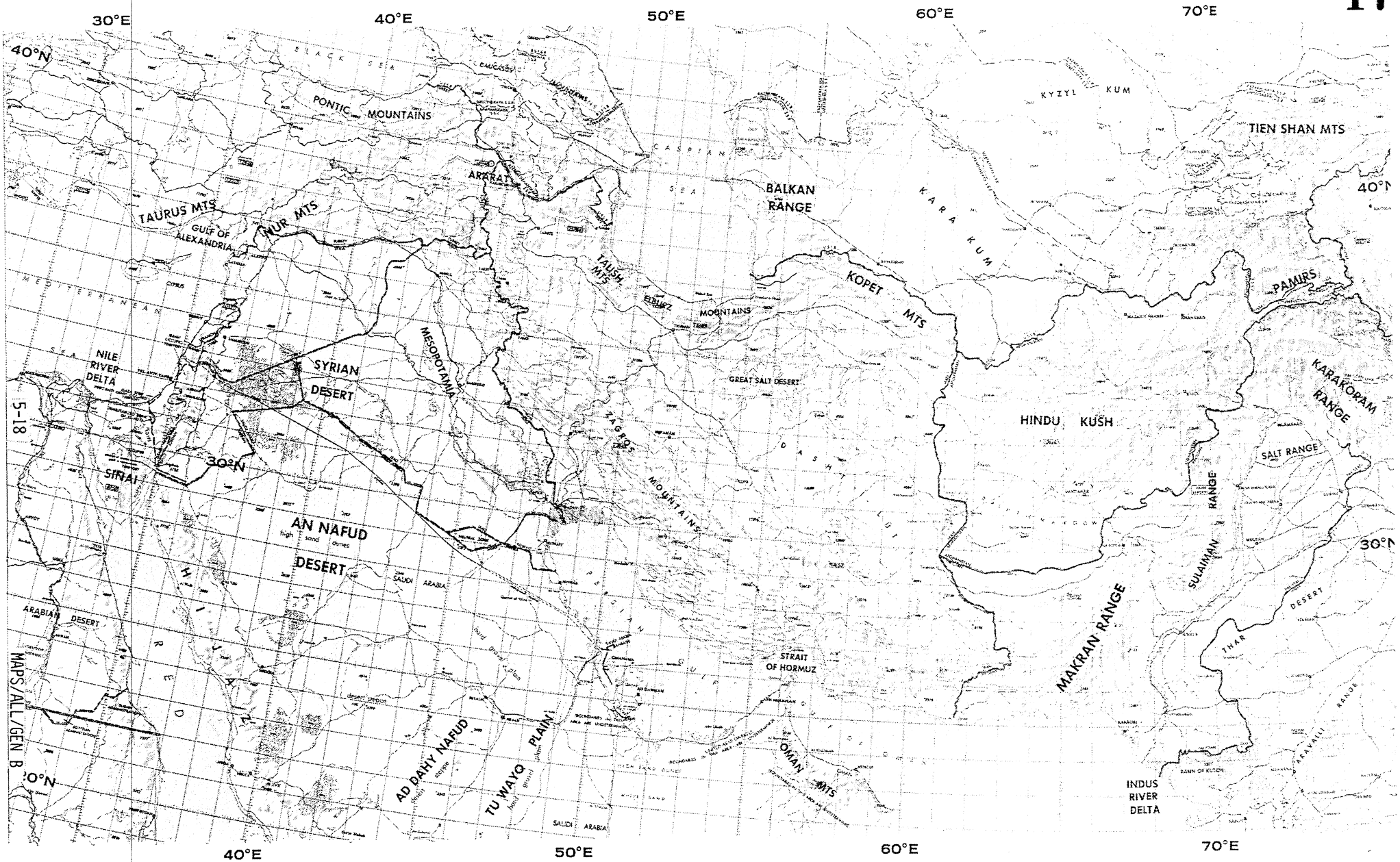

80°W
30°N
20°N
10°N
0°
90°W
NORTH ATLANTIC OCEAN
GULF OF MEXICO
CARIBBEAN SEA
NORTH PACIFIC OCEAN
CUMBERLAND PLATEAU
OUACHITA MOUNTAINS
APALACHEE BAY
MISSISSIPPI RIVER DELTA
FLORIDA CURRENT
LOOP CURRENT
YUCATAN PENINSULA
EL CHICHON
MAYA MTS.
GULF OF HONDURAS
PACAYA
IZALCO
GULF OF FONSECA
CORDILLERA ISABELLA
GOSIGUINA
MOSQUITO COAST
MANAGUA
MASAYA
ARENAL
GULF OF NICOYA
GULF OF DARIEN
PANAMA CITY
CORDILLERA OCCIDENTAL
RUIZ
PURACE
GALERAS
GALAPAGOS ISLANDS
ECUADOR
FERNANDINA
CUBA
LA MATIANA
SIERRA MAESTRA
WINDWARD PASSAGE
GREATER ANTILLES
BAHAMAS

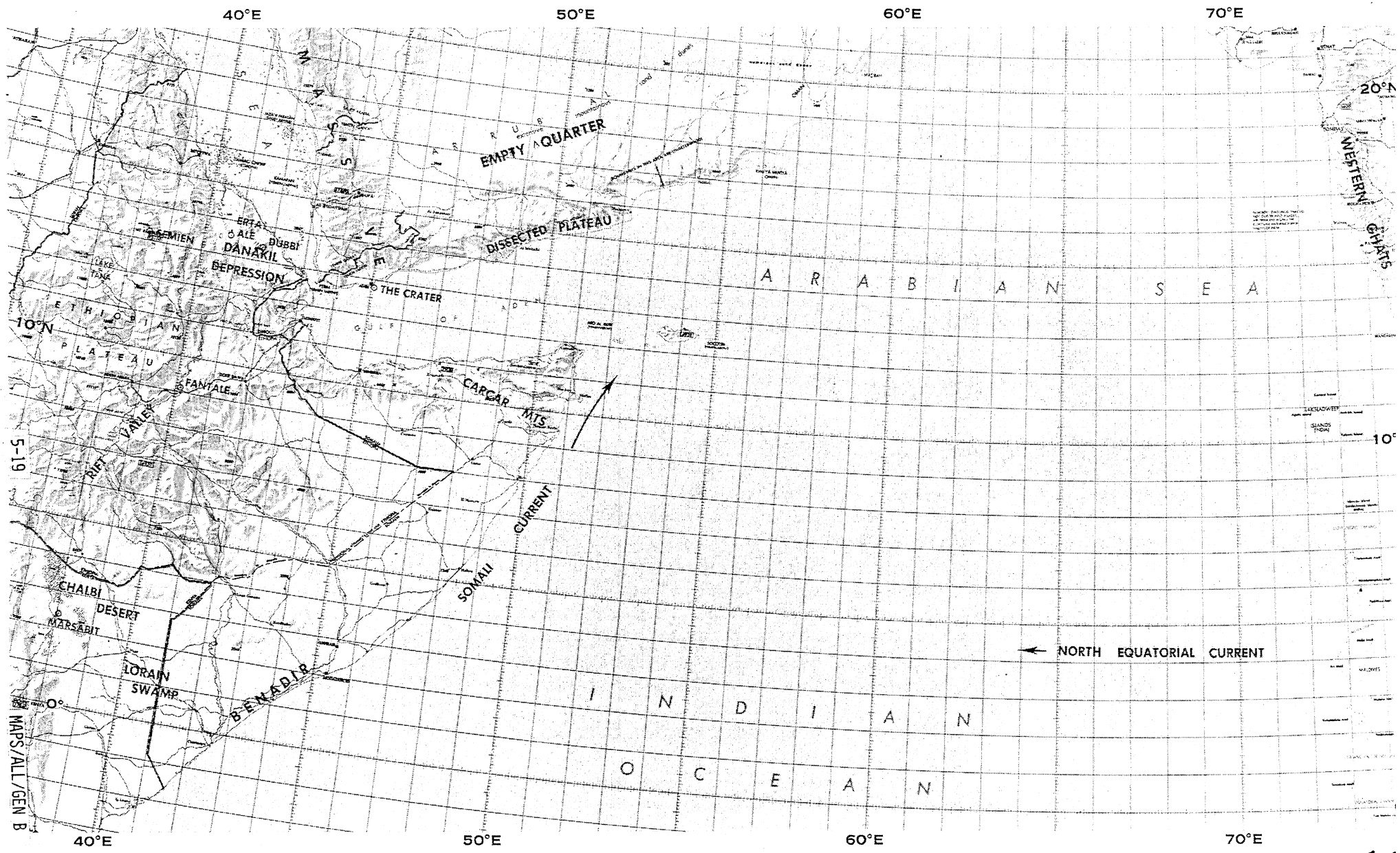

80°W
70°W
60°W
50°W
20°N
10°N
0°
CUBA
LA HABANA
SIERRA MAESTRA
WINDWARD PASSAGE
GREATER ANTILLES
LESSER ANTILLES
ANTILLES CURRENT
LA SOUFRIERE, GUADALUPE
PELEE
LA SOUFRIERE, ST VINCENT
CARIBBEAN SEA
MOSQUITO COAST
GULF OF DARIEN
SIERRA DE PERIJA
COASTAL RANGE
ORINOCO RIVER DELTA
NORTH EQUATORIAL CURRENT
ORINOCO RIVER BASIN
GUIANA HIGHLANDS
WILHELMINA MTS
AMAZON RIVER DELTA
CORDILLERA OCCIDENTAL
CORDILLERA CENTRAL
CORDILLERA ORIENTAL
NORTH ATLANTIC OCEAN
NORTH PACIFIC OCEAN

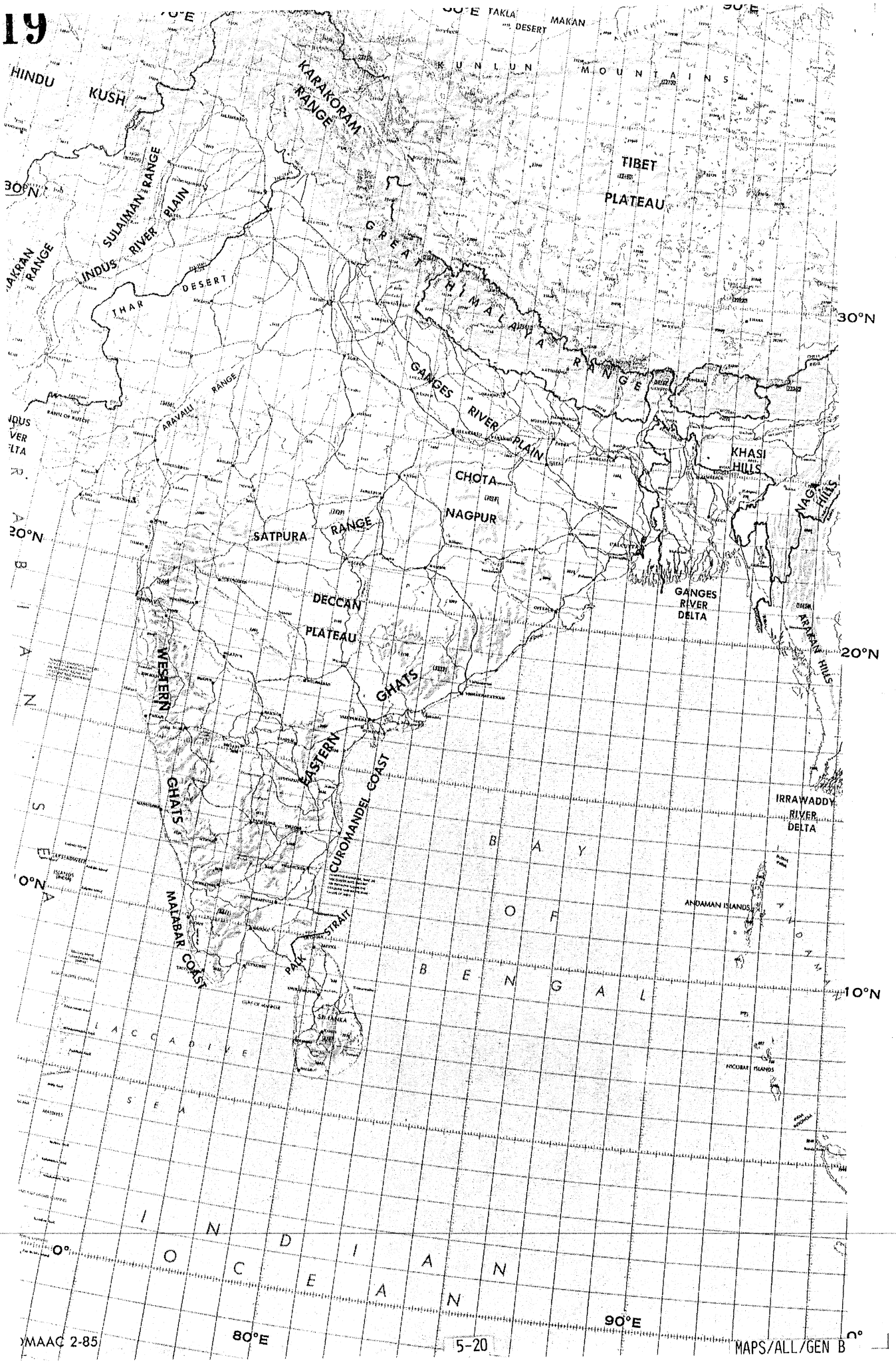

AZORES
PORTUGAL CURRENT
BAETIC MTS
ALBORAN SEA
GULF OF CADIZ
RIF
TELL ATLAS
ATLAS MOUNTAINS
MADEIRA ISLANDS
CANARY ISLANDS
ANTI ATLAS
IGUIDI DESERT
30°N
NORTH ATLANTIC OCEAN
ADRAR MTS
EL DJOUF
SAHARA DESERT
20°N
TRARZA DESERT
CANARY CURRENT
CAPE VERDE ISLANDS
INLAND DELTA OF NIGER RIVER
LOMA MOUNTAINS
NIMBA MOUNTAINS
10°N
GRAIN COAST
GUINEA CURRENT
20°W
10°W
0°

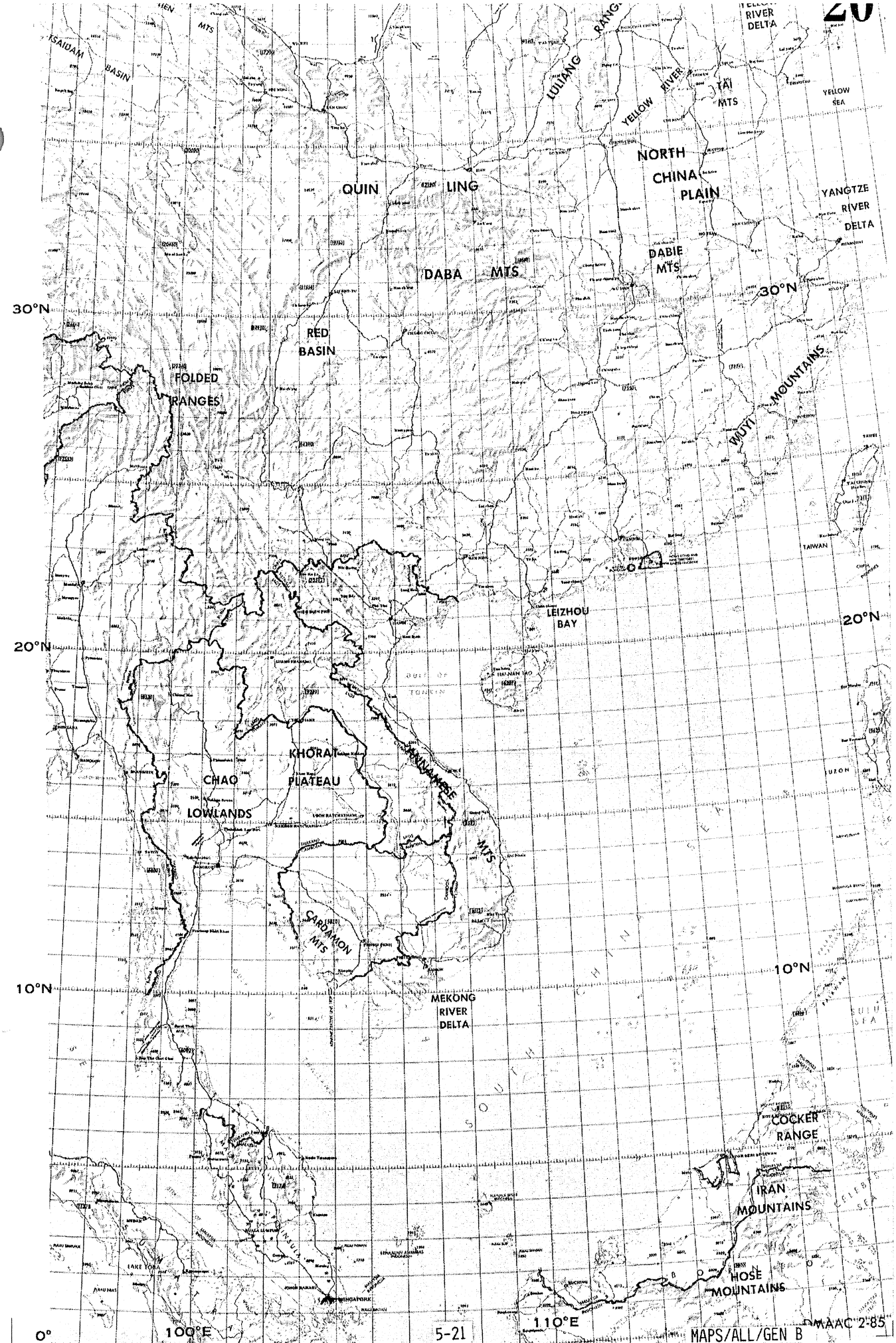

10°W
0°
10°E
NORTH ATLANTIC OCEAN
GULF OF CADIZ
BAETIC MTS
ALBORAN SEA
RIF
TELL ATLAS MOUNTAINS
ATLAS MOUNTAINS
NEMENCHA MTS
MOUNT ETNA
MEDITERRANEAN SEA
GULF OF GABES
SAHARAN ATLAS
ANTI ATLAS
30°N
GRAND ERG OCCIDENTAL
GRAND ERG ORIENTAL
IGUIDI DESERT
TADEMAIT PLATEAU
TINRHERT PLATEAU
TANEZROUFT
AHAGGAR MOUNTAINS
MARZUQ DESERT
SAHARA
TENERE DESERT
TCHIGAI PLATEAU
TIBESTI MTS
20°N
ADRAR DESIFORMS
TALAK DESERT
AIR MTS
INLAND DELTA OF NIGER RIVER
TAGAMA DESERT
LAKE CHAD
MANGA DESERT
10°N
MANDARA MTS
JOS-BAUCHI PLATEAU
LAKE VOLTA
SLAVE COAST
BIGHT OF BENIN
IVORY COAST
GOLD COAST
NIGER RIVER DELTA
CAMEROON
BIGHT OF BONNY
ISLA FERNANDO PO
GULF OF GUINEA
GUINEA CURRENT
0°
10°E

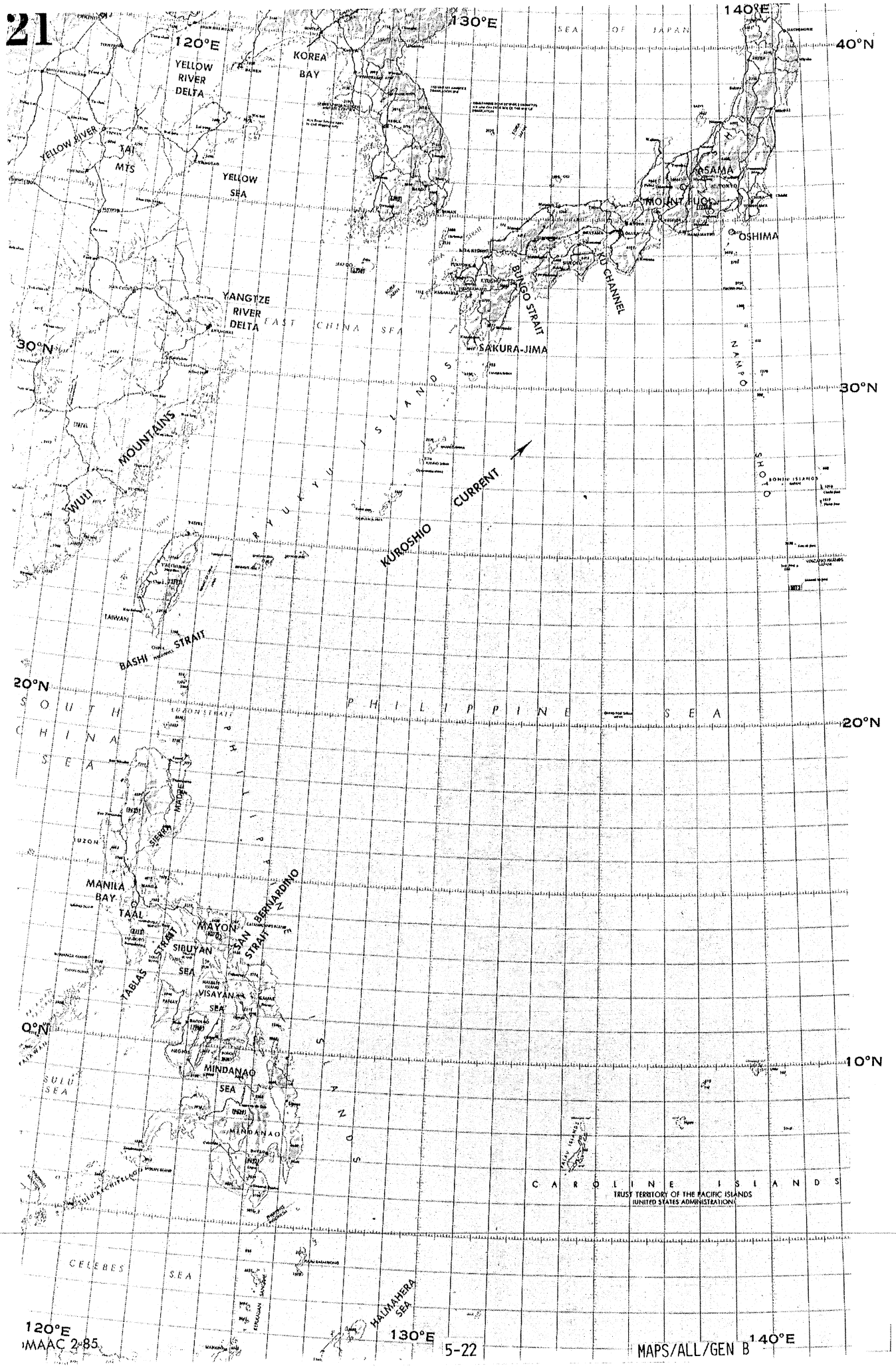

TAURUS MTS
GULF OF ALEXANDRIA
40°E
MESOPOTAMIA
SYRIAN DESERT
NILE RIVER DELTA
30°N
SINAI
ANNAFUD DESERT
ARABIAN DESERT
RED SEA
LIBYAN DESERT
GREAT SAND SEA
GILF KEBIR PLATEAU
REBIANA SAND SEA
DESERT
NUBIAN DESERT
20°N
TIBESTI MOUNTAINS
BAYUDA
BODELE DESERT
ENNEDI PLATEAU
ERTA ALE
DANAKIL DEPRESSION
GUERA MASSIF
ETHIOPIAN PLATEAU
10°N
RIFT VALLEY
TONDOU MASSIF
SUDD
KOBOWEN SWAMP
CHALBI DESERT
O-MARSABIT
ELGOU
MT KENYA
LONGONOT
KENYA HIGHLANDS
SUSWA
LAKE VICTORIA
CONGO RIVER BASIN
30°E
0°
20°E

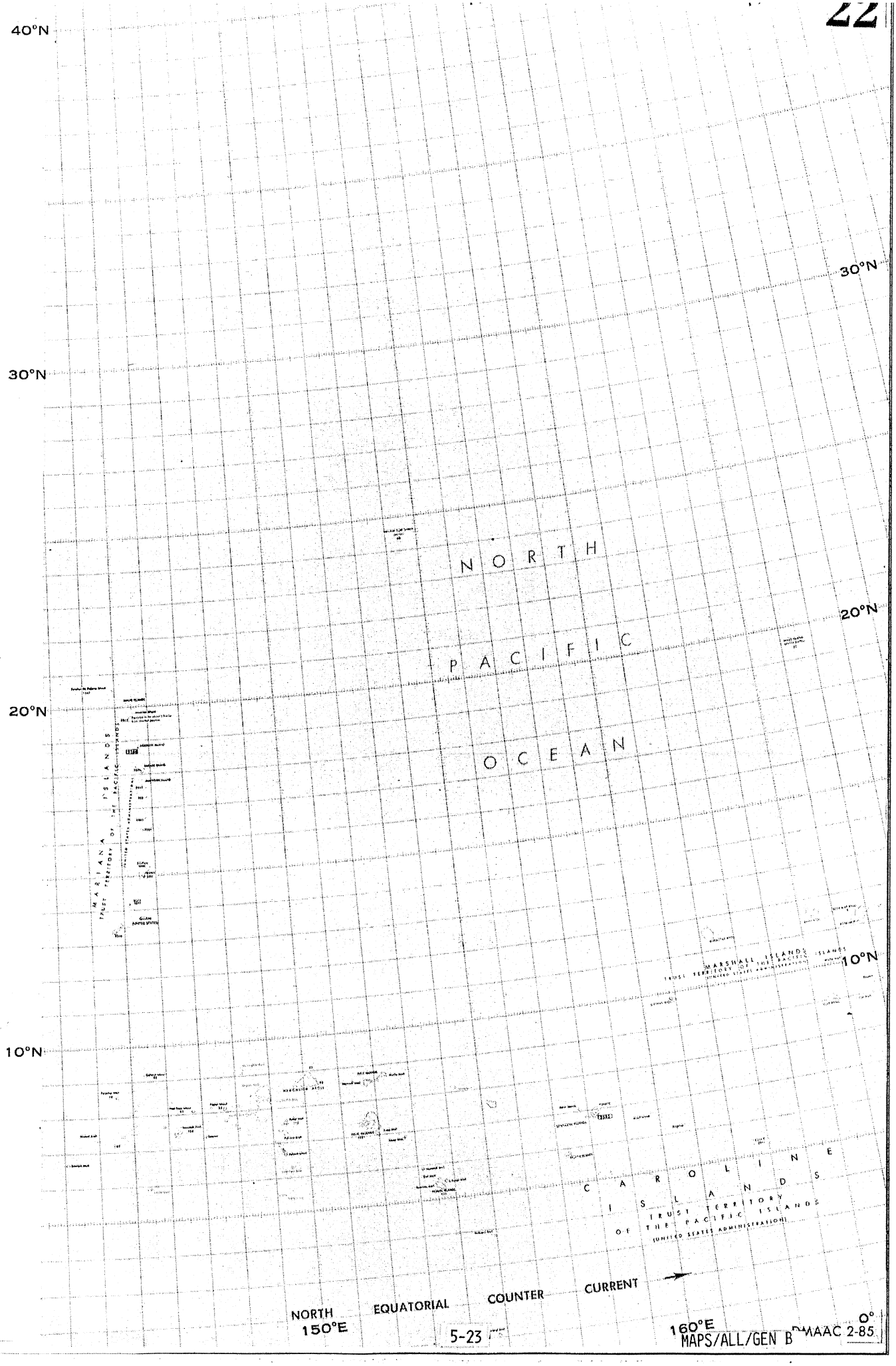

30°E
40°E
50°E
60°E
70°E
40°N
30°N
BLACK SEA
CAUCASUS MOUNTAINS
PONTIC MOUNTAINS
ARARAT
CASPIAN SEA
KYZYL KUM
TIEN SHAN MTS
BALKAN RANGE
KARA KUM
TAURUS MTS
NUR MTS
GULF OF ALEXANDRIA
MEDITERRANEAN SEA
CITRUS
TAUSH MTS
ELBURZ MOUNTAINS
KOPET MTS
PAMIRS
NILE RIVER DELTA
SYRIAN DESERT
MESOPOTAMIA
GREAT SALT DESERT
KARAKORAM RANGE
HINDU KUSH
SALT RANGE
ZAGROS MOUNTAINS
SINAI
AN NAFUD DESERT
SULAIMAN RANGE
HIJAZ
RED SEA
ARABIAN DESERT
SAUDI ARABIA
PERSIAN GULF
STRAIT OF HORMUZ
MAKRAN RANGE
THAR DESERT
AD DAHY NAFUD
TU WAYQ PLAIN
OMAN MTS
ARAVALLI RANGE
INDUS RIVER DELTA
5-18
MAPS/ALL/GEN B

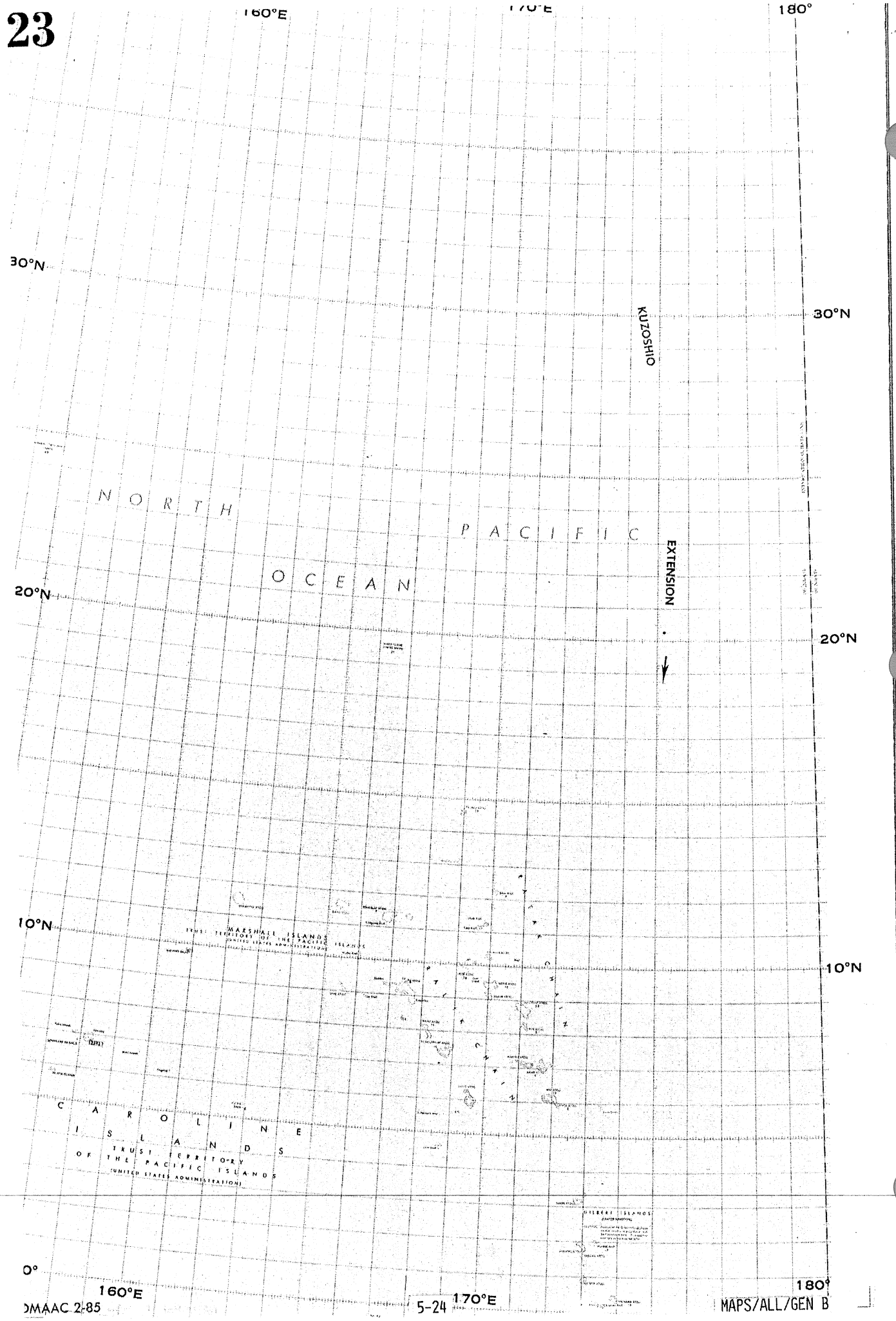

40°E
50°E
60°E
70°E
20°N
10°N
0°
EMPTY QUARTER
DISSECTED PLATEAU
WESTERN GHATS
ARABIAN SEA
ERTA ALE
DUBBI
SEMIEN
DANAKIL
DEPRESSION
LAKE TANA
THE CRATER
GULF OF ADEN
ETHIOPIAN PLATEAU
FANTALE
CARGAR MTS
RIFT VALLEY
SOMALI CURRENT
CHALBI DESERT
MARSABIT
LORAIN SWAMP
BENADIR
INDIAN OCEAN
NORTH EQUATORIAL CURRENT
LAKSHADWEEP
MALDIVES
5-19
MAPS/ALL/GEN B

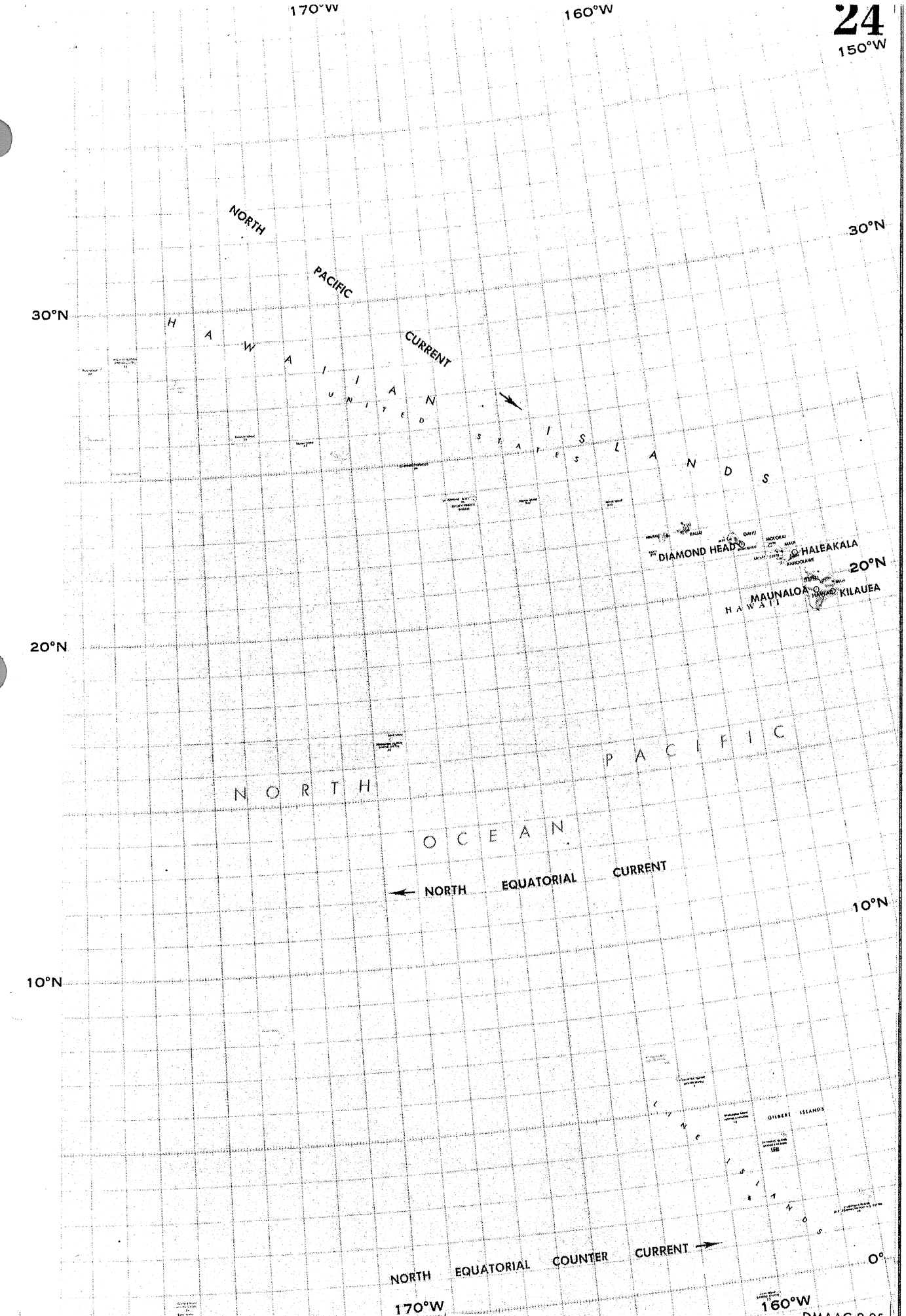

TAKLA MAKAN DESERT
KUNLUN MOUNTAINS
HINDU KUSH
KARAKORAM RANGE
TIBET PLATEAU
SULAIMAN RANGE
INDUS RIVER PLAIN
THAR DESERT
GREAT HIMALAYA RANGE
ARAVALLI RANGE
GANGES RIVER PLAIN
KHASI HILLS
CHOTA NAGPUR
SATPURA RANGE
DECCAN PLATEAU
GANGES RIVER DELTA
WESTERN GHATS
EASTERN GHATS
COROMANDEL COAST
MALABAR COAST
PALK STRAIT
IRRAWADDY RIVER DELTA
ANDAMAN ISLANDS
NICOBAR ISLANDS
BAY OF BENGAL
ARABIAN SEA
INDIAN OCEAN
LACCADIVE
30°N
20°N
10°N
0°
80°E
90°E

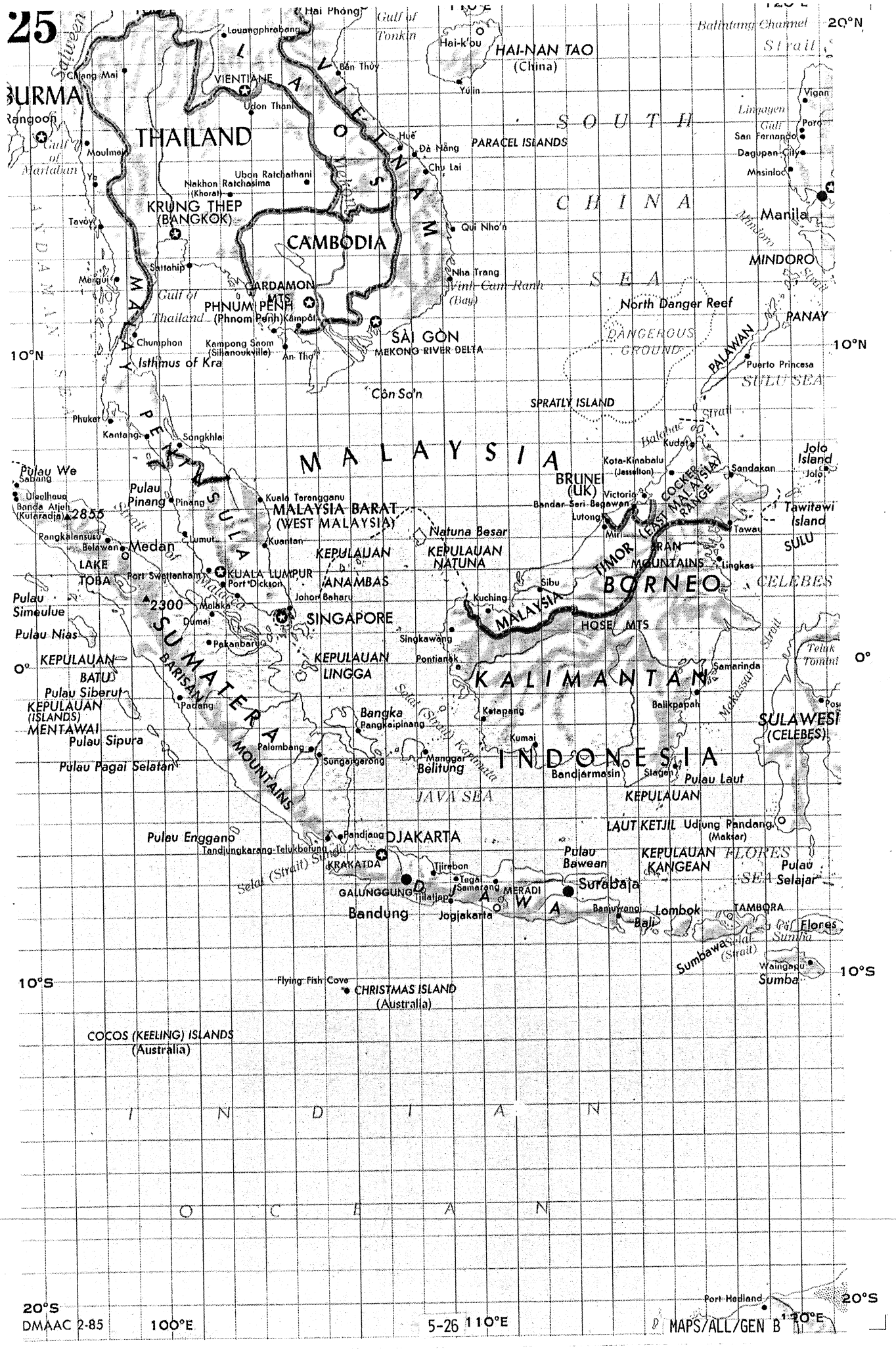

20
RIVER DELTA
TSAIDAM BASIN
MTS
LULIANG RANG
YELLOW RIVER
TAI MTS
YELLOW SEA
NORTH CHINA PLAIN
QUIN LING
YANGTZE RIVER DELTA
DABIE MTS
DABA MTS
30°N
RED BASIN
FOLDED RANGES
WUYI MOUNTAINS
TAIWAN
LEIZHOU BAY
20°N
HAINAN TAO
KHORAT PLATEAU
ANNAMESE MTS
CHAO LOWLANDS
CARDAMON MTS
10°N
MEKONG RIVER DELTA
SOUTH CHINA SEA
COCKER RANGE
IRAN MOUNTAINS
LAKE TOBA
SINGAPORE
HOSE MOUNTAINS
0°
100°E
110°E

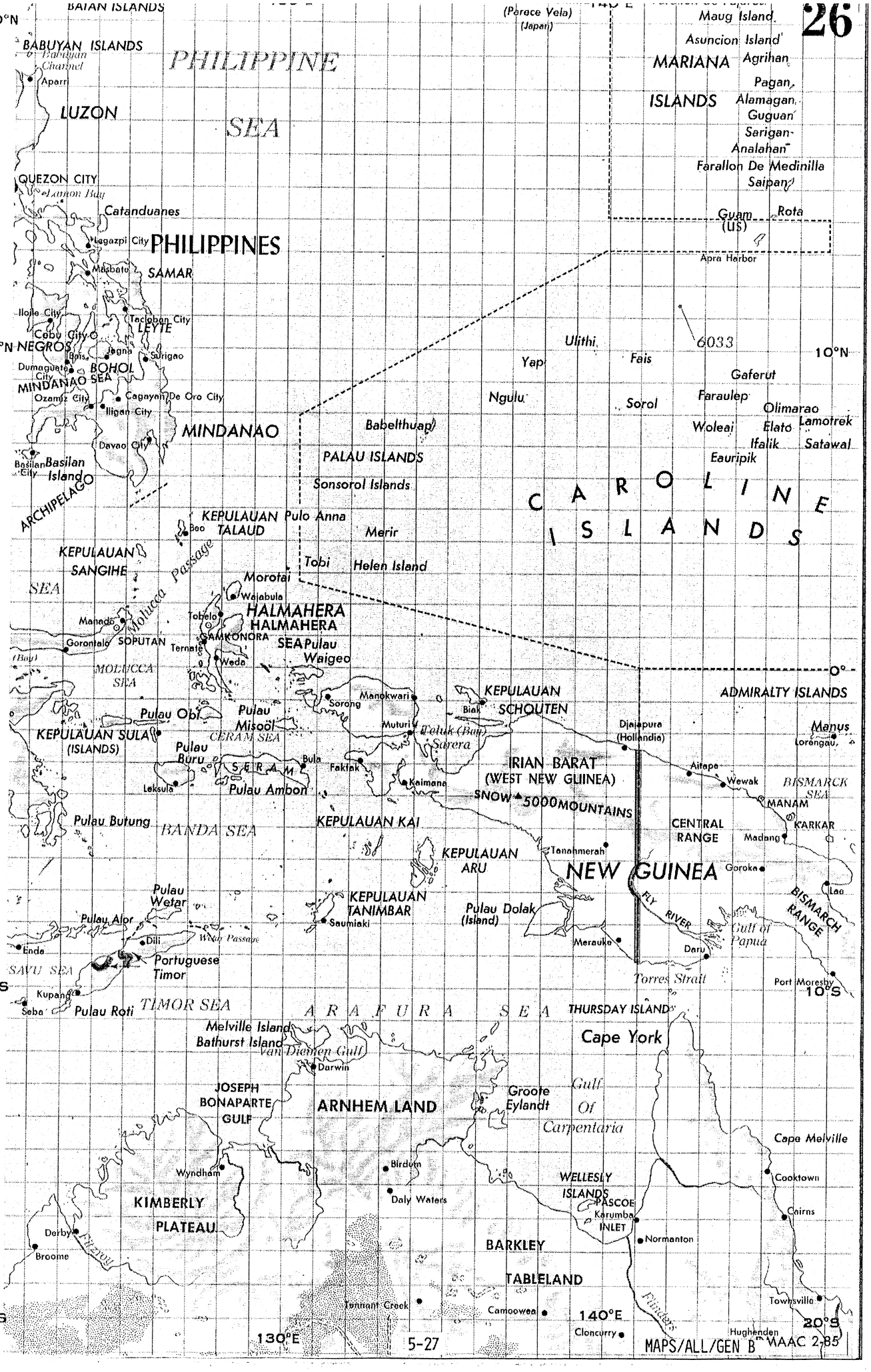

120°E
130°E
140°E
40°N
30°N
20°N
10°N
0°N
YELLOW RIVER DELTA
KOREA BAY
SEA OF JAPAN
YELLOW RIVER
TAI MTS
YELLOW SEA
OSAMA
MOUNT FUJI
OSHIMA
BUNGO STRAIT
IZU CHANNEL
YANGTZE RIVER DELTA
EAST CHINA SEA
SAKURA-JIMA
NANPO SHOTO
RYUKYU ISLANDS
MOUNTAINS
WULI
KUROSHIO CURRENT
TAIWAN
BASHI STRAIT
PHILIPPINE SEA
SOUTH CHINA SEA
LUZON
SIERRA MADRE
MANILA BAY
TAAL
MAYON
SAN BERNARDINO STRAIT
SIBUYAN SEA
TABLAS STRAIT
VISAYAN SEA
MINDANAO SEA
MINDANAO
PHILIPPINES
SULU SEA
SULU ARCHIPELAGO
CAROLINE ISLANDS
TRUST TERRITORY OF THE PACIFIC ISLANDS
(UNITED STATES ADMINISTRATION)
CELEBES SEA
HALMAHERA SEA

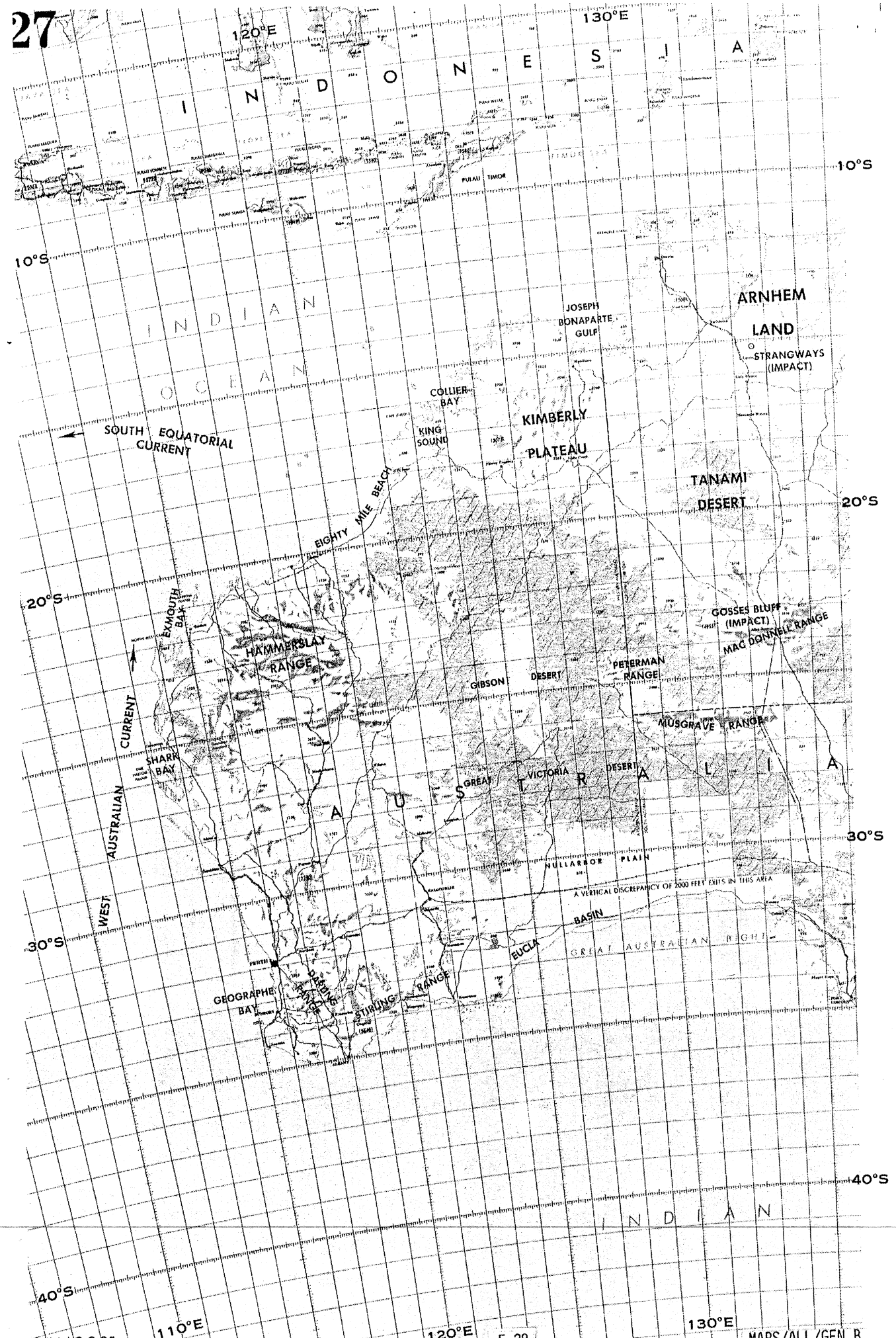

40°N
30°N
20°N
10°N
NORTH
PACIFIC
OCEAN
MARIANA ISLANDS
TRUST TERRITORY OF THE PACIFIC ISLANDS
UNITED STATES ADMINISTRATION
MARSHALL ISLANDS
TRUST TERRITORY OF THE PACIFIC ISLANDS
UNITED STATES ADMINISTRATION
CAROLINE ISLANDS
TRUST TERRITORY OF THE PACIFIC ISLANDS
UNITED STATES ADMINISTRATION
NORTH EQUATORIAL COUNTER CURRENT
150°E
160°E
0°

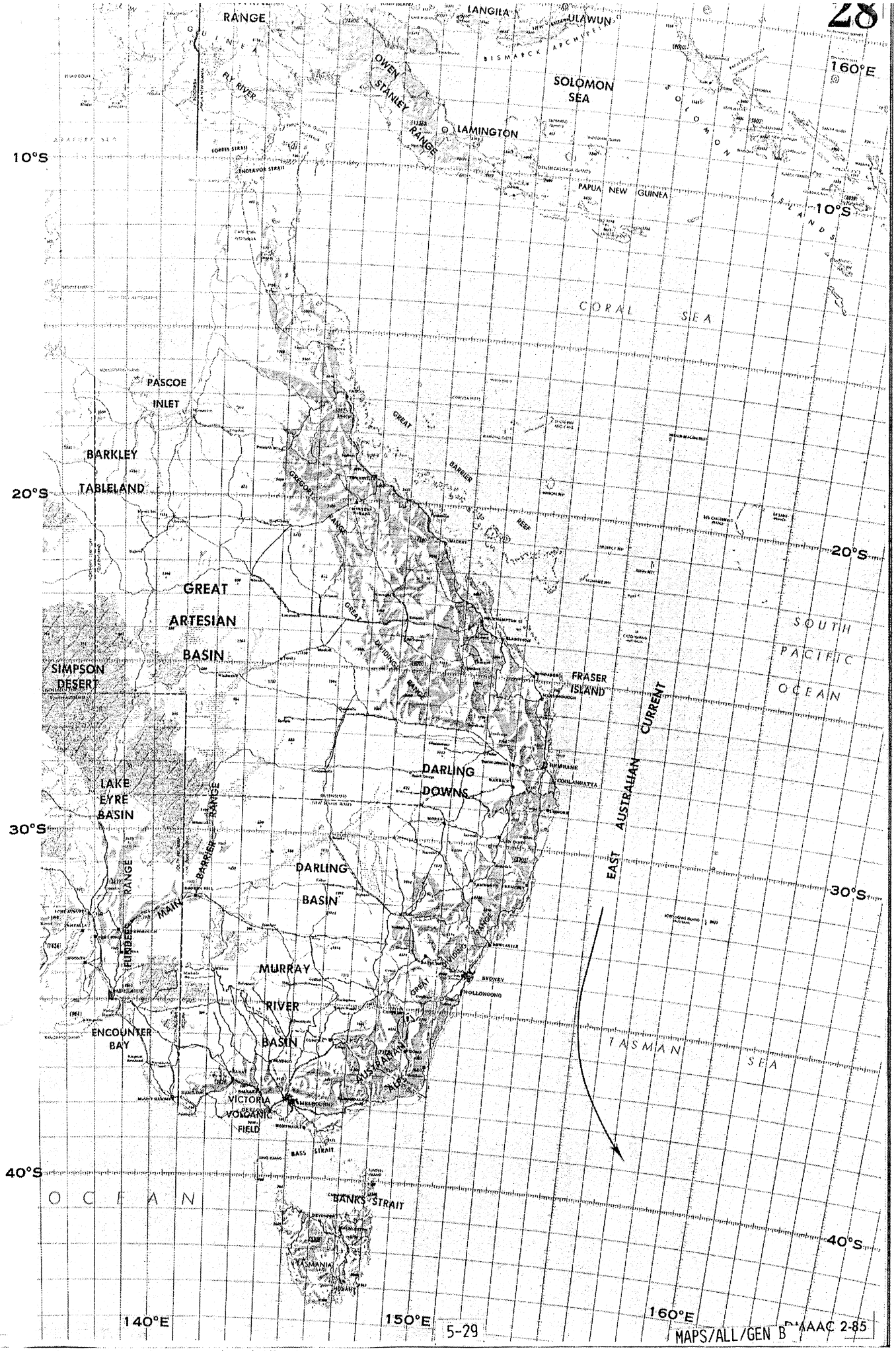

160°E
170°E
180°
30°N
20°N
10°N
0°
KUZOSHIO
EXTENSION
NORTH
PACIFIC
OCEAN
MARSHALL ISLANDS
TRUST TERRITORY OF THE PACIFIC ISLANDS
(UNITED STATES ADMINISTRATION)
CAROLINE
ISLANDS
TRUST TERRITORY
OF THE PACIFIC ISLANDS
(UNITED STATES ADMINISTRATION)
GILBERT ISLANDS
160°E
170°E
180°

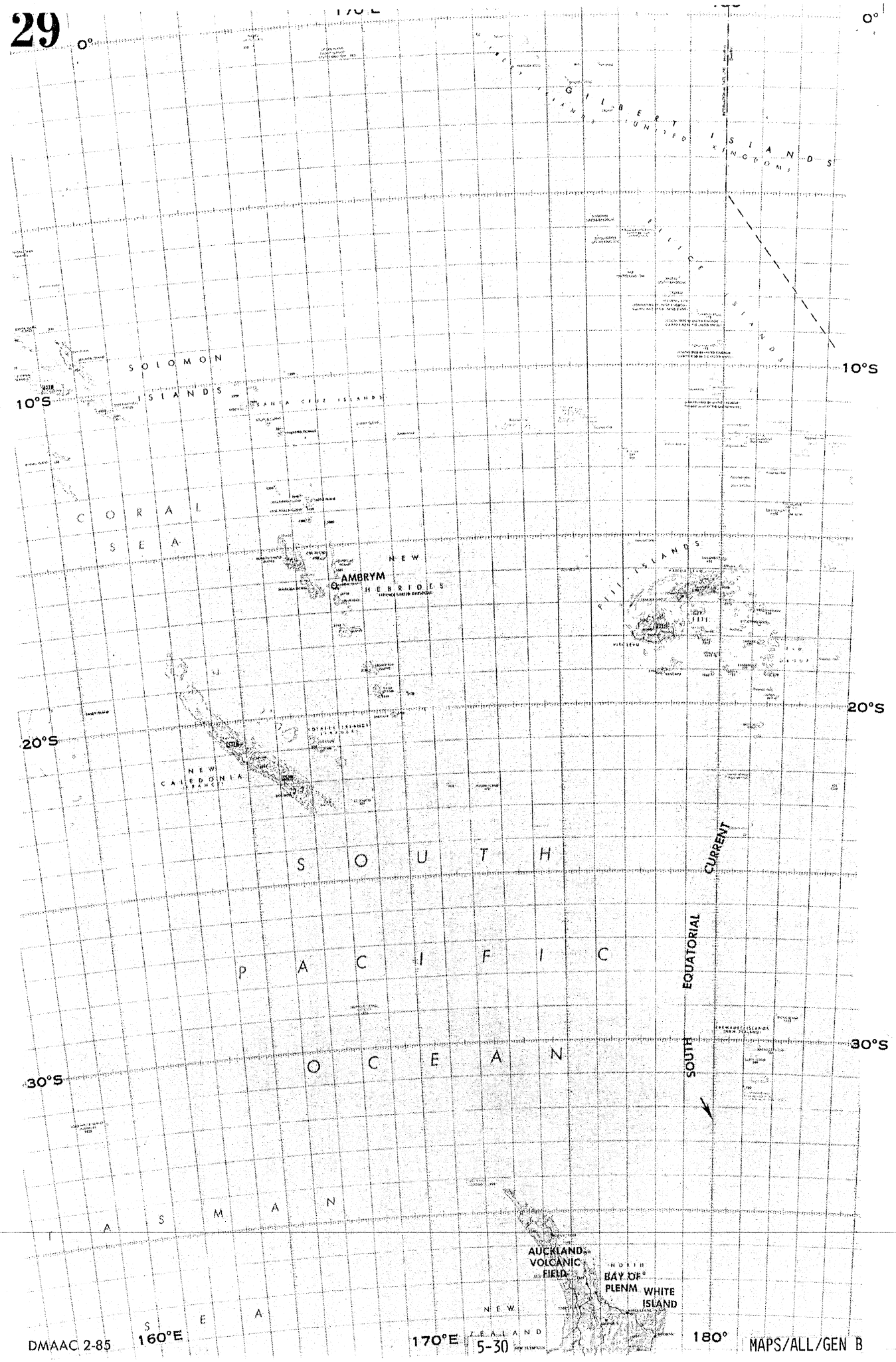

170°W
160°W
150°W
30°N
20°N
10°N
0°
NORTH PACIFIC CURRENT
HAWAIIAN
UNITED STATES ISLANDS
DIAMOND HEAD
HALEAKALA
MAUNALOA
KILAUEA
HAWAII
NORTH PACIFIC OCEAN
NORTH EQUATORIAL CURRENT
NORTH EQUATORIAL COUNTER CURRENT
GILBERT ISLANDS

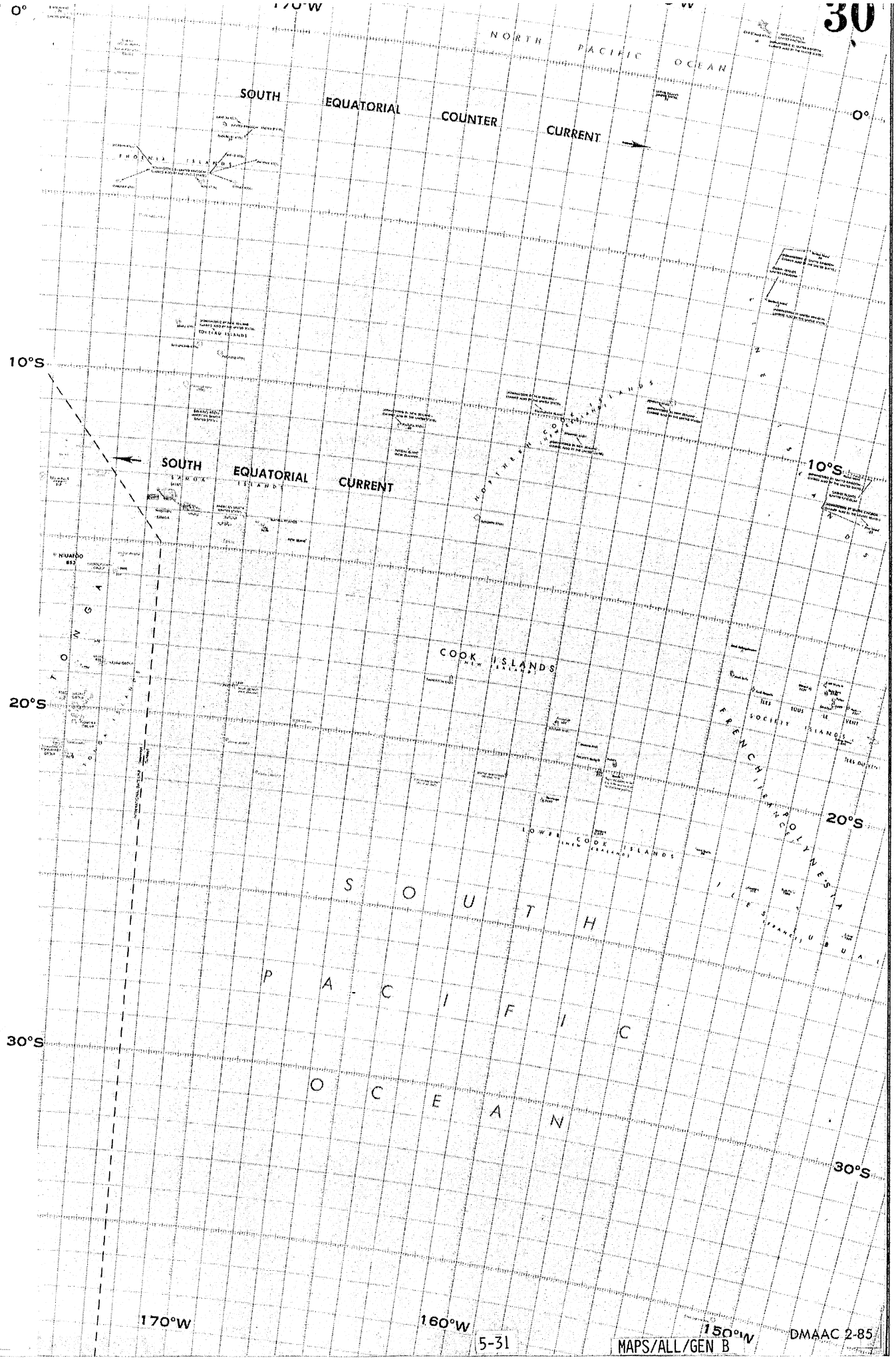

Hai Phòng
Gulf of Tonkin
Hai-k'ou
HAI-NAN TAO (China)
Balintang Channel
Strait
20°N
Louangphrabang
LAOS
VIENTIANE
Bản Thủy
Yulin
Vigan
Lingayen Gulf
Poro
San Fernando
Dagupan City
Masinloc
Chiang Mai
BURMA
Rangoon
Udon Thani
THAILAND
Gulf of Martaban
Moulmein
Huế
Đà Nẵng
PARACEL ISLANDS
Chu Lai
Ubon Ratchathani
Nakhon Ratchasima (Khorat)
KRUNG THEP (BANGKOK)
Tavoy
CAMBODIA
Qui Nho'n
CHINA SEA
Manila
Mindoro Strait
MINDORO
Sattahip
Nha Trang
Vinh Cam Ranh (Bay)
CARDAMON MTS
PHNUM PENH (Phnom Penh)
Kampôt
Gulf of Thailand
North Danger Reef
PANAY
SÀI GÒN
MEKONG RIVER DELTA
Chumphon
Kampong Saom (Sihanoukville)
An Thoi
DANGEROUS GROUND
PALAWAN
Puerto Princesa
10°N
Isthmus of Kra
Côn Sa'n
SULU SEA
SPRATLY ISLAND
Phuket
Kantang
Songkhla
MALAYSIA
Kudat
Jolo Island
Jolo
Pulau We
Sabang
Kota-Kinabalu (Jesselton)
Sandakan
BRUNEI (UK)
Victoria
Bandar Seri Begawan
Lutong
Miri
CROKER RANGE (EAST MALAYSIA)
Tawitawi Island
Tawau
SULU
Ulaolheue
Banda Atjeh (Kutaradja) 2855
Pulau Pinang
Pinang
Kuala Terengganu
MALAYSIA BARAT (WEST MALAYSIA)
Natuna Besar
Rangkalansuat
Belawan
Medan
Lumut
Kuantan
KEPULAUAN ANAMBAS
KEPULAUAN NATUNA
TIMOR
IRAN MOUNTAINS
Lingkas
LAKE TOBA
Port Swettenham
KUALA LUMPUR
Port Dickson
Johor Baharu
Sibu
BORNEO
CELEBES
Pulau Simeulue
2300
Malaka
Dumai
SINGAPORE
Kuching
MALAYSIA
HOSE MTS
Pulau Nias
Singkawang
Pekanbaru
Pontianak
Samarinda
0°
KEPULAUAN BATU
KEPULAUAN LINGGA
KALIMANTAN
Pulau Siberut
Padang
Balikpapan
KEPULAUAN (ISLANDS) MENTAWAI
Bangka
Pangkalpinang
Ketapang
SULAWESI (CELEBES)
Pulau Sipura
Palembang
Sungaigerong
Kumai
Manggar
Belitung
INDONESIA
Bandjarmasin
Slagen
Pulau Laut
Pulau Pagai Selatan
JAVA SEA
KEPULAUAN
LAUT KETJIL
Udjung Pandang (Makasar)
Pulau Enggano
Tandjungkarang-Telukbetung
Pandjang
DJAKARTA
Pulau Bawean
KEPULAUAN KANGEAN
FLORES SEA
Pulau Selajar
KRAKATOA
Tjirebon
Tegal
Semarang
MERADI
Surabaja
GALUNGGUNG
Tjilatjap
Bandung
Jogjakarta
Banjuwangi
Lombok
Bali
TAMBORA
Flores
Sumbawa
Selat (Strait) Sumba
Waingapu
Sumba
10°S
Flying Fish Cove
CHRISTMAS ISLAND (Australia)
COCOS (KEELING) ISLANDS (Australia)
INDIAN OCEAN
Port Hedland
20°S
100°E
110°E
120°E

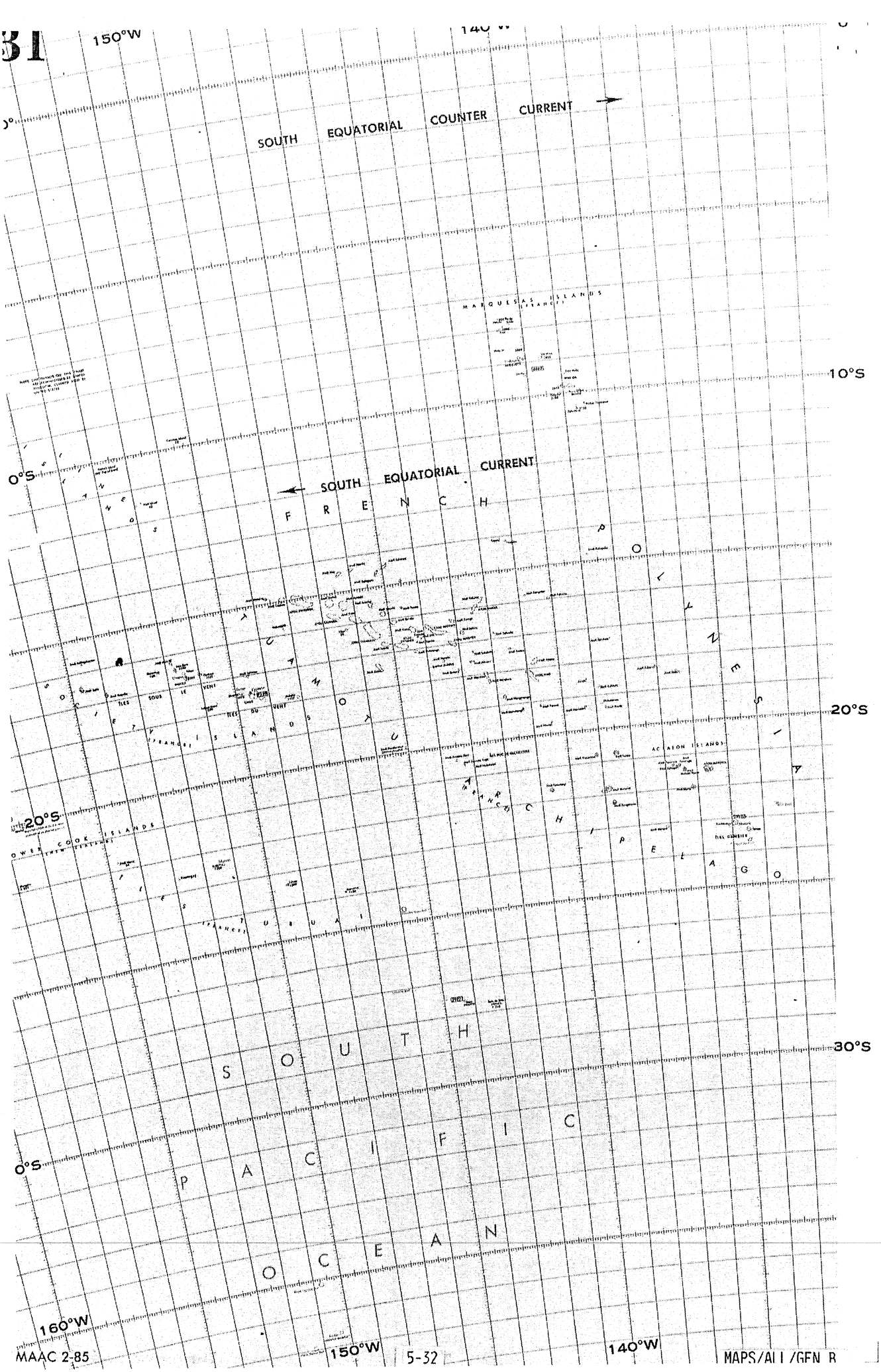

BAIAN ISLANDS
20°N
BABUYAN ISLANDS
Babuyan Channel
Aparri
PHILIPPINE SEA
LUZON
QUEZON CITY
Lamon Bay
Catanduanes
Legazpi City
PHILIPPINES
Masbate
SAMAR
Ilolo City
Tacloban City
LEYTE
Cebu City
10°N NEGROS
Bais
Jagna
Surigao
Dumaguete City
BOHOL
MINDANAO SEA
Ozamiz City
Cagayan De Oro City
Iligan City
MINDANAO
Davao City
Basilan City
Basilan Island
ARCHIPELAGO
KEPULAUAN SANGIHE
Boo
TALAUD
KEPULAUAN Pulo Anna
Merir
Tobi
Helen Island
Morotai
SEA
Molucca Passage
Wajabula
HALMAHERA
Tobelo
Manado
Gorontalo
SOPUTAN
SAMKONORA
Ternate
Weda
SEA
Pulau Waigeo
0°
(Bay)
MOLUCCA SEA
Sorong
Manokwari
KEPULAUAN SCHOUTEN
Biak
Pulau Obi
Pulau Misool
KEPULAUAN SULA (ISLANDS)
CERAM SEA
Muturi
Teluk (Bay) Sarera
Djajapura (Hollandia)
Pulau Buru
S E R A M
Bula
Fakfak
Leksula
Pulau Ambon
Kaimana
IRIAN BARAT (WEST NEW GUINEA)
SNOW ▲ 5000 MOUNTAINS
Aitape
Wewak
BISMARCK SEA
MANAM
KARKAR
Madang
CENTRAL RANGE
Pulau Butung
BANDA SEA
KEPULAUAN KAI
KEPULAUAN ARU
Tanahmerah
NEW GUINEA
Goroka
Lae
Pulau Wetar
Pulau Alor
Saumiaki
KEPULAUAN TANIMBAR
Pulau Dolak (Island)
FLY RIVER
BISMARCK RANGE
Gulf of Papua
Dili
Wetar Passage
Merauke
Daru
Ende
SAWU SEA
Portuguese Timor
Torres Strait
Port Moresby
10°S
Kupang
Seba
Pulau Roti
TIMOR SEA
A R A F U R A S E A
THURSDAY ISLAND
Melville Island
Bathurst Island
Van Diemen Gulf
Cape York
Darwin
JOSEPH BONAPARTE GULF
ARNHEM LAND
Groote Eylandt
Gulf Of Carpentaria
Cape Melville
Wyndham
Birdum
WELLESLY ISLANDS
Cooktown
Daly Waters
KIMBERLY PLATEAU
PASCOE
Karumba
INLET
Cairns
Derby
Broome
Fitzroy
Normanton
BARKLEY TABLEFLAND
Tennant Creek
Camooweа
Cloncurry
Townsville
Flinders
Hughenden
20°S
130°E
140°E
Ulithi
6033
Yap
Fais
Gaferut
Ngulu
Sorol
Faraulep
Olimarao
Woleai
Elato
Lamotrek
Ifalik
Satawal
Eauripik
Babelthuap
PALAU ISLANDS
Sonsorol Islands
CAROLINE ISLANDS
(Palau Yela) (Japan)
Maug Island
Asuncion Island
MARIANA ISLANDS
Agrihan
Pagan
Alamagan
Guguan
Sarigan
Anatahan
Farallon De Medinilla
Saipan
Guam (US)
Rota
Apra Harbor
ADMIRALTY ISLANDS
Manus
Lorengau

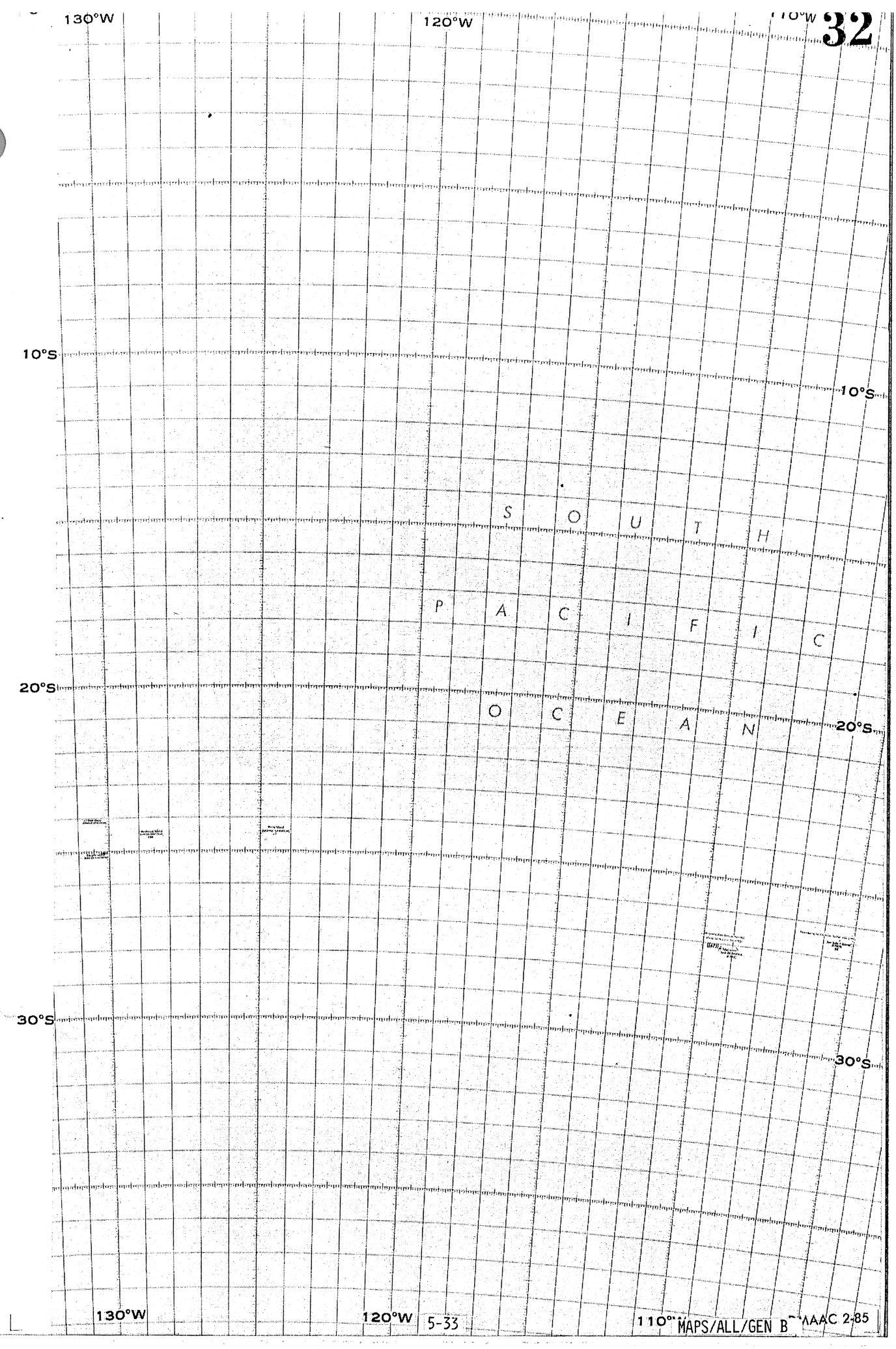

120°E
130°E
I N D O N E S I A
10°S
PULAU TIMOR
INDIAN OCEAN
JOSEPH BONAPARTE GULF
ARNHEM LAND
STRANGWAYS (IMPACT)
COLLIER BAY
KING SOUND
KIMBERLY PLATEAU
SOUTH EQUATORIAL CURRENT
TANAMI DESERT
20°S
EIGHTY MILE BEACH
EXMOUTH BAY
HAMERSLEY RANGE
GOSSES BLUFF (IMPACT)
MAC DONNELL RANGE
GIBSON DESERT
PETERMAN RANGE
MUSGRAVE RANGE
AUSTRALIAN WEST CURRENT
SHARK BAY
GREAT VICTORIA DESERT
A U S T R A L I A
30°S
NULLARBOR PLAIN
A VERTICAL DISCREPANCY OF 2000 FEET EXISTS IN THIS AREA
EUCLA BASIN
GREAT AUSTRALIAN BIGHT
PERTH
GEOGRAPHE BAY
DARLING RANGE
STIRLING RANGE
40°S
I N D I A N
110°E
120°E
130°E


RANGE
LANGILA
ULAWUN
BISMARCK ARCHIPELAGO
160°E
OWEN STANLEY RANGE
FLY RIVER
SOLOMON SEA
LAMINGTON
TORRES STRAIT
ENDEAVOR STRAIT
10°S
PAPUA NEW GUINEA
SOLOMON ISLANDS
CORAL SEA
PASCOE INLET
BARKLEY TABLELAND
GREAT BARRIER REEF
GREGORY RANGE
20°S
GREAT ARTESIAN BASIN
SIMPSON DESERT
GREAT DIVIDING RANGE
FRASER ISLAND
SOUTH PACIFIC OCEAN
EAST AUSTRALIAN CURRENT
LAKE EYRE BASIN
DARLING DOWNS
BRISBANE
COOLANGATTA
30°S
DARLING BASIN
MAIN RANGE
FLINDERS RANGE
BARRIER RANGE
MURRAY RIVER BASIN
SYDNEY
WOLLONGONG
OPEN PLAINS
ENCOUNTER BAY
AUSTRALIAN ALPS
TASMAN SEA
VICTORIA VOLCANIC FIELD
MELBOURNE
BASS STRAIT
40°S
OCEAN
BANKS STRAIT
TASMANIA
HOBART
140°E
150°E
160°E

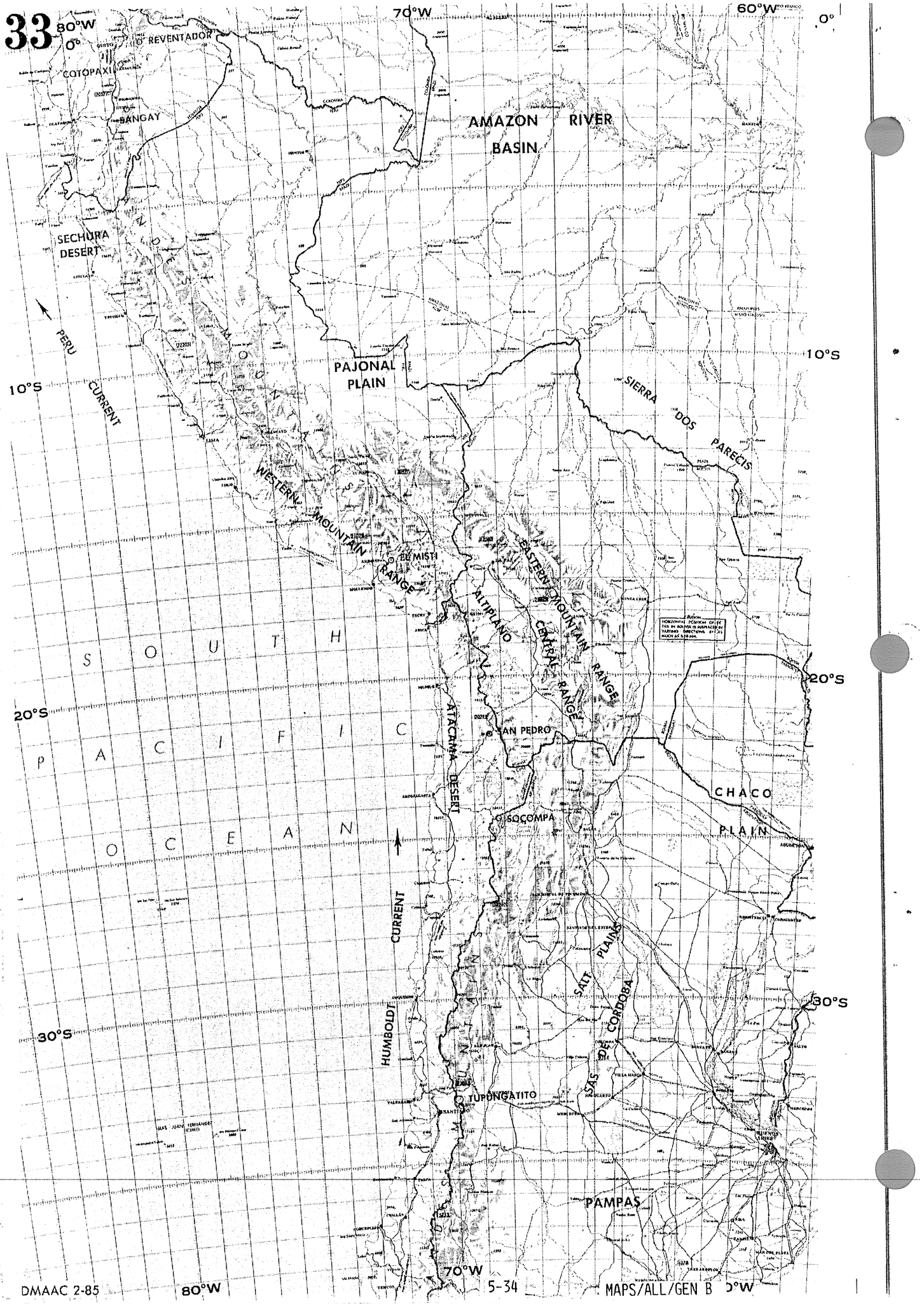

0°
GILBERT ISLANDS
SOLOMON ISLANDS
10°S
CORAL SEA
NEW HEBRIDES
AMBRYM
FIJI ISLANDS
20°S
NEW CALEDONIA
SOUTH PACIFIC OCEAN
EQUATORIAL CURRENT
SOUTH
30°S
TASMAN SEA
AUCKLAND VOLCANIC FIELD
BAY OF PLENTY
WHITE ISLAND
NEW ZEALAND
160°E
170°E
180°

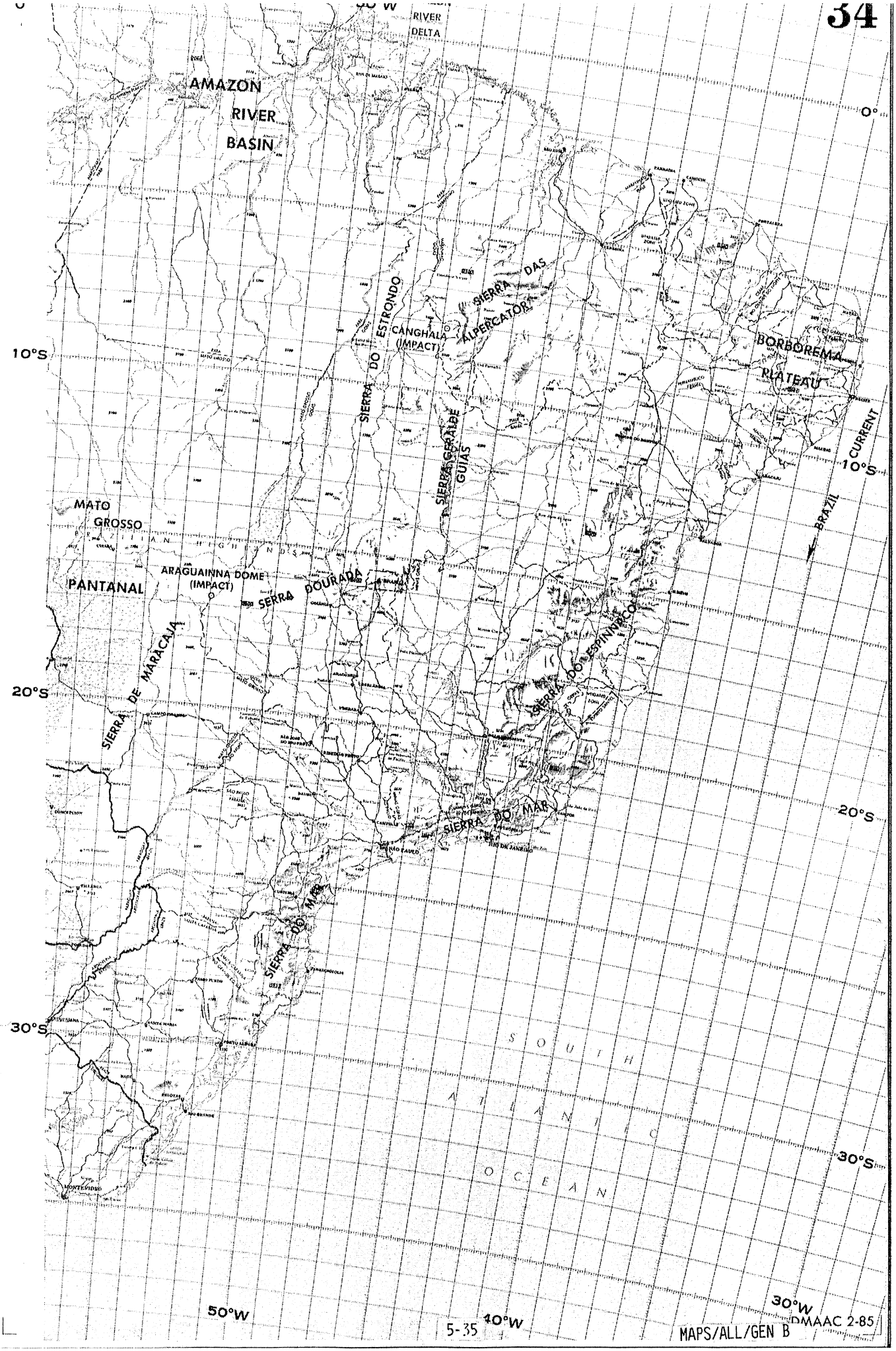

0°
170°W
NORTH PACIFIC OCEAN
SOUTH EQUATORIAL COUNTER CURRENT
PHOENIX ISLANDS
TOKELAU ISLANDS
10°S
SOUTH EQUATORIAL CURRENT
SAMOA ISLANDS
NORTHERN COOK ISLANDS
COOK ISLANDS
SOCIETY ISLANDS
ILES SOUS LE VENT
LOWER COOK ISLANDS
ILES AUSTRALES
FRENCH POLYNESIA
20°S
SOUTH PACIFIC OCEAN
30°S
170°W
160°W
150°W

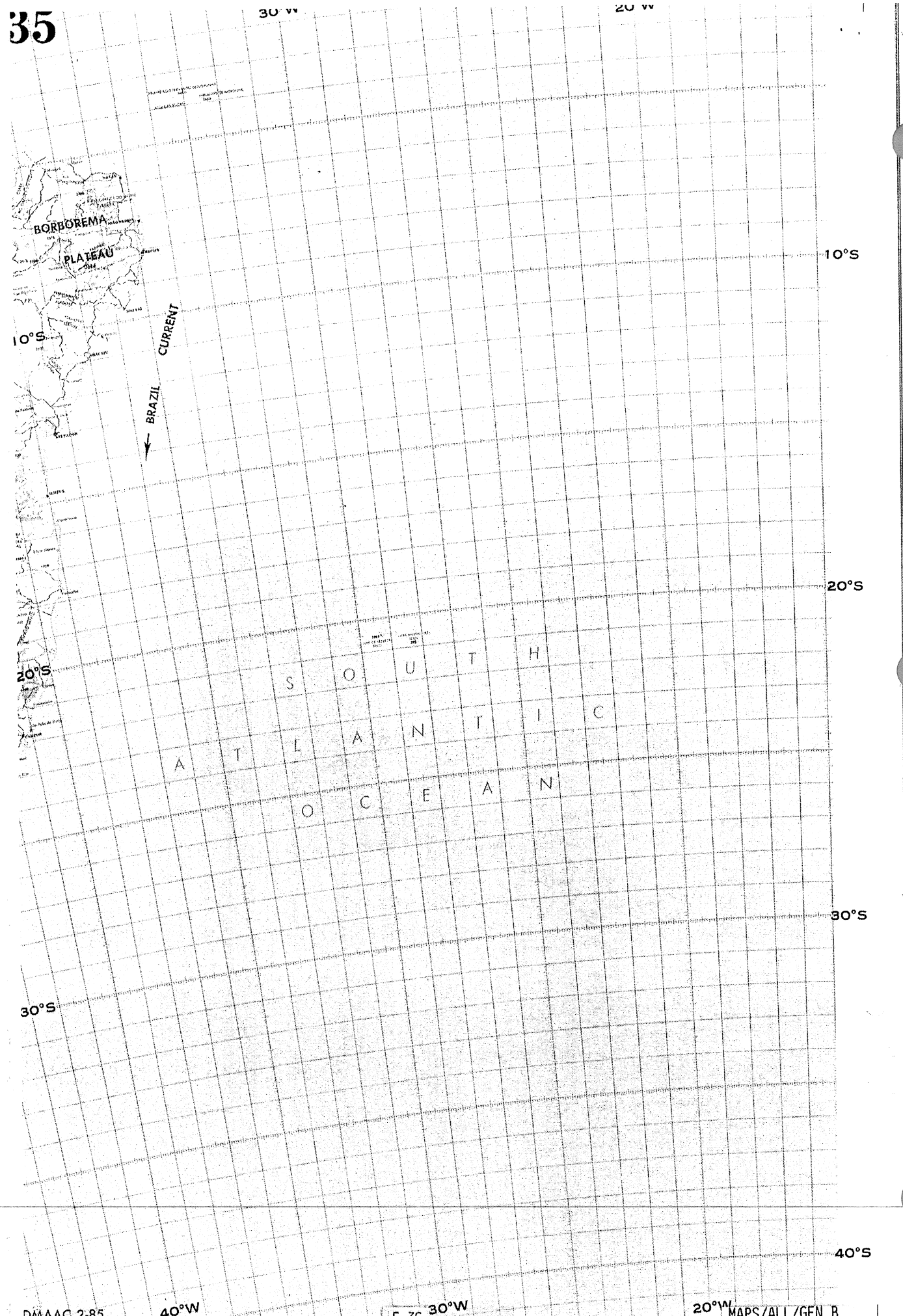

150°W
SOUTH EQUATORIAL COUNTER CURRENT
MARQUESAS ISLANDS
10°S
0°S
SOUTH EQUATORIAL CURRENT
F R E N C H
P O L Y N E S I A
20°S
AUSTRAL ISLANDS
ARCHIPELAGO
COOK ISLANDS
S O U T H
P A C I F I C
O C E A N
160°W
150°W
140°W

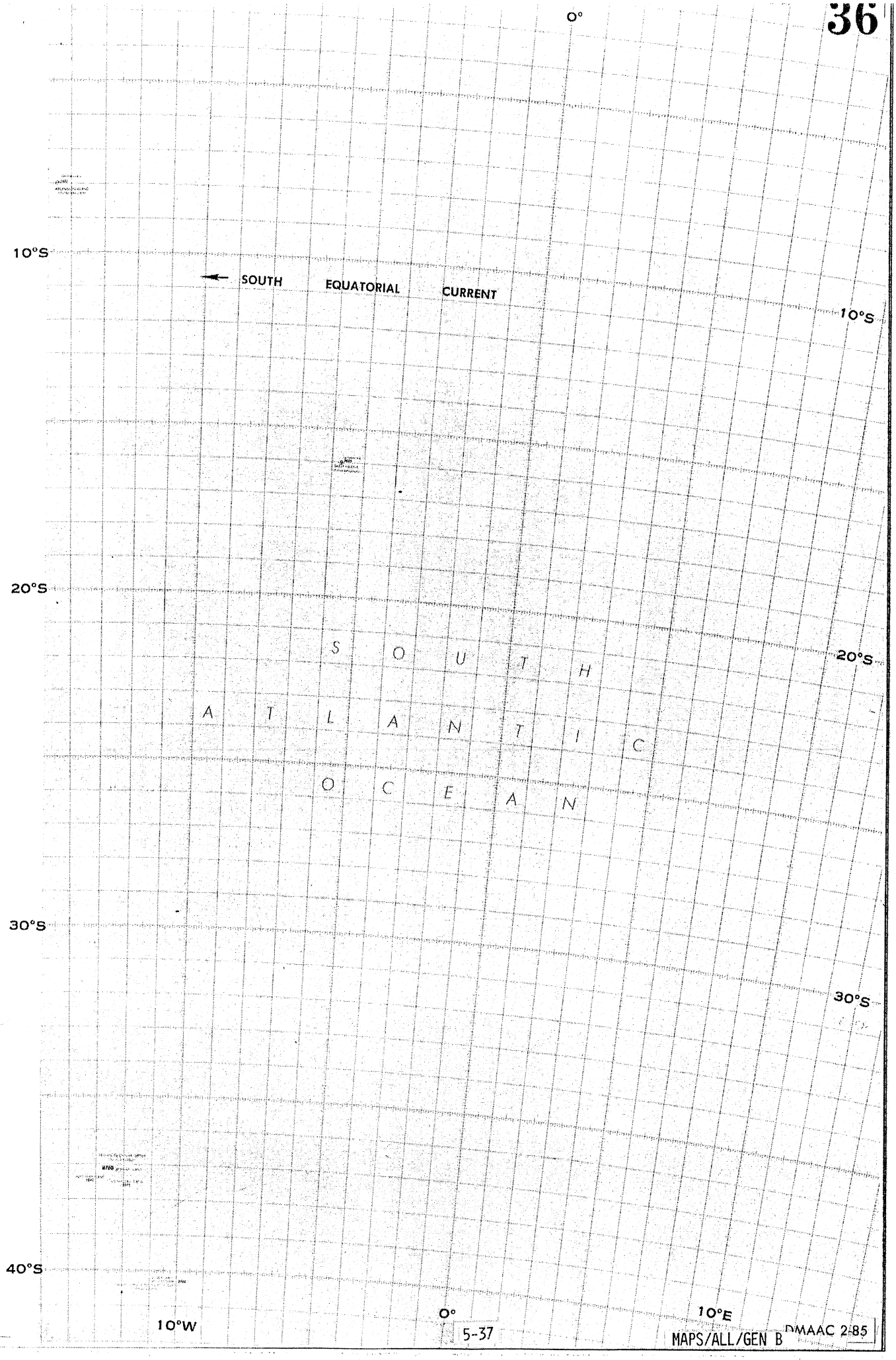


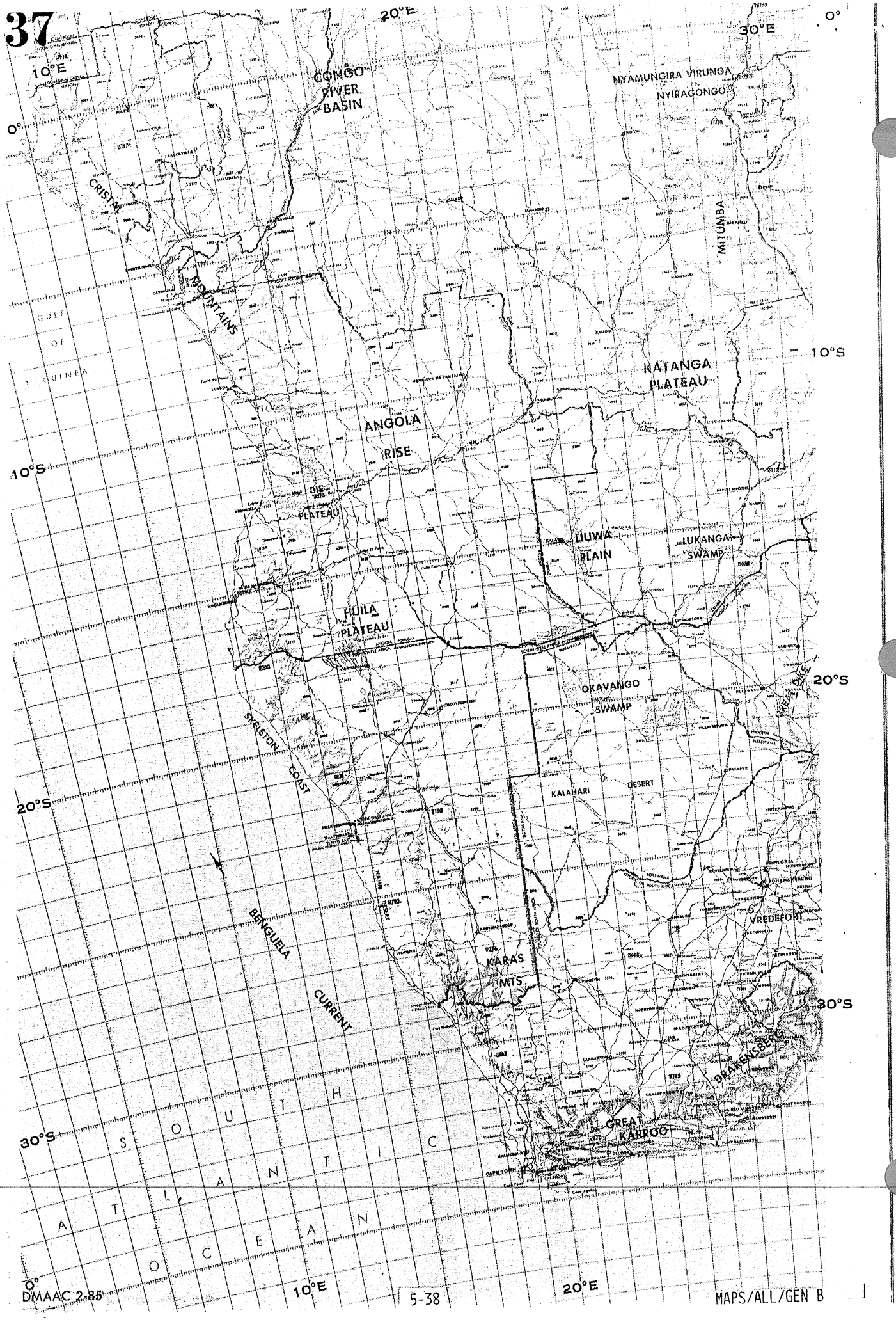
MAPS/ALL/GEN B AAAC 2-85

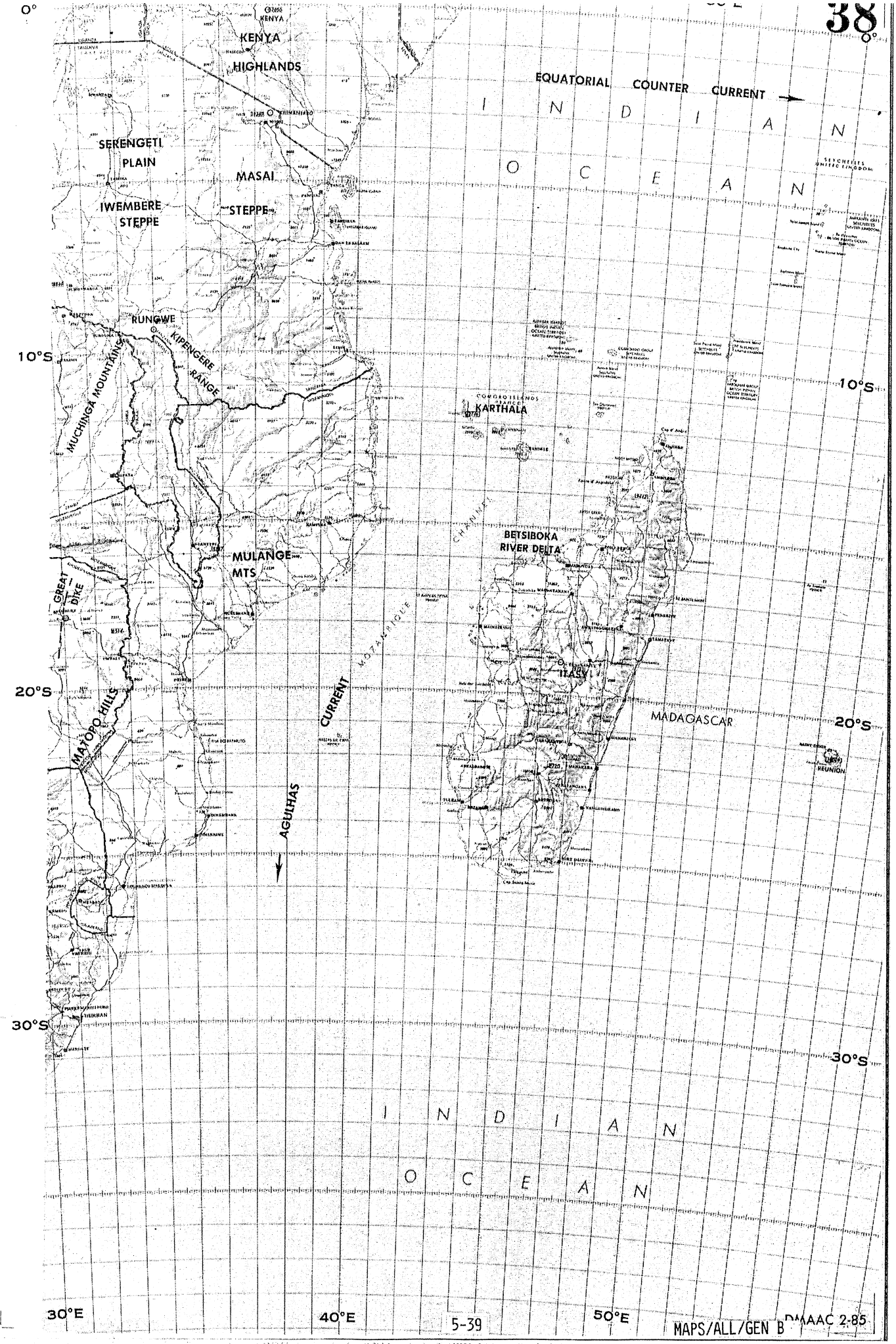

33
80°W
70°W
60°W
0°
10°S
20°S
30°S
EL REVENTADOR
COTOPAXI
BANGAY
AMAZON RIVER BASIN
SECHURA DESERT
PERU CURRENT
PAJONAL PLAIN
SIERRA DOS PAREDIS
WESTERN MOUNTAIN RANGE
EL MISTI
EASTERN MOUNTAIN RANGE
ALTIPLANO
CENTRAL RANGE
SAN PEDRO
ATACAMA DESERT
SOCOMPA
CHACO PLAIN
HUMBOLDT CURRENT
SALT PLAINS
SAS DEL CORDOBA
TUPONGATITO
PAMPAS
SOUTH PACIFIC OCEAN

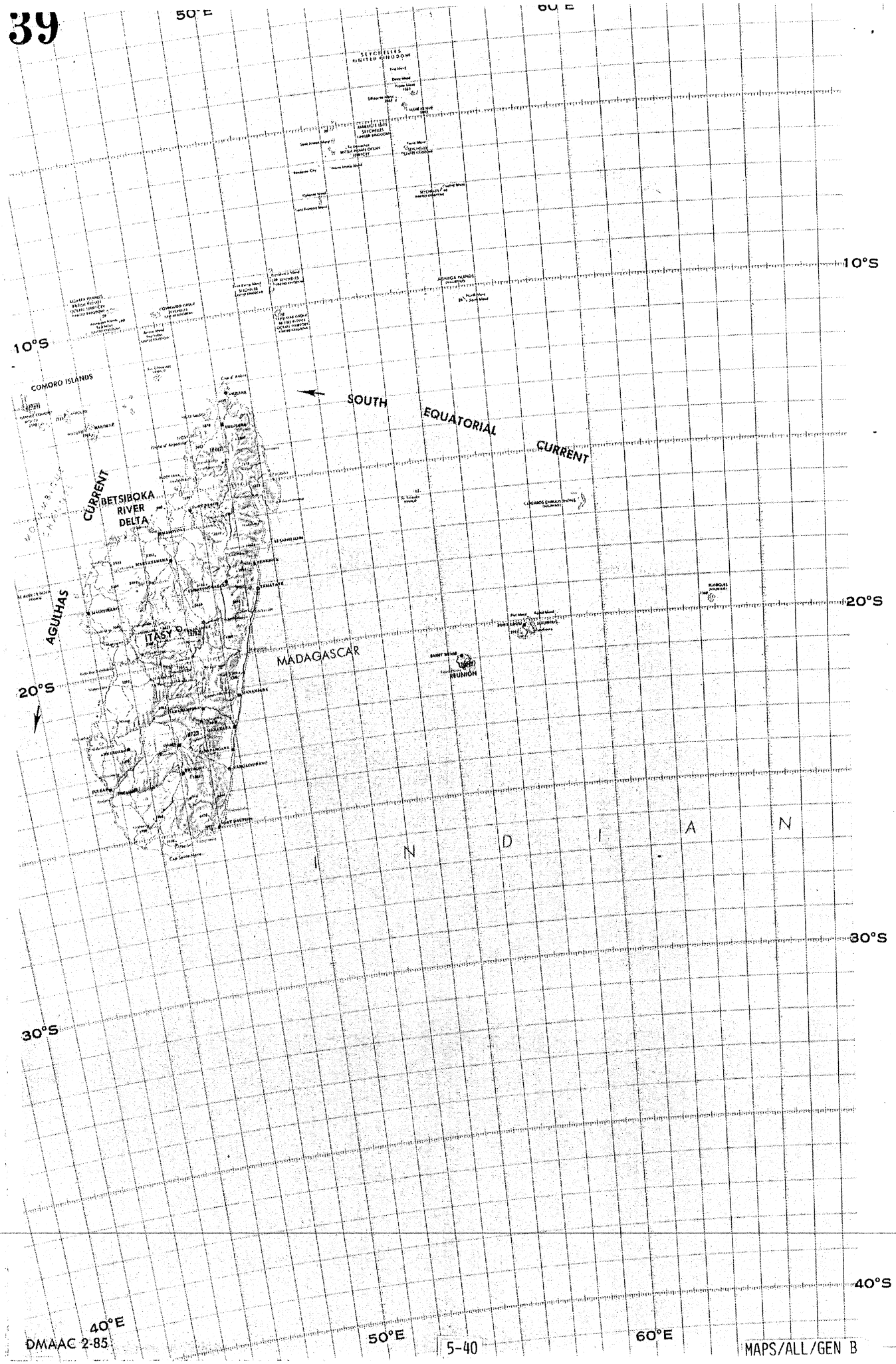

RIVER
DELTA
AMAZON
RIVER
BASIN
0°
10°S
20°S
30°S
50°W
40°W
30°W
SIERRA DO ESTRONDO
SIERRA DAS
ALPERCATAS
CANGHALA
(IMPACT)
SIERRA GERAL DE GUIAS
BORBOREMA
PLATEAU
CURRENT
BRAZIL
MATO
GROSSO
BRAZILIAN HIGHLANDS
PANTANAL
ARAGUAINNA DOME
(IMPACT)
SERRA DOURADA
SIERRA DE MARACAJA
SIERRA DO ESPINHACO
SIERRA DO MAR
SIERRA DO MAR
SOUTH
ATLANTIC
OCEAN

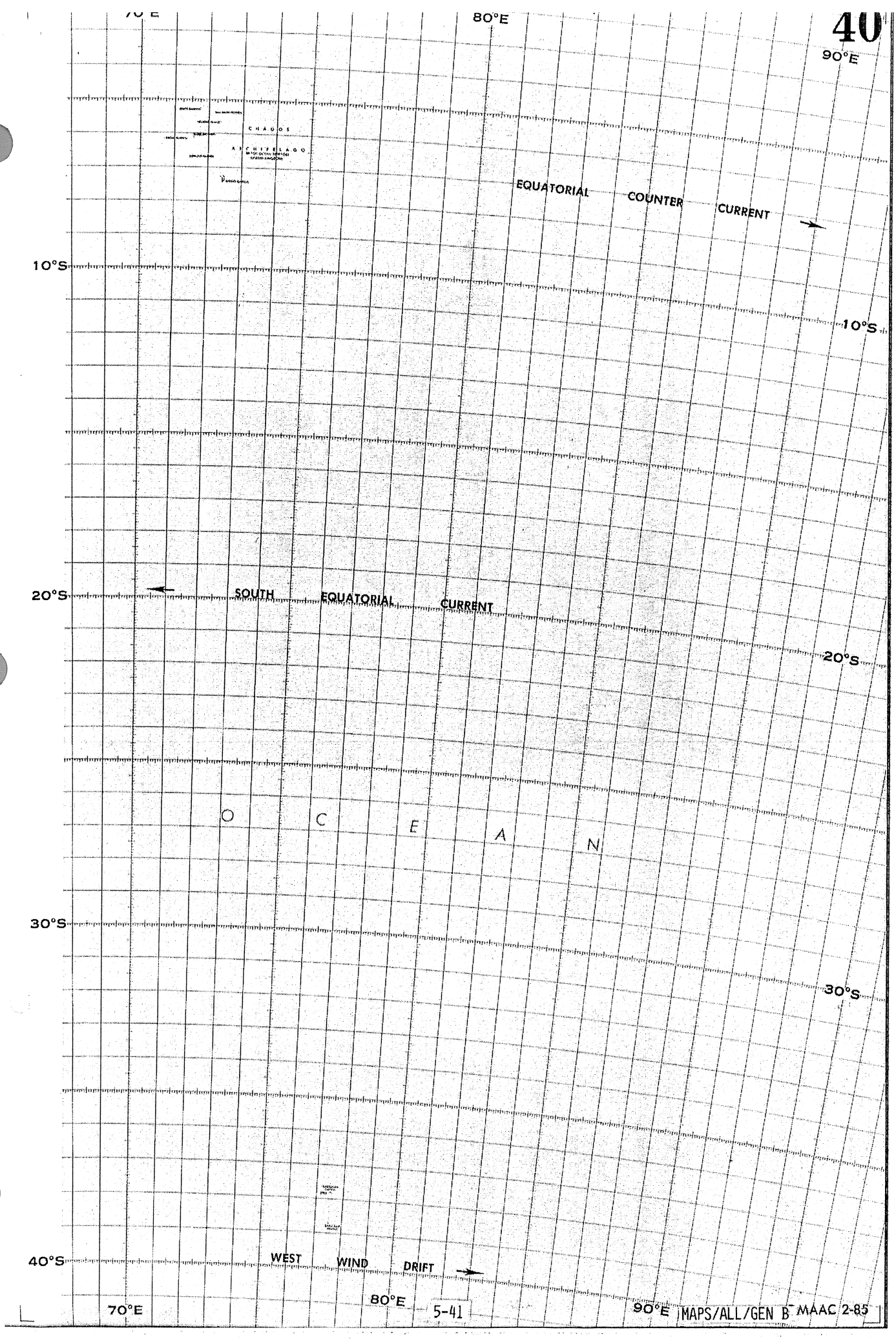

30°W
20°W
BORBOREMA
PLATEAU
BRAZIL
CURRENT
10°S
20°S
30°S
40°S
SOUTH
ATLANTIC
OCEAN

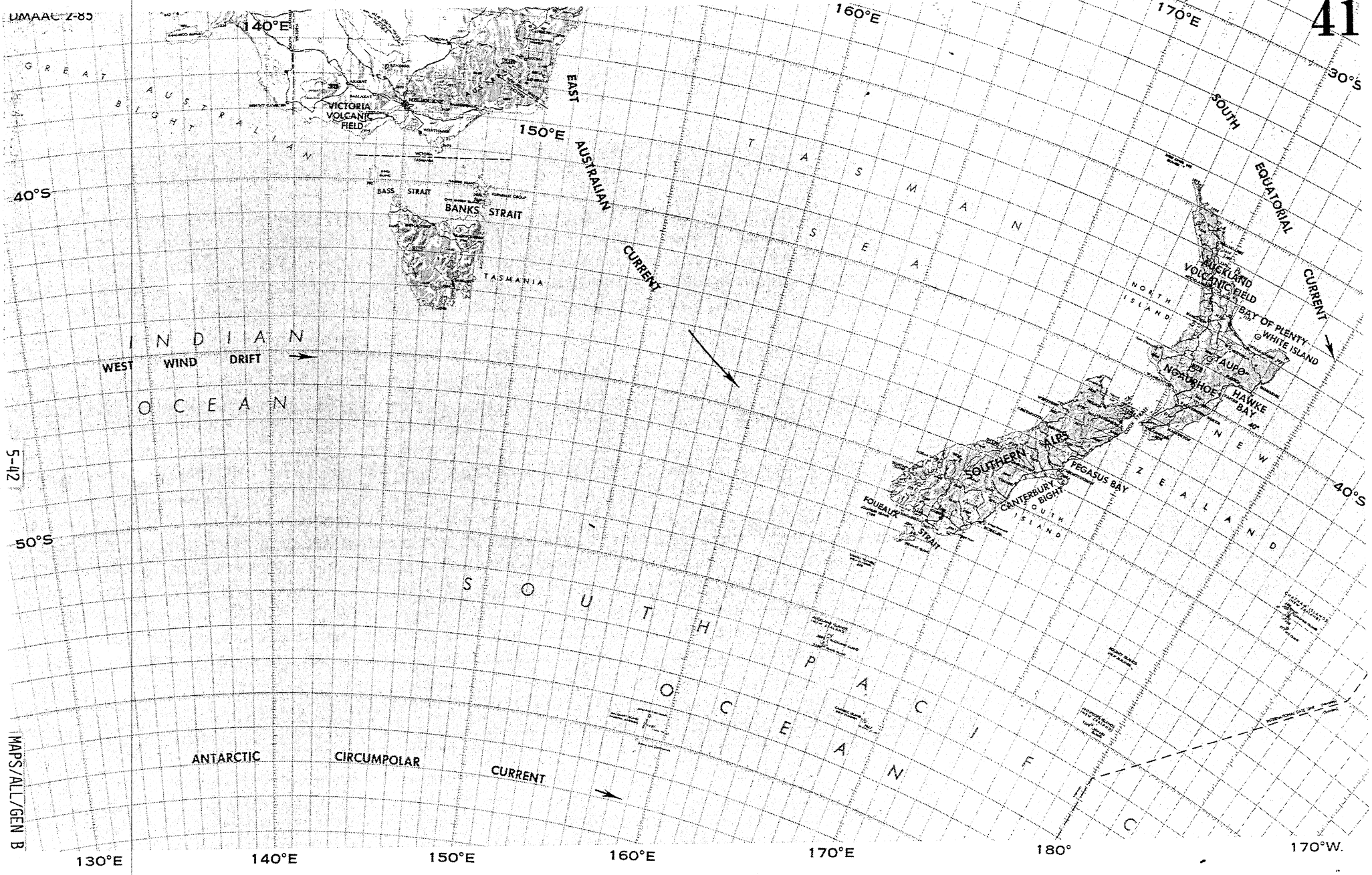

0°
10°S
SOUTH EQUATORIAL CURRENT
10°S
20°S
SOUTH ATLANTIC OCEAN
20°S
30°S
30°S
40°S
10°W
0°
10°E

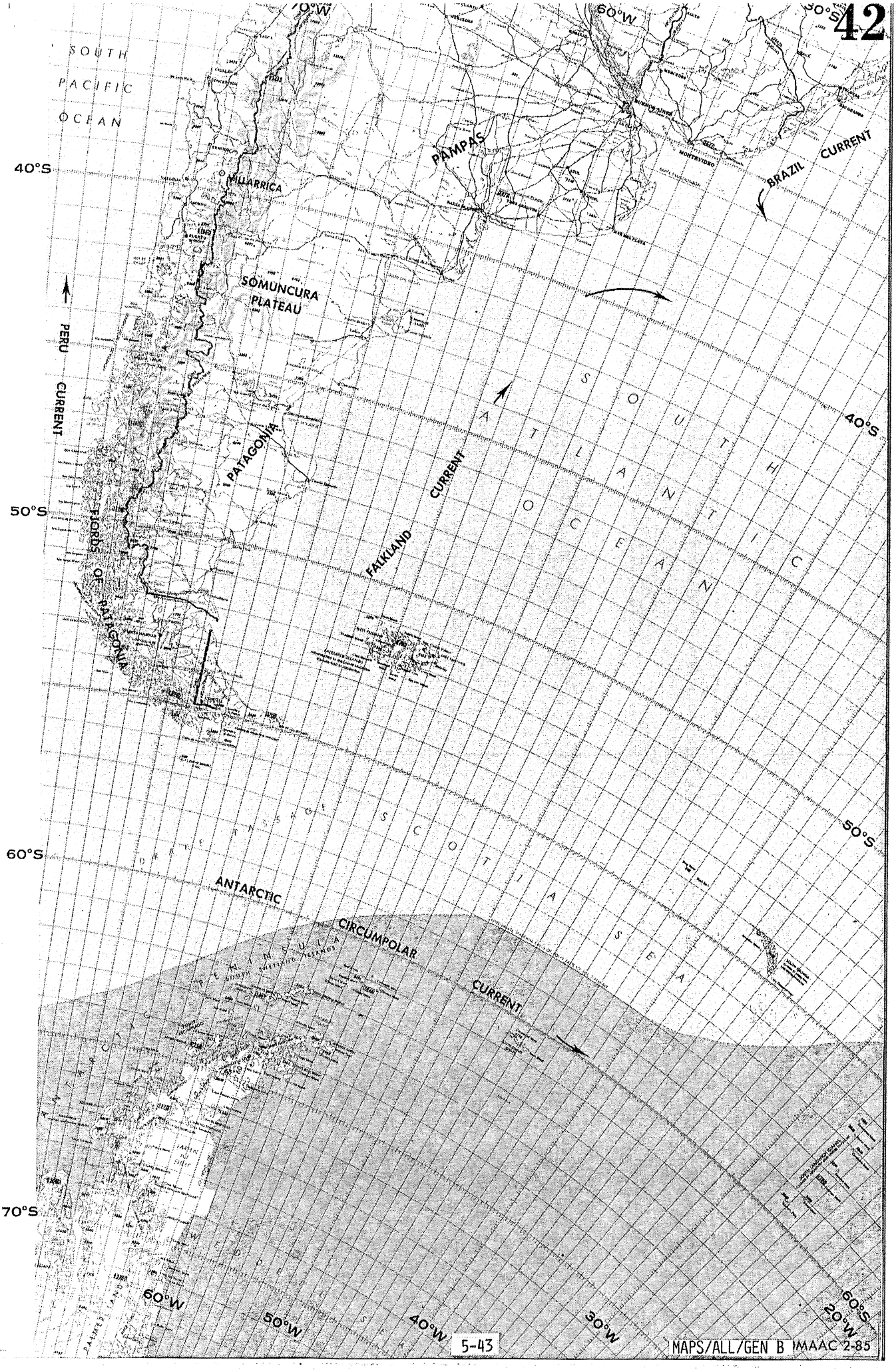

10°E
20°E
30°E
0°
10°S
20°S
30°S
CONGO RIVER BASIN
NYAMUNGIRA VIRUNGA
NYIRAGONGO
MITUMBA
CRISTAL MOUNTAINS
GULF OF GUINEA
KATANGA PLATEAU
ANGOLA RISE
BIE PLATEAU
LUWA PLAIN
LUKANGA SWAMP
HUILA PLATEAU
OKAVANGO SWAMP
GREAT DIKE
SKELETON COAST
KALAHARI DESERT
BENGUELA CURRENT
VREDEFORT
KARAS MTS
DRAKENSBERG
GREAT KAROO
SOUTH ATLANTIC OCEAN

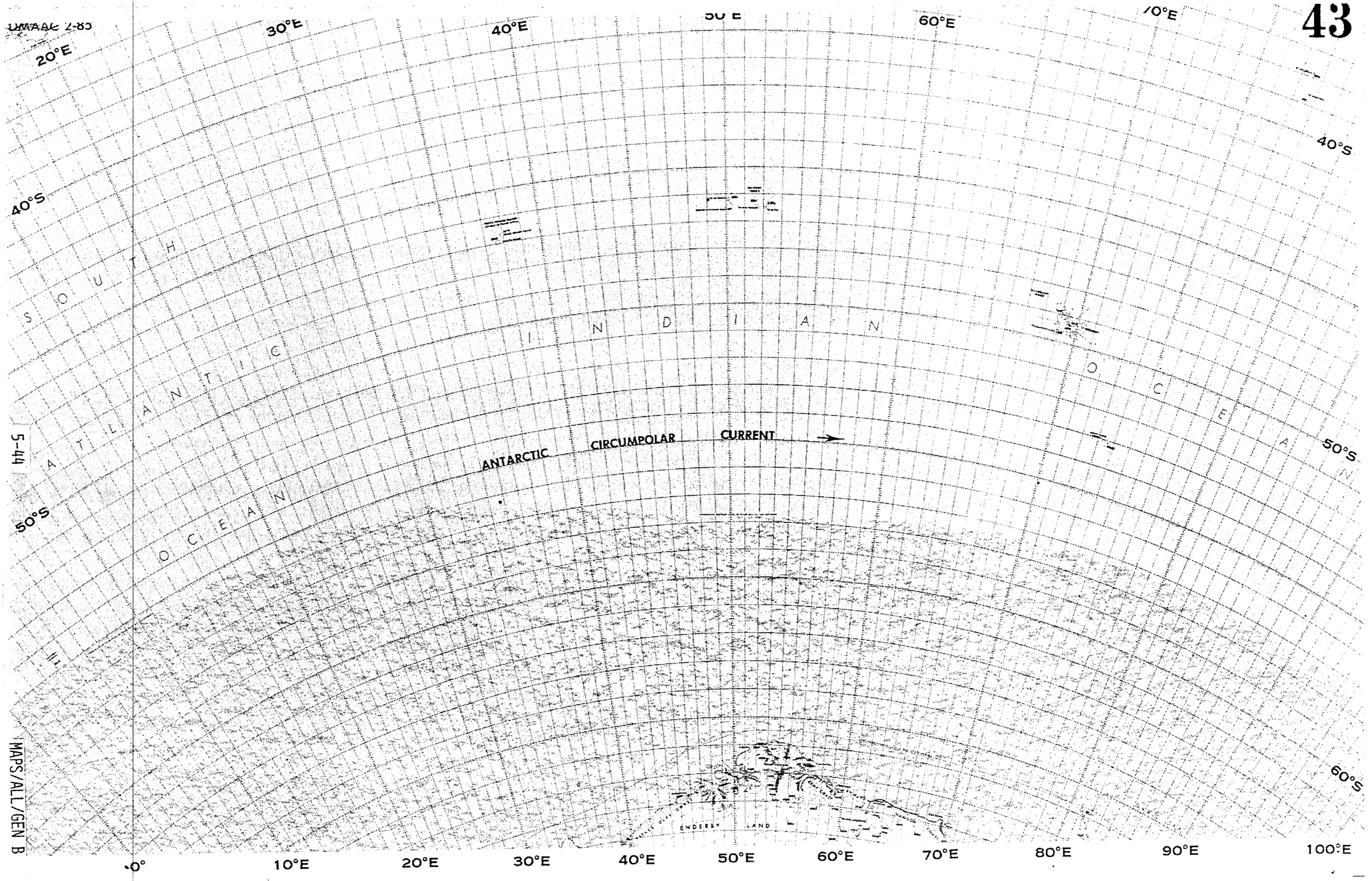

0°
KENYA
KENYA HIGHLANDS
EQUATORIAL COUNTER CURRENT
INDIAN OCEAN
SERENGETI PLAIN
MASAI STEPPE
IWEMBERE STEPPE
RUNGWE
KIPENGERE RANGE
MUCHINGA MOUNTAINS
10°S
COMOROS ISLANDS
KARTHALA
BETSIBOKA RIVER DELTA
MOZAMBIQUE CHANNEL
MULANGE MTS
GREAT DIKE
ITASY
MADAGASCAR
20°S
MOZAMBIQUE CURRENT
MATOPO HILLS
AGULHAS CURRENT
REUNION
30°S
INDIAN OCEAN
30°E
40°E
50°E


50°E
60°E
10°S
20°S
30°S
40°S
40°E
50°E
60°E
SEYCHELLES
COMORO ISLANDS
SOUTH EQUATORIAL CURRENT
AGULHAS CURRENT
BETSIBOKA RIVER DELTA
ITASY
MADAGASCAR
REUNION
I N D I A N


70°E
80°E
90°E
CHAGOS
ARCHIPELAGO
EQUATORIAL COUNTER CURRENT
10°S
SOUTH EQUATORIAL CURRENT
20°S
O C E A N
30°S
WEST WIND DRIFT
40°S
70°E
80°E
90°E


GREAT AUSTRALIAN BIGHT
VICTORIA VOLCANIC FIELD
BASS STRAIT
BANKS STRAIT
TASMANIA
INDIAN OCEAN
WEST WIND DRIFT
EAST AUSTRALIAN CURRENT
TASMAN SEA
SOUTH EQUATORIAL CURRENT
AUCKLAND VOLCANIC FIELD
BAY OF PLENTY
WHITE ISLAND
NORTH ISLAND
TAUPO
NGAURUHOE
HAWKE BAY
SOUTHERN ALPS
PEGASUS BAY
CANTERBURY BIGHT
FOVEAUX STRAIT
SOUTH ISLAND
NEW ZEALAND
SOUTH PACIFIC OCEAN
ANTARCTIC CIRCUMPOLAR CURRENT
130°E
140°E
150°E
160°E
170°E
180°
170°W.
30°S
40°S
50°S


SOUTH
PACIFIC
OCEAN
70°W
60°W
30°S
40°S
50°S
60°S
70°S
PAMPAS
MONTEVIDEO
BRAZIL CURRENT
MILLARICA
SOMUNCURA PLATEAU
PERU CURRENT
PATAGONIA
FJORDS OF PATAGONIA
FALKLAND CURRENT
SOUTH ATLANTIC OCEAN
SCOTIA SEA
ANTARCTIC CIRCUMPOLAR CURRENT
60°W
50°W
40°W
30°W
20°W
60°S



5-44
MAPS/ALL/GEN B

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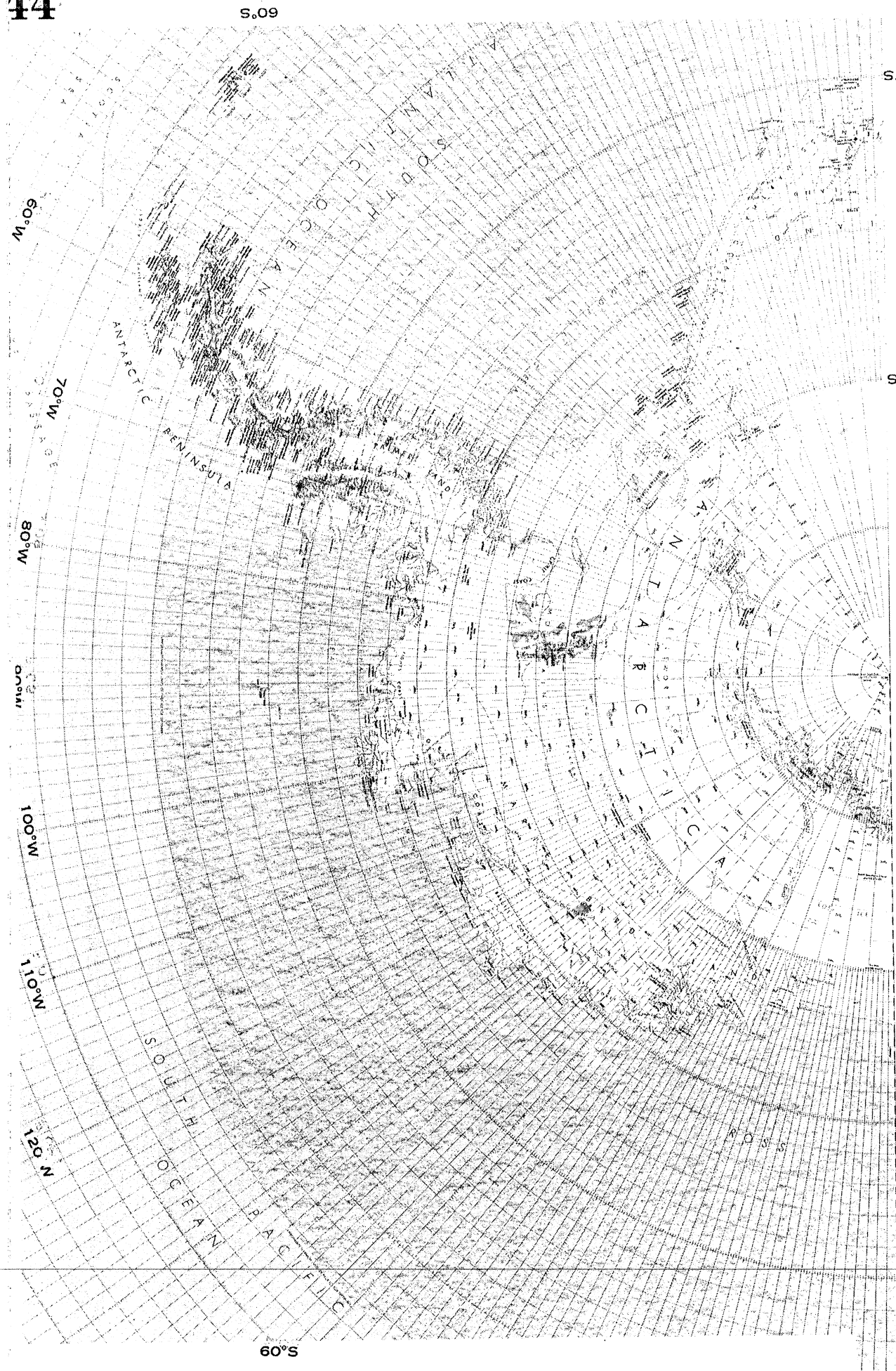
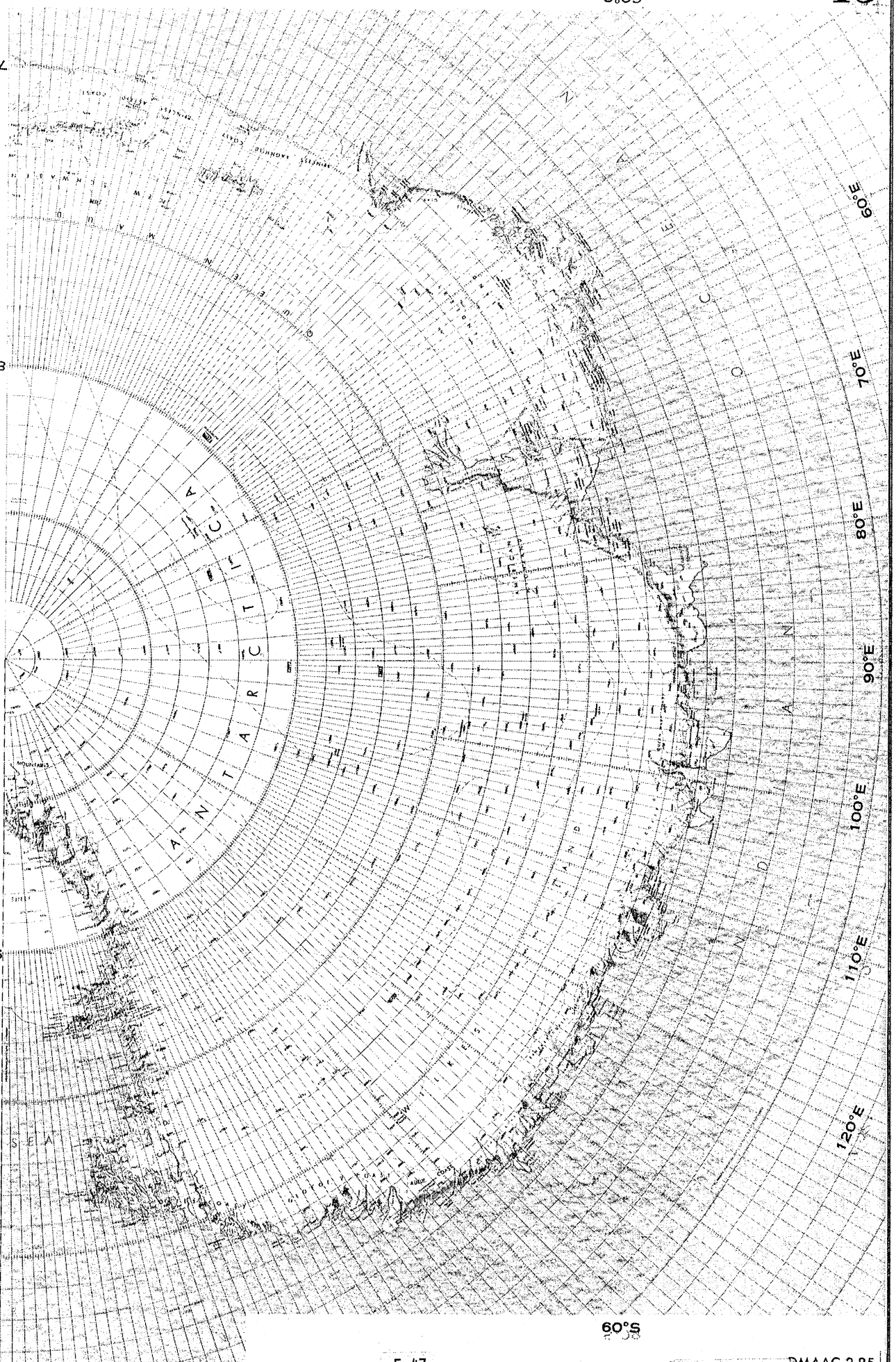
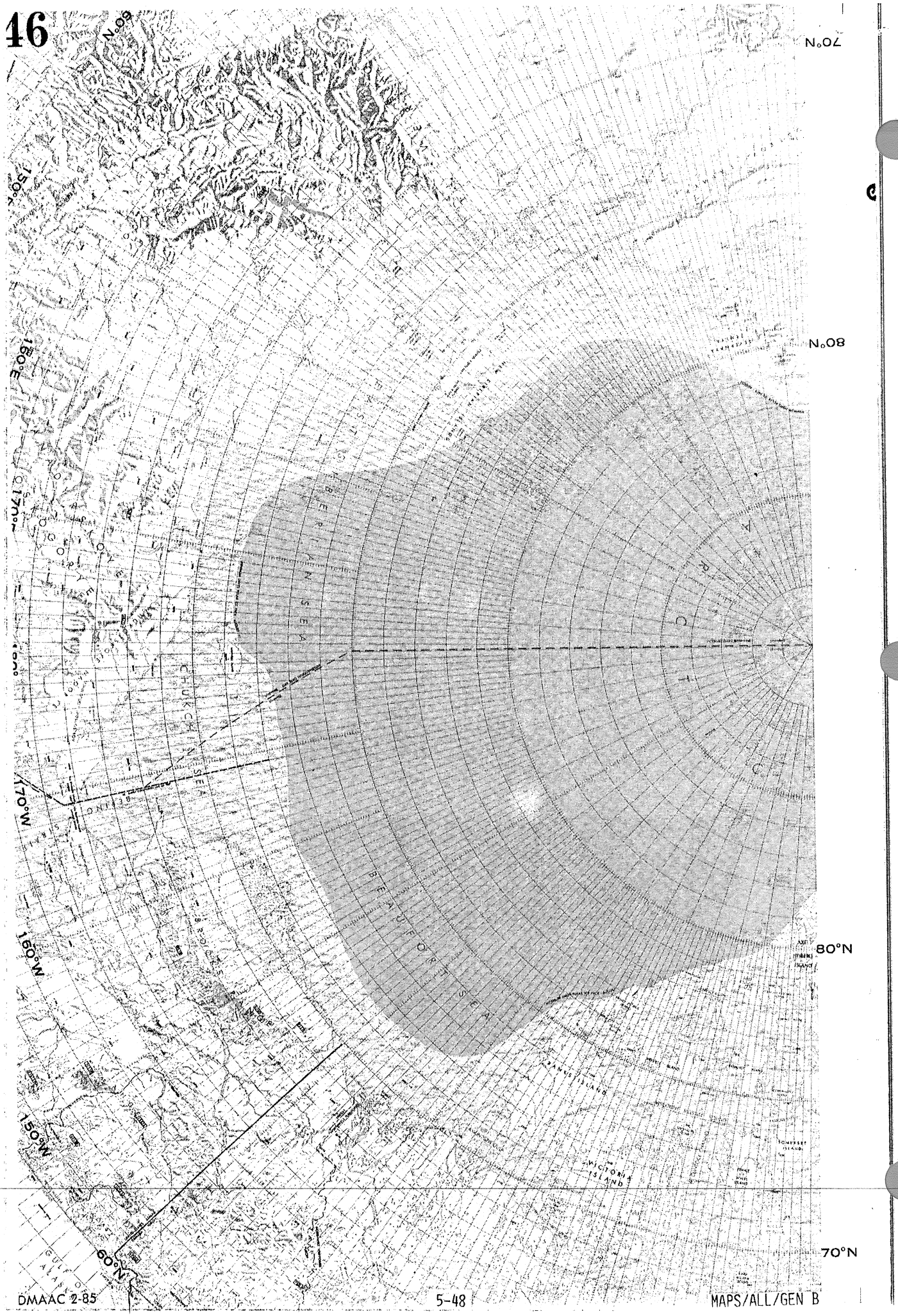

60°S
70°S
80°S
60°W
70°W
80°W
100°W
110°W
120°W
60°S
70°S
80°S
SOUTH ATLANTIC OCEAN
ANTARCTIC PENINSULA
PALMER LAND
ANTARCTICA
SOUTH PACIFIC OCEAN


S.09
S.07
S.08
80°S
70°S
60°S
60°E
70°E
80°E
90°E
100°E
110°E
120°E
ANTARCTIC
OCEAN
INDIAN
SEA


N.09
N.07
N.08
150°E
170°W
160°W
150°W
80°N
70°N
60°N
BEAUFORT SEA
CHUKCHI SEA
BARROW
WAINWRIGHT
WAINWRIGHT ISLAND
WISCONSIN ISLAND
TOPAGORUK
ICE EDGE
ARCTIC
CIRCLE

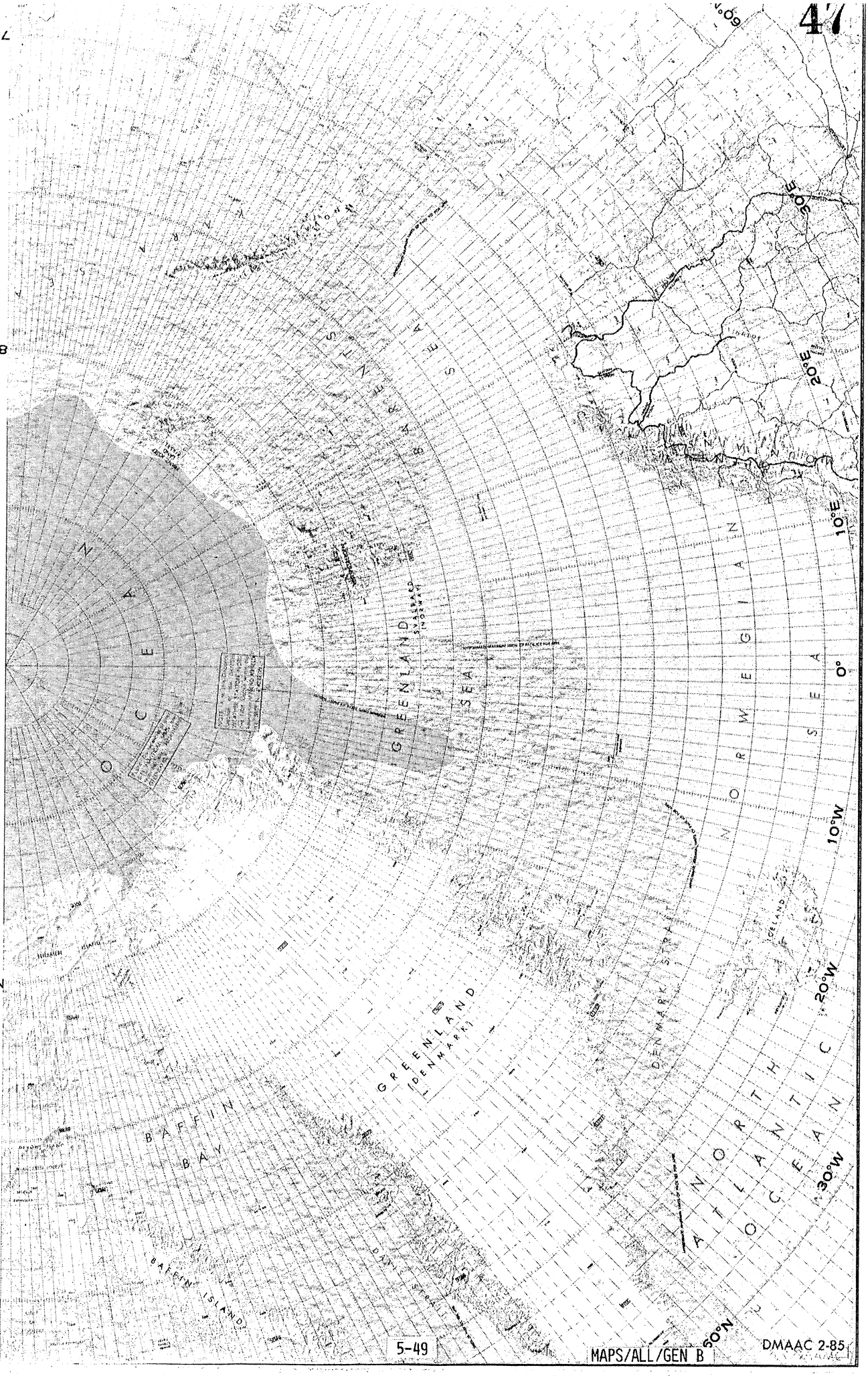
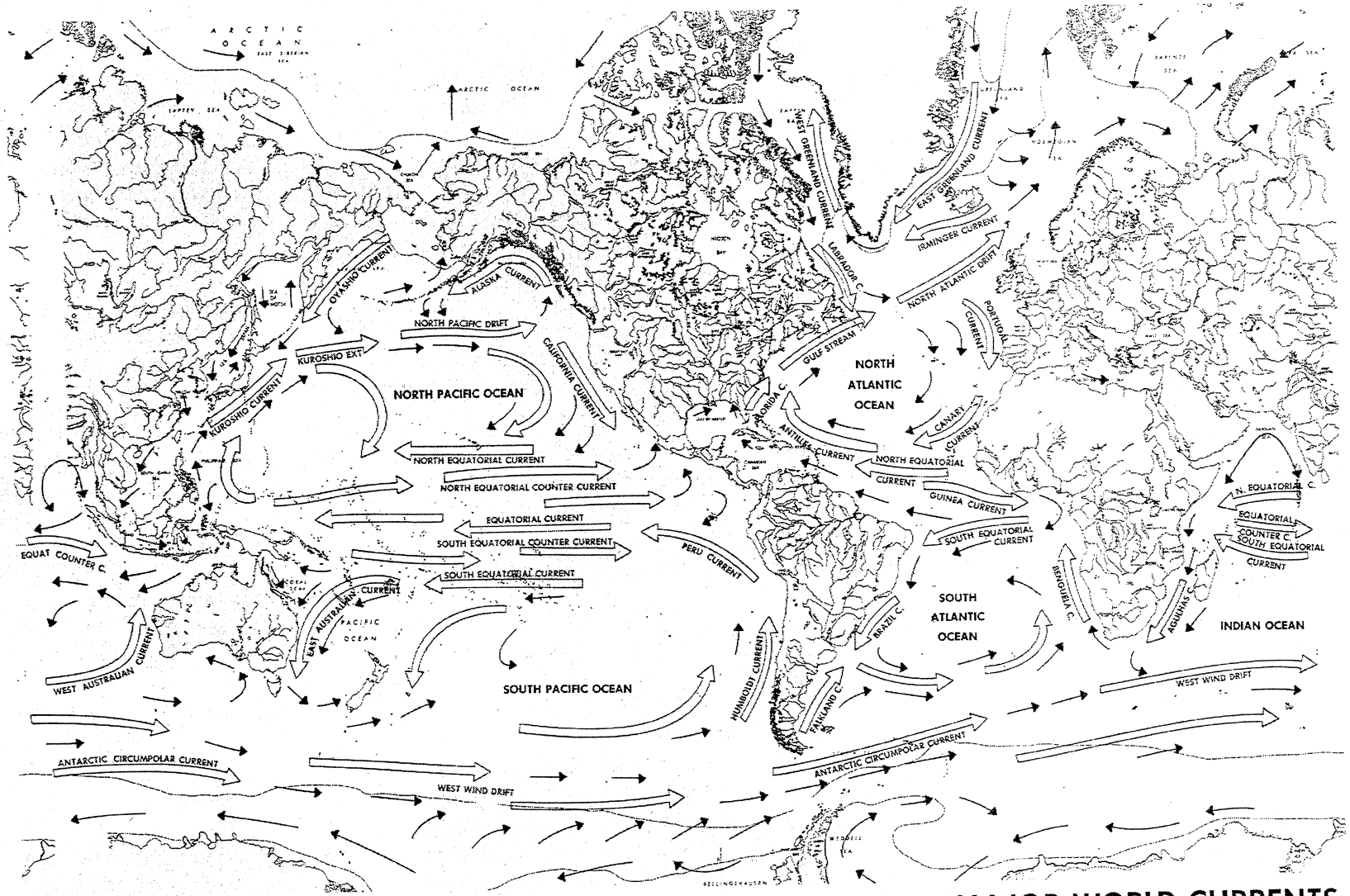

70°N
80°N
80°N
70°N
60°E
30°E
20°E
10°E
0°
10°W
20°W
30°W
50°N
ARCTIC OCEAN
GREENLAND SEA
NORWEGIAN SEA
ATLANTIC OCEAN
BAFFIN BAY
GREENLAND (DENMARK)
ICELAND
DENMARK STRAIT
BAFFIN ISLAND
DAVIS STRAIT

EXHIBIT B



MAJOR WORLD CURRENTS