

AD-A198 491

FILE COPY

SACLANTCEN MEMORANDUM
serial no.: SM-297

SACLANT UNDERSEA
RESEARCH CENTRE
MEMORANDUM



MAKE_MAP
and MEDMAP:

Two programs
for plotting maps of
the Mediterranean Sea

DTIC
ELECTE
S AUG 04 1988 D
u D

P. Scrimger and
A. Trangeled

June 1988

The SACLANT Undersea Research Centre provides the Supreme Allied Commander Atlantic (SACLANT) with scientific and technical assistance under the terms of its NATO charter, which entered into force on 1 February 1963. Without prejudice to this main task—and under the policy direction of SACLANT—the Centre also renders scientific and technical assistance to the individual NATO nations.

DISTRIBUTION STATEMENT
Approved for public release
Distribution Unlimited

88 8 04 044

This document is released to a NATO Government at the direction of SACLANT Undersea Research Centre subject to the following conditions:

- The recipient NATO Government agrees to use its best endeavours to ensure that the information herein disclosed, whether or not it bears a security classification, is not dealt with in any manner (a) contrary to the intent of the provisions of the Charter of the Centre, or (b) prejudicial to the rights of the owner thereof to obtain patent, copyright, or other like statutory protection therefor.
- If the technical information was originally released to the Centre by a NATO Government subject to restrictions clearly marked on this document the recipient NATO Government agrees to use its best endeavours to abide by the terms of the restrictions so imposed by the releasing Government.

Page count for SM-207
(excluding covers)

Pages	Total
i-iv	4
1-20	20
	24

SACLANT Undersea Research Centre
Viale San Bartolomeo 400
19026 San Bartolomeo (SP), Italy

tel: 0187 540 111
telex: 271148 SACENT I

NORTH ATLANTIC TREATY ORGANIZATION

**MAKE_MAP and
MEDMAP:**

**Two programs for
plotting maps of the
Mediterranean Sea**

P. Scrimger and A. Trangeled

The content of this document pertains
to work performed under Project 21 of
the SACLANTCEN Programme of Work.
The document has been approved for
release by The Director, SACLANTCEN.



Issued by:
Underwater Research Division

R. Thiele

R. Thiele
Division Chief

Accession For	
NTIS DRAW	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or special
A-1	

SACLANTCEN 9M-207

- ii -

intentionally blank page

MAKE_MAP and MEDMAP:

**Two programs for plotting
maps of the Mediterranean Sea**

P. Scrimger and A. Trangeled

computer
Abstract: Two FORTRAN programs MAKE_MAP and MEDMAP are described which, when used together, will plot maps of all or any portion of the Mediterranean Sea. Examples are given which show the high degree of detail provided by the 2' resolution of the database. A description of how the maps are created in the MAKE_MAP program by means of intermediate landmass matrices is given, and applications of these landmass matrices are mentioned. A flow chart of the main stages of this program is given. The landmass matrix is read by MEDMAP which uses an interpolating contour routine to plot the coastline; a flow chart of the program is given. FORTRAN listings for MAKE_MAP and MEDMAP are also included.

Keywords: maps • Mediterranean • modelling • SONDA • UNIRAS

UNIRAS computer graphics, maps

Contents

1. Introduction	1
2. Some sample maps	2
3. The MAKE_MAP program	6
4. The MEDMAP program	8
 References	 10
 Appendix A - MAKE_MAP, a FORTRAN listing	 11
Appendix B - MEDMAP, a FORTRAN listing	15

1. Introduction

There is an ever-present need in any major research organization to be able to quickly and easily display graphical information. At SACLANTCEN the SONDA [1,2] system was used in past years to display such oceanographic information. This report presents two new computer programs which provide similar plotting capabilities to that provided by the SONDA system for areas located in the Mediterranean Sea. The advantages offered by these new programs are the increased resolution and the creation of intermediate plotting matrices which can be used in modelling applications. The MAKE_MAP and MEDMAP programs were originally developed to satisfy the requirements of an existing model in use at SACLANTCEN, namely the Mediterranean shipping distribution model [3]; however they can easily find application in other areas.

Section 2 gives three examples of map production using the available database, these examples include plots of the entire Mediterranean Sea, the central Mediterranean including the islands of Corsica, Sardinia and Sicily as well as the Italian coastline and finally the Aegean Sea. Section 3 describes the MAKE_MAP program and provides information on how the pre-plotting data matrix is created and Sect. 4 describes the MEDMAP program and lists the various output devices supported by the software. The two programs have been written in VAX FORTRAN and are currently running on a VAX 8600 with the VAX/VMS version 4.6 operating system. They are listed in Appendix A and Appendix B, respectively. The library plotting routines are all taken from the commercially-available graphics package UNIRAS.

2. Some sample maps

The examples shown in this section are designed to show the usefulness and ease of operation of the two programs. The first example produces a map of the whole Mediterranean Sea. It makes use of the entire mapping database defined from (30°N,6°W) to (46°N,37°E) in 2' steps. This database was originally created from a series of 10 charts of the Mediterranean [4] drawn using a Mercator projection at a scale of 1:1 000 000 at 38°N.

In order to generate one of these maps, the user should follow these steps in VAX/VMS DCL:

-
1. \$ DEFINE DATA Device_1:[Directory_1]
 2. \$ RUN Device_2:[Directory_2]MAKE_MAP
 3. \$ RUN Device_2:[Directory_2]MEDMAP
-

Note that in step 1 the user must define the logical name 'DATA' to point to the directory which is to contain the intermediate data matrix created by the program MAKE_MAP. Step 2 will run the MAKE_MAP program which creates the intermediate data matrix (see Sect. 3) and step 3 will run the MEDMAP program which plots this data matrix (see Sect. 4).

Example 1

Figure 1 was generated by entering the following data in response to the prompts issued by program MAKE_MAP:

Enter coordinates of lower left cell (min. 30N06W): 30N06W
Enter coordinates of upper right cell (max. 46N37E): 46N37E

This causes the MAKE_MAP program to read the entire database which consists of 688 separate input files. Each input file corresponds to a $1^\circ \times 1^\circ$ area of the Mediterranean Sea and contains 900 elements (-1.0 or 1.0) contained in 30 records of 30 elements per record. The plotting is done by program MEDMAP on the user selected output device.

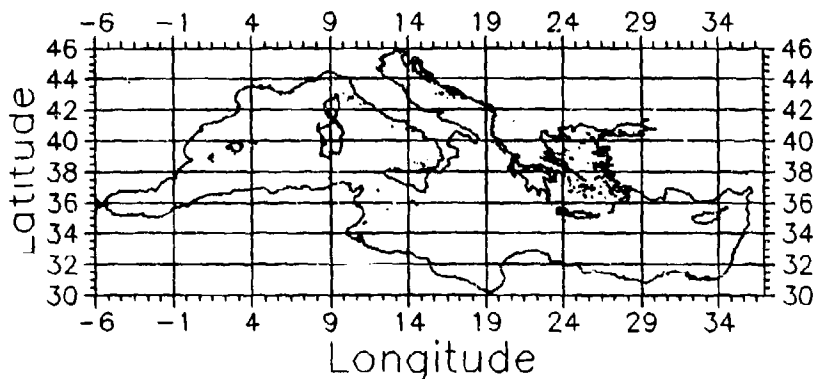


Fig. 1. The Mediterranean Sea.

Example 2

Example 2 reads a subsection of the database which contains the islands of Corsica, Sardinia and Sicily as well as the Italian coastline. The water masses include the Tyrrhenian Sea, the Ligurian Sea and the Adriatic Sea as well as the northern portion of the Ionian Sea. This area is defined from (36°N,7°E) to (46°N,20°E) and so the following data was entered in response to the prompts issued by program MAKE_MAP:

Enter coordinates of lower left cell (min. 30N06W): 36N07E
Enter coordinates of upper right cell (max. 46N37E): 46N20E

Note that in this example only 130 out of the total 688 input files are used when generating an intermediate plotting matrix. The resulting plot is shown in Fig. 2.

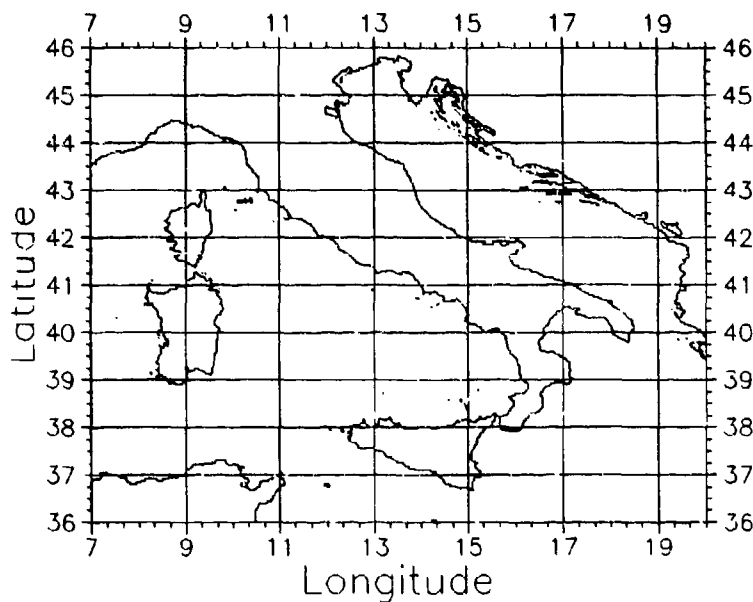


Fig. 2. The Central Mediterranean.

Example 3

Example 3 again uses a subsection of the database and illustrates some of the fine detail available at a resolution of 2 min. The map area is defined from (35°N,22°E) to (42°N,29°E), and so the following data was entered in response to the prompts issued by program MAKE_MAP:

Enter coordinates of lower left cell (min. 30N06W): 35N22E
Enter coordinates of upper right cell (max. 46N37E): 42N29E

Note that in this example 49 out of the total 688 input files are used when generating an intermediate plotting matrix. The resulting plot is shown in Fig. 3.

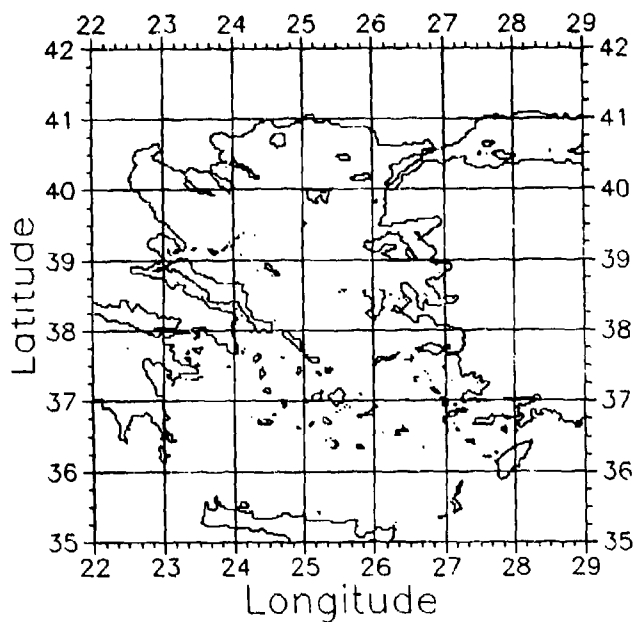


Fig. 3. The Aegean Sea.

3. The MAKE_MAP program

The function of the MAKE_MAP program is to create a data matrix in a form which is suitable for subsequent plotting with the MEDMAP program. There are two important advantages to using such a two-stage process in obtaining plots. The first advantage is plotting speed since each subsequent plot (via MEDMAP) can be done without having to reaccess the full database. This is useful for example when the user wishes to preview the plot on his terminal before obtaining a hard copy (on a colour plotter, laser printer, etc.). A second advantage is that an intermediate landmass matrix is produced. This matrix is made up of ($2' \times 2'$) cells containing either a -1.0 (land) or a 0.0 (water). Landmass matrices of this type are often used in modelling applications, for example when modelling shipping movements [1], or modelling target locations [5] and could find future application in modifications to such programs as the RANDI-2 ambient noise model [6] where the position of landmasses could be used to identify the end points of the transmission loss function. The organizational layout of this program is shown schematically in the flow chart given in Fig. 4.

MAKE_MAP Flow Chart

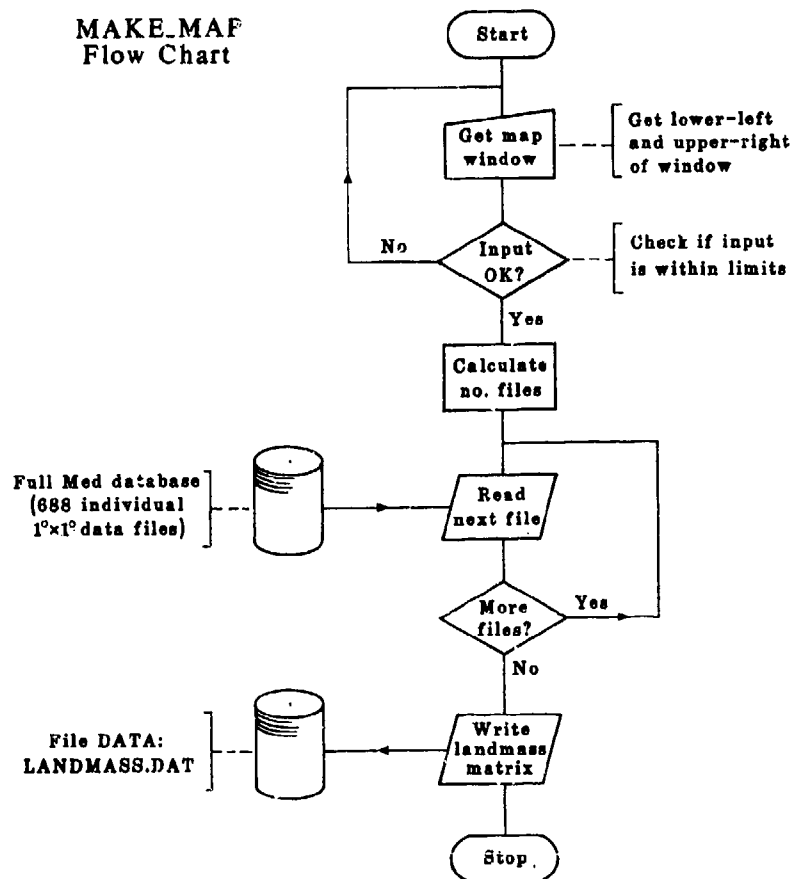


Fig. 4. A flow chart of program MAKE_MAP.

4. The MEDMAP program

This program represents the second stage of map production and is primarily a plotting routine designed to allow the user to produce output on the device of his choosing. The program uses a 2D contour mapping routine which supports 10 levels of interpolative smoothing. The presently supported devices at SACLANTCEN are presented to the user as a 'form'. A copy of this form is given in Fig. 5.

MEDMAP V1.0		Seldev V2.0	
Hardcopy devices		CRT devices	
COL	Tektronix 4691 A3	VTT	Local Vt200-series
COL4	Tektronix 4691 A4	LTER	Local Tek41XX-series
VUG	Tektronix 4692 Vugraf	4105	Host Tek4105
PRX	Printronix OPER-room	NEWS	DSI news of 01-NOV-1987
PRXU	Printronix user area	INFO	UNIRAS info
CCP	Calcomp 5105	DELA	Delete completed plots
LA50	LA50 Printer	UTIL	Soon available
T03	LN03 to USR\$LASER	EXIT	Terminates image
Select output device:		(Press PF2 for HELP)	

Fig. 5. The plotting options form.

As before, the organizational layout of the program is shown schematically in a flow chart (Fig. 6).

**MEDMAP
Flow Chart**

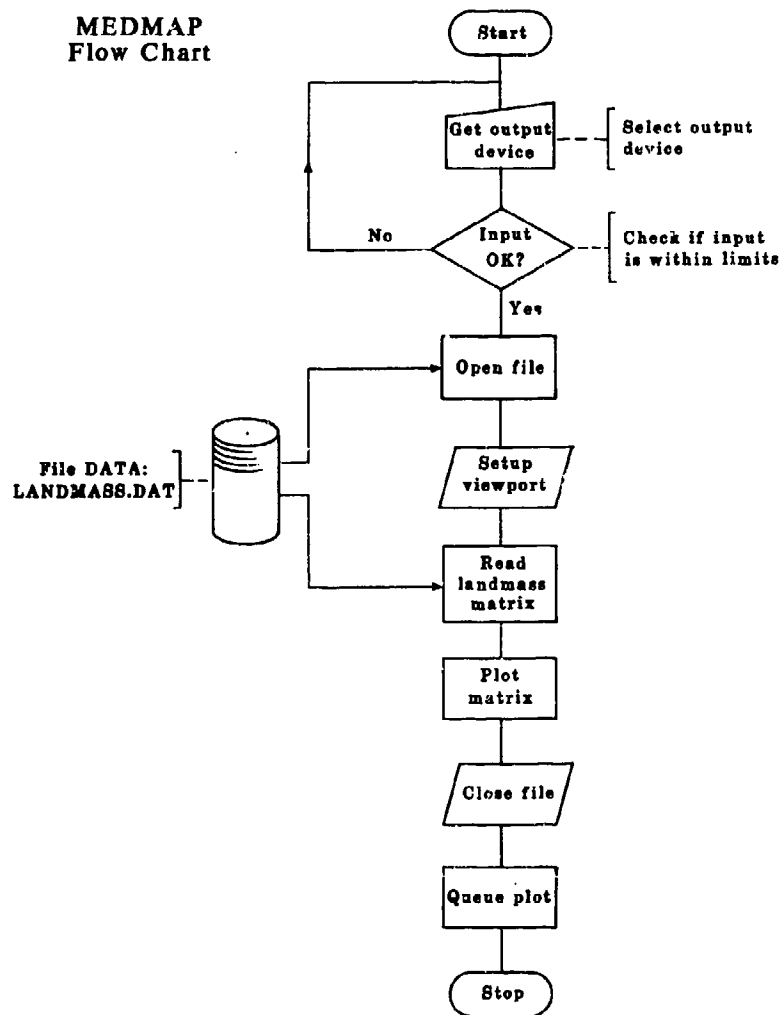


Fig. 6. A flow chart of program MEDMAP.

References

- [1] WINTERBURN, R.F.J. The SACLANTCEN oceanographic database, Volume I: Design criteria and data structure and content, SACLANTCEN SM-150. La Spezia, Italy, SACLANT ASW Research Centre, 1981.
- [2] WINTERBURN, R.F.J. The SACLANTCEN oceanographic database, Volume II: Access, interrogation and display, SACLANTCEN SM-151. La Spezia, Italy, SACLANT ASW Research Centre, 1981.
- [3] SCRIMGER, P. and HEITMEYER, R.M. A computer model of the movement of shipping in a basin with application to the Mediterranean Sea, SACLANTCEN SR-143, La Spezia, Italy, SACLANT Undersea Research Centre, 1988.
- [4] INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION, International bathymetric chart of the Mediterranean, Leningrad, USSR, Department of Navigation and Oceanography, Ministry of Defence (Under the authority of IOC (UNESCO)), 1981.
- [5] HEITMEYER, C. and CARRIERE, J.-C. A hybrid approach to multitarget tracking. SACLANTCEN SR-130, La Spezia, Italy, SACLANT Undersea Research Centre, 1988.
- [6] HAMSON, R.M. and WAGSTAFF, R.A. An ambient-noise model that includes coherent hydrophone summation for sonar system performance in shallow water, SACLANTCEN SR-70. La Spezia, Italy, SACLANT ASW Research Centre, 1983.

Appendix A
MAKE_MAP, a FORTRAN listing

```

1      PROGRAM MAKE_MAP
2
3      C      PROGRAM DESCRIPTION:
4      C
5      C      Creates file DATA:LANDMASS.DAT from data taken from
6      C      USE:[SCRINGER.WORK]. The output file will contain coastline
7      C      data for a selected area.
8      C
9      C      AUTHORS:
10     C
11     C
12     C      Alex Trangeled & Paul Scringer
13     C      SACLANT Undersea Research Center,
14     C      V. San Bartolomeo 400,
15     C      19026 La Spezia, Italy
16     C
17     C      CREATION DATE:   Summer 1987
18     C
19     C
20     C
21     C      C H A N G E   L O G
22     C
23     C      Date       / Name / Description
24     C-----+-----+-----
25     C[change_entry]
26     C
27
28     COMMON /POS/ LAT1,LAT2,LNG1,LNG2
29
30     CHARACTER*1  CSTR,NSTR,ESTR,WSTR
31     CHARACTER*2  STRLAT,STRLNG
32     CHARACTER*10  PROMPT
33     CHARACTER*40  OUTPUT_FILE,BUFF1,BUFF2,LINE,FIL
34
35     INTEGER*4  PARSE_POS,ARRAY(30,30)
36
37     REAL       MATRIX(1290,480)
38
39     C      -----
40     C      PROMPT = '($,1X,A)'
41     C      CSTR = 'C'
42     C      OUTPUT_FILE = 'DATA:landmass'
43     C      -----
44     C
45     C      OPEN (UNIT=9,FILE=OUTPUT_FILE,STATUS='NEW',
46     C      1FORM='UNFORMATTED',ERR=999)
47
48     10  WRITE(6,PROMPT) 'Enter coordinates of lower left cell
49     1(min. 30N08W): '
50

```

SACLANTCEN SM-207

```

51 READ(5,'(A)',END=10) BUFF1
52 ISTAT=PARSE_POS(BUFF1,1)
53 IF(ISTAT.NE.0) GOTO 10
54
55 C -----
56 20 WRITE(6,PROMPT) 'Enter coordinates of upper right cell
57 1(max. 48N37E): '
58
59 READ(5,'(A)',END=20) BUFF2
60 ISTAT=PARSE_POS(BUFF2,2)
61 IF(ISTAT.NE.0) GOTO 20
62
63 C -----
64 C Calculate no. of cells in x direction (longitude)
65
66 NO_CELLX=(LNG2-LNG1)+1
67 NO_ELX=NO_CELLX*30 !30*30 data points in each cell
68
69 C Calculate no. of cells in y direction (latitude)
70
71 NO_CELLY=(LAT2-LAT1)+1
72 NO_ELY=NO_CELLY*30
73
74
75 C Set MATRIX counter to 0 in x and y direction
76
77 INATX=0
78 INATY=0
79
80 C Start reading data and fill MATRIX
81
82 ITOTAL_FILES=(LAT2-LAT1+1)*(LNG2-LNG1+1)
83
84 C -----
85 DO 110 LAT=LAT1,LAT2
86 DO 100 LNG=LNG1,LNG2
87
88 ICUR_FIL=ICUR_FIL+1
89
90 IF(LNG.LE.0) THEN
91 WRITE(FIL,800) LAT,LNG*-1
92 ELSE
93 WRITE(FIL,801) LAT,LNG
94 ENDIF
95
96 C Open cell-file and fill up array with 30*30 elements
97
98 OPEN(UNIT=10,FILE='US6:[SCRINGER.WORK]\\\\FIL,READONLY,STATUS='OLD',
99 1 ERR=800)
100
101 WRITE(6,806) fil(1:10),ICUR_FIL,ITOTAL_FILES
102 DO II=30,1,-1
103 READ(10,'(A40)') LINE
104 DO JJ=0,35
105 READ(LINE(JJ:JJ),'(I1)') ARRAY(JJ-5,II)
106 END DO
107 END DO
108
109
110

```

SAOLANTOEN SM-207

```

111      CLOSE(UNIT=10,STATUS='KEEP')
112
113 C      Write these elements to the big array
114
115      DO II=1,30
116      DO JJ=1,30
117      MATRIX(JJ+INATX,II+INATY)=ARRAY(JJ,II)*-1.
118      END DO
119      END DO
120      INATX=INATX+30
121
122 100      CONTINUE
123      INATX=0
124      INATY=INATY+30
125 110      CONTINUE
126
127 C      -----
128
129 890      CONTINUE
130
131 C      Write range information to output file
132
133      WRITE(9) NO_ELEM1
134      WRITE(9) NO_ELEM2
135      WRITE(9) LNC1
136      WRITE(9) LNC2+1
137      WRITE(9) LAT1
138      WRITE(9) LAT2+1
139
140
141      WRITE (9) ((MATRIX(I,J),I=1,NO_ELEM1),J=1,NO_ELEM2)
142      CLOSE (UNIT=9,STATUS='KEEP')
143      STOP
144 C      -----
145
146 900      WRITE(6, '(1X,A)') 'ERROR OPENING FILE '//FIL
147      STOP
148 C      -----
149
150 999      STOP 'Error opening outfile'
151
152 C      -----
153 666      FORMAT('Current file ',A10,' is no. ',i3,' out of ',i3,' files')
154 800      FORMAT(1X,'C',I2.2,'N',I2.2,'W')
155 801      FORMAT(1X,'C',I2.2,'N',I2.2,'E')
156
157      END
158
159      INTEGER FUNCTION PARSE_POS(LOWBUFF,ITYPE)
160      ROUTINE DESCRIPTION:
161 C
162 C      This routine parses the coordinate passed in LOWBUFF
163 C      If value is illegal parse_pos=1 else parse_pos=0
164 C      ITYPE specifies if we are reading first or second value
165 C      If parse_pos succeeds, the common block POS is loaded with the
166 C      appropriate values
167 C

```

SACLANTCEN SM-267

```

108 C   AUTHORS:
109 C
110 C       Alex Trangeled & Paul Scringer
111 C       SACLANT Undersea Research Center,
112 C       V. San Bartolomeo 400,
113 C       19026 La Spezia, Italy
114 C
115 C   CREATION DATE:   Summer 1987
116 C
117 C
118 C       C H A N G E   L O G
119 C
120 C       Date       / Name / Description
121 C -----
122 C [change_entry]
123 C
124 C       COMMON /POS/ LAT1,LAT2,LNG1,LNG2
125 C
126 C       CHARACTER*40 BUFF,LOWBUFF
127 C -----
128 C       PARSE_POS=0
129 C
130 C       CALL STR$UPCASE(BUFF,LOWBUFF)  !Convert string to uppercase
131 C
132 C       READ(BUFF(1:2),'(I2)',ERR=50) ITEMP1 !Read integer value
133 C       READ(BUFF(4:5),'(I2)',ERR=50) ITEMP2
134 C
135 C       IF (BUFF(3:3).NE.'N') GOTO 50
136 C       IF ((BUFF(6:6).NE.'E').AND.(BUFF(6:6).NE.'W')) GOTO 50
137 C
138 C -----
139 C       PARSE_POS=0  !Everything ok
140 C       IF(ITYPE.EQ.1) THEN
141 C           LAT1=ITEMP1
142 C           LNG1=ITEMP2
143 C           IF(BUFF(6:6).EQ.'W') LNG1=LNG1+1
144 C
145 C       ELSE IF(ITYPE.EQ.2) THEN
146 C
147 C           LAT2=ITEMP1-1
148 C           LNG2=ITEMP2-1
149 C           IF(BUFF(6:6).EQ.'W') LNG2=LNG2+1
150 C
151 C       ELSE
152 C
153 C           WRITE(6,'(1X,A)') 'Illegal type specified -
154 C           1 Check your program !!!//CHAR(7)
155 C           STOP 'termination on error'
156 C
157 C       END IF
158 C       RETURN
159 C -----
160 C
161 C 50  PARSE_POS=1  !Invalid input
162 C       WRITE(6,'(1X,A)') 'Illegal coordinate specified -
163 C       1Please reenter !!!//char(7)
164 C       RETURN
165 C
166 C       END

```

Appendix B

MEDMAP, a FORTRAN listing

```

1      PROGRAM MEDMAP
2      C
3      C  PROGRAM DESCRIPTION:
4      C
5      C      This program plots the coastline data contained in the file
6      C      DATA:LANDMASS.DAT, which is created by MAKE_MAP. For additional
7      C      information please refer to separate documentation.
8      C
9      C      Link this program using the following command:
10     C
11     C      $ LINK MEDMAP, US0:[TRANGELED.SUBS]ROUTINES/LIB,SL:UNIRAS/LIB
12     C
13     C  AUTHORS:
14     C
15     C      Alex Trangeled & Paul Scringier
16     C      SACLANT Undersea Research Center,
17     C      V. San Bartolomeo 400,
18     C      19026 La Spezia, Italy
19     C
20     C  CREATION DATE:   Summer 1987
21     C
22     C
23     C      C H A N G E   L O G
24     C
25     C      Date       / Name / Description
26     C      -----
27     C      C[change_entry]
28     C
29
30
31     INTEGER      STATUS,      !Status returned by system calls
32     2             VN_SIZE,     !Size of virtual memory (VN) needed
33     2             VN_ADDN,     !Starting address of the VN
34     2             MSD1COL      !Declaration of the main part
35
36     INTEGER      LIB$GET_VN,   !System routines - for documentation
37     2             LIB$FREE_VN, !see VAX/VMS System Services reference
38     2             LIB$SHOW_VN  !guide
39
40
41     CALL LIB$INIT_TIMER
42
43     CALL GROUPE('LIST *') !Prompt for output device
44
45     C
46     C  Open the LANDMASS file to find the number of elements in it
47
48     OPEN(UNIT=9,ERR=9999,FILE='DATA:LANDMASS.DAT',
49     1STATUS='OLD',FORM='UNFORMATTED',READONLY)
50
51     READ (9) L1      !No. elements in X
52     READ (9) L2      !No. of elements in Y

```

SACLANTOEN SM-207

```

53
54      !Close the LANDMASS file
55
56      CLOSE (UNIT=9,STATUS='KEEP')
57 C
58 C      Calculate the amount of VM we need for this file. We'll
59 C      need 4 bytes for every element in the matrix.
60
61      VM_SIZE=L1*L2*4 !Size we will need
62
63 C      Allocate the VM
64
65      STATUS=LIB$GET_VM(VM_SIZE,VM_ADDR)
66      IF(.NOT.STATUS) CALL LIB$SIGNAL(%VAL(STATUS))
67
68 C      Call the map drawing part, passing the starting address
69 C      and size of the VM that we allocated
70
71      STATUS=MSD1COL(%VAL(VM_ADDR),VM_SIZE)
72      IF(.NOT.STATUS) CALL LIB$SIGNAL(%VAL(STATUS))
73
74 C      Deallocate the VM
75
76      STATUS=LIB$FREE_VM(VM_SIZE,VM_ADDR)
77      IF(.NOT.STATUS) CALL LIB$SIGNAL(%VAL(STATUS))
78
79 C      Terminate UNIRAS
80
81      CALL GCLOSE
82
83      CALL LIB$SHOW_TIMER
84      CALL EXIT(0)
85
86      STOP 'Normal successful termination'
87 9999 STOP 'Error opening landmass database'
88
89      END
90
91      INTEGER FUNCTION MSD1COL(Z,IZSIZE)
92
93      DIMENSION X(izsize),      !VM area containing shipping matrix
94      1          X(600),        !The X- and Y-array are used with
95      1          Y(600)         !the ship (or sub) tracks
96      DIMENSION ZZ(2)          !Class limit array
97
98      CHARACTER*12  FIL1        !File name string
99      CHARACTER*12  NSTRING
100     CHARACTER*1   YESNO
101
102     LOGICAL SEGSTORE,GRID
103
104     SEGSTORE = .FALSE.        !Set flag if UNIRAS segment storage is on
105     GRID = .FALSE.
106     XOR=20.
107     YOR=30.
108
109     !Prompt for the size in the x direction
110

```

SACLANTOEN SM-201

```

111      CALL dsifedatr (
112      1      'Enter XS in mm: ',
113      1      '200.',
114      1      NSTRING)
115
116      READ(NSTRING,*) XS
117
118
119
120
121      IF (XS.EQ.0.) THEN
122          WRITE(6,*) 'XS NOT SPECIFIED - USING DEFAULT'
123          XS=200.
124      ELSE
125          WRITE(6,*) 'XS SPECIFIED - ',XS
126      END IF
127
128      CALL dsifedatr (
129      1      'Do you want to plot a grid Y/N: ',
130      1      'Y',
131      1      YESNO)
132
133      IF((YESNO.EQ.'Y').OR.(YESNO.EQ.'y')) GRID = .TRUE.
134
135      CALL dsifedatr (
136      1      'Do you want to create a UNIPICT file Y/N: ',
137      1      'Y',
138      1      YESNO)
139
140      IF((YESNO.EQ.'Y').OR.(YESNO.EQ.'y')) SEGSTORE = .TRUE.
141
142
143
144      YS=XS*0.8
145
146      ITX=1
147      ITY=1
148
149      C      Define only one class limit as we want to use two colours only
150
151      ZZ(1)=-0.9
152
153      C      -----
154      C      Read binary file
155
156      OPEN(UNIT=9,ERR=9999,FILE='DATA:LANDMASS.DAT',
157      1STATUS='OLD',FORM='UNFORMATTED',READONLY)
158
159      READ (9) MAXX
160      READ (9) MAXY
161      READ (9) LNG1
162      READ (9) LNG2
163      READ (9) LAT1
164      READ (9) LAT2
165
166      LNG2=LNG2
167      LAT2=LAT2
168
169      !Print info to terminal
170

```

```

170 WRITE(6,800) MAXX
171 WRITE(6,801) MAXY
172 WRITE(6,802) LNG1
173 WRITE(6,803) LNG2
174 WRITE(6,804) LAT1
175 WRITE(6,805) LAT2
176
177 READ (9) (Z(J),J=1,MAXX*MAXY)
178 CLOSE (UNIT=9,STATUS='KEEP')
179
180 C -----
181 C Initiate UNIRAS
182
183 CALL GOPEN
184 CALL GRESET
185
186 IF (SEGSTORE) THEN
187     WRITE(6,*) 'Segment storage is ACTIVE'
188     WRITE(6,*) 'Opening segment file #1'
189     CALL GSEGCH(1)
190 END IF
191
192
193 C Set up class limits, user coordinate system and viewport
194
195 CALL EXCL(ZZ,1,0)
196 CALL GLINIT(FLOAT(LNG1),FLOAT(LNG2),FLOAT(LAT1),FLOAT(LAT2),0.,0.)
197 CALL GVPOR(XOR,YOR,XS,YS)
198
199 C Set colour of contourlines to anti-background
200
201 CALL GEUCOL(1)
202
203 C Set smoothing level and plot contour lines
204
205 CALL GSNTH(9)
206 CALL GCHR2V(Z,MAXX,MAXY)
207
208 C Terminate GCHR2V
209 C And draw axis
210
211 ITX=ITX+6
212 ITY=ITY+4
213
214 CALL GLIMIT(FLOAT(LNG1),FLOAT(LNG2),FLOAT(LAT1),FLOAT(LAT2),0.,0.)
215
216 CALL GTICKN(ITE)
217 CALL GAXIS(1,FLOAT(LNG1),0.,FLOAT(LNG2),'Longitude')
218
219 CALL GTICKN(ITY)
220 CALL GAXIS(2,FLOAT(LAT1),0.,FLOAT(LAT2),'Latitude')
221
222 C Draw secondary axis
223
224 CALL GAXORI(FLOAT(LNG2),FLOAT(LAT1))
225 CALL GTICKN(ITY)
226 CALL GAXIS(-2,FLOAT(LAT1),0.,FLOAT(LAT2),'S')

```

SACLANTOEN SM-297

```

227
228      CALL GAXORI(FLOAT(LNG1),FLOAT(LAT2))
229      CALL GTICKN(ITX)
230      CALL GAXIS(-1,FLOAT(LNG1),0.,FLOAT(LNG2),'$')
231
232      CALL GEOCOL(1)
233
234      IF (GRID) CALL GGRID(1,1)
235      CALL GUNDEF(999.999,31)
236
237      IF (SEGSTOR=) CALL GSEGCL(1)
238      CALL GCHARJ(0)
239      mdicol=1
240
241      RETURN
242
243
244 800      FORMAT(1X,'No. points in the X-direction: ',I)
245 801      FORMAT(1X,'No. points in the Y-direction: ',I)
246 802      FORMAT(1X,'Longitude minimum      : ',I)
247 803      FORMAT(1X,'Longitude maximum      : ',I)
248 804      FORMAT(1X,'Latitude minimum       : ',I)
249 805      FORMAT(1X,'Latitude maximum       : ',I)
250
251 9998     STOP 'Error during read of track data base'
252 9999     STOP 'Error opening landmass data base'
253
254      END
255
256      SUBROUTINE DSI@RDSTR(PROMPT,DEFAULT,ANSWER)
257  C
258  C      ROUTINE DESCRIPTION:
259  C
260  C          This routine writes PROMPT on the terminal, and
261  C          allows the user to use VMS's line editing functions to
262  C          modify or replace the default answer
263  C
264  C      AUTHORS:
265  C
266  C          Alex Troncello
267  C          SACLANT Undersea Research Center,
268  C          V. San Bartolomeo 400,
269  C          19026 La Spezia, Italy
270  C
271  C      CREATION DATE:   May 1986
272  C
273  C
274  C          C H A N G E   L O G
275  C
276  C          Date       / Name / Description
277  C          -----
278  C [change_entry]
279  C
280      CHARACTER*(*) PROMPT,
281      1              DEFAULT,
282      1              ANSWER
283      COMMON /SNGID/ ID
284
285      IF (ID.NE.0) GOTO 5

```

SACLANTCEN SM-207

```
286      CALL SMG$CREATE_VIRTUAL_KEYBOARD(ID)
287
288 5     CALL SMG$READ_STRING(ID,ANSWER,PROMPT,
289      1      ,,,,,,DEFAULT)
290      RETURN
291      END
292
293
```

Initial Distribution for SM-207

Ministries of Defence

JSPHQ Belgium	2
DND Canada	10
CHOD Denmark	8
MOD France	8
MOD Germany	15
MOD Greece	11
MOD Italy	10
MOD Netherlands	12
CHOD Norway	10
MOD Portugal	2
MOD Spain	2
MOD Turkey	5
MOD UK	20
SECDEF US	60

NATO Authorities

Defence Planning Committee	3
NAMILCOM	2
SACLANT	3
SACLANTREPEUR	1
CINCWESTLANT/ COMOCEANLANT	1
COMSTRIKFLTANT	1
CINCIBERLANT	1
CINCEASTLANT	1
COMSUBACLANT	1
COMMAIREASTLANT	1
SACEUR	2
CINCNORTH	1
CINCSOUTH	1
COMNAVSOUTH	1
COMSTRIKFORSOUTH	1
COMEDCENT	1
COMMARAIMED	1
CINCHAN	3

SCNR for SACLANTCEN

SCNR Belgium	1
SCNR Canada	1
SCNR Denmark	1

SCNR Germany	1
SCNR Greece	1
SCNR Italy	1
SCNR Netherlands	1
SCNR Norway	1
SCNR Portugal	1
SCNR Turkey	1
SCNR UK	1
SCNR US	2
French Delegate	1
SEC GEN Rep. SCNR	1
NAMILCOM Rep. SCNR	1

National Liaison Officers

NLO Canada	1
NLO Denmark	1
NLO Germany	1
NLO Italy	1
NLO UK	1
NLO US	1

NLR to SACLANT

NLR Belgium	1
NLR Canada	1
NLR Denmark	1
NLR Germany	1
NLR Greece	1
NLR Italy	1
NLR Netherlands	1
NLR Norway	1
NLR Portugal	1
NLR Turkey	1
NLR UK	1

Total external distribution	250
SACLANTCEN Library	10
Stock	20
Total number of copies	280