UNITED STATES DEPARTMENT OF THE INTERIOR

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USER'S MANUAL FOR RASSMP

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INTRODUCTION

This is the user's manual for the program rassmp (RASS map). Rassmp plots sample location maps from data contained in RASS files (see fig. 1). RASS files are special unformatted files prepared and manipulated by the RASS-STATPAC SYSTEM. The RASS-STATPAC SYSTEM is described by VanTrump and Miesch (1977). Rassmp uses the subroutines of the DISSPLA subroutine package (Integrated Software Systems Corp., 1978). This section describes the features of rassmp. The next section gives step-by-step procedures for using rassmp. The following section contains a listing of rassmp in the FORTRAN computer language. A bibliography completes this manual.

Rassmp has these features

- Runs on the U.S. Geological Survey Multics computer in Menlo Park, Calif.
- Plots a map with a plus sign at the location of each sample contained in a RASS file. It is assumed that the RASS file contains latitudes and longitudes for each sample. All points lying outside the map area are ignored.
- Uses the output from the undocumented program raslst written by Richard Koch of the U.S. Geological Survey. Raslst creates a formatted file containing latitudes and longitudes for each sample contained in the RASS file. The raslst file serves as the input file for rassmp.
- Plots coastlines and political boundaries on the map for all continents. Figure 2 lists all the available coastline and boundary options.
- Queries the user for the latitude and longitude boundaries of the map. All samples lying within these boundaries will be located on the map.
- Labels the map with latitude and longitude tics.
- Queries the user for the map projection to be used. Sixteen different projections are available. Figure 3 lists these projections. They are described further in Integrated Software Systems Corporation (1978) and in any standard cartographic text.
- Fits the map to a 25-in. square plotter area. Other sizes can be obtained using the SCA (scale) command on a Zeta plotter (Zeta Research, 1978). The plotter area is framed within a 32 inch square area.

There are two restrictions on the use of rassmp. The longitudes of both north-south map boundaries must either lie within the range of 0° to 180° or 0° to -180°, and the latitudes of both east-west map boundaries must either lie within the range of 0° to 90° or 0° to -90°. The second restriction is that data sets should only contain points within these same ranges. For example, a data set that contains points with locations (lat 10° N., long 37° W.) and (lat 10° S., long 37° W.) would be unacceptable. Use of such a data set would result in plotting points on the map which actually lay in the other hemisphere.

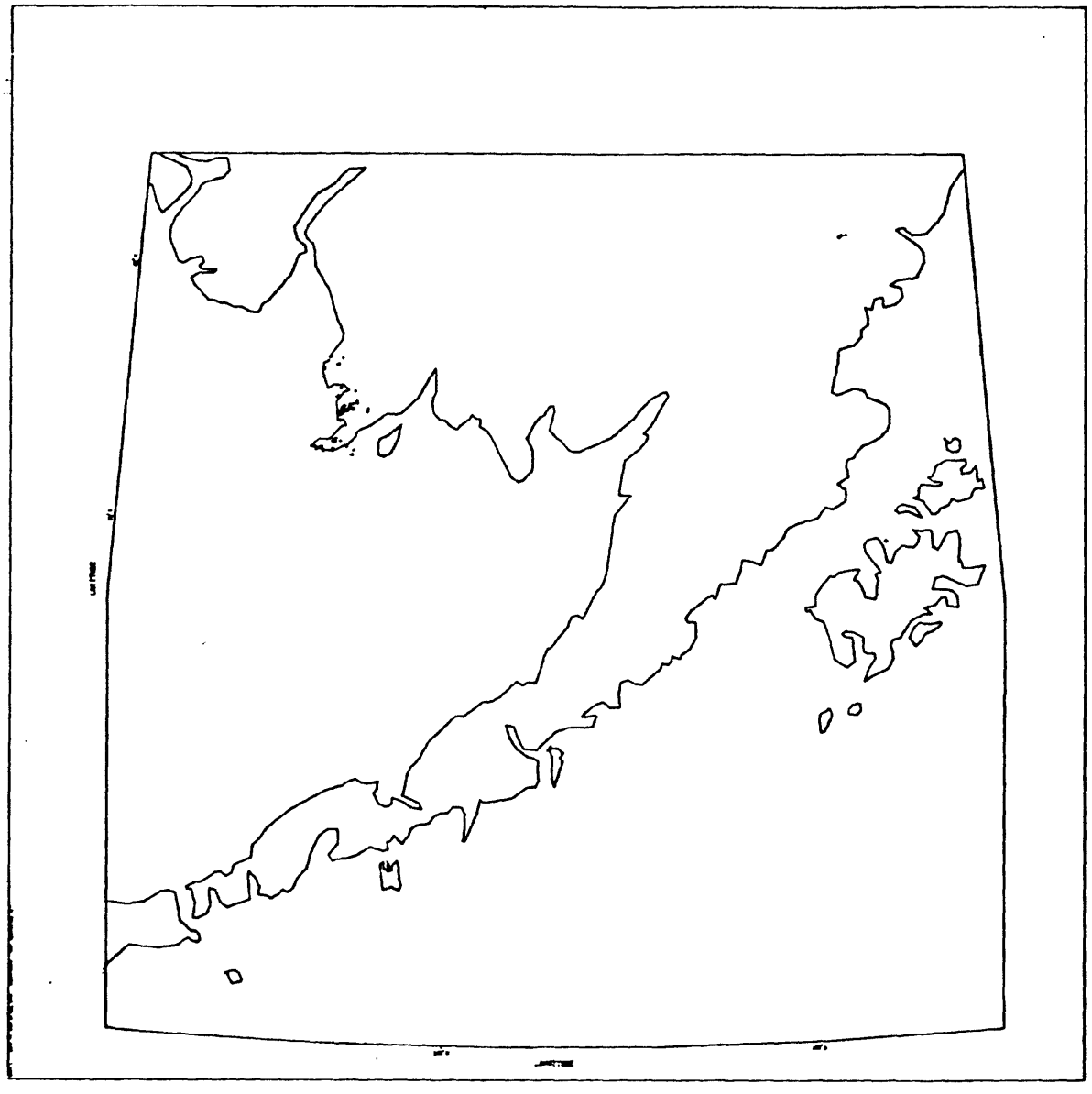

FIGURE 1. Sample location map. This figure shows a portion of Alaska and the locations of all samples collected in this area. (Reduced to 20%)

The user is cautioned that the requirements for DISSPLA's projections may vary, and Part IV of the previously mentioned DISSPLA manual should be reviewed if any difficulty arises.

Figure 2.--Geographic data files

Coastlines	Political Boundaries
Africa	Africa
Antarctica	None
Asia	Asia
Australia	Australia
Europe	Europe
North America	North America
South America	South America
United States[1]	United States[1]

[1]The United States files do not contain Alaska. Both files contain coastlines which are slightly different.

Figure 3.--Available geographic projections

Uncorrected Cylindrical
Uncorrected Mercator
Corrected Cylindrical
Mollweide
Aitoff
Sansom Sinusoidal
Elliptical
Biparallel Conformal Conic
Albers Equal Area Conic
Polyconic
Gnomonic
Orthographic
Stereographic
Azimuthal Equal Distant
Azimuthal (Lambert) Equal Area

OPERATING INSTRUCTIONS

Use the following procedures to run rassmp. Each line of user input should be followed by a carriage return.

Step 1. First you must create a raslst output file. Do this by running the program raslst by typing:

```
asr >udd>Amrap>rdklib>object
raslst
```

Continue with raslst answering each question asked.

Step 2. Now log on to the Multics computer using a Zeta terminal. The use of the Zeta terminal is described by Zeta Research (1977, 1978). Use the following procedure. Precede all characters intended to be capital letters with a \ (CTRL L).

```
SCA OFF or SCA X.XX,Y.YY   (used to rescale plots)
ROT OFF or ROT ON
COR ON
COP COM PLO or COP COM TAP
```

Use the standard login procedure except that after the login message you must precede the login command with:

```
MAP
```

Multics prints:

```
PASSWORD
BUSBYUQBWEVBG
etc.
```

Continue with the usual login command.

Step 3. Type:

```
ASR >UDD>\W\MIN\RES>\C\CARLSON>CACLIB>SOURCE
```

Step 4. Type:

```
RASSMP
```

Multics prints:

```
THIS IS RASSMP.  VERSION 2.0
ENTER THE NAME OF THE RASLST OUTPUT FILE
```

Step 5. Type the name of the output file from raslst.

Multics prints:

COASTLINE	POLITICAL BOUNDARIES
1) AFRICA	1) AFRICA
2) ANTARCTICA	2) NONE
3) ASIA	3) ASIA
4) AUSTRALIA	4) AUSTRALIA
5) EUROPE	5) EUROPE
6) NORTH AMERICA	6) NORTH AMERICA
7) SOUTH AMERICA	7) SOUTH AMERICA
8) UNITED STATES	8) UNITED STATES
9) NONE	9) NONE

ENTER THE TWO NUMBERS CORRESPONDING TO THE TWO OPTIONS TABULATED ABOVE, E.G. 5,9 WOULD SELECT THE COASTLINES AND WATER BODIES OF EUROPE WITH NO POLITICAL BOUNDARIES TO BE SHOWN.

Step 6. Type the two numbers which indicate the desired combination of possible coastlines and political boundaries.

Multics prints: ENTER THE LEFT AND RIGHT BOUNDARIES OF THE MAP IN DEGREES LONGITUDE. REMEMBER, IN NORTH AMERICA LONGITUDES ARE NEGATIVE, E.G. -122.5,-122.0 BRACKETS THE LONGITUDE OF MENLO PARK, CA.

Step 7. Type the left and right longitude boundaries of the map.

Multics prints: ENTER THE LOWER AND UPPER BOUNDARIES OF THE MAP IN DEGREES LATITUDE. NORTH AMERICA HAS POSITIVE LATITUDES, E.G. 37.0,37.5 BRACKETS THE LATITUDE OF MENLO PARK, CA.

Step 8. Type lower and upper latitude boundaries of the map.

Multics prints: ENTER THE LONGITUDE AND LATITUDE SPACING FOR THE LABELS TO BE PLOTTED ON YOUR MAP, E.G. .25,.25 SPECIFIES 15 MINUTE SPACING.

Step 9. The latitudes and longitudes on your map will be labeled with the spacing that you indicate here. Type your choices. Use degrees.

Multics prints:

1) CYLINDRICAL	9) BIPARALLEL CONFORMAL CONIC
2) MERCATOR	10) ALBERS EQUAL AREA CONIC
3) CORRECTED CYLINDRICAL	11) POLYCONIC
	12) GNOMONIC
4) CORRECTED MERCATOR	13) ORTHOGRAPHIC
	14) STEREOGRAPHIC
5) MOLLWEIDE	15) AZIMUTHAL EQUAL DISTANT
6) AITOFF	16) AZIMUTHAL (LAMBERT)

```
                    7) SANSOM                EQUAL AREA
                       SINUSOIDAL
                    8) ELLIPTICAL

                   CHOOSE ONE OF THE ABOVE PROJECTIONS.  ENTER THE
                   CORRESPONDING NUMBER, E.G. 7 FOR SANSOM SINUSOIDAL
```

Step 10. Choose a projection from this list and type the corresponding number. Depending on which projection you choose, rassmp may ask you additional questions. Consult the DISSPLA manual (Integrated Software Systems Corporation, 1978) for further information about each projection.

Rassmp will now prepare to plot your map. The DISSPLA system will list a summary of subroutine calls on the terminal. Then the map will be plotted.

PROGRAM LISTING

```
C     ************************************************************
C     *  RASSMP:  PLOTS A MAP WITH COASTLINE AND POLITICAL BOUND- *
C     *  ARIES ON ZETA PLOTTER USING THE DISSPLA SUBROUTINES.     *
C     *  SHOWS LOCATIONS OF SAMPLES REFERENCED IN A RASLST FILE   *
C     *  BY CCARLSON, JAN. 28, 1982.                              *
C     ************************************************************
      DIMENSION X(2500),Y(2500)
      MAXPTS=2500
      I=0
1000  FORMAT(V)
      EXTERNAL asr(DESCRIPTORS)
      EXTERNAL dsr(DESCRIPTORS)
      EXTERNAL in (DESCRIPTORS)
      EXTERNAL tm (DESCRIPTORS)
      EXTERNAL dl (DESCRIPTORS)
      CHARACTER*32 SEGNAM
      CHARACTER*3 ANS
      CALL asr(">iml>dissplа","-after","working_dir")
      CALL in(">udd>WMinRes>CCarlson>plots")
      CALL in(">udd>WMinRes>CCarlson>plot")
      WRITE(0,1000)"this is rassmp.  version 2.0"
      WRITE(0,1000)"enter the name of the raslst output file"
      READ(0,1000)SEGNAM
      OPEN(10,FORM="FORMATTED",FILE=SEGNAM)
      OPEN(14,FORM="UNFORMATTED",FILE="PLOTFILE")
5010  READ(10,5001)ANS
5001  FORMAT(10X,A3)
      IF (ANS.NE."TAG") GOTO 5010
      READ(10,1000)
C  SET UP PLOT
C
C   *** SELECT CONTINENT ***
C
      WRITE(0,1000)
      WRITE(0,1000)"    coastline              political boundaries"
```

```
      WRITE(0,1000)
      WRITE(0,1000)"  1) africa                    1) africa"
      WRITE(0,1000)"  2) antarctica                2) none"
      WRITE(0,1000)"  3) asia                      3) asia"
      WRITE(0,1000)"  4) australia                 4) australia"
      WRITE(0,1000)"  5) europe                    5) europe"
      WRITE(0,1000)"  6) north america             6) north america"
      WRITE(0,1000)"  7) south america             7) south america"
      WRITE(0,1000)"  8) united states             8) united states"
      WRITE(0,1000)"  9) none                      9) none"
10    WRITE(0,1000)"enter the two numbers corresponding to the two"
      WRITE(0,1000)"options tabulated above, e.g. 5,9 would select"
      WRITE(0,1000)"the coastlines and water bodies of europe with"
      WRITE(0,1000)"no political boundaries to be shown."
      READ(0,1000)ICONT,IPOLY
      IF ((ICONT.LT.1).OR.(ICONT.GT.9)) GOTO 10
      IF ((IPOLY.LT.1).OR.(IPOLY.GT.9)) GOTO 10
C
C   *** CHOOSE BOUNDARIES OF MAP ***
C
3010  WRITE(0,1000)"enter the left and right boundaries of the map"
      WRITE(0,1000)"in degrees longitude.  remember, in north america"
      WRITE(0,1000)"longitudes are negative, e.g. -122.5,-122.0"
      WRITE(0,1000)"brackets the longitude of menlo park, ca."
      READ(0,1000)XLEFT,XRIGHT
      IF (XLEFT*XRIGHT.LT.0.0) WRITE(0,1000)"error.  two hemispheres.  r
     +e-enter."
      IF (XLEFT*XRIGHT.LT.0.0) GOTO 3010
      XSIGN=XLEFT/ABS(XLEFT)
3020  WRITE(0,1000)"enter the lower and upper boundaries of the map"
      WRITE(0,1000)"in degrees latitude.  north america has positive"
      WRITE(0,1000)"latitudes, e.g. 37.0,37.5 brackets the latitude"
      WRITE(0,1000)"of menlo park, ca."
      READ(0,1000)YLOWER,YUPPER
      IF (YLOWER*YUPPER.LT.0.0) WRITE(0,1000)"error.  two hemispheres.
     +re-enter."
      IF (YLOWER*YUPPER.LT.0.0) GOTO 3020
      YSIGN=YLOWER/ABS(YLOWER)
      WRITE(0,1000)
      WRITE(0,1000)"enter the longitude and latitude spacing for the"
      WRITE(0,1000)"labels to be plotted on your map, e.g. .25,.25 "
      WRITE(0,1000)"specifies 15 minute spacing."
      READ(0,1000)XSTEP,YSTEP
C
C   *** CHOOSE PROJECTION ***
C
      WRITE(0,1000)
      WRITE(0,1000)" 1) cylindrical       9) biparallel conformal conic"
      WRITE(0,1000)" 2) mercator         10) albers equal area conic"
      WRITE(0,1000)" 3) corrected        11) polyconic"
      WRITE(0,1000)"    cylindrical      12) gnomonic"
      WRITE(0,1000)" 4) corrected        13) orthographic"
      WRITE(0,1000)"    mercator         14) stereographic"
      WRITE(0,1000)" 5) mollweide        15) azimuthal equal distant"
```

```
      WRITE(0,1000)" 6) aitoff           16) azimuthal (lambert)"
      WRITE(0,1000)" 7) sansom               equal area"
      WRITE(0,1000)"    sinusoidal"
      WRITE(0,1000)" 8) elliptical"
      WRITE(0,1000)
20    WRITE(0,1000)"choose one of the above projections.  enter the"
      WRITE(0,1000)"corresponding number, e.g. 7 for sansom sinusoidal"
      READ(0,1000) IPROJ
      IF ((IPROJ.LT.1).OR.(IPROJ.GT.16)) GOTO 20
C
C   *** STORE THE PLOT OF THE MAP ***
C
40    CONTINUE
      CALL ZETA
C
C  *** READ THE DATA ***
C
1010  READ(10,1002,END= 1020)YDEG,YMIN,YSEC,XDEG,XMIN,XSEC
1002  FORMAT(32X,F4.0,2F2.0,X,F4.0,2F2.0)
      X1=(XDEG+XMIN/60.0+XSEC/3600.0)*XSIGN
      Y1=(YDEG+YMIN/60.0+YSEC/3600.0)*YSIGN
      IF ((X1.LT.XLEFT).OR.(X1.GT.XRIGHT)) GOTO 1010
      IF ((Y1.LT.YLOWER).OR.(Y1.GT.YUPPER)) GOTO 1010
      I=I+1
      X(I)=X1
      Y(I)=Y1
      IF (I.LT.MAXPTS) GOTO 1010
1020  IF (IPROJ.EQ.1)CALL PROJCT("cylin")
      IF (IPROJ.EQ.2)CALL PROJCT("merca")
      IF (IPROJ.EQ.3)CALL PROJCT("exact")
      IF (IPROJ.EQ.4)CALL PROJCT("corre")
      IF (IPROJ.EQ.5)CALL PROJCT("mollw")
      IF (IPROJ.EQ.6)CALL PROJCT("aitof")
      IF (IPROJ.EQ.7)CALL PROJCT("sanso")
      IF (IPROJ.EQ.8)CALL PROJCT("ellip")
      IF (IPROJ.EQ.9)CALL PROJCT("confo")
      IF (IPROJ.EQ.10)CALL PROJCT("alber")
      IF (IPROJ.EQ.11)CALL PROJCT("polyc")
      IF (IPROJ.EQ.12)CALL PROJCT("gnomo")
      IF (IPROJ.EQ.13)CALL PROJCT("ortho")
      IF (IPROJ.EQ.14)CALL PROJCT("stere")
      IF (IPROJ.EQ.15)CALL PROJCT("azimu")
      IF (IPROJ.EQ.16)CALL PROJCT("lambe")
C
C   *** CHOOSE LOWER AND UPPER REFERENCE PARALLEL ***
C
      IF ((IPROJ.LT.9).OR.(IPROJ.GT.11)) GOTO 30
      WRITE(0,1000)
      WRITE(0,1000)"enter lower and upper reference parallels.  enter"
      WRITE(0,1000)"0.0,0.0 to use default of 1/4 and 3/4 of map span."
      READ(0,1000)YREF1,YREF2
      CALL MAPREF(YREF1,YREF2)
30    CONTINUE
```

```
C
C   *** CHOOSE MAP POLE ***
C
      IF (IPROJ.LT.12) GOTO 40
      WRITE(0,1000)
      WRITE(0,1000)"enter longitude and longitude of map pole.  0.0,0.0"
      WRITE(0,1000)"is the default location."
      READ(0,1000)XPOLE,YPOLE
      CALL MAPOLE(XPOLE,YPOLE)
      CALL FLATBD
      CALL PAGE(32.0,32.0)
      CALL TITLE(1H ,1,9HLONGITUDE,9,8HLATITUDE,8,25.0,25.0)
      CALL MAPGR(XLEFT,XSTEP,XRIGHT,YLOWER,YSTEP,YUPPER)
      CALL FRAME
      CALL MARKER(3)
      CALL NOCHEK
      IF (I.GT.0) CALL CURVE(X,Y,I,-1)
      IF (ICONT.EQ.1)CALL MAPFIL('afri')
      IF (IPOLY.EQ.1)CALL MAPFIL('parf')
      IF (ICONT.EQ.2)CALL MAPFIL('anta')
      IF (ICONT.EQ.3)CALL MAPFIL('asia')
      IF (IPOLY.EQ.3)CALL MAPFIL('pasi')
      IF (ICONT.EQ.4)CALL MAPFIL('aust')
      IF (IPOLY.EQ.4)CALL MAPFIL('paus')
      IF (ICONT.EQ.5)CALL MAPFIL('euro')
      IF (IPOLY.EQ.5)CALL MAPFIL('peur')
      IF (ICONT.EQ.6)CALL MAPFIL('nort')
      IF (IPOLY.EQ.6)CALL MAPFIL('pnor')
      IF (ICONT.EQ.7)CALL MAPFIL('sout')
      IF (IPOLY.EQ.7)CALL MAPFIL('psou')
      IF (ICONT.EQ.8)CALL MAPFIL('nort')
      IF (IPOLY.EQ.8)CALL MAPFIL('usah')
      CALL ENDPL(1)
      CALL DONEPL
      CLOSE(10)
      CLOSE(14)
C
C   *** NOW ACTUALLY PLOT THE MAP ***
C
      CALL dsr(">iml>disspla")
      CALL tm(">udd>WMinRes>CCarlson>plots")
      CALL tm(">udd>WMinRes>CCarlson>plot")
      CALL asr(">udd>WMinRes>CCarlson>zeta","-after","working_dir")
      CALL plots(53,0,-1)
      OPEN(14,FORM="UNFORMATTED",FILE="PLOTFILE")
2010  READ(14,END=2000)X1,Y1,N1
      GOTO 2010
      CALL plot (X1, Y1, N1)
2000  CONTINUE
      CLOSE(14)
      CALL tm(">udd>WMinRes>CCarlson>zeta>plot")
      CALL dsr (">udd>WMinRes>CCarlson>zeta")
      CALL dl ("PLOTFILE")
      END
```

Bibliography

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