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**ALACARTE User Interface - AML Code and
Demonstration Maps**
Version 1.0

ALACARTE, an easily used menu interface cast in geologic terms
that controls ARC/INFO, a commercial geographic information system

Todd T. Fitzgibbon and Carl M. Wentworth

1991

Open-File Report 91-587 A

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INTRODUCTION

ALACARTE is a menu-driven interface to ARC/INFO, a commercial Geographic Information System (GIS) software package from Environmental Systems Research Institute (ESRI, Redlands, California). ALACARTE is designed for use by geologists in making, analyzing, and plotting geologic maps and associated data sets, including detailed large-scale quadrangle maps. ALACARTE consists of more than 25,000 lines of code and 10,000 comment lines in 470 subroutines written in the ARC/INFO Macro Language (AML), a high-level interpreted language.

This report describes how to obtain a machine-readable version of ALACARTE on tape or through anonymous ftp, load the ALACARTE files onto your system, and print out the Installation and System Manual and User Manual. The installation of ALACARTE is completed by following directions in the Installation and System Manual. The ALACARTE 1.0 distribution includes the ALACARTE AML's and menus, demonstration maps, geologic symbol sets, and machine-readable versions of the ALACARTE manuals.

The **ALACARTE Installation and System Manual, USGS Open File Report 91-587 B**, by **Todd T. Fitzgibbon**, describes the technical aspects of ALACARTE, including hardware and software requirements, installation, and source code details. User documentation is in the report, **ALACARTE User Manual Version 1.0, USGS Open File Report 91-587 C**, by **Carl M. Wentworth and Todd T. Fitzgibbon**. Paper copies of both these reports and additional copies of this manual may be obtained for the cost of reproduction from:

U.S. Geological Survey
Books and Open-File Reports Section
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P.O. Box 25425
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Development of ALACARTE

ALACARTE is designed by T.T. Fitzgibbon and C.M. Wentworth, with assistance from P.K. Showalter, and is written by Fitzgibbon with assistance from Showalter, P.H. Rice, D.L. Knifong, T.A. Lindquist and others. Creation of the program was stimulated by the confluence of several factors, particularly the emergence of powerful and affordable computer workstations with high-resolution color displays, the experience gained from various CAD programs and the PC-based geologic compilation program GSMAP (Selner, G.I. and Taylor, R.B, GSMAP System version 7.0, U.S. Geological Survey Open-file Report 91-1), and commercial release of a full-featured vector GIS with a macro programming language that supports menus. ALACARTE is written in ARC Macro Language (AML) and runs in association with ARC/INFO (version 5.0.1) on UNIX and Prime computers. Its development was supported in the U.S. Geological Survey by programs for National Geologic Mapping and Development of Assessment Techniques and by the Survey's GIS Research Laboratory in Menlo Park. Sample AML's and technical support from ESRI are greatly appreciated.

THE ALACARTE USER INTERFACE

ALACARTE offers a convenient way to compile geologic maps in the computer as spatial databases that can be used to prepare both cartographic images and analytic derivatives. It is a menu-controlled shell, organized in geologic terms, that provides on-screen control of the program ARC/INFO, a commercial geographic information system (GIS). Input can be from imported scans, digitizer tracing, or on-screen tracing or mapping with a mouse-controlled cursor over a digital topographic base, and interactive editing can be done on-screen using a broad suite of edit functions. Compilations begun in other digital systems can be imported for completion as digital databases in ARC/INFO. The digital files that represent a geologic map can be used to prepare near-publication-quality color plots of the maps with full symbology or to create high-quality printing negatives. These files also constitute a digital database that can be used for computer-based query and analysis as well as for digital distribution of the map and associated data.

ALACARTE allows the non-specialist to use ARC/INFO without having to struggle with its excruciating details and hundreds of line commands. ARC/INFO is a powerful GIS that, because of its breadth and flexibility, requires considerable training and experience to be used directly from the command line. Even ARC/INFO experts will find that ALACARTE offers a preferable ease of use in working with geologic maps. Functions called by picking menu items on the screen include many complex sequences of ARC/INFO commands that are prohibitively time consuming or awkward to use directly. The menus are organized according to major compilation and editing procedures and permit great flexibility in working with maps. The system and ARC/INFO command lines are always accessible from within ALACARTE if needed.

This is not just a drafting system, although it serves that purpose well. ALACARTE-ARC/INFO supports the creation of a sophisticated geologic database in the course of compiling a digital geologic map. Lines, points, and the perimeters and identities of areas are recorded in vector form and can have essentially unlimited digital information attached to them. For display, symbols for lines and points and colors for areas are separately assigned to these features as a function of feature attributes in the database, which permits great flexibility in on-screen display, plotting, and preparation of printing negatives. Plots can be made at any stage in compilation using custom geologic line and point symbol

sets, and can include a digital topographic base map. Plots made with high-resolution color plotters approach the quality of published maps.

The ability to manipulate and analyze the feature attributes and two-dimensional topology in the database of a digital map is a development offering great promise for geology. Various data layers can be overlaid for comparison or actually combined into a new map. The database can be searched both topically, according to feature attributes or information in other cross-referenced databases, and-or spatially, according to the location or spatial interrelations of map elements. Rules can be specified to control such searches and the way in which a derivative interpretation or statistical result is prepared. Data can be extracted from the digital geologic map for use in other quantitative or graphical operations and the result returned to ARC/INFO for further use.

Compilation of geologic maps with ALACARTE - ARC/INFO thus offers several important benefits: (1) efficient preparation for print publication, (2) easy map revision and preparation of derivative maps, (3) creation of a spatial database for use in computer-based manipulation and analysis, (4) the ability to make color plots of near-publication quality showing any or all aspects of a map database, and (5) the ability to store, transfer, and publish the resulting geologic map files in digital form. It is the combination of convenient drafting of geologic maps with uniformly high quality of line work and symbols, the ability to work interactively with all aspects of the maps in digital form, and the automatic creation of a digital database that makes ALACARTE - ARC/INFO an attractive system.

Scope of Version 1.0

Work on the present version has concentrated largely on the set up and geographic projection of maps and the entry, editing, and attributing of map features (the Setup and Edit sections of ALACARTE). A Version 1.1 release is planned to include bug fixes, minor enhancements, and a revised manual. Further work will expand the more rudimentary sections on plotting, conversions, databases, and analytic procedures and accommodate version 6.0 of ARC/INFO.

HARDWARE AND SOFTWARE REQUIREMENTS

ALACARTE runs under ARC/INFO 5.0.1 on UNIX systems and Prime minicomputers. It was developed on and has been extensively used on Sun 3 and SPARC systems running SunOS 4.0 and 4.1. It has been tested on Data General Aviiion systems under DG/UX 4.32. It also runs on Prime minicomputers under the Primos operating system. It has been tested and extensively used on a Prime 9955 under Primos Revision 22. The same ALACARTE code runs on both UNIX and Prime systems.

ALACARTE can be modified to run on DEC VAX/VMS systems by changing the system-specific code that handles pathnames, as demonstrated with some VMS-specific code remaining from an early test version of ALACARTE. ALACARTE will not run under PCArc on IBM PC compatibles at this time because PCArc uses a different macro language, Simple Macro Language (SML). ALACARTE 1.0 has been partially tested under the ARC/INFO 6.0 preview release on the Sun SPARC platform and runs with some errors due to minor AML and command syntax differences between revisions 5.0.1 and 6.0.

ALACARTE, whenever possible, supports all peripheral hardware that is supported by ARC/INFO. ALACARTE can be accessed from workstation consoles and from terminals that support both graphic display and AML menus. These are the Tektronix terminals with model numbers of 4105 and above, and software packages that emulate them. Most digitizers are supported.

OBTAINING THE ALACARTE 1.0 DISTRIBUTION

A machine-readable copy of the ALACARTE executable code and associated files can be obtained by anonymous ftp over Internet or by sending the authors a tape which will be returned with the ALACARTE 1.0 distribution. The ALACARTE AML source code is not available on paper (hard-copy).

Anonymous ftp (UNIX)

ALACARTE is available as a single 14.1 MB tar file through anonymous ftp by those sites connected to the Internet network. This procedure is recommended only for UNIX systems because the Primos UX_TAPE command can not extract files from a tar file but only from a magnetic tape. The ARC/INFO coverages, INFO files and symbols sets have been converted to ARC/INFO's system-independent ASCII export format, which is compatible with both UNIX and Prime systems. Import AML's are included in the ALACARTE tour and symbol directories. The ftp procedure is as follows:

log in to your UNIX system

cd /tmp

ftp sierra.wr.usgs.gov

Name: *anonymous*

Password:

cd pub

get alacarte1.0.tar

quit

go to a temporary directory to receive the tar file
numeric address is 130.118.4.116

use anonymous as user name

enter your user name as password

This places the alacarte1.0.tar file on your system in the temporary directory. Next follow the instructions in the UNIX section below, **LOADING FROM FTP TAR FILE**.

User-supplied Tape

ALACARTE can also be obtained by sending a tape to the authors (at the address below) which will be returned with the ALACARTE 1.0 distribution. The acceptable tape types are:

UNIX: 1/4 inch QIC-24 format (60MB) cartridge, 3M DC600A or equivalent

1/4 inch QIC-150 format (150MB) cartridge, 3M DC6150 or equivalent

Prime: 1/2 inch 9-track tape reel

Send the appropriate tape to:

ALACARTE
c/o Todd Fitzgibbon
U.S. Geological Survey
345 Middlefield Rd. MS-975
Menlo Park, CA 94025

Note that the authors can not supply tapes or paper copies of the ALACARTE manuals. The UNIX cartridge will contain a tar file of all ALACARTE directories and files in ARC/INFO UNIX format. It will be written on a Sun SPARC system. The Prime tape will contain a single Primos magsav logical unit of all ALACARTE directories and files in ARC/INFO Primos format. It will be written at 6250 bpi density with the Primos Rev. 22 magsav command. Coverages and related files supplied on the cartridge or tape do not require ARC/INFO import.

To load ALACARTE, follow the instructions in the UNIX or Prime section below, **LOADING FROM TAPE**.

LOADING ALACARTE ONTO YOUR SYSTEM

The sections below describe how to load the ALACARTE files onto your system. If you already have a copy of the ALACARTE Installation and System Manual, you can go directly to the section, **INSTALLING ALACARTE**, in that manual and skip the rest of the steps below. If you do not have a copy of the manual, follow the steps below to load the ALACARTE files and make a printout of the Installation manual. You must then complete the installation as outlined in the Installation manual. See **COMPLETING THE INSTALLATION** at the end of this manual on exactly how to proceed.

Installation of ALACARTE on UNIX and Prime systems is simple. The same ALACARTE code runs on both systems. The UNIX format is provided on 1/4 inch cartridge tapes, the Prime format on 1/2 inch 9-track tapes. These tapes contain identical AML files and the same sample coverages and symbol sets, but in UNIX and Prime ARC/INFO formats, respectively. The AML files and sample coverages and symbol sets are also available as a tar file that can be downloaded over Internet by anonymous ftp. In this tar file, the coverages and symbol sets are in ARC/INFO export formats.

ALACARTE should be loaded into a menus directory below the ARC/INFO system directory, **arcexe50** (see below), which requires system administrator privileges. After loading the ALACARTE files, a simple installation procedure, described in the Installation manual, is followed to make ALACARTE accessible to ARC/INFO users.

Contents of the ALACARTE 1.0 Distribution

The ALACARTE files are organized into several subdirectories below the alacarte directory.

ALACARTE AML code directories contain AML files with a .aml extension and menu files with a .men (not .menu) extension:

Size (UNIX KB)	Size (Prime records)	Directory	Contents
214	179	main	startup and common routines
67	81	demo	routines to display 21 ALACARTE demonstration screens
206	170	setup	setup menu routines
650	574	edit	edit menu routines
21	20	plot	plot menu routines
0	0	mapx	empty dir for MAPX routines (unpublished software by A. Tarr, Golden, CO, USGS, see below)
50	47	analysis	analysis menu routines
41	56	general	general menu routines
45	61	conversn	conversion menu routines

Other directories:

335	622	symbols	geologic line and marker symbols and sample LUTs (in ARC/INFO UNIX format on the UNIX tar tape, in ARC/INFO Prime format on the magsav tape, exported in the ftp tar file)
1720	1515	tour	sample coverages for ALACARTE demo (in ARC/INFO UNIX format on the UNIX tar tape, in ARC/INFO Prime format on the magsav tape, exported in the ftp tar file)
21	39	tagmenus	templates for custom feature-tagging menus
62	94	help	help text files
18	19	utils	UNIX shell scripts related to ALACARTE

Documentation directory:

9887	4927	doc	documentation, including IslandWrite, Postscript and ASCII versions of this manual, the ALACARTE Installation and System Manual, and the ALACARTE User Manual.
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	UNIX	Prime
Total size of tape:	13,340 KB	8405 Prime records
Size of ftp tar file:	14,078 KB	

MAPX is a preliminary ARCPLOT style sheet for geologic maps developed by A. Tarr. It uses a parameter file containing variable assignments appropriate to a given map and plot. The MAPX 2.0 beta version has been linked to and tested with ALACARTE, but had not been published at the time of this writing.

If disk space is problem, the util and doc directories can be deleted. Deleting the demo and tour directories is not recommended, because the ALACARTE demo and the sample tour coverages would then be unavailable to users. Do not delete the symbols directory because it contains standard lookup tables.

Loading onto UNIX Systems

ALACARTE is provided in machine-readable form on a user-supplied 1/4 inch cartridge tape or in a tar file obtainable by anonymous ftp. Use of ALACARTE requires a copy of ARC/INFO on the system where ALACARTE is to be run. The ALACARTE distribution tapes are written on a Sun SPARC system and are known to be compatible with Sun tape drives (60 and 150MB formats) and Data General Aviiion drives (150MB format only). The distribution tape contains a single 13.4 MB UNIX tar file. Loading the tape or ftp tar file with tar creates an alacarte subdirectory in the directory where tar is invoked, normally /arcexe50/menus. The procedures are slightly different for tape and ftp tar file.

LOADING FROM TAPE

Load the ALACARTE AML's and documentation files onto your system with the following steps:

1. Extract the contents of the tape:

place cartridge in system's cartridge drive

su

cd /arcexe50

mkdir menus

cd menus

tar xvf /dev/rst8

remove the cartridge from the drive and retain it as a backup copy of ALACARTE.

become root (superuser)

go to ARC/INFO system directory

OPTIONAL: create menus directory if one doesn't already exist

substitute your local device file for /dev/rst8

These steps will create the `alacarte` subdirectory in `/arcexe50/menus` and load the ALACARTE subdirectories and files below it.

Next, make a printout of the ALACARTE Installation and System Manual by following the steps in the section, **PRINTING THE INSTALLATION AND USER MANUALS**, below.

LOADING FROM FTP TAR FILE

You should have obtained the `alacarte.tar` file using the instructions in **OBTAINING THE ALACARTE 1.0 DISTRIBUTION** above. Perform the following steps to load the ALACARTE AML's and documentation files onto your system:

1. Extract the ALACARTE directories and files from the `alacarte1.0.tar` file into the ARC/INFO system area.

<code>su</code>	become root (superuser)
<code>cd /arcexe50</code>	
<code>mkdir menus</code>	OPTIONAL: create menus dir if one doesn't already exist
<code>cd menus</code>	
<code>tar xvf /tmp/alacarte1.0.tar</code>	assumes <code>alacarte1.0.tar</code> is in <code>/tmp</code>

These steps will create the `alacarte` subdirectory in `/arcexe50/menus` and load the ALACARTE subdirectories and files below it.

Next, make a printout of the ALACARTE Installation and System Manual by following the steps in the section, **PRINTING THE INSTALLATION AND USER MANUALS**, below.

Loading onto Prime Systems

ALACARTE is provided in machine-readable form on a user-supplied 1/2 inch 9-track tape. (Obtaining ALACARTE by anonymous ftp is recommended only for UNIX systems because the Primos `UX_TAPE` command apparently can not extract files from a tar file but only from a magnetic tape.) Use of ALACARTE requires a copy of ARC/INFO on the system where ALACARTE is to be run. The ALACARTE distribution tapes are written on a Prime 9955 system under Primos Revision 22 using `Rev. 22 magsav -na` at 6250bpi density. The distribution tape contains one 8405 record logical tape unit that contains the `alacarte` directory and its subdirectories and files. Loading the tape with `magrst` creates an ALACARTE subdirectory in the directory where the tape command is invoked.

LOADING FROM TAPE

Load the ALACARTE AML and documentation files with the following steps:

1. Restore the contents of the tape:

load the tape into your tape drive using 6250bpi density
log in as user who has all permissions in the arcexe50 and igl63exe directories
attach arcexe50 move to the ARC/INFO system directory
create menus OPTIONAL: create menus directory if one doesn't already exist
down menus move to the menus directory
assign mt0 assign the tape drive, substitute your tape drive for mt0 if
different
magrst invoke Rev. 22 magrst command and follow the dialog. The
logical unit number is 1. Enter yes to load the entire tape
contents.
unassign mt0 -unload
remove your tape from the drive and keep it as a backup copy of ALACARTE.

These steps will create the alacarte subdirectory in arcexe50>menus and load the ALACARTE sub-directories and files below it.

Next, make a printout of the ALACARTE Installation and System Manual by following the steps in the section, **PRINTING THE INSTALLATION AND USER MANUALS**, below.

PRINTING THE INSTALLATION AND USER MANUALS

The ALACARTE 1.0 distribution includes IslandWrite, Postscript and ASCII versions of the ALACARTE manuals in the doc subdirectory. The IslandWrite files are included for users who have the IslandWrite desktop publishing package (IslandGraphics) on a Sun system and who wish to customize or modify the manuals. Printouts of the manuals may be made on Postscript printers or on standard line printers using the Postscript and ASCII versions, respectively. The README file in the doc directory lists the files that make up each manual and the number of pages in each. Because printing procedures and available printers differ with each site, no specific printing instructions can be given here. See your system administrator for instructions.

COMPLETING THE INSTALLATION

A few additional steps are required to complete the ALACARTE installation now that the ALACARTE files are loaded onto your system and you have a printout of the ALACARTE Installa-

tion and System Manual. Refer to the **Installation on Unix Systems** or **Installation on Prime Systems** section, as appropriate, in the Installation Manual. Follow steps 2 through 4 in the corresponding **INSTALLATION FROM TAPE** section to complete the installation.

ALACARTE USER SUPPORT

The principal support provided by the authors is the distribution of the ALACARTE machine-readable files via anonymous ftp and user-supplied tape, registering ALACARTE sites, and logging change requests. Registered sites will be notified upon release of updated versions of ALACARTE. Change requests will be prioritized and incorporated into updates as part of the ALACARTE development plan. The authors do not have the resources to provide individual support for ALACARTE users. A workable support strategy within the U.S. Geological Survey is to identify an individual in each working group to be responsible for installing ALACARTE and providing support for local users; this person may be the existing ARC/INFO system administrator. This individual can then communicate with the authors on a time-available basis about specific problems and questions. No direct support can be given to outside (non-USGS) users, however suggestions in the form of change requests and any contribution of freely-distributable AML code to be considered for incorporation into ALACARTE would be greatly appreciated. The authors can supply neither paper copies of the manuals (these are available from Books and Open-File Reports Section) nor blank tapes for distributing ALACARTE.