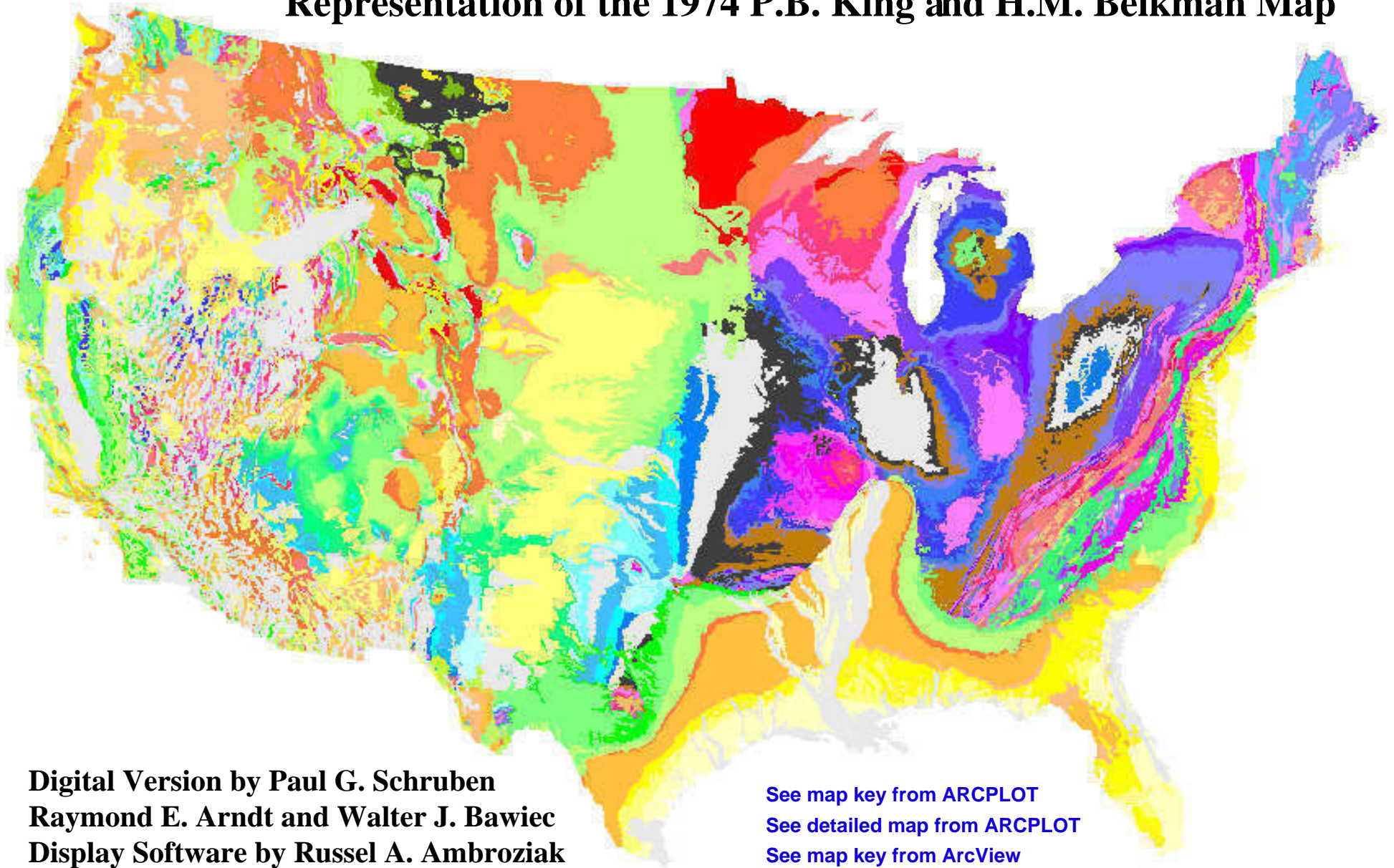# Geology of the Conterminous United States at 1:2,500,000 Scale--A Digital Representation of the 1974 P.B. King and H.M. Beikman Map

Digital Version by Paul G. Schruben
Raymond E. Arndt and Walter J. Bawiec
Display Software by Russel A. Ambroziak

See map key from ARCPLOT
See detailed map from ARCPLOT
See map key from ArcView

Geology of the Conterminous United States at 1:2,500,000 Scale--A Digital Representation of the 1974 P.B. King and H.M. Beikman Map

By Paul G. Schruben,[1] Raymond E. Arndt,[2] and Walter J. Bawiec[1]
Display software by Russell A. Ambroziak[3]

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This CD-ROM was produced in accordance with the ISO 9660 standard and thus allows access to the disc files by computers with ISO 9660 software drivers. The disc contains Adobe Acrobat Reader software for DOS, Macintosh, UNIX, and Windows as well as Geologic Information Visualization (GIV) software.

1) ADOBE ACROBAT READER REQUIREMENTS:

Windows 95 - rs32e30.exe

Minimum
    i386(TM), i486(TM), Pentium(R), or
    Pentium Pro processor-based personal computer
    Microsoft Windows 95, or Windows NT(R) 3.51 or later
    8 MB of RAM (16 MB for Windows NT) for Acrobat Reader
    10 MB of available hard-disk space

Recommended
    Pentium processor-based personal computer
    Windows 95 or Windows NT
    16 MB of RAM (24 for Windows NT)
    10 MB of available hard-disk space

Windows NT - rs32e30.exe

Minimum
    i386(TM), i486(TM), Pentium(R), or Pentium Pro processor
    Windows NT(R) 3.51 or later
    8 MB of RAM (16 MB for Windows NT) for Acrobat Reader
    10 MB of available hard-disk space

Recommended
    Pentium processor-based personal
    computer
    Windows 95 or Windows NT
    16 MB of RAM (24 for Windows NT)
    10 MB of available hard-disk space

Windows 3.1 and 3.11 for Workgroups - rs16e30.exe

Minimum
    i386(TM), i486(TM), Pentium(R), or Pentium Pro processor
    Microsoft Windows 3.1 or Windows 3.11 or later

8 MB of RAM for Acrobat Reader
5 MB of available hard-disk space

Recommended
    Pentium processor-based personal computer
    Microsoft Windows 3.1 or Windows 3.11 or later
    12 MB of available hard-disk space

Macintosh and Power Macintosh - Install Acrobat Reader 3.0, Search Installer

Minimum
    Macintosh with a 68020 or greater processor, or Power Macintosh
    3.5 MB of RAM (5 MB for Power Macintosh) available to Acrobat Reader
    Apple(R) System Software version 7.1 or later

Recommended
    8 MB of available RAM
    Apple System Software version 7.1.2 or later
    12.5 MB of available hard-disk space

UNIX

UNIX system requirements
    12 MB of disk space for Acrobat Reader
    System with 32 MB of RAM

Sun SPARCstation(R) - acroread_sunos_30.tar.gz, acroread_solaris_30.tar.gz
    SunOS 4.1.3 or 4.1.4 or Solaris 2.3, 2.4, or 2.5
    OpenWindows(TM) (version 3.0 or later),
    Motif(TM) window manager (1.2.3 or later),
    OpenLook version 3.0, or
    Common Desktop Environment (CDE) 1.0 and above

HP Series 9000 workstation, model 700 or greater - acroread_hpux_30.tar.gz
    HP-UX 9.0.3 or later
    X Window System(TM) X11R5 with HP-VUE or CDE 1.0
    12 megabytes of available hard disk space
    A 32 megabyte machine

IBM(R) RS/6000(TM) workstation - acroread_aix_30.tar.gz
    AIX 4.1 or later operating system
    Common Desktop Environment (CDE) or the Motif window manager

Silicon Graphics workstation - acroread_irix_30.tar.gz
    IRIX(TM) 5.3 or later operating system software

12 megabytes of available hard disk space
    A 32 megabyte machine

Linux workstation - acroread_linux_30.tar.gz
    LINUX 5.3 or later operating system software
    12 megabytes of available hard disk space
    A 32 megabyte machine

OS/2 - aro2e30.exe

Minimum
    i386, i486, Pentium, or Pentium Pro processor
    IBM OS/2 Warp or Warp Connect 3.0 or later
    4 MB application RAM available to Acrobat Reader
    8 MB RAM for system
    5 MB hard-disk space, plus 5 MB temporary space for installation

 Recommended
     Pentium processor
     IBM OS/2 Warp 4.0

Adobe Acrobat Reader 1.0 for DOS - rdrdos10.zip

Minimum
    i386(TM), i486(TM) processor
    Microsoft DOS 3.3 or later
    2 MB of RAM for Acrobat Reader.
    5 MB of available hard-disk space

Recommended
    486 or Pentium processor
    Microsoft DOS 3.3 or later
    4 MB of application RAM
    5 MB of available hard-disk space

2) GIV and ABACUS MAPVIEW REQUIREMENTS:

IBM or compatible computer WITH MOUSE
640 kb RAM (at least 540 kb free memory)
Math coprocessor
MS- or PC-DOS version 5.0 or later
Microsoft MSCDEX version 2.1 or later
CD-ROM drive with ISO 9660 software driver
Hard disk drive (5 Mb free)
Super VGA graphics system (640x480 pixels with 256 colors)

3) ARCVIEW 3 REQUIREMENTS

80486 or better CPU
Windows 3.x, 95, or NT
12-16 Mb of RAM
Super VGA graphics system, 256 colors, 640x480 pixels minimum,
  1024x768 pixels strongly recommended
Microsoft-compatible mouse

or

Power Macintosh or 68040 processor with FPU
System 7.1 or higher
16-18 Mb of RAM

OVERVIEW

This CD-ROM contains a digital version of the Geologic Map of the conterminous United States, originally published at a scale of 1:2,500,000 (King and Beikman, 1974b). It excludes Alaska and Hawaii. The map key is present as a graphic file and as a searchable text file. Also, a digital version of Professional Paper 901 is included. PP901 describes the historical background of the map, details of the compilation process, and limitations to interpretation. Its text and figures are available in Adobe Acrobat and HTML formats.

AVAILABLE DIGITAL MAP FORMATS

The digital geologic map of the conterminous United States on this CD-ROM are in the following formats:

1) ArcView .apr, ARC/INFO Export .e00, and raw ARC/INFO coverage formats. Compatible with Environmental Systems Research Institute's ArcView 2 and 3, ARC/INFO Version 7.04 or later. Also included on the disc are ARCPLOT and ArcView files in the following formats: ARC/INFO .gra, Postscript .eps, Adobe Illustrator 6 .ai6, and Adobe Acrobat .pdf files .

Geologic map:
```
kbge.gra     geologic map in ARC/INFO ARCPLOT .gra format
kbge.eps     above file converted to Postscript format
kbge.ai6     above file converted to Illustrator 6 format
kbge.ps      above file converted to a downloadable HP DesignJet 755CM
                 Postscript plot file format. Prints two 36" x 82" pages
kbge.pdf     kbge.ai6 converted to Acrobat .pdf format

kbgeav.eps   geologic map from an ArcView 3 layout.  Illustrator
                 could not parse this file
```

Map key:
```
kbleg.gra    map key in ARC/INFO ARCPLOT .gra format
kbleg.eps    above file converted to Postscript format
kbleg.ai6    above file converted to Illustrator 6 format
kbleg.ps     above file converted to a downloadable HP DesignJet 755CM
                 Postscript plot file format
kbleg.pdf    kbleg.ai6 converted to Acrobat .pdf format

kblegav.eps  map key from ArcView 3 layout
kblegav.ai6  above file converted to Illustrator 6 format
kblegav.ps   above file converted to HP DesignJet 755CM plot file
                 format
kblegav.pdf  kblegav.ai6 converted to Acrobat .pdf format
```

2) U.S. Geological Survey Digital Line Graph (DLG) Optional format (U.S. Geological Survey, 1986, 1987, and 1989).

3) Geologic Information Visualization (GIV) and Abacus format. The GIV software is included on the disc and is launched from a menu-driven DOS program. The Abacus browser, MAPVIEW, is also included on the disc.

CREATING THE DIGITAL PRODUCTS

Converting the King and Beikman paper map to digital format was undertaken to facilitate presentation and analysis of the map. Also, the digital version can be combined with other thematic layers (Phillips and others, 1993). Digital maps can be displayed at any scale or projection, whereas a paper map has a fixed scale and projection. However, the geologic map on this disc is not intended to be used at any scale more detailed than 1:2,500,000.
The linework was captured by hand digitizing as well as scanning and autovectorizing from the paper map and negatives. The digital map was assembled and edited in ARC/INFO on a State-by-State basis, which caused some edge-matching problems. The final mosaic was adjusted several times to correct for registration problems. At the time, a 13,000 polygon coverage severely taxed the capabilities of the available CPU.
Professional Paper 901 was scanned at 300 dots per inch on a LaCie scanner and Macintosh computer. The text image was converted to ASCII text with READ-IT! optical character recognition software. The figures were converted to TIFF (tag image file format) files and are displayed with Adobe Acrobat and HTML programs.

RESOLUTION

The GIV raster image is stored at 1-km resolution.   Both the raster and vector maps are intended for use at scales no more detailed than 1:2,500,000. The coastline coverage, "STATES", was taken from the 1:2,000,000 scale Digital Line Graph data (U.S. Geological Survey, 1987), generalized to 1 km.

CAUTIONS RELATING TO USE OF THE MAP

The users of the geologic map on this disc should respect the intentions of the compilers of the map and be aware of the map's limitations. The Geologic Map of the United States (King and Beikman, 1974b) is intended to be used at a scale of 1:2,500,000; it is not intended to be used at a more detailed scale. For instance, Colorado is about 10 inches wide at the published scale of the King and Beikman map.
Construction of a geologic map of an area as large and complex as the

conterminous United States requires a great deal of generalization. Geologic units shown on larger scale maps are combined into broader map units and their contacts are simplified to produce a pattern that is legible at the scale of publication. The process of generalization used in the compilation of the Geologic Map of the United States is described in PP901, King and Beikman (1974a, p. 20).

Furthermore, the Geologic Map of the United States is primarily a bedrock map, which depicts geologic materials present beneath the soil or relatively thin mantles of surficial deposits, not necessarily the surficial materials themselves. For example, the map does not depict the glacial deposits in the northern States, the widespread eolian deposits in the High Plains, and the high-level gravels that mantle older Tertiary and pre-Tertiary units in much of the Atlantic and Gulf Coastal Plains.

MAP PROJECTION

The GIV raster image is in the original map's Albers equal-area projection. The vector maps are unprojected in decimal degrees. Projection parameters for the original 1974 King and Beikman map follow:

projection	Albers equal-area
units	meters
first standard parallel	29.5°
second standard parallel	45.5°
central meridian	-96°
latitude of origin	23°

DATA DICTIONARY

The ARC/INFO version of the Geologic Map of the United States consists of four coverages:

1) kbge   - geology   12,800 polygons, 161 units plus water
2) kbf   - faults   three fault types and hidden contacts
3) kbleg   - legend   map key correlation chart
4) kbgl   - glacial   two line types, Wisconsin and older

The annotation in the legend coverage is present in 2 ways. The first way is an annotation subclass called "anno.sc". This text did not translate very well to ArcView so it was re-created in ArcView. The .gra, eps, ai6,and .pdf files were all created using the old "anno.sc" annotation.
The geology coverage has three line types:

1) contact   - border between rock units
2) metamor   - metamorphic division within a rock unit
3) split   - split in large polygons to improve fill

The fault coverage has four line types:

1) FAULT   - faults
2) DASH   - dashed faults
3) DOT   - dotted faults
4) CONTAC   - hidden rock unit contacts

DIFFERENCES FROM THE PUBLISHED PAPER MAP

The coverages on this disc differ in several ways from the original paper map. The county outlines, cities, drainage, and other base-map information are not present on the digital version except as overlays in MAPPER. Only the larger water bodies are included.

The larger geology polygons are split into several smaller polygons to avoid problems with color and pattern fill on screen plots and plotters. The maximum polygon size is 1476 vertices, which was the limit in older versions of PostScript. Most modern software has higher limits, so for most users, these polygons can dissolved back together using the "UNIT" and "METAMOR" fields.

The lookup tables KBCOLOR.LUT and KBPAT.LUT contain rock-unit code name in uppercase letters as well as the originally published mixed case. For instance:

TrPe	TRPE
Trg	TRG
Tri	TRI
lMze	LMZE
lMzv	LMZV
lPz	LPZ
lPze	LPZE
lTa	LTA

The uppercase code names were used during the editing process because an INFO sort in ARC/INFO is case sensitive and a tally of the unit names was much easier to use with all the unit names sorted alphabetically in one group rather than two. Note in the example above, the "L's" sort after the "T's" because lowercase "l" is higher in the ASCII code scheme. Current users of the map should be aware that the lookup tables are now sorted on the mixed-case code name so the unit names are appear in two groups, uppercase followed by lowercase. It may be useful or less confusing for some purposes to sort on the uppercase name. However, the ARCPLOT POLYGONSHADES command will not work correctly with the lookup tables sorted by the uppercase code name.

Longer rock-unit descriptions such as:

    Cretaceous granitic rocks
    Washita Group

are in the ROCKDESC column of the .PAT files. Some of the unit names have been modified to avoid ambiguity. The Pennsylvanian symbol is stored as "PP" in:

    PP
    PP1
    PP1a
    PP2
    PP3
    PP4

The Triassic symbol is stored as "Tr" in:

    JTr
    Tr
    TrPe
    Trv
    Tri
    Trg

The Cambrian symbol is stored as "C" in:

    C
    Cq
    OC
    Ce
    Cv
    Cg

Changes to the Paleozoic metamorphic complexes:

m1 is replaced with mm1 to avoid confusion with M1
m2 is replaced with mm2 to avoid confusion with M2
m3 is replaced with mm3 to avoid confusion with M3
m4 is replaced with mm4 for consistency

Metamorphic overlay:

On the original map, the metamorphic rocks are represented with a dot-pattern overprint on the parent rocks as well as unpatterned units. The authors state (King and Beikman, 1974a, p25) that the overprint pattern is not used for Precambrian rocks on the original map but Y1, Y2, and Z units are so patterned. For the purposes of this publication, the metamorhpic rocks are divided into three categories in the METAMOR column of the geology coverage described below. Select 'METAMOR' not equal to blank or "" to select all the metamorphic rocks.

METAMOR polygon column in KBGE:

blank   No metamorphism.
kparent   Metamorphic overlay for rocks with known parent-rock ages. These units are present on the map in both metamorphic and non-metamorphic states.
noparent Metamorphic rocks with unknown parent-rock ages. These units are metamorphic everywhere on the map. The protolith is uncertain. They are shown on the original map with the same stippled pattern as the overlay. Units ms, mm1, mm2, mm3, mm4.
nopat   These Precambrian units are metamorphic everywhere on the map but are shown without a stippled pattern on the original map. Units:
Ym   - paragneiss and schist
Ygn   - orthogneiss
Xm   - orthogneiss and paragneiss
Wgn   - orthogneiss and paragneiss.

DISC CONTENTS

```
1readme.doc   help file, Microsoft Word format
1readme.pdf   help file, Adobe Acrobat format
1readme.txt   help file, plain text
acrobat       directory containing Adobe Acrobat Reader installers
datafile      directory containing graphics files
   ARCVIEW      directory containing ArcView project and ARC/INFO
                  coverages
   DLG          files and instructions for geologic map in Digital Line
                  Graph (DLG) Optional format
   EXPORT       ARC/INFO Export format .e00 files
GIV           Geologic Information Visualization (GIV) directory
   2MIL         1:2,000,000 DLG data converted into GIV format
   MAP          directory containing .MAP files for 48 states, used by
                  MAPPER
   SOFTWARE     directory containing GIV executable programs
   TEXTFILS     directory containing GIV documentation
PP901         directory containing Professional Paper 901
```

DLG FORMAT

The digital geologic map of the conterminous United States is stored in Digital Line Graph (DLG) Optional format files. The geology and fault DLG coverages are stored in the following files:

kbge.dlg	geology
kbf.dlg	faults
kbcolor.comma	colors for Versatec plotter
kbpat.comma	patterns for Versatec plotter

The following instructions for converting DLG files to ARC/INFO coverages have been adapted from ARC/INFO manuals (Environmental Systems Research Institute, 1990):

1) Copy the kbcolor.comma and kbpat.comma files and the DLG files from the CD-ROM to the info directory; for instance, from a UNIX prompt:

```
cdrom in
cd info
cp /pdd/cdrom/software/dlg/kbcolor.comma .
cp /pdd/cdrom/software/dlg/kbpat.comma .
cd ..
cp /pdd/cdrom/software/dlg/kbge.dlg .
cp /pdd/cdrom/software/dlg/kbf.dlg .
cdrom out
```

2) Launch ARC/INFO and create a lookup table for the rock unit codes:

```
ARC
INFO
ARC
DEFINE KBCOLOR.LUT
 ITEM NAME>MAJOR1
 ITEM WIDTH>6
 ITEM OUTPUT WIDTH>6
 ITEM TYPE>I
     7
 ITEM NAME>CODE
 ITEM WIDTH>6
 ITEM OUTPUT WIDTH>6
 ITEM TYPE>C
    13
 ITEM NAME>CODELC
 ITEM WIDTH>6
 ITEM OUTPUT WIDTH>6
 ITEM TYPE>C
    19
 ITEM NAME>COLOR
 ITEM WIDTH>6
 ITEM OUTPUT WIDTH>6
 ITEM TYPE>I
    25
 ITEM NAME>
ADD FROM KBCOLOR.COMMA
```

```
DEFINE KBPAT.LUT
  ITEM NAME>CODE
  ITEM WIDTH>6
  ITEM OUTPUT WIDTH>6
  ITEM TYPE>C
       7
  ITEM NAME>PATTERN
  ITEM WIDTH>6
  ITEM OUTPUT WIDTH>6
  ITEM TYPE>I
      13
  ITEM NAME>
ADD FROM KBPAT.COMMA
Q STOP
```

3) Convert the geology DLG file to a coverage:

```
DLGARC OPTIONAL KBGE.DLG KBGE
BUILD KBGE
BUILD KBGE LINE
    Join the major1 item from KBGE.PCODE using the -ID as key
JOINITEM KBGE.PAT KBGE.PCODE KBGE.PAT KBGE-ID KBGE-ID
    Join the unit names and polygon colors from KBCOLOR.LUT
    using major1 key
JOINITEM KBGE.PAT KBCOLOR.LUT KBGE.PAT MAJOR1 MAJOR1
    Join major1 which contains the line type from KBGE.ACODE
JOINITEM KBGE.AAT KBGE.ACODE KBGE.AAT KBGE-ID KBGE-ID
```

4) Convert the fault DLG file to a coverage:

```
DLGARC OPTIONAL KBF.DLG KBF
BUILD KBF LINE
JOINITEM KBF.AAT KBF.ACODE KBF.AAT KBF-ID KBF-ID
```

GEOLOGIC INFORMATION VISUALIZATION (GIV) AND ABACUS MAPVIEW FOR DOS

The map is available in GIV and Abacus format for DOS computers. The GIV software on the disc includes a browser called MAPPER and other programs for creating GIS layers. GIV lacks graphic driver support for many modern PC's and laptops. For this reason, the Abacus browser, MAPVIEW, is also included on the disc. It supports most IBM/PC graphics cards and laptops but is only a browser, not an authoring program. A Windows launcher for MAPVIEW is evoked by selecting the MAPWIN.EXE application.


```
              GEOLOGIC INFORMATION VISUALIZATION (GIV) SOFTWARE

                 Instructions by Christine Cook and Paul Schruben

These instructions explain the GIV graphics software included on the
disc.  GIV is a both a geographic information system (GIS) as well as an
easy to use graphics browser.

To view the CD-ROM material, place the disc into the disc drive.
At the DOS prompt, type the drive letter followed by a colon and
then press return.  At the CD-ROM drive DOS prompt, type RUN
followed by return.  This mode of operation does not require any hard
disk space but executes slower than installed programs and does not
allow the user to save image files to disk.

DOS users who wish to save image files to disk should make the CD-ROM
drive the active drive; then type  INSTALL<RETURN>.  For   starts   after
installation,   type C:\DDS11<ENTER>.

Non-DOS users should copy and convert map files from the other available
graphics formats listed in the A_README.1ST file in the disc's root
directory.

After launch, DOS users see the following menu tree:

      MAIN MENU
    1 - View Raster Map
    2 - View Interactive Map, Entire U.S.
    3 - View Interactive Map, by State
    4 - MENU: View Software Documentation
          1 - VIEWLBL Documentation
          2 - MAPPER User Documentation
          3 - Raster Map Production
          4 - Return To MAIN MENU
    5 - Map Key (without colors)
    6 - Prof. Ppr. 901, King and Beikman
          To exit to DOS, press <Esc>

To activate a menu option, either move the highlight bar over
that option and press <Enter>, or type the corresponding number.

The display software was written by Russell A. Ambroziak and is
part of the Geologic Information Visualization (GIV) package.
```

The primary programs used are MAPPER, VIEWLBL, and RASTMAP. Option
1, View Raster Map, calls program VIEWLBL. Options 2 and 3 of the
Main Menu, View Interactive Map, call the program MAPPER, which
is mouse operated. RASTMAP is the program that created the
raster map in option 1.

Option 1, View Raster Map, uses program VIEWLBL, which is an image
viewer. You will see a list of 2 '.LBL' files appear after
invoking Option 1. Move the highlight bar over 'MAP.LBL' and
press <Enter> on the keyboard, or press the left mouse button.
You will see the subsampled display of an image of the digital
geologic map. With the keyboard, move the box around the image
and press <Enter>. The area of the image contained within that
box will be displayed at full resolution. The image was created
by RASTMAP and is viewed by VIEWLBL. VIEWLBL contains
functions for displaying and manipulating images; the VIEWLBL
documentation contains more information. To leave VIEWLBL, move
the bar to 'QUIT' and press the left mouse button. You will then
see the list of '.LBL' files. Hit <Esc> a couple of times to
return to the menu system.

Option 2, View Interactive Map, brings up the entire geologic map of the
conterminous 48 States of the United States. If you see the error
message, "Could not boot the board," then, either your video card is
configured for a setting other than 640 by 480 by 256 colors, or
the installed card is not one we currently support. In the
latter case, you will have to place one of the aforementioned
cards into your computer, properly configure it, and try the disc
again.

While looking at the geologic map of the United States, you will see a
menu along the top of the screen. This digital map is fully
interactive, and most of the functions of MAPPER will work
directly off the CD-ROM. The function 'save map' will not work
because a file cannot be written to the CD-ROM. In order to save a
map, you will have to copy the file 'MAPPER.EXE' onto your hard
disk and use the following command line:
     c:>mapper l:\giv
where 'c:>' is your hard disk, and 'l:' is the CD-ROM drive
letter.

The digital maps contained on this disc were created by MAPPER
and related programs; MAPPER is not only a visualization tool, it
is also a creation tool. Therefore, many of the functions in
MAPPER are designed for creating a digital map as well as
displaying it. For more information on how to use MAPPER, see
the MAPPER tutorial.

Option 3 is similar to Option 2 in that it runs MAPPER. However,
it shows the geology with the selected state centered on the screen.
After choosing Option 3, you will see a list of files, each containing
the State two-letter code. Move the highlight bar over a code,
and press the left mouse button, or the <Enter> key on the keyboard.
You will then see that portion of the digital map which contains
that State displayed in MAPPER. By choosing 'QUIT', you will be
returned to the list of States. Hit <Esc> a couple of times to
return to the menu system.

All the other menu options allow you to view documents about the disc, the data on the disc, acknowledgments, and so forth. The text files are ASCII files and can be printed using the DOS 'print' command or brought into a text editor. You are en-couraged to fill out the User Registration form found within the Technical Information menu.

CONTACTS FOR ADDITIONAL INFORMATION

Questions about the digital geologic map of the conterminous United States should be directed to the authors:

	Phone	FAX	Email
Paul Schruben	(703) 648-6142	6383	pschrube@usgs.gov
Walt Bawiec	(703) 648-6148	6383	wbawiec@usgs.gov

U.S. Geological Survey, 954 National Center, Reston, VA 22092-9998.

Copies of DDS-11 CD-ROM are available for $32 each from U.S. Geological Survey, Map Distribution, Box 25286, Building 810, Federal Center, Denver, CO 80225.

The original 1974 publication of the Geologic Map of the United States is available as three color sheets numbered IA10-1, 2, and 3 for $4 per sheet from:
  U.S. Geological Survey Map Distribution
  Box 25286, Building 810
  Federal Center, Denver, CO 80225
Tel: 1-888-ASK-USGS
http://mapping.usgs.gov/esic/to_order.html

The ESIC help line can also supply maps. Telephone 1-888-ASK-USGS.

REFERENCES CITED

Environmental Systems Research Institute, Inc., 1990, ARC/INFO 5.0 User
Manuals: Redlands, CA.

King, Philip B., and Beikman, Helen M., 1974a, Explanatory text to accompany
the geologic map of the United States: U.S. Geological Survey Professional
Paper 901, 40 p.

King, Philip B., and Beikman, Helen M., 1974b, Geologic map of the United
States (exclusive of Alaska and Hawaii) on a scale of 1:2,500,000: U.S.
Geological Survey, 3 color plates.

Phillips, J.D., Duval, J.S., and Ambroziak, R.A., 1993, National geophysical
data grids: Gamma-ray, gravity, magnetic, and topographic data for the
conterminous United States: U.S. Geological Survey Digital Data Series
DDS-9, 1 CD-ROM.

U.S. Geological Survey, 1986, Digital line graphs from 1:24,000-scale maps:
U.S. Geological Survey US GeoData Data Users Guide 1, 109 p.

U.S. Geological Survey, 1987, Digital line graphs from 1:2,000,000-scale maps:
U.S. Geological Survey US GeoData Data Users Guide 3, 71 p.

U.S. Geological Survey, 1989, Digital line graphs from 1:100,000-scale maps:
U.S. Geological Survey US GeoData Data Users Guide 2, 88 p.

ACKNOWLEDGMENTS

The following people have contributed to Release 2:
        Lorri A. Peltz-lewis - corrections to the polygon tags in the map
        David Traudt - HTML web version of PP901, CD mastering

USER REGISTRATION

By providing the address information below, you will be
placed on the U.S. Geological Survey's mailing list (at no cost
to you) for periodical issues of "New Publications of the U.S.
Geological Survey." Announcements of new CD-ROM releases will be
made through this publication.

```
-------------------------------------------------------------
User name(s)

-------------------------------------------------------------
Address (Line 1)

-------------------------------------------------------------
Address (Line 2)

-------------------------------------------------------------
City                            State        ZIPCODE

-------------------------------------------------------------
Phone Number (Optional)
```

Please return this registration form to:

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> Reston, VA 22092-9998

Thank you for your interest.

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