The original objective of this project was to develop a powerful and user friendly soils database using data collected by the Alaska Department of Transportation and Public Facilities (AKDOT&PF). We proposed using a Geographical Information System (GIS) as the reflective tool to manage the soils data. A GIS allows taking existing CAD maps and drawings as well as alphanumeric data and placing it in an integrated database management environment. However most GIS software requires learning new commands and operating procedures. Therefore, we chose to use software that is already being used within AKDOT&PF. We were able to accomplish this since AutoCAD release 12 has links to several possible relational database software packages (dBase II, dBase III, dBase IV, Paradox, etc.). The GIS developed in this project uses AutoCAD release 12 for Windows with Paradox storing alphanumeric files in dBase III format. This GIS is much more than just a soils database but rather a complete system for storing and retrieving any AKDOT&PF project information which can be referenced to a spatial coordinate system.

There have been two primary considerations during this project:
1. Keep it simple - both in terms of the implementation and operation.
2. Coordinate with AKDOT&PF users and managers to develop a useful system which meets the needs of AKDOT&PF.

We feel that we have accomplished all objectives.
DEVELOPMENT OF A POWERFUL AND USER FRIENDLY SOILS DATABASE

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DISCLAIMER

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ABSTRACT

The original objective of this project was to develop a powerful and user friendly soils database using data collected by the Alaska Department of Transportation and Public Facilities (AKDOT&PF). We proposed using a Geographical Information System (GIS) as the reflective tool to manage the soils data. A GIS allows taking existing CAD maps and drawings as well as alphanumeric data and placing it in an integrated database management environment. However most GIS software requires learning new commands and operating procedures. Therefore, we chose to use software that is already being used within AKDOT&PF. We were able to accomplish this since AutoCAD release 12 has links to several possible relational database software packages (dBase II, dBase III, dBase IV, Paradox, etc.). The GIS developed in this project uses AutoCAD release 12 for Windows with Paradox storing alphanumeric files in dBase III format. This GIS is much more than just a soils database but rather a complete system for storing and retrieving any AKDOT&PF project information which can be referenced to a spatial coordinate system.

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1. PRESENT SYSTEM

1.1. BACKGROUND

The Alaska Department of Transportation and Public Facilities (AKDOT&PF) has gathered a large amount of soils data from the many bridge and road construction projects as well as information on material borrow sites. This information is stored in files throughout the state. We were selected to investigate the possibility of establishing a user friendly yet powerful computer based soils database. Therefore, the present method of storing soils information was analyzed as to the content, filing and retrieval. In effect there are two different methods of data storage: paper reports and CAD (computer aided design) magnetic files. Each method will be investigated in this report.

1.2. CONTENT

1.2.1. Paper Reports

Soils information has been collected on most bridges and many roadwayys within the state. These typically include test hole logs, penetrometer records, casing blow counts soil type and pile driving records. The information is normally contained in two main reports - Material Site Report and the Engineering Geology & Soils Report.

Material Site Report

A typical Material Site Report usually consists of the following:
- Project Name - includes name of highway and the section of roadway (i.e., mileposts or older projects included names - Richardson Highway: Sheep Creek to Thompson Pass)
- State Project Number - (some older projects only have federal numbers)
- Federal Project Number
- Location Map
- Introduction
- A variety of text information sections depending on project and conditions, for example:
  - Geology and Topography
  - Climatology
  - General Materials Source Information
General Recommendations
Location and Access
Description
Ground Water and Frozen Ground
Clearing and Stripping
Station to Station Descriptions
Comments

Centerline Soil Data Sheets - consisting of the following:
  Project Name
  State Project Number
  Federal Project Number
  Sampled By
  Material Site
  Station
  Offset
  Depth
  Test Hole Number
  Field Number
  Laboratory Number
  Estimated Percent +10"
  Estimated Percent +3"
  Percent Passing 3"
  Percent Passing 2"
  Percent Passing 1"
  Percent Passing 3/4"
  Percent Passing 1/2"
  Percent Passing #4
  Percent Passing #10
  Percent Passing #40
  Percent Passing #50
  Percent Passing #200
  Percent Passing .02mm
  Percent Passing .005mm
  Liquid Limit
  Plastic Index
  AASHO Class
  F.S.V.
  Specific Gravity, Fine
  Nat. Moisture Percent
  Other Information Deemed Important (e.g., Sodium Sulfate)

Centerline Soils and Profile Sheets
Engineering Geology & Soils Report

A typical Engineering Geology & Soils Report usually consists of the following:

- **Project Name** - includes name and location of the bridge (i.e., milepost or older projects included names - Gulkana River Bridge No. 754)
- **State Project Number** - (some older projects only have federal numbers)
- **Federal Project Number**
- **Location Map**
- **Introduction**

A variety of text information sections depending on project and conditions, for example:

- **Description**
- **Field Studies**
- **Laboratory Testing**
- **Site Conditions**

**Summary of Test Data - Foundation Soils** consisting of the following:

- **State Project Number**
- **Federal Project Number**
- **Project Name**
- **Boring Number**
- **Depth**
- **Laboratory Number**
- **Percent Passing Gravel 1”**
- **Percent Passing Gravel 3/8”**
- **Percent Passing Gravel #4**
- **Percent Passing Sand #10**
- **Percent Passing Sand #40**
- **Percent Passing Silt #200**
- **Percent Passing Silt .02mm**
- **Percent Passing Clay .005mm**
- **Liquid Limit**
- **Plastic Index**
- **Nat. Dry Density P.C.F.**
- **Nat. Moisture Percent**
- **Specific Gravity, Fine**
- **F.S.V.**
- **AASHO Class**
Other Information Deemed Important (e.g., type of sampler used)

- Triaxial Compression Test
- Unconfined Compression Test
- Consolidation Test
- Log of Test Borings

Additional information may be part of reports or stand alone data that is added to a project folder. Some of this is due to advances in technology that provide new or different information. Examples of additional information include

- Pile Driving Record
- Dynamic Pile Measurements of Test Piles
- Wave Equation Analysis

1.2.2. CAD Magnetic Files

A large portion of all soils information is contained in drawings. For the last few years CAD systems have been used by AKDOT&PF to produce and store the drawings. The most recent CAD system (and the one that has become an industry standard by engineering and construction firms) is AutoCAD. These files include the following portions of the above mentioned reports.

- Location Map
- Centerline Soils and Profile Sheets
- Centerline Seismic Data Sheets
- Log of Test Borings
- Some Material Borrow Sites Information

1.3. FILING

1.3.1. Paper Reports

The paper reports are filed in a system that is based on the highway name as the primary sort criteria. The beginning mile post of a project is the secondary sort criteria. The federal number that is assigned to a project is based on the highway number assigned by the federal government.

1.3.2. CAD Magnetic Files

All CAD files that we investigated were filed by the state project number. The CAD files that we investigated were all AutoCAD files.
1.4. RETRIEVAL

1.4.1. Paper Reports

When personnel are locating files, they use geographic information of the project since the highway name and first milepost are the primary and secondary filing criteria. To see if more than one project has been done on a particular location, personnel must check adjoining files to see if there is overlap or redundancy. The intersections of two highways and associated structures (e.g., the interchange between the Richardson Highway and the Mitchell Expressway) would seem to be an area where things could be missed (for example: if an interchange was built under one highway name and work was being considered for the other highway). Also, there is concern that there are certain ambiguities in the names and numbers (e.g., the Richardson Highway between Fairbanks and Delta is considered part of the Alaskan Highway by the federal numbering system and the Richardson Highway - Mitchell Expressway interchange is named as the Parks Highway - Richardson Highway). The efficiency of the present system relies heavily upon the experience and knowledge of the user.

1.4.2. CAD Magnetic Files

There is no way of retrieving appropriate CAD files without knowing the pertinent state project number.

1.5. ANALYSIS OF PRESENT SYSTEM

The investigators believe as the road systems for Alaska become more complicated and there is change of personnel with associated loss of historical knowledge, there is a greater chance of missing a relevant project and thus possible costly redundancies in soils data collection and analyses. A system is needed that directs the user to the appropriate reports. This system should make it equally easy to retrieve the correct CAD files as well as project information. One central master file should be used for all files so when a change is made everyone accessing the data will have the correct information. We feel this system should be computer based, taking advantage of the already installed network in AKDOT&PF. A graphical front end to data access would make the system user friendly. The software to accomplish this already exists in AutoCAD R12, which is being used by AKDOT&PF.
2. PROPOSED SYSTEM

2.1. BACKGROUND

This section of the report will have the same format as the section on the present system. This should allow for easier comparisons between the present database system and the geographical database system that has been developed.

2.2. CONTENT

The geographical database system that we have developed will accommodate all the information that is contained in all paper reports and CAD magnetic files. The range and comprehensives of historical data that is to be included will be a decision that requires the input from all users of the present database. However, we believe that the minimum amount of information which should be included is the geographic position and report identifier (i.e. project number) of every project performed for or by AKDOT&PF.

2.3. FILING

The geographical database should be located on a server that can be accessed through the AKDOT&PF statewide computer network. The method that has been used for the CAD (Computer Aided Drafting) files (i.e., files are stored in subdirectories named the state project number) should prove to be adequate. Sort criteria is not critical as the new database has multiple methods for viewing and analyzing the data.

2.4. RETRIEVAL

There will be multiple ways of retrieving the data, however one scenario could be an engineer seeking soils data for a portion of a road that needs to be modified. The highest level of the geographic database hierarchical system is a map of Alaska with all roadways. The engineer would then “zoom in on” (or enlarge) the area of interest. The state project numbers and corresponding color representation of affected area would now be visible. The engineer would then point and click the mouse on the project number of interest. A map of the project would then be displayed. Again the engineer could zoom in on any portion of the area of interest, pointing and clicking on
the appropriate detailed drawing number. This will display a plan drawing of the roadway for the area of interest and cross sectional drawings of the soil types with laboratory analysis number for each bore hole. Pointing and clicking on the bore hole number will access an alpha numeric database which contains the information from the present soils testing report analyses sheets. This information can also be displayed using the simple point and click procedure.

This is one demonstration of how someone with only the knowledge of a general geographic location for a project can obtain detailed information on a soil analysis. The engineer is not required to understand the complexities of project numbering systems or the possibility of reports being misfiled. Also, the person would not be faced with the possibility of not receiving the latest report at a certain office since all offices would be using one centralized database.

2.5 ANALYSIS OF THE PROPOSED SYSTEM

1. As a minimum implementation of the geographic database system, all projects should be incorporated at the highest level (estimates of approximately 15 minutes per project to properly enter this information). With this implemented, a person could at least determine the projects of interest (with their names, locations and reference numbers) and use existing paper reports to provide data. Pre-ACAD (older) projects could be included at other levels depending on their importance and the relevance of information they provide (scanning of original paper reports is a possibility - costs to scan and vectorize a typical drawing are about $35/sheet). Projects which include ACAD drawings should be placed in all levels (time estimate for this level of incorporation would be approximately another 15 minutes).

2. One part of the present project reports that has not been included in the geographic database system is the text of the report (with photographs). The geographic system can easily handle this information and new projects should include all text information. This will be much easier to incorporate if format and word processing software can be agreed upon within AKDOT&PF and contractors who prepare reports for AKDOT&PF.

3. The present ACAD drawings (that we have investigated) do not have a consistent coordinate system for maps. AKDOT&PF should use a standard coordinate system for all maps - with GPS (Global Positioning Systems) it should be accurate and inexpensive. This will allow information to be drawn more easily from several reports when forming queries about the data.
4. Soil laboratory analyses should be placed into an alpha/numerical database as part of the laboratory reporting process. As with word processing software, the alpha/numeric database software should be standardized throughout AKDOT&PF offices.

5. End user training can be completed in less than an hour. While the training for personnel who will be entering and maintaining the geographic database system should be less than twenty hours. AKDOT&PF should identify the centralized file server and personnel that will be responsible for the geographic database system so that the software can be installed and the training can be given.
3. IMPLEMENTING PROPOSED SYSTEM

3.1. BACKGROUND

The previous sections report on the present and proposed database systems. The contents, filing and retrieval methods of the data were discussed. Deficiencies were identified throughout and solutions were suggested in the Analysis part of the sections.

This section will address how the various databases can be linked and how sample queries can be generated.

3.2. DATABASES

There are two basic types of databases in the proposed system: geographic and alpha/numeric attribute data. Generally speaking, the geographic data are contained in AutoCAD files and the alpha/numeric data are contained in Paradox files. There are some exceptions (e.g., site or field notes describing project site) but over 95% of all data are contained in these two file types. Access to the non database information will be provided but the main thrust of this section is accessing databases.

The AutoCAD SQL Extension (ASE) allows users to access and manipulate non graphic data stored in external databases. You can perform these manipulations directly from within the AutoCAD program. Since AKD&PF uses AutoCAD presently, this graphical interface was selected to handle both geographic and alpha/numeric data.

The ASE is available in AutoCAD Release 12. Previous release of AutoCAD provided graphic/nongraphic association through attributes, entity handles, and extended entity data; these methods continue to be supported in Release 12. The ASE facility, however, provides direct access from within AutoCAD to external database management systems (DBMS). The DBMS system that we have chosen is Paradox. ASE provides the same command set regardless of the database in use.

SQL is an abbreviation for Structured Query Language. Many commercial and proprietary DBMS languages have been developed to interact with relational databases. SQL was designed to replace these with a standard language applicable across multiple platforms.

At this time, connections have been established between the boreholes in project
drawings and data from the laboratories on the specific borehole. Other connections between objects in the drawings and data in a database can be established as needs are identified and AKDOT&PF resources can be allocated. Our intent is to demonstrate the method and to train appropriate personnel. Then AKDOT&PF will be able to select the objects in the drawings to associate with data in the databases.

3.3. LINKING

To access data from a nongraphic DBMS from inside an AutoCAD drawing, commands (software) must be developed to provide the necessary links. ASE provides a command set that provides users with access and allows them to manipulate data in external databases from within AutoCAD, with or without using SQL syntax. Also the commands allow object selection based on both graphic and nongraphic data. As ASE is implemented into the AKDOT&PF soil databases, displayable attributes (text entities that display data values in linked, nongraphic databases) can be updated automatically if data changes. Because of the flexibility of ASE, there are no restrictions on the type, amount of data, or organization of databases beyond those of SQL and the DBMS.

But because of its flexibility and power, ASE commands are not intuitive. Attached (in Appendix A) are the listings to link two projects (both graphical and borehole laboratory analyses DBMS) to an AutoCAD drawing with a map of Alaska. Also attached are listings of AutoCAD LISP programs to simplify the interface for the end user. During the training session for the implementation of the geographic database system, a large portion of the time will be devoted to ASE commands as well as DBMS implementation and design. The end user will never need to have an understanding of ASE commands and the database manager will only edit the existing ASE programs to fit some specialized data processing need.

3.4. QUERIES

Once the links between AutoCAD entities and external data have been created, the links can be used for a variety of purposes. The simplest and most common use of external data is viewing it along with the graphics. Another use is editing an entity’s attributes from within AutoCAD. To perform either of these queries, ASE commands are needed (or associated AutoCAD LISP commands). Once the simple program steps are understood, AKDOT&PF personnel can easily adapt query screens for the end user ease of use.
3.5. ANALYSIS

1. The implementation of the geographic database system will greatly simplify obtaining soils information for the end user. Little information other than a general area within the state will be needed to select specific information from previous AKDOT&PF projects.

2. Selected AKDOT&PF personnel must understand the structure and design of the geographic database system so that data can be added and maintained. The training that we will perform will provide the basics of the system. AKDOT&PF personnel selected to maintain the data must understand AutoCAD, relational databases, and programming.
4. SUMMARY AND CONCLUSIONS

4.1. BACKGROUND

This section of the report will address the presentations made to AKDOT&PF personnel and the work accomplished based on their feedback.

4.2. PRESENTATIONS

On April 6, 1994, a presentation was made for the following AKDOT&PF personnel at the University of Alaska Fairbanks, School of Engineering:

Tony Barter
Gary Brazo
Keith Korri
Paul Misterek
Robert McHattie
Mike Wassmann
Maureen Lee
Monte Weaver

The demonstration was made using AutoCAD release 12 for DOS and covered the capabilities of the system while illustrating the mechanics of using the system.

The main concerns of the personnel that could be addressed by the present funding were:

1. Putting the database into the AutoCAD release 12 for Windows environment rather than the AutoCAD release 12 for DOS;

2. Allowing for working backwards through the links for additional queries;

3. Using a base map that uses latitude/longitude for the coordinate system with the understanding that new projects would all use latitude/longitude coordinate system.

On May 18, 1994, a presentation using AutoCAD release 12 for Windows was made for David Esch of AKDOT&PF and Steve Boch of FHWA.

A presentation was also made on April 7, 1994 for the American Water Resources
4.3. COMPLETED WORK

The database has now been completely placed in the AutoCAD release 12 for Windows environment. The changes to the AutoLISP routines were much smaller than anticipated; the only changes made were cosmetic. The revised AutoLISP routines and associated DCL files are attached in the Appendix (disks with all files were sent to AKDOT&PF with the Draft Final Report in May 1994). The main changes are contained in the ACAD.MNU and ACADR12.LSP files which provide additional commands to the pull down menus of AutoCAD release 12 for Windows. The largest change is the file format for Paradox (alphanumeric relational database) files. AutoCAD release 12 for Windows could not link properly with the standard Paradox file format. After contacting AutoDesk (AutoCAD developers), it was determined that placing the files in dBase III format would allow for proper linking. Only a small change is required in Paradox and is invisible to the end user. The change was made and every function works properly.

The second concern of backward progression through drawings was solved once the database was placed in the AutoCAD release 12 for Windows environment. Zooming and selecting previous drawings has been greatly simplified and we feel that this is no longer a concern. Future presentations will demonstrate this capability.

The task of obtaining a digitized base map using latitude/longitude coordinate system has not been completed. We contacted USGS, the Geophysical Institute of the University of Alaska Fairbanks, and DNR. All had digitized maps but each lacks certain features. We discussed this with Mr. David Esch (AKDOT&PF) during the May 18, 1994 demonstration. Mr. Esch suggested contacting Mr. Leo Lutchansky (AKDOT&PF). Mr. Lutchansky stated that a suitable base map does not exist but has been identified as a State of Alaska need. The need has progressed so that funds have been allocated and the Governor has made a request to USGS to create such a map. Mr. Lutchansky stated that the earliest such a map would be available will be the fall of 1996. He also suggested that we contact Mr. Shepard who is working on a similar project for the Division of Emergency Services.

We contacted Mr. Shepard who confirmed that he knows of no digitized base map using the latitude/longitude coordinate system for Alaska. He has approximately 8 percent of the state into digitized maps but they are not continuous and he doubts if they would be of much use for our purpose. He also suggested that the DNR maps should be carefully analyzed as he has found some errors.
4.4. ANALYSIS AND FUTURE WORK:

1. The implementation of the AutoCAD release 12 for Windows geographic database system will greatly simplify obtaining soils and project information for the end user. Little information other than a general area within the state will be needed to identify and locate specific information from previous AKDOT&PF projects. If used for no other purpose than locating project and project numbers, the system should provide a very attractive Cost/Benefit ratio by saving time for the end users. It will also provide an easy front end for more public access to AKDOT&PF project information.

2. Selected AKDOT&PF personnel must understand the structure and design of the geographic database system so that data can be added and maintained. AKDOT&PF personnel selected to maintain the data must understand AutoCAD, relational databases, and programming.

3. The need for a digitized, accurate base map with latitude/longitude as the coordinate system still exists and has been identified as a priority by many divisions within AKDOT&PF and other state agencies. Once the map is developed, it can easily be implemented as the base map for the GIS.

4. Additional demonstrations and training are possible by the authors, however, additional funds must be allocated for these activities.
APPENDIX
AKMAP.LSP

(defun c:akmap()
  (if (not (equal (getvar "dbmod") 0))
      (command "open" "y" "/acadwin/support/akmap.dwg")
      (command "open" "/acadwin/support/akmap.dwg"))
)

PROJECT.LSP

;; This AutoCAD LISP program is to use menu
;; Using Box to get different projects
(defun do_help(cmd)
  (if (= (type acad_helpdlg) 'EXSUBR)
      (acad_helpdlg "acad.hip" cmd)
      (alert "Help dialogue not found")
    )
  (princ)
)

;; This function is to get project name
(defun do pname()
  (setq pname (strcase (get_tile "pname")))
)

;; Main function
;; Using box to select the project you want to see
(defun c:project/pname()
  (if ( < (setq dcl_id (load_dialog "project.dcl")) 0) (exit))
    (setq what_next 5)
    (if (not (new_dialog "project" dcl_id)) (exit))
    (action_tile "pname" "(do_pname)"
    (action_tile "sel_pro" "(done_dialog 3)"
    (action_tile "accept" "(done_dialog 1)"
    (action_tile "cancel!" "(done_dialog 0)"
    (action_tile "help" "(do_help \"line\\")"
    (setq what_next (start_dialog))
    (unload_dialog dcl_id)
    (if (= what_next 3)
        (progn
          (setq ss (ssget)))

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(setq ename (ssname ss 0))
(setq ed (entget ename ))
(setq ed0 (assoc 1 ed))
(setq pname0 (cadr ed0))
(setq pname (substr pname0 1 7))
)
)
(setq pnamep "/acadwin/support/")
(setq pnameq (strcat pnamep pname))
(if (not (equal (getvar "dbmod") 0))
(command "open" "y" pnameq)
(command "open" pnameq)
)
)

PROJECT.DCL

dcl_settings : default_dcl_settings {audit_level = 0;}

project : dialog {
  label = /*MSG1*/"Select Project";
  : row {
    : edit_box {
      label = /*MSG2*/"Project Name:";
      mnemonic = /*MAG3*/"B";
      key = "pname";
      edit_width = 20;
      edit_limit = 31;
    }
  }
  :row {
    spacer_1;
    alignment = centered;
    : button {
      label = /*MSG45*/"Select Project ...";
      mnemonic = /*MSG47*/"S";
      width =30;
      alignment = centered;
key = "sel_pro";
}

 sentencing;
 sentencing;
 ok_cancel_help_errtile;
}

SLHOLE.LST

;; This AutoCAD LISP program is to use menu
;; Using Box to get different projects
(defun do_help( cmd)
  (if (= (type acad_helpdlg) 'EXSUBR)
    (acad_helpdlg "acad.hlp" cmd)
    (alert "Help dialogue not found")
  )
  (princ)
)

;; This function is to get project name
(defun do_pname()
  (setq pname (strcase (get_tile "pname")))
)

;; Main function
;; Using box to select the project you want to see
(defun c:shole(/ pname )
  (setq pname "")
  (if ( < (setq dcl_id (load_dialog "slhole.dcl")) 0) (exit))
  (setq what_next 5)
  (if (not (new_dialog "shole" dcl_id)) (exit))
  (action_tile "pname" "(do_pname)"
  (action_tile "sel_pro" "(done_dialog 3)"
  (action_tile "accept" "(done_dialog 1)"
  (action_tile "cancel" "(done_dialog 0)"
  (action_tile "help" "(do_help "line\")"
  (setq what_next (start_dialog))
  (unload_dialog dcl_id)
  (if ( = what_next 3)
   (progn

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(setq ss (ssget))
(setq ename (ssname ss 0))
(setq ed (entget ename))
(setq ed0 (assoc 1 ed))
(setq pname (cdr ed0))
)
(setq name1 "63538")
(setq name0 "65197")
(setq pname (substr pname 1 5))
(if (= pname name0)
  (progn
    (setq pname "/mnt/th/65197/"
    (setq p0name (strcat ppname pname))
  )
  )
(if (= pname name1)
  (progn
    (setq pname "/dott/63538/"
    (setq p0name (strcat ppname pname))
  )
  )
(if (not (equal (getvar "dbmod") 0))
(command "open" "y" p0name)
(command "open" p0name)
)
)

---

SLHOLE.DCL

dcl_settings : default_dcl_settings {audit_level = 0;}

slhole : dialog {
  label = "/"MSG1"/"Select Position";
  row {
    : edit_box {
      label = "/"MSG2"/"Position No.;
      mnemonic = "/"MAG3"/"B";
    }
  }
}
key = "pname";
edit_width = 20;
edit_limit = 31;

}
}
:row {
  spacer_1;
  alignment = centered;
  : button {
    label = /*MSG45*/"Select Position No. ...";
    mnemonic = /*MSG47*/"S";
    width =30;
    alignment = centered;
    key = "sel_pro";
  }
}
}
space;
space;
ok_cancel_help_errtile;

--

LINKDOT.LSP

;; This AutoCAD LISP program is to use menu
;; Using Box to get different samples and link the DOT database
(defun do_help( cmd)
  (if (= (type acad_helpdlg) 'EXSUBR)
    (acad_helpdlg "acad.hlp" cmd)
    (alert "Help dialogue not found")
  )
  (princ)
)

;; This function is to get samples number
(defun do_hname()
  (setq hname (strcase (get_tile "hname")))
)

;;Main function
;;Using box to select the samples database you want to see
(defun c:linkdot(/ hname )

20
(if ( < ( setq dcl_id (load_dialog "linkdot.dcl")) 0) (exit))
(setq what_next 5)
(if (not (new_dialog "linkdot" dcl_id)) (exit))
(action_tile "hname" "(do_hname)"
(action_tile "sel_pro" "(done_dialog 3)"
(action_tile "accept" "(done_dialog 1)"
(action_tile "cancel" "(done_dialog 0)"
(action_tile "help" "(do_help \"line\")")
(setq what_next (start_dialog))
(unload_dialog dcl_id)
(if ( = what_next 0) (exit))
(if ( = what_next 3)
  (progn
    (setq ss (ssget))
    (setq etype (ssname ss 0))
    (setq ed (entget etype ))
    (setq ed0 (assoc 1 ed))
    (setq pname0 (cdr ed0))
    (setq na0 (strlen pname0))
    (setq na1 (- na0 13))
    (setq qq (substr pname0 na1))
    (if (/= 83 (ascii qq))
      (progn
        (setq na2 (- na0 14))
        (setq qq (substr pname0 na2))
      )
    )
    (setq hname (substr qq 8))
  )
)
(xload "ase")
(load "ase")
(c:aseinit)
(c:asesetdbms "DBASE3")
(c:asesetdb "setdot" "dot" "dot")
(c:asesettable "soil01" "labnumber" "")
(c:asesetrow "k" hname)
(textscr)
(c:aseviewrow)
(prompt "")
(prompt "Change to graph screen <return>:")

21
(setq yun (getstring))
(if (= yun "") (setq zx (graphscr)))
)

LINKDOT.DCL

dcl_settings : default_dcl_settings {audit_level = 0;}

linkdot : dialog {
  label = /*MSG1*/"Select Sample";
  : row {
    : edit_box {
      label = /*MSG2*/"Sample Number:";
      mnemonic = /*MAG3*/"B";
      key = "hname";
      edit_width = 20;
      edit_limit = 31;
    }
  }
  :row {
    spacer_1;
    alignment = centered;
    : button {
      label = /*MSG4*/"Select Sample No. ...";
      mnemonic = /*MSG4*/"S";
      width =30;
      alignment = centered;
      key = "sel_pro";
    }
  }
  spacer;
  spacer;
  ok_cancel_help_errtile;
}

_
ACADR12.LSP

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;;; Version 1.0 for Release 12 Windows (2/1/93)

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;;; Note: This file is loaded automatically by ACAD.MNL at the start
;;; of each editing session. It establishes an autoloader and
;;; other utility functions.

;;;;=== General Utility Functions ===

(defun *merr* (msg)
  (setq *error* m:err m:err nil)
  (princ)
)

(defun *merrmsg* (msg)
  (princ msg)
  (setq *error* m:err m:err nil)
  (princ)
)

;;;;=== AME and Region Modeler Functions ===

(defun ai_setup (len area lu mass vol)
  (setq m:err *error* *error* *merrmsg*)
  (ai_loadame)
  (if SOLUNION
      (progn
        (sollength len)
      )
    )
)
(solareau area)
(setvar "lunits" lu)
(princ "nLength unit is set to ")(princ len)(princ ". "
(princ "Area unit is set to ")(princ area)(princ ".\n")
(if SOLBOX
  (progn
    (solmass mass) ;don't ask for regions
    (solvolume vol) ;don't ask for regions
    (princ "Mass unit is set to ")(princ mass)(princ ". "
    (princ "Volume unit is set to ")(princ vol)(princ ".\n")
  )
)
(c:soldisplay)
(c:solwdens)
)
(setq *error* m:err m:err nil)
(princ)
)

(defun ai_upgvar ()
  (setq m:err *error* *error* *merrmsg*)
  (ai_loadame)
  (if SOLUTION
    (progn
      (solhangle 45)
      (solhpat "U")
      (solsolidify 3)
      (princ "nVariables Upgraded. Objects will be automatically solidified.")
    )
  )
  (setq *error* m:err m:err nil)
  (princ)
)

(defun ai_upgprec ()
  (setq m:err *error* *error* *merrmsg*)
  (ai_loadame)
  (if SOLUTION
    (progn
      (solupgrade 1)
(solpurge "bfile")
(princ "\nAME R1 solids will be converted to Double Precision."
)
)
(setq *error* m:err m:err nil)
(princ
)
)
(defun ai_scrcomp ()
(setq m:err *error* *error* *merrmsg*)
(ai_loadame)
(if SOLUNION
 (progn
 (solamecomp "ame1")
 (princ "\nScript compatibility set to AME R1."
)
)
)
(setq *error* m:err m:err nil)
(princ)
)
)
(defun ai_loadame ()
(setq m:err *error* *error* *merrmsg*)
(if (not SOLUNION)
 (if (or (findfile "region.exp") (findfile "region.exe") (findfile "region"))
  (_autoxload "region")
  (_autoxload "ame")
)
)
(setq *error* m:err m:err nil)
(princ)
)
)
(defun ai_unloadame ()
(setq m:err *error* *error* *merrmsg*)
(if (xunload "ame" nil)
 (progn
 (ai_aloadame)
 (princ "$\nAME unloaded.$")
)
)}
(if (xunload "region" nil)
  (progn
    (autoxload "region" "("solidify" "solint" "solsub" "solunion" "solarea"
      "solmove" "solchp" "solsep" "sollist" "solmassp"
      "sollength" "solvar" "solmesh" "solwire" "solfeat"
      "solwdens" "solucs" "solpurge" "ddsolve"
      "ddsolmassp" "solamever" "solareau" "solaxcol"
      "soldelent" "soidisplay" "solhangle" "solhpail"
      "solhsize" "sollength" "solpagelen" "solrender"
      "solservmsg" "solsolidify" "solmatcurr")
    )
    (if (or (findfile "ame.exp") (findfile "ame.exe") (findfile "ame"))
      (ai_amegrey "")
    )
    (princ "\nRegion unloaded.\n")
  )
)
(menucmd "S=X")
(menucmd "S=S")
(setq *error* m:err m:err nil)
(princ)
)

(defun ai_select (/ load)
  (setq m:err *error* *error* *merrmsg*)
  (if (and
      (or (findfile "ame.exp") (findfile "ame.exe") (findfile "ame"))
      (or (findfile "region.exp") (findfile "region.exe") (findfile "region"))
    )
    (progn
      (princ "\nNo modeler is loaded yet. \n")
      (princ "Both AME and Region Modeler are available. \n")
      (initget "Ame Region")
      (setq load (getkeyword "\nAutoload Region/<AME>: 
")
      (if (= load "Region")
        (setq app "region")
        (setq app "ame")
      )
    )
  )
  (setq *error* m:err m:err nil)

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(princ)
)

;;;; AI_AMEGREY is used to enable/disable the items in the "Model" (POP10) pulldown menu, based on whether AME or the Region Modeler has been loaded. If you move "Model" to a different pulldown menu or add items to it, adjust the "base" value and/or the menu-item number list accordingly.

(defun ai_amegrey (action / base)
  (setq base (list "P10" 0)) ; Identify top of "Model" menu
  (foreach a '(1 2 4 13 15 16 27 28 33 35 36 44 45 47 50 51)
    (menucmd (strcat (car base) "." (itoa (+ (cadr base) a)) ",=" action)))
  (if (= action "~") (setq ai_isamegrey T) (setq ai_isamegrey nil))
)

(defun ai_aloadame (/ exist_reg)
  (setq ai_isamegrey nil)
  (if (null c:solunion)
    (progn
      (setq m:err "error* "error* "merrmsg")
      (if (or (findfile "region.exp") (findfile "region.exe") (findfile "region"))
        (progn
          (setq exist_reg "yes")
          (autoxload "region" ":solidify" ":solint" ":solsub" ":solunion" ":solarea" ":solvmove" ":solchp" ":solfep" ":sollist" ":solmassp" ":sollength" ":solvar" ":solfmesh" ":solwire" ":solfeal" ":solwdens" ":solocs" ":solpurge" ":ddsolvar" ":ddsolmassp" ":solamever" ":solareau" ":solaxcol" ":soldelent" ":soldisplay" ":solhangle" ":solhpat" ":solhsize" ":sollength" ":solpagelen" ":solrender" ":solservmsg" ":solsolidify" ":solmatcurr")
          (autoxload "ame" ":solbox" ":solcone" ":solcyl" ":solsphere" ":soltorus" ":solwedge" ":solext" ":solvrev" ":solcham" ":solfill" ":solcut" ":solinterf" ":soldecomp" ":solsubdiv" ":solmass" ":solvolume" ":solsect" ":solprof" ":solmat" ":solin" ":solout" ":ddsolmat" ":solamecomp" 

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"solmass" "solsectype" "solupgrade" "solvolume")

)
)
(autoxload "ame" ("solbox" "solcone" "solcyl" "solsphere" "soltorus" "solwedge" "solext" "sorev" "solidify" "solint" "solsub" "solunion" "solcham" "solfill" "solcut" "solmove" "solchp" "solfep" "sollist" "solmassp" "solare" "solinterf" "sodecomp" "solsubdiv" "sollength" "solmass" "solvar" "solvolume" "solmesh" "solwire" "solfeat" "solsect" "solprof" "solwdens" "solmat" "solute" "solin" "solout" "solpurge" "ddsolvvar" "ddsolmassp" "ddsolmat" "solamecomp" "solamever" "solareau" "solaxcol" "soldelet" "soldisplay" "solhangle" "solhpat" "solhsize" "sollength" "solmass" "solmatcurr" "solpagelen" "solrender" "solsectype" "solservmsg" "solsolidify" "solupgrade" "solvolume")
)
)
(if (and
    (null (or (findfile "ame.exp") (findfile "ame.exe") (findfile "ame")))
    (= exist_reg "yes")
)
(ai_amegrey "~")
)
(setq *error* m:err m:err nil)
)
)
)
(princ)
)

;;;=== AVE Render Functions ===

(defun ai_loadaverrender ()
  (if (null c:render)
      (autoxload "averender" ("render" "light" "scene" "finish" "rpref"
                                "stats" "replay" "saveimg" "rconfig")
       )
    )
  (princ)
)
(defun c: ai_unloadave ()
  (princ "\n")
  (if (xunload "averendr" nil)
    (progn
      (princ "\nRender unloaded.\n")
      (ai_loadaverendr)
    )
  )
  (menucmd "S=X")
  (menucmd "S=S")
  (princ)
)

;;;;== ASE Functions ==
;;;;

;;; AI_ASEGREY is used to enable/disable the ASE items in the "File" (POP1) pulldown menu, based on whether ASE has been loaded. If you move "File" to a different pulldown menu, change the "P1" string accordingly. If you add items to the "File" menu prior to the "->ASE" item, adjust the "base" value accordingly.

(defun ai_asegrey (action / base)
  (setq base (list "P1" 10)) ; Identify "->ASE" item number
  (foreach a '(2 4 5 7 8 10 11 12 14 15 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 42)
    (menucmd (strcat (car base) "." (itoa (+ (cadr base) a)) "=" action))
  )
  (if (= action "~")
    (setq ai_aseinit_yet nil)
  )
  (setq action (if (= action "~") "~" "~")) ; Invert action for "Initialize"
  (menucmd (strcat (car base) "." (itoa (1+ (cadr base))) "=" action))
)

(defun ai_bitmaps ()
  (princ "\nLoading menu bitmaps...")
  (foreach a '(5 6 7 8)
    (menucmd (strcat "p" (itoa a) "=p" (itoa a) "bitmaps")))
)

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(ai_redo_grey)
)

(defun ai_text ()
  (princ "\nUnloading menu bitmaps..."
  (foreach a '(5 6 7 8)
    (menucmd (strcat "p" (itoa a) "=p" (itoa a) "text")))
  (ai_redo_grey)
)

(defun ai_redo_grey ()
  (if (not ai_aseinit_yet) (ai_asegrey "~") (ai_asegrey " "))
  (if ai_isamegrey (ai_amegrey "~") (ai_amegrey " "))
  (princ)
)

(defun ai_aseinit_chk ()
  (menucmd "S=X")
  (if ai_aseinit_yet
    (menucmd "S=ASE")
    (menucmd "S=ASEINIT0")
  )
  (princ)
)

(defun ai_aseinit ()
  (setq m:err *error* *error* *merrormsg*)
  (if (= nil c:aseinit)
    (progn
      (princ "\nAutoCAD SQL Extension")
      (if (and (or (= nil (findfile "ase"))
        (= nil (findfile "ase.exp")))
        (= nil (findfile "ase.exe"))
      )
      (= nil (findfile "ase.lsp"))
    )
    (progn
      (xload "ase")
      (load "ase.lsp")
      (ai_asegrey " ")

      (ai_redo_grey)
)
(menucmd "S=X")
(menucmd "S=ASE")
(setq ai_aseinit_yet T)
(princ " loaded.")
(c:aseinit)
)
(progn
  (princ " not loaded.")
  (princ "nThe ASE files were not found in your search path directories.")
  (princ "nCheck the installation of the SQL Extension and try again.")
)
(progn
  (ai_asegrey " ")
  (menucmd "S=X")
  (menucmd "S=ASE")
  (if (not ai_aseinit_yet)
    (progn
      (if (findfile "ase.lsp")
        (load "ase.lsp")
        (princ "nASE.LSP not found. 'Quick' commands not available.")
      )
      (c:aseinit)
    )
  )
  (setq ai_aseinit_yet T)
)
(setq *error* m:err m:err nil)
(princ)
)

(defun ai_aseterm ()
  (setq m:err *error* *error* *merrmsg*)
  (if (= ase_errno 0)
    (progn
      (xunload "ase")
      (ai_asegrey "-"")
      (menucmd "S=X")
      (menucmd "S=S")
    )
  )
(princ "\nAutoCAD SQL Extension unloaded."
)

(setq *error* m:err m:err nil)
(princ)

;;; ====== AutoLoad ======

(defun _autoqload (quo app cmdliste / qapp symnam)
  (setq qapp (strcat "\"" app "\")
  (mapcar
   "'(lambda (cmd / nom_cmd)
     (progn
       (setq nom_cmd (strcat "C:" cmd))
       (if (not (eval (read nom_cmd)))
         (eval
          (read (strcat
            "(defun " nom_cmd "(/ rtn)"
            "(setq m:err *error* *error* *merror*)"
            "(if (ai_ffile " qapp ")"
            "(progn (princ "$\nInitializing...\$")"
            "("auto" quo "load " qapp ") (setq rtn (" nom_cmd ")))"
            "("ai_nofig " qapp ")")"
            "("setq *error* m:err m:err nil)"
            ""rtn)"
            ))))))

  cmdliste)

nil
)

(defun autoload (app cmdliste)
  (_autoqload "" app cmdliste)
)

(defun autoxload (app cmdliste)
  (_autoqload "x" app cmdliste)
)

(defun _autoload (app)
  ; (princ "Auto:(load ") (princ app) (princ ")") (terpri)

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(load app)
)

(defun _autoxload (app)
  ; (princ "Auto:(xload ") (princ app) (princ ")") (terpri)
  (if (= app "region") (ai_select))
  (xload app)
  (if (= app "region") (ai_amegrey "~"))
)

(defun ai_file (app)
  (or (findfile (strcat app ".lsp"))
    (findfile (strcat app ".exp"))
    (findfile (strcat app ".exe"))
    (findfile app)
  )
)

(defun ai_nofile (filename)
  (princ
    (strcat "\nThe file 
      filename
    ".lsp/.exp/.exe) was not found in your search path directories."
  )
  
  (princ "\nCheck the installation of the Support Files and try again.")
  (princ)
)

;;;;=== AutoLoad LISP Applications ====

(autoload "appload" ("appload"))

(autoload "filter" ("filter"))

(autoload "dline" ("dline" "dl"))

(autoload "3d" ("3d" "ai_box" "ai_pyramid" "ai_wedge" "ai_dome" "ai_mesh" "ai_sphere" "ai_cone" "ai_torus" "ai_dish"))

)
(autoload "ddinsert" ("ddinsert"))
(autoload "asctext" ("asctext"))
(autoload "ddattdef" ("ddattdef"))
(autoload "ddatttext" ("ddatttext"))
(autoload "3darray" ("3darray"))
(autoload "ddmodify" ("ddmodify"))
(autoload "ddchprop" ("ddchprop"))
(autoload "ddview" ("ddview"))
(autoload "ddvpoint" ("ddvpoint"))
(autoload "mvsetup" ("mvsetup"))
(autoload "ddosnap" ("ddosnap"))
(autoload "ddptype" ("ddptype"))
(autoload "dducsp" ("dducsp"))
(autoload "ddunits" ("ddunits"))
(autoload "ddgrips" ("ddgrips"))
(autoload "ddselect" ("ddselect"))
(autoload "ddrename" ("ddrename"))
(autoload "rman_dcl" ("rmmenu"))
(autoload "ddsolprm" ("ddsolprm"))
(autoload "plud" ("plud"))
(autoload "akmap" ("akmap"))
(autoload "project" "project")
(autoload "slhole" "slhole")
(autoload "linkdot" "linkdot")

;;;===== AutoXLoad ADS Applications =====

(autoload "rasterin" "gifin" "pcxin" "riaspect" "ribackg"
    "riedge" "rigamut" "rigrey" "rithresh" "tiffin")

(autoload "geomcal" "cal")

(autoload "geom3d" "mirror3d" "rotate3d" "align")

(princ)
ACAD. MNU (This is only the affected portion of the file - a complete file is on the disk)

***Comment

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NOTE: AutoCAD looks for an ".mnl" (Menu Lisp) file whose name is the same as that of the menu (.mnx) file, and loads it if found. If you modify this menu and change its name, you should copy acad.mnl to <yourname>.mnl, since the menu relies on AutoLISP routines found there.

***BUTTONS1
;
$p0=*^C^C
^B
^O
^G
^D
^E
^T

***BUTTONS2
$p0=*
***AUX1

$p0=*
^C^C
^B
^O
^G
^D
^E
^T

***AUX2
$p0=*

***POP0
[Osnap]
[/CCenter]_center
[/EEndpoint]_endp
[/sInsert]_ins
[/lIntersection]_int
[/MMidpoint]_mid
[/aNearest]_nea
[/dNode]_nod
[/PPerpendicular]_per
[/QQuadrant]_qua
[/TTangent]_tan
[/NNone]_non

***Comment

Some items in the POP1 menu are enabled/disabled by ACADR12.LSP. If you move this menu elsewhere or add items prior to its "ASE" item, you'll need to modify the "ai_asegrey" function in ACADR12.LSP.

***POP1
[/FFile]
[/NNew...]^C^C_new
[/OOpen...]^C^C_open
[/SSave...]^C^C_qsave
[/ASave As...]^C^C_saveas
[/BSave DIB]^C^C_savedib
[^/MDBMS..]C^C$S=X $S=aseerase _aseerasedbms
[<-/AA][C^C$S=X $S=aseerase _aseeraseall
[CClose DB..]C^C$S=X $S=ase _aseclosedb
[<-/TTerm DBMS..]C^C$S=X $S=ase _asetermdbms
[-]
[<-/TTerminate]C^C_aseterm;$M=$(if,$=,$(getvar,cmddia),0),\]^P(ai_aseterm) ^P
[->/IllImport/Export]
[/DDXF In...]^C^C_dxfin
[/BDXB In...]^C^C_dxbin
[/IIGES In...]^C^C_igesin
[/PPPostScript In...]^C^C_psin
[/WWMF In...]^C^C_wmfin
[/nWMF In Options...]^C^C_wmfopts
[-]
[/XDXF Out...]^C^C_dxfout
[/OIGES Out...]^C^C_igesout
[/SPPostScript Out...]^C^C_psout
[/MMWF Out...]^C^C_wmfout
[<-/FFilmroll...]^C^C_filmroll
[->/Xref]
[/AAttach...]^C^C_xref;_attach;~
[/DDetach]^C^C_xref;_detach
[/RRReload]^C^C_xref;_reload
[/LList]^C^C_xref;?;*
[<-/CChange Path]^C^C_xref;_path
[-]
[/rPreferences...]^C^C_preferences
[/CConfigure]^C^C_config
[/mCompile...]^C^C_compile
[/UUtilities...]'_files
[/IAApplications...]^C^C_apload
[-]
[/xExit AutoCAD]^C^C_quit

***POP2
[/EEdit]
[->]
[->/DDDE]
[SEExport Selection Set]^C^C^P(if (null ddsetset) (xload "ddead")((ddset);^P
/[BExport Blocks ]^C^C^P(if (null ddsetset) (xload "ddead")((deblocks);^P

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$\text{[Export Drawing]}^C^C^P(\text{if (null ddedrawing) (xload "ddeads"))}(\text{ddedrawing})^P$

$\text{[-]}$

$\text{[Import Changes]}^C^C^P(\text{if (null ddeupdate) (xload "ddeads"))}(\text{ddeupdate})^P$

$\text{[Dialog...]}^C^C^P(\text{if (null ddedialog) (xload "ddeads"))}(\text{ddedialog})^P$

$\text{[-]}$

$\text{[No Filters]}^C^C^P(\text{if (null ddeformat) (xload "ddeads"))}(\text{ddeformat 1})^P$

$\text{[1Attribute Filter 1]}^C^C^P(\text{if (null ddeformat) (xload "ddeads"))}(\text{ddeformat 2})^P$

$\text{[2Attribute Filter 2]}^C^C^P(\text{if (null ddeformat) (xload "ddeads"))}(\text{ddeformat 3})^P$

$\text{[-]}$

$\text{[/Unload DDE]}^C^C^P(\text{xunload "ddeads"})^P$

$\text{[-]}$

$\text{[->/SSelect]}$

$\text{[/Point]}^M=$$(\text{if,}$$(\text{getvar,cmdactive)},._\text{select;})$

$\text{[/Window]}^M=$$(\text{if,}$$(\text{getvar,cmdactive)},._\text{select;})_.\text{window}$

$\text{[/Last]}^M=$$(\text{if,}$$(\text{getvar,cmdactive)},._\text{select;})_.\text{last}$

$\text{[/Crossing]}^M=$$(\text{if,}$$(\text{getvar,cmdactive)},._\text{select;})_.\text{crossing}$

$\text{[/All]}^M=$$(\text{if,}$$(\text{getvar,cmdactive)},._\text{select;})_.\text{all}$

$\text{[/Fence]}^M=$$(\text{if,}$$(\text{getvar,cmdactive)},._\text{select;})_.\text{fence}$

$\text{[/WPolygon]}^M=$$(\text{if,}$$(\text{getvar,cmdactive)},._\text{select;})_.\text{wpolygon}$

$\text{[/YPolygon]}^M=$$(\text{if,}$$(\text{getvar,cmdactive)},._\text{select;})_.\text{ypolygon}$

$\text{[/Add]}^M=$$(\text{if,}$$(\text{getvar,cmdactive)},._\text{select;})_.\text{add}$

$\text{[/RRemove]}^M=$$(\text{if,}$$(\text{getvar,cmdactive)},._\text{select;})_.\text{remove}$

$\text{[/MMultiple]}^M=$$(\text{if,}$$(\text{getvar,cmdactive)},._\text{select;})_.\text{multiple}$

$\text{[/Previous]}^M=$$(\text{if,}$$(\text{getvar,cmdactive)},._\text{select;})_.\text{previous}$

$\text{[***POP3]}$

$\text{[/View]}$

$\text{[/Redraw]}_.\text{redraw}$

$\text{[/ARedraw All]}_.\text{redrawall}$

$\text{[-]}$

$\text{[/Zoom]}$

$\text{[/Window]}_.\text{zoom }\text{window}$

$\text{[/DDynamic]}_.\text{zoom }\text{dynamic}$

$\text{[/Previous]}_.\text{zoom }\text{previous}$

$\text{[/All]}^C^C_.\text{zoom }\text{all}$

$\text{[/EExtents]}^C^C_.\text{zoom }\text{extents}$

$\text{[/Vmax]}_.\text{zoom }\text{vmax}$

$\text{[/Pan]}_.\text{pan}$

$\text{[-]}$

$\text{[/Set,}$(\text{if,}$$(\text{getvar,cmdactive)},._\text{tilemode})_$.\text{Tilemode}]^C^C_.\text{Tilemode }^M=$(\text{if,}$$(\text{getvar,cmdactive)},_0$
$S = mview, 1$

[/VToggle Viewport] Ctrl+V

[/MMModel Space] $C^C_mspace \ S = \$(if,$=,$(getvar, tilemode), 0), \ S = mview )^Z$

[/SPaper Space] $C^C_pspace \ S = \$(if,$=,$(getvar, tilemode), 0), \ S = mview )^Z$

[->/wMView]

[/CCCreate Viewport] $C^C_mview$

[/OViewport ON] $C^C_mview \ S = \$(if,$=,$(getvar, tilemode), 0), \ ; \ _on)$

[/FViewport OFF] $C^C_mview \ S = \$(if,$=,$(getvar, tilemode), 0), \ ; \ _off)$

[/HHideplot] $C^C_mview \ S = \$(if,$=,$(getvar, tilemode), 0), \ _hideplot; )^Z$

[/VFit Viewport] $C^C_mview \ S = \$(if,$=,$(getvar, tilemode), 0), \ _fit; )^Z$

[/22 Viewports] $C^C_mview \ S = \$(if,$=,$(getvar, tilemode), 0), 2;)^Z$

[/33 Viewports] $C^C_mview \ S = \$(if,$=,$(getvar, tilemode), 0), 3;)^Z$

[/44 Viewports] $C^C_mview \ S = \$(if,$=,$(getvar, tilemode), 0), 4;)^Z$

[->/pVplayer] $C^C_vplayer$

[->/eSet View]

[/DDview] $C^C_dview$

[->/PPlan View]

[/CCurrent UCS] $C^C_plan$

$S = \$(if,$=,$(getvar, cvport), 1), \$(=,$(getvar, tilemode), 0)), \ ; \ _)$

[/WWorld] $C^C_plan$

$S = \$(if,$=,$(getvar, cvport), 1), \$(=,$(getvar, tilemode), 0)), \ ; \ _w; )^Z$

[->/NNamed UCS] $C^C_plan$

$S = \$(if,$=,$(getvar, cvport), 1), \$(=,$(getvar, tilemode), 0)), \ ; \ _u; )^Z$

[->/VViewpoint]

[/AAxes] $C^C_vpoint$

$S = \$(if,$=,$(getvar, cvport), 1), \$(=,$(getvar, tilemode), 0)), \ ; \ _)$

[/PPresets...] $C^C_m$ = \$(if,$=,$(getvar, cvport), 1), \$(=,$(getvar, tilemode), 0)), \ ; \ _p_vpoint; \ P, \ p_dvpoint;)^Z$

[->/VSet Vpoint] $C^C_vpoint$

[->/NNamed View...] $C^C_dview$

[->/LLayout]

[/MMV Setup] $C^C_mvsetup$

[->/TTiled Viewports...] $C^C_P(ai_tiledvp_chk) ^P$

[->/DDot]

[/AAkmap] _Dot_ akmap

[/PProject] _Dot_ project