# Contents

## What's New in ArcCAD

# Introduction

The *ArcCAD Installation Guide* explains how to install and get started with ArcCAD® for AutoCAD® Release 13. This guide includes information on

- System requirements
- Running the setup program
- Installation options
- Configuring ArcCAD
- Configuring ArcCAD to use SQL themes
- Starting ArcCAD
- What's new in this version

For more detailed information on using ArcCAD, see the *ArcCAD User's Guide* or *ArcCAD Command Reference*. For information on programming with ArcCAD, see the *ArcCAD Programmer's Guide.*

This chapter explains how to install ArcCAD on a standalone computer. The first part of this chapter helps you get up and running as quickly as possible.

The last section of this chapter, 'Changes Setup makes to your system', provides more detailed information on how running Setup changes your system and the directories installed for ArcCAD.

# Before installing ArcCAD

Before you install ArcCAD, review the system requirements and notes about preserving previous versions of ArcCAD.

To read late-breaking information about ArcCAD, including information on installation, see the README.WRI file on the ArcCAD Setup CD or ArcCAD Setup Disk 1.

## System requirements

ArcCAD for AutoCAD Release 13 requires the following software and hardware:

- AutoCAD Release 13 for Windows or Windows NT, installed and configured (AutoCAD Release 13c2b or higher recommended)
- A fixed disk with at least 18 megabytes of free disk space

ArcCAD requires the same hardware and software as AutoCAD Release 13 for Windows. Please refer to Chapter 1 of the *AutoCAD Installation Guide for Windows* for information on the minimum hardware and software requirements for AutoCAD.

## Preserving a previous version of ArcCAD

If you have a previous version of ArcCAD on your system, Setup will ask whether you want to install ArcCAD over the existing version. To keep the previous version, make sure to specify a new directory in which to install ArcCAD. For more information, see 'Using an earlier version of ArcCAD' in the chapter 'Configuring ArcCAD'.

## AutoCAD compatibility

ArcCAD for AutoCAD Release 13 is fully compatible with AutoCAD Release 13. At the time of publication, ArcCAD had been tested on AutoCAD Release 13, Release 13c1, and Release 13c2b.

All of ArcCAD software's functionality is available to users of AutoCAD Release 13c2b. When using ArcCAD with earlier versions of AutoCAD Release 13, there is no support for SQL themes. You may also have problems with entity-feature links and unexpected results when saving data.

# Installing ArcCAD

To use ArcCAD, you must run the ArcCAD Setup program. The files on the distribution media are compressed and cannot simply be copied to your hard disk.

The Setup program checks your system for available disk space and to see that AutoCAD Release 13 is properly installed. The Setup program asks you to select a directory where you want to install ArcCAD and to indicate the location of the AutoCAD executable, and prompts for installation options.

## Running Setup

Before running Setup, make sure that AutoCAD Release 13 for Windows or Windows NT is correctly installed and configured.

To run the Setup program from either the CD or diskettes, you must be running Windows or Windows NT. Before starting the Setup program, close all other applications.

- If installing from diskettes, insert ArcCAD disk 1 into your floppy disk drive. If installing from CD, insert the ArcCAD Setup CD into your CD–ROM drive.

- From Program Manager, choose Run from the File menu. In the Command Line box, type *x:*\setup, where *x:* is the drive in which you inserted the ArcCAD Setup disk. Choose the OK button.

When the ArcCAD Setup program starts, follow the instructions on the screen. After you enter your registration information, you'll need to specify which components you want to install. (See the next section, 'Installation options', for more information.) After you make your choices, Setup installs ArcCAD from the disks and updates your system configuration.

The ArcCAD Setup program creates a new program group in the Windows Program Manager. Double-click the ArcCAD README icon to read last-minute information about ArcCAD.

Since Setup updates your system environment, you'll need to restart your system before running ArcCAD for the first time. If Setup is unable to update your system or AutoCAD environment, you may have to do these modifications yourself. An on-screen message explains which configuration setting failed and which files you should update before continuing. For more information on the changes made to your system, see the section 'Changes Setup makes to your system' later in this chapter.

## Installation options

During setup, you can choose from four installation options. At a minimum, you'll want to install the ArcCAD program files. Optionally, you can choose to install the following:

- ArcCAD Sample Source—useful AutoLISP routines you can use to learn about the ArcCAD extensions to AutoLISP and tools to enhance ArcCAD
- Map Projection Program—a standalone application that transforms coverages between different map projections
- ArcCAD QuickStart Tutorial—a detailed tutorial that explains GIS fundamentals and helps get you started using ArcCAD

## Online registration

The ArcCAD Setup program asks you for your name, company name and product serial number. You can find your serial number on the registration card included in your ArcCAD package.

You must complete the dialog box with a name, company name and a valid serial number. This information personalizes your copy of ArcCAD.

# Installing the hardware key *(International distribution only)*

If you are installing an international version of ArcCAD, you must attach the hardware lock to your computer's parallel port in order to run ArcCAD. The hardware lock affects ArcCAD only—it does not affect any devices connected to your system's parallel port. The lock works only with ArcCAD and not any other ESRI® products.

To install the hardware lock *after* installing ArcCAD

- Turn off the computer and any peripheral devices.
- Attach the connector of the hardware lock to a parallel port on your computer. (You can disconnect any cables connected to the parallel port, install the lock, and then connect the cable to the open end of the hardware lock.)
- Turn on your computer.

# Changes Setup makes to your system

The ArcCAD setup program

- Installs the files needed for the options you selected during Setup to the ArcCAD program directory
- Creates an ArcCAD Program Manager group and icon
- Updates both your system environment configuration and your AutoCAD configuration
- *(International distribution only)* Adds and configures device drivers for the hardware key

## Changes to the system environment

ArcCAD uses a system environment variable to designate the ArcCAD program directory. After making a backup copy of your original AUTOEXEC.BAT, the Setup program adds the following line to the file:

SET ARCAD=<*directory*>

where <*directory*> is the directory you chose as your ArcCAD program directory during Setup.

If the ARCAD variable is already set in your AUTOEXEC.BAT, the old variable is commented out and a new variable is added.

Under Windows NT, the environment variable is set in both the AUTOEXEC.BAT file and the NT system environment for the current user.

## Changes to the ACAD.INI

The ArcCAD Setup program updates the AutoCAD support directories path stored in ACAD.INI to include the ArcCAD program directory you specified during setup.

For example, a typical ACAD.INI support directories path setting after installing ArcCAD is

```
acad=c:\acadr13\win;c:\acadr13\win\support;c:\acadr13\common\
      support;c:\acadr13\common\fonts;c:\arcadwin
```

If the Setup program cannot update your ACAD.INI, it reports the error and you must update the AutoCAD program path yourself before starting ArcCAD. Setup cannot update your ACAD.INI if the file is read-only or is on a read-only network drive.

## The ArcCAD directory structure

The ArcCAD Setup program creates several directories in the ArcCAD program directory for program and support files. The directories are

| | |
|---|---|
| BIN | ArcCAD executable files, menu file, and prototype drawing |
| DATUM | Data files for the map projection program |
| QWIKSTRT | Data files for the ArcCAD QuickStart tutorial |
| SAMPLES | Sample AutoLISP routines |
| SYMBOLS | ArcCAD symbolset files |
| TEMPLATES | ArcCAD database file templates |

After you've run Setup, you'll see a program group in the Windows Program Manager called 'ArcCAD'. This program group includes icons for ArcCAD, README.WRI, and optionally, the QuickStart ArcCAD tutorial.

Normally, you'll start ArcCAD using the ArcCAD program icon. This section explains each of your options for starting ArcCAD and what happens as ArcCAD loads.

# Starting ArcCAD from Windows

By double-clicking the ArcCAD icon in the ArcCAD program group, you'll start both AutoCAD Release 13 for Windows and ArcCAD for AutoCAD Release 13.

You may want to copy the ArcCAD program icon and customize your configuration for different projects. You can use program item properties to configure the working directory and any command-line options you wish to pass on to AutoCAD (such as a drawing file name).

For more information about starting programs from within Windows or Windows NT or configuring program item properties, see your Microsoft® Windows® documentation.

# Starting ArcCAD using AutoLoad

If you'd like to start ArcCAD every time you start AutoCAD Release 13, you can use the ArcCAD AutoLoad option.

The first time you start ArcCAD using the ArcCAD program icon, you can choose the option 'Automatically start ArcCAD when AutoCAD starts' from the **esri_prefs** command.

For more information on **esri_prefs**, see the *ArcCAD Command Reference*.

# Starting ArcCAD from AutoCAD

To start ArcCAD once you've already started AutoCAD, you can run the ArcCAD AutoLISP® startup routine.

At the AutoCAD command prompt, type:

```
(load "arcad")
```

# Loading a new drawing

Whenever you create or load a new drawing in AutoCAD, you'll need to reload ArcCAD before you can use any ArcCAD commands. ArcCAD loads automatically if the option 'Automatically start ArcCAD when AutoCAD starts' is toggled 'on' in **esri_prefs**.

After the new drawing loads, start ArcCAD by typing at the AutoCAD command prompt:

```
(load "arcad")
```

# Loading a drawing with ArcCAD links

When you create themes in a drawing, ArcCAD creates entity-feature links. Upon loading, ArcCAD checks the current drawing for themes, the existence of their associated GIS data sets, and valid entity-feature links.

If the drawing contains themes or entity-feature links, ArcCAD tries to locate the GIS data sets used by those themes to reestablish the links.

There are several reasons why ArcCAD may not be able to find the GIS data sets associated with the drawing. If you have deleted or moved the data sets or if you did not create the drawing, ArcCAD may not be able to locate the data and reestablish entity-feature links.

When ArcCAD cannot locate a theme's GIS data set, the Theme Recovery dialog box appears. By choosing the Browse button, you bring up the Coverage Selection dialog box. In the Coverage Selection dialog box, you can select the location of the missing coverage. Choose OK to accept the new location of the missing GIS data set.

Alternatively, you can choose Cancel to abort theme recovery. The theme's GIS data set will remain set to an invalid location. Since this pathname does not point to the correct GIS data set, the theme contains no data, and entity-feature links do not exist. You can use the **kill** command to delete a theme that points to an invalid GIS data set.

If the drawing is new, or you have never created themes in the drawing, ArcCAD loads normally.

# What happens when you start ArcCAD

When you start ArcCAD, you'll see the ArcCAD banner showing your registration information.

If you did not install ASE options when you installed AutoCAD Release 13 for Windows, a warning message from ArcCAD indicates that ASI is not initialized. This message lets you know that during this ArcCAD session, you will not be able to define or use SQL themes.

The AutoCAD command prompt area displays ArcCAD version and registration information, followed by messages telling you the ArcCAD functions, symbols, menus and dialogs are loaded.

After the ArcCAD program files load, ArcCAD shows you a Tip of the Day. Tips of the Day are useful hints about how you can use ArcCAD most productively. (You may choose to disable displaying tips when ArcCAD loads by using the check box on the Tip of the Day dialog box.)

If your drawing includes ArcCAD themes from a previous ArcCAD session, ArcCAD searches for their GIS data sets. If ArcCAD locates the GIS data sets, ArcCAD reestablishes the entity-feature links. If ArcCAD cannot locate the GIS data sets, the Theme Recovery dialog box appears. (For more information on recovering themes, see the section 'Loading a drawing with ArcCAD links' in this chapter.)

After successfully initializing, ArcCAD is ready to accept commands.

# Getting started with QuickStart

If you're just getting started with ArcCAD and GIS, you may want to explore the ArcCAD QuickStart tutorial before starting on your own projects.

The QuickStart is a Windows help file with step-by-step lessons and sample data to familiarize you with ArcCAD.

To use QuickStart, close ArcCAD and AutoCAD. Double-click on the ArcCAD QuickStart icon in the ArcCAD program group. To start your first lesson, click on the 'Continuing lessons' button.

If you stop the tutorial before completing all the lessons and wish to resume the tutorial from where you left off, choose 'Continue lessons' the next time you start QuickStart. To start the tutorial from the beginning again, choose 'Restart tutorial'.

# Configuring peripherals

ArcCAD depends on AutoCAD Release 13 for support for all peripheral devices, such as video displays, digitizers, plotters and printers. Any device that works with AutoCAD will also work with ArcCAD.

# Customizing ArcCAD

After running the ArcCAD Setup program, ArcCAD is ready to use. However, you may want to customize ArcCAD to better suit your preferences.

You can use the command **esri_prefs** to customize

- How dates should be displayed
- Your temporary directory
- The path to AutoCAD
- Whether you prefer dialog boxes or the command-line interface

For complete information on customizing ArcCAD using **esri_prefs**, see the *ArcCAD Command Reference*.

# Using an earlier version of ArcCAD

All versions of ArcCAD require the environment variable ARCAD. If you have more than one version of ArcCAD installed, you'll need to modify your system environment before starting a different version of ArcCAD.

To modify your system environment, edit your AUTOEXEC.BAT. Modify the line

SET ARCAD=<*directory*>

where <*directory*> is the full path to the location of the directory containing the desired version of ArcCAD. You will need to restart your system for these changes to take effect.

# Configuring ArcCAD for SQL

ArcCAD for AutoCAD Release 13 includes support for SQL themes. ArcCAD software's implementation of SQL themes is based on the AutoCAD SQL2 environment.

This section reviews the basics of configuring ArcCAD and AutoCAD Release 13 to use SQL2. For complete information on configuring the AutoCAD SQL2 environment, refer to your AutoCAD documentation.

## Before using SQL

To use SQL themes in ArcCAD, you must choose the ASE option when installing AutoCAD Release 13 and have appropriate ASE drivers.

In addition, the directory including your ASI.INI must either be in your system path or in the current working directory.

## Understanding the SQL2 environment

SQL2 is a new international standard based on the previous SQL standard. The previous SQL model was based on the databases and tables of a database management system (DBMS). SQL2 is based on a hierarchy that includes environments, catalogs, schemas and tables. This section is intended to be an overview of the AutoCAD SQL2 environment (ASE). For detailed instructions on setting up ASE, consult your AutoCAD documentation.

### Database environments

#### What is an SQL environment?

The AutoCAD SQL2 environment is the top level of a hierarchy that includes catalogs, schemas and tables. The environment tells AutoCAD and ArcCAD information about your chosen database program, such as dBASE®, INFORMIX, Paradox, or FoxPro.

### Connecting to your database

Since ArcCAD is based on AutoCAD software's SQL support, ArcCAD supports any DBMS supported by AutoCAD. Using the ODBC connection provided by AutoCAD, ArcCAD can connect to most popular databases.

The easiest way to obtain an ODBC driver is to contact the database vendor. A list of vendor names can be obtained from Microsoft.

### What is ASI?

The AutoCAD SQL Interface (ASI) is an AutoCAD Development System™ (ADS) 'C' library and developer Application Programming Interface™ (API). ASI is the foundation used by ArcCAD to access the SQL2 environment.

## Catalogs

### What is a catalog?

A catalog is comparable to a database or a collection of database files in SQL. If you have a directory that stores a collection of database files or subdirectories, this could be defined as a catalog.

For example, if you have a collection of database subdirectories located under C:\DATA, you may wish to define your catalog as:

```
SAMPLE = C:\DATA
```

where SAMPLE is the catalog name.

### Location of the catalog

The catalog is defined beneath the environment as **environment.catalog**. There may be multiple catalogs defined per environment.

For the environment to recognize the catalog, its name must be contained in the [CATALOG] section of the ASI.INI. For example, to use the SAMPLE catalog in the DB3 environment, enter the following in the [CATALOG] section:

```
DB3 = SAMPLE
```

If you are in the DB3 environment and using the catalog in the previous example, the SQL2 expression showing the catalog's relationship to its environment is

```
DB3.SAMPLE
```

# Schemas

## What is a schema?

A schema is a subset of a catalog and contains a portion of the complete database. In a single environment, a schema may or may not contain tables.

For example, if you have a portion of your database located at C:\DATA\WATER and the catalog is defined to C:\DATA, one way to define your schema is

```
SAMPLE.FILES = WATER
```

where SAMPLE is the defined catalog and FILES is the schema name.

## Location of the schema

Your schema is defined in relationship to the environment and the catalog as **environment.catalog.schema**. There may be multiple schemas defined per catalog.

For example, if you are in the DB3 environment using the catalog and schema in the previous example, an SQL2 expression showing the schema's relationship to its catalog is:

```
DB3.SAMPLE.FILE
```

# Tables

## What is a table?

A table contains the rows and columns, or records and items, of the data that you access using SQL2. Tables may be specified as a schema defined in your ASI.INI, or specified manually as part of the SQL query expression. See the AutoCAD ASE documentation to decide which method works best for you.

Using the C:\DATA\WATER directory as an example, any database file compatible with that environment can be a table. The following files would be acceptable as tables in the DB3 environment:

```
TCP.DBF, GRAY.DBF, PONDS.DBF
```

### Location of the table

The table is located within the schema as **environment.catalog.schema.table**. If you are in the DB3 environment with a catalog of SAMPLE = C:\DATA, schema of FILES = WATER, and PONDS.DBF as the database file, an SQL2 expression showing the table's relationship to its schema would look like

```
DB3.SAMPLES.FILES.PONDS
```

# Configuring your SQL environment

To access a database, you must first configure your SQL2 environment. Within this environment, the DBMS driver controls the connection between ASI and the data in the external database. Establishing the connection between the DBMS driver and the SQL2 environment occurs within the ASI.INI file.

The ASI.INI is divided into sections that provide information required by the drivers. Some sections contain information pertinent to all DBMS drivers, while other sections supply information for the individual environments. This section explains a few of the areas in the ASI.INI file. For detailed information on configuring ASE and your ASI.INI, refer to your AutoCAD documentation.

## ASI section

The [ASI] section is used to locate the DBMS drivers, define the default character set and specify the default collation.

```
[ASI]
Path = C:\ACADR13\WIN\ASE\LANG
Names = ANSI_1252
Collation =
```

You must specify the *fully qualified* path in this section.

## Environment section

The environment section of ASI.INI references many of the other sections to define a specific environment.

For example, the DB3 environment might look like

```
[DB3]
Driver = DB3DRV
Names = dos437
Collation = ascii437
Lock =
Set_Date =
Set_Century =
Timeout =
Catalog = ASE
Schema = DB3Samp
ASE = c:\acadr13\common\sample
ASE.DB3Samp = dbf
```

This environment has been set up so that the catalog and schema are defined within [DB3]. However, you may configure ASI.INI to support separate sections for catalog, schema and table definition. These sections follow.

## Catalog section

This section identifies the catalogs for each environment by listing environment names and corresponding catalogs. An environment may have multiple entries specifying different catalogs. This enables multiple catalogs per environment.

```
[ASE_CATALOGS]
DB3 = ASE
DB3 = SAMPLE
PDX40 = cat
FOX = cat1
FOX = cat2
```

## Schema section

The entries in this section define the schemas available per catalog. The first part of the entry defines the **environment.catalog** where the schema is located. The second part of the entry is the schema name.

```
[ASE_SCHEMAS]
DB3.ASE = FILES
```

## Table section

The entries in this section define the tables available in schemas. The fist part of the entry is the **environment.catalog.schema** in which the table resides. The second part of the entry is the table name.

```
[ASE_TABLES]
DB3.ASE.db3sample = employee
DB3.ASE.db3sample = customer
```

ArcCAD for AutoCAD Release 13 includes many new and enhanced features to help you create, edit and maintain GIS data. This section highlights these changes. For more detailed information on how to use the new features of ArcCAD, refer to the *ArcCAD User's Guide* and *ArcCAD Command Reference*. Some of the new features are also demonstrated in the ArcCAD QuickStart tutorial.

Some of the enhanced features of ArcCAD for AutoCAD Release 13 include SQL and image themes. Along with these new theme types, there are new commands to display and manipulate image and SQL themes.

You'll also find new commands such as **wbrowse**, **ddfeat**, **dumpxed** and **esri_prefs**.

Because of these new commands and features, the ArcCAD extensions to AutoLISP are also enhanced. Refer to the *ArcCAD Programmer's Guide* for information on new and changed AutoLISP and ADS routines.

# New theme types

## SQL record themes

ArcCAD for AutoCAD Release 13 now includes a new type of record theme, the SQL theme, in addition to dBASE record themes. New SQL-based record themes allow ArcCAD to access other industry-standard databases, such as FoxPro, Paradox, and ODBC-compliant databases. You'll find support for SQL record themes through ArcCAD commands, dialogs, and a developer API.

## Image themes

ArcCAD for AutoCAD Release 13 introduces another new theme type: images. The image theme allows ArcCAD to support basic raster image functionality, such as the display of images as a backdrop to your AutoCAD drawing and the ability to georeference the image to real-world coordinates.

You'll find support for the new image themes in some of the standard ArcCAD commands and also through new commands including **image**, **izoom**, **ipan**, **iclose**, and **iregister**.

# New commands

**Wbrowse** is a new command added to let you view and edit a theme's data. Use **wbrowse** to view both record theme types dBASE and SQL, as well as feature attributes associated with point, line, polygon and tic themes.

The **esri_prefs** command allows you to adjust a number of ArcCAD system settings. Settings include the path to temporary directories, the display format of date items, whether ArcCAD should start automatically behind AutoCAD, and other settings.

**Ddfeat** is a dialog box interface to help you enter drawing data into themes.

**Dumpxed** is a new command to help you extract extended entity data from theme features into a dBASE record theme.

**Shapein** converts ArcView shapefiles to coverages you can then use with ArcCAD themes.

# Modified commands

To better support the new theme types and improved functionality, many commands available in earlier versions of ArcCAD have been modified.

All commands that act on record themes have been modifed to handle the new subclasses of record themes: SQL and dBASE. If you've developed tools and utilities using the ArcCAD extensions to AutoLISP, you'll need to update your code to reflect the modified command structure.

**Savefeat**, **addfeat** and **modfeat** have been modified to automatically create an AutoCAD property table. When you enter the name of a new optional property table, ArcCAD creates the new theme and an associated dBASE record data set as it adds features to the feature theme.

The **userid** command now sets the base and the increment values, storing these values with the theme. Therefore, each theme returns to its own base and increment values when you add new features to the theme.

**Esri_import** and **esri_export** now support double-precision ARC/INFO export files with either a specified or default x-y shift. This enhanced feature allows you to more easily communicate with WorkStation ARC/INFO users.

**esri_intersect**, **esri_union** and **esri_tolerance** were renamed to avoid confusion with new AutoCAD commands union, intersect and tolerance.