DrafTools for AutoCAD(tm)* --

Installation & Operation Manual

For Custom Title Block Management Routines

Version 1.00

Copyright 1993

Manu-Soft Computer Services

by Owen Wengerd

Printed 10/03/93

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     DrafTools
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I. THE SHAREWARE CONCEPT

Shareware distribution gives users a chance to try software before buying it. If you try a Shareware program and continue using it, you are expected to register. Individual programs differ on details -- some request registration while others require it, some specify a maximum trial period. With registration, you get anything from the simple right to continue using the software to an updated program with printed manual.

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II. INTRODUCTION

DrafTools is a comprehensive set of LISP routines designed to automate the tedious process of creating and using title blocks, adding and updating revision blocks, and inserting tables of hole sizes, bills-of-material, etc. This manual covers only the Custom Title Block Management portion of DrafTools. For information on other modules please contact the author (see Section VI for address).

NOTE: This manual is intended for use by someone already familiar with AutoCAD Release 12, AutoLISP variables, and the MSDOS file structure. The installation process also requires the ability to edit the ACAD.MNU file with a text editor. The recommended method is by using Microsoft's EDIT.COM included with MSDOS 5.0 & 6.0, since many other editors cannot load a file as large as ACAD.MNU.

III. SYSTEM REQUIREMENTS

IBM-Compatible PC with MSDOS operating system
AutoCAD Release 12/Dos, installed & running
Text editor (preferably EDIT.COM by Microsoft)
Approx. 380K Hard Disk Space

IV. INSTALLATION INSTRUCTIONS

A. Copying Files To Your Hard Disk

Before beginning the installation process, you need to decide where on your hard disk you want to put the DrafTools Applications. In order to keep DrafTools separate from other AutoCAD files, it is recommended that you create a subdirectory under your AutoCAD directory and name it DRAFTOOL. If your AutoCAD directory is C:\ACAD, you would describe this new subdirectory by the pathname C:\ACAD\DRAFTOOL. Here is what your directory structure might look like after creating the DRAFTOOL subdirectory:

```
C:\
 |--ACAD
 |     |--ADS
 |     |     \--DOCS
 |     |--ASE
 |     |--DRAFTOOL    <----DrafTools Directory
 |     |--DRV
 |     |--FONTS
 |     |--IGESFONT
 |     |--R11SUPP
 |     |--SAMPLE
 |     |--SOURCE
 |     |--SUPPORT
 |      \--TUTORIAL
 |            \--DBF
 |--DOS
  \--GAMES
```

After creating a DrafTools subdirectory, simply copy every file from the installation diskette into the newly created subdirectory on your hard disk. (See Appendix A for a list of files on the installation diskette.) If you are a first time user, you should also copy the sample files (see Appendix A, Section C for a list of sample files) to the same newly created subdirectory on your hard disk.

B. Editing ACAD.MNU

    The next step involves adding new menus to your AutoCAD menu
file. This step may not be necessary if you already have a previous
version of DrafTools installed. Check for additional instructions in
the README.DOC file on the installation diskette root directory.
    The AutoCAD menu file is ACAD.MNU (unless you have customized
your menu and given it a different name) and it is located by default
in the SUPPORT subdirectory. The use of a text editor which can edit
very large files (many editors and word processors cannot load large
files like ACAD.MNU) will be required. The editor included with MSDOS
5.0 & 6.0 (EDIT.COM) works very well.

    The file ACADPMNU.TXT is an ASCII file which defines a pop-up
AutoCAD menu allowing the user to execute DrafTools commands.
Following is a listing of that file:

    ***POP10
    [DrafTools]
    [Insert Title Block]^C^CINSTITLE
    [& Border]^C^CINSTITLE
    [Edit Title Block]^C^CEDTITLE
    [Attributes]^C^CEDTITLE
    [Define New Title]^C^CMAKEBDR
    [Block Border]^C^CMAKEBDR

    To add the DrafTools pop-up menu to your menu file, ACADPMNU.TXT
must be inserted into your ACAD.MNU file after the last pop-up menu in
the file. Consult your AutoCAD manual for information on the
structure of the ACAD.MNU file. After inserting the new pop-up menu,
change the line "***POP10" to "***POPnn", where nn is the next pop-up
menu number available to you.

    NOTE: To insert ACADPMNU.TXT with EDIT.COM, you first load
ACADPMNU.TXT into the editor. Then, highlight everything and pick
EDIT|COPY to copy the entire file into the EDIT Clipboard. Next, load
ACAD.MNU by picking FILE|OPEN and selecting ACAD.MNU. Once ACAD.MNU
is in the editor, you can insert the contents of the clipboard at the
cursor location by picking EDIT|PASTE.

C. Editing ACAD.LSP

    The file DT_INIT.LSP must be loaded by your ACAD.LSP file. If
you don't have a file called ACAD.LSP (usually in the SUPPORT
subdirectory), you must create a new one. Using an ASCII (plain text)
editor, add the following line:

    (load "C:\\ACAD\\DRAFTOOL\\DT_INIT")

Make sure the path specified points to the directory in which you
installed DrafTools. Note the "\\" (Double Backslashes).

    The file DT_INIT.LSP initializes global variables and user
settings: you must edit this file to change customizable settings.
The section which merits attention (first screen) in DT_INIT.LSP looks
like this:


```
; ===========================
; ==  Set Global Variables  ==
; ===========================

(setq *DT_PATH "c:\\acad\\draftool\\")

[Set other global variables here]
```


   The (setq *DT_PATH... line sets the global variable *DT_PATH to the
DrafTools Subdirectory path. This variable should always be set, or
DrafTools may be unable to find required files.
   You may also set the global variable *TBLAYER to the name of the
layer you want title blocks inserted on. If *TBLAYER is not defined,
"TITLE" becomes the default. You can override the layer setting
during title block insertion.
   The global variable *TBSCALES is the name of the file containing
your predefined scales, and defaults to "TBSCALES" if none is
specified. TBSCALES.TBD is provided as a sample to get you started.
By setting different filenames in *TBSCALES, you can maintain multiple
predefined-scale files (possibly for different disciplines).

D. Checking The Installation

     After ACAD.MNU, ACAD.LSP, and DT_INIT.LSP have been modified and
saved, start AutoCAD. Do the following tests to make sure the
installation is working properly:

          A)   Make sure the pop-up menu you inserted is available. It
               should be the right-most pop-up menu along the top of
               the screen, named 'DrafTools'. If your display
               resolution is too low, you may not be able to see all
               of the pop-up menus. If this is the case, rearrange
               their order so that the 'DrafTools' menu is
               available, or just combine two of your current pop-up
               menus into one.

          B)   Select "Define New Title Block Border" from the
               DrafTools Pop-up menu. If AutoCAD gives you an
               "error: Load Failed" message, then your *DT_PATH
               variable does not specify the correct pathname to
               your DRAFTOOL subdirectory. Check DT_INIT.LSP and
               make sure the path is correctly specified. (See the
               installation instructions for further details.) You
               should be greeted with a dialog box entitled "Define
               New Title Block Border".

          C)   Pick the <Reorder and Edit Attributes> button. If you
               get a dialog box entitled "Attribute Re-Order", you
               can safely assume that the installation has been a
               success. Press <Cancel> to exit the dialog boxes,
               until you're back at the Command: prompt.

     Once DrafTools is installed properly, you should read the
following sections before trying to use the DrafTools applications.

V. GETTING STARTED

A. Using the Sample Title Blocks

The easiest way to understand how a custom title block works is to examine the sample title blocks included on the installation diskette (C_ARCH.BDR & D_ARCH.BDR). When DrafTools looks for a title block to insert, it looks for a file with the .BDR (for "BorDeR") extension. A .BDR file is simply an AutoCAD drawing whose file extension has been changed from .DWG to .BDR, thereby denoting it as a DrafTools title block. The two sample title blocks (C_ARCH.BDR & D_ARCH.BDR) cannot be loaded into AutoCAD directly because they have the wrong extension; however by copying the .BDR files to .DWG files (Ex. COPY C_ARCH.BDR C_ARCH.DWG), you can load these files into the drawing editor like any other AutoCAD drawing. To see what the border file is made of, do that now for C_ARCH.BDR (the C-Size border).
Load the converted drawing C_ARCH.DWG into the drawing editor. Change your units to 'Architectural' with the UNITS command. Notice that the lower left corner of the title block border is at the origin (0,0,0). This corner will become the title block's insertion point. Zoom into the title block area of the drawing, so you can see the attributes that have been defined in the title block. You may notice that the attributes are more representative of a Civil Engineering drawing; however, they will nevertheless demonstate the potential of "smart" title blocks.
Select 'Define New Title Block Border' in the DrafTools pop-up menu, then push <Re-order and Edit Attributes>. You should be greeted with a dialog box entitled 'Attribute Re-order'. This is the main "Attribute Editing" dialog.
Pick the <Get All> button in the top left section of the box. This places all "ATTDEF" entities in the 'Attributes' List Box, listed by their "tag". Immediately after an addition to this list, all added attributes are "selected" (highlighted): un-select them by pressing the <Deselect All> button beneath the list box. Once no attributes are selected ("Selected Items: None" above the list box), click on the "DRAWING" attribute to highlight it. If this is the only highlighted attribute ("Selected Items: 1" above the list box), then the <Edit> button should become un-greyed. Pick the <Edit> button to edit the selected attribute definition.
You should be presented with the 'Edit Attribute Definition' dialog box. There are three items of interest: The Tag ("DRAWING"), the Prompt ("Drawing Name"), and the Default ("=(getdwgname)"). The default value is an AutoLISP function in this case. The function (getdwgname) is defined in the sample TBLOCK.LSP file, and it returns the current drawing file name; e.g., when this title block is inserted the default value for this attribute will be the name of the drawing. The process will be better understood by actually inserting this title block. Experiment with the features in the dialog boxes to get a feel of their functionality before continuing.

Start a new drawing named "TEST", change to Architectural units, then select 'Insert Title Block & Border' from the DrafTools pop-up menu. Select border 'C_ARCH' from the available list. Next, define a new drawing scale definition for title blocks: Pick the <Add New...> button in the 'Drawing Scale' section. For 'Scale ID' enter the text [1" = 8'], then enter a scale of [1"]=[8'] and press <OK>. You have just added [1" = 8'] to the list of available pre-defined scales. You will want to add others to this list as you find you need them.

Next, pick an insertion point for the title block. Press <Pick Point> and pick a point in the drawing area. You can press <Check It Out> at any time after you have specified a border name to see what the title block will look like once it's inserted: do that now.

If you are satisfied, press <OK> to insert the selected border. You will be delivered to the standard AutoCAD attribute edit dialog to enter attributes in the title block. If all went according to plan the default value of the Drawing Name attribute should be "TEST", the name of the current drawing.

Push the <Next> button to advance to the next page, and enter "Sword Excavating" (with all lower-case except first letters of the words) for the INSTALLER attribute. You will notice the default values for the Installer's address and phone number are AutoLISP functions beginning with two equal signs ('=='): such a function calculates the attribute value _after_ you pick the <OK> button. In this case it will search a database of installer's names and addresses (SSINST.DBF) for the correct values based on the entered value of the 'INSTALLER' attribute. Pick the <OK> button to insert the title block and border into the drawing.

Once a title block is inserted, you can edit its attributes by selecting 'Edit Title Block Attributes' from the DrafTools pop-up menu: do this now. As you can see, the installer's name and address are "looked up" again after you edit attributes.

Once you have a title block on screen, select 'Insert Title Block & Border' from the DrafTools pop-up menu again. This time toggle the 'Replace Existing Title Block' button to "on" (checked). Now insert the "D_ARCH" border over top of the "C_ARCH" border (or insert the "C_ARCH" border at a different scale). The program looks in the existing title block for tags of the same name as those in the replacement, and copies their values to the new title block. If more than one title block exists in the drawing you will be prompted to pick the insertion point of the one you want to replace.

After inserting a title block the global variable *DWGSCALE is set to the scale of the title block just inserted. To verify this, type !*DWGSCALE at the Command: prompt. This global variable can be used by user functions in "smart" attributes if they need to know the scale factor used by the title block.

Before exiting, the title block insertion program calls the (SETSCALES) function (in TBLOCK.LSP) to set any pertinent system or dimensioning variables to the selected scale. Try inserting the "C_ARCH" border at different scales and checking the DIMSCALE system variable before and after the insertion. (For more information, see Appendix C, Supplied User Functions.)

B. Defining Your Own Title Block

     If you already use a conventional AutoCAD block as a title block,
disregard the following instructions to begin a new drawing and
instead load in your existing title block for editing. You may need
to erase your border and edit your attributes to take advantage of
DrafTools' features. If you use different borders for different paper
sizes, it is recommended that you save the attribute part of the title
block (that part which is the same in all title blocks) separately,
then use it as a starting point for drawing each size of border.
     To define a new custom title block, start a new drawing and
create the title block and attributes with no border. Make sure you
are drawing on layer zero (0), so that the inserted title block will
take on the characteristics of the layer on which it is inserted. If
you are editing an existing block, make sure all entities are on layer
zero (0). If you want some entities to have different linetypes or
colors, then change that property explicitly instead of putting the
entity on a layer with the desired characteristics. This will prevent
problems in the future, as all entities in the title block will then
reside on the same layer.
     First, draw all constant text and graphics entities such as
dividing lines, company logos, etc. which stay the same in every
drawing. Next, define text attributes: Select 'Re-Order Title Block
Attribs' from the 'DrafTools' pop-up menu. Pick <New> to define a new
attribute. (If you already have attributes defined, pick <Get All> to
load them into the attribute list box, then, after picking <Deselect
All>, select an attribute (shown by it's "tag") and pick <Edit> to
make any desired changes.) Following are some pointers to keep in
mind when defining attributes:
     1) Give each attribute a unique tag name, so that it can be
              referenced later without confusion.
     2) Use the proper alignment method so that the resulting text
              will be properly aligned when inserted.
     3) Specify a concise prompt that will identify the attribute
              when you are editing attribute values during
              insertion.
     4) Use a different text style for attributes and non-attribute
              text. A mono-spaced font works best for attributes
              because it allows you to determine a constant maximum
              string length for each individual attribute based on
              available space, whereas proportional spaced fonts
              vary in length depending on the actual characters in
              the string.

5)   In order to let DrafTools do as much of your work as
          possible, specify a default value for each attribute.
          If the attribute value will usually be the same, use
          that value as a default. You can also specify a
          "dynamic default value" by using either of the
          following methods:

          a. precede an AutoLISP function with an equal sign
          (=). The default will be the string returned by the
          function at the time of insertion. This is useful,
          for instance, when prompting for the drawing date:
          the default value can be the current system date.
          Ex. '=(menucmd "M=$(edtime,$(getvar,date),M/D/YY)")'
          will return the current date as the default value.

          b. precede an AutoLISP function with two equal
          signs (==). This type of dynamic default value works
          in a similar fashion as the one just mentioned,
          except that the function does not evaluate until the
          attributes have all been entered and the block is
          being inserted. This is useful if the value of one
          attribute depends on what was entered in another.
          One example would be when an address and phone number
          need to be looked up. The user would first enter a
          name to use in the lookup, so the address and phone
          number cannot be retrieved until the user clicks <OK>
          to signify that the name has been entered. A
          complete description of the LOOKUP function included
          in the TBLOCK.LSP file can be found in Appendix C,
          User Functions Supplied with DrafTools.

   Once you have what you like, save this drawing under a name like
'TITLE', so you can use it in the borders of different drawing sizes.
HINT: If you re-order the attribute definitions before you SAVE (push
<Re-order and Edit Attributes> in the 'Define New Title Block Border'
dialog box and reorder them, then exit the dialog without creating a
border file), your attributes will appear in the correct order, and
won't need any re-ordering later.

    The next step is creating a .BDR file for different drawing
sizes. Start a new drawing and give it an identifying name like "C"
or "C_GM" for the C-Size border. Make sure you are drawing on Layer
zero (0).

    Starting at the UCS origin (0,0,0), draw the border for the
selected drawing size, so that 0,0,0 is the lower-left corner of the
border. Make sure that you draw the border at a scale of 1:1, so that
one drawing unit is equal to 1 plotted unit. For example, if your
plotter's maximum plotting size for a C-Size sheet is 32.0" x 20.0"
and your drawing dimensions are in inches then your border should be
32.0 drawing units by 20.0 drawing units in size.

    Once you have your border, insert the drawing of your title block
attributes at its proper position in the border. Check the attribute
prompts and default values to make sure they are satisfactory, but
don't bother entering any attribute values. Explode the attribute
block once it is positioned where you want it. When the block is
exploded, the attributes it contained will display as attribute tags
and attribute values will be lost.

    Now select 'Define New Title Block Border' from the 'DrafTools'
pop-up menu, and push <Re-order and Edit Attributes>. This gives you
an opportunity to check the order of the attributes and to make any
modifications for this particular border size. Once you are
satisfied, exit the 'Attribute Re-order' dialog by pushing either
<Reorder> or <Cancel>. Push <Create New Border> in the main dialog
and enter the new border's filename when asked. You now have a new
border available when you try to insert a new title block! Try
inserting the new border, and see if it works.

C. Customizing TBLOCK.LSP

The file TBLOCK.LSP is a SAMPLE file which contains a number of
functions used by the sample title blocks C_ARCH.BDR & D_ARCH.BDR. It
also contains the (SETSCALES) function, which is evaluated each time a
new title block is inserted.
The sample TBLOCK.LSP file should be customized to fit your
needs: delete any functions you don't need, and edit the (SETSCALES)
function to change variables such as DIMSCALE, TEXTSIZE, etc. to your
desired value, based on the entered drawing scale which is passed to
the function by the title block program.
NOTE: the 'scale' argument passed to (SETSCALES) is the inverse
of the specified drawing scale. This allows you to use 'scale' as a
multiplier when setting variables (that is, 'scale' can be multiplied
by a constant to return the appropriate value).

        Ex.:
                If 'Scale Factor' was 1" = 8'
                  then 'scale' will be 96 (8'/1" = 96")

                If 'Scale Factor' was 1 = 2
                  then 'scale' will be 2 (2/1 = 2)

VI. REPORTING PROBLEMS & GETTING SUPPORT

Any problems with this software can be reported to the author via CompuServe:

        Owen Wengerd
        71324,3252

or via mail:

        DrafTools
        Manu-Soft Computer Services
        P.O. Box 84
        Fredericksburg, OH 44627

or via phone:

        (216) 695-5903
    (Call eves or leave name, phone number, & time to return call)

It is the author's desire to make this software as easy to use as possible. However, to make use of it's advanced features requires some AutoLISP experience. If you need help in that area it is recommended that you find someone in your area who can get you started in AutoLISP programming: the benefits of learning to program in AutoLISP will be well worth the effort.

VII. REGISTRATION

You are encouraged to pass a copy of DrafTools along to your friends for evaluation. Please encourage them to register their copy if they find that they can use it. All registered users will receive the following:

        The latest version of DrafTools
        Unprotected source code
        Free minor updates as they occur
        Free technical support
        Special reduced rates on major upgrades

To register, print the order form (!ORDER.FRM) and send it with check or money order for $25.00 (US) per copy to:

    DrafTools
    Manu-Soft Computer Services
    P.O. Box 84
    Fredericksburg, OH 44627

VIII. APPENDIX A--Files Included with DrafTools

A. Installation and Documentation

README   .DOC   Start-up instructions & last minute details.

!LICENSE.DOC   Licence, registration, and ordering instructions.

!ORDER .DOC   Order form.

!PACKING.LST   List of included files.

!MANUAL .TXT   This users manual. Plain text format for on-line
                viewing.

!MANUAL .PRN   This users manual. COPY this file to any printer for a
                printed manual.

ACADPMNU.TXT   This ASCII file defines the pop-up DrafTools menu, and
                must be inserted into your ACAD.MNU file.

B. DrafTools Program Files

DT_INIT .LSP   This file defines custom settings and initializes
                DrafTools. It must be loaded by your ACAD.LSP file.

MAKEBDR .LSP   AutoLISP program that creates a new Title Block Border.

MAKEBDR .DCL   Dialog box definition (DCL) file used by MAKEBDR.LSP.

INSTITLE.LSP   AutoLISP program that inserts a new title block into a
                drawing.

INSTITLE.DCL   Dialog box definition (DCL) file used by INSTITLE.LSP.

INSTITLE.HLP   On-line help text for INSTITLE.LSP (AutoCAD help file
                format).

EDTITLE .LSP   AutoLISP program that allows attribute value editing of
                a previously inserted title block.

EDATTRIB.LSP   AutoLISP program for editing attribute definitions.

EDATTRIB.DCL   Dialog box definition (DCL) file used by EDATTRIB.LSP.

EDATTRIB.HLP   On-line help text for EDATTRIB.LSP (AutoCAD help file
                format).

RE-ORDER.LSP   AutoLISP program for re-ordering and editing attribute
                definitions.

RE-ORDER.DCL   Dialog box definition (DCL) file used by RE-ORDER.LSP.

RE-ORDER.HLP   On-line help text for RE-ORDER.LSP (AutoCAD help file
                 format).

XDOS_DT .C   Source code for XDOS_DT.EXP (ADS application).

XDOS_DT .EXP   ADS application used by DrafTools for performing DOS
                 file functions from within AutoCAD. This routine was
                 adapted from AutoDesk's XDOS utility.

        C. Sample Programs

TBLOCK .DWG   Sample title block design.

C_ARCH .BDR   Sample C-Size Title Block using TBLOCK.DWG.

D_ARCH .BDR   Sample D-Size Title Block using TBLOCK.DWG.

TBLOCK .LSP   AutoLISP functions required by TBLOCK.DWG.*

SSINST .DBF   DBase file containing names and addresses of septic
                 system installers--used by sample title blocks.

SSINST .ASC   ASCII file of contents of SSINST.DBF, included only to
                 show contents of DBase file.

     * DrafTools programs look for and load a file named TBLOCK.LSP
                 before inserting or editing a title block. This file
                 contains the (SETSCALES) function (see Appendix C,
                 Supplied User Functions) as well as any functions
                 required by "dynamic default values". However, if a
                 function is only required by one particular title
                 block it can be defined in xxxxxxxx.LSP where
                 xxxxxxxx is the name of the title block xxxxxxxx.BDR
                 file that uses it. (That is, if you insert C.BDR,
                 the file C.LSP will be loaded if it exists.)

IX. APPENDIX B--Global Variables

*DT_PATH . . . . Pathname of DrafTools subdirectory.
                  Ex. "C:\\ACAD\\DRAFTOOL\\"

*DWGSCALE . . . . Current Default Drawing Scale, set by specifying a
                  drawing scale during title block insertion.

*TBLAYER . . . . String variable specifying name of layer for Title
                  Blocks. Default layer is "TITLE" if none specified.

*TBSCALES . . . . String variable specifying name of file to use for
                  storing predefined drawing scales. Default filename
                  is "TBSCALES.TBD" if none specified.

Note: All Global variables that need to be set should be set in the
            DT_INIT.LSP file with the following AutoLISP command:
            (setq VARIABLE VALUE) where VARIABLE is the variable
            name and VALUE is its desired value. String values
            must be specified in double quotes ("").

X. APPENDIX C--Supplied User Functions

* All User functions are supplied AS SAMPLES ONLY, and reside in
             TBLOCK.LSP (see above)

(SETSCALES scale)--This function is used to set system and dimension
             variables after a drawing scale has been determined.
             It is automatically called by DrafTools when
             inserting a new title block. This function may be
             edited to set variables as desired.

(getdwgname)--Returns the name of the current drawing or the empty
             string ("") if the drawing is unnamed.

(getattribval ent tag)--Returns a string, the 'value' of an attribute,
             where "ent" is the entity name of the block
             containing the attribute and "tag" is the attribute
             tag.

(pack string)--Returns string "string" with trailing spaces removed.

(lookup dbase tag index field)--Returns the contents of field "field"
             from a dbase .dbf file (database) in the record where
             the contents of the "index" field are equal to the
             current value of the attribute "tag". This function
             is used to look up an address, for example, when
             another attribute contains the name of the person for
             whom you want an address.
             Example: (lookup "SSINST.DBF" "INSTALLER" "NAME"
             "PHONE")