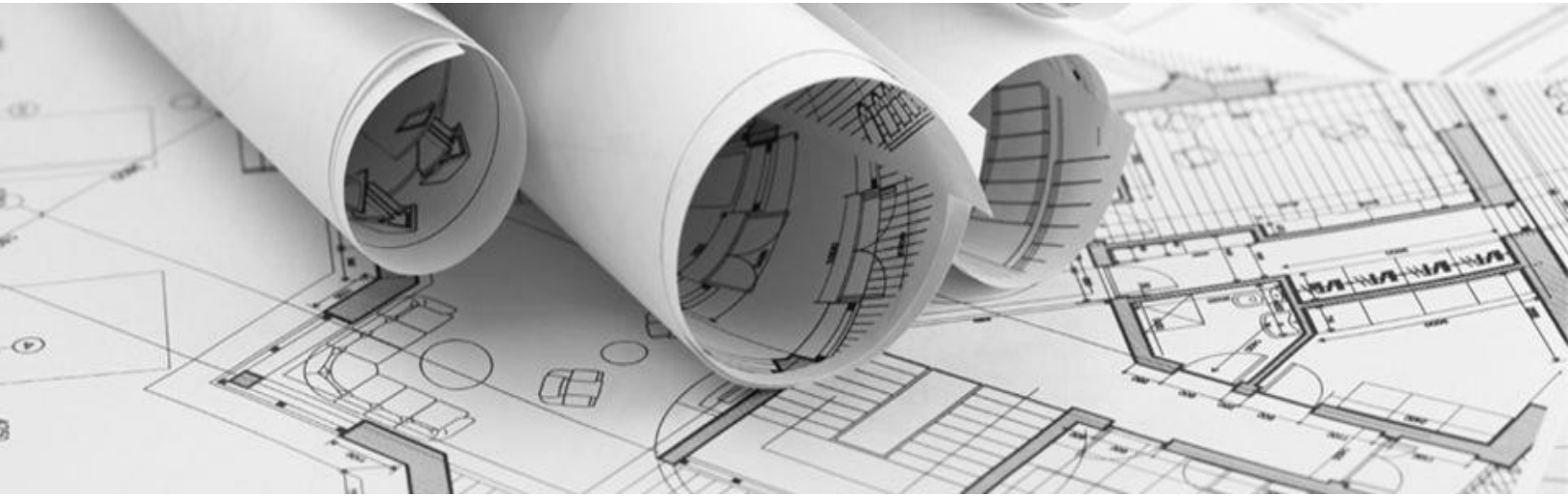


Where Paper and CAD Connect™



GTX Tutorials

The following tutorials were to get users familiarized with the interface and to provide a basic overview on how to use the product.

Please contact GTX Corporation to order a comprehensive, in-depth training course. GTX offers both on-site and on-line training programs.

GTX Europe Ltd

+44 (0) 1256-814-444



Using the Tutorials



To get the most from these lessons, we recommend that you familiarize yourself with the AutoCAD 2021's image commands. Experiment with the AutoCAD **Image** command to attach images within AutoCAD, **ImageAdjust**, **ImageQuality**, **Transparency**, basic drawing and property-modifying commands (entity drawing commands, the **Properties** command, **Object Snapping** modes).

Following the Lessons

Try performing these exercises twice. The first time, follow the instructions literally to learn how each command and feature works. The second time, try to accomplish the same results as fast as possible, using the options and techniques with which you are most comfortable.

The user interface for the GTXRaster CAD Series is very similar to AutoCAD. The majority of the commands were developed and named to mirror the AutoCAD's commands.

There are a couple of ways you could work with the software:

1. Using the command toolbar on AutoCAD's ribbon
2. Using the GTX Toolbars
3. Using the AutoCAD command line

In the following lessons you will be using the GTX Raster CAD Main Toolbar, which can be found on the AutoCAD ribbon, under the GTX Tab and GTX Toolbars panel. Please familiarize yourself with each icon by moving your cursor over them. A brief description of the command will appear next to the icon.

Please note that GTX allows you to select raster entities by using the Intelligent Object Picking™ (IOP) tools.

Lesson 1: Basic Commands

In this lesson you will load a raster file and clean up the file using GTXRaster CAD enhancement commands. You will then edit the file using a combination of GTXRaster CAD and AutoCAD commands and then save the edited file.

MENUS	IMAGING	ENHANCE	EDIT	CONVERT	CLEAN
COMMANDS	gAttach gSave	gCleaniop gEdge	gErase		

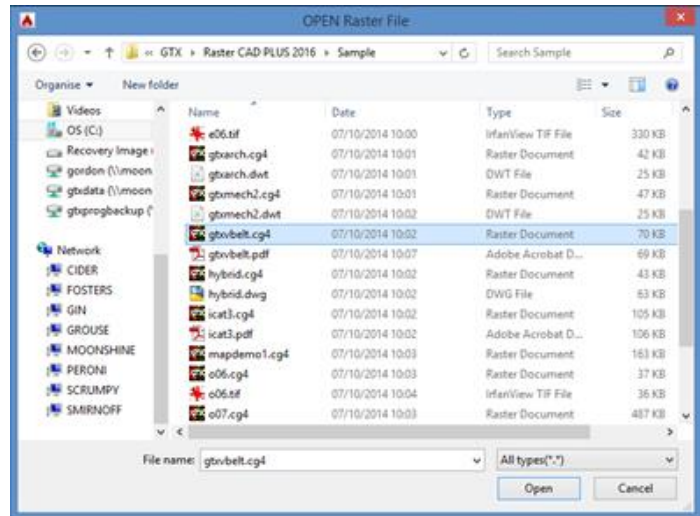
Attach a Raster File

The GTXRaster CAD Series software displays a vector CAD drawing in front of scanned raster images. You can edit the vector file in the foreground using the raster backdrop as a guide. Please use the GTX' **gATTACH** command to load raster files directly into AutoCAD.



- Using the GTXRaster CAD Toolbar select the **Quick Attach** Icon
- Select "All Types" in the Open Raster Window under "Files of Type".

Please notice the major raster file formats that are supported by GTX



- Select the gtxvbelt.cg4 file found in *c:\program files\gtx\raster cad 2021\sample\gtxvbelt.cg4*
- Please note that the raster image is automatically inserted at 0,0 point at a scale of 1.

Rename an Attached Image



Select **GTXImaging>Save**. Save the raster image with your name as the filename (*c:\program files\gtx\raster cad 2021\sample\<Your Name>.cg4*).

The file has been saved under the new filename.

In order to have a correct view of the drawing you will turn the raster image by 90 degrees using gTurn command:



- Invoke the **gTurn** command
- Specify the rotation angle (default value in brackets)
- Type 90 and press ENTER to execute the command

Enhance the Raster Image

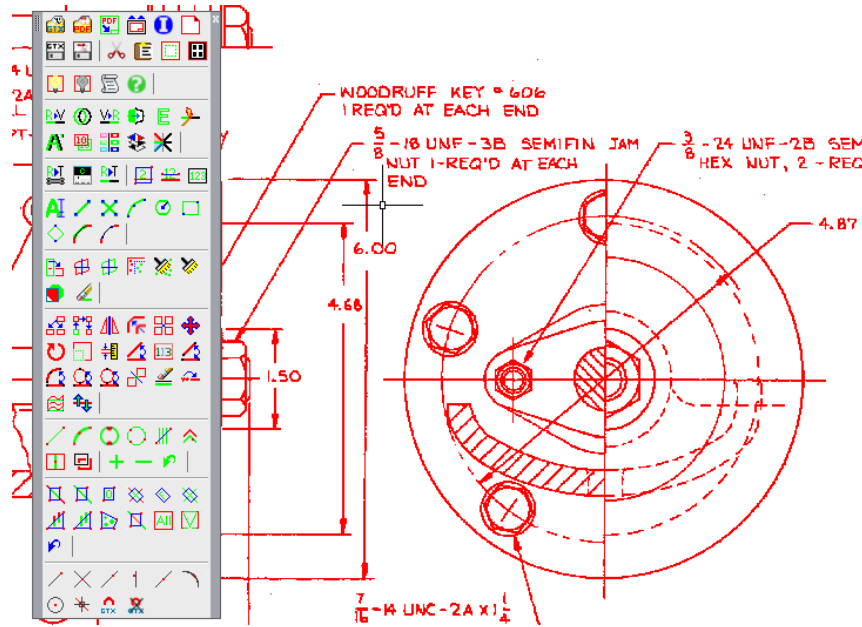
GTXRaster CAD allows you to perform a semi-automatic clean up of the raster drawing.

Use gCleanIOP to Straighten and Despeckle the Drawing

This drawing is slightly rotated (**skewed**) and has small stains (**speckles**) along the perimeter. You will run the gClean IOP command that automatically straightens the drawing and selects everything it considers as noise or unnecessary content.



1. Click on the **CleanIOP Raster** icon
2. The drawing is automatically deskewed
3. Everything considered noise or speckles is selected in green
4. Examine the drawing carefully to make sure that important data hasn't been selected
5. Remove the two parts of dashed line inside the CAM that were selected as speckles, using **IOP Remove** icon and then selecting **IOP Window** icon around the raster
6. Press ENTER to execute the command.
7. Zoom to extents by typing "z" for zoom, ENTER, and "e" for extents, ENTER.

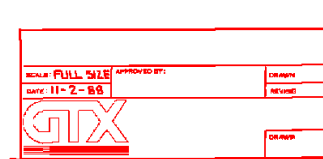


Remove Solid Entities

Solid entities consume a lot of memory and are generally hard to vectorize, especially if they have holes in them or are not 100% filled. GTXRaster CAD Series allow you to **Edge** the solid raster entities.



1. Click the **Edge** Icon to run the command
2. Zoom around the GTX solid logo in the lower-right corner of the drawing
3. Select the GTX logo using **IOP Object** icon
4. Press ENTER. Your result should look like the image above.



Erase Raster

GTXRaster CAD allows you to erase raster entities interactively using GTX Raster Picking tools. For the purposes of this lesson you will erase the table around the text in the upper-right corner of the drawing.



1. Zoom closely into the table
2. Click on the **Erase Raster** Icon
3. Select the table using **IOP Fence** icon by dragging a line across the table and avoiding text, the raster is selected
4. Press Enter to execute the command

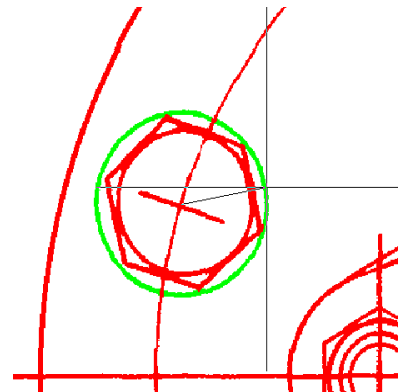
PC NO.	NAME	MAT.	QUAN.	NOTES
101	BRACKET	C.I.	1	
102	GEAR	C.I.	1	
103	SHAFT	STEEL	1	
104	GLAND	C.I.	1	
105	PULLEY	A.I.	1	DIE CAST
106	BUSHING	BRQ.	1	



Change Raster

GTX Software gives you the ability to “change” raster lines, circles and arcs using original image pixels, thus eliminating the lengthy erase-redraw process.

1. Zoom into the upper-left area of the cam
2. Select **Change Raster Circle** command to change the radius of the circle
3. Click on a point and drag the rubber-band to indicate the circle
4. Enter a new radius, 0.5 for example, on the command line
5. Please note, you can use Change Raster command for lines and arcs as well
6. **Lines**: change the length and the angle of the line, where your first selection point will become the point of displacement.
7. **Arcs**: change the circumference and the radius of the arc, where your first point becomes the point of displacement.



Save Your Changes

After spending time editing the drawing it is recommended to save the changes. You will want to save the image to a different name to preserve the original tutorial image.



Click on the **Save Raster icon**. This will save the attached raster image, please use AutoCAD save command to save the vector entities.

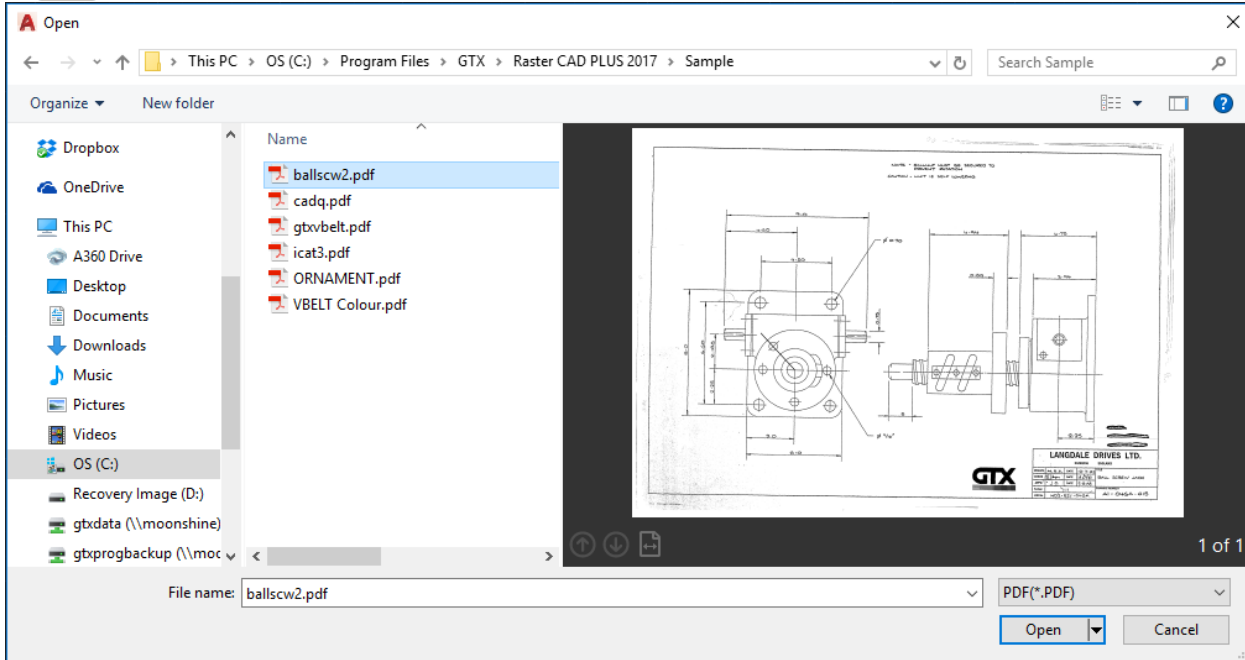
Please note that raster file is saved as a reference image linked to your AutoCAD DWG file by a directory path. Therefore, if you move or rename the original raster file AutoCAD will no longer be able to locate and attach it to your DWG.

Opening PDF images in GTXRaster CAD.

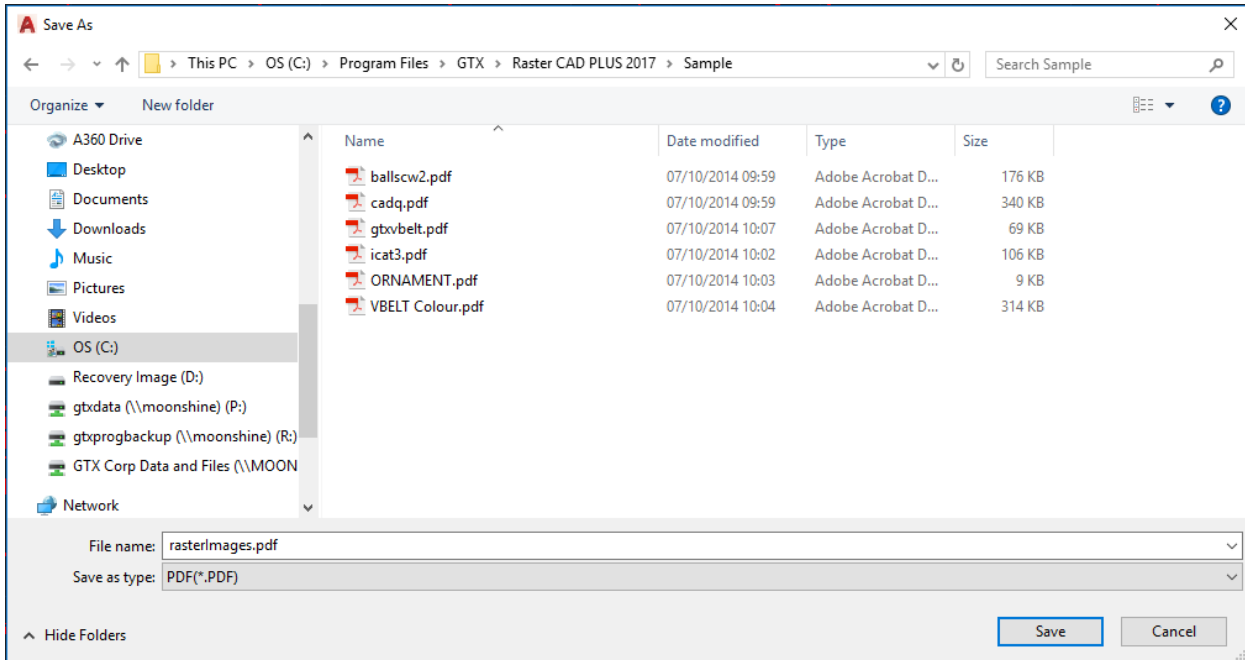
You can now attach PDF images into GTXRaster CAD by using the gPDFAttach command, these files can be Black and White images and color Images.



GPDFAttach :- Loads or attaches a PDF image.



GPDFSave :- Saves the current selected raster image to a PDF.



Once you have opened your PDF image in GTXRaster CAD you can also save the image as a tiff so this function allows you to go from PDF to tiff and tiff to PDF.

Lesson 2, Basic Raster to Vector Conversion Commands

MENUS	IMAGING	ENHANCE	EDIT	CONVERT	CLEAN
COMMANDS	gAttach gSave	gCleaniop		gConvrt	gJoin

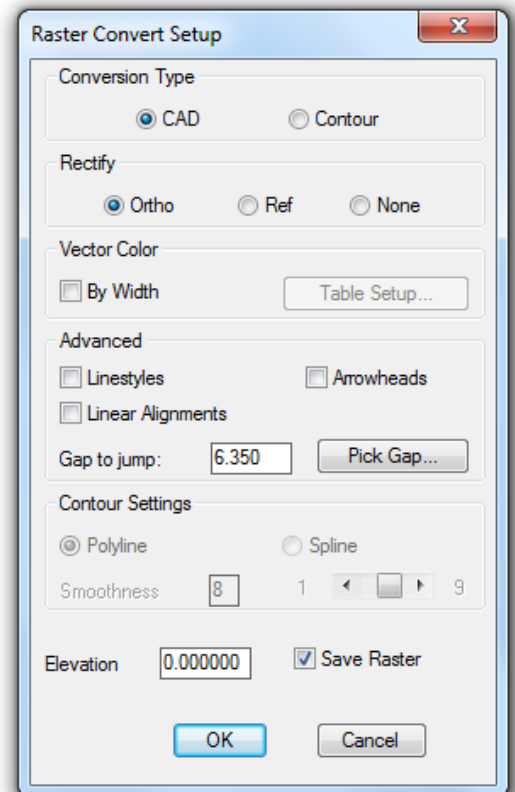
Please follow the steps described in Lesson 1 in order to attach the drawing and perform basic clean up. It is not recommended to convert the raster drawing into a vector format without at least some clean up.

Convert to Vector Format



GTXRaster CAD gives you the ability to convert your entire drawing into a DWG format in a matter of few mouse-clicks! Please note, text and geometry vectorization are two separate algorithms and have to be performed separately. In this lesson you will learn how to vectorize all geometrical entities in the drawing.

- Zoom to extends to get a view of the entire drawing by typing “z” – Enter - “e” – Enter
- Click on the **Raster to Vector** Icon
- Use **IOP All** icon to select the entire drawing
- Remove text form your selection using **IOP Remove** and **IOP All Text** icons
- Notice that all text entities have been excluded form the selection (marked in red). In addition certain parts of the hatch and dashed lines have been deselected.
- Add the hatch and dashed lines into the active selection using **IOP Add**
- Select IOP Window and window around the hatch and dashed lines to include them in the selection
- Click Enter once all geometrical entities are added to the active selection
- The following Vectorization menu will appear:



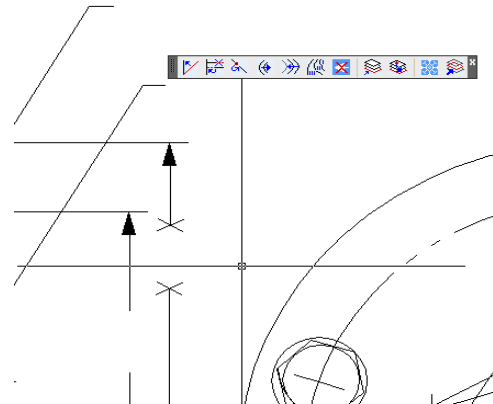
- Setup option will be discussed in the proceeding lessons. For the purposes of Lesson 2, please copy the selections as shown in the image
- Conversion Type: CAD; Rectify: Ortho; Advanced: Check the box for arrowheads to include them in the vector file
- Check the Linear Alignment box. Linear Alignment is designed to join “broken” lines at a specified Gap to jump. In this case, please select the gap of 20 pixels.

13. The save Raster box, when checked, allows you to save the initially selected raster as a reference. Please uncheck the box, which will allow you to see the vector entities separately.
14. Please notice that text still appears on the drawing as a raster image.

Vector Clean Up

In addition to raster editing and clean up GTXRaster CAD PLUS 2021 offers comprehensive vector clean up. In this section you will learn how to join “broken” vector lines.

1. Zoom into the area of the drawing to the left of the Cam
2. Bring up GTX VClean toolbar from the toolbar's panel
3. Click on the **Join Lines** icon
4. Select two lines that you wish to join, by clicking on them, as shown in the image
5. Press ENTER to execute the command



Save Your Changes

After spending time editing the drawing it is recommended to save the changes. You should save the image to a different name to preserve the original tutorial image.



Click on the **Save Raster icon**. This will save the attached raster image, please use AutoCAD save command to save the vector entities.

Please note that raster file is saved as a reference image linked to your AutoCAD DWG file by a directory path. Therefore if you move or rename the original raster file AutoCAD will no longer be able to locate and attach it to your DWG.

Lesson 3, Intermediate Raster Clean-up and Editing

MENUS	IMAGING	ENHANCE	EDIT	CONVERT	CLEAN
COMMANDS	gAttach gSave	gDeskew gSpeckle gCrop	gCut gPaste		

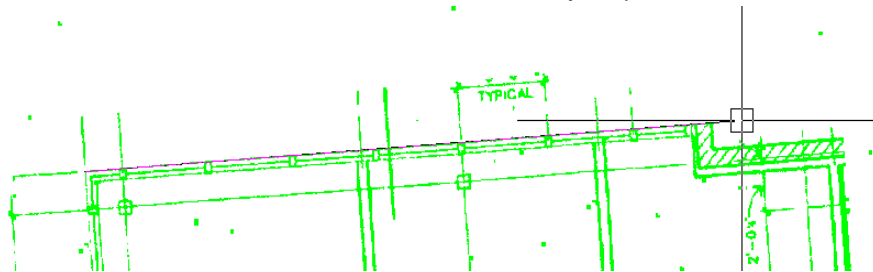
Please attach the gtxarch.cg4 drawing from the samples folder using AutoCAD's Image manager

Manually Deskew and Crop Raster

1. Type "image" in the command line to load the image manager. Select "Attach Image" in the top-left corner of the dialog box and select gtxarch.cg4
2. Please be sure to select the insertion point of 0,0 and scale of 1, as well as 0 rotation angle
3. Assign the entire image to the RASTER layer by clicking on the image's frame and right-mouse-click to select properties. Please select RASTER under the layer tab



4. The color of the entire image should change from black to red
5. Use **Deskew Raster** command to straighten the image
6. Select **IOP All** icon to include the entire image and press ENTER
7. Select the longest raster line available to accurately capture the angle
8. Please be sure to follow the raster line as closely as possible



9. The following message will appear on the command line: *Deskewing 4.198538 degrees.*



10. Use **Crop Raster** command to get rid of the speckles around the drawing
11. Window as closely as possible around the actual floor plan

Manually Despeckle Raster

Please note that gSpeckle command is designed for both despeckling and filling holes in the raster image.



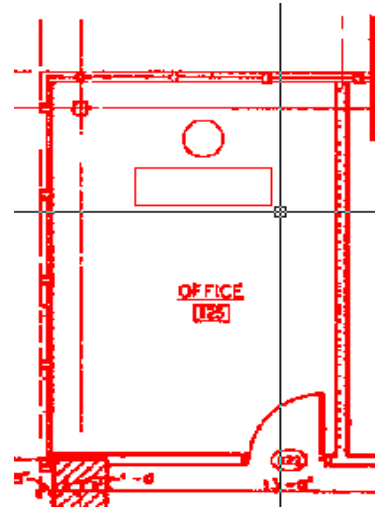
1. Use **Despeckle Raster** command to erase the noise
2. Pick the speckle off the screen by typing “p” in the command line to select the max size:
Speckle size <0.000>/Box/Pick: p
3. Type “d” in the command line to set the mode for deleting speckles
Mode <Delete speckle>/Fill hole: d
4. Review the selection to make sure that only noise was selected. Press ENTER
5. Repeat the command or manually erase speckles as necessary.

Draw, and Cut Raster

Suppose, it is necessary to add furniture in several offices on the floor plan



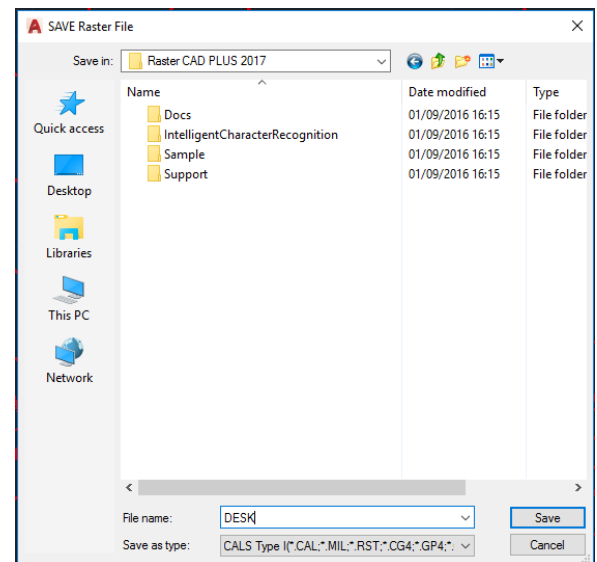
1. Use **Draw Rectangle** command to draw a desk
2. Use **Circle** command to draw an office chair
3. Measure the furniture using AutoCAD’s “distance” (Type DIST in the command line) command to see how it will fit in every desired room



4. Use **Cut Raster** command
Mode <Copy>/Erase:
5. Type “C” to select Copy.
Select raster<INSIDE>:
3. Window around the desk and chair. They will be highlighted. Press ENTER
Select lower left corner of raster limits:
4. The lower left corner becomes the “insertion point” when pasting the image. Select a point below and to the left of the highlighted objects as if you were picking the first point for a window.
Select upper right corner of raster limits:
5. Select the second point near and above and to the right of the desk.

Destination File/<Buffer>:

6. Type “F” to copy the selected raster to a file.
7. Save the file to C:\Program Files\gtx\raster cad 2021\desk.cg4.





Paste and Move Raster

1. Zoom in on the room in the lower-left office in the drawing

2. Use **Paste Raster** command

Source File/<Buffer>:

3. Type **F** to paste data from a raster file.

4. Select C:\Program Files\GTX\Raster CAD 2018\Sample\desk.cg4.

5. Select a point inside the room near lower left corner. It does not have to be in the exact spot as you can adjust the location later.

Insertion point <0.0000,0.0000>:

Loading raster—C:\Program Files\GTX\Raster CAD PLUS 2018\Sample\desk.cg4...

Move/Rotate/Scale:

6. Type **"R"** to rotate the image, and "270" for the rotation angle

Rotation angle <0.0>/Reference: 270

7. The data will appear with its lower left corner at the insertion point. Obviously the scale is too large. Type **"S"** to select the Scale option, highlighting the pasted raster.

Base point

8. Select a point at the lower left corner of the desk-chair arrangement.

Scale factors <1.0,1.0>/Fit:

9. Type "3/4,3/4"

The data will be made smaller and the highlighting will disappear.

Move/Rotate/Scale:

10. Type **"M"** to move the object

Base point or displacement:

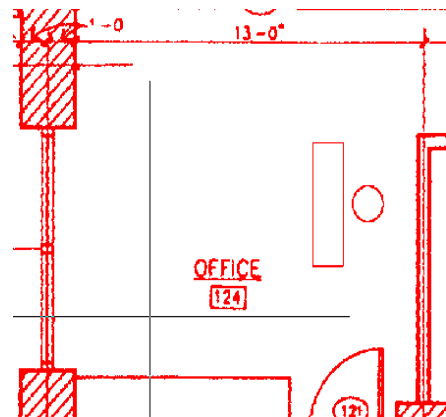
11. Select the upper left corner of the desk. A line will rubber-band from this point.

Second point of displacement:

12. Move the box such that the furniture is next to the door in the wall at the top of the room.

Move/Rotate/Scale:

13. You can keep moving the image around, or press ENTER to exit the command



Lesson 4, Typing New Raster Text and Editing Raster Text

MENUS	IMAGING	ENHANCE	EDIT	CONVERT	CLEAN
COMMANDS	gAttach gSave		gText gCText gHText		

Icon: Type raster text (gText)

Type raster text in the current image aided by the Text Formatting control.

Instructions:

Command: gtext

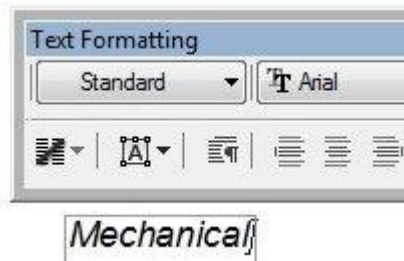
1. Specify start point of text:

The start point is the bottom left point of the first character in the text string.

2. Specify height: Enter a numeric value for the height of the text characters.

3. Specify rotation angle of text:

Text can be entered at any orientation angle that is specified. The default angle is zero degrees. After selection of the rotation angle the Text Formatting control appears with the In-Place Text Editor. Begin adding text entries. The keyboard Return key will add a new line for text entry.



4. To end editing click the OK button on the Text Formatting toolbar or click outside the In-Place Text Editor

After closing the text editor the raster text will appear.

-Raster text is created upon closure of the text editor

Mechanical

-Raster text with a vector text overlay is created if the GTX gHybridmode command was enabled before initiating the gText command.

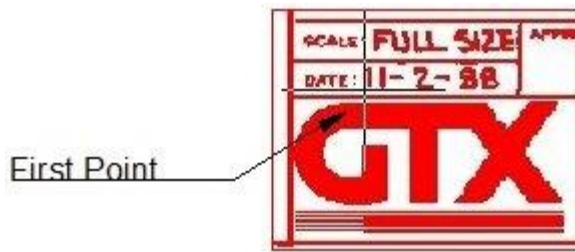
Mechanical

Icon:  **Change raster text (gCText)**

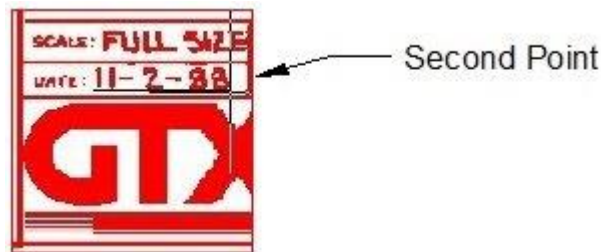
The change text feature begins by framing an area of the current raster image that contains raster text data that is to be replaced by new raster text. The framed area is defined by a baseline at any orientation angle and the replacement raster text will be drawn at that angle. The replacement text is entered with the aid of the Text Formatting control.

Instructions:

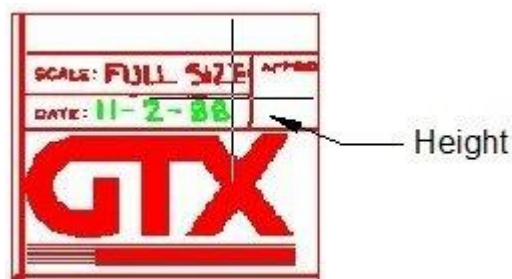
1. Select insert point of baseline The point chosen will be the lower left point of the first text character of the replacement raster text.



2. Select end point of baseline This point defines the width of the existing raster data that will be replaced by either new raster text or blank space.



3. Select rectangle height This point completes the frame of raster data that will be replaced by new raster text or blank space.



All raster data contained within the framed area will be highlighted. All highlighted raster data will be removed and replaced by the following steps.

4. Specify new text height Enter a numeric value that will set the height of the new raster text. The height of the existing raster text may be determined ahead of time by using the Dist command.

5. The Text Formatting control with the In-Place Text Editor will appear. Type over the raster text that was highlighted in step #3.



6.To end the editing click the OK button on the Text Formatting toolbar or click outside the In-Place Text Editor.



gCtext Advanced Instructions:

The change text command provides the choice of multiple IOP (intelligent object picking) selections on any part of the raster data in the current image object, however only the area of the data highlighted by the baseline and height framing is subject to editing of raster text. Any other highlighted raster will be erased when the gCtext command has completed.

In this example the editable text in the following images is the word BRACKET. That word was framed using the baseline and height selection. The two text lines at the bottom of this example were subsequently highlighted using an IOP selection, in this case the Inside selection.

This is the sequence gCtext command responses that complete this example;

Command: gctext

Select insert point of baseline:

Select end point of baseline:

Select rectangle height:

PC NO.	NAME	MAT.	QUAN.	NOTES
101	BRACKET	C.I.	1	
102	GEAR	C.I.	1	
103	SHAFT	STEEL	1	
104	GLAND	C.I.	1	
105	PULLEY	A.I.	1	DIE CAST
106	BUSHING	BRO.	1	

The word BRACKET was framed by a baseline and height point.

Select raster <INSIDE>:

Select opposite corner of window:

PC NO.	NAME	MAT.	QUAN.	NOTES
101	BRACKET	C.I.	1	
102	GEAR	C.I.	1	
103	SHAFT	STEEL	1	
104	GLAND	C.I.	1	
105	PULLEY	A.I.	1	DIE CAST
106	BUSHING	BRO.	1	

The last two lines of text were selected and highlighted by the Inside IOP

Select raster <INSIDE>:

Multiple IOP choices on other sections of raster data are allowed. Press the keyboard Return to escape further picking choices

Specify new text height



PC NO.	NAME	MAT.	QUAN.	NOTES
101	BRACKETS	C.I.	1	
102	GEAR	C.I.	1	
103	SHAFT	STEEL	1	
104	GLAND	C.I.	1	
105	PULLEY	A.I.	1	DIE CAST
106	BUSHING	BRO.	1	

The In-Place Text Editor opens and the word BRACKET is edited.

To end editing click the OK button on the Formatting toolbar or click outside the In-Place Text Editor

PC NO.	NAME	MAT.	QUAN.	NOTES
101	BRACKETS	C.I.	1	
102	GEAR	C.I.	1	
103	SHAFT	STEEL	1	
104	GLAND	C.I.	1	

The word BRACKET has been changed and all IOP selected raster data is removed.

Icon: **A** Change raster and vector, hybrid text (gHText)

The gHtext command begins with the selection of a vector text object. The command can edit any DTEXT or MTEXT entity or hybrid text that was created by using the gText command while the gHybridmode function is enabled. Hybrid text is raster text with a vector text overlay. The final result of text editing with the gHtext command will be hybrid text. If vector text is selected and there is no attached raster image then a raster image will be created by an automatic start of the gCreate command. Edited hybrid text will be oriented at the same angle as the text that is chosen to be edited. The gHtext command initiates a vector text editor aided by the Text Formatting control.

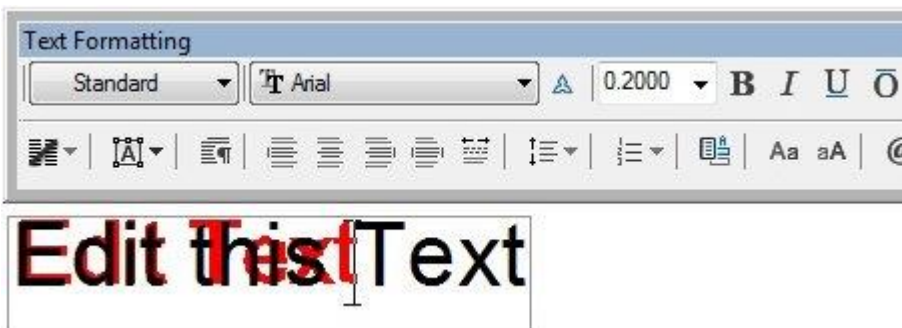
Instructions:

Command: ghtext

1. Select text object: Mouse click on the vector text to be edited.
2. Selection of a vector text string opens the Text Formatting control with the In-Place Text Editor.



3. Place the cursor at the point where text is to be added or deleted. Type new text or swipe over existing text to delete.



4. When editing is complete, click the OK button on the Text Formatting control or click somewhere outside of the In-Place Text Editor. The changed hybrid text is completed.

Edit this Text

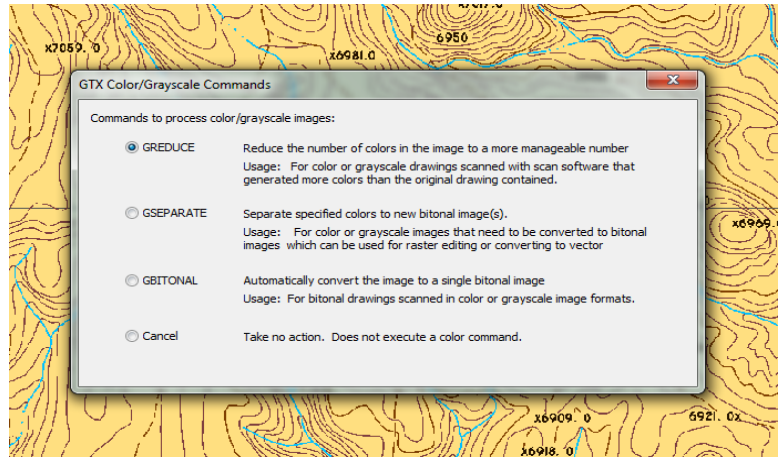
Lesson 5, Working With Color Images

MENUS	IMAGING	ENHANCE	EDIT	CONVERT	CLEAN
COMMANDS	gAttach gActive			gSeparate gReduce	

The GTXRaster CAD series has been designed to work predominantly with binary (Black & White) images and cannot directly edit color images like photos or high-resolution color pictures. However, the new color commands allow extraction and conversion of color images to bitonal images that can then be edited and converted to AutoCAD entities. We recommend that you first reduce the color image down to a manageable number of colors (between 4 to 256 colors) before you apply the Color Separation command. Some color images are scanned with the 'anti-aliasing' option turned on. Anti-aliasing can enhance the quality of some images, particularly photographs. However it is not ideal for images with solid fill color as it tends to mix colors to achieve a more blurred image.

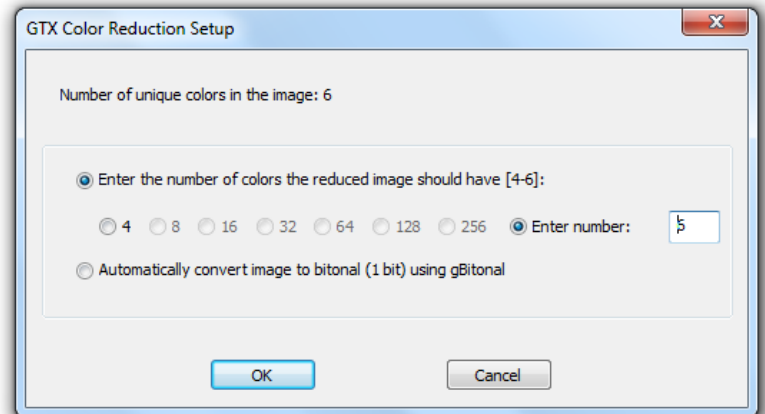


1. Load a color raster file
2. Select color mapdemo.tif and click Open. The image will then appear on the screen.
3. A dialog appears giving you various options: **gReduce**, **gSeparate**, **gBitonal**
4. Please Select Cancel



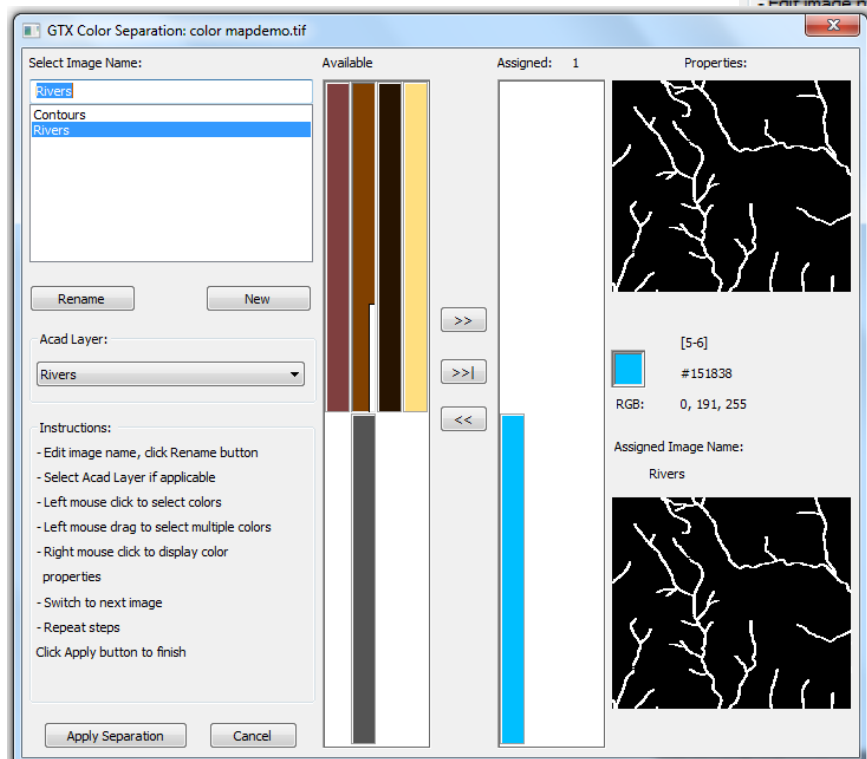
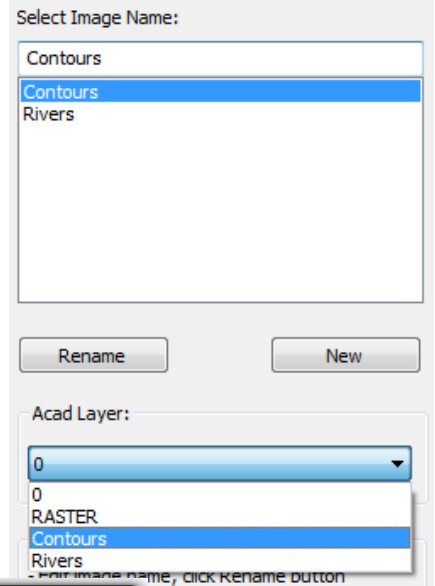
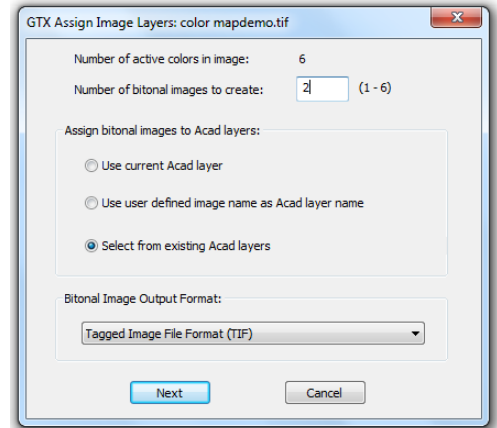
Reducing the number of colors in an image

1. Use **Reduce Color Image** Command
2. Select the option to reduce the image to 4 colors. This is a manageable number of colors to use for the tutorial
3. Select the OK button to reduce the color image down to 4 colors
4. Please note, you cannot use the command to increase the number of colors.

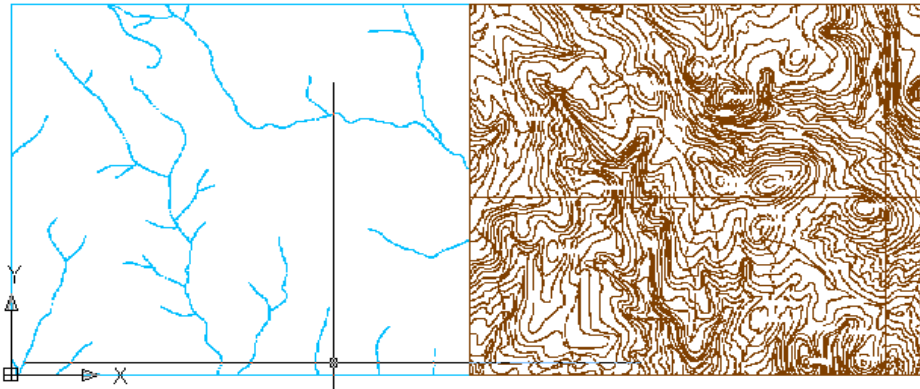


Color Separation

1. Please create two new layers in AutoCAD, and call one "contour" and the second one "river". We recommend assigning different colors to the layers to better distinguish them visually.
2. Use **Separate Color Image** Command to start the separation process. You will create two new Bitonal (black and white) images after completing the steps.
3. In the dialog box type "2" for the number of images to create
4. "Select from existing Acad layers" is the second option you will select
5. We recommend saving new images in TIFF format, under "Bitonal Image Output Format"
6. Click "Next" to proceed
7. Please be sure to rename the images by typing the new image's names and clicking the "rename" button
8. Assign each image to a previously created AutoCAD layers
9. Please make sure you select colors for one image at a time
10. The colors that have been selected will have a white rectangular mark on the bottom-right corner
11. The image below shows the complete color separation menu



13. Use left-mouse click to assign the blue color for “rivers” image and layer
14. Assign brown for the “contours” image and layer
15. Double check your assignment by clicking on the image name in the top-left corner of the window
16. Click “Apply Separation” to create two new bitonal images
17. Type “IMAGE” in the command line to open AutoCAD’s Image Manager
18. Detach the original “color mapdemo” image and place/move new images side by side
19. Your results should look like the image below.



20. **Please note that you cannot edit two images at the same time. In order to switch images please use the gACTIVE command and select the image from the window or click on the images frame.**

Notes on Digital Color

File formats and compression methods

Numerous compression techniques have been developed in order to reduce the size of the scanned image; they can be divided into two major categories: *lossy* and *lossless*. Among the most commonly used file formats TIFF, GIF and BMP are considered lossless as they do not actually remove pixel data. On the other hand, JPEG or JPG is a lossy format designed chiefly for photographs and prints. Although GTX can load & save .jpg (JPEG) files it is not an ideal operating format for GTX work. Due to the fact that JPEG is a format intended to work with pictures or photographs, saving in JPEG format colors can automatically be added or removed from the color pallet, reducing the data integrity and quality. We recommend that you save JPEG files in .TIF or .PNG format to avoid losing image definition.

Anti-Aliasing

Some color images are scanned with the “anti-aliasing” option turned on. Anti-aliasing can enhance the quality of some images, particularly photographs, however, it is not recommended for images with solid fill color as it tends to mix colors to achieve a more blurred image.

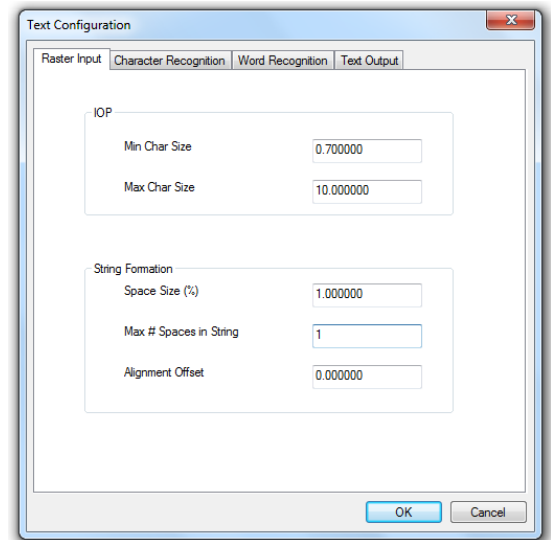
Although the gSEPARATE command will work with anti-aliased images, the results may not be as good as required. As such we recommend that, if possible, to scan your images with anti-aliasing turned off.

Lesson 6, Converting Raster Text into Vector

GTX Raster CAD series allows converting raster text, including hand-written character, into the vector format. One of the major benefits of Intelligent Character Recognition, GTX® ICR™ text conversion, is the ability to train the software and thus increase the productivity. **Please note, two different algorithms govern text and geometry conversion, therefore the two have to be performed separately.**

MENUS	IMAGING	ENHANCE	EDIT	CONVERT	CLEAN
COMMANDS	gAttach gSave	gCleanIOP		gTconfig gTconvrt	

1. Attach the gtxvbelt image typically found in C:\Program Files\GTX\Raster CAD PLUS 2021\Sample\gtxvbelt.cg4
2. Please follow the steps described in the Lesson 1 (Turn Raster, Clean IOP, Save etc) to create a generally workable image
3. Use **Configure Text Conversion** command to set up the conversion process, the following dialog window will appear:
4. Under the IOP box the min and max size of a raster entity selected as text is defined
5. Keep the maximum selection at the default 0.4; change the minimum to 0.03 for this particular drawing
6. Under The String Formation box the **Space Size** represents the distance (in terms of the portion of a character's width) between two raster characters required to insert "space character" between them. Change the default value to .75
7. **Max # Spaces** represents the maximum number of space characters allowed before the characters need to be split into two separate AutoCAD text entities
8. **Alignment Offset** represents the vertical offset allowed between two characters that are of the same text string



9. **Character Recognition** is probably the most important selection in the text conversion process. Under this tab you will upload and train one or several “dictionary” files, provided by GTX, stored in the main GTX Raster CAD PLUS Series 2021 directory:

C:\Program Files\GTX\Raster CAD PLUS 2021\IntelligentCharacterRecognition

10. Please click “Open or new” button to upload tutorial.icr and g_u_0.icr files as you are able to train during your text conversion process

11. Tutorial.icr is the most complete file storing information about upper case, lower case characters as well as numbers at 0% orientation on the plane. In the names of the ICR files “**U**” stands for upper-case, “**L**” stands for lower-case, “**N**” - for numbers. Numbers “**270**”, “**90**” and “**0**” represent the orientation of the text on the XY plane that will be recognized

12. **For Example:** g_u_90.icr is the file containing upper-case characters at 90-degree angle, g_n_0.icr is the file containing numbers at 0-degree angle. **Please note,** Arial.icr – is the file containing Arial font style, cad.icr contains special CAD symbols, simplex.icr contains Simplex font style, template.icr contains samples of characters hand-drawn using a standard plastic template

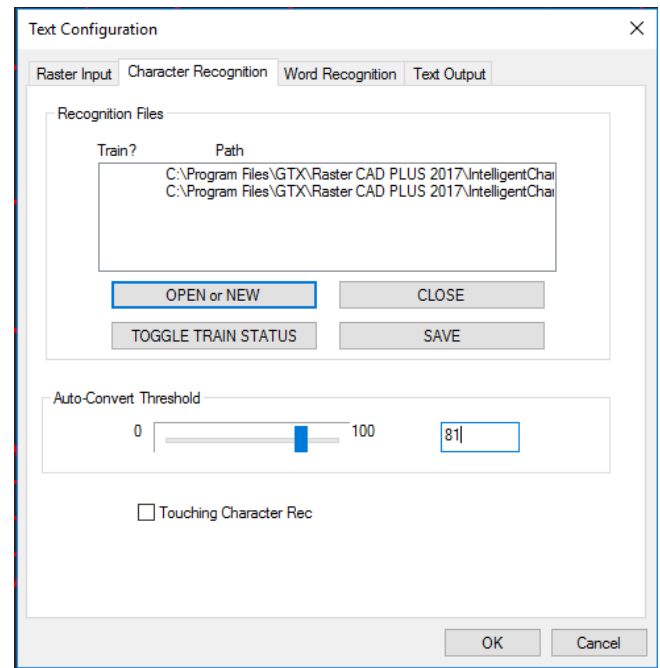
13. In order to train a particular file please highlight the file in the Path box and click the “Toggle train Status” button. An “X” will appear to the left of the file’s name
14. Auto-Convert Threshold sets the level of confidence at which the software will convert the text automatically. For Example: 0- means that every character will be converted automatically, 100- means that the software will prompt the user to double-check every character

15. We recommend setting the Auto-Convert threshold around 80, depending on the initial ability of the software to recognize your specific text

16. **Word Recognition** is the second method of text conversion, where the software attempts to recognize individual words as opposed to individual characters. Please note, in order to achieve optimal text conversion results it is best to train the program to recognize individual characters before the words. Therefore we recommend using Character Recognition method at first

17. Similarly to character recognition, load **base.dtc**. Base.dtc and User.dtc are the two dictionary files provided by GTX, where base.dtc contains 6626 words. User.dtc was created for definition by each individual use, as both of these files are editable in Microsoft Notepad

18. **Select the touching characters box if your raster text is touching.** This will initiate the software’s ability to recognize joined letters



19. **Text output** is the final stage of configuration. Please measure the raster text size using AutoCAD DIST command, and try to use the average for the vector text size

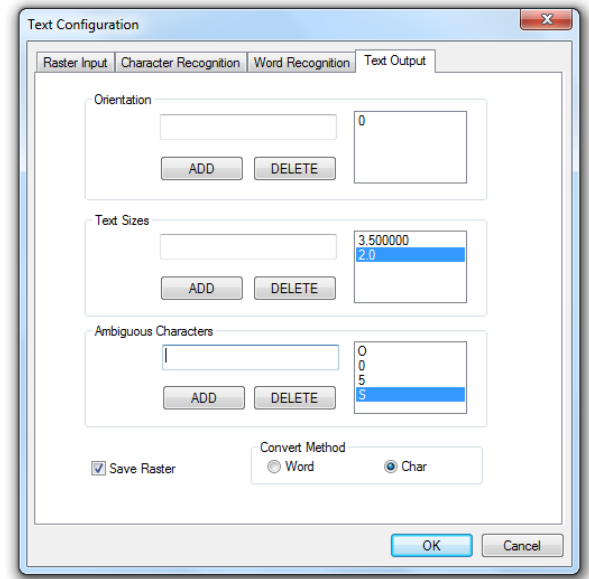
20. Input .15 for this particular lesson, select "ADD" or click "ENTER"

21. Ambiguous characters are letters and numbers that, even when drawn clearly, can be confused or mistaken as another character. For Example: "1" and "l", "0" and "O", "5" and "S". When these characters are input into the program it will not convert them automatically into vector text, regardless of the level of confidence

22. Input the above mentioned characters

23. Select "Save Raster" option if you would like to keep a copy of the image

24. Please remember to use Character conversion method at first



25. Upon completing the configuration we will proceed to Text Conversion. **Select Convert to Text** command from the toolbar



26. Zoom into the upper-right corner of the drawing containing a table of text

27. Select a few columns using **IOPTextWindow**



28. Select a line of text using **IOPTextLine**

29. Press ENTER after you have completed the selection. As we mentioned before, it is best to start working with small amounts of text and train the software before proceeding to selecting the entire image's text. In order to select everything the program considers text use **IOPAIIText**

PC NO.	NAME	MAT.	QUAN.	NOTES
101	BRACKET	C.I.	1	
102	GEAR	C.I.	1	
103	SHAFT	STEEL	1	
104	GLAND	C.I.	1	
105	PULLEY	A.I.	1	DIE CAST
106	BUSHING	BRO.	1	

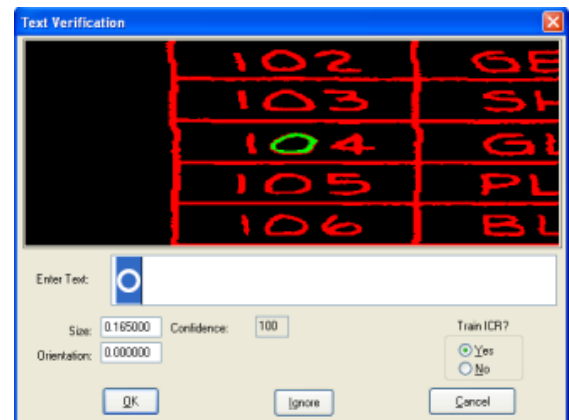


30. Text Verification menu will appear

31. In order to correct the program simply delete the wrong character and type in a new one

32. Please pay attention to the confidence level of the software as characters are verified

33. **Please remember to save your trained ICR files**



Command Reference

This section is your quick reference guide to the Menus and the Commands found within the GTXRaster CAD Series 2021 software.

Function Keys


























The function keys control useful features and modes. Here is a list of the function key controls:

F1	F2	F3	F4
Online Help	Text Window	List Vector Entities	Raster Drawing Status
F5	F6	F7	F8
Redraw	Toggle Coords	Toggle Grid	Toggle Ortho Snap
F9	F10	F11	F12
Toggle Snap	Toggle Status Bar	Zoom All	Zoom Previous

Raster Picking Options

Most commands affect a subset of the raster image. To **gMOVE** a raster circle, you need to first pick that circle. The GTXRaster CAD series uses **Intelligent Object Picking (IOP)** to pick raster entities from the drawing as if they were intelligent CAD entities. These options can be typed, found in the **GTX Edit>Raster Pick**, the toolbar or the screen menu.









The following list describes each IOP option:

IOP	Result	IOP	Result
 Window	All in rectangle	 PWindow	All in polygon
 Crossing	Inside & crossing polygon	 PCrossing	Inside & crossing polygon
 Inside	Entirely within rectangle	 Pinside	Entirely within polygon
 RWindow	All in rotatable rectangle	 RCrossing	Inside & crossing rotatable rectangle
 RInside	Entirely within rotatable rectangle	 Fence	Crossing polyline
 Line	Intelligent Line	 Arc	Intelligent Arc
 2p-Circle	Intelligent Circle	 Circle	Intelligent Circle
 Object	Isolated object	 Segment	Contour/ Segment
 AllText	All Text	 Text Win	Text Window
 Text Line	Text Line	 Under	Under vector
 Add	Adds to selection	 Previous	Previous selection
 Remove	Removes from selection	 All	All Raster
 Undo	Undo last pick		
















Raster Object Snapping Options

The GTXRaster CAD series provides transparent “raster snaps”. While using a CAD or Raster command, select Control-Right-mouse button to choose raster snaps from a pop-up menu.

In addition to transparent raster snaps, the GTXRaster CAD series includes the **gAUTOSNAP** command, enabling **Endpoint**, **Intersection**, **Nearest** and **Node** AutoSnap™ methods within active raster entities. The following table lists each raster snap option.


















Icon	Name	Keyboard	Description
	None	'rnone	Disables previous snap mode settings
	Endpoint	'rend	Snaps to the nearest end of a raster entity
			Endpoint activates as running snap under AutoCAD's End AutoSnap™.
	Intersection	'rint	Snaps to the intersection of two or more raster entities
			Intersection activates as running snap under AutoCAD's Intersection AutoSnap™.
	Nearest	'rnea	Snaps to the centerline of the nearest raster object
			Nearest activates as running snap under AutoCAD's Nearest AutoSnap™.
	Edge	'redge	Snaps to the edge of the nearest raster object.
			Edge activates as running snap under AutoCAD's Node AutoSnap™.
	Center	'rcen	Snaps to the center of a circle or arc defined by three raster points
	Midpoint	'rmid	Snaps to the midpoint of a line defined by two raster points
	MidArc	'rmida	Snaps to the midpoint of a raster arc defined by the endpoints and a circumference point

Imaging Commands

Command	Result	Available
 GATTACH	Loads or attaches a raster image	ALL
 GPDFAttach	Loads or attaches a PDF image	ALL
 GDETACH	UNLoads or detaches a raster image	ALL
 GINFO	Obtains details about the current raster image	ALL
 GCREATE	Creates a new raster image	ALL
 GSAVE	Saves the currently selected raster image	ALL
 GPDFSave	Saves the currently selected raster image to a PDF	ALL
 GCUT	Cuts raster to a file or a memory buffer.	ALL
 GPASTE	Pastes raster data into current image from buffer or raster file.	ALL
 GRESIZE	Resizes the active image	ALL
 GINVERT	Reverses the background and foreground raster colors of the current raster image.	ALL
 GACTIVE	Loads an image and makes it "current"	ALL
 GINACTIVE		ALL
 IMAGEFRAME	Displays image frames so you can select images.	ALL
 GHHELP	Launches GTXRaster CAD Help File	ALL





Edit Commands

Edit commands let you directly edit drawings without converting them to vector first.

Command	Result	Available
 GERASE	Erases selected raster.	ALL
 GCOPY	Copies selected raster to a new location in the current image.	ALL
 GMCOPY	Multiple Copies of selected raster to a new location in the current image.	ALL
 GMIRROR	Mirrors selected raster across a mirror line.	ALL
 GOFFSET	Offsets raster lines, arcs and circles.	ALL
 GARRAY	Copies selected raster data in rectangular or polar arrays.	ALL
 GMOVE	Moves selected raster data.	ALL
 GROTATE	Rotates selected raster data to a specified angle.	ALL
 GSCALE	Scales selected raster data by a specified scale factor.	ALL
 GCOORDS	Resizes the raster image by a specified measurement.	ALL
 GCHANGE	Stretches raster lines, arcs and circles.	ALL
 GCTEXT	Change raster text by text replacement	ALL
 GSLICE	Slices raster objects that should not be joined.	ALL
 GRUB	Erases raster under selected vector objects.	ALL
 GSMOOTH	Smoothens the selected raster data.	ALL
 GWARP	Stretches areas of the current image between source and destination points.	ALL
 GREFLCT	Reflects the current image about the X or Y axis.	ALL









Modify Images Commands

Modify Images commands applies the AutoCAD Move, Copy, Scale and Rotate commands to all images at once.

Command	Result	Available
 GMAI	Moves all images.	ALL
 GCAI	Copies all images.	ALL
 GSAI	Scales all images.	ALL
 GRAI	Rotates all images.	ALL











Enhance Commands

Enhance commands provide an effective way to prepare an image for editing or conversion.




Command	Result	Available
 GTURN	Quickly Turns the active image by a multiple of 90 degrees.	ALL
 GDESKEW	Deskews the current image.	ALL
 GADESKEW	Automatically deskews the current image.	ALL
 GSPECKLE	Deletes speckles from the current image.	ALL
 GCLEANIOP	Automatically deskews and despeckles the current image.	ALL
 GACLEAN	Automatically cleans and deskews the current image.	ALL
 GCROP	Deletes all raster data outside a specified rectangular window.	ALL
 GERASE	Erases selected raster.	ALL

Conversion Commands

Conversion commands translate data from one format to another (i.e., raster to vector).

Command	Result	Available
 GCONVRT	Converts raster data to AutoCAD vector geometry.	PLUS
 GHTEXT	Edit vector text and create a raster underlay.	ALL
 GHYBRIDMODE	Enable vector overlay of drawn raster lines, arcs, circles, rectangles and text.	ALL
 GRASTER	Converts vector objects to raster.	ALL
 GECONVRT	Converts the edges of solid raster to vector objects.	PLUS
 GEDGE	Removes the inside of solid raster regions, leaving only the edge.	ALL
 GBURN	Converts all vector objects in the drawing to raster ("burns" to raster).	ALL
 DRAWORDER	Moves all raster image entities' draworder to back.	ALL
 GTRACE	Traces over raster objects with vector entities	ALL
 GVECTOR	Converts a single raster entity into vector	ALL

TEXT Conversion Commands

Command	Result	Available
 GTCONFIG	Configures text conversion.	PLUS
 GTRAIN	Trains ICR recognition files.	PLUS
 GTCONVRT	Converts raster text to AutoCAD text objects.	PLUS