

# TMSSequoia Cut and Paste ActiveX Control

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User's Guide  
ImageBASIC 3.1

*IMAGE*  *BASIC*

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# Chapter 1: Introduction

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## Linking of ImageBASIC Controls

Virtually all ImageBASIC controls can accept image data from other ImageBASIC controls. The process of designating where each ImageBASIC component gets its image data is referred to as linking of controls. With the exception of those controls that can directly access files or scanners, all ImageBASIC controls must be linked to another ImageBASIC control to receive any image data.

Linking of controls is the primary method of moving an image through a series of processing steps. For example, an image may be originally captured through the PixScan ActiveX, passed to a TMS Display ActiveX for operator verification, optionally routed through the TMS Cut and Paste control for enhancement, then to a TMSFile control to be written to disk, and finally to a TextBridge ActiveX for OCR processing to generate indexing information for that file.

### Creating the Link

All of the ImageBASIC controls have a property named **ImageDataSource**. To create the data link between controls, this property is set to the Name of the source ImageBASIC control. Any image that is received by the named control will also be sent to the linked control. For example, if the **ImageDataSource** property of a TMS Display control is set to the Name of a PixScan control, each time a new image is scanned, the display control will receive that image.

Linking each control requires only one line of code that can be executed at any time. The source of image data can be changed during program execution by naming another ImageBASIC control in the **ImageDataSource** property, as shown here:

```
TMSCP1.ImageDataSource = TMSDispl
```

Each time the image data flowing from one ImageBASIC control changes, the receiving control's **ImageDataChanged** event is triggered. From this event, any procedure that is to be performed on each image can be started. For example, each time an OCR control **ImageDataChanged** event occurs, an OCR attempt could be started on the new image data.

## Licensing Verification

In order for any application using the TMSCP ActiveX to function, it must be able to verify that the control is licensed. This verification usually takes the form of a

search for a license in a database or on a hardware key. In all cases, however, the developer is given some control over when the control requests licensing verification.

# Chapter 2: Using Cut and Paste Operations

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## Introduction to the Cut and Paste Control

The cut and paste functionality of this ActiveX allows you to cut or copy the entire image or regions of images to the Window's Clipboard. Once an image is pasted into the Clipboard, it can then be pasted back into the Image Display Window or paste into other applications which accept compatible image files.

Determining regions for cut and paste can be accomplished in one of two ways: visually specifying the regions using the working region on the display control or programmatically specifying the regions.

## Setting Source and Destination Regions

The cut and paste options allows you two different ways to specify the source region for cutting or copying. Users can visually define a region using the right mouse button. This is a function of the display control. This option allows the user more freedom over which areas to cut and paste.

However, if you are running an automated system and the area which you need to cut and paste will be the same for each image, you can programmatically set these regions. This reduces operator error and speeds up production time.

### *Using Working Regions to Set Source and Destination Regions*

When using Working Regions to cut and paste image regions, you must make sure that the **ImageDataSource** property is set to the display control. This will inform the control that information that it is to receive can be found in the display.

### Setting the Source Region

To set the source region for cutting or copying from the display's working region:

- 1) Set the **ImageDataSource** property to display that you will be cutting or copying the source image region from:

```
TMSCP1.ImageDataSource = TMSDisplay1
```

- 2) Set the **SourceRegOption** to *0--Working Region*:

```
TMSCP1.SourceRegOption = 0
```

This options allows the user to set a working region on the display specified in the **ImageDataSource** property.

- 3) Set the cut or copy method.
  - To cut the region out of the source display:  
`TMSCP1.Cut`
  - To copy the region out of the source display:  
`TMSCP1.Copy`

These methods will send the cut or copied regions to the Window's Clipboard where it will stay until another image or text is copied to the Clipboard.

### Setting the Destination Region

To set the destination region through Working Regions:

- 1) Set the **ImageDataDest** property to the display control which is going to receive the cut or copied image:  
`TMSCP1.ImageDataDest = TMSDisplay1`
- 2) Set the **DestRegOption** property to the *0--Working Region* option:  
`TMSCP1.DestRegOption = 0`

This options allows the user to set a working region on the display specified in the **ImageDataDest** property.

- 3) Set the **Paste** method:  
`TMSCP1.Paste`

This method will paste the current image or text stored in the Window's Clipboard into the designated Working Region

### Programmatically Setting Source and Destination Regions

Setting the source and destination regions programmatically is one of the best ways to reduce operator error when designing an automated cut and paste application. When using similar images, this method assures that the regions will be accurately cut and pasted. This method does require some simple testing in order to determine the coordinates. To find out more on this subject, see the section "Determining Regions" later in this chapter.



## Setting the Source Region

To programmatically set the source region on the display window:

- 1) Set the **ImageDataSource** to the display control supplying the source image:

```
TMSCP1.ImageDataSource = TMSDisplay1
```

- 2) Set the **SourceRegOption** property to the *I--RegXXX properties* option. This will activate the source region parameter properties:

```
TMSCP1.SourceRegOption = 1
```

- 3) Determine the area that you need to cut or copy, (see the section, "Determining Regions" later in this chapter for more information) and set the source region properties to these values:

```
TMSCP1.SourceRegBottom = 300
```

```
TMSCP1.SourceRegLeft = 300
```

```
TMSCP1.SourceRegRight = 600
```

```
TMSCP1.SourceRegTop = 1200
```

- 4) Set the cut or copy method.

- To cut the region out of the source display:  

```
TMSCP1.Cut
```
- To copy the region out of the source display:  

```
TMSCP1.Copy
```

These methods will send the cut or copied regions to the Window's Clipboard where it will stay until another image or text is copied to the Clipboard.

## Setting the Destination Region

To programmatically set the destination region for the cut or copied image:

- 1) Set the **ImageDataDest** property to the display control which is going to receive the cut or copied image:

```
TMSCP1.ImageDataDest = TMSDisplay1
```

- 2) Set the **DestRegOption** property to the *I--RegXXX properties* option:

```
TMSCP1.DestRegOption = 1
```

This option activates the destination region properties which will specify the area into which to paste the image region.

- 3) Determine the area that you need to paste the region into, (see the section, "Determining Regions" later in this chapter for more information) and set the source region properties to these values:

```
TMSCP1.DestRegBottom = 300
TMSCP1.DestRegLeft = 300
TMSCP1.DestRegRight = 600
TMSCP1.DestRegTop = 1200
```

- 3) Set the **Paste** method:

```
TMSCP1.Paste
```

This method will paste the current image or text stored in the Window's Clipboard into the designated specified region

## Determining Regions

When programmatically setting regions to cut and paste, it is almost impossible to determine the numerical value of the source and destination regions visually. A simple way to determining the region you would like to cut, copy or paste is to perform a test on the image using the working region in the display control. This provides an accurate way of determining region coordinates.

In the **MouseUp** event of the display control, the following code will report the coordinates of the working region you specify in the Visual Basic Debug Window. This allows you to visually draw the regions on the image you will be using for the cut, copy and paste operations. After you have determined these coordinates, you can then place the values in the source and destination region properties of the cut and paste control:

```
Private Sub TMSDispl_MouseUp(ByVal Button As Integer, ByVal
    Shift As Integer, ByVal ScreenX As Integer, ByVal
    ScreenY As Integer, ByVal ImageX As Integer, ByVal
    ImageY As Integer)
    If Button = 2 Then
        Debug.Print "TMSDispl.RegTop = " & TMSDispl.RegTop
        Debug.Print "TMSDispl.RegLeft = " & TMSDispl.RegLeft
        Debug.Print "TMSDispl.RegBottom = " & TMSDispl.RegBottom
        Debug.Print "TMSDispl.RegRight = " & TMSDispl.RegRight
    End If
End Sub
```

- 3) Depending on whether you are cutting and copying or pasting, the region properties for the TMS Display control and the TMS Cut and Copy control look similar. The following table corresponds the TMS Display region properties to the TMS Cut and Paste source and destination region properties

Display Regions	Cutting or Copying	Pasting
TMSDisp1.RegBottom	TMSCP1.SourceRegBottom	TMSCP1.DestRegBottom
TMSDisp1.RegLeft	TMSCP1.SourceRegLeft	TMSCP1.DestRegLeft
TMSDisp1.RegRight	TMSCP1.SourceRegRight	TMSCP1.DestRegRight
TMSDisp1.RegTop	TMSCP1.SourceRegTop	TMSCP1.DestRegTop

---

## Paste Options

The Cut and Paste control offers several options for pasting. These including merging of the source and destination image data and also stretching of pasted regions. Bitmap merging contains many different options which will allow the Cut and Paste control to analyze the data that is being inserted against the destination data to determine if modifications of the source data needs to be modified. The other paste option available involves stretch the image that is being inserted to the destination region. Both of these pasting options greatly enhance your ability to customize your imaging application.

## Bitmap Merging

The PasteMode property determines how image data from the source and destination regions will be merged. In addition to a direct copy which will overwrite any existing data at the destination, you can perform six different Boolean operations on the image data in the two regions. The specification for the **PasteMode** property must be made in design time before the **Paste** method is called.

To perform these comparisons, the Cut and Paste control first calculates the position of the source data in the destination display. All necessary scaling of the source is accomplished first so that the source and destination regions are at the same resolution. At this point, each pixel in the source region has the same coordinates as a pixel in the destination region. All the Boolean comparisons

detailed below are then performed on each complementary pair of pixels. the valid values for the **PasteMode** property are described below:

0--Source Copy	(Default) Copies the source image coordinates directly to the destination coordinates.
1--Source Paint	Combines the colors of the source and destination coordinates by using the Boolean OR operator.
2--Source AND	Combines the colors of the source and destination coordinates by using the Boolean AND operator.
3--Source Invert	Combines the colors of the source and destination coordinates by using the Boolean XOR operator.
4--Source Erase	Combines the inverted colors of the destination coordinates with the colors of the source rectangle by using the Boolean AND operator.
5--Not Source Copy	Copies the inverted source coordinates to the destination.
6--Not Source Erase	Combines the colors of the source and destination coordinates by using the Boolean OR operator and then inverts the resultant color.
7--Merge Copy	Merges the colors of the source coordinates with the specified pattern by using a Boolean AND operator.
8--Mark Merge Paint	Merges the colors of the inverted source coordinates with the colors of the destination rectangle by using the Boolean OR operator.
9--Pattern Copy	Copies the specified pattern into the destination bitmap.
10--Pattern Paint	Combines the colors of the pattern with the colors of the inverted source rectangle by using the Boolean OR operator.
11--Pattern Invert	Combines the colors of the specified pattern with the colors of the destination coordinates by using the Boolean XOR operator.
12--Destination Invert	Inverts the destination coordinates.
13--Blackness	Fills the destination rectangle using the color associated with the index 0 in the physical palette. (This color is black for the default physical palette.)
14--Whiteness	Fills the destination rectangle using the color associated with index 1 in the physical palette. (This color is white for the default physical palette.)

## Bitmap Stretching

The Cut and Paste control also offers a couple of paste options which can be used to create different paste effects. The **StretchMode** property offers two options for pasting images: *0--Stretch* or *1---Insert*:

- |             |   |
|-------------|---|
| Stretch (0) | Will stretch the pasting bitmap to the size of the destination region.  |
| Insert (1)  | Will insert the pasting bitmap in proportion to the original cut or copied image. If the pasting bitmap is too large for the destination region, then only a portion of the bitmap will appear. |

The **StretchMode** property defaults to the Stretch (0) option.



# Chapter 3: TMSCP ActiveX Reference

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## TMSCP Properties, Methods and Events

### *AboutBox Method*

<b>Definition:</b>	Displays a message box containing the name of the control, a copyright message and an OK button. Pressing the button will unload the message box.
<b>Parameters:</b>	None
<b>Syntax:</b>	<code>Annotel&gt;AboutBox</code>
<b>Return Value:</b>	None
<b>Comments:</b>	This message box provides information about the Barcode control.

### *Active Property*

<b>Definition:</b>	<p>If set to True at design time, the control will fully initialize and verify licensing immediately upon initialization of the runtime application.</p> <p>If set to False at design time, full initialization of the control will be delayed at initialization of the runtime application. In this case, this property must be explicitly set to True at runtime before the control is used.</p>
<b>Data Type:</b>	Boolean
<b>Design Access:</b>	Read/Write
<b>Runtime Access:</b>	Read/Write (see limits below)
<b>Comments:</b>	<p>If this property is set to True (the default) at design time, the control is fully initialized and licensing is verified immediately upon initialization of the application at runtime. The related technology libraries are loaded and the control is ready to be used.</p> <p>If this property is set to False at design time, the control will only partially initialize when the application loads at runtime. By delaying these two actions, the application should be able to load more quickly:</p> <ol style="list-style-type: none"><li>1) The related technology libraries for the control will not be loaded.</li></ol>

2) The licensing server will not verify an available token for the control.

If the control initializes with Active set to False, this property must be explicitly set to True by the application. Until Active is set to True, the control will ignore all instructions to it.

If the control fails to find a license token, the Active property will be automatically set to False. The application can check this value on Form Load to determine if each control is licensed and can be used.

### ***Copy Method***

**Definition:** Copies the specified region to the Window's Clipboard.  
**See Also:** ImageDataSource property, Paste method, property  
**Description:** Before this method can be called a region must be specified, either programmatically or through the display's working region function. Otherwise the entire image will be copied.

### ***Cut Method***

**Definition:** Cuts the specified region to the Window's Clipboard.  
**See Also:** ImageDataSource property, Paste Method, SourceRegOption property  
**Description:** Before this method can be called a region must be specified, either programmatically or through the display's working region function. Otherwise the entire image will be copied.

### ***DestRegBottom Property***

**Definition:** Specifies the bottom portion of the region where the cut or copies image is to placed.  
**Data Type:** Integer  
**Design Access:** Read/Write  
**Runtime Access:** Read/Write  
**See Also:** DestRegLeft property, DestRegRight property, DestRegTop property, DestRegOption property  
**Description:** Before this property can be used, the **DestRegOption** property must be set to *1--Use RegXXX Properties*. This will activate the destination parameter properties which specify where to paste the cut or copied image.



### ***DestRegLeft Property***

<b>Definition:</b>	Specifies the farthest left region where the cut or copied image is to be placed.
<b>Data Type:</b>	Integer
<b>Design Access:</b>	Read/Write
<b>Runtime Access:</b>	Read/Write
<b>See Also:</b>	DestRegBottom property, DestRegRight property, DestRegTop property, DestRegOption property
<b>Description:</b>	Before this property can be used, the DestRegOption property must be set to <i>1--Use RegXXX properties</i> . This will activate the destination parameter properties which specifies where to paste the cut or copied image.

### ***DestRegOption Property***

<b>Definition:</b>	Specifies the destination option for the cut and copy functions. Cut or copied images can be pasted into the current working region specified on the display, or programmatically pasted using the destination parameter properties.
<b>Data Type:</b>	Enumerated
<b>Design Access:</b>	Read/Write
<b>Runtime Access:</b>	Read/Write
<b>See Also:</b>	DestRegBottom, DestRegLeft, DestRegRight, DestRegTop, and "Chapter 4: Regions in ImageBASIC" in the <i>ImageBASIC TMS Display ActiveX User's Guide</i>
<b>Description:</b>	When set to <i>0--Working Region</i> , the user will need to visually draw the region in which to paste the cut or copied image. However, if the second option <i>1--RegXXX properties</i> is chosen, the image will be pasted into the coordinates specified in the destination register properties.

### ***DestRegRight Property***

<b>Definition:</b>	Specifies the farthest right region where the cut or copied image is to be placed.
<b>Data Type:</b>	Integer
<b>Design Access:</b>	Read/Write
<b>Runtime Access:</b>	Read/Write
<b>See Also:</b>	DestRegBottom, DestRegLeft, DestRegTop, DestRegOption
<b>Description:</b>	Before this property can be used, the DestRegOption property must be set to <i>1--Use RegXXX properties</i> . This will activate the destination parameter properties which specifies where to paste the cut or copied image.

## ***DestRegTop Property***

<b>Definition:</b>	Specifies the farthest top region where the cut or copied image is to be placed.
<b>Data Type:</b>	Integer
<b>Design Access:</b>	Read/Write
<b>Runtime Access:</b>	Read/Write
<b>See Also:</b>	DestRegBottom, DestRegLeft, DestRegRight, DestRegOption
<b>Description:</b>	Before this property can be used, the DestRegOption property must be set to <i>1--Use RegXXX properties</i> . This will activate the destination parameter properties which specifies where to paste the cut or copied image.

## ***Error Event***

<b>Definition:</b>	Occurs for each error internal to the control.														
<b>Parameters:</b>	<table><tr><td>Number</td><td>A long error code that identifies the error</td></tr><tr><td>Description</td><td>Descriptive string of the error</td></tr><tr><td>SCode</td><td>A composite long number indicating the severity of the error, the facility code, the origin of the error, and the native error code</td></tr><tr><td>Source</td><td>Descriptive string of the source of the error</td></tr><tr><td>HelpFile</td><td>Suggested help file name that should have a detailed explanation of the error</td></tr><tr><td>HelpContext</td><td>Context ID in the help file</td></tr><tr><td>CancelDisplay</td><td>If set to True during this event, the standard error dialog will not be displayed</td></tr></table>	Number	A long error code that identifies the error	Description	Descriptive string of the error	SCode	A composite long number indicating the severity of the error, the facility code, the origin of the error, and the native error code	Source	Descriptive string of the source of the error	HelpFile	Suggested help file name that should have a detailed explanation of the error	HelpContext	Context ID in the help file	CancelDisplay	If set to True during this event, the standard error dialog will not be displayed
Number	A long error code that identifies the error														
Description	Descriptive string of the error														
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Source	Descriptive string of the source of the error														
HelpFile	Suggested help file name that should have a detailed explanation of the error														
HelpContext	Context ID in the help file														
CancelDisplay	If set to True during this event, the standard error dialog will not be displayed														
<b>Description:</b>	Any time an error occurs inside the TMS Cut and Paste control, the <b>Error</b> event is triggered.														

## ***ImageDataDest Property***

<b>Definition:</b>	Specifies the name of the ImageBASIC control that will be supplied the image data from the TMSCP control
<b>Data Type:</b>	String
<b>Design Access:</b>	Read/Write
<b>Runtime Access:</b>	Read/Write
<b>Description:</b>	This property may be set to the name of any ImageBASIC control that is capable of inputting image data from the cut and paste control.

## ***ImageDataSource Property***

<b>Definition:</b>	Specifies the name of the ImageBASIC control that will supply image data to this control.
<b>Data Type:</b>	String
<b>Design Access:</b>	Read/Write
<b>Runtime Access:</b>	Read/Write
<b>Description:</b>	This property may be set to the name of any ImageBASIC control that is capable of outputting image data from the Cut and Paste control.

## ***Paste Method***

<b>Definition:</b>	Pastes image region from the Window's Clipboard into the specified region on the display.
<b>See Also:</b>	DestRegOption property, ImageDataDest property, Paste method
<b>Description:</b>	Before this method can be called a region must be specified, either programmatically or through the display's working region function.

## ***PasteMode Property***

<b>Definition:</b>	Specifies a Boolean operator for use in the cut and paste functions for merging source and destination image data.
<b>Data Type:</b>	Integer (Enumerated)
<b>Design Access:</b>	Read/Write
<b>Runtime Access:</b>	Read/Write
<b>Possible Values:</b>	<p>Source Copy (0) Copies the source image coordinates directly to the destination coordinates.</p> <p>Source Paint (1) Combines the colors of the source and destination coordinates by using the Boolean OR operator.</p> <p>Source AND (2) Combines the colors of the source and destination coordinates by using the Boolean AND operator.</p> <p>Source Invert (3) Combines the colors of the source and destination coordinates by using the Boolean XOR operator.</p> <p>Source Erase (4) Combines the inverted colors of the destination coordinates with the colors of the source rectangle by using the Boolean AND operator.</p> <p>Not Source Copy (5) Copies the inverted source coordinates to the destination.</p> <p>Not Source Erase (6) Combines the colors of the source and destination coordinates by using the Boolean OR operator and then inverts the resultant color.</p>

Merge Copy (7) Merges the colors of the source coordinates with the specified pattern by using a Boolean AND operator.

Mark Merge Paint (8) Merges the colors of the inverted source coordinates with the colors of the destination rectangle by using the Boolean OR operator.

Pattern Copy (9) Copies the specified pattern into the destination bitmap.

Pattern Paint (10) Combines the colors of the pattern with the colors of the inverted source rectangle by using the Boolean OR operator.

Pattern Invert (11) Combines the colors of the specified pattern with the colors of the destination coordinates by using the Boolean XOR operator.

Destination Invert (12) Inverts the destination coordinates.

Blackness (13) Fills the destination rectangle using the color associated with the index 0 in the physical palette. (This color is black for the default physical palette.)

Whiteness (14) Fills the destination rectangle using the color associated with index 1 in the physical palette. (This color is white for the default physical palette.)

**Description:** Bitmap merging contains many different options which will allow the Cut and Paste control to analyze the data that is being inserted against the destination data to determine if modifications of the source data needs to be modified.

### ***SourceRegBottom Property***

**Definition:** Specifies the farthest left point of the image region to be cut or copied to the Window's Clipboard.

**Data Type:** Integer

**Design Access:** Read/Write

**Runtime Access:** Read/Write

**See Also:** SourceRegLeft property, SourceRegOption property, SourceRegRight property, SourceRegTop property

**Description:** Before this property can be used the SourceRegOption property must be set to *1--Use RegXXX properties*. This will activate the source region properties which will specify the image region to cut or copy.

### **SourceRegLeft Property**

<b>Definition:</b>	Specifies the farthest left point of the image region to be cut or copied to the Window's Clipboard.
<b>Data Type:</b>	Integer
<b>Design Access:</b>	Read/Write
<b>Runtime Access:</b>	Read/Write
<b>See Also:</b>	SourceRegBottom property, SourceRegOption property, SourceRegRight property, SourceRegTop property
<b>Description:</b>	Before this property can be used the SourceRegOption property must be set to <i>1--Use RegXXX properties</i> . This will activate the source region properties which will specify the image region to cut or copy.

### **SourceRegOption Property**

<b>Definition:</b>	Specifies the destination option for the cut and copy functions. Cut or copied images can be pasted into the current working region specified on the display, or programmatically pasted using the destination parameter properties.
<b>Data Type:</b>	Enumerated
<b>Design Access:</b>	Read/Write
<b>Runtime Access:</b>	Read/Write
<b>See Also:</b>	SourceRegBottom property, SourceRegLeft property, SourceRegRight property, SourceRegTop property, and "Chapter 4: Regions in ImageBASIC" in the <i>ImageBASIC TMS Display ActiveX User's Guide</i>
<b>Description:</b>	When set to <i>0--Working Region</i> , the user will need to visually draw the region in which to paste the cut or copied image. However, if the second option <i>1--RegXXX properties</i> is chosen, the image will be pasted into the coordinates specified in the source register properties.

### **SourceRegRight Property**

<b>Definition:</b>	Specifies the farthest right point of the image region to be cut or copied to the Window's Clipboard.
<b>Data Type:</b>	Integer
<b>Design Access:</b>	Read/Write
<b>Runtime Access:</b>	Read/Write
<b>See Also:</b>	SourceRegBottom property, SourceRegLeft property, SourceRegOption property, SourceRegTop property
<b>Description:</b>	Before this property can be used, the SourceRegOption property must be set to <i>1--Use RegXXX properties</i> . This will activate the

source region properties which will specify the image region to cut or copy.

### ***SourceRegTop Property***

- Definition:** Specifies the farthest top point of the image region to be cut or copied to the Window's Clipboard.
- Data Type:** Integer
- Design Access:** Read/Write
- Runtime Access:** Read/Write
- See Also:** SourceRegBottom property, SourceRegLeft property, SourceRegOption property, SourceRegRight property
- Description:** Before this property can be used, the **SourceRegOption** property must be set to *1--Use RegXXX properties*. This will activate the source region properties which will specify the image region to cut or copy.

### ***StretchMode Property***

- Definition:** Determines if the pasted image will be pasted to fit the specified destination region or to pasted in the proportions of the original cut or copied region.
- Data Type:** Enumerated
- Design Access:** Read/Write
- Runtime Access:** Read/Write
- Description:** When set to the default *0--Stretch*, the pasted image will be stretched or condensed to fit the designated destination region. If the *1--Insert* option is chosen, the pasted image will be pasted in proportion the originally cut image. This means that if the destination region is smaller than the cut or copied image region, then only a portion of that image will be displayed in the paste operation.

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