

JPEGMetaDataReader Help File

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Author

This program was written by J.R. Toelken. It uses licensed code from other authors to actually read Exif data. My programming provides the user interface and data formatting, analysis features, plus the DDE interface.

Introduction

JPEGMetaDataReader is written with the Delphi programming language. It is designed to be a stand alone program that can be used by itself to view the Exif and other metadata contained in .JPG, .TIF and .PSD files. Its primary purpose is to report this information via the DDE interface to other programs such as Access database programs. If you run the program via the user interface, you can set various configuration options that affect how data is reported via DDE. Just double click on the program to use the normal user interface. (Note, it may open [minimized](#), since that is the default behavior.) In addition to reporting Exif data and makers notes, this program can also report CRC hash and/or MD5 hash via the exact same DDE interface.

The earlier versions of this program, 1.0.0.x, were written with Delphi 7 and used Exif reading code called dExif. The author of dExif has abandoned maintaining that

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code. Version, 2.0.0.x is written in Delphi XE2 and uses the CCR-Exif package by Chris Rolliston. It adds the ability to display many makers notes and user tags generated by programs such as Photoshop Elements. It also adds many configuration options and this help file. The default formatting of Exif data and all DDE methods of receiving that data should be exactly compatible with the older version of the program and require no changes for an Access program. The default formatting is based on dExif which presented the Exif data in tag number order. Version 3.0.0.x is written in Delphi 10.3 and includes ImageEn to view images and display Exif data, plus the prior Exif and makers notes from CCR-Exif. It also adds many research and comparison features to try to diagnose previously unidentified makers notes tags.

What is EXIF data?

Exif data is information stored inside each .JPG or .TIF file created by a digital camera. Photoshop may retain much of the data when it converts an image file to its own style of file, .PSD. This program can display the Exif data, if any, from .JPG, .TIF, and .PSD files. A camera typically stores useful things like the make and model of the camera, the shutter speed, aperture, focal length, photo resolution, ISO speed, and whether the flash was used. It also records the date and time of the photo, based on the camera's internal clock. There is a wide variety of other information stored by cameras which may be of value in figuring out what camera settings yield the best photos. Exif is also used as a generic term for a variety of other data including XMP, IPTC, and [Makers Notes](#). If available these types of data are also displayed.

NOTE: If a photo has been edited, the editing software often loses some or all of the EXIF data. Photoshop Elements in particular seems to lose all Makers Notes when it edits a file, but doesn't lose the normal Exif data. You should make backup files before editing them. Scanned images typically have no EXIF data so this program won't be very useful.

What is DDE?

DDE is a protocol for direct communication between programs. The program sending DDE commands is called the DDE Client and the program receiving and obeying DDE commands is called the DDE Server. For example: An Access program would be called the DDE Client and this program would be called the DDE Server because it serves up data to the Access program.

Configuring to control JPEGMetaDataReader via DDE

Your DDE Client program such as Access must be capable of configuring the required details to initiate and use a DDE link to talk back and forth between the two programs. You will need to specify this information:

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DDEname = JPEGMetaDataReader (the name of this program)

DDEtopic = DdeServerItem1

Sample Access code to open DDE connection:

```
IDDEChannel = DDEInitiate("JpegMetaDataReader", "DdeServerItem1") '
Establish link and store handle in IDDEChannel, a long integer.
```

Establish a link once and then use the link to request as many file inspections as needed.

Receiving Exif data via DDE

Once your program has established a DDE link with JPEGMetaDataReader, it then needs to communicate what file it would like to view the Exif data and it needs to receive the Exif data back from JPEGMetaDataReader. These steps can be repeated as often as needed while the DDE connection is open. Step 1 is to tell JPEGMetaDataReader what file to read using the DDE command to read a file: **{ReadEXIF}|%1**. This command and all DDE commands are case sensitive. They should appear exactly as written.

Your program must replace the %1 with the file name, similar to this:

```
Function jrOpenDDEfile_JPG(inChannel As Long, inFile As String) As Boolean
On Error GoTo ErrjrOpenDDEfile_JPG
Dim sFile As String
Dim sOpenMsg As String
sOpenMsg = "{ReadEXIF}|%1"
If inChannel = 0 Then
    MsgBox "No DDE Server was able to be launched.", vbExclamation, "Error"
    jrOpenDDEfile_JPG = False
Else
    ' Delphi auto closes prior file before reading next file
    sFile = inFile
    sOpenMsg = StringReplace(sOpenMsg, "%1", sFile)

    DDEExecute inChannel, sOpenMsg
    jrOpenDDEfile_JPG = True
End If
```

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ExitjrOpenDDEfile_JPG:

Exit Function

ErrjrOpenDDEfile_JPG:

If Err = 285 Then

 If Not bHide285ErrorMsg Then

 If MsgBox(Err & " The DDE Server program reports it was unable to view the requested file." & vbCrLf & vbCrLf & inFile & _

 vbCrLf & "The server may have been closed improperly." & vbCrLf & vbCrLf & _

 "The DDE Server may not understand the [DDE Open Message] as configured." & vbCrLf & vbCrLf & _

 "The DDE Server may be incorrect, so hiding this message may be the correct solution." & _

 vbCrLf & vbCrLf & "Hide this message in the future?", _

 vbYesNo + vbInformation, "jrOpenDDEfile_JPG Error") = vbYes Then

 bHide285ErrorMsg = True

 End If

 End If

ElseIf 7952 Then

 MsgBox "The DDE Server was manually closed without this program's knowledge." & vbCrLf & vbCrLf & _

 "Close this form and re-open it to allow it to launch the DDE Server again" & vbCrLf & vbCrLf & _

 vbInformation, "jrOpenDDEfile_JPG Error"

 IDDEChannelJPG = -1 'block continued use of DDE

Else

 MsgBox "Error # " & Str(Err.Number) & ". " & Err.Description, , "jrOpenDDEfile_JPG Error"

End If

jrOpenDDEfile_JPG = False

Resume ExitjrOpenDDEfile_JPG

End Function

Step 2 is to receive and process the Exif data from JPEGMetaDataReader. This is a sample function to receive, processing is up to you:

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```
Function jrReceiveDDEdata(inChannel As Long) As Variant
```

```
On Error GoTo ErrjrReceiveDDEdata
```

```
Dim vDDEdata As Variant
```

```
vDDEdata = DDERequest(inChannel, "DdeServerItem1")
```

```
If jrEmpty(vDDEdata) Then
```

```
    jrReceiveDDEdata = "Not an EXIF file"
```

```
Else
```

```
    jrReceiveDDEdata = vDDEdata
```

```
End If
```

```
ExitjrReceiveDDEdata:
```

```
Exit Function
```

```
ErrjrReceiveDDEdata:
```

```
MsgBox "Error # " & Str(Err.Number) & ". " & Err.Description, ,  
"jrReceiveDDEdata Error"
```

```
Resume ExitjrReceiveDDEdata
```

```
End Function
```

Be sure to return the value of this function to a memo field on a form, or a string variable. It will return much more than 255 characters for most files, so a text field will not work. This program lets you choose many options for how the data is formatted before being returned. The user interface of the program will let you see what your Access program should be receiving. In my Access program I return the Exif values into a global string variable and then parse that variable to obtain the few actual Exif tags that I desire. That isn't technically necessary anymore since the new version of JPEGMetaDataReader lets the user interface specify the exact tags that you wish to use in your Access program by setting favorites.

Telling this program to ignore a file

If your DDE Client program is able to detect that a file won't have Exif data to display, it can decide not to send the file name to JPEGMetaDataReader. This has a downside though since the program will still display the Exif data for the preceding file and that might be confusing. If this situation exists for you, you can send an alternate DDE command. Instead of sending **{ReadEXIF}%1**, send **{NOEXIF}%1**. This alternate command tells this program to clear all of its displays and substitute just a message that shows the file name and the fact that no Exif is available.

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DDE Close Message:

When you finish processing files and receiving Exif data into your Access program, you must close the DDE connection.

There is only one command to close the DDE connection to this program: **{Close}**

That command should appear by itself and must include the curly braces around it. In fact all of the DDE commands are surrounded by curly braces { }.

This command and all DDE commands are case sensitive. They should appear exactly as written.

Sample Access code:

```
DDEExecute IDDEChannel, "{Close}" 'use IDDEChannel handle to identify  
what DDE link is being closed.
```

```
DDETerminate inChannel 'terminate the DDE handle
```

Customizing the program

In addition to setting the configuration options via the [Configuration menu](#) you can also customize the caption displayed by this program. This requires manually editing the .INI file with a file name that matches the program name.

Open the .INI file with a simple editor such as Notepad.exe. Double clicking on the .INI file usually launches Notepad.

Find the [System] section of the file.

Insert a row below the [System] tag such as this:

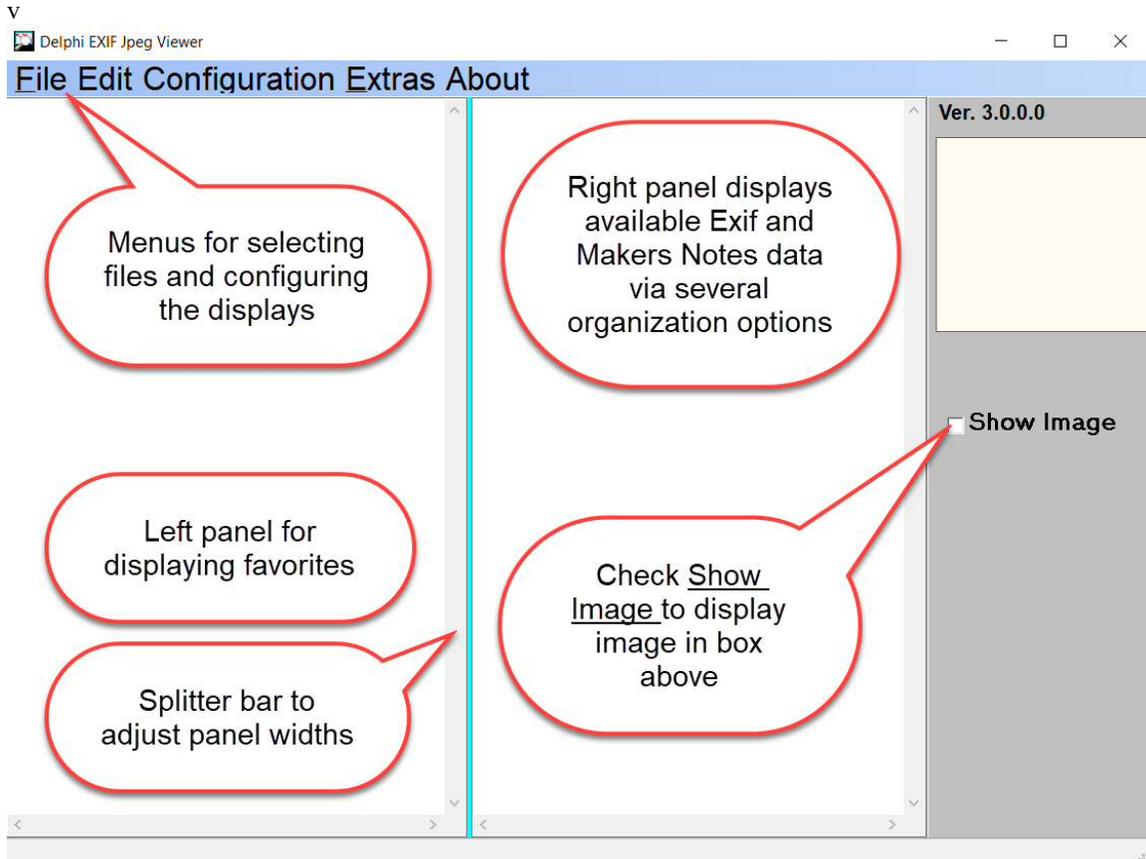
```
caption=Ver 1.5.0 JPEG Reader
```

Now the program caption will say “Ver 1.5.0 JPEG Reader” instead of the default caption “Delphi EXIF Jpeg Viewer”.

Detailed Program Operations

The user interface of the program looks like this:

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Special Keys

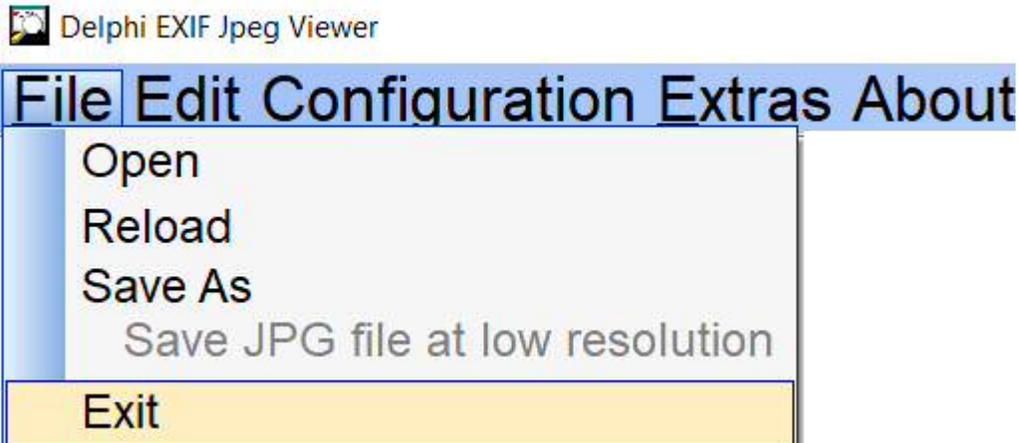
Note: The left and right panels are memo fields. The following special keys are available:

Use Ctrl + A to hi-lite an entire panel for copying to the clipboard. Both panels can be edited, if desired. The desired panel must have focus.

Use Ctrl + Plus to increase the font size in both panels. Focus is not required on a particular memo field. The selected font size is remembered when you close the program and restored when you open the program again.

Use Ctrl + Minus to decrease the font size in both panels. Focus is not required on a particular memo field.

File Menu



Open

This option provides a common file dialog to select your image file. It has several filtering options to limit the display of image files and speed your selection. .JPG, .TIF, and .PSD files can be read. All files will display a thumbnail if Show Image is checked. If you have a program like my Photorenamer.exe which uses the DDE interface to tell this program the name of the next file to inspect, it will be faster and easier to compare a large set of files. This menu option is good for smaller inspection tasks.

Reload

This option reloads the currently selected file. This is very useful after changing your desired configuration of the Exif display in the right panel or your favorites in the left panel.

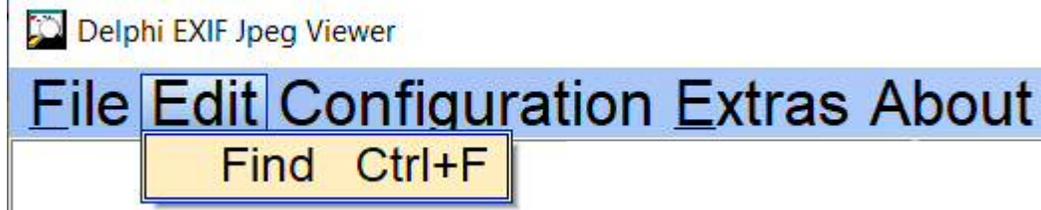
Save As

This option saves the file with a new file name and shrinks the file drastically to allow fast upload to [meta data websites](#). The metadata is not harmed by this shrinking. The file name that is offered removes any spaces since some websites don't play well with long file names.

Exit

This option exits the program and saves all configuration options in the .INI file. If the program began without a .INI file, then a new .INI is created.

Edit Menu



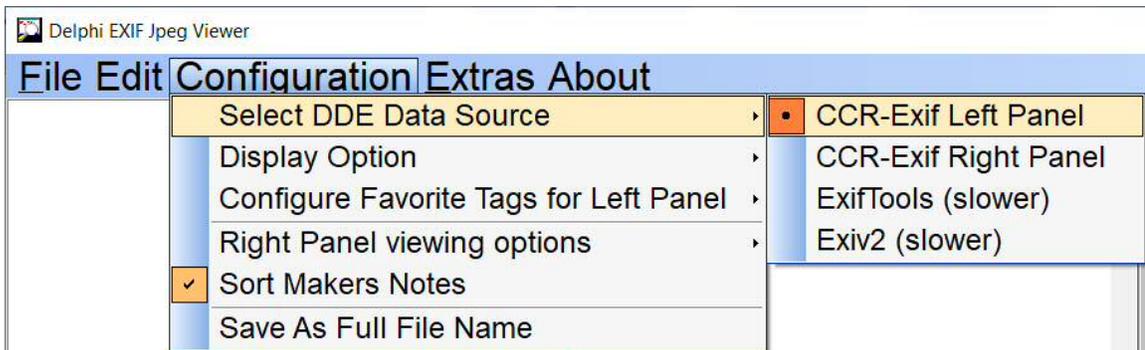
The Edit Menu has only one option, Find. The hot key Ctrl+F also activates the find feature.

The Find feature searches whichever panel currently has focus. It looks like this:



Just type what you desire to find inside the **Find what** field and click **Find Next**. If you wish to search the other panel, just click in the desired panel, then click **Find Next** again.

Configuration Menu



Select DDE Data Source

This option lets you choose which panel will supply the Exif information over the DDE interface.

CCR-Exif Left Panel

If you choose the left panel you must use the [Configure Favorite Tags for Left Panel](#) option to select what information is delivered via DDE.

CCR-Exif Right Panel

If you choose the right panel, you can select how the Exif data is presented via the [Right Panel viewing options](#) menu. The default selection is Right Panel.

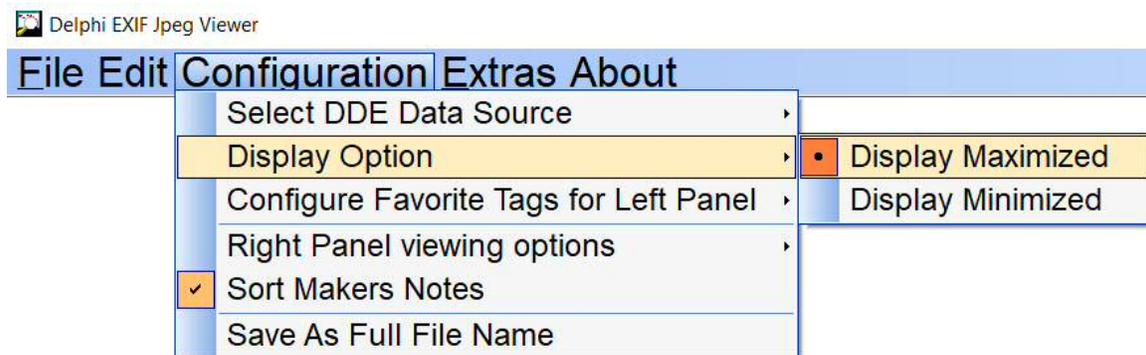
ExifTools (slower)

This option will report the results of running ExifTools.exe. It will automatically switch to [CCR-Exif Right Panel](#) if ExifTools.exe is not available. ExifTools presents its data in its own format. Any program receiving this data via the DDE interface will need a custom function for parsing the data, different from the function for parsing CCR-Exif data. Because ExifTools.exe is a command line utility, this option will be much slower than using the internal CCR-Exif information.

Exiv2 (slower)

This option will report the results of running Exiv2.exe. It will automatically switch to [CCR-Exif Right Panel](#) if Exiv2.exe is not available. Exiv2 presents its data in its own format. Any program receiving this data via the DDE interface will need a custom function for parsing the data, different from the function for parsing CCR-Exif data. Because Exiv2.exe is a command line utility, this option will be much slower than using the internal CCR-Exif information.

Display Option



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This option lets you choose whether the program opens minimized or maximized. When the program is used to provide data via DDE there is no need for it to be visible, so the default choice is to open minimized. Opening maximized is primarily of value when using the user interface to select files or configure options. It is also valuable when using the user interface to research and modify [makers notes translations](#).

Configure Favorite Tags for Left Panel



If you choose the left panel as the [DDE data source](#), you should configure favorites. Favorites are your selection of Exif tags and makers notes tags from the right panel. You can insert them in any order. They will be presented in the order you have selected. To begin configuring favorites you must have a current file displayed.

There are two steps to configuration. First click Create/Edit Tags to Display. This will disable several conflicting menu options. It changes the right panel to read-only to prevent accidental changes. You can then use the clipboard to copy individual Exif tags from the right panel to the left panel. Copy the entire tag and its value. There is no need to delete the current value after the equal sign. The program will do it for you when you save the tag configuration. It will also trim any leading spaces from the tag. You can copy separator lines from the right panel to help group your tags into visually easy groups. --- and === are common separator lines.

The second step is to click the Save Tag Configuration option. It was enabled when you began Create/Edit. The save option stores the list of favorites in the .INI file after trimming off the current values after the equal sign. It restores the disabled options and changes the right panel back to being editable.

NOTE: The program will only report favorite tags in the left panel that exactly match tags in the right panel. If you turn off [Sort Makers Notes](#) the tags in the right panel will include the numeric tag identifier. If the favorites tags don't have those identifiers, they will no longer appear as favorites. For example:

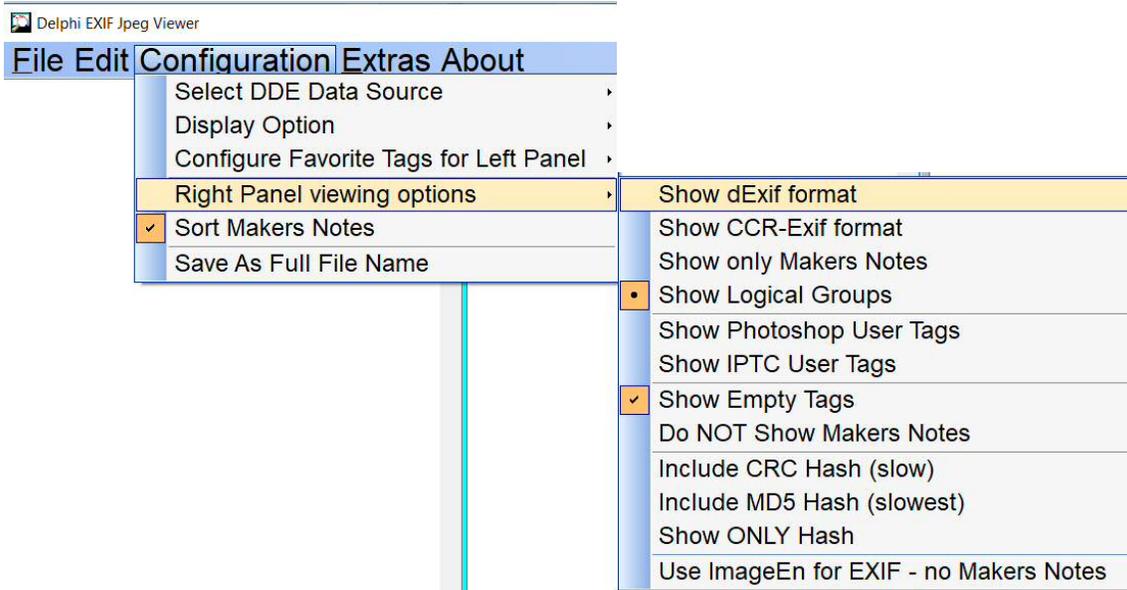
```
[$0001] Image quality = High
[$0002] Firmware version = {00010500}
```

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NOTE: Favorites are not displayed if they aren't found. This lets you set favorites for tags with different names with different camera makers that are synonymous.

Once you have completed configuration, the [File > Reload](#) option will make it easy to test the results by reloading the current file.

Right Panel viewing options



This menu option offers multiple choices to determine what information is presented in the right panel and how it is formatted. Note the separator bars in the submenu. The top two groups delineated by those separators can only select a single option at a time since they are mutually exclusive.

Show dExif format

This is the default setting. This option will display the Exif information in the same order and almost entirely in the same format as the old dExif code did in earlier versions of this program. dExif reported the Exif tags in the order in which they were stored, so this will be the best option when comparing to the reporting from [ExifTools.exe](#) or [Exiv2.exe](#). Minor formatting improvements were made to some values so that the client Access program doesn't need to do that anymore. These changes did not harm my legacy Access code. As an example, dExif presented some values as fractions whereas this program presents the calculated result of the fraction. For example, dExif presents

“Exposure Bias Value = -66/100” and this program presents
“Exposure Bias Value = -0.66 EV”.

In other cases such as resolution values, this program presents the same fractional values as dExif, but also presents a friendlier format like this:

Focal Plane XResolution = 3264000/291

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Focal Plane YResolution = 2448000/219

Focal plane resolution = 11216 x 11178

This program also calculates the MegaPixels value whereas dExif did not.

dExif presented the ISO speed with several tags: “ISOSpeed Ratings”, “ISO:” and “ISO Speed”. This program standardizes with “ISO Speed”.

Show CCR-Exif format

CCR-Exif normally presents its data according to how Exif data is organized inside an image file with useful group headings.

Show only Makers Notes

This option is mutually exclusive with the [Do Not Show Makers Notes](#) option.

This option might be useful while trying to customize the program to correctly translate Makers Notes for your camera. See the [Makers Notes](#) section for further details.

Show Logical Groups

This option displays the Exif tags in groups that seemed logical and useful to me, to make it easier to find the information that is helpful to photographers.

Show Photoshop User Tags

Photoshop Elements (PSE) allows users to edit a large number of Exif and IPTC tags. (IPTC tags are additional tags within the Exif data storage specification.) In PSE8, select File > File Info. PSE8 presents a multiple tab dialog. This option shows any tags entered on the Description and IPTC tabs. Note that some tags are duplicated among several tabs, so it may show information entered on other tabs. This is the default setting. This option must be selected for these tags to be displayed. Note also that PSE does not use some Exif tags in the standard fashion which is why there are tags labeled IPTC tags which aren't shown via the next option. This option conforms to how PSE does things.

Show IPTC User Tags

The author of CCR-Exif provides a sample program called IPTC-Editor. It displays and edits a variety of IPTC tags, many of which are not represented within Photoshop Elements. In the event that you have software which can edit these additional tags, this option will show them. This option must be selected for these tags to be displayed.

Show Empty Tags

The default behavior of the program is to hide any Exif tag which was not stored by the camera. That removes considerable clutter since there are many obscure Exif tags.

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The program automatically tries to find a substitute value for some missing values. For example, some cameras record the “Aperture Value” instead of “FNumber” and the program performs the same substitution. Some cameras record both values.

With values that the program automatically substitutes, it displays them as empty when “Show Empty Tags” is turned on.

This feature only controls the display of empty EXIF tags, not Makers Notes tags. Makers Notes always show only the tags that are actually found.

Do NOT Show Makers Notes

This option is mutually exclusive with the [Show Only Makers Notes](#) option.

This option blocks the program from most processing of Makers Notes. It turns out that Makers Notes can be flaky in some .JPG files. This option will help avoid processing errors for such bizarre files. This is the default setting. Note that the program will automatically turn off processing Makers Notes for individual files if it realizes it can't process them. See [Exif Notes](#). The program has several reporting options:

1. Report the actual Makers Notes.
2. Report “Makers Notes not shown”, because this option is checked.
3. Unable to read Makers Notes values
4. Maker Note = Unrecognized format
5. No MakerNote found. Count of Tags = 0

Include CRC Hash (slow)

This option calculates a CRC hash for the selected file. The hash is displayed at the top of each panel, just below the file name, size, and date. This option will slow processing if you are performing a mass review of files via the DDE interface and another program such as Access. This is off by default.

Include MD5 Hash (slowest)

This option calculates a MD5 hash for the selected file. The hash is displayed at the top of each panel, just below the file name, size, and date. This option will slow processing significantly if you are performing a mass review of files via the DDE interface and another program such as Access. The MD5 hash is a more secure hash than the CRC so it takes longer to calculate. This is off by default.

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Show ONLY Hash

This option turns off all Exif and Makers Notes processing. If all you need to calculate is one of the hash values, it should speed the processing. This is off by default.

Use ImageEn for EXIF – no Makers Notes

ImageEn can read a few more Exif values but does not currently read Makers Notes.

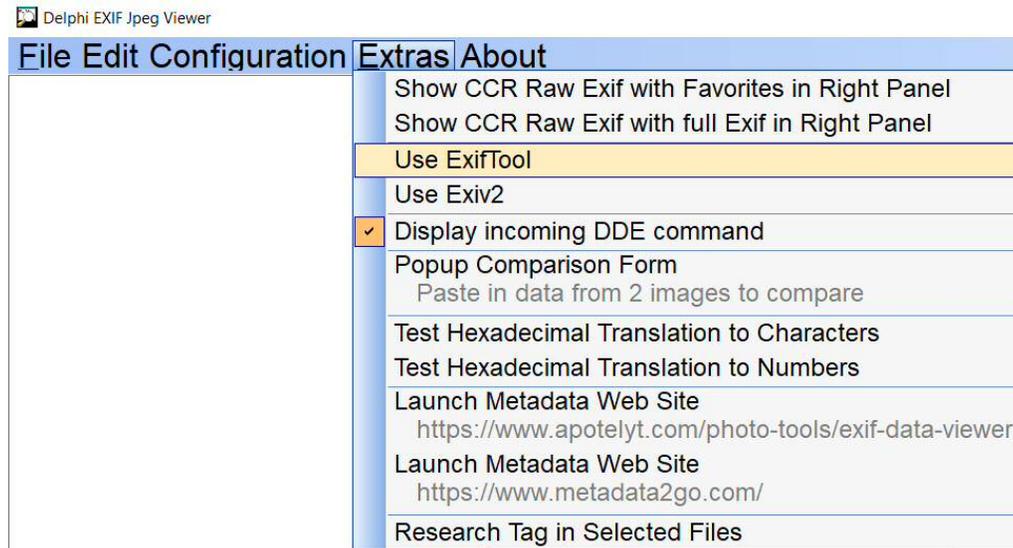
Sort Makers Notes

Sorting Makers Notes is the default option since it helps group options logically if you have [named makers notes tags](#) in a logical fashion. This option lets you choose not to sort. If the Makers Notes are not sorted, they are presented with their internal tag numbers, in tag number order. This will make it easy to compare to the raw Exif data (or data from [ExifTools.exe](#) or [Exiv2.exe](#)) and try to diagnose how to improve the translation of Makers Notes. See the [Makers Notes](#) section for further details.

Save As Full File Name

The [File > Save As](#) option normally shortens the file name and eliminates spaces in the file name. This option maintains the full original long file name.

Extras Menu



There is a hidden feature in the program's .INI file which controls whether the [Extras](#) Menu is visible. The [Extras](#) Menu presents options which may help you diagnose details of the Makers Notes or extract additional information from a file. The primary purpose is to help figure out better translations for the Makers Notes.

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If you wish to use the Extras Menu, you will need to modify the program's .INI file (not the Makers Notes.INI). Open the .INI with Notepad and look for the [System] section. Insert a new tag identical to this:
ShowExtras=1

The default behavior of the program is to not have this .INI tag and not display the Extras Menu.

Show CCR Raw Exif with Favorites in Right Panel

This option will display the raw (un-translated) Exif values in the left panel. Makers Notes will be presented in the order of the numeric tag, so you should turn off sorting Makers Notes via the [Configuration Menu](#) so that the right panel also presents the data with the numeric tag, in the same order. This may help compare the details and perhaps compare the details to information found on the web.
NOTE: If favorites are displayed in the left panel, they will automatically be moved to the right panel. This means you can select favorites for the Exif tags or Makers Notes that you wish to compare and have them automatically switch to the right panel for easy comparison. You will need to use [File > Reload](#) to activate this feature with your desired file.

Show CCR Raw Exif with Full Exif in Right Panel

This option will display the raw (un-translated) Exif values in the left panel and the full Exif data in the right panel. Makers Notes will be presented in the order of the numeric tag, so you should turn off sorting Makers Notes via the [Configuration Menu](#) so that the right panel also presents the data with the numeric tag, in the same order. This may help compare the details and perhaps compare the details to information found on the web. You will need to use [File > Reload](#) to activate this feature with your desired file.

Use ExifTool

<https://exiftool.org/>

ExifTool.exe by Phil Harvey is a command line utility that understands some different Makers Notes and Exif tags than this program. This option will ask ExifTool.exe to report on the currently displayed file and load the result into the left panel. You can [configure](#) the program to present the results of this option over the DDE interface.

The default display of ExifTool.exe is to show tags in numerical order, so you should turn off sorting Makers Notes via the [Configuration Menu](#) so that the right panel also presents the data with the numeric tag, in the same order. Also you

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should select the [dExif](#) style displays of Exif tags. This may help compare the details and perhaps compare the details to information found on the web.

NOTE: If favorites are displayed in the left panel, they will automatically be moved to the right panel. This means you can select favorites for the Exif tags or Makers Notes that you wish to compare and have them automatically switch to the right panel for easy comparison.

ExifTool.exe is a command line utility which means that it will be somewhat slow and you will see a black command window appear briefly when it executes. In fact this program creates a batch file called "JRExifTool.Bat" which contains the command line, and then executes this batch file. The batch file creates a text file called "jrExifTool.txt" which is loaded into the left panel.

ExifTool.exe has many command line switches to control its operation. The default command line switches are "-a -u -t -g1 -H". This can be changed by reading the "ExifTool help.txt" to learn about other switches, then modifying this program's .INI file. Look for the following section of the .INI file and modify it as needed:

```
[ExifTool]
CommandLine=-a -u -t -g1 -H
```

Version 3.x of this program is provided with a copy of ExifTools.exe, version 11.9.2.0

Use Exiv2

<http://www.exiv2.org/index.html>

Exiv2.exe by Andreas Huggel is a command line utility that understands some different Makers Notes and Exif tags than this program. This option will ask Exiv2.exe to report on the currently displayed file and load the result into the left panel. You can [configure](#) the program to present the results of this option over the DDE interface. This option was last tested in version 2.x of this program.

The default display of Exiv2.exe is to show tags in numerical order, so you should turn off sorting Makers Notes via the [Configuration Menu](#) so that the right panel also presents the data with the numeric tag, in the same order. Also you should select the [dExif](#) style displays of Exif tags. This may help compare the details and perhaps compare the details to information found on the web.

NOTE: If favorites are displayed in the left panel, they will automatically be moved to the right panel. This means you can select favorites for the Exif tags or Makers Notes that you wish to compare and have them automatically switch to the right panel for easy comparison.

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Exiv2.exe is a command line utility which means that it will be somewhat slow and you will see a black command window appear briefly when it executes. In fact this program creates a batch file called “JRExif2.Bat” which contains the command line, and then executes this batch file. The batch file creates a text file called “jrExiv2.txt” which is loaded into the left panel.

Exiv2.exe has many command line switches to control its operation. The default command line switches are “-PEIXlxtvgy”. This can be changed by reading the “exiv2-man.html” to learn about other switches, then modifying this program’s .INI file. Look for the following section of the .INI file and modify it as needed:

```
[Exiv2]
CommandLine=-PEIXlxtvgy
```

This program is provided with a copy of Exiv2.exe, version 0.21.1. Note that Exiv2.exe also requires libexpat.dll to be in the same folder. It is also provided with this program.

Display incoming DDE command

This includes the DDE command in the right panel display. It is for error analysis if your DDE client program is not receiving the desired data.

Popup Comparison Form

This option pops up a [form](#) that is designed to help compare Exif and makers notes between two files. It shows two panels. Paste the right panel data from the main program into one panel and after changing files, paste the right panel data into the other panel of the popup. There are a variety of features to assist in the comparing the data from the two files. Or you can paste data from one image file into a panel and paste data for that file from one of the [websites](#) to compare.

Test Hexadecimal Translation to Characters

The contents of many unknown makers notes are reported as strings of hexadecimal characters. This option lets you test to see what ASCII characters they translate into.

Test Hexadecimal Translation to Numbers

The contents of many unknown makers notes are reported as strings of hexadecimal characters. This option lets you test to see what ASCII numbers they translate into.

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Launch Metadata Website

This option launches a website that allows you to drag and drop a file to analyze and display its metadata:

<https://www.apotelyt.com/photo-tools/exif-data-viewer>

This website requires a file name with no spaces and a full sized image file will take a long time to upload. Be sure to use [File > Save As](#) to shrink the file and convert the file name so that it has no spaces and works with this website.

This website uses the latest metadata translations from Phil Harvey. Most of the Exif tag names used by this program have been matched to this website to make it easier to compare them. When [customizing the makers notes .INI file](#) I also try to name the makers notes with the same tag name as used on this website.

It is valuable to use this website to try to identify additional maker notes tags and add them to your translations when [customizing the makers notes .INI file](#).

Launch Metadata Website

This option launches a website that allows you to drag and drop a file to analyze and display its metadata:

<https://www.metadata2go.com/>

This website does not require a file name with no spaces. But a full sized image file will take a long time to upload. Be sure to use [File > Save As](#) to shrink the file for easy uploading to this website.

It is valuable to use this website to try to identify additional maker notes tags and add them to your translations when [customizing the makers notes .INI file](#).

The data provided by this website can be copied to the clipboard. It must be pasted into the left panel of the popup form since that is the only panel that can [reformat the data](#) from two lines to a single line for accurate comparison to data from the other website or from this program.

Research Tag in Selected Files

If you observe that the value of an unknown makers notes tag is changing when you change a camera setting, this option may help to see if that value change is meaningful and can be interpreted. Use the main panels of this program to copy a tag name to the clipboard, then paste it in to the input box for this feature. It will prompt for a second optional tag name too. It then prompts you to select the files to research for these values. The research process can take awhile so it presents a status display below the thumbnail image. (I recommend researching all of your samples files to gain an understanding of how the subject tag is being used.) It presents the results on the clipboard in a columnar format containing the one or

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two values you are researching plus the file name of each image file. You can paste these values into any text display like Notepad.exe or into the [popup form](#) provided by this program. Sometimes it is very frustrating because the unknown values change regularly but not in a way that I could interpret. Sometimes I was able to confirm exactly what the unknown tag was reporting.

Exif Notes

The Exif specification is not fully supported by all cameras. The following notes will explain some anomalies:

- Not all cameras record the “Date time” value. Unless the [Show Empty Tags](#) option is turned on, the program automatically inserts the “Date Time original” if the “Date time” is missing.
- Some cameras record the “Shutter Speed Value” instead of the “Exposure Time”. Unless the [Show Empty Tags](#) option is turned on, the program automatically inserts the “Shutter Speed Value” and calls it “Exposure Time” to provide a standard output form.
- Some cameras record the “Aperture Value” instead of “FNumber”. Unless the [Show Empty Tags](#) option is turned on, the program automatically inserts the “Aperture Value” and calls it “FNumber” to provide a standard output form.
- Apparently cameras do not record the “Max Aperture Value” very well. I’ve seen situations where the reported maximum aperture was less than the actual aperture used! (This was true for multiple different programs reading the same Exif data.) ImageEn appears to get this right, so it is always used to read this value.
- Not all cameras record the “Focal Length in 35mm Film” value. If enough other information is recorded, the program will calculate the correct value and put “EST” after it to alert you that it was calculated, like this: “Focal Length in 35mm Film = 36.48 mm EST”.
- Exif can store GPS information, if the camera is GPS equipped. This program added new formats of GPS data to be compatible with Bing and Google Maps.
- Exif tags may be lost when editing an image with some programs.
- Exif tags may be changed by image editing programs.
- Makers Notes data may be lost when editing an image. Apparently the Exif specification is not very precise, making it difficult to preserve some Makers Notes. As an example, Photoshop Elements 8 (PSE8) removes the Makers Notes if you use its feature to enter your own user tags or if you edit a photo with PSE. This reinforces the need to keep a backup of photos that you edit and to analyze your camera settings on an unedited copy of the image file.
- When emailing images, Windows often offers to shrink the image file. Exif data seemed to survive the shrinking but User Tags from PSE were lost as were Makers Notes.
- There are several types of Makers Notes recorded by Nikon cameras. Some cameras that use NikonType3 Makers Notes do not record the ISO in the regular Exif tag. This program attempts to find the information in the raw Exif data tag for Makers Notes, \$0002, unless the [Show Empty Tags](#) option is turned on.

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Unfortunately some don't record it in a way known to this program. The program also tries to extract the ISO from raw makers notes in NikonType2 format, if possible.

- This program is capable of reading Canon and Nikon makers notes but I have few .jpg files to test and no cameras. I have multiple Panasonic cameras and a huge number of test images so the makers notes for Panasonic cameras are the best developed.

Makers Notes

The normal Exif tags are specified by an industry wide specification. But camera manufacturers constantly improve their cameras and need to store additional information about the settings of the camera. The Exif specification provides space for them to do this by recording any data they want, in any format they want, within the Makers Notes. Since the content and format of the Makers Notes is proprietary (and may be encrypted!) and may change from one camera to another, it is difficult for a program to read these values and translate them into appropriate English. At this writing CCR-Exif provides a mechanism for reading and translating many tags for Nikon, Canon, and Panasonic cameras. My implementation of CCR-Exif is designed to let users customize the program if they discover appropriate translations for Makers Notes tags for their own cameras, assuming they are Nikon, Canon, or Panasonic. Only a skilled programmer, with access to the source code, can add new makes. But it is easy to customize how the program translates Makers Notes for particular models via the MakerNotes.INI file.

NOTE: Makers Notes can be flaky. See the menu option Configuration > Right Panel Viewing Options > [Do NOT Show Makers Notes](#).

MakerNote .INI file

CCR-Exif stores its known Makers Notes translations in the file MakerNotes.INI. This program will automatically use that .INI file to translate known and available tags. However, it also allows you to create your own .INI file for specific cameras.

If the standard .INI file is used, the program reports like this:

```
===== Makers Notes =====  
Maker Note = Canon  
INI File used, Standard: = MakerNotes.INI  
Count of items = 116
```

Alternately you can copy the standard .INI file to a file named with the exact Make and Model that is reported from the Exif data in the right panel. For example: Panasonic DMC-G1.INI. If the program finds a .INI file that exactly

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matches this naming convention then it will be used. The program then reports like this:

```
===== Makers Notes =====  
Maker Note = Panasonic  
INI File used, Custom: = Panasonic DMC-G1.INI  
Count of items = 84
```

Notes about Makers Notes:

- It is not necessary to retain all information about other cameras that is stored in the custom .INI file. For example, you may remove all Canon and Panasonic information when customizing the translations for your Nikon.
- Many Makers Notes tags are unknown and may be very long. These may be truncated in the display to save space and readability.
- If no Makers Notes are found, the program reports like this: “No Makers Notes found = Canon”.

Customizing Makers Notes translations

It is common for camera makers to add new features that are saved with new codes. For example: The Panasonic translations in this program include only 4 options for “Focus mode” but my DMC-G1 saves a fifth option. The number and variety of makers notes exploded with the advent of the GH3 and later the G9 model camera. Below you will see how I improved that situation and updated the [Panasonic DMC-G1.INI file](#).

There are several ways of identifying improvements to the MakerNotes.INI file. For starters be sure to Google your camera and “makers notes” to see if someone else has done the work for you. And be sure to use the [websites](#) that this program can launch for you.

Next you can make sample photos with your own camera and carefully record the settings you used so you can compare them to how the program reports the settings. (I use my program, Photorenamer.exe, to rename each file with information that describes the specific settings being tested.) Be sure to read the owner’s manual to learn about setting options.

When reviewing Makers Notes, you will find it best to use the favorites feature to select the Makers Notes you wish to review. [Configure > Configure Favorite Tags for Left Panel](#). That will make it easy to see them as you process different picture files to see what the camera recorded. You might also find it helpful to select [Configure > Right Panel viewing options > Show Only Makers Notes](#). The [popup form](#) is particularly useful for comparing makers notes tags between two image files or comparing the tags from this program to those from the available websites.

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Obtain the actual values of the codes stored in the Makers Notes by using [Extras > Show CCR Raw Exif](#). Then update the .INI file if you learn anything new.

It is often useful to use the [File > Reload](#) option to easily inspect the same file with another configuration setting.

Another method is to use the [Extras Menu](#). It provides a method of loading Exif and Makers Notes from two other [programs](#) that appear to be quite comprehensive. Comparing their results with the results of this program may allow you to update some of the translations in the MakersNotes.INI file for this program. **NOTE:** These additional programs may NOT have additional information at times, and may be just plain wrong for your camera. Testing your own camera is the best bet. Also note that you should obtain the latest versions of these programs as they are updated to accommodate new cameras.

Perhaps the easiest method is to use the [Extras Menu](#). It provides a method of launching two different [websites](#) that may report useful metadata. [Comparing](#) their results with the results of this program may allow you to update some of the translations in the MakersNotes.INI file for this program.

MakerNotes.INI editing example

The original MakerNotes.INI contains the following two tags:

[TPanasonicMakerNote.\$0007]	← do not change this
TagDescription=Focus mode	← Do not change "TagDescription=". "Focus mode" is the description displayed as a tag by this program.
1=Auto	
2=Manual	← These are the translation values
3=Auto, focus button	
4=Auto, continuous	
[TPanasonicMakerNote.\$000F]	← do not change this
TagDescription=Spot mode	← Do not change "TagDescription="

In this example, there are 4 translations for Focus mode and no translations for Spot mode. After testing my camera I made the following changes:

[TPanasonicMakerNote.\$0007]	
TagDescription=Focus mode	
1=Auto Focus Single	
2=Manual Focus	
3=Auto, focus button	← This value may be correct for older cameras or perhaps a feature I haven't found yet.
4=Auto, continuous	← This value may be correct for older

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	cameras or perhaps a feature I haven't found yet.
5=Auto Focus Continuous	← New value (5 was the value in CCR Raw Exif)
[TPanasonicMakerNote.\$000F]	
TagDescription=Autofocus mode	← "Autofocus mode" is a better description than "Spot mode"
16,0=1 Area Focus	← "16,0" was found in CCR Raw Exif
32,0=23 Area Focus	← "23 Area" is from the owner's manual
64,0=Face Detect Focus	
;it only records Face Detect if it sees a face.	← A semi-colon in front of a line makes it a comment that is ignored by the program. Use this to document details that might help you understand the values you have translated.

MakerNotes.INI Adding new translation:

CCR reported the following information for Canon DSLRs:

[\$0095] Unknown (\$0095)Unknown = EF135mm f/2L USM

ExifTools:

0x0095 Lens Model EF135mm f/2L USM

Exiv2:

0x0095 Canon LensModel Ascii EF135mm f/2L USM

A search of the INI file found no Canon sections for the 0095 tag. Based on this, I added a new section to the Canon portion of MakerNotes.INI that looks like this:

;Added by JR Toelken	Comment to explain and identify my change
[TCanonMakerNote.\$0095]	New section name to link to the 0095 tag
TagDescription=Lens type	New description. I chose the same description used for Nikon and Panasonic to provide a consistent response via DDE

Now CCR reports:

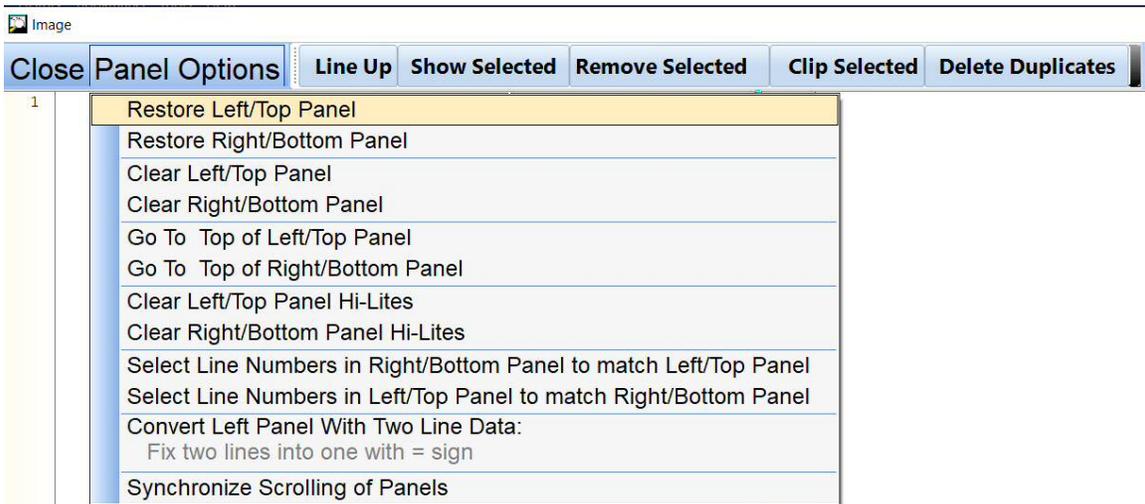
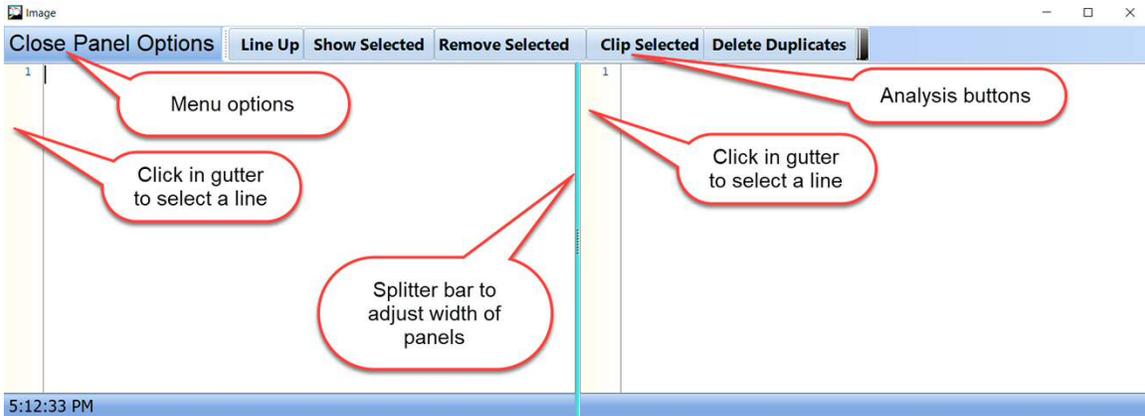
[\$0095] Lens type = EF135mm f/2L USM

Or, if Configuration > [Sort Makers Notes](#) is turned on, it looks like this:

Lens type = EF135mm f/2L USM

Popup Comparison Form

This popup form is opened via the [Extras](#) menu on the main program. It automatically formats the two data panels side by side if on a landscape mode monitor or up/down if on a portrait mode monitor. When data is pasted into a panel from the right panel in the main program or from a website, you can use the features of this form to compare data from two data sources or from two files. Ctrl+F also launches a [Find dialog](#) for this panel that operates the same as the Find dialog in the main program.



Restore Left/Top Panel

Restore Right/Bottom Panel

Many of the analysis options on this form remove data lines that are just clutter so you can see the important data. This option restores the original data that was pasted into this panel prior to executing the option. It is a single level undo.

Clear Left/Top Panel

Clear Right/Bottom Panel

Before starting a new analysis, you may wish to just clear all data from a panel.

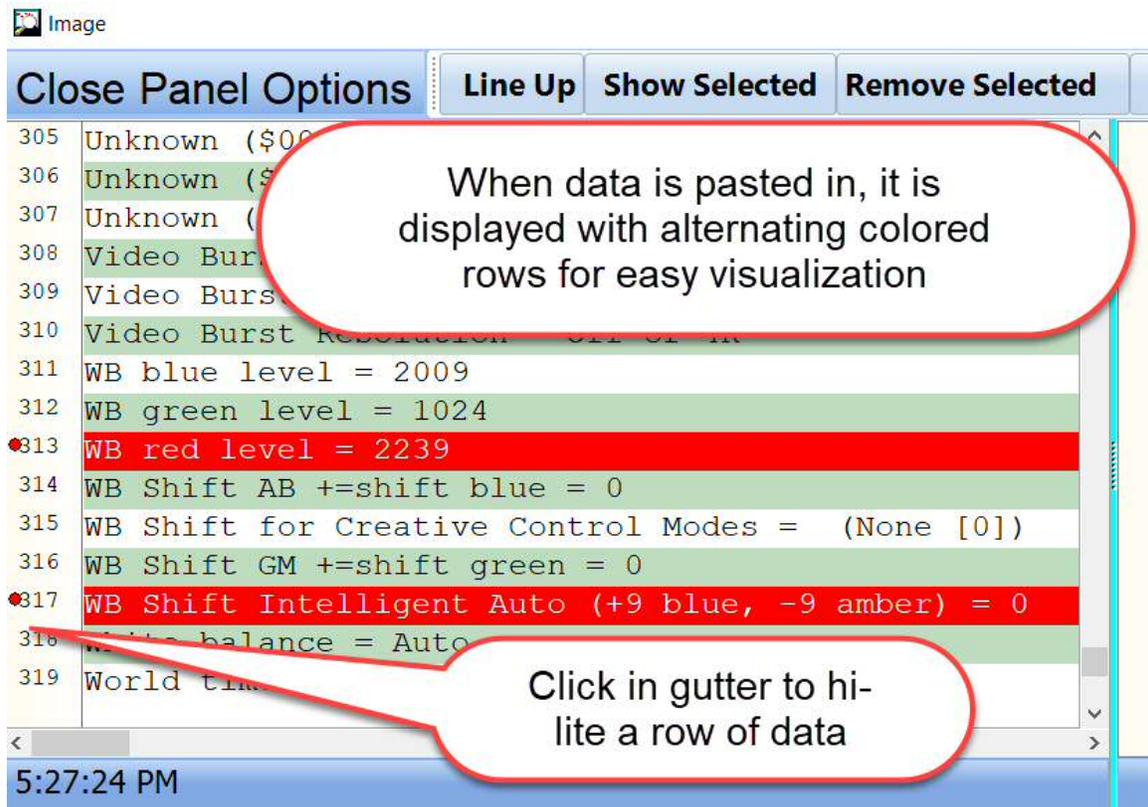
Go To Top of Left/Top Panel

Go To Top of Right/Bottom Panel

There may be over 300 lines of data containing Exif and makers notes for a single file. This is one way to jump to the top of a panel. Ctrl+Home also works.

Clear Left/Top Panel Hi-Lites

Clear Right/Bottom Panel Hi-Lites



These options clear all hi-lites so you can start again.

Select Line Numbers in Right/Bottom Panel to match Left/Top Panel

Select Line Numbers in Left/Top Panel to match Right/Bottom Panel

If you click in the gutter of one panel to hi-lite rows, you can instantly hi-lite the matching line numbers in the other panel. This is most useful if you have use the [Line Up](#) button.

Convert Left Panel with Two Line Data:

The data in the website available from [Extras > Launch Metadata Website](#) pastes in as two lines. This option reformats the data so it can be compared with data on single lines from this program or from the other [Metadata Website](#). Only the left panel is able to adjust the data from this website to allow comparing to other sources.

Synchronize Scrolling Panels

This option links the two panels. Scrolling in one panel causes the other panel to scroll so that the line numbers remain linked together. This is particularly useful if you have used the button [Line Up](#). This feature automatically turns off when you are processing the [Line Up](#) or [Delete Duplicates](#) feature, then turns back on when finished.

Analysis Buttons



Line Up

The **Line Up** button attempts to line up Exif and Makers Notes tag names in side by side rows in the two panels. It is a good idea to name your makers notes tags the same as the website you are comparing to, to maximize the value of this feature. If you are comparing data from this program for two different image files then the tag names will already match. This feature starts by aligning exactly matched tag names. Then it tries to line up partially matching tags, and finally shows unmatched tags. Hopefully this will make visual comparisons between the data in two panels much easier.

NOTE: **Line Up** is automatically part of the [Delete Duplicates](#) button.

Show Selected

Often it will be useful to select only a few rows of data that you wish to compare. This is done by clicking in the gutter next to the desired line to select it. This button will remove all other data in both panels so you can easily make your

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comparison. Note that [Panel Options > Restore](#) .. can restore the removed rows if needed.

Remove Selected

This option is the opposite of [Show Selected](#). It removes all hi-lited rows of data. Note [that Panel Options > Restore](#) .. can restore the removed rows if needed.

Clip Selected

This option copies all selected rows to the clipboard so you can paste them wherever needed. Selected rows from both panels are included.

Delete Duplicates

This option first executes the [Line Up](#) feature. Then it removes any rows that have identical tag names AND identical values. Hopefully this will allow you to rapidly identify the tags that are different and thus worth inspecting. Note [that Panel Options > Restore](#) .. can restore the removed rows if needed.

Forensic use of this program

This program may have limited forensic value. Exif data may be helpful in determining if an image has been edited. (This program does not change or re-save image files in any way, except [File > Save As](#).) Many editing programs update the “Software” tag. The loss of Exif data would also demonstrate tampering. That does not represent a comprehensive method of determining if changes have been made, however.

When using this program for forensic purposes, be sure to record MD5 hashes for all test photos before using this program and then confirm those [MD5](#) hashes are identical after using this program. I have tried to insure that no damage to your test files will occur, but it is best for you to confirm this as part of your test protocol.

Makers Notes may include the camera serial number and/or the lens serial number. This might be useful in proving which camera took a photo. In my limited testing so far, there are some problems:

My Panasonic camera reports a camera serial number that bears no resemblance to the number engraved on the exterior of the camera (the program now translates that serial number data, but it still doesn't match the serial number engraved on the camera). It also reports the serial number of Panasonic lenses, but the internal serial number does not match the number engraved on the lens. In contrast, it reports the serial number of an Olympus lens correctly. If you wish to connect a particular camera or lens to a photo, be sure to do some basic checking such as

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contacting the manufacturer about whether the reported serial numbers are unique and whether there is a connection between the internal and external serial numbers. Alternately, obtain additional sample cameras or lenses and take sample photos to document that the numbers are unique. Take sample photos with the subject camera and confirm that it reports the same as the suspect photos. The following websites offer downloadable sample files for a variety of cameras that may serve as test controls:

<http://www.dpreview.com/galleries/reviewsamples/albums>
http://owl.phy.queensu.ca/~phil/exiftool/sample_images.html

I also found that Googling for the camera make and model with “Exif” might yield sample photos.

You can also use the [Extras Menu](#) to obtain Exif and Makers Notes translations from two other fairly comprehensive programs. This may provide additional assistance to a forensic examination. The default command lines for those programs do not damage or change files in any way. Be cautious about changing those defaults since both programs have very powerful features for changing Exif data in files.

You should not rely on the Makers Notes translation provided by this program until you have confirmed them with sample photos taken with the subject camera. This program may be a useful tool, but offers no guarantees. Your testimony should be based on your confirmation of the results provided by this program.

Version Notes:

Version No.	Changes
1.0.0.1	Original version compiled in Delphi 7 using dExif to read Exif data.
1.0.0.2	Interim version compiled with Delphi Explorer 2006 using both dExif and CCR-Exif to read Exif data and CCR-Exif to read Makers Notes.
2.0.0.0	Compiled with Delphi XE using only CCR-Exif. dExif no longer worked properly and was removed.
	Added menu with many options for configuring the display.
	Added left/right panel display and the option to configure favorites in the left panel, plus the option to select which panel is reported via the DDE interface.
	Added the ability to read Exif data from a .PSD file.
	Added the Extras Menu .
	Modified the MakerNotes.INI. The translation “Nikon ISO Speed Use” was changed to “ISO Speed” to agree with Canon and to help the Favorites feature capture the information.
	Replaced ISOSpeed Ratings” and “ISO:” Exif tags. This program standardizes with “ISO Speed”.
	Added CRC and MD5 hashing options.
	Added ExifTools.exe and Exiv2.exe to the DDE output options.

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Ver. 2.0.0.1	Modified how it formats baby and pet ages in Panasonic Maker Notes
	Completed Panasonic Maker Notes. Not all tags were identified, but many were identified and many were expanded for the Panasonic DMC-G1.
	<u>Do Not Show Makers Notes</u> and <u>Show only Makers Notes</u> are now mutually exclusive.
	Implemented new CCR-Exif version with better error handling for corrupted Makers Notes.
	NikonType2 EXIF data now yields the ISO speed from the raw data, if it wasn't stored in the normal EXIF tag.
	Implemented improved CCR-Exif flash detail reporting and removed flash reporting based on raw Exif translation.
	<u>Configuration > Configure Favorite Tags for Left Panel > Save Tag Configuration</u> now handles automatic stripping of current values delimited by = or :.
	Added the ability to modify the .INI file to set a custom caption for the program.
Ver. 2.0.0.2	Fixed some bugs that caused the program to return no Exif data if it was unable to read the original or modified dates. Now it returns blank dates along with the remaining Exif data.
	Compiled with Delphi XE2.
	Added new DDE command: {NOEXIF}
	Added ability to view Exif data for .JPEG files and .TIFF, assuming they are in standard .JPG or .TIF format.
	The font size can now be changed up to size 18 instead of 14 via Ctrl+Plus and Ctrl+Minus.
	The font size is now stored and restored from the .INI file.
	The file name being analyzed now displays in the status bar.
	Added <u>Edit > Find</u> on the menu bar.
	Modified colors to minimize affect of Windows Themes.
	Modified GPS coordinate translation to include a format that is compatible with Google Maps and Bing Maps.
Ver. 2.0.0.3	Modified <u>Extras</u> menu with two choices for raw data display. Show CCR &Raw Exif with Favorites Show CCR Raw Exif with full Exif
Ver. 2.0.0.4 02/07/2017	Improved handling of {NOEXIF} DDE command.
	Added <u>Extras > Display incoming DDE command</u>
	Replaced the main menu with the TMS advanced menu and set the font size to 12 for greater readability.
Ver. 2.0.0.6	Added ability to include a tag in the Favorites left panel. It must start with a minimum of 3 === signs.
	The number of Favorites tags was previously limited to 75. It is now 250. Any blank tag will stop reading the list.
Ver 3.0.0.1	Added Extras > Popup Comparison Form to allow comparing values

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May 2020	from two files.
	Added ability to display raw Offset Time, Offset Time Original, Offset Time Digitized for cameras that record this. (G9 did so, GH3 did not.) It displays with Extras > Show CCR Raw Exif with Favorites
	Added ability to display a bunch of extra EXIF data tags using CCR EXif.
	Added ability to display additional GPS data using ImageEn.
	The image of a file is now displayed via ImageEn so that correct EXIF values for Max Aperture can be obtained. This also allows displaying an image of .PSD and .TIF files.
	Tag names in the .INI file for displaying Favorites now are compared in a case insensitive fashion so different camera .INI files can have slight differences in their .INI files while still displaying the information.
	Updated the About form to provide correct data about available memory and screens.
	Fixed bug that caused a pasted in OffSet Time = +00:00 OffSet Time Original = +00:00 OffSet Time Digitized = +00:00 to be saved in Favorites as +00: instead of just =. This prevented Favorites from displaying these Offset Times.
	Added the ability to display EXIF Sub Sec Time, Sub Sec Time Original, and Sub Sec Time Digitized.
	Added File > Save As to save only .JPG files in low resolution while retaining metadata. It also shrinks the file name back to the original camera file name with no spaces since one website requires it.
	Added Extras > Launch Metadata Website. Actually two website options.
	Changed constraints so program can shrink more and so research display of file count isn't cut off by a too short form.
	Add Extras > Research option.
	Added Configuration > Panel Viewing Options > Use ImageEn for EXIF - no Makers Notes option. It allows Photorenamer to take advantage of Favorites to display ImageEn data. As much as possible the captions for each tag match those from CCR-Exif to make comparison easy with the popup form.
	Modified the option to use ExifTools and Exiv2. They now clear the prior contents from the left panel before displaying their own content.
	Fixed bug: Show Only Hash now actually shows the selected hash values plus the file info.
	Added check box to show the image. Default is false.
	Added ability to show User Ratings via ImageEn or CCR-Exif.
	Added ability to read the Body Serial Number via Exif or ImageEn XMP for both ImageEn and CCR-Exif.
	Added Help > View Help File
	Added ability to display Image Ratio in addition to Image Size.