

# AccuSplit

## Software User Manual

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## **1.0 General Information**

### **1.1.1 Introduction**

Thank you for choosing to use AccuSplit. This application was designed to rapidly and reliably split large files and computer videos into smaller segments to allow for easy archival to external media like DVD, CD-R, Zip™ or floppy disks. These file segments can then be recombined at a later time into an exact copy of the original file. The application was initially developed to split very large computer video files into smaller segments so that they could be moved from the hard drive onto inexpensive CD-R disks, thereby freeing up significant disk space on the system. However, the application is capable of segmenting and then correctly reconstructing ANY file.

To insure that the file reconstructed from the file segments exactly matches the original source file the application incorporates an advanced cryptographic algorithm that computes an MD5 Message Digest for both the original and reconstructed files. An MD5 Message Digest match between these files indicates with absolute certainty that no data was lost during the file split and reconstruction process. Additionally, if absolute data integrity as well as foolproof error-correction capabilities are desired, AccuSplit also includes the capability to create RAID-formatted file segments. In this mode the software creates file segments that are embedded with a very powerful RAID-style error correction mechanism that allows it to correct for data errors on damaged media. Errors ranging from a single corrupted data byte on a scratched CD to an entirely missing file segment are fully correctable with this option.

AccuSplit also includes the ability quickly and losslessly split computer videos into “independently playable” segments. This option currently supports all MPEG-1 format file types – including the Video-CD and CD-I formats. It also supports all re-encodable AVI format file types (including the popular INDEO, DIVX, and XVID codecs), DV-AVI files (digital camcorder – both Type-1 and Type-2 formats), Windows Media Center DVR-MS format files, and all WMV formats - including the WMV High Definition formats - 720p, 1080i, and 1080p. Using AccuSplit you can split your large videos into CD-sized (or any other size) segments and play those segments back directly – no file reconstruction is required.

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### **1.1.2 Accessibility Features**

AccuSplit incorporates a novel accessibility feature that enhances its ease of use for vision-impaired users. Integrated with the Windows Speech Interface the user can enter a

"CTRL" + "S" keystroke command sequence that will cause the application to audibly recite the tool tip text for the user interface element that currently has the input focus.

*NOTE - Windows 9x/ME/2000 users must have the Microsoft Speech SDK installed to utilize this accessibility feature.*

## 1.2.1 Installation

This application has been designed to run as a stand-alone executable. There is nothing to install. Simply double-click on the AccuSplit.EXE file to begin program execution. The application runs under Windows™ [95/98/ME/NT/2000/XP/Server2003/Vista] and doesn't include any of the annoying SpyWare, AdWare, or NagWare plug-ins that are common to many of today's shareware applications.

### NOTES:

1. *To split AVI format files using the AccuSplit's "Video File Smart Split" option you must have Microsoft DirectX version 8.0A or later installed.*
2. *AccuSplit's "Video File Smart Split" support for WMV format files requires the installation of Microsoft's free Windows Media Encoder 9 Series software package.*
3. *If you would like to have access to the AccuSplit help file via the AccuSplit executable's HELP button you must insure that the help file (ACCUSPLIT\_HELP.CHM) resides in the same directory as the AccuSplit executable (ACCUSPLIT.EXE).*

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## 1.2.2 Use the Windows™ SENDTO folder for one-click Splits and Rebuilds

One of the most effective ways to make use of AccuSplit is by placing a copy of it in the Windows™ "SendTo" folder. After doing this you will be able to "send" your target files to AccuSplit by simply right-clicking on the target file and then selecting:

**"SENDTO" --> "ACCUSPLIT.EXE"**

from the pop-up options. The location of the Windows™ "SendTo" folder varies depending on the version of the operating system you are using. Typical paths for various versions are listed below. If you are unsure of the location you should consult your operating system documentation for information.

95/98

C:\WINDOWS\SENDTO\

NT

C:\WINNT\PROFILES\\SENDTO\

2000/XP

C:\DOCUMENTS AND SETTINGS\\SENDTO\

Vista

C:\USERS\\APPDATA\ROAMING\MICROSOFT\WINDOWS\SENDTO\

### 1.3.1 Limitations of the Shareware Version

The Shareware Version of this software is still extremely capable. One of my personal pet-peeves is demo versions of software that are crippled to the point of being useless. That said, the Shareware Version limits users to a maximum file segment size of 100MB, with a maximum of eight file segments allowed. This is enough to split an 800MB file into eight segments and store it onto two recordable CDs or eight 100MB Zip™ disks.

The Full Version of the software has no limitations on either the segment size or on the number of file segments that can be created. With this version you could take the same 800MB file and split it into 650MB segments for easy CD storage or if you were a masochist split it into *eight hundred* 1MB pieces for storage onto floppies. The Full Version of AccuSplit is also capable of working with extremely large files. It has no problem handling files whose size exceeds 2.1GB and has been used to successfully split and reconstruct files with sizes in excess of 150GB.

## 1.4.1 Command Line Options

AccuSplit incorporates several command line options that easily facilitate its use in either a batch script or standalone environment. All of the options listed below are available for use during file split operations. However, for file rebuild processes only the /AUTO, /QUIET, and /DEST options are valid. Additionally, the /EDITTIME and /EDITFRAME options are only available in the Full Version release of the software. These two options are not available in the free shareware version of AccuSplit.

**/MODE** – This parameter specifies the type of split operation to be performed. The available modifiers are:

/MODE=STD           (Standard Mode Split)  
/MODE=VID           (Video Smart Split)  
/MODE=RAW           (Raw Mode Split)

**/SIZE** – This parameter specifies the desired size for the file segments. The size value should be entered in kilobytes – for example:

/SIZE=647000         (Segment size for a 650MB CD-R)  
/SIZE=4580000       (Segment size for DVD media)  
/SIZE=1350           (Segment size for floppy disks)

**/SIZEMB** – This parameter functions similarly to /SIZE except that the segment size value should be entered in megabytes – for example:

/SIZEMB=647         (Segment size for a 650MB CD-R)

**/DEST** – This parameter specifies the destination directory to which either the split file segments or the reconstructed file will be written – for example:

/DEST=D:\TEMP

**/RAID** – This parameter will instruct the application to create RAID-formatted output segments during the file split process. (Standard Split Mode Only)

**/COMP** – This parameter directs the application to create compressed output segments during the file split process. (Standard Split Mode Only)

**/EDITTIME** – (*Full Version software release only*) This parameter will instruct the application to utilize the Video Smart Split Mode to extract a single sub-clip from the original file. It currently supports AVI, DV-AVI, WMV, and DVR-MS format files. Enabling this option also automatically enables the /AUTO option. The starting and ending times (hr:min:sec.ddd) for the sub-clip to be extracted should be entered as follows:

`/EDITTIME=<start_time> - <stop_time>`

(i.e. `/EDITTIME=10:32.324-1:21:45.562` To extract the clip beginning at time 10:32.324 [10min 32.324sec] and ending at time 1:21:45.562 [1hr 21min 45.562sec])

**/EDITFRAME** – (*Full Version software release only*) This parameter will instruct the application to utilize the Video Smart Split Mode to extract a single sub-clip from the original file. It currently supports AVI, DV-AVI, WMV, and DVR-MS format files. Enabling this option also automatically enables the /AUTO option. The starting and ending frames for the sub-clip to be extracted should be entered as follows:

`/EDITFRAME=<start_frame> - <stop_frame>`

(i.e. `/EDITFRAME=15-1342` To extract the clip beginning at frame 15 and ending at frame 1342)

**/AUTO** – This parameter directs the application to automatically begin the split or rebuild operation. User intervention will only be required in the event of an error.

**/QUIET** – This parameter will prevent the application's graphical user interface (GUI) from being displayed. Enabling this option also automatically enables the /AUTO option.

**/SHUTDOWN** – This parameter will direct the application to shutdown the computer when file processing is complete.

Several examples of these options being used in typical command scripts are shown below.

---

Split the file C:\TEST.MPG into segments using the Video Smart Split mode. The specified size for the file segments is 1350KB and the segments will be created in the directory D:\TEMP\. The split process is set to begin automatically – no user intervention is needed.

`C:\ACCUSPLIT.EXE C:\TEST.MPG /DEST=D:\TEMP /SIZE=1350 /MODE=VID /AUTO`

---

Split the file C:\BIG FILE.DAT into segments using the Standard Split mode. The specified size for the file segments is 4580000KB (4580MB). The split process is set to begin automatically – no user intervention is needed. **Note that the name of the file to be split is enclosed in quotes. This should be done whenever the filename or file path contains spaces.**

```
C:\ACCUSPLIT.EXE "C:\BIG FILE.DAT" /SIZE=4580000 /MODE=STD /AUTO
```

---

Rebuild the AccuSplit segment file "C:\MY FILES\TESTFILE.DAT.0000.SEG". The reconstructed file will be named "TESTFILE.DAT" and it will be located in the same directory as the Segment Index File (i.e. C:\MY FILES\). The rebuild process is set to begin automatically – no user intervention is needed. **Note that the name of the file to be split is enclosed in quotes. This should be done whenever the filename or file path contains spaces.**

```
C:\ACCUSPLIT.EXE "C:\MY FILES\TESTFILE.DAT.0000.SEG" /AUTO /DEST=D:\TEMP
```

---

Split the file C:\TEST.DAT into segments using the Standard Split mode. The specified size for the file segments is 647MB and the segments will be created in the directory D:\TEMP\. The Create RAID Segments and Compress Output Segments options have both been enabled. The split process is set to begin automatically – no user intervention is needed.

```
C:\ACCUSPLIT.EXE C:\TEST.DAT /MODE=STD /SIZEMB=647 /DEST=D:\TEMP /RAID /COMP /AUTO
```

---

Extract a single video sub-clip from the file C:\TEST.AVI using the Video Smart Split mode. The start time for the clip is selected to be 10min 30.324sec and the stop time is selected as 45min 21.623sec.

```
C:\ACCUSPLIT.EXE C:\TEST.AVI /MODE=VID /EDITTIME=10:30.324-45:21.623
```

## **2.0 Splitting Files**

### **2.1.1 How to Split Files**

Splitting files into segments couldn't be easier. Simply enter the name of the file to be split (including the path) into the FILE TO SPLIT entry box or locate the file using the BROWSE button. Select the removable media type that you are going to use via the REMOVABLE MEDIA QUICK SELECT list. Press the SPLIT button and wait for the application to inform you that the operation has completed. If you desire a non-standard file segment size then simply enter the desired segment size into the SEGMENT SIZE entry box. The program does not alter your original source file. The new file segments are created in the same directory as the source file and have a special numerical ".0xxx.SEG" extent added to the filename. Additionally, a MD5 Message Digest will be computed for the original file and each of the generated file segments. The Message Digests will be added into a special header section at the start of each file segment. During the file reconstruction process these recorded signatures will be used to validate the integrity of the reconstructed file.

***NOTE – Once the file split operation has been successfully completed it is important that the user avoid altering the names of the generated file segments. Altering the names of these files can cause the file reconstruction process to fail.***

The following example demonstrates the segment files created for a Standard Split operation:

Split the file named D:\TEST\JUNK.TXT which has a size of 950MB into 647MB segments for storage onto CD-R.

1. Browse to D:\TEST\JUNK.TXT
2. Select the 650MB CD-R option from the REMOVABLE MEDIA QUICK SELECT list
3. Click on the SPLIT button

Upon completion the following new files will have been created:

- D:\TEST\JUNK.TXT.0000.SEG (with a size of 647MB)
- D:\TEST\JUNK.TXT.0001.SEG (with a size of 303MB)

## 2.2.1 Advanced File Splitting Options

The **Standard** or default mode of splitting files using AccuSplit works quite well for breaking a file into segments for transport or archival to external media. The file segments that are created can later be used by AccuSplit to rebuild an exact copy of the original file. However these individual file segments have limited usefulness for any application other than AccuSplit. To meet the needs of power-users, AccuSplit also makes available two specialized modes of splitting files that greatly enhance the usefulness of the generated file segments:

- **Video File Smart Split** – This option is for users who would like to split large video files into smaller, independently playable segments. When this mode is enabled AccuSplit analyzes the internal structure of the video file to determine the location of a valid split point which lies nearest to the user designated segment size. By splitting the video file only at these special locations AccuSplit is able to insure that each of the segment files it creates will play back properly on both software and hardware playback devices. This option currently supports all MPEG-1 format file types – including the Video-CD and CD-I formats. It also supports all re-encodable AVI format file types (including the popular INDEO, DIVX, and XVID codecs), DV-AVI files (digital camcorder – both Type-1 and Type-2 formats), Windows Media Center DVR-MS format files, and all WMV formats including WMV-HD 720p, 1080i, and 1080p.

*NOTE – File segments created using the Video File Smart Split option can not be recombined into a copy of the original composite file.*

- **Raw Mode Split** – This option is for users who desire to split a file into segments that contain only the raw data from the original file. In the Standard or default file splitting mode AccuSplit adds one kilobyte of data to the header portion of each of the generated segment files. This header contains information such as the number of file segments originally created, the MD5 signature for the original composite file, the MD5 signature for the current file segment, etc. AccuSplit uses this information during the file reconstruction process to insure the data integrity of the rebuilt file. When the Raw Mode Split option is enabled this header data is not added to the generated file segments.

*NOTE – File segments created using the Raw Mode Split option can not be recombined into a copy of the original composite file.*

---

The file segments that are created using either of these Advanced Mode file splitting options do not follow the same naming convention that is used by AccuSplit during its Standard or default mode splits.

The following example demonstrates the segment files created by a split operation using one of the Advanced Mode options:

Split the file named D:\TEST\JUNK\_VIDEO.MPG which has a size of 950MB into 647MB segments for storage onto CD-R. The user desires that each of the resulting two file segments be independently playable so the VIDEO FILE SMART SPLIT option will be selected.

1. Browse to D:\TEST\JUNK\_VIDEO.MPG
2. Select the 650MB CD-R option from the REMOVABLE MEDIA QUICK SELECT list
3. Select the VIDEO FILE SMART SPLIT option from the SPLIT MODE group
4. Click on the SPLIT button

Upon completion the following new files will have been created:

- D:\TEST\JUNK\_VIDEO\_0000.MPG (with a size of 647MB)
- D:\TEST\JUNK\_VIDEO\_0001.MPG (with a size of 303MB)

### 2.3.1 The Video Smart Split PREVIEW and TWO-PASS Options

When the **Video File Smart Split** mode is selected two additional parameters become available to the user. The **Preview Split Points** and **Two-Pass** options give the user added control over how the video file is going to be split into segments.

- **Preview Split Points** - This option allows the user to examine each of the file segments that AccuSplit is going to create - before the split process begins. The user is able to visually preview each file segment to determine whether the split points that AccuSplit automatically calculated are satisfactory. If they are not, the user can easily adjust both the start and stop times for the individual file segments. This allows you to tailor each of the splits so that they occur at the optimum time and effectively eliminates the problem of splits that occur in the middle of an important scene. For detailed instructions on using the Preview Split Points option see the section below titled "Using the Preview Split Points Window".
  - **Two-Pass Split** - This option splits the video file using two discrete passes for more accurate control of the resulting file segment size. This option is only used when splitting AVI format files - the setting is ignored if it is selected when splitting an MPEG-1 format file.
- 

### 2.3.2 Using the Preview Split Points Window

The Preview Split Points Window is designed to be an intuitive and easy-to-use interface that will allow the user to preview, and if necessary, adjust the start and stop times for each of the file segments. The interface controls are grouped into several major sections which are explained below.

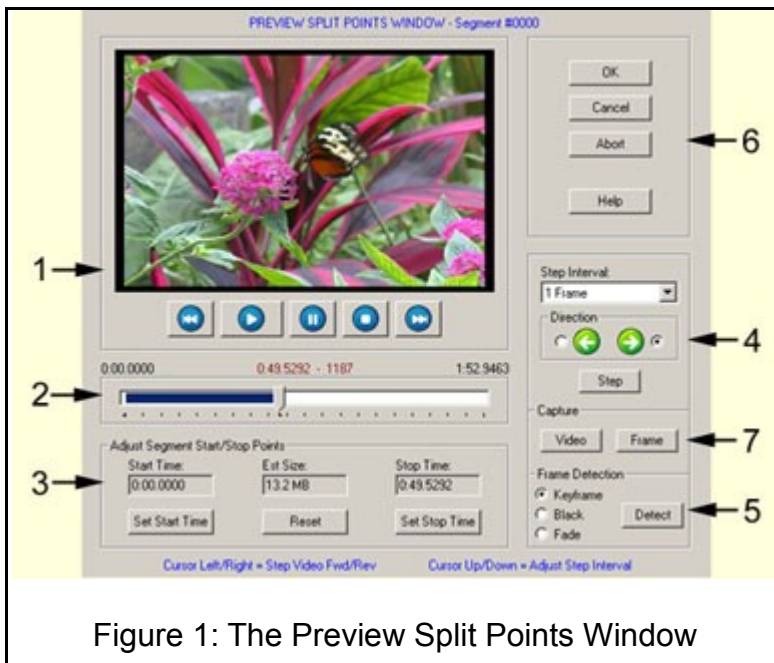


Figure 1: The Preview Split Points Window

### **SECTION 1: The Video Preview section**

This section contains a display window for previewing the video content of each file segment. It also contains buttons that control the video playback: PLAY, PAUSE, STOP, SEEK-START, and SEEK-END. The PLAY and STOP buttons enable the user to easily audit the effects of any changes that are made to the default segment start and stop times. Clicking the PLAY button causes playback of the file segment to begin, starting from the current file position and continuing until the currently selected segment STOP TIME is reached. Clicking the STOP button rewinds the file position back to the currently selected START TIME. The SEEK-START button can be used to set the video position to either the currently selected START TIME or the default segment start position. Similarly, the SEEK-END button can be used to set the video position to either the currently selected segment STOP TIME or the default segment stop position.

### **SECTION 2: The File Position Seek Bar and Time Position Displays section**

This section contains a slider control that can be dragged to allow you to quickly seek to any portion of the current file segment. The section also includes three time position indicators above the seek bar that display (from left to right, respectively) the default segment start time, the current time and frame position within the segment, and the default segment stop time.

### **SECTION 3: The Adjust Segment Start/Stop Points section**

Use the controls in this section to alter the default segment start and stop times. When the Preview Window for each segment initially opens the START TIME and STOP TIME display fields contain the default segment split times that AccuSplit calculated. If you don't like these

split points you can easily change them by using a combination of the File Position Seek Bar and the Step Controls. Once you have located the desired split point you simply mark that position by clicking the SET START TIME or SET STOP TIME buttons as appropriate. The RESET button can be used to reset the segment START TIME and STOP TIME values back to the default segment split times that AccuSplit originally calculated.

The EST SIZE display field lists the estimated size of the video clip calculated using the currently selected START TIME and STOP TIME settings.

*NOTE - When splitting MPEG-1 files the SET START TIME button is disabled. When working with this file type users are only able to modify the segment STOP TIME value.*

#### **SECTION 4: The Step Control section**

The controls present in this section give the user the capability to "step" through the video clip using discrete time increments. In this fashion the user can easily dial-in the exact location for the file split - for instance you can adjust the split point so that it occurs during the "fade-to-black" frames that typically exist between scene changes. The Step Interval is adjustable among eight fixed step increments (5 Minutes, 3 Minutes, 2 Minutes, 1 Minute, 30 Seconds, 10 Seconds, 1 Second, 1 Frame). The direction of the step is also adjustable so that it occurs in either the forward or reverse directions. The STEP button steps the video clip one increment in the specified direction.

However, **the recommended method for quickly single-stepping through a video clip is to use the cursor keys.** The LEFT, RIGHT, UP, and DOWN cursor keys all perform functions similar to those found in the Step Control section of the interface. The LEFT cursor key steps the video one increment in the reverse direction, the RIGHT cursor key steps the video one increment in the forward direction, the UP cursor key increases the Step Interval by one increment (i.e. from 30 Seconds to 1 Minute), and the DOWN cursor key decreases the Step Interval by one increment.

#### **SECTION 5: The Frame Detection section**

You can use the controls in this section to quickly seek to specific frame-types within your video clip. To use these functions first select the frame-type which you would like to detect (Keyframe, Black frame, or Fade Point), then select the desired direction in which to scan (the FORWARD arrow searches ahead of the current video position; the BACK arrow searches before the current position), and then click the DETECT button. A description of each of these frame detection modes is given below:

*NOTE - When working with MPEG-1 files there may be a small amount of error associated with the file seek points that are returned from the Black and Fade Point detection algorithms. This is a limitation of DirectX. In the worst case scenario this error might place the detected position one or two frames away from the true target frame position. In this situation you can manually step the video a couple of frames in either direction to find the correct target frame location.*

- **KEYFRAME** - This option searches in the specified direction for the nearest keyframe to the current position. Splitting files at keyframe points can be desirable with certain codecs because it can eliminate problems such as inverted video with the subsequent video file segments. Also, AccuSplit will always split MPEG-1 format files at the keyframe location that is nearest to the user selected position.
- **BLACK FRAME** - This option scans the video clip in the specified direction to detect the nearest video frame with all black content (RGB value 0,0,0). In commercial broadcasts black frames are typically used as markers to signify the breakpoint between the featured content and the commercials. Using this option you can easily detect the black frame marker that exists between these points. Then by selecting your split point at this location you can quickly edit out any undesired commercial content from either the beginning or end of your video segments.
- **FADE POINT** - This option scans the video clip in the specified direction to detect the nearest video frame that consists of only a single color value. Most consumer camcorders (Digital and Analog) can be set up to insert either blank frames or a gradual fade-out to a blank frame into the recording whenever a stop recording command is given. The Fade Point detection algorithm scans the video content searching for this type of blank frame.

*NOTE - Both the Black and the Fade Point types of frame detection can be very time-intensive processes due to the type of video analysis being performed.*

## **SECTION 6: OK / CANCEL / ABORT / HELP**

The controls in this section are fairly self-explanatory:

- **OK** - Closes the Preview Split Points Window for this file segment and saves any modifications the user has made to the segment start and stop times.
- **CANCEL** - Closes the Preview Split Points Window for this file segment and discards any modifications the user has made to the segment start and stop times.
- **ABORT** - Terminates the current file split operation and deletes any file segments that have already been created.
- **HELP** - Opens the AccuSplit help file.

## **SECTION 7: The Capture section**

The controls in this section enable you to extract either a single video frame or a selected sub-section of the video to an external file. The FRAME capture button gives the user the capability to capture an individual video frame and to save that frame as a bitmap ( \*.BMP ) file. To use this function simply step the video to the frame that you wish to capture and click the FRAME button. The application will prompt you for a filename and disk location for the captured bitmap file. The VIDEO capture button can be used to save a section of your video to a file. To use this function simply select the START TIME and STOP TIME values for the section of the clip that you would like to save and click the VIDEO button. The application will prompt you for a filename and disk location for the captured video segment. The captured video clip will be saved in the same format as the original source video.

### **2.4.1 Removable Media Quick Select**

The drop down list in the REMOVABLE MEDIA QUICK SELECT section offers you a list containing the most popular removable media types. Selecting a media type from this list quickly sets up the optimum segment size for the split operation targeting that media type. If you desire an alternate segment size simply enter the desired size directly into the SEGMENT SIZE entry field.

---

### **2.4.2 The “74min Video-CD” and “80min Video-CD” Options**

These two options in the REMOVABLE MEDIA QUICK SELECT list are intended for users desiring to split a Video-CD format MPEG-1 file into segments that are sized to fit onto CD-R media recorded in the Video-CD format. This is a specialized CD-R format that effectively yields more data space on the CD. A standard 650MB CD-R recorded in the Video-CD format can actually hold approximately 742MB of MPEG data. A 700MB CD-R recorded in this format can hold approximately 803MB of MPEG data. These two options can only be used when working with MPEG files that are recorded in conformance to the Video-CD specification. Additionally the CD-R disk must also be “burned” in the Video-CD format. When creating CD-sized segments for all other file types the “650MB CD-R” or “700MB CD-R” options should be selected from the Removable Media Quick Select list.

## 2.5.1 Which File Splitting Mode Should I Use?

The answer to this question depends upon the type of file that you want to split and what you intend to do with the file segments after you split it. Remember that no matter which file splitting mode you choose your original file is not altered in any way by AccuSplit.

**Standard Split** – use this mode when you want to split ANY file into smaller pieces for archival or transport via external media. You can later use AccuSplit to rebuild these segments into an exact copy of the original file. The data integrity of this rebuilt file is guaranteed by the MD5 signature embedded into the file segments which was calculated for both the original file as well as each of the individual segments. This mode also includes two user options - **Create RAID Segments** and **Compress File Segments** - that expand its capabilities. The Create RAID Segments option allows you to create RAID-formatted file segments that incorporate a very robust error correction capability. The Compress File Segments option allows you to compress the data that is written to the output file segments in order to minimize the required storage space.

**Video File Smart Split** – use this option if you have a large AVI, DV-AVI, WMV, DVR-MS, or MPEG-1 format (including Video-CD) file that you would like to split into smaller pieces that will then be independently playable. There are however, a couple of constraints to be aware of when choosing this option:

- If the file is an MPEG file it must be an MPEG-1 *System Stream* format file. MPEG-1 *Elemental Stream* format files (typically with extensions like \*.M1V, \*.MP2, etc) are not supported. *Elemental Stream* format files are typically only utilized by video professionals so this limitation shouldn't affect most users.
- If the file is an MPEG file it can contain only one multiplexed video stream. The MPEG standard allows for up to 16 multiplexed video streams to exist within a single file. However this capability is rarely utilized outside the professional video environment so again this shouldn't affect most users.
- If the file is a DVR-MS format file then you must be using Windows XP SP2 or later. The Video Smart Split mode does not support DVR-MS format files on earlier versions of XP, Windows 2000, Windows NT, or Windows 9x/ME.
- The file segments created using this split mode **cannot** later be recombined by AccuSplit into a copy of the original file. If you plan to later rebuild the file segments into a copy of the original file you should only use the Standard File Splitting mode.

**Raw Mode Split** – use this option if you have a large file that needs to be “cut” into smaller pieces that contain only the “raw” content of the original file. As with the Video File Smart Split option the file segments created using this split mode **cannot** later be recombined by AccuSplit into a copy of the original file. If you plan to later rebuild the file segments into a copy of the original file you should only use the Standard File Splitting mode.

## **3.0 Combining File Segments**

### **3.1.1 How to Rebuild a File from its Segments**

To rebuild the file from its segments simply select the REBUILD FILES tab and enter the filename and path for the Segment Index File into the appropriate entry field. You can also use the BROWSE button to select the file. The Segment Index File is the segment file that has the “.0000.SEG” extension. By default, the reconstructed file will be saved into the same directory as the Segment Index File. If you desire an alternate location then simply enter the new destination path into the DESTINATION PATH entry box. If the Segment Index File resides on a read-only media device such as CDROM, the application will prompt you to select an alternate destination path. Also, by default, the reconstructed file will have the same name as the original file that was split. If a file with this name already exists in the destination path the application will prompt you to select:

- (a) an alternate name for the reconstructed file
- (b) an alternate destination path
- (c) you can choose to have the application overwrite the existing file

During the file reconstruction process the MD5 signature for each of the segments is continually computed and compared against the recorded signature for each segment. If any data discrepancies are detected the user is notified and given the option of terminating the reconstruction process. As an additional check, after the reconstruction is complete the MD5 signature for the rebuilt file is compared to the recorded signature of the original file. A match between these signatures insures that the reconstructed file is an exact duplicate of the original.

If the file segments were created as RAID segments then any data errors encountered during the reconstruction process will be automatically corrected via the RAID data that is embedded into the other file segments.

### **3.2.1 Registering the ".SEG" File Extension**

Advanced users can expedite the process of rebuilding a file from its segments by associating the ".SEG" file extension with the AccuSplit application. After associating this file type users can simply double-click on the Segment Index File (\*.0000.SEG) to launch the AccuSplit application in file rebuild mode. Specific instructions on how to associate a file extension with a particular application are dependent upon the type of Windows™ operating system in use and users should consult the appropriate operating system documentation for assistance.

## **4.0 User Options**

### **4.1.1 General Options**

The selections available on the General Options page allow the user to tailor AccuSplit's behavior while the file processing is in progress. The specific functions of these options are detailed below:

- **Destination Directory for File Segments** – By default, AccuSplit creates the file segments in the same directory as the original file. However, by selecting the "Prompt User for Destination Directory" option the user can have AccuSplit prompt them for the desired location for the segment files. Selecting an alternate destination location can alleviate problems that occur when there is not enough space available in the default directory to hold both the original file as well as the segment files. Users can also greatly speed up the file split process by choosing a destination location that resides on an alternate physical disk drive.
- **Shutdown Computer When Complete** – This option directs the application to automatically shut down the computer system when file processing is complete.

*NOTE - The currently configured settings for all of the User Options Categories can be made persistent by clicking on the SAVE button at the bottom of the OPTIONS page. Similarly, the default configuration for these settings can be restored by clicking on the DEFAULT button.*

## 4.2.1 Standard Split Mode Options

The selections available on the Standard Split Options page allow the user to tailor how AccuSplit processes files when using the Standard File Splitting mode. The specific functions of these options are detailed below:

- **Create RAID Segments** – When this option is enabled the file segments that are created will be embedded with a very powerful error correction mechanism that is patterned after the Redundant Array of Independent Disks (RAID) technology that is used in environments that require a robust error recovery capability. Using RAID-formatted file segments the software can automatically correct for data errors on damaged media. Errors ranging from a single corrupted data byte on a scratched CD to an entirely missing file segment are fully correctable with this option. This option can also be used in conjunction with the Compress File Segments option.
- **Compress File Segments** – When this option is selected the data that is written to the file segments will be compressed allowing you to minimize the amount of storage space that is required on your archival media. Using this option is very handy when splitting large uncompressed files such as Windows Backup files. This option can also be used in conjunction with the Create RAID Segments option.

*NOTE - The currently configured settings for all of the User Options Categories can be made persistent by clicking on the SAVE button at the bottom of the OPTIONS page. Similarly, the default configuration for these settings can be restored by clicking on the DEFAULT button.*

### 4.3.1 MPEG Options

The selections available on the MPEG Options page allow the user to tailor how AccuSplit processes MPEG files when splitting this file type using the Video Smart Split mode. The specific functions of these options are detailed below:

**\*\* NOTE - The options in this section are tailored toward advanced users.**

- **Use Default DirectShow Components for Preview** – AccuSplit has been designed to work most effectively when used with the standard Microsoft MPEG DirectShow components. For that reason this option is selected by default. However, if a user has other, third-party MPEG DirectShow components installed and would prefer to use these items in the Preview Mode, then this option can be de-selected to permit their use. This option setting only affects Preview Mode operation and does not alter the mechanism that AccuSplit uses during the file split process.
- **Correct Invalid File Segment Audio Sync Data** – When this option is selected AccuSplit will evaluate the MPEG Audio Header that resides at the beginning of each created file segment. If the sync data in this audio header is invalid AccuSplit will correct it to preclude any audio playback problems with that file segment. In most circumstances the use of this option will not be required, however, if you are experiencing audio playback problems with some of your MPEG file segments then selecting this option should correct the problem.
- **Zero File Segment Clock References** – In order to maximize the speed of the file split process, AccuSplit, by default, does not reset the MPEG file's internal video and audio packet time stamps back to a zero reference starting point in the file segments it creates. Since the ISO MPEG-1 Standard does not require that the data packet time stamps begin at a zero reference point this behavior will have no adverse impact on the playability of the individual file segments. However, it is possible that some third-party video editing or post-processing applications may require that the file segments contain a zero reference starting point for all data packet time stamps. Setting this option will correctly zero-ize all pertinent packet time stamps to allow for compatibility with these applications. *The use of this option will slow the file split process, therefore it is recommended that it only be selected when required.*

*NOTE - The currently configured settings for all of the User Options Categories can be made persistent by clicking on the SAVE button at the bottom of the OPTIONS page. Similarly, the default configuration for these settings can be restored by clicking on the DEFAULT button.*

#### 4.4.1 DV-AVI Options

The selections available on the DV-AVI Options page allow the user to tailor how AccuSplit processes DV-AVI files when splitting this file type using the Video Smart Split mode. The specific functions of these options are detailed below:

*\*\* NOTE - The options in this section are tailored toward advanced users.*

- **Transcode Segments to Type-1 DV-AVI Format** – This option will convert all output file segments for Type-2 DV-AVI source files into the Type-1 DV-AVI format.
- **Transcode Segments to Type-2 DV-AVI Format** – This option will convert all output file segments for Type-1 DV-AVI source files into the Type-2 DV-AVI format.

*NOTE - The currently configured settings for all of the User Options Categories can be made persistent by clicking on the SAVE button at the bottom of the OPTIONS page. Similarly, the default configuration for these settings can be restored by clicking on the DEFAULT button.*

## **5.0 The MD5 Message Digest**

### **5.1.1 What is an MD5 Message Digest**

The MD5 Message Digest algorithm was developed by Professor Ronald L. Rivest of MIT. What it does, to quote the executive summary of rfc1321, is:

*[The MD5 algorithm] takes as input a message of arbitrary length and produces as output a 128-bit "fingerprint" or "message digest" of the input. It is conjectured that it is computationally infeasible to produce two messages having the same message digest, or to produce any message having a given prespecified target message digest. The MD5 algorithm is intended for digital signature applications, where a large file must be "compressed" in a secure manner before being encrypted with a private (secret) key under a public-key cryptosystem such as RSA.*

In essence, the MD5 algorithm is a way to verify data integrity, however it is much more reliable than a checksum or many other commonly used methods. In other words, when the MD5 signatures of two files match it is absolutely certain that the files are identical.

The code that this application uses to generate the MD5 Message Digest includes part of the MD5SUM source code written by Colin Plumb in 1993. MD5SUM is in the public domain and is not copyrighted.

### 5.2.1 What if the MD5 Digests Don't Match

If an MD5 signature error is reported during the reconstruction process the most likely cause of the problem is bad data blocks on the removable media upon which the file segments were stored. It is important to remember that MD5 is a data validation algorithm and does not improve upon the error correction capabilities that are integrated into the hardware of the removable media drives. Treat your removable media with care to minimize the chance for physical damage and data errors.

If data integrity and foolproof error correction capabilities are desired then it is recommended that you always split your files using AccuSplit's **Create RAID Segments** option. With RAID file segments it is possible for AccuSplit to correct almost any type of data error that would typically be encountered. Errors ranging from a single invalid data byte on a scratched CD to an entirely missing file segment are correctable with this option.

## **6.0 Support Information**

### **6.1.1 Who to Contact**

This application was developed by Joseph Flynn. It has been rigorously tested to insure that it performs as designed, however because nothing is perfect, please see the terms of the License Agreement. For users of the unregistered shareware version of this software the following disclaimer applies:

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A special thanks go to Roger White who has provided invaluable assistance in debugging the multi-threaded portions of the application and Andrew Koenig for his idea on integrating a RAID-style error correction mechanism into the software package. Thanks also go to the various AccuSplit beta testers whose comments, suggestions, and troubleshooting efforts have made it possible to deliver a much better product.

This application makes use of the ZLIB data compression library. ZLIB is copyrighted by Jean-loup Gailly and Mark Adler and is used in accordance with their licensing agreement.

For comments, questions, or to suggest improvements you can contact me at:

[AccuSplit\\_support@cox.net](mailto:AccuSplit_support@cox.net)

Or visit the AccuSplit website at:

[http://members.cox.net/accusplit\\_support/index.htm](http://members.cox.net/accusplit_support/index.htm)

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