Captioning with Media Access Generator (MAGpie)

This document describes the basic procedure for creating captions and subtitles for, and integrating audio descriptions with, digital multimedia using the PC-based Media Access Generator (MAGpie).

MAGpie is a PC-based basic editor for the creation of captions and subtitles for digital multimedia. MAGpie can be downloaded for free at: http://ncam.wgbh.org/webaccess/magpie/index.html . Using MAGpie, you can author captions and subtitles for playback with three playback engines:

- Windows Media Object using SAMI (Synchronized Accessible Multimedia Interchange) format
- Apple's QuickTime Player using Qttext and
- RealNetworks' RealPlayer G2 and above using SMIL (Synchronized Multimedia Integration Language format). MAGpie also has the capability to sequence audio descriptions in the RealPlayer.

Acceptable media formats include:

1. .Windows Media formats: .ASF, .ASX.
2. .AVI
3. .MPEG (.mpg, .mpeg, .m1v, .mp2, .mpa, .mpe)
4. .MIDI (.mid, .midi)
5. .Apple QuickTime (.qt, .aif, .aifc, .aiff, .mov)
6. .Sun Microsystems and NeXT (.au, .snd)
7. .WAV

You can output your captions or subtitles in three formats:

- The W3C's SMIL (Synchronized Multimedia Integration Language) via RealText
- Apple's QuickTime and
- Microsoft's SAMI (Synchronized Accessible Media Interchange) format.

File extensions that you should be familiar with:

- .MAG Project file (with project settings)
- .AVI Media file
- .STRM Stream file with captions/Stream file with audio description pointers
- .SMIL Output file (playable with the RealPlayer)
- .RT RealText output file with formatted captions and audio description pointers
- .WAV Audio description sound file
- .SMI Output file (playable with Windows Media Player)
- .TXT Sample QuickTime caption-text output file

To view caption output in Windows Media Player, make sure that the .AVI and .SMI files are in the same folder, and then open the .AVI file with Windows Media Player.

To view caption/description output in the RealPlayer, make sure that the .SMIL, .RT, .AVI, .WAV are in the same folder, and then open .SMIL with the RealPlayer.

To view caption output in QuickTime, open the .AVI with QuickTime Player, then use the QuickTime Player to Import the .TXT into a new (text) movie, and then cut/paste the entire text movie into the original. Position the text at the bottom using the GetInfo/Size/Adjust control.

Create a project

MAGpie projects are made up of one or more streams. Each stream is a single caption or subtitle source file.

1. Start MAGpie by choosing the MAGpie icon from the Windows START menu. The splash screen will disappear after five seconds, or you can get rid of it by pressing the <Enter> key.
2. Open a new project by choosing FILE, New.

3. In the Project Name text field, give your project a descriptive name or title. In the Comments text field, type any special notes you want associated with the project.

4. Choose the MEDIA tab and locate the media (that is, the video or audio file) you want to caption or subtitle.

5. Choose the STREAM tab and select the font, size and color you want to use, or just accept MAGpie's defaults (Arial, 12-point, white text on a black background). You can always change these properties later.

6. Press the OK button. MAGpie will open the editing grid and display the media in a separate window to the right.

Enter and format text

The MAGpie editing grid consists of three columns:

- Timecode,
- Speaker and
- Caption.

The Timecode column contains the timing cues which make each caption or subtitle appear or disappear from the screen; the Speaker column contains text, which identifies who is speaking (its use is optional); the Caption column contains the actual text to be displayed.

In order to add captions to multimedia, you must first transcribe the audio track into MAGpie. If you already have a script available electronically, you can import the text into MAGpie and reformat the text into captions.

Note: MAGpie does not come with a spell-check feature.

If You Are Transcribing:

You can transcribe all the audio into one caption cell and then break the text into smaller captions, or you can transcribe caption by caption. In either case, position the cursor in the first cell in the Caption column. Press <F6> to play the media and listen to the audio you want to transcribe. Press <F5> to pause. (Note: <F7> will stop the media and return to the beginning of the clip.) Type text into the first caption cell. MAGpie will wrap lines of text automatically for you, or you

can press the <Enter> key once to break lines manually. Keep playing and pausing the media until all the captions are entered.

Summary of keyboard controls for the media player:

- Pause: F5
- Play: F6
- Stop: F7
- Jog Backward: F11
- Jog Forward: F12
- Jog Backward by 5 seconds: CTRL+SHIFT+F11
- Jog Forward by 5 seconds: CTRL+SHIFT+F12
- Sync Player to Stream: F4
- Sync Stream to Player: SHIFT+F4

Once all the text has been entered, you must break it into captions. Captions normally consist of one, two or three rows of text; they usually change from one to the next at natural pauses in the soundtrack, or at end punctuation. To start a new caption, position the cursor at the breaking point in the text and press the <Enter> key twice. Continue breaking the text into captions until you reach the end of the stream.

If You Are Importing Text:

If you want to transcribe text in something other than MAGpie, use a plain-text editor like NotePad or WordPad. You can also use Word, but be sure to save the document as text-only, with or without line breaks. No matter what you use, you must insert an extra carriage return between each block of caption text, like this:

This is the first caption.

This is the second caption,

which contains two rows of text.

This is the third caption.

When you have transcribed the entire file, save your work and open MAGpie. Place the cursor in the first caption cell and choose STREAM, Import Text…. Select the text file you want to import. MAGpie will import the transcription file, placing each caption (as delineated by the extra carriage returns) in its own caption cell.

If you aren't particular about where line breaks occur within each caption or subtitle, let MAGpie wrap the text for you. However, if you want the text to look a

certain way on the screen, you will need to add line breaks manually by pressing the <Enter> key once per break.

- You can combine two caption cells by positioning the cursor at the beginning of the second cell and choosing EVENT, Combine Events.

- You can split a caption by positioning the cursor at the breaking point and pressing the <Enter> key twice, or choose EVENT, Split Event.

- To delete an entire cell, position the cursor anywhere within the row and press <Shift+Delete>, or choose EVENT, Delete Event.

If you want to identify who is speaking, you can enter an identifier (such as the person's name) into the Speaker column. The identifier will be visible above all subsequent captions until you replace it with a new one, or until you delete it from the column.

Save your work with <CTRL+S>, or STREAM, Save Stream. The first time you save your work you will be asked to supply two file names.

1. The first name will be for the stream. MAGpie will add the .STRM extension for you.

2. The second name will be for the entire project. MAGpie will add the extension .MAG for you.

MAGpie allows you to change font face, size, style, text color, background color, etc. Highlight the text within one cell you want to change, then open the FORMAT menu and select the appropriate items. Changes will be visible in the editing grid.

If you want one style to be effective throughout the entire stream, specify the attributes in the FILE, Properties, and Stream dialog box.

You can also position captions to the left, center or right. However, different multimedia players (such as the RealPlayer, the Quicktime Player or Windows Media Player) treat positioning differently:

-- When playing back captions or subtitles using SAMI, your text may not appear centered in the media window even though you have applied centering as a style in the MAGpie editor. This is a feature of the Windows Media Player and SAMI, which left-justifies captions while centering them in the player window. Left-placed captions will appear left justified, and right-placed captions will appear on the right but will be left justified.

-- When playing back captions in the QuickTime Player your captions will, in fact, appear as you specify them in the editor.

-- When playing back captions using SMIL via RealPlayer, centered captions may be centered relative to the root layout of the player, not to the position of the video. This is a feature of RealText and the RealPlayer. Thus, centered captions may not actually fit completely within the player's display. The RealPlayer currently does not accommodate right-placed captions.

Time captions or subtitles

After transcribing and formatting text, you must assign each caption or subtitle a specific time to appear on the screen.

- Position the cursor anywhere in the first row of the editing grid.
- Press <F6> to play the media.
- When it is time for the first caption or subtitle to appear, press <F9>. MAGpie will automatically read the timecode, insert it into the first Timecode cell and move the cursor to the next row in the editing grid. With the media still playing, press <F9> again when it is time for the next block of text to appear.
- If there is a long pause in the audio (say, more than one or two seconds), press <F10> to insert a blank caption row and timecode, which will erase the text display. Press <F9> again when it is time for the next caption or subtitle to appear.
- If you make a mistake in timing, press <F5> to pause the media. Move the cursor to the appropriate cell, move the media back to the corresponding point in the timeline, press <F6> to start playing the media and press <F9> to retime the text. You can automatically synchronize the player to any point in the stream file by pressing <F4> or by choosing PLAYER, Sync Player to Stream. Conversely, you can synchronize the caption stream to the media position by pressing <Shift+F4>, or choose PLAYER, Sync Stream to Player. In either case, press <F6> again to start the player.

Since the timecode also appears visually at the bottom of the media window, you can also make timecode adjustments by hand. Simply delete the appropriate numbers and type in the new ones. Be sure to follow the timing convention HH:MM:SS.FF (hours:minutes:seconds.frames), paying attention to the use of two colons and one period in the timecode notation.

Review captions or subtitles

After formatting and timing the text, you can review the captions or subtitles along with the media file from within MAGpie, making corrections to text and timing as necessary.

Output files

You can output your captions or subtitles in three formats:

1. The W3C's SMIL (Synchronized Multimedia Integration Language) via RealText

2. Apple's QuickTime and

3. Microsoft's SAMI (Synchronized Accessible Media Interchange) format.

MAGpie actually uses SAMI to simulate how your presentation will appear in its final form. If your eventual goal is a SMIL or QuickTime presentation, you will need to output the text in these formats and play the files using the appropriate player to verify your work. If a SAMI presentation is your goal, you can see exactly how your captions or subtitles look by just reviewing them from within MAGpie. You will, however, still need to output a SAMI file to complete the process.

Note: Some media players will automatically take control over files with certain extensions (such as .SMI, .SMIL and .TXT) and open by default when you double-click the files. For this reason, you should open your output files from within the appropriate player, rather than by double-clicking on them.

To output SMIL via RealText:

- Choose OUTPUT, SMIL via RealText.

- MAGpie will create a RealText file (.RT) for each stream. It will also create a basic SMIL (.SMIL) file containing layout information and pointers to the media and stream file(s) relevant to your MAGpie project only. If there are other elements, which need to be included in your SMIL presentation, you must add them to the .SMIL file **by hand**.

- Review your work by opening the .SMIL file from within the RealPlayer. If you find errors, make the appropriate changes in MAGpie and output your

work again. MAGpie will automatically overwrite the old RealText and .SMIL files.

Note: Currently, MAGpie only supports SMIL text display using the RealPlayer G2 and above.

For complete information on creating RealPlayer SMIL presentations, see http://www.realnetworks.com/devzone/index.html.

To output QuickTime:

- Choose OUTPUT, QuickTime.
- MAGpie will create a QText file (.TXT) for each stream. You must then import the .TXT file(s) as QuickTime movies and add them to the original uncaptioned media. For instructions on adding captions to QuickTime movies, see http://www.wgbh.org/wgbh/pages/ncam/webaccess/captionedmovies.html.
- Review your work using the QuickTime Player (version 4.0 and higher) or MoviePlayer (version 2.0 and higher). If you find errors, make the appropriate changes in MAGpie and output your work again. MAGpie will automatically overwrite the old QText file(s).

To output SAMI:

- Choose OUTPUT, SAMI.
- MAGpie will create a SAMI file (.SMI) containing all the streams and pointers to relevant media.
- Review your work by opening the .SMI file in the Windows Media Player. If you find errors, make the appropriate changes in MAGpie and output your work again. MAGpie will automatically overwrite the old SAMI file.

SMIL Basics

Understanding SMIL

SMIL is a standard language defined by the World Wide Web Consortium (W3C). It's is designed to be the standardized markup language for playing streaming media clips in media players. Once your clips (e.g., video, text, still images, etc.) are encoded in their streaming formats, you assemble your presentation using SMIL.

Creating a SMIL File

You can create a SMIL file using any text editor or word processor that can save output as plain text.

In its simplest form, a SMIL file lists multiple clips played in sequence:

```
<smil>
  <body>
        <audio src="rtsp://realserver.example.com/one.rm"/>
        <audio src="rtsp://realserver.example.com/two.rm"/>
        <audio src="rtsp://realserver.example.com/three.rm"/>
  </body>
</smil>
```

General SMIL Rules

SMIL has many similarities to HTML, but also some important differences. When you create a SMIL file, keep the following general rules in mind.

- The SMIL markup must start with a <smil> tag and end with the </smil> closing tag. All other markup appears between these two tags:

```
<smil>
        ...all other SMIL markup...
</smil>
```

- A SMIL file can include an optional header section defined by <head> and </head> tags. It requires a body section defined by <body> and </body> tags:

```
<smil>
  <head>
        ...optional section with all header markup...
```

```
  </head>
  <body>
        ...required section with all body markup...
   </body>
</smil>>
```

The header section is used to specify presentation information.

- SMIL tags and attributes must be lowercase, and a tag that does not have a corresponding end tag (for example, the <smil> tag has the corresponding end tag </smil>) must close with a forward slash. For example:

  <audio src="first.rm"**/**>

- Attribute values must be enclosed in double quotation marks. Each file name in SMIL must reflect the file name exactly as it appears on the server. File names can use uppercase, lowercase, or mixed case.

- Save your SMIL file with the extension .smil or .smi. The .smil extension is preferable, as it reduces the potential for conflict with other files.

- You need to use codes to add quotation marks, apostrophes, ampersands, or angle brackets to content in a SMIL header, such as a presentation title.

- As in HTML, the SMIL comment tag starts with <!-- and ends with -->. The ending does not include a forward slash:

  <!--This is a comment-->

Specifying Clip Locations

For every clip you want to play in your presentation, (e.g., audio, video, or text clip), you must add a source tag to your SMIL file. A clip source tag tells RealPlayer where to find the clip on a network. It can also include several attributes that affect the clip's playback.

To add a clip to a presentation, you'll include in the SMIL body section a clip source tag that describes the clip type and location:

<audio src="rtsp://realserver.example.com:554/audio/first.rm"/>

Within each clip source tag, a mandatory src attribute lists the clip location. How you specify this location depends on whether you will stream the presentation

with RealServer, download the clip from a Web server, or play clips back from a local computer, as described in the following sections.

Linking to Clips on RealSystem Server

When clips reside on RealSystem Server, each clip's src attribute gives the clip's URL like this:

```
<audio src="rtsp://realserver.example.com:554/audio/first.rm"/>
```

Linking to Clips on a Web Server

To use a clip hosted on a Web server, use a standard HTTP URL like this in a clip source tag:

```
<img src="http://www.example.com/images/logo.gif"/>
```

Linking to Local Clips

If your presentation clips will reside on the user's local computer, you need to include the SMIL file locally as well. The src attributes in the SMIL file list presentation clips in this format:

src="audio/first.rm" (Using relative links)
src=file://c:\audio\first.rm (Using local absolute links)

Creating a Base URL

If your presentation includes many clips that reside on the same server, you can make each URL relative to a base target that you define in the header. Here is an example:

```
<head>
  <meta name="base" content="rtsp://realserver.example.com/"/>
</head>
  <body>
        <audio src="audio/first.rm"/>
        <audio src="audio/second.rm"/>
        <audio src="rtsp://realserver.real.com/media/third.rm"/>
  </body>
```

Because the third clip in this example uses a full URL, the base target is ignored. For the first two clips, however, the src values are appended to the base target, effectively giving the clips the following URLs:

rtsp://realserver.example.com/audio/first.rm
rtsp://realserver.example.com/audio/second.rm

If no base target is given, RealPlayer assumes that the clip paths are relative to the location of the SMIL file.

Tip: The relative syntax for SMIL files works like relative links in HTML, so you can use directory notation such as "../".

Example of a .smil file taken out of the CFO Website:

```
<head>
  <meta name="title" content="Darrell Waltrip"/>
  <meta name="base" content="http://www.nws.noaa.gov/cfo/media/"/>
  <layout>
    <root-layout background-color="black" height=" 315" width=" 325"/>
    <region id="videoregion" background-color="black" top=" 5" left=" 5" height="
240" width=" 320"/>
    <region id="textregion" background-color="#000000" top=" 255" left=" 5"
height=" 60" width=" 320"/>
  </layout>
</head>
<body>
  <par>

  <!-- VIDEO -->
  <video src="darryl2.avi" region="videoregion"/>

  <!-- CAPTIONS -->
  <switch>
    <textstream src="darrell_waltrip.rt" region="textregion" system-
language="en" system-captions="on" title="Darrell Waltrip" alt="Darrell Waltrip"/>
  </switch>
  </par>
</body>

</smil>
```

Useful links:

http://ncam.wgbh.org/richmedia/tools.html
http://ncam.wgbh.org/webaccess/magpie/index.html
http://ncam.wgbh.org/richmedia/crossplatcaps.html
http://wiscinfo.doit.wisc.edu/ltde/access/ewers.htm