SpinScape-1 User's Guide

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SpinScape-1 User's Guide

Legal Disclosure

Declaration of Conformity

Model:	SpinScape-I
Trade Name:	SpinPic
Responsible party:	PhotoMosaic Technologies, Inc.
Address:	SpinPic, MB #345
	39120 Argonaut Way, Fremont, CA 94538-1304
Telephone:	1-866-SPINPIC

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions

1. This device may not cause harmful interference, and

2. This device must accept any interference received, including interference that may cause undesired operation.

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment regulations.

Radio and Television Interference

Changes or modifications not expressly approved by PhotoMosaic Technologies, Inc. may void the user's authority to operate this equipment. The SpinScape-I has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. The SpinScape-I generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions provided, may cause harmful interference to radio communications.

There is no guarantee that interference will not occur in a particular installation. If the SpinScape-I does cause harmful interference to radio or television reception, which can be determined by turning the SpinScape-I off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna

- Increase the distance between the SpinScape-I and the receiver

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About This Guide

Organization

Chapter 6, "Troubleshooting and Maintenance,"provides information about what to do if you suspect that the SpinScape is not operating properly. It also describes how to maintain the SpinScape in optimum working condition.

Appendix A, "Warranty Information,"provides SpinPic product warranty information, along with instructions about how to return a product for warranty service.

Using This Manual On Line

An online version of this guide is available on the SpinScape-1 Software CD, as well as on the SpinPic Web site. The following conventions are used for online manual use:

- From the Table of Contents, click the chapter or section name, or the page number, to jump to the Contents topic.

- From the Index, click the page number to jump to the Index topic.

- Text underlined in blue links to a Web page

- Text underlined in green links (jumps to) the underlined topic.

SpinPic Contact Information

Direct all comments and inquiries to support@spinpic.com, and include detailed information related to your inquiry. You can also request by telephone at at 1-866-SPINPIC

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Introducing the SpinScape-1

The SpinScape-1 is a programmable, microprocessor-controlled turntable that works with your camera to create image sequences. The images created during these sequences can then be electronically combined, on your PC, to form either panoramic or animated digital images.

Standard Equipment

The system consists of the following standard equipment:

- **SpinScape**–Programmable device that positions the camera or object to capture image sequences. Image sequencing is set using either the remote control (preferred method) or the setup switches on the SpinScape control panel.

- **Sony remote control**–Device you use to remotely program and control the SpinScape.

- **Camera bracket**–Bracket with which you attach your camera to the SpinScape.

■ **Bubble level**–Device you use to ensure that the SpinScape is level. The level can be mounted in one of two locations on the SpinScape.

■ **Battery charger**–Device you use to charge the SpinScape battery.

■ **Hex keys (2)**–Tools you use to adjust the SpinScape camera bracket and to reposition the SpinScape bubble level.

■ **SpinScape-1 CD,**–Software CD-ROM that includes the following:

   ■ Panorama Factory Ver. 2.3 (SpinPic edition), the software utility that enables you to stitch together SpinScape image sequences to create a composite panoramic image.

   ■ SpinScape-1 User's Guide (this manual) in .PDF format. If you want to use the manual on line, you must have Adobe Acrobat Reader installed on your computer (you can download Reader from the SpinPic Web site).

Note:

Although Panorama Factory is compatible with Intel-based PCs running Windows 98 (or later) operating systems, the software works best on a system equipped with an Intel Pentium III (or later) CPU.

If any of these components are missing from your SpinScape package, contact SpinPic Technical Support by telephone at

866 SPINPIC

on the Web at

www.spinpic.com

or by e-mail at support@spinpic.com.

Optional Equipment

Several options are available for the SpinScape, including

- **120VAC charger**–SpinScape battery charger for systems shipped within the domestic United States. One such charger is included with each SpinScape-1.

- **100 to 240VAC charger**–SpinScape battery charger for use on international (100 to 240VAC) 50/60Hz systems.

- **Camera trigger attachment**–Device that enables the SpinScape controller to transmit image-capture commands to the camera.

- **12-inch SpinTable**–White circular platform for use in object photography

- **Pneumatic Release** (includes gantry)– Device that emulates the action of a finger pressing the camera's shutter release button (for use with cameras that do not provide an external trigger capability).

The SpinPic Web site provides the most up-to-date information about SpinScape product releases, equipment options, and supported cameras.

SpinScape-1 Turntable
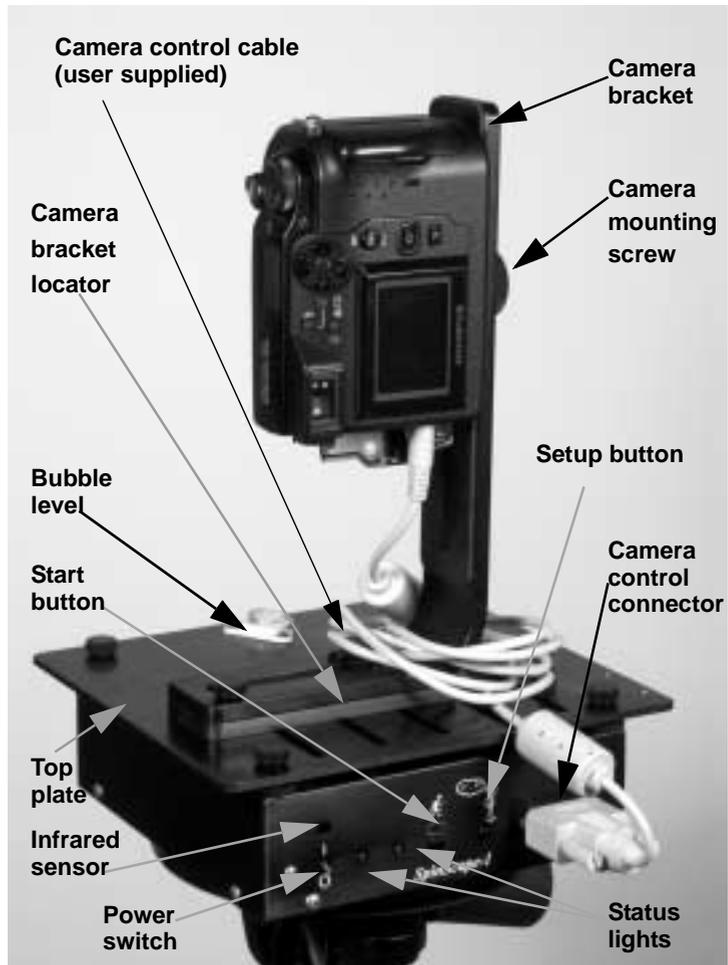
The SpinScape-1 is pictured in Figure 1-1, with a digital camera attached.

Note:
The camera and camera cable pictured in Figure 1-1are not included with the SpinScape system.

Figure 1-1. SpinScape-1 Features

Table 1-1 describes the SpinScape features depicted in Figure 1-1. Because you perform many tasks using the SpinScape control panel, control panel functions are listed first.

Table 1-1.   SpinScape-1 Features

Feature	Function
Power switch	Turns the SpinScape *On* or *Off*.
Infrared sensor	Detects SpinScape commands sent from the remote control.
Status lights	Provide a visual confirmation whenever a button is pressed on the SpinScape control panel or on the remote control
Start button	Begin (or pauses) the imaging sequence you have programmed using the remote control or SpinScape Setup button.
Setup button	Enables you to program a SpinScape imaging sequence without the remote control: 1 press = Remote control button 1 2 presses = Remote control button 2 3 presses = Remote control button 3 . 9 presses = Remote control button 9 No presses = Remote control button 0
Camera control connector	If your camera can be controlled by an RS232 signal, connects directly to your camera's serial (DB-9) cable. **Note:** Visit the SpinPic Web site for a list of compatible cameras controlled by an RS232 signal. If you use an optional camera-trigger attachment (see "Optional Equipment" on page 1-3), the attachment connects to the camera control connector and also to the camera.
Bubble level	Enables you to ensure, before beginning an imaging sequence, that the SpinScape is level.
Camera bracket	Mounts the camera to the SpinScape.
Charger connector	Enables you to charge the SpinScape battery.
Charger indicator	When illuminated, indicates that the battery is being charged at the high rate. The indicator turns off when the battery is fully charged.
Camera bracket locator	Enables you to adjust the location of the camera bracket on which the camera is fixed during image sequencing. The bracket locator enables you to remove the camera bracket before transporting the SpinScape and return it to the same location when setting up again.

Producing Images with the SpinScape

You can use the SpinScape to produce two types of digital images: *panoramic images* and *animated images*. Although panoramic captures produce a very different composite image than captures you do for animation purposes, the method of producing these images is similar.

Note:
The SpinScape-1 system supports several types digital camera (visit the SpinPic Web site for up-to-date information about supported cameras). Although 35 mm cameras should also work with the SpinScape system, they have not been tested by SpinSpic.

Panoramic Image Production

A SpinScape panoramic image is comprised of several individual images that you capture using your camera with the SpinScape. The individual images are *stitched together* to form a composite image (see "Using the Image Stitcher" on page 3-6. Each composite panoramic image can provide up to a 360-degree view of a site you photograph using your camera with the SpinScape.

Note:
The SpinScape is pre-programmed at the factory to facilitate the production of 90°, 180°, and 360° panoramic images using typical camera settings. For information about using pre-programmed parameters, see "Programming the SpinScape-1" on page 2-4.

Animated Image Production

Like a panoramic image, a SpinScape animated image is comprised of several individual images that you capture using your camera with the SpinScape. However, when capturing image sequences for animation, the *object* you are photographing for animation purposes

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What To Do
Before Setting Up

Know Your Equipment

If you are unfamiliar with your camera's features, take the time now to read the manual provided with the camera. The more you know about your camera's features, the more successful you will be in capturing the SpinScape-1 image sequences you want.

Note:
Camera functions, as well as the method you use to set up the functions, vary according to manufacturer. Therefore, the way you set the camera functions recommended in this manual, and the results achieved with those settings, will also vary from camera to camera.

Ideally, the SpinScape triggers the camera to take a shot shortly after the camera has come to rest at a new position. Many, but not all, digital cameras can be triggered electronically by means of a serial cable. Some cameras provide other means for external triggering, and some have no means at all of accepting external triggers. Unfortunately, there are no standards that apply to all cameras for this functionality. If your camera does not support external triggering, you

may want to order the optional SpinPic Pneumatic release
(see).

SpinPic continues to develop optional accessories for the SpinScape
that provide electronic triggering for an increasing range of cameras.
Please visit the SpinPic Web site (www.spinpic.com) for a current list
of cameras for which triggering compatibility with the SpinScape has
been verified.

Test the SpinScape-1

Before you program your SpinScape for panoramic sequencing (see
) or object sequencing (), take a few minutes to test
the operation of the SpinScape. Before you begin, make sure you
have the remote control handy, and ensure that the TV button (upper
right corner of the control) has been activated.

SpinScape Functional Test

The following procedure will familiarize you with the basic operation
of the SpinScape.

Note:
Refer to if you are not already familiar with the
SpinScape control panel.

3. **Turn on the SpinScape** by flipping the Power switch to the **I**
   (*On*) position. The SpinScape rotates slightly back-and-forth,
   to ensure that it is accurately positioned for operation. When
   the SpinScape is ready for use, the status lights illuminate,
   then blink twice and turn off.

4. **Test the clockwise step-rotation** of the SpinScape. Point the
   remote control toward the SpinScape infrared sensor; then
   press the **0** button. The SpinScape rotates in 1.5° increments,

in a clockwise direction. Press **0** again (or any other remote control button) to stop the rotation.

Repeat this step, this time using the remote control [VOL +] button to also rotate the SpinScape clockwise in 1.5° increments.

5. **Test the counterclockwise step-rotation** of the SpinScape. Point the remote control toward the SpinScape infrared sensor; then press the volume [VOL −] button. The SpinScape rotates counterclockwise in 1.5° increments. Press [VOL −] again (or any other remote control button) to stop the rotation.

6. **Test the clockwise continuous-rotation** of the SpinScape. Point the remote control toward the SpinScape infrared sensor; then press the channel up [CH +] button. The SpinScape rotates continuously in a clockwise direction. Press [CH +] again (or any other remote control button) to stop the rotation.

7. **Test the counterclockwise continuous-rotation** of the SpinScape. Point the remote control toward the SpinScape infrared sensor; then press the channel down [CH −] button. The SpinScape rotates continuously in a counterclockwise direction. Press [CH −] again (or any other remote control button) to stop the rotation.

You are now ready to use the SpinScape for either panoramic image sequencing (see Chapter 3, "Creating Panoramic Images") or for object sequencing (see Chapter 4, "Creating Animated Images"). Both types of image sequencing use incremental rotation.

If You Have a Problem

If you experience difficulties in testing the SpinScape, first charge the battery in the SpinScape. For instructions on charging the battery, see Chapter 6, "Troubleshooting and Maintenance."

For problems that you cannot resolve by reading the documentation for your camera or SpinScape, please contact SpinPic Technical Support at support@spinpic.com.

Programming the SpinScape-1

Typically, you program the movement of the SpinScape using the supplied remote-control device. However, the Pause function is available only from the SpinScape **Start** button. If you have not already done so, familiarize yourself with the rotational capabilities of the SpinScape by performing the functional tests described in this chapter (see page 2-2).

Remote-Control Functions

Table 2-2 describes SpinScape functions you can program using the remote-control device. Unless otherwise noted, you can also perform these functions using the Setup button on the SpinScape control panel (see Figure 1-1 on page 1-4).

On Table 2-2, dashes (−) are used to indicate button sequences on the remote control. For example, if you are told to press
9–0–1–5, you should first press the **9** button, then the **0** button, then the **1** button, then the **5** button.

Table 2-2.   SpinScape-1 Programmable Functions

This button	Performs this function	Comments
1	**Initiate a panoramic image sequence covering 90°:** From the current position, retract 45° before capturing the first image. For each subsequent image, rotate clockwise by the amount defined as the increment from the previous position (default is 22.5°). Following the final image, reposition the SpinScape to its original location.	Use the [CH +] or [CH −] button to position the camera at the center of the desired panoramic view. If the incremental angle divides evenly into 90°, the final image is taken at +45° relative to the starting location. If the increment does not divide evenly into 90°, the sequence completes at the first position after reaching + 45° from the starting location. 22.5° increments produce 5 images over 90°. This increment is usually satisfactory when the camera lens is set to wide angle. However, if the camera lens is zoomed in, 22.5° increments may not provide sufficient overlap between adjacent images−resulting in stitched images that are unsatisfactory. If you use the default increment of 22.5, Function **1** initiates a 5-image sequence, symmetrically placed with respect to the starting location.
2	**Initiate a panoramic image sequence covering 180°:** From the current position, retract 90° before capturing the first image. For each subsequent image, rotate clockwise by the amount defined as the increment from the previous position (default is 22.5°). Following the final image, reposition the SpinScape to its original location.	Position the camera in the middle of the desired panoramic view. (As a convenience, the actual captured view contains half the field of view on each side of the 180° span.) If the incremental angle divides evenly into 180°, the final image is taken at +90° relative to the starting location. If the increment does not divide evenly into 180°, the sequence completes at the first position after reaching + 90° from the starting location. If you use the default increment of 22.5°, Function **2** initiates a 9-image sequence, symmetrically placed with respect to the starting location.

This button	Performs this function	Comments
3	**Initiate a panoramic image sequence covering 360°** Wait for the amount of time defined by Function **7**, then take the first image in a sequence covering 360°. For each subsequent image, rotate clockwise according to the increment defined from the previous position (default is 22.5°).	22.5° increments provide 16 images over 360°. This number of images is usually satisfactory. However, when the camera lens not zoomed to wide angle, the number may not provide sufficient overlap between adjacent images–resulting in stitched images that are unsatisfactory. Using Function **3** is the best way to initiate a sequence of images for object photography.
4	**Reset to factory default angular increment of 22.5°**	Attempts to select Function **4** using the SpinScape Setup button are ignored.
5	**Not used**	
6	**Not used**	
7	**Set and remember a custom delay before positioning the SpinScape to the location of the *first* image in a sequence.**	You are unlikely to use this delay. However, it allows you the opportunity to trigger the SpinScape before positioning it to capture the image sequence. The default value is 2 seconds. **Note:** Attempts to select Function **7** using the SpinScape Setup button are ignored. To set the delay value, use the remote control to first select function **7.** Then select two more digits to indicate the delay time. For example, to specify a 30-second delay value press **7−3−0**.

This button	Performs this function	Comments
8	**Set and remember a custom pause after coming to rest at a new position, and before tiggering the shot (overrides the 5-second default setting):** This delay may be needed for the camera to finish processing and storing the previous image. The green status light illuminates each time a button is depressed. When a new delay value is accepted, both status lights illuminate for one second, indicating that the delay time is in effect.	Each set-delay-value operation requires a **2-digit input** that you can enter *only from the infrared remote control*. **Note:** Attempts to select Function 8 using the SpinScape Setup button are ignored. To set the delay value, use the remote control to first select Function 8**.** Then select two more digits to indicate the delay time. For example, to specify a 12-second delay value press **8−1−2**.
9	**Set and remember a custom increment angle between image captures (overrides the 22.5° default value):** The increment angle value determines how far the SpinScape rotates between images. The green status light illuminates each time a button is depressed. When a new increment angle value is accepted, both status lights illuminate for one second, indicating that the new increment angle is in effect. The new increment angle remains in effect until it is changed using Function 9 or reset to its default value using Function 4.	Each set-increment-angle operation requires a **3-digit input** that you can enter *only from the infrared remote control*. **Note:** Attempts to select Function **9** using the SpinScape Setup button are ignored. The angle increment value you set will depend upon the camera zoom level you are using. To set the increment angle, use the remote control to first select Function 9**.** Then select three more digits to indicate the increment angle, as follows: Digits = n where n = Number of steps of 1.5° each. For example, to specify a 15° angle increment, press **9−0−1−0**. To specify a 9° angle increment, press **9−0−0−6.**

This button	Performs this function	Comments
0 **or** **[VOL +]**	**Rotate clockwise in 1.5° increments**	Stop the rotation by pressing any remote-control button or any SpinScape control panel button.
[VOL −]	**Rotate counterclockwise in 1.5° increments**	Stop the rotation by pressing any remote-control button or any SpinScape control panel button.
[CH +]	**Rotate clockwise continuously**	Stop the rotation by pressing any remote-control button or any SpinScape control panel button.
[CH −]	**Rotate counterclockwise continuously**	Stop the rotation by pressing any remote-control button or any SpinScape control panel button.

Pause Function

You can use the SpinScape **Start** button to pause the system as it rotates from one image-capture position to another. This function is useful for eliminating unwanted objects from a panoramic sequence, which can appear after sequencing begins. For example, a real estate agent might want to pause an image-capture sequence if, in attempting to capture the ambience of a quiet neighborhood, a large truck suddenly appears on the scene and blocks the view of a tree-lined street. Once the truck has past, the agent can then resume the sequence.

To pause the SpinScape's rotation during image sequencing, press the SpinScape **Start** button. Press **Start** again to resume image-capture sequencing.

Recommended Camera Settings

This section provides general guidelines for the camera settings that work best with the SpinScape. Not all of the settings are available for all cameras. When more than one recommendation is suggested, it is likely that only one recommendation will apply.

Table 2-3.   Recommended Camera Settings

Setting	Recommendation(s)	Explanation
Capture resolution	Use 1024 X 768 or better pixel resolution	Many cameras allow you to produce images at pixel resolutions such as 640x480 (VGA), 1024x768 (SVGA), 1280x1024 (XGA), and 2048x1536. For images intended for use on a Web site, 1024x768-pixel resolution is probably more than sufficient. However, if you want to produce more impressive *printed* images, a maximum resolution is more appropriate.
		Note: Most cameras take noticeably longer to process and store high-resolution images than to process and store low-resolution images. Therefore, you may want to use a non-default SpinScape delay value (see Function 8) to allow for the time your camera takes to process images with its current settings
		.
Compression level	Select the JPEG compression value	Many cameras allow you to save images in *uncompressed* formats (TIFF, Raw, and the like). Saving an image in an uncompressed format works well, in theory; however, these uncompressed formats can also produce very large files (over 10 MB that require considerable time to write to storage.
		JPEG compression permanently discards picture detail that you cannot restore, but many cameras allow you to select the amount of detail to discard. Using a light compression setting produces images that are significantly smaller, and often visually indistinguishable, from uncompressed images.

Setting	Recommendation(s)	Explanation
Focus	■ Use fixed focus (manual focus) ■ Disable auto-focus	Some cameras have only fixed-focus capability, so auto-focus is not a problem. However, many cameras include both auto-focus and fixed focus modes, and use auto-focus as the default mode. If possible, disable auto-focus when using a dual-mode camera. Disabling auto-focus often involves setting the camera to a manual focus and then selecting a suitable fixed-focus value.
Exposure	■ Use auto-exposure lock (AE Lock) ■ Use full manual mode (preferred method), or ■ Use fixed aperture with auto-exposure time (aperture priority-mode alternative)	Many cameras select the exposure time and/or aperture setting for each image. Because varying image-to-image aperture settings produce different depths-of-field, panoramic image sequences, in particular, can cause an object such as a tree to be sharp in one image and blurry in the next, which can degrade the final image. One solution to the varying aperture problem is to fix both the aperture and exposure time, perhaps using a camera's *auto exposure lock* (AE Lock) feature. If your camera does not have an AE Lock, you might be able to control time and aperture settings using the camera's *full manual mode*. However, be aware that light levels often vary significantly across a panorama, so some areas can be correctly exposed while other areas are under or over exposed, or both. To avoid such exposure problems, set the aperture and let the camera calculate the exposure time (use aperture priority mode).
Flash	■ Disable auto-flash ■ Use fixed flash	Setting your flash to *always on* or *always off* prevents the auto-flash feature from illuminating only some images in a sequence, thus eliminating uneven lighting. Use a fixed flash outdoors to help eliminate shadows. Take care, however, to guard against unwanted surface reflections caused by such things as mirrors and windows.

Setting	Recommendation(s)	Explanation
White Balance	- Disable auto-color balance - Use a larger overlap on panoramic imaging sequences	Some cameras calculate color balance for every image, based on available light and the captured field of view. This process can cause an object's colors to render differently across adjacent images. Many cameras allow you to set the *white balance* depending on lighting conditions – sunny, cloudy, fluorescent, incandescent, and the like. If your camera causes all images to be "color corrected" (you cannot set the white balance), be sure to select a smaller angular increment for a larger overlap on panoramic image sequences. Greater overlap can help minimize the effect of automatic color balancing.
Digital Zoom	Disable digital zoom	Use of the digital zoom produces lower-quality images. Use with discretion.
Automatic Reset	Disable auto-reset	Cameras that use an automatic reset function "forget" all previous setting when the camera is turned off. To avoid having to reset features that you use with the SpinScape, disable auto-reset.

What to Do Next

Once you are familiar with your camera equipment and have a basic understanding about the camera settings you will use, you are ready to mount your camera to the SpinScape and begin image sequencing. See Chapter 3, "Creating Panoramic Images" and Chapter 4, "Creating Animated Images" for detailed instructions.

3

Creating Panoramic Images

How Panoramic Sequencing Works

To create a panoramic image, you first mount your camera to the SpinScape turntable. You program the SpinScape, capture a sequence of images, and then stitch the images together to form a composite panoramic image.

The SpinScape is preset at the factory to produce 90°, 180°, and 360° panoramic images. You will only need to reprogram the SpinScape if you are using special settings. See "Selecting Panoramic Angle Increments" on page 3-4 for more information.

Setting Up For Panoramic Imaging

This section explains how to set up the camera and the SpinScape for panoramic image sequencing. See "Selecting Panoramic Angle Increments" on page 3-4 for information about how to optimize your image sequencing by choosing the correct angle increments.

You will need the following to set up for panoramic imaging:

- SpinScape

- Camera bracket

- Camera

- Two hex keys (supplied)

The SpinScape system is easy to assemble. You can set up the SpinScape wherever there is a level surface—either before you get to your photo site (at home) or "on-the-fly" when you spot a panoramic photo opportunity.

If necessary, refer to Figure 1-1 on page 1-4 as you complete this procedure.

1. If you want to relocate the SpinScape bubble level before setting up, use the small hex key to remove the level from its current position and replace it in the alternate position. The bubble level can be relocated at any time—before or after setting up.

2. Position the top plate on the SpinScape so that the camera bracket locator is parallel to the control panel (the bracket locator should be on the control-panel side of the SpinScape).

3. Using the large hex key, loosen the screws on the camera bracket locator until you can move the bracket easily in both directions.

4. Position the SpinScape camera bracket so that the short end of the bracket sits atop the (loosened) camera bracket locator; the screw on the camera bracket will align with the threads on the camera bracket locator.

5. Position your camera so that the camera's tripod socket aligns with the camera mounting screw (large screw on the camera bracket). Then attach the camera to the base of the bracket by tightening the camera mounting screw.

Note:
When properly mounted, the camera lens should point away from the SpinScape-1 control panel.

6. With the camera securely attached to the bracket, adjust the position of the camera bracket/bracket locator until the center of the top plate is about halfway between the front of the camera lens and the back of the camera.

   Visual Cue: Look for the small hole in the center of the SpinScape top plate. Your camera will usually be adequately aligned when the hole is centered between the front of the camera lens and the back of the camera.

7. Once the camera is properly centered on the top plate, tighten the screws so that the bracket locator is locked in position. To adjust the vertical position of the camera, loosen the camera mounting screw and move the camera up or down on the bracket until it is properly positioned. Re-tighten the camera screw to secure the camera.

8. Using the SpinScape bubble level, ensure that the SpinScape is level.

Note:
When you are ready to begin image sequencing, check the bubble level again to ensure that the SpinScape is still level.

Selecting Panoramic Angle Increments

Camera lenses are described by their *aperture* and *focal length*. The aperture describes how bright the image is. The focal length governs the size of the image produced by the lens on the electronic image sensor. The focal length is usually given in millimeters (mm).

A Word About Digital Camera Lenses

Most digital cameras have a zoom lens that can be adjusted within a range of focal lengths. Because the focal length of a zoom lens varies from camera-to-camera (depending on the model and manufacturer), the focal length required for a specific panoramic image sequence also varies.

The focal length of a zoom lens is usually described by the manufacturer in one (or both) of the following ways:

- Actual focal length

- Focal length that would be required on a 35mm camera to yield an equivalent image coverage.

Increment Angle Recommendations

Typically, you will want a panoramic image to have as large a vertical view as possible (which is why your camera mounts to the SpinScape in portrait mode). You are also likely to set your lens to its widest angle in order to achieve maximum coverage for each image. Therefore, you need to know how to predict the angle that a given shot will cover in order to set up the correct angular increment between images in a panoramic sequence.

Table 3-4 provides some incremental angle recommendations based upon equivalent 35mm SLR lens settings.

Note:

The values on Table 3-4 result in an image overlap of about 50%. This overlap value is quite generous, but enables the image stitcher to create a very high-quality final image.

Table 3-4. Increment Angle Recommendations

For this focal length (35mm equiv.)	Use this number of 1.5⁰steps (50% overlap)	To Produce		
		90⁰ panoramic using this no. of shots	180⁰ panoramic using this no. of shots	360⁰ panoramic using this no of shots
21	21	4	7	12
28	16	5	9	15
30	15	5	9	16
32	14	6	10	18
35	13	6	11	19
40	11	7	12	22
45	10	7	13	24
50	9	8	15	27
60	7	10	19	35
70	6	11	21	40
72	6	11	21	40
80	5	13	25	48
96	4	16	31	60
100	4	16	31	60
135	3	21	41	80
150	3	21	41	80
200	2	31	61	120
300	1	61	121	240

A Real-World Example

An Olympus 3030 digital camera has a zoom lens that can be set from 6.5mm to 19.5mm. The manufacturer states that the 35mm SLR equivalent of this zoom range is 32mm to 96mm. Assuming that your goal is to produce a 360° panoramic image with the maximum vertical coverage possible, you would set the lens to its widest angle setting (6.5mm).

As shipped from the factory, the SpinScape default increment value is 15 steps. You would probably use this default value for your panoramic sequence, because 15 steps represents 22.5° increments, and divides evenly into 360°. (Note that if you were producing a 90° panoramic image, the SpinScape would retract to 45° and take a total of five shots at 22.5° increments.). The resulting image would be symmetrical about the original starting location. Provided that adjacent images overlap at least 25%, the image stitcher (see "Using the Image Stitcher" on page 3-6) should be able to create a good final image. In general, the greater the overlap, the better the result.

For more tips on optimizing your panoramic images, see Chapter 5, "Tips and Tricks."

Using the Image Stitcher

As described in Chapter 1, a SpinScape panoramic image consists of a sequence of images, captured by the camera, while the SpinScape rotates across the selected scene. You use the supplied Panorama Factory software to *stitch together* the images you create with your camera and the SpinScape system.

This section provide general information about the Panorama Factory software. Consult the Panorama Factory online documentation (Help system and online manual) for more information about this utility.

Panorama Factory Performance Considerations

Images that are being operated upon during the creation of panoramas are composed of millions of points, each of which is a precisely defined color. Images are overlapped, merged and color-matched. These operations are best performed while the images are held in memory. However, especially with high resolution source images, your PC may not have enough memory to hold all the images. Under these circumstances, the Windows operating system uses a mechanism called *virtual memory*, which makes Panorama Factory think that the PC has far more memory installed than is actually the case.

Virtual memory is implemented using a file on the PC's disk storage subsystem, and can represent a very heavy load. In fact, with a high-speed CPU (even a 2GHz Pentium 4), a system's performance with a demanding application such as Panorama Factory, can be limited by the speed of the storage subsystem.

For optimal performance when using Panorama Factory, your PC should have the highest-speed CPU available, as much memory as you can afford, and a high-performance storage subsystem. For more information about configuring your PC for optimal uses with the SpinPic system, visit the SpinPic Web site at www.spinpic.com.

Installing Panorama Factory

If you have not already done so, install the Panorama Factory software as follows:

1. Insert the Panoramic Factory distribution CD into the CD-ROM drive.

2. From Windows Explorer, access the CD-ROM drive and click the Panorama Factory folder.

3. Double-click the file **pf2p3sp.exe** to initialize the installation program, then follow the instructions on the screen to install Panorama Factory on your PC.

Stitching the Image Sequences

The Panorama Factory distribution CD provides detailed instructions for stitching together panoramic image sequences. This section provides a brief overview of the process.

outlines the steps you use to stitch your SpinScape image sequences into a single panoramic image.

Table 3-5.   Panorama Factory Stitching Process

Dialog Box	Action	Description
Step 1	Click **Import** to choose the images for the panorama.	Navigate to the directory that contains the image sequences you want to use, then select the files you want to stitch together.
	Click **Open**.	If necessary, use the "rotate left" button to correct the orientation of the thumbnail images.
		Using the scroll bar at the bottom of the screen, verify that the images are in the correct order.
	Click **Next**.	
Step 2	Describe your camera	Select the make and model of your camera
	Click **Next**.	Enter your camera's 35 mm focal length equivalent

Dialog Box	Action	Description
Step 3	Select the panorama type Click **Next**.	Select the type of panoramic image you want to produce. If you are unsure about the types of images that will result from your selections, click **Help** for a detailed description of the Step 3 choices.
Step 4	Create your panorama Click **Next**.	Choose the display type (Internet or print), resolution, and size of the panoramic. Image stitching begins
Step 5	Save and print your panorama Click **Done**.	Save your final image as a project so you can edit it later. Or print the final panoramic.
Step 6	Create and save a thumbnail of the final image	
Step 7	Close panorama factory *or* Start the sequence again to create another panorama	

Panorama Creation Scenario

The scenario described in this section is typical of what you need to do to produce a panoramic image for printing or viewing on line.

You are on vacation, driving along a mountain road, when you arrive at a vista point with a spectacular view. The tripod and digital camera

you always use are in your car, along with the SpinScape. The camera bracket locator has remained mounted to the SpinScape since yesterday's photo session. You won't need to adjust the camera for the 180° panorama you have in mind, and the SpinScape settings are fine as currently set. So you are ready to set up and begin shooting.

You would complete the following tasks to produce a panoramic image of the mountain vista before you:

1. Mount the camera bracket.

2. Attach the camera to the SpinScape camera bracket.

3. Mount the SpinScape to the tripod (which is equipped with a leveling device)

4. Level the SpinScape by adjusting the tripod, and align the camera so that it is pointing to where you want the center of the final panoramic image to be.

5. If the SpinScape triggers the camera via a serial connection, attach the cable to the camera and to the SpinScape. If you are using a trigger mechanism other than a serial connection, install whatever is needed.

6. Turn on the camera. Check that you have the desired camera settings and that there is sufficient space in the camera's memory for the image sequence.

7. Take an initial "start here" shot that is not part of the image sequence, but that will help you determine where sequencing begins. This will later help you to select the correct series of images to input to the stitcher.

   (Some SpinScape users store with the SpinScape a cardboard sign with the words START written on one side and END written on the other.)

8. Turn on the SpinScape and press **2** on the remote control to start the 180° panoramic image sequence.

9. When image sequencing is complete, take another shot that will help you to identify where sequencing ends.

10. When you return to your hotel, transfer the images to your laptop computer. Then use the Panorama Factory image stitcher to turn your images into a beautiful panorama.

4

Creating Animated Images

How Object Sequencing Works

To create animated images, you use the SpinScape to rotate an object. Your camera remains in a fixed position, pointed toward the object you want to photograph.

The SpinScape works well for rotating small objects (perhaps no larger than a coffee cup). However, if you plan to create animated images of larger objects, you will need an optional 12-inch SpinTable (see).

Typically, you will do the following to create animated object images:

11. Convert the SpinScape for object use (see). If you are using an optional SpinTable, mount the SpinTable to the SpinScape.

12. Place the object you want to photograph on the SpinScape or optional SpinTable.

13. Program the SpinScape for the incremental angle you desire. For example, the remote-control button sequence **9**-**0**-**0**-**8** sets the SpinScape to rotate in 12° increments

(8 x 1.5°), which results in 30 images and produces a fairly smooth animation.

14. Create an animated .GIF file that produces a single, rotating image.

Setting Up for Object Imaging

This section explains how to ready the camera and SpinScape for animated object sequencing.

Note:
Although the SpinScape can be used successfully with your camera for photographing small objects, you will need a larger turntable to photograph objects that are too large for the SpinScape. For your convenience, SpinPic currently offers a 12-inch SpinTable that mounts easily to the SpinScape. Visit the SpinPic Web site (www.spinpic.com) for more information.

To create object image sequences for animation, you use your camera in a fixed position (usually mounted on a tripod), with the camera lens focused on an object that rotates on the SpinScape (with or without the optional SpinTable). Figure 4-2 illustrates an object imaging session in which the SpinScape is used with a 12-inch SpinTable to rotate the object. Object imaging setup is the same whether or not you use the optional SpinTable.

Figure 4-2. SpinScape in Use as Object Turntable (optional SpinTable also pictured)

Note:

If you have not already done so, read Chapter 2, "What To Do Before Setting Up," before you set up an object imaging session. Chapter 2 contains important information about setting up you camera, and the SpinScape, to produce optimum image sequences.

You need the following to set up for object imaging:

- Camera and tripod

- SpinScape

- SpinTable (optional)

- Extension cable for camera trigger attachment (optional)

Figure 4-2 illustrates a typical setup for object imaging.

1. Remove the SpinScape top plate. The camera bracket and camera bracket locator can remain attached to the top plate.

2. Turn the SpinScape upside down, so that it rests on the feet on the bottom of the unit.

3. If you are using an optional SpinTable, position it on the SpinScape- by inserting the SpinTable's center pin into the SpinScape screw hole.

4. Place on the turntable the object you want to photograph. Then mount your camera to the tripod and position the camera so that it is pointing directly at the object.

5. Illuminate the object appropriately.

6. If you are using a camera trigger attachment, attach the cable to the camera and to the SpinScape. Depending on how close you want to be to the object rotating on the turntable, you may also need additional cable extensions.

Animated-Object Creation Scenario

Suppose you are a California art dealer promoting a series of tabletop sculptures by a new artist. You want potential clients from around the world to view these three-dimensional works of art, without having to board an airplane and travel halfway around the world. With the SpinScape and optional SpinTable, you could create images of each work of art that, when viewed over the World Wide Web, would rotate continuously and provide potential clients a 360° view of each sculpture.

You would complete the following tasks to produce a rotating image suitable for viewing on the Web:

1. Follow the instructions on to set up your object imaging session.

2. Turn on the camera. Check that you have the desired camera settings and that there is sufficient space in the camera's memory for the image sequence.

3. Turn on the SpinScape and change the angular increment settings for object use. (Because the SpinScape default settings are for panoramic image sequencing, you will need to change the settings for the first art object you photograph.)

    Let's say you decide that 30 images will provide an acceptable animation. To produce 30 images, you need an increment angle of 12° (360° / 30)). Therefore, you use the following button sequence on the remote control: **9-0-0-8** (12° is 8 x 1.5°).

4. You do not need to make additional changes to the camera or SpinScape settings (note that this may not always be the case), so you are now ready to initiate the image sequence.

    Press button **3** on the remote control to initiate the series.

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5

Tips and Tricks

Things to Do Before Taking Pictures

You can save a lot of time in re-shoots by following these guidelines as you plan your SpinScape session:

Close the Camera's Light Shutter

If your camera's through-the-lens viewfinder has a "shutter" to block out light, be sure to close the shutter before starting your image sequencing. Closing the shutter will prevent unwanted light from entering the camera and ruining your images.

Know Your Camera Lens' Focal Length

If you don't know the equivalent 35mm SLR focal length (range) of your digital camera lens, experiment a bit with your camera.

Position the camera on the SpinScape and determine how many steps result in approximately 50% overlap between adjacent images. You can do this by sighting a distant object and positioning it in the center of the viewfinder. Then determine how many SpinScape increments

are required for the object to be at the edge of the field of view. Use that number when taking panoramic image sequences with the lens at the selected focal length.

Check the Camera's Inactivity Timer

Most digital cameras conserve battery power by automatically shutting off after a period of inactivity. This time period can usually be set by the user. Because setting up the camera and Spinscape can take several minutes (especially for new SpinScape users), you need to ensure that the camera's automatic shut-off time is long enough for you to complete your SpinScape setup tasks.

General Tips for Image Captures

As you become more familiar with the SpinScape, you will discover which rotational settings work best with your camera and your usage needs. The following guidelines help you get started, and are appropriate for both novice and experienced users:

- Program your images to overlap by 30% to 60%

- Select an angle coverage area of 90°, 180°, or 360°.

- Use the default increment value of 15 steps. This setting works successfully with many popular cameras that have

their standard zoom lenses set to the shortest focal length available.

Tips for Panoramic Imaging

Set a Good Time Delay Between Images

To ensure that each image is stored properly before going to the next, use Function 8 to set the time delay between images to a large number. (For example, set a time delay of 15 seconds by pressing remote control buttons **8**−1−**5**). Next, monitor the camera during a 360° panorama, and ensure that each image is completely stored before going on to the next. Finally, reduce the delay time one step at a time to determine the balance between rapid panorama capture and slow image storage.

Record the Beginning and End of a Session

To help you determine the correct series of images for a particular session, take an initial "start here" photo before you begin an image sequence. Then take an "end here" shot when image sequencing is complete. This practice ensure that you will select the select the correct images to input to the stitcher when you create the panoramic image.

Some SpinScape users carry a placard with their SpinScape system, with the word START written on one side and word STOP written on the other. They photograph the back and front of the placard each time they begin and end a panoramic imaging sequence.

Tips for Animated Imaging

Optimize Animations for Web Delivery

■ For animations that will be delivered over the Web, avoid using 1.5° angle increments during image sequencing. Although this angle increment produces a very smooth animation, the resulting file (usually a .GIF) contains 240 images and could take a long time to display.

Instead, shoot an image sequence every 12° (or more) to reduce the total number of images in a 360° rotation. Following are some examples of typical object angle increments:

12° = 30 images
15° = 24 images
18° = 20 images

■ Shoot objects at your camera's lowest resolution. Because the final animated image is comprised of multiple images, shooting each image sequence at a high resolution results in a final file size too large for rapid delivery over the Internet. Focus tightly on the object, and crop or resize the final image to adjust to a size acceptable for the for Web page.

Be Aware of Graphic Interface Format Limitations

Be aware that animated .GIF files are limited to 256 colors. Panorama Factory automatically selects the optimized color palette for your final image, but some color clarity could be lost.

6

Troubleshooting and Maintenance

Functional Test

If you suspect that the SpinScape is not operating properly, test the system by performing the Functional Test described in Chapter 2 (see page 2-2). If the SpinScape does not successfully completes the test, do not attempt to diagnose the problem yourself. Rather, contact SpinPic Technical Support

- On the Web at support@spinpic.com.

- By telephone at 1-866-SPINPIC

Troubleshooting

Following are some of the more common problems you could encounter while using the SpinScape system. Where appropriate, possible solutions are suggested.

Lighting Interference

If you use the SpinScape in a location that is illuminated by fluorescent or other discharge lighting, the pulsating light could interfere with the use of the infrared remote controller. The SpinScape has provision for this situation.

If the SpinScape appears to be affected by such interference (unexpected stops and starts, for example), do the following:

5. Turn off the SpinScape.

6. Shield the SpinScape's infrared detector from the lighting (this might mean moving the SpinScape to a location with different lighting). Then program it according to your needs.

7. Relocate the SpinScape for your panoramic image sequence and turn on the unit *while depressing the* **Setup** *button*; then immediately release the Setup button.

8. The effect of this operation is to disable the SpinScape's infrared detector until the unit has been turned off and on again. Whatever parameters were most recently programmed will remain in effect.

When you are ready to initiate the image capture sequence, do one of the following:

-   Press the setup button once, then press the run button (produces a 90° sequence, which is equivalent to pressing Function **1** on the remote control.

-   Press the setup button twice, then press the run button (produces a 180° sequence, which is equivalent to pressing Function **2** on the remote control).

-   Press the setup button three times, then press the run button once (produces a 360° sequence, which is equivalent to pressing Function **3** on the remote control).

Missing Images in a Panoramic Sequence

If you discover that random images are missing from your final panorama, the problem could be caused by a camera that attempts to capture an image while the previous image capture is still being processed. This problem is especially prevalent when 1) you use your camera in a high-resolution mode, or 2) complex images do not compress sufficiently.

To correct the problem, you might need to experiment with time delays between images, as follows:

1. Use Function 8 to increase the delay time between each image. (For example, set a time delay of 15 seconds by pressing remote control buttons **8**−1−**5**).

2. Monitor the camera during a $360°$ panorama, and make sure that each image is completely stored before another image is captured.

3. If necessary, reduce the delay time one step at a time to determine the balance between rapid panorama capture and slow image storage.

Stray Light on Images

Many cameras provide a through-the-lens viewfinder with a "shutter" that can be closed off when not needed. Closing off the viewfinder prevents unwanted light from entering the camera and affecting the exposure on an image. If you find that your images contain an unexpected amount of light, you may have forgotten to close the viewfinder shutter.

Maintenance

Apart from keeping the SpinScape system clean and free of foreign particles, the only required maintenance you will need to perform is charging the SpinScape battery.

⚠️ **WARNING:**
Do not attempt to dismantle the SpinScape system. Doing so will invalidate the warranty.

Cleaning the SpinScape

If the SpinScape becomes dusty, clean it with a soft brush or cloth. Take care to keep dust or sand from getting between the plastic plates at the bottom of the unit. Dirt that gets past the white foam protector (to the ball bearings) can cause the ball bearings to seize.

Charging the SpinScape Battery

The SpinScape contains a lightweight NiMH battery and an intelligent charger that requires 12VDC (nominal) input. When fully charged, the battery should support more than 8 hours of continuous panoramic shooting.

The following battery charger options are available for the SpinScape:

- A 120VAC (nominal) "power brick" charger for use in the USA (included with SpinScape systems shipped to locations within the domestic United States).

- An optional international charger for use on 100 to 240VAC, 50/60Hz.

- An optional power cord that enables the battery to be charged from a cigarette lighter socket in an automobile.

Note:
The SpinScape system can be placed on charge at any time, without danger of overcharging.

The SpinScape battery charges at two different rates, depending upon its state of charge. When first connected to a power source, the charger switches to the higher rate and illuminates the red LED beside the power socket. When the battery is fully charged, it switches to a low "trickle rate", ensuring that the battery is maintained fully charged. It takes approximately five hours to fully charge a discharged battery.

All rechargeable batteries are subject to a small spontaneous discharge current. Therefore, a battery that was fully charged a few weeks ago and not used will no longer be fully charged. You need to periodically place the SpinScape on charge so that it is always ready for a full day of shooting.

If, in an emergency, you needed to charge the SpinScape from a source not obtained from SpinPic, the battery charger socket is 2.1 x 5.5mm, with the tip being +12VDC relative to the connector barrel. The maximum charging current is approximately 500mA.

⚠️ **WARNING:**
Connecting to a reversed polarity source will damage the SpinScape. SpinPic assumes no responsibility for damage caused by using a charger not supplied by SpinPic.

A

Warranty Information

What your warranty covers:

- Any defect in material and/or workmanship associated with your SpinPic product.

For how long after your purchase:

- Ninety days for labor charges

- One year for parts

What your warranty does not cover:

- Damage from misuse or neglect. For example, dropping the unit, improper power input, etc.

- Consequential damages, such as loss of income, caused by failure of any SpinPic product.

What you must do:

1. To obtain warranty benefits, first request a Return Material Authorization (RMA) from SpinPic:

   ■ Contact support@spinpic.com, or

   ■ Telephone SpinPic at 1-866-SPINPIC.

2. Package the product so that it is protected from damage during shipping, and ship it, along with the original purchase receipt, to the address provided on the RMA.

Note:
You must include your original purchase receipt, with the product, in order to obtain warranty service

Once service is completed, the product is shipped back to you freight prepaid.

⚠ **CAUTION:**
The warranty is null and void if the SpinPic product is serviced, or chassis opened, by anyone other than an authorized SpinPic service provider.

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