THE MOVIE MAKER™ TOOLKIT

Interactive Picture Systems

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Contents

Preface

It is difficult to convey the "feel" of MOVIE MAKER in a written manual. This system is a totally new tool for artistic expression. Because it can do things that have not been possible before, it entices you to think in new ways. MOVIE MAKER gives you control over things that are just not possible with pen and ink, film, video-tape, or any other medium.

MOVIE MAKER is incredibly open and flexible. Unfortunately, it is necessary in this manual to describe the MOVIE MAKER procedures sequentially because of the limitations of the written page and because no one can learn everything at once. When you use MOVIE MAKER, however, you will be able to "use everything at once." You can move freely back and forth among procedures to try out new ideas. It is hard to overstate the freedom and opportunity this gives you.

MOVIE MAKER is a lot easier to use than it may appear at first. It allows you to experiment right from the start without fear of losing or damaging anything. Although this manual necessarily "talks through" each step of every procedure, in actual use you won't have to think about every step. The MOVIE MAKER commands will become part of your vocabulary, and you will use them without consciously thinking about them. You will even develop a distinctive style in using them, just as you have a distinctive style of talking and writing.

MOVIE MAKER is fun! It really is a marvelous tool for artistic creation and expression. MOVIE MAKER makes it easy to try out ideas and bring them to life. And seeing those ideas bring pleasure to others adds to the fun.

Get to know MOVIE MAKER. You'll enjoy it.

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Welcome to
MOVIE MAKER

MOVIE MAKER is a complete movie animation system on a micro-computer. It's the first and only one. It can do almost anything that professional animators do by hand, only much faster and easier. With MOVIE MAKER you don't have to do any programming—just learn a few simple commands—such as "A" for Action, "C" for Color, and "E" for Erase; then let your imagination and creativity run free. It's fun!

MOVIE MAKER encourages you to experiment. It enables you to draw shapes, create animation sequences and put them into a short movie. You can add color, sound, titles and text. It lets you try out an idea and see the results immediately. MOVIE MAKER gives you an extremely powerful and flexible set of tools. It's like having your own animation studio on a microcomputer.

What You Need to Run MOVIE MAKER

Here is what you need to run MOVIE MAKER:

1. An ATARI®* microcomputer with 48K of Random Access Memory (RAM)

2. One or two ATARI disk drives .

3. A joystick

4. At least four blank disks for your MOVIE MAKER files

5. A little imagination.

How to Make an Animation With Only Five Commands

You can produce an animation in your first MOVIE MAKER session with only five simple commands. Want to try it? Here's how:

1. Remove any software cartridges from the ATARI microcomputer, put the MOVIE MAKER disk into the disk drive (or Drive 1 if you have two drives) and turn on the microcomputer. (See your ATARI manual if you're uncertain about how to start up the computer.)

NOTE: If you have a recent ATARI computer with BASIC language in ROM, you will have to hold down the OPTION key on the keyboard while MOVIE MAKER is booting.

After the title and credits for MOVIE MAKER run, the Main Me▲will appear on the screen. It looks like this:

```
MOVIE MAKER

1) COMPOSE
2) RECORD
3) SMOOTH
4) PLAY

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INTERACTIVE
PICTURE SYSTEMS
INC.
```
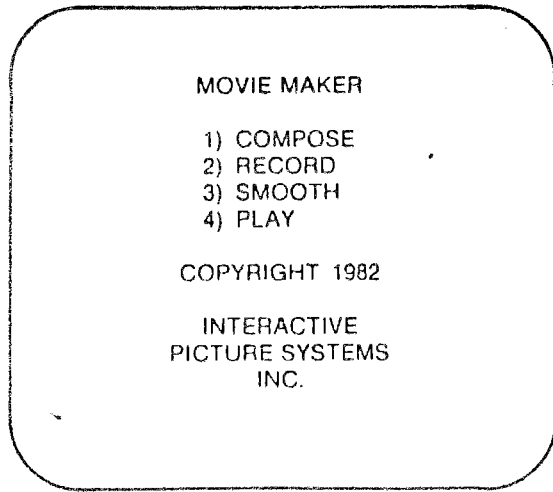
2. Type 1 to select COMPOSE and press the RETURN key. The COMPOSE Utility Menu will appear. It looks like this:

```
MOVIE MAKER. COMPOSE
UTILITY MENU

CATALOG files        RENAME file
GET file             DELETE file
KEEP file            FORMAT disk
MAIN MENU            SELECT drive
COMPOSE              CLEAR memory

use ARROWS and RETURN to select

CURRENT FILE
SHP
BKG
CURRENT DRIVE: 1
```
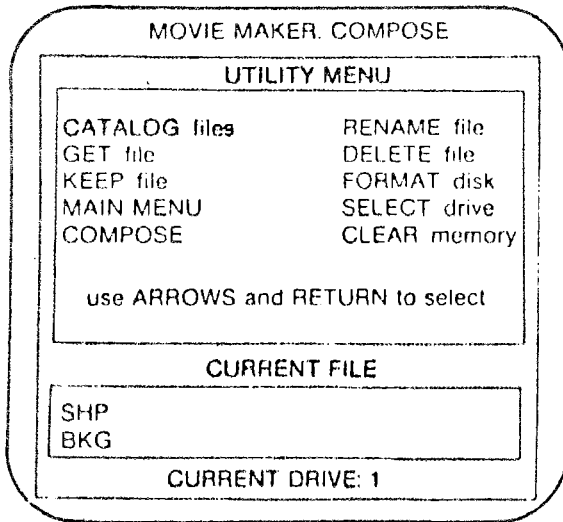
3. Press the down Arrow Key to move the lighted Selector Bar over the words "GET FILE," then press RETURN. Another menu will appear. It looks like this:

```
MOVIE MAKER: COMPOSE

SHAPE
BACKGROUND
XTRA FUNCTION
UTILITY MENU

WHAT SHOULD I GET?
Use ARROWS and RETURN to select.

CURRENT FILE
SHP
BKG

CURRENT DRIVE: 1
```
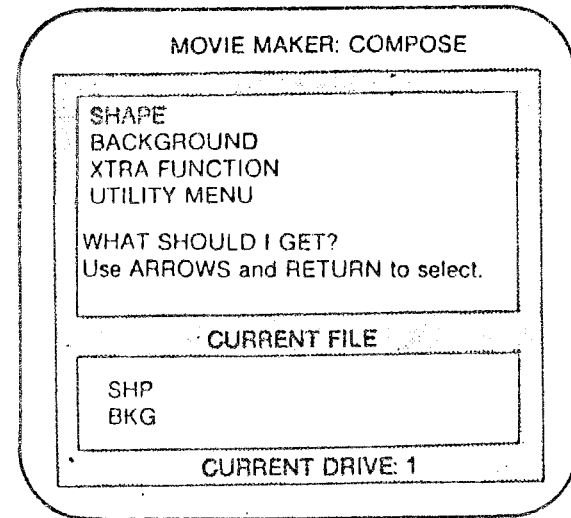
4. Press the arrow keys to move the lighted Selector Bar over the word "SHAPE" if it is not already there. Press RETURN.

5. MOVIE MAKER will ask, "WHAT FILE SHOULD I GET?" Type DOG and press RETURN. A screen full of dog shapes will appear.

Ready to make an animation? Here are the five commands.

1. Type A. A single dog will appear in the center of the screen.

2. Type S1 and press the space bar. The dog will start to move. Press the space bar again and the dog will stop. (The space bar starts and stops animations. You can do the same thing by holding down and releasing the button on the joystick.)

3. To change the speed of animation, type F (for Frame Rate) and any number betweeen 1 and 9. The fastest speed is F9. You can

change the speed while the animation is running ("on the fly" or when it is stopped. Try it with different numbers.

4. Type C0 and press the right and left Arrow Keys to change the Background color. Press the up an down Arrow Keys to change the color intensity. Try different combinations. You can change colors on the fly or with the animation stopped.

5. Now start the animation and move the joystick. The dog will move around the screen. When you're through trying out the animation, type U to return to the COMPOSE Utility Menu.

Congratulations! You've just made your first simple animation!

Now if you'd like to see some fancy animations that were made with MOVIE MAKER, remove the MOVIE MAKER disk from the drive, turn it over so that the AUTOPLAY side is up, put it back in the drive, and press the SYSTEM RESET key. You'll see several different animations. They will cycle repeatedly. You can use the space bar to stop and start the animations, and the F-number command to change the animation speed.

What MOVIE MAKER Does

The Computer Helps You Draw

MOVIE MAKER does a lot of drawing for you. As you draw a shape, MOVIE MAKER "remembers" what you draw. It lets you duplicate all or part of the shape and move it to a different section of the screen. You can then alter the duplicate while the original shape remains unchanged. You can reverse or "flip-flop" the shape without having to redraw it. (This is very handy for combining simple shapes into complex figures.) If you draw a hollow shape, MOVIE MAKER can insert any four of the 128 ATARI colors into the space. If you

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make a mistake or change your mind, MOVIE MAKER lets you erase as much or as little as you wish. If you want to animate only part of a figure, MOVIE MAKER enables you to work on just that part without having to redraw the whole figure.

MOVIE MAKER "Flips the Pages" For You

You probably know that animated movies create the impression of movement by using a sequence of pictures. Each picture is slightly different from the previous one. When you flip rapidly from one picture to the other through the sequence, the figures in the picture appear to move. In fact, professional animators call each of these sequences a "flip." To see how this works, look at the arrow at the bottom righthand corner of page 7 and then use your right thumb to fan the pages of this manual from front to back. Try it at different speeds. That's what the computer does when you use MOVIE MAKER.

When you use MOVIE MAKER, you draw or copy shapes on the microcomputer screen with a joystick or with the keys on the keyboard. At your command, MOVIE MAKER duplicates the shapes, moves them around on the screen to form pictures and sequences, and then automatically cycles the sequences of pictures to create the impression of movement on the screen. It even smooths the pictures to remove the "flicker" when you play the finished movie.

A finished movie can be up to 300 "frames" long. Depending on the speed and repetitions you select, it can take from a few seconds to several minutes to run. You can direct the computer to run the movie once, several times, or continuously. And with the PLAY disk, you can store several movies so that they will run one after another.

MOVIE MAKER Stores Your Movie Elements in Files

When you finish each element of a movie, MOVIE MAKER lets you keep the finished element in a file for future use. MOVIE MAKER has six kinds of files for different elements: (1) shape files (SHP), (2)

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background files (BKG), (3) animation files (ANI), (4) sound ~~rs~~
(SND), (5) extra function files for type fonts and special ei.~~~ts~~
(FNC) and (6) MOVIE MAKER files (MVM) for finished movies. You
may create as many files of each type as you wish, so long as you
give each file a different name.

MOVIE MAKER has four sections: COMPOSE, RECORD,
SMOOTH and PLAY. You do most of your creative work in COM-
POSE and RECORD. In the COMPOSE section, you draw Shapes,
insert color, and combine Shapes into Sequences and Back-
grounds. When they are finished, you can store them for later use as
Shape Files and Background Files.

In the RECORD section, you record the Sequences over Back-
grounds into the Animation File. You can move from one to six
Actors around on the Background with your joystick as you record.
You also can vary the colors, Sequences, animation speed, and the
number of repetitions of each Sequence.

You can perform many procedures in both COMPOSE and
RECORD. However, you can draw and duplicate Shapes only in
COMPOSE. And you can add sounds and record Animation Files
only in RECORD.

Although these procedures are described separately and sequen-
tially in this manual, in practice you will use them together and in
varying order. You will move back and forth among the procedures
as you try out new ideas and add them to your animations.

In the SMOOTH section, MOVIE MAKER automatically smooths
out the bumps and flicker from the Animation File to produce a
finished MOVIE MAKER File. The SMOOTH section works auto-
matically.

In the PLAY section, MOVIE MAKER plays back the finished
MOVIE MAKER File that you have previously recorded and
smoothed.

Basic Steps in Making a MOVIE MAKER Animation

Here are the basic steps in making a MOVIE MAKER animation:

Draw Some Shapes

Draw a Background

Insert Color

Combine Shapes Into Sequences

Add Sound, Titles, Other Special Effects

RECORD an Animation File

SMOOTH Results into a MOVIE MAKER File

PLAY the Finished MOVIE MAKER File

COMPOSE

RECORD

SMOOTH

PLAY
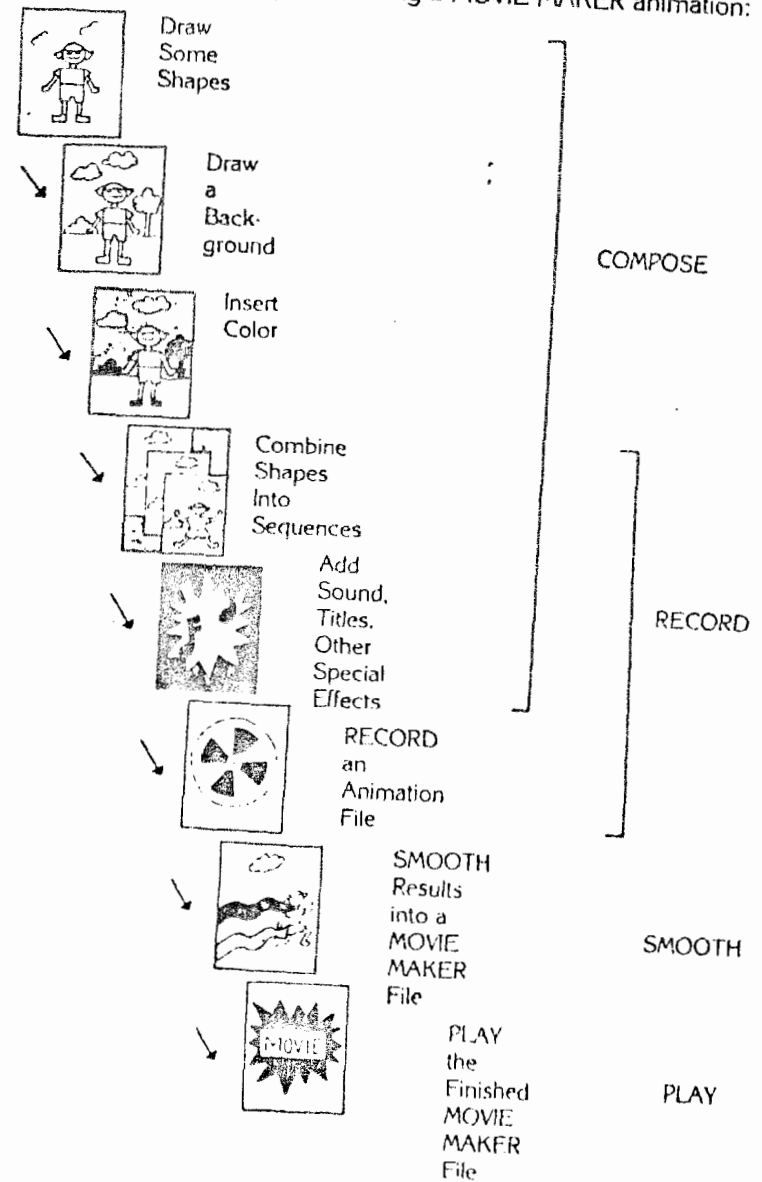
21. U—for Utility Menu

22. V—for View and Voice

23. W—for Window

24. X—for Xtra Function

25. Y—for Yank

26. Z—for Zoom

/—Mark a frame

ESC—Change screen pages

Space Bar—Stop and start action; terminate commands

Arrow Keys—Draw, change, colors, review Shapes, step forward and backward through frames

MOVIE MAKER produces powerful results. To see how, turn to the next chapter.

The MOVIE MAKER Commands

Like any software system that is powerful and flexible, MOVIE MAKER has more features than you will be able to learn at one sitting. However, the extensive use of menus and simple one-letter commands makes it easy to learn and use. You'll probably be surprised at how quickly you can master MOVIE MAKER.

Here is the complete set of commands:

1. A—for Action and Actor

2. B—for Border

3. C—for Color

4. D—for Duplicate

5. E—for Erase

6. F—for Frame Rate

7. G—for Go To

8. H—for Help Line

9. I—for Insert Color

10. J—for Jump

11. K—for "Kwickness" (Quickness)

12. L—for Loop

13. M—for Mirror

14. N—for Noise

15. O—for Outline

16. P—for Pen and Playback

17. Q—for Quiet

18. R—for Restore and Rewind

19. S—for Sequence

20. T—for Trade Color

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Let's Make a Movie

Now it's time to start your own movie. This chapter and the next two will show you how, step by step. They will introduce the various MOVIE MAKER commands and procedures as you create your own animation. After a little practice, the command sequences will become so familiar to you that you will be able to create animations very quickly.

Preparing a Script and Log

The first step in creating a movie is to decide what story you want the movie to tell. Professional animators prepare a script for this purpose and assemble sketches of the main scenes into a "storyboard" to show the sequence of the story. You don't have to get this fancy, but you do need to plan the Actors, backgrounds, and animation before you begin. You should make some simple notes of your plan so that you won't leave anything out when you start making your movie. These notes will be your "script."

it is absolutely essential to keep a log as you make your movie. The log helps you keep track of the different parts of your movie. It can tell you which Shapes and figures are stored in which files. It can tell you which Sequences, Backgrounds and sounds should start and stop at which frames. It also can identify Sequences of animation and sound, in case you wish to use them again.

One suggested format for a MOVIE MAKER log appears at the end of this manual. You may wish to adapt the format for your own use.

Very soon after starting to use MOVIE MAKER you will be able to make quite intricate animations. You may be surprised at how many files you will create. You will need a record of your files, sounds, and Shapes to keep them straight. Make it a habit from the beginning to keep good records of the locations of your various movie elements.

Format Some Disks for Files

Before you start making a movie, you need to have a supply of disks on hand for files and duplicate copies of files. Experience will teach you how many file disks you need. To start, however, you need at least four disks: one for your original work files (Shape, Background, and Animation), one for your MOVIE MAKER (MVM) files, and two for backup copies of these files. Make it a habit from the outset to make frequent backup copies of all your work.

Before you can use a disk for MOVIE MAKER files, you must "format" it. Formatting puts some information on the disk to enable the Atari to recognize and read it.

To format a disk, boot the MOVIE MAKER Disk. When the Main Menu appears, type 1 and press RETURN to choose the COMPOSE option. When the COMPOSE Utility Menu appears, use the arrow keys to move the lighted Selector Bar over the words "FORMAT DISK" and press RETURN. The following message will appear on the screen:

REMEMBER: From any Utility Menu you can get to the Main Menu and from there to any section of MOVIE MAKER by following the prompts on the screen. You don't have to re-boot; just be sure that your MOVIE MAKER Disk is in the drive when you move from section to section.

Start With Some Shapes

Let's start making your movie. To keep it simple, let's begin with some existing Shapes.

You can use either the COMPOSE or RECORD section to combine Shapes into Sequences. For now, we'll use COMPOSE.

Remove any software cartridges from the computer and boot the MOVIE MAKER Disk. (If there are any software cartridges in the computer, MOVIE MAKER won't boot.) When the Main Menu appears, type 1 to select the COMPOSE section. When the COMPOSE Utility Menu appears, select the GET FILE option. When MOVIE MAKER asks what type of file to get, select the SHAPE option. When MOVIE MAKER asks the name of the file to get, type DOG. Notice that the file name appears beside the letters "SHP" (for Shape) as a Current File.

To see the current Shape File, move the Selector Bar over COMPOSE and press RETURN. Do you see a lot of dogs? This is the Shape Page of the DOG file.
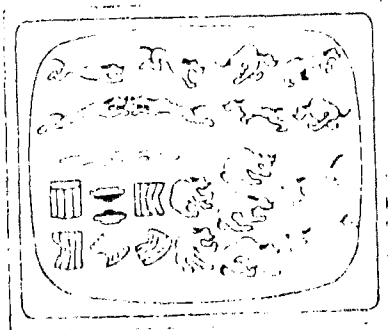
The Shape Page

At the top of the Shape Page are three Color Bars showing the current Shape colors. These colors are designated (from the left) 1, 2, and 3. A fourth color (0) is used for the Background.

Across the bottom of the Shape Page is the green Help Line. It looks like this:

F4	s0.00	K1	J0	L0	C1.00.2	01/64	SHP

The Help Line gives you the current status of various commands as well as other information. There will be more about this as we go along.

The Help Line and Color Bars can be turned off by typing H and turned back on by typing H again. Try it a few times.

Create an Action Sequence

Now that you have some Shapes (in this case already drawn for you), the next step is to put them into a Sequence. Planning a Sequence requires some thought about the final result desired, but it takes very few Shapes to create a believable motion. You should add each Shape to the Sequence in the order you wish to have it appear in the animation.

To define a Sequence, first type S followed by a number from 1 to 9. In this case, since you have no other Sequences yet, start with the number 1. The Sequence command report on the Help Line should look like this:

S1.00

PRESS Y TO CONFIRM OR
RETURN TO UTILITY MENU

This a safety reminder. Remove the MOVIE MAKER disk from the drive and insert the disk to be formatted.

CAUTION: Be sure that the disk in the drive is the one you wish to format. If you accidentally re-format one of your file disks, all of the information stored on the disk will PERMANENTLY DESTROYED!

When you have confirmed that the correct disk is in the drive, type Y. The disk drive will whir and make a series of clicking sounds. When the formatting is complete, the prompt will disappear from the screen, and the Selector Bar will return to the top of the menu.

While you're at it, format a few more disks for spares. You don't want to lose valuable work because your file disk fills up or you run out of spares. Here's a good rule of thumb:

When the catalog of file names on your file disk goes over into the second column, it's time to start a new file disk.

Disks are cheaper than your time! Use plenty of them, and always keep some spares on hand.

Moving Around in MOVIE MAKER

You've already seen how to select menu options with the Selector Bar and move from the Main Menu to the COMPOSE Utility Menu and back. The prompts on the screen always tell you what to do. You will use these procedures again and again in the various sections of MOVIE MAKER, and you will quickly become familiar with them. Let's review them:

1. There are four sections of MOVIE MAKER: COMPOSE, RECORD, SMOOTH, and PLAY.

A Note for Users with More Than One Disk Drive

MOVIE MAKER can be used with either one disk drive or two. One drive works perfectly well, but using two drives can save you some time and reduce the amount of physical handling of disks that you have to do.

If you have more than one disk drive, always put your MOVIE MAKER Disk in Drive 1 and leave it there. Use Drive 2 for your work and MVM File Disks. Since most of the instructions in this guide are written for single-drive setups, you will have to do a little "translating." Except for the formatting of new disks, whenever this Guide tells single-drive users to remove the MOVIE MAKER Disk from the drive and insert another disk, you may simply leave the MOVIE MAKER Disk in Drive 1, insert the appropriate file disk in Drive 2, and change the drive assignment to Drive 2. The computer always "knows" that the MOVIE MAKER Disk is in Drive 1.

To change the drive assignment, go to the COMPOSE, RECORD, or SMOOTH Utility Menu. Move the Selector Bar over the words "SELECT Drive," and press RETURN. When the screen prompts you for the drive to be assigned, type the appropriate number (1 or 2) for the drive you want.

2. Each section of MOVIE MAKER has its own Utility Menu.

3. To select an option from a Utility Menu, use the Arrow Keys to move the lighted Selector Bar to the option, then press the RETURN key.

4. If you're inside a MOVIE MAKER section and you want to go to a Utility Menu, type U.

5. To move from a section back to the Main Menu, move the Selector Bar to the MAIN MENU option (regardless of the section) and press RETURN.

At the top left of the Shape Page you'll see a blinking re⌒ngl This is the Shape Outline. Move the joystick from side to side and you'll see the Outline jump from Shape to Shape on the screen.

In creating a Sequence, use the joystick to move the Outline over the first Shape for your Sequence and press the joybutton to "pick up" the Shape. Then move the Outline to the next Shape in the Sequence and press the joybutton again. Repeat these steps until you have picked up the entire Sequence. Each Sequence can have up to 16 Shapes.

For our first Sequence, we'll use just two Shapes. Use the joystick to move the Outline over the Shape that looks like this:
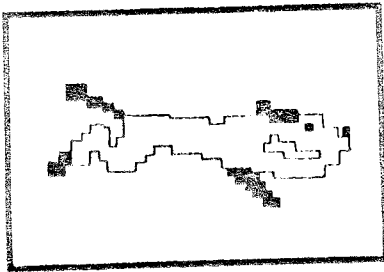
When the Outline is over the desired Shape, press the joybutton and a "yoo-hoo" sound will indicate that the Shape has been added to the Sequence. (If you don't hear the sound, try turning up the volume control on your color monitor.)

Move the Outline over the Shape that looks like this and press the joybutton again:
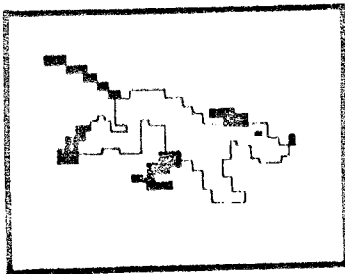
These two shapes will comprise your first Sequence.

Notice that the S-number on the Help Line changes each time you add a Shape to the Sequence.

Preview the Action Sequence

MOVIE MAKER lets you preview your action Sequence (or animation) immediately. Just type A (for Action).

MOVIE MAKER moves to the Background Page (which is blank at this time). Notice that the Help Line is red and the arrow in the Help Line turns down to indicate the Background Page. At the center of the page is the first Shape in your current Sequence.

To start the action, press the space bar. To stop the action, press the space bar again. Try it and you'll see your Shape *spring* into action!

Now let's try some tricks. Want to move the dog around on the screen? Just move your joystick while the animation is running. Try it!

Want to change the speed of the animation? Type F7. (This is the Frame Rate command. A high number means fast, a low number means slow.) Notice that the F-number on the Help Line changes to reflect your command. Then press the space bar again. Try it!

You can also change the Frame Rate while the animation is running ("on the fly"). Try this, too. To return to the original speed, stop the action, type F4, and press the space bar again. You will probably find the frame rates between F4 and F7 the most appealing and therefore the most frequently used.

Want to change colors? Let's try it with the Background. Stop the action and type C0. (C is for Color; 0 is for the background color.) Now you can change the color hue by pressing the left and right Arrow Keys. Try it!

There are a total of 16 possible color hues. Notice that each time you press the key, the C-number on the Help Line reflects the

hue (00 to 15). You can also change the luminance or brightness of the color by pressing the up and down Arrow Keys. Try it. There are eight possible levels of luminance or intensity for each color. Again, the C-number on the Help Line reflects your command (0 to 7).

You can change the other colors in a similar fashion by first typing C1, C2, or C3 and then pressing the Arrow Keys. Try it!

You can also change the "quickness" of the animation. To try this, stop the action and type K3 (for "Kwickness"). Notice that the K-number on the Help Line changes to reflect your command. Now when you press the space bar you'll see each Shape hold on the screen for three frames before changing. To return to the original speed, stop the action, type K1, and press the space bar again.

You can also control the number of "loops" the Sequence makes. So far the Sequence has been running continuously. If you look on the Help Line, you'll see that the L command (for Loop) is set at 0. To make the Sequence loop through only once, stop the action and type L1. To make the Sequence loop through three times, type L3. Try these commands. When you are finished, type L0 to return the Sequence to continuous play.

As you preview your animation and try out different combinations of Frame Rate, Color, Kwickness, and Loops, you may wish to make a note in your log of the combinations you like best so that you can remember them later.

When you finish previewing the animation, return to the Shape page by pressing the ESC key. (Notice that the arrow in the Help Line turns up again.)

Now let's try making another Sequence. Give it another number or you'll erase the first Sequence you created. Type S2 and then use the joystick and joybutton to pick up the Shapes you want, in the order you want them, for your second Sequence.

NOTE: A Sequence can have as many as 16 different Shapes or repeats of the same Shape or a combination of different and repeat Shapes. However, you only need as

many Shapes in a Sequence as it takes to complete one full cycle of action.

When you have completed the Sequence, try it out by typing A and pressing the space bar. Try some of the tricks you tried on the first Sequence. If the action is not what you want, you can re-do the Sequence by keeping the same Sequence number and picking up a new Sequences of Shapes with the joystick and joybutton.

Keep the Sequences

When you have some Shapes and Sequences you like, you can store them in a Shape File. To do this type U to get to the COMPOSE Utility Menu. Then remove the MOVIE MAKER disk from the drive and insert a blank, formatted disk to receive the file. (If you have two disk drives, put the blank, formatted disk in Drive 2. Use the Selector Bar to select the SELECT DRIVE option, and follow the screen prompts to change the drive assignment to Drive 2.) Use the Selector Bar to select the KEEP FILE option. When you press RETURN, MOVIE MAKER prompts you for the type of file, so use the Selector Bar to choose the SHAPE option.

Then MOVIE MAKER will ask you which file to keep. This is asking you for a file name. Use a short name that is different from your other files. (For example, you might have names of DOG1, DOG2, DOG3, etc.) Type your file name and press RETURN. Notice that the new file appears immediately as the current Shape (SHP) File at the bottom of the Utility Menu. This file will remain current (active) until you tell MOVIE MAKER to get a different file.

Now before you go any further, repeat the process of keeping the file with another disk in the drive. This will give you a duplicate or backup copy in case something happens to your original. At a minimum, you should backup files at the end of each MOVIE MAKER session. You may also want to make some notes in your log each time you Keep a file to remind you of what Shapes and Sequences are in the file.

File Handling Survival Tips

Here are five file handling tips that can save your life—or at least safeguard your work! Read them and heed them!

1. **Save your work frequently.** As soon as you finish creating some Shapes, Sequences, or an animation, use the KEEP FILE option to store your work in one or more files. Be sure to make backup copies. Then if there is a power failure or your microcomputer develops a problem, you won't lose all of your precious work.

2. **Name your files carefully.** Each file name may be up to eight characters long and must not contain any blanks or punctuation. It must start with a letter, but the remaining characters may be any combination of letters and numbers. (To say it another way, each file name may contain up to eight letters and numbers, provided that the name starts with a letter and does not contain any blanks or punctuation.) Use short names to save space. Wherever possible, choose names for your Shape and Background files that relate to the MOVIE MAKER file you have built from them. For example, for a MOVIE MAKER file called "DOG," your ANI and BKG file could also be named DOG, and your SHP files could be named DOG1, DOG2, DOG3 (or DOGA, DOGB, DOGC), etc.

> WARNING: Don't give the same name to two files of the SAME type! If you do, the second file will be kept, and the first file will be DESTROYED! Don't worry about giving the same name to files of DIFFERENT types. MOVIE MAKER automatically keeps track of them by supplying identifiers that you don't see.

3. **Always CATALOG your files before you use the KEEP FILE option.** This will display your files names so that you can avoid duplicate names of the same file type. To CATALOG your files, move the Selector Bar over the words "CATALOG FILES"

on any Utility menu d press RETURN. MOVIE MAKER will display on the screen the names and types of all files on the currently assigned disk.

4. **Keep your MOVIE MAKER (MVM) files on a separate disk from your work files.** This will make it much easier to play your MOVIE MAKER (MVM) files.

5. **Use your log to record what's stored under each file name.** When you KEEP a file, jot down the name in your log and make a few notes to describe what is stored on the file. A few good notes in your log can save you a lot of time searching files to find what you want.

You'll find additional tips on handling files in the section on "File Housekeeping" in Chapter 5.

Record an Animation File

Besides enabling you to create Shape and Background files, the RECORD section of MOVIE MAKER also enables you to record action Sequences and backgrounds in Animation (ANI) Files. (We'll see how to make a Background in the next chapter.) In addition to recording Sequences and Backgrounds, you can also record Zoom and Color changes as well as sounds.

The RECORD section works like a videorecorder and animation camera. You can be very creative with RECORD.

There are four RECORD modes. When you activate them, the Help Line turns red. The four commands that activate these modes are A (for recording Actors), C (for recording color changes), N (for recording Noises or sounds), and Z (for recording Zoom changes). For now, let's concentrate on the Actors.

You can think of an Actor as "a series of Shapes moving across a Background." With MOVIE MAKER, you can record one Actor at a time and store up to six recorded Actors at a time in each Animation File.

To record the first Actor, go to the Main Menu, choose the RECORD section, GET the file you just saved, and select the RECORD option on the Utility Menu. Then type A1. When the Background Page appears, you'll see that the Help Line is red, indicating that the recorder is turned on.

In addition to specifying the Actor's number, you must specify which Sequence the Actor is to follow. It must be a Sequence previously defined (in either RECORD or COMPOSE) and kept in the current Shape File. For now, type S1.

The first Shape of the specified Sequence will appear on the screen. It can be moved around the screen (now and when the recorder is running) by using the joystick or Arrow Keys.

Although the recorder is turned on, it will not actually start running until you press the space bar.

THE SPACE BAR STARTS AND STOPS THE RECORDER

Checking the Speed Settings

Before starting the recorder, you should review the speed settings and change them if necessary. The default settings are usually the best to start with.

F—Frame Rate

A frame in MOVIE MAKER is equivalent to a click of the shutter of an animation camera, that is, one frame of film. It is set by the command F followed by a number between 1 and 9. The default setting is F4. The higher the number, the faster the frames are clicked off. When the recorder is turned on, the clicks are audible (unless the Help Line has been toggled off).

The command F0 is special. It causes the recorder to advance one frame at a time when the space bar is pressed. It enables you to record frame by frame while moving your Actor between frame changes, if you wish. This gives you very fine control over the movement of the Actor. For now, set the Frame Rate at F4.

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K—Kwickness

The Kwickness setting determines the number of frames that each Shape is held on the screen before the next Shape in the Sequence is put up on the screen. K1 specifies one frame per Shape, K2 specifies two frames per Shape, and so forth, up to K9. K0 freezes the Sequence, and the Shape remains unchanged while the frames click away. The default setting is K1.

With the Kwickness command, you can have one Actor move faster than another. For example, an Actor recorded at K2 will move through a Sequence half as fast as an Actor recorded at K1. For now, leave Kwickness at the default setting.

J—Jump

The J Command determines how far the Actor moves (jumps) for each movement of the joystick or press of an Arrow Key. J1 means it moves one pixel, J2 means 2 pixels, and so forth up to 9 pixels. J0 is special: it sets an accelerating Jump rate. The default setting is J1. For now, leave Jump at the default setting.

L—Loop

The L command determines the number of times the current Sequence cycles while being recorded. L1 means the Sequence cycles once, L2 twice, L3 three times, and so forth up to 9 cycles. L0 means the Sequence cycles continuously. The default setting is L0. For now, leave Loop at the default setting.

Record an Actor

Now that you are ready to begin recording your first Actor (assuming that you have already typed A1 to turn on the recorder), use the joystick to move the first Shape just off the screen to the left. Start the recorder by pressing the space bar. The frames will begin to click off. Note the frames being counted on the Help Line. Move the Actor on the screen with the joystick or Arrow Keys. Notice that the dog is going through its Sequence (S1) over and over again. Make

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Reading the RECORD Help Line

The Help Line in RECORD has the following fields

001	F4	A1	S1.01	K1	J0	L0	N-.1	C1

1. An arrow at the left. The direction of the arrow at the left tells which page is on the screen. An arrow pointing up indicates the Shape Page; down indicates the Background Page.

2. A three-digit number between 001 and 300. This is the Frame Counter. It indicates the number of the current frame.

3. An F followed by a number between 0 and 9. The F-number indicates the Frame Rate, or the speed at which frames are changed.

4. An A followed usually by a number between 1 and 6. This indicates the Actor currently being recorded. A zero indicates that no Actor has been recorded.

5. An S (for Sequence) followed by a decimal number. The number to the left of the decimal point indicates the current Sequence being recorded (0 to 9). Zero (0) means no Sequence has been selected for recording. The number to the right of the decimal point indicates the current frame (00 to 16) within the Sequence. Each Sequence can have up to 16 different frames. The double zero (00) indicates that no Shapes have been selected for the current Sequence.

6. A K followed by a number between 0 and 9. This indicates the Kwickness setting.

7. A J followed by a number between 0 and 9. This indicates the Jump Rate setting.

8. An L followed by a number between 0 and 9. This is the Loop setting. It indicates the number of times the current Sequence will cycle during recording.

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9. A N-number (in the next to last field). The number to the left of the decimal point indicates the Noise (1-8) to be recorded. N0 means that Noise is turned off. The number to the right of the decimal point indicates the current Voice (1-4). You may record only one Voice at a time.

10. A C-number (in the last field). It shows which color is current (0, 1, 2, or 3), but not the hue and luminance settings. You may record only one color at a time.

The RECORD Help Line can be turned off by typing H and turned back on by typing H again.

the Actor move all around the screen. You can record up to 300 frames, and you can stop the recorder at any time by pressing the space bar. To resume recording, just press the space bar again.

After you have recorded your first Actor, the second one will be easy. Type G to go back to frame 001. Then type A2 to create the second Actor. We're going to use the same Shape Sequence, so you can leave the S-number unchanged. The second Actor's movements will record on the same 300 frames as the first Actor's.

Use the joystick to move the Shape just off the screen to the left, and press the space bar when you're ready to start. Again, use the joystick to move the Actor around the screen. Stop the Actor (and RECORD) by pressing the space bar. RECORD stops automatically when the Frame Counter reaches 300.

Now let's record a third Actor. This time we'll use a different Sequence. Type G to go back to the first frame. Type A3 to create the third Actor. Then type S2 to use the second Sequence you created. Move the Shape off the screen with the joystick, then press the space bar to start the recorder. Again, use the joystick to move the Actor around the screen, and press the space bar when you're ready to end RECORD (or let it end automatically when the Frame Counter reaches 300).

Now you should have dogs running and jumping all over the place!

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You can re-record any Actor by specifying that Actor A-number again. Keep in mind, however, that if you re-record an actor after recording some others, the level in which they appear will be changed. This will come in handy later.

After recording an Actor, you can record Zoom and Color changes in much the same way. To change colors, type C0, C1, C2, or C3. You can then change the hue and luminance of the current color by pressing the Arrow Keys. After you press the space bar to start the recorder, you can continue to change the hue and luminance "on the fly." You can also change the current color on the fly by pressing 0, 1, 2, or 3 while the recorder is running under the C command. To terminate the C command, press ESC.

To record Zoom changes, type Z1, Z2, or Z3. You can tell when Zoom is in effect by the large cross-hair on the screen. After you press the space bar to start the recorder, you can change the Zoom settings on the fly by pressing 1, 2, or 3. To terminate the Zoom command, press ESC.

More information about making Color and Zoom changes appears in the chapter on Creating Special Effects.

Playback the Animation File

After recording an Actor, you can preview the Animation File by typing P (for Playback) followed by a number from 1 to 9 to indicate the Frame Rate. In Playback, the Help Line is green, and the animation cycles repeatedly. The space bar starts and stops the Playback. You can change the Frame Rate on the fly by typing a number from 1 to 9; you don't have to repeat the P. To see the Animation File you've created up to this point, type P4 and press the space bar.

Keep the Animation File

The procedure for storing an Animation File is similar to keeping a Shape or Background File.

Start typing U to get to the RECORD Utility Menu. Remove the MOVIE MAKER disk from the drive and insert a formatted disk to receive the file. Use the Selector Bar to select the KEEP FILE option. When you press RETURN, MOVIE MAKER prompts you for the type of file. Use the Selector Bar to choose the ANIMATION option.

When MOVIE MAKER asks you which file to keep, it is asking you for a file name. Pick a name that is similar to your Shape and Background file names (for example, DOG1A). Type your file name and press RETURN. Notice that the new file name appears immediately as the current Animation (ANI) File at the bottom of the Utility Menu. This file will remain current until you tell MOVIE MAKER to get a different ANI file.

Remember to make some notes in your log to remind you of what is in each file.

Smooth the Animation File

The next step is the easiest of all. It removes the flicker from your Animation File and produces a finished MOVIE MAKER (MVM) File. The whole procedure is automatic.

Return to the Main Menu and type 3 to select the SMOOTH section. Remove your work disk, insert the MOVIE MAKER Disk in the drive, and press RETURN. If the Shape, Background, and Animation files that you want are current, there is no need to GET new files. Otherwise, use the GET FILE option on the Utility Menu to select the files of your choice. Then remove the MOVIE MAKER Disk from the drive and insert a disk to receive the MVM FILE. This will be your Movie or PLAY disk.

Select the SMOOTH option on the Utility menu to produce a flicker-free MOVIE MAKER (MVM) File. MOVIE MAKER will ask you for a name to give the MVM file. It's a good idea to call your MVM files by the same names as the ANI files they were created from. That way you know which belong to which. Don't worry about confusing the

Now sit back and enjoy watching your movie. You can adjust the Frame Rate by typing an appropriate F-number. The slash key (/) turns the continuous cycle on and off. The space bar stops and starts the movie.

Exit MOVIE MAKER

Before you exit MOVIE MAKER, be sure to KEEP any Shapes or Sequences that you want to save.

If you exit MOVIE MAKER without KEEPing your work, the work will be DESTROYED FOREVER!

Now remove all the disks from your drives and turn off the computer. That's all there is to it! You can EXIT at any time from any section of MOVIE MAKER.

As with any microcomputer, you should remove the disks from the drives BEFORE you turn off the computer. Otherwise, the power switch can cause a power surge that could scramble the information stored on your disk and ruin them—including your MOVIE MAKER Disk. Play it safe! Always remove the disks BEFORE you turn off the computer.

MVM and ANI files. MOVIE MAKER automatically keeps track of which is which by supplying file identifiers that you don't see.

When you type the name and press RETURN. MOVIE MAKER automatically completes the SMOOTH operation. When finished, MOVIE MAKER prints "SUCCESS" on the screen. Press RETURN to continue.

Play the Finished Movie

At last, you're ready to PLAY the finished movie! From the Main Menu select option 4 for PLAY. Remove your Movie disk from the drive, insert the MOVIE MAKER Disk, and press RETURN. The PLAY Utility Menu will appear. It looks like this:

```
                 MOVIE MAKER: PLAY
    ┌──────────────── UTILITY MENU ────────────────┐
    │                                              │
    │  CATALOG files                               │
    │  PICK file                                   │
    │  PLAY                                        │
    │  MAIN MENU                                   │
    │  SELECT drive                                │
    │  RENAME file                                 │
    │  DELETE file                                 │
    │                                              │
    │  Use ARROWS and RETURN to select             │
    ├──────────────── CURRENT FILE ────────────────┤
    │  MVM                                         │
    ├──────────────── CURRENT DRIVE: 1 ────────────┤
```
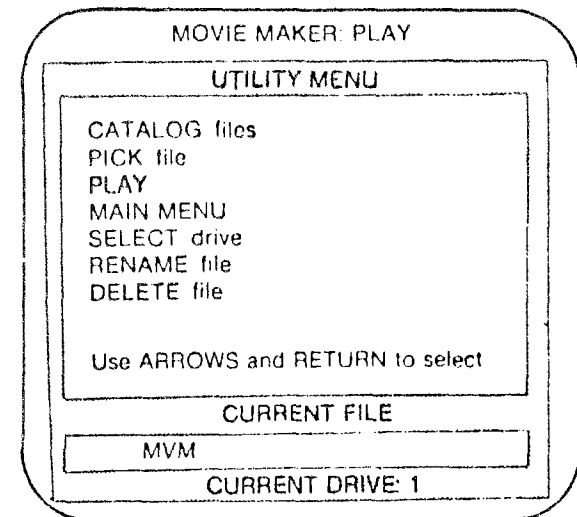
Remove the MOVIE MAKER Disk from the drive and re-insert your Movie disk. Move the Selector Bar to the "PICK File" option and press RETURN. (No MVM files will be current.) Type the name of the MVM file you created in SMOOTH and press RETURN. Then move the Selector Bar to PLAY and press RETURN.

3

Drawing Your Own Shapes

The previous chapter showed you how to make a movie with existing Shapes, but to create your own animation you'll need to draw your own Shapes. Want to try it? It's easier than you may think.

All of your drawing will be done in the COMPOSE section of MOVIE MAKER. There are five commands that you will use again and again in COMPOSE:

1. P (for Pen) is the command for drawing.

2. Z (for Zoom) lets you view Shapes close up.

3. W (for Window) enables you to duplicate and move Shapes around on the screen.

4. O (for Outline) transforms a drawing into a defined Shape that can be picked up for Sequences.

5. B (for Border) lets you alter the size and shape of Windows and Outlines used in drawing, assembling, and duplicating Shapes.

To start your drawing, re-boot the MOVIE MAKER Disk. (If the computer is already turned on, just put the MOVIE MAKER Disk in

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the di...e and press the SYSTEM RESET key.) This will clear out all of your previous work and give you a clean workspace for drawing.

A Special Feature for Left-Handers

If you prefer to draw with your left hand, you may convert the joystick for left-hand use by pressing the SELECT key while the Main Menu is on the screen. A small *L* will appear in the lower left-hand corner of the screen, signifying that MOVIE MAKER has changed the joystick from a right-hand to a left-hand model. You will be able to move the stick with your left hand and press the joybutton with your right thumb.

From the Main Menu, type 1 and press RETURN to go to the COMPOSE section. From the COMPOSE Utility menu, move the Selector Bar over the word COMPOSE and press RETURN. A blank Shape Page will appear. (You'll recognize it by the up arrow in the Help Line.)

You may draw images on either the Shape Page or the Background Page. For now, we'll use the Shape Page.

Drawing Simple Shapes

The command for drawing is P (for Pen) followed by a number from 0 to 3 to indicate the pen color. When you type P, a blinking square appears on the screen—the Pen Cursor. It moves around in response to the joystick and the Arrow Keys. To draw, move the Pen Cursor inside the Outline rectangle on the screen, hold down the joybutton, and then move the joystick or press the Arrow Keys. When using the arrow keys, you may hold down the CTRL key instead of the joybutton to make the Pen draw. The Pen keeps drawing as long as you hold down the joybutton or CTRL key.

For practice, type P1 and try drawing a tree Shape like this:
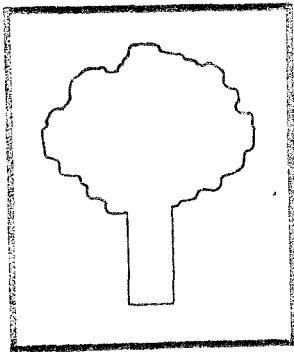
When you have finished drawing, press the Space Bar to cancel the P (Pen) command.

Drawing Tips

1. The Arrow Keys are best for drawing straight horizontal or vertical lines. They automatically repeat if held down. Most people find it easier to press the CTRL key insted of the joybutton to draw with the Arrow Keys.

2. To change the color you are drawing with, press 0 for the background color or 1, 2, or 3 for any of the Shape colors on the Color Bar. (The color on the left is 1.) If you change the hue or luminosity of a current color, any lines that you have already drawn with that color will change to match the new color.

3. Drawing with the background color (P0) is the equivalent of erasing if it is done over a previously drawn area. This is a useful technique for touching up mistakes.

4. Even though the Pen Cursor can *move* outside of the Outline, it will not *draw* outside of the Outline. If you need more space, enlarge the Outline. We'll see how next.

Aids for Drawing

Magnify the Work Space

To draw fine details or get in for a close look at your work, you can magnify the current Outline area with the Z (for Zoom) command. Type Z, followed by a 2 or 3. The command Z3 causes the largest magnification. To return to the original magnification, type Z1. If you have not used another command since typing a Z, you can see the various magnifications merely by typing 1, 2, or 3.

Change the Size of the Shape Outline or Window

You'll often need to change the size or shape of the Outline to fit a particular figure. To do this, type B (for Border). A small, flashing cursor will appear at the upper left corner of the Outline. By moving the joystick or pressing the Arrow Keys, you can "stretch" the Outline up or down and in or out from the upper left corner, changing its size or proportions. When this corner is where you want it to be, press the joybutton to set it. The flashing cursor will then shift to the lower right corner. You can move this corner in and out as you did the top left corner. When the corner is where you want it to be, press the joybutton to set it. A visual sweep will move from left to right within the Outline, indicating that a new Shape Outline has been defined.

MOVIE MAKER will not allow you to make an Outline larger than one-quarter of the screen. The larger the Outlines, the slower the final animation will be during Playback.

Moving and Redefining the Shape Outline

Sometimes you'll want to pick up a Shape and Outline, move them, and place them down at a new location on the screen. For example, when you finish a Shape, you way wish to move the Outline and Shape next to another Outline in order to organize the Shape page.

Restoring Erasures

If you Erase something by mistake—and everyone does sometime—type R and the Erased material will be Restored. You *must* issue the R command before issuing any other command or this will not work.

Building Complex Shapes from Simple Ones

Suppose you want to draw a forest. Wouldn't it be nice to be able to draw one tree and then copy it again and again to make the forest? Or suppose you're making a moving figure. Wouldn't it be nice to be able to draw the parts once and then copy them in different arrangements to create the animation?

Fortunately, you can do this. One of the most powerful features of MOVIE MAKER is its ability to copy simple Shapes and combine them into complex ones. It can save you a lot of work and turn out better drawings than you could ever make by yourself. Here's how it works.

Duplicating Shapes

To make a copy of a Shape without removing the original, you need to use three commands. First, type W to create a "Window." A Window can be recognized by its thick, non-blinking border that seems to replace the Outline. Actually, the Outline is still there, beneath the Window.

The Window has two functions. First it works as a sort of "movable enclosure" to enable you to zero in on the part of the picture that you want to change and exclude the part that you want to leave intact. Second, it works as a sort of "dump truck" to carry that part of the picture to any location on the screen and dump it. The Window

To pick up and move the Shape Outline and anything within it, first press the space bar to cancel any current command. Then press the joybutton. You'll hear a sound cue rise in pitch, and the Help Line will turn red, indicating that a Shape Outline has been picked up and is, in effect, dangling from the end of your joystick ready to be moved. Use the joystick or arrow keys to move the Shape Outline. When you have it positioned where you want it, press the joybutton again to release it.

> CAUTION: Be careful not to hit the space bar while you have an Outline picked up ("dangling from your joystick"). If you hit it, the Outline and any Shapes with it will immediately drop to the page beneath.

When the Outline is released, you'll hear the sound cue fall in pitch and the Help Line will turn back to green, indicating a successful drop. You'll also see a visual sweep from left to right within the Outline, indicating that a Shape has been redefined.

Moving Shape Outlines around on the screen can help you get the most out of MOVIE MAKER. The closer you can fit your Shape Outlines together on the Shape Page, the more Shapes you can use.

Erase a Drawing

If you been experimenting with the commands above—as you should have—you probably have a tangle of lines on the screen. There are two ways to erase them.

1. To erase everything within an Outline, type E. Everything within the Outline will be erased, but the Outline will remain intact. Try it with different sized Outlines and different Outline positions.

2. To erase part of a drawing without distrubing the rest, you can change the Pen Color to match the Background Color (type P0) and draw over the lines you wish to erase. This is handy for touching up Shapes you have drawn. Try it!

moves independently of the Shapes, as you can see by moving the joystick or Arrow Keys.

Sometimes you'll need to change the size of a Window to fit a new Shape that you're building. If so, when you have the Window in effect, use the B (Border) command, just as you would for an Outline. In fact, changing the size or shape of a Window also changes the Outline beneath the Window.

Use the joystick to position the Window over the Shape or part of a Shape that you want to duplicate. Then type D (for Duplicate) to make a copy. You'll hear a sound cue, and the Help Line will turn red, signalling that duplicating has begun.

Now when you move the Window, a copy or Duplicate of the Shape will move with it. For now, move the Duplicate Window somewhere off to the side of the original Shape so that the Duplicate image will not overlap the original.

The Duplicate image you've just created is not yet defined as a Shape because every Shape must be enclosed within an Outline. To create an Outline and Shape, you must be on the Shape Page. Type O. A sound cue and a visual sweep within the Outline will signal success.

Let's go over that again: (1) Type W to make a Window around a Shape. (2) Type D to pick up a Duplicate image of the Shape. (3) Type O to deposit the image and put an Outline around it, defining it as a Shape. The O command can only be used on the Shape Page.

You can repeat this process indefinitely and "stamp" identical images anywhere on the Shape and Background Page by repeatedly moving the Window and press the joybutton. If you wish to turn the image into defined Shapes, however, you must put them on the Shape Page and put an Outline around them with the O command.

If you really want to save yourself some work, you can make a lot of duplicate images in a hurry by holding down the joybutton with the W and D commands in effect. MOVIE MAKER will shoot a rapid-fire series of duplicate images right across the page!

CAUTION: Don't press the space bar while a Shape is in the Duplicate Window and the Help Line is red, or you will cancel the Duplicate command, and the Shape will disappear from the Window. (You can replace it by going back to the original Shape and duplicating it again.)

Would you like to combine parts of a Shape to make a new Shape? You can do that with the Window. Pick up the portion of a Shape or image that you want by positioning an appropriately sized Window over that portion and pressing the joybutton to lift it. Use the joystick to move your Shape over to a second Shape to which it is to be added, position it as you like, and press the joybutton again to drop it. The duplicate portion will now be part of the second Shape. (However, the new portion will not be a Shape until you surround it with an Outline. You'll learn how to do this soon.)

Before dropping the duplicate portion over the second Shape, you can erase anything under the Window by typing E. This does not affect the portion contained within the Window.

Whenever you use the joybutton to drop a copy of a Shape, be sure to go back and enclose the new Shape within an Outline. If necessary, adjust the Border of the Window with the B command to encircle the new Shape, and then type O to surround the new Shape with an Outline.

To cancel the Window, press the space bar.

Mirroring Shapes

Here's another neat trick to save work. Have you ever noticed how many Shapes are symmetrical—that is, one side is the reverse of the other? Or how many parts of Shapes are mirror images of other parts? Wouldn't it be nice if you could draw one side of a Shape and have the computer draw the rest?

Good news—you can! With the M (for Mirror) command you can reverse or "flip-flop" all or part of a Shape. You can Mirror images to the right, left, up, or down. Here's how it works.

Suppose you want to flop part of a Shape. First, make a duplicate of the part to be flopped and put it somewhere else on the screen. Then with the Outline or Window surrounding the part to be Mirrored, type M and press an Arrow Key for the direction you want the image to be Mirrored (horizontal or vertical). MOVIE MAKER will automatically re-draw the Mirrored image. When the Mirrowing is complete, you'll have a new Shape that can be Sequenced, moved, or Duplicated just like any other Shape.

Let's try out these procedures with an example. We'll draw a fat letter "M" by drawing only half of the figure, then Duplicating it, Mirroring it, and moving it to join up the two halves. Here are the steps:

1. Draw the left half of the "M" as shown below. (Try using the Z (Zoom) command to enlarge the details.)
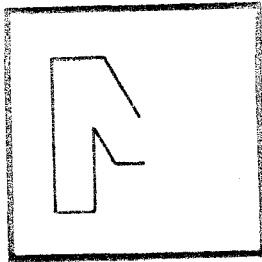
2. Type W to create a Window.

3. Type D to pick up a Duplicate of the Shape.

4. Move the Duplicate image to the side and press the joybutton to deposit it.

5. Type M and press the right Arrow Key to Mirror the Duplicate Shape horizontally. Now you have the right half of a fat "M." It should look like this:
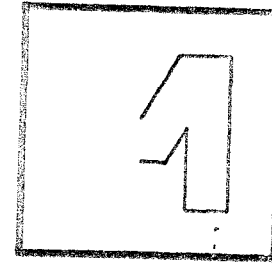
6. Type W and D to create another Duplicate Window.

7. Press the joybutton to lift a Duplicate of the right half of the M.

8. Move the Duplicate right half of the M over, carefully align it to join up with the left half of the M, and press the joybutton to drop the Duplicate. (Be sure the Shape is completely enclosed. Touch it up with the P command, if necessary.) It should look like this:
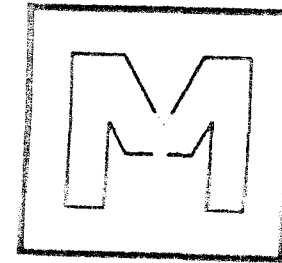
9. Use the B command to enlarge the Window and surround the whole figure M.

10. Type O to put an Outline around the figure M and define it as a Shape.

Congratulations! You now have a fat M and you know how to Mirror shapes.

Inserting Color

It's very easy to Insert color into your Actors and Backgrounds. It takes only five steps.

1. Make a Window around the part of the picture you want to color. (It can be a whole Shape, part of a Shape, or part of the background.)

2. Type I (for Insert). A small, nonblinking cursor will appear near the center of the Window.

3. Use the joystick or Arrow Keys to position the cursor somewhere inside the Shape.

4. Type 0, 1, 2, or 3 to choose a color. Use the arrow keys if necessary to get the hue and luminance that you want. Make color 2 red.

5. Press the joybutton.

MOVIE MAKER does the rest. After a pause, the color you have chosen will infuse throughout the entire Shape. If the Shape is not completely closed, MOVIE MAKER will deposit color from the edge of the Shape to the edge of the Window.
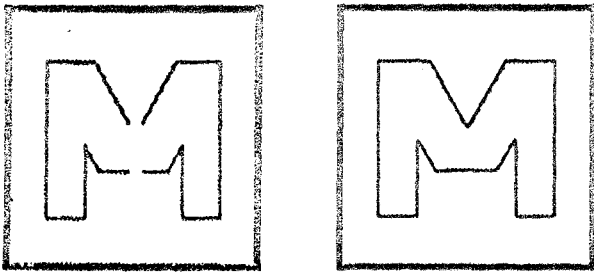
Remember that the hue and luminance level of the current color are indicated in the Help Line.

To terminate the Insert command, press the space bar. If you make a mistake and wish to eradicate the color, type R (for Restore) before typing any other commands and the color you just Inserted will disappear.

Now try out the Insert command on the fat "M" you created. Let's color it red: (1) type W to create a Window, (2) type I, (3) use the joystick to position the cursor inside the M, (4) type 2 to select color number 2, and (5) press the joybutton.

Congratulations! You now have a fat RED M and you know how to Insert color.

The Compose Help Line

You've seen that some of the symbols in the COMPOSE Help Line are slightly different from the ones in the RECORD Help Line. Let's review them.

The COMPOSE Help Line looks like this:

F4	s0.00	K1	J0	L0	C1.00.2	01/64	SHP

As in RECORD, the arrow tells you which page is on the screen. An up arrow indicates the (upper) Shape Page. A down arrow indicates the (lower) Background Page.

The F, S, K, J, and L symbols have the same meanings in COMPOSE as they do in RECORD. The F-number indicates the current Frame Rate. The S-number indicates the current Sequence. The K-number indicates the "Kwickness" setting (usually 1). The J-number shows the "Jump" rate. J1 indicates the smallest jumps, J9 the largest, and J0 means a progressively increasing Jump rate. The L-number shows the number of Loops the current Sequence is to run (L0 is for continuous looping).

The C-number in the COMPOSE Help Line has a slightly different form. The first number indicates the current Color (0, 1, 2, or 3).

The two digits in the middle indicate the hue (00 to 15). The single digit to the right indicates the luminance (0 to 7).

The last item of information in the Help Line gives the current number of Shapes and the maximum number of Shapes possible. A reading of 1/64, for example, means that one Shape out of a possible 64 are currently defined by Shape Outlines.

4

Building Backgrounds

Build a Background

You now have an animation, but you need a Background for it. Fortunately, you already know how to do nearly everything you need for a Background.

Working on the Background Page is different from working on the Shape Page in one important way:

There are no Outlines or defined Shapes on the Background Page.

(Outlines are only necessary when you're selecting Shapes for animation Sequences.) To move all or part of an image on the background page, just move the Window around the image and use the joybutton to lift it. When you have the image in the position you desire, press the joybutton to deposit it. Similarly, to duplicate all or part of an image, move the Window around it, use the D command to lift the duplicate, and press the joybutton to deposit the duplicate.

NOTE: You can use the Background Page as a work page when you're building images on the Shape Page and use the Shape Page as a work page when you're working on Backgrounds. It's easy to toggle the ESC key and transfer images from the background page to the Shape page, and *vice versa*. In this way you can get much more working space to build your images.

To build a simple background, we'll create a sky and horizon, then draw a bush shape and transfer it from the Shape Page to build a stand of shrubs on the Background Page. Here are the steps:

1. Return to the Shape Page (select COMPOSE on the COMPOSE Utility Menu).

2. Press ESC to go to the Background Page.

3. Type C0 and press the Arrow Keys to change color 0 to green.

4. Type C1 and press the Arrow Keys to change color 1 to blue.

5. Use the B command to stretch the Window to the top and sides of the screen, and about one-third of the way up from the bottom of the screen like this:
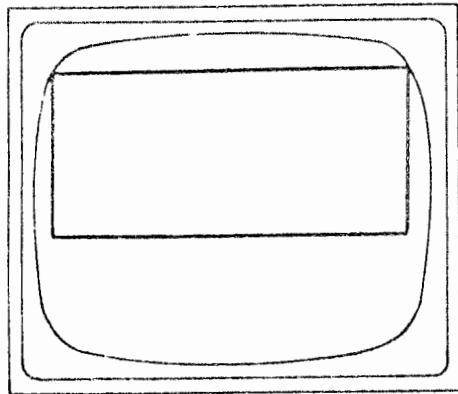
6. Type I and press the joybutton to color the sky blue.
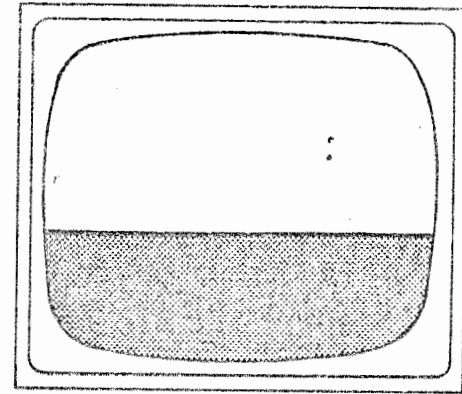
7. Press ESC to return to the Shape Page. Then type P2 and draw a squiggle like this:

8. With the D command, duplicate the squiggle, move it over to the side, and drop the Duplicate with the joybutton. Mirror the Duplicate squiggle, like this:

9. Use the D command to pick up a copy of the original squiggle, press ESC to move it to the Background Page, and then press the joybutton to stamp a series of squiggles on the Background, like this:
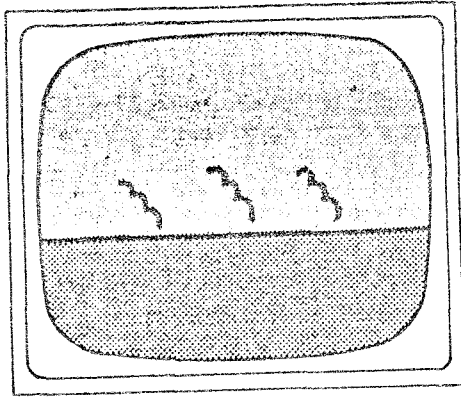
10. When you've finished, press the space bar to cancel the D command. The go back to the Shape Page and transfer a duplicate copy of the Mirrored squiggle in the same manner to complete the background foliage.
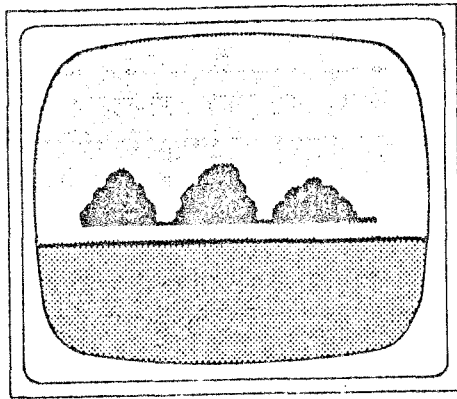
There you have it: your first background!

Preview the Background With Your Animation

Now you are ready to preview your animation and Background together. First, empty your Window if it is not already empty. Go to the Shape Page—press ESC, if necessary. (Get a different Shape File from the Utility Menu, if you want to.) Type A (for Action), then S1 (or whatever Sequence number you wish to view). Press the space bar to start your animation. You'll be able to move the figure around on the screen with the joystick and change the Frame Rate as you did in RECORD.

Keep the Background

You can store the Background in a Background file, just as you created a Shape file earlier. Here are the steps.

Type U to get to the COMPOSE Utility Menu. Remove the MOVIE MAKER Disk from the drive and insert a formatted disk to receive the file. Use the Selector Bar to select the KEEP FILE option. When you press RETURN, MOVIE MAKER prompts you for the type of file. Use the Selector Bar to choose the BACKGROUND option and press RETURN.

When MOVIE MAKER asks you which file to keep it is asking you for a file name. Again, use a name that is different from your other files but short and related to the Shape file it accompanies (for example, SHRUBS). Type your file name and press RETURN. Notice that the new file name appears immediately as the current Background (BKG) file at the bottom of the Utility Menu. This file will remain current until you tell MOVIE MAKER to get a different file.

Again, you should make some notes in your log to remind you what is in the file.

Recording Actors and Backgrounds

The process of RECORDing Actors is the same with a Background as it is with a blank Background; that is, you go to the RECORD section, get the Shape file that you want to use, get the Background file that you want to use, and then select RECORD. To record the first Actor, you type A1; to record the second, you type A2, and so forth. The Background file that you select will be the one that appears in your animation file. You may use different Backgrounds to create another animation. Experiment with this idea.

You'll find additional tips on recording and editing Actors and Backgrounds in Chapter 6.

5

Screen and File Housekeeping

When you're working with a microcomputer, keeping your work areas and files in proper order is not a luxury—it's positively a necessity! The following procedures will help you keep your MOVIE MAKER "studio" in order.

Viewing the Outlines

Ordinarily, only one Outline on a page is visible at a time—the current Outline. However, there may be other outlines around Shapes and parts of Shapes. To see all of the Outlines on your Shape Page, type V (for View). The current Outline will blink; the others will not. Anything on your screen outside of an Outline is not a Shape. Press V again or any other key to turn off View.

Overlapping Outlines

Outlines of various sizes and proportions can overlap a single drawing. Each portion of the drawing within an Outline will be a separate

Shape capable of being Sequenced. There are some situatio͏ ͏ ͏you'll discover where this technique can be useful. It also economizes on workspace.

Screen Housecleaning

Erasing Nonshapes

Sooner or later your work area will get cluttered with extraneous nonshapes. To clear the work, create a Window by pressing W. Make it as large as you wish by using the B command. Position it over anything you wish to remove and then type E for Erase. Of course, you can restore what you just Erased by typing R for Restore. When you are finished with your housecleaning, exit Window by pressing the space bar.

"Yanking" Unneeded Outlines

You may also have unneeded Outlines, empty or otherwise, in your work area. These may be removed one by one. To remove an unwanted Outline, first move the joystick or Arrow Keys to make it the "current" (blinking) Outline. Then type Y (for Yank). The Outline will vanish with a shwoooosh sound.

A YANKED OUTLINE CANNOT BE RECOVERED OR RESTORED!

All is not lost, however. The image will no longer be a Shape because it no longer has an associated Outline. To redefine the image as a Shape, type W to create a Window and O to create an Outline around it.

Clearing Memory

After you store any of your work in files, the work you stored will remain active (along with any work that you have not stored) in the computer's current "memory" until you either turn off the power or clear the m͏͏ory. Having this work clutter up the place can be a nuisance when you want to start working on something new.

Rather than turning off the power switch and destroying ALL of your work when you want to clear out the work space, it's much better to use the CLEAR MEMORY option. This lets you clear some things from active memory without destroying other things that you may wish to continue using. It also lets you continue without having to re-boot the MOVIE MAKER Disk.

You may use this option from the COMPOSE or RECORD, or SMOOTH Utility Menu. Simply move the Selector Bar over the words CLEAR MEMORY and press RETURN. The following menu will appear:

```
          MOVIE MAKER: COMPOSE
 ┌──────────────────────────────────────┐
 │  SHAPE                                │
 │  BACKGROUND                           │
 │  XTRA FUNCTION                        │
 │  UTILITY MENU                         │
 │                                       │
 │  Use ARROWS and RETURN to select      │
 │  .                                    │
 └──────────────────────────────────────┘
          CURRENT FILE
 ┌──────────────────────────────────────┐
 │  SHP                                  │
 │  BKG                                  │
 └──────────────────────────────────────┘
          CURRENT DRIVE: 1
```
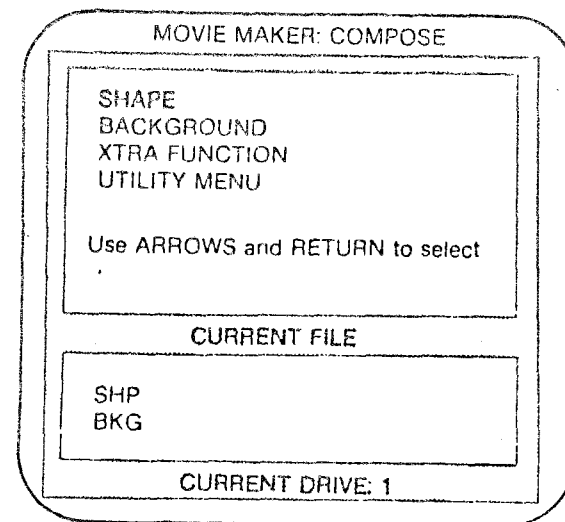
Move the Selector Bar over the word that describes what you want to erase from memory, check to be sure that you really do want to DESTROY this work, and then press RETURN. If you want to clear ALL of your work from current memory and start completely fresh, move the Selector Bar over the word "EVERYTHING," and press RETURN. Then you can start again without having to re-boot MOVIE MAKER.

WARNING: Use this option with care! Once you clt
something from memory, you can't get it back unless you
have previously stored it in a disk file.

File Housekeeping

Changing File Names

As you create more files, you may find it useful to rename some
of them to keep them straight. This is easy to do.

The Utility Menu in each section of MOVIE MAKER has an
option for Renaming files. You must be in the PLAY section to
Rename an MVM file. Other file types can be Renamed from any
other section.

To change a file name, just select the RENAME FILE option in
the appropriate section and follow the instructions that appear on
the screen. MOVIE MAKER will prompt you for the file type, the old
file name, and a new file name.

Deleting Files

The only reason ever to delete a file is if you absolutely have to
make room for something and you don't have another disk around.
(Otherwise, if you have some files you don't need, it's best to try to
reformat an entire disk for your new files so that you don't scatter
them helter-skelter throughout a lot of other disks.) If you absolutely
must delete a file, however, first be DOUBLY SURE that you can do
without it.

ONCE A FILE IS DELETED,
IT IS DESTROYED FOREVER!

The Utility Menu in each section of MOVIE MAKER has an
option for deleting files. You must be in the PLAY section to delete
an MVM file. Otherwise, you can Delete any other type of file from
either the COMPOSE, RECORD, or SMOOTH section.

To Delete a file, select the DELETE FILE option in the appropriate
riate section and follow the instructions that appear on the screen.

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MOVIE M. ..ER will prompt for the file type (except in PLAY) and the
name of the file to be deleted.

CAUTION: Stop and think before you type the file name
and press RETURN. MOVIE MAKER does not give you any
other warning, and once you press RETURN the file cannot
be retrieved.

If you change your mind in the middle of a deletion, backspace
to erase any file names you have typed in, and then press RETURN
to cancel the command.

Be very careful with this command, and always keep a backup
copy of your files!

Changing Drives

The Utility Menu in each section of MOVIE MAKER gives you
the option of selecting Drive 1 or Drive 2 to handle files. If you have
one disk drive, you should ignore this option. Just be sure that you
have the appropriate file disk in the drive before you select a menu
option or issue a command to a work file, or else MOVIE MAKER will
be unable to find the file and will issue a FILE NOT FOUND
message.

If you have two drives, you have the choice of selecting Drive 1
or Drive 2 to be the "current" drive (that is, the drive to receive
commands addressed to files). In general, you should select which-
ever drive contains the files you're addressing. If you need to address
files on two different disks, you can simply change the drive selection
instead of physically swapping the disks in and out of the same drive.

If you have two drives, you should ALWAYS keep the MOVIE
MAKER file in Drive 1 and use the other drive for your file disks. If
you have a lot of files on different disks, however, you may wish to
put file disks in both drives at times. Just remember which files are
located in which drive when you are changing the drive selection.

To change the drive assignment, choose the SELECT DRIVE
option from any of the Utility Menus. MOVIE MAKER will prompt you
for the drive number (1 or 2) you wish to be current.

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6

Creating Special Effects

Editing Your Movie

Once you lay down and smooth the basic animation Sequences, you have just begun to create! There are many additional refinements and special effects that you can add to your movie. You do this by editing--repeatedly going back over your movie to try out and add refinements. Fortunately, MOVIE MAKER enables you to try new things without fear of damaging your work. In fact, this is the best way to learn what MOVIE MAKER can do. You can experiment and see the results immediately. Then if you aren't satisfied with the effect, you can change it almost instantaneously. This is the real power of MOVIE MAKER!

Editing enables you to exercise your creative urges. You can go about as far as your own artistic talents and standards lead you. Experiment with MOVIE MAKER and you'll discover the sense that is built into it!

Several MOVIE MAKER commands and procedures facilitate this process.

Playback

When you are in the RECORD section, the commands P, G, and R turn off the recorder and put you in the Playback mode (green Help Line).

P—Playback

As we saw earlier, after recording an Actor, you can Playback the animation by typing P and a number from 1 to 9 to indicate the frame rate you desire. The space bar stops and starts Playback, and Playback cycles continuously.

G—Goto Frame

The command G followed by a number puts you in Playback and repositions the recorder at the frame number specified. You can use any number from 001 to 300, but note that on numbers below 100 you must include enough leading zeros to make three digits. If the number you specify is larger than the last frame recorded, MOVIE MAKER will go to the last frame recorded—a handy feature if you've forgotten the last Frame recorded.

If you type the G command without a number, MOVIE MAKER always goes to the First Frame (Frame 001).

R—Rewind

The Rewind command is like the P command, but in reverse. Typing R followed by a number between 1 and 9 sets the Frame Rate specified by the number, turns off the recorder, and puts you in reverse Playback. When you press the space bar, the recorder begins running Playback in reverse. The space bar stops and starts Rewind, and Rewind cycles continuously.

/ (SLASH)—The Frame Marker

The Slash (/) is used to mark a frame where the recorder will stop automatically. Whether you are recording or in Playback, the recorder will proceed to the marked frame and stop. Pressing the space bar will restart the recorder, which will continue to the last

recorded frame, cycle back to frame 001, and stop again at the marked frame.

To mark the Frame, stop the recorder on the desired Frame (or use the G command to get there), type a Slash (/), and then press the space bar to continue.

Once you mark a Frame with the Slash, the recorder will always stop at that frame unless you remove the mark. To remove a Frame Marker, simply type a Slash (/) again.

Shift-Arrow Keys

Holding down the SHIFT key and either the right or left Arrow Key enables you to view ahead one frame or back one frame, respectively. This can be very useful when you are editing several Actors. The SHIFT-ARROW keys work when you are recording and during Playback.

Freezing a Sequence

A Sequence can be frozen at any Shape in the Sequence. You can then animate with this one, unchanging Shape. There are three methods of doing this:

1. Record frame-by-frame. Set the Frame Rate to 0 (F0). Start the recorder with the space bar and record frame by frame by pressing the space bar repeatedly until you reach the Shape in the current Sequence that you wish to freeze. Release the Actor from your joystick by pressing the joystick button, and use the space bar to record as many frames as you wish. (Reset the Frame Rate, if necessary.) The Actor will remain frozen at the selected Shape in the Sequence until you pick it up again with the joystick button. In between frame changes, you can, if you wish, pick up the Actor, move it somewhere else on the screen, drop it, and continue to record.

2. Use the S0 and K0 command after getting to the Shape you want to freeze. The actor will be frozen at this Shape in the

Sequence while the recorder is running. Keep the Actor at the end of your joystick, and move it while the recorder runs.

3. Redefine a Sequence so that is consists of only one Shape (the Shape of the Actor to be frozen). See below.

Redefining Sequences

We are limited to redefining only nine Sequences because that is all than can be saved with a single Shape Page in a SHP file. It is possible to redefine a Sequence in RECORD, however, and thereby tap an unlimited number of Sequences! To redefine a Sequence, first press ESC to get into the Shape Page, then follow the same procedures for making a Sequence as in COMPOSE. Remember that defining a new Sequence rewrites any old Sequence having the same number.

Zooming

You may wish to Zoom in close to an Actor or part of the Background for several frames. To do this, go to the frame at which you wish to begin the Zoom (using Playback, Rewind, Goto Frame, or the SHIFT-ARROW keys) Then type Z2 or Z3. A large, rapidly blinking cross-hair will appear at the center of the screen. Position this cross-hair with the joystick or arrow keys and press the space bar to start the recorder. While recording, you can track an Actor by using the joystick to keep the cross-hair centered on the Actor. It is helpful to use a slower Frame Rate when tracking or panning in Zoom. You can also change the Zoom magnification on the fly by typing 1, 2, or 3 before you press any other keys. To terminate the Zoom, issue another RECORD command (A, C, G, N, P, or R), or press the space bar to stop the recorder and press ESC.

Expanding Shapes with "SCALE"

MOVIE MAKER has what is called an XTRA FUNCTION file named SCALE, which you can use to expand shapes to double their height or width. You can use it with any Window or any Shape that has an Outline around it.

You must be in COMPOSE to use SCALE. Use the GET FILE option to select the XTRA FUNCTION file named SCALE. Then select COMPOSE and press RETURN. When the Shape Page appears, move the Window or Outline over the area you wish to expand and type X. Then if you move the joystick, you will see the Outline double in size in the direction that the joystick moves. You may expand the Outline to the right or left, or up or down, as long as there is room on the page for the expanded shape.

CAUTION: Be sure to leave plenty of room when you work with SCALE because the expanded Shape will cover up any other Shapes or images that get in the way!

When the expanded Outline is in the positon you desire, press the joybutton. A visual sweep will cross the Outline and deposit an expanded Shape in its wake. This terminates the SCALE.

After you have expanded a Shape once, you can expand it again by typing X. You may keep expanding the Shape in any direction, as long as there is enough room on the page and an Outline does not exceed one quarter of a page in size.

Changing Actors, Sequences and Scenes

One Actor does not have to follow the same Sequence for the entire 300 frames or to remain on stage for the entire length of the movie. You can change Sequences at any time by typing Z followed by the number of a new Sequence. The new Sequence can include the same Snap or an entirely new set of Shapes. The Sequence change can be done either "on the fly" while the recorder is running, or after first stopping the recorder.

Erasing a Frame

When you are recording (red Help Line), it is possible to Erase one frame or several frames by typing E. Erase always works one frame at a time, but it the E key is held down it repeats and several frames can be Erased quickly.

When you Erase one or more frames, all subsequent frames are renumbered. For example, if you want to Erase frame number 20, you would go to that frame, (turn on the recorder with A if it were off), and type E. Frame number 20 would be Erased and the Frame Counter on the Help Line would change to 19. What had been frame number 21 would now be frame number 20, and so on.

Yanking a Single Actor

Rather than Erasing an entire frame and, consequently, all the Actors in that frame, it is possible to Yank any Actor from any frame or series of frames. To do this, first go to the desired frame (using Playback, Rewind, Goto Frame, or the SHIFT-ARROW keys). Then type A. You will see an Outline around one of the Actors. Move the joystick or press the arrow keys until the Outline moves around the Actor you wish to Yank. Notice which A-number appears on the Help Line. Type Y and the Actor will disappear! To Yank the Actor from the next frame, go to that frame, move the Outline or type the same A-number if necessary, then type Y again. Repeat this process for as many frames as you desire.

Repositioning an Actor

Suppose you discover some flaws in the placement of one or your Actors in a few frames here and there. You'd like to reposition the Actor in the offending frames only, without having to record the entire track again.

To reposition an Actor in any frame or series of frames, first go to the frame in question. If you know the exact frame number, the quickest way to get there is to type G and then the frame number. If you know only the approximate frame number, type G and the approximate number; then use the SHIFT-ARROW keys to get to the exact frame.

When you're at the desired frame, you can use the joystick to move any Actor in the frame to a new position. Type A followed by a number to specify the Actor to be moved. An Outline will mark the specified Actor, and a sound cue of rising pitch will indicate that the Actor is at the end of your joystick. Move the Actor to the new location with the joystick or Arrow Keys and press the joystick button to drop the Actor in place. A sound cue of descending pitch will indicate a successful drop. You can repeat this process in other frames to reposition the same Actor or others.

Changing Colors

RECORD starts out with the colors as they were defined in COM-POSE or as they were saved in the SHP and BKG files. Typing C followed by a number from 0 to 3 turns on the recorder and allows you to change the background color (number 0) or the other colors (numbers 1, 2, and 3). The last field of the RECORD Help Line tells you which color is current. Use the right and left Arrow Keys to control the color hue; use the up and down Arrow Keys to control the luminance, exactly as you did in COMPOSE. When you press the

space bar and start the recorder, the color changes will be recorded. You can stop the recorder to change colors, or change them on the fly by pressing the 1, 2, 3, 0, and Arrow Keys before entering any other commands.

You can change the four colors one at a time by following the same routine as for laying down Actors. That is, record one color, then record another color, and so forth. You can't "erase" a color, but you can change one that is already recorded by re-recording the color at a different setting.

Trading Colors

Sometimes it's useful to swap colors in part of a picture—that is have everything that was Color 1 become Color 2, and everything that was Color 2 become Color 1. You can get quite dramatic anima-tion effects this way, especially when you alternate the color swaps rhythmically—like a blinking light.

To Trade Colors, you must be in the COMPOSE section. You may trade any two colors within a Window or Outline. Type T (for Trade) followed by the numbers of the two colors to be Traded. For example, to Trade Colors 1 and 3, you would type T13 (or T31). Anything within the Outline or Window in Color 1 will be changed to Color 3, and *vice versa*. R will Restore your original colors.

By putting a Shape in a Sequence, then Trading Colors and adding the new Shape to the Sequence, you can get a Shape with alternating colors.

Adding Sounds

You may incorporate a variety of sounds into your movies with MOVIE MAKER. You do this by recording one to four sounds tracks onto your ANI file. You must get the sounds from the SND file on the MOVIE MAKER Disk, as it is not possible to make new SND files yourself.

The SND file in MOVIE MAKER is named SOUND. It contains a variety of musical notes and sound effects. There are four "Voices" in the file, and each Voice contains eight different "Noises" or sounds.

To preview these sounds, get into the RECORD section and use the GET FILE option to get the SND file from the MOVIE MAKER Disk. Select the RECORD option, type N (for Noise), then type V1 (for Voice 1). When you press any keys numbered 1 through 8, you'll hear organ notes. To stop an individual Noise, press the space bar. To cancel Voice 1, type V again.

To hear the sounds from Voice 2, type V2, and then press the number keys 1 through 8. You'll hear a variety of tones, crashes, and rhythmic sounds. Voice 3 contains more sounds like those on Voice 2, and Voice 4 contains low-pitched organ notes. You may preview them in the same way. Type N, the V-number, and then the number keys 1 through 8.

Sounds may be heard only in RECORD. They may not be heard in COMPOSE.

WARNING: If you move from RECORD to COMPOSE after recording some sounds, you will have to GET the SOUND file again when you return to RECORD. Use the KEEP File option to store the sounds in an ANI file before moving to the COMPOSE section.

To record sounds in your animation, use Playback, Rewind, Goto, or the SHIFT-ARROW keys to get to the frame where the sound recording is to begin. (It can begin at any frame except number 001.) Type N (for Noise) to turn on the recorder. The Help Line will turn red. Type V followed by a number from 1 to 4 to indicate the Voice track you wish to record. (The V-number specifies the Voice from which you draw sounds and the track that you are laying down in the ANI file.)

Press the space bar to start the recorder and then press the number keys to make a composition of Noises from the specified

Voice file while the recorder is running. Press the space bar to stop the recorder. Type 0 (zero) to turn off Noise but not the recorder.

You can listen to the various Noises of the current Voice at any time that the recorder is stopped by pressing the number keys.

You may record up to four Voice tracks on each ANI file. Each track will contain sounds from a single Voice. To record a second, third, or fourth Voice track, position the recorder at the desired frame, type N and another V-number. Press the space bar to begin recording and press the appropriate number key(s), as with the first Voice. While recording additional tracks, you will hear the previous Voices (unless they have been Quieted).

To erase a track, type the Voice number you wish to erase, type N0, and re-record the Voice. You'll actually be "recording" silence.

You can turn off the audio monitor of a recorder Voice (Quiet it) while recording additional Voices by stopping the recorder and typing Q followed by the number of the Voice you wish to Quiet. For example typing Q1 will silence Voice 1. (The sound will still be on the file, you just won't hear it when you start recording again.) To turn a Voice back on, type V followed by the number of the desired Voice. To Quiet or turn on several Voices, stop the recorder and repeat the respective commands for each Voice.

Adding Titles and Text

The MOVIE MAKER Disk has an Xtra Function file named TEXT that you can use to put type and graphic characters into your animation. You may have upper case letters, lower case letters, any graphic characters available on your computer, and the inverse versions of any of these.

To put text or graphics into your animation, you must be in COMPOSE. Use the GET FILE option to select the Xtra Function file

named TEXT. (The FNC file name will not be displayed as a current file on the COMPOSE menu.) Then select the COMPOSE option.

To type on the Shape or Background Page, first type X. A small square Window will appear. You may move it around with the joystick to position it where the first letter should appear. Then you can use your keyboard as a typewriter. Type a letter, and it will appear in the square. The Window will move one space to the right to get ready for the next letter. Each letter will be spaced automatically.

You can use the control keys to type graphic characters that are available on the ATARI computer. Press the space bar to leave a space. Press the ATARI key to produce inverse characters.

If you make a mistake, you may erase a character by placing the square Window over the character and pressing the space bar. To replace a character, first erase it, then reposition the square Window and type the correct character.

To terminate the Xtra Function mode, press ESC.

Once you have some text on a Shape or background page, you can move the whole block of text around by putting a Window around it. If you put it on the Shape page with an Outline around it, you can Sequence the block like any other Shape.

Managing Multiple Actors

Up to six Actors can be recorded. To record additional actors after the first one, use the P, R, or G command to get to the frame where the new Actor is to enter. Then type A followed by the number of the Actor to be recorded. Then type S followed by a number to specify the Sequence you desire to record. Press the space bar to start the recorder and record the Actor just as you did the first one.

When recording several Actors, the last Actor always records on top of the previous ones. That is, the last Actor will always appear to be in front of the previous actors. You can take advantage of this

feature to make it appear that an actor is going behind another Actor or behind part of the scenery.

For example, in COMPOSE you could define one Sequence as a single Shape of a tree. If you then selected this Sequence and a new Actor, you could place the tree Shape in the landscape, precisely positioned over one of the background trees. When the Actor is recorded, nothing will have seemed to change. However, if the tree Shape is recorded after a first Actor and before a third Actor, then the first Actor will always move behind the tree, and the third Actor will always move in front of the tree. By editing precisely and controlling the order of appearance of the various Actors, it is possible to have one actor move sometimes in front of and sometimes behind a piece of scenery or another Actor.

When recording additional Actors, it is sometimes necessary to know the location of other Actors in the frames ahead. You can use the SHIFT-ARROW keys for this purpose to view frames forward or backwards.

Keep in mind that if you stop recording an Actor before reaching frame 3000, the Actor will stand frozen while the remaining frames run. To avoid having one Actor freeze while others are moving through the later frames, Yank the Actor from the last frame you wish to have it appear in.

7

Tips for Advanced Animators

Making Your Own Play Disks

There are three ways to play your own MVM files:

1. You can boot the MOVIE MAKER Disk each time, go to the PLAY section, use the PICK FILE option to select one file, and then select the PLAY option to play the movie. This works fine for playing individual files, but it does take some time to boot MOVIE MAKER and get to the PLAY section. Also, you can't play a series of MVM files without returning to the Utility Menu to PICK a file each time.

2. You can boot the AUTOPLAY Disk, then while the beginning countdown is going from 10 to 1, slip the AUTOPLAY Disk out of the drive and insert the disk of your MVM files. When the countdown finishes, the MVM files on your disk will play one after the other in the order that they were recorded on the disk. This method plays more quickly than the first one.

3. You can make your own AUTOPLAY disk. First use your ATARI* DOS COPYDISK program to make a copy of the MOVIE M*KER AUTOPLAY Disk. (Copy the entire disk.) Then boot the

MOVIE MAKER Disk, go to the PLAY section, and Catalog the files on the copy. You will see several MVM file names. Use the DELETE FILE option to delete these files EXCEPT for the one named CNTDWN.INI. THE CNTDWN.INI file must remain on the disk!

You will then have an AUTOPLAY disk that will boot by itself and play any MVM files that you record on it or copy on to it. The MVM files will play one after another, in the order recorded on the disk. This is the best method for playing your MVM files quickly.

Getting the Most Out of the System

Like any computer system, MOVIE MAKER has certain limits. Here are some of the limits and some ways to deal with them. If you exercise some ingenuity in designing scripts and animations, you can develop solutions of your own.

1. Four Colors. MOVIE MAKER can use only four colors at a time on both the Shape Page and Background Page together. If you use some ingenuity, however, you can minimize this constraint. One way is to simplify your pictures. In animation, it usually takes only a few colors to suggest the effect you want. You can get the effect of a different color or texture by adding dots of a contrasing color to a Shape. Another technique is to stop recording in the middle of an animation file and change the background or Sequence colors before finishing the recording. You can also study how colors appear in different contexts, then use the combinations that best evoke the effect you desire.

2. Nine Sequences. Even though you can keep only nine Sequences at a time, the number of Sequences you can have in an ANI file is unlimited. By redefining your Sequences in the RECORD section, you can make a limitless number of Sequences available for any animation.

3. Sixteen Frames In a Sequence. If you're creating an animation Sequence that requires more than sixteen frames, you can probably simplify it to require fewer frames or else split the motion up into two or more Sequences. If you can't simplify it to fit one Sequence, try stringing more than one Sequence together to complete the planned movements.

4. Sixty-Four Shape Outlines on the Shape Page. If 64 Shapes are not enough for your animation, see if you can get the same animation effect with fewer Shapes or else try to simplify the "script" or movements to require fewer Shapes.

5. One-Quarter Screen for a Shape Outline. If you need a Shape to appear larger than a quarter of the screen, try Zooming in on it during recording, or using two Shapes together.

6. Six Actors. If you need to have more than six moving Actors on the screen at a time, see if you can group some of them together so that more than one figure or Shape can move together as a single Actor. (By putting more than one figure into the same Actor, the figures can do separate movements at the same time.)

7. Three-Hundred Frames in One Animation. To give the impression of greater length to an animation, use the slowest Frame Rate that will give a satisfactory impression of motion, use short scenes and frequent changes of Actors, and use as much animation (movement) as possible. To lengthen the actual running time of an animation, see if you can design the story to have the entire animation Loop more than once when you are PLAYing the MVM file. Finally, you can string more than one MVM file in succession on a PLAY Disk (see beginning of this chapter). There will be a pause between the files when the Disk is playing, but if you design your story carefully, you probably can make the pauses come at natural breaks in the story. Remember that you can have individual MVM files Loop more than once when you are playing a succession of PLAY files.

Timing Is Important

In animation, timing is crucial. Often a difference of one frame can make the difference between a successful sound or motion effect and one that misses the mark. Notice the Frame Counter during Playback, and proceed one frame at a time when you are editing critical scenes.

You Can Leave Out Some Details

With animation and the resolution of the microcomputer screen, one dot can mean a lot. It can be an eye, nose, mouth, or all three. Movements and expressions must be exaggerated to be noticeable. Your eye notices outlines and colors more than details when figures are moving. Take advantage of this fact when you are drawing Shapes. For ideas on how to leave out details, use the Zoom command to study the shapes in the following SHP files on the MOVIE MAKER Disk: ACTORS, DOG, SCIFI, and SPACE. Also use the space bar to study the demonstration animations on the AUTOPLAY disk.

Tricks With Actors and Backgrounds

It is possible to have what appears to be a Background actually be an Actor. By recording an Actor composed of "background" elements, you can have the "background" spring into life or move off the stage.

You can use the same technique to "change scenes" during an animation. The trick is to create the Background or part of it as a one-frame Sequence that Loops continuously. By recording the Background Sequence first, it will serve as a separate Actor, and the other Actors will appear to move in front of it. You can replace it later with another "background" Actor. To avoid problems in moving

back and forth between RECORD and COMPOSE, make it a habit to record sound effects last! (See below.)

You can also have one figure "grow" out of another. Just assemble a short Sequence of Shapes in which parts of the first figure are progressively replaced with parts of the second figure. Then when you record the Sequence, the second figure will appear to grow out of the other (animators call this "metamorphosis").

Varying the Speed and Amount of Animation

You can actually vary the speed of animation several ways. The Frame Rate is the most obvious and easy to use. The Kwickness command can be effective when you want to show one Actor slowing down while another Actor continues to move at the regular rate. The Jump command affects the speed of animation in a subtle way. When an Actor moves a greater distance with each move, it appears to move faster, even though the speed of animation is unchanged. You will have to experiment with these different speed commands to get the "feel" of each in different situations.

The amount of animation needed for any particular effect usually depends on the circumstances. The trick is to make the movement noticeable. And if other Actors move in response to each other, the effect is even more dramatic. If you Zoom in and fill the screen with action, the effect is very dramatic indeed.

Tips on Using Sound

Sounds can heighten the sense of anticipation and action. A little sound goes a long way. Sounds can also provide rhythmic and audio cues to help identify Actors and events. Timing sounds to coincide precisely with the action is critical. First record the action, then put the sounds in to appear at exactly the right moment. Don't

overlook the possibility of "layering" sounds—recording several tracks of sound on the same frames. This can be especially effective when the different sounds have contrasting "textures" and rhythms, or when you give each Actor a distinctive sound keyed to its particular character and speed of movement.

Registration

All Shapes and Actors are registered from the bottom center of their Outlines. You can make a single Shape jump up and down by creating several Outlines of varying heights.

§

Summary of MOVIE MAKER Commands

NOTE: Most MOVIE MAKER commands require only a single key stroke — either a letter or special key. A few commands require a letter followed by an arrow or one or two numbers. In this list, if a command needs a number, the range of possible numbers for the command is enclosed in brackets. For example, the notation P[0-3] means that you should type the letter P followed by a number 0, 1, 2, or 3.

Compose Section

COMMAND	NAME	FUNCTION
DRAWING AND SEQUENCE COMMANDS		
P[0-3]	Pen	Draw with Joystick or Arrow Keys, using specified Color (0-3). Default is P1. (Must be done within an Outline on Shape page. Joybutton or CTRL must be held down.)

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W	Window	Create a Window so that an image can be moved, duplicated or defined as a Shape.
O	Outline	Create an Outline beneath the current Window; transform a drawing into a defined Shape.
B	Border	Change size and shape of a Window or Outline. (Joybutton must be pressed to establish the corners.)
D	Duplicate	Duplicate a Shape or part of a Shape located within a Window. (Joybutton must be pressed to deposit a duplicate Shape. Space bar cancels.)
M (Arrow Key)	Mirror	"Flip" a Shape located within a Window or Outline horizontally or vertically to produce its mirror image. (Arrow Key indicates direction that the image flips.)
Z[1-3]	Zoom	Magnify an image to view it close up. Default is Z1.
S[1-9]	Sequence	Define a Sequence of up to 16 Shapes; specify a Sequence to preview. Default is S0. (Up to 9 Sequences may be defined at a time.)
X	Xtra Function	Activate current Xtra Function (TEXT or SCALE).

COLOR COMMANDS		
C[0-3]	Color	Assign current Color with arrow keys. Default is C1.
I	Insert Color	Insert current Color into a boundary, Shape or Window.
T[0-3]	Trade Colors	Swap any two current Colors.

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F[0-9]	Frame Rate	Set speed at which frames are changed under A (Action) command. Default is F4. (High numbers are fastest. F0 steps one frame at a time.)
J[0-9]	Jump	Set the Jump distance for animation movements. Default is J0. (J0 sets accelerating Jump distance.)
K[0-9]	Kwickness	Set number of frames to be run for each Shape in a Sequence. Default is K1. (K0 freezes the Shape until changed.)

EDITING COMMANDS

E	Erase	Erase everything within a Window or Outline.
R	Restore	Restore everything changed by previous E, I, P, or T command. (Must immediately follow command to be restored.)
Y	Yank	Delete current Outline.
V	View	Display all existing Outlines (Toggles on and off.)

PREVIEW COMMANDS

A	Action	Prepare current Sequence for action on the Background Page. (Space bar starts and stops the action.)
L[0-9]	Loop	Set number of times Sequences are to cycle. Default is L0. (L0 sets continuous play.)

MISCELLANEOUS COMMANDS

H	Help Line	Toggle the Help Line on and off.
U	Utility Menu	Go to Utility Menu of current section.

SPECIAL KEYS

ESC Key	Swap Shape and Background Pages on the screen.
Space Bar	Cancel most drawing commands; start and stop action.
Joybutton	Lift and deposit Outlines; lift and deposit images and Shapes with the Duplicate Window; activate P (Pen) command; fix corners of B (Border) command; start and stop action.
Up and Down Arrow Keys	Review Shapes; change luminance (0-7) with C (Color) command.
Left and Right Arrow Keys	Change hue (00-15) with C (Color) command.

Record Section

COMMAND	NAME	FUNCTION

RECORDING AND SEQUENCE COMMANDS

A[1-6]	Actor	Turn on recorder and record specified Actor on background page. (Up to 6 Actors may be in memory at a time.)
L[0-9]	Loop	Set number of times Sequences are to cycle. Default is L0. (L0 sets continuous play.)

S[1-9]	Sequence	Define a Sequence of up to 16 Shapes; specify Sequence to be recorded. Default is S0. (Up to 9 Sequences may be defined at a time.)
Z[1-3]	Zoom	Record specified Zoom magnification. Default is Z1. (May be changed on the fly.)

COLOR COMMANDS

C[0-3]	Color	Turn on recorder and record changes in specified Color using Arrow Keys. Default is C1. (May be changed on the fly.)

SPEED COMMANDS

F[0-9]	Frame Rate	Set speed at which frames are changed under A, C, N, P, R and Z commands. Default is F4. (High numbers are fastest. F0 steps one frame at a time.)
J[0-9]	Jump	Set the Jump distance for animation movements. Default is J1. (J0 sets accelerating Jump distance.)
K[0-9]	Kwickness	Set number of frames to be run for each Shape in a Sequence. Default is K1. (Normal is K1. K0 freezes the Shape until changed.)

SOUND COMMANDS

N[0-8]	Noise	Turn on recorder and record a specified sound (1-8) from the current Voice. (Space bar starts and stops recording. N0 turns off Noise.)
Q[1-4]	Quiet	Turn off audio monitor of a specified Voice during recording or Playback.

V[1-4]	Voice	Designate a Voice track (1-4) to record using the N (Noise) command. Default is V1. (To try out sounds, with recorder stopped, type a V number, then type N and press number keys 1-8 to hear sounds.)

EDITING COMMANDS

E	Erase	Erase the current frame while recording under A, C, N, or Z command.
G	Go to Frame	Go to frame 001
G[001-300]	Go to Frame	Go to specified frame (001-300). (Restarts Playback at that frame.)
Y	Yank	Delete Outlined Actor from current frame during recording (A, C, N, or Z).
/ (Slash)	Frame Marker	Mark a frame for automatic halt during recording or Playback.

PLAYBACK COMMANDS

P[0-9]	Playback	Turn off recorder and begin Playback. Default is P4. (Number specifies the Frame Rate. P0 sets frame by frame mode.)
R[0-9]	Rewind	Turn off recorder and begin Playback in reverse. Default is R4. (Number specifies the Frame Rate. R0 sets frame by frame mode.)

MISCELLANEOUS COMMANDS

H	Help Line	Toggle the Help Line on and off.
U	Utility Menu	Go to Utility Menu of current section.

| Shift/Arrow Keys | Single step forward (Right Arrow) and backward (Left Arrow) through frames; during recording or Playback. |
| ESC Key | Swap Shape and background pages on the screen. |

Space Bar Start and stop recorder and Playback.

Joybutton	Lift and deposit Outlines and Actors; pause during A, C, N, P, R, and Z commands.
Up and Down Arow Keys	Change luminance (0-7) with C (Color) command.
Left and Right Arrow Keys	Change hue (00-15) with C (Color) command.
CTRL/Arrow	Review shapes.

Appendix A

What To Do When Things Go Wrong

MOVIE MAKER is very forgiving of your mistakes. It lets you experiment with commands and usually just ignores mistakes. If there is a problem with disk activities, it gives you an error message on the Utility Menu screen saying what is wrong.

It is possible, however that the system may refuse to respond to one of your commands or will "hang"—just freeze up and not respond to any commands or keystrokes. If this happens, here is what to do:

● If the system won't execute a particular MOVIE MAKER command (but will respond to other commands) . . .

There is probably an error in the way you're issuing the command:

a. Check to be sure that you're in the right section of MOVIE MAKER. (Is it a command that can be used only in COMPOSE or only in RECORD?)

b. Check to see if you have the right MOVIE MAKER page on the screen. (Are you trying to put an Outline on the Back-

ground Page? Are you trying to type A in COMPOSE be.
your Window is empty?)

   c. Check to see if you have typed the COMMAND syntax
correctly. (Have you left off a number from a command or typed
a number outside the proper range?)

● If the system "hangs" . . .

You probably issued a command or combination that the
computer can't understand or a command that can't be executed.

   a. Check to see if you have the appropriate disk in the approp-
riate drive and that the drive door is properly closed. If not, cor-
rect the problem and press RETURN a few times. If the system
still hangs, you'll have to re-boot the MOVIE MAKER Disk.

   b. If you have a Shape or Background Page on the screen,
try pressing the space bar a few times. If that doesn't free the
system, type U. If you can't get the Utility Menu on the screen,
then the program has "bombed," and you'll have to re-boot the
MOVIE MAKER Disk.

   c. If you have a menu on the screen, try pressing RETURN
a few times. If that doesn't free the system, the program has
"bombed," and you'll have to re-boot the MOVIE MAKER Disk.

Try to avoid re-booting the MOVIE MAKER DISK, if possi-
ble, because it will erase all your work that has not been
saved in a disk file!

● If a disk drive runs on and on but won't complete a command
. . . OR if you get a persistent error message on the screen that the
computer can't read your file disk . . .

Your disk may be damaged, or there may be a problem with the
drive.

   a. Is the disk drive door closed?

   b. See he computer can read a similar disk. (Be sure that
it's properly formatted.) If it can, your first disk is probably
damaged.

   c. If the computer can't read any disks at all, there may be a
problem with the drive,. Try turning off the drive, opening the
door, reseating the disk, then closing the door and turning the
drive back on. You may have to re-boot the MOVIE MAKER Disk.
If the problem continues, consult your microcomputer service
center.

Shift/Arrow Keys	Single step forward (Right Arrow) and backward (Left Arrow) through frames; during recording or Playback.
ESC Key	Swap Shape and background pages on the screen.

Space Bar Start and stop recorder and Playback.

Joybutton	Lift and deposit Outlines and Actors; pause during A, C, N, P, R, and Z commands.
Up and Down Arrow Keys	Change luminance (0-7) with C (Color) command.
Left and Right Arrow Keys	Change hue (00-15) with C (Color) command.
CTRL/Arrow	Review shapes.

Appendix A

What To Do When Things Go Wrong

MOVIE MAKER is very forgiving of your mistakes. It lets you experiment with commands and usually just ignores mistakes. If there is a problem with disk activities, it gives you an error message on the Utility Menu screen saying what is wrong.

It is possible, however that the system may refuse to respond to one of your commands or will "hang"—just freeze up and not respond to any commands or keystrokes. If this happens, here is what to do:

• If the system won't execute a particular MOVIE MAKER command (but will respond to other commands) . . .

There is probably an error in the way you're issuing the command:

a. Check to be sure that you're in the right section of MOVIE MAKER. (Is it a command that can be used only in COMPOSE or only in RECORD?)

b. Check to see if you have the right MOVIE MAKER page on the screen. (Are you trying to put an Outline on the Back-

Appendix B

Glossary

Actor   An independently controlled Sequence or several Sequences of Shapes.

Animation   The process of creating the illusion of movement in a series of still images, each image slightly different from the one before. When one flips rapidly through such a series or sequence of images, the phenomenon of persistence of vision creates the illusion of movement.

Autoplay   An AUTOPLAY disk is one that will boot automatically when the computer is turned on. It plays MOVIE MAKER MVM files one after another.

Background   A passive graphic image or scene over which the animation of Shapes takes place.

Boot   To load a program into the computer's memory from a disk, thereby enabling the computer to operate.

Catalog   A list of the files on a disk. To catalog a disk is to display the file names.

Cel   A single component of a Sequence; a Shape.

Cross-Hair   See cursor.

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Cue   /)nal that confirms an activity. MOVIE MAKER employes sound cues and visual cues to confirm processes such as lifting and putting down Shapes and creating Outlines.

Cursor   In MOVIE MAKER, a cursor is a screen marker indicating the position for action by the D, I, P, and Z commands.

File   An area on a disk used to store data permanently. Unlike the data stored within a computer, data stored on a disk is not lost when the computer is turned off.

Flicker   The momentary loss of an image between frames. In MOVIE MAKER, flicker is eliminated by using the SMOOTH section.

Font   The entire set of graphic symbols constituting an alphabet, including letters, numerals, punctuation symbols, and special characters.

Frame   In MOVIE MAKER, a frame is analogous to a single exposure of film in traditional animation.

Function   Any one of MOVIE MAKER's capabilities, such as Action, Erase, KEEP File, etc.

Get (or PICK)   To choose a file from a disk and bring it into the computer's memory so that the computer can act on the information stored in the file.

Hue   One of the 16 colors available on the ATARI microcomputer. Each hue has eight luminance levels.

Keypress   A single press of any key on the keyboard. Most commands in MOVIE MAKER require only one or two keypresses.

Loop   A single cycle or run-through of one or more Sequences.

Luminance   Refers to the degree of brightness of a color. There are eight luminance levels for each ATARI color or hue.

Memory   The area inside a computer where data is stored for processing while the computer is running; distinct from disk storage.

Menu   A display of options which are either program or disk activities. MOVIE MAKER has one Main Menu and four utility menus (one for each section). There are also additional menus for certain functions in some sections.

Mode   The state a computer is in as it performs a particular set of one or more functions.

On the fly   To do something "on the fly" means to do it while some action, such as playing an animation, is going on.

Outline   A thin-sided rectangle that indicates and defines the border of a MOVIE MAKER Shape.

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Page   A screenful of Shapes or a Background scene, or the blank
        on which these Shapes or Backgrounds are drawn.

Pick   See GET.

Pixel   The smallest addressable element of a computer screen.

Selector Bar   The lighted bar on MOVIE MAKER menus which the user
        moves to select functions to be performed.

Sequence   A redefinable series of Shapes displayed in succession to
        create an animated image.

Screen   See page.

Shape   Often called a sprite. A small graphic image capable of being
        moved independently around the screen.

Sweep   A visual sweep or a Shape sweep is a movement of light on the
        screen that confirms the creation of a new Outline.

Toggle   A switch activated by a keypress. Pressing the key once turns a
        function on; pressing it again turns the function off. Examples in MOVIE
        MAKER include H, V, /, and the space bar.

Window   In MOVIE MAKER, a rectangle with thick sides used with the
        joybutton to duplicate, mirror, pick up, and deposit images and Shapes
        on the screen. It is used with the D, E, M, O, and B commands.

Appendix C

Using MOVIE MAKER In Your Own Programs

MOVIE MAKER was designed to provide the consumer with a powerful yet easy to use tool for making animation. It was not intended as a programmer's development tool. A version of MOVIE MAKER, MOVIE MAKER PROFESSIONAL is available on a licensed basis directly from Interactive Picture Systems, Inc., 270 Park Avenue South, New York, NY 10010.

A good programmer may, however, use MOVIE MAKER to a limited extent in software development. Certainly MOVIE MAKER is ideal for storyboarding and previewing animated sequences. Also, with a little know-how, the programmer may use image data generated by MOVIE MAKER in programs.

Both the SHAPE and BACKGROUND pages were left unprotected by IPS to accommodate the serious programmer and hobbyist. These files are, for all intents and purposes, Graphics 7 image files.

Using a BACKGROUND created in MOVIE MAKER is as simple as loading it into your program at the proper address. The trick is the

Appendix B

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Autoplay   An AUTOPLAY disk is one that will boot automatically when the computer is turned on. It plays MOVIE MAKER MVM files one after another.

Background   A passive graphic image or scene over which the animation of Shapes takes place.

Boot   To load a program into the computer's memory from a disk, thereby enabling the computer to operate.

Catalog   A list of the files on a disk. To catalog a disk is to display the file names.

Cel   A single component of a Sequence; a Shape.

Cross-Hair   See cursor.

Cue   / I that confirms an activity. MOVIE MAKER employes sound cues and visual cues to confirm processes such as lifting and putting down Shapes and creating Outlines.

Cursor   In MOVIE MAKER, a cursor is a screen marker indicating the position for action by the D, I, P, and Z commands.

File   An area on a disk used to store data permanently. Unlike the data stored within a computer, data stored on a disk is not lost when the computer is turned off.

Flicker   The momentary loss of an image between frames. In MOVIE MAKER, flicker is eliminated by using the SMOOTH section.

Font   The entire set of graphic symbols constituting an alphabet, including letters, numerals, punctuation symbols, and special characters.

Frame   In MOVIE MAKER, a frame is analogous to a single exposure of film in traditional animation.

Function   Any one of MOVIE MAKER's capabilities, such as Action, Erase, KEEP File, etc.

Get (or PICK)   To choose a file from a disk and bring it into the computer's memory so that the computer can act on the information stored in the file.

Hue   One of the 16 colors available on the ATARI microcomputer. Each hue has eight luminance levels.

Keypress   A single press of any key on the keyboard. Most commands in MOVIE MAKER require only one or two keypresses.

Loop   A single cycle or run-through of one or more Sequences.

Luminance   Refers to the degree of brightness of a color. There are eight luminance levels for each ATARI color or hue.

Memory   The area inside a computer where data is stored for processing while the computer is running; distinct from disk storage.

Menu   A display of options which are either program or disk activities. MOVIE MAKER has one Main Menu and four utility menus (one for each section). There are also additional menus for certain functions in some sections.

Mode   The state a computer is in as it performs a particular set of one or more functions.

On the fly   To do something "on the fly" means to do it while some action, such as playing an animation, is going on.

Outline   A thin-sided rectangle that indicates and defines the border of a MOVIE MAKER Shape.

SHAPE page. What is needed are the location, heigh.. .ind
e individual shapes. They are not player/missiles!
 artist create the images and shapes for the program.
te the artist fairly. An artist can save the programmer an
le amount of time and create far more interesting gra-
MOVIE MAKER. Tell the artist how many Sequences to
how many shapes to put in each Sequence. Also, suggest
ist make the Shapes all the same size. Remember that in
AKER all Shapes have been registered from the bottom
 the top left. Color 0 is transparent.
number the Shapes and copy them to the screen in the
artist put them. Add paths, joystick routines, collision
and game play. You are off to a great start!

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MOVIE MAKER LOG

Animator: _____
Title: _____
Shape File: _____
Animation File: _____
Starting Color _____

Date: _____
Background File: _____
MOVIE MAKER File: _____

Frame	Actor 1 2 3 4 5 6	Color 0 1 2 3	Voice 1 2 3 4	Frame Rate	Zoom	Comment
001						
002						
003						
004						
005						
006						
007						
008						
009						
010						
011						
· · ·						
300						

COMMAND	NAME	FUNCTION	DEFAULT

DRAWING AND SEQUENCE COMMANDS

COMMAND	NAME	FUNCTION	DEFAULT
P [0-3]	Pen	Draw with Joystick or Arrow Keys, using specified Color (0-3)	P1
W	Window	Create a Window so that an image can be moved, duplicated, or defined as a Shape.	
O	Outline	Create an Outline beneath the current Window; transform a drawing into a defined Shape.	
B	Border	Change size and shape of a Window or Outline.	
D	Duplicate	Duplicate a Shape or part of a Shape located within a Window.	
M (Arrow Key)	Mirror	"Flip" a Shape located within a Window or Outline horizontally or vertically to produce its mirror image.	
Z [1-3]	Zoom	Magnify an image to view it close up.	Z1
S [1-9]	Sequence	Define a Sequence of up to 16 Shapes; specify a Sequence to preview.	S0
X	Xtra Function	Activate current Xtra Function (TEXT or SCALE).	

COLOR COMMANDS

COMMAND	NAME	FUNCTION	DEFAULT
C [0-3]	Color	Assign current Color with Arrow Keys.	C1
I	Insert Color	Insert current Color into a boundary, Shape, or Window.	
T [0-3] [0-3]	Trade Colors	Swap any two current Colors.	

SPEED COMMANDS

COMMAND	NAME	FUNCTION	DEFAULT
F [0-9]	Frame Rate	Set speed at which frames are changed under A (Action) command.	F4
J [0-9]	Jump	Set the Jump distance for animation movements.	J0
K [0-9]	Kwickness	Set number of frames to be run for each Shape in a Sequence.	K1

EDITING COMMANDS

COMMAND	NAME	FUNCTION	DEFAULT
E	Erase	Erase everything within a Window or Outline.	
R	Restore	Restore everything changed by previous E, I, P, or T command.	
Y	Yank	Delete current Outline.	
V	View	Display all existing Outlines.	

PREVIEW COMMANDS

COMMAND	NAME	FUNCTION	DEFAULT
A	Action	Prepare current Sequence for action on the Background Page.	
L [0-9]	Loop	Set number of times Sequences are to cycle.	L0

MISCELLANEOUS COMMANDS

COMMAND	NAME	FUNCTION	DEFAULT
H	Help Line	Toggle the Help Line on and off.	
U	Utility Menu	Go to Utility Menu of current section.	

SPECIAL KEYS

COMMAND	NAME	FUNCTION	DEFAULT
	ESC Key	Swap Shape and Background Pages on the screen.	
	Space Bar	Cancel most drawing commands; start and stop action.	
	Joybutton	Lift and deposit Outlines; lift and deposit images and Shapes with the Duplicate Window; activate P (Pen) command; fix corners for B (Border) command; start and stop action.	
	Up and Down Arrow Keys	Review Shapes; change luminance (0-7) with C (Color) command.	
	Left and Right Arrow Keys	Change hue (00-15) with C (Color) command.	

Command	Name	Description	Default
A [1-6]	Actor	Turn on recorder and record specified Actor on Background Page.	
L [0-9]	Loop	Set number of times Sequences are to cycle.	
S [1-9]	Sequence	Define a Sequence of up to 16 Shapes; specify Sequence to be recorded.	50
Z [1-3]	Zoom	Record specified Zoom magnification.	Z1

COLOR COMMANDS

Command	Name	Description	Default
C [0-3]	Color	Turn on recorder and record changes in specified Color using Arrow Keys.	C1

SPEED COMMANDS

Command	Name	Description	Default
F [0-9]	Frame Rate	Set speed at which frames are changed under A, C, N, P, R, and Z commands.	F4
J [0-9]	Jump	Set the Jump distance for animation movements.	J1
K [0-9]	Kwickness	Set number of frames to be run for each Shape in a Sequence.	K1

SOUND COMMANDS

Command	Name	Description	Default
N [0-8]	Noise	Turn on recorder and record a specified sound (1-8) from the current Voice.	
Q [1-4]	Quiet	Turn off audio monitor of a specified Voice during recording or Playback.	
V [1-4]	Voice	Designate a Voice track (1-4) to record using N (Noise) command.	V1

EDITING COMMANDS

Command	Name	Description	Default
E	Erase	Erase the current frame while recording under A, C, N, or Z command.	
G	Go to Frame	Go to Frame 001.	
G [001-300]	Go to Frame	Go to specified frame (001-300).	
Y	Yank	Delete Outlined Actor from current frame during recording (A, C, N, or Z).	
/ (Slash)	Frame Marker	Mark a frame for automatic halt during recording or Playback.	

PLAYBACK COMMANDS

Command	Name	Description	Default
P [0-9]	Playback	Turn off recorder and begin Playback.	P4
R [0-9]	Rewind	Turn off recorder and begin Playback in reverse.	R4

MISCELLANEOUS COMMANDS

Command	Name	Description
H	Help Line	Toggle the Help Line on and off.
U	Utility Menu	Go to Utility Menu of current section.

SPECIAL KEYS

Key	Description
Shift/Arrow	Single step forward (Right Arrow) and backward (Left Arrow) through frames; during recording or Playback.
ESC Key	Swap Shape and Background Pages on screen.
Space Bar	Start and stop recorder and Playback.
Joybutton	Lift and deposit Outlines and Actors; pause during A, C, N, P, R, and Z commands.
Up and Down Arrow Keys	Change luminance (0-7) with C (Color) command.
Left and Right Arrow Keys	Change hue (00-15) with C (Color) command.
CTRL/Arrow	Review Shapes.