

A R C A D E

Game Construction Kit™

User's Manual



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ARCADE

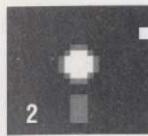


Game Construction Kit™

By Mike Livesay

User's Manual

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Dedication

To my wife Cynthia, for her patience and unfaltering support during the development of this product.

Credits

- AGCK Design,**
- Music and Programming:** Mike Livesay
- Product Manager:** Gregory Hammond
- Sample Games,**
- Music and Sound Effects:** Gregory Hammond, Paul Reiche III, Greg Johnson, Don Daglow
- Sample Game Graphics:** Gregory Hammond, Greg Johnson, Paul Reiche III
- Title Screen Graphics:** Arturo Sinclair
- Manual Written by:** Leo LeGallienne
- Tested By:** Will Naber, Warren Yamashita, and the Brøderbund Quality Assurance Department
- Special Thanks To:** Russell Sipe, Johnny Wilson, Arnie Katz, Bill Kunkel, Joyce Worley



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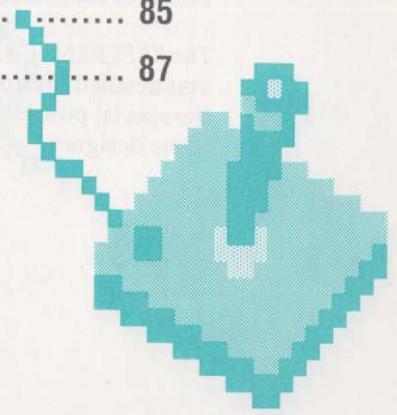
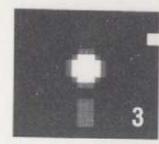
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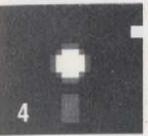
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Introduction: Having Fun with AGCK in 5 Minutes

Welcome to the Arcade Game Construction Kit! This manual will tell you how to use all the power built into the AGCK system. It is divided into two sections: a TUTORIAL SECTION to help you get started, and a REFERENCE SECTION to let you learn all the power of the system. But first, let's let you have fun with the games. Here's how to start having fun in five minutes:

If you want to start by playing a game... turn to page 6 and read PLAYING YOUR FIRST AGCK GAME. This is a great way to start learning AGCK.

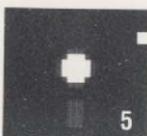
If you want to start modifying a game to make it play the way you want it... turn to page 8 and read MAKE THE GAME PLAY YOUR WAY. This is a tutorial designed to give you an easy way to start learning how to use the editors to build your own games.

When you're ready to build your first game from scratch... be sure to read MIKE LIVESAY'S GAME DESIGN TIPS, on page 75. Mike is one of the finest programmers in the business and has been writing arcade and action games for years. Anyone who wants to be a game designer will learn a lot from his special hints on how to use the system.

Note: We suggest you practice modifying games before you try writing one from scratch—it really is the fastest way to learn all the power of the system.

The REFERENCE SECTION of this manual, starting on page 15, gives you detailed information on all the options of AGCK. Use it to learn all the special powers of AGCK as you grow to become an experienced game designer.

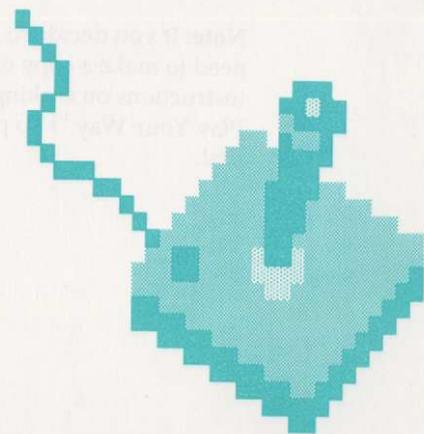
Introduction: Having Fun with AGCK in 5 Minutes



We've had a lot of fun working with Mike Livesay to create AGCK for you. We hope you have lots of fun using it, and that you and your friends enjoy playing the games you design.

If you have any comments about AGCK, we'd love to hear them. Please write to:

Arcade Game Construction Kit Comments
Brøderbund Software
17 Paul Drive
San Rafael, California 94903



Tutorial Section: Playing Your First AGCK Game

This chapter of the manual is in a hurry, because we want you to be playing a game and having fun in five minutes! Here are the five steps you need to take to play a game:

1. Place the AGCK Disk in your disk drive and type:
LOAD ",",8,1
In a few moments you'll see the AGCK Title Screen and hear the theme music.
2. Press the joystick button and you'll see the Main Options Menu. Use the joystick to move the cursor over the word **PLAY** and press the joystick button. The disk drive will whirl for a few moments and then a window will appear and ask you to **INSERT GAME**.
3. Take out your AGCK Disk, turn it over, and put it into the disk drive upside down. You're doing this because the 50-level game "Labyrinth Master" is on the back of the disk, ready for you to play. (**Note: if you were playing a game on a different disk, this is when you'd put that disk in the disk drive**). Move the cursor over the "OK" in the little window and press the button. The disk drive will whirl again and then display the game's title screen.
4. Move the cursor over the word **PLAY** in the bar at the top of the screen and press the button. The game will start, and you're ready to experience the power of the Arcade Game Construction Kit!

Note: If you decide to make any changes to "Labyrinth Master" you'll need to make a copy of the game from which to work. (See page 8 for instructions on making a game disk in the chapter, "Make the Game Play Your Way.") To play the game, you don't need to make a copy first.

Tutorial Section: Playing Your First AGCK Game

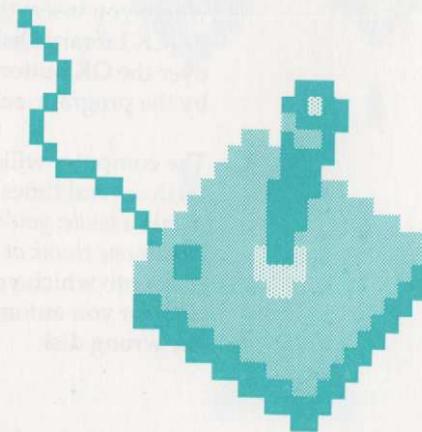
INSTRUCTIONS FOR "LABYRINTH MASTER"

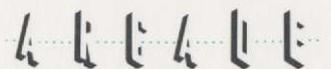
Labyrinth Master, the game you're about to play, is a game of action and adventure set in a very large and very dangerous castle. As the player, you portray the Wizard, a magician dedicated to the forces of good and opposed to all forms of evil. You also enjoy picking up gold and treasures that happen to be lying around!

Use your joystick to control the Wizard. In the first screen of the game you're in a large, empty room deep inside the castle. You can leave the room by going up, down, right or left. Pressing the joystick button causes the Wizard to magically throw a fireball in the direction in which he's moving.

Watch out for ghosts, monsters and all sorts of ghoulish meanies as you wander through the castle. There are trick doors, hidden monsters and enough surprises to fill five horror movies. And every single feature was built using AGCK, with no extra programming tricks or added programming.

If you can survive all 50 levels of the game you'll reach the Inner Sanctum. Then you'll be ready to go back and take the game apart, learn all its secrets, and start changing it to make it play the way you want it to play. With AGCK, it's *you* who gets to design the game.





Tutorial Section: Make the Game Play Your Way

This chapter will lead you through all the things you need to know to change a game to make it play the way you want it to play. We'll take one of the Sample Games from a Library Disk, make a copy of it, and then change it to make the game play differently. We'll also give you some ideas on creating new levels of your own, and for each section indicate where in this manual you can look for detailed instructions on using all the power of AGCK.

Before we start, you'll need to have a blank disk or one which contains files or data you want to erase. Everything else you need is inside the AGCK package.

STEP 1: Copy the Game You Want to Modify Onto Your Disk

- A. After booting AGCK (see page 6 for instructions), you'll see the title screen. Press the joystick button to go to the Main Menu, which offers you the choices of EDITORS, OPTIONS and PLAY. Place the cursor over the OPTIONS menu item and hold down the joystick button (don't just press it—you have to hold it down); this is called "pulling down" the menu. A set of additional choices will appear. Move the cursor over the choice DISK UTILITIES and release the joystick button. This "selects" that menu item.
- B. You're now offered the choices CREATE DISK and COPY PARTS. Pull down the CREATE DISK menu and select GAME DISK. A window will appear and will ask you to INSERT SOURCE. This is where you insert the disk you wish to copy. Take Side A of the AGCK Library Disk and insert it in the drive, then place the cursor over the OK button and press the joystick button. When prompted by the program, select the "AGCK TUTORIAL".
- C. The computer will lead you through trading the disks back and forth several times to make the copy. *Don't worry if the process seems to take a while: you're copying a lot of data and the computer can only handle one chunk at a time.* The TARGET disk it asks for is the blank disk onto which you're copying the game; AGCK will format this disk for you automatically. The computer won't let you copy onto the wrong disk.

Tutorial Section: Make the Game Play Your Way

- D. When the process is complete, place the cursor in the little box in the upper left hand corner of the screen (the "done button") and press the joystick button. This takes you back to the Main Options Menu after asking you to confirm your choice. The "F1" key on the Commodore has the same function as choosing the "done button."

To learn all about placing Actors in levels, turn to page 61.

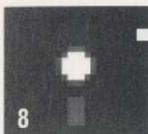
To read about creating Actors, turn to page 32.

To learn about setting up the environment in which the game is played, turn to page 26.

To master the AGCK Sound Editor, turn to page 52.

STEP 2: Learn the Game and Choose a Level to Edit

- A. We now have a fresh disk and are ready to change the game. If it isn't already there, insert the AGCK disk in your disk drive. Pull down the EDITORS menu and choose option, LEVEL EDITOR. You'll be asked to put in your new GAME DISK so the computer can read what's in the game.
- B. You'll see the game screen for the AGCK Tutorial, which shows a set of enemy spacecraft at the top of the screen and your lone heroic spaceship at the bottom. At the top of the screen are the menu choices DISK, EDIT, LEVEL 01, RUN and QUIT. Your first task is to learn the game, so place the cursor over RUN and press the joystick button. This allows you to test the current level of the game you're building.
- C. The enemy spaceships will dance down the screen and threaten your craft. You can shoot them by pressing the joystick button. Once you've shot all the spacecraft so that the screen contains no enemies, the level will end and the cursor will reappear. If you want to end the level without shooting all the enemies, just press the space bar.



- D. Place the cursor over the LEVEL 01 menu item at the top of the screen and hold down the button. You'll see several choices appear, including "TO EDIT." This is short for "Level to Edit" and is how you load another level. Still holding down the joystick button, slide the cursor down to TO EDIT and let go of the button.
- E. A window will appear, labeled SELECT LEVEL, and containing the numbers 1-25 and the word MORE. Place the cursor over the number "2" and press the joystick button; the number will be highlighted. Then place the cursor over the "done button" and press the joystick button. This will load in Level 2.
- F. Level 2 is just like Level 1, but it points out the key parts of the game level, the Sentry Actors, the Player Actor, the Missiles (which for the moment are invisible) and the Scenery Blocks. Let's make our first change in the game.

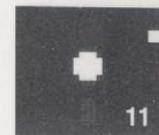
If after completing this tutorial you want to learn all about using the Level Editor, turn to page 58.

STEP 3: Change the Action of the Enemy Spacecraft

- A. Place the cursor over the EDIT menu item and hold down the joystick button, then slide the cursor down to the DELETE ACTOR menu item and release the joystick button. This makes it so you can delete an Actor from this level, and "DEL" appears below the cursor to remind you this is what you're doing. The Missiles in the lower right hand corner will also appear.
- B. Point the cursor at the top enemy spacecraft and press the button. The spacecraft will disappear. Press the joystick button again while the cursor is anywhere *except* on top of an Actor and the DEL will disappear.
- C. Again place the cursor over the EDIT menu item and hold down the joystick button, then slide the cursor down to the ADD ACTOR menu item and release the joystick button. (You'll notice that this option is now available, where before it had a red background to mark it as not active. This is because all seven possible Actors were already on screen.)



- D. A window labeled SELECT will appear on the screen, with a picture of the Player's Ship and two arrows. (The color will look different than it does on the game screen because the window has a white background instead of a black background.) Press the arrow pointing to the right twice and you'll see the picture of the Enemy Ship.
- E. Move the cursor to the little box in the upper left hand corner of the SELECT window and press the button. As it will do with any window, this "closes" it and makes it go away. (Hitting "F1" on the keyboard will do the same thing.) The cursor will now point at the Enemy Spacecraft, and you can move it around the screen.
- F. Place the spacecraft wherever you want it on screen: at the top, in the middle, anywhere except on top of the Player's Ship (since this would kill the Player at the start of every game on this level). When you're pleased with its location, press the joystick button.
- G. A window will appear instructing you to TRACE MOVEMENT. This is just a reminder to tell you that this is when you'll be telling the Spaceship, a "Sentry Actor," where it should patrol on the screen. Press the joystick button to make the window disappear. You'll see the cursor pointing to the Actor whose path you're about to trace.
- H. Using the joystick, move the Spaceship around the screen in the pattern you want it to follow. Press the joystick button when you've finished the Spaceship's pattern. It can record fairly long and complex routes, but if you go farther than it can remember before pressing the joystick button it will automatically stop recording the path.
- I. A window will come on screen labeled SPEED, containing a slider. Adjust the Actor's speed with this slider. It will follow its path on screen at the selected speed while you choose so you can try to time it properly. When you're done, move the cursor to the little box in the upper left hand corner of the SPEED window and press the button.



J. You can repeat steps A-I on as many of the Spaceships as you wish.

STEP 4: Add Saturn to the Background

- A. Let's make that plain background more interesting by adding Saturn to it. Place the cursor over the EDIT menu and hold down the joystick button to pull it down. Still holding down the joystick button, move the cursor to EDIT SCENERY, then release the joystick button. A window will prompt you to insert the AGCK disk; after a few moments a new menu bar will appear at the top of the screen, with the items CLEAR, SELECT, COPY, COLORS and DONE.
- B. Move the cursor to the SELECT menu item and press the joystick button (or type the "S" key on the keyboard). A window labeled SELECT BLOCK (short for "Select Scenery Block") will appear. In Row 2, the first four Scenery Blocks are the four parts of the planet, the upper left, lower left, upper right and lower right portions (in that order).
- C. Place the cursor over the first Scenery Block in row 2 and press the joystick button. A black square appears around the Scenery Block to indicate it is selected. Move the cursor to the place on the screen where you want Saturn to be and press the button. The upper left corner of Saturn will appear. Repeat this procedure with the other three parts. If you make a mistake, choose the blank Scenery Block in the upper left hand corner (row 1, column A), then use it to "blank out" your error.
- D. When you're done you can close the SELECT BLOCK window by moving the cursor to the small box in the upper left hand corner of the screen and pressing the joystick button (or by pressing the F1 key on the keyboard). If you want to move the SELECT BLOCK window around the screen to make a different part of the screen visible, place the cursor over the top bar of the window and, while holding down the joystick button, move the window with the joystick. Both the closing and moving of windows (except those too big to move) work this way throughout AGCK.

STEP 5: Make Some of the Stars Twinkle

- A. Let's give the screen some extra interest by making some stars twinkle. Again, choose SELECT to bring up the SELECT BLOCK window. We'll need to make one copy of the "star" Scenery Block and one copy of the blank Scenery Block; by switching back and forth between these blocks we can make the star appear to twinkle. You'll begin the process by first moving the cursor to the star, the second Scenery Block in the first row. Press the button to select that Scenery Block.
- B. Move the cursor over the DUP (for "duplicate") at the bottom right hand corner of the window. Press the button, and DUP will be highlighted. Now place the cursor over the Scenery Block just to the right of the star and press the joystick button. The star is duplicated in that "slot" in the Parts Box. Repeat the process one more time to copy the blank Scenery Block (Row 1, Column A) to the right of the second star (in Row 1, Column D). You should now have the pattern blank-star-star-blank at the start of Row 1.
- C. Select the star on the right (Row 1, Column C) with the cursor and then place the cursor over the word EDIT and press the joystick button. The EDIT BLOCK menu will appear, with a large picture of the Scenery Block and a number of different menu items. The highlighted choices will indicate that this is a NORMAL and a BACKGROUND Scenery Block.
- D. Move the cursor over the word SWITCH, just below NORMAL near the center of the window, and press the joystick button. This indicates that we want to have this Scenery Block switch to another Scenery Block on screen. The SWITCH BLOCK SPECIAL POWER window will appear, with more settings.
- E. Move the cursor over the word SWITCH at the right center of the window and press the joystick button. This is where we select the Scenery Block to which the current block will switch. The SELECT BLOCK window will appear again; use the joystick to select the blank Scenery Block on the right of the star (Row 1, Column D) as the new Scenery Block.

- F. Close the SELECT BLOCK window (via the small box at the upper left corner), then look for a slider at the bottom of the window labeled DELAY. Adjust it to indicate how much time you want the star to be displayed before it blacks out. Then close each window in succession until you see the SELECT BLOCK window where you started.
- G. Repeat steps C-F, but this time start with the blank Scenery Block (Row 1, Column D) and make it switch to the star Scenery Block (Row 1, Column C). Make sure the delay you select for this Scenery Block is different than for the first one, so the stars won't all twinkle at the same time. Again, return to the SELECT BLOCK window.
- H. Place 2 or 3 each of the switching star Scenery Block and the switching blank scenery block on screen. By using some of each (remember, you gave them each different delays) you keep the stars from all being off or on at the same time. Now close the SELECT BLOCK window.
- I. Use the joystick to select the DONE menu item at the upper right hand corner of the screen. When the RUN menu item is again available, select it with the joystick. Your stars should be twinkling in the background!

For more ideas on using Switch Scenery Blocks for animation, turn to page 71.

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There are four different types of disks that can be used or created with AGCK. Here are the names we'll use to describe them throughout this manual.

AGCK DISK

Used to boot the AGCK system. Holds all of the programs and editors that make up the AGCK system.

GAME DISK

Holds the data for one game of 50 levels. This is where you'll store the games you make. All editors can read and write to this disk. The back of the AGCK Disk is a Game Disk that holds the 50-level action adventure "Labyrinth Master".

Note: AGCK won't allow you to switch Game Disks so that you load data from one disk and save to another. (It marks each disk you LOAD from and only allows the next SAVE to go to that disk.) This is to prevent you from accidentally saving your Actors from "Invasion of the Insurance Salesmen" onto your "Math Monsters" disk. To copy Parts Boxes from one game to another, use the DISK UTILITIES in the OPTIONS menu on the Main Menu.

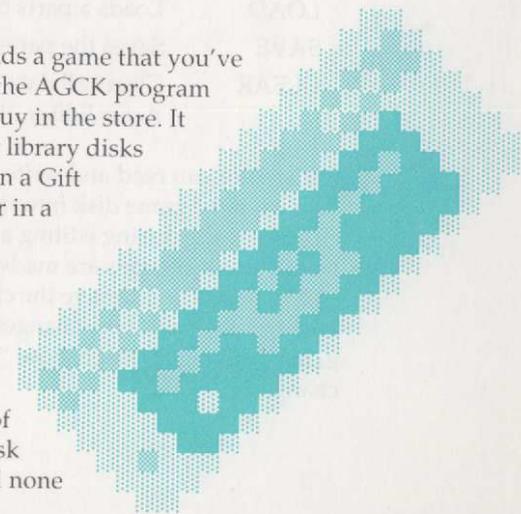
GIFT DISK

This type of disk lets you give your friends a game that you've created with AGCK. It does not require the AGCK program and is booted just like any game you'd buy in the store. It can be created from either game disks or library disks BUT you can't edit or change anything on a Gift Disk, because the data is packed together in a special way to save space. It holds one game of 15 levels.

LIBRARY DISK

This type of disk holds three games of 5 levels each, along with a complete set of parts boxes for each game. A Library Disk cannot be created using the program and none

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of the editors can read or write to it. It can, however, be used to create game or gift disks, and can also be played directly by the Play Game option. We created Library Disks as a way to give you the six sample games included with AGCK; each side of the Library Disk in the package holds three sample games.

Two other important notes about AGCK disks...

Each disk is ID coded so that AGCK can identify it. AGCK always first checks the current disk in the drive when accessing information. If the disk is not the disk AGCK is looking for, AGCK asks you for the correct disk. Any disk read/write errors are also trapped and displayed when they occur.

Please note that only the AGCK and Gift disks have a file directory. If you try to look at the directory of the Game or Library disks you will probably get an error. Also note that you should not try to save other program files on any of the AGCK disks - this could destroy the information on them!

THE AGCK DISK MENUS

In all of the different AGCK editors you'll find a menu item called "DISK", which triggers this pull-down menu:

- LOAD Loads a parts box into memory
- SAVE Saves the parts box currently in memory
- CLEAR Clears all data from the current editor (e.g. in the Actor Editor, it clears the Actors)

Each editor can read and write only to Game Disks. It loads its game data from the game disk into memory before you start work. Any changes made during editing are made only to the data currently in memory. No changes are made to the Game Disk. When you exit an editor, it asks you to save the changes you've made. If you decide you aren't pleased with the changes you've made and want to keep the game unchanged, just choose "no" when asked if you want to save changes.

CAUTION: COPYING DISKS

We suggest that you do NOT use "bit copiers" or "fast copy" programs to copy your AGCK Game Disks, but instead use the AGCK Disk Utilities. AGCK contains its own "Fast" disk routines, although it may require more disk swapping than a separate disk copy program. Many bit copy programs place data in slightly different places on the disk when they make a copy, and even very subtle differences (like 1/1,000 of an inch) in the location of a single sector may cause the disk drive to malfunction. This could cause problems which you might not see for two or three hours after you made the copy, and you could lose a lot of your work.

Reference Section: The AGCK Main Menu

The AGCK main menu is the first screen you see after the Title Screen. It offers you the choice of EDITORS, OPTIONS and PLAY.

EDITORS

The EDITORS will be covered in later chapters:

ENVIRONMENT	Turn to page 26.
LEVEL	Turn to page 58.
ACTOR	Turn to page 32.
SOUND	Turn to page 52.

PLAY

To play a game created with AGCK, select the PLAY menu item. When the program asks you to insert a game disk, insert either a game or library disk. If you insert a library disk, you are asked which of the three games you want to play.

When the game begins the game's title and author (maybe you!) are displayed along with a copyright notice. Along the menu bar of this window are two menu items:

PLAYERS opens a pull down menu that lets you select the number of players (1-4) to play the game.

PLAY starts the game.

During game play the following keyboard commands are active:

R	returns you to the play game window
S	toggles the sound on/off
Space Bar	pauses/unpauses the game.

The scoreboard along the top of the game's screen shows:

- The current player's score
- The all-time top score for this game
- The number of lives the current player has left

OPTIONS

If you select the OPTIONS item from the Main Menu, you'll see these options:

ADJUST CURSOR	Adjust the color and speed of the cursor
DISK UTILITIES	Copy all or part of disks
ABOUT AGCK	Tells you background information on AGCK

Adjust Cursor

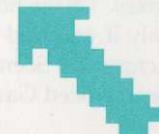
When you choose ADJUST CURSOR from the OPTIONS menu, you'll see two sliders, one for the cursor color, the other for the cursor speed. Changing the cursor color helps make the cursor more visible if you've chosen screen colors that make it blend into the background.

You may find that the cursor in AGCK moves a little too fast or too slowly for your taste. The cursor speed slider will adjust this for you. Any change is saved to the AGCK disk and will remain the same until you choose to alter it.

Disk Utilities

The AGCK Disk Utilities menu lets you create game and gift disks (either from game disks or from library disks) and to copy portions of game and library disks to game disks. To open the disk utilities window, select the DISK UTILITIES menu item on the OPTIONS pull down menu, and see these menu items:

CREATE DISK opens a pull down menu that lets you create game or gift disks, or clear a Game Disk.



COPY PARTS opens a pull down menu that lets you copy the various parts boxes and levels on a game disk without copying the whole disk.

Creating A Game Or Gift Disk and Clearing Games

To create a game or gift disk you need another game disk or a library disk (referred to as the "Source disk") and a blank disk or disk which contains data you no longer wish to save (the "Target disk"). The target disk doesn't need to be formatted.

You don't need to worry about accidentally mixing up the disks and ruining your game. AGCK marks each disk so that if you insert the source disk when you should insert the target disk, it will prompt you to correct your mistake before going on.

If you choose the CREATE DISK menu item, you'll see these options:

GAME DISK—Create a game (maximum of fifty levels) with parts boxes copied from another game. You'll need AGCK to play the game.

GIFT DISK—Create a game (maximum of fifteen levels) with parts boxes copied from another game. You won't need AGCK to play the game, since the computer program to play it is actually copied onto the disk. This is a great way to give games to your friends.

Caution: If you are making a GIFT DISK for a friend, remember that it will hold only the first fifteen levels of your game. If the game is a "continual" level game (see page 28), make sure that any edges of the screen that would lead to levels of the game higher than Level 15 are blocked by walls or other barriers. If an Actor does anything on a Gift Disk that causes it to go to a level higher than Level 15, the game will freeze and the user will have to restart the computer. The easiest way to avoid such problems is to use only the 5x10 matrix for continual-level Gift Disks, and to put walls all along the bottom edges of levels 11-15 and the top of levels 1-5.

BLANK GAME—Create a game disk with nothing in any of the parts boxes. This is how you'd start a completely new game. Hint: Do this only if you find that none of the games included with AGCK have Actors and Scenery Blocks like those you want for your game. Even experienced Game Designers like Mike Livesay will often work from

old graphics or code to build their next new game; never feel like the game isn't original just because you used one or more of the AGCK parts boxes.

To begin creating a disk, select the appropriate menu item on the Create Disk pull down menu. The program will ask you for source and target disk swaps as they are needed. No more than seven source/target cycles will be necessary.

If you use a library disk as your source disk, you are asked to select one of the three games as your source game. When creating a gift disk, you will also be asked to insert the AGCK disk, since information is needed from the AGCK disk to create a gift disk.

Copy Parts

SCENERY BLOCKS—Copy the Scenery Blocks parts box

ACTORS—Copy the Actors parts box

ENVIRONMENT—Copy the Environment game settings

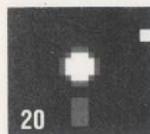
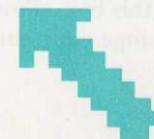
SOUND EFFECTS—Copy the Sound effects parts box

LEVELS—Copy a series (or all) of the levels of the game

As with creating game disks, your Source disk can be either a game or library disk. If it is a library disk, the program will ask you to choose the desired game. The Target disk is always a game disk when you are copying parts boxes.

Caution: If you replace the scenery block or Actor parts boxes on a game disk with those of another disk, its levels may not run properly and screens may look jumbled, since they were created using Scenery Blocks and Actors from different parts boxes. Copying parts of a game works best when you want to make a game with similar graphics, but plan to start building your levels from scratch.

MENU



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Reference Section: How to Get Things Done in AGCK

To tell AGCK what you want to do, you use a joystick to move the flashing arrow cursor around the screen and manipulate various windows and the items they contain.

AGCK uses the following kinds of windows and menus:

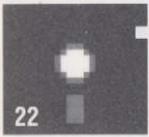
PULL DOWN MENUS, which are triggered by selecting menu items. They remain visible only while you hold the joystick button down.

POP UP WINDOWS, which are triggered by selecting menu items. They remain visible until you close them by pressing a “done button.” Only one such window may be “active” at a time, which means that even if you have four windows layered on top of each other on screen, only the top one will respond to your choices.

UNAVAILABLE ITEMS are title bars, menus, menu items or sliders that have red backgrounds. This is how AGCK lets you know that a certain choice isn’t available or that you can’t add more of something, such as more than seven Actors on a screen.

THE TITLE BAR is the white bar along the top of a window that contains the name (the “title”) of the window. With a pop-up window that doesn’t occupy the full screen, you can place the cursor over the title bar, hold down the joystick button, and “drag” the window around the screen so it doesn’t block some screen area you want to see. If a window isn’t “active” because another window is layered on top of it, the title bar has a red background to show you its choices aren’t available.

DONE BUTTON. On the left side of the title bar is a small box. This is the “Done” button, which closes the window when you “select” it with the cursor. When a window opens, the cursor is automatically placed at this box, allowing you to quickly close the window, should you change your mind.



Reference Section: How to Get Things Done in AGCK

MENU BAR. The yellow bar directly below the title bar is called the MENU BAR. It usually holds menu items that trigger pull-down menus or other windows.

A window may contain the following items:

SELECTABLE ITEMS—Words which can be highlighted (selected) to indicate which features you want in your game.

SLIDERS—On-screen “volume controls” that allow you to adjust speeds, colors, etc.

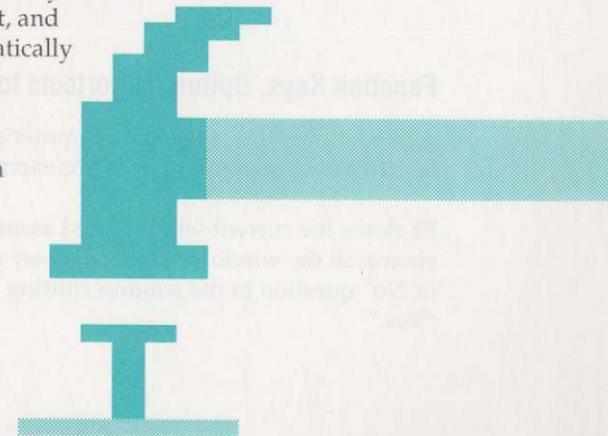
ENTRY CELLS—Small areas where you can type in text, usually to name things for easy reference.

Selectable Items

Selectable Items (often just referred to as “menu items”) are the most common and powerful tools you’ll use in AGCK. Since AGCK works by allowing you to choose many settings and options from lists of possible choices, the ability to scan a list and “pick” one setting is very useful.

To choose a Selectable Item, move the cursor to the item and press the joystick button. The item will light up (“highlight”) to indicate that you have chosen it. On some menus you can repeat the process if you change your mind and decide not to choose the item, and it will go back to its normal color. On others, you can choose only one item from a list, and making a second choice automatically cancels your first selection.

Holding down the joystick button lights up any selectable item the cursor touches, but only the item the cursor is pointing to when you release the joystick button will actually remain highlighted and selected.

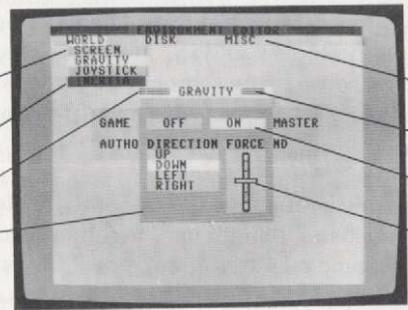


Sliders

Sliders are used to set speeds (such as for Actors), time delays (like how long an Actor waits before entering the screen), colors and strengths (for things like gravity, friction, etc.). You adjust them by holding the joystick button down, placing the cursor over the horizontal bar on the slider and moving it up and down. The top of the slider is "more", the bottom is "less".

Entry Cells

Entry cells are used to enter and display text. Select them the same way as selectable items. Once you've selected an entry cell you can type in text from the keyboard. Press RETURN when you've finished entering the text.



- PULL DOWN MENU
- UNAVAILABLE ITEM
- DONE BUTTON
- POP UP WINDOW
- MENU BAR
- TITLE BAR
- SELECTABLE ITEM
- SLIDER

Function Keys: Optional Shortcuts to Save You Time

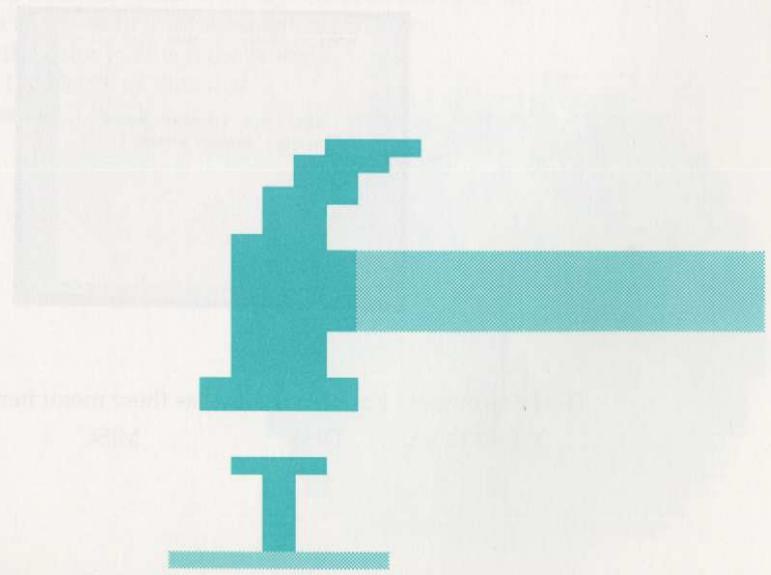
AGCK allows you to use the computer's function keys to save time and keystrokes once you've gotten accustomed to the system.

F1 closes the current window, and assumes that all the sliders and choices in the window are just the way you want them. If there is a "Yes or No" question in the window, hitting F1 is the same as choosing "Yes."

Reference Section: How to Get Things Done in AGCK

F3 places the cursor on the title bar of the current active window; if windows are stacked on top of each other this will always be the window on top.

F5 is useful in the Level Editor, and makes all the menu text stand out so it's easier to read. Use this key if you choose screen colors that make the text pale or invisible. You can use it to toggle between the colors you've actually selected and black text.





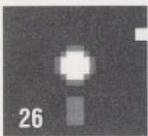
Reference Section: The AGCK Environment Editor

The Environment Editor lets you edit the environment settings of a game. These settings are the universal instructions you give the computer which affect every level of your game.

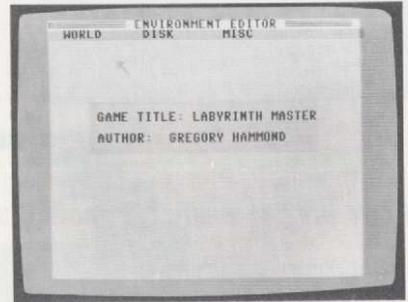
Hint: Many of these settings are very powerful, and even small changes can radically affect your game! We've noted below several settings you may not want to change without careful planning.

Here's an old Game Designer's trick suggested by Mike Livesay: If you do change these delicate settings, change them one at a time, playing the game for a while after each change to see if you like the new results. If you adjust the settings all at once, you'll be like the cook who changed five ingredients in his/her recipe on the same day: the results don't please you, and you don't know which change made everything else go wrong.

At the Main menu, use the Edit pull-down menu and choose the Environment Editor



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The Environment Editor Window has these menu items:

- WORLD
- DISK
- MISC

Reference Section: The AGCK Environment Editor

You'll also see the following information from the game's title page:

Game Title—Use the cursor to select this option, then type in a new name for your game.

Author—Type your name in here in the same way.

DISK opens a pull down menu that contains the standard DISK menu items (see page 16 for further information);

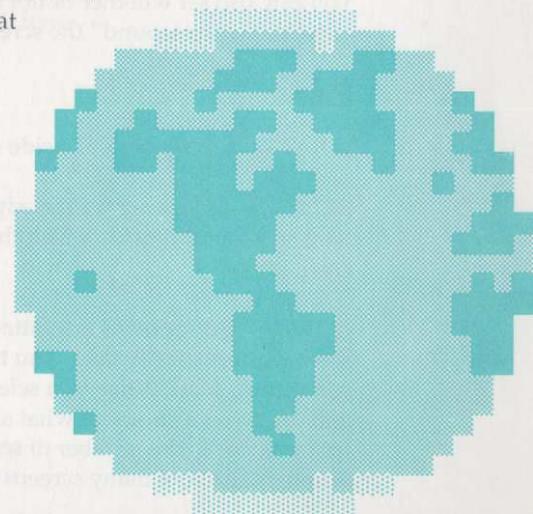
WORLD offers you the following choices:

- SCREEN** Set up how the screen edges work & basic building materials for the screen edges; these affect what happens to Actors when they reach the edge of the screen. This is where you can set up maps of screens that are "attached" to each other.
- GRAVITY** Set up the direction and strength of gravity.
- JOYSTICK** Set up how the joystick will work.
- INERTIA** Determine how inertia will affect the game.

MISCELLANEOUS is a hodge-podge of different functions that allow you to determine how many "lives" the Player has; award an extra life; set whether Actors pass in front of or behind Scenery Blocks; determine the color in which the score is displayed; and set the length of time that Special Effects Cues last.

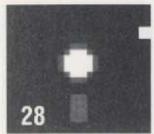
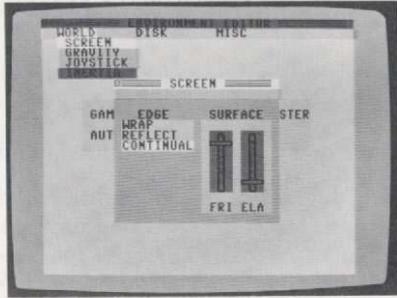


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SCREEN ENVIRONMENT SETTINGS



The Screen Environment Settings let you set up a variety of characteristics for the screen edges of all levels of the game. This allows you to determine whether an Actor will bounce off the edge of the screen as if it hit a trampoline, reappear on the opposite side of the screen, or stop in its tracks as it hits a brick wall.

The two sliders in this window, "FRI" (FRICTION) and "ELA" (ELASTICITY), determine the settings of the building materials of the screen edge. (For more information on Building Materials, see page 68.)

You can also set whether or not an Actor will reflect off the screen edge, or "wrap around" the screen to the opposite edge.

Edge

WRAP—Actors leaving one side of the screen reappear at the other side.

REFLECT—Actors regard the edge of the screen as being made of Barrier Scenery Blocks, which they can bounce off of, slide along or crash into.

CONTINUAL—Screens are "attached" to each other, and leaving one screen automatically takes you to the one which is next to it on the computer's map. When you select this option a window will appear and offer you a choice of what size of map you want to specify. The first number is the number of screens wide the map will be; the second number tells how many screens high the map will be.

GRAVITY SETTINGS

The gravity settings in any game are very important, because they let you establish the fantasy world in which your game takes place. For an outer space shoot-em-up, you'll use no gravity at all. For a climbing game you might have normal gravity from the bottom of the screen. For a game where a hurricane is blowing everything to the right of the screen you might have gravity come from the right to simulate the wind's power.

The Gravity Settings Window allows you to turn gravity off and on, choose its direction and adjust its strength using a slider. If gravity is turned off, some options in AGCK are no longer appropriate and will be displayed with red backgrounds to indicate they are not available for selection.

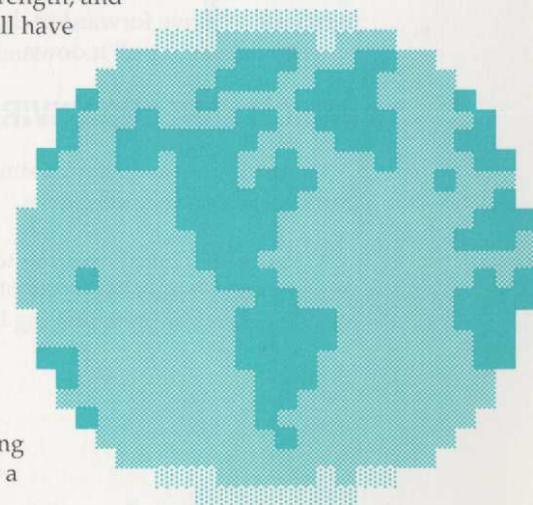
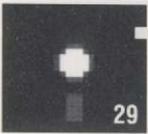
Hint: Be careful when you start adjusting the strength of gravity! It will change the speed, movement, jumps and Missile aiming of every Actor, so stick with the original settings in the game until you know just what change you want to make!

JOYSTICK SETTINGS

The Joystick settings are three sliders that let you set the HORIZONTAL strength, VERTICAL strength, and button JUMP height that the joystick will have on Player Actors during the game.

Hint: Like gravity, these are settings you often won't need to change, and HORIZONTAL and VERTICAL can have subtle effects on the Player Actor that can make the joystick feel sluggish or too sensitive during play. Don't change these settings until you're sure you want to, and never change gravity at the same time!

HORIZONTAL and VERTICAL both adjust the strength of the joystick pushing in those directions. If you want to make a





game like Space Invaders, where the Player Actor is a spaceship that never leaves the bottom of the screen, adjust the VERTICAL slider all the way down. This makes it so the joystick can only move the Player Actor horizontally from side to side. Doing the same to the HORIZONTAL slider would allow the Player Actor to only move up and down. Turning both all the way down means that only the joystick button affects the Player Actor. Each position on the JUMP slider equals 8 pixels of jump height for Player Actors on the screen (provided that gravity is on, of course).

INERTIA

Inside the AGCK system INERTIA is the tendency of an Actor to continue going in the direction it was going even after the player stops moving it with the joystick or it falls off a building. This is just like inertia in real life: when you stop pedaling your bike you still keep rolling forward—your *inertia* keeps you moving. Try playing with these settings to learn more about what the concept of inertia really means!

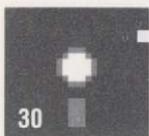
If INERTIA is turned off, Actors will fall straight down when walking off barriers. They can also jump forward from a stationary position in games which have gravity.

If INERTIA is turned on, Actors that want to jump forward must first get a running start. If an Actor runs off a barrier such as a cliff, it will continue to move forward in the direction it was running even though gravity begins to pull it down.

MISCELLANEOUS ENVIRONMENT SETTINGS

This section has a variety of simple settings that allow you to adjust various factors in your games.

EXTRA LIFE—This allows you to determine at which score value you will award a bonus life to the player. This is a traditional way to help good players continue playing longer.



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Hint from Mike Livesay: Don't give lives away too often—it makes the game too easy. But don't ever frustrate the successful player. Reward them with a bonus life regularly as a way of telling them they're good players—it makes them feel good about themselves...and about the game. This is easiest to do with Scenery Blocks which are set to ADD LIVES when touched by the Player.

START LIVES—Choose how many lives the player has at the start of the game.

PRIORITY—Determines whether Actors or Scenery Blocks are visible when they overlap. ACTORS ABOVE, the usual setting, has Actors in front of Scenery Blocks. SCENERY ABOVE has the Actors going behind the backgrounds. This might be useful in a game where fish and sharks hide behind floating masses of seaweed, or where underground monsters hide inside caves. Scenery Block colors 3 and 4 will “hide” Actors when you select SCENERY ABOVE.

SCORE COLOR—Choose the color in which the score bar displays the score. The colored block in the window displays the current color.

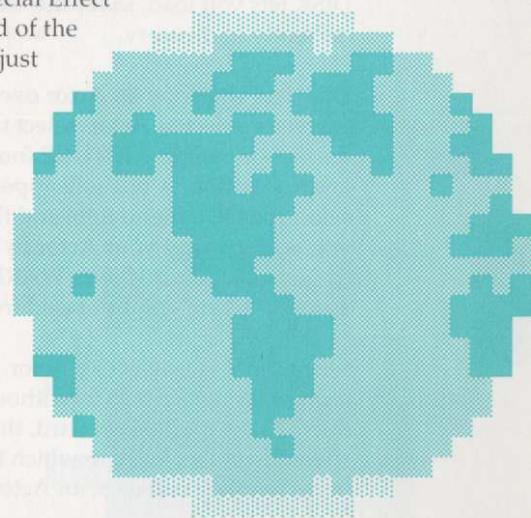
F/X CUES—Determines how long Special Effects Cues last. (For more information on Special Effects Cues, see page 59.) This tells how long your Special Effects last.

For example, in Pac Man™, where a Special Effect is to let Pac Man™ eat the ghosts instead of the ghosts eating Pac Man™, you would adjust this setting to determine how long Pac Man™ could chase ghosts before the power pill wore off.

There is a separate slider for each of the four Special Effects Channels, “A”, “B”, “C” and “D”. This lets you have one special effect that lasts for only three seconds, while another special effect might last ten times that long.



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Reference Section: The AGCK Actor Editor

Anything that moves around the screen in AGCK is called an Actor. Actors can be controlled by the player using the joystick or can be controlled by the computer.

An AGCK game has a parts box of Actors available for use by all levels in the game. Each Actor in the parts box consists of a list of graphics and Special Powers that describe the way it will look and act when used in a level. You, as the game designer, can draw every picture and determine every one of these special powers just by choosing items from the lists of options presented by AGCK.

You can use the Actor Editor to:

Set the attributes and select the animation for each Actor;

Create and edit each of the frames for use in Actor animation sequences.;

On the Actor Editor menu bar are these two menu items:

DISK DUP

DISK lets you load, save, and clear all Actors and animation frames currently in memory.

DUP lets you copy an Actor over another Actor. To duplicate the currently selected Actor, select the Actor you wish to copy by moving the cursor over its PICTURE (not its name) and then pressing the joystick button. A box will appear around the selected Actor. Then select the DUP menu item and then select the Actor "slot" to which you wish to copy your Actor by moving the cursor over it and pressing the joystick button down. **WARNING:** The Actor in the slot to which you're copying will be erased from the parts box.

Shortcut: If you select an Actor, then place the cursor over another location in the Parts Box (without pressing the joystick button), then hit the "D" key on the keyboard, the selected Actor will instantly be copied over the Actor to which the cursor is pointing. This allows you to make many copies of an Actor quickly.

To cancel duplication, select DUP again without selecting an Actor "slot" to copy to.

Editing Actors

To edit an Actor, use the joystick to select its NAME (not its picture) and press the joystick button. This displays the Edit Actor Window and these two menu items:

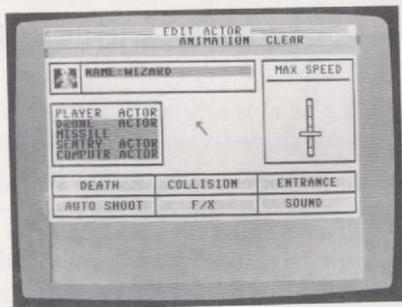
ANIMATION CLEAR

ANIMATION displays the Assign Animation Window (see Animation section beginning on page 45).

CLEAR clears the current Actor's animation sequences and Special Powers.

In the upper left corner of the Edit Actor Window is the Actor's Name cell. Use this to assign a name to an Actor for easy reference. The name has no effect on an Actor's behavior.

To the right is the Maximum Speed setting slider. This sets the maximum speed the Actor can travel on screen. **WARNING:** This slider setting should normally stay in the middle of its range. Placing it higher can use up more computer time and slow down the rest of the game, as well as throwing your AGCK joystick settings and attract/repel strengths out of balance. Once you're used to playing with AGCK you can experiment with this slider to see what happens.



ACTOR TYPES

Below the Actor Name are the Actor Type menu items.

PLAYER ACTOR	The player's character, joystick-controlled
DRONE ACTOR	An Actor who always travels in 1 direction
MISSILE	Anything shootable: Bullets, missiles, arrows
SENTRY ACTOR	This Actor always traces a path you choose
COMPUTER ACTOR	Actors who "think" and chase the player

Across the bottom of the window are the different Special Powers menu items. Each opens a different pop-up window, containing related Special Powers settings and sliders.

Player Actors

The Player Actor's movement is controlled by the player's joystick. You can have more than one Player Actor on screen at a time; all will respond to the joystick's movement. (Also, a player's "life" isn't over until *all* the Player Actors die.) The Button settings control the way the Actor responds to the pressing of the joystick button. When you select that an Actor will be a Player Actor the following button setting choices appear:

OFF causes the Actor to ignore the joystick button.

JUMP causes the Actor (if gravity is present) to jump when the joystick button is pressed.

SHOOT causes the Actor to shoot a missile when the button is pressed. The editor will ask you to choose the direction in which to aim the missile; the choices are the same as those described on page 70 for Scenery Blocks that fire missiles. Actors may also be set to fire missiles FORWARD, which shoots the missile in the same direction that the player is moving.

The FALL slider sets the maximum distance that the player Actor may fall without being killed. If you set it high, the player may fall off high ladders without being hurt; if you set it low even the slightest fall will kill the player.

Drone Actors

Drone Actors are the simplest kind of Actors. They have no intelligence and just move in a straight line up and down or left and right, affected only by gravity, Scenery Blocks which block, attract or repel them. A vulture that regularly flies across the top of the screen threatening the player could be a Drone Actor, since it only needs to move in a straight line. When you select that an Actor will be a Drone Actor, you are asked to choose the direction in which it will move when it first appears.

Missile Actors

We usually refer to Missile Actors simply as "Missiles", because that's the easiest way to think of them. Missiles are anything that any Actor shoots: bullets, missiles, arrows, cannonballs, daggers, etc. Or in a sports game a missile could be a golf ball or a baseball.

You choose the Missile's aim at the time you create the Actor or Scenery Block that shoots it.

When a missile Actor is added to a level in the Level Editor it is kept in a certain type of list, called a "queue" (pronounced "cue", like the stick you use to play pool!). The queue has to hold as many missiles as you want the Actor to be able to fire at once: if you want to

allow two bullets to be on screen at once, you have to put two bullets in the queue on screen.

IMPORTANT: The REBIRTH setting of the Missile must be turned on; if you don't do this the Missile will only be fired once on each level and then the gun (or bow and arrow or whatever) won't work. See page 39 for more information on the REBIRTH setting.

The Player Actor has one queue and all the other Actors share another; when you choose a missile as "PLAYER SHOOTABLE" or "OTHER SHOOTABLE" you choose which queue the missile will occupy. This keeps the Player and opponents from trying to shoot the same bullets, etc. at the same time.

Place enough missiles in the game to make your game level fun, but remember you can have only seven Actors on screen at once and the Missiles in the queues all count as Actors! If you use two missiles each for the Player and the computer, that leaves room for only the Player Actor and two other Actors on screen.

Missiles are different from all other Actors in that they die when they bump into barrier blocks (unless the DIE ON BARRIER option is disabled, which allows you to ricochet missiles off of barriers), collide with an Actor or touch the edge of the screen.

Sentry Actors, Elevators, Sliding Walls & Moving Platforms

Sentry Actors do just what their name suggests: they move along a path you choose for them, "guarding" that space. This makes them great guards for evil castles, or giant rats that search an area for food.

Sentry Actors also have a second important ability: they can move Actors who touch them. This allows you to use them as elevators, sliding walls, moving platforms or anything less that moves the player or swings into and out of the player's way.

When you select that an Actor will be a Sentry Actor, you're given the following choices:

BACKGROUND The Actors aren't moved by the Sentry Actor

BARRIER

The Sentry Actor can move other Actors. Gravity must be turned on for this effect to work. If a Sentry Actor can act as a BARRIER it has the same Building Materials characteristics (FRICTION and ELASTICITY) as a Barrier Scenery Block. See page 68 for a summary of how these Building Materials work.

The Sentry Actor's path is determined by the pattern you trace for it in the Level Editor when you actually place the Actor on screen. This means that the one Sentry Actor you create in the AGCK Actor Editor might appear in five different places in each of fifty different levels in a game, and you could make every one of those 250 Sentry Actors move in a different pattern!

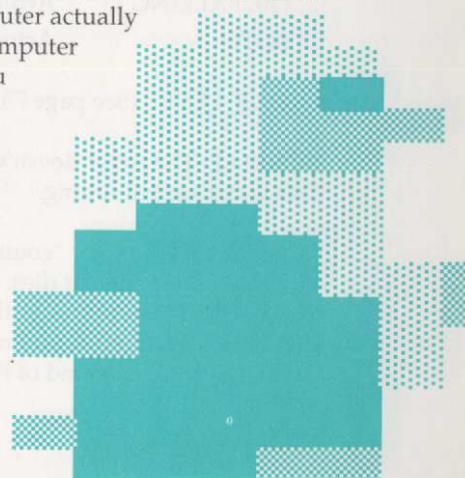
Sentry Actors ignore all scenery block collisions, so you can't make them react to barriers, deadly Scenery Blocks, etc.

Computer Actors

Computer Actors are the most complex of all non-player Actors, because they think for themselves and actually chase the player on screen.

The Computer Actor's movement is controlled by internal "artificial intelligence" logic, which causes the computer Actor to follow and "home in" on the nearest player Actor. The computer actually uses different algorithms to control the computer Actor, depending on the kind of game you design. You adjust the IQ of Computer Actors and the kind of strategy it will use through a window which opens when you select that an Actor will be a Computer Actor.

If the game has gravity, the computer will automatically choose the right kind of strategy for the computer opponent to chase the player. In games without gravity the MAZE strategy will work best where there are lots of



walls and obstacles. In other kinds of games the OPEN strategy works best, since it runs faster by not thinking about how to get past barriers.

Hint: Since Computer Actors, with their sophisticated intelligence, use up more of the computer's power than other Actors, using too many of them on screen at once can slow down game play. To avoid this, use Drone Actors, Sentry Actors and Scenery Blocks that shoot Missiles at the player to create most of your game level's dangers. Then you can add a Computer Actor to chase the player and force them to stay on the run.

ACTOR POWER SPECIAL SETTINGS

Actors have various Special Power Settings that determine how an Actor will move when it "dies", what kind of awards it will give when the player touches or kills it and whether or not it will trigger the end of the level when touched or killed.

Death

Selecting this menu item displays the gruesomely named Actor Death Window, which contains the following choices:

DEATH MOVEMENT

- | | |
|-------------|--|
| DIE STUNNED | Causes Actor to freeze when it is killed |
| DIE FALLING | Actor falls off of the screen when killed |
| BOTH | Actor freezes, then falls off screen when killed |

END OF LEVEL (See page 73 for more information.)

NORMAL—The Actor doesn't trigger the END OF LEVEL when it dies. This is the normal setting.

COUNTDOWN—Actor "counts down" (subtracts 1 from) the END OF LEVEL counter when it dies. See page 74 for an explanation of how COUNTDOWN works. Caution: Never set the Player Actor to COUNTDOWN unless you're using the MUTATE Special Power to have more than one kind of Player Actor.

END LEVEL—The Actor triggers the END OF LEVEL when it dies. If you choose this you'll be asked to choose which level of the game the player should go to next. Use the "+" and "-" buttons on the screen to move through the level numbers till you've reached the next level you want. This allows you to send the player back one level, up one level, back to the first level, etc. "NEXT" will send you to the next level in numerical order.

REBIRTH—This setting chooses whether or not the Actor will return to the screen after it is killed. If your Actors keep disappearing on you, this setting is probably turned off!

MUTATE—When you select this option, the Actor doesn't really die, it turns into another Actor. You'll be shown a window with arrows to allow you to choose the Actor into which you want this Actor to change. You could use this option to create a monster that grew or changed form every time you shot it, or to change a frog into a prince after it's touched by a Good Fairy.

Note: Missiles and Sentry Actors CAN'T mutate, so this option will not be available for them. You also can't turn a different kind of Actor into a Missile or a Sentry Actor, so the Missiles and Sentry Actors won't be available when you choose a new form for your mutated creature.

Caution: If you have a game that changes a prince into a frog, then you change your mind and replace the frog with an arrow which is a Missile, you'll have to change the game so the prince doesn't try to turn into the arrow. (Remember, you can't mutate an Actor into a Missile or Sentry Actor.) If you don't make this change the game will try to change the prince into an arrow and may malfunction when played. The player may then need to reboot the computer to continue.



AWARD

AWARD POINTS—Award or subtract points when Actor dies

AWARD LIVES—Award or subtract lives when Actor dies

Collision

There are two types of collisions that may occur during game play:

- Actor-to-Actor Two Actors touch each other
- Actor-to-Scenery Block An Actor touches a Scenery Block

The way that an Actor reacts when it collides with other Actors and the types of Scenery Blocks it recognizes or ignores can be selected with its Collision settings.

When you choose the COLLISION menu item you see the following window options:

ACTOR

- KILL NONE The Actor kills nothing it touches
- KILL OTHER Kills all non-player Actors it touches
- KILL PLAYER The Actor kills all Player Actors it touches
- KILL ALL The Actor kills any other Actor it touches
- INVINCIBLE The Actor kills all others and cannot die

SCENERY

- BARRIER The Actor can't cross Barrier Scenery Blocks
- DEADLY The Actor is killed by Deadly Scenery Blocks
- TELEPORT The Actor is teleported by Teleport Blocks
- LADDER The Actor can climb Ladder Scenery Blocks

Entrance

The Level Entry settings describe:

- Where an Actor enters a level for the first time
- When an Actor enters a level for the first time
- Whether or not an Actor re-enters a level after death



When you choose the ENTRANCE menu item you see the following window options:

IMMEDIATELY—Actor appears on screen immediately after the start of the level.

AFTER DELAY—Causes an Actor to appear on screen after a delay, the length of which you adjust with a slider labeled DLY.

AFTER RANDOM—Causes an Actor to appear on screen after a random delay.

REBIRTH DLY—Determines the delay in an Actor's rebirth (if the Actor is reborn at all) after death.

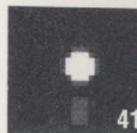
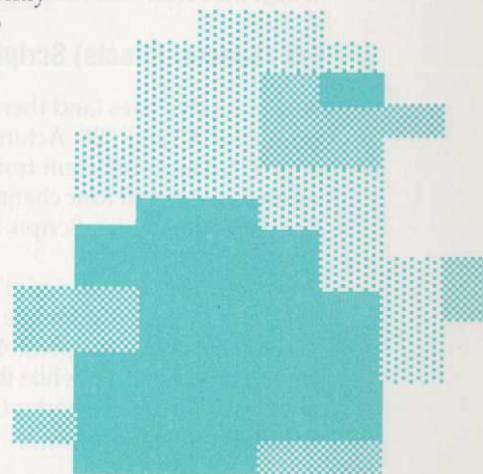
CUED ENTRY—The Actor will wait for a Special Effects Cue before entering the screen. This allows you to have the bear enter the screen after you steal its honey, or make the dragon enter after you destroy the gate to its castle. AGCK will bring up a window to ask you which cue (channel "A", "B", "C" or "D") the Actor will wait for.

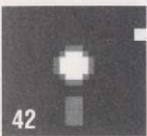
ORIGINAL LOC—Causes an Actor to appear at the same starting location on screen you chose for its position in the Level Editor.

RANDOM LOC—Causes an Actor to appear at a randomly selected location at the start of a level. When randomly placing an Actor on a level, AGCK tries to place it over background Scenery Blocks, if possible, rather than over deadly or barrier Scenery Blocks.

Auto Shoot

Actors can be set to shoot missiles automatically, and you can choose both the rate at which they fire and the direction in which they aim. This is a feature you'll use often for Actors who try to kill the player.





When you choose the AUTO SHOOT menu item you see the following window options:

- ENABLED Turns on the Actor's automatic missile firing
- DISABLED Turns off the Actor's automatic missile firing

MISILE AIM sets the aim of the missile Actor that is shot. The direction choices are the same as those used by player Actors to shoot missiles when the joystick button is pressed. See page 70 for a description of aiming Missiles.

FRQ (Frequency) slider—Adjusting this slider sets the frequency with which the Actor will fire missiles.

F/X (Special Effects) Scripts

Actors receive cues (and therefore can have Scripts for) Special Effects channels "A" and "B". Actors send cues on connection channels "C" and "D". This is different from Scenery Blocks, which both send and receive cues on all four channels. (See page 58 for a discussion of how Special Effects, Cues, Scripts and Phone Channels all work).

The "A Script" and "B Script" settings for each Actor describe the way the Actor will respond while it's receiving a cue. You can select one, several or none of the possible scripts for each channel. The Actor will act out its script only while it's actually receiving its cue. To make the cues last a longer or shorter time, see page 31 for instructions on using the Environment Editor.

F/X

A Script and B Script

MUTATE—When you select this option, the Actor turns into another Actor. You'll be shown a window with arrows to allow you to choose the Actor into which you want this Actor to change.

Note: Missiles and Sentry Actors CAN'T mutate, so this option will not be available for them. You also can't turn a different kind of Actor into a Missile or a Sentry Actor, so the Missiles and Sentry Actors won't be available when you choose a new form for your mutated creature.

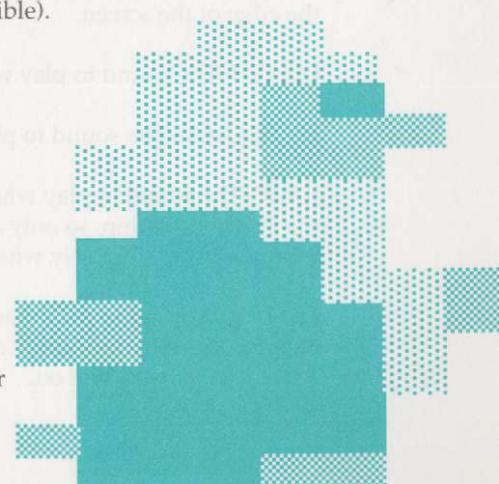
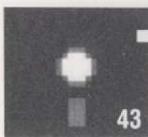
Unlike the use of MUTATE as a setting for what happens when an Actor dies, when you use this option as a Special Effect, you can select whether the change is temporary or permanent. If you select the TMP menu item in the MUTATE window, the mutation will last only as long as the Cue is being sent on the selected channel, and the Actor will return to its old form after the Cue is over. If you don't select this option, the change will be permanent on this level. If the Actor appears on any other levels of your game, it will NOT be changed by the MUTATE on this level.

INVINCIBLE—For the duration of the Cue, the Actor can't be killed by anyone or anything, and will kill all other Actors which it touches (except those which are themselves invincible).

FREEZE—Makes an Actor stand still as long as the cue is being received.

NO SHOOT—Stops the Actor from shooting Missiles if it was set up to be shooting them.

REV BUTN (REVERSE BUTTON)—This option is available for Player Actors only. If you chose to have the joystick button make the Player jump, this option will (for as long as the Cue is being sent) cause the joystick button to fire a missile. If you set





the joystick button to fire a missile, it will now cause the Player Actor to jump. **Caution:** Make sure you have added a missile to every level where you'll use this option for the Actor to shoot if you're using this to make the Actor fire missiles. Otherwise the Player will press the joystick button and nothing will happen!

Cue C and Cue D

OFF-When this item is selected, the Actor never sends out any cues.

DEATH-The Actor sends out a cue on the channel you choose when it dies.

ENTRANCE-The Actor sends out a cue on the channel you choose whenever it enters the screen.

BOUNCE-The Actor sends out a cue whenever it hits the edge of the screen or a Barrier Scenery Block.

Sound

The Sound Effect settings define what sound effects are triggered when an Actor does certain things. You can always leave each setting turned to "OFF" if you don't want any sound effect tied to that action.

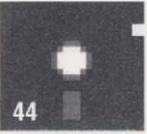
BOUNCE-Select the sound for when this Actor hits a barrier or touches the edge of the screen.

DEATH-The sound to play when this Actor dies.

ENTRANCE-The sound to play whenever this Actor enters the screen.

JUMP-The sound to play whenever the Player jumps. Note that only the Player can jump, so only a Player Actor can trigger this sound. Jumping is possible only when gravity is turned on.

FALL-The sound to play when this Actor falls. This also is possible only for Player Actors and Computer Actors. Falling is possible only when gravity is turned on.



MOVE-The sound to play each time this Actor moves (such as the roar of a tank's engines, etc.)

To select a sound effect, move the cursor to the name of the Actor Action on the left. Holding down joystick button cycles through the names of all the available sound effects. Release the button when the sound effect name you want appears to the right of the Actor Action.

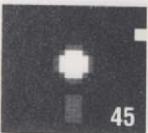
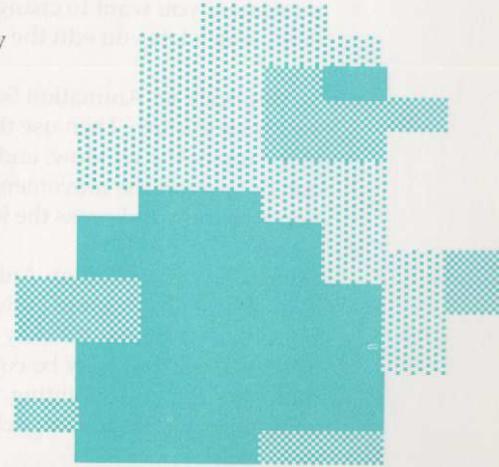
Animation

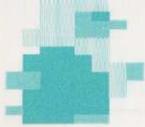
Select the ANIMATION menu item on the Edit Actor Window to use the Assign Animation Window, which lets you assign animation sequences to each of the Actor's possible movements. This is where you'll create all the exciting action graphics for your games.

In AGCK, an Actor may move in any one of the following ten ways:

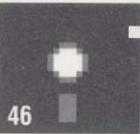
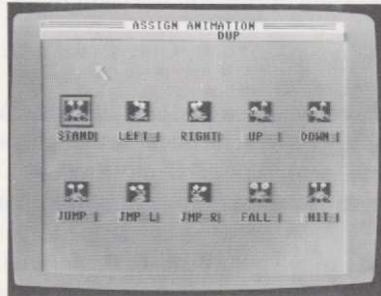
- Stand
- Left
- Right
- Up
- Down
- Jump (Player Actors Only)
- Jump Left (Player Actors Only)
- Jump Right (Player Actors Only)
- Fall (Player and Computer Actors Only)
- Hit

You can choose a different animation, each with its own number of frames, for each of these ten ways (for a Player Actor) or six ways (for any other Actor). You can draw the player standing still, running in each direction, climbing up and down (for when the Actor is on ladders), jumping, falling and even a special graphic for when the character is hit by an enemy and dies.





In the middle of the window are the names of the possible movements, each with a picture of the first position of its currently assigned animation sequence. The movement names in green are available for use by the Actor. The movement names in red are not used—this is how AGCK reminds you that Actors who aren't Player Actors can't jump.



If gravity is not turned on, JUMPS and FALL are not available to Actors.

If you move the cursor over a picture on this window and press the joystick button it will animate to show you what the current animation looks like.

To change the animation, select the NAME (not the picture) of the movement you want to change. This opens the Edit Animation Window, which lets you edit the Actor's animation sequence.

To duplicate an Animation Sequence, select the Animation Sequence you wish to copy. Then use the cursor to select DUP from the menu bar at the top of the window, and press the joystick button. Finally, use the cursor to select the movement to which you want to copy the Animation Sequence and press the joystick button.

Shortcut: If you select an Animation Sequence, then place the cursor over another movement in the Parts Box (without pressing the joystick button), then hit the "D" key on the keyboard, the selected Animation Sequence will instantly be copied over the Animation Sequence to which the cursor is pointing. This allows you to make many copies of an Animation Sequence quickly.

Edit Animation Window

After you select the desired animated movement, you'll see the Edit Animation Window. This lets you edit the movement's animation sequence:

FRAMES—A slider allows you to use 1 to 8 animation frames to give the impression of movement

COLOR 4—Allows you to adjust the unique "COLOR 4" for this movement.

SPEED—Sets the speed at which the image will animate (not the speed at which the Actor will move).

This window also lets you view the animation in stationary and moving form. On the window's menu bar are two menu items:

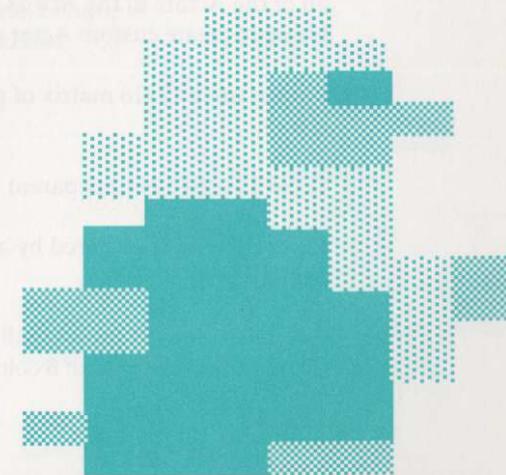
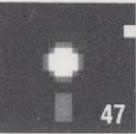
TYPE CLEAR

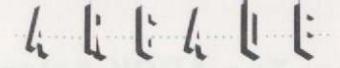
TYPE offers the following options:

ONCE—The Actor will go through the animation sequence once each time this particular movement is called for. This is most commonly used for things like when the Actor jumps or is hit and you only want it to go through its action once.

REPEAT—This is the most common setting. It tells the Actor to replay its animation sequence over and over again so that it walks, runs or climbs naturally.

ALTERNATE—This feature is actually a trick to allow you to have 16-frame animations using only 8 frames. When this option is selected, the Actor is displayed first as frames 1-8 in the usual order, then as frames 8-1 in reverse order, then as 1-8, etc. For actions that repeat themselves naturally, such as jumping up and down, this will give a





very smooth-looking effect. You only have to draw 8 frames of the Actor jumping up, and the computer will automatically show the frames in reverse to show the Actor coming down again.

CLEAR—clears the animation sequence so it contains only copies of frame (1,A), which is always blank.

Below these menu items are eight frames numbered 1 - 8. These are the frame slots that make up the animation sequence and are “flipped” in order to create animation. A lit frame number indicates the last frame in the sequence.

Directly below the frames is the actual animation, in stationary and moving form.

All About Frames

An animation is a group of still pictures, called Frames, that are flipped through in a preset order at a preset speed to achieve animation. You’ve probably played with books of pictures which, if you flipped through them, turned into a short movie. Computer animation works the same way.

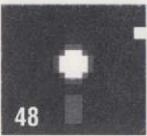
The frame is the basic building block of an animation and is nothing more than a single picture built of colored dots (the dots are called “pixels”). An AGCK game has a parts box of frames that is shared by all of the Actors in the Actors parts box. You can create or edit each frame to create custom Actor graphics.

Frames are a 12x16 matrix of pixels. Each pixel may be one of four colors:

Color 1 is always transparent

Colors 2 and 3 are shared by all frames and are chosen from a palette of 16 colors

Color 4 is selected individually for each animated movement and is chosen from a palette of 8 colors



Select Frame Window

AGCK lets you select frames one by one to build animations, and allows you to edit the graphics of any of the frames in the frame parts box (except for frame 1-A, which is always blank). To do this, select the position number of one of the frame slots on the Edit Animation Window. This opens the Select Frame Window, which lets you select one of the frames in the frame parts box for inclusion in the sequence or for editing. On this window’s menu bar are the menu items:

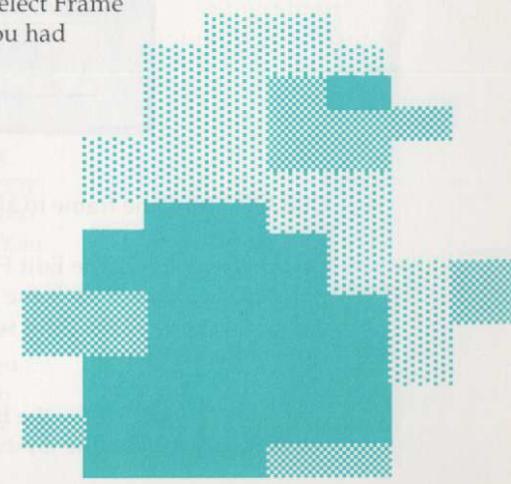
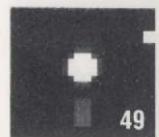
EDIT COLORS

EDIT opens the Edit Frame Window for the selected frame so you can create or change its picture. Typing the “E” key on the keyboard has the same effect as selecting this item.

Below the EDIT menu item on the Select Frame Window is a rectangle displaying a portion of the frames in the frame parts box. On the right of the window are two arrows and a DUP (Duplication) menu item. The arrows are used to scroll the frames in the parts box back and forth so you can see them all.

Below the arrows is a display of the currently selected frame. Select the frame you want to edit by moving the cursor over it and pressing the joystick button; a box will appear around the selected frame. Move the cursor over the DONE menu item to return to the Edit Animation Window. The frame you selected in the Select Frame Window will now be visible in the slot you had selected in the Edit Animation Window.

The DUP button is used to duplicate the selected frame into a new location in the Parts Box. To duplicate an Animation Frame, select the Frame you wish to copy. Then use the cursor to select DUP from the menu bar at the top of the window, and press the joystick button. Finally, use the cursor to select the location in the Parts Box to which you want to copy the Animation Frame and press the joystick button.





Shortcut: If you select an Animation Frame, then place the cursor over another location in the Parts Box (without pressing the joystick button), then hit the "D" key on the keyboard, the selected Frame will instantly be copied over the Animation Frame to which the cursor is pointing. This allows you to make many copies of a Frame quickly.

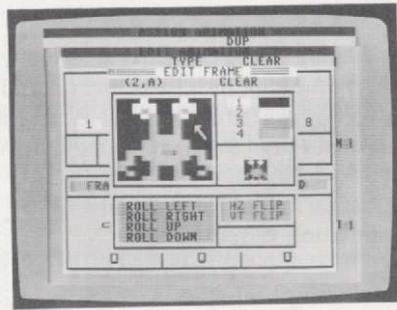
COLORS allows you to use two sliders to select colors 2 and 3 for ALL Actors in this Parts Box. Remember that if you set COLOR 2 to green when you draw a frog, then draw a Prince and change color 2 to red for the Prince's cape, you just changed your frog from green to red!

An Important Hint from Mike Livesay: Plan your Actor colors ahead of time, before you start drawing your graphics, so you don't end up with red frogs or green-faced Princes!



Edit Frame Window

The Edit Frame Window lets you create or change the graphics in the selected frame.



CLEAR—Clears the frame to all blank (color #1) dots.

On the upper left of the Edit Frame Window is a magnified image of the selected frame. This is the paint area. To choose which color to paint, select one of the color select menu items, marked "1"-"4", to the right of the paint area.

You paint the picture for the frame by moving the cursor over the area while holding down the joystick button. Whenever you do this, you'll

created a dot of the currently selected color. Below the color menu items is the frame in its actual size. Watch this to see what the image will look like in your game.

Just as when drawing Scenery Block graphics, you can also use the "I", "J", "K" and "M" keys to move the cursor around the screen, and the space bar to "paint" the currently selected square with the currently selected color. Pressing the space bar a second time (or the joystick button) turns the square back to Color #1 (which will always be transparent so the background will show through). The number keys 1 through 4 can be used to change the selected color at any time. Once you get used to them these "shortcut" keys will probably be easier to use than the joystick for drawing graphics.

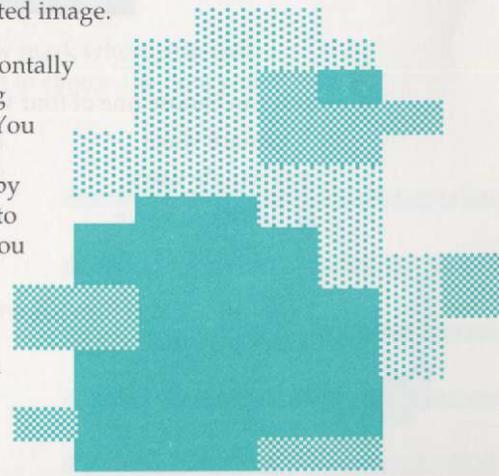
Hint from Mike Livesay: If you're editing an animation frame you've already drawn, sometimes you'll make changes to it and then decide you really liked it better the way it was before. If you make a copy of the animation frame in an empty space in the Parts Box before you start to edit it, you'll have that copy as a "backup" in case you accidentally ruin the original.

On the bottom of the window are menu items which graphically manipulate the frame in various ways:

ROLL LEFT, ROLL RIGHT, ROLL UP and ROLL DOWN shift the frame in one of four directions. This is useful to move the picture a little if you're shifting around the animated image.

HZ FLIP and VT FLIP flip the frame horizontally or vertically. This is very useful in creating characters that can go in either direction. You draw a picture of the little figure running right; you can then use HZ FLIP to turn it into a picture of the little figure running left. You drew the picture once, but you get two animated frames that look great.

While the frame edit window is open, you can select the "+" or "-" keyboard keys to select the next or prior frame in the frame parts box for editing.

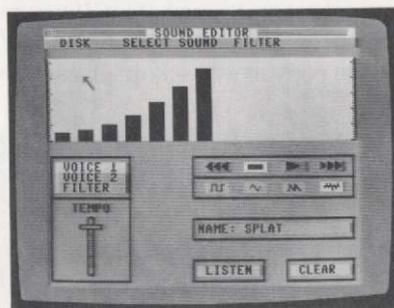


Reference Section: The AGCK Sound Editor

Using AGCK's powerful sound editor, you can compose great music and design exciting sound effects that can be triggered by Scenery Blocks or Actors. Every AGCK game contains a parts box of sound effects that you can create and edit.

An AGCK sound is a series of sounds (musical tones or other sound effects) that you can play at a speed you select.

Each sound effect has two "voices", which are different sounds, kind of like a stereo with two speakers, and one "filter". Each voice has a list of notes and a "waveform," a series of choices of different kinds of electronically synthesized sounds.



You can choose one of four waveforms for each voice:

- | | |
|---------------|----------------------------|
| Square wave | Hollow sound |
| Triangle wave | Soft, pure tones |
| Sawtooth wave | Buzzes |
| White noise | Sounds like static or wind |

Each sound effect also has a tempo, which is the speed at which the voices play their notes.

The Sound Editor lets you create and edit the Sound Effects Part Box of a game. The Sound Editor Window contains three items on its menu bar:

DISK SELECT SOUND FILTER

DISK opens a pull down menu that lets you LOAD, SAVE, or CLEAR all of the sound effects currently in memory.

SELECT SOUND lets you select the number of the sound effect you want to listen to or edit.

FILTER lets you choose the filter that the sounds will go through. A filter is a kind of electronic processing that the sounds go through that can make them take on new and interesting characteristics.

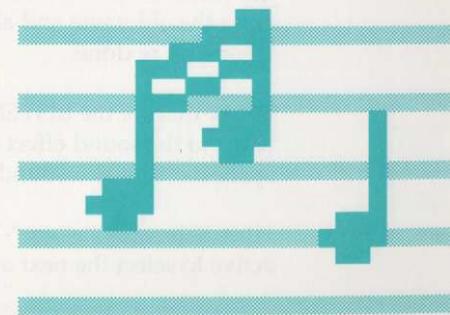
The Note Display Window and Voice Bar Graphs

Directly below the menu bar is the note display window of the currently selected voice or filter; remember that each sound has two voices and a filter, so you have to work on them one at a time. It displays a portion of the voice's or filter's bar graph, showing each note as a high or low bar. You can use the cursor to adjust each bar by moving the cursor over the bar's area while holding the joystick button down and "pulling" the top of the bar up or down. The higher the bar, the higher the pitch; a blank bar represents no note at all and will make that voice silent.

The large notches at the side of the window mark where different octaves begin and end. This makes it easier to choose the note you want.

"CASSETTE" Control Buttons

To the lower right of the note display window are some cassette-like buttons. These are used to choose what part of the music or sound effect you're editing or listening to. When you hit the "play" button on this cassette the computer will play the sound effect starting from the





When you pull down the FILTER menu, you're given the following choices:

LOW PASS—When this setting is on, the filter will “filter out” (i.e. make softer) the high frequencies of the voice(s) it's filtering.

BAND PASS—Filters out the extreme high AND low frequencies of the voice(s) it's filtering.

HIGH PASS—Filters out the low frequencies of the voice(s) it's filtering.

NOTCH—Filters out ONLY the middle frequencies of the voice(s) it's filtering. This is the exact opposite effect of the Band Pass.

ZERO Q—The filter has almost no effect on the the voice(s) it's filtering.

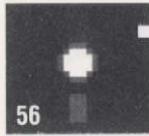
LOW Q—The filter has a small effect on the voice(s) it's filtering.

MED Q—The filter has a moderate effect on the voice(s) it's filtering.

HIGH Q—The filter has a great effect on the voice(s) it's filtering.

VOICE 1—When selected, the filter will affect Voice 1. When off, Voice 1 ignores the filter. You can filter both voices, either one by itself, or none at all.

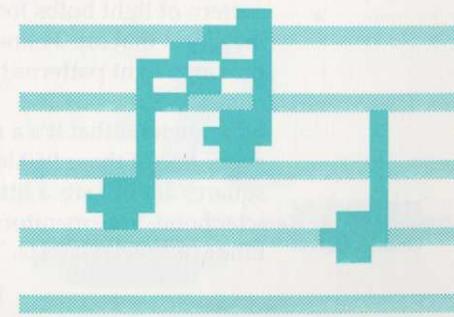
VOICE 2—When selected, the filter will affect Voice 2. When off, Voice 2 ignores the filter.



Using the Bar Graph to Adjust a Filter

When you use the bar graph to create tones for music or sounds on Voice 1 or Voice 2, you can hear the sounds you're creating. But when you use the bar graph to create a “filter pattern”, you're actually adjusting the range of sounds that will be affected by the filter for each individual note or tone.

If you set the bar high for a particular tone, it will (depending on the kind of “pass” you choose) affect the higher range of frequencies in that tone. If you set the bar low, it will affect the lower range of frequencies. Experiment with different settings and you'll soon get a feel for how this affects the sounds you hear.



Reference Section: The AGCK Level Editor

AGCK LEVELS, SCENERY BLOCKS AND SPECIAL EFFECTS: AN OVERVIEW

In most arcade games the action is broken up into levels, individual screens on which the action takes place. You can have up to 50 levels of action on an AGCK game disk. And you can give a friend a gift disk that holds 15 levels, even if your friend doesn't own AGCK.

Each level in AGCK is made up of a series of empty spaces on the screen and a "Parts Box" of Scenery Blocks which you can use to fill those spaces.

All Parts Boxes (every game has Scenery Block, Actor and Sounds Parts Boxes) are shared by all the levels in a game. The Martian Landscape you build for Level 7 of your game can also be used in Level 47, if you wish.

Scenery Blocks

Each Scenery Block is made up of colored dots which you turn on and off to create a miniature picture.

Each Scenery Block also has a set of Special Effects Settings and Special Powers which you can adjust to create all kinds of visual magic on the screen.

The easiest way to picture this concept is to picture a giant scoreboard at a baseball stadium. The scoreboard shows letters by lighting up a pattern of light bulbs for each character. The scoreboard can display messages that are 24 lines long and 40 letters wide, and it can also use the same light patterns to show pictures.

Now pretend that it's a really gigantic scoreboard, and that behind every one of those 960 letters (remember, that's 24 squares high and 40 squares across) sits a little operator with a bunch of switches and a telephone. The operators can turn the switches on and off to show all kinds of special effects. They can receive phone calls from the little

operators in the other boxes that tell them what to do. Or they can call up any or all of the other little operators and give them instructions.

As we show you how to use Scenery Blocks, we'll keep talking about the little operators in the scoreboard who're depending on you to tell them what to do and what messages to send each other.

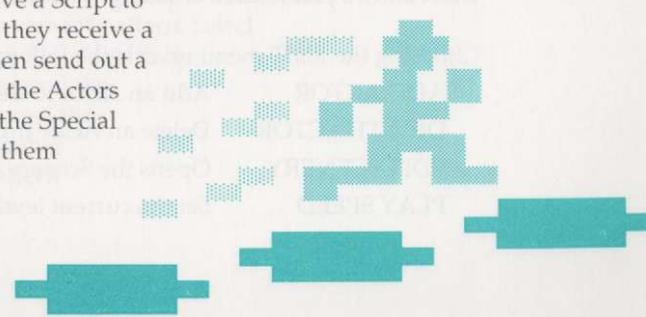
Special Effects

The F/X (Special Effects) Scripts and Cues are what you use to tell the computer to create unique, exciting twists and variations in game play. Whether you suddenly make the player able to kill the ghosts that have been chasing him, as in Pac Man™, or make a huge gate open, as in Commando™, AGCK Special Effects allow you to introduce surprising new elements to your games.

Actors have phone lines connecting them to each other and to all the Scenery Blocks, just as Scenery Blocks do. The four phone channels are called "A", "B", "C" and "D". When a Scenery Block or an Actor wants to tell another Scenery Block or Actor what to do, they send out a "Cue" on one of those four phone lines. The Cue, in effect, makes the phone ring inside all the Actors and all the Scenery Blocks, and they know what channel the cue is on.

Each Scenery Block and Actor can also be set up to have a "Script". If you were in a play or a movie, you'd wait for your cue and then do what it says in your script. In AGCK Actors and Scenery Blocks do the same thing: they wait for cues and, when they get them, they do what it says in their scripts.

If you have designed your game so that Scenery Blocks or Actors have a Script to do something special when they receive a cue on Channel "A", and then send out a signal on that channel, ALL the Actors and Scenery Blocks will do the Special Effects Script you chose for them for signals coming in on Channel "A". That might kill one Actor, turn another Actor from



a frog into a Prince, and make all the torches burning on screen turn into flowers.

This chapter on the Level Editor will explain how to build your levels and how to use Scenery Blocks to create exciting screens and special effects.

Using the Level Editor

The Level Editor lets you:

- Edit each level's scenery
- Edit the scenery blocks for an entire game
- Add Actors to each level
- Delete Actors from each level
- Play-test each level
- Set each level's run speed
- Set the number of levels in the game

When the Level Editor's window opens, you see a level's screen with all of its Actors (except missiles) displayed in their starting locations. The Level Editor, when you enter it, automatically loads Level 1 of your game and displays it on screen.

Across the top of the Level Editor's window are five menu items:

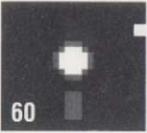
- DISK
- EDIT
- LEVEL
- RUN
- QUIT

The 2 digit number next to the level menu item is the number of the current level displayed.

DISK allows you to save or load parts boxes from the disk.

Choosing the EDIT menu reveals the following options:

- ADD ACTOR Add an Actor to the current level
- DELETE ACTOR Delete an Actor from the current level
- EDIT SCENERY Opens the Scenery Blocks Editor Window
- PLAY SPEED Set the current level's run speed



LEVEL triggers a pull-down menu with the following menu items:

- TO EDIT Select the level you wish to edit
- FIRST LEVEL Choose the level number where the game will start
- LAST LEVEL Choose the highest level number the game will play before going back to the first level and starting through the sequence again.
- COPY TO Copy the current level over another level on the game disk

RUN allows you to test out the level by playing it until you press the Space Bar. Leaving the current screen, dying or completing the level will also stop play and return you to the Level Editor.

QUIT returns you to the Main menu.

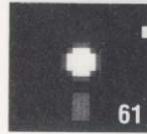
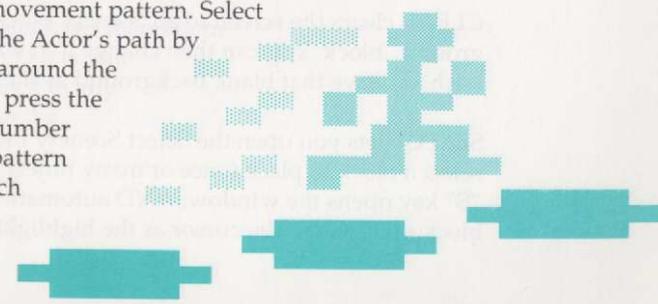
Adding an Actor to the Level

To add an Actor to the current level, select ADD ACTOR in the EDIT pull-down menu. A window will appear which will display an Actor, along with two arrows. Use the right and left arrows to display all the available Actors.

To select an Actor, display it in the window and then select the Done button. This erases the window displaying the Actor. Move the cursor to drag the Actor to its desired starting location and press the joystick button (unless the Actor is a missile – see below) to leave it there.

Adding Sentry Actors

If the Actor is a Sentry Actor, after you drop it on the screen you are asked to trace its movement pattern. Select the OK button, then trace the Actor's path by using the cursor to drag it around the screen. When you're done, press the joystick button. The total number of steps in the movement pattern is limited to 500; if you reach this limit the path will automatically be ended.



You'll then see a window that lets you adjust the movement speed of the Actor. Select the "done button" on the window (or press "F1") when the speed setting is where you want it.

Adding Missiles

If the Actor is a Missile you will not have to set a starting location on the screen since a missile's starting location is set when it is shot. Instead, all missiles currently included in the level (including the one you just added) will be displayed in the lower right corner of the screen until you press the joystick button.

Deleting an Actor from the Level

To delete an Actor from the level select the DELETE ACTOR menu item in the EDIT pull-down menu. This causes any missiles placed in the level to appear in the lower right corner of the screen. The letters "DEL" will appear under the cursor to indicate that you are in "delete mode". To delete an Actor, move the point of the cursor to that Actor and press the joystick button. To end this mode, move the arrow away from any Actor and press the joystick button.

EDIT SCREEN: THE SCENERY BLOCK EDITOR

To use the Scenery Block Editor, select the EDIT SCENERY menu item in the EDIT pull-down menu. When the Scenery Block Editor's window opens, you see the current level's screen, as before, but without any Actors.

Along the top of the screen are five menu items:

CLEAR SELECT COPY COLORS DONE

CLEAR clears the screen to all Scenery Block "1-A", the "blank background" block. You can then change it to whatever Scenery Block you wish, or leave that blank background as the basis for your game.

SELECT lets you open the Select Scenery Block Window so you can select a block to place (once or many times) on the screen. Hitting the "S" key opens the window, AND automatically chooses the scenery block underneath the cursor as the highlighted block.

COPY lets you copy a section of the screen to another section of the screen.

COLORS lets you select the shared scenery block colors (Colors 1-3) for all Scenery Blocks on the screen.

DONE returns you to the Level Editor.

Select

The SELECT Scenery block Window lets you view a portion of the Scenery block Parts Box and to select one of the Scenery Blocks to edit. On the menu bar are the menu items:

EDIT (1,A) CLEAR

To the right of the EDIT option are the coordinates of the currently selected scenery block.

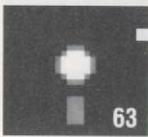
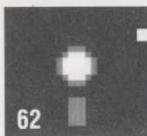
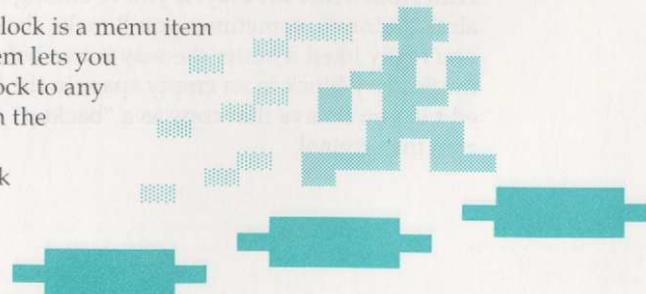
EDIT opens the Edit Block Window for the selected scenery block. The "E" key selects this option, as does the usual cursor selection with the joystick.

CLEAR clears ALL the Scenery Blocks in this Parts Box. Use this ONLY if you plan to draw everything in the Parts Box from scratch. Usually you'll only want to clear one Scenery Block at a time.

Along the right edge of the window are two arrows, which are used to scroll the window area left or right over the Scenery Blocks in the parts box.

Below the arrows is a picture of the currently selected scenery block.

Below the current scenery block is a menu item marked DUP. This menu item lets you copy the current scenery block to any other scenery block "slot" in the parts box. Once selected, it stays lit until a scenery block is copied or selected again (to cancel duplication).



Shortcut: If you select a Scenery Block, then place the cursor over another location in the Parts Box (without pressing the joystick button), then hit the "D" key on the keyboard, the selected Scenery Block will instantly be copied over the Scenery Block to which the cursor is pointing. This allows you to make many copies of an image quickly.

To select or duplicate a scenery block, use the arrows on the screen to move the window until the desired scenery block is displayed. Then move the cursor over the desired scenery block, and press the joystick button to select it. A small square appears around the selected scenery block and it will appear in the selected block area, below the arrows.

To place the current scenery block on the screen, move the cursor to the spot where you want to drop the scenery block. and press the joystick button. Holding the button down while moving the cursor will quickly "paint" many copies of the block on the screen.

You can also use the "I", "J", "K" and "M" keys to move the cursor around the screen. This is frequently easier and more precise than using the joystick to select small Scenery Blocks.

Placing the cursor over any Scenery Block that is already placed on the level's screen and pressing the "S" key will automatically select that Scenery Block so you can edit it or place it elsewhere on the screen. This allows you to choose scenery blocks without actually opening the Select Scenery Block Window.

To close the Select Scenery Block Window, select the Done button. Any scenery block changes you have made are saved to disk when you save the level to disk.

Hint from Mike Livesay: If you're editing a Scenery Block you've already drawn, sometimes you'll make changes to it and then decide you really liked it better the way it was before. If you make a copy of the Scenery Block in an empty space in the Parts Box before you start to edit it, you'll have that copy as a "backup" in case you accidentally ruin the original.

Copy

To copy one area of the screen to another area of the screen, select the COPY menu item. This will cause the entire menu bar to change to a red color to signify its other choices temporarily aren't available.

Move the cursor to a corner of the rectangular area you wish to copy, and press the joystick button. Then, while holding the button down, move the cursor until the white flashing rectangle covers the desired area and release the joystick button. Now you may repeatedly drag the rectangular area to various locations and press the joystick button to copy it there permanently. The "I", "J", "K" and "M" keys work well for moving the copied graphics to the exact right place.

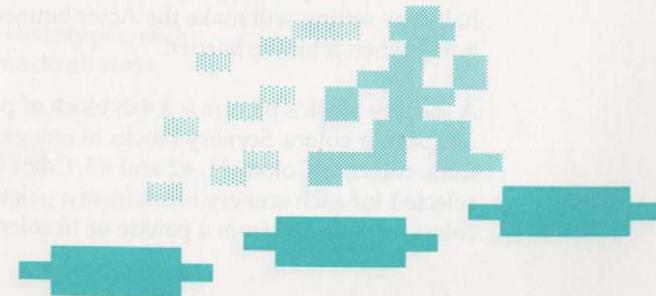
To stop copying, press the joystick button twice while making the last copy of the selected blocks, or move the cursor to the menu bar at the top of the screen and press the button.

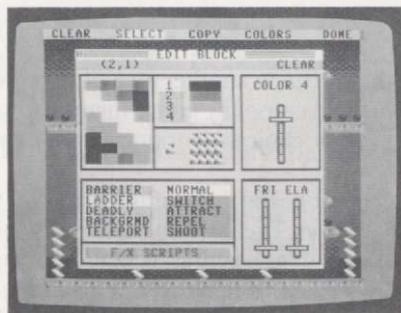
Creating and Editing Individual Scenery Blocks

The Edit Block Window

Select the EDIT menu item on the Select Block Window to use The Edit Block Window, which lets you:

- Paint the selected scenery block's picture
- Choose its colors
- Edit its Special Powers, Special Effects, etc.





On the window's menu bar is one menu item:

(1,A) CLEAR

In parentheses before it are the coordinates of the currently selected scenery block.

CLEAR clears the Special Powers, Special Effects, Building Materials and graphics of the selected scenery block.

There are three sliders on the Edit Block Window:

COLOR 4 sets the fourth color of the selected scenery block.

FRI sets the "friction" of the Building Materials of the selected scenery block.

ELA sets the "elasticity" of the Building Materials of the selected scenery block. At the top setting the Actor will bounce away at full speed; the half-way setting will make the Actor bounce off at half the speed it was going when it hit the barrier.

A scenery block's picture is a 4x8 block of pixels and each pixel may be one of four colors. Scenery Blocks in any game parts box all share the same colors as Colors #1, #2 and #3. Color 4, may be individually selected for each scenery block from a palette of eight colors. All shared colors are selected from a palette of 16 colors.

Scenery block Color

The four menu items marked 1-4 on the Edit Block Window are used to set the current paint color of the cursor when drawing Scenery Blocks. The keyboard keys 1-4 may also be used to select the paint color.

Painting the Scenery block

The enlarged picture of the scenery block in the upper left is the paint area. This is where you may use the cursor, by holding the joystick button down, to paint the scenery block's picture. To the lower right of the paint area are single and multiple actual size representations of the scenery block.

You can also use the "I", "J", "K" and "M" keys to move the cursor around the screen, and the space bar to "paint" the currently selected square with the currently selected color. Pressing the space bar a second time (or the joystick button) turns the square back to Color #1 (which will usually be black). The number keys 1 through 4 can be used to change the selected color at any time. Once you get used to them these "shortcut" keys will probably be easier to use than the joystick for drawing graphics.

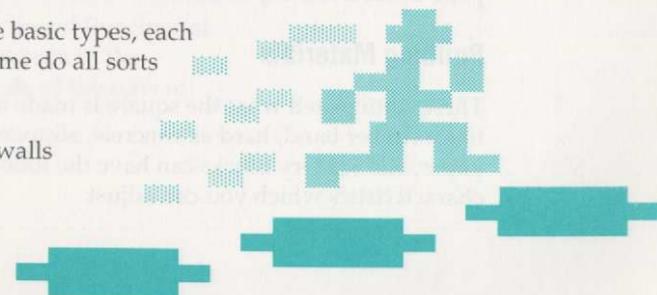
Hint: To advance the editor to the next or prior scenery block, press the "+" or "-" keys while in the Edit Block Window. This is useful if you are editing several Scenery Blocks and don't want to return to the selection window each time you change blocks.

Types of Scenery Blocks

Below the paint area are the Scenery Block Characteristics menu items. The leftmost group of menu items select the scenery block type.

Scenery Blocks come in five basic types, each of which can make your game do all sorts of great-looking things:

BARRIER—Act as barriers/walls to Actors



LADDER– Act as ladders for Actors, allowing them to defy gravity (if gravity is used in the game). Ladders have to be at least 3 blocks wide and 2 blocks high. Ladders can also take the form of conveyor belts (“CONVEYORS”) of different types. The DIR menu item allows you to choose the direction in which a conveyor belt will move an Actor (up, down, right or left); the MOVEMENT slider allows you to select how far the Actor will be moved each time the belt moves, and the “DLY” (DELAY) slider will determine how rapidly or slowly the belt moves.

Note: Ladders allow Actors to climb them based on the full size of the Scenery Blocks, NOT on the size of the pictures that are drawn in the Scenery Blocks. If you have a narrow ladder picture, the Actors will still be able to climb it as if the ladder were wide, and may appear to “hang in space.” To make ladders look as if they’re working properly, be sure to use the full width of the ladder’s Scenery Blocks for the graphics.

DEADLY– Kill any Actor that comes in contact with them.

BACKGROUND– Have no effect on Actors. These Scenery Blocks are useful for background graphic areas.

TELEPORT– Teleports an Actor that comes in contact with it to another selected Teleport block. Teleport blocks must be linked to each other in order to teleport an Actor between them. The SELECT menu item allows you to choose the Scenery Block to which the teleporter will move the Actor. The LINKED TO window displays the current choice.

Note: Actors will ignore any of these kinds of Scenery Blocks if the collision setting of the Actor for that type of block is turned off. See page 40 for a full explanation of these Actor settings.

Building Materials

These settings tell what the square is made out of in the game: bouncy like a rubber band, hard as concrete, slippery like ice, rough like sandpaper, etc. Scenery Blocks can have the following Building Materials characteristics which you can adjust:



Surface Friction–Sets the amount of “slipperiness” a scenery block has when Actors touch it. A scenery block with low friction acts like an oil slick, causing an Actor to have a hard time accelerating and to come to a stop slowly. A scenery block with high friction acts like a cement sidewalk, causing an Actor to accelerate quickly and come to a stop on a dime.

Surface Elasticity–Sets the “rubberiness” of a Barrier block when Actors touch it. A scenery block with high elasticity acts like a rubber band, causing Actors to bounce off when they bump into it. A scenery block with low elasticity acts like a cement wall when Actors hit it.

Special Effects Scripts

Below these menu items is the F/X SCRIPTS (Special Effects Scripts) menu item which opens a window that lets you edit that group of settings. Some of these menu items open windows that let you edit Special Effects in more detail.

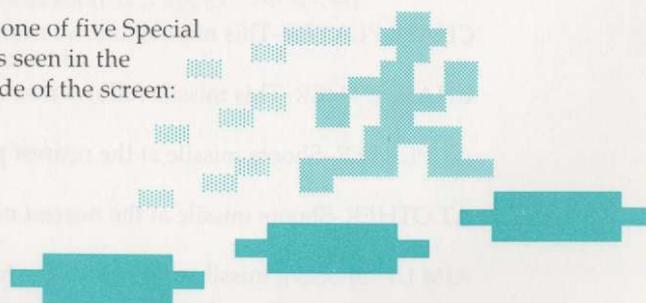
A scenery block may be set to react a certain way while it is receiving a Special Effects Cue on channel “C” or “D”. The possible Special Effects Scripts are:

IGNORE CUES	Ignore Special Effects Cues
BE BARRIER	Act like a barrier while cue is on
BE LADDER	Act like a ladder while cue is on
BE DEADLY	Kill Actors while cue is on
BE BACKGROUND	Ignore Actors while cue is on
STOP SHOOTING	Stop shooting while cue is on

Scenery block Special Powers

Each scenery block also has one of five Special Powers associated with it, as seen in the window at the right hand side of the screen:

- NORMAL
- SWITCH
- ATTRACT
- REPEL
- SHOOT MISSILE



Normal

The Normal Special Power really isn't a Special Power at all. This setting means the scenery block has no unique characteristics.

Attract and Repel

The Attract and Repel Special Powers cause a scenery block to attract or repel Actors within a certain distance of it. Both have a slider which you can adjust to control their strength. Use the Attract Special Power to create magnets or whirlpools. Try using the Repel Special Power to create giant fans, windy weather or strong current on a river.

Note: If an Actor is standing on a barrier of some kind, (or if gravity is off and the Actor is on top of a Background Scenery Block) the FRICTION setting of the Scenery Blocks on which it is standing will radically affect the strength of ATTRACT and REPEL. An Actor standing on "ice" (low friction) will be easy to move; an Actor standing on "sandpaper" (high friction) will be hard to move. The Actor's MAX SPEED setting will also radically affect how ATTRACT and REPEL work.

Shoot Missile

The Shoot Missile Special Power lets a scenery block shoot Missile Actors at the target of your choice and at the frequency you select. Scenery Blocks that you allow to shoot Missiles have the following settings:

- FRQ (Shot Frequency)—Sets frequency of missile firings.
- CHASE PLAYER—This missile follows nearest player Actor.
- CHASE OTHER—This missile follows nearest non-player Actor.
- AT PLAYER—Shoots missile at the nearest player Actor.
- AT OTHER—Shoots missile at the nearest non-player Actor.
- AIM UP—Shoots a missile up towards the top of the screen.

AIM DOWN—Shoots a missile down towards bottom of screen.

AIM LEFT—Shoots a missile to the left.

AIM RIGHT—Shoots a missile to the right.

SWITCH: THE MOST POWERFUL SPECIAL POWER

The Switch Special Power causes a scenery block to replace itself with another selected scenery block when certain events occur: an Actor collision, a Special Effects Cue, etc. It can also switch automatically after a delay which you select.

When the scenery block switches, it can also do the following things:

POINT AWARD	Changes the player's score
LIFE AWARD	Adds or subtracts lives from the player
SOUND EFFECT	Plays a sound effect
CUE	Sends a Special Effects Cue
END OF LEVEL	Declare the player has completed level

Switch Scenery Blocks are useful for such things as "takeable" screen elements (like the power pills in "Pac Man™") or small animated screen areas. Switch Scenery Blocks have the following settings, which are displayed on the Switch Block Special Power Window.

Trigger Source

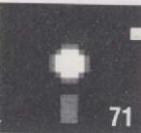
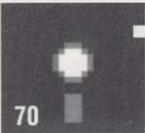
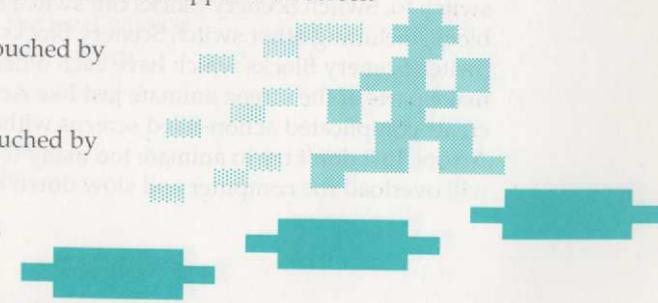
The Trigger Source setting selects the type of event that will cause the scenery block to switch. Your choices are:

AUTOMATIC—Block switches as soon as it appears on screen

PLAYER—Switches when touched by Player Actor

DRONE—Switches when touched by Drone Actor

MISSILE—Same for Missiles



COMPUTER—Same for Computer Actors

EFFECTS CUES A, B, C OR D—Switches when Cue is received

Note that, unlike many Special Effects Scripts (which can change things on screen temporarily), a Switch Scenery Block's change is permanent. If you want it to switch back to its prior form, make the target Scenery Block (the block to which it switches) a Switch Scenery Block set to switch to the first block after a delay. This is how you'll do "background animation" in AGCK.

Chain Reaction

The Chain Reaction setting causes a scenery block, when it switches, to trigger all adjacent switch blocks which have the same Trigger Source setting.

This is useful when creating takeable on-screen objects that require more than one scenery block to display, like the big hammer you can pick up in "Donkey Kong™". By placing chain reaction switch Scenery Blocks in a row, you can have an Actor change a large picture on the screen just by touching one small scenery block. Many special effects are possible.

Sound

The Sound setting allows a scenery block to trigger a sound effect when it switches. Sound effect triggering may also be turned off.

"Switch" (Target Block) Menu item

The Switch Target Block setting sets the scenery block that a block will switch to. Switch Scenery Blocks can switch to any type of scenery block, including other switch Scenery Blocks. By setting up 2 or more Switch Scenery Blocks which have each other as target blocks, you can make parts of the screen animate just like Actors. This is a great way to create complicated action-filled screens without using up all your Actors. Just don't try to animate too many blocks at once, since this will overload the computer and slow down the action of your game.

Switch Delay

The Switch Delay setting is the delay between the time a scenery block's switch is triggered and the time it actually switches. This is used for controlling the speed of the scenery block animation described in the prior paragraph.

F/X Cues

These settings cause the scenery block to send a Special Effects Cue on any combination of connection channels when it switches.

Award and Penalize

The Awards setting can cause a scenery block to:

- Award lives to the player
- Subtract lives from the player
- Award points to the player's score
- Subtract points from the player's score

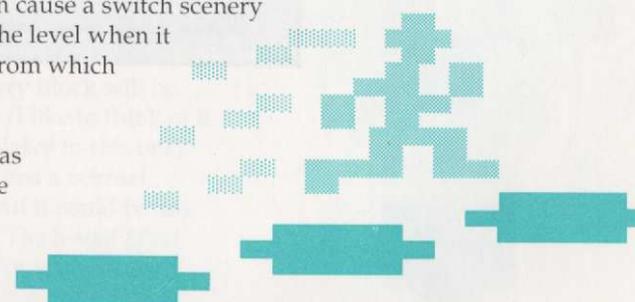
When you select any of these options a second window will appear, in which you can choose the amount of the award or penalty.

End of Level

AGCK keeps track of whether or not a player has completed a level in two ways. It can count how many times the player does something you want them to do, like shoot vampire bats as they leave a dark castle. Or it can wait for the player to do one special thing which you've declared allows them to complete the level.

The End of Level setting can cause a switch scenery block to trigger the end of the level when it switches. The menu items from which you choose are:

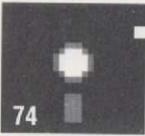
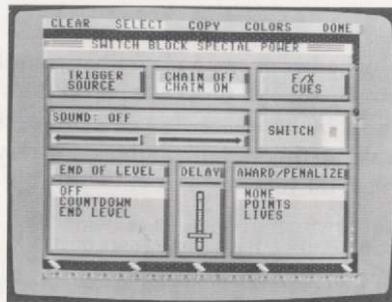
OFF—The switching block has no effect on determining the End of Level.



COUNTDOWN-AGCK counts how many of these Switch Scenery Blocks you place on the screen. When all of them have switched, the Player is considered to have completed the level and the game jumps to the next level. You could use this function to count how many dots a character like Pac Man™ has eaten (if you made each dot a Switch Scenery Block that switched to a regular background block when touched by the player).

Caution: Actors can also be set so that the game counts how many of them have been killed and then ends the level when they are all dead. If you have both Switch Scenery Blocks and Actors set up for COUNTDOWN on the same level, ALL of those Scenery Blocks must switch and ALL of those Actors must be killed before the Player will be considered to have finished the level. Since Actors can be set to be “reborn” and since Switch Scenery Blocks can turn into other Switch Scenery Blocks that are set for COUNTDOWN, you can create levels where it’s not easy to get everything to happen just right. Mike Livesay suggests that, at least for your first few levels, you try to keep your uses of COUNTDOWN simple so you can get a feel for how the system works.

END LEVEL-The block automatically ends the level. Selecting this allows you to choose the level number the game will jump to next.



By Mike Livesay

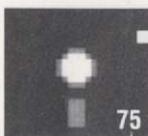
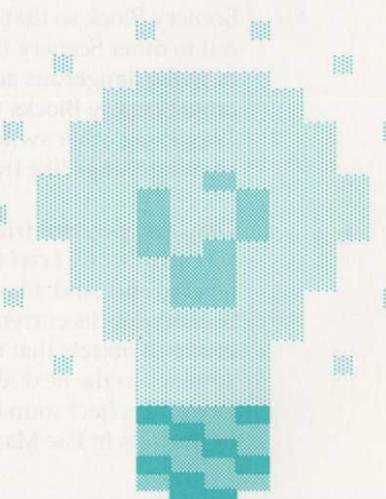
Below are some techniques for creating some of the more popular arcade game elements with AGCK. They by no means, represent the limit of what you can do with AGCK; I've included them as examples and hope that they will help you to find ways to create new and unique effects in the games you design. I want to encourage you to experiment as often as possible and, most importantly, have a great time doing it!

Creating “Takeable” Objects for Your Games

Most arcade games have stationary objects that the player can take by touching them to earn extra points, end the level, etc. With AGCK you can create these “takeable” objects by using *background* scenery blocks with the *switch* special power enabled. To do this, edit a scenery block in the Level Editor, clear it, and set up its graphics and color. Then set its type to *Background* and its special power to *switch*. Here is a breakdown of its *switch* Special Power Settings:

- Trigger Source: Player
- Chain: Off
- F/X Cues: All Off
- Sound Effect: Desired/Off
- Switch Block: Desired
- End Of Level: Off
- Delay: Minimum
- Award/Penalize: Desired

Note that since this Scenery Block is to be takeable by player actors, the *Trigger Source* option is set to *Player*. If you want to award/penalize points or lives when the Scenery Block is taken, select the appropriate *Award/Penalize* options. The *Switch Block* parameter is the scenery block that this Scenery Block will be replaced by when it is taken (I like to think of it as the Scenery Block that is *linked* to this one). In this example it should be just a normal, background Scenery Block but it could be any other type of Scenery Block. The *Sound Effect* parameter can be turned off or set to the



desired sound effect to trigger when the Scenery Block is taken.

You can use this same technique to create things like walls that disappear when shot by using *Barrier* switch Scenery Blocks with their *trigger source* set to *missile*. (You probably wouldn't want to award any points and could set the *award/penalize* parameter to *none*). If you wanted a wall that has to be shot more than one time before it disappears, all you would have to do is set the *switch block* setting so the Scenery Block would switch to another missile-triggered switch Scenery Block and that Scenery Block could be linked to another one and so on (the last Scenery Block in the chain would be a normal *background* Scenery Block). You can link as many of these Scenery Blocks together as you like and each link would represent one of the shots needed to remove the wall. If you made each Scenery Block in the chain a different color or pattern, then the wall would change its color or pattern each time it was shot. All sorts of interesting effects are possible by using variations on this technique.

If you would like to have a takeable object that is more than one Scenery Block in size, you can do this by turning on the *chain* Special Effect and creating other switch Scenery Blocks with the same *trigger source* and *delay* settings. Just place them side by side on the screen and when the player touches one of them, they will all switch simultaneously!

Another nice trick is to turn on one of the *F/X Cue* choices on a takeable Scenery Block so that when the Scenery Block is taken it will send a cue out to other Scenery Blocks or actors. This is useful if you want to freeze or make dangerous actors friendly for a time or if you want to cause other Scenery Blocks to switch when the player takes the Scenery Block. Triggering other switch Scenery Blocks with *F/X* cues is great for creating things like trap doors or gates that release enemies, etc.

One last powerful trick you can do with "takeable" Scenery Blocks is to set their *End Of Level* option to *Countdown*. What this does is cause the level to end (and advance to another level) when all of the "countdown" Scenery Blocks currently on the screen are taken. So you can create a group of objects that need to be taken/killed before the player can advance to the next level (**Note:** actors also have a *Countdown* setting). Does this effect sound familiar? How about the ledges in *Miner 2049er™* or the dots in *Pac Man™*?

Scenery Block Animation

Let's say you want to have an animating stationary area on one of the levels of your game, but don't have a spare Actor. What do you do? Use scenery blocks instead! How? Well, first let's talk about *animation*. Animation is created by continuously flipping through a sequence of pictures at a constant speed in the following manner:

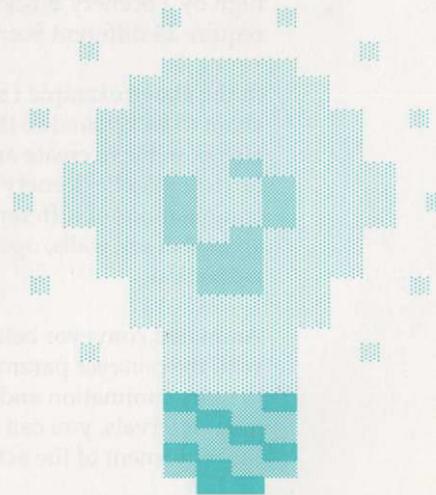
Picture #1 → Picture #2 → Picture #3 →
Picture #4 → Picture #1...

In the above example there are four pictures in the *animation sequence*; each picture (called a *frame*) is shown for a short time and is then replaced by the next picture in the sequence until the last picture is reached, which is replaced by the first picture and then the whole process repeats itself. It is similar to shuffling a deck of four cards by repeatedly removing the top card and placing it on the bottom of the deck. If there were pictures on the top of each card and you could shuffle them fast enough, the pictures on them would appear to animate. Scenery block animation is accomplished in a similar manner:

Scenery Block #1 → Scenery Block #2 → Scenery Block #3 →
Scenery Block #4 → Scenery Block #1...

Each Scenery Block replaces itself with the next Scenery Block in the sequence until the end of the sequence is reached and the whole thing is repeated. As with "takeable" Scenery Blocks, Scenery Block animation is accomplished by using Scenery Blocks with the *Switch* Special Power. Each Scenery Block in the sequence is set to trigger automatically, *delay*, and then switch to the next Scenery Block in the sequence. (The last Scenery Block in the sequence is set to switch to the first Scenery Block in the sequence). Since Scenery Block animation sequences are created by "linking" switch Scenery Blocks together, I call them *Scenery Block animation chains*.

For the sake of simplicity, in the following example the animating area is the size of one Scenery Block. Assuming that you don't want



the animating area to affect actors, set all of the Scenery Blocks in the chain to *background* and enable their *switch* special power. The following is a breakdown of the switch Special Power settings for each Scenery Block:

- Trigger Source: Auto
- Chain: N/A
- F/X Cues: Off
- Sound Effect: Off
- Switch Block: Next Block
- End Of Level: Off
- Delay: Desired
- Award/Penalize: None

Note that the *Award/Penalize*, *Sound Effect*, *End Of Level*, and *F/X Cue* options are all turned off, as in most cases you would not want to add points, trigger a sound effect, or end the level each time a Scenery Block in the chain switches. The *delay* parameter of each Scenery Block sets the speed of the animation. To achieve smooth animation, the *delay* settings of all of the Scenery Blocks should be the same.

It is possible to animate areas larger than one Scenery Block by placing different Scenery Block animation chains next to each other on the screen. Remember that areas larger than one Scenery Block can use up a lot of Scenery Blocks in your parts box (i.e. an area 3 Scenery Blocks high by 2 Scenery Blocks wide with four frames of animation would require 24 different Scenery Blocks from the parts box: $3 \times 2 \times 4 = 24$).

In the above example I set all of the Scenery Blocks in the animation chain to *background* so that they would have no effect on actors. It is also possible to create animating walls or dangerous zones by using all *barrier* or *deadly* Scenery Blocks in animation chains. You can even use combinations of different Scenery Blocks in animation chains to create areas that are walls, openings, or deadly at different times during their animation.

Animated conveyor belts can be created by using *ladder* Scenery Blocks with the *conveyor* parameter selected in the animation chain. By using the same animation and conveyor delays and the appropriate movement intervals, you can synchronize the conveyor belt animation with the movement of the actors on it.

One final trick with Scenery Block animation chains is to have the first Scenery Block in the chain triggered by a player (or other) actor to create areas that animate when a certain type of actor touches them. This is useful for effects such as exploding mines or treasure chests that animate (and add points) when taken.

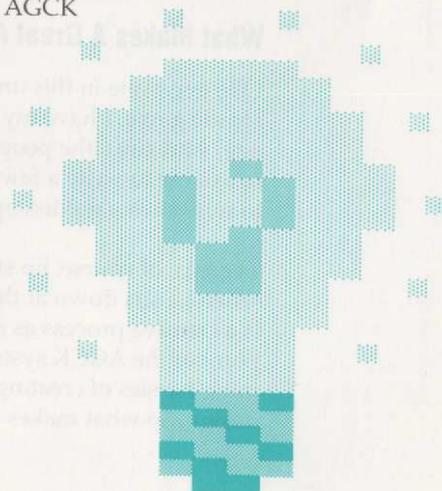
The last Scenery Block in the chain doesn't have to be linked to the first Scenery Block either. If you want something that animates once and then stops, put a normal Scenery Block at the end of the animation chain. All sorts of interesting effects are possible—just use your imagination!

Continual Level Games

Most arcade games (especially climbing games and shoot-em-ups) are played one level at a time and the levels follow each other in sequence. Other games are played across more than one screen and allow the player to exit on any side of the screen he is on and enter the adjacent level. In this way, the player can wander freely around the "arcade game world" the designer has created.

To create a game like this you must first select the *Continual Screen* setting in the *Screen* window of the Environment Editor. You will also have to set the *Level Matrix Size* value. In a continual level game, AGCK organizes the levels into a matrix, the dimensions of which you select. For example, if you select a 5 X 10 level matrix, AGCK organizes the levels in the following way:

01	02	03	04	05
06	07	08	09	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50

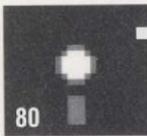




So, if a player is on level 13 and walks off of the bottom of the screen, he will enter on the top of level 18; if he walks off the top, he will enter on the bottom of level 8; if he walks off the left side, he will enter on the right side of level 12; and if he walks off the right side, he will enter on the left side of level 14.

The top-most and bottom-most levels of the matrix "wrap around" to each other (i.e. if a player exits on the top of level 2 he will enter on the bottom of level 47 and vice-versa), and levels on the leftmost and rightmost edges wrap around as well (exiting level 20 on the right wraps to level 16 and exiting level 6 on the left wraps to level 10).

The other matrix dimensions available are configured in a similar manner; some may not use all of the levels possible (ie: the 4 X 12 configuration only uses 48 levels). Continual level games may only be used on a gift disk if the designer limits the player to the first 15 levels of the game. Don't allow the player to walk off of the top of levels 1 - 5 in a 5 X 10 matrix because levels 46 - 50 don't exist on a gift disk. This will make your game freeze and the player won't be able to continue.



If you turn gravity off in a continual level game, it will operate as if the levels are lying flat on a table and the player is looking straight down at them (this is the way *Labyrinth Master* is organized). If you turn gravity on, the levels will appear to be organized like a multi-story building with one wall missing so you can see the action inside.

What Makes A Great Arcade Game?

Like everyone in this universe who has ever played or written an arcade game, I have my opinions on the subject of what makes a great one. And since the people at Brøderbund Software were kind enough to ask me to write a few words on the subject, I certainly am not going to miss such a golden opportunity to mutter my philosophies.

There is, of course, no standard procedure that a game designer uses when he sits down at the drawing board to design his next product. It is a creative process as much as it is a technical one and the whole point of the AGCK system is to relieve the designer of the programming hassles of creating a game so he or she can focus on pure game design. So what makes a great game? Here are some guidelines:



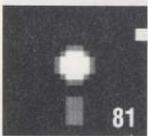
1. TOP-NOTCH GRAPHICS AND SOUND

Arcade games are an *audiovisual* art form, like movies, and a lot of the "heat" in a hot game is directly related to its graphics and sound effects. So try to make your game look and sound good (and if you're like me and have enough problems trying to sign your name so other people can read it, you can use the graphics from the sample games included with AGCK, which were created by professional graphic artists).

2. GREAT HOOKS

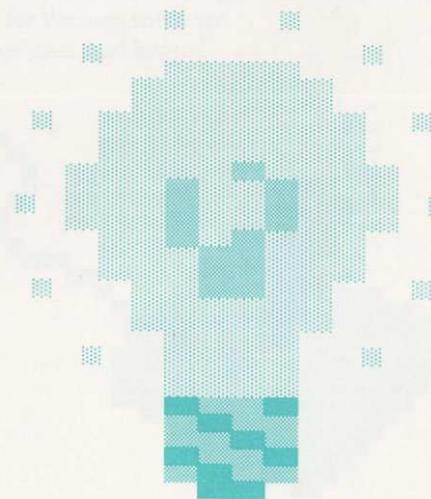
In the music business, the catchy musical phrase in a song (the one that makes you want to hear it again and again) is called a *hook*. In arcade games, the hook is the element of game play that is addictive—it is responsible for all those quarters you dumped in *Marble Madness*™ last week.

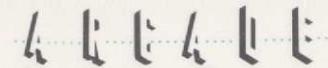
The hook is usually in the form of a some sort of puzzle that must be solved, obstacle that must be overcome, or goal that must be reached. Most of the time there is a satisfying graphic or audio reward tied to it. A good example of a classic arcade game hook is the eating of the dots in *Pac Man*™. There is something satisfying about clearing a maze full of dots by eating them and the 'wocka-wocka' sound associated with their digestion.



3. WELL BALANCED PLAY

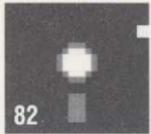
A great arcade game should be hard enough to peak someone's interest but not so hard as to turn them off. A game that is *easy to learn but hard to master* will hold someone's interest a long time. Also, try to keep the pace of the game up - don't let the player sit around thinking. Keep him or her busy dodging arrows or running away from robots while trying to reach the goal!





4. LOTS OF DEPTH

In the early days of arcade games, one variation on the theme of a game was enough to hold most gamers' interest. Today's gamers are a little more jaded - a game must have lots of depth and variation to hold their attention. So once you've developed a theme and some good hooks for your game, take it to the limit! Add lots of levels with lots of interesting variations and you may find your friends fighting over who is going to play your game next! And believe me, *that* can be one of most rewarding experiences a person can have!



Mike Livesay's fascination with technology began at the early age of 12, when he built his first electronic project: a strobe light kit from Radio Shack. Electronic Music became his passion, and he designed and built synthesizers while still in junior high school.

Mike first became involved in computers in the Eighth Grade, where he wrote programs on the math lab's teletype, connected to a remote

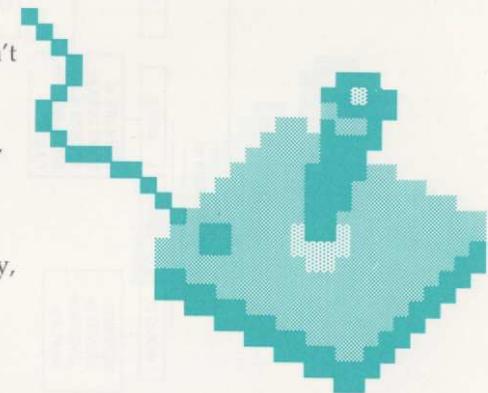
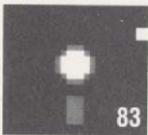
computer with a whopping 8K of RAM. He bought (and built) his first 6502 computer during high school, learned assembly language, and wrote his first game: a crude version of *Space Invaders*.

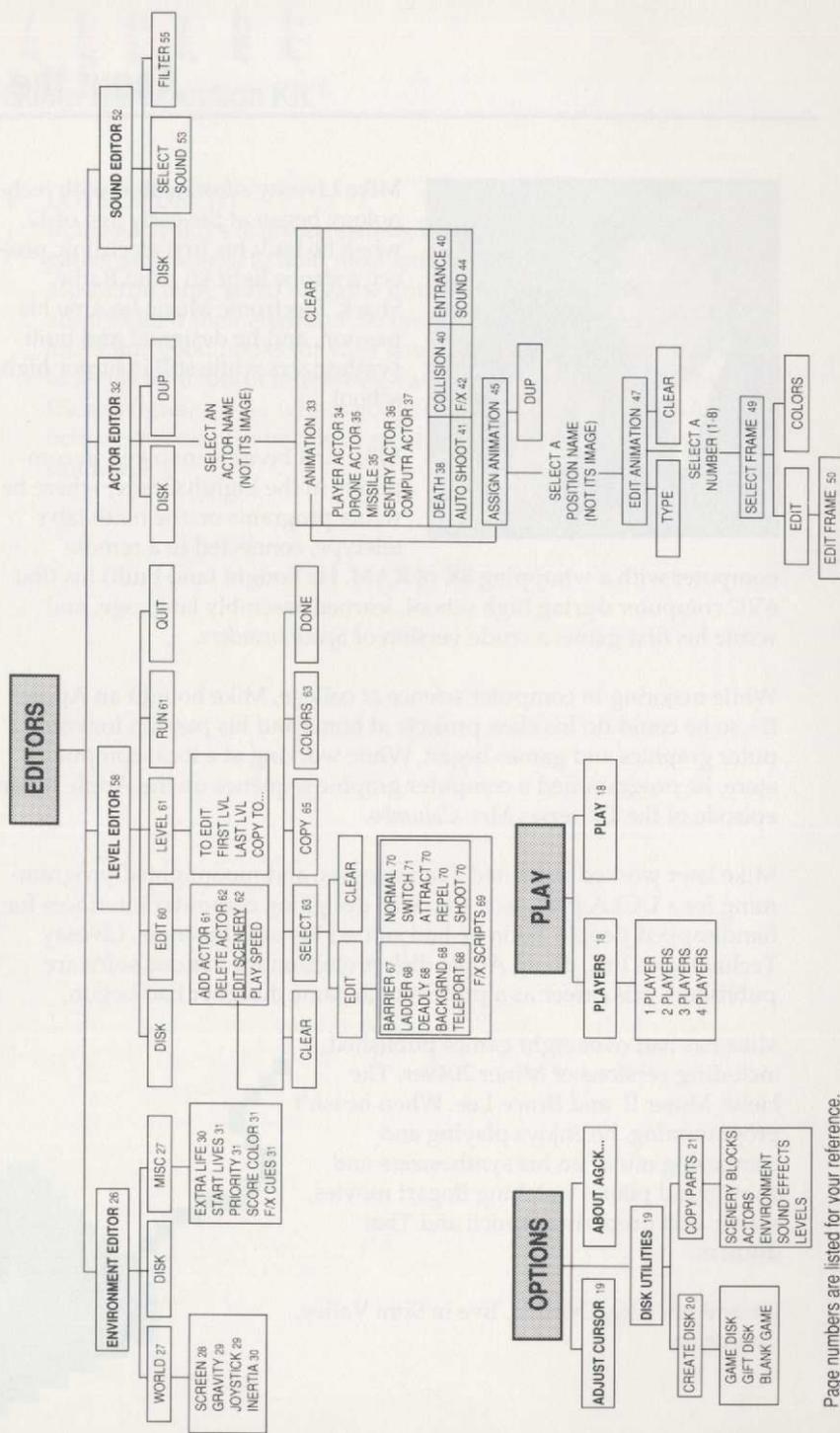
While majoring in computer science at college, Mike bought an Apple II+ so he could do his class projects at home and his passion for computer graphics and games began. While working at a local computer store, he programmed a computer graphic sequence on the Apple for an episode of the TV series *Mrs. Columbo*.

Mike later worked at United Technologies, and moonlighted programming for a UCLA professor who was designing computer interfaces for handicapped people. Soon he had started his own business, Livesay Technologies Inc., doing Apple disk protection for various software publishers. His career as a professional game designer had begun.

Mike has had over eight games published, including versions of *Miner 2049er*, *The Heist*, *Miner II*, and *Bruce Lee*. When he isn't programming, he enjoys playing and composing music on his synthesizers and baby grand piano, watching Bogart movies, skiing, and preparing French and Thai dinners.

He and his wife, Cynthia, live in Simi Valley, California.





Index Chart/Warranty Information

Warranty Information

Brøderbund's Limited Ninety-Day Warranty

Brøderbund warrants for a period of ninety (90) days following the original retail purchase of this copy of Arcade Game Construction Kit that the program is free from substantial errors or defects that will materially interfere with the operation of the program as described in the enclosed user documentation. This policy applies to the initial purchaser only.

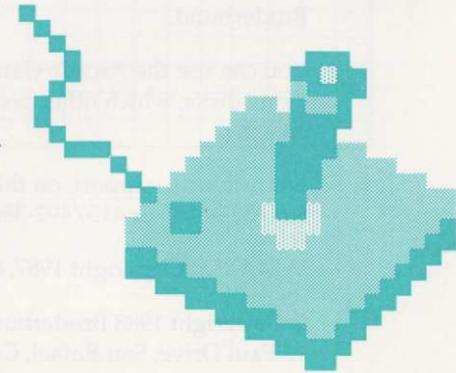
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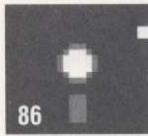
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You can use the Arcade Game Construction Kit to create your own game disks, which other people can play (even if they don't have AGCK).

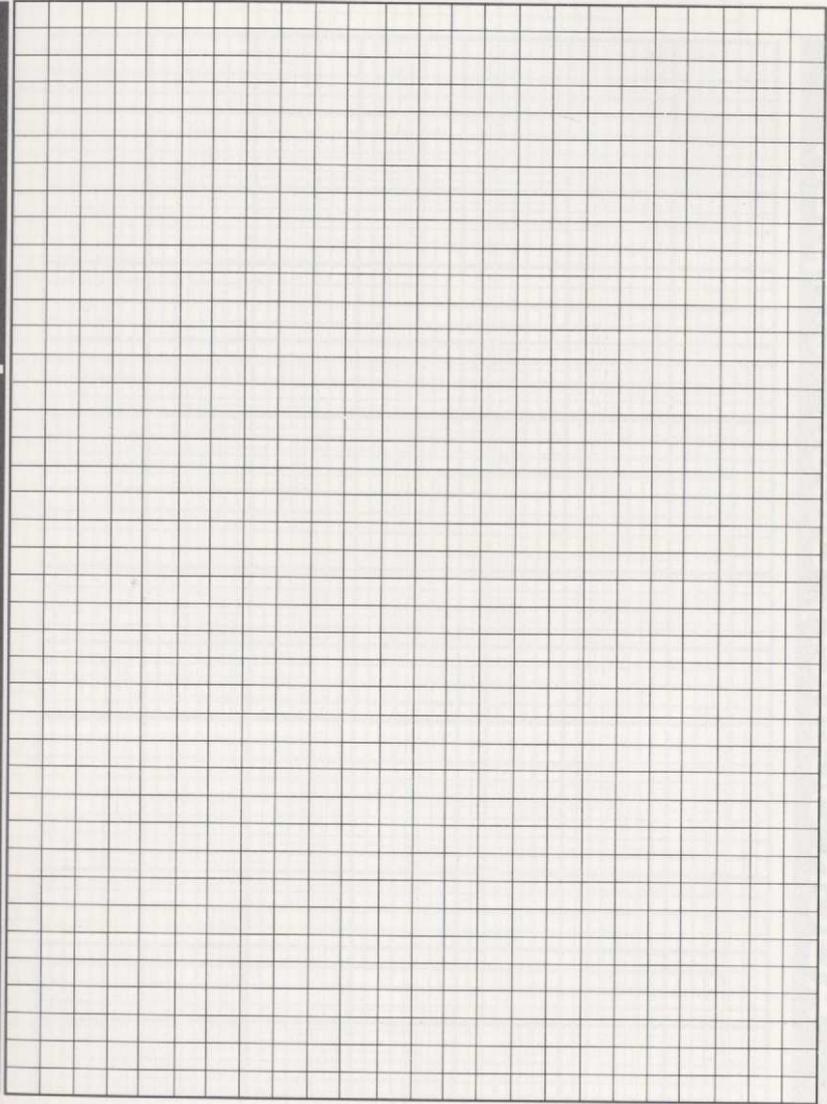
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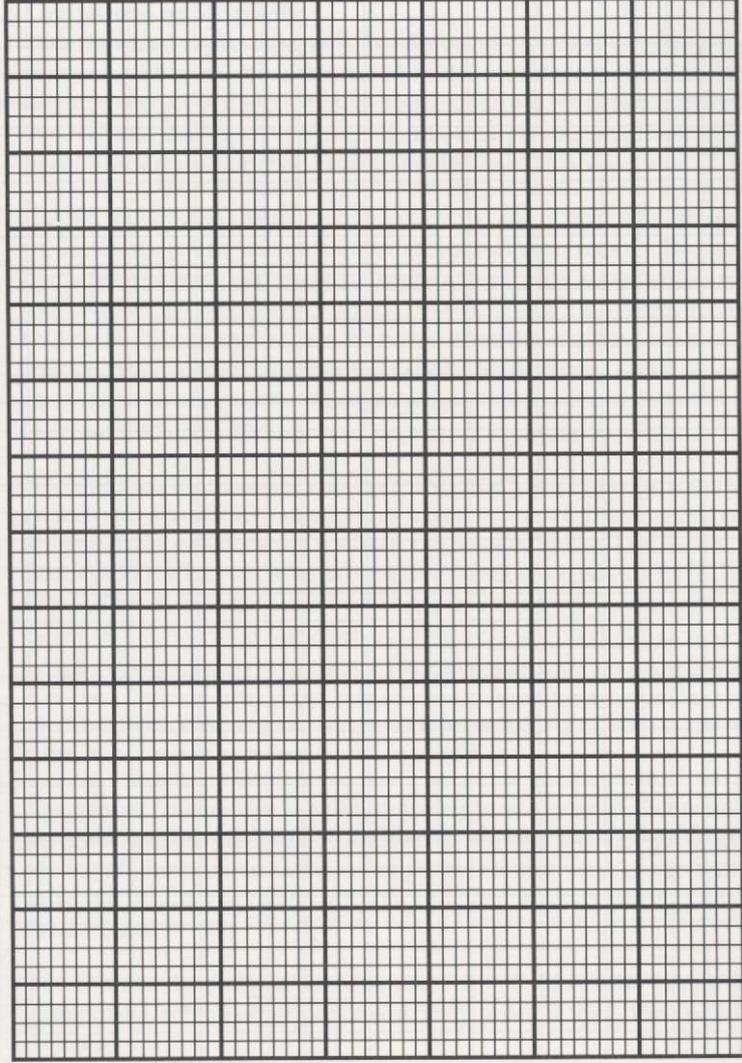
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AGCK Level Template

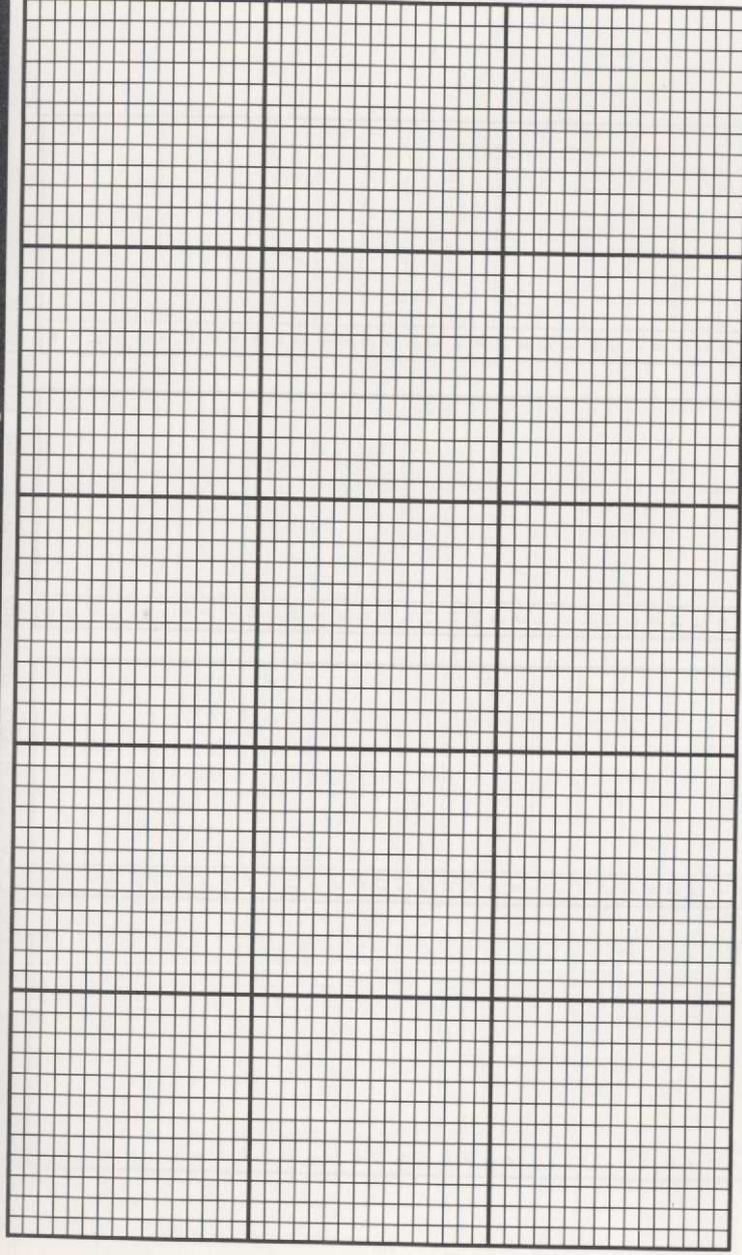


AGCK Scenery Block Template



AGCK Travel Template

AGCK Actor Template



AGCK Scenery Block Template

AGCK Scenery Block Record

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Key: Br=Barrier L=Ladder (C↑↓←→)=Conveyor D=Deadly Bk=Background T=Teleport (?,?,)=Teleport to
 N=Normal Sw=Switch (?,?,)=Switch to A=Attract R=Repel Sh=Shoot (cP, cO, aP, aO, ↑↓←→)=Shot direction