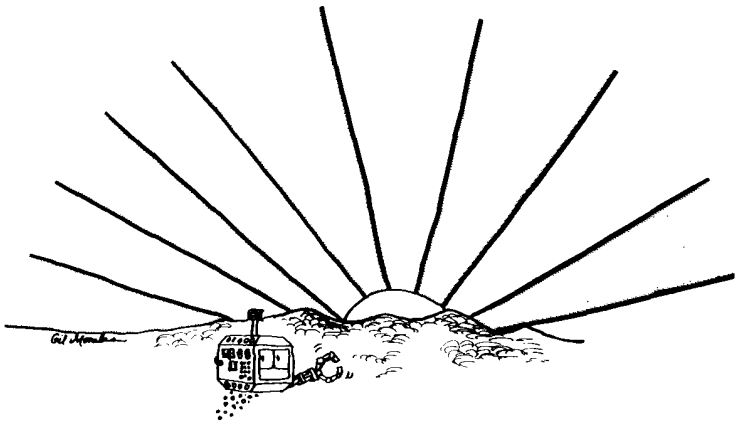
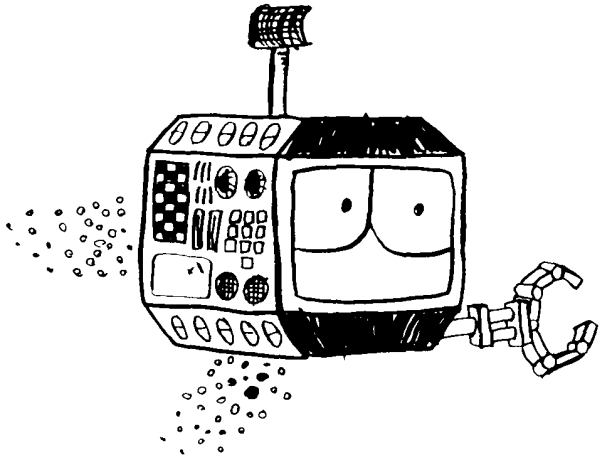


The Learning Company®

Robot Odyssey 1®



Program robots to help you escape from the eerie underground city of Robotropolis.

Tandy

Quick Start

You don't need to learn everything about robots before you can have fun with Robot Odyssey. You can play the Robotropolis adventure game almost immediately and learn as you go. Here's what to do to get started right away:*†

Put a Robot Odyssey disk in the disk drive and close the door. Turn on the computer. Select ROBOTROPOLIS PREVIEW** from the menu. This program shows the highlights of the Robotropolis game.

- ☐ Select ROBOT ANATOMY from the menu and press [?] for a summary of keyboard commands. In this program, you'll learn enough to master the first level of the game, the Sewer.
- ☐ Choose ROBOTROPOLIS from the menu. Can you find your way from the Sewer to the Subway? Press [?] for hints.
- ☐ Save your Robotropolis game often on a separate disk. (See page 40.) Then you won't need to start at the beginning each time you play.
- ☐ See page 5 for using the other programs in Robot Odyssey.
- ☐ Use this guide when you need to look something up or when you need more information on using the program.

*On IBM computers you need to install DOS first. See Appendix A.
†On Tandy Color Computers you should first back up the disks. See page 2. Also, if you don't have a standard OS-9 boot procedure, see Appendix A.
**Available on Apple only.

The Learning Company®

Robot Odyssey 1®

For:
- ☐ Ages 13 and up

Robot Odyssey runs on:

With:

- ☐ Apple II, 64K
- ☐ Apple II+, 64K
- ☐ Apple IIe
- ☐ Apple IIc

  - ☐ Disk][for 5¼" disks
  - ☐ UniDisk 3.5 for 3½" disks
  - ☐ Monitor or TV (color recommended)

- ☐ IBM PC, 256K
- ☐ IBM PCjr., 256K
- ☐ IBM PC XT
- ☐ IBM PC AT
- ☐ IBM PC Portable

  - ☐ Double-sided Disk Drive
  - ☐ DOS 2.0 or higher
  - ☐ Color/Graphics Monitor Adapter (except jr.)
  - ☐ Monitor or TV (color recommended)

- ☐ Tandy 1000, 256K

  - ☐ Double-sided Disk Drive
  - ☐ DOS 2.1 or higher
  - ☐ Monitor or TV (color recommended)

- ☐ Compaq, 256K

  - ☐ Double-sided Disk Drive
  - ☐ DOS 2.0 or higher
  - ☐ Monitor or TV (color recommended)

- ☐ Tandy Color Computer, 64K

  - ☐ Single-sided Disk Drive
  - ☐ Monitor or TV (color recommended)

Optional:
- ☐ Joystick
- ☐ Mouse (Apple only)

Credits

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Leslie Grimm

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Mike Wallace

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Introducing . . .

The Learning Company

Since its beginning in 1982, The Learning Company has been widely recognized as the leader in educational software. Our innovative products have won "software of the year" awards from *Learning* magazine and *Parents' Choice*, "critics' choice" awards from *Family Computing*, and earned the coveted approval of the National Education Association. Developed and evaluated by a team of educators, program designers, and educational software specialists, our programs have set the highest industry standards for educational quality and design excellence. We've combined imaginative graphics, the best in animation and program design, and proven educational theory to bring you the finest educational software available today.

Introducing . . .

Robot Odyssey

Robot Odyssey is a powerful computer simulation that combines the intrigue of an adventure game with the almost infinite possibilities of a robot construction kit. Teenagers and young adults develop advanced logical thinking skills as they program robots to help them escape Robotropolis—an underground city inhabited by robots, guarded by sentries, and loaded with challenges of all sorts. By wiring robots to negotiate mine fields, unlock doors to secret rooms, and maneuver past sentries, hot wires, and magnetic storms, players develop strategies for analyzing problems, forming hypotheses, building models, and refining solutions. In the process, they learn the fundamentals of digital logic, circuit design, and computer programming.

In addition to the Robotropolis adventure game, Robot Odyssey contains a highly entertaining demonstration of the game*, a set of engaging tutorials that introduce concepts sequentially, a library of microchips for building robot circuits, and a "laboratory" where players can experiment with circuit designs and create their own robot games. The program is carefully structured so that players can enjoy the adventure game while learning the skills they need. Concepts introduced in the first tutorial will successfully advance players through the first level of the five-level game. The other tutorials sequentially present the concepts and skills needed to solve the increasingly complex problems encountered in Robotropolis. From basic robot anatomy to complex circuitry and chip design, the tutorials are almost as rich and varied as the game itself.

But Robot Odyssey is much more than an ingenious program. It's an endlessly rewarding experience in a microworld where "getting there" is not as important as the journey itself. The journey, indeed, can take weeks or months, yet continue to captivate and challenge even the most adept player. Combining the best in adventure, entertainment, and education, Robot Odyssey will be as much fun to explore in a year as it was on the first day.

*Available on Apple only.

Introducing . . .

The Authors

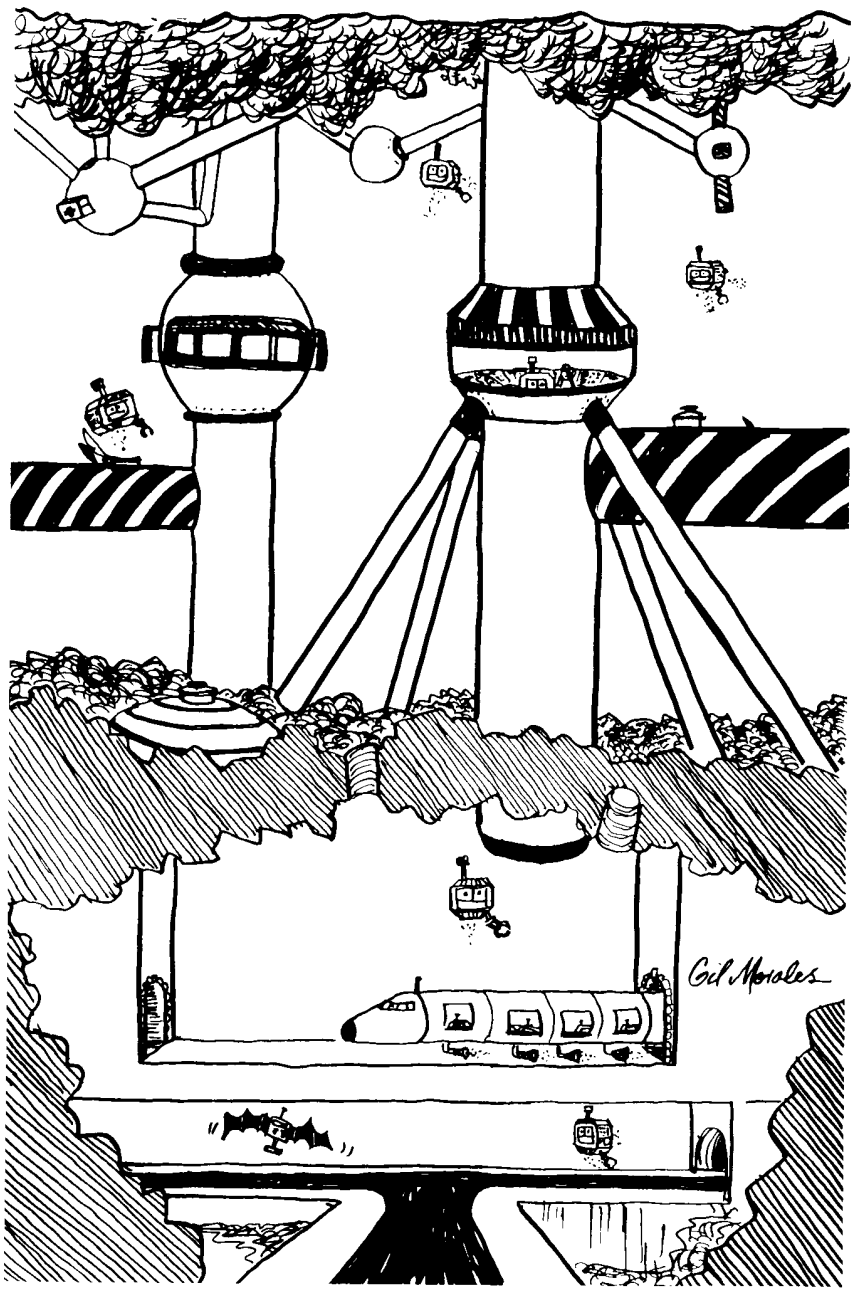
Mike Wallace

Meet Mike Wallace, the creative genius behind Robot Odyssey and designer of the Innovation Lab portion of the program. Mr. Wallace, who first conceptualized the idea of an electronic robot construction kit, programmed the capability of building microchips within microchips and moving inside and outside robots—features which give the program its multidimensional aspect. His original thinking and formidable skill as a programmer contributed to the real-life quality of this simulation. Currently a student of Software Engineering at Stanford University, Mr. Wallace has already made a name for himself in educational software.

Leslie Grimm

Meet Leslie Grimm, Ph.D., co-author, director, and contributing game designer and programmer of Robot Odyssey. In addition to this program, she has designed and programmed other award-winning TLC learning games, including Bumble Plot and Bumble Games, Gertrude's Secrets and Gertrude's Puzzles, Moptown Parade and Moptown Hotel, Reader Rabbit, and the latest release of Magic Spells. Having earned degrees from Stanford University and the University of Washington, Dr. Grimm taught in the classroom for many years, working with children of all ability levels. She then turned her talents to designing and programming educational software—software that was to earn her national acclaim as an innovator of discovery-based learning programs for children. Recognized for her creativity, technical expertise, and commitment to education, Dr. Grimm currently manages all product development for The Learning Company.

Contents



Welcome to Robot Odyssey

Are you ready to take an unforgettable trip through the robot city of Robotropolis? It may be a long journey, but you won't be going alone. Three robots are waiting for you right now in the Sewer of Robotropolis. You'll need to program these robots to perform certain tasks, like opening doors, sneaking past sentries, and picking up keys, tickets, and other things—things you'll need to escape the city and return to civilization. Along the way, you may have to brave a magnetic storm, tiptoe through a minefield, and even negotiate a ventilator shaft, but that's all part of the fun.

Programming robots is what Robot Odyssey is all about. There are several different programs that show you what you need to know to have fun with robots and play the Robotropolis game. You'll learn all about robot equipment, energy sources, and how to wire up circuits inside the robots. There's even a Toolkit with special circuit parts, a Solderpen for wiring, and a Remote Control for operating robots.

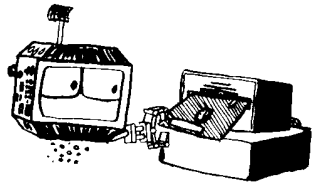
You can program robots in Robotropolis or in the fully equipped Innovation Lab—a great place to take a break from the rigors of Robotropolis! Go to the lab when you need a safe place to figure things out. You'll find your tools and circuit parts there, as well as special equipment for making "chips"—circuits in pint-sized packages. These chips can be wired into other circuits or even into other chips. You can put chips inside of chips inside of chips for building some pretty powerful and sophisticated robots!

Whether you're programming robots to play the game or just tinkering with robot circuits in the lab, you'll be learning to think like a scientist— defining the task you want to perform, breaking it down into small parts, testing different possibilities, and refining the solution. In the process, you'll learn the basics of computer logic and electronic circuitry—the same concepts taught to engineering students in college.

To begin your odyssey, turn the page and go through the programs in the order suggested there. Take your time and learn everything step by step. Have fun, and enjoy a safe and successful trip!

Getting Started

On an Apple computer:
Robot Odyssey is contained on either a single 3½" disk or two 5¼" disks, labeled Side A, B and C. You can load either disk.



☐ Put a Robot Odyssey disk in the disk drive and close the door.
☐ Turn on the computer.

On an IBM computer:
Robot Odyssey is contained on two disks, labeled Disk 1 and Disk 2. Use Disk 1 to load the program.

Before you use Robot Odyssey for the first time, you will need to install DOS on Disk 1, and run a "setup" program. See Appendix A.

☐ Put Disk 1 in the disk drive and close the door.
☐ Turn on the computer.

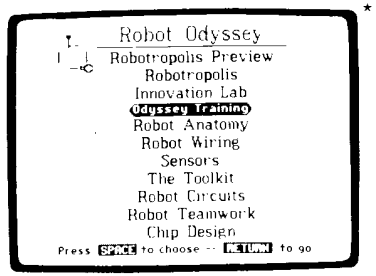
On a Tandy Color Computer:
Before running Robot Odyssey, make a backup of both sides of the program diskette that came with the package. (Use the standard backup procedure.) Place the original program diskette in a safe place and use only your backup copy for running the program. You can use your copy of the disk to save your games and chips, if desired.

Connect the joystick, if you have one, to your computer by plugging it in the right joystick port of your computer. If you do not have a standard OS-9 boot procedure, see Appendix A, Starting OS-9 from Your Color Computer. If you have OS-9, type DOS or use the OS-9 boot procedure that you are accustomed to using.

☐ Boot the side of the disk marked "Boot this side."

☐ Follow the instructions on the color adjustment screen.

Choosing a Program
After the opening pictures, the menu appears, listing the programs contained on both disks.



*

☐ Press SPACEBAR to move the window to the program you want.
☐ Press RETURN, ENTER, or ↵ and follow the instructions on the screen.

To leave a program:
☐ Press BREAK. This returns you to the menu where you can choose another program.

To get help or hints:
☐ Press ?. (See page 57 for a list of special keys.)

*Illustration shows menu from Apple version.

1. **Robotropolis**
   Play Robotropolis and work your way up through all five levels of the underground city: the Sewer, Subway, Town, Master Control Center, and Skyways. Use the robots to help you, collect objects along the way, and save your game often. (See pages 36-52.)

2. **Innovation Lab**
   Use this robot workshop to tinker with robots, build chips, and test circuits that will help you in Robotropolis. (See pages 25-35.)

3. **Robotropolis Preview***
   See some of the highlights from the Robotropolis game.

4. **Robot Anatomy**
   Learn how to move, pick up and drop objects, and how robots behave and what equipment they have. You'll learn everything you'll need to know to get safely through the Sewer in Robotropolis. (See pages 8-11.)

*Available on Apple only

5. **Robot Wiring***
   Learn how to wire robot parts to make robots move and send signals. (See pages 12-13.)

6. **Sensors***
   Find out how to use sensors to make robots find and grab objects and send signals. (See pages 14-15.)

7. **The Toolkit**
   Discover the parts and tools you have at your disposal to wire up robots. (See pages 16-19.)

8. **Robot Circuits****
   Learn how to program robots to do the things you want them to do in Robotropolis. (See pages 20-22.)

9. **Robot Teamwork****
   Find out how to coordinate two robots to solve puzzles in Robotropolis. (See page 23.)

10. **Chip Design**
    Learn how to store circuits in tiny packages called 'chips' and use the special equipment in the Innovation Lab. (See pages 27-35.)

*On a Tandy Color Computer, Sensors is combined with Robot Anatomy, and Robot Wiring is included in the Toolkit.
**Not available on Tandy Color Computers. See the circuits described on pages 20-23, and try making them in the lab.

For First-Time Users

Begin with **Robotropolis Preview** to see highlights from the game.* You'll get to see some of the obstacles and challenges that will face you and your three robot companions as you journey upward through the five levels of Robotropolis.

Prepare for your journey through Robotropolis by studying some **Robot Anatomy**. This short course on robot basics will get you off to a good start in Robotropolis.

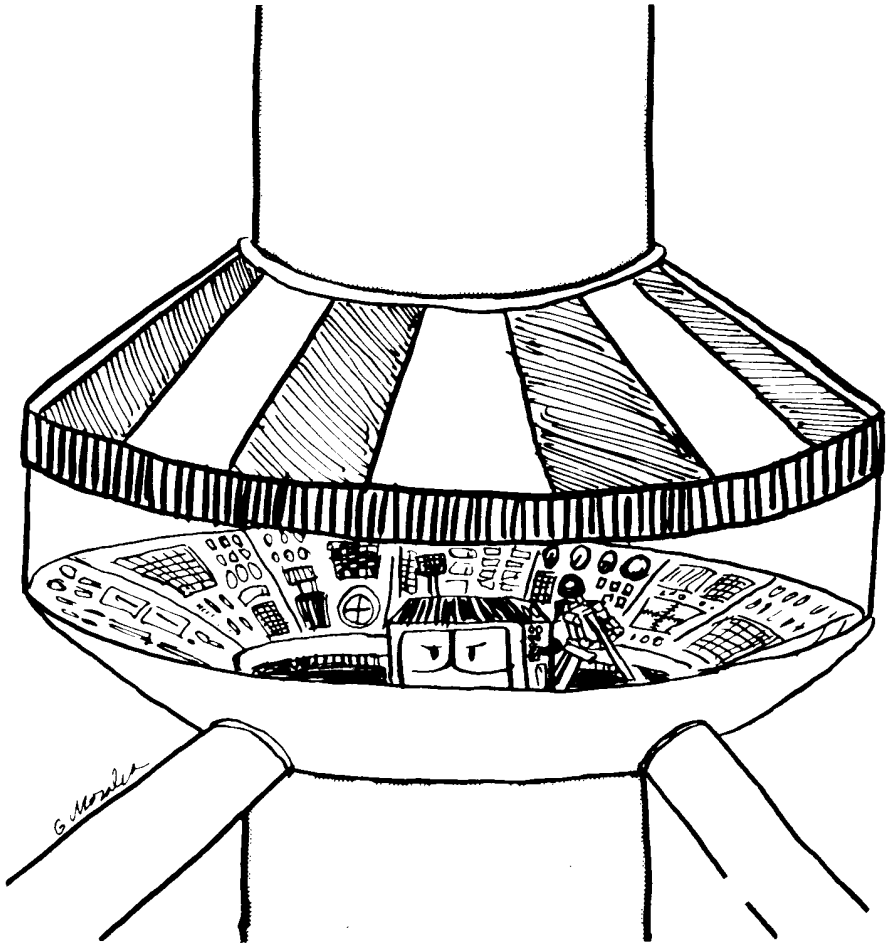
Then begin your odyssey in **Robotropolis**. The journey starts in the Sewer and progresses up through four more levels. With what you learned in Robot Anatomy, you'll be able to escape the Sewer safely without changing the wiring inside the robots. Collect all the objects you find and save your game often. See page 38 for some survival tips.

Before you can go higher in Robotropolis, you'll need to learn about **Robot Wiring, Sensors,** and the **Toolkit****. You might also want to see how to connect some useful **Robot Circuits**. To solve some puzzles, two robots must work together, communicating with their antennas. **Robot Teamwork** will show you how.

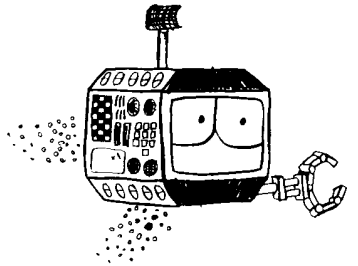
In the two highest levels of the game—the Master Control Center and the Skyways—you might find it convenient to put your robot circuits into chips. Chips are easy to replace if you encounter hot wires or other hazards that destroy robot circuits. Learn all about chips in **Chip Design**.

Go to the **Innovation Lab** anytime you want to experiment with robots in a safe place. Use the lab to build and test circuits that will help you in Robotropolis.

*Available on Apple only.
**For Tandy Color Computers, see notes on page 4.



Programming Robots



The tutorial or training programs on the menu show you how robots behave and how to program them to carry out tasks in Robotropolis.

You start by learning about robot parts—equipment like thrusters, bumpers, grabbers, and radios—and the energy that makes them work. Then you go inside a robot to wire these parts together to create a circuit. You'll use the Solderpen for wiring circuits to make a robot move, send signals, grab objects, or carry out a multitude of tasks simultaneously. A Remote Control turns the power on, and you'll be able to see orange electricity flow through the wires to activate the robot parts.

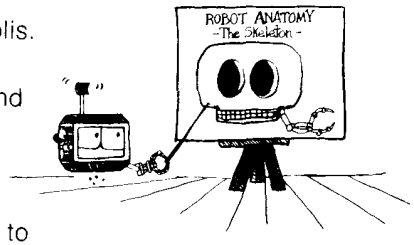
Next you investigate three kinds of sensors—devices that turn on robot equipment—and the special parts inside your Toolkit. These parts, called flipflops, nodes, and logic gates, are used in circuits to control the flow of electricity. They control what a robot does and when it does it.

Programming a robot and learning how to do it is a step-by-step process. So go through these programs in order: ROBOT ANATOMY, ROBOT WIRING, SENSORS, THE TOOLKIT, ROBOT CIRCUITS, ROBOT TEAMWORK, and CHIP DESIGN*. When you finish with ROBOT ANATOMY, you're ready to try your luck in Robotropolis. So go there as soon as you learn the basics about robots and have some fun exploring the Sewer. You won't need to wire any circuits down there. The robots are already wired to help you.

*For Tandy Color Computers, see notes on page 4.

ROBOT ANATOMY

In ROBOT ANATOMY, you'll meet Sparky, Checkers, and Scanner. These are the three robots you'll program to help you in Robotropolis. Before you can program a robot, you'll need to go inside a robot and learn about its parts.



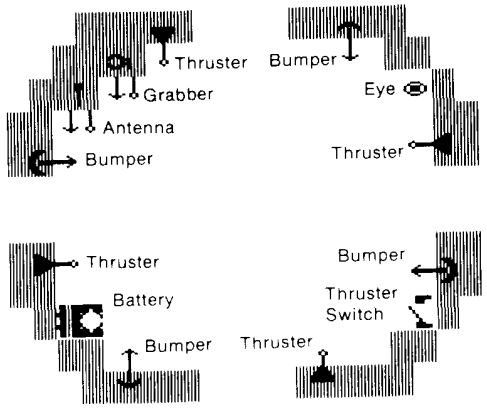
To move inside a robot:

☐ Move the cursor in small steps to the center of the robot and pop inside. (It may take a few tries to get inside.)

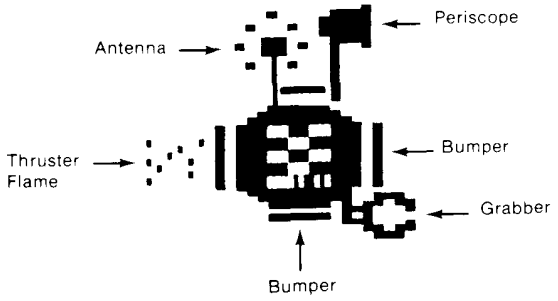
Each robot is equipped with:

- 4 thrusters that make it move up and down, left and right, and at angles; a thruster moves a robot in the direction opposite its thrust (for example, the top thruster moves the robot down).
- 4 bumpers that detect walls; a bumper can be used to activate a thruster.
- 1 antenna that can send and receive signals.
- 1 grabber that can grab an object.
- 1 eye that works like a periscope to peek at surroundings.
- 1 battery that stores electricity to power the robot equipment.
- 1 thruster switch that turns the power to the thrusters on or off; when the switch is closed, the power is on and when it's open, the power is off.

Inside a Robot



Outside a Robot

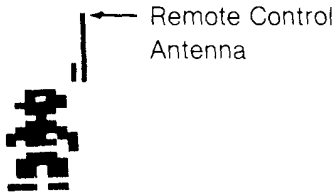


Powering Robots

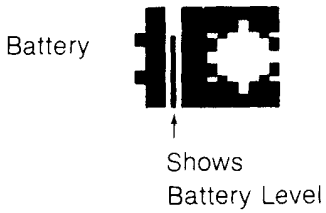
Robots operate on energy stored in their batteries. Electricity flows through the walls of a robot to power its thrusters, bumpers, grabber, and antenna. The Remote Control turns the power on to make the robots work.

To use the Remote Control:

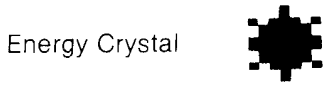
- ☐ Press [R] to turn on the Remote Control and start the flow of electricity through the robot. An antenna appears on the cursor whenever the Remote Control is on.
- ☐ Press [R] again to stop the flow of electricity. The antenna on the cursor disappears when the Remote Control is off.



Robots use a lot of energy when they're turned on, and sometimes their batteries go dead. You can see how much electricity is stored in the battery by the orange level line. When the battery runs out of electricity, the orange disappears and the robot stops working.



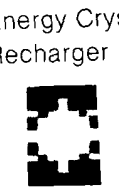
You can recharge dead robot batteries with energy crystals. You'll find these pulsating blue and orange crystals in the Innovation Lab, and here and there in Robotropolis.



To recharge a battery:

- ☐ Pick up an energy crystal.
- ☐ Pass it over the crystal shape inside the dead battery. The orange level line will rise to the top of the battery. Electricity drains out of the energy crystal and turns it white.

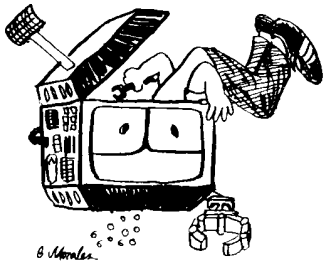
Energy crystal rechargers are used to recharge dead (white) energy crystals. There's a recharger in the Innovation Lab and a few in Robotropolis.



To recharge an energy crystal:

- ☐ Pick up the dead crystal.
- ☐ Pass it over the crystal shape inside the recharger. The crystal pulsates blue and orange with electricity.

WIRING ROBOTS



In ROBOT WIRING*, you'll find out how to wire robots to do all kinds of things. The wiring inside a robot is called a circuit. It controls what the robot does.

To wire a robot, you need to connect its parts together. All the parts inside a robot have either an input (circle), an output (arrow), or both, like the grabber and antenna. The inputs and outputs direct the flow of electricity when the robot is turned on. Electricity flows *out of* an output and *into* an input.

Wires

Input Output

The Solderpen is used to connect inputs to outputs. (You cannot connect inputs to inputs or outputs to outputs.)

Tip

Solderpen

To use the Solderpen:

- ☐ Press [S] to change the cursor to the Solderpen.
- ☐ Move it to an input (or an output) until its tip glows orange.
- ☐ Press [SPACEBAR] to start the wire. It will follow you as you move.
- ☐ Move the Solderpen to an output (or an input) until its tip glows orange again. Press [SPACEBAR] to connect the wire.
- ☐ Press [C] to change back to the cursor.

To disconnect wires:

- ☐ Move the Solderpen to an input or output until its tip glows orange.
- ☐ Press [SPACEBAR] and the wire disappears.

The Solderpen can only wire inputs and outputs that are in the same room, or inside one robot. If you pick up an object with a wire attached and move it around, the wire will stretch. However, you can't stretch a wire out of a room or outside of a robot.

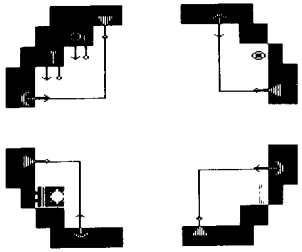
*On a Tandy Color Computer, see Toolkit.

Wiring Bumpers to Thrusters

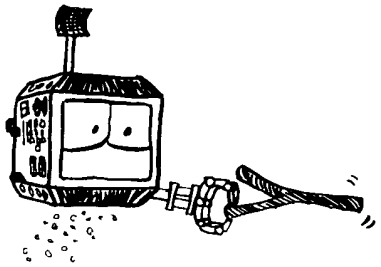
Since bumpers have outputs and thrusters have inputs, you can wire them together.

This robot has all its bumpers wired to its thrusters. If you put this robot in the middle of a room and turned on the Remote Control, nothing would happen. Why? Electricity will only flow out a bumper's output when the bumper detects a wall. The wall "activitates" the bumper, which turns it on. Orange electricity flows out the bumper's output, through the wire, and into the thruster's input. This turns the thruster on and moves the robot.

Counter-clockwise Wall-follower



USING SENSORS



In SENSORS*, you'll learn about three kinds of devices called sensors that can be used to make a robot send signals, pick up objects, or find objects. Sensors send out electricity when they detect objects that match the sensor shape. (If two objects of the same shape are in the room, the sensor detects only one of them.) A sensor can turn on a robot's thrusters, grabber, antenna, or any robot circuit it is wired to.

To make a sensor detect objects:
☐ The Remote Control must be on.
☐ The object can't be held by the cursor or by a robot.

Contact Sensor

This sensor turns on when it touches the object, or when a robot containing the sensor touches the object.

Contact Sensor

You can use this sensor to make a robot send signals or move when its body touches the sensor object. Just wire the sensor to the antenna input or to one of the thrusters inside the robot.

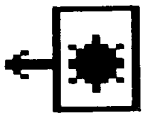
NOTE: You can wire this sensor to the grabber input to make a robot pick up the sensor object, but the robot won't hold on to the object. Why? As soon as the robot grabs the object, the sensor no longer detects it. Electricity stops flowing from the sensor and the robot drops the object.

*On a Tandy Color Computer, see Robot Anatomy.

In-Same-Room Sensor

This sensor turns on when it is in the same room as the object, or when a robot containing the sensor is in the same room as the object.

In-Same-Room Sensor

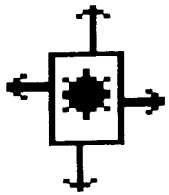


Use this sensor inside a robot when you want the robot to move, send signals, or grab things whenever it is in the same room as the sensor object. When the robot is in the same room as the sensor object and you wire this sensor to the grabber input, the robot will grab and hold on to any removable object its body touches *except* the sensor object.

Directional Sensor

The outputs of this sensor that point in the direction of the object turn on when it is in the same room as the object, or when a robot containing the sensor is in the same room as the object.

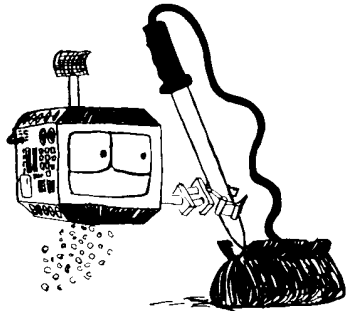
Directional Sensor



This sensor is handy when you want a robot to move toward an object in the same room. Wire it to the thrusters so the robot moves toward the object. (See the "crystal finder" circuit on page 21.)

USING THE TOOLKIT

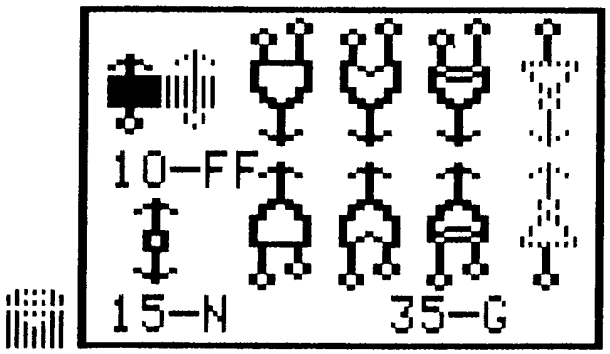
In THE TOOLKIT, you'll find out how to use your Toolkit and the special parts inside it for building robot circuits.



To use your Toolkit:

- Press [T] to summon the Toolkit from another room. Then press [T] again to open and close it. Inside you'll find parts called flipflops and nodes, and four different kinds of logic gates: AND, OR, XOR, and NOT.
- Move the cursor on top of a part to pick it up and press [SPACEBAR]. Carry the part to wherever you want to wire it up.
- Move the part anywhere inside the open Toolkit and press [SPACEBAR] to drop it. (The part must not have wires connected to it.)

The counter inside the Toolkit keeps track of the number of parts inside it. A full Toolkit has 10 flipflops, 15 nodes, and 35 gates. The 35 gates can be any combination of the four different kinds of gates.

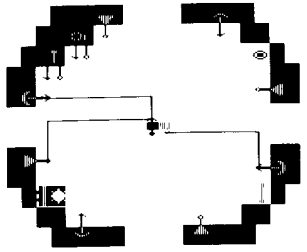


Flipflops

A flipflop switches the direction of electricity. Electricity flows out one output at a time and flips to the other output when electricity flows into the other input. A flipflop will "flip" only when electricity flows into the white input when no electricity is flowing into the orange input.

Since one side of a flipflop is always on (contains electricity), it can keep a robot moving. If you wire the orange side of a flipflop to a thruster, the thruster stays on.

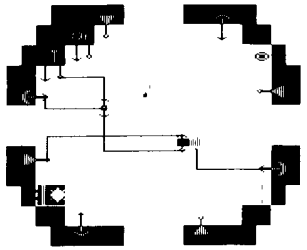
Flipflops are great when you want a robot to do two different things, one after the other. For example, you can make a robot change direction with a flipflop. In this robot, electricity flows out of the flipflop and turns the left thruster on. When the robot bumps into a wall, electricity flows out the bumper's output and turns the other side of the flipflop on, powering the right thruster. The robot moves back and forth.



Nodes

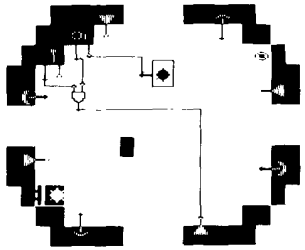
A node is a wire that directs the flow of electricity to two places. When electricity flows into its single input, both of its outputs turn on.

Use nodes when you want a robot to do two different things at one time. In this robot, whenever the left bumper is on, its antenna sends signals and its flipflop "flips." A node is also handy for turning on two thrusters at once.



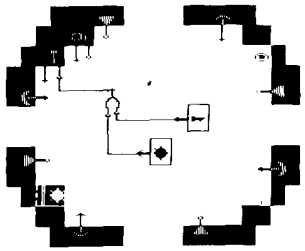
AND-Gate
Electricity flows through the output of an AND-gate only when electricity comes through the left *and* right inputs.

Use an AND-gate when you want two things to happen before a robot does something. When this robot receives a signal *and* it is holding an object, it moves up.



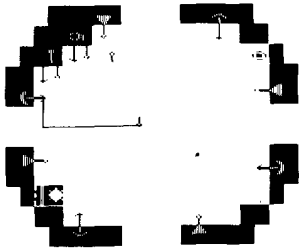
OR-Gate
When electricity flows through either the left *or* right input of an OR-gate or through both inputs, electricity flows out its output.

Use an OR-gate when you want your robot to do something when one or two things happen. This robot sends a signal when either an energy crystal or a key is in the room.



NOT-Gate
A NOT-gate works backwards—when electricity flows through its input, none comes out its output. When its input is on, its output is *not* on and vice versa.

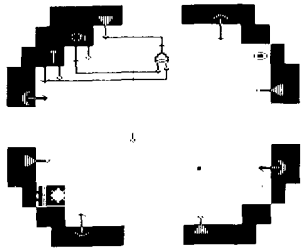
Since a NOT-gate contains electricity (when its input is off), it can keep a robot moving. If you wire a NOT-gate to a thruster, the thruster stays on.



Use NOT-gates to start and stop robots. This robot's top thruster stays on unless its left bumper touches a wall. A NOT-gate is also handy for turning on a robot's grabber.

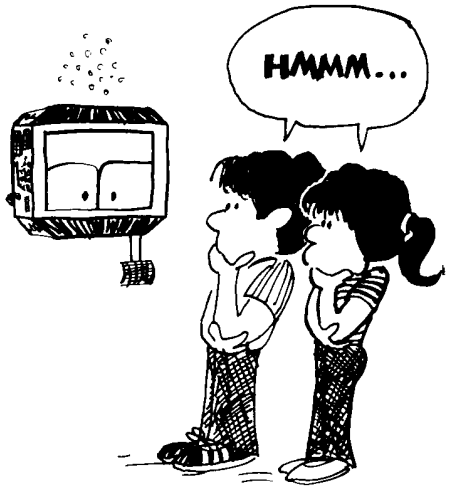
XOR-Gate
An XOR-gate turns on when electricity flows through *either* one of its inputs, but not both.

Use XOR-gates when you want one of two things to happen to make a robot do something. Whenever this robot grabs an object or receives a signal, it moves down. But if it is grabbing an object and receives a signal at the same time, the robot won't move.



BUILDING CIRCUITS

In ROBOT CIRCUITS*, you'll learn how to make useful circuits using sensors and the parts in your Toolkit. Programming robots to do what you want them to do can be tricky. Here are a few guidelines to make building circuits easier.



Strategies

- ☐ Define the task you want the robot to do.
- ☐ Break the task down into pieces. Then build a circuit for each piece, one at a time.
- ☐ Try building the circuit, even if you know it is not quite right. You can change it later.
- ☐ Keep your circuit neat so you can easily see where the wires go. The wires always move horizontally when you start the Solderpen.
- ☐ Test your robot in the Innovation Lab. Refine the circuit if it doesn't work quite right.
- ☐ If you have an existing circuit that does a task similar to the one you want, try to modify that circuit rather than build a new one.
- ☐ Remember, there is often more than one circuit design that will do the same task.
- ☐ If your circuit is fairly complex, you may want to put it inside a chip and wire the chip inside the robot instead. See page 24.
- ☐ Use the Robot Spec Sheet on page 57 to keep a record of your working circuit. Draw the circuit and describe how it works.

Trouble-Shooting

If you build a circuit that should work but doesn't, check:

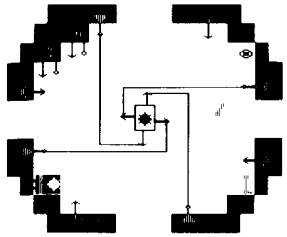
- ☐ Is the Remote Control on?
- ☐ Is the thruster switch closed?
- ☐ Is there energy in the battery?
- ☐ Are the inputs connected to the correct outputs?

*Not available on Tandy Color Computers.

Useful Circuits

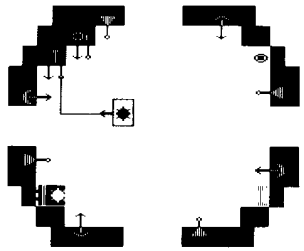
Here are some circuits that may be helpful to you in Robotropolis. You can wire up these circuits in the Innovation Lab to see what the robots do.

Crystal Finder



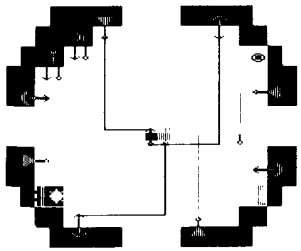
This robot moves toward an energy crystal if it detects one in the room.

Crystal Signaler



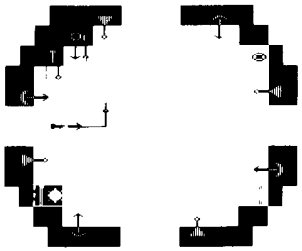
This robot sends a signal when it detects an energy crystal in the room.

Left-Wall Crawler



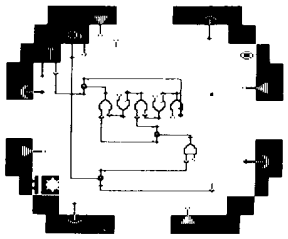
This robot bounces up and down between walls. The NOT-gate on the right thruster moves the robot left until it hits a wall.

Non-Key Grabber



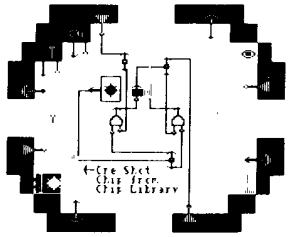
This robot grabs and holds on to any object its body touches as long as it does not touch a key. You could use this circuit to make the robot drop whatever it is holding by touching it with a key. (Be sure to let go of the key so that the sensor can detect it.)

Delay Circuit

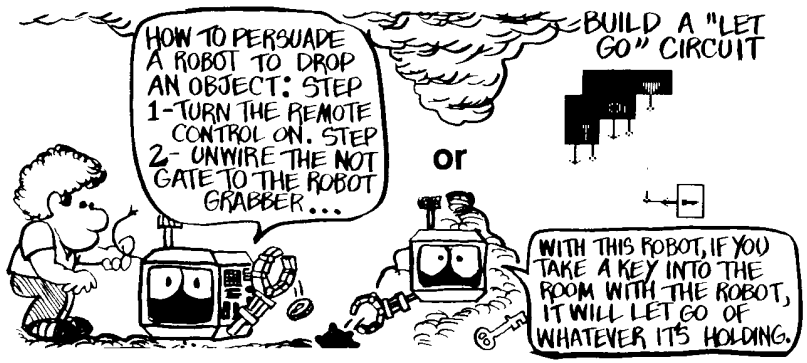


This robot sends a "coded" signal when it grabs an object. The OR-gates work as delays to slow down the flow of electricity.

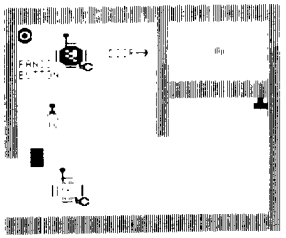
Combination Circuit



This robot always moves right and either up or down when the cursor drops and picks up a crystal in the same room. This circuit is useful for navigating a specific route, especially when the bumpers can't be used to turn on the thrusters.

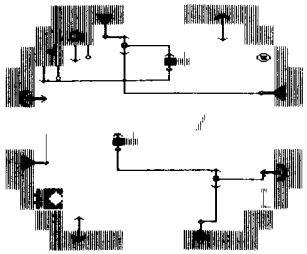


USING ROBOT TEAMS

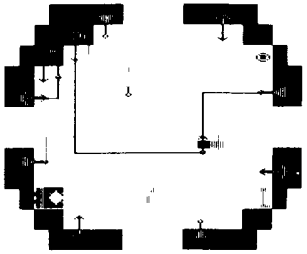


In ROBOT TEAMWORK*, you'll find out how to program two robots to solve one puzzle. You'll use the robots to perform different tasks and communicate with each other by sending signals through their antennas.

To solve this puzzle, Sparky must hold the door open so Checkers can go inside the room above and retrieve the crystal.

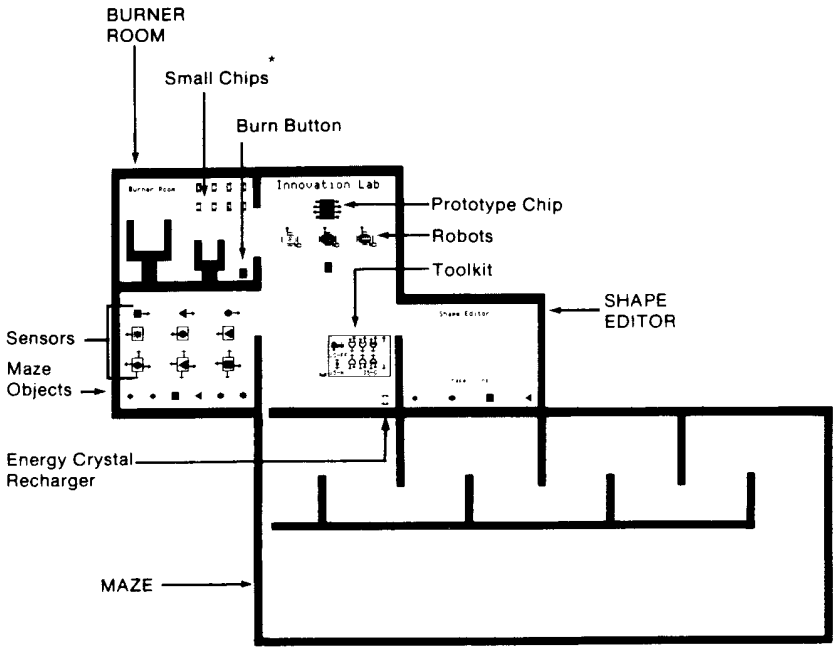


Sparky is wired to move right, then up until it touches the button, which opens the door. Sparky remains there until a signal is received from Checkers. Then Sparky moves left and down. When Sparky moves away from the button, the door closes.



Checkers is wired to move right, grab any object it touches, and then move left. The antenna is wired to send a signal when Checkers touches a wall on the left (when it is safely past the sentry).

*Not available on Tandy Color Computers.



Map of Innovation Lab

*Tandy Color Computer version has 4 chips.

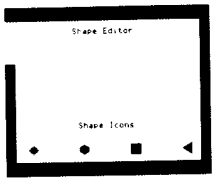
Innovation Lab

The Innovation Lab is a fully equipped robot workshop far away from the dangers of Robotropolis. Here you can build robot circuits and test them without worrying about sentries, electrical storms, and dead batteries. You can simulate some of the conditions in Robotropolis, like walls and doorways, and program robots to solve puzzles in the game. For example, you can recreate a maze from Robotropolis and experiment with different circuits to make the robot go through the maze. But you can also use the Innovation Lab just for fun. You might want to investigate robot racers and create a robot race track, or program robots to dance ballets. (See page 54 for additional ideas on robot projects.)

All the tools, parts, and robots you need for your experiments are here in the lab. There's a Shape Editor for changing the shapes of objects and sensors, a Maze Area for drawing walls, doorways, or obstacle courses, and some special equipment for working with chips. CHIP DESIGN shows you how to use all the lab's equipment.

USING THE SHAPE EDITOR

The Shape Editor changes the shape of objects and the pictures inside sensors. You can change the shape of six objects and three CONTACT, IN-SAME-ROOM, and DIRECTIONAL sensors. Use the Shape Editor when you need a specially shaped sensor or object to make your circuit work.



To use the Shape Editor:

- ☐ Pick up an object or sensor in the Innovation Lab storeroom.
- ☐ Pass the object or sensor over the shape icon you want. The shape changes automatically.

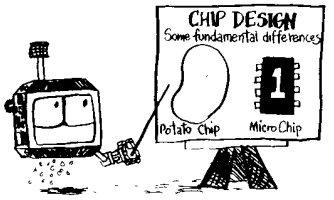
DESIGNING MAZES

You can paint and erase walls in the Innovation Lab Maze Area using the Paintbrush. You can design mazes and recreate the layout of rooms in Robotropolis and use them to test your robot circuits.

To use the Paintbrush:

- ☐ Press P to change the cursor to the Paintbrush.
- ☐ Move to the Maze Area. (This is the only place where the Paintbrush works.)
- ☐ Press SPACEBAR to paint or erase a wall. You can move through walls when you are using the Paintbrush.
- ☐ Press C to change back to the cursor.

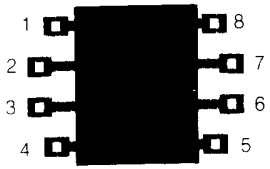
WORKING WITH CHIPS



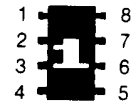
In the Innovation Lab, you can program robots by wiring circuits inside chips. Chips save space inside robots and can increase the power and sophistication of your robots. You can use a chip as part of another circuit inside a robot, and even wire, or "nest," a chip inside of a chip inside of a chip. This means that you can program one robot to carry out a whole series of tasks, one after the other, without building and dismantling circuits each time you want the robot to do something different. This kind of robot capability comes in very handy in the two highest levels of Robotropolis.

The prototype chip in the Innovation Lab is used for wiring circuits. Once you've got a circuit wired inside this large chip, you can "burn" or copy the circuit inside a small chip. Small chips have numbers on them so you can tell them apart. You can keep a record of what each chip does by documenting a chip in the Chip Record Room. You can also save any chips you design on a separate disk and load them to use when you're in Robotropolis. You can even load prewired chips from the special Chip Library to use in the lab or to help you in Robotropolis.

Prototype Chip



Small Chip



Wiring Chips

Use the prototype chip in the Innovation Lab to wire circuits.

- ☐ Go inside the prototype chip.
- ☐ Wire a circuit to one or more of the pins, just as you would to robot parts inside the robot. The pins change to inputs or outputs, depending on how they are wired.
- ☐ Move outside the chip and notice that the outside pins have also changed to inputs and outputs. Inputs on the inside of the chip are outputs on the outside of the chip and vice versa.
- ☐ Pick up the chip and take it inside a robot. Wire the outside pins to the robot parts you want to connect.
- ☐ Turn on the Remote Control to see if the circuit works.

When you are satisfied that your chip works, you can copy it inside a small chip by burning it (see page 29). Then you can document the chip (see page 30) and save it on a separate disk (see page 31). Your documentation will be saved, as well as your chip circuit.

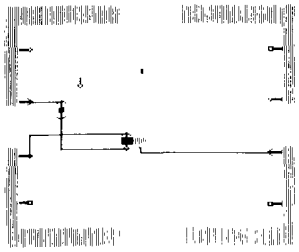
Before you wire the prototype chip inside a robot, you can test the chip using the "hot cursor."

- ☐ Press [H] to change the cursor from white to orange.
- ☐ On the outside of the chip, move on top of each input. You'll see where the electricity flows because one or more of the outputs will glow orange.
- ☐ Press [H] again to change the cursor back to white.

Hot Cursor

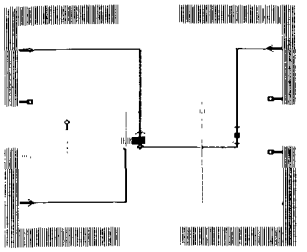
Chips within a circuit. The circuit in this chip is wired to make the robot move down and bounce left and right between walls.

Chip A

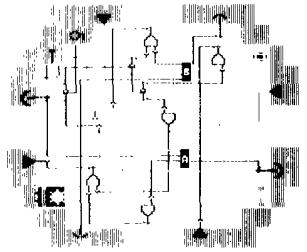


This chip is wired to make the robot move to the right and bounce up and down between walls.

Chip B

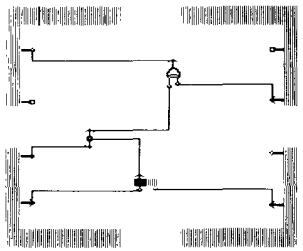


Both of these chips are used in this circuit. AND, OR, and NOT gates are used to connect the chips to each other and to the robot parts and to control which chip directs the robot at any given time. In this robot, Chip A directs the movement of the robot until it grabs an object. Then Chip B takes over.

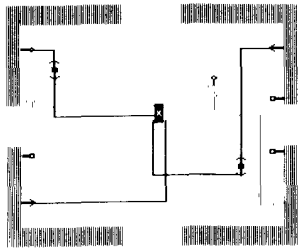


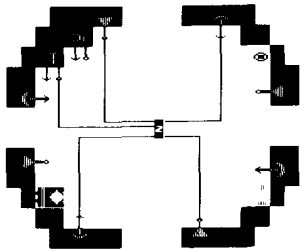
Nesting chips. This is an example of a circuit with nesting chips. Chip X is wired inside Chip Z, and Chip Z is wired inside the robot. This circuit makes the robot bounce between the top and bottom walls, sending a signal as it moves up.

Chip X



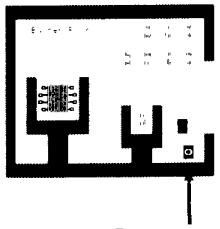
Chip Z





Burning Chips

You can make a copy of a circuit inside the prototype chip by burning it in the lab's Burner Room. Then you can use the small burned chip as part of another circuit and reuse the prototype chip for wiring more chips.



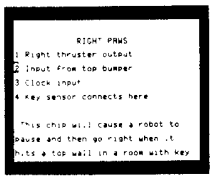
Burn Button

To burn a chip:

- ☐ Drop the prototype chip inside the large Y-shaped chamber.
- ☐ Drop one of the small chips inside the small Y-shaped chamber.
- ☐ Move the cursor on top of the burn button and press SPACEBAR. This copies your circuit inside the small chip.

Documenting Chips

In the Chip Record Room of the lab, you can record information about your burned chip. Since you can't go inside these small chips, documenting them makes it easier to remember how to use them days, weeks, or even months later. (You can also document your chip using the Chip Spec Sheet on page 66.)



To document a burned chip:

- ☐ Pick up the chip and press ? to enter the Chip Record Room.
- ☐ Type in a name for your chip (up to 15 characters) and a one-line description for each pin. Record what the pin is connected to, or where to connect the pin inside a robot. Press ? to see a list of special keys to use when typing your documentation. (These keys are listed on page 57.)
- ☐ Press ESC or BREAK to return to the lab.

Whenever you want to get documentation on a chip (or to see if the chip is blank), pick up the chip and press ?. (Documentation on a chip is only available in the lab.)

To see examples of chip documentation, load in one of the chips from the Chip Library. See pages 32.

Saving Chips

The only way you can use your chips in Robotropolis is by saving them on a separate disk. Saving burned chips is also a good way to recycle the chips in the lab so you can use them again for new circuits.

On an **Apple** computer, use the Robot Odyssey disk to create a storage disk (see below). On an **IBM** computer or **Tandy Color Computer**, you must already have a formatted disk before you save your chips. See your DOS manual. On a **Tandy Color Computer,** if you can't make an OS-9 storage disk, use your copy of side 1 of Robot Odyssey.

To save a burned chip on an **Apple** computer:

- ☐ Pick up the chip and press S.
- ☐ Make sure your Robot Odyssey disk is in the disk drive and press ESC.
- ☐ You will be prompted to insert the Robot Odyssey Storage Disk. To create a storage disk:
  - Press C when prompted.
  - Insert a blank disk in the disk drive and press RETURN.

  If you already have a storage disk:
  - Insert the disk in the disk drive and press RETURN.
- ☐ A Chip Directory menu appears, labeled with letters. Choose a letter and type the name of your chip. Then press RETURN to save your chip.
- ☐ Insert the Robot Odyssey disk when you see the prompt, and press RETURN to go back to the lab.

To save a burned chip on an **IBM** computer:

- ☐ Pick up the chip and press S.
- ☐ Insert your formatted storage disk when prompted.
- ☐ A Chip Directory menu appears, labeled with letters. Choose a letter and type the name of your chip. Then press ENTER or ↵ to save your chip.

To save a burned chip on an **Tandy Color Computer:**

- ☐ Pick up the chip and press S.
- ☐ Insert your formatted storage disk when prompted.
- ☐ Type a name for your chip (use letters or numbers only, up to 15 characters in a name). Then press ENTER to save your chip.

Loading Chips

To use the chips you've saved, you need to load them in the Innovation Lab or in Robotropolis. You can load the chips you've already saved, or load prewired chips from the Chip Library. In the lab, you can experiment with these chips by using them in different circuits. In Robotropolis, you can use them to help you escape.

To load a chip:

☐ Pick up a blank chip or a chip with circuitry you no longer need, and press L.

☐ For the Apple, make sure your Robot Odyssey disk is in the disk drive and press ESC.

☐ To load a chip from the Chip Library:

- Insert the Robot Odyssey disk containing the Chip Library (see disk label).
- Press RETURN, ENTER, or ↵.

☐ To load a chip you've saved on a separate disk:

- Insert your storage disk and press RETURN, ENTER, or ↵.

☐ A menu appears listing the names of the chips, labeled by letters. Press the letter of the chip you want and wait for it to load. On a Tandy Color Computer, letters will not appear. Type the name of the chip and press ENTER.

☐ For the Apple or Tandy Color Computer, make sure your Robot Odyssey disk is in the disk drive, and then press RETURN or ENTER to go back to the lab or Robotropolis.

Using the Chip Library

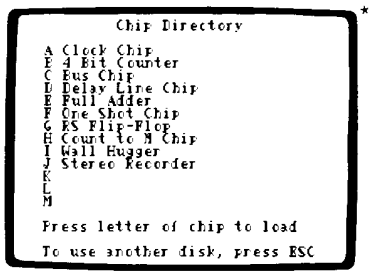
Robot Odyssey contains a Chip Library with several prewired chips that are useful in Robotropolis. Some chips can be wired to the thrusters and bumpers inside a robot. Others can be wired inside circuits you've already built.

To use a chip from the Chip Library:

☐ Load it into a blank chip in the Innovation Lab.

☐ Pick up the chip and press ? to read its documentation in the Chip Record Room.

☐ Wire the chip inside a robot or wire it to some nodes or logic gates to see how it works. Use the hot cursor to turn the inputs on.

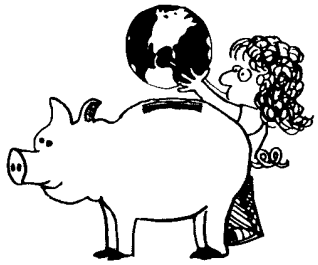


*

*Illustration shows directory from Apple version.

Saving and Loading the Innovation Lab

You can save all your work in the lab (including your chips, mazes, and sensor and object shapes) on a separate disk to return to later. When you come back, everything will be just where you left it.



On an **Apple** computer, use the Robot Odyssey disk to create a storage disk (see below). On an **IBM** computer or a **Tandy Color Computer,** you must already have a formatted disk before you save your lab. See your DOS manual. On a **Tandy Color Computer,** if you can't make an OS-9 storage disk, use your copy of side 1 of Robot Odyssey.

To save the lab on an **Apple** computer:

☐ Press ESC to leave the lab.

☐ Make sure your Robot Odyssey disk is in the disk drive. Then press S to save the lab.

☐ You will be asked to insert the Robot Odyssey Storage Disk.

To create a storage disk:

- Press C when prompted.
- Insert a blank disk in the disk drive and press RETURN.

If you already have a storage disk:

- Insert the disk in the disk drive and press RETURN.

☐ A World Directory menu appears, labeled with letters. Choose a letter and type a name for your lab. Then press RETURN to save your lab.

☐ Insert the Robot Odyssey disk when you see the prompt, and press RETURN to go back to the lab.

To save the lab on an **IBM** computer:

- ☐ Press [ESC] to leave the lab.
- ☐ Press [S] to save the lab.
- ☐ Insert your formatted storage disk when prompted.
- ☐ A World Directory menu appears, labeled with letters. Choose a letter and type a name for your lab. Then press [ENTER] or [↵] to save your lab.

To save the lab on a **Tandy Color Computer:**

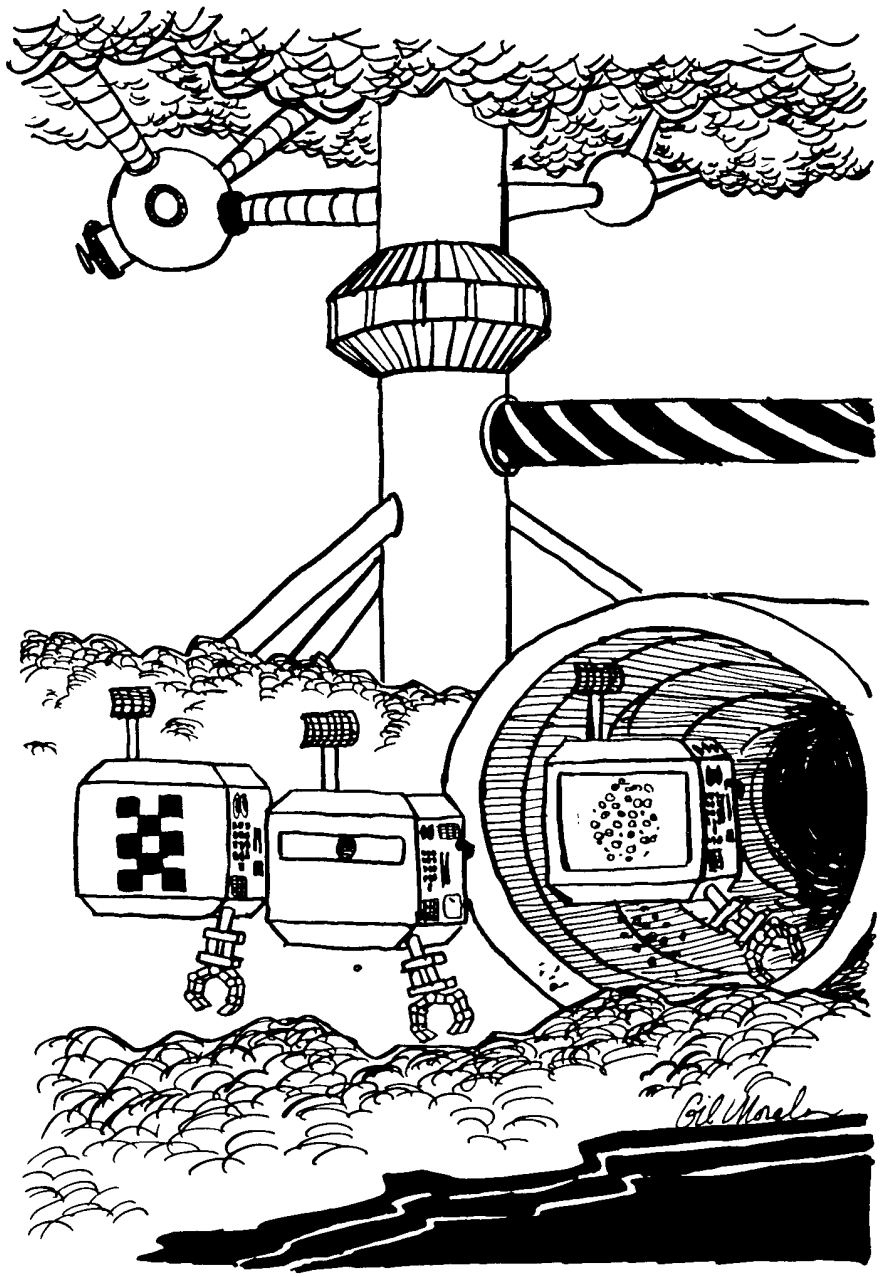
- ☐ Press [BREAK] to leave the lab.
- ☐ Press [S] to save the lab.
- ☐ Insert your formatted storage disk when prompted.
- ☐ Type a name for your lab (use letters or numbers only, up to 15 characters in a name). Then press [ENTER] to save your lab.

To load a saved lab on an **Apple** computer:

- ☐ Choose INNOVATION LAB from the menu and press [RETURN].
- ☐ When you see the prompt, press [O] to load an "old" lab.
- ☐ Insert your Robot Odyssey Storage disk at the prompt and press [RETURN] The World Directory appears.
- ☐ Press the letter of the lab you want and wait for it to load.
- ☐ Insert the Robot Odyssey disk in the disk drive when you see the prompt, and press [RETURN]. The lab appears exactly as you last left it.

To load a saved lab on an **IBM** computer or **Tandy Color Computer:**

- ☐ Choose INNOVATION LAB from the menu and press [ENTER] or [↵].
- ☐ If prompted, insert the other Robot Odyssey disk.
- ☐ When you see the prompt, press [O] to load an "old" lab.
- ☐ Insert the Robot Odyssey Storage disk and press [ENTER] or [↵].
- ☐ Press the letter of the lab you want and wait for it to load.
- ☐ On a Tandy Color Computer, reinsert side 1 of Robot Odyssey when prompted.



Robotropolis

Notes from a Traveler Who Made It

Boy! Was I unprepared for what awaited me in Robotropolis! Not only wasn't I dressed for the occasion, but I didn't quite know what to make of these robots—bouncing off walls and going every which way. But one thing was clear—I knew I'd better get acquainted with these characters right away, or spend the rest of my life locked in the Sewer—not a very pleasant place.

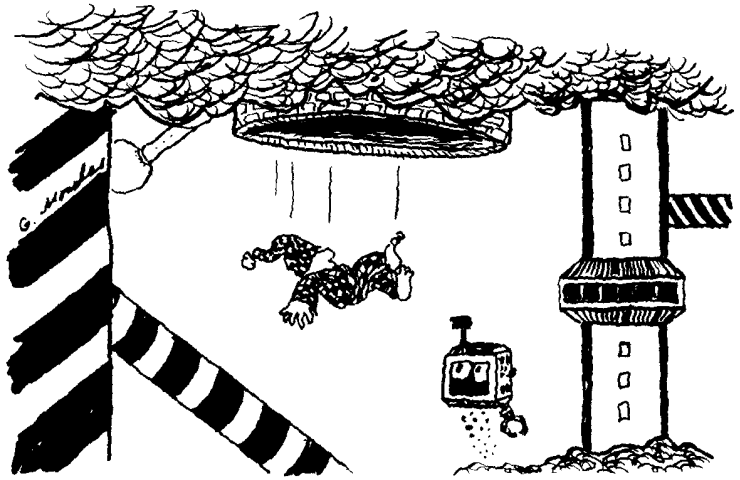
After my first course in Robot Anatomy, things went better and I actually became fond of my robot companions. I carried them around with me everywhere and used them to carry my souveniers—things I picked up along the way to show the folks back home. (They never did believe my story.)

I soon discovered that Robotropolis was a big place—full of rude (sometimes nasty) sentries, locked doors, force fields, and dead ends. It took me a long time to figure out the customs here, like the Bota token currency and the transportation system between the levels of the city. Just finding my way around through the tortuous mazes and passageways took all the wits I possessed. When I drew a map of the subway system, it turned out to be a donut! I wondered how I would ever get out of this place!

But the more I learned about robots, the more comfortable I felt in their secret underground. I got used to hiding inside robots to sneak past sentries, opening automatic push-button doors, and making use of the things I'd found. I was determined to explore *everything* and find out what this place was all about. There were even times when I forgot all about escaping — like the time I found the Master Robot held hostage behind force fields and an invisible mine field. In fact, that was near the place I thought I'd seen the last of my robot friends. After hours of searching, I discovered them in the Trash Room of all places! (It was that Hall Sweeper who did it.) After that, I was more careful with my robots. We needed each other, and I wasn't about to go exploring alone.

There were many times when I didn't think I'd make it. I learned everything by making mistakes—plenty of them—and starting over until I got things right. I spent a lot of time in the Innovation Lab, building and testing circuits to make the robots work just right. (I even considered a career as a robot engineer, but I missed my friends back home.) It took several days to perfect one circuit—a circuit I was particularly proud of. When I stood back and watched it work, I thought only a genius could have designed it. (Actually, it just took some logical thinking and the thought of seeing home again.)

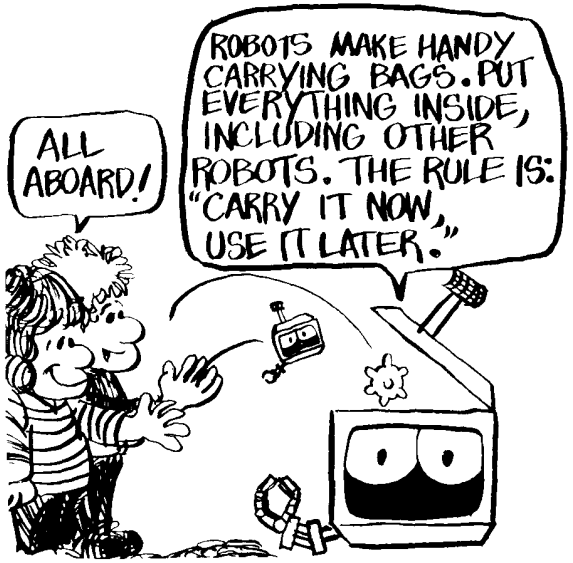
When at last I'd reached the top of Robotropolis (after being hit in traffic, zapped by hot wires, lost for hours in an invisible maze, and a hundred other things), I knew immediately that the room with the nine push-buttons would send me home. It was then that I realized my incredible adventure was almost over. I hesitated boarding the Transporter for the last time, but when I finally did, the most unusual thing happened! Robotropolis. I'll never forget it.

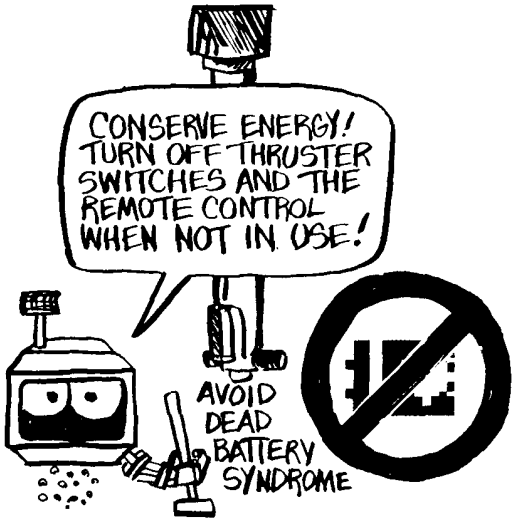


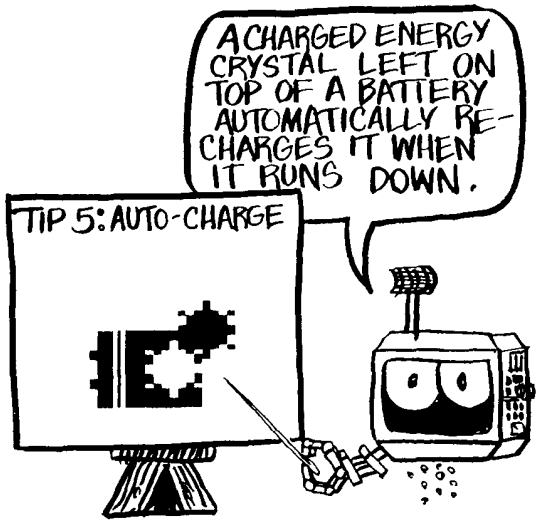
SURVIVAL SKILLS

To enjoy a safe and successful trip through ROBOTROPOLIS, follow the general guidelines below. These tips will save you time and help you through all the levels of the adventure game.

- ☐ Press [?] when you first reach a new level of the game. You'll get hints to help you on your way.
- ☐ Save your game before you start on a difficult task. (See page 40 for instructions.) Then you won't need to start at the beginning each time you play Robotropolis.
- ☐ Collect everything you see lying around in the rooms and passageways and carry them with you. Most of these objects will come in handy later in the game or when you reach the higher levels of Robotropolis.
- ☐ Carry all your robots with you whenever you can. You don't want to lose one. You need them all to win the game.
- ☐ Draw maps on paper to help you find your way in each level. Most of the maps won't be flat, but will twist and turn and double-back. Some maps will have two stories.
- ☐ Explore every room in each level if you can. You don't want to miss anything!







Saving and Loading a Game

You can save your place in Robotropolis on a separate disk to return to later. When you come back, everything will be just the way you left it.

On an **Apple** computer, use the Robot Odyssey disk to create a storage disk (see below). On an **IBM** computer or **Tandy Color Computer,** you must already have a formatted disk before you save your game. See your DOS manual. On a **Tandy Color Computer,** if you can't make an OS-9 formatted disk, use your copy of side 2 to save games.

To save a game on an **Apple** computer:

☐ Press [ESC] to leave the game.
☐ Make sure your Robot Odyssey disk is in the disk drive. Then press [S] to save the game.
☐ You will be prompted to insert the Robot Odyssey Storage Disk.
To create a storage disk:
- Press [C] when prompted.
- Insert a blank disk in the disk drive and press [RETURN].

If you already have a storage disk:
- Insert the disk in the disk drive and press [RETURN].

☐ A World Directory menu appears, labeled with letters. Choose a letter and type a name for your game. Then press [RETURN] to save the game.
☐ Insert the Robot Odyssey disk when you see the prompt, and press [RETURN] to go back to the game.

To save a game on an **IBM** computer:

☐ Press [ESC] to leave the game.
☐ Then press S to save the game.
☐ Insert your formatted storage disk when prompted.
☐ A World Directory menu appears, labeled with letters. Choose a letter and type a name for your game. Then press [ENTER] or [↵] to save the game.

To save a game on a **Tandy Color Computer:**

☐ Press [BREAK] to leave the game.
☐ Then press [S] to save the game.
☐ Insert your formatted storage disk when prompted.
☐ Type a name for your game (use letters or numbers only, up to 15 characters in a name). Then press [ENTER] to save the game.

To load a saved game on an **Apple** computer:

☐ Choose ROBOTROPOLIS from the menu and press [RETURN].
☐ When you see the prompt, press [O] to load an "old" game.
☐ Insert your Robot Odyssey Storage disk at the prompt and press [RETURN]. The World Directory appears.
☐ Press the letter of the game you want and wait for it to load.
☐ Insert the Robot Odyssey disk in the disk drive when you see the prompt, and press [RETURN]. The game appears exactly as you last left it.

To load a saved game on an **IBM** computer or **Tandy Color Computer:**

☐ Choose ROBOTROPOLIS from the menu and press [ENTER] or [↵].
☐ If prompted, insert the other Robot Odyssey disk.
☐ When you see the prompt, press [O] to load an "old" game.
☐ Insert the Robot Odyssey storage disk and press [ENTER] or [↵].
☐ Press the letter of the game you want and wait for it to load.
☐ On a Tandy Color Computer, reinsert side 2 of Robot Odyssey when prompted.

THE SEWER—LEVEL 1

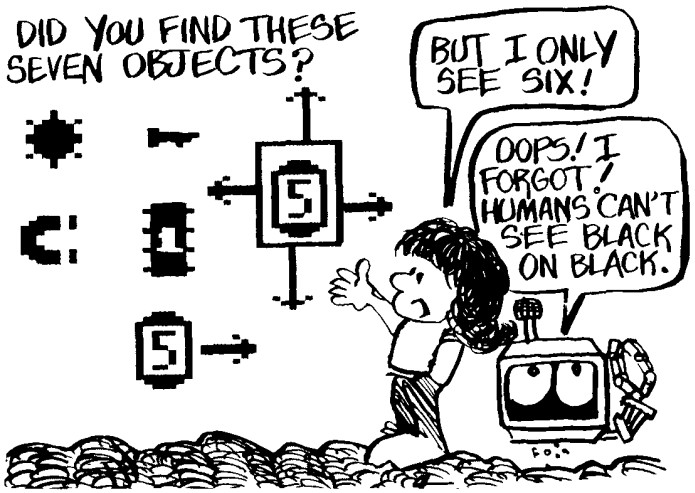
Your odyssey begins in the Sewer by opening the door with the blue key. Your goal is to collect seven objects, then find your way to the Transporter to move up and out of the Sewer. To do all that, you need to use robots to get past the sentries that guard objects and block your escape route. You also need a robot to find an invisible (black) energy crystal. In the Sewer, you won't need to rewire any robots to help you.

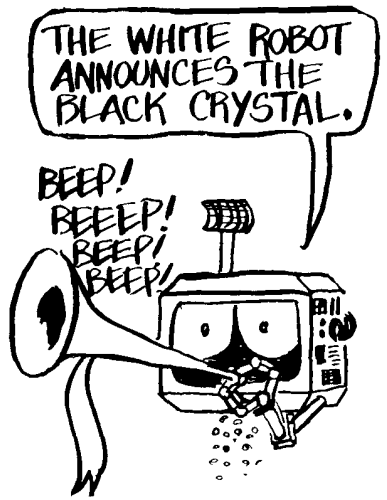
Travel Tips

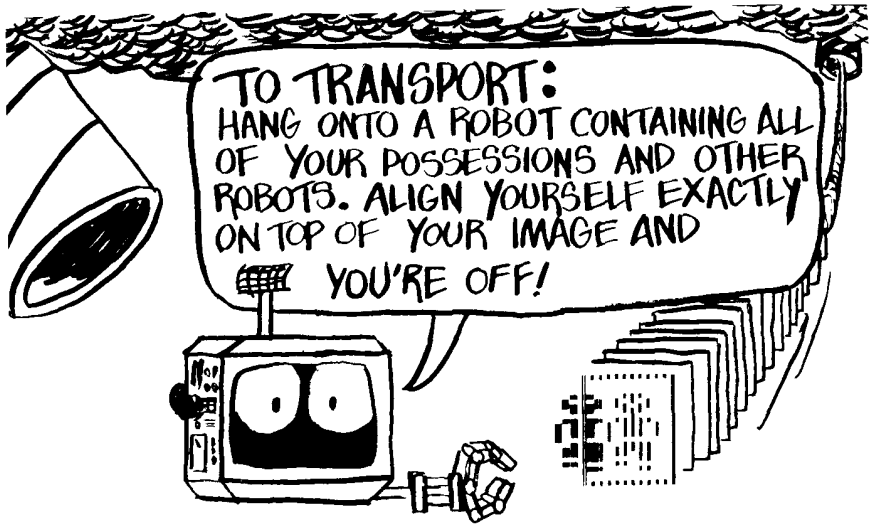
- ☐ Take the blue key with you. You'll need it later on.
- ☐ Explore all the rooms to find the seven objects. You may not need all of them, but they will make your journey easier in the next level of Robotropolis.
- ☐ Observe how the robots move to identify the ones that can maneuver past the sentries.
- ☐ Conserve energy. Keep the thruster switches open and the Remote Control off when you're not using the robots.
- ☐ Use the map on page 44 to find your way if you get lost.

Dangers

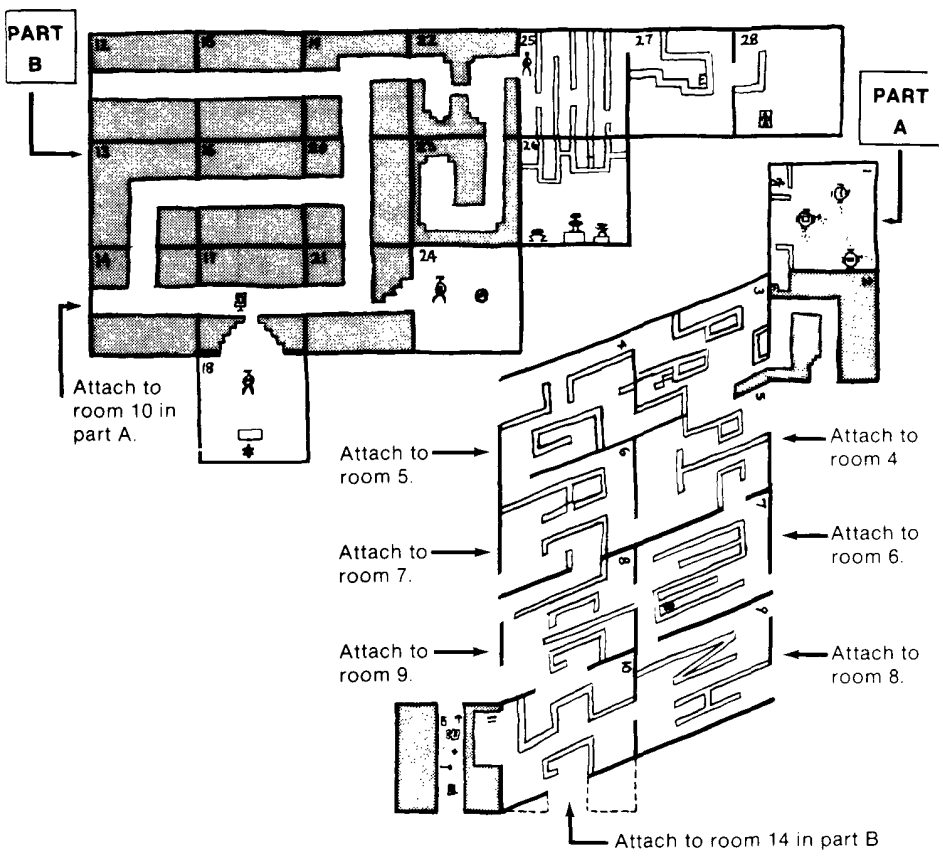
- ☐ Ampire 'bot. This creature sucks energy from robot batteries and energy crystals. Press ? for a hint on how to fool this 'bot.







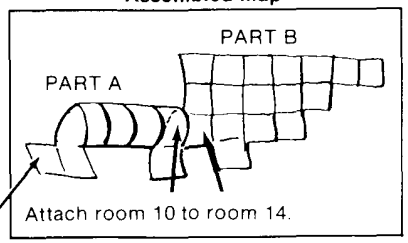
MAP OF SEWER



TO ASSEMBLE:

1. Cut out part A and part B of the map.
2. Roll part A over so that room 4 attaches to room 5, room 6 to room 7, and room 8 to room 9.
3. Then attach room 10 on part A to room 14 on part B.

Assembled Map

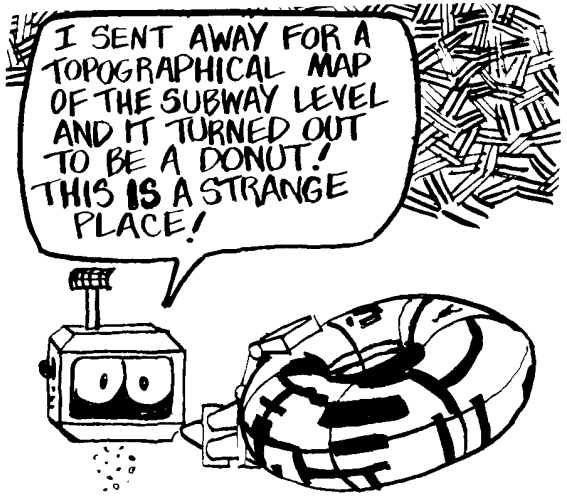


THE SUBWAY—LEVEL 2

Most of the Subway is explored by riding a subway train. The train moves through seven stations and you can get off at each one and take a look around. To get to the train, you need to find the "5-Bota" subway token, drop it through a slot, and go through a turnstile to the Depot. In the Depot, you can call the train and ride it to different parts of the Subway. When the train appears, move on top of it and press SPACEBAR to start the train*. When you want to get off at a station, just move off the train. You can return to the token slot from each station without boarding the train, but you'll need to find the token again (and return to the Depot) each time you want to ride the train to another station. As you travel through the Subway, look for the Exit ticket. You'll need it to get to the next level of Robotropolis.

In the Subway, you need to rewire robot circuits to:

- get past the first sentry guarding the subway token
- push the button in the Depot to call the train
- retrieve the subway token guarded by another sentry after it falls through the slot
- grab the Exit ticket guarded by a sentry



*On Tandy Color Computers, just move on top of the train.

Travel Tips

- ☐ Remember to press [?] for hints when you arrive in the Subway.
- ☐ Blue sentries have X-ray vision. They won't let a robot past with you inside. Stand back and use the Remote Control to operate your robots from a distance.
- ☐ Doors are opened by touching buttons or by grabbing a handle and pulling. Only one door is locked and needs a key to open.
- ☐ Recharge all your energy crystals and robot batteries before leaving the Subway. If the batteries are not dead, let them drain (by turning on all the thrusters) so you can recharge them. It's a long way to the next rest stop!
- ☐ Remember to save your game often.

Dangers

- ☐ **Losing robots.** If you send a robot past a sentry and it won't come back, you've lost a robot! (You need all three robots to continue the trip.) Test your circuits in the Innovation Lab to make sure they will come back to you after performing their tasks.

THE TOWN—LEVEL 3

To explore the tortuous mazes of the Town, you need to brave a magnetic storm that can zap robot batteries. Once you find a magnetic shield, you can travel freely to the main parts of town. Your goal is to find "Form 12" and give it to the Gatekeeper who guards the exit out of town. The route to the Gatekeeper is blocked by sentries, locked doors, and a room only robots can enter until a button is pushed.

In the Town, you need to wire robots to:

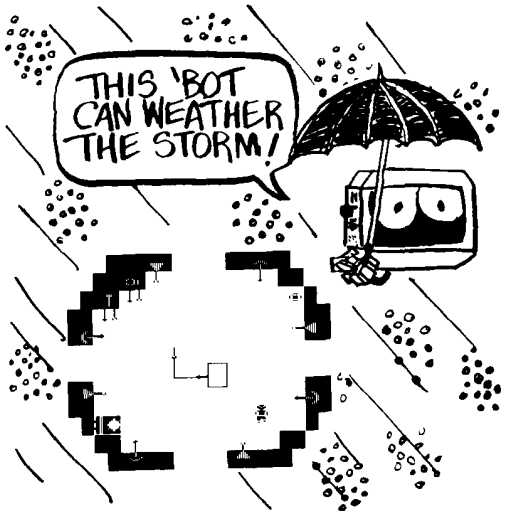
- detect a magnetic storm and turn on a magnetic shield.
- grab a token that moves when you get near it. Operate the vending machine to get Form 12. (You'll need to wire two robots to do this.)
- press two buttons to make a sentry disappear so you can get by.
- enter a room you can't get to and press a button to open the door.

Travel Tips

- ☐ If you become lost in the mazes when you first enter the Town, try leaving things in rooms to find your way around. You can also draw a map on paper.
- ☐ You can peek into the secret room by moving on top of the eye-shape. The room with the peephole button is shaped just like the secret room, so you can test circuits there before sending your robot in the secret room alone.

Dangers

- ☐ Magnetic Storm. This storm can wipe out robot batteries, but a magnetic shield can protect them.

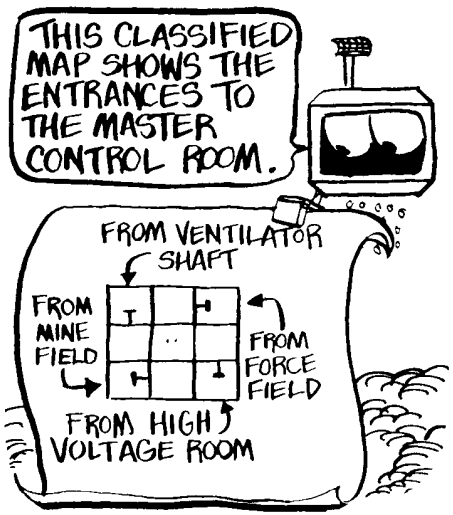


THE MASTER CONTROL CENTER—LEVEL 4

Your trip begins in a room just off a long, seemingly empty, hallway—a hallway that encloses the 60 rooms of the Master Control Center building. You're here to free the Master Robot locked inside a room in the center of the building. To release this fourth robot (which you'll need in Level 5), you need to press four buttons in the Control Room, each reached through a different path. To help you find your way around, collect five floppy disks you'll see scattered about. Use them in the disk drive of the Library's computer for helpful hints and to view a spectacular map of the entire building.

One path leads through the High Voltage Room—a room you can't see into and only a robot can enter. Another path leads through a tunnel blocked by force fields. The colors of the force field lines tell you which robots can get through. A third path leads through an invisible mine field where one false step causes an explosion. The final path takes you through the Ventilator Shaft—a wind tunnel only a robot can explore. Only one of its many passageways lead to the Control Room. So that you don't lose robots, you need to follow these paths in order: first through the High Voltage Room, then the force field tunnel, then the mine field, and finally the Ventilator Shaft.

When you've pressed all four buttons and released the fourth robot, take a last look around. Things have really changed! Then board the Transporter to the top of Robotropolis.



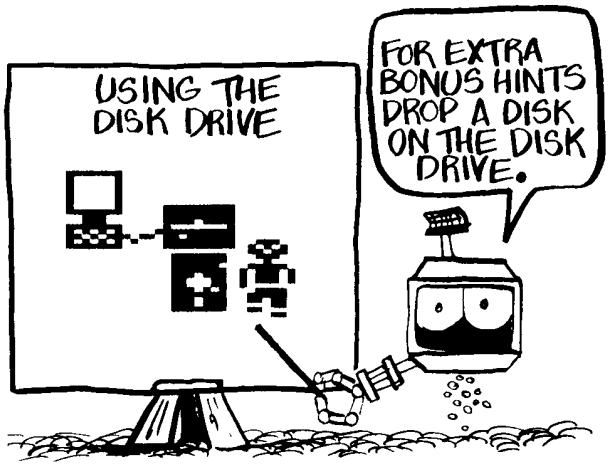
In the Master Control Center, you need to wire robots to:

- chase down a moving, flashing button.
- enter the Ventilator Shaft and negotiate the passageways. (The "count-to-N" chip might help you here.)
- cross the force field and pass a key from robot to robot. (Wiring a chip will be helpful.)
- communicate with each other and simultaneously negotiate the Map Rooms and the invisible mine field. (Wiring a chip is probably necessary.)

Travel Tips

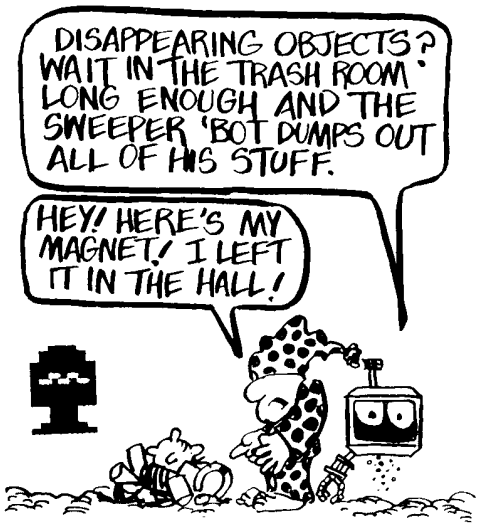
☐ The cameras in the rooms take pictures when you use the map floppy disk. Use this disk to view rooms you can't enter.

☐ Use the floppy disk next to each hazard to view hints on negotiating that hazard.



Dangers

- ☐ **Hall Sweeper.** This fellow sweeps up everything in the hallway except a robot you're inside, your Toolkit, or anything you're holding. If you do leave something in the hallway, you'll eventually find it in the Trash Room when the Hall Sweeper makes his rounds. (It may take a long time because he moves slowly.)
- ☐ **Invisible mine field.** Mines explode here when you or your robot touch an invisible wall. The mines destroy robot circuits and zap you and your robot back to the starting room in Level 4. Use a robot in the Map Rooms to guide a robot through the mine field.



THE SKYWAYS—LEVEL 5

To explore the busy Skyways of Robotropolis, you need to cross a series of congested highways that lead to your final destination—the Projection Room that propels you back to civilization. Along the way, you need to ride inside a robot past a sentry and take a ride through a giant spinning disk drive—the Disk-o-Tek. Inside the Disk-o-Tek is a data card you need later to open doors leading to the Projection Room. Then travel the highway to a room with hot wires and an invisible maze.

Find the Odd-Before-Even room and operate a lock by timing four robots to press four buttons. Then navigate the blue grid to enter the Projection Room—the last room in Robotropolis. Now that you've made it to the top, can you escape?

In Skyways, you need to wire robots to:

- Get past a sentry.
- Grab the data card in the Disk-o-Tek.
- Transmit coded signals to open a sonic lock.
- Cross a room without touching hot wires and press a button that deactivates the sentry.
- Follow a path across a grid and touch a button to open a door.
- Press four buttons in the correct order to open a door.
- Solve the final puzzle in the Projection Room.

Travel Tips

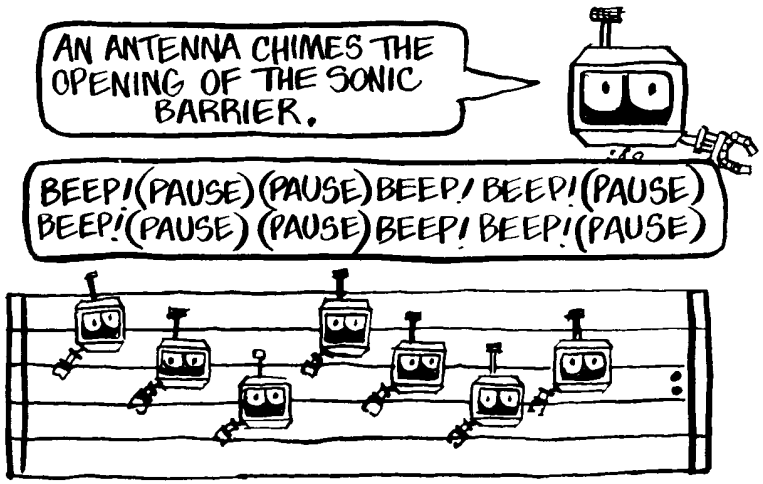
- ☐ Visit the Innovation Lab often to test circuits and wire chips. Chips are especially useful in avoiding hazards that destroy circuits.
- ☐ Carry extra energy crystals with you at all times. You now have four robot batteries to maintain.
- ☐ To cross the hot-wired room and the blue grid, you need to control robot movements without using bumpers. Use the antenna instead.

Dangers

☐ **Skyway traffic.** The crowded highways make crossing difficult and dangerous. If you get hit, you are bumped back to the last highway you crossed and you'll need some time to recover. When crossing the highway, move step by step or ride a robot to avoid a collision.

☐ **Disk-o-Tek.** This giant disk drive could keep you spinning forever. You need to be fast to escape through a doorway on the left.

☐ **Hot wires.** These wires burn batteries when a robot touches them. Avoid them by controlling a robot with signals to direct its movements.



The Learning List

Here is a brief list of the content, strategies, and skills you will explore in Robot Odyssey.

Content

- Electrical engineering fundamentals
- Digital logic
- Circuit design

Strategies

- Debugging
- Breaking a task into small pieces
- Building a model or simulating an event
- Looking for multiple solutions
- Modular design

Skills

- Observation
- Hypothesis generation and testing
- Data collection and analysis
- Spatial visualization

NOTE TO TEACHERS: A booklet including learning objectives and evaluation tools for introducing Robot Odyssey in the classroom is now available. Send $3.00 (postage and handling) to:

Classroom Materials Division
The Learning Company
545 Middlefield Road, Suite 170
Menlo Park, CA 94025
Item Number: **TM205**

Additional Activites

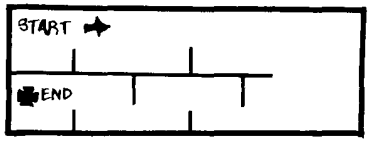
INNOVATION LAB PROJECTS

The Innovation Lab is not just a place to detour from Robotropolis—it's also a place to create your own interesting games and puzzles. Here are a few ideas to get you started.

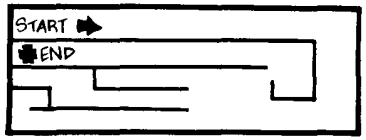
Maze Runners

Program one robot to run both of these mazes without getting stuck.

MAZE 1

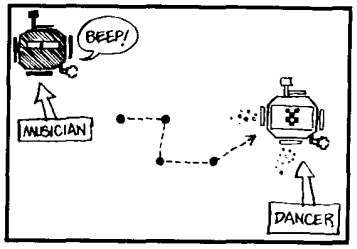


MAZE 2



The Musician and the Dancer

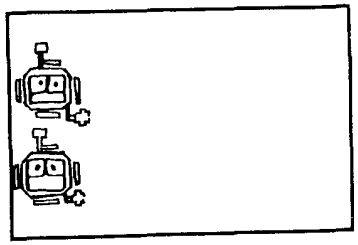
Program these two robots so that when one sends a syncopated signal, the other turns on a thruster or pair of thrusters. Then sit back and watch the show!



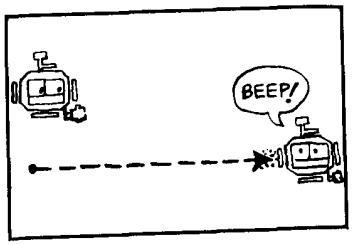
Robot Ballerinas

Try choreographing these two robots to dance a robot version of *Swan Lake*!

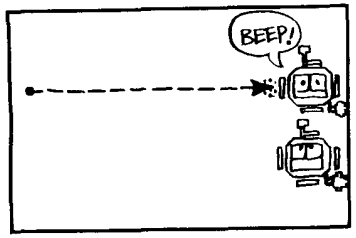
1. Start. Two robots at rest.



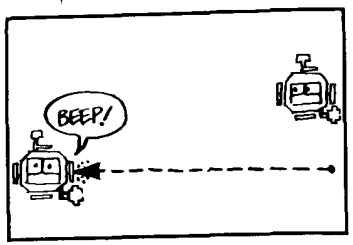
2. Robot A moves to the right. When it hits the wall, it stops and sends one beep.



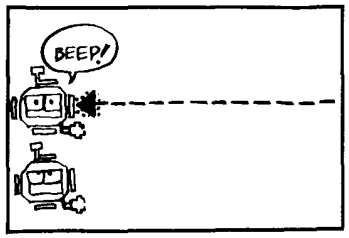
3. Robot B moves to the right. When it hits the wall, it stops and sends one beep.



4. Robot A moves to the left. When it hits the wall, it stops and sends one beep.



5. Robot B moves to the left. When it hits the wall, it stops and sends one beep.



6. The pattern continues from frame 2.

ROBOT KITS, USER'S GROUPS, AND BOOKS

Find out more about robots through construction kits, user's groups, and books on robot technology.

Robot Construction Kits

For moderately priced kits to build your own robot, write to: Amarobot, 1780 Shattuck Ave., Berkeley, CA 94709.

Robot User's Groups

Homebrew Robotics Club, 91 Roosevelt Circle, Palo Alto, CA 94304.

Robotics Society of America, 200 California Ave., Palo Alto, CA 94306.

Books

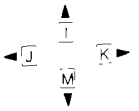
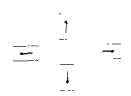
Digital Electronics, Mims, F. M. *Engineer's Notebook: A Handbook of Integrated Circuit Applications.* Fort Worth, TX: Radio Shack, 1979

Robots and Computers, Heiserman, D. L. *Robot Intelligence with Experiments.* Blue Ridge Summit, PA: Tab Books, Inc., 1981.

Building Robots, Heiserman, D.L. *How to Build Your Own Self-Programming Robot.* Blue Ridge Summit, PA: Tab Books, Inc. 1979.

Safford, E. L., Jr., *The Complete Handbook of Robotics.* Blue Ridge Summit, PA: Tab Books, Inc., 1978.

Special Keys

APPLE KEYS	IBM KEYS	TANDY COLOR COMPUTER KEYS	FUNCTION
Keyboard Basics			
			*To move up, down, right, and left*
CONTROL + I, J, K, or M	SHIFT + ↑ ↓ ← or →	SHIFT + ↑ ↓ ← or →	*To move slowly*
REPT + I, J, K, or M	Hold down arrow keys	Hold down arrow keys	*To move quickly (On an Apple IIe or IIc, hold down I, J, K, or M.)*
SPACEBAR	SPACEBAR	SPACEBAR	*To pick up and drop objects with the cursor. SPACEBAR has other functions with different tools which are described on the next page*
Special Functions			
ESC	ESC	BREAK	*To return to the menu*
?	?	?	*To get help or hints*
CONTROL + S	CONTROL + G	CONTROL + S	*To turn the sound on and off*
Joystick and Mouse* Basics			
			*To move up, down right, and left.*
BUTTON	BUTTON	BUTTON	*To pick up and drop objects with the cursor. Use the BUTTON instead of SPACEBAR to operate the different tools described on the next page*

*Mouse available on Apple only. (If you have both a joystick and a mouse plugged in on an Apple IIe, only the joystick will work.)

†CONTROL is labeled CLEAR on some Tandy Color Computers.

Special Keys (continued)

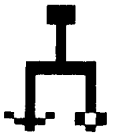
APPLE KEYS	IBM KEYS	TANDY COLOR COMPUTER KEYS	FUNCTION
How to Document a Chip To enter the Chip Record Room, hold a chip in the Innovation Lab and press ?. Then use these keys when typing your chip documentation.			
← or →	← or →	← or →	*To move left or right within a line*
RETURN	ENTER or ↵	ENTER	*To end a line and move down a line*
CONTROL + D	DELETE	@ or ALT + D	*To delete a character under the cursor*
N/A	BACKSPACE	N/A	*To delete a character to the left of the cursor*
CONTROL + I	INSERT	@ or ALT + I	*To insert a character*
CONTROL + C	CONTROL + C	@ or ALT + Z	*To clear (zap) ALL existing documentation for a chip*
?	?	?	*To get help typing your documentation*
ESC	ESC	BREAK	*To quit*
How to Use the Tools			
Cursor C SPACEBAR H	C SPACEBAR H	C SPACEBAR H	*To use the cursor* *To pick up and drop objects* *To make the cursor hot or cold*
Remote Control R	R	R	*To turn the Remote Control on and off*
Solderpen S SPACEBAR	S SPACEBAR	S SPACEBAR	*To use the Solderpen* *To solder or disconnect wires*
Paintbrush P SPACEBAR	P SPACEBAR	P SPACEBAR	*To use the Paintbrush*[2] *To paint or erase walls*

[1]Not available in Robotropolis, Robot Anatomy, Robot Wiring or Sensors
[2]Available in Innovation Lab and Chip design only

Glossary

Robot Parts

Antenna

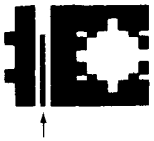


Output On When Receiving

Input On When Sending

The robot's antenna sends and receives signals. It sends a signal when its input is on. Its output turns on when it receives a signal.

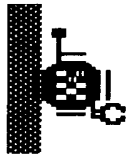
Battery



Shows Battery Level

The battery stores electricity to power the robots. When the battery is charged, you can see its orange electricity. When it runs out of electricity, the orange disappears and the robot stops working.

Bumper



Outside Bumper Touching Wall

Inside Bumper Indicator

The robot's bumper detects walls. It turns on when the bumper touches a wall.

Robot Parts

Eye

The robot's eye is a periscope. It lets you look around the room while you are still inside the robot. The periscope turns on when you move on top of the eye.

Grabber

Output On When Grabbing — Input On To Grab

The robot's grabber picks up an object that the robot bumps into when the grabber's input is on. When it grabs something, its output turns on.

Thruster

Thrust This Way — Move This Way

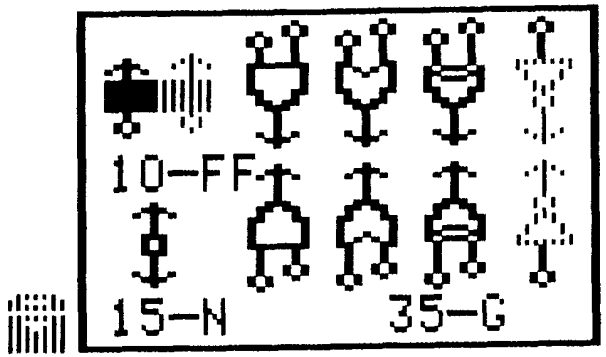
A thruster moves a robot in the direction opposite its thrust. For example, the top thruster moves the robot down. A thruster turns on when electricity flows through it.

Thruster Switch

Open — Closed

The thruster switch turns on the electricity to the thrusters. When the switch is closed, electricity can flow to the thrusters so they can work. When the switch is open, electricity cannot flow to the thrusters.

Toolkit



Open Toolkit

The Toolkit contains many of the parts you need to build circuits. Press [T] to summon the Toolkit from another room. Then press [T] again to open and close the Toolkit. To pick up a part, move the cursor on top of it and press [SPACEBAR]. To return a part to the Toolkit, move it anywhere inside the open Toolkit and press [SPACEBAR] to drop it. The counter inside the Toolkit keeps track of the number of parts inside it. A full Toolkit has 10 flipflops, 15 nodes, and 35 gates. The 35 gates can be any combination of the four different kinds of gates.

Closed Toolkit

Glossary (continued)

Toolkit Parts

Flipflop

The flipflop switches the flow of electricity. Electricity flows out of one output at a time. To switch the flow of electricity, turn on whichever input is off.

Node

A node is a wire that directs the flow of electricity to two places. When electricity flows into its single input, both of its outputs turn on.

AND-Gate

An AND-gate turns on when electricity flows through both its left AND right inputs.

OR-Gate

An OR-gate turns on when electricity flows through either its right OR left input OR both.

XOR-Gate

An XOR-gate turns on when electricity flows through either one of its inputs, but not both.

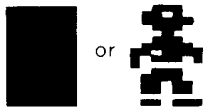
Glossary (continued)

Toolkit Parts

NOT-Gate

A NOT-gate inverts the flow of electricity. It turns on when electricity is NOT flowing through its input and turns off when electricity IS flowing through its input.

Cursor



The cursor picks up and drops objects. Press C to use the cursor. Press SPACEBAR to pick up and drop objects.

Remote Control

The Remote Control freezes and unfreezes electricity everywhere in the Odyssey. Press R to turn the Remote Control on or off. An antenna appears on the cursor whenever the Remote Control is on. When the Remote Control is on, electricity is flowing. When it is off, electricity is frozen and you can see how the electricity was flowing through your circuit at the moment it was frozen. You can also freeze electricity when wiring circuits to prevent the robot from moving before you are ready and to stop the battery from draining electricity.

Glossary (continued)

Toolkit Parts

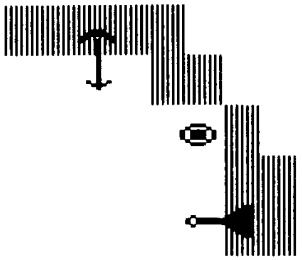
Solderpen

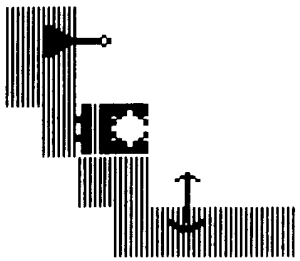
The Solderpen connects and disconnects wires to inputs and outputs. Press [S] to use the Solderpen. Move it to an input or output until the tip glows orange. Press [SPACEBAR] to start and stop the flow of solder. The Solderpen can only wire inputs and outputs that are in the same room. To disconnect a wire, move the Solderpen to an input or output until the tip glows orange. Press [SPACEBAR] and the wire will disappear.

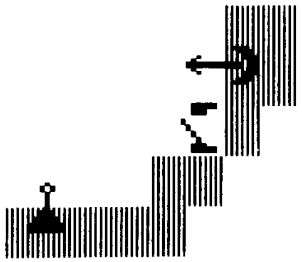
Paintbrush

The Paintbrush paints and erases walls in the maze rooms of the Innovation Lab. Press [P] to use the Paintbrush. Press [SPACEBAR] to paint or erase a wall. You can move through maze walls when you are using the Paintbrush.

Robot Spec Sheet







Designer: _____

Date: _____

Robot #: _____

General Description:

_____

_____

Special Uses:

_____

_____

Antenna Activated By:

_____

_____

Grabber Activated By:

_____

_____

Thrusters Activated By:

_____

_____

Chip Spec Sheet

Designer: _____

Date: _____

Disk #: _____

General Description:

_____

_____

_____

_____

Title: _____

Connections:

Pin 1 _____

Pin 2 _____

Pin 3 _____

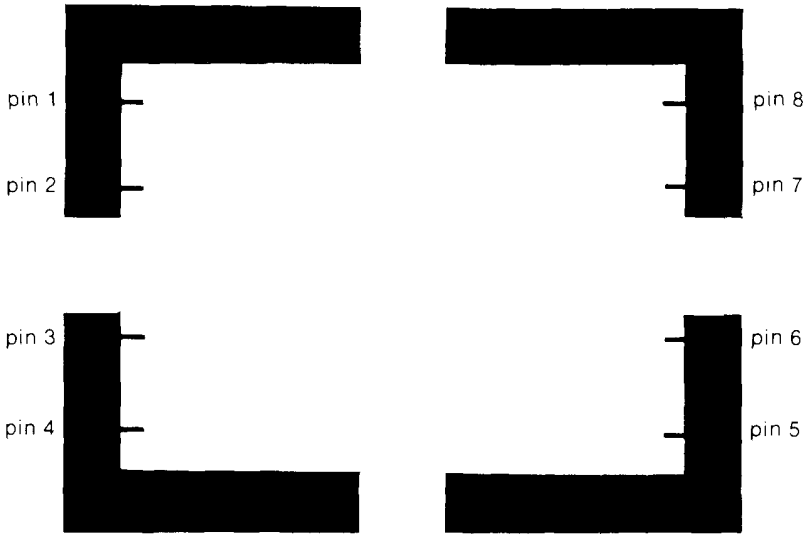
Pin 4 _____

Pin 5 _____

Pin 6 _____

Pin 7 _____

Pin 8 _____



Mail us your best circuits or chip designs. We may use them in the next odyssey! Be sure to include your name and address. Send it to:

Robot Odyssey
The Learning Company
545 Middlefield Rd., Suite #170
Menlo Park, CA 94025

Appendix A

ADDING DOS TO YOUR IBM DISK

You need to add DOS to your IBM or IBM-compatible Robot Odyssey disk before you use it for the first time. Just follow the instructions below. (If you are using an IBM compatible computer, the procedure may vary slightly. Just follow the prompts on your screen.)

After DOS is installed, put your Robot Odyssey disk in drive A and type **SETUP**. Follow the instructions on the screen. This program stores information about your computer system and joystick on the disk.

If you change computer systems or your use of the joystick, you will need to rerun the SETUP program. Boot a DOS system disk, put your Robot Odyssey disk in drive A, type **SETUP**, and follow the instructions on the screen.

If You Have Two Disk Drives:

1. Put your DOS disk in drive A.
2. Put your Robot Odyssey disk in drive B.
3. Turn on the computer.
4. When you see **Enter new date:**, press ENTER or ↵.
5. When you see **Enter new time:**, press ENTER or ↵.
6. When you see **A >**, type **B:INSTALL**. Then press ENTER or ↵.
7. When you see **A >. . . . . Now your disk is ready to use. . .** put your Robot Odyssey disk in drive A and type **SETUP**.
8. When the SETUP program is completed, put your Robot Odyssey disk 1 in drive A, then press CTRL, ALT, and DEL all at once to run Robot Odyssey.

If You Have One Disk Drive:

1. Put your DOS disk into the drive.
2. Turn on the computer. Wait.
3. When you see **Enter new date:**, press ENTER or ↵.
4. When you see **Enter new time:**, press ENTER or ↵.
5. When you see the prompt **A>**, type **B:INSTALL**. Then press ENTER or ↵.
6. When you see **Insert diskette for drive B: and strike any key when ready,** remove your DOS disk, put your Robot Odyssey disk in the drive, and strike any key.
7. When you see **Insert diskette for drive A: and strike any key when ready,** remove your game disk, put your DOS disk in the drive, and strike any key.
8. Keep repeating steps 6 and 7 until you see **A>.....Now your disk is ready to use...** put your Robot Odyssey disk in the drive and type **SETUP**.
9. When the SETUP program is completed, press CTRL, ALT, and DEL all at once to run Robot Odyssey.

If You Have One Floppy Disk Drive And A Fixed Disk Drive:

1. Turn on your computer, booting from your fixed disk drive.
2. When you see **Enter new date:**, press ENTER or ↵.
3. When you see **Enter new time:**, press ENTER or ↵.
4. You must have the following files on the directory under which you are working:

   COMMAND.COM
   SYS.COM

   To see if these files are on your directory, type **DIR** and then press ENTER or ↵. The files in your directory will be listed on the screen. If the file *is* there, go on to step 5. If the file is *not* there, find out which directory it is on, and move to that directory before going on to step 5.
5. Place your Robot Odyssey disk in your floppy disk drive A.
6. Type **A:HINSTALL** and press ENTER or ↵.
7. When you see **...Now your disk is ready to use...**, type **A:** and press ENTER or ↵.
8. When you see the **A>** prompt, type **SETUP** and press ENTER or ↵.
9. When the SETUP program is completed, put your Robot Odyssey disk 1 in drive A and press CTRL, ALT, and DEL all at once.

STARTING OS-9 FROM BASIC ON A TANDY COLOR COMPUTER

If you do not have a Color Computer with BASIC version 1.1 or later or if you do not have the OS-9 System, you can type in the following program and use it to start Robot Odyssey.

Enter the following program from disk extended BASIC.

```
10  REM ****************
20  REM * BOOT OS-9 FROM BASIC
30  REM ****************
40  FOR I=0 TO 70
50  READ A$
60  POKE &H5000+I,VAL("&H"+A$)
70  NEXT I
80  CLS:PRINT "INSERT OS9 DISKETTE"
90  PRINT "INTO DRIVE 0 AND PRESS A KEY"
100 A$=INKEY$:IF A$="" "THEN 100
110 EXEC &H5000
120 DATA 86,22,8E,26,00,8D,0D
130 DATA FC,26,00,10,83,4F,53
140 DATA 26,03,7E,26,02,39,34
150 DATA 20,10,BE,C0,06,A7,22
160 DATA 86,02,A7,A4,6F,21,6F
170 DATA 23,6C,23,AF,24,10,BE
180 DATA C0,06,A6,23,81,13,27
190 DATA 12,AD,9F,C0,04,4D,27
200 DATA 06,6C,23,6C,24,20,E9
210 DATA 7F,FF,40,35,A0,4F,20
220 DATA F8
```

Type the following instruction at the OK prompt to save the above program to a newly formatted disk:

SAVE "*" ENTER

Type the following to use this program to start the application:

RUN "*" ENTER

When the prompt appears, insert the Robot Odyssey diskette and press ENTER. If you boot on a separate OS-9 system disk, put the Robot Odyssey disk in drive 0 and type **CHX /D0/CMDS**. Type **RUN "ROBOT"** ENTER to start Robot Odyssey.

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