SECTION F

PUTTING IT ALL TOGETHER

ACTIVITIES

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2. Robot Exercise Leader
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ACTIVITY 1: ROBOT PATROL

You have had RB5X performing sentry duty already. It would be very useful if the robot could really patrol an area and sound an alarm or give a verbal warning. By combining commands and techniques learned in earlier sections, you can do just that.

Let's Experiment

Decide on an area you would like RB5X to patrol. Work out the path the robot is to follow much like you did in "Robot Pathfinder" (Section A, Activity 5). Decide if you want RB5X to give you an "OK" from time to time, so you know it is still on the job. Then decide how close something should be to the robot before it detects it. What kind of alarm do you want RB5X to give?

You should use techniques from "Respond When Sonar Activated" (Section B, Activity 5), "Morse Code" (Section C, Activity 3), and "A Sentry Robot" (Section C, Activity 10); from Section D, "Speech Programming;" and whatever other commands you wish.

DEFINE a task and enter the commands. Try out your task to see that it works properly. Then put RB5X to work.

ACTIVITY 2: ROBOT EXERCISE LEADER

Remembering to get your daily exercise can sometimes be a problem, especially if you exercise alone. Why not let RB5X keep you company, and remind you what to do next and when? Robots need to keep in shape too!

Let's Experiment

If you already have a regular exercise program, make a list of the exercises you do and the time you spend on each one. If you don't already have a program, get some ideas from a friend or find a book in the library on exercise.

Once you have decided on a program, think how RB5X can best help you stick to the routine. What kind of encouragement would you like to receive? What movements can RB5X use to remind you of what you should be doing? Do you want the robot to count each exercise for you, or to give you a cue when you are almost finished?

Write a script for the robot, including speech, movement, time, and other aids in the order you want them done. You can use techniques from all of the previous

activities to make RB5X a first-class exercise leader. Test each exercise as you go to be sure it does what you want. When you are finished, invite some friends to join you and RB5X for your daily practice.

ACTIVITY 3: ROBOT EXPRESS

A robot that can run simple errands and deliver messages or objects from one place to another can be quite helpful. Suppose you are working on something and are at a point where you can't leave, but you need something or need to tell someone something. Let RB5X do it for you. With what you have already learned, you can write many utility tasks that send the robot to different known places, ask for or deliver information, and carry small objects back and forth.

Let's Experiment

Pick a location where you spend a lot of time doing many things. Using the ideas in "Robot Pathfinder" (Section A, Activity 5), make maps of the routes you would like RB5X to follow to reach certain places. Using ideas from "Deliver an Important Message" (Section D, Activity 4), you can have the robot carry information to these places. You can also equip RB5X with a basket or carrying box that can take written notes to or from different places along with small objects.

Decide how you want the robot to do these things. DEFINE a separate task for each location and write your programs. You will soon see just how helpful RB5X can be.

ACTIVITY 4: ROBOT VAUDEVILLE

You already know that RB5X is quite a show-stopper. It would be nice if the robot had several different routines it could perform for different occasions. RB5X might have a special set of songs, dances, and jokes or sayings for birthdays, another set for Valentine's Day, and a different

routine for Halloween. Once these performances are developed, you and RB5X are ready for whatever may come along.

Let's Experiment

You really need to use your imagination here. You can use ideas from all of the activities you have worked on so far to make up these routines. First, you need to write a robot script for each special occasion that includes just what RB5X is going to do and when. You may find that you can use tasks you have already written as parts for some of the new tasks.

When you have your script, DEFINE a task for each occasion and enter the proper commands. It is a good idea to try these out on someone else before RB5X performs for a group to be sure that the first "real" performance is perfect.

ACTIVITY 5: ROBOT PROFESSOR

Here is an excellent opportunity to see how easy it is to create new activities for RB5X once you have developed a lot of smaller tasks. You have created, in previous activities, all of the tasks you need to let RB5X put on a really complete lesson on what it can do. You can use only those tasks you have already written or you can add more.

Let's Experiment

Start with the task you wrote for "A Robot Introduction" (Section D, Speech Programming). After RB5X speaks each phrase, insert another task you have already written that lets RB5X show off each capability after it is described. If you feel you left something out of the original introduction task, now is the time to add it.

Select the proper phonemes for the new things that you want RB5X to explain, then add the action tasks. Did you remember to modify any tasks that included such elements as PREPARE THE ROBOT and extra CALLs and JUMPs? When you are finished, RB5X should be able to show your friends just how many things it can do.

ACTIVITY 6: ROBOT ZOO

You had RB5X imitate the movements of different animals in "Animal Charades" (Section A, Activity 6). By adding all of the robot's other capabilities, you can have RB5X do an even better job. You may already have some tasks written that can be included to create more meaningful animal imitations, such as arm movements, horn and LED routines, and sensing tasks.

Let's Experiment

As you did in "Animal Charades," decide on the types of animals you would like RB5X to imitate, remembering to pick animals that have distinct, identifiable characteristics. Think about all of RB5X's abilities and decide which of these are suitable for each animal. Use your imagination. You might have RB5X use its arm to give the appearance of an elephant's trunk, for example.

Decide if you want to put all of the animals in one task (it may get too big, however) or if you want to make each animal a separate task that can later be arranged in order in a larger task. DEFINE your task and write the commands. RB5X can do a good job of entertaining your friends at a party with these antics.

ACTIVITY 7: ROBOT BUTLER

A personal butler is something very few people can have. You can have your own with RB5X. You can write several tasks that allow RB5X to perform useful chores. These tasks can be arranged in many different ways for future use, depending on what you need done at a certain time. You might have a task that has RB5X greet guests at the door and take their coats to a certain spot, and another that asks guests if they would like refreshments and then to alert someone who can serve them.

Let's Experiment

Think about all of the useful jobs RB5X could do for

you. Decide which jobs you would like to have tasks for now. Write a script for each task. Remember that if a task is going to have the robot go to a special place, you need to know the distance and angle of that location as you did in "Robot Pathfinder" (Section A, Activity 5).

Once you have selected the tasks, the phrases RB5X will say, and the other capabilities each task will use, DEFINE and write the programs for each separate task. To get the effects that you want, put the separate tasks together in a larger task and see what kind of personal butler RB5X is.

ACTIVITY 8: ROBOT HOST

Besides acting as a butler, RB5X can help you take care of a group of visitors. The robot can move around a room, stopping to make small talk with different people who are visiting. You may have some good phrases already written in "A Conversation with Your Robot" (Section D, Activity 8). Try writing others.

Let's Experiment

There are several things you will want to decide. What do you want RB5X to talk about? How many things do you want the robot to say before it moves on to someone else? How will the robot decide to move and how will it decide to stop again? Do you want to include arm movements for effect? What tasks that you have already written can you include in this task?

Once you have made all of the decisions, DEFINE a task and write the program. If you are not expecting a group of visitors right a way, invite a few friends over to see how well RB5X does with a group.

ACTIVITY 9: RB5X SAYS

RB5X can play games with people, too. Almost everyone knows how to play "Simon Says," so why not let your robot play "RB5X Says"? You can add some things to the routine

that will convince the players that the robot can see just who is following instructions and who isn't.

Let's Experiment

Remember that in "Simon Says" the leader tells the players to do many different, simple things. The only things that the players are supposed to do are the things that start out with "Simon says..." Doing anything not starting out with "Simon says..." disqualifies the player.

Decide what people can do that RB5X can do, such as turning around, facing front, facing back, opening your hand, or wiggling your wrist. Then select what the robot is going to say and when it will say "RB5X says..." Also, write some phrases for the robot like, "Someone is not paying attention" or "Did I say to do that?" You can use these randomly throughout the program. Remember that if RB5X doesn't "say" to do something, the robot doesn't do it.

Once you have worked out the game on paper, DEFINE the task and enter the commands. This is a task you will use over and over along with all of the other games you create for RB5X.

ACTIVITY 10: MULTIPURPOSE ROBOT

You have learned how to have RB5X do a little of everything. You have taught RB5X how to work, to play, and to just be good company. It would be nice to have the robot be able to show off its versatility by writing one, large task. Here is another easy way to use many of the smaller tasks you have created.

Let's Experiment

Do you remember the command "EXIT IF THIS BUMPER is touched"? You can use this command to have RB5X be ready to fill many different roles at once. Decide what you want the robot to do when each bumper is pressed. You can even paste identifying labels on each bumper if you like so others can choose what the robot will do. Just remember not to get the overall program so big that it does not fit into the robot's memory.

You might have RB5X wave when one bumper is touched, think when another is touched, perform a movement pattern with another bumper, give instructions on a signal from a fourth, and so on. Experiment with this idea to see just how many things RB5X can remember at one time.