Instructions

for the

Heathkit

Educational Systems

AUTOMATIC MODE ROM

Model ET-18-7

INTRODUCTION

The Automatic Mode ROM contains an obstacle avoidance program that enables the Robot to navigate a random path. This program uses the sonar to detect obstacles in the Robot's path and to select alternate routes of travel. The Robot uses its light sensor to determine if it is actually moving. The program also uses the optional Voice accessory to produce 18 different phrases.

PARTS LIST

#444-239-1	1	Automatic Mode ROM
	1	Blue and white label
#597-260	1	Parts Order Form
	1	Instruction Sheet

INSTALLATION

( ) Turn off the Robot power. Refer to the "Disassembly and Component Locations" section in your ET-18 Technical Manual and remove the back body panel and the two screws that secure the hinged door.

( ) Pick up and hold in one hand the new Automatic Mode ROM, still mounted on its foam pad, then touch the Robot chassis to discharge any static electricity.

( ) Carefully remove the ROM from its foam pad. Make sure all its pins are straight and that both rows of pins are perpendicular to the plastic body of the device.

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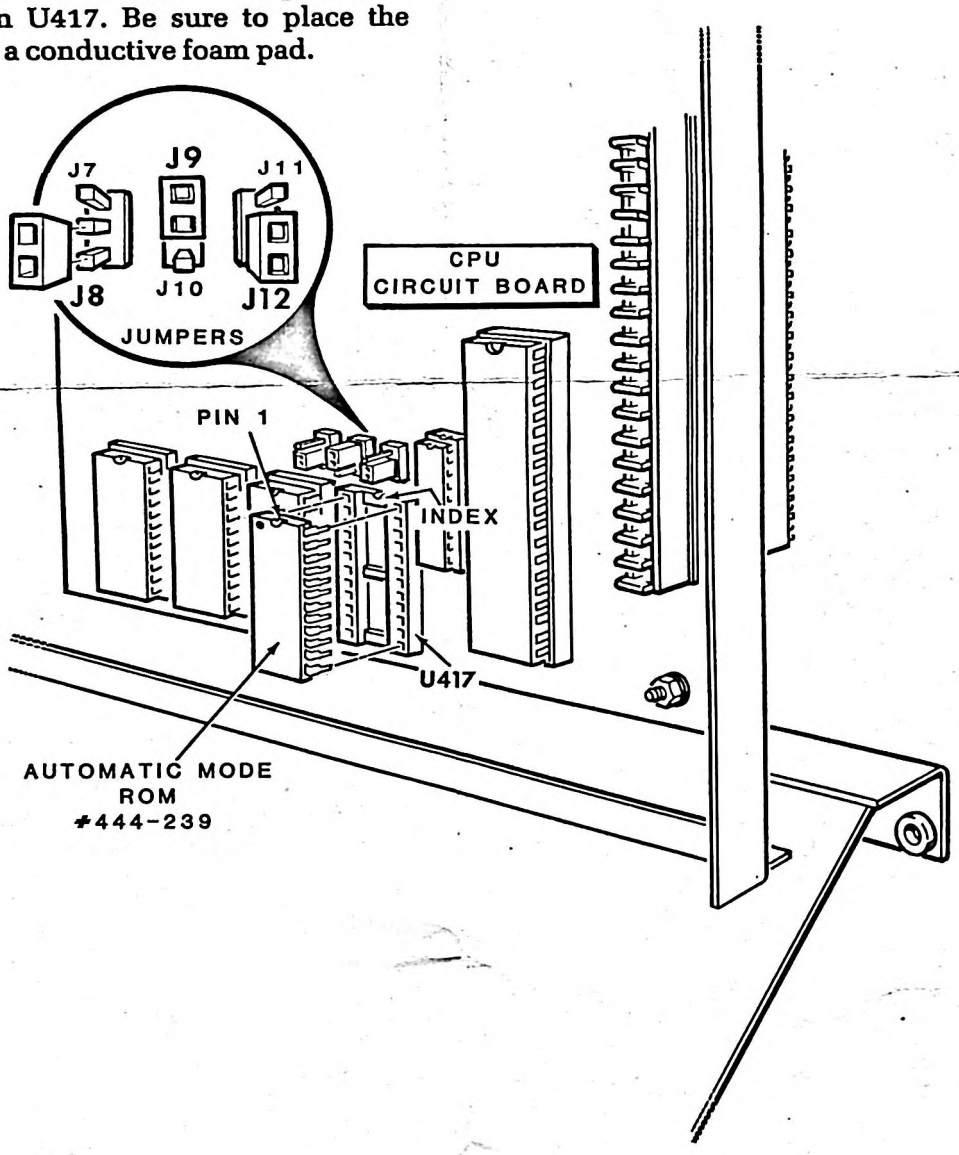
NOTE: If you previously installed the Model ET-18-6 Expansion Module in your Robot, refer directly to that Manual to install the Automatic Mode ROM on that circuit board. Then return to this Instruction Booklet for the "Operation" instructions. Do **not** perform the next three steps.

CPU Circuit Board

( ) If your Robot has some other ROM option installed at U417, you must carefully remove that ROM with an IC lifter or small screwdriver before you perform the following steps. Thereafter, you must decide which option you wish to keep in U417. Be sure to place the unused ROM in a conductive foam pad.

( ) Push the new ROM into CPU circuit board socket U417, making sure to match the pin 1 end of the ROM with the marked index on the circuit board.

( ) Refer to the inset drawing below, and install the three jumpers at J8, J9, and J12 as shown.



( ) Remove the paper backing from the blue and white label and press the label in place on the chassis near the CPU or the Memory Expansion circuit board.

( ) Resecure the hinged door with the screws previously removed; then remount the Robot back body panel.

OPERATION

( ) Turn on the Robot power and listen for the "ready" response.

( ) If you have a version 1.0 Monitor ROM, you must initialize your Robot; press '31.' Listen for the "ready" response.

ACTION	DISPLAY
( ) Press 'A'.	A.##### (5 blanks)
( ) Press 'D'.	_ _ _._ do.
( ) Enter the address of the ROM: U417 = 2000 U102 = 1000 U103 = 3000 U104 = 4000 U105 = 6000 U106 = 8000 U107 = A000	SELECt SPEEd# (1 blank)

( ) Listen for the oral request "Please select speed."

( ) Select speed: 1 (low); 2 (med), 3 (high).* XXYYZZ**

* Use 1 for smooth floors, 3 for pile carpeting, for example. If you select an incorrect key, you will get an oral error message, "Please select 1 for low, 2 for medium, or 3 for high."

** XX = the detected sonar range.
YY = the light reference level.
ZZ = the present detected light level.

NOTE: The avoidance program overwrites data in addresses 0050H through 008BH; for this reason, you should not use these addresses for data or other programs.

After stating, "I think I'll explore," your Robot will proceed on a random path and will stop when his RESET button is pushed. During his travels, he will vocally state two "trouble" messages, "Oops" and "Help" (if totally boxed in).

Other random messages are:

"I think I'm lost."
"Where am I?"
"Which way should I go now?"
"Rats! Another dead end."
"I gotta get outta here!"
"Now where did I leave my charger?"
"It must be here somewhere."
"Maybe this way!"
"My computer said there would be days like this."
"Where are you?"
"Excuse me."
"Are you in my way again?"
"Oops" (2nd place in memory)
"This sure is a long hall!"

SPECIFICATIONS

Code	Relocateable to any address that is a multiple of 100H.
Navigation Sensing ..	Uses data from sonar and light sensors.

TROUBLESHOOTING

First, check to make sure the new Automatic Mode ROM chip pins were not bent under when you installed it. Recheck the jumper positions.

If the Robot moves in a reverse direction, check the drive wheel optical encoder.

If the sonar gives erroneous readings, check the sonar adjustment. See "Adjustments; Sonar Transmit Frequency" in your Technical Manual. Also check for false sonar noises from other ultrasonic devices.

If the side or arm of the Robot hits against something, the head may become misaligned. If this happens, push the "RESET" button, manually place the head in a straight forward direction. Then push the correct keys to restart the automatic mode.

If you are unable to resolve a problem, refer to "Customer Service" in your Technical manual.