

# HEATH COMPANY

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December 27, 1971

Dear Customer:

Please make the following changes in your Manual before starting to assemble your Miniature Servo.

Page 4 – Left column, under "Resistors, 1/4 Watt," add:

A1	1-38-12	2	.10	220 k $\Omega$ (red-red-yellow)
A1	1-16-12	2	.10	180 k $\Omega$ (brown-gray-yellow)

– Under "Precision,"

Change:	A2	2-34-12	1	1.75	15 k $\Omega$
To:		<u>2-20-11</u>	1	1.75	<u>14.3 k<math>\Omega</math></u>

Page 5 – Left column, under "Hardware,"

Delete:	D6	259-2	1	.05	#8 solder lug
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Page 11 – Tape the new Page 11 attached to this letter over the corresponding page in your Manual.

Page 16 – Similarly, replace this page in your Manual with the new Page 16 attached to this letter.

Page 24 – In the step that starts with "( ) Adjust the control drive shaft," delete the words: "the #8 solder lug or. . ."

Page 26 – Left column, seventh line,

Change:	Refer to Pictorial 15 (fold-out from Page 24) for the following steps.
To:	Refer to Pictorial <u>16</u> (fold-out from Page 24) for the following steps.

Page 35 – Tape the new Schematic supplied with this letter over the one on the fold-out from your Manual page.

On the loose, fold-in Schematic supplied with your Manual, locate resistors R2 and R3 near the top of the diagram. Delete the values (330K) of both of these resistors. Then write the following note above R2 and R3:

See last "Note" on fold-out from Page 35 for resistor value.



– Change the value of R1 from 15K to 14.3K.

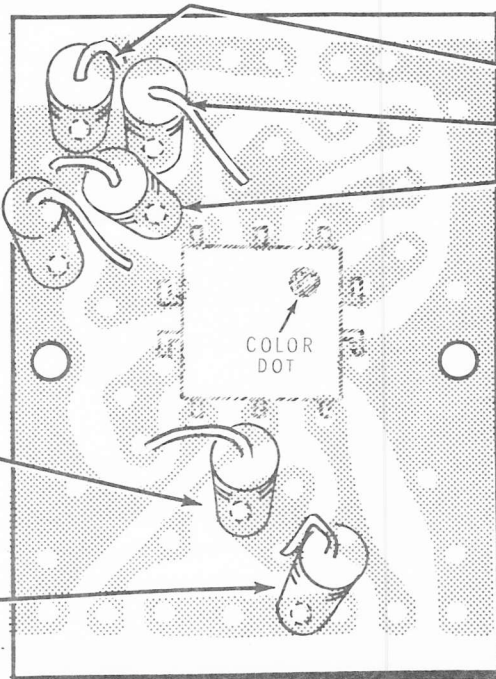
Thank you,

HEATH COMPANY

**START**



- ( ) 14.3 kΩ precision.  

- ( ) 2200 Ω (red-red-red).  

- ( ) 8200 Ω (gray-red-red).

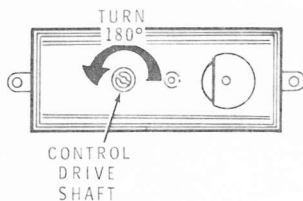


PICTORIAL 4

**CONTINUE**



- ( ) 18 kΩ (brown-gray-orange).
- NOTE: The resistors that you will install next depend on the color dot on the IC. Select the resistors in the next step that go with your IC.
- ( ) Yellow color dot – select two 180 kΩ (brown-gray-yellow) resistors.
  - Green color dot – select two 220 kΩ (red-red-yellow) resistors.
  - Blue color dot – select two 330 kΩ (orange-orange-yellow) resistors.
- ( ) Install the two resistors you selected.
- You may discard the other four resistors. They will not be used.



Detail 8B

Refer to Detail 8B for the following steps.

- ( ) Rotate the control drive shaft with a small screwdriver until you feel a notch in the control. Then, without forcing it, rotate the shaft 180 degrees in either direction. If the shaft does not want to turn during this rough centering adjustment, refer to the Note below. Proceed with the next step if you have no difficulty turning the shaft.

NOTE: If the shaft does not want to move, do not force it. Instead, remove the two screws and the control. Then rotate the shaft, with the control wiper, 180 degrees (the two raised tongues of the wiper should be roughly opposite the location where the large slot of the control will be; refer to Detail 8A again). Without permitting the shaft and wiper to move, install the control with the two screws, as before. Continue with the next step.

- ( ) Carefully remove the control drive shaft. Do not rotate the control wiper inside. The control will hold the control wiper in place.

Refer to Pictorial 9 for the following steps.

- ( ) Prepare the free ends of three of the four 1-3/4" wires coming from the circuit board. Do not prepare the black wire located between the two transistors on the short side of the circuit board. Remove 1/8" of insulation from each of the three wire ends, twist the small strands together, and melt a small amount of solder on the exposed strands.
- ( ) Melt solder on all three lugs of the control.

NOTE: In the following steps, lay each wire flat against the control and solder it as shown.

- ( ) Connect the 1-3/4" green wire to lug 1 of the control (S-1).
- ( ) Connect the 1-3/4" black wire, coming from the long side of the circuit board, to lug 2 of the control (S-1).
- ( ) Connect the 1-3/4" red wire to lug 3 of the control (S-1).
- ( ) Test the solder connections by pulling gently on each of the three wires.

## SCHEMATIC OF THE HEATHKIT<sup>®</sup> MINIATURE DIGITAL PROPORTIONAL SERVO MODEL GDA-19-41

### NOTES:

1. ALL RESISTORS ARE 1/4 WATT. RESISTOR VALUES ARE IN OHMS (K=1000).
2. ALL CAPACITOR VALUES ARE IN  $\mu$ F.
3. ○ THIS SYMBOL INDICATES A POSITIVE DC VOLTAGE MEASUREMENT WITH NO SIGNAL BEING RECEIVED.
4. □ THIS SYMBOL INDICATES THE NORMAL OPERATING VOLTAGE RANGE.
5. □ THIS SYMBOL INDICATES ON VOLTAGE.
6. □ THIS SYMBOL INDICATES OFF VOLTAGE.
7. ● THIS SYMBOL INDICATES A WAVEFORM DISPLAY AT THE POINT INDICATED, AS SHOWN NEXT TO THE SCHEMATIC.
8. VOLTAGE ON PIN 2 OF THE IC IS VARIABLE FROM 0.2 TO 0.4, DEPENDING ON THE INPUT PULSE.
9. VOLTAGE ON PIN 6 OF THE IC IS VARIABLE FROM 1.5 TO 2.7, DEPENDING ON THE INPUT PULSE.
10. ALL VOLTAGES ARE MEASURED WITH A HIGH IMPEDANCE VOLTMETER FROM THE POINT INDICATED TO COMMON GROUND. VOLTAGES MAY VARY  $\pm 20\%$ .
11. REFER TO THE SERVO PHOTOGRAPH AND CIRCUIT BOARD X-RAY VIEW FOR THE PHYSICAL LOCATION OF PARTS.

\* THE IDENTICAL VALUES OF R2 AND R3 DEPEND ON THE RATING OF THE IC, WHICH IS EXPRESSED BY A COLOR DOT ON THE IC CASE:

YELLOW DOT - 180K  
GREEN DOT - 220K  
BLUE DOT - 330K

