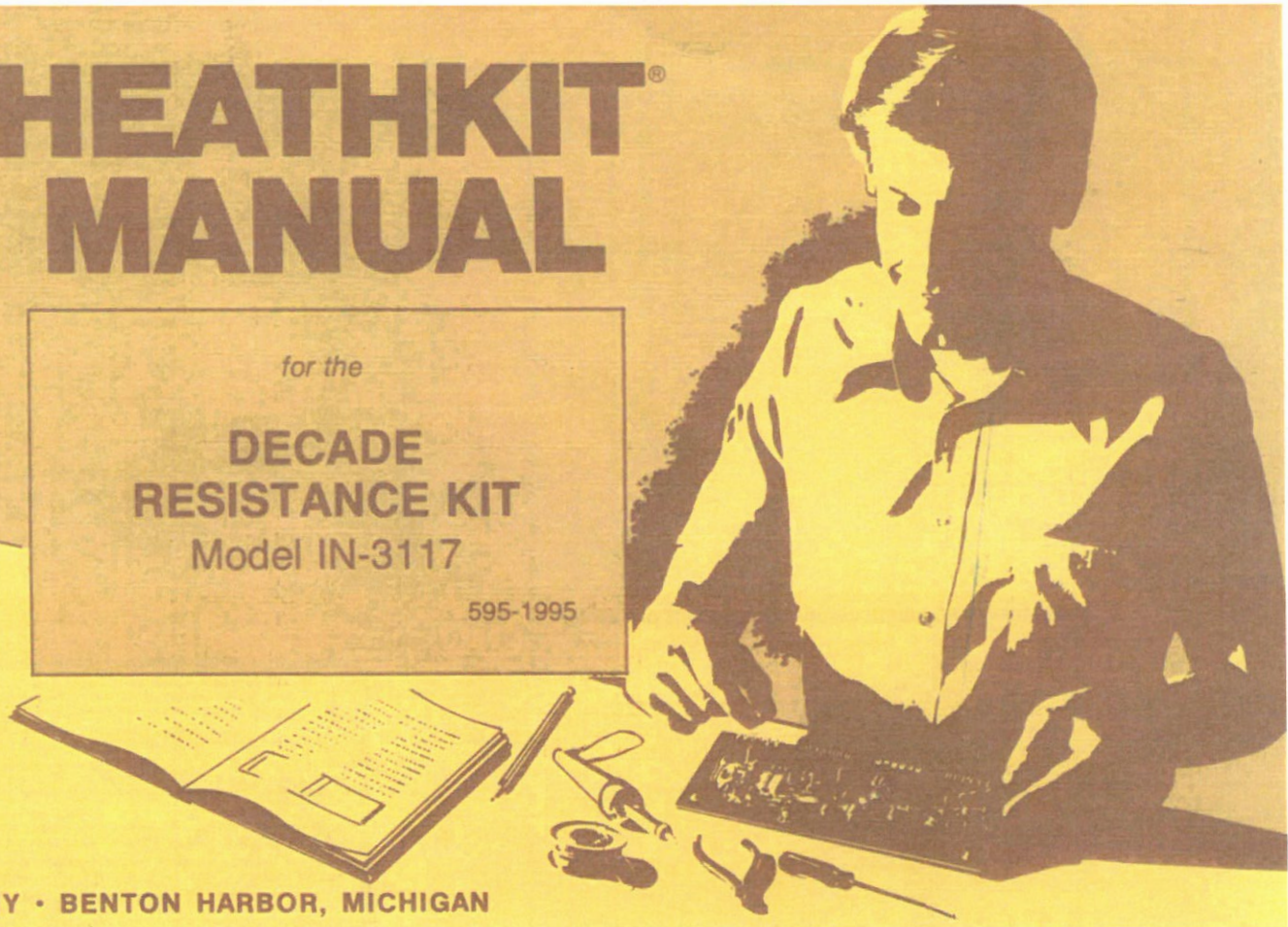


HEATHKIT[®] MANUAL

for the

**DECADE
RESISTANCE KIT**
Model IN-3117

595-1995



HEATH COMPANY • BENTON HARBOR, MICHIGAN

Assembly and Operation
of the



DECADE RESISTANCE KIT

MODEL IN-3117

HEATH COMPANY
BENTON HARBOR, MICHIGAN 49022

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The Heath Company reserves the right to discontinue products and to change specifications at any time without incurring any obligation to incorporate new features in products previously sold.

CIRCUIT DESCRIPTION

The series arrangement of the range switches and the precision resistors as shown on the Schematic Diagram will yield any resistance value from 1 to 999,999 Ω in 1 Ω steps. Each resistor is rated to be within 1/2% of its ohmic value for precision applications. The 0 position of the range switches allows the resistors to be bypassed if desired. The multiplier printed

beneath each range switch on the front panel indicates the value of each resistor for that particular switch. The "shorting-type" switches with make-before-break action permit smooth adjustment of the resistance value without opening or shorting of the circuit.

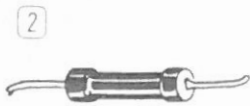
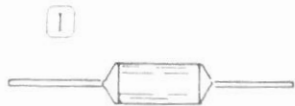
PARTS LIST

Open the kit carefully and check each part against the Parts List. The numbers in front of the Part Number correspond to the picture of that part for quick and positive identification.

ART No.	PARTS Per Kit	DESCRIPTION
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RESISTORS (Precision 1/2% 1 Watt)

-46-1	9	1 Ω
-47-1	9	10 Ω
-48-1	9	100 Ω
-49-1	9	1 K Ω
-50-1	9	10 K Ω
-51-1	9	100 K Ω



To order a replacement part, use the Parts Order Form furnished with this kit. If a Parts Order Form is not available, refer to "Replacement Parts" inside the rear cover of the Manual. For pricing information, refer to the separate "Heath Parts Price List."

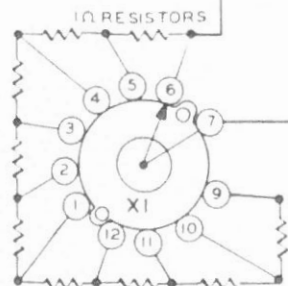
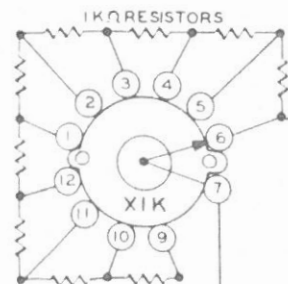
PART No.	PARTS Per Kit	DESCRIPTION
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SHEET METAL PARTS

90-352-3	1	Cabinet shell
203-1853-1	1	Front panel

HARDWARE

250-8	4	#6 sheet metal screw
250-89	4	6-32 screw
252-3	4	6-32 nut
252-7	6	Control nut



SCH
DECAL

The abbreviation "NS" indicates that a connection should not be soldered yet as other wires will be added. When the last wire is installed, the terminal should be soldered and the abbreviation "S" is used to indicate this. Note that a number will appear after each solder instruction. This number indicates the number of leads that are supposed to be connected to the terminal in point before it is soldered. For example, if the instruction reads, "Connect a lead to lug 1 (S-2)," it will be understood that there will be two leads connected to the terminal at the time it is soldered.

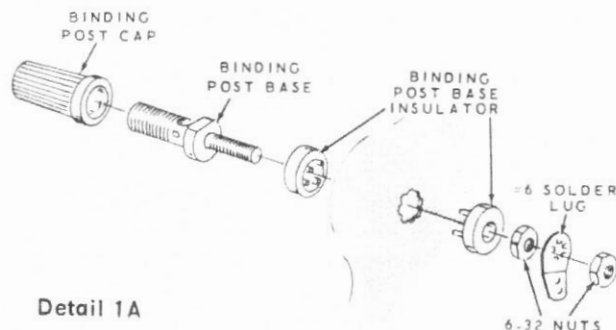
Position the work, if possible, so that gravity will help to keep the solder where you want it. The joint to be soldered should be heated with the flat side of the soldering iron tip sufficiently to melt the solder. Apply only enough solder to the heated terminal to thoroughly wet the junction. Remove the solder and then the iron when a smooth soldered junction appears. Do not move the leads until the solder is solidified.

ROSIN CORE SOLDER HAS BEEN SUPPLIED WITH THIS KIT. THIS TYPE OF SOLDER MUST BE USED FOR ALL SOLDERING IN THIS KIT. ALL GUARANTEES ARE VOIDED AND WE WILL NOT REPAIR OR SERVICE EQUIPMENT IN WHICH ACID CORE SOLDER OR PASTE FLUXES HAVE BEEN USED. IF ADDITIONAL SOLDER IS NEEDED, BE SURE TO PURCHASE ROSIN CORE (60:40 or 50:50 TIN-LEAD CONTENT) RADIO TYPE SOLDER.

STEP-BY-STEP ASSEMBLY

Refer to Pictorial 1 (fold-out from Page 4) for the following steps.

- () Mount binding posts at A and B with black and red caps, respectively. Note solder lug positioning. See Detail 1A for assembly, using the binding post insulators.
- () Locate all nine 100 K Ω resistors so that they will be readily available. (Make sure that all nine of the resistors are 100 K Ω).
- () Position one of the range switches so that a rear view of the switch will correspond to that shown in Detail 1B.



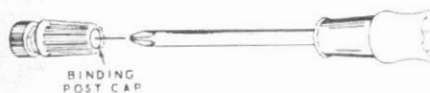
Detail 1A

Strip 1/4" of insulation from each end of the hookup wire to be connected between the following lugs. See Pictorial 1 for proper wire positioning.

<u>FROM LUG</u>	<u>TO LUG</u>
) 6 of switch 10 K (S-2)	Solder lug of binding post B (S-1).
) 7 of switch 100 K (S-1)	7 of switch 10 K (S-1).
) 7 of switch 100 (S-1)	6 of switch 100 K (S-2).
) 6 of switch 100 (S-2)	7 of switch 10 (S-1).
) 6 of switch 10 (S-2)	7 of switch 1 (S-1).
) 6 of switch 1 (S-2)	7 of switch 1 K (S-1).
) 6 of switch 1K (S-2)	Solder lug of binding post A (S-1).

This completes the wiring. Check all the resistors and other wiring for proper solder connections. Make sure each resistor and its lead does not touch the adjacent resistor and its lead.

Detail 1D shows how to keep the binding post caps from falling off. This is done by slightly spreading the open end of the binding posts with a phillips screwdriver after the binding post caps have been screwed on. Tap the screwdriver lightly.



Detail 1D

INITIAL OPERATION CHECK

If an ohmmeter is handy, the range switch contacts and the wiring may be checked for proper operation. If you do not have an ohmmeter, proceed to the Final Assembly section. Connect the ohmmeter leads to the red and black binding posts of the IN-3117. Set all the range switches in the 0 position. The ohmmeter should read 0. Keep in mind that the measured resistances will vary, depending on the accuracy of your ohmmeter. Now advance the X1 range switch. With the ohmmeter set properly, it should

increase by 1 Ω increments. Advance and check the X10 range switch for 10 Ω increments. All of the switches should be checked in this manner. If a short circuit, open circuit, or improper incremental resistance increase is detected as the switches are rotated, it can be remedied very quickly by checking the associated switch circuitry. If necessary, refer to the In Case Of Difficulty section. If operation is as described, you may assume that it is properly constructed.

FINAL ASSEMBLY

- () Place a speednut on each of the small L brackets located on each side of the front panel. The flat side of each speednut should face toward the outside of the panel.
- () Install a rubber foot at each corner on the bottom of the cabinet shell. First remove the protective backing, then press the foot firmly into place.
- () Carefully peel away the backing paper from the blue and white identification label. Then press the label onto the inside of the cabinet. Be sure to refer to the numbers on this label in any communications you have with the Heath Company about this kit.
- () Mount the cabinet shell to the front panel, using 6-32 screws on the L brackets and four #6 sheet metal screws on the bottom of the front panel.

CUSTOMER SERVICE

REPLACEMENT PARTS

Please provide complete information when you request replacements from either the factory or Heath Electronic Centers. Be certain to include the **HEATH** part number exactly as it appears in the parts list.

Replacement parts are maintained specifically to repair Heath products. Parts sales for other reasons will be declined.

ORDERING FROM THE FACTORY

Print all of the information requested on the parts order form furnished with this product and mail it to Heath. For telephone orders (parts only) dial 616 982-3571. If you are unable to locate an order form, write us a letter or card including:

- Heath part number.
- Model number.
- Date of purchase.
- Location purchased or invoice number.
- Nature of the defect.
- Your payment or authorization for COD shipment of parts not covered by warranty.

Mail letters to: Heath Company
Benton Harbor
MI 49022
Attn: Parts Replacement

Retain original parts until you receive replacements. Parts that should be returned to the factory will be listed on your packing slip.

OBTAINING REPLACEMENTS FROM HEATH ELECTRONIC CENTERS

For your convenience, "over the counter" replacement parts are available from the Heath Electronic Centers listed in your catalog. Be sure to bring in the original part and purchase invoice when you request a warranty replacement from a Heath Electronic Center.

TECHNICAL CONSULTATION

Need help with your kit? — Self-Service? — Construction? — Operation? — Call or write for assistance, you'll find our Technical Consultants eager to help with just about any technical problem except "customizing" for unique applications.

The effectiveness of our consultation service depends on the information you furnish. Be sure to tell us:

- The Model number and Series number from the blue and white label.
- The date of purchase.
- An exact description of the difficulty.
- Everything you have done in attempting to correct the problem.

Also include switch positions, connections to other units, operating procedures, voltage readings, and any other information you think might be helpful.

Please do not send parts for testing, unless this is specifically requested by our Consultants.

Hints: Telephone traffic is lightest at midweek — please be sure your Manual and notes are on hand when you call.

Heathkit Electronic Center facilities are also available for telephone or "walk-in" personal assistance.

REPAIR SERVICE

Service facilities are available, if they are needed, to repair your completed kit. (Kits that have been modified, soldered with paste flux or acid core solder, cannot be accepted for repair.)

If it is convenient, personally deliver your kit to a **Heathkit Electronic Center**. For warranty parts replacement, supply a copy of the invoice or sales slip.

If you prefer to ship your kit to the factory, attach a letter containing the following information directly to the unit:

- Your name and address.
- Date of purchase and invoice number.
- Copies of all correspondence relevant to the service of the kit.
- A brief description of the difficulty.
- Authorization to return your kit COD for the service and shipping charges. (This will reduce the possibility of delay.)

Check the equipment to see that all screws and parts are secured. (Do not include any wooden cabinets or color television picture tubes, as these are easily damaged in shipment. Do not include the kit Manual.) Place the equipment in a strong carton with at least **THREE INCHES** of resilient packing material (shredded paper, excelsior, etc.) on all sides. Use additional packing material where there are protrusions (control sticks, large knobs, etc.). If the unit weighs over 15 lbs., place this carton in another one with 3/4" of packing material between the two.

Seal the carton with reinforced gummed tape, tie it with a strong cord, and mark it "Fragile" on at least two sides. Remember, the carrier will not accept liability for shipping damage if the unit is insufficiently packed. Ship by prepaid express, United Parcel Service, or insured Parcel Post to:

Heath Company
Service Department
Benton Harbor, Michigan 49022