MODEL

HM-2103 RF Load Wattmeter

HEATHKIT®

ASSEMBLY MANUAL

HEATHKIT®

PRICE $2.00

595-1518

Dear Customer:

The Heathkit electronic product you have purchased is one of the best performing electronic products in the world.

Here's how we aim to keep it that way:

Your Heathkit Warranty

During your first 90 days of ownership, any parts which we find are defective, either in materials or workmanship, will be replaced or repaired free of charge. And we'll pay shipping charges to get those parts to you — anywhere in the world.

If we determine a defective part has caused your Heathkit electronic product to need other repair, through no fault of yours, we will service it free — at the factory, at any retail Heathkit Electronic Center, or through any of our authorized overseas distributors.

This protection is exclusively yours as the original purchaser. Naturally, it doesn't cover damage by use of acid-core solder, incorrect assembly, misuse, fire, flood or acts of God. But, it does insure the performance of your Heathkit electronic product anywhere in the world — for most any other reason.

After-Warranty Service

What happens after warranty? We won't let you down. If your Heathkit electronic product needs repairs or you need a part, just write or call the factory, your nearest retail Heathkit Electronic Center, or any Heath authorized overseas distributor. We maintain an inventory of replacement parts for each Heathkit model at most locations — even for many models that no longer appear in our current product line-up. Repair service and technical consultation are available through all locations.

We hope you'll never need our repair or replacement services, but it's nice to know you're protected anyway — and that cheerful help is nearby.

Sincerely,

HEATH COMPANY
Benton Harbor, Michigan 49022

Assembly and Operation of the

HEATHKIT®

RF LOAD WATTMETER

MODEL HM-2103

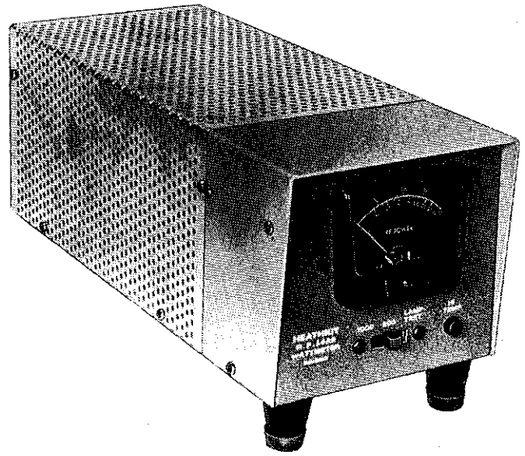


TABLE OF CONTENTS

HEATH COMPANY
BENTON HARBOR, MICHIGAN 49022

SPECIFICATIONS

Frequency Range	1.8 to 30 MHz.
Wattmeter Range	0-200 and 0-1000 watts.
Wattmeter Accuracy	±10% of full-scale reading.
Power Rating	175 watts continuous, 1000 watts maximum, see the derating curve on Page 19.
Overload Indication	Thermal switch activated (requires 9 volt battery, NEDA #1604).
SWR	Less than 1.2:1.
Load Type	Noninductive, solid carbon.
Load Impedance	50 ohms nominal.
Connectors	UHF type SO-239.
Dimensions	5-3/8" wide x 6" high x 13-3/4" deep.
Net Weight	4-1/2 lbs.

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.

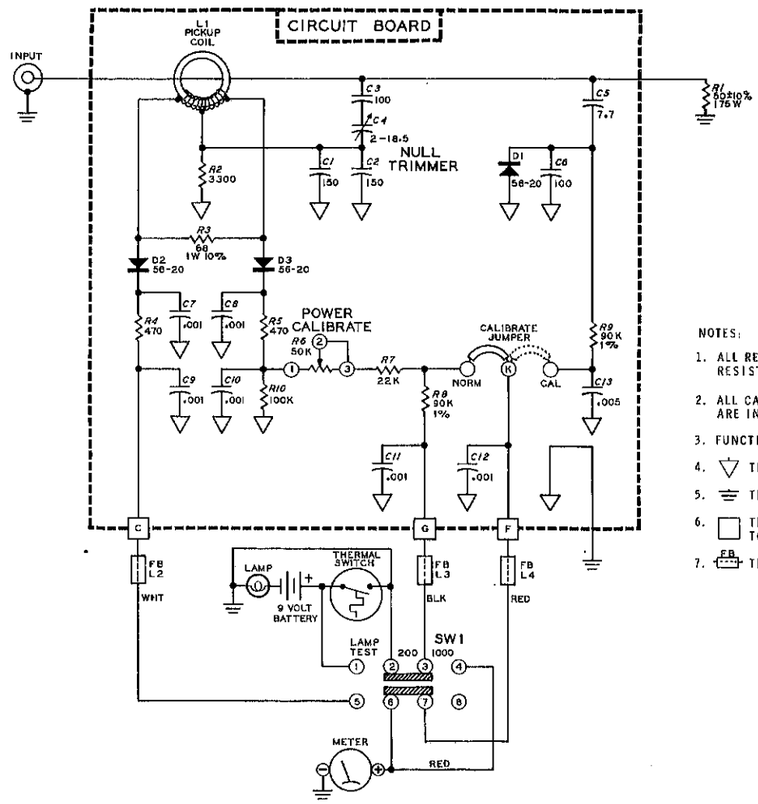
CIRCUIT DESCRIPTION

Refer to the Schematic while you read this Circuit Description.

Toroid coil L1 is a current pickup element. When power is transmitted into the load resistor, R1, an AC field is present around the wire that passes through the eyelet in coil L1. The AC field induces current into L1 and produces a voltage that is rectified by diode D3. Then it is adjusted by resistor R6 to a calibrated level, and applied to the meter to indicate the amount of power present in the load. Capacitor C8 and resistor R5 filter and decouple the voltage. Resistors R7 and R8 form a voltage divider for the two power ranges. Resistor R3 forms a load across L1 to reduce the Q of the coil circuit for a broader frequency range.

Another winding on coil L1 picks up reverse current. This is effectively an SWR bridge and is used only to null out the capacitive effects in coil L1 through capacitors C1, C2, C3, and C4.

Capacitors C5 and C6, diode D1, and resistor R9 form a frequency sensitive RF voltmeter. At 40 meters, it accurately indicates actual power on the meter. Ferrite beads L2, L3, and L4 prevent RF from traveling through the cable into the meter.



SCHEMATIC OF THE
HEATHKIT®
RF LOAD WATTMETER
MODEL HM-2103

NOTES:

1. ALL RESISTORS ARE 1/2 WATT 5% UNLESS OTHERWISE NOTED. RESISTOR VALUES ARE IN OHMS (k=1000).
2. ALL CAPACITORS LESS THAN 1 ARE IN μF; GREATER THAN 1 ARE IN pF.
3. FUNCTION SWITCH SHOWN IN 200 POSITION.
4. ▽ THIS SYMBOL INDICATES CIRCUIT BOARD COMMON.
5. ⏚ THIS SYMBOL INDICATES CHASSIS GROUND.
6. □ THIS SYMBOL INDICATES AN EXTERNAL CONNECTION TO THE CIRCUIT BOARD.
7. FB ⊟ THIS SYMBOL INDICATES A FERRITE BEAD.

CIRCUIT BOARD X-RAY VIEW

NOTE: To identify a part shown in this View, so you can order a replacement, proceed in either of the following ways:

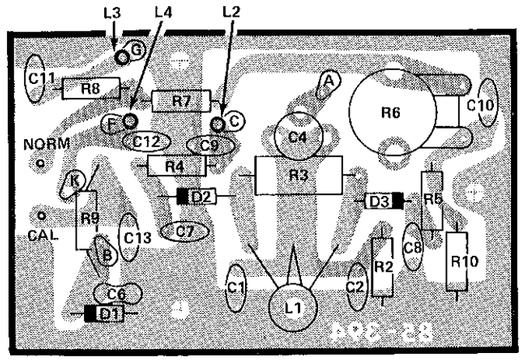
1. A. Refer to the place where the part is installed in the Step-by-Step instructions and note the "Description" of the part (for example: 22 kΩ, .005 μF, or 1N295).

   B. Look up this Description in the "Parts List."

2. A. Note the identification number of the part (R-number, C-number, etc.).

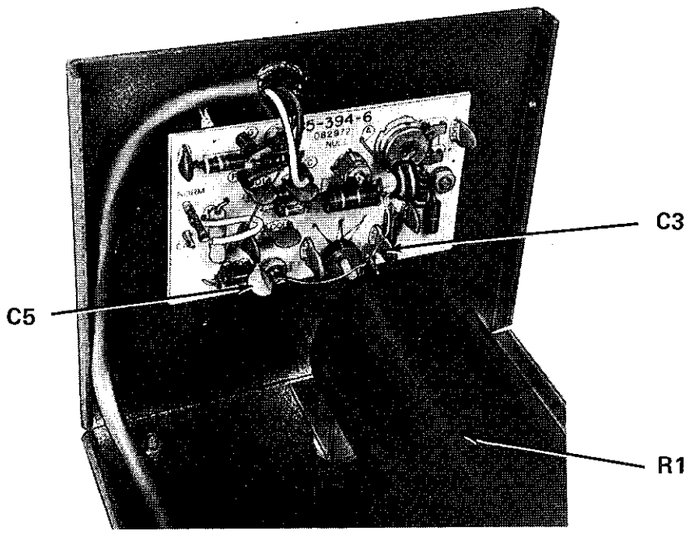
   B. Locate the same identification number (next to the part) on the Schematic. The "Description" of the part will also appear near the part.

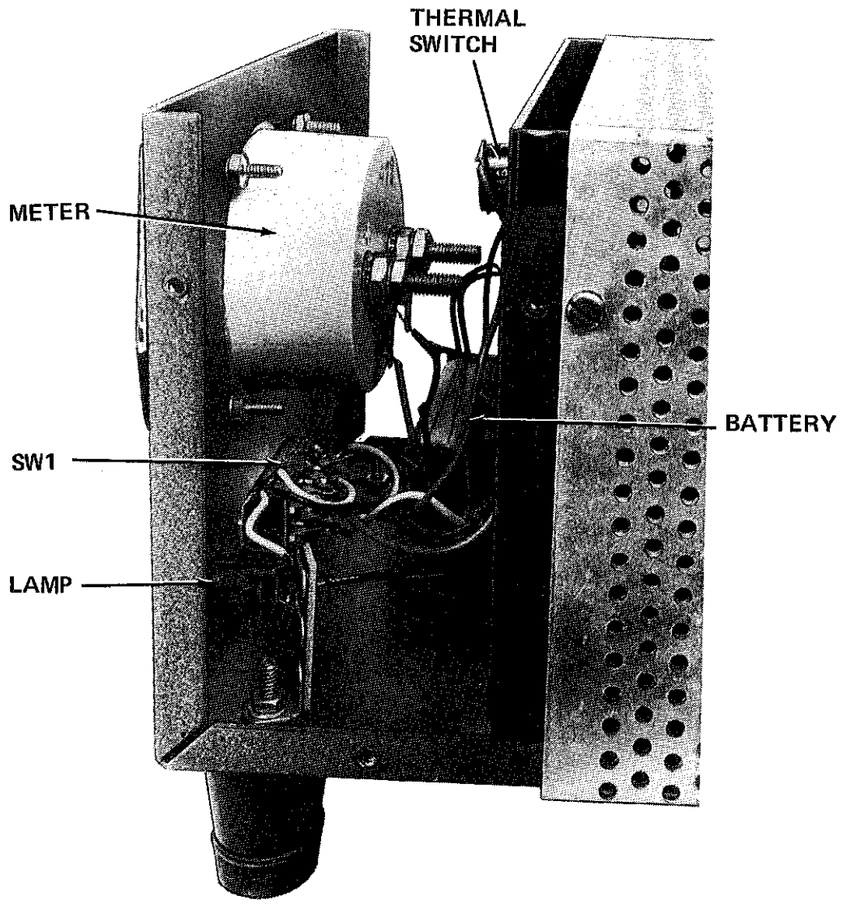
   C. Look up this Description in the "Parts List."



VIEW FROM COMPONENT SIDE

CABINET PHOTOGRAPH





HEATH

Schlumberger

HEATH COMPANY • BENTON HARBOR, MICHIGAN

THE WORLD'S FINEST ELECTRONIC EQUIPMENT IN KIT FORM

LITHO IN U.S.A.