PRICE $1.00

Assembling and Using Your...

Heathkit

CAPACI-TESTER

MODEL CT-1

HEATH COMPANY

A Subsidiary of Daystrom Inc.

BENTON HARBOR, MICHIGAN

595-161

ASSEMBLY AND OPERATION OF THE HEATHKIT CAPACI-TESTER

MODEL CT-1

SPECIFICATIONS

Range:

Open Test:..... 50 $\mu\mu$fd to infinity.
Shunted by more than:
2 KΩ at 50 $\mu\mu$fd,
400 Ω at 100 $\mu\mu$fd,
30 Ω at 350 $\mu\mu$fd or more.

Short Test:..... Up to 20 μfd shunted by at least 10Ω. (All types of capacitors except electrolytic.)

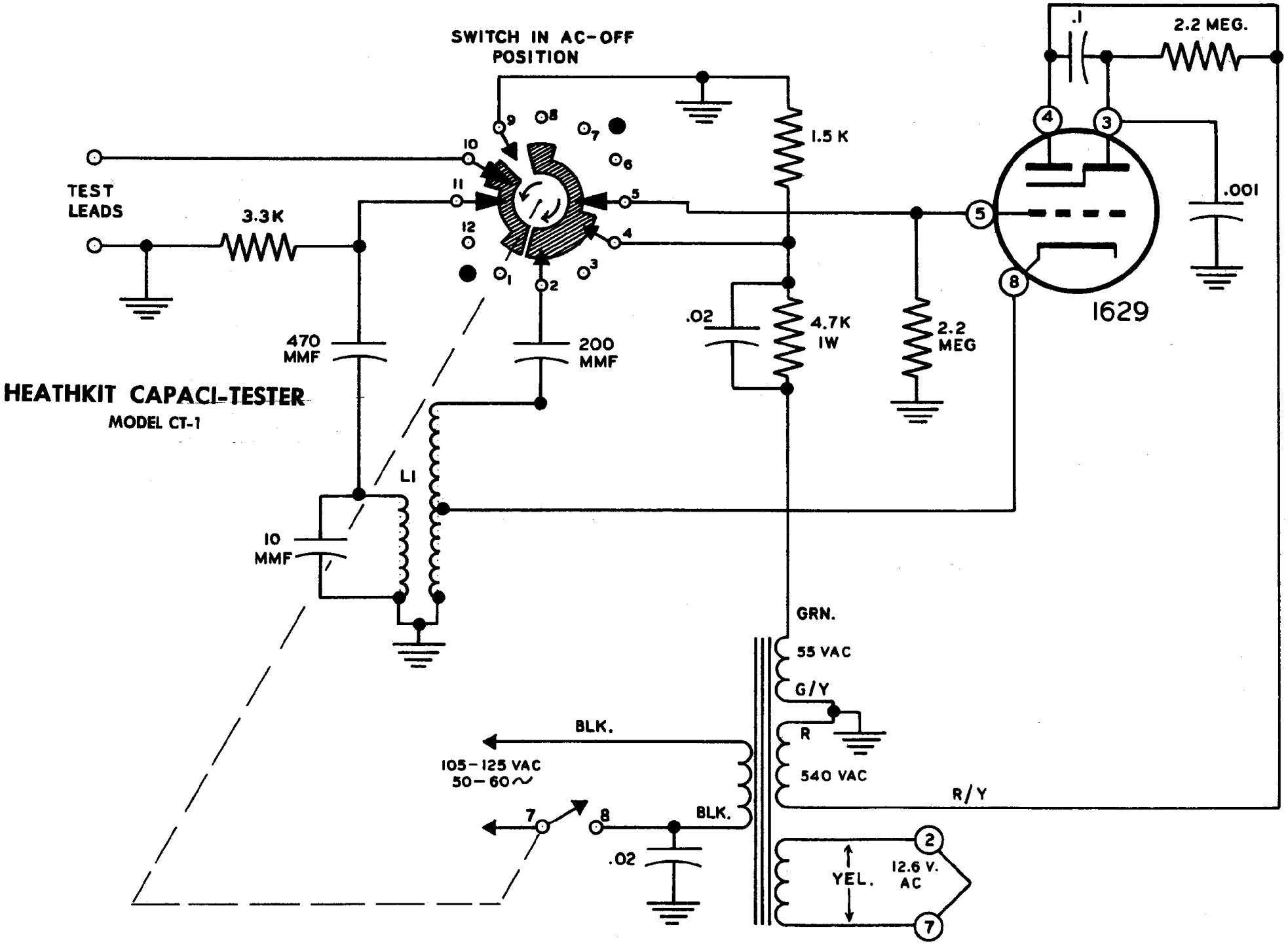
Test Frequencies:

Short Test:..... 60 cycles.
Open Test:..... 19 megacycles.

Power Requirements:..... 105-125 volts, 50-60 cycles AC, 5 watts.

Cabinet Size:..... 7 3/8" high, 4 11/16" wide by 4 1/8" deep.

Shipping Weight:..... 3 1/2 lbs.


SWITCH IN AC-OFF POSITION
TEST LEADS
3.3K
470 MMF
200 MMF
10 MMF
L1
1.5 K
.02
4.7K 1W
2.2 MEG
.1
2.2 MEG.
.001
1629
HEATHKIT CAPACI-TESTER
MODEL CT-1
GRN.
55 VAC
G/Y
R
540 VAC
R/Y
BLK.
105-125 VAC 50-60~
BLK.
.02
YEL.
12.6 V. AC

INTRODUCTION

The Heathkit model CT-1 Capacitor Tester is an instrument which will disclose open or shorted capacitors without removing them from the circuit. It is an extremely simple instrument, both to construct and operate, but yet an instrument which should give many years of good service if the assembly instructions are followed carefully. By not trying to "out-do" the manual to come up with an exceptionally "pretty" wiring job, you should be able to plug it in, turn it on, and yell, "Hey Ma, it works!"

An important note should be injected here: Route wiring according to the pictorial diagrams! Due to the high frequencies encountered within the tester, lead length and placement is quite critical, especially around the switch.

Only one tube is used, since it can be made to "double-in-brass". It functions as an oscillator, an indicator, and it is self-rectifying.

A five-position switch is employed, which controls the power to the instrument, selects the test being made (i.e., OPEN or SHORT), and also provides a check on the proper operation of the tester continuously. A further explanation of the switch position functions will be found in the "OPERATING" section of the manual.

CIRCUIT DESCRIPTION

OPEN TEST: The triode section of the electron ray indicator tube, or "Magic Eye", is employed as a conventional Hartley oscillator, but here convention ceases. Reference to the schematic diagram will reveal a "secondary" winding coupled to the oscillator coil, with the oscillator tuned to about 19 megacycles. Now here's the catch! Coupling is "tight" enough to cause the oscillator to quit oscillating! In this respect it can be compared to a Grid Dip Meter. As coupling is increased, the absorbtive action of the coupled circuit sucks energy out of the oscillator coil, lowering the strength of the oscillation to the point where the oscillator quits altogether. Had enough oscillators for a while? Then let's proceed.

With no oscillation present, no bias is developed across the grid leak, resulting in maximum current flow through the tube. Under these conditions, the eye is open to its widest angle. When a capacitor which is not open (i.e., good or shorted) is connected across the secondary, it becomes de-tuned sufficiently to allow the circuit to oscillate. Under these circumstances, bias is developed which limits the current flow to a relatively low value, causing the eye to close. In other words, if the capacitor has continuity, the eye closes. Simple, eh?

SHORT TEST: A biasing voltage, obtained from the power transformer, is fed through a current limiting network to the grid of the tube. The test leads are connected between grid and ground. A shorted capacitor will short out this bias voltage, opening the eye. One which is not shorted has no effect, unless its reactance is extremely low. However, a reference is provided to determine the effect of a shorted capacitor, and unless the capacitor has a reactance of less than 10 Ω at a sixty-cycle frequency, the check is accurate. A further description of this reference can be found in the "OPERATING" section.

POWER SUPPLY: The power supply in this instrument consists of a power transformer only. No rectifier is necessary, since the "eye" tube is self-rectifying! When the potential on the plate is positive in respect to the cathode, current flows. When the voltage on the plate swings negative on the other half of the cycle, no current flows, and the tube just "coasts". Since AC is used on the plate and grid, proper phasing of the transformer windings is necessary.

ABOUT THE MANUAL

With the exception of the circuit description, this manual was written for a definitely non-technical minded individual. To you with a technical background, it may seem rather elementary to have to follow a step-by-step procedure such as this manual incorporates. However, experience with all types of instruction methods has shown the method used here to be the most foolproof for both amateur and professional builders. The combination of pictures, diagrams and worded