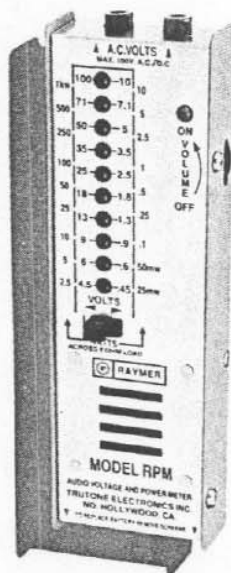




Product Data Model RPM



Audio Voltage

Power Meter

MODEL RPM AUDIO VOLTAGE AND POWER METER. This portable hand-held test instrument visually indicates the voltage present across 25 volt and 70 volt speaker lines or the wattage applied to speaker voice coils by means of ten light emitting diodes calibrated in 3db increments. A two-position range switch permits instantaneous reading of AC voltages from .4 volts to 100 volts without the error caused by the ballistics of a meter movement. Corresponding scales on the front panel indicate direct wattage readings from 25 milliwatts to 1000 watts when measuring across the 8 ohm output of an amplifier or an 8 ohm speaker load.

A built-in amplifier and speaker with volume control is provided to audibly monitor the signal under test. This amplifier automatically shuts off when the battery voltage drops below 6½ volts in order to conserve power and keep the LED indicators operating accurately. A visual indication is provided for end of usable battery life.

Powered by a standard 9 volt battery and weighing less than a pound, this unit is a valuable tool for the service man or installer because of its capability of being operated in areas where conventional instrumentation would be limited. Applications for the Model RPM include dynamic measurement of the power at each speaker of an installation and a relative indication of the total load on an amplifier output.

Housed in a sturdy metal case with a baked enamel finish, this unit is supplied ready-to-operate with 9 volt battery, a handy belt clip and a pair of test leads.

Specifications. Voltage Range: 10V Full Scale: .45V to 10V, 100V Full Scale: 4.5V to 100V. **Input Impedance:** 10V Range 33K Ohm, 100V Range 330K Ohm. **Accuracy:** ± 1.5db. **Frequency Response:** 50Hz to 500KHz. **Size:** 1" x 2¼" x 7". **Shipping Weight:** 3 lbs.

MANUFACTURED IN THE USA BY



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OPERATING PROCEDURE

1. Plug the test leads into the red and black jacks at the top end of the unit. Take care to match red and black colors.
2. Turn unit on by rolling thumb-wheel on the right hand side of the case in the direction indicated by the arrow on the front panel. The green LED indicates that the unit is on.
3. Connect the test leads to the speaker line, terminals or audio circuit to be measured.
If the circuit is referenced to ground, the black test lead must be connected to the ground side to prevent erroneous readings.
4. Select the switch position on the front panel that will give a visual read-out on the LED display. If the input voltage is greater than the full scale value of the selected range, the top LED will stay lit continuously.
5. Read the voltage adjacent to the highest LED illuminated. Use the scale on the left or right as determined by the position of the selector switch.
When reading the wattage across an 8 ohm load, use the outer scale on the side as indicated by the position of the switch.
6. To audibly monitor the signal being measured, roll the thumb-wheel in the direction indicated by the arrow until the signal is heard from the internal loud speaker.
7. When not in use, turn the unit off by rolling the thumb-wheel in a direction opposite to the arrow. The On/Off switch will physically detent and turn off the green LED.

BATTERY

The RPM operates from one standard 9 volt transistor radio battery, Eveready No. 216 or equivalent. To replace this battery, remove the two screws as indicated by the two arrows at the bottom edge of the front panel. The battery is then accessible behind the small bottom panel. Remove the battery when storing for long period of time to prevent damage from corrosion.

Battery life is dependent on operating conditions. Please note that loud volume operation of the monitor speaker will greatly reduce battery life. ALWAYS TURN UNIT OFF WHEN NOT IN USE. Low battery voltage is indicated by a clicking or buzz in the monitor speaker as the amplifier shuts itself off to conserve power. By reducing the monitor volume, the LED indicators will continue operating accurately until the end-of-battery life as indicated in the following test.

END OF BATTERY LIFE TEST

1. Turn unit ON. Green LED should light.
2. Move selector switch carefully to center position.
3. If top LED only lights, the LED indicators are still accurate even though battery voltage may be too low for amplifier operation.
4. If top two LED's light, battery is too low for accurate readings and should be replaced.

OPERATING NOTES

In order to properly interpret the readings that you observe with the Model RPM, keep in mind the fact that each step of the LED indicators represents a 3db change. This is a voltage ratio of 1.4:1 or a power ratio of 2:1.

Under normal operating conditions the full rated voltage may not appear across a 25 or 70 volt line. As an example, if the voltage across a 70 volt line reads 35 volts, then by counting down two steps from the 70 volt to the 35 volt LED's as 3db each, it indicates that the line is operating 6db below full power. This 6db is referred to as "headroom." The same db value of headroom appears at the secondary of any line matching transformer connected across that line. In this example the voltage at the 8 ohm secondary of a line matching transformer connected for 10 watts would be -6db or 2 steps down from the 10 watt rating. The wattage reading at these terminals would only be 2.5 watts instead of the 10 watts that you would expect.

Voltage readings below the rated line value do not always represent headroom. If the sound becomes distorted or the circuit breaker on your Raymer amplifier trips even though the full voltage is not measured across the speaker line, then that speaker line is mismatched and is overloading the output of the amplifier. This could indicate that a higher wattage amplifier is required, or that the speaker line is miswired or has a short circuit condition. To accurately determine the impedance of a speaker line, use the Raymer Model LWT test instrument.

A voltage reading 3db higher than the rated speaker line value indicates that the line is substantially under-loaded. When there is a steady voltage reading across a speaker line, although no audible sound is present, it is an indication that the amplifier is oscillating at a very high frequency. This is usually caused by capacitive coupling of the amplifier output back into one of the inputs due to poor shielding of that input wiring. Ground loops common to both output and input as well as inductive coupling between long lines can also cause this oscillation.

The wattage values on the Model RPM are valid only when reading across an 8 ohm load. When measuring across a 4 ohm load, double the value shown on the scale to obtain the correct reading. In the case of a 16 ohm load, the value shown on the scale should be divided by two.

The RPM may also be used as a signal tracer for audio signals as low as 10mv. DO NOT USE THIS UNIT TO SIGNAL TRACE VACUUM TUBE CIRCUITS OR ANY CIRCUITS WHERE THERE IS MORE THAN 100 VOLTS AC OR DC PRESENT.

**DAMAGE TO THE UNIT CAUSED BY BATTERY LEAKAGE
IS NOT COVERED BY WARRANTY.**

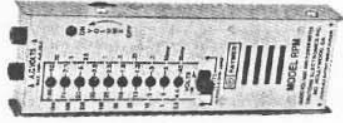
This unit has been very carefully inspected and is warranted to be free from defects in material and workmanship under normal use and service for a period of one year from date of sale to the original purchaser. This Warranty does not extend to any unit which has been subject to abuse, misuse, neglect, accident, improper installation, or alterations. The obligation of Trutone Electronics under this Warranty is limited to the repair of any defect in material or workmanship and/or the replacement of any defective part, provided the unit is returned to Trutone Electronics Inc. transportation paid within the year. Batteries are not covered under this warranty.

It is recommended that any unit on which service is required be processed through your distributor or installation company wherever possible.

This Warranty is expressly in lieu of all other Warranties, expressed or implied, and of all other obligations or liabilities on our part. We neither assume nor authorize any other person to assume for us any other liability in connection with the products manufactured by Trutone Electronics, Inc.

RAYMER

OPERATING INSTRUCTIONS



MODEL RPM
AUDIO VOLTAGE
AND
POWER METER

DESCRIPTION

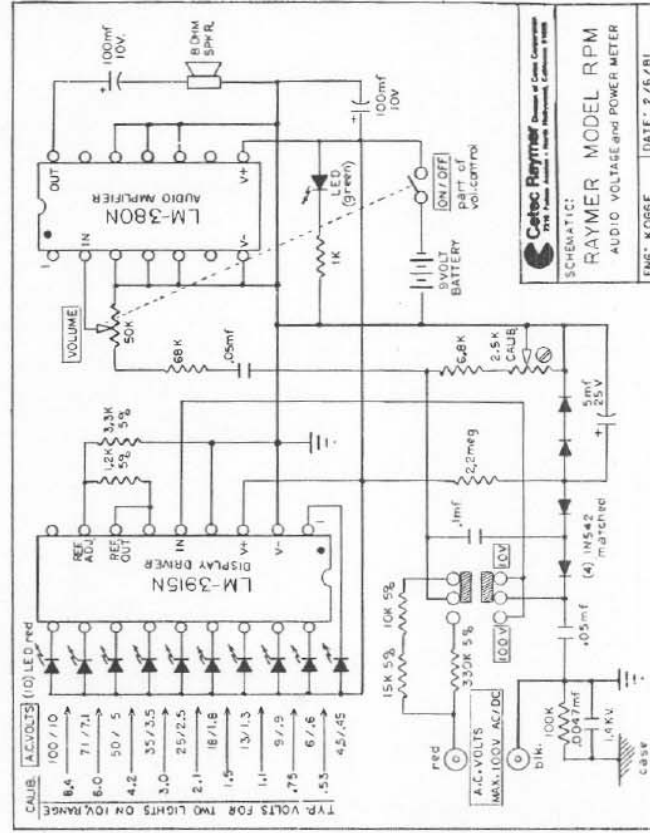
The Raymer Model RPM is a self-contained battery powered test instrument which visually indicates the instantaneous value of audio voltages from .45 volts to 100 volts by means of ten light emitting diodes calibrated in 3db increments. Voltage readings are divided into two ranges: .45 to 10 volts and 4.5 to 100 volts as determined by a two-position selector switch on the front panel. Corresponding scales on the front panel permit direct readings from 25 milliwatts to 1000 watts when measuring across the 8 ohm output of an amplifier or an 8 ohm speaker load.

A built-in amplifier with speaker and volume control is provided to audibly monitor the signal under test. The amplifier automatically shuts off when the battery voltage drops below 6½ volts in order to conserve power and keep the LED indicators in calibration. To assure accurate readings, a visual indication is provided to determine end of usable battery life.

Housed in a sturdy metal case with baked enamel finish, the RPM is supplied ready-to-operate with a standard 9 volt battery, a belt clip and one pair of test leads.

UNPACKING

The unit is to be removed carefully from the carton and inspected for any possible damage in transit. If there is any evidence of damage which might have occurred in shipment, immediately notify your supplier, or the transportation company which delivered it. Claims for damage sustained in transit must be made to the carrier. Save all packing material for inspection by the claim agent—who will furnish you with the proper forms and will also give you the necessary instructions for filing a claim.



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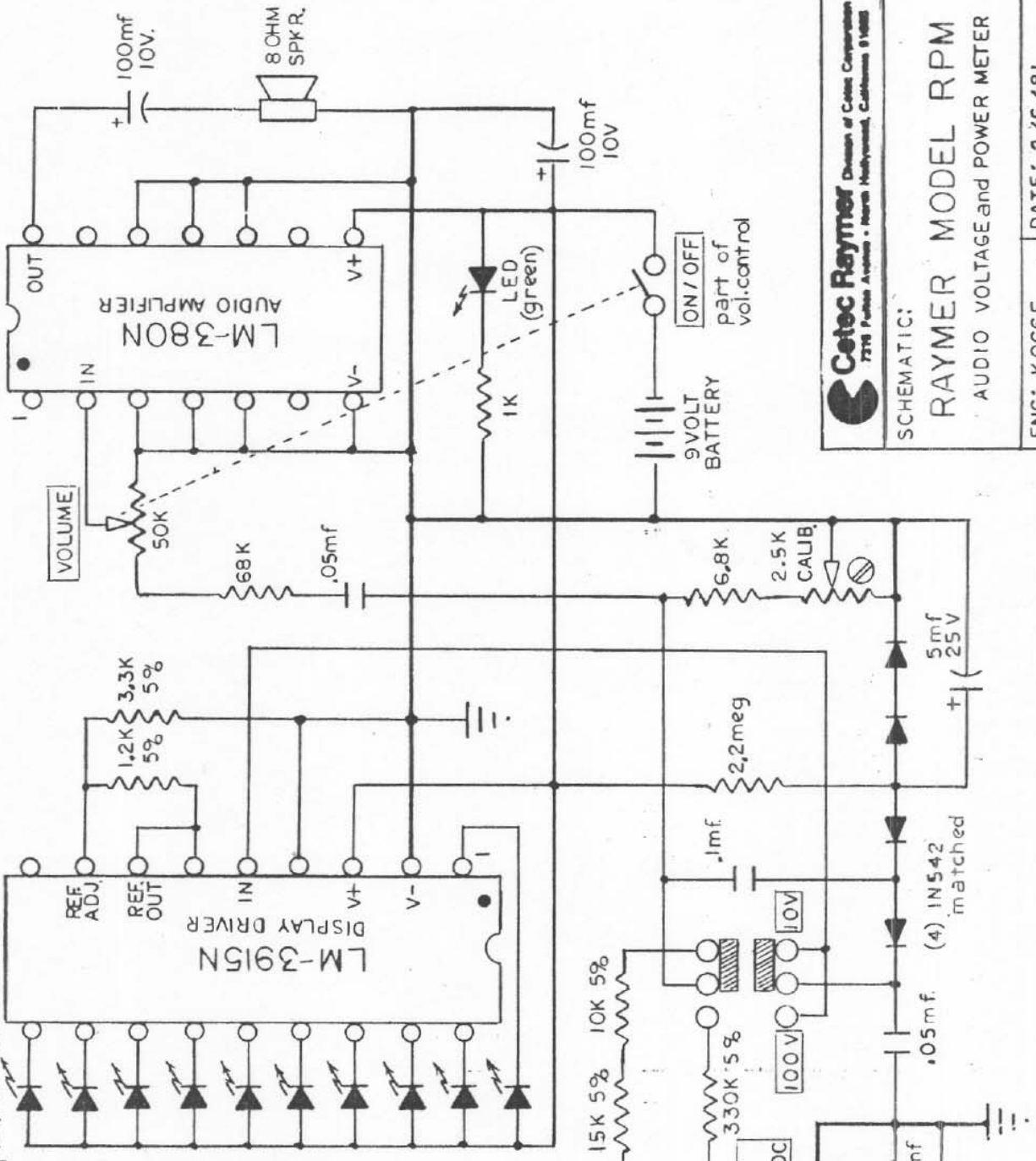
Cetec Raymer
ELECTRONICS, INC.

Cetec Raymar Commercial Sound Products
Division of Cetec Corporation
7315 Fulton Ave., No. Hollywood, CA 91605 • (213) 875-0423 / 764-3434

CALIB. A.C. VOLTS (10) LED red

TYP. VOLTS FOR TWO LIGHTS ON 10V RANGE

8.4	100 / 10
6.0	71 / 7.1
4.2	50 / 5
3.0	35 / 3.5
2.1	25 / 2.5
1.5	18 / 1.8
1.1	13 / 1.3
.75	9 / .9
.53	6 / .6
	4.5 / .45



Cetec Raymer Division of Cetec Corporation
1718 Pabian Avenue • Norwalk, California 90651

SCHEMATIC:

RAYMER MODEL RPM
AUDIO VOLTAGE and POWER METER

ENG: KOGGE DATE: 2/6/81