

OPERATING HANDBOOK

LM-13

SIGNAL LEVEL METER



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WARRANTY

All Wavetek/Mid State instruments are warranted against defects in material and workmanship for a period of six months on field equipment or one year on laboratory equipment after date of manufacture. Wavetek/Mid State agrees to repair or replace any assembly or component (except batteries) found to be defective under normal use during this period. Wavetek/Mid State's obligation under this warranty is limited solely to repairing any such instrument which, in Wavetek/Mid State's sole opinion, proves to be defective within the scope of the warranty when returned to the factory or to an authorized service center. Transportation to the factory or service center is to be prepaid by purchaser. Shipment should not be made without prior authorization by Wavetek/Mid State.

This warranty does not apply to any products repaired or altered by persons not authorized by Wavetek/Mid State, or not in accordance with instructions furnished by Wavetek/Mid State. If the instrument is defective as a result of misuse, improper repair, or abnormal conditions or operations, repairs will be billed at cost.

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Any recommendations made by Wavetek/Mid State for use of its products are based upon tests believed to be reliable, but Wavetek/Mid State makes no warranty of the results to be obtained. This warranty is in lieu of all other warranties, expressed or implied, and no representative or person is authorized to represent or assume for Wavetek/Mid State any liability in connection with the sale of our products other than set forth herein.

OPERATION

MEASURING SIGNAL LEVELS

The LM-13 will measure signal levels of from -30 dBmV to $+30$ dBmV. To make a measurement, connect the system signal to the RF IN connector, select the channel to be measured, and peak the meter with the FINE TUNE control. When the 20 dB attenuator button is depressed, read the top scale (-10 dBmV to $+30$ dBmV). With the 20 dB attenuator button out, read the bottom scale (-30 dBmV to $+10$ dBmV). Indicator marks are at 2 dB intervals across the meter face.

AUTO OFF

The LM-13 is equipped with a circuit to automatically turn the instrument off when the meter has not been used for two minutes. This circuit senses meter deflection, so shut-down during measurement will not occur. After the instrument turns itself off, it may be re-energized by simply pushing the ON button in, out, and back in.

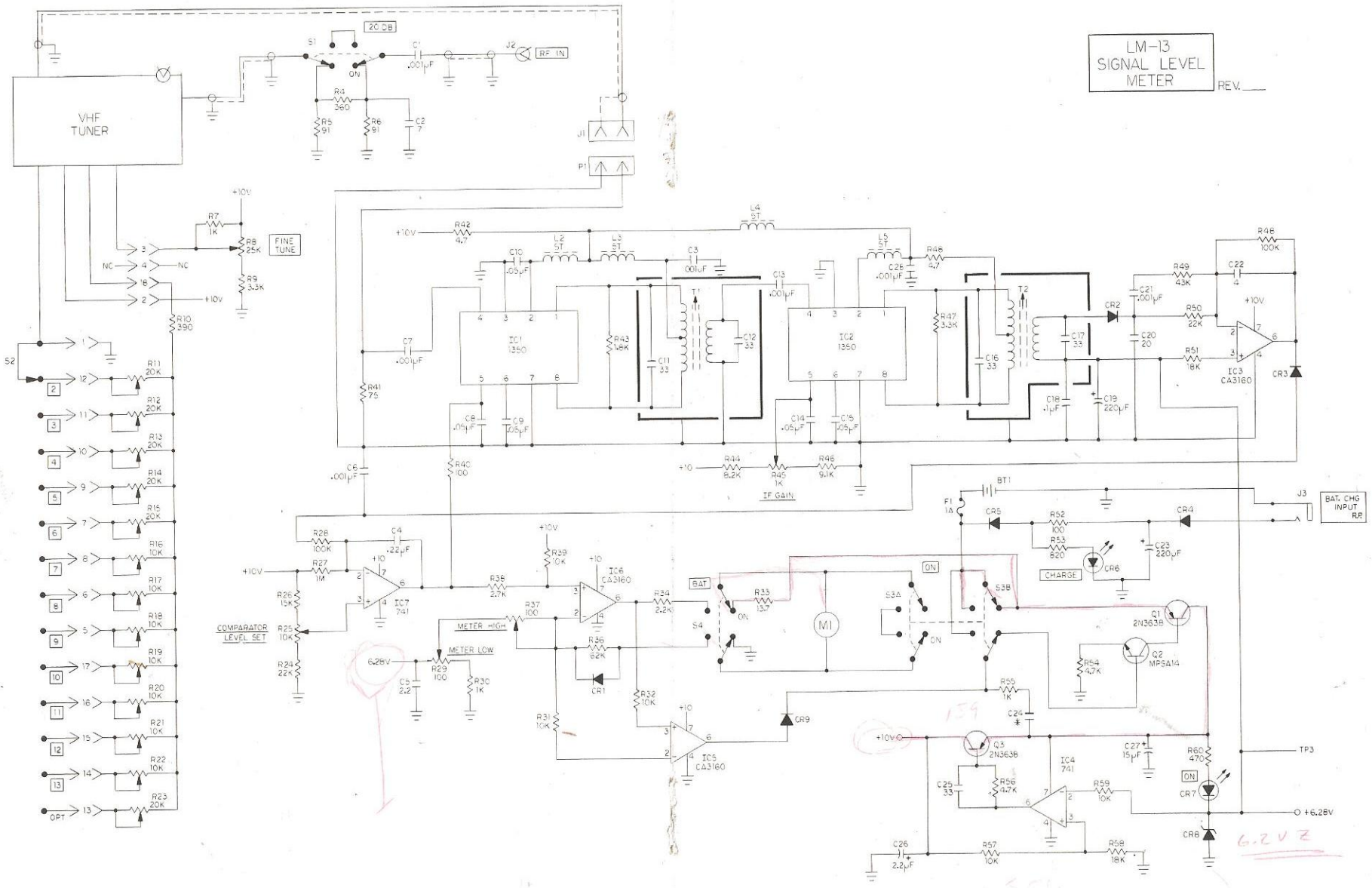
BATTERIES AND CHARGER

The LM-13 is provided with 10 rechargeable AA Nicad batteries as a power source. The charger supplied provides 16 VAC to the rear-panel charging connector. The internal charging circuit then rectifies this AC input to recharge the Nicad batteries.

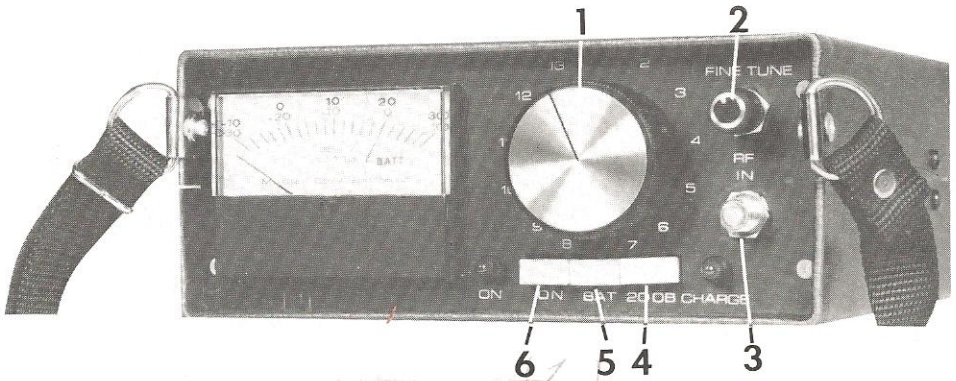
OPTIONS

- KS This option provides a genuine leather protective case with a cover flap to protect the meter face.
- 13 A 13th channel or pilot may be ordered at any frequency from 55 MHz to 280 MHz.

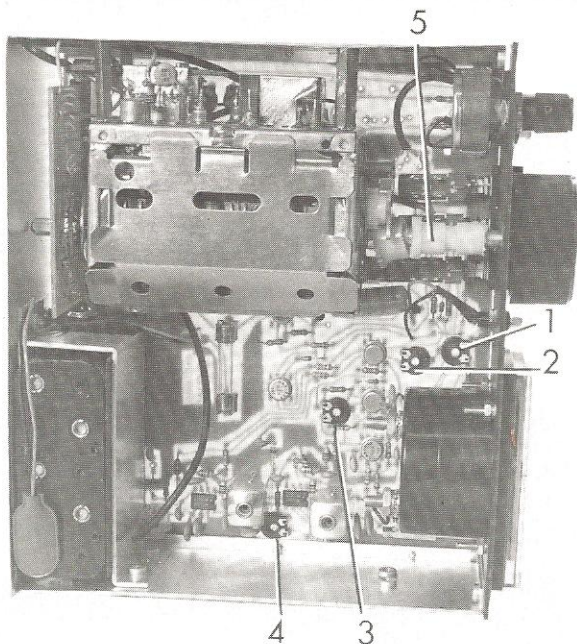
LM-13
SIGNAL LEVEL
METER REV. _____



FRONT PANEL CONTROLS



1. Selector Selects channel to be measured.
2. Fine Tune Peaking control for channel.
3. RF IN Input connector.
4. 20 dB Input attenuator, depress for 20 db attenuation
5. BAT Battery Test
6. ON Power on - off.

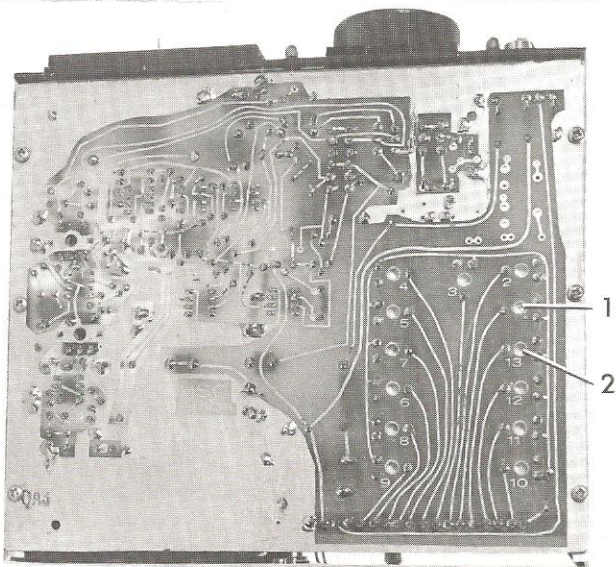


DESCRIPTION OF INTERNAL CONTROLS

1. Meter Circuit low end adjust.
2. Meter Circuit high end adjust.
3. Comparator level set, factory adjust only.
4. IF GAIN:
5. Frequency Adjust.

Bottom Side

1. 13th channel adjust.
2. Channel 13 adjust. Other channels as marked on board.



CALIBRATION

FREQUENCY

When tuned to a standard TV channel, the fine tune knob should be in about the center of its range. To retune channels for offset carriers or normal recalibration, simply center the fine tune knob and, using internal control No. 5, peak the meter for a maximum reading on the meter face. Repeat this procedure for all channels and or pilot carriers.

AMPLITUDE

Before starting calibration, make sure the battery is charged. It is possible to calibrate a unit with insufficient battery level, but the power supplies will not regulate and as soon as the batteries are charged or replaced, the LM-13 will require calibration again.

There are two separate calibration circuits in the LM-13. One circuit is for front panel meter calibration and the other for calibrating each individual channel. Prior to performing any calibration, perform a calibration check to determine if only a few channels need to be touched up or if a meter circuit calibration will calibrate all or most channels. This test is easily performed by checking each channel at 0 dBmV. Then take one channel at about 0 dBmV and attenuate 20 dB. The meter should fall 20 dB + 1 dB. If the error is greater than +1 dB the meter circuit should be calibrated. If it is within the +1 dB limit, use the individual channel controls.

Meter Circuit Calibration

1. Connect a calibrator signal to the front panel connector at -20 dBmV and peak fine frequency tuning.
2. Adjust internal control No. 1 on the top of the PCB for a meter reading of -20 dBmV.
3. Set calibrator level at 0 dBmV and adjust internal control No. 2 for a meter reading of 0 dBmV.
4. Repeat the above steps to compensate for the interaction of the adjustment controls.

Channel Calibration

Looking at the photo of the bottom of the LM-13 you will see 13 adjustment controls. Control No. 1 is to set the 13th optional channel. Control No. 2 is for channel 13. The other channels are marked accordingly on the PCB.