

# **OPERATOR'S MANUAL**

**Model 30M8/30M8RM  
30 Band 1/3 Octave RTA**

## **GENERAL:**

The Gold Line 30M8 is a complete 1/3 octave battery operated portable audio spectrum analyzer complete with remote mic and 8 memories. It is also an accurate dB meter and will read Sound Pressure Levels in either "A" or "C" weighting. The Gold Line 30M8RM is a 1/3 octave rack mounted audio spectrum analyzer with performance specifications identical to the 30M8.

**The microphone:** A calibrated microphone is provided with the 30M8. This microphone is internally equalized to be flat  $\pm 1$ dB from 20Hz - 20kHz. It can be attached directly or with a cable. The microphone is calibrated for proper sensitivity and other microphones will give incorrect readings or not work at all.

**Pink Noise:** The 30M8 is often used in conjunction with a pink noise generator such as the Gold Line PN2. Pink noise is a sound that has equal amount of energy per octave of bandwidth. By inputting pink noise to a sound system you are certain that the system is receiving a flat signal source. Pink noise is the basic reference for all measurements and adjustments to a system. Pink noise normally has a flatness of  $\pm 2$ dB with random waves that may be higher or lower. The 30M8RM has a built-in pink noise generator which turns on when the unit is turned on. The rear panel mounted output jack accepts a standard 1/4" phone plug.

## **The Controls:**

**Input sensitivity:** The input sensitivity of the 30M8 can be adjusted over a wide range to match many conditions and sound pressure levels (SPL). The sensitivity is controlled with the INPUT SENSITIVITY switch which provides five 10dB steps from 75dB - 115dB for a 0 reference indication.

**Input Range:** In addition to turning the analyzer on and off, the INPUT RANGE switch can be set for 0dB, the normal operating range or for -20dB which increases the maximum sensitivity setting from 75dB to 55dB. Keep in mind that the displayed SPLs are actually 20dB below the INPUT SENSITIVITY switch setting when the INPUT RANGE is at -20dB.

**Weight curve:** The 30M8 has three frequency response functions selected with the WEIGHT switch. In FLAT, there is no shaping of the response curve. In "C", C type weighting is applied to the response curve and the 25Hz channel is switched to Broadband showing the overall level in dBC. In "A", A type weighting is applied and the 25Hz channel shows the overall level in dBA. "A" weighting is often used when making speech interference measurements and "C" is often used for music and environmental noise measurements.

**Decay time:** The DECAY switch provides three functions; FAST, SLOW and HOLD. In FAST, a response at 0dB will fall to -10dB in 2 seconds at 25Hz and to 0.5 seconds or less at 500Hz and above. In SLOW, the same response will fall 10dB in about 20 seconds at 25Hz and to 6 seconds at 500Hz and above. The response to a sudden increase in level, the attack time, is short in both FAST and SLOW. When monitoring music or speech use FAST to see rapid level changes. When using pink noise use SLOW for a more stable display. HOLD is used to temporarily freeze the display.

## **The Display:**

The display consists of a matrix of 300 LED's: a column for each of 30 filter bands on standard ISO frequencies with 10 LED's in each column with a 2.5dB step between LED's. The scale thresholds are at -15, -12.5, -10, -7.5, -5, -2.5, 0, +2.5, +5, +7.5dB.

## **Line Input:**

The input jack accepts a standard 1/4" phone plug and has an impedance of 10k $\Omega$ . A 0dB indication will be obtained from 0.69 millivolts to 1.10 V rms (-81dBm to +3dBm) depending on the input sensitivity and input range. The microphone is automatically disconnected when a plug is inserted. A handy system check can be made by plugging pink noise into the line jack. Use the SLOW setting and set the sensitivity to center the resulting flat line.

**Power:**

The 30M8 is powered by eight AA alkaline or nicad batteries. An internal switch must be set to select the type when the batteries are installed. **Do not** use carbon-zinc types. At a nominal 12 volts, the current drain is 200 mA with an LED on in each filter band. An external supply such as the Gold Line BE1 battery eliminator can also be used to power the unit via a 3.5mm jack on the side of the case. This will supply the proper voltage at the proper current. Alkaline batteries are disconnected when a battery eliminator is plugged in. Nicads are kept in circuit and can be recharged in the case. Access to the batteries is gained by removing the rear cover plate. Recharging or replacement is indicated when there is a noticeable drop in display brightness. A battery test switch is also provided. When the test light will not light, the batteries must be replaced or recharged. Nicads can be recharged in 8 to 16 hours. The 30M8RM is powered by a 12 volt battery eliminator via a 3.5mm jack on the rear panel. This will supply the proper voltage at the proper current.

**The memories:**

The 30M8 is provided with eight memories. The memories are active until the 30M8 is turned off. You can overwrite memories as often as you wish.

**Mode:** A mode button allows you to select between live real time analysis "RTA" or memory mode.

**Status LED's:** Indicate the current status of the 30M8, "RTA" or memory.

**Store function:** When in the RTA mode, select which memory you wish to store into with the memory switch. Then press STORE to freeze a response into memory. Press mode to return to RTA.

**Recall function:** Push the mode button to change from RTA to MEMORY. Select a memory with the memory switch. Press mode to return to RTA.

**Memory switch:** An eight position switch allows you to select any of eight memories for storage or recall.

**TO ELIMINATE FEEDBACK:**

Gold Line real time audio analyzers are the most effective way to prevent feedback.

1. Feed pink noise into the line input of the system and set the volume for a moderate level from the speakers.
2. Turn up the gain on the main microphone input until feedback starts.
3. With the analyzer, look for one band to be peaking above the others. Increase the sound level if necessary.
4. Adjust the equalizer to put in just enough cut in that band to stop the feedback. Set a parametric equalizer to minimum bandwidth.
5. Continue to increase volume and cut where indicated.
6. When feedback occurs in 3 or more bands the practical limit of feedback control with the minimum effect on the overall sound has been reached.
7. Open other microphones that will be on at the same time and change settings as needed for best performance.
8. As a final adjustment, performers should stand at the microphones in their normal positions, the proximity can cause some changes in feedback modes.

**GENERAL PROCEDURES FOR EQUALIZATION:**

1. Turn off the sound system before making connections, and put all controls to flat. Set volume to zero.
2. Connect the pink noise source to a line level input for one channel only. Turn on the system.
3. Advance to volume to a moderate level loud enough to overcome ambient noise. Do not overdrive.
4. Set the 30M8 to SLOW with low gain and sensitivity.
5. Place the microphone in the center of the listening area.

6. Set the SENSITIVITY of the 30M8 to put the majority of the response curve near 0dB. Make sure the microphone is pointed at the speaker. Record the levels or store them in memory.
7. In the lower frequencies there can be great deviations from flat caused by speaker and room characteristics. Usually it is impossible to make changes in room shape and size but speaker positions can be changed.
8. If inside, try different speaker positions along and up and down the back wall. Also try varying distances from the wall. Each response can be store in memory for later comparison. Move the microphone around the room to see where differences occur.
9. The high frequency response of the system will be greatly effected by the speaker's angular position; how it is pointed relative to the room. Make adjustments for maximum output in the highest frequencies.
10. After making changes, move around the room while observing the analyzer's display taking note of changes in response.
11. Adjust the system's equalizers, tone and tweeter controls, etc., to obtain the flattest response. Do not try to boost out deep notches which might be caused by poor crossover. To much boost can overdrive the entire system. Use cut to reduce problem areas. Try to use tone controls or other broad shelving type EQs to reduce the extent of narrow-band EQ.
12. Recheck the system response with the analyzer and trim adjustments for the best compromises over all bands.
13. Repeat the above steps for other channels.
14. With channels equally driven, touch up low frequency EQ for flat response in the listening area up to 250Hz.
15. The liveliness of a room will have an effect primarily in the medium/high frequency areas. Rugs, furniture, drapes and people absorb sound which could cause a need to boost medium/high frequencies.
16. **CAUTION- DO NOT** use extreme amounts of bass boost with small speakers. They could be destroyed. Try to find the best speaker to wall distance to minimize the need for boost.

**NOTES:**

## SPECIFICATIONS

**MEASUREMENT RANGE:** Microphone input: 40dB - 122dB SPL  
Line input: -81dBm to +3dBm  
(.069mV - 1.10V rms)

**DISPLAY:** 30 Channel, 25dB window in 2.5dB steps.  
25Hz channel shows broadband SPL when in A or C weighting.

**INPUTS:** Microphone: XLR 3 pin receptacle with phantom power.  
Line: Unbalanced 1/4" phone jack. 10kΩ  $\mu$ πεδονχρ

**MICROPHONE:** 600Ω omnidirectional electret condenser. Model MK8.

**SENSITIVITY SWITCH:** 5 position 10dB / step attenuator.

**INPUT RANGE SWITCH:** 0dB or -20dB

**CENTER FREQUENCIES:** ISO 1/3 octave between 25Hz - 20kHz

**CENTER FREQUENCY ACCURACY:** Typically  $\pm 3\%$

**MEMORIES:** Eight volatile. (Active only while the unit is turned on).

**FILTERS:** ANSI Class II

**RELATIVE FLATNESS CHANNEL TO CHANNEL:**  $\pm 1.0$ dB

**WEIGHTING:** IEC A, C and FLAT.

**DECAY RATE (@ 500Hz):** SLOW 2.2dB/s, FAST 18dB/s. HOLD for short duration display freeze.

**POWER REQUIREMENTS:** Batteries - Eight AA alkaline or nicad.

**30M8** External - 12Vdc @ 500mA via 3.5mm jack

Internal switch must be set to NICAD when recharging NICAD batteries.

**POWER REQUIREMENTS :** 12Vdc @ 500mA power adapter (supplied)

**30M8RM**

**SIZE (W x H x D); WEIGHT 30M8:** 12½" x 7¼" x 2½"; 50 oz.

**SIZE (W x H x D); WEIGHT 30M8RM:** 19" x 7" x 2½"; 64 oz.

**CASE MATERIAL:** Painted Aluminum

### WARRANTY and Factory Service

GOLD LINE products are proudly made in the USA and are covered by a one year limited warranty. For details of this warranty, consult the enclosed warranty registration card or your local dealer.

GOLD LINE Customer Service will help you get the most from your new analyzer. For answers to questions regarding use of the unit, or for information not covered in this manual, please write us. If you are experiencing difficulties with your analyzer, please consult your dealer regarding factory service. If factory service is needed, you may call or fax us between 9:00am and 4:30pm US Eastern Time for instructions and a return authorization.

Enter your serial# \_\_\_\_\_ date of purchase \_\_\_\_\_



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