# OPERATOR'S MANUAL

**Model FD23**
**23 Channel Feedback Detector**

Generally, feedback (ringing) is a self-sustaining and erroneous oscillation that occurs when sound arriving at a microphone is greater than the sound produced by the person or instrument using that microphone. Feedback is controlled through the use of a graphic or parametric equalizer, and these units are most effective when the sound engineer can quickly recognize the frequency at which feedback is occurring. The FD23 provides a quick inexpensive means of detecting which frequency is causing the feedback.

The FD23 operates in the same manner, using the same filter design that is found in Gold Line's spectrum analyzers. Ease of operation is through a single on/off/sensitivity control. If a frequency is ringing and the sensitivity is set accurately, the display of the FD23, which has LEDs for standard ISO third-octave frequencies from 80Hz to 12.5kHz, will light an LED representing the frequency that is ringing (within that frequency's tolerance). Most equalizers have adjustments (sliders) at the same frequencies and by moving the slider that matches the frequency indicator on the FD23 you will reduce the feedback. If the sensitivity of the FD23 is set too high, many LEDs will light, making it difficult to know what frequency is ringing. If the sensitivity is too low, you will not see any LEDs lit. The FD23 can also be used in situations where feedback is not actually happening. By carefully adjusting the FD23's sensitivity, you can detect a frequency that is building up (but not necessarily feeding back). You can then use the equalizer to reduce the buildup.

The FD23 is a rugged, inexpensive, hand-held instrument that can be used with either alkaline or nicad batteries. It can also be powered with a wall-wart providing 12Vdc @ 200mA. To install or change batteries, remove the four screws that hold on the back cover. Separate the cover from the unit being careful not to pull on the power leads. Select either nicad or alkaline with the internal switch provided. Observe the polarity markings in the battery boxes. Nicad batteries can be recharged through the external power jack.

**To eliminate feedback:**

1. Feed pink noise into the line input of the system under test and set the volume for a moderate level from the speakers.
2. Turn on the FD23 and set the sensitivity so that the LED's are just beginning to flicker.
3. Turn up the gain on the main microphone input until feedback starts.

As you turn up the system's gain, you may want to decrease the sensitivity of the FD23 until the feedback starts.

4. With the detector, look for one band to be peaking above the others. Increase the sound level if necessary.
5. Adjust the system's equalizer to put in just enough cut in that band to stop the feedback. Set a parametric equalizer to minimum bandwidth.
6. Continue to increase volume and cut where indicated.
7. 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.
8. Open other microphones that will be on at the same time and change settings as needed for best performance.
9. As a final adjustment, performers should stand at the microphones in their normal positions, the proximity can cause some changes in feedback modes.
10. During a live performance, keep the FD23 at the sound engineer's console, turned on with the LED's just beginning to flicker. As feedback occurs, you can quickly adjust the corresponding frequency.

## SPECIFICATIONS

**MICROPHONE:** Built-in omnidirectional electret condenser.

**MEASUREMENT FREQUENCIES (Hz):** 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1k, 1.25k, 1.6k, 2k, 2.5k, 3.15k, 4k, 5k, 6.3k, 8k, 10k, 12.5k.

**MEASUREMENT RANGE:** 60dB - 120dB

**DISPLAY:** Individual LED for each channel (23) measured.

**APPROVALS:** Emissions: - EN 55022 B - FCC Class B
Immunity: - EN 55024 B
**POWER REQUIREMENTS:** Batteries: Eight AA alkaline or nicad.
External: 12vdc @ 200mA via 3.5mm jack
Internal switch must be set to NICAD when recharging NICAD batteries.
**SIZE (W x H x D); WEIGHT:** 3¼" x 8" x 2¼"; 12 oz.

**CASE MATERIAL:** High impact ABS.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

*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 detector. 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 detector, 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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