SYSTEMS INC
The ultrasound approach

UE SYSTEMS INC.

THE ULTRAPROBE 2000 MANUAL

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OVERVIEW

INTRODUCTION

The ULTRAPROBE 2000 is a valuable tool for ultrasonic troubleshooting and predictive maintenance. The instrument provides testing capability ranging from leak detection to mechanical analysis. It is a testing laboratory that fits in the palm of your hand.

BASIC COMPONENTS OF YOUR KIT

COMPONENTS

METERED PISTOL HOUSING

The main component of the Ultraprobe 2000 is its' pistol housing. From back to front, let's examine each part.

ANALOG METER. This ballistic meter has intensity increments of from 0 to 100. The 50 divisions reflect intensity changes only: the more intense the ultrasonic signal, the higher the reading.

BATTERY LEVEL LIGHT. This red light turns on only when the batteries need recharging.

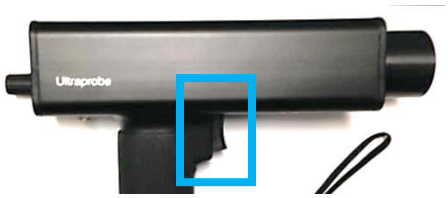
NOTE: *When the trigger on/off switch is pulled to the on position, the red battery light will flicker on and off quickly and the meter will Jump rapidly to indicate that the instrument is working properly.*

SENSITIVITY SELECTION (NUMERICALLY CALIBRATED) DIAL. The increments on this dial allow for 500 individual set-points. There are 2 sets of numbers. The outer window reflects the whole digit and reads from 0 to 10. The inside digits are for fine tuning and these smaller gradations are shown as lines which represent 2 divisions each. As the numbers go UP in value, the sensitivity of the instrument also goes up. The maximum sensitivity level is 10, the minimum sensitivity level is 0.0.

On the sensitivity selection switch is a LOCK lever. This allows a user to lock the sensitivity selection and thereby prevent it from being moved inadvertently. To lock the sensitivity selection, rotate the lever clockwise; to release the lock, rotate the lever counter-clockwise.

HEAD SET JACK. This is where you plug in the headset. Be sure to plug it in firmly until it clicks.

TRIGGER SWITCH. The Ultraprobe is always "off' until the trigger switch is pulled. To operate, simply pull the trigger; to turn the instrument off, release the trigger.



FREQUENCY ADJUST DIAL. There are numbers ranging from 100 kHz down to 20 kHz. These represent the range of frequency selection capable with the Ultraprobe. These frequencies may be "tuned in" when performing mechanical and valve analysis with the contact (stethoscope) probe (refer to description of contact probe). There is also a position, labeled "fixed band". This selection automatically locks the circuitry of the Ultraprobe into the peak response of the transducers of either the contact (stethoscope) module or the Trisonic™Scanning Module. It is an extremely narrow band response that, when used with the contact (stethoscope) module, reduces most stray unwanted pipe and mechanical noises. In the scanning mode, it provides for extreme sensitivity and is the preferred position in leak detection and electrical inspection activities.

METER SELECTION. There are three positions for this dial:

- Log: this selection allows the meter to respond in a real-time, instant, mode. This selection is used when fast, instant meter response is needed, as in leak detection.
- Lin: this selection, linear, can be considered a slow response. It eliminates the high and low swings of the meter and averages the response for a more measurable result. This selection is utilized when too rapid a meter response might be confusing to the operator.
- Aux: this is the auxiliary position, which is to be used ONLY when a specially adapted instrument is to be interfaced with the Ultraprobe.

RECHARGE JACK. This jack receives the plug from the recharger. The recharger is designed to plug into an electrical outlet.

TO CHARGE THE UP2000 Ultraprobe

- Insert Ultraprobe plug (black) into Ultraprobe 2000 Recharge jack and then plug the recharger into an electrical outlet.
- Make sure that the LED on the charger is blinking when recharging.
- The LED remains solid when the battery is charged. The instrument may stay connected to the charger without damaging the battery. Charge time is approximately 4 hours.

WARNING: Use the supplied UE Systems recharger (BCH-2) only. Use of unauthorized rechargers will void the warranty and may degrade or damage the battery.

WHEN TO RECHARGE: When the red low level indicator light illuminates, IMMEDIATELY recharge the Ultraprobe. If the instrument is not used for a week or more, recharge it. If the Ultraprobe is not used for a few days, it can be used without recharging, however, for best results, it is advisable to recharge it as a "booster" for about an hour before using.

TO CHARGE THE ULTRAPROBE 2000 WTG-1 (Warble Tone Generator)

- Insert Tone Generator plug **(yellow)** into Warble Tone Generator Recharge jack and then plug the recharger into an electrical outlet.
- Make sure that the LED on the charger is blinking when recharging.
- The LED remains solid when the battery is charged. The instrument may stay connected to the charger without damaging the battery. Charge time is approximately 4 hours.
- **WARNING:** Use the supplied UE Systems recharger (BCH-2) only. Use of unauthorized rechargers will void the warranty and may degrade or damage the battery.

TRISONIC™ SCANNING MODULE

This module is utilized to receive air-borne ultrasound such as the ultrasounds emitted by pressure leaks and electrical discharges. There are three prongs at the rear of the module. For placement, align the prongs with the three corresponding jacks in the front end of the metered pistol housing and plug in.

TO USE THE TRISONIC™ SCANNING MODULE

- Plug in to front end.
- Select the LOG position on the meter selection dial.
- For general use position the frequency selection dial to the "fixed-band" mode.
- Start with the sensitivity selection dial at maximum (10).
- Start to scan the test area.

The method of air borne detection is to go from the "gross to the fine". If there is too much ultrasound in the area, reduce the sensitivity, place the RUBBER FOCUSING PROBE (described below) over the scanning module and proceed to follow the test sound to its' loudest point constantly reducing the sensitivity and following the meter.

CONTACT (STETHOSCOPE) MODULE

This is the module with the metal rod. This rod is utilized as a "waveguide" in that it is sensitive to ultrasound that is generated internally such as within a pipe, bearing housing, steam trap or wall. Once stimulated by ultrasound, it transfers the signal to a piezoelectric transducer located directly in the module housing. This module is shielded to provide protection from stray RF waves that tend to effect electronic receiving. It is equipped with low noise amplification to allow for a clear, intelligible signal to be received and interpreted.

TO USE THE STETHOSCOPE MODULE

- Align the pins located at the rear of the module with the three jacks in the front end of the Metered Pistol Housing (MPH) and plug in.
- For detecting leaks in valves, steam traps, etc., position the meter selection dial to LOG. If performing mechanical analysis, select the LIN mode on the meter selection dial.
- For general use, position the frequency selection dial to "Fixed-Band". For problem solving, i.e. finding a problem sound (refer to section on Mechanical Analysis).
- Touch test area. 5. As with the scanning module, go from the "gross" to the "fine". Start a maximum sensitivity on the Sensitivity Selection dial and proceed to reduce the sensitivity until a satisfactory sound and meter level is achieved.

At times, it may be necessary to utilize the stethoscope probe with the sensitivity level at or near maximum. Occasionally when in this situation stray ultrasound may interfere with clear reception and be confusing. If this occurs, place the RUBBER FOCUSING PROBE over the Stethoscope probe to insulate against the stray ultrasound.

STETHOSCOPE EXTENSION KIT

This consists of three metal rods that will enable a user to reach up to 31 additional inches (78.7 cm) with the Stethoscope Probe.

TO USE:

- Remove the Stethoscope Module from the Metered Pistol Housing.
- Unscrew the metal rod in the Stethoscope Module.
- Look at the thread of the rod you just unscrewed and locate a rod in the kit that has the same size thread - this is the "base piece".
- Screw the Base Piece into the Stethoscope Module.
- If all 31" (78.7 cm) are to be utilized, locate the middle piece. (This is the rod with a female fitting at one end) and screw this piece into the base piece.
- Screw third "end piece" into middle piece.
- If a shorter length is desired, omit step 5 and screw "end piece" into "base piece".

RUBBER FOCUSING PROBE

The Rubber Focusing Probe is a cone-shaped rubber shield. It is used to block out stray ultrasound and to assist in narrowing the field of reception of the Scanning Module. To use, simply slip it over the front of the scanning module or the contact module.

NOTE: *To prevent damage to the module plug, always remove the module BEFORE attaching and removing the Rubber Focusing Probe.*

HEADSET

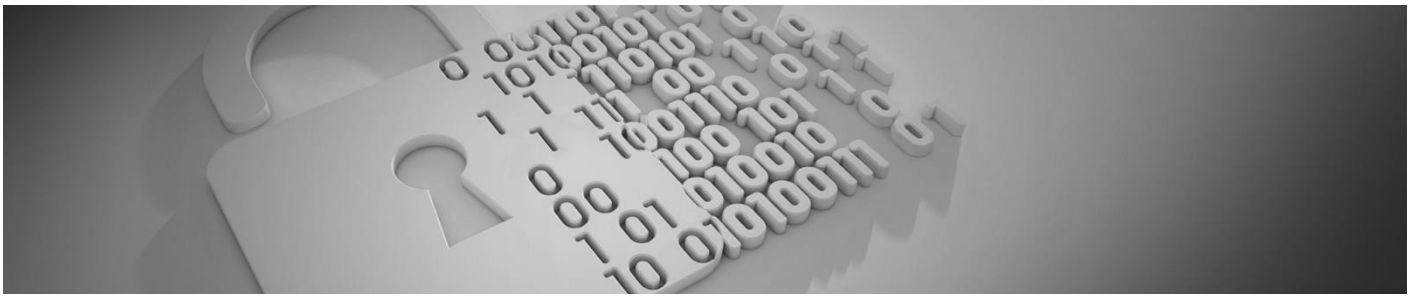
This heavy-duty headset is designed to block out intense sounds often found in industrial environments so that the user may easily hear the sounds received by the ULTRAPROBE. To use, simply plug the headset cord into the headset Jack on the metered pistol housing and place the headphones over your ears. The **UE-DHC-2HH Hard Hat Headphones** are specifically designed for hard hat use.

WTG-1 WARBLE TONE GENERATOR (STANDARD)

The WTG-1 Tone Generator is an ultrasonic transmitter designed to flood an area with ultrasound.

TO USE THE WARBLE TONE GENERATOR

- Turn Tone Generator on by selecting either "LOW" or "HIGH" for high amplitude.
- When the Tone Generator is on, a red light (located below the recharge Jack in the front) flickers.
- To test the condition of the Warble Tone Generator battery, set to the LOW INTENSITY position and listen to the sound through the Ultraprobe in the FIXED BAND mode. A smooth continuous warbling sound should be heard. If a "beeping" is heard instead, then a full recharge of the Warble Tone Generator is indicated.
- Follow directions in RECHARGE JACK (page 4).

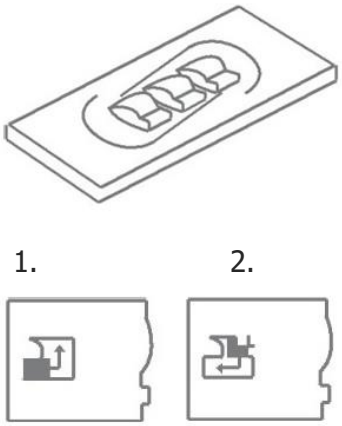


INSTRUCTIONS FOR SETTING COMBINATION ON CARRYING CASE

The combination is factory set at --0--0--0

SETTING YOUR PERSONAL COMBINATION

- Open the case. Looking at the back of the lock inside the case you will see a change lever. Move this change lever to the middle of the lock in a way that allows it to hook behind the change notch (drawing 1).
- Set your personal combination, turning the dials to the desired combination (i.e. birthday, phone #, etc.).
- Move the change lever back to the normal position (drawing 2).
- To lock, rotate one or more dials. To open, set to your personal combination.



INTERNATIONAL PATENTS PENDING

Your Personal Lock Number

SPECIFICATIONS FOR THE MODEL ULTRAPROBE 2000

ULTRASONIC INSPECTION SYSTEM FACTORY MUTUAL INTRINSICALLY SAFE RATING EXPLANATION

The Ultraprobe 2000 is to be considered intrinsically safe for use in Class 1, Division 1, Groups A, B, C, & D only when it has the appropriate "Factory Mutual System Approved" logo and label affixed to the bottom rear panel of the instrument.

NOTE: If the Ultraprobe 2000 has been modified to interface with a chart recorder, the Factory Mutual approval does not apply. An intrinsically safe Ultraprobe 2000 is an instrument in which any spark or thermal effect, produced either normally or in specified fault conditions, is incapable, under the test conditions prescribed in article 500 of the national Electrical Code, NFPA-70 of causing ignition of a specified mixture of flammable or combustible material in air.

There are a few necessary precautions to take, which will ensure that your instrument remains intrinsically safe. The precautions are as follows: (1) Do not recharge the instrument (metered pistol housing or warbling tone generator) in a hazardous location. (2) Substitution of any components in the instrument will void the Factory Mutual Approval. (3) Only the UE BPA-1 or BPA-2 battery pack can be utilized to power the instrument. This battery pack is in the pistol handle and is changeable in the field. Check with factory for correct style pack before replacing.

NOTE: Failure to comply with the above will void the intrinsically safe rating.

SPECIFICATIONS

CONSTRUCTION	Hand held metered pistol type made with anodized aluminum and ABS plastic.
CIRCUITRY	Solid state heterodyne receiver with temperature compensation
FREQUENCY RESPONSE	Detect ultrasonic frequencies between 20 kHz and 100 kHz, continuously variable. Frequencies are converted to 100 Hz to 3 kHz audio.
PROBES	**Scanning module**: plug-in type consisting of a phased array of multiple transducers for airborne ultrasound. This probe is shielded against RF interference. **Rubber focusing probe** (flexible) slips over scanning module to concentrate conical directivity and to shield reception of stray ultrasound. It also fits over stethoscope module to shield against high ambient ultrasound while unit is at maximum sensitivity. **Stethoscope module**: Plug-in type, insulated probe with RE shielding: 5 1/2" long chrome plated brass probe tip, conically shaped for uniform surface contact. Probe tip is interchangeable.
HEADSET	**Stethoscope extension kit**: 3 piece, segmented to increase stethoscope contact range 20" and 31". Noise isolating type: double headset wired monophonic. Impedance, 16 ohms.
INDICATORS	**Ballistic output meter**: linear calibration scale of 0-100 for logging relative measurements. Meter is accurate + 3% throughout entire scale.
BATTERIES	**Low level battery LED indicator** for main housing internal power supply. Self-contained NiMH rechargeable.
FEATURES	**Frequency tuning adjustment dial**: scale 20-100 kHz with "fixed band" position for ultra-narrow frequency response. **Bi-modal meter switch** for logarithmic and linear meter scale adjustments. **Precision 10-turn adjustment dial** with numerically calibrated sensitivity increments for finite gain adjustment. **Spring loaded trigger switch.**
OVER-ALL SIZE	Complete kit is housed in a Zero Halliburton aluminum carrying case: 14" x 18"x5" (35.6x45.7xl2.7 cm)
WEIGHT	Pistol unit: 2 lbs. (.75 kg). Complete kit including carrying case: 13 lbs. (4.9 kg)

SAFETY ADVISORY. PLEASE READ BEFORE USING YOUR INTRUMENT.

WARNING!

Improper use of your ultrasonic detector may result in death or serious injury. Observe all safety precautions. Do not attempt to make any repairs or adjustments while the equipment is operating. Be sure to turn off and LOCK OUT all electrical and mechanical sources before performing any corrective maintenance. Always refer to local guidelines for appropriate lockout and maintenance procedures.

SAFETY PRECAUTION. Although your ultrasonic instrument is intended to be used while equipment is operating, the close proximity of hot piping, electrical equipment and rotating parts are all potentially hazardous to the user. Be sure to use extreme caution when using your instrument around energized equipment. Avoid direct contact with hot pipes or parts, any moving parts or electrical connections. Do not attempt to check findings by touching the equipment with your hands or fingers. Be sure to use appropriate lockout procedures when attempting repairs.

Be careful with loose hanging parts such as the wrist strap or headphone cord when inspecting near moving mechanical devices since they may get caught. Don't touch moving parts with the contact probe. This may not only damage the part but cause personal injury as well.

When inspecting electrical equipment, use caution. High voltage equipment can cause death or severe injury. Do not touch live electrical equipment with your instrument. Use the rubber focusing probe with the scanning module. Consult with your safety director before entering the area and follow all safety procedures. In high voltage areas, keep the instrument close to your body by keeping your elbows bent. Use recommended protective clothing. Do not get close to equipment. Your detector will locate problems at a distance.

When working around high temperature piping, use caution. Use protective clothing and do not attempt to touch any piping or equipment while it is hot. Consult with your safety director before entering the area.

Need further support?
Want information regarding products or training?

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