OPERATOR'S MANUAL

Model APT2B
Absolute Polarity/Phase Analyzer

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The Gold Line Polarity / Phase Analyzer utilizes state of the art signal processing to accurately determine absolute polarity which is unimpaired by passive crossovers or signal waveform distortions produced by the device under test. The Absolute Phase Analyzer works on tweeters, mid-ranges, woofers, subwoofer speakers and cabinets, equalizers, amplifier and crossovers. With this handy instrument an entire speaker system can be checked in only seconds.

THEORY OF OPERATION

The Gold Line Phase Analyzer analyzes the initial rise and the peak amplitude of a repetitive acoustic pulse picked up by the microphone to determine and indicate the absolute polarity of the acoustic pulse. A repetitive test pulse signal, with a fast rise and a known polarity is applied to the loudspeaker under test, with or without an amplifier. The Polarity / Phase Analyzer contains special discriminating circuitry to minimize the influence of loudspeaker transient distortion (preshoot) which varies greatly from speaker to speaker and unless properly screened, is a potential source of false polarity indication. To check acoustical or electrical phasing, the generator is connected to the input of the device under test. The detector is utilized to pick up the output signal. The analyzer section processes the information and decides whether the device under test reverses signal phase or not. The results are displayed via two LEDs: (+) or IN PHASE and (-) or OUT of PHASE.

THE APT2B features the Polarity / Phase Analyzer and the Pulse Generator as separate units allowing the user greater mobility in halls or stadiums since either module can be placed in the most convenient location. The phase analyzer module contains two LEDs to indicate IN PHASE or OUT OF PHASE, the pick up microphone, the push to activate button and a mic selector switch. Select between using the built-in (internal) microphone or an external microphone that can be plugged into either a ¼" phone or a 3 pin XLR input jack. Both jacks provide for a balanced input. The pulse generator module has a RED flashing LED to indicate when the generator is in operation. The generator output is selectable between either a line level output signal or a signal capable of driving speakers without amplification. The pulse output is also sent to a ¼" phone and a 3 pin XLR output jack. Both jacks provide for balanced line output and unbalanced speaker output.

OPERATING INSTRUCTIONS

SPEAKER POLARITY TEST

1. Speaker leads should be terminated with a ¼ inch phone plug or 3 pin XLR male connector. The ¼ inch tip should be (+) positive with the sleeve as ground. The XLR should be P1 - ground, P2 - hot.
2. Activate the PULSE GENERATOR by switching from OFF to LINE or SPKR. A one second interval strobing pulse should be indicated by the RED LED and heard from the speaker.
3. Activate the POLARITY ANALYZER by depressing the PUSH to activate button on the front panel, and hold the analyzer or seprate microphone in front of the speaker, preferably centered and if possible as close as two or three feet. One of the LEDs should light for about 1/3 second on each pulse indicating the absolute acoustic polarity: (+) indicates positive-going acoustic polarity (the speaker cone is displaced towards the analyzer creating a positive air pressure pulse). This also means that the positive (+) terminal of the speaker (usually coded with a red dot) is connected to the TIP of the phone plug. Conversely, (-) indicates negative-going polarity and means that the positive (+) terminal of the speaker is the one connected to the SLEEVE of the phone jack.

SPEAKER PLUS AMPLIFIER TEST

1. Make sure the system is off. Set the amplifier volume control to minimum.
2. Plug one end of a shielded audio cable into the input of the amplifier for the system under test.
3. Activate the PULSE GENERATOR. A one second interval pulse should be indicated by the RED LED.
4. Activate the amplifier and advance the volume control to set a normal acoustic level. A one second interval pulse should be heard from the speaker.
5. Activate the PHASE ANALYZER by depressing the PUSH to activate button and sequentially hold it in front of each speaker to be tested, preferably centered, and about two or three feet away from the speaker. Note the LED indication for each speaker. One of the LEDs should light for about 1/3 second on each pulse indicating the overall absolute polarity relation between the acoustic output and the amplifier input receiving the test signal: (+) indicates positive-going acoustic polarity and (-) indicates negative-going polarity. Generally all speakers in a multiple system are intended to have the same polarity.

ANALYZER SPECIFICATIONS

LED Indication: 300ms ON duration per pulse typical.
(+): indicates positive-going pulse polarity.
(-): indicates negative-going pulse polarity.
REQUIRED ACOUSTIC LEVEL AT ANALYZER: useful range 70dBc to greater than 110dBc. BATTERY: 9Volt
BATTERY DRAIN: Mainly from LED approx. 20mA peak instantaneous.

PULSE GENERATOR SPECIFICATIONS

PULSE WAVEFORM:
Repetition rate: 1s nominal
Polarity: Positive-going
LINE OUTPUT PULSE for driving an amplifier input:
Amplitude: 0.8V peak typical
Rise time: <100 µs
Fall time: 40 ms typical
Source impedance: 50 Ω nominal
Duty factor: 0.3% typical
Battery drain line output: 1.5mA average
SPEAKER OUTPUT PULSE for driving a loudspeaker directly:
Amplitude: 6.5V peak to 4Ω speaker (9V battery)
Rise time: <100 µs
Fall time: 1.5ms typical
POWER: 14 watts peak instantaneous (4Ω speaker, 9V battery.)
Duty factor: 0.15% typical
Battery saver circuit: Cuts in when no speaker is connected.
Battery drain: 3.7mA with 4Ω speaker.

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.

U.S. Patent 5,319,714

Enter your serial#_____ date of purchase_____

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Box 500 West Redding, CT. 06896 203-938-2588 phone - 203-938-8740 fax
http://www.gold-line.com Email - sales@gold-line.com