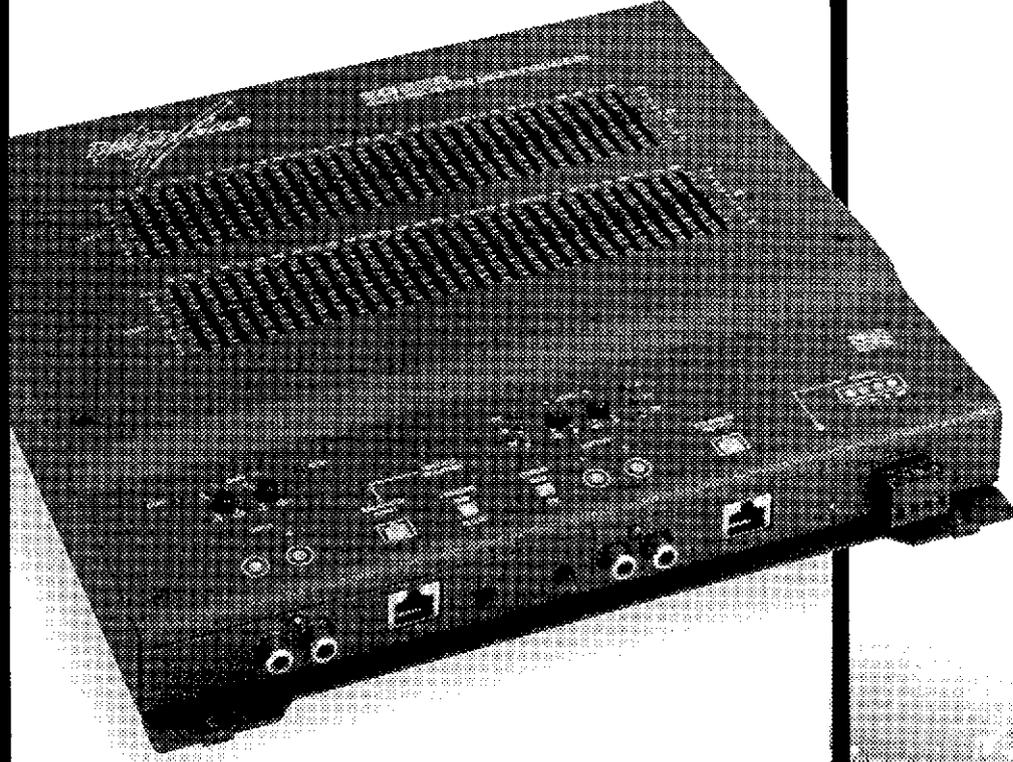


**OWNER'S  
MANUAL**

# **EQ232**

**ONE-THIRD OCTAVE  
GRAPHIC EQUALIZER**

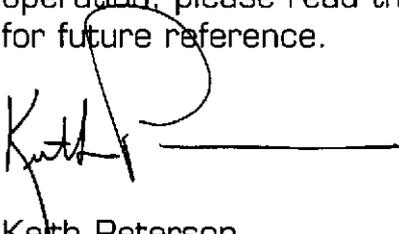


*Phoenix Gold*  
**NO LIMITS!**

Dear Phoenix Gold enthusiast,

I thank you for purchasing this Phoenix Gold product. By doing so, you have demonstrated a desire to own the finest audio components available for the car and home. At Phoenix Gold we use state-of-the-art design, engineering and production methods to continually improve the quality, reliability and performance of our products.

The EQ232 provides the ultimate in precision equalization capabilities for the most demanding audiophile or competitor. When properly installed by an Authorized Phoenix Gold Mobile Electronics Retailer, the EQ232 will provide years of enjoyment. For proper operation, please read this manual carefully and keep it for future reference.



Keith Peterson  
President



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**FEATURES**

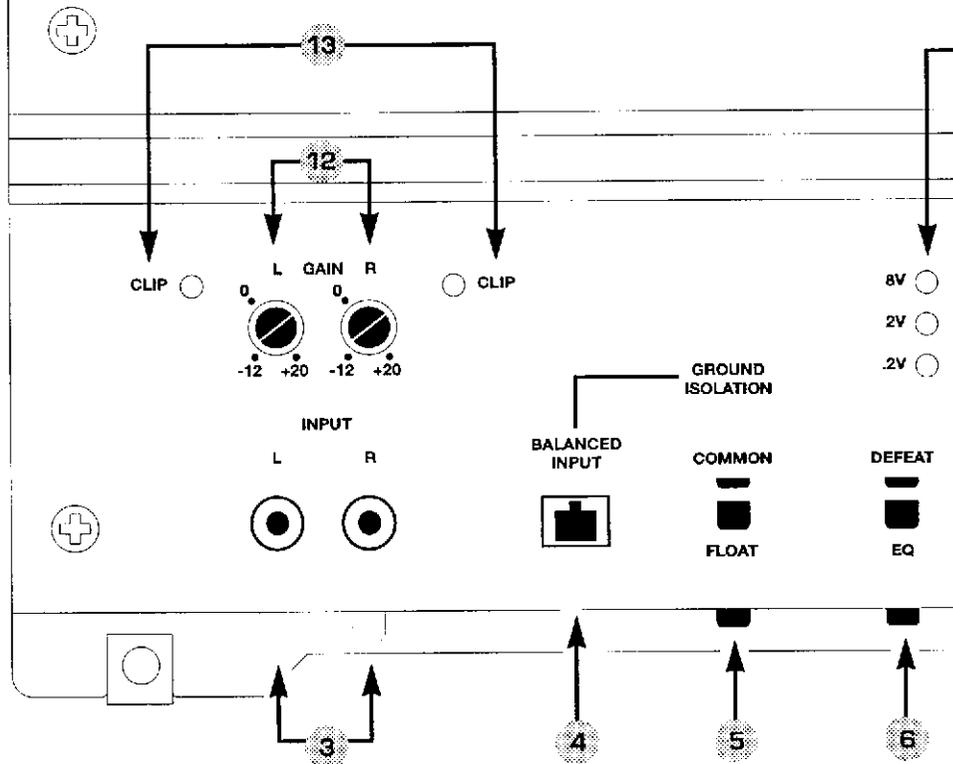
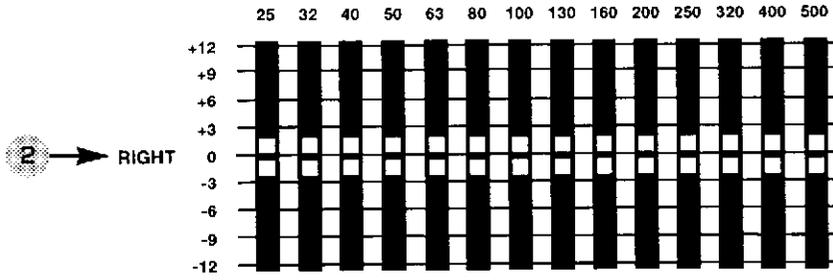
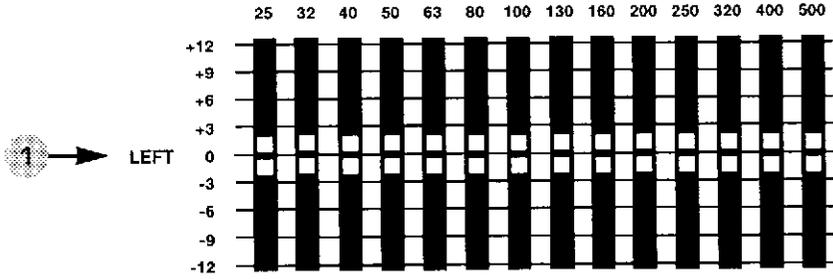
- 30 Independently Adjustable, Sliding Style, High-Q Frequency Controls for each Channel with 1/3 Octave Spacing
- Balanced Signal Input and Output Capability
- 24kt Gold Plated, Standard Input and Output Jacks
- Separate Left and Right Input Sensitivity Controls
- Separate Left and Right Output Level Controls
- Separate Left and Right Input Clipping LED Indicators
- Separate Left and Right Tri-level Output Level LED Indicators
- Pulse-width-modulated Power Supply
- Power-on LED Indicator
- Equalization Defeat Switch
- Quick Disconnect Power Plug
- 3 Second Delayed Remote Turn-on Output
- 24kt Gold Plated, Double-sided, G10 Glass-epoxy Printed Circuit Boards
- Audiophile Grade 1% Metal-film Resistors
- Precision Laser Cut 16 Gauge White or Black Powder-coated Steel Chassis

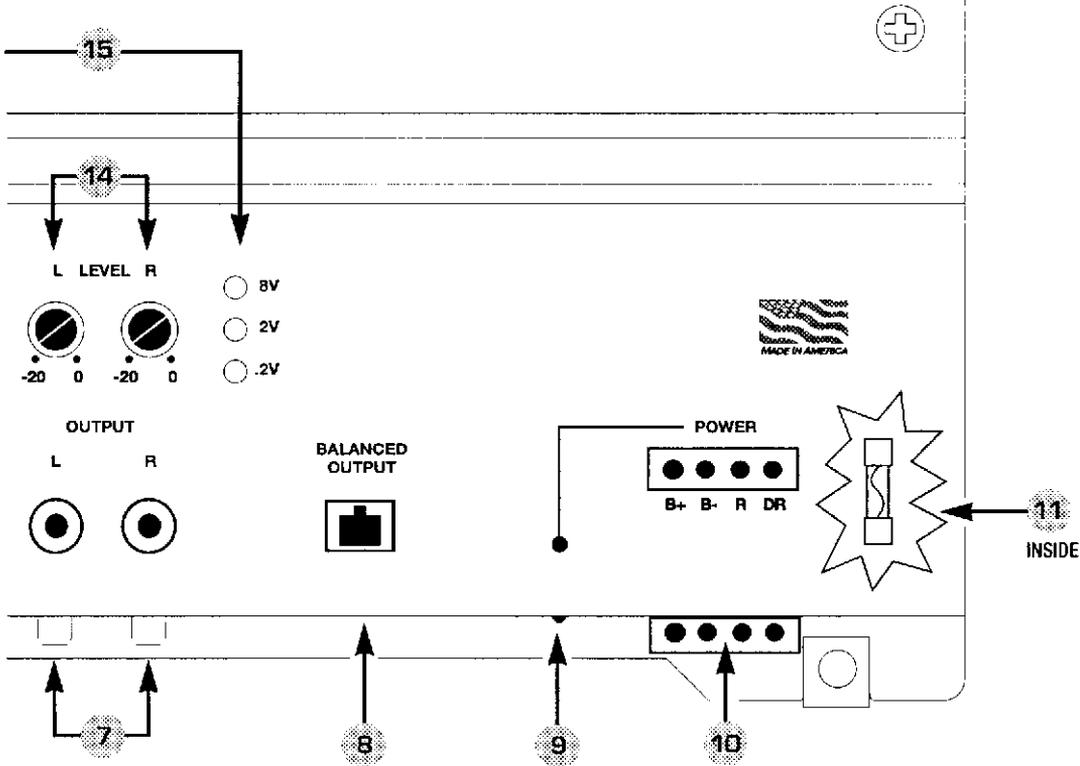
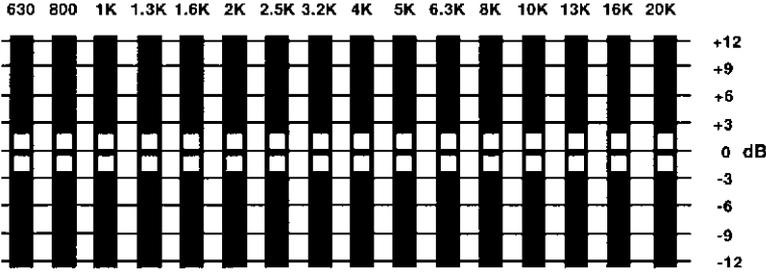
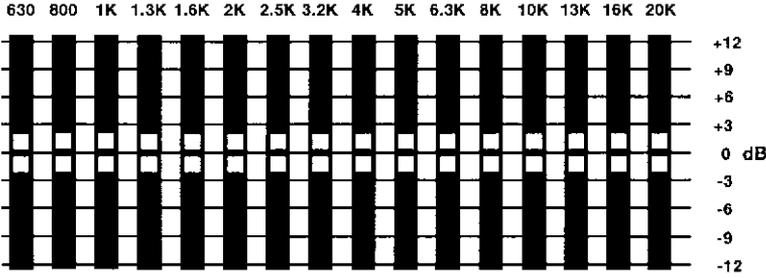
**SPECIFICATIONS**

Frequency Response .....	±1dB, 20Hz to 20kHz
S/N Ratio (A-weighted) .....	>105dB ref. to 8 VRMS
Total Harmonic Distortion .....	0.020 %
Input Impedance, Standard/Balanced .....	5kΩ/50kΩ
Output Impedance, Standard/Balanced .....	510Ω/30Ω
Input Signal Range .....	0.8 VRMS to 32 VRMS
Input Sensitivity .....	-12dB to +20dB
Maximum Output Level .....	8 VRMS
Output Level Range .....	-20dB to 0dB
Filter Q .....	4.3
Filter Boost/Cut Range .....	+12dB to -12dB
Filter Center Frequency Spacing .....	1/3 Octave
Power Supply Operating Range .....	10 Vdc to 15.5 Vdc
Typical DC Current Draw .....	1 amp
Internal DC Power Fuse .....	GMC 2 amp
Dimensions, Chassis (inches) .....	11.25L x 9.9W x 1.6H
Dimensions, Overall (inches) .....	11.25L x 10.3W x 1.6H

Due to continuous product development, features and specifications are subject to change without notice.



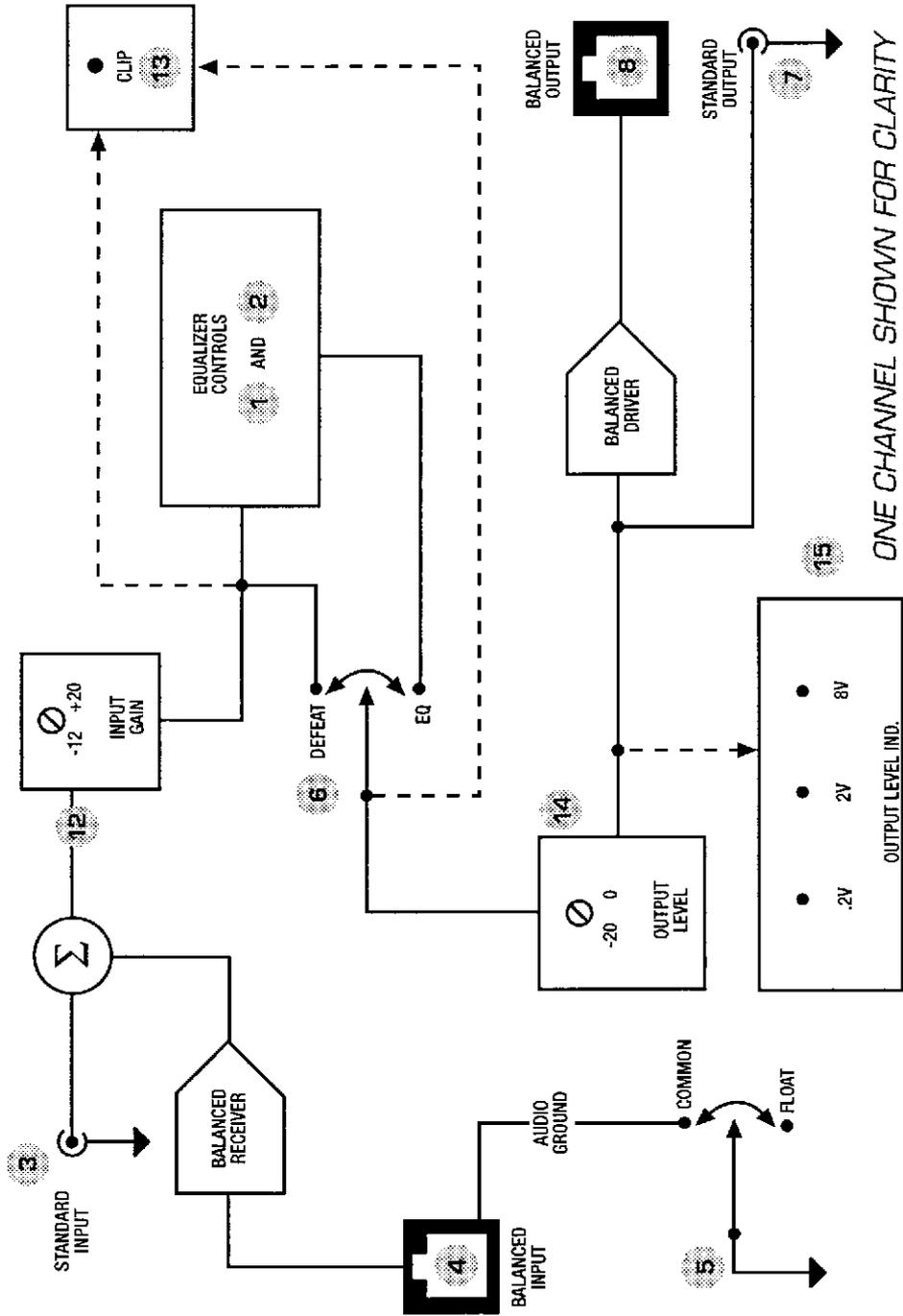




**PHOENIX GOLD**  
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# OPERATIONAL DETAILS

**SIGNAL FLOW DIAGRAM**



ONE CHANNEL SHOWN FOR CLARITY



1. **Left Channel Equalization Controls:** Use these controls to boost or cut various left channel frequencies as much as 12 decibels. There are thirty separate frequency bands spaced 1/3 octave apart from 25Hz to 20kHz. A center detent indicates when a control is set to zero.
2. **Right Channel Equalization Controls:** Use these controls to boost or cut various right channel frequencies as much as 12 decibels. There are thirty separate frequency bands spaced 1/3 octave apart from 25Hz to 20kHz. A center detent indicates when a control is set to zero.
3. **Standard Input Jacks:** These inputs accept standard RCA style signal cables from the headunit, line driver or other signal processor.
4. **Balanced Input Jack:** This input accepts an XBC style balanced signal cable from a Phoenix Gold signal processor such as the TBAt2 Balanced Line Driver. The equalizer receives both left and right signals from the XBC cable. The Ground Isolation Switch #5 is usually set to the (COMMON) position when using this input.  
*Note:* The EQ232 can receive signals from both Standard and Balanced inputs simultaneously. Therefore it is possible to use the EQ232 to connect a second source unit to the system. However, the signals will be summed together unless the installation includes a method to turn one source off while the other is on.
5. **Ground Isolation Switch:** This switch determines how signal ground is referenced when using the Balanced Input Jack #4. It has no effect on signal ground from the Standard Input Jacks #3 or the Balanced Output Jack #8. Setting this switch to (COMMON) provides the best noise rejection for the majority of installations. Setting this switch to the (FLOAT) position disconnects the overall shield of the XBC cable from audio ground inside the EQ232. There is no absolute best setting for all installations. Use the setting that results in the lowest amount of system noise.



6. **Equalizer Defeat Switch:** This switch allows the user to defeat and bypass the Left Equalization Controls #1 and the Right Equalization Controls #2. This allows an instant comparison of the system's sound quality with and without equalization.
7. **Standard Output Jacks:** These outputs accept standard RCA style signal cables that connect to another signal processor or to an amplifier. The Balanced Output Jack #8 may be used simultaneously if desired.
8. **Balanced Output Jack:** This output accepts an XBC balanced signal cable for connection to another balanced Phoenix Gold signal processor such as the ZPX2 Crossover. The equalizer sends both left and right signals out through the XBC cable. A balanced input IS NOT necessary to use this output. The Standard Output Jacks #7 may be used simultaneously if desired.
9. **Power-on LED Indicator:** This LED indicates when the EQ232 is on. The unit cannot turn on unless it is grounded through the B-terminal and is receiving 12 volts at both the B+ and Remote Turn-on terminals of the Quick Disconnect Power Plug #10.
10. **Quick Disconnect Power Plug:** This Plug is easily removed for servicing wiring connections and contains the following four terminals:

**B+ Terminal (Battery Positive):** Connect to the power distribution system that is connected directly to the positive battery terminal. DO NOT connect to the vehicle's factory fuse box. Use a 16 gauge cable.

**B- Terminal (Chassis Ground):** Connect to a clean, solid chassis ground of the vehicle. Use a 16 gauge cable. Keep the cable as short as possible. DO NOT connect directly to the negative battery terminal.

**R Terminal (Remote Turn-on):** This connection allows the unit to turn on and off remotely. Connect to a switched 12 volt source such as the "remote out" or power antenna wire from the headunit. DO NOT connect this to his B+ cable.



**DR Terminal (Delayed Remote Turn-on Output):** This output delays the turn-on of amplifiers if they reproduce noises (turn-on pop) generated by pre-amp components as the system is first powered up. DO NOT connect this output to other signal processors.

11. **Internal Power Fuse:** This fuse is installed inside the unit to protect the power supply from improper connection (reverse polarity) or a short in the B+ cable. It should never blow from normal operation. If replacement is necessary, use a fuse of the same size and type (GMC 2 amp). NEVER USE A FUSE WITH A HIGHER RATING.
12. **Input Sensitivity Controls:** These controls allow separate left and right input sensitivity adjustments. Input signal may be boosted as much as 20dB or cut as much as 12dB. These knobs ARE NOT volume controls for the equalizer. The EQ232 may be driven to its proper operating voltage (8 VRMS) with a wide range of signal levels (.8 to 32 VRMS). A signal level lower than 8 VRMS will require increased sensitivity. A signal level higher than 8 VRMS will require decreased sensitivity.
13. **Input Clipping LED Indicators:** These separate left and right LEDs will light when peaks in the musical signal approach 8 volts. They sense the signal level passing through the Input Sensitivity Controls #12 and the left and right Equalization Controls #1 and #2.
14. **Output Level Controls:** These controls allow separate adjustment of the left and right outputs. The level may be cut as much as 20dB. With these controls set to maximum, the EQ232 can pass 8 volts to the next component. The next component in the system determines the amount of output signal required. Consult the manufacturer's specifications to determine the proper input signal level.
15. **Tri-level Output LED Indicators:** These separate left and right LEDs indicate the signal level sent to the next component in the system. They sense the signal level passing through the Output Level Controls #14.



## **PLANNING**

A successful installation must begin with planning. There are several things to consider:

**1. Inspect the vehicle's electrical system:**

The vehicle's battery and charging system must be in excellent condition. If necessary, have the electrical system inspected and repaired by a qualified technician.

**2. Plan the mounting locations for all components:**

Choose a location for each component. Consult with a qualified custom installer before attempting any custom work. Trying to modify your vehicle without the proper tools and experience can lead to damaging the equipment or vehicle.

a. **Speaker placement:** This is the most important consideration for a great sounding system. Try to mount the front left and right mid/high frequency speakers an equal distance from the listening position. The kick panel area is a good location. Low frequency speakers are less critical.

b. **Pre-amp components:** Easy access to a component's adjustments will make the system easy to adjust while it's operating. Make sure no loose cargo or other items can cause damage or accidentally alter the component's settings.

c. **Amplifiers:** The primary consideration for amplifier location is ventilation. Make sure your amplifiers will receive plenty of fresh air to avoid overheating.

**3. Plan all system cable routes:**

Do not allow system cables to interfere with the mechanical operation of the steering wheel, gas pedal, brake pedal, clutch pedal, trunk hinges, etc.

a. **Power cables:** All main power cables must be fused within 18 inches of the positive battery terminal. Do not route power cables near hot engine components such as exhaust manifolds. Power cables must be protected with grommets when they pass through any metal panels such as the firewall.

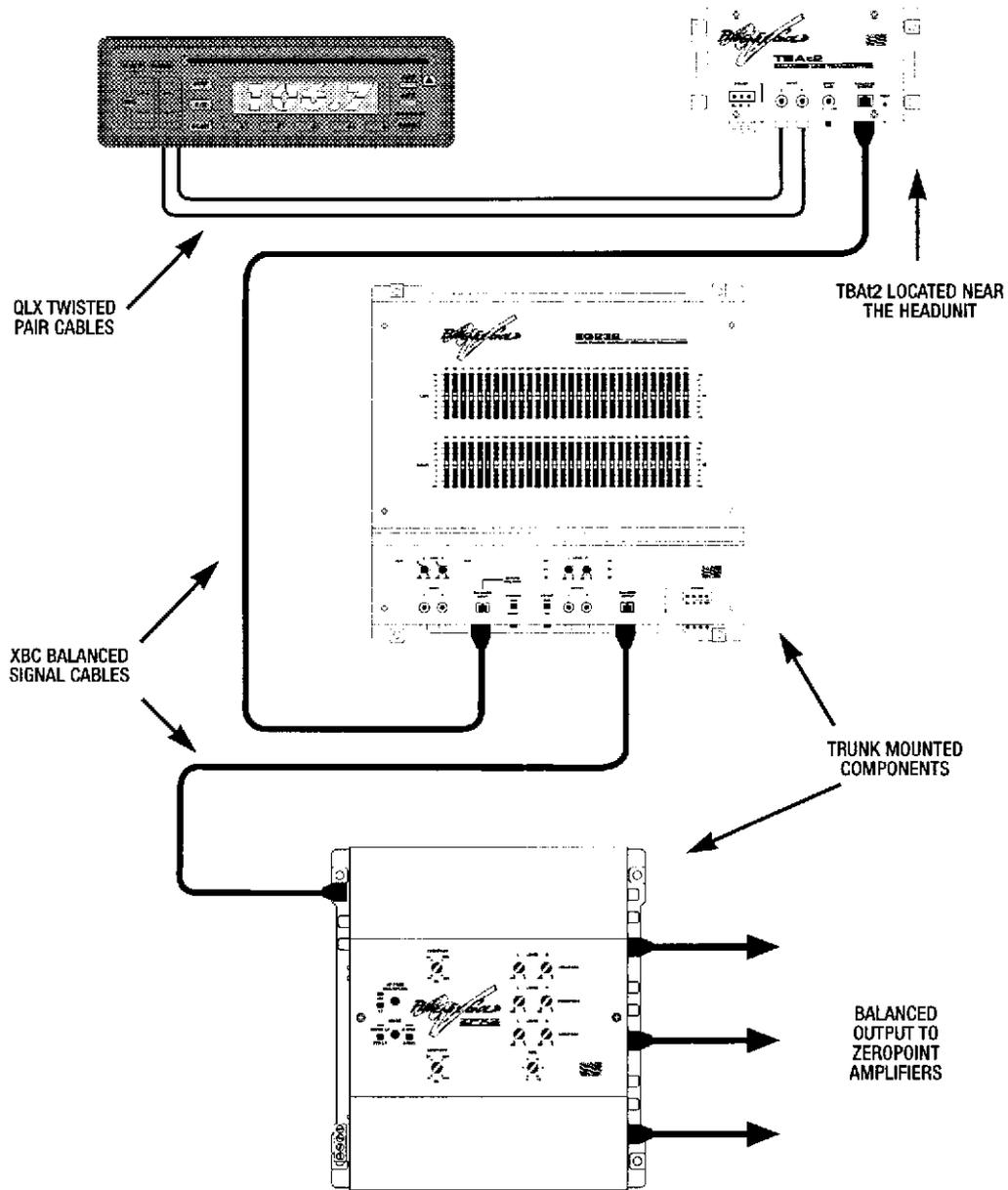
b. **Signal cables:** Do not run signal cables alongside power cables. Make sure to route them away from all other vehicle wiring and electrical components such as computers.

Wherever possible, use Phoenix Gold QLX, TRX, or XS series interconnects to maximize noise rejection.



### RECOMMENDED EXAMPLE

The following system diagram is offered as one example of how to integrate an EQ232 into a system. It is not the only way to use it.



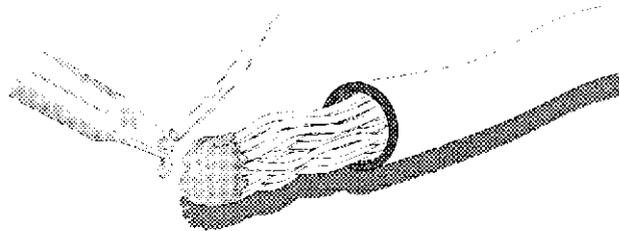
## MOUNTING

You can mount the EQ232 in almost any position. There are only a few precautions to observe.

1. Never mount the equalizer where it can get wet. Water damage is not covered by the limited warranty.
2. Do not mount the equalizer where debris or cargo can hit the equalizer and damage it or change the equalizer's settings. Physical damage is not covered by the limited warranty.
3. Mount the equalizer to a flat surface with screws. Make sure the equalizer's base does not flex or distort.
4. Do not mount the equalizer where it may be exposed to excessive amounts of heat.

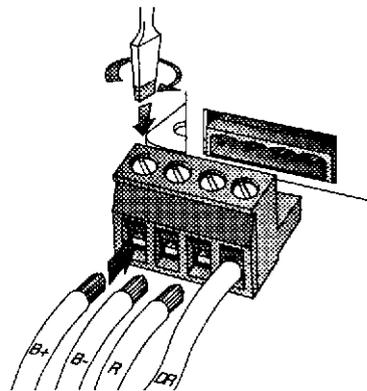
## ELECTRICAL

All power connections are made with the removable power connector. Strip 1/4" of insulation from the end of the wire and "tin" the tip with solder.



Insert each wire into the appropriate position in the power connector and tighten the set screw with a flat blade screwdriver.

*Note:* Use 16 gauge cable for the B+ and B- connection. Use 18 gauge cable for the Remote and Delayed Remote connections.



**XBC BALANCED SIGNAL CABLES**

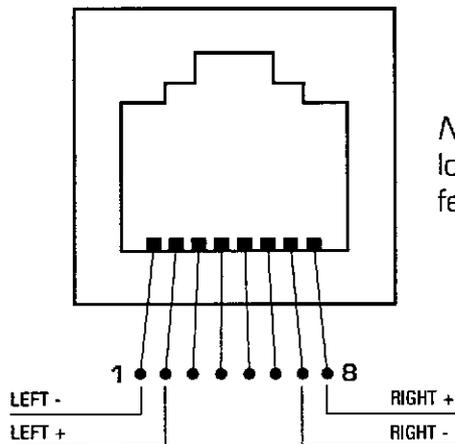
Phoenix Gold's exclusive XBC cables are available in 0.5, 1.0, 2.5, 5.0 and 6.0 meter lengths. These lengths are adequate for most needs. If desired, custom made longer length cables may be ordered through an authorized Phoenix Gold dealer.

The information below is provided for the benefit of the custom installer who wishes to modify an XBC cable by cutting an existing cable to length and installing a new connector on one end. Order the following parts from an authorized Phoenix Gold dealer:

X8PC - A special eight-position shielded connector with a protective rubber boot.

CT8P - A special crimping tool used to properly crimp the X8PC onto the XBC cable.

Balanced Input AND Output Jacks



*Note: View looking into the female jack.*

Attaching a new X8PC to an XBC cable:

Refer to the diagram on page 15.

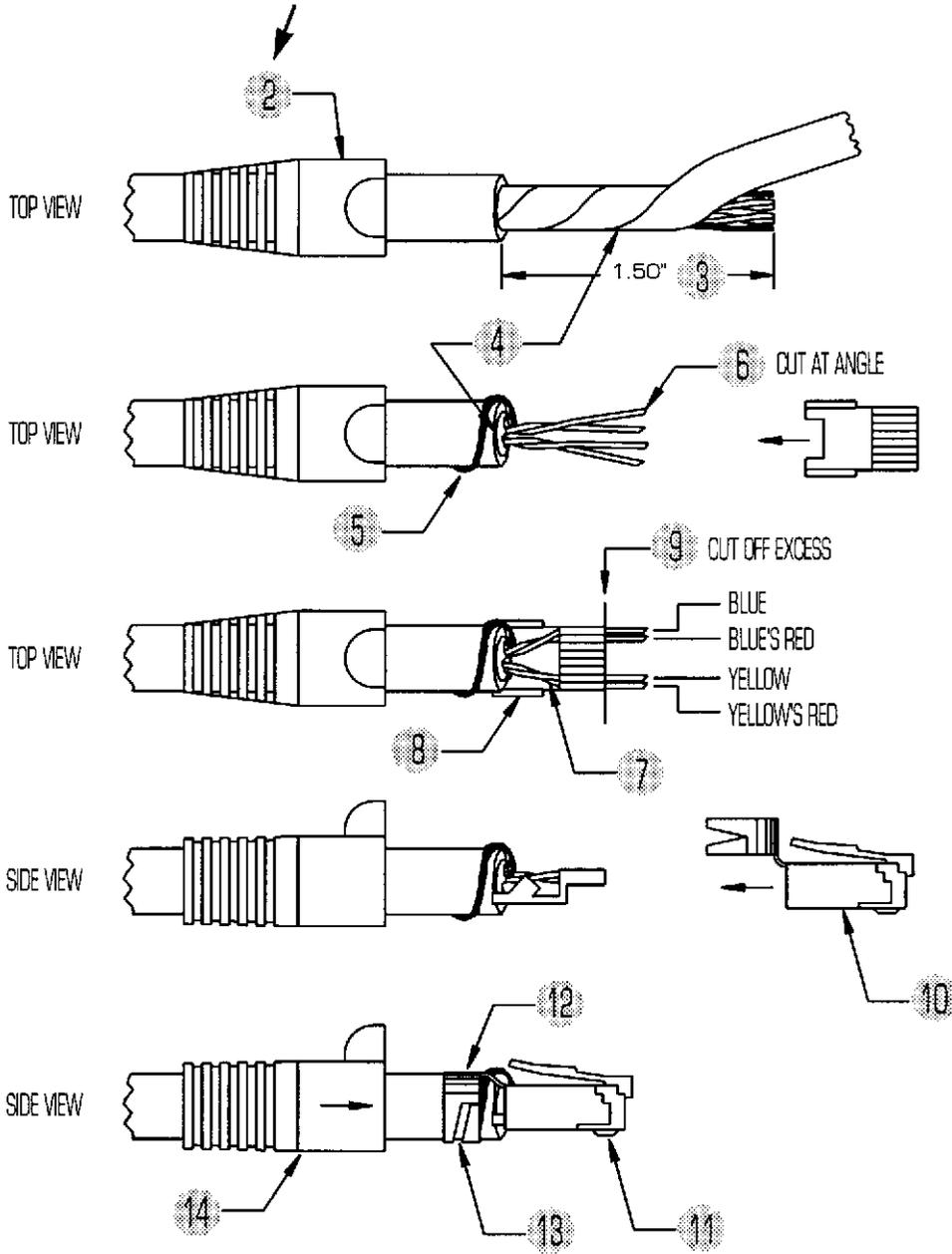
1. Cut the XBC cable to length.
2. Slide the rubber boot onto the XBC cable.
3. Strip the cable's insulating jacket back 1.5 inches from the end.
4. Unwrap the foil shield and cut it off flush with the end of the cable's insulating jacket.



5. Separate the bare ground wires from the twisted conductor pairs, twist the bare wires together and wrap them around the end of the cable's insulating jacket.
6. Trim the ends of the insulated conductors at an angle to make threading them into the insert easier.
7. Thread the conductors into the insert. Make sure the conductors are in the proper order according to the color code shown on page 15. Keep the conductors twisted together as much as possible.
8. Press the insert back snugly against the end of the cable jacket while pulling the conductors through the insert to remove any slack.
9. Trim the excess insulated conductors off flush with the end of the insert.
10. Press the insert into the connector housing. Make sure the insert is pressed all the way into the housing.
11. Use the CT8P crimping tool to press the eight brass contacts down into the insulated conductors.
12. Bend the plug housing's strain relief down to lie flat against the cable.
13. Crimp the strain relief around the cable using the CT8P crimping tool making sure the ground wires are securely crimped between the cable jacket and the strain relief.
14. Slide the modular rubber boot into place on the connector housing.
15. Verify continuity of each conductor from end to end with an ohm meter. There should be virtually no resistance.



**INDICATES CORRESPONDING  
STEP IN THE INSTRUCTIONS**



### INPUT GAIN AND OUTPUT LEVEL SETTING

1. Install the system's power fuses after connecting all power, speaker and signal cables.
2. Set the EQ232's Input Sensitivity Controls and Output Level Controls to their minimum settings (full counterclockwise).
3. Set the Ground Isolation Switch to (COMMON) if the Balanced Input Jack is used. The switch may be in any position if using the Standard Input Jacks.
4. Set the EQ/Defeat Switch to the (BYPASS) position.
5. Set all other signal processor input sensitivity controls and output level controls to their minimum settings.
6. Set all amplifier input sensitivity controls to their minimum settings.
7. Turn the headunit on with the volume set to minimum.
8. Visually check the EQ232's condition. The green Power-on LED should be on. The red Input Clipping LED indicators and Tri-level Output LED indicators should be off.
9. Visually check the power-on indicators (if equipped) of all other system components to verify that they are on.
10. Set the headunit's tone controls, balance and fader to the center (flat) position and turn off any loudness features or other processing effects.
11. Set the volume control of the headunit for maximum undistorted output (on most headunits this is approximately 7/8 of maximum). Play a very clear and dynamic recording.
12. Adjust all pre-amp components between the headunit and EQ232 for maximum undistorted output as per the manufacturer's instructions. Start with the first component after the headunit and work your way towards the EQ232.



13. Turn up the EQ232's left and right Input Sensitivity Controls separately until the red Input Clipping LED indicators flicker on about once a second with the peaks in the music.
14. At this point approximately 800 millivolts is passing through the Output Level Controls to the next component. It is possible to send as much as 8 volts to the next component by turning up the Output Level Controls. The needs of the next component determine the correct settings.

EQ232 output going directly to an amplifier:

Turn up each Output Level Control separately until the speakers reach maximum undistorted output. If this adjustment cannot distort the speakers, then leave the Output Level Control at maximum and use the amplifier's input sensitivity control to reach maximum undistorted output.

*Note:* The idea is to establish the maximum undistorted output of each amplifier channel and its associated speakers independently of the others. When each output is properly adjusted, go to step 15.

EQ232 output going to another signal processor:

- a. Turn up each Output Level Control separately until the next signal processor is receiving the maximum amount of signal it can accept (consult the manufacturer's specifications). The Tri-level Output LED Indicators will show the amount of signal being sent to the processor connected to the Main outputs.
- b. Turn up the output level adjustments of the next signal processor according to the input needs of the following signal processor. Repeat this procedure for each processor until the correct input sensitivity is set for the last signal processor.
- c. Turn up the output level of the last processor until the speakers reach maximum undistorted output. If this adjustment cannot distort the speakers, then leave the output level control at maximum and use the amplifier's input sensitivity control to reach maximum undistorted output. The idea is to establish the maximum undistorted output of each amplifier channel and its associated speakers independently of the others.



15. Once you've determined the maximum undistorted output for each amplified channel, it will be necessary to listen to the overall balance of the system and readjust the output level controls for some channels.

*Example:* If the right channel sounds louder than the left channel, the right channel's output should be lowered until it's equal to the left channel. Compare front to rear, subwoofer to midbass, midbass to midrange, etc. until the system is properly balanced.

16. When all input sensitivities and output levels are set correctly, the system will reach maximum undistorted output at the volume level set in step 11. If more overall volume is desired, it will be necessary to increase amplifier power or speaker capability or both.

### **ADJUSTING EQUALIZATION CONTROLS**

The equalization process should not begin until all other system adjustments are complete. Use speaker placement, crossover points, phase and sensitivity adjustments to achieve the best possible sound quality before applying equalization.

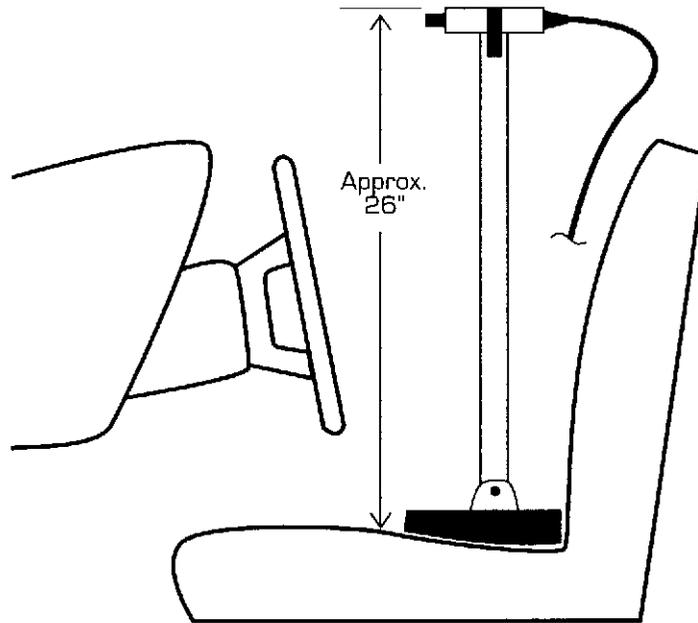
Space limitations do not allow a complete course on all the aspects of using equalization in the mobile environment. This section is intended as a basic guide to setting the equalization controls. Many factors can combine to affect the way sound is perceived in the mobile environment. An understanding of these factors and how they affect the final sound quality of the system is essential to getting the best possible results.

A real time analyzer (RTA) capable of 1/3 octave resolution will be required to properly set the equalization controls.

1. Set up the RTA so its display can be seen while adjusting the EQ232. Set the response time of the RTA's display to a slow setting (updates once every couple of seconds).
2. Attach the RTA microphone to a stand and place it in the driver's seat as shown below. The microphone should be horizontal and pointing forward towards the dash with a height of 26 inches from the seat cushion.



3. Set the system up to analyze the left and right speaker systems independently by disabling one channel.



4. Adjust all Equalization Controls for the left and right channels to their center position (0dB).
5. Set the EQ/Defeat Switch to the (EQ) position.
6. Play uncorrelated (stereo) pink noise with the headunit's repeat track function turned on and the bass and treble controls set to their flat positions. Turn off any loudness controls or other sound processing effects.
7. Set the volume level for approximately 90 decibels.  
*Note:* The level must be at least 10 decibels above any ambient noise that could interfere with RTA readings.
8. Observe the RTA and adjust its sensitivity to center the overall curve in the display area.



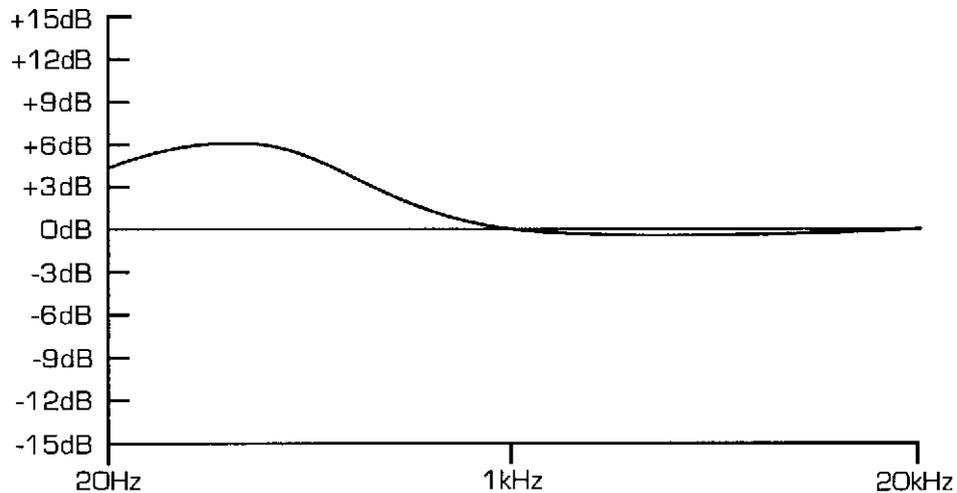
9. Use the equalization controls to achieve a smooth octave to octave curve in the display. There is no single correct response curve for all systems. The example below shows a typical curve for a car audio system.

*Note:* It is customary to have more output in the base region to overcome low frequency road noise.

Start by cutting the largest peak first and then the next largest peaks in turn. After reducing the peaks, boost the dips to further smooth the curve.

*Caution:* Apply boost very sparingly. Every 3 decibels of boost requires double the amplifier power at that frequency.

10. Disable the adjusted channel and reconnect the opposite channel.
11. Repeat step 9.



12. After equalizing both channels separately, compare the Left and Right equalizer control settings. They should be similar. If the settings required to achieve a smooth curve are very different from left to right, check for out of phase speakers, incorrect crossover points, improper sensitivity settings, etc.



13. Reconnect the disabled channel and observe the RTA with all speakers playing.
14. Fine tune the curve by adjusting both left and right Equalization Controls together.
15. Check the sound quality of the system with various music selections and fine tune the equalizer settings based on what you hear.
16. Recheck the red clipping LED indicators and readjust if necessary (steps 11 through 13 in the Input Sensitivity and Output Level Setting section).
17. Record the Equalizer Control settings on page 23 for future reference.



# TROUBLE-SHOOTING



SYMPTOM	PROBABLE CAUSE	SOLUTION
No output and Power-on LED is off	No battery, chassis ground, or remote connection	Connect B+, B-, and Remote Turn-on to the Quick Disconnect Power Plug (pages 8 & 12)
No output and Power-on LED is on	No signal from the headunit Faulty input or output signal cables	Check the headunit for proper output Try substituting different signal cables
Distorted sound in all speakers	Clipped input signal Input Sensitivity Controls set too high	Make sure the headunit is not providing a clipped signal (pages 16 - 18) Set the Input Sensitivity Controls to a lower setting (pages 16 - 18)
Distorted sound in individual channels	Output Level Controls set too high for the next component	Set the Output Level Controls to a lower setting (pages 16 - 18)



## EQUALIZATION CONTROL SETTINGS

	<b>Left</b>		<b>Right</b>
25 Hz	_____	25 Hz	_____
32 Hz	_____	32 Hz	_____
40 Hz	_____	40 Hz	_____
50 Hz	_____	50 Hz	_____
63 Hz	_____	63 Hz	_____
80 Hz	_____	80 Hz	_____
100 Hz	_____	100 Hz	_____
130 Hz	_____	130 Hz	_____
160 Hz	_____	160 Hz	_____
200 Hz	_____	200 Hz	_____
250 Hz	_____	250 Hz	_____
320 Hz	_____	320 Hz	_____
400 Hz	_____	400 Hz	_____
500 Hz	_____	500 Hz	_____
630 Hz	_____	630 Hz	_____
800 Hz	_____	800 Hz	_____
1 kHz	_____	1 kHz	_____
1.3 kHz	_____	1.3 kHz	_____
1.6 kHz	_____	1.6 kHz	_____
2 kHz	_____	2 kHz	_____
2.5 kHz	_____	2.5 kHz	_____
3.2 kHz	_____	3.2 kHz	_____
4 kHz	_____	4 kHz	_____
5 kHz	_____	5 kHz	_____
6.3 kHz	_____	6.3 kHz	_____
8 kHz	_____	8 kHz	_____
10 kHz	_____	10 kHz	_____
13 kHz	_____	13 kHz	_____
16 kHz	_____	16 kHz	_____
20 kHz	_____	20 kHz	_____



### LIMITED WARRANTY

Phoenix Gold provides a limited warranty on all electronics (free of manufacturing defects in materials and/or workmanship) to the original consumer/purchaser for a period of eighteen (18) months when installed by an Authorized Phoenix Gold Mobile Electronics Retailer. Returning a copy of the original sales receipt with the warranty registration card extends the period to thirty-six (36) months. The limited warranty period is thirty (30) days if installed by anyone other than an Authorized Phoenix Gold Mobile Electronics Retailer. We will cover parts and labor provided the product was purchased from an Authorized Phoenix Gold Retailer. This Warranty does not apply to any product where the tags and/or serial numbers have been cut, removed, tampered or altered in any manner. This limited warranty is applicable to only the original consumer/purchaser and is not transferable. Electronics that are deemed defective during the warranty period will be repaired or replaced at the discretion of Phoenix Gold. Repaired or replaced product will be covered until the original warranty period expires. Phoenix Gold will not be responsible for any incidental or consequential damages that may result from a defect in the product. Select states may not allow the exclusion or limitation of incidental or consequential damages, so the prior limitations may not apply.

### GUARANTEE LIMITÉE

Phoenix Gold vous procure une garantie limitée sur tout ses électroniques pour une période de 12 mois dans le cas où ils ont été installés par un revendeur agréé de Phoenix Gold. Si l'installation a été faite par autrui, la garantie se limite à 30 jours. Les pièces détachées et la main d'œuvre utilisés pour les réparations seront couverts durant la période de garantie si vous avez acheté le produit chez un revendeur agréé de Phoenix Gold. En cas d'absence du numéro de série, ou un déplacement du numéro de série, la garantie ne sera plus appliquée. La garantie est seulement applicable pour le premier acheteur/consommateur et n'est donc pas transférable. Les électroniques qui sont défectueuses durant la période de garantie peuvent seulement être réparées par des services techniques approuvés par le distributeur officiel de Phoenix Gold afin que la garantie soit applicable. Phoenix Gold ne sera pas responsable pour tout endommagements qui peuvent résulter d'un manquement du produit Phoenix Gold.

Dealer's Name \_\_\_\_\_

Telephone Number \_\_\_\_\_

Sales Person's Name \_\_\_\_\_

Model Number \_\_\_\_\_ EQ232 \_\_\_\_\_

Serial Number \_\_\_\_\_