



1700 Series Mixer/Power Amplifiers

Operating Instructions



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DESCRIPTION

The 1700 Series Mixer/Power Amplifiers offer a highly flexible integration of a user configurable six input mixer with a fully protected power amplifier in one convenient cost effective package.

The six input ports accept any of the several input modules or output module. The programmable input modules may have their muting circuitry configured in either "priority", "slave" mode, or may be set to ignore muting commands. When a module configured in the "Priority" mode is activated, modules in the "slave" mode will be muted.

Circuitry is also provided to allow remote volume control of individual inputs.

Multiple mainframes may be dynamically linked together. Separate preamp-out and amplifier-in jacks allow the insertion of equalizers or other, signal processing between the mixer and the power amplifier.

A multi-tone generator and a compressor/limiter are also provided.

INCLUDED ACCESSORIES:

- 1 Operating/Service Instruction documents.
- 1 Shorting Bar (Installed on Direct Output to OT in).
- 1 "U" Shorting Bar (Installed on Preamp Out to Amp In).
- 4 Rubber Feet (installed).
- 1 System Configuration Label installed on top cover.
- 1 International fuse.
- 1 International 220/240 VAC voltage sticker.
- 1 International Fuse sticker.
- 1 Rack mount hardware kit.

OPTIONAL INPUT OUTPUT ACCESSORY MODULES:

1781A Programmable Input Module.

1781AT Programmable Input Module with 1785A 600 ohm to 10 kohm isolation transformer installed.

1783 Line Output Module.

1785A 600 ohm to 10 kohm Input Isolation Transformer.

1786 600 ohm to 600 ohm Output Isolation Transformer.

1791 Female XLR Connector.

1792 Male XLR Connector.

1793 Dual RCA Phono Connector.

1794 5-Lug Screw Terminals.

ELECTRICAL CONNECTIONS FOR THE 1700 SERIES MIXER/POWER AMPLIFIERS

Power Connections (120 Volt, 50/60 Hz)

The mainframe configuration for both mixer/ power amplifiers comes with the power transformer's primary line voltage strapped for 120-volt operation from the factory. Refer to Table 1 for exact strapping details and other voltage options.

NOTE:

Make sure the line voltage corresponds with the selected line voltage power rating BEFORE you connect the mainframe to the alternating current line.

Power Connections (100, 200, 220, or 240 Volt; 50/60 Hz) 1700C/1715C Only

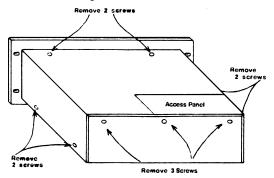
Table 1. AC Line Voltage Selection and Strapping Chart								
Primary Line	Transformer Primary Lead Color							
Voltage	White	White Yellow Red Blue Orange						
100v	5	2	11	9	3			
120V	2	5	11	3	9			
200V	5	2	7	10	8			
220V	5	2	7	8	10			
240V	2	5	7	8	10			

You may change the mixer/power amplifier's 120-volt power connection to a 100-, 200-, 220-, or 240-volt power connection by restrapping the power transformer's primary line voltage. Use the following procedure to change the factory strapping to another line voltage.

- 1. If you connected the mixer/power amplifier to an alternating current power source, disconnect it.
- Remove and save the nine screws that secure the mixer/ power amplifier's top cover. There are two screws near the bottom of each side, two screws on top near the rear edge of the front panel, and three screws at the top edge of the rear panel. Refer to Figure 1 for details.

The numbers in Table 1 correspond to the numbered positions on the alternating current terminal block connector, which is adjacent to the power transformer. To select a line voltage, install the colored primary lead wires into the corresponding numbered positions on the terminal block.

3. Locate the voltage selection terminal block between the



side of the chassis and the power transformer.

Figure 1. Top Cover Removal

4. While referring to Table 1, disconnect the primary lead wires from the terminal block. Pull each wire firmly to disengage the push-on connector. Then reconnect each lead wire into its designated position on the terminal block that corresponds to the desired line voltage. Press each connector to snap into place.

Table 2. AC Fuse Selection Chart				
AC Line Voltage	AC Line Fuse			
	1707C	1715C		
100V	3.5 A/250 V	7.0 A/250 V		
120 V	3.5 A/250 V	7.0 A/250 V		
200V	2.0 A/250 V	4.0 A/250 V		
220V	2.0 A/250 V	4.0 A/250 V		
240 V	2.0 A/250 V	4.0 A/250 V		

5. Install the appropriate fuse value from Table 2.

NOTE

Use of fuses other than those listed in Table 2 will VOID THE WARRANTY.

- If you connected the power transformer's primary leads for 200-, 220-, or 240-volt operation, perform steps 7, 8, and 9 below to prevent future confusion and possible damage to the amplifier. Otherwise, proceed with step 10 below.
- Affix the supplied 220/240 VAC label above the power cord and cover the 120 VAC silkscreened designation.
- Affix the 2-amp fuse/1707C, (4-amp/1715C) label over the original 3.5 amp/1707C, (7-amp/1715C) silkscreened designation.
- Replace the standard AC line fuse with the 2-amp fuse/ 1707C, (4-amp/1715C) supplied. You should find the labels and the fuse enclosed in the plastic bag with this manual. Refer to Table 2 for an AC fuse selection chart.
- 10.If you are not installing additional modules in the mainframe right now, reinstall and secure the top cover with the nine screws previously removed in step 2 above.

NOTE:

You can buy and install additional modules into the mixer/power amplifier, which has six ports that you can configure as input or output modules.

INSTALLING MODULES IN THE MAINFRAME

- 1. Remove and save the two screws that secure the access panel to the top cover. Refer to figure 1 for details.
- Plug the input or output module into one of the six channel positions with the controls facing the rear as shown in Figure

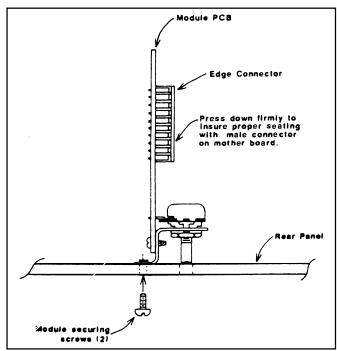


Figure 2. Module Installation

- 2. Secure the module with the two screws provided.
- Remove the blank cover panel as shown in Figure 3. Install the selected connector assembly with the screws provided.

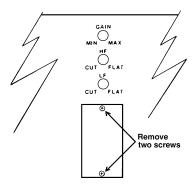


Figure 3. Removal of Blank Cover Panel

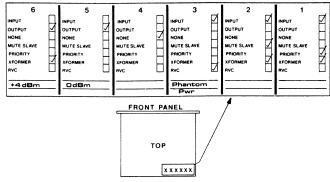


Figure 4. System Configuration Label

Plug the pigtail connector (from the main connector assembly) onto its appropriate male mating connector on the module's printed circuit board.

4. On the top cover is a System Configuration Label. Use it to indicate the module type, configuration, and any options for future reference. Write directly on the label with a permanent marker. Refer to Figure 4 for a sample of this label.

SHELF OR RACK MOUNTING

You may shelf mount or rack mount the mainframe. For shelf or countertop applications, four rubber feet on the bottom of the chassis will protect resting surfaces and provide elevation for air flow underneath the unit. For rack or cabinet applications, remove the four rubber feet from the bottom of the chassis. Then install the unit in the rack with the screws and shoulder washers provided. The unit **must** have 1.75" of blank space both above and below it.

Ventiliation

The mixer/power amplifier generates minimal heat during normal use. Although the amount of generated heat is low, make sure the mainframe is property ventilated to prevent an excessive temperature rise. Because the output power devices (transistors) are sensitive to heat, you should not place the amplifier between other heat generating equipment or in areas where the ambient temperature exceeds 50°C (122°F).

If you mount the mainframe in an equipment rack or cabinet with other heat producing equipment, provide adequate space between the units. Otherwise, the equipment may become too warm.

If a rack or cabinet contains several amplifiers, you may need to check the ambient air temperature. To determine the ambient air temperature, operate the system until the temperature stabilizes. Measure the ambient air with a bulb-type thermometer held at the bottom of the uppermost amplifier.

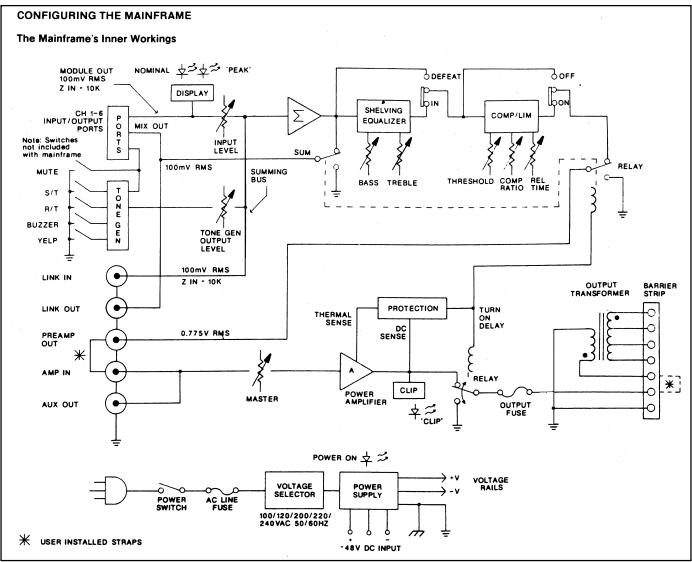


Figure 5. Block Diagram of 1707C / 1715C Mixer/Power Amplifiers

CAUTION

Don't let the thermometer bulb touch the metal chassis. The chassis might be hotter than the ambient air.

CAUTION

If the air temperature exceeds 60°C (140°F), place the equipment farther apart or <u>install a blower</u> to provide air movement within the cabinet. Make sure you don't block the air intake holes located on the bottom of the chassis or the exhaust holes on the top cover.

Figure 5 above displays a block diagram of the mixer/power amplifier mainframe. Study it carefully. To use the system's full capabilities, you'll need a good understanding of the inner workings of the mainframe. Brief explanations of how the inside of the mainframe works follow in the text below.

The signal coming from each additional input module simultaneously routed to the mixer/power amplifier's front-panel nominal/peak LED indicators and to the input channel level

controls. The dual LED nominal/peak displays are pre-fader and designed to monitor the output level from the corresponding input module. The nominal (green) LED indicators have an approximate 10 dB window over which they will illuminate. This makes it easy to properly adjust the gain for each input module while efficiently using the rest of the system in terms of performance and headroom.

The mixer/power amplifier then sums the signal at the wiper of each input channel level control into a true virtual ground summing node or bus. The summing amplifier has eight input channels - input channels one through six on the front panel, tone generator output, and the link input or LINK IN on the rear panel. The summing amplifier's output signal drives the link output, or LINK OUT, located on the rear panel of the mainframe. The E.Q. and compressor/limiter sections are in series with each other, as shown in Figure 5. The compressor/limiter's output signal drives the preamplifier output, or PREAMP OUT, located on the rear panel which then provides the input signal to the main amplifier section.

The BASS and TREBLE E.Q. controls are ideally suited to make adjustments to the overall response of the mix. The low and high frequency shelving equalizers provide ±12 dB of boost

and cut with the maximum boost occurring at 100 Hz and 10kHz respectively.

The compressor/limiter section features variable release time, compression ratio, and threshold. The circuit uses a feed-forward topology that will minimize level differences for a more nearly constant output level. The compression ratio can approach \S :1, and the attack time is fixed at approximately 10 ms.

The main amplifier section protects itself and the load against radio frequency interference, spurious oscillatory waveforms, excessive temperatures, direct current, turn-on/turn-off transients, and excess voltage/current phase shift due to reactive loading.

A signal overload circuit monitors the level at the output stage of the amplifier section. The front-panel CLIP LED indicator illuminates when signal levels are high enough to cause significant output clipping.

A dual slope V-I limiter protects the output devices. It keeps the output devices operating within their SOA (safe operating area) as defined by the device manufacturer.

A special integrated circuit function block monitors the heatsink temperature, powersupply voltage, and the amplifier's output. When it detects a problem, it immediately disengages the output relay.

Output Connections (1707C/1715C Only)

Make output connections to the seven-terminal barrier strip connector located on the lower-left side of the mainframe's rear panel.

The **1707C** main output connections include an 8 ohm direct output (24.5 vrms) and three transformer balanced outputs; 4 ohm (17.4 vrms), 25 vrms (8.3 ohm), and 70.7 vrms (66.6 ohm).

The **1715C** main output connections include a 4 ohm direct output (24.5 vrms) and a 25 vrms (4.2 ohm), an 8 ohm (34.6 vrms), and a 70.7 vrms (33.3 ohm) balanced transformer output. Refer to Figure 6 for a display of the direct output connections and Figure 7 to see the transformer output connections.

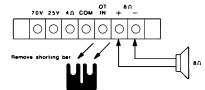


Figure 6. Direct Output Connections

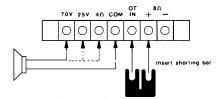


Figure 7. Transformer Output Connections

To use a transformer balanced output, install a U shorting bar between the direct (+) output and the output transformer's input (OT IN).

NOTE:

When using the output transformer, you may use any combination of output connections as long as the total connected load does not consume more than 75 watts for the 1707C or 150 watts for the 1715C.

Output Fuse: A fuse in series with the output of the amplifier section protects the amplifier from excessive current consumption by a load. If this output fuse blows, replace it only with a fuse that matches the same type and rating as silkscreened on the rear panel of the unit. If the fuse continues to blow. check the load to see if it shorted or is exceeding the rated power consumption. If the problem continues, have a qualified service technician service the unit.

Mute/Tone Generator Connections

The seven-lug screw terminal connector located on the mid-left rear of the mainframe provides access to the system mute and tone generator. For connection details, refer to Figure 8.

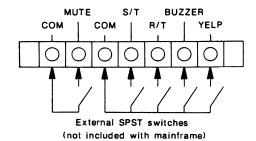


Figure 8. Mute/Tone Generator Switch Connections

A switch closure between the mute and common (COM) terminals will mute any input modules configured in the slave mode. You can use the remaining switches to select one of the following sounds:

A single-tone chime (S/T),

A repeating-tone chime (R/T),

A buzzer, or

A yelp (siren).

For the duration of a tone, the tone generator automatically mutes any input modules configured in the slave mode.

Output-Level Control:

The tone generator's output-level control is conveniently located on the rear panel of the mainframe. To increase the tone generator's output level, rotate the screwdriver-slotted control shaft clockwise.

NOTE:

Optional External Mute, (connected at the factory) allows external muting of the tone generator. If disconnected, the tone generator cannot be externally muted.

Resistance Effects of Long-Cable Runs on Mute/Tone Generator Circuits:

Table 3 shows the maximum allowable cable resistance (total resistance) that the mixer/power amplifier can support. Resistances greater than these values, resulting from excessively long-cable runs or small gauge wire, may cause the mute or tone generator circuitry to fail to operate. Please make sure all cable resistances are less than the values shown in Table 3.

Table 3. Maximum Allowable Cable Resistances

Function	Resistance (ohms)
S/T Chime	13 k
R/T Chime	15.8 k
Buzzer	8 k
Yelp	8 k
Mute	8 k

LINK IN/LINK OUT Connections

The LINK IN/LINK OUT phono connectors on the mid-rear panel of the mainframe permit you to dynamically *link* two or more systems together. If you require more channels, the **1707C/1715C** mixer/power amplifiers are fully compatible with **1700C** mixer/preamplifier.

The signal appearing at the LINK OUT connector is the summation of all input channels as mixed by the input channel level controls. LINK IN is a direct input to a system's mixing amplifier; it's also a seventh input channel.

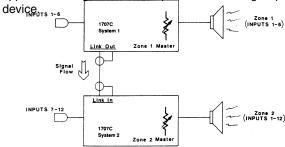
To link two units together, connect LINK OUT of system one to LINK IN of system two. System two will now control the mix of up to twelve input channels. Please refer to Figure 9 for typical linking connections.

NOTE:

The LINK OUT signal is not affected by the compressor/limiter or the E.Q. circuits.

PREAMP OUT/AMP IN CONNECTIONS

The PREAMP OUT signal is a mix of all input channels processed by the compressor/limiter and tone control circuits. Normally, you would insert a U shorting bar between the PREAMP OUT and AMP IN phono connectors on the rear panel. However, you can remove the shorting bar to patch in an external equalizer or other signal processing device with a proper level match of 0.775 vrms nominal. Figure 10 shows a typical application using an external equalizer or other signal processing



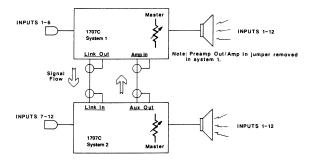


Figure 9. Typical Linking Connections

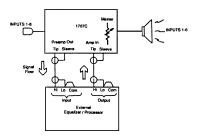


Figure 10. Patching an External Equalizer or Other Signal Processing Device

AUX OUT CONNECTIONS

The auxiliary output (AUX OUT) phono connector on the rear panel is wired directly (internally) to the AMP IN phono connector. You can use it to drive a second amplifier or a tape recorder. Please refer to the **1707C/1715C** mixer/power amplifier's block diagram shown in Figure 5.

BATTERY INPUT CONNECTIONS

You can power a system from the battery input connector for auxiliary operation or standby switchover. The battery input connector is the three-terminal barrier strip located on the upper-left rear panel of the mainframe. The system requires two ±48V DC battery power sources.

To connect the battery backup system to the three-terminal barrier strip, follow the three steps shown in Figure 11.

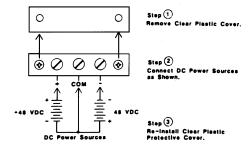
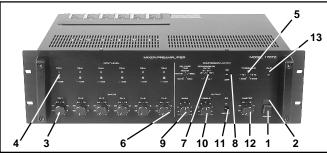


Figure 11. Battery Input Connections

FRONT/REAR-PANEL CONTROLS, SWITCHES, INDICATORS. AND CONNECTORS

Figure 12 below displays the front panel on the mixer/power amplifier with numbers that point at each control, indicator, and switch. You can find the corresponding number and name description for each control, switch, or indicator in the text below.

Figure 12. Front-Panel Control, Switches, and Indicators for the 1707C



INITIAL SETUP AND OPERATION OF

Item	Name	Function/ Description
1	POWER Switch	Applies primary power. Two-position push-push switch for on/off mode.
2	ON LED Indicator	Illuminates red display on POWER switch when you turn on power.
3	CH 1- 6 Controls	INPUTS: Continuously variable potentiometers graduated from ∞ to 0 dB. You can increase or decrease level for each corresponding inputchannel. Rotateclockwise to increase level and counterclockwise to decrease level.
4	Green/Red Dual LED Indicators	INPUT LEVEL: Displays nominal (green) and peak (red) indication for each channel.
5	THRESHOLD Control	COMPRESSOR/LIMITER: Continuously variable potentiometer. Determines the level at which limiting begins.
6	RELEASE TIME Control	Continuously variable potentiometer. Determines the required for the system to return to normal after signal falls below threshold.
7	COMPRESSION RATIO Control	Continuously variable potentiometer. Determines the level exceeds the threshold, is set by the THRESHOLD control.
8	ON/OFF Switch	Places compressor/limiter circuit in or out of the signal path.
9	BASS Control	OUTPUT: Continuously variable potentiometer. Provides boost or cut in bass response. You can obtain normal or flat response at a zero setting. Rotate clockwise to boost response or counterclockwise to cut response.
10	TREBLE Control	Continuously variable potentiometer. Provides boost or cut in treble response. You can obtain normal or flat response at a zero setting? Rotate clockwise to boost response or counterclockwise to cut response.
11	EQ IN/DEFEAT Switch	Two-position switch . DEFEAT position disconnects BASS and TREBLE controls when appropriate for application. such as Acousta-Voicing. EQ IN connects the BASS and TREBLE controls.
12	MASTER Level Control	Continuously variable potentiometer graduated from ∞ to 0 dB. Use it to simultaneously increase or decrease all input channels. Rotate clockwise to increase level or counterclockwise to decrease level.
13	CLIP LED Indicator	Illuminates when an internal signal overload circuit detects high output signal levels that may cause output clipping.

MAINFRAME WITH MODULES INSTALLED

Initial Setup of an Input Module

You can buy and install the following input modules from ElectroVoice:

The 1781A programmable input module. The 1781AT programmable input module with 1785A input isolation transformer, and the 1780A and 1780AT mic/line input modules.

To initially set up an input module, follow these steps:

- Rotate the input module's gain control to the 12:00 o'clock (MID) position for planned microphone inputs or to the MIN (fully counterclockwise) position for line-level inputs. If the input type is unknown, rotate the gain control to the MIN position.
- 2. Rotate the high-cut (HF) filter to the FLAT position.
- Rotate the low-cut (LF) filter to the FLAT position.

Initial Setup of an Output Module

You can buy the **1783** line output module from ElectroVoice. This module can be installed with or without the optional 1786 output isolation transformer (also available from Altec Lansing). To initially set up an output module, rotate the output module's output level control (labeled GAIN on the rear panel) to the MIN position.

Initial Setup of the Mainframe

- Rotate the MASTER output level control on the front panel of the mainframe to the position (fully counterclockwise).
- Set the compressor/limiter ON/OFF switch to the OFF position.
- 3. Set the tone control **EO IN/DEFEAT** switch to the DEFEAT position.

Operating the 1700 Series Mixer/Power Amplifiers

 Connect a source representative of the type of input signal to one of the input module positions, if any. Slowly rotate the input module's gain control clockwise until the mixer/ power amplifier's green LED display (-10 dB) on the input-level front panel section fully illuminates. This is the nominal level for providing the most efficient performance and headroom.

The mixer/power amplifier's red LED display may briefly illuminate on signal peaks. This is permissible as long as it does not flash more than fifty percent of the time. If it does, reduce the gain of the input module by rotating its gain control counterclockwise or use an external pad.

NOTE:

The LED display precedes each frontpanel input-level control. As a result, it will always indicate the nominal and peak levels regardless of input channel settings. Please refer to the mainframe block diagram shown in Figure 5.

Table 4 below lists the function/descritption of each connector or control on the rear panel on the mixer/power amplifier.

Table 4. Rear-Panel Control and Connectors for the 1707C

Name	Function/Description
Blank Cover Panel	Covers connector mounting holes. Protects against internal voltages when not using port and connector.
LINK OUT Connector	Combine two units together by connecting LINK OUT of system one to LINK IN of system two. This is an RCA-type phono connector.
LINK IN Connector	Provides a direct input to the amplifier. This is an RCA-type phono connector (ref. 1 kHz, 100 mvrms).
PREAMP OUT Connector	Use to patch auxiliary equipment between unit's mixer and power amplifier. PREAMP OUT is normally strapped to AMP IN. The PREAMP OUT connector precedes the front-panel MASTER level control. This is an RCA- type phono connector.
AMP IN Connector	Provides a direct input to the amplifier. This is an RCA-type phono connector (ref. 1 kHz, .775 mvrms).
AUX OUT	Connector Provides an auxiliary output of the signal appearing at the amplifier's input. This is an RCA-type phono connector.
Seven-Lug Screw Terminal Connector	Permits connection of external switches to operate the system's mute and tone generator circuits.
OUTPUT LEVEL	Control Increase the output level of the tone generator by rotating the screwdriver-slotted control shaft clockwise. To decrease the output level, rotate it counterclockwise.
Seven-Terminal Barrier Strip Connector (1707C/1715C 0nly)	Permits connection of various loads to the amplifier.
U Shorting Strip	Connects output of amplifier to input of output transformer. When in place, use only the transformer outputs.
OUTPUT FUSE	Protects load against excessive current from amplifier. Replace only with the same fuse type and power rating.
Battery Input Connector	Use to power system from battery supply for auxiliary operation or standby switchover. Requires one ±48V DC battery power source, 1.5 amps maximum for the 1707C and 3 amps for the 1715C.
AC FUSE	Protects against excessive current drain from an alternating current source. Replace only with same fuse type and power rating.
GND	The ground terminal lets you connect auxiliary equipment to the mainframe.

- 2. Once the gain is set for each input module channel, rotate the front-panel input-level channel controls (CH 1-6) on the mixer/ power amplifier to their 12:00 o'clock (MID) position. Slowly increase the MASTER output level control on the front of the mainframe until you hear a normal operating level through the loudspeaker system. Then readjust the input-level channel controls slightly for the desired mix or blend of signals.
- Adjust the high-cut (HF) and low-cut (LF) filters on the input module as needed for the desired response. The widest possible bandwidth occurs when you rotate both of these controls to the FLAT position. This is the best setting for music. However, in speech-only channels, you should limit the bandwidth to help reduce noise and system feedback.
- To use the mixer/power amplifier's output tone-control section, move the two-position EQ IN/DEFEAT slide switch to the EQ IN position. Then adjust the BASS and

TREBLE controls for the desired response. From a center or 12 o'clock (MID) position, rotate either control clockwise to boost response or counterclockwise to cut response. If using the tone-control section is inappropriate for current applications, such as Acousta-Voicing, move the EQ IN/DEFEAT slide switch to the DEFEAT position. This disconnects the BASS and TREBLE controls.

To use the compressor/limiter section, follow this procedure:

Move the slide ON/OFF switch to the ON position.

Rotate the RELEASE TIME control to its maximum position (full clockwise).

Rotate the **COMPRESSION RATIO** control to minimum position (full counterclockwise).

Rotate the **THRESHOLD** control to its 12 o'clock (MID) position.

Begin increasing the compressor/limiter by rotating the COMPRESSION RATIO control clockwise until you achieve the desired amount of compression or limiting. Since the amount of compression or limiting depends on the incoming signal level, you may need to readjust the THRESHOLD control. To lower the triggering threshold, rotate the THRESHOLD control counterclockwise. If the system requires a higher incoming signal level to trigger the compressor/limiter, raise the threshold by rotating the THRESHOLD control clockwise.

NOTE:

A high compression ratio and a low threshold setting may decrease the system's apparent loudness since peak signals and parts of the nominal signal may be above the threshold. You can correct this by raising the threshold level; just rotate the THRESHOLD control clockwise.

6. If you installed the 1783 line output module, adjust the output level control on the 1783 for the desired output level. The higher the output level, the better the signal-to-noise ratio. However, too high a level reduces the available headroom and may cause premature clipping.

NOTE:

If you set the 1783's output level control at its MAX (full clockwise) level, the output level is +8dBm. However, this level only applies if you use a 100 mvrms reference level on the input of the output module from the mix output bus. It also only applies if you have a balanced 600 S2 load.

1781 Mic/ Line Input Module

DESCRIPTION

The ELECTRO-VOICE 1781A program mable input module accepts either mic or line level signals through a wide variety of connector interfaces. Standard features include an electronically balanced input stage with adjustable gain, continuously variable high and low pass filters, RFI protection, 36 volt phantom powering two levels of muting, and remote control capability. Programming is accomplished with plug-in jumpers which may select phantom power (on or off), mute priority or slave, or remote volume control. ELECTRO-VOICE also offers the 1781AT, a programmable input module with a Transformer installed.

INSTALLATION OF OPTIONAL 1785A INPUT ISOLATION TRANSFORMER

- Remove the two wire jumpers with ferrite beads, designated FB1 and FB2, near the upper right corner of the module when looking at the component side of the circuit board. Refer to Figure 1 for details.
- Thread the four wires from the transformer through the larger center hole from the component side. Secure the transformer with the two screws and washers provided.
- 3. Lay the module on the component side (circuit side up) and attach the four wires as shown in Figure 2.

CONFIGURING THE 1781A

A block diagram of the **1781A** input module is shown in Figure 3. Study the diagram carefully and refer to it as needed.

PROGRAMMING THE 1781A

Mute"Priority" Mode of Operation

In the priority mode, a signal applied to the designated priority channel will cause all other input channels configured in the slave mode to be fully attenuated.

To configure an input module for the priority mode, install a 2-pin female jumper onto J4, the 2-pin male header connector located near the lower right corner of the module as shown in Figure 1.

Any number of channels can be configured in the priority mode, however, activity in one priority channel will not attenuate the other priority channels.

Mute "Slave" Mode of Operation

In the slave mode, a module (or all slave modules) will be fully attenuated either during activity in the priority channel, switch closure between the MUTE and COM (common) terminals of the 7-lug screw terminal connector located on the rear of the mainframe, or a switch closure between the common and any one of the tone generator control inputs (for the duration of the tone).

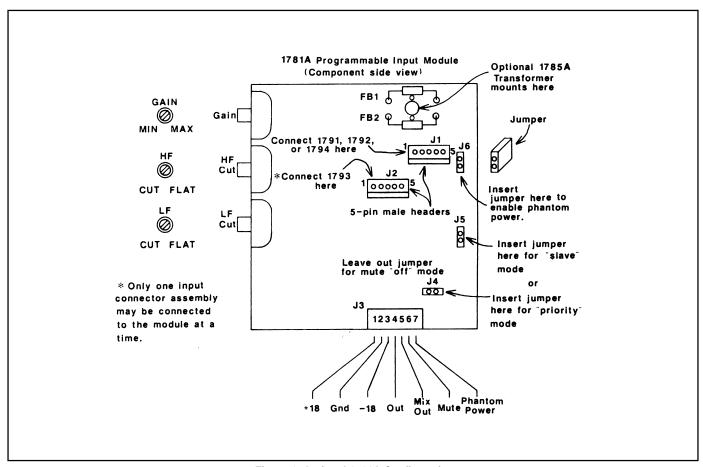


Figure 1. Optional 1781A Configuration

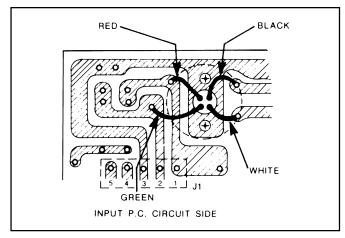


Figure 2. 1785A Input Transformer Connections

To configure the module for the slave mode, install a 2-pin female connector onto J5, the 2-pin male header connector located near the right edge of the module as shown in Figure 1.

Mute "Off " Mode of Operation

By not installing a jumper in either the priority (J4) or slave (J5) position, the channel can not be muted, or cannot mute other channels.

Phantom Power

To enable phantom powering of condenser microphones, install a 2-pin female jumper onto J6, the 2-pin male header connector located near J1 as shown in Figure 1. This will apply +36 VDC to each side ("+" and "-") of the microphone's signal lines.

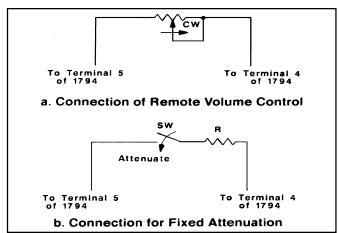


Figure 4. Remote Volume Control Applications

REMOTE VOLUME CONTROL CONFIGURATIONS

Remote Volume Control Connections

A remote volume control (RVC) may be used with the **1794** 5-lug screw terminal connector assembly to vary the output level of the input module. The resistance setting of a potentiometer determines the amount of attenuation in the voltage -controlled attenuator (VCA). Since only DC is present on the potentiometer (no audio signal), the pot may be located long distances from the mainframe. The RVC function is usable regardless of the mute circuit's mode of operation.

To implement a remote volume control, connect an audio taper potentiometer (10 kohm or greater) between pins 4 and 5 of the **1794**. Refer to Figure 4a.

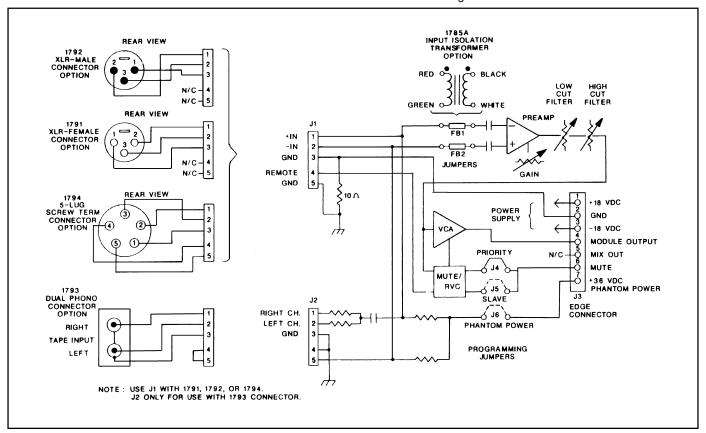


Figure 3. Block Diagram of the 1781A Input Module

Alternative Configurations Using the RVC Circuitry for Preset Attenuation

A variation of the remote volume control is shown in Figure 4b. A switch in series with a fixed value resistor "R" may be used to attenuate (or mute) the channel to a predetermined level. If the resistor is removed and replaced with a zero ohm jumper, a switch closure will fully attenuate the channel. Table 1 shows typical attenuation values expected for various values of resistor "R".

NOTE:

VR001 (located near J1) calibrated for 60 dB of attenuation, with pins 4 & 5 of the 1794 shorted.

Simultaneous Remote Volume Control of Several Input Modules

It is possible to parallel pins 4 and 5 of several **1794** 5-lug screw terminal connectors to permit one potentiometer (connected between the pins 4 and 5) to control the modules simultaneously. This technique works reasonably well with an audio taper potentiometer 10 kohm or greater). To insure that the channels track throughout the range of attenuation, each module's attenuation-adjust potentiometer, VR001, should be adjusted for the same maximum attenuation.

Table 1. Resistance Table for Fixed Attenuation

Amount of Attenuation	Approximate Value of R (1/4 W)			
(±2 dB Typ.)	1%	5%		
10 dB	2.80 kohm 2.7 kohm			
20 dB	1.50 kohm 1.5 kohm			
30 dB	887 ohm 910 ohm			
40 dB	511 ohm 510 ohm			
50 dB	191 ohm 200 ohm			
60 dB	0 ohm	0 ohm		

Connector Options for the 1781A

The *1781A* programmable input module has two 5-pin male header connectors (J1 and J2) which are used to interface the 1790-series of connector assemblies. Due to circuit differences between a balanced mic input ("+" and "-") and a tape input (L and R), use J1 with the *1791*, *1792*, or *1794*. Connector J2 should only be used with the *1793* dual phono connector. Please refer to Figures 1 and 3 for additional information.

NOTE:

When using the 1793 dual phono connector assembly, insure that the phantom powerjumper is removed from J6.

The pinouts of the connectors are shown in Table 2. Figure 5 shows how external equipment may be connected to the **1781A** through the various connector choices.

Table 2. Connector Assembly Wiring

	1791	1792	1794
Pin No.	XLR-F	XLR-M	5-lug screw term.
1	Gnd (Shield)	Gnd (Shield)	Gnd (Shield)
2	+ in (Hi)	+ in (Hi)	+ in (Hi)
3	- in (Lo)	- in (l.,o)	- in (Lo)
4	Shell (Chas)	Shell (Chas)	RVC
5	N/A	N/A	RVC Gnd

NOTE:

Only one input connector assembly may be used with the 1781A programmable input module at a time.

Use of High Line Level Input Signal switch the 1781A

The sensitivity of the electronically balanced input stage at minimum gain is approximately 100 mVrms. Therefore it may be necessary to pad the incoming line if its nominal level exceeds -18 dBu 100 mVrms), or -28 dBu (30 mVrms) when using the **1781AT** refer to Table IV for a suggested pad and the required attenuation for various input levels.

Alternatives to the External Resistive Pad

The ferrite beads, FB1 and FB2, can be replaced by resistors. For example, replacing the ferrite beads with 91 kohm resistors will reduce the sensitivity by nearly 20 times (at minimurn gain) enabling a nominal level of +8 dBu. (1.95 Vrms) to produce rated output from the module (100 mVrms). Refer to Table 3 for the approximate resistor values required for other input levels.

Table 3. Resistor Replacements for FB1 & FB2 to Reduce Sensitivity of 1781A

Nominal Input Level (dbu)	Replace FB1 & FB2 with values below
+8	91 kohm
+2	47 kohm
-2	30 kohm
-6	5.1 kohm
-10	4.3 ohm

If the **1781AT** is used, it is also possible to select a resistor from Table IV and connect it between pins 4 and 5 of the **1794** 5-lug screw terminal connector (or directly to J1-4 and J1-5 on the printed circuit board). This technique works by increasing the attenuation in the VCA. It should not, however, be used on input signal levels above -2 dBu. With higher levels (requiring more attenuation in the VCA), the distortion through the VCA increases. Therefore, if the application requires that the input module handle nominal line levels in excess of -2 dBu, the external resistive pad offers the best performance.

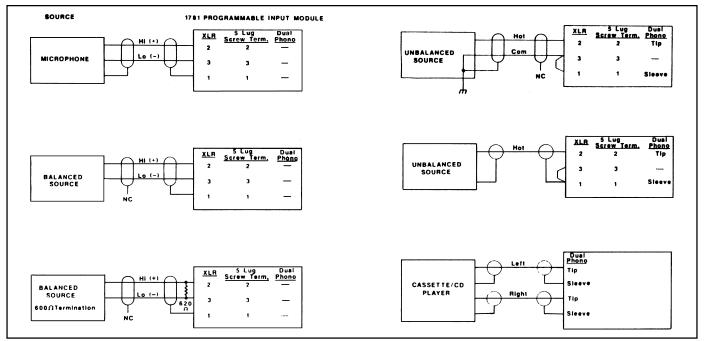
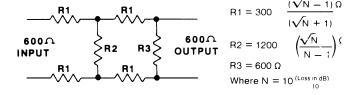


Figure 5. Typical Input Module Connections

Table IV Attenuator Pad Resistance Values

		Electronically Balanced Input 1781A Resistor Values for Pad (in ohms)						
Signal	Amount of	F	R1	F	R2		R3	
Level	Attenuation	1%	5%	1%	5%	1%	5%	
-18 dBu	None							
-8 dBu	10 dB	154	150	422	430	604	620	
-4 dBu	14 dB	200	200	249	240	604	620	
0 dBu	18 dB	232	240	154	150	604	620	
+10 dBu	28 dB	274	270	47.5	47	604	620	
		Electronically Balanced Input 1781AT Resistor Values for Pad (in ohms)						
Signal	Amount of	F	R1		R2		R3	
Level	Attenuation	1%	5%	1%	5%	1%	5%	
-28 dBu	None			-				
-18 dBu	10 dB	154	150	422	430	604	620	
-8 dBu	20 dB	243	240	121	120	604	620	
-4 dBu	24 dB	261	270	75	75	604	620	
0 dBu	28 dB	274	270	47.5	47	604	620	
+10 dBu	38 dB	294	300	15	15	604	620	



SPECIFICATIONS

1781A PROGRAMMABLE INPUT MODULE	
Gain: 0 dB to 50 dB, contin	•
10 dB to 60 dl	B W/1/85A
Input Sensitivity:	
(Ref. 1 kHz, 0 dBr = 100 mVrms output, 10 kC	load)
Without 1785A: 0.3 mVrm	s to 100 mVrms
(-50 dBr t	o 0 dBr)
With 1785A : 0.1 mVrr	ns to 30 mVrms
(-60 dBr	or -10 dBr)
Input Impedance: (Ref. 1 kHz)	
Electronically balanced:	>8 kohm
Transformer balanced: 200 c	
With 1793 installed:	>39 kohm
Frequency Response: (Ref. 1 kHz, 100 mVrr	ms output. 10
kohm load)	
Without 1785A:	
±1 dB (Minimum gain):	20 Hz to 40 kHz
±1 dB (Maximum gain):	
±3 dB (Minimum gain):	
±3 dB (Maximum gain):	
With 1785A:	
±1 dB (Minimum gain):	00 Hz +0 0E kHz
±1 dB (Maxim.um gain):	
±3 dB (Minimum gain):	
±3 dB (Maximum gain):	
Total Harmonic Distortion (THD):	20 112 to 50 Ki iz
(Ref. I kHz, 100 mVrms output, minimum gain,	10 kl 2 load 30
kHz low pass filter)	, 10 ALL 1044, 00
20 Hz to 20 kHz:	<0.03%
Equivalent Input Noise:	
Equitatoric input Holde	\ 120 abi

(Ref. 0 dBr = 100 mVrms output, 10 kohm load, 2000 ohm input

termination maximum gain, A-weighted)

High Pass Filter (Low Cut):
(Ref., 100 mVrms output, minimum gain, 10 kQ load)
FI: 320 Hz (>10 dB at 100 Hz)
Slope: 6 db/oct (20 db/dec)
Low Pass Filter (High Cut):
(Ref. 100 mVrms output, minimum gain, 10 kQ load)
FI: 5 kHz (>6 dB at 10 kHz)
Slope: 6 dB/oct (20 dB/dec)
Attenuation:
(Ref. 1 kHz, 100 mVrms output, 10 kohm load)
Mute:>60 dB
10 kohm remote
Optional Accessories:
1785A Input Isolation Transformer
1785A INPUT ISOLATION TRANSFORMER

Impedance Ratio: 600il: 10	kil
(Primary: Secondar	ry)
Frequency Response (Ref. I kHz, 100 mVrms output)	• •
±1 dB: 40 Hz to 20 kH	Ηz
±3 dB: 20 Hz to 40 kH	Ηz
Total Harmonic Distortion (THD): (Ref 1 kHz, 100 mVn	ns
output)	
50 Hz - 20 kHz:<0.2	%
Insertion Loss:<1 c	Яk
(Ref. 1 kHz, 100 mVrms output)	
Included Accessories:	
2 - Mounting screws	
1 - Flat washer	

1783 Line Output Module

Voltage Gain: 10 dB

CONFIGURING THE 1783

A block diagram of the **1783** line output module is shown in Figure 1. Study and refer to the diagram as needed during the following sections.

CONNECTOR OPTIONS FOR THE 1783 LINE OUTPUT MODULE

The **1783** line output module can use any of the **1790**-series connector assemblies. The connector assembly wiring is shown in Table 1. A detailed drawing showing typical output module connections to external equipment is shown in Figure 2.

Table 1. Connector Assembly Wiring

	1791	1792	1794
Pin No.	XLR-F	XLR-M	5-lug screw term
1	Gnd (Shield)	Gnd (Shield)	Gnd (Shield)
2	+ In (Hi)	+ In (Hi)	+ In (Hi)
3	- In (Lo)	- In (Lo)	- In (Lo)
4	Shell (Chas)	Shell (Chas)	RVC
5	N/A	N/A	RVC Gnd

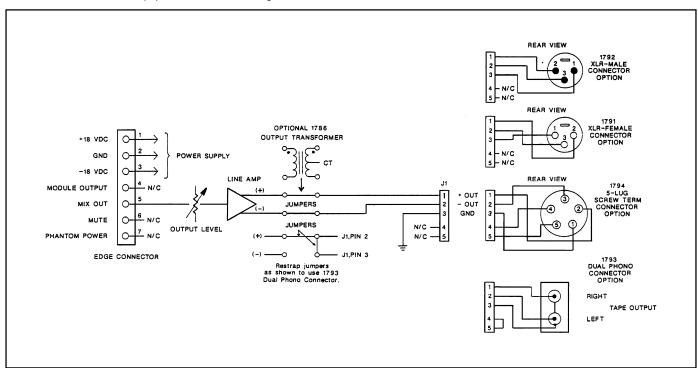


Figure 1. Block Diagram of the 1783 Line Output Module

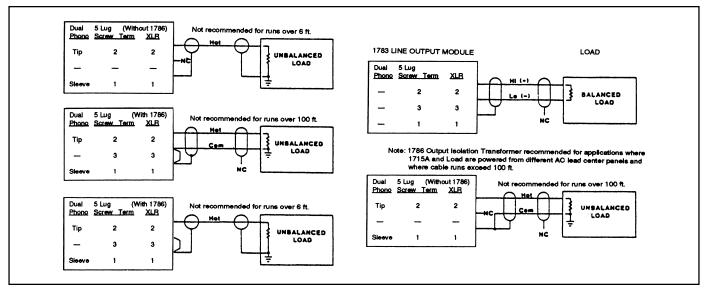


Figure 2. Block Diagram of the 1783 Line Output Module

The 1783 line output module has an electronically-balanced (differential) output providing high drive capability with low distortion.

It resembles a power amplifier's output in the bridge mode. If the output module is required to drive an unbalanced load, DO NOT strap the low side of the output (Pin 3 of 1791, 1792 and 1794) to ground. This could cause overheating and possible damage to the integrated circuit. Connect only between the "+" output (Pin 2) and ground (Pin 1). This will result in a 6 dB decrease in output level (or a 3 dB decrease in output power). However, the output level control can easily compensate for the loss.

When using the 1793 dual phono connector, it is necessary to restrap the inverting "-" output jumper wire (connected to the

operational amplifier's inverting output) to the amp's non-inverting output. This will put the same polarity signal on both phono connectors. Refer to Figures 1 and 3 for additional information.

INSTALLATION OF OPTIONAL 1786 OUTPUT ISOLATION TRANSFORMER

The following outlines the installation of the 1786 transformer:

- Remove the two wire jumpers near the lower left corner of the module. Refer to Figure 3.
- 2. Install the **1786** output isolation transformer in the position shown in Figure 3.
- 3. Lay the module on the component side (circuit side up) and solder the transformer in place.

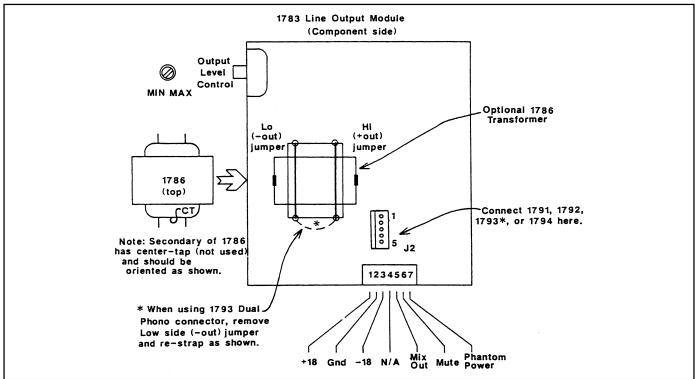


Figure 3. Optional 1783 Configuration Layout Guide

VOX GATE

DESCRIPTION

The ELECTRO-VOICE **1781A** programmable input module can be modified to become a current controlled gate with a adjustable threshold. There are two applicable modifications, A and B. The A modification will stand alone (gated only by its input). The B modification will be gated by the external mute, and/or other B modified modules.

The advantages to using the VOX GATE modification is to reduce or eliminate noise on open microphone lines. The VOX GATE supresses extraneous noise from entering mixer inputs from open microphone lines or from inactive microphones. This results in increased quietness of sound systems of all sizes. After installation of the VOX GATE modification a 1781A or 1781AT will operate within all of the original specifications.

MODIFICATION A (refer to Figure 1):

- 1. Remove capacitor C001 (47 mF) and C002 (.01 mF).
- 2. Remove resistor R101 (47 kohm).
- 3. Remove resistor R113 (10 kohm)
- 4. Connect a resistor from the junction of C102/R101 and the junction of C224 (negative side) and MCL703C (resistor value will depend on the required threshold, from 5 kohms to 50 kohms, refer to Figure 1 and Table 1).
- Place a jumper trace across transistors Q103 and Q105 (PNP 2SC1815Y) collectors.
- 6. Priority jumper must be removed.

modification B (reference Figure 1):

- 1. Remove capacitor C001 (47 mF) and C002 (.01 mF).
- 2. Remove resistor R101 (47 kohm).
- 3. Remove resistor R113 (10 kohm).
- 4. Connect a resistor from the junction of C102/R101 and the junction of C224 (negative side) and MCL703C (resistor value will depend on the required threshold, from 5 kohm to 50 kohm, refer to Figure 1 and Table 1).
- Place a jumper trace across transistors Q103 and Q105 (PNP 2SC1815Y) collectors.
- 6. Priority jumper must be in place.

Table 1. Threshold Sensitivity Resistive Value Reference: 1 kHz, 1781A (-18 dBu = 0 dBr In, Linkout 100 mVrms 10 kohm Load). 1781AT (28 dBu = 0 dBr In, Linkout 100 mVrms 10 kohm Load.

Threshold Sensitivity dBr ± 1 dB	R101 Value in Ohms ± 1 db
21.50 dBr	4.99 kohm
17.75 dBr	10. 0 kohm
13.25 dBr	20.0 kohm
10.25 dBr	30.1 kohm
8.00 dBr	40.2 kohm
6.25 dBr	49.9 kohm

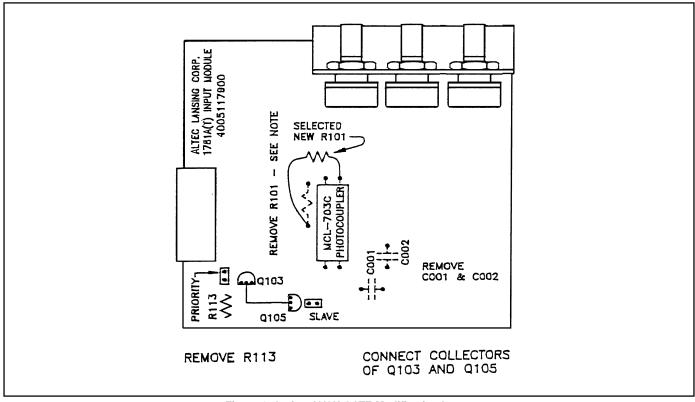


Figure 1. Optional VOX GATE Modification Layout

 USA
 12000 Portland Ave South, Burnsville, MN 55337, Phone: 952-884-4051, Fax: 952-884-0043

 Canada
 705 Progress Avenue, Unit 46, Scarborough, Ontario, Canada, M1H2X1, Phone: 416-431-4978, 800-881-1685, Fax: 416-431-4588

 Germany
 Hirschberger Ring 45, D9431f, Straubing, Germany, Phone: +49 9421-706, Pax: +49 9421-706 287

 France
 Parc de Courceirin, Allee Lech Walesa, Lognes, 77185 Marne la Vallee, France, Phone: +33 1 6480-0909, Fax: +33 1 6480-4538

 Australia
 Unit 23, Block C, Slough Business Park, Slough Avenue, Silverwater, N.S.W. 2128, Australia, Phone: +61 2-9648-3455, Fax: +61 2-9648-585

 Hong Kom
 Unit E & F, 21/F, Luk Hop Industrial Blog, 8 Luk Hop St., San PO Kong, Kowloon, Hong Kong, Phone: +652-2351-3628, Fax: +652-2351-3628, Fax: +652-2451-56031

 Singapore
 3015A Ubi Rd 1,05-10, Kampong Ubi Industrial Estate, Singapore 408705, Phone: +65-746-8760, Fax: +65-746-1206

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