

Operating Manual

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# **Programmable Mic Processor**

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Models 787A and 787ASL

**orban**

**IMPORTANT NOTE:** Refer to the unit's rear panel for your Model #.

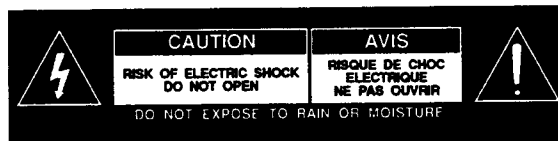
<b>Model Number:</b>	<b>Description:</b>
787A/U	Programmable Mic Processor 115V
787A/E	Programmable Mic Processor 230V
787A/UM	Programmable Mic Processor 115V Midi
787A/EM	Programmable Mic Processor 230V Midi
787A/U2	Programmable Mic Processor 115V RS232
787A/E2	Programmable Mic Processor 230V RS232
787A/U4	Programmable Mic Processor 115V RS422
787A/E4	Programmable Mic Processor 230V RS422
787A/UP	Programmable Mic Processor 115V Preamp
787A/EP	Programmable Mic Processor 230V Preamp
787A/UPM	Programmable Mic Processor 115V Preamp Midi
787A/EPM	Programmable Mic Processor 230V Preamp Midi
787A/UP2	Programmable Mic Processor 115V Preamp RS232
787A/EP2	Programmable Mic Processor 230V Preamp RS232
787A/UP4	Programmable Mic Processor 115V RS422
787A/EP4	Programmable Mic Processor 230V RS422
787ASL	Programmable Mic Processor Slave
787ASL/P	Programmable Mic Processor Slave Preamp
787ARC	Remote Control for 787A

### OPTIONS AVAILABLE

<b>Model Number:</b>	<b>Purpose:</b>
RET045	MIDI Serial Port
RET046	Mic Preamp (Jensen Design)
RET050	RS-232 Serial Port
SC2	Clear Security Cover

### MANUAL

<b>Part Number:</b>	<b>Description:</b>
95068-000-04C	787A Manual



**CAUTION:** TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

**WARNING:** TO REDUCE THE RISK OF FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.



This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure — voltage that may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Read the manual.

# IMPORTANT SAFETY INSTRUCTIONS

All the safety and operating instructions should be read before the appliance is operated.

**Retain Instructions:** The safety and operation instructions should be retained for future reference.

**Heed Warnings:** All warnings on the appliance and in the operating instructions should be adhered to.

**Follow Instructions:** All operation and user instructions should be followed.

**Water and Moisture:** The appliance should not be used near water (e.g., near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.).

**Ventilation:** The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

**Heat:** The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.

**Power Sources:** The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

**Grounding or Polarization:** Precautions should be taken so that the grounding or polarization means of an appliance is not defeated.

**Power-Cord Protection:** Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

**Cleaning:** The appliance should be cleaned only as recommended by the manufacturer.

**Non-Use Periods:** The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

**Object and Liquid Entry:** Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

**Damage Requiring Service:** The appliance should be serviced by qualified service personnel when:

- The power supply cord or the plug has been damaged; or
- Objects have fallen, or liquid has been spilled into the appliance; or
- The appliance has been exposed to rain; or
- The appliance does not appear to operate normally or exhibits a marked change in performance; or
- The appliance has been dropped, or the enclosure damaged.

**Servicing:** The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

**The Appliance should be used only with a cart or stand that is recommended by the manufacturer.**

## Safety Instructions (European)

**Notice For U.K. Customers If Your Unit Is Equipped With A Power Cord.**

**WARNING: THIS APPLIANCE MUST BE EARTHED.**

The cores in the mains lead are coloured in accordance with the following code:

GREEN and YELLOW - Earth      BLUE - Neutral      BROWN - Live

As colours of the cores in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The core which is coloured green and yellow must be connected to the terminal in the plug marked with the letter E, or with the earth symbol, (⏏), or coloured green, or green and yellow.

The core which is coloured blue must be connected to the terminal marked N or coloured black.

The core which is coloured brown must be connected to the terminal marked L or coloured red.

The power cord is terminated in a CEE7/7 plug (Continental Europe). The green/yellow wire is connected directly to the unit's chassis. If you need to change the plug and if you are qualified to do so, refer to the table below.



**WARNING:** If the ground is defeated, certain fault conditions in the unit or in the system to which it is connected can result in full line voltage between chassis and earth ground. Severe injury or death can then result if the chassis and earth ground are touched simultaneously.

CONDUCTOR		WIRE COLOR	
		Normal	Alt
L	LIVE	BROWN	BLACK
N	NEUTRAL	BLUE	WHITE
E	EARTH GND	GREEN-YELLOW	GREEN

**AC Power Cord Color Coding**

## Safety Instructions (German)

Gerät nur an der am Leistungsschild vermerkten Spannung und Stromart betreiben.

Sicherungen nur durch solche, gleicher Stromstärke und gleichen Abschaltverhaltens ersetzen. Sicherungen nie überbrücken.

Jedwede Beschädigung des Netzkabels vermeiden. Netzkabel nicht knicken oder quetschen. Beim Abziehen des Netzkabels den Stecker und nicht das Kabel erfassen. Beschädigte Netzkabel sofort auswechseln.

Gerät und Netzkabel keinen übertriebenen mechanischen Beanspruchungen aussetzen.

Um Berührung gefährlicher elektrischer Spannungen zu vermeiden, darf das Gerät nicht geöffnet werden. Im Fall von Betriebsstörungen darf das Gerät nur von befugten Servicestellen instandgesetzt werden. Im Gerät befinden sich keine, durch den Benutzer reparierbare Teile.

Zur Vermeidung von elektrischen Schlägen und Feuer ist das Gerät vor Nässe zu schützen. Eindringen von Feuchtigkeit und Flüssigkeiten in das Gerät vermeiden.

Bei Betriebsstörungen bzw. nach Eindringen von Flüssigkeiten oder anderen Gegenständen, das Gerät sofort vom Netz trennen und eine qualifizierte Servicestelle kontaktieren.

## Safety Instructions (French)

On s'assurera toujours que la tension et la nature du courant utilisé correspondent bien à ceux indiqués sur la plaque de l'appareil.

N'utiliser que des fusibles de même intensité et du même principe de mise hors circuit que les fusibles d'origine. Ne jamais shunter les fusibles.

Éviter tout ce qui risque d'endommager le câble secour. On ne devra ni le plier, ni l'aplatir. Lorsqu'on débranche l'appareil, tirer la fiche et non le câble. Si un câble est endommagé, le remplacer immédiatement.

Ne jamais exposer l'appareil ou le câble à une contrainte mécanique excessive.

Pour éviter tout contact avec une tension électrique dangereuse, on n'ouvrira jamais l'appareil. En cas de dysfonctionnement, l'appareil ne peut être réparé que dans un atelier autorisé. Aucun élément de cet appareil ne peut être réparé par l'utilisateur.

Pour éviter les risques de décharge électrique et d'incendie, protéger l'appareil de l'humidité. Éviter toute pénétration d'humidité ou fr liquide dans l'appareil.

En cas de dysfonctionnement ou si un liquide ou tout autre objet a pénétré dans l'appareil couper aussitôt l'appareil de son alimentation et s'adresser à un point de service après-vente autorisé.

## Safety Instructions (Spanish)

Hacer funcionar el aparato sólo con la tensión y clase de corriente señaladas en la placa indicadora de características.

Reemplazar los fusibles sólo por otros de la misma intensidad de corriente y sistema de desconexión. No poner nunca los fusibles en puente.

Proteger el cable de alimentación contra toda clase de daños. No doblar o apretar el cable. Al desenchufar, asir el enchufe y no el cable. Sustituir inmediatamente cables dañados.

No someter el aparato y el cable de alimentación a esfuerzo mecánico excesivo.

Para evitar el contacto con tensiones eléctricas peligrosas, el aparato no debe abrirse. En caso de producirse fallos de funcionamiento, debe ser reparado sólo por talleres de servicio autorizados. En el aparato no se encuentra ninguna pieza que pudiera ser reparada por el usuario.

Para evitar descargas eléctricas e incendios, el aparato debe protegerse contra la humedad, impidiendo que penetren ésta o líquidos en el mismo.

En caso de producirse fallas de funcionamiento como consecuencia de la penetración de líquidos u otros objetos en el aparato, hay que desconectarlo inmediatamente de la red y ponerse en contacto con un taller de servicio autorizado.

## Safety Instructions (Italian)

Far funzionare l'apparecchio solo con la tensione e il tipo di corrente indicati sulla targa riportante i dati sulle prestazioni.

Sostituire i dispositivi di protezione (valvole, fusibili ecc.) solo con dispositivi aventi lo stesso amperaggio e lo stesso comportamento di interruzione. Non cavallottare mai i dispositivi di protezione.

Evitare qualsiasi danno al cavo di collegamento alla rete. Non piegare o schiacciare il cavo. Per staccare il cavo, tirare la presa e mai il cavo. Sostituire subito i cavi danneggiati.

Non esporre l'apparecchio e il cavo ad esagerate sollecitazioni meccaniche.

Per evitare il contatto con le tensioni elettriche pericolose, l'apparecchio non deve venir aperto. In caso di anomalie di funzionamento l'apparecchio deve venir riparato solo da centri di servizio autorizzati. Nell'apparecchio non si trovano parti che possano essere riparate dall'utente.

Per evitare scosse elettriche o incendi, l'apparecchio va protetto dall'umidità. Evitare che umidità o liquidi entrino nell'apparecchio.

In caso di anomalie di funzionamento rispettivamente dopo la penetrazione di liquidi o oggetti nell'apparecchio, staccare immediatamente l'apparecchio dalla rete e contattare un centro di servizio qualificato.

Operating Manual

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# **Programmable Mic Processor**

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Models 787A and 787ASL

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# Programmable Mic Processor

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Models 787A and 787ASL

page	contents
1-1	<b>Section 1: Introduction</b> Orban's Programmable Mic Processor Applications, Security Registration, Warranty, Feedback
2-1	<b>Section 2: Installation</b> Installation of 787A Installation of 787ASL Slave Unit
3-1	<b>Section 3: Operation</b> Controls and Displays Operating Instructions Quick Reference, Preset Log
4-1	<b>Section 4: Maintenance</b> Routine Maintenance Getting Inside the Chassis Performance Evaluation, Alignment
5-1	<b>Section 5: Troubleshooting</b> Problems and Possible Causes Technical Support, Factory Service
6-1	<b>Section 6: Technical Data</b> Specifications Circuit Description Parts List, Schematics, Assembly Drawings Abbreviations

# Index

## A

abbreviations 6-70  
accessories 6-3  
alignment 4-3  
applications 1-4  
assembly drawings 6-40  
audio connections 2-9  
audio input 2-9, 2-10, 6-2  
audio output 2-9, 6-2

## B

balanced inputs 2-12  
balanced output transformer 2-10, 2-11  
block diagram, simplified 3-5  
buzzes 5-3

## C

cable 2-9  
shielding 2-9, 10, 2-12  
chassis  
getting inside 4-3  
ground 2-12  
circuit boards  
access to 4-3  
front panel 4-3  
circuit description 6-4  
circuit ground 2-12  
cleaning 4-2  
clicks 5-3  
clock circuit 6-5  
common-mode rejection 2-12  
component numbering system 6-4  
component vendors 6-39  
components, replacing 5-5  
compressor control 6-16  
connectors, audio 2-9  
covers  
replacing 4-3  
removing 4-3  
customer service 5-7

## D

DE-ESSER 6-19  
digital-controlled analog processing  
circuitry 6-8  
dimensions 6-2  
display  
circuit 6-7  
red zone 3-6

## E

effects send and receive 6-20  
equalizer 6-16

## F

factory service 5-7  
"flat" set-up 3-11  
frequency response 6-2  
front panel 1-2  
fuse 2-7, 6-2

## G

gain reduction display 3-6  
grounding 2-10, 2-12, 5-3  
difficult situations 2-13  
ground loop 2-12, 2-13

## H

hum 5-3  
humidity 6-2

## I

impedance  
load 2-11  
output 2-11  
input  
attenuator 6-14  
buffer 6-13  
level 2-9  
inputs, unbalanced 2-10, 11  
installation 2-1

## J

jumpers, access to 4-3

## M

maintenance, routine 4-2  
microcomputing circuitry 6-6  
microphone pre-amp 6-22  
MIDI option 6-9

## N

nastinesses, various 3-6  
noise 6-2  
noise gate 6-19

## O

opamps 5-3, 5-5  
options 6-3  
output  
level 2-9  
module 5-3  
problems 5-3  
overload indicator 6-21  
overload point (audio input) 2-9

## P

packing for shipment 5-7  
packing list 2-2, 2-14  
PEAK OUTPUT LEVEL metering 6-20  
performance evaluation 4-3  
power  
cord 2-7  
monitoring circuitry 6-5  
requirements 6-2  
supply 5-3, 6-21  
preset 0 3-11  
problems 5-2  
product features 1-3

## R

rack-mounting unit 2-6, 2-15  
rear panel 1-2  
registration card 1-6  
remote control option 6-11  
return authorization 5-7  
RFI 5-3  
RS-232 option 6-10

## S

schematics 6-40  
service 5-7  
shielding 2-10  
shipping  
damage 2-2, 2-14  
instructions 5-7  
specifications 6-2  
switch decoding 6-7

## T

temperature 6-2  
technical support 5-7  
troubleshooting 5-1  
components 5-5

## U

unbalanced input 2-10  
unbalanced load 2-11  
user feedback 1-6

## V

voltage-controlled amplifiers 6-14  
voltage regulators 5-3

## W

warranty 1-6

## X

XLR connectors 2-9



# Section 1

# Introduction

page contents

---

1-3	The 787A Orban Programmable Mic Processor
1-2	Fig. 1-1: Front and Rear Panels
1-4	Applications
1-5	Security
1-6	Registration, Warranty, Feedback

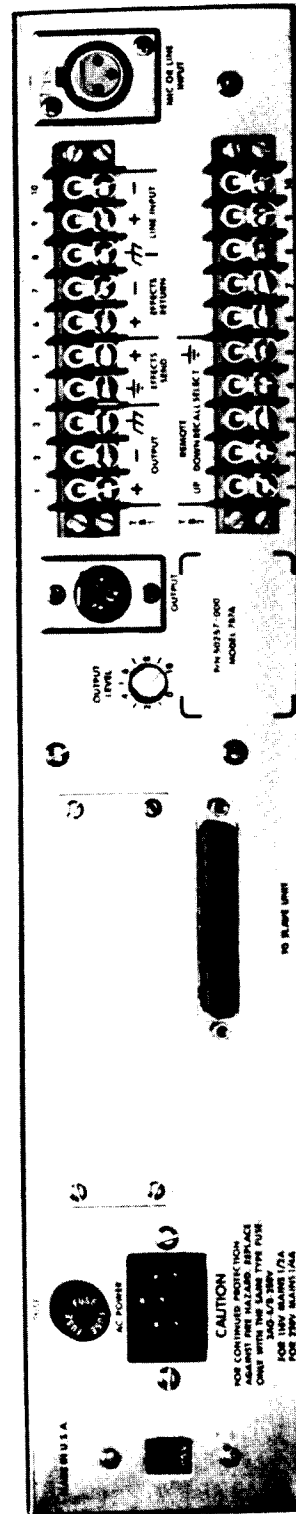
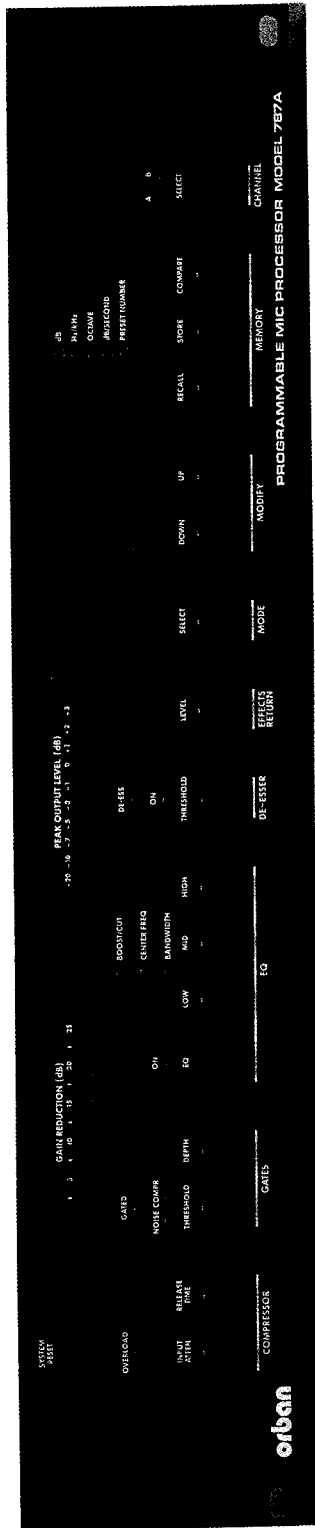


Fig. 1-1: Front and Rear Panels

## The Orban 787A Programmable Mic Processor

The Orban 787A Programmable Mic Processor integrates a three-band parametric equalizer, compressor, de-esser, noise gate, and compressor gate into one compact, powerful system. The optional 787ASL Slave unit provides a second channel of programmable mic processing for dual-mono or stereo operation.

787A Programmable Mic Processor features include:

- Instantaneous access to 99 user-programmed control setups.
- 3-band parametric equalizer with variable frequency, bandwidth, and boost/cut for precision control.
- Smooth compressor with adjustable release time to deliver maximum presence and “punch” while maintaining consistent levels.
- Full-function de-esser to help control excessive sibilance.
- Compressor gate to prevent rush-ups during pauses.
- Noise gate to attenuate noise by up to 25dB.
- Effects send-and-return with programmable return level to simplify integration of external reverb or “psychoacoustic exciter.”
- Digital display of current control settings.
- Easy-to-read bargraph displays of output and gain reduction levels.
- Memory protected by internal back-up battery.
- Security code to lock programming controls and prevent tampering.
- Optional MIDI or RS-232 interface.
- Optional basic remote control accessory with digital display.
- Line-level input standard; optional high quality transformer mic preamp with 48-volt phantom power.

## Applications

Orban's Programmable Mic Processor integrates a unique combination of processing functions in a fully-programmable package. Its flexibility and efficiency provide all the processing tools you need to precisely define the sound of DJs, announcers, narrators, singers, or certain musical instruments — and, when you've got the sound you want, the Programmable Mic Processor remembers the control settings so you can get exactly the same sound later, with the push of a button.

### **Broadcast Mic Processing**

Nearly any voice can be made more appealing by the judicious use of mic processing. Each voice at your station can be assigned a permanent set-up for each mic/studio combination for instant recall just before the voice airs. The Programmable Mic Processor gives you an important competitive edge by enabling you to get the sound you want quickly and consistently.

It can also dramatically improve the quality of phone line feeds for talk shows and remotes by making levels more consistent, improving frequency response, and reducing noise through gating.

### **Multi-Track Recording, Post-Production**

The 787A can increase efficiency and result in significant savings of time in recording and production facilities. If you often work with the same voice talent, you can conveniently store their personal "sound" in memory and quickly achieve satisfying results each time you record. Set-ups for instruments can also be reproduced quickly and efficiently. Less time will be spent on tuning processors, so more time can be devoted to getting better creative results.

The producer who moves from studio to studio knows that the final product can vary tremendously. The Programmable Mic Processor eliminates some of the uncertainty and variation in getting that special "sound." The professional artist can note the settings and the particular mic used for an especially satisfying session, and then use these as a reasonable starting point for processing when working in other studios or at live venues.

### **Installed Sound Systems and Live PA**

Why use daisy-chained signal processing when one unit will do? The Programmable Mic Processor takes up less rack space, guarantees that headroom will be used optimally to minimize noise and distortion, and ensures consistent quality. Performers can concern themselves with their performance, instead of worrying about the sound of the system. Pre-program the mic processing for each performer or set-up, then recall individualized processing for each performer with just the push of a button.

## Security

Access to the 787A's audio processing controls can be restricted to authorized users with a programmable security code. When the unit is locked, only those controls which recall and compare preset control settings, unlock controls, and reset the system will function.

If you have an optional 787ASL second channel unit connected to your 787A, the controls for both units are locked or unlocked simultaneously.

If remote control or the optional MIDI or RS-232 interfaces are installed, the 787A (and 787ASL) can be controlled externally even when the front-panel controls are locked.

In situations where it is desirable to limit access to *all* front-panel controls, an optional acrylic security cover can be installed. This arrangement might be appropriate, for example, when the 787A is being controlled entirely by remote control or through the optional MIDI interface. See page 3-12 for more information.

## Registration, Warranty, Feedback

### Registration Card

There are two good reasons for returning the Registration Card:

- 1) It enables us to inform you of new applications, performance improvements, and service aids that are developed, and
- 2) It helps us respond promptly to claims under warranty without having to request a copy of your bill of sale or other proof of purchase.

Please fill in the Registration Card and send it to us today. If it is lost (or you have purchased this unit used), please photocopy the duplicate below, fill it in, and send it to Orban at the address on the inside of the front cover.

### Registration Card

Model # \_\_\_\_\_ Serial # \_\_\_\_\_ Purchase Date \_\_\_\_\_

Your name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_ Telephone \_\_\_\_\_

Street \_\_\_\_\_

City, State, Mail Code (Zip), Country \_\_\_\_\_

Nature of your product application \_\_\_\_\_

How did you hear about this product? \_\_\_\_\_ Purchased from \_\_\_\_\_

Comments \_\_\_\_\_

\_\_\_\_\_

Which magazines do you find the most useful to your job?

<input type="checkbox"/> Audio	<input type="checkbox"/> Broadcast Engineering	<input type="checkbox"/> Broadcast	<input type="checkbox"/> dB Magazine
<input type="checkbox"/> Electronic Musician	<input type="checkbox"/> EQ	<input type="checkbox"/> Millimeter	<input type="checkbox"/> Mix
<input type="checkbox"/> Post	<input type="checkbox"/> Pro Sound News	<input type="checkbox"/> Radio & Records	<input type="checkbox"/> Radio World
<input type="checkbox"/> RE/P	<input type="checkbox"/> Sound & Communications	<input type="checkbox"/> S & VC	<input type="checkbox"/> TV Broadcast
<input type="checkbox"/> TVTech	_____	_____	_____
_____	_____	_____	_____

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### Warranty

The warranty, which can be enjoyed only by the first end-user of record, is stated on the separate Warranty Certificate packed with this manual. Save it for future reference. See page 5-7 for information about factory service.

### User Feedback Form

We are very interested in your comments about this product. Your suggestions for improvements to the product or the manual will be carefully reviewed. Use the postpaid User Feedback Form in the back of this manual — or write us at the address on the inside of the front cover. Thank you.

# Section 2

# Installation

page contents

---

2-2	Installation
2-3	Fig. 2-1: Option Jumpers
2-5	Fig. 2-2: Installation of 787ASL Connector in Host 787A
2-7	Fig. 2-3: AC Power Cord Color Code
2-9	Audio Wiring: Cable, Connectors, Levels
2-12	Grounding: Power, Circuit, Audio, Difficult Situations
2-10	Fig. 2-4: Some Possible Grounding Schemes
2-14	Installation of Optional 787ASL Slave Unit
2-17	Fig. 2-5: Option Jumpers

## CAUTION

The installation and servicing instructions in this manual are for use by qualified personnel only. To avoid electric shock do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.



# Installation

Allow about 15 minutes for installation.

Installation consists of unpacking the 787A, mounting it in a rack (if desired), and connecting audio and power. In addition, input or output levels can be changed, low- and mid-band equalization can be relocated to follow the compressor, and external remote control or effects processing can be connected. If the optional 787ASL second channel slave unit will be used, a connector to accommodate the 787ASL must be installed on the 787A's rear panel.

Installation instructions for the optional 787ASL slave unit begin on page 2-14.



### WARNING

This equipment generates, uses, and can radiate radio-frequency energy. If it is not installed and used as directed by this manual, it may cause interference to radio communications. This equipment complies with the limits for a Class A computing device, as specified by FCC Rules, Part 15, Subpart J, which are designed to provide reasonable protection against such interference when this type of equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference. If it does, the user will be required to eliminate the interference at the user's expense.



### WARNING

"This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications." "Le present appareil numerique n'emet pas de bruits radioelectriques dépassant les limites applicables aux appareils numeriques (de la class A) prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministre des Communications du Canada."

## 1) Unpack and inspect.

- A  If obvious physical damage is noted, contact the carrier immediately to make a damage claim.
- B  Make a mental note of how the unit is packed and *save all packing materials* for future use.

If you should ever have to ship the 787A (e.g., for servicing), it is best to ship it in the original packing materials since these have been carefully designed to protect the unit.

- Packed with the 787A are:
- 1 Power cord
  - 1 Warranty Certificate
  - 1 Registration Card
  - 1 Operating Manual



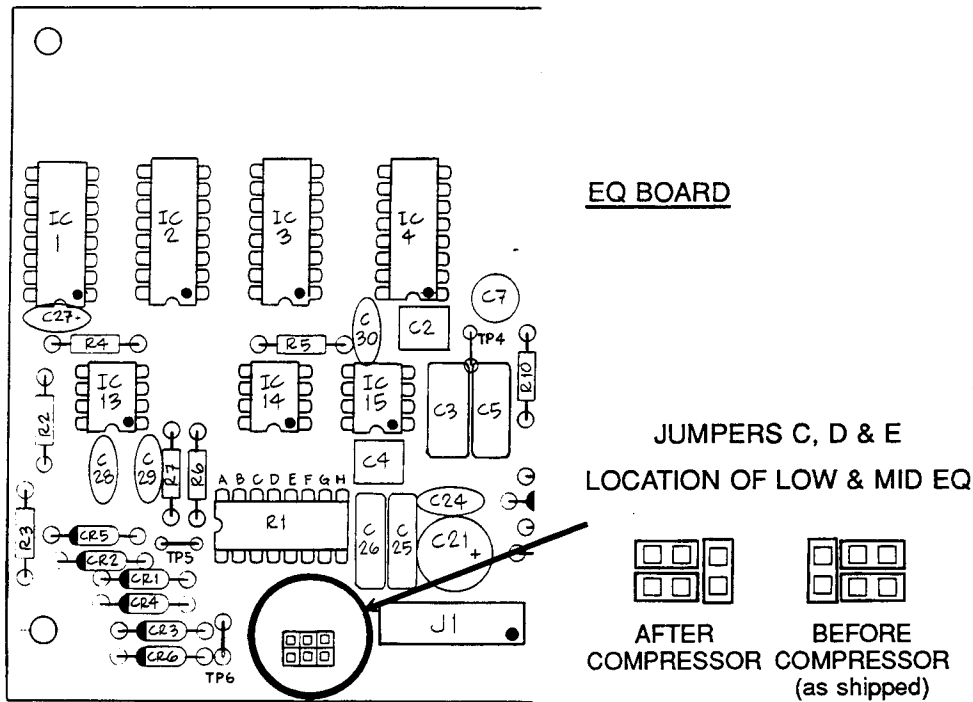
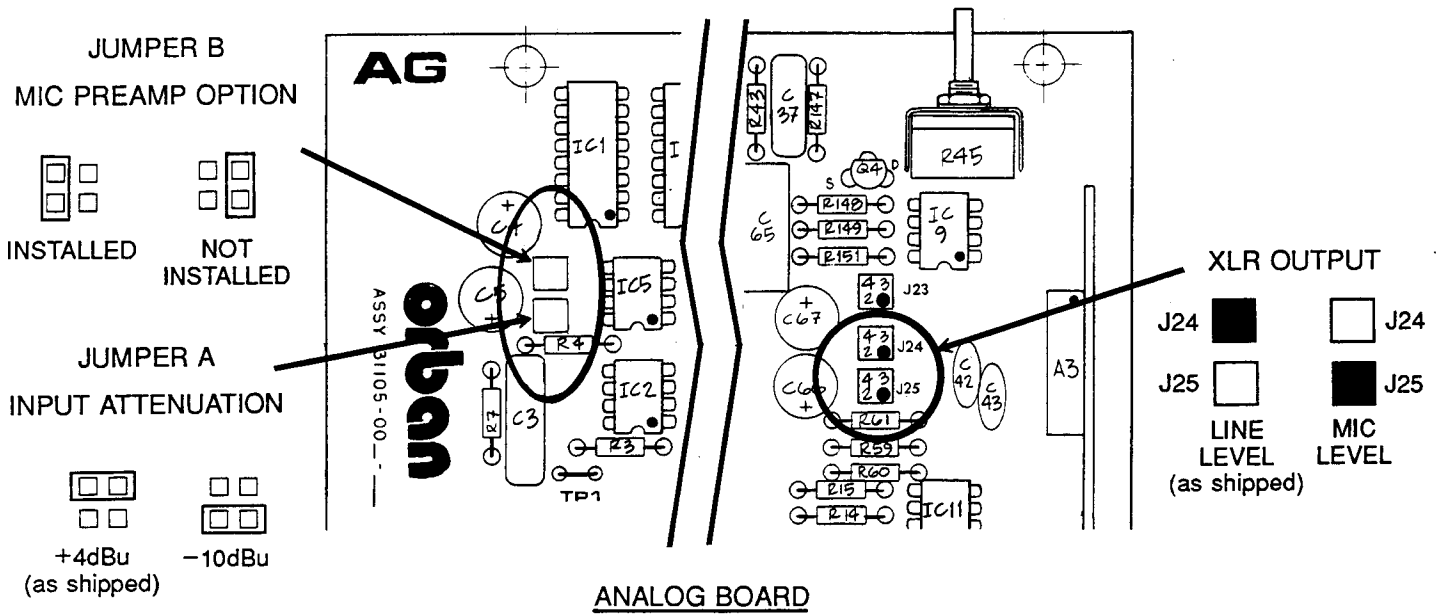


Fig. 2-1: Option Jumpers

## 2) Change input or output levels, reconfigure equalization. (optional)



**DO NOT CONNECT POWER YET!**

*[Skip this step unless you will be feeding the 787A a -10dBu signal, want to relocate the low- and mid-band equalization to follow the compressor, or want mic level output.]*

To move any of these jumpers, first remove the 787A's top cover. Remove the eight screws that hold the cover in place, then lift it off. If you are also installing the optional 787ASL second channel slave unit, leave the top cover off for step 3. When replacing the cover, replace all eight screws snugly (but be careful not to strip the threads by fastening the screws too tightly).

### A Change input attenuation level. (optional)

As shipped, the 787A is configured to accommodate an input signal level of +4dBu. If you are feeding the 787A a signal at -10dBu, move jumper A on the analog circuit board to the -10dBu position (see Fig. 2-1).

### B Change output level. (optional)

As shipped, the 787A's nominal output level is +4dBm into 600 ohms. This line output can be reduced to mic output level *at the XLR OUTPUT connector only* by moving the plug at connector J24 on the analog circuit board to connector J25 (see Fig. 2-1). The mic output level is approximately 60dB below the line output level. (This does not change the EFFECTS SEND output level.)

### C Move LOW and MID EQ, so they follow the compressor. (optional)

Most voice-only audio is best processed with the low- and mid-band equalization before the compressor, so that the compressor's output level is adjusted for level changes caused by equalization. However, this arrangement may result in "pumping" on music with a significant bass component. This happens because large amounts of bass energy will cause substantial gain reduction without contributing proportionately to average loudness, thus audibly modulating the loudness of the midrange energy (to which the ear is most sensitive). If the low and mid bands follow the compressor, bass boosts cannot affect the compressor's output level, and no pumping occurs. The trade-off here is that the output level of the 787A can vary with the amount of boost or cut if the compressor is located before equalization. Select the configuration that is most appropriate for your application.

As shipped, the low- and mid-band equalization is located before the compressor. If you want to relocate low- and mid-band equalization to *after* the compressor, move jumpers C, D, and E on the equalization circuit board to the AFTER COMPRESSOR position (see Fig. 2-1). (The high-band equalization is located after the compressor, and cannot be relocated.)

**3) Install 787ASL connector. (optional)**

*[Skip this step unless you are also installing the optional 787ASL second channel slave unit at this time.]*

- A  If it is still in place, remove the 787A's top cover.

Remove the eight screws that hold the cover in place, then lift it off.  
Save the screws.

- B  Remove the metal plate above the words TO SLAVE UNIT on the 787A's rear panel.

See Fig. 2-2. Discard the plate and matching screws.

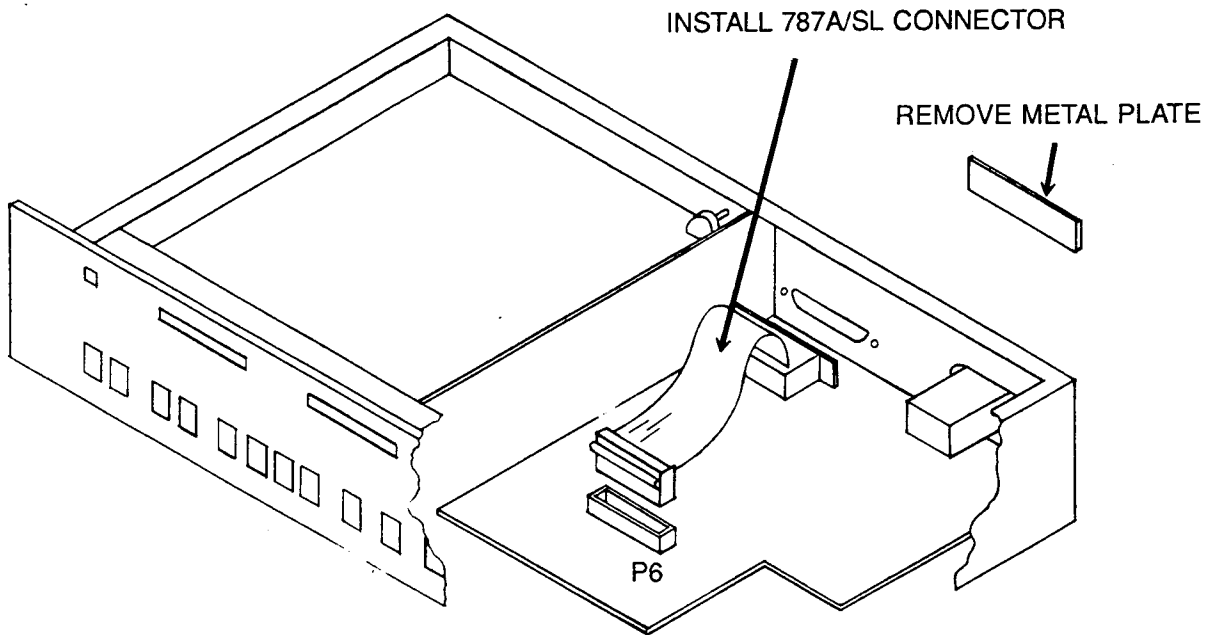


Fig. 2-2: Installation of 787ASL Connector in Host 787A

- c  Attach the connector on the shorter cable provided with the 787ASL to the inside of the 787A's rear panel.

Use the two jackscrews and nuts provided with the 787ASL.

- d  Plug the other end of the cable into connector P6 on the 787A's digital circuit board.

See Fig. 2-2.

- e  Replace the top cover and the eight screws that hold it in place.

Tighten the screws snugly, but be careful not to strip the threads by fastening the screws too tightly.

#### **4) Mount the 787A in a rack. (optional)**

The 787A requires two standard rack units (3.5 inches, 8.9 cm).

For best EMI rejection, there should be a good ground connection between the rack and the 787A chassis.

Mounting the unit directly over large heat-producing devices (such as a vacuum-tube power amplifier) may shorten component life and is not recommended. The ambient temperature should not exceed 113°F (45°C) when equipment is powered.

#### **5) Connect audio input and output.**

See the connection and grounding information beginning on page 2-9.

Use the OUTPUT LEVEL control on the 787A's rear panel to match the output level to downstream equipment.

An optional mic preamp (RET046) can be installed to boost mic level inputs to line level.

#### **6) Connect external effects generator. (optional)**

Audio can be taken from a point following the compressor, equalization, and de-esser, processed externally, then returned to the 787A prior to the OUTPUT LEVEL pot. Reverb and "psychoacoustic excitation" for example, can be added in this way.

Connect external effects processing to the EFFECTS SEND and EFFECTS RETURN terminals on the rear panel. The connection and grounding information beginning on page 2-9 applies, *except* the EFFECTS SEND output is unbalanced, and the EFFECTS RETURN input level can be adjusted with the EFFECTS RETURN key on the front panel. The EFFECTS SEND level is nominally +4dBu, and cannot be adjusted.

## 7) Connect remote control. (optional)

The UP, DOWN, RECALL, and SELECT CHANNEL functions can be controlled by an external remote control system through the REMOTE terminals on the rear panel. Momentarily ground the appropriate terminal to activate a function.

Orban manufactures an optional basic remote control accessory (ACC024) which can be mounted at the console. The basic remote control accessory has UP, DOWN, RECALL, and SELECT CHANNEL controls and a digital preset number display.

The 787A can also be remotely controlled through the optional MIDI (RET045) or RS-232 (RET050) interface. See page 3-13 for more information.

## 8) Connect power.

A  DO NOT connect power to the unit yet!

B  Check the line voltage.

The 787A is shipped ready for 115 or 230V, 50/60Hz operation. Refer to the unit's rear panel for your Model # and the inside front cover of this manual for your Model #'s line voltage setting. To change the operating voltage, set the VOLTAGE SELECTOR to 115V or 230V as appropriate (voltages 15% of the nominal voltage are acceptable). Do not attempt this unless you are qualified to do so.

C  Check the value of the fuse and change the fuse if the value is incorrect.

For safety the fuse must be 1/2-amp 250V Slo-Blo fuse — 3AG or 250mA "T" type as appropriate (for 115-volt (or) 230-volt operation).

D  Connect the 787A's power cord to an appropriate AC power source.

The power cord is ordinarily terminated in a "U-ground" plug (USA standard), or CEE7/7 plug (Continental Europe), as appropriate to your 787A's Model #. The green (or green/yellow) wire from the safety-ground prong is connected directly to the 787A chassis.

If it becomes necessary to lift this ground to suppress ground loops, do so with a three-prong to two-prong adapter plug, rather than by damaging the power plug. But you should *not* defeat the ground unless absolutely necessary, because it eliminates the intrinsic safety feature of the three-wire system.



### WARNING

If the ground is defeated, certain fault conditions in the unit or in the system to which it is connected can result in full line voltage between chassis and earth ground. Severe injury or death can then result if the chassis and earth ground are touched simultaneously.



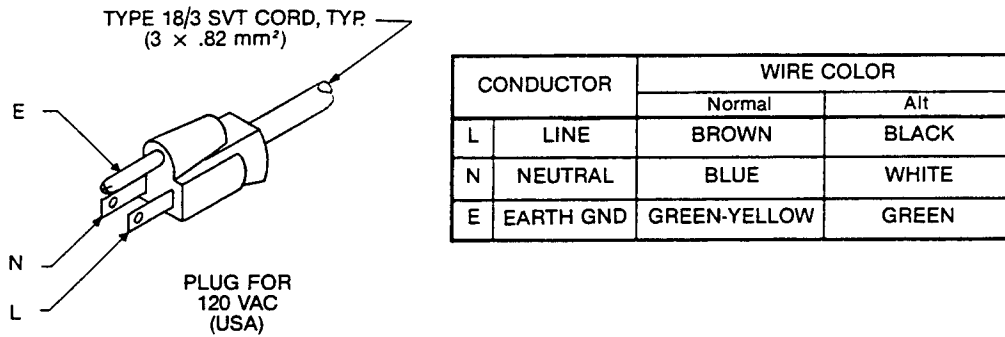


Fig. 2-3: AC Power Cord Color Coding

**9) Complete the Registration Card and return it to Orban.**  
(please)

The Registration Card enables us to inform you of new applications, performance improvements, and service aids which may be developed, and it helps us respond promptly to claims under warranty without having to request a copy of your bill of sale or other proof of purchase. Please fill in the Registration Card and send it to us today. (If it is lost, use the duplicate on page 1-6.)

## Audio Connections

### Cable:

We recommend using **two-conductor shielded cable** (such as Belden 8451 or equivalent), because signal current flows through the two conductors only. The shield does not carry signal, is used *only* for shielding, and is ordinarily connected to ground at one end only.

Because use of single-conductor cables virtually eliminates any possibility of carefully controlling the system grounding scheme, it is **NOT RECOMMENDED!** Even so, it often does work adequately.

Sometimes, particularly if you are using the 787A with musical instruments or home-type equipment, single-conductor shielded cable may be the only practical alternative. In this case, connect the inner conductors of the shielded cables to the (+) sides of the 787A inputs and outputs. Connect the shield of the 787A *input* cable to the (-) input, and connect the shield of the 787A *output* cable to the 787A's (-) output terminal on the rear-panel barrier strip. Connect both IN (-) and OUT (-) terminals to the corresponding  $\perp$ .

### Connectors:

- **Input and output connectors** are XLR-type in parallel with barrier strip terminals (with #5 screws). If the optional mic preamp (RET046) is installed, connect mic level inputs to the XLR INPUT connector only — the barrier strip LINE INPUT terminals should only be used for line-level input signals. Effects send and return is through barrier strip connections only.

### Levels:

- **Nominal input level** is +4dBu (-10dBu if the input level jumper has been moved — see step 2-A on page 2-4). The absolute overload point is +20dBu (or +6dBu if the input level jumper has been moved). If the optional mic preamp (RET046) is installed, levels and overload points will be approximately 65dB lower at the XLR INPUT connectors *only*.

### Input Configuration:

See Fig. 2-4 for some examples.

- The **electronically-balanced input** of each channel is compatible with most professional and semi-professional sound equipment, balanced or unbalanced, with a source impedance of 600 ohms or less. If the source impedance is greater (as in some vacuum-tube audiophile preamps), remove capacitor C2, and connect the hot side of the driving equipment's outputs to the 787A's (+) inputs.

### Audio Connections (continued)

#### Audio Input:

- Input connections are the same whether the driving source is balanced or unbalanced.
- Do not connect the cable shield — it should be connected at the source end only. Connect the red (or white) wire to the appropriate (+) input terminal, and the black wire to the corresponding (-) input terminal.
- If the output of another unit is unbalanced and does not have separate  $\uparrow$  and (-) (or LO) output terminals, connect both the shield and the black wire to the common (-) or ground terminal. It is rarely necessary to balance an unbalanced output with a transformer. As long as it is feeding a balanced input, the system will work correctly.

(You must add an input transformer if the source equipment is powered from a separate mains transformer and power ground. Terminate the transformer's secondary with a 20k resistor.)

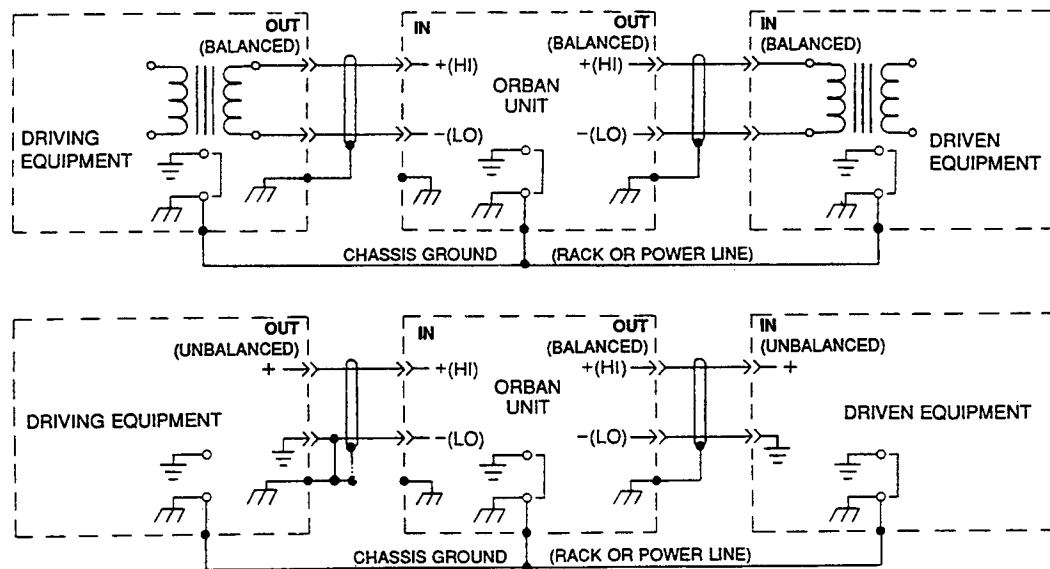


Fig. 2-4: Some Possible Grounding Schemes



## Audio Connections (continued)

### Output Configuration:

See Fig. 2-4 for some examples.

- The **electronically-balanced and floating output** simulates a true transformer output. The *source* impedance is 30 ohms. There is a 1000pF capacitor between each output (+) and (-) to the chassis for RFI suppression. The output is capable of driving loads of 600 ohms or higher. Maximum output level is +20dBm into 600 ohms.
- If an **unbalanced output** is required (to drive unbalanced inputs of other equipment), it should be taken between the (+) and (-) outputs. No special precautions are required even though one side of the output is grounded. Connect the (-) output terminal to  $\frac{1}{2}$ .

### Audio Output:

- Use two-conductor shielded cable (Belden 8451, or equivalent).
- At the 787A's output (and at the output of other equipment in the system), connect the cable's shield to the  $\frac{1}{2}$  terminal for that channel (pin 1 on XLR connectors). Connect the red (or white) wire to the channel's (+) terminal (pin 2 on XLR connectors), and the black wire to the channel's (-) terminal (pin 3 on XLR connectors).
- It may be necessary to isolate the 787A with output transformers when operating next to a transmitter, when driving more than 100 feet (30 meters) of cable, when the 787A's "ground" potential differs from that of driven equipment by more than 2 volts, or in other difficult situations.

## Grounding

Very often, grounding is approached in a “hit or miss” manner. But with care it is possible to wire an audio studio so that it is free from ground loops (which induce hum and can cause oscillation) and provides maximum protection from power faults.

In an ideal system:

- All units in the system should have *balanced inputs*. In a modern system with low output impedances and high input impedances, a balanced input will provide common-mode rejection and prevent ground loops — regardless of whether it is driven from a balanced or unbalanced source. (The 787A has balanced inputs.)
- All equipment *circuit grounds* should be connected to each other; all equipment *chassis grounds* should be connected together.
- *Cable shields* should be connected at one end only — preferably the source (output) end.

### Power Ground:

- Ground the 787A chassis through the third wire in the power cord. Proper grounding techniques *never* leave equipment chassis unconnected to power (earth) ground. *A proper power ground is essential to safe operation.* Lifting a chassis from power ground creates a potential safety hazard.



### Circuit Ground:

To maintain the same potential in all equipment, the circuit (audio) grounds must be connected together:

- *In a small system*, the connection through power ground (via the power cord’s third wire) will suffice. Connect the 787A’s circuit ground ( $\perp$ ) terminal to its chassis ground ( $\uparrow$ ) terminal. Also connect the circuit and chassis grounds of other equipment.
- *In larger systems*, it is common to establish an isolated circuit ground system that is insulated from the power ground except at one point (usually the studio power distribution panel). In such a system, disconnect the 787A’s circuit ground ( $\perp$ ) terminal from its chassis ground ( $\uparrow$ ) terminal, then connect the 787A’s circuit ground ( $\perp$ ) terminal to the isolated circuit ground system.

## Grounding (continued)

### Difficult Situations:

Because it is not always possible to determine if the equipment driving or being driven by the 787A has its circuit ground internally connected to its chassis ground (which is always connected to the ground prong of the AC power cord, if present), and because the use of the AC power ground often introduces noise or other imperfections such as RFI, hum, clicks, and buzzes, the wiring techniques in Fig. 2-4 are not universally applicable.

If you follow Fig. 2-4 and hum or noise appears, don't be afraid to experiment. If the noise sounds like a low-level crackling buzz, then probably there isn't *enough* grounding. Try connecting the (-) input of the 787A to a chassis ground terminal on the barrier strip and see if the buzz goes away. You can also try strapping the 787A's chassis and circuit grounds together, and see if this helps.

A ground loop usually causes a smooth, steady hum rather than a crackly buzz. If you have a ground loop, you can often break it by *disconnecting* the jumper between circuit and chassis grounds on the 787A's rear-panel barrier strip. In either case, think carefully about what is going on, and keep in mind the general principle: one and *only one* circuit ground path should exist between each piece of equipment! (Bear in mind that the circuit grounds of the 787A and the 787ASL slave unit are connected through the interconnect cable, and could conceivably introduce a ground loop if you do not take this connection into account in planning your wiring.)

When a single-conductor shielded cable is used for audio connections, the shield will ordinarily receive chassis ground from the external equipment which it is connecting to the output of the 787A. The chassis ground/circuit ground jumper on the rear barrier strip of the 787A should be left in whichever configuration gives minimum hum or buzz. To minimize hum or buzz, it may be necessary to jumper one or more shields to chassis ground, and/or to jumper the 787A's (-) output to chassis ground.

## Installation of Optional 787ASL Slave Unit

*Before installing the 787ASL, first install the host 787A — see page 2-2. The 787ASL can only be used if it is connected to a host 787A.*

Allow about 30 minutes for installation.

Installation consists of unpacking the 787ASL, installing a connector in the host 787A, mounting the 787ASL in a rack (if desired), connecting audio inputs and outputs, and connecting the 787ASL to its host 787A. In addition, input or output levels can be changed, low- and mid-band equalization can be relocated to follow the compressor, and external effects processing can be connected.

### 1) Unpack and inspect.

- A  If obvious physical damage is noted, contact the carrier immediately to make a damage claim.
- B  Make a mental note of how the unit is packed and *save all packing materials* for future use.

If you should ever have to ship the 787ASL (e.g., for servicing), it is best to ship it in the original packing materials since these have been carefully designed to protect the unit.

Packed with the 787ASL:	1	Connector/cable assembly
	1	Interconnect cable
	1	Warranty Certificate
	1	Registration Card

### 2) Install connector in host 787A.



#### WARNING

BE SURE THE POWER TO THE HOST 787 IS NOT CONNECTED.

- A  Remove the host 787A's top cover.  
 If the 787A is in a rack, remove it and place it on a workbench. Remove the eight screws that hold the cover in place, then lift it off. Save the screws.
- B  Remove the metal plate above the words TO SLAVE UNIT on the 787A's rear panel.  
 See Fig. 2-2 on page 2-5. Discard the plate and matching screws.
- C  Attach the connector on the shorter cable provided with the 787ASL to the inside of the 787A's rear panel.  
 Use the two jackscrews and nuts provided with the 787ASL.

- Plug the other end of the cable into connector P6 on the 787A's digital circuit board.

See Fig. 2-2.

- Replace the top cover and the eight screws that hold it in place.  
Tighten the screws snugly, but be careful not to strip the threads by fastening the screws too tightly.

### 3) Change input or output levels, reconfigure equalization. (optional)

*[Skip this step unless you will be feeding the 787ASL a -10dBu signal, want to relocate the low- and mid-band equalization after the compressor, or want mic level output.]*

To move any of these jumpers, first remove the 787ASL's top cover. Remove the six screws that hold the cover in place, then lift it off. When replacing the cover, replace all six screws snugly (but be careful not to strip the threads by fastening the screws too tightly).

- Change input attenuation level. (optional)

As shipped, the 787ASL is configured to accommodate an input signal level of +4dBu. If you are feeding the 787ASL a signal at -10dBu, move jumper A on the analog circuit board to the -10dBu position (see Fig. 2-5).

- Select mic-level output. (optional)

As shipped, the 787ASL's nominal output level is +4dBm into 600 ohms. This line output can be changed to a mic output level by moving the plug at connector J24 on the analog circuit board to connector J25 (see Fig. 2-5). The mic output level is approximately 60dB below the line output level. (This does not change the EFFECTS SEND output level.)

- Move LOW and MID EQ, so they follow the compressor. (optional)

As shipped, the low- and mid-band equalization is located before the compressor. If you want to relocate low- and mid-band equalization to follow the compressor, move jumpers C, D, and E on the equalization circuit board to the AFTER COMPRESSOR position (see Fig. 2-5). (The high-band equalization is located after the compressor, and cannot be relocated.)

Both locations have advantages and disadvantages — see step 2-C on page 2-4.

### 4) Mount the 787ASL in a rack. (optional)

The 787ASL requires one standard rack unit (1¾ inches, 4.4 cm).

For best EMI rejection, there should be a good ground connection between the rack and the 787ASL chassis.

Mounting the unit directly over large heat-producing devices (such as a vacuum-tube power amplifier) may shorten component life and is not recommended. The ambient temperature should not exceed 113°F (45°C) when equipment is powered.

## 5) Connect audio input and output.

See the connection and grounding information beginning on page 2-9 (substitute "787ASL" for "787A)."

Use the OUTPUT LEVEL control on the 787ASL's rear panel to match the output level to equipment that follows the 787A.

An optional mic preamp (RET046) can be installed to boost mic level inputs to line level.

## 6) Connect external effects generator. (optional)

Audio can be taken from a point following the compressor, equalization, and de-esser, processed externally, then returned to the 787ASL prior to the OUTPUT LEVEL pot. Reverb and "psychoacoustic excitation" for example, can be added in this way.

Connect external effects processing to the EFFECTS SEND and EFFECTS RETURN terminals on the rear panel. The connection and grounding information beginning on page 2-9 applies, *except* the EFFECTS SEND output is unbalanced, and the EFFECTS RETURN input level can be adjusted with the EFFECTS RETURN key on the front panel. The EFFECTS SEND level is nominally +4dBu, and cannot be adjusted.



### WARNING

Unplug the 787A's power cord before connecting or disconnecting the 787ASL. Severe damage to the 787ASL may result if the units are connected while the host 787A is powered.

## 7) Connect the 787ASL to the host 787A with the interconnecting cable.

The 787A supplies the 787ASL with power through this cable. The cable also connects the circuit grounds of the two units.

## 8) Complete the Registration Card and return it to Orban. (please)

The Registration Card enables us to inform you of new applications, performance improvements, and service aids which may be developed, and it helps us respond promptly to claims under warranty without having to request a copy of your bill of sale or other proof of purchase. Please fill in the Registration Card and send it to us today. (If it is lost, use the duplicate on page 1-6.)

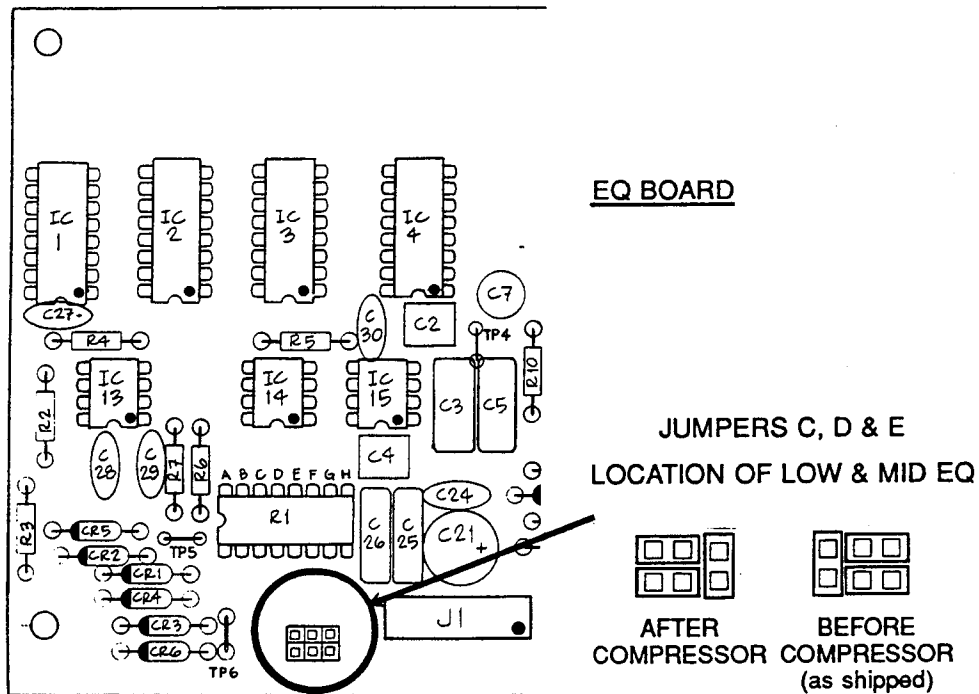
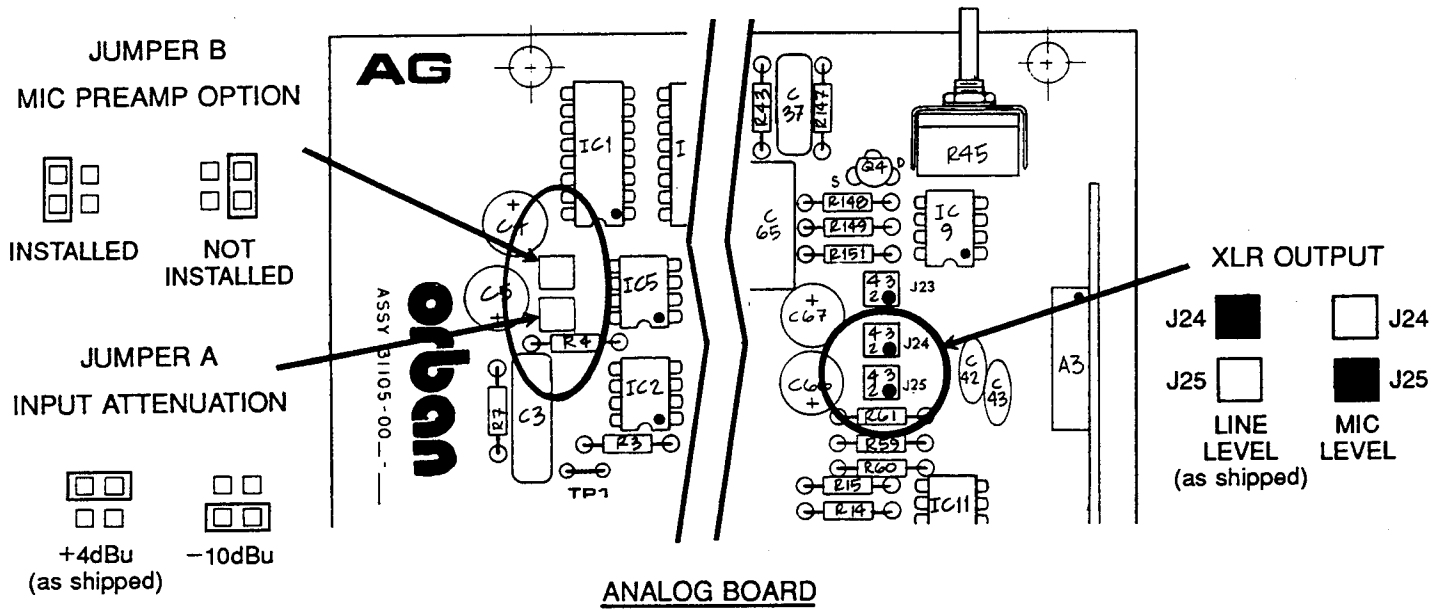


Fig. 2-5: Option Jumpers