



Omnia-3

Audio Processor

Installation and Operation Manual Version 2.1 / June 2005

***Applicable to fm Turbo, am and net/drm styles
with v3.04.01 Release Software and Higher***



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GREETINGS!

Welcome to Omnia-3, the next generation of broadcast audio signal processing. Omnia-3 applies the same advanced design philosophy as the entire Omnia family, to yield performance and flexibility never before available, in this class of processor. Omnia-3, like all Omnia products, delivers crystal-clear highs, thundering bass and amazing loudness, with none of that “digital grunge aftertaste!”

Omnia-3 is a fully digital system that is available in three versions, pre-configured to match the processing needs of any broadcaster. For FM broadcasters there’s the Omnia-3fm Turbo with integral stereo encoder. For AM broadcasters there’s Omnia-3am. And, for Internet webcasters or Digital Radio, there’s Omnia-3net/drm, optimized for the unique demands of encoded audio.

Omnia-3’s flexibility is built-into the design. Instead of keeping the processing algorithms on a set of EPROMs or proprietary potted modules, the system’s DSP (Digital Signal Processing) resources are entirely configured through software contained on a plug-in PC Card (PCMCIA-type). Even fundamental rearrangements of the system architecture can be easily accomplished in the field by plugging in a new PC card or, by using the free downloadable Windows-based remote control application, through local serial RS-232 connection or remotely through the optional plug-in modem card or optional Ethernet network interface.

Omnia-3, the promise of digital. . . delivered.

Here’s to Dial Dominance,

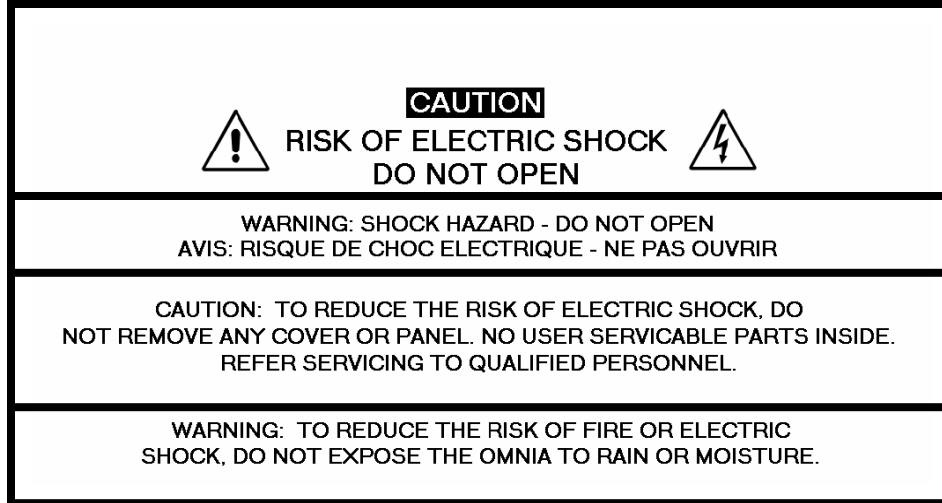
A handwritten signature in black ink, appearing to read "Frank Foti". The signature is stylized with a large initial "F" and a cursive "Foti".

Frank Foti

SAFETY INSTRUCTIONS

1. **Read All Instructions.** All safety and operating instructions must be read before operating the product.
2. **Retain All Instructions.** All safety and operating instructions must be retained for future reference.
3. **Heed All Warnings.** All warnings on the product and those listed in the operating instructions must be adhered to.
4. **Follow All Instructions.** All operating and product usage instructions must be followed.
5. **Heat.** This product must be situated away from any heat sources such as radiators, heat registers, stoves, or other products (including power amplifiers) that produce heat.
6. **Ventilation.** Slots and openings in the product are provided for ventilation. They ensure reliable operation of the product, keeping it from overheating. These openings must not be blocked nor covered during operation. This product should not be placed into a rack unless proper ventilation is provided through following the manufacturer's recommended installation procedures.
7. **Water and Moisture.** Do not use this product near water—for example; near a bath tub, wash bowl, kitchen sink or laundry tub; in a wet basement; or near a swimming pool or the like.
8. **Attachments.** Do not use any attachments not recommended by the product manufacturer as they may cause hazards.
9. **Power Sources.** This product must be operated from the type of power source indicated on the marking label and in the installation instructions. If you are not sure of the type of power supplied to your facility, consult your local power company.
10. **Grounding and Polarization.** This product is equipped with a polarized AC plug with integral safety ground pin. Do not defeat the safety ground in any manner.
11. **Power Cord Protection.** Power supply cords must be routed so that they are not likely to be walked on nor pinched by items placed upon or against them. Pay particular attention to the cords at AC wall plugs and convenience receptacles, and at the point where the cord plugs into the product.
12. **Lightning.** For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the AC wall outlet. This will prevent damage to the product due to lightning and power line surges.
13. **Overloading.** Do not overload AC wall outlets, extension cords, or integral convenience outlets as this can result in a fire or electric shock hazard.
14. **Object and Liquid Entry.** Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
15. **Accessories.** Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious damage to a child or adult, and serious damage to the product. Any mounting of the product needs to follow manufacturer's installation instructions.
16. **A Product and Cart Combination** should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and the cart combination to overturn.
17. **Servicing.** Refer all servicing to qualified servicing personnel.
18. **Damage Requiring Service.** Unplug this product from the wall AC outlet and refer servicing to qualified service personnel under the following conditions:
 - a. When the AC cord or plug is damaged.
 - b. If liquid has been spilled or objects have fallen into the product.
 - c. If the product has been exposed to rain or water.
 - d. If the product does not operate normally (following operating instructions).
 - e. If the product has been dropped or damaged in any way.
 - f. When the product exhibits a distinct change in performance. This indicates a need for service.
19. **Replacement Parts.** When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or that have the same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock, or other hazards.
20. **Safety Check.** Upon completion of any repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
21. **Cleaning.** Do not use liquid cleaners or aerosol cleaners. Use only a damp cloth for cleaning.

HAZARD / WARNING LABELS



The **Exclamation Point** symbol, within an equilateral triangle, alerts the user to the presence of important operating and maintenance (servicing) instructions in product literature and instruction manuals.

The **Lightning Flash With Arrowhead** symbol, within an equilateral triangle, alerts the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



WARNING -- This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions in this manual it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device (pursuant to subpart J of Part 15 FCC Rules), designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, at which case, the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

See the following page for additional information.

CANADA WARNING – This digital apparatus does not exceed the Class A limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications. Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux brouillage radioelectrique edicte par le ministere des Communications de Canada.

CE CONFORMANCE – This device complies with the requirements of the EEC Council Directives: 93/68/EEC (CE Marking); 73/23/EEC (Safety – low voltage directive); 89/336/EEC (electromagnetic compatibility). Conformity is declared to those standards: EN50081-1, EN50082-1.



LITHIUM BATTERY CAUTION -- Danger of explosion if the internal battery is replaced incorrectly. Replace only with same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.



USE OF SHIELDED CABLING -- To conform to the CE requirements for High Frequency radiation, shielded cables must be used for all audio and data connections. For analog and digital connections, the cable shield **MUST** be connected to the XLR-type connector shell, which is at chassis ground potential!

Manual Update Notification

Due to the dynamic nature of audio processing products, this manual and all future manuals will be considered as 'preliminary documentation'.

Audio Processing is an art form that we take very seriously. As part of our dedication to this science, we will continue to update both the product and its documentation based on continued research, field experience and valued customer input.

We strongly encourage our customers to visit our Omnia website for product enhancement announcements, software updates, manual updates, and customer care bulletins.

The following URL listing has been included for your update convenience:

Manual Updates	http://www.omniaaudio.com/support/manuals.htm
Installation Tips	http://www.omniaaudio.com/tech/tips.htm
Tech Bulletins and Papers	http://www.omniaaudio.com/tech/
Tech Support – Software Upgrades	http://www.omniaaudio.com/support/updates.htm

Thank you for selecting the incredible Omnia-3 Audio Processor. Your continued patronage and support are appreciated.

Sincerely,

Team Omnia

SPECIFICATIONS

Note: All measurements made with the supplied “Proof of Perf” preset, which is available in the Preset Submenu.

System

- Signal to Noise:** The measured noise floor will depend upon the settings of the Input and Output Gain controls. The Omnia’s noise floor is primarily governed by the dynamic range of the 24-bit Crystal Semiconductor CS5360 A/D Converter, which has a specified Dynamic Range of 105 dB. The dynamic range of the Omnia 3 digital signal processing chain is 144 dB. Typical SNR using the “Proof of Perf” preset is greater than –80dB referenced to 100% modulation.
- Distortion:** No greater than 0.01% THD 20 Hz -- 20 kHz bandwidth.

FM Specifications (Omnia3-fm Turbo only)

- Frequency Response:** Complies with the standard 50 or 75 microsecond pre-emphasis curve within ± 0.50 dB, 30 Hz to 15 kHz. The analog left/right outputs and AES/EBU Digital outputs can be configured for flat or pre-emphasized output.
- Signal-to-Noise Ratio:** > -80 dB de-emphasized, 20 Hz — 15 kHz bandwidth, referenced to 100% modulation).
- System Distortion:** Less than 0.01% THD, 20 Hz – 7.5 kHz. Second harmonic distortion above 7.5 kHz is not audible in the FM system
- Stereo Separation:** Greater than 65 dB, 20 Hz — 15 kHz; 70 dB typical.
- Crosstalk:** > -70 dB, 20 Hz -- 15 kHz.
- Composite Outputs:** Configuration: Two electrically independent outputs. Software based level adjustment.
Source Impedance: 10 ohms or 75 ohms, jumper-selectable. Single-ended and floating over chassis ground.
Load Impedance: 50 ohms or greater load is suggested.
Output Level: 1.2 – 9.2 Vp-p, software adjustable.
Pilot Level: Adjustable from 6.0% to 12.0% in 0.1% steps.
Pilot Stability: 19 kHz, ± 0.5 Hz.
D/A Conversion: Burr Brown PCM1704, 24-bit sign-magnitude D/A converter.
Signal-to-Noise Ratio: -85 dB typical, 75 μ S de-emphasized, 15 kHz bandwidth, referenced to 100% modulation).
Distortion: < 0.02% THD 20 Hz – 15 kHz bandwidth, 75 μ S de-emphasized, referenced to 100% modulation.
Stereo Separation: > 65 dB, 30 Hz – 15 kHz.
Linear Crosstalk: > -80 dB, main to sub or sub to main channel (referenced to 100% modulation).
Non-linear Crosstalk: > -80 dB, main to sub or sub to main channel (referenced to 100% modulation).
38 kHz Suppression: > 70 dB (referenced to 100% modulation).

76 kHz Suppression: > 80 dB (referenced to 100% modulation).
57 kHz (RDS/RBDS) Protection: better than -50 dB.

Connectors: Two EMI suppressed female BNC, floating over chassis ground.

Maximum Load Capacitance: 5nF (at 10 ohms source impedance).

Maximum cable length: 100 feet/30 meters RG-58A/U.

Analog I/O

Analog Audio Input: Configuration: Left/Right Discrete Stereo. Electronically balanced, floating and symmetrical.
Input impedance: 10k ohms resistive, electronically balanced.
Maximum Input Level: +24 dBu.
Nominal Input Level: +4 dBu when the Input Level Control is set to 0.0 dB.

A/D Conversion: Crystal Semiconductor CS5360, 24 bit 128x over-sampled delta sigma converter with linear-phase anti-aliasing filter. Pre-ADC anti-alias filter, with high-pass filter at <10 Hz.

Connectors: Two EMI-suppressed XLR female. Pin 1 chassis ground, and Pin 2 is "hot".

Analog Audio Output: Configuration: Left/Right Discrete Stereo. Electronically balanced, Source Impedance: 20 ohms, electronically balanced and floating.
Load Impedance: 600 ohms or greater, balanced or unbalanced.
Output Level (100% peak modulation): Adjustable from -2 dBu to +22 dBu peak, into 600 ohms or greater load, software-adjustable.

D/A Conversion: Crystal Semiconductor CS4390 24 bit, 128x over-sampled.

Connectors: Two, EMI-suppressed XLR-male. Pin 1 chassis ground, Pin 2 "Hot".

Digital I/O

Digital Audio Input: Configuration: Stereo per AES/EBU standard, CS8420 Digital Audio Transceiver with 24 bit resolution, software selection of stereo, mono from left, mono from right or mono from sum. Automatically accepts and locks to input sample rates between 12 and 50 kHz.

Connector: XLR-female, EMI-suppressed. Pin 1 chassis ground, pins 2 and 3 transformer isolated, balanced, and floating – AES3 standard 110 ohm impedance.

Digital Audio Output: Stereo per AES3 standard. Output can be configured in software for flat or pre-emphasized response at 50 or 75 microseconds.

Output sample rate fixed at 48 kHz.

Connector: XLR-male, EMI-suppressed. Pin 1 chassis ground, pins 2 and 3 transformer isolated, balanced, and floating. Standard AES3 specified 110 ohm source impedance.
Digital Output Level: -22.0 to 0.0 dBFS software adjustable.

Remote Control

Remote Control

Methods:

Configuration: Modem, Direct Serial, or 10/100BaseTX Ethernet.
Modem: Optional PCMCIA modem with pop-out X-jack connector or any Hayes command set compatible external modem.
Direct Serial: Standard RS-232, no hardware handshaking employed. Baud rates of 9,600, 19,200, and 57,600 supported.
TCP/IP Ethernet: Optional interface emulates a telnet session on port 23.
Connectors: RS-232 port, EMI-suppressed DB-25 female connector. Industry standard EMI suppressed RJ-45 connector for Ethernet.

Remote Interface:

Configuration: Eight (8) inputs, RS-232 level-compatible. Software sensing of both 'go-high' and 'go-low' transitions. Inputs are protected to +/- 15 VDC.
Connector: EMI suppressed DE-9 male.
Control: User-programmable using built-in Trigger Script feature in Omnia-3 Remote Control software. Virtually any parameter of the Omnia may be programmed to change through this interface feature.

General

Power Requirements: Voltage: 100-250 VAC, 50/60/440 Hz., < 55VA
Connector: EMI suppressed IEC male. Detachable 3-wire power cords supplied for US and European use.

Internal Power Supply: Overvoltage and short circuit protected. Meets EN55022, EN55011 Level B Conducted Emissions. EN61000-4-2, -3, -4, -5, -6 level 3 immunity compliant. Full international safety approval. CE marked.

Environmental: Operating Temperature: 32 to 122 degrees F / 0 degrees to 50 degrees C for all operating voltage ranges.
Humidity: 0-95% RH, non-condensing.

Dimensions: 19" wide x 3.5" high x 16.25" deep (48.3cm wide x 8.9 cm high x 41.3 cm deep) including connectors. Unit requires two EIA rack spaces for proper mounting.

Shipping Weight: 26 lbs. / 11.8 kg

Telos/Omnia Research and Development is constantly working to improve the quality of our products. Actual specifications are subject to change or improvement without notice.

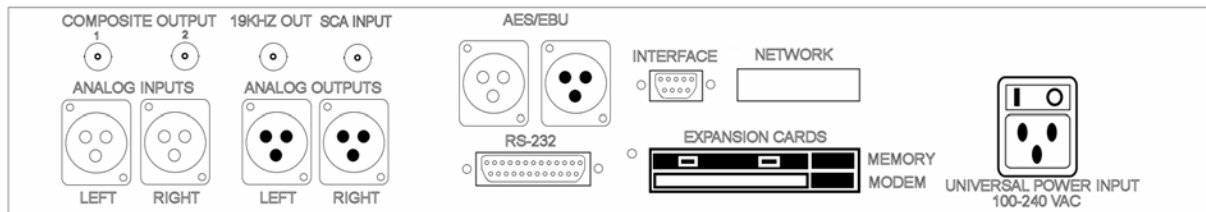
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Omnia-3 Quick-Start Setup Guide

We know that you're probably in a hurry to get on the air with your new Omnia-3. If you have technical expertise and previous knowledge of audio processor fundamentals, using the following Eight-Point Quick-Start procedure will get you up and running as quickly as possible. Please refer to the remainder of the Operating Guide for additional information.

Refer to the following drawing for the location of the various connectors associated with the installation:



Omnia-3 Rear Panel View

1. Insert the supplied PCMCIA memory card into the *top* card slot on the rear panel with the large Omnia label facing up and the version number sticker facing down. **DO NOT FORCE!** Gently press the card into the slot until the black release button, to the right of the card, pops out about ½" [12.70 mm]. This indicates that the card is properly inserted in the PCMCIA slot.
2. Install the Omnia-3 in the equipment rack using at least two rack screws. If only two screws are used, they **MUST** be in the bottom holes of the rack ears!
3. Connect AC power to the unit, and turn on power using the rear-panel power switch.
4. Connect the audio inputs that are appropriate for your installation and provide normal program audio to the Omnia-3.
5. Navigate to the ***Input & Output*** menu by rotating the jog-wheel until ***Input & Output*** is highlighted and then "click" (push in on the jog-wheel) to enter that menu. Navigate to ***Input Source***, click, and select either the Analog or AES/EBU input. Press the front panel push-button once to switch to the metering screen. If your audio source is providing an audio feed you should see meter activity on the I/O and Process meters. Rotating the jog-wheel switches between the I/O and Process bargraph screens. Turn it left for the I/O meters and right for the Processing gain-reduction bargraphs.
6. Turn the Jog-Wheel to the left to display the I/O metering screen. Observe the input meters (***L In*** and ***R In***) and adjust the controls in the ***Input Levels*** menu until the input meters are peaking up to about -15dB (or a little higher) with normal program audio. Each press of the front panel push-button will switch between the selected metering screen and the menu screen where the input level controls are.
7. Connect the audio outputs that are appropriate for your installation.
8. If you are using the Analog or Digital XLR audio outputs, navigate to the ***Input & Output*** Menu and adjust the controls in the ***Output Levels*** menu to the correct peak level for the equipment that follows the Omnia-3. If you are using the Composite MPX Outputs (fm Turbo style only), navigate to the ***Stereo Generator*** Menu and adjust the ***Composite 1*** or ***Composite 2*** output levels as appropriate for the STL transmitter or Exciter following the Omnia-3.

You're now ready to go on the air!

Note that the Omnia-3 is shipped with the "Rock" preset as the default. While leaning toward the competitive side, it provides a rich and balanced sound - a good starting point for nearly every format. Remember that our preset names do not necessarily mean that the preset is useful for *only* the formats to which the name refers. Feel free to experiment!

Chapter-1: Installation

Even though we believe the Omnia-3 is the easiest processor to install in its class, please take a few minutes to read through this chapter before proceeding with the installation.

Pre-Installation Tasks

This section offers common procedures for installing any version Omnia-3 processor. Additional model-specific information is given in the chapters on specific versions (Omnia-3fm Turbo in Chapter 4, Omnia-3am in Chapter 5 and Omnia-3net/drm in Chapter 6).

Omnia-3 Components

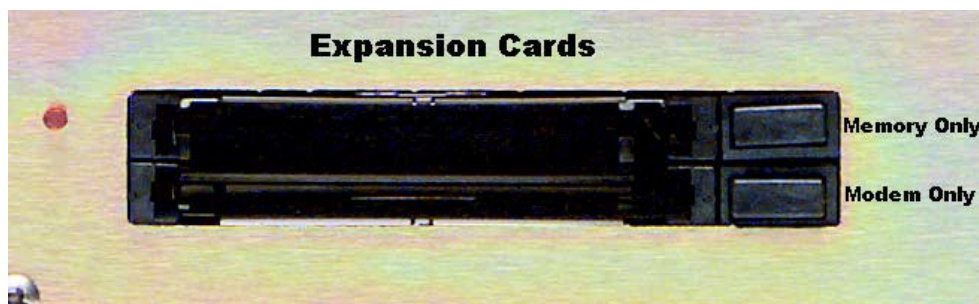
By now, you've unpacked the shipping carton to at least gain access to this manual. Be sure to inspect the Omnia-3 and shipping carton for any shipping damage, which must be reported to your carrier for any claims.

The Omnia-3 shipping box includes the following components:

- Omnia-3 processor (containing the DSP hardware)
- Omnia-3 PCMCIA card (holding the DSP software)
- Omnia-3 Operating Manual
- Warranty Registration Card (fill it out and fax it or return it)
- IEC Power Cord

PC Card and Optional Modem Installation

Before installing your Omnia-3, or even plugging in the power cord, make sure the Omnia-3 PC Memory Card and optional Modem Card (if ordered) are installed into the correct card slots on the back panel and are fully seated. Installation or removal of cards must be done with the power *off* unless directed otherwise.



The PC Memory Card is inserted into the *top* card slot with the larger Omnia label facing up, and the version sticker facing down. The optional Modem Card is inserted into the *bottom* card slot below the Omnia PC Card. Both the PC Card and the Modem Card are keyed to prevent improper insertion. **DO NOT FORCE!** Gently press the cards into the slots until the black release button, to the right of the card, pops out about 1/2" [12.70 mm]. This indicates the card is properly seated in the PCMCIA slot.

Important Note 1: The PC Card used in the Omnia-3 is not a *generic* PCMCIA cards that can be bought in any local computer store. They are cards that are specified by Omnia specifically for this product. If you need a backup card, please contact Omnia Customer Support to purchase an additional card. Inserting a card of unknown origin risks damaging the Omnia or the cards, and doing so will void your warranty!

Important Note 2: If you wish to operate the Omnia-3 using a PCMCIA type modem, you must use the optional modem card from Omnia. No other modem cards are approved for use at this time. We cannot assume correct operation of any other modem card, nor can we provide support for it. Typically any external Hayes compatible modem may be connected to the rear-panel serial port. See chapter 6 for more details on the Modem and the Remote Control Software.

Note: The rear panel PCMCIA Memory Card must remain in the top slot unless you are prompted by the system to remove it. Randomly removing the PC Card without system instruction may cause unpredictable operation and PC Card data damage.

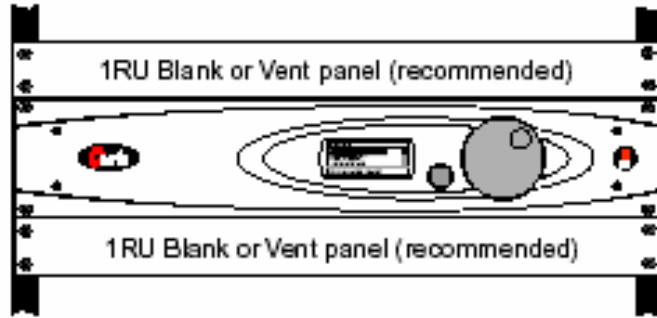
AC Environment

Since the Omnia-3 is microcomputer-based, it requires the same clean AC environment as any computer system. Even though the unit has internal AC input transient suppression, we recommend that transient suppressors/voltage regulation or an Uninterruptible Power Supply (UPS) be employed as well. This is especially recommended when installing the processor at a transmitter site. (As is proper grounding) Heavy transient demands on power lines, from normal switching to lightning strikes, have been known to wreak havoc with data in computer systems. This is another reason we ask that you give your AC environment thorough consideration before plugging in your unit. For more information on surge suppression and proper grounding techniques, please see the tech-talk paper “The Ins and Outs of Surge Suppression” on the Telos website here:

<http://www.telos-systems.com/techtalk/surge.htm>

Installation & Connections

As these instructions cover the entire Omnia-3 family of processors, there may be some connections listed that are not used on your specific model. Refer to the individual model chapter for additional details specific to your Omnia-3 version. Throughout this section reference is made to “software parameters.” These are part of the User Interface, which is covered in Chapter 2.

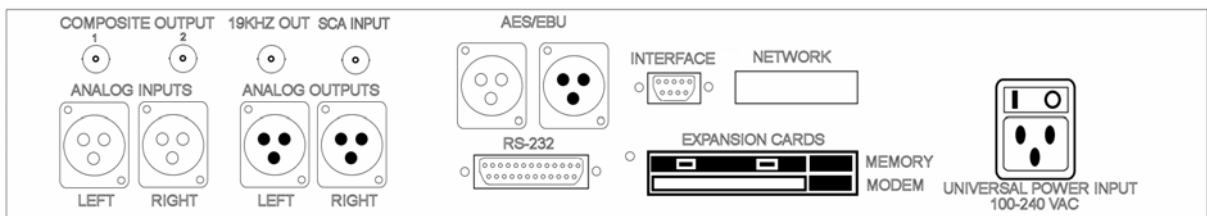


Omnia-3 Rack Mounting Requirements

Rack Mounting

The Omnia-3 requires 2RU (3.50" [89 mm]) of rack space. Rack mount the unit using four rack screws. It is preferred to leave at least one rack unit of empty space above the Omnia-3 to enhance ventilation and to prolong component life. Install a 1RU (1.75") vented or solid panel to fill this space. It is recommended that another 1RU blank panel be installed below the unit for the same reason, if rack space is not at a premium.

Rear Panel Connections



Omnia-3 Back Panel Connections

AC Connection (IEC)

The Omnia-3 uses a universal power entry module with integral AC switch just above the IEC power cord receptacle. It can operate on AC mains voltages from 100 to 240 VAC, 50/60 Hz since a self-adjusting switching power supply is used. In the USA, plug the supplied AC power cord into the unit and then into an isolated ground AC outlet. Outside of the USA you must obtain an appropriate local IEC power cord.

Audio Inputs (Female XLR)

Balanced XLR-type connectors are used to input both analog and AES-3 digital audio. Even though both analog and digital cables can be connected, only one input can be set active. Input selection is done through the ***Input Source*** software parameter in the ***Input & Output*** menu. The **Analog** input is the factory default selection.

The stereo analog inputs are designed for standard +4 dBu balanced signals. The digital AES-3 input accepts any sampling rate between 32 and 50 kHz. No user adjustment is necessary since a sample rate converter is built into the unit. Individual channel gain and level setting for both analog and digital is done using the ***Input & Output*** menu's software parameter settings.

A Note About Relative Phase: If the relative phase of your installation including the Omnia-3 differs from your existing system, it could cause your announcers to feel they sound “weird” in their headphones. If this happens, then the relative phase of the processor is 180 degrees from what your air talent are used to. To remedy this, you can reverse the polarity to both of the two analog inputs (is pin 2 or pin 3 hot!?), but it's a lot easier to accomplish this function by changing the *Input Phase* software parameter setting located under *Input Levels* in the ***Input & Output*** menu.

Discrete Audio Outputs—Analog & Digital (Male XLR)

Individual Left and Right analog outputs are available on two male XLR jacks, as is a single stereo AES-3 output. The 48 kHz digital output is produced directly from the output of the final processing section. The analog output is derived from a D/A converter driven from the digital output.

Note: Both the analog and digital AES-3 outputs are always active and can be used simultaneously.

Composite Outputs (BNC) – fm Turbo versions only

These two low impedance outputs (Composite 1 and Composite 2) are each capable of driving up to 50 feet of coax cable. The output levels are individually adjustable between the outputs so the unit can operate as a “composite DA” to drive a variety of equipment. The output levels and other stereo generator settings are set through software parameters in the *Stereo Generator* menu.

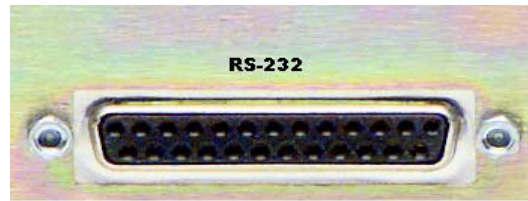
19 kHz Data Output (BNC) – fm Turbo versions only

This TTL-level 19 kHz square wave output can be used as the reference signal for any SCA generator that operates at 57 kHz or other multiple of the 19 kHz pilot frequency. Using the 19 kHz clock from the Omnia-3 stereo generator makes it much easier to phase lock the SCA signal to the pilot frequency. This is extremely helpful in eliminating intermodulation components that might exist between the pilot and SCA signal. For RDS users, this feature is also very useful.

SCA Input (BNC) – fm Turbo versions only

Any SCA signal above 53 kHz can be added to the composite outputs of the Omnia-3 by routing the SCA signal through the SCA INPUT connector. The SCA signal is mixed directly into both composite outputs. A high-pass filter on the SCA input provides additional crosstalk protection from the SCA to the main channel composite signal. The SCA modulation is controlled through software parameters in the *Stereo Generator* menu.

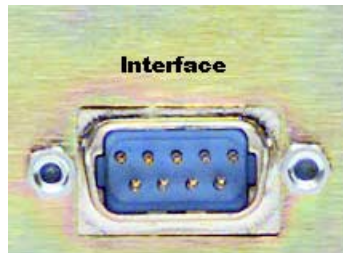
RS-232 Connection (DB-25F)



This connector serves two important purposes: It can be used for a local, bi-directional computer connection with Omnia-3 Remote Control, or it can be used for troubleshooting and error code resolution. In the former case, Omnia-3 Remote Control software is utilized. In the latter, any terminal emulation program can be used. In either case, you must use a standard, straight-through serial cable (*not* a null modem cable) between the RS-232 connector and the serial port connector on the computer. Typically, a DB25 male to DB-9 or DB-25 female cable will be used, with the DB-25 male end of the cable attached to the Omnia-3.

The Remote Control application is available as a free download from the www.omniaaudio.com website and is covered in detail in Chapter 8.

Interface Connection (DB-9M)



The 9-pin male Interface connector uses eight pins as “trigger” inputs with the ninth pin as the ground reference. The trigger inputs can be used to dynamically alter the Omnia-3’s operational attributes in response to logic signal transitions. The Omnia-3 responds uniquely on each trigger input to both go-high and go-low transitions. With eight inputs, and two possible triggers (logic go-high and go-low), sixteen unique “trigger scripts” can be written (using the Omnia-3 Remote software) to control the Omnia-3 in response to these trigger input logic transitions. The Trigger Script Interface Editor is covered in detail in Chapter 8.

The ***Pinout*** of the Omnia-3 rear-panel DB-9 Interface connector is as follows:

PIN 1 activates Trigger Script 1	PIN 6 activates Trigger Script 2
PIN 2 activates Trigger Script 3	PIN 7 activates Trigger Script 4
PIN 3 activates Trigger Script 8	PIN 8 activates Trigger Script 7
PIN 4 activates Trigger Script 6	PIN 9 activates Trigger Script 5
PIN 5 is connected to ground	

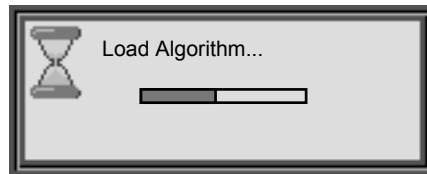
Ethernet Connection (Optional)

The Remote Control link for your Omnia-3 over 10BaseT and 100BaseT networks can be utilized if the Ethernet Interface hardware option is installed. (Part # 2091-00013) Installation instructions are provided with the hardware. The setup and operation of the Remote Control software application is covered in detail in Chapters 8 and 9.

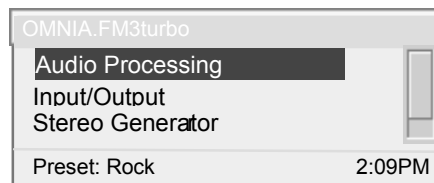
Powering Up

Press the “I” side of the rear panel power switch to turn on the unit. The processor is designed to be turned on and left on. Press the “O” side of the switch to turn off the unit for servicing.

When the Omnia-3 is first turned on, there is a few seconds of delay as the system starts up. An operating system start up screen is displayed. Under normal conditions it should appear as:



After approximately ten seconds, audio will be present from the analog and composite MPX outputs. The AES/EBU output also becomes usable at this time. However, full initialization of the software is not complete for several more seconds. After a few seconds, the Main Menu display will appear:

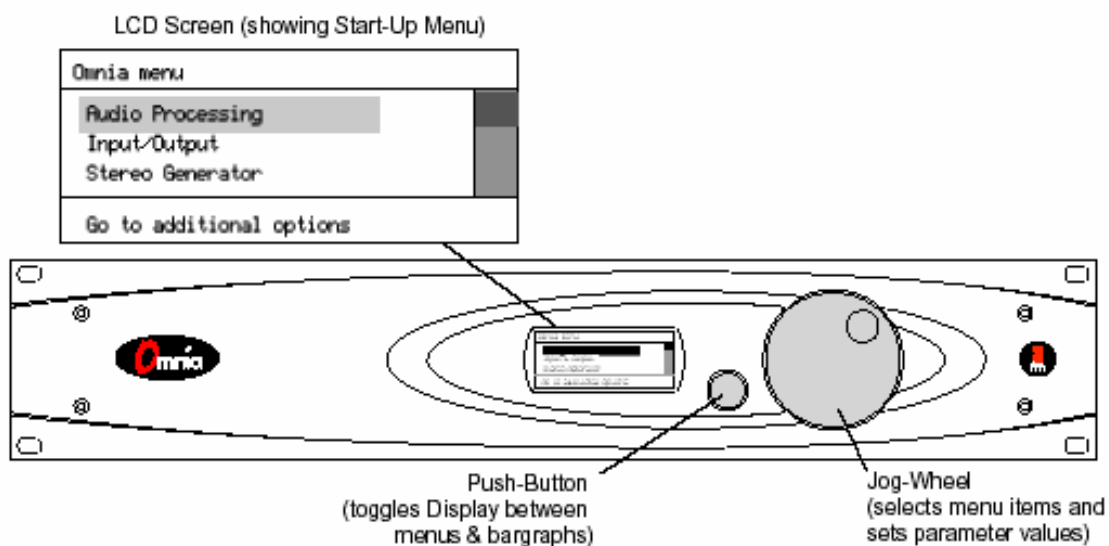


At this point, the Omnia-3 is fully operational. The next chapter covers its operation through the front-panel user interface.

Chapter 2: The User Interface

Now that your Omnia-3 is rack-mounted, connected to a program audio source, and turned on, you're ready to learn how to operate it! This chapter covers the Graphical User Interface, your window into the Omnia-3 processor.

The user interface consists of a front panel-mounted jog-wheel with push-switch, a push-button and an LCD screen. The LCD screen displays menus, parameter settings and bargraphs (Level Meters and Processing activity). The push-button toggles between the two display modes: the menus/parameters mode and the bargraph mode. The menus are used during initial setup and for adjusting the processing parameters. In normal day-to-day operation, one of the bargraphs is typically displayed to dynamically indicate the real-time signal processing.



Using the Jog Wheel

The main user control for the Omnia-3 is the large, easy to use jog wheel with its integral push-switch. We believe that you will quickly become comfortable with how it works, and appreciate its simplicity.

Rotating the Jog-Wheel moves a highlighting bar up or down through menus and parameter choices. Pressing the jog-wheel (called "clicking") selects the highlighted menu item or parameter choice. When editing the parameter values, rotating the jog-wheel adjusts the parameter's value up (by rotating CW) or down (CCW). Once the desired value is reached, clicking the jog-wheel saves the value and returns the display to the previous menu or sub-menu.

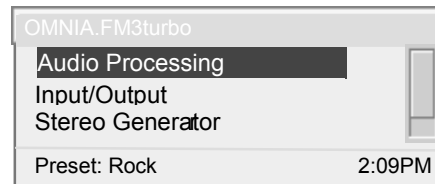
The behavior of the Omnia-3's menu system is consistent across pages and is easy to learn. The following procedure is used for all parameter selection and editing:

1. Use the jog-wheel to highlight a menu item or sub-menu item.
2. Click the jog-wheel to open up that item.
3. Once a parameter is displayed, highlight and click the name to open up the parameter value edit box.
4. Use the jog-wheel to adjust the value of the parameter.
5. Click to accept the value and return to the last sub-menu.

When the front panel is in bargraph mode, the jog-wheel is used to select between various pages of bargraphs that can be displayed. Push the push-button located to the left of the jog-wheel to change to bargraph mode. Rotating the jog wheel counter-clockwise moves left one page and rotating clockwise moves right. The pages do not wrap around from beginning to end or vice-versa. Rotating the wheel CCW will always eventually bring up the I/O meter page and remain there.

Main Menu Orientation

When the processor is first turned on, several start-up screens are displayed. After ten to fifteen seconds the Omnia-3 Main Menu is displayed with a sliding *menu bar* along the right side of the screen to indicate your position within the menu hierarchy. A multipurpose help line is located at the bottom of the display.



Note: After a time-out, the help line will cycle through: the current preset name, the status of dayparts, and the day and date. The time is displayed at the right side.

The menu system has been designed to be intuitive and simple to use, with a minimum of sub-menu layers. Most operating parameters are found less than three sub-menus deep. This allows multiple processing changes to be made “on-the-fly” with relative ease. The complete system is managed through the four menu choices on the Main Menu. They are: **Audio Processing**, **Input & Output**, **Display** and **Utility**. A fifth sub-menu, **Stereo Generator**, is added for the Omnia-3fm Turbo style.

The **Audio Processing** menu item is shown highlighted in the Main Menu Items illustration. The highlighting is controlled by the jog-wheel. Rotate the jog-wheel CW to step the highlighting down through the menu items. When the desired menu item is reached, press the jog-wheel once (“click”) to select that item. If the item has sub-menus (like **Audio Processing**), then the sub-menu choices will be displayed. If the menu item is a parameter selection, then the parameter choices or a bargraph value indicator is displayed. Rotating the jog-wheel steps through the choices and raises (when rotated CW) or lowers (when rotated CCW) the parameter value. Click the jog-wheel to select the parameter.

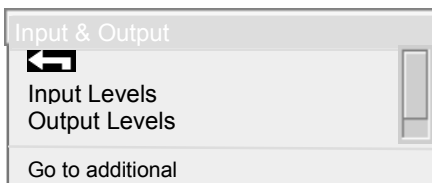
When a sub-menu is displayed, the top menu item will always be the return arrow. Highlight the return arrow and then “click” to move back to the next higher menu.

User Interface Tutorial

The following two exercises are a useful introduction to the user interface. They also show you how to select an input source and set input levels, which are among the first things that need to be done to set-up the processor. Start from the top of the Main Menu (as displayed when the unit is first turned on).

The first exercise demonstrates how to make a parameter selection:

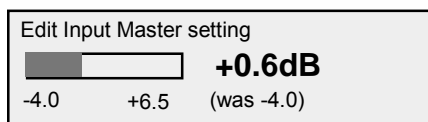
1. Rotate the jog-wheel to highlight **Input & Output**.
2. Select this menu item by “clicking” the jog-wheel (push once on the jog-wheel). The **Input & Output** sub-menu is presented:



3. Rotate the jog-wheel CW to scroll down to highlight ***Input Source***.
4. Click the jog-wheel to select ***Input Source***. An expanded edit box appears with the word **ANALOG** shown in large type (this is the default input selection).
5. Rotate the jog-wheel to alternate between the available parameter choices, in this case: **ANALOG** and **AES/EBU**. Note that the choices do not “wrap around.” You must rotate the jog-wheel CCW to return to a previous choice.
6. With **ANALOG** displayed, click the jog-wheel. The selection takes effect and the screen returns to the sub-menu item (***Input Source***).
7. To exit the ***Input & Output*** menu and return to the **Main Menu** rotate the jog-wheel CCW until the **return arrow** at the top of the menu is highlighted. Click on the **return arrow** to return to the **Main Menu**.

The next exercise demonstrates how to adjust a parameter that uses a value:

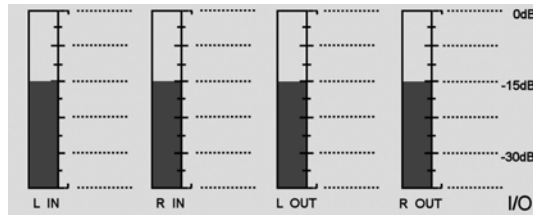
1. From the ***Input & Output*** sub-menu, rotate the jog-wheel until ***Input Levels*** is highlighted.
2. Click the jog-wheel to select and display the ***Input Levels*** sub-menu. There are three menu items displayed: ***Input Master***, ***Right Trim*** and ***Input Phase***.
3. The highlighted item is the ***Input Master*** parameter. Click to select.
4. An expanded edit box appears at the bottom of the display with a level bar displayed in the middle:



5. Rotate the jog-wheel CW to increase the input gain in 0.1 dB steps. Rotate the jog-wheel CCW to decrease the input gain. The current setting display updates as the jog-wheel is moved. Just below the current setting is the previous setting display. “(was -4.0)” All parameters display the previous setting below the current setting as soon as the jog-wheel is rotated. This allows the parameter to be easily returned to its previous setting.

Note: The ***Input Master*** control adjusts both the left and right channel levels simultaneously. If needed, the relative level between the channels can be adjusted using the ***Right Trim*** control, which has a range of -3 dB to +3 dB.

6. Adjust the input settings so that, with normal program audio, the **L In** and **R In** bargraphs in the I/O metering screen (viewed by pressing the push-button and turning the jog-wheel to the left) show peak indications hitting a bit higher than -15 dB (half to two-thirds of the way up).
- 7.



- Once the desired gain is reached, click the jog-wheel to accept the value and to return to the sub-menu item. The push-button will conveniently enable you to switch between the parameter adjustment and the bargraph metering screens.

All of the Omnia-3's software parameters are set in similar fashion through scrolling through menus and sub-menus to select which parameter to edit. The parameter choices or values are then selected by rotating the jog-wheel until the desired setting is displayed. Clicking the jog-wheel selects the parameter value and returns to the menu or sub-menu item.

Note: Changing the parameter value affects the audio output in real time so that the changes can be auditioned immediately.

User Interface Concepts

This section introduces you to several important concepts needed to understand and use the Omnia-3.

Presets

Each processor comes with processing presets designed for that style to cover most broadcasting formats or netcasting applications. A preset contains the saved values for every parameter listed under the *Audio Processing* menu for that style. When a preset is loaded, these values configure the Omnia-3's processing.

The factory presets can be used as-is by loading them using *Select Preset*, or they can be used as a starting point to tailor the processing for a specific requirement. Any of the presets parameters can be edited (using *Edit Parameters*) to obtain the desired sound. The edited preset can then be saved to the PC Card as a User Preset (using *Save to Card as*) and selected just like the factory presets. Editing presets is covered in detail in Chapter 7, Editing Presets

Presets can be backed up to your computer using the free Remote Control software available for download at www.omniaaudio.com. Full information about Remote Control is covered in Chapter 8.

System Parameters

System Parameters are any parameters that are not part of a processing preset. These include all settings in the *Input & Output* and *Stereo Generator* menus as well as other system settings such as Dayparts and Trigger Scripts. Such parameters are typically set once and left alone, and having them change when a new preset is selected would be undesirable. These are stored in a battery-backed NVRAM chip on the motherboard. If an event should occur that clears the NVRAM (such as a power outage combined with a dead battery etc.), the unit restarts using the last saved set of System Parameters stored on the PC card. This means all *Input & Output* and *Stereo Generator* settings are restored from the PC card, as well as other system settings such as any Dayparts and Trigger Scripts. Also, the preset that was running when the system was saved to the card is stored there as the default preset.

Important Note: You should save the System Parameters to the PC card after changing any System Parameter or if you change your default processing preset.

If your current System Parameters were never backed up by saving them to the PC Card, the parameters restored would be the factory defaults and the default preset would be the first factory preset in the preset list.

To save the System Parameters, navigate to the *Utility Menu* and click on *System Attributes* and then *Save to Card*.

Also in the *System Attributes* menu are the options to *Load Defaults* (loads the factory defaults) and *Load from Card* (loads previously saved parameters or those from another PC card).

Security

The Omnia-3 includes two security levels that permit “lockout” of the unit to prevent unauthorized personnel from making adjustments. **Normal** mode allows read-only access to the Omnia-3 and its menu structures. An **Engineer** mode allows full access to all controls. Additionally, the unit can be locked altogether, preventing any access whatsoever. Default passwords supplied with the unit are “vito” (all lower case) for **Normal** mode and “tomtom” (all lower case) for **Engineer** mode.

Trigger Scripts

The Omnia-3 Remote Control software (available as a free download from www.omniaaudio.com) contains a special script editor that allows the programming of System Parameter changes that can be “triggered” by logic state changes on the rear-panel DB-9 “Interface” connector.

Using Trigger Scripts, you can make the Omnia-3 do things with contact closures that would normally need to be done either by manual intervention at the front panel, or via Omnia-3 remote control. There are 8 Trigger Inputs available, and they respond to dry contact closures on the rear-panel “Interface” connector. Full information about Trigger Scripts is covered in Chapter 8, Remote Control.

Dayparts

The audio processing can be automatically adjusted by dayparts. This permits different presets to be invoked according to a schedule that you create. If there is no daypart selected for an interval of time, the system returns to the default preset selected by the user before dayparting is enabled. Configuration of dayparts is covered in detail later in this Chapter in the “Utility” sub-section of the “Menu Descriptions” section.

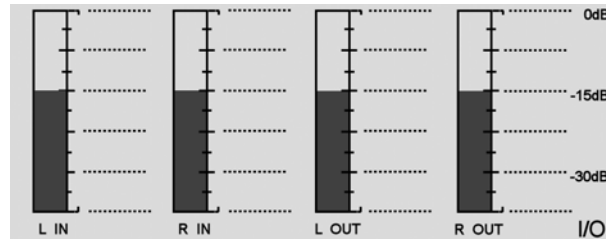
Bargraph Display Metering Screens

The bargraph screens are displayed by pressing the front panel push-button (located between the LCD and the jog-wheel). This toggles between the two display modes: the menus/parameter mode and the bargraph meter mode. Multiple screens are available in bargraph mode, and are selected by turning the jog wheel. The first screen can be reached by turning the wheel counter-clockwise until the screen no longer changes. Each screen is titled in the lower right-hand corner as a navigation aid.

The screens available depend on the style of Omnia-3. All styles have the first I/O screen that shows the input and output levels. On Omnia-3am and net units there is one combined “Process” bargraph screen that shows the wideband AGC bargraph and three limiter bargraphs (four on the Omnia-3am). The Omnia-3fm Turbo style has two processing bargraph screens -- one for the wideband and multi-band AGC bargraphs (labeled “AGC”) and the other for the multi-band limiter bargraphs (labeled “LIM”).

I/O Levels Display

Both input and output levels are displayed in real time. The output bargraphs only indicate the output levels of the digital and analog XLR outputs and do not indicate composite MPX levels on Omnia-3fm Turbo units. The bargraphs indicate peak levels below 0 dBFS, which is the absolute maximum level of the internal digital signal processing. In normal operation with normal program audio, signal level peaks should regularly indicate just above -15 dBFS and never hit 0 dBFS.



Process Display

The process bargraphs indicate the amount of processing (gain-reduction) of the AGC and Limiter bands in the Omnia-3. Maximum indicated gain-reduction is 25 dB, which occurs at the bottom of the screen. The bargraphs also have a *GATED* indication as determined by the *Gate Thresh* or *Hold Thresh* setting for that band.

Note: It is normal for the wideband AGC to “recover” to a platform of 10 dB of gain reduction if it is gated over a long period of time. Refer to Chapter 7, Editing Presets for more information on interpreting and using the Processing bargraph display.

Menu Descriptions

This section gives an overview of the menus, sub-menus and parameters. The next chapter (Chapter 3, Processing Overview) presents an overview of the Omnia-3 processing. Chapter 7, Editing Presets, gives more information on editing parameters including procedures for editing the factory presets to create your own custom presets.

Main Menu

This menu has four items in Omnia-3am and Omnia-3net/drm: **Audio Processing**, **Input & Output**, **Display** and **Utility**. A fifth item: **Stereo Generator** is added on the Omnia-3fm Turbo style.

Audio Processing

It is from the Audio Processing sub-menu items—**Select Preset** and **Edit Parameters**, that the unit’s processing power is unleashed. Omnia-3 is equipped with numerous presets that can be selected to instantly configure the processing. The presets are selected using **Select Preset**. Selecting **Edit Parameters** opens up the parameter-editing sub-menu, which allows any processing parameter to be “fine-tuned” to tailor your processing. **Save to Card as** allows the edited preset to be saved to the PC Card as a new User Preset.

Input & Output

This sub-menu provides the **Input Levels** and **Output Levels** adjustments for the discrete left and right inputs and outputs, selection of **Input Source** (Analog or AES-3), **Preemphasis** and **Deemphasis** options (Omnia-3fm Turbo style only) and **Mono Mode** options. These are generally “set once” selections or parameters, adjusted during installation and then generally left alone.

Stereo Generator (Omnia-3fm Turbo only)

This sub-menu has the adjustments for the *SCA Level*, *Composite 1 & Composite 2* output levels, *Pilot Level*, *Pilot Phase* and *Separation*.

Display

This sub-menu has the adjustments for the LCD screen (*Contrast* and *Backlight*).

Utility

Numerous maintenance and utility functions are nested within this sub-menu. You can find the currently running system software versions in the *About* sub-menu. The housekeeping of *Preset* and *System Attributes* data, along with PC *Card Maintenance* is provided here. Enabling *Dayparts* as well as setting *Security* features to prevent tampering by unauthorized personnel are also provided under this sub-menu. Finally, the *Date*, *Time* and the RS-232 serial *Ctrl Port Baud* rate can be set here.

Audio Processing

This sub-menu is used to make changes that affect the on-air sound. It has five items: *Select Preset*, *Edit Parameters*, *Undo Edit*, *Save to Card*, *Save to Card as*. The Omnia-3am style also has an *Editing Mode* item.

Select Preset

This opens up a selection box to select a factory preset or a user preset that was previously saved to the PC Card. The name of the preset that is currently running is displayed. Use the jog-wheel to scroll through the list to find a preset to load. Once the desired preset name is displayed, click the jog-wheel to immediately load that preset into the unit's memory. This also returns you to the Select Preset menu item.

Note that once you move the jog-wheel to display another preset name, a message below the preset name indicates the previous selection, i.e., "(was Jazz-6AM)" will be shown if that was the currently running preset. This serves as a reminder, so you can reselect that preset in case you change your mind about changing presets, since there is no way to "cancel" selecting a new preset to load.

A thermometer bar along the left side of the window indicates where you are in the list of presets. All User Presets are added onto the end of the list, so they will be found when the bar is toward the bottom of the thermometer.

Editing Parameters

Here you have detailed control of *all* processing parameters. Such parameters as attack/release times, gate thresholds, multiband EQ settings and clipping drive are available through a graphical block diagram based interface. The first blocks name, "AGC Wideband" flashes, indicating that it's the current parameter. To edit the AGC Wideband parameters, click the jog-wheel. A list of the parameters relevant to that part of the processing algorithm is shown (in this case; Phase Rotator, Wideband AGC, etc.). To edit another block's parameters, rotate the jog-wheel until the desired block name is flashing and then click the jog-wheel. Detailed editing is covered in more detail in Chapter 7, Editing Presets.

Undo Edit

Restores the preset state from before the last edit operation.

Save to Card

Saves the current parameters to the PC Card, overwriting any previous settings saved under the current Preset name. This function cannot be used with factory presets, since they cannot be changed. If you have made changes to a factory preset and wish to save them, use *Save to Card as* to save the changes under a new name.

Save to Card As

Opens up a Preset Naming dialog box to allow the Preset name to be changed before saving the preset to the PC Card. Preset names can be up to 12 characters in length. Click the jog-wheel to select a highlighted character to be changed. Then rotate the jog-wheel to step through all the possible characters. Once the desired character is displayed, click the jog-wheel to select that character. The highlighting moves to the next character. To insert a new character between others, select the character after the insertion point, then change it to the “ins” symbol. To delete an existing character select it, then change it to the “del” character. When the last character is reached, rotate the jog-wheel to highlight “**Save**”. Click to save the preset. Highlight “**Cancel**” to cancel the operation.

Input & Output

This sub-menu has four main items common to all styles: *Input Levels*, *Output Levels*, *Input Source* and *Mono Mode*, plus four additional items (*Preemphasis*, *Deemphasis*, *BS-412 ITU Limiter*, and *BS-412 Limiter Power*) in the fm Turbo style, one additional item (*LPF Frequency*) in the Omnia-3net/drm style, and five additional items (*Asym Mod*, *Tilt EQ*, *Tilt Frequency*, *LPF Frequency* and *HP Filter*) in the Omnia-3am style. Common items will be covered here while items specific to a style will be covered in the chapter on that style.

Input Levels

Three parameters are located under this sub-menu item: *Input Master*, *Right Trim*, and *Input Phase*.

Input Master & Right Trim: These level controls are active when either Analog input or AES/EBU input is selected since their adjustments take place in the digital domain. The factory default setting is 0.0, which corresponds to a nominal average program audio input level of +4 dBu. To change input level, rotate the jog-wheel to adjust the level in 0.1 dB steps. The *Input Master* affects both the left and right inputs simultaneously, while the *Right Trim* only affects the right channel over a +/- 3 dB range. Use the level bargraphs to make this adjustment so that signal peaks read a bit higher than -15 dB with normal program audio. 0 dB corresponds to 0 dBFS (decibels below Full Scale digital, i.e. the digital clip point) so be sure that peaks do not reach 0 dB regularly or distortion will result.

Input Phase: If the relative phase relationship of the Omnia-3 is different from your existing system, it could cause your announcers to think they sound “weird” when monitoring through the system using their headphones. If this happens, the relative phase of the Omnia-3 is 180 degrees different from what your announcers are used to. To remedy this, you can reverse the polarity with this menu selection. This is the same as but much more convenient than swapping pins 2 & 3 on both L & R input XLR connectors!

Output Levels

Two parameters are located under this sub-menu item: *Output Master* and *Right Trim*.

Adjustment of the left/right audio levels is done in the same manner as setting the input levels. Since these settings take place before the D/A converter, the settings affect both digital (AES/EBU) and analog XLR outputs. In Omnia-3fm Turbo units, the composite MPX outputs are not affected by these controls.

Note: Both the analog and digital AES/EBU outputs are active at the same time. Connections can be made simultaneously to the analog and digital outputs, as well as the composite outputs on the Omnia-3fm Turbo.

Input Source

Selects whether the input is supplied by the **Analog** or **AES/EBU** digital input.

Mono Mode

This sub-menu has five items: *Stereo*, *Mono L*, *Mono R*, *Mono L+R* and *Swap*.

The **Stereo** selection indicates that the processor will process a 2-channel stereo signal. Please note that the two channels cannot be separate un-related signals since the processing is stereo strapped.

Mono L: The signal at the left input is fed to both the left and right channels of the processing.

Mono R: The signal at the Right input is fed to both the left and right channels of the processing.

Mono L+R: A sum of the two input channels is fed to both left and right channels of the processing.

Swap is similar to **Stereo** but the L & R channels are reversed. (swapped)

Pre-Emphasis (Omnia-3fm Turbo only)

See **Omnia-3fm Turbo System Adjustments** in chapter 4 for full details.

De-Emphasis (Omnia-3fm Turbo only)

See **Omnia-3fm Turbo System Adjustments** in chapter 4 for full details.

BS-412 Power Limiter (Omnia-3fm Turbo only)

See **Omnia-3fm Turbo System Adjustments** in chapter 4 for full details.

BS-412 Average Power (Omnia-3fm Turbo only)

See **Omnia-3fm Turbo System Adjustments** in chapter 4 for full details.

Asymmetrical Modulation (Omnia-3am only)

See **Omnia-3am System Adjustments** in Chapter 5 for full details.

Tilt EQ (Omnia-3am only)

See **Omnia-3am System Adjustments** in Chapter 5 for full details.

Tilt Frequency (Omnia-3am only)

See **Omnia-3am System Adjustments** in Chapter 5 for full details.

LPF Frequency (Omnia-3am only)

See **Omnia-3am System Adjustments** in Chapter 5 for full details.

LPF Frequency (Omnia-3net/drm only)

See **Omnia-3net/drm System Adjustments** in Chapter 6 for full details.

Stereo Generator (Omnia-3fm Turbo only)

Six parameters are set under this sub-menu: **SCA Level**, **Composite 1**, **Composite 2**, **Pilot Level**, **Phase Adjust**, and **Separation**.

See **Omnia-3fm Turbo System Adjustments** in chapter 4 for full details.

Display

Two parameters are set under this sub-menu: **Contrast** and **Backlight**.

Contrast adjusts the brightness difference between the lightest and darkest segments in the front panel display. Note that if this setting is mis-adjusted the display will “disappear.”

Backlight adjusts the LCD’s backlight to compensate for room brightness.

Utility

There are nine parameters or sub-menus reached through this menu item: *About*, *Preset*, *System Attributes*, *Card Maintenance*, *Daypart Table*, *Security*, *Set Time*, *Set Date* and *Control Port Baud*.

About

The first thing displayed when you click on *About* is the Omnia factory telephone number in Cleveland! To display the currently running software versions, click **OK**. The Style and Release version will be displayed. Click **OK** again and the Bios, display and Loadset versions are displayed. Clicking **OK** again brings up the copyright screen and one more click returns you to the Utility menu.

Preset

This sub-menu has two parameters: *Delete* and *Rename*. Select *Delete* to permanently delete a User Preset from the PC Card. A selection box will be displayed allowing you to choose a preset for deletion. Once a choice is made, a confirmation box is displayed. The preset will not be deleted until “OK” is selected from the confirmation box. Select *Rename* to change the name of an existing User Preset. A selection box will be displayed allowing you to choose a preset to be renamed. Once a choice is made, a naming box is displayed to enter the new name for the preset. This works as described above in “Audio Processing”: “Save to Card as”.

System Attributes

There are three parameters under this sub-menu item: *Load Defaults*, *Load From Card* and *Save to Card*.

Load Defaults: Reloads all of the factory default system parameters into the system. System parameters are anything that is not saved with the processing preset, such as input and output levels, and RS-232 baud rate. User presets saved to the PC card are not affected but the default preset is reset to the first factory preset shown in the list.

Load From Card: Loads previously saved system parameters from the PC Card.

Save to Card: Saves system parameters to the PC card. This makes a “copy” of the system configuration that normally resides in the nonvolatile RAM within the Omnia-3, storing it on the PC Card. This simplifies getting back to a previous state after numerous system adjustments have been made, but you want to return.

Card Maintenance

Erase User Data: Choose this selection when you want to erase all *user* information on the PC Card, including user presets, saved system settings, dayparts, and trigger scripts. When this function is selected, the PC Card is restored to the initial factory condition, and only the factory presets are available. Before this function is executed, a pop-up screen will ask for confirmation. Follow the instructions presented on the screen to confirm erasure of the card.

Daypart Table

Sub-menus in this menu allow viewing and setup of dayparts. These sub-menus are:

Show All: Displays all of the currently defined dayparts through a series of dialog boxes.

Add Part: Permits the creation of dayparts. Using various screens, you can select the start day and time, the end time, and preset. The system will warn the user if the daypart being added overlaps one of the dayparts already defined.

Note: You can cancel the *Add Part* operation at any time by selecting the *Cancel* option on any of the daypart *Add Part* screens.

Modify Part: Permits editing of dayparts already created. The system prompts the user to select one of the currently defined dayparts, and then displays the same sequence that the user sees when doing an *Add Part*,

allowing you to edit the daypart. The user can then change the start day and time, end time, or preset associated with the daypart being edited.

Remove Part: Permits removal of a daypart. The system prompts the user to select one of the currently defined dayparts, and then prompts the user with a *Continue To Delete?* dialog with a *Yes/No* option. If the user selects *Yes*, the selected daypart is deleted.

Load from Card: Retrieves daypart data stored on the PCMCIA card. This operation will restore any dayparts that were previously saved to the card with the *Save to Card* operation, described below.

Save to Card: Backs up daypart information onto the PCMCIA card (for safety and sharing with others). It saves all of the currently defined dayparts and the daypart state to the Omnia-3 PC card. These settings can be loaded later by selecting the *Load from Card* option.

Current State [Enabled/Disabled]: Activates or deactivates the use of created dayparts. If *Enabled*, then the system will automatically change presets as specified by any of the dayparts defined. If *Disabled*, then the system will not use any of the dayparts defined.

Security

This menu allows configuration of all Omnia security features, such as password access, screen locking, and remote access control. There are six sub-menus: *Lock Unit*, *Login*, *Lock Password*, *Engineer Password*, *Enable Remote* and *Disable Remote*.

Lock Unit: Immediately locks the front panel controls and display. A dialog box is presented for password entry to unlock the unit. Either the normal mode or engineer mode password can be used to unlock the unit.

Login: Permits access at one of two security levels (**Normal** or **Engineer**), using the appropriate password.:

Normal mode: vito (all lower case)

Engineer mode: tomtom (all lower case)

Lock Password: Allows changing the password for “**Normal**” access. This really should be called “Normal Password”, but our software engineers wanted to include something to keep the users on their toes. This can be performed either from “**Normal**” or “**Engineer**” security levels.

Engineer Password: Allows changing the password for “**Engineer**” access. Can be performed only from the “**Engineer**” security level.

To change a password, use the standard click and turn of the jog-wheel to select the character position you wish to change, and to select the character for that position.

After choosing a new password, continue rotating the jog-wheel until **OK** is highlighted. Push on the jog-wheel. The password is now saved. If you wish to cancel this operation, just scroll onto the *Cancel* box and press the jog-wheel. The operation is canceled.

Caution: Do not attempt to assign the same password to both security levels! You will lock yourself out permanently!

Enable Remote: Allows remote control access to individual system parameters previously inhibited by the *Disable Remote* command (see below). In other words, you can selectively cancel individual parameters that were disabled for remote access. A list of parameters that have been disabled (through the *Disable Remote* menu) for remote users is displayed. When a parameter is selected, it becomes available to “**Engineer**” password users to edit through the remote software. Selecting **Exit** (**None** on am and net styles) exits the *Enable Remote* screen without changing the current settings.

Disable Remote: Allows the user to restrict access to a list of system parameters so that remote users won't be able to change the selected parameters. When the ***Disable Remote*** option is selected, a list of the system parameters that are editable through the remote is displayed. When a parameter is selected, it is no longer editable through the remote command interpreter. Selecting **Exit (None** on am and net styles) exits the ***Disable Remote*** screen without disabling any parameters. To restore a parameter so that remote users can edit it, use the ***Enable Remote*** option.

Set Time

Sets the current time for the unit. This must be performed before dayparts can be used. The time is set using the familiar "turn and push" action of the jog wheel.

Note: The time can be synchronized to ":00" seconds by pressing the jog wheel in synchronization with the seconds indicator of an external clock. To maintain accurate dayparting, periodically reset the internal clock to your external reference.

Note: An additional menu will prompt you to set the unit to Daylight Saving or Standard time.

Set Date

Sets the current date. This must be performed before dayparts can be used. The date is set using the familiar "turn and push" action of the jog wheel.

Control Port Baud

This option sets the RS-232 serial communications port baud rate. The default rate is 19200 bps.

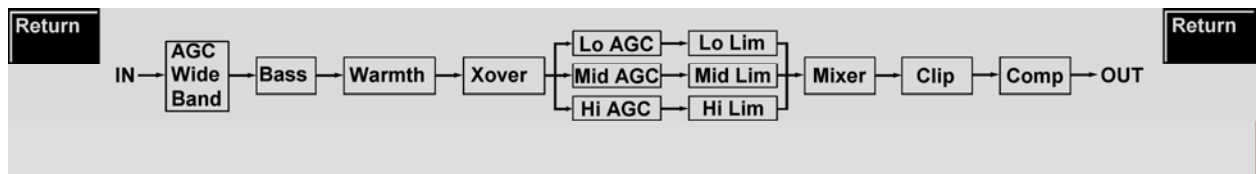
Chapter 3: Processing Overview

This chapter presents an overview of the processor using the block diagram from the Omnia-3fm Turbo to provide a guide to the various processing sections. Not all processing sections discussed in this section are found in each style. Refer to the chapter on your specific style for additional processing information including a style-specific block diagram and a Parameter Worksheet.

Note: More detailed technical information about the audio processing employed in Omnia-3 can be found in the Technical Papers section on the Omnia web site (www.omniaaudio.com).

The Omnia-3 and Audio Processing

There are thirteen possible processing blocks depending on which style of Omnia-3 is being discussed. Common to all styles are an input AGC circuit for initial level control, bass and warmth EQ adjustment sections, a multiband crossover section, a multiband limiter, a mixer circuit and a final limiter at the output. The following block diagram presents the order of these processing blocks as used in the Omnia-3fm Turbo.



Wideband AGC: A very flexible wideband leveler section to provide transparent and smooth control of the input program. This is achieved through two significant innovations: a dual referenced gate and an intelligent “makeup” gain algorithm. The dual gate reference is a unique process that references the input dynamics to a “rolling” reference level.

A user-adjustable Make-Up Gain feature uses an algorithm incorporating a *hidden* control signal that knows when a sustained softer portion of program is occurring. It then “fills in” the softer section so that the average level is increased. This allows the overall AGC function to operate with a slower time constant, yielding lower intermodulation distortion without losing loudness in the softer passages.

As an example, with classical music, the orchestra might be playing along at a fairly robust level, then enter into a quiet passage. A conventional AGC would hold the softer passage down until it was able to slowly recover, keeping the soft passage much too quiet! With Omnia-3’s *makeup gain* function, the hidden, faster time constant will allow a quick recovery, but *only during the softer passage*. As soon as the orchestra starts to play louder, the “makeup” time constant yields control to the primary AGC circuit, hence returning gain to the previous platform level. This sophistication better preserves the dynamic integrity of the signal.

Typically the wideband AGC should be adjusted to give 10-12 dB of gain reduction on moderately loud passages.

A built-in phase rotator ensures symmetrical clipping of positive and negative peaks. But, for a more musically transparent sound (or if phase rotation is built-in to your mic processing) this feature can be defeated.

A third-order (18dB/Octave) high pass filter with five selectable cutoff frequencies from 60 Hz down to 20 Hz allows removal of subsonic frequencies that may cause problems in processing and further along the airchain.

Bass EQ: For those who demand *thunderous* bass, the Omnia-3’s got it! Up to 12 dB of “thunder” can be added to shake your listener’s walls! This is not some simple bass EQ, but rather a sophisticated concept that takes into consideration the time alignment of the low frequencies as they pass through the entire system. This allows

loud, clean low end, with no sacrifice to the overall loudness of your signal. The Deep Bass and Phat Bass parameters are found under the Bass menu. Deep Bass is a shelf boost at 90 Hz that utilizes a phase linear 12 dB/octave slope to produce the shelving EQ function. Phat Bass is a unique enhancement that adds filtered harmonics to the bass frequencies. Low frequency texture is emphasized with this parameter. Older materials sound fuller (or phatter) with the added illusion of loudness.

Warmth EQ: The Warm Bass parameter is found under the Warmth menu. Warm Bass is a shelf boost that functions up to 150 Hz. Adjusting Warm Bass compensates for program material that is naturally lacking in upper-bass punch. The parameter is adjustable over a 6 dB range.

Phase Linear, Time Aligned Crossover: Most multiband audio processors must make a compromise in the crossover area: either provide true phase linearity, or dynamic flat response. The problem with implementing only the former is that, under dynamically controlled conditions, peaks or notches will occur at the crossover frequencies once the bands are recombined. In an effort to minimize this problem in older designs, crossover frequencies were phase-offset, so when they were recombined, these peaks and notches would be minimal—thus maintaining some degree of flatness. Such a compromise results in the loss of phase linearity, which reduces clarity. In Omnia-3's DSP implementation, the crossover network is carefully time-aligned so the recombined spectrum remains flat, regardless of the amount of gain control being applied within any band. This yields a phase linear response, so that no harmonic content is ever displaced in time. The result: a truer, more natural sound without smearing.

Multiband AGC Section (Omnia-3fm Turbo Only): Similar in character to the wideband AGC described above, but expanded to three bands, this section has the ability to add significant power, consistency and loudness to the audio while tailoring and pre-processing it for delivery to the multiband limiter section.

Multiband Dynamic Peak Limiter: These are not just simple limiter sections using single time constants, but rather a process that can make adjustments based upon the “peak weight” of the signal. The sophisticated algorithm relies upon a *peak-weighted* calculation to determine the strength of a transient peak. It then determines if very fast dynamic control is required. In this fashion, faster timing is used only when necessary, and then only under certain conditions that are dictated by the density of the peak signal. If the peak is very short in nature, then the limiter will ignore it and let it pass onto the next processing stage (the final limiter/clipper). A built-in *Hold* feature allows the limiter to rest momentarily in order to reduce IM distortion.

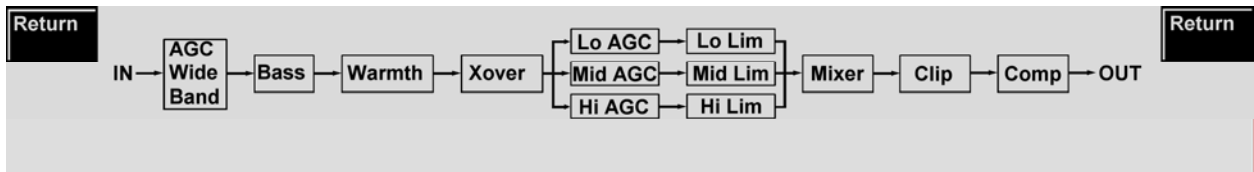
Non-Aliasing, Distortion Controlled Final Limiter: This is where other DSP attempts have failed, resulting in “digital grunge” and the unflattering phrase “that digital sound.” Omnia-3's proprietary method generates no aliasing products and does *not* need to over-sample the audio data, thus conserving valuable DSP power. This reduces audible processing distortion while producing a clean, loud signal. Users have reported that this implementation exceeds the “smoothness” of a well-designed analog limiter.

Stereo Generator /Encoder (Omnia-3fm Turbo only): With an all-digital, numeric implementation, theoretically perfect performance is approached. Stereo separation is typically greater than 65 dB. Suppression of the 38 kHz carrier is greater than 75 dB. User parameters include separation, pilot phase, pilot level and composite output level.

Selectable Composite Clipper with Phase Linear Composite Low Pass Filter (Omnia-3fm Turbo only): This feature is provided for those who wish to add an “afterburner” to their FM signal. This clipper does not interfere with the 19 kHz pilot, because the pilot is added post-clipper. There is also a digital implementation of the *Dividend* Composite Filter, which allows composite processing to be used without generating *any* harmonic content in the SCA spectrum. With 3 dB of composite processing employed, all content above 53 kHz is suppressed by 75 dB. This precise spectral management contributes to loudness, since it ensures that no wasted energy is transmitted.

Chapter 4: Omnia-3fm Turbo

This chapter presents additional installation and operation information specific to the Omnia-3fm Turbo processor. An Omnia-3fm Turbo Block Diagram is shown below, and a Parameters Worksheet is included at the end of this chapter. Use the Parameter Worksheet as a master sheet for photocopying so that the parameter settings for any custom presets can be recorded. Presets can also be saved to your computer and printed using the Omnia-3fm Turbo Remote Control software.



Processor Location

Believe or not, this is an important consideration! Where you choose to locate the processor—at the studio or at the transmitter—can have a profound impact on the overall performance. We present a few considerations that will aid in making this decision.

In most applications, installing the processor at the transmitter site provides a solid coupling between the processor and the FM exciter. Since there is nothing between the processor and the exciter to degrade the tightly-controlled output, modulation performance will be maximized. The drawback to this setup is that the unit is located in a remote location that is usually a very noisy environment. However, having the unit located afar is mitigated by Omnia-3fm Turbo’s remote control capability.

If the plan is to set up the processor at the studio, consideration must be given to these STL factors:

- Is the STL path a clean shot? If the path is noisy, especially if an analog composite STL is used, unwanted composite noise can be added to the processed signal through the STL receiver, and that can waste modulation and degrade sonic performance.
- Is the STL Discrete or Composite? Analog or Digital? If a discrete system is used, there must be a provision for a stereo generator/encoder at the transmitter. In that instance, it is imperative that this stereo generator/encoder not introduce any distortion or overshoot to the system. Most stand-alone stereo generator/encoders employ some form of low pass filter and safety clipper. These sections can add distortion and overshoot if not set up properly. This applies to the ones built into digital exciters as well. If a composite STL is used, the multiplexed output of Omnia-3fm Turbo can be connected directly to the STL. At the transmitter location, the composite receiver can be connected directly to the exciter. If the STL is discrete digital and it employs “compression” (a data-reduction codec), the Omnia-3 must be located at the transmitter site to avoid the overshoots, distortion and audible side-effects of feeding a codec with a tightly peak-controlled and pre-emphasized signal. Newer discrete digital designs are un-compressed (linear) and can accept the pre-emphasized output of the processor well.
- Overshoots: Some analog STL systems are known to generate overshoots due to their design deficiencies. One known culprit is the “bounce” that can be created by an inefficient modulator/demodulator of the STL system. This can steal 1 - 2 dB of modulation, and that’s lost loudness. A method to verify that a composite STL system is free of overshoots is to connect an oscilloscope to the STL receiver and monitor the composite waveform, paying special attention to the integrity of any low frequency square waves. Of interest is the “squareness” of the low frequency waveform, and if there is any noticeable “grass” or “peaky” looking waveforms that would exceed the peak level of the low frequency signals. The low frequency waveform should

look very “square.” If it appears to “tilt” in any manner, then there is a coupling problem in the STL system. (We’d offer further information here on the “how and why” this occurs, but that could consume a whole chapter unto itself!) Simply stated, the problem could be due to either AC coupling in the STL system or “bounce” generated by either the modulator or demodulator of the STL. Sometimes it’s a little of both!

If you notice any “grass” exceeding the peak level of the low frequency waveforms, there could be noise getting into the system somewhere. That can occur if the RF path is noisy due to RF signal loss. This “grass” can also be created if the composite path through the STL system is not linear throughout the 53 kHz bandwidth that a composite signal requires. This would create overshoots to the processed signal.

A simple fix for either of these two problems is to employ a composite clipper at the transmitter site. But beware: This could lead to additional audible distortion due to the added clipping of the overshoots.

While the above items must be given some thought, there are many advantages to installing the processing at the studio. If the STL link operates in a solid fashion, superior performance can be achieved, along with having easy access to the processing for monitoring and adjustment.

Omnia-3fm Turbo Connections

The Omnia can generate audio power in the low frequency region so strong that it may affect the performance of some exciters. It is imperative that the exciter has a dual speed PLL in the AFC, or it may unlock. This is not the fault of the audio processor, but of the exciter. For those who wish to have good, solid, powerful bass on the air, this is a key point that cannot be overlooked, or loudness will be lost due to inefficient modulation.

Interfacing With A Digital Exciter

Although the current rage is to create the *all-digital* broadcast transmission path, there are some key issues to be aware of or you can sacrifice loudness in an attempt to gain quality. I know what you must be thinking right now: “How can they say this when *everything* is digital!”

One issue concerns the sampling rate of the audio processor and the input to the exciter. It is possible to have two differently sampled systems interfaced in the digital domain. This compatibility is made possible through a neat little device known as the “sample rate converter.” A device that outputs digital audio data using a 48 kHz sampling rate can be converted *down* to a lower rate of, say, 32 kHz Unfortunately, this can create overshoots, which rob loudness. Detailed information can be found in the technical papers *Digital Broadcast Audio Processing: Finally The New Frontier* and *Omnia.fm: An Engineering Study* on the Omnia web page (www.omniaaudio.com).

We strongly believe that any stereo generator for FM must use a 48 kHz sampling rate. In this manner, any processor that is connected to the stereo generator can’t overshoot. Unfortunately, there are others who are building DSP stereo generators that use a lower sampling rate than 48 kHz However, reducing the sampling rate of the Omnia-3fm Turbo runs the risk of creating the nasty *digital sound*.

The key is the sampling rate. If the digital exciter is *actually* operating at a 48 kHz sampling internally, then there is no problem. But, should the exciter provide a *downward* conversion of the 48 kHz sampling rate from the Omnia-3fm Turbo, then you could have overshoot problems.

Output Connection Possibilities

Left/Right Analog: Given the other choices, this is the least-recommended procedure. The stereo generator in the Omnia-3fm Turbo provides superior performance, so you should use it instead of the one provided in the exciter.

Analog Composite: If you don't object to going partially analog, this will provide excellent peak control and sound quality.

AES/EBU: The new Prediction Analysis Clipper that can be activated within the clipper section mitigates much of the overshoots resulting from the “sample rate roller coaster” of multiple rate conversions and lowpass filtering. However, it cannot make up for potential sonic degradations. This method is similar to Left/Right Analog above in that it is bypassing the Omnia-3's excellent stereo generator (and composite clipper) relying on the stereo generator built into the digital exciter instead.

Pre-Emphasis: Where To Insert?

Another item of concern is with pre-emphasis. Most digital exciters can generate pre-emphasis within their DSP stereo generator. This is overkill! Omnia-3fm Turbo provides not only the proper pre-emphasis for any region in the world, but also exhibits excellent peak control of the pre-emphasized signal so that no overshoots occur. Using the pre-emphasis in the digital exciter will not guarantee this type of performance. Here's some background in the context of operating in a complete digital environment:

1. Most exciter manufactures will recommend the use of their pre-emphasis network. If that was done, then the incoming audio data from the processor must be *de-emphasized* before it reaches the exciter. Why perform the emphasis function twice? Also, and more importantly, if the pre-emphasis phase delay is not **exactly the same** as the previous de-emphasis in the processor, overshoots will occur. Therefore, it is far more advantageous to employ pre-emphasis only once—in the Omnia-3fm Turbo—and then set the exciter to accept a *flat* input. The overshoot problem is greatly reduced.

2. We understand why the exciter manufacturers have provided these pre-emphasis options. It has to do with digital codec STLs. Research has shown that pre-emphasized audio routed through a codec is not very *friendly* sounding. Hence the de-emphasis in the processor, and second pre-emphasis in the exciter. That's a poor example of a Band-Aid. If you are in a situation where you need to use a codec STL, then locate the processor at the transmitter. This totally eliminates any codec abnormalities to the processed audio, along with letting the processor have the best possible electrical coupling to the exciter, be it analog or digital.

You can find more detailed information in the Technical Papers on the Omnia web page (www.omniaaudio.com).

If your desire is to create an all-digital transmission path, please be aware of the topics that have been discussed here. Should you experience any problems with overshoot or added distortion, you should look to the function of the digital exciter and its stereo encoder. As a reference, you can easily make signal comparisons with the analog outputs from the Omnia-3fm Turbo system, especially the composite output. Viewing the signal on an oscilloscope will reveal that the output is well controlled, with no overshoots, providing a clean baseband spectrum.

Digital Exciter Connection Considerations

The physical connection to a digital exciter is through an AES/EBU connection. Using a shielded audio cable with appropriate XLR connectors on each end, connect the processor to the exciter. The exciter should be set for *flat* input, which means that the exciter is not adding any pre-emphasis to the input signal.

In the *System Adjustments* section that follows, set the **Deemphasis** option to **None**. This ensures that the output from the processor is now pre-emphasized. You will also need to adjust the output levels. Since the digital exciter will provide the stereo generator function, set the output levels for the discrete left/right channels. This is done in the **Output Levels** sub-menu, which is a subset of the **Input & Output** menu.

When editing processing parameters, you will probably want to engage the **P.A.C.** (Prediction Analysis Clipper) function in the Clipper stage. This allows the clipper to compensate for overshoots that result from the interaction of the AES/EBU output of the Omnia with succeeding digital audio stages.

Processing Presets

Important Note: Presets are not compatible between the older Omnia-3fm and the Omnia-3fm Turbo styles. That is, presets created using Omnia-3fm software (WB AGC followed by 3-Band Limiter) will not load properly on a unit running the newer Omnia-3fm Turbo (fm turbo) software (WB AGC followed by 3-Band AGC and 3-Band Limiter) due to the presence of the 3-Band AGC section that does not exist in the older software. Similarly, presets created using Omnia-3fm Turbo software will not load properly on a unit running the older Omnia-3fm software.

Numerous processing presets have been provided in each style as starting points for customizing the sound of your station and its format. But note that we do not warrant in any way that these presets are the *de facto standards* for the format names used. Each was derived in an effort to create a generic starting point for each respective format. In some markets, these presets may sound too strong or aggressive. In others, they might not be aggressive enough. Our experiences with the presets in earlier products were that the presets were judged to be about 50% good and 50% bad. That feedback indicated to us that we were probably about in the middle of the playing field with respect to where the presets need to be to serve as a starting point for any given market.

With all of that having been said, please rely on the presets to get yourself going. From there, we can provide assistance, if you desire, or you can venture off to discover new frontiers of processed sound. It is our belief that there is not any *nirvana* of processed sound, or *special secret* preset that we keep for only the Big Stations. Each station in each market is unique unto itself. Try to remember that when “crafting” that special sonic personality for your station. Omnia-3 gives you the power to create a sound totally different from, and better than, your competitors. Enjoy that power!

We could publish the entire preset list, but chances are that we will continue to develop new or modify existing presets. So, a list that is guaranteed to be obsolete would be of little help. Besides, the name of each should be self-explanatory. If you need more clarification, please contact our technical support department.

Adjustments to the processing preset parameters are covered in Chapter 7, Editing Presets

Omnia-3fm Turbo System Adjustments

The system parameters pertaining only to the Omnia-3fm Turbo are found under the **Input & Output** and **Stereo Generator** menus.

Input & Output

Pre-Emphasis

For FM broadcasting worldwide, some form of time constant pre-emphasis, typically 50 μ s or 75 μ s, is employed. For North and South America, 75 μ s is used. In Europe, Australia and New Zealand, 50 μ s is employed. The factory default pre-emphasis setting is 75 μ s. The **Preemphasis** selection affects the operation of the audio processing and is applied to both the composite and discrete outputs. The pre-emphasized signal at the Left/Right outputs can be restored to flat, if needed, by the **Deemphasis** parameter selection.

To set the Pre-Emphasis, rotate the jog-wheel to cycle through the three choices: *None*, *50 μs* or *75 μs*. Click the jog-wheel to set the pre-emphasis selection.

Note: Normally, the *None* selection would not be used in FM transmission applications, but is provided in instances where processing of a flat signal is desired. One example would be when pre-processing prior to a satellite uplink in distributed radio networks.

De-Emphasis

The Left/Right outputs are pre-emphasized under normal circumstances, such as when feeding an outboard stereo generator or discrete microwave studio-transmitter link. The same applies when feeding a digital exciter from the AES/EBU output. These outputs can also be de-emphasized for installations that require a flat response, as is the case when feeding land lines. The factory default de-emphasis setting is *75 μs*.

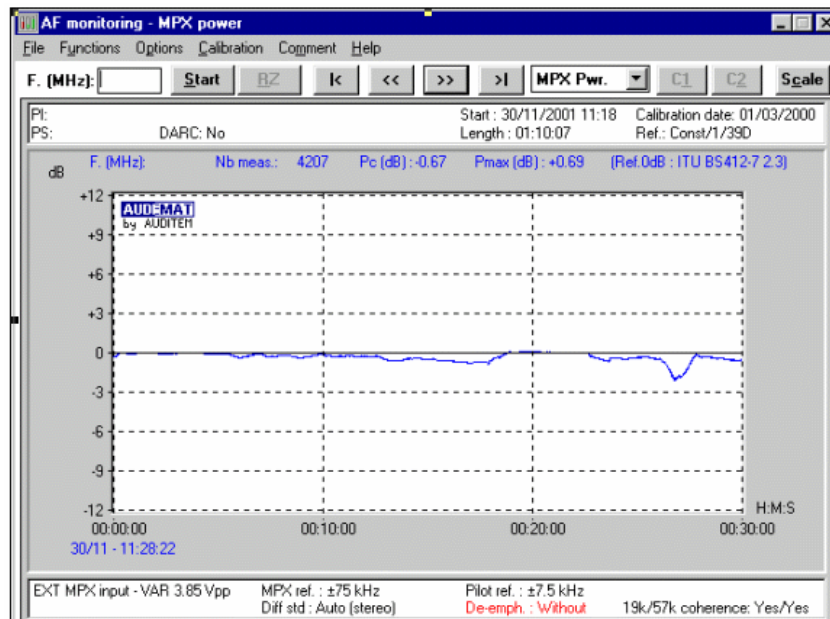
To change the *Deemphasis* setting, rotate the jog-wheel to cycle through the three choices: *None*, *50 μs* or *75 μs*. Click the jog-wheel to set the de-emphasis selection. If choosing a de-emphasis time constant, be sure it matches the pre-emphasis time constant. Bear in mind that selecting *None* means that the outputs have pre-emphasis, assuming that one of the time constants was selected in *Pre-Emphasis*.

Note: The *Deemphasis* setting does not affect the composite MPX outputs, which always follow the *Preemphasis* setting.

ITU BS-412 Power Limiter (fm Turbo style only)

In certain parts of the world, the average multiplex signal power must be controlled to reduce adjacent channel interference. The currently enforced standard falls under the ITU BS-412 regulations. The Omnia-3fm Turbo has a very effective Multiplex Power Limiter that may be enabled to comply with these regulations.

The Power Limiter control sets the average multiplex power from 0.0dB up to 9.0dB (in 0.25dB steps) above the original 0.0dB ITU BS-412 standard. The default setting is *Off*.



Effectiveness of the Omnia's ITU BS-412 Power Limiter

Loudness Loss Warning!

If your country's regulatory agency does not require the use of the ITU BS-412 Multiplex Power Limiter, make certain that the BS-412 Power Limiter is set to **off**, or severe loss of loudness will result! For example, when the ITU BS-412 Power Limiter is switched on and set at 0.0dB, there is approximately a FIVE dB loudness loss over the limiter being switched off!

Stereo Generator

Six parameters are set under this sub-menu which is only available in the Omnia-3fm Turbo style: ***SCA Level, Composite 1, Composite 2, Pilot Level, Phase Adjust, and Separation.***

SCA Level: Use this parameter to set SCA modulation, as observed with a calibrated modulation monitor.

Note: Any change in the ***Composite Output*** setting also affects this level, since the two controls are in series. Should you have to adjust the composite output, you will probably need to reset the ***SCA Level*** adjustment.

Composite 1 & Composite 2: These parameters individually set the levels on the two Composite outputs. The output level range can provide over 9 volts peak/peak. Use the jog-wheel to select the modulation level. Once the desired peak modulation level is displayed, click the jog-wheel to set the level.

Use program material and a calibrated modulation monitor to set modulation. Reference tones can't be used since the RMS level of a steady state tone does not *crest* at 100% modulation.

Tip: If you have an accurate modulation monitor (and you should!), you can use the pilot as a reference to set the overall modulation level. To do this, adjust the pilot level so that the front panel display reads the desired pilot modulation (such as 8%) level (see procedure immediately below). Now set your modulation monitor to observe pilot modulation. Then, adjust the composite output level so that the modulation monitor's display matches the pilot level previously set on the Omnia-3fm Turbo. Total modulation will then be automatically correct!

Pilot Level: Sets the pilot level between 6 and 12% relative to 100% modulation using 0.1% steps. To defeat the pilot, adjust the range to below 6%; the screen then indicates the pilot is ***OFF***.

Pilot Phase: This parameter sets the phase relationship between the 19 kHz pilot and the 38 kHz suppressed carrier. The system default is 0.0°, as the performance of the DSP stereo generator borders on the theoretically perfect. Should the phase need adjustment in order to offset time domain errors in the overall transmission system, the phase can be changed $\pm 12^\circ$, in 2° increments. We recommend that a calibrated modulation monitor be used for this adjustment. If one is not available, the tried and true "bow tie" method using an out-of-phase 100 Hz tone will suffice. If you are not familiar with this method, contact Omnia technical support for details.

Separation: The stereo "soundfield" can be reduced by 3 dB or 6 dB, or the processing can be set for mono operation, in addition to being set for standard stereo. The reduction of the stereo soundfield can be used to suppress processing-induced multipath that can occur with heavier levels of processing on stereo programming. When a setting of -3 dB or -6 dB is used, the amount of perceived stereo effect is reduced, but in difficult RF signal coverage areas, the amount of perceived multipath that might occur from heavy processing will be reduced as well. This occurs due to the reduction in RMS level of the L-R sub-channel in the composite signal. The Omnia-3fm Turbo defaults to a setting that uses the full stereo L-R signal. We suggest that you leave it in that mode, but the other settings are available for those who wish to experiment.

Omnia.3fmt Parameter Worksheet

Preset Name _____

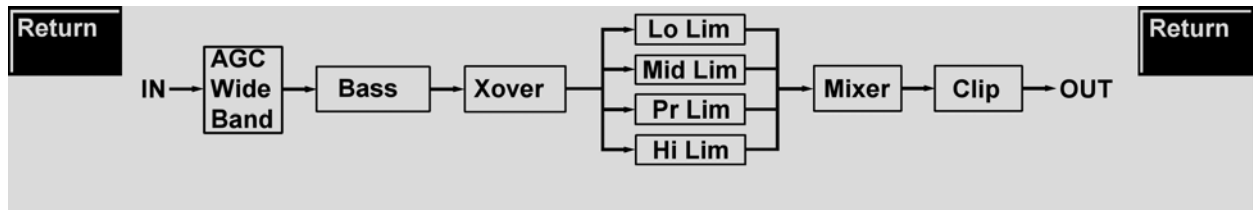
Engineer _____

Date _____

Parameter	Value	Parameter	Value	Parameter	Value	Parameter	Value
WB-AGC		LOW AGC		Low Limiter		System Settings	
HP Filter	<input type="text"/>	Attack	<input type="text"/>	Drive	<input type="text"/>	Input Submenu Settings	
Ø Rotator In/Out	<input type="text"/>	Release	<input type="text"/>	Limit threshold	<input type="text"/>	Parameter	Value
AGC In/Out	<input type="text"/>	Make-Up Gain	<input type="text"/>	Attack	<input type="text"/>	Input Master	<input type="text"/>
AGC Drive	<input type="text"/>	Gate Thresh	<input type="text"/>	Release	<input type="text"/>	Right Trim	<input type="text"/>
Attack	<input type="text"/>	RTP Speed	<input type="text"/>	Hold Thresh	<input type="text"/>	Input Phase	<input type="text"/>
Release	<input type="text"/>	RTP Level	<input type="text"/>	Mid Limiter		Input Source	<input type="text"/>
Make-Up Gain	<input type="text"/>	MID AGC		Drive	<input type="text"/>	Mono Mode	<input type="text"/>
Gate Threshold	<input type="text"/>	Attack	<input type="text"/>	Limit threshold	<input type="text"/>	Preemphasis	<input type="text"/>
Enhancers		Release	<input type="text"/>	Attack	<input type="text"/>	Output Submenu Settings	
Deep Bass	<input type="text"/>	Make-Up Gain	<input type="text"/>	Release	<input type="text"/>	Parameter	Value
Phat Bass	<input type="text"/>	Gate Thresh	<input type="text"/>	Hold Thresh	<input type="text"/>	Output Master	<input type="text"/>
Warm Bass	<input type="text"/>	RTP Speed	<input type="text"/>	High Limiter		Right Trim	<input type="text"/>
X-Over		RTP Level	<input type="text"/>	Drive	<input type="text"/>	Deemphasis	<input type="text"/>
LF Drive	<input type="text"/>	HIGH AGC		Limit threshold	<input type="text"/>	BS412 Lim In/Out	<input type="text"/>
MF Drive	<input type="text"/>	Attack	<input type="text"/>	Attack	<input type="text"/>	BS412 MPX Pwr	<input type="text"/>
HF Drive	<input type="text"/>	Release	<input type="text"/>	Release	<input type="text"/>	Stereo Generator	
		Make-Up Gain	<input type="text"/>	Hold Thresh	<input type="text"/>	Parameter	Value
		Gate Thresh	<input type="text"/>	Limiters Mixer		SCA Level	<input type="text"/>
		RTP Speed	<input type="text"/>	Low Band	<input type="text"/>	Composite #1	<input type="text"/>
		RTP Level	<input type="text"/>	Mid Band	<input type="text"/>	Composite #2	<input type="text"/>
				High Band	<input type="text"/>	Pilot Level	<input type="text"/>
				Clipper		Phase Adjust	<input type="text"/>
				Drive	<input type="text"/>	Separation	<input type="text"/>
				P.A.C. On/Off	<input type="text"/>		
				Comp Clipper			
				Drive	<input type="text"/>		

Chapter 5: Omnia-3am

This chapter presents important installation and operation information specific to the Omnia-3am. A block diagram for the Omnia-3am is shown below. An Omnia-3am Parameters Worksheet is included at the end of this chapter. Use it as a master sheet for photocopying so that the parameter settings for any custom presets can be recorded. Presets can also be saved to your computer and printed using the Omnia-3 Remote Control software.



Processor Location

In most applications, installing the processor at the transmitter site provides a solid coupling between the processor and the transmitter. Since there is nothing between the processor and the transmitter to degrade the tightly controlled output, modulation performance will be maximized. The drawback to this setup is that the unit is located in a remote location that is usually a very noisy environment. However, having the unit located afar is mitigated by Omnia-3am's remote control capability.

Processing Presets

Omnia-3am is equipped with numerous processing presets that are provided as a starting point for customizing the sound of your station and its format. These presets are not warranted in any way as being the de facto standard for the formats listed. Each was derived in an effort to create a generic starting point for the respective formats. In some markets, these presets may sound too strong or aggressive. In others, they might not be enough. Our experiences with the presets in our earlier product, the Unity, were that the presets were judged to be about 50% good and 50% bad. That feedback indicated to us that we were probably about in the middle of the playing field with respect to where the presets need to be to serve as a starting point for any given market.

Please rely on the presets to get yourself going. From there, we can provide assistance, if you desire, or you are off to discover new frontiers of processed sound. It is our belief that there is not any nirvana of processed sound, or special secret preset that we keep for only the Big Stations. Each station in each market is unique unto itself. Try to remember that when crafting that special sonic personality for your station. Omnia-3am gives you the power to create a sound totally different from, and better than, your competitors. Enjoy that power!

We could publish the entire preset list, but chances are that we will continue to develop new or modify existing presets. So, a list that is guaranteed to be obsolete would be of little help. Besides, the name of each should be self-explanatory. If you need more clarification, please contact the technical support department.

Adjustments to the processing preset parameters are covered in Chapter 7, Editing Presets.

Omnia-3am System Adjustments

The system parameters pertaining only to the Omnia-3am are found under the **Input & Output** menu.

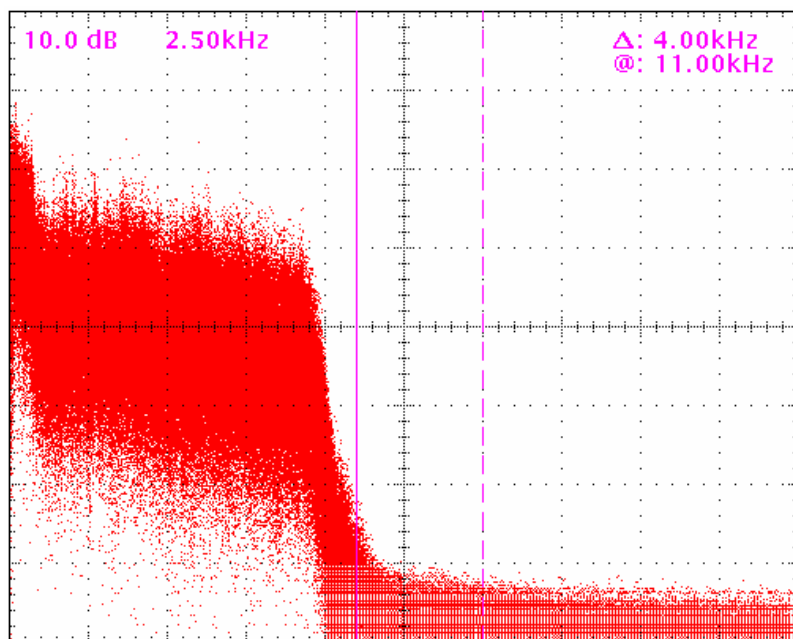
Input & Output

Asymmetrical Modulation

Asymmetrical positive modulation is possible by adjusting the *Asym Mod* parameter, located in the **Input & Output** menu, to some value other than 100%. The range of adjustment allows asymmetry up to 150% of the negative modulation value.

LPF Frequency

This parameter adjusts the cutoff frequency of the Omnia-3am post clipper low pass filter to match that of the regulatory agency requirements. Cutoff frequencies of 4 kHz, 6 kHz and 10 kHz have been provided. The following spectrograph displays the performance of the 10kHz NRSC compliant low pass filter:



Tilt EQ and Tilt Frequency

Low frequency tilt and equalization controls have been provided after the Omnia-3 am clipper section in order to compensate for certain design deficiencies in older transmitters. Particularly in plate modulated AM transmitters, interstage audio coupling transformers, interstage coupling capacitors, the modulation transformer and reactor, and the type of coupling between them, all contribute to low frequency tilt performance. Since transmitter-induced low frequency tilt appears as overshoot on the station's modulation monitor, minimizing it will improve station loudness. In order to perform the Tilt Compensation alignment procedure, a sine wave audio oscillator and an oscilloscope are required.

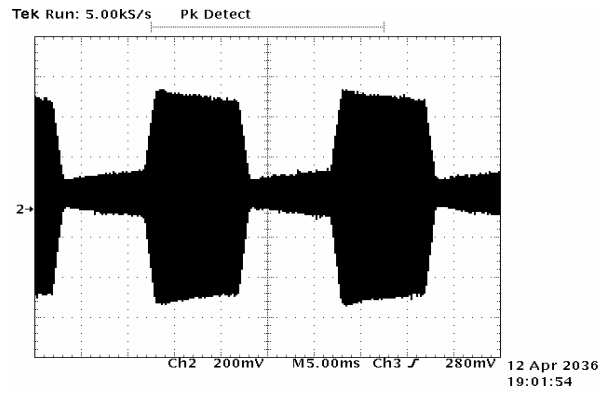
Note: The Omnia-3am output level must be reduced before starting this procedure. Raise it only after instructed to do so in order to produce no more than 50% to 75% modulation. Failure to follow this advice may overstress or even damage older transmitters. Omnia assumes no responsibility for such damage.

Tilt Equalization Adjustment Procedure

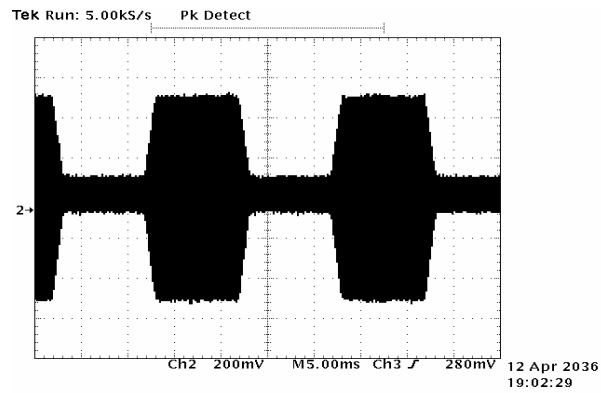
Since the purpose of Low Frequency Tilt Equalization of an AM transmitter is to optimize its performance on low frequency, clipped audio waveforms, proper adjustment of the Tilt Equalizer is mandatory if optimum modulation performance (maximum loudness) is the goal. Overcompensation, by using too much tilt equalization, is actually worse than no tilt equalization at all because it further taxes the transmitter's modulator and power supply. In fact, on some transmitters, it may be preferable to not completely cancel low frequency tilt because of power supply and modulator headroom issues. Only field experience with the subject transmitter (or experimentation) will reveal whether or not low frequency tilt can, or should be applied to the transmitter. Note also that by nature of its operation, Low Frequency Tilt Equalization puts additional demands on the transmitter which are beyond that created by the Omnia's competitive audio processing alone. In fact, the combination of these two stresses, especially when applied to older, plate modulated transmitters, may cause damage. The reader is therefore forewarned to use care, caution, and common sense when adjusting the Omnia's Tilt Equalizer when it is being used on older, less adequate transmitters!

1. Navigate to the Omnia-3a's Input & Output Menu, and reduce the output levels to 0dBu on both Left and Right channels.
2. Connect a sine wave Audio Oscillator to the Omnia-3am audio inputs. Set the oscillator to provide a 50 Hz, 0dBu output.
3. Adjust the Omnia's input level controls so that at least 10 dB of gain reduction is seen on the Wideband AGC bargraph meter.
4. In the Limiter Mixer menu, increase the output of the LF Limiter to its +6dB maximum value.
5. In the Clipper Menu, increase the Clipper Drive to the +6 dB setting. This will produce sufficient clipping on the 50 Hz tone to allow the following adjustments to be performed.
6. In the Output Menu, increase the Omnia-3am's output level to produce no more than 50% to 75% modulation as shown on the station's modulation monitor.
7. Connect a RF sample to the oscilloscope input and observe the signal envelope. The modulated carrier should appear similar to Figure 1. The clipped 50 Hz waveform should have a *flat-top* if there is no low frequency tilt in the transmitter. If Tilt is visible, as in Figure 2, then adjustment of the Tilt Equalization control is required.
8. Use a mixture of the Tilt EQ and Tilt Freq parameters to change the appearance of the tilt in the waveform so that the top becomes as flat as possible. A properly compensated transmitter's modulation envelope should appear similar to Figure 1. If too much Tilt Correction is applied, the modulated envelope will appear similar to Figure 3.
9. After optimizing the Tilt controls for your particular transmitter, the Tilt adjustment is complete. Normal programming may be applied and the Omnia -3am's output levels adjusted for the desired negative and positive modulation. Please see the following page for oscilloscope photographs of three examples of tilt equalization.

Low Frequency Tilt Equalization Adjustment Examples

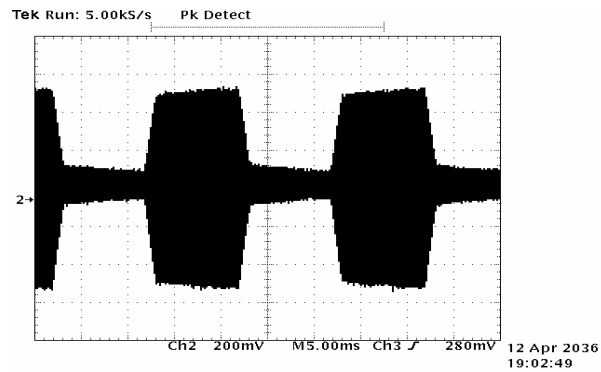


Insufficient Tilt Equalization



Proper Tilt Equalization

(Or a transmitter that does not require it)



Excessive Tilt Equalization

Omnia.3am Parameter Worksheet

Preset Name _____

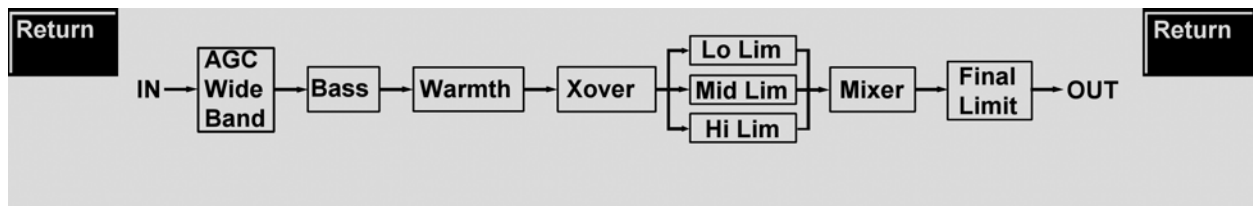
Engineer _____

Date _____

Parameter	Value	Parameter	Value	Parameter	Value	
WB-AGC		LOW Lim		System Settings		
HP Filter	<input type="text"/>	Lim Thresh	<input type="text"/>	Input Submenu Settings		
Ø Rotator In/Out		Attack		<input type="text"/>	Parameter	Value
AGC In/Out		Release			Input Master	<input type="text"/>
AGC Drive		Hold Thresh			Right Trim	
Attack		MID Lim			Input Phase	
Release		Lim Thresh	Input Source			
Make-Up Gain		Attack	Hold Thresh	Mono Mode		
Gate Threshold		Release	Output Submenu Settings		Parameter	Value
Enhancers		Hold Thresh	Output Master		<input type="text"/>	
Deep Bass	<input type="text"/>	Pres Lim		Right Trim		
Warm Bass		Lim Thresh	Asym Mod			
Phat Bass		Attack	Tilt EQ			
X-Over		Release	Hold Thresh	Tilt Freq		
Low Gain	<input type="text"/>	Hold Thresh	HIGH Lim			
Mid Gain		Lim Thresh	Lim Thresh	<input type="text"/>		
Pres Gain		Attack	Attack			
Hi Gain		Release	Release			
HF EQ		Hold Thresh	Hold Thresh			
		Limiters Mixer			LPF Freq	
		Low Band	<input type="text"/>			
		Mid Band				
		Pres Band				
		High Band				
		Clipper				
		Drive	<input type="text"/>			

Chapter 6: Omnia-3net/drm

This chapter presents important installation and operation information specific to the Omnia-3net/drm. A block diagram for the Omnia-3net/drm is shown below. An Omnia-3net/drm Parameters Worksheet is included at the end of this chapter. Use it as a master sheet for photocopying so that the parameter settings for any custom presets can be recorded. Presets can also be saved to your computer and printed using the Omnia-3 Remote Control software.



Omnia-3net/drm Connections

The Omnia-3net/drm is designed to provide audio processing for Webcasting, DAB and similar applications. The unit provides full maximum 20 kHz bandwidth and audio processes which are optimized for a variety of coding algorithms. Because of the company's extensive experience with MP3 and other codec technologies, the Omnia-3net/drm is designed to maximize the sound quality of networked audio, even at low bit-rate settings.

When the unit is connected to a professional-grade real-time encoder, the AES/EBU outputs will generally be used to eliminate conversion steps. The inputs can be from either analog or digital (AES/EBU) sources.

The analog outputs can also be used to connect to the encoding equipment. If the encoder is a PC card, care should be exercised to prevent ground loops and other connection problems. In the case where the PC card audio inputs are unbalanced (typically an RCA or mini-phone jack is used), connect the + signal output (pin 2 on the XLR connector) to the tip of the unbalanced plug. Connect the shield on the unbalanced plug to pin 1 (Ground) on the XLR connector. In this application you do not connect pin 3 of the XLR (the - output).

The factory processing presets have been optimized for use with coded audio. They should be used as a starting point to optimize the audio for your exact coding requirements. For more information on audio processing for the Internet, refer to the white paper on Audio Processing for DAB and the Internet found on the Omnia web page: <http://www.omniaaudio.com/>

Adjustments to the processing preset parameters are covered in Chapter 7, Editing Presets.

Omnia-3net/drm System Adjustments

The system parameters pertaining only to the Omnia-3net/drm are found under the **Input & Output** menu.

Input & Output

LPF Freq(ueency)

This is a **key** control for matching the audio bandwidth of the processed audio to bitrate of the following codec. Proper bandwidth will ensure minimal side effects and aliasing distortion products from the codec process. Settings are: **4, 6, 8, 10, 13, 16** and **22** kHz. These are the frequencies at which the filter reaches full (at least 100dB) attenuation. A frequency at or below half the sampling frequency of the encoder should be selected.

Omnia.3net Parameter Worksheet

Preset Name _____

Engineer _____

Date _____

Parameter	Value	Parameter	Value	Parameter	Value
WB-AGC		LOW Lim		System Settings	
HP Filter	<input type="text"/>	Lim Thresh	<input type="text"/>	Input Submenu Settings	
∅ Rotator In/Out	<input type="text"/>	Attack	<input type="text"/>	Parameter	Value
AGC In/Out	<input type="text"/>	Release	<input type="text"/>	Input Master	<input type="text"/>
AGC Drive	<input type="text"/>	Hold Thresh	<input type="text"/>	Right Trim	<input type="text"/>
Attack	<input type="text"/>	MID Lim		Input Phase	<input type="text"/>
Release	<input type="text"/>	Lim Thresh	<input type="text"/>	Input Source	<input type="text"/>
Make-Up Gain	<input type="text"/>	Attack	<input type="text"/>	Mono Mode	<input type="text"/>
Gate Threshold	<input type="text"/>	Release	<input type="text"/>	Output Submenu Settings	
Enhancers		Hold Thresh	<input type="text"/>	Parameter	Value
Deep Bass	<input type="text"/>	HIGH Lim		Output Master	<input type="text"/>
Phat Bass	<input type="text"/>	Lim Thresh	<input type="text"/>	Right Trim	<input type="text"/>
Warm Bass	<input type="text"/>	Attack	<input type="text"/>	LPF Freq	<input type="text"/>
X-Over		Release	<input type="text"/>		
Low Drive	<input type="text"/>	Hold Thresh	<input type="text"/>		
Mid Drive	<input type="text"/>	Limiters Mixer			
Hi Drive	<input type="text"/>	Low Band	<input type="text"/>		
		Mid Band	<input type="text"/>		
		High Band	<input type="text"/>		
		Final Limit			
		On/Off	<input type="text"/>		
		Drive	<input type="text"/>		

Chapter 7: Editing Presets

Many broadcasters will be amazed at the dramatic sonic improvements Omnia-3 delivers right out of the box using one of the factory presets. Some will want to tailor the presets slightly to create a more “custom” sound. A few broadcasters will wish to delve in and really modify the parameter settings to create their own “signature sound.”

If you’re new to audio processing, we recommend proceeding with caution. Your success in getting the most out of your Omnia-3 processor starts with knowing your objectives beforehand. If your goal is to be the moment-to-moment loudest station and obtain extreme amounts of detail and quality, please keep in mind that there *are* limits. Thus far, there has never been any research, or ratings information, that has indicated that being the moment-to-moment loudest station on the dial is of sole benefit. Generally it gives a select few individuals the false security that louder is better and that the added distortion from added loudness doesn’t generate a negative effect on your listeners. Be careful.

Having said all of this, though, we firmly believe that Omnia processors will get you closer to your ideal than any other processor or combination of processors. It is definitely capable of generating moment-to-moment loudness; it has the *muscle*. The point of view presented in the paragraph above is motivated by an effort to encourage broadcasters to create good, *competitive* loudness while maintaining a high degree of quality.

Preset Editing Overview

Clarify Your Processing Objectives

Whether one is seeking better overall quality or specific spectral improvements, try to articulate and write down your goals. Do you want a little more loudness or “presence” on the dial? Are there certain characteristics of the sound of other stations in your market that you want to emulate or surpass? Are there any you want to avoid? This point is probably the most contentious issue with regards to adjusting processing. Please give thought—real thought, to how you’d like your station to sound. What do we mean by that? Well, if your desire is to add loudness, and in most cases it probably will be, decide on the *degree* of loudness that you want. Is the goal to be *competitively* loud with respect to other stations on the dial, or must you be the *kingpin*, the moment-to-moment loudest thing known to God and Man? This will impact how you set up the processing.

Engineering, programming, and management should all participate in the development of these objectives. After all, processing can have a direct effect on the bottom line of your station. A little bit of agreement before installation can save you a whole lot of disagreement afterwards.

Set Aside Some Time

It can take some time, a good deal of serious time to optimize the audio processing for your station. We realize that in our business today, time is a precious commodity. But please don’t try to install the Omnia-3 in between other major projects or the week your boss or your assistant is on vacation. Make certain in advance that the staff members who helped you set your objectives will be available to consult with you when you adjust the processing parameters.

How much is enough time? We feel that working with a system for at least a week is a good starting point. We don’t suggest that you drop everything for a solid week. What we do recommend is that you install the Omnia-3 during a week when you can spend a few hours per day on the project.

The Adjustment Procedure

1. Review your objectives.
2. Once on the air, proceed from a degree of processing similar to that currently used by your station and then, if desired, become more aggressive. A careful approach is less likely to draw hasty, or negative, opinions.
3. Listen for a while, and then adjust. Try to avoid the temptation to “fiddle” with adjustments moments after getting the system on the air. Remember, you should evaluate the operation over time, not moment to moment! When it is time to adjust, the provided Worksheets (found in the chapters on the specific Omnia-3 models) can assist in establishing improved settings of operation.
4. In making changes to the system, do not make hasty or radical changes. Also, do not make too many different adjustments all at once. If too many parameters are changed at one time, it is hard to determine which change made the difference. That can be frustrating whether the change made you station sound better or worse. Take your time with the Omnia-3. You have a great deal of processing power at your fingertips. In order for you to become “sonically” comfortable, you should learn the limits of each function. Try making changes in different operating levels. We suggest making changes in increments of no more than +0.5 dB or - 1 dB, or in 1 or 2 step increments. Try turning different functions on and off. Working this way, you will be able to get a better feel for what the Omnia-3 is capable of producing.
5. Use the “sleep on it method:” Spend time adjusting and then listening, and when the system gets to a point where it sounds good, stop for the day. In making changes, there does come a time when the ears become less and less sensitive to adjustments performed. The ears sort of “burn out.” That is why spreading the adjustment period over a number of days is recommended. If it still sounds good after you have “slept on it,” quit adjusting. If it does not, continue with small iterations until you’re satisfied. If the procedure is working, you will find that each day the discrepancies become smaller and you’re making fewer adjustments.
6. When you get it where you like it, **stop and enjoy!**

The Processing Display

In addition to the menus, the LCD screen also provides processing information in the form of bargraphs indicating Processing activity. The processing display is activated by pressing the push-button located to the lower right of the LCD screen. From any menuing screen, pressing the push-button will switch the LCD screen to the Processing or Levels bargraph display.

Display Contents

The processing bargraphs provide a wealth of information about the dynamics control in Omnia-3. Each displays the amount of gain reduction, with the top of the bar indicating no gain reduction, and the bottom indicating 25 dB. Thus, the bar “fills-in” from the top down to emulate an analog gain reduction meter.

The AGC algorithms respond slowly to the program dynamics, and this is reflected in the meters. They will change gradually in real-time to indicate processing activity. Additionally, the appearance of “Gated” next to a meter indicates that the gate has activated in the AGC. In this state the meter will freeze or return to a platform level, depending on the settings of the particular AGC.

The limiter algorithms have the ability to modify the style of peak control that is employed on a moment by moment basis. This can be seen if observed over a period of time, say a few minutes. During normal operation, the limiter indicators will have a dynamic “bounce” that you will be able to get a feel for. But every now and then, the limiter will very quickly show a large amount of gain reduction. Notice that the response can be very fast at times.

Another feature, indicated by the appearance of “Gated” next to each band, is the limiter “Hold” function. During brief pauses in limiter activity, the bargraphs “freeze” to show the limiter has entered the *Hold* function of the algorithm; akin to the *Gate* function in the AGCs. This is most easily noticed when there is a “dry” voice being processed. The Limiter bargraphs, like the AGC section, can indicate up to 25 dB of linear gain reduction.

Interpreting Processing Displays

Through observation of the processing bargraphs, significant information can be acquired and analyzed about the audio signal on a moment-by-moment basis.

Since Omnia-3 is capable of performing many different processing functions at different times, the display bargraphs may indicate various kinds of operation. This is based upon dynamic range differences in the program material. For program material that is already processed or lacking dynamic range, this will cause the bargraphs to indicate differently than material that possesses a high degree of dynamic range. This is because audio signals that lack dynamic range, naturally or by previous processing, will possess a high level of RMS energy and a low level of peak energy. Conversely, audio signals with wide dynamic range possess lower levels of RMS energy but higher levels of peak energy.

Program material that has low dynamic range, high RMS and low peak levels will generate more activity in the AGC sections and less activity in the Limiter sections in the displays. This is due to the AGC section responding to the RMS energy while the Limiter section reacts to peak energy. When these situations occur, it is normal for the unit to indicate more AGC action as compared to Limiter action. Sometimes the Limiter section may not indicate any action! Examples might include heavily processed commercials or music, or music with passages of sustained level. A good example is the Aerosmith CD “Pump.” This recording has very little dynamic range. Try any up-tempo selection from this disk and you will see the Wideband-AGC section make initial adjustments along with small amounts of limiting. Once adjusted, the Wideband-AGC section will be deep in gain reduction, although with little movement, and limiting action will be minimal.

When the programming has wide dynamic range, with low RMS but high peak levels, the opposite will occur. The Limiter section becomes active, while the AGC section will appear not to respond. During these situations it is possible that the Limiter sections could approach full scale, while the AGC section may only indicate half scale. Examples are: vocal passages or live voice, classical music, or passages with transient levels. Good test examples: almost anything classical; almost anything by Steely Dan!

Also keep in mind that the AGC section will operate much more slowly than the Limiter sections. This is in part due to the nature of each function. Remember, the AGC section operates on the RMS energy, which is calculated over an “integration” time by the signal processor. It is during the integration time that the “average” level is established, and gain adjustments, if needed, are made. This is why the AGC section will move slower, since they are making changes, as needed, over relatively long time periods.

With the Limiter sections, the intention is to control the peak activity. This is accomplished by controlling, or limiting, the highest crest, or peak, of the audio waveform. There is intrinsically little time available to get this job done. The Limiter section must quickly grab the signal, reduce the gain to the proper operating range, and then return the gain to normal until the next peak signal comes along. Peak energy must be detected and adjusted in a quick and accurate manner while, at the same time, not interfering with the sonic integrity of the audio signal. For this reason, the Limiter sections operate very quickly, and on an as-needed basis.

Since these displays are capable of providing a wide range of information, we do not recommend setting up this system to any specified amount of processing based upon meter indications. Instead, we recommend setting up the processing by using your ears to judge the sound. We provide the meters to analyze the signals and aid you on adjusting the specific parameters needed to achieve the desired sonic results.

Parameter Editing

The Omnia-3 system architecture has a great number of audio processing functions and features. The following sections detail the adjustments one can make while in Expert Edit Mode.

Before tackling this section you must be familiar with navigating through the menu system and be comfortable with the Omnia-3 controls. (See Chapter 2, The User Interface) If so, you're ready to tackle Omnia-3's more sophisticated adjustments. To edit a preset it must first be loaded into the Omnia-3. Once loaded, it can be modified to your heart's content. The changes can then be temporarily used, or they can be saved to the PC Card so they won't be lost.

The **Audio Processing / Edit Parameters** sub-menu and those below it provide access to the heart of Omnia-3, where comprehensive and very fine adjustments to the audio processing are possible. We suggest that only those with experience in processing adjustment should make use of this section. Here is where the user can either shine and stand out on the dial, or crash and burn if they're not careful! That's right: Unlike other processors, we don't artificially limit the range of adjustments to try to keep you out of trouble—you better know what you're doing. This section of the manual will help you do just that.

Upon entering this menu, a unique graphical block diagram of the processing system appears. This block diagram not only indicates the architecture of the processing system, but also provides access to the sub-menus for each of these parameters. Take a moment and rotate the jog-wheel. The diagram scrolls from left to right as different processing blocks are selected. Clicking the jog-wheel enters the sub-menu for that processing block. Parameter adjustment is then accomplished using the previously discussed methods—turning the jog-wheel to adjust a parameter, then clicking on it to effect the selection. Generally, turning the wheel clockwise will result in “more” processing. For example, attack and release times become smaller as the wheel is rotated clockwise. While this may at first seem counter-intuitive, it provides consistency across all the controls. The following paragraphs will provide insight on each of the parameters.

Notice in the lower right-hand corner of the screen there is a horizontal *scroll* indicator to show the exact location within the block diagram. This will help in navigating through the system.

Wideband AGC

There are numerous items to adjust in this selection. Of note are the **Attack** and **Release** functions. The lower numbers relate to slower time constants, and the larger numbers relate to faster time constants. Since the time constants are program-dependent, absolute time constant values (in ms.) would be useless—therefore the use of numbers. Use a *higher* number if you want “fast” attack and release times, and *lower* numbers for slower attack and release times. Generally, the best sound quality is achieved with slow attack and release times; greater loudness is achieved with faster attack and release times.

The other item to note is the **Make-Up Gain** menu. This parameter sets the amount of gain to be filled in during quieter, softer program passages. The range is **OFF** to **7**. This function is also program dependent, and it interacts with the main time constants. As the attack/release times are modified, the system also scales the **Make-Up Gain** time constants. Use *less* makeup gain for processing more faithful to the source material; use *more* makeup gain for greater loudness and “density.”

Use the **Drive** control to ensure you are in adequate gain-reduction. Having the control set too low can rob you of loudness, and defeat the “leveling” function of the Wideband AGC in dealing with varying program levels. If wideband leveling is being performed upstream of the Omnia, the **Wideband AGC** control can be set to “OUT” to bypass the AGC entirely.

Use the **Gate Thresh** control to set the level at which gating occurs, hence “freezing” the gain during short pauses. Correct use will eliminate “pumping” effects that can lend an unnatural quality to the processing.

Additionally, the control for the **HP Filter** is located in this menu. In most systems, subsonic frequencies in the input audio program should usually be rolled off to prevent difficulties with certain exciters and STL systems. The Omnia-3 has a third-order (18dB/Octave) high-pass filter with five selectable cutoff frequencies from 60 Hz down to 20 Hz. The factory default is “Out”, which means that audio frequencies to well below 2Hz are passed through the system without attenuation. You may select one of the other values that may be more appropriate for your system.

One final control is the **Phase Rotator** bypass. Phase Rotators (also known as Phase Scramblers) are commonly utilized to make asymmetrical waveforms (such as voice) more symmetrical. This ensures that clipping occurs equally on positive and negative peaks, making better use of the symmetrical nature of the modulation process. Phase rotation can make talent voice sound cleaner, but since it disturbs the phase integrity of musical signals, music might sound more faithful to the original source if phase rotation is not used. **Off** can be chosen if previous phase rotation has been performed in your system (in a microphone processor for example) or to preserve the phase integrity of the original program as described above.

Bass & Warmth Enhancement

Deep Bass EQ: For those who demand *thunderous* bass, the Omnia-3 has it! Up to 12 dB of “thunder” can be added to shake your listener’s walls! This is not a simple bass boost, but a rather sophisticated concept that takes into consideration the time alignment of the low frequencies as they pass through the entire Omnia system. It allows a loud, clean low end, with absolutely no sacrifice to the overall loudness of your signal. We won’t tell you where the control is in the signal chain. But we *will* tell you that **Deep Bass** function is a shelf boost at 90 Hz, utilizing a phase compensated 12dB/octave slope to emulate the EQ function.

Phat Bass EQ: Phat Bass is a unique enhancement that adds filtered harmonics of the lower registers to the upper bass frequencies. The algorithm extracts information contained in the initial attack to do its work, and low frequency texture is therefore emphasized. Older recordings sound fuller (or phatter) with the added illusion of loudness. **Phat Bass EQ** also helps radios with small speakers sound like they have more bass than they actually do. A little of this effect goes a long way so be careful not to apply too much boost. Be sure to listen on several different types of radios to arrive at a setting that works best for all of them.

Warmth EQ: The Warm Bass parameter in the Enhance section of the Process submenu is a shelf boost at 150 Hz. This compensates for program material that is naturally lacking in upper-bass punch. Be judicious about applying too much, as this can cause excessive gain-reduction in the low and mid bands. Also, the resonant frequency of most automobile interiors lies in this frequency range!

XOver

The crossover points are set in software and cannot be modified. In fm Turbo units, they are set at 150 Hz and 3 kHz. In Omnia-3fm Turbo units, the 3-Band AGC’s and Limiters are in series and share the same crossover. In am units, the 4-Band Limiter crossover points are 150 Hz, 750 Hz and 3 kHz. You can however, change the output gain of each crossover filter using the **LF Drive**, **MF Drive** and **HF Drive** controls. These control the drive level of the audio fed to the following respective multiband section. These are some of the **key** adjustments you will be using to increase loudness! The greater the drive, the greater the loudness and the effect of dynamic equalization to achieve a consistent spectral balance. Increasing some bands while not others effectively adds emphasis to those boosted bands.

HF EQ: (Omnia-3am only) This parameter adds the high-frequency boost that conforms to the NRSC standard “Modified 75us AM Pre-Emphasis Curve”. Increasing **HF Eq** will add boost to the presence and treble range that follows a high frequency shelf network that is inserted before the multiband limiter section. The numerical

setting (0,2,4,...20) indicates the amount of boost, in dB, provided at just below 10 kHz. Set this control to “10” for the exact NRSC curve.

Multiband AGC (Omnia-3fm Turbo only)

Similar in character to the wideband AGC described above, but with three bands, this section has the ability to add power, consistency and loudness to the audio while tailoring and pre-processing it for delivery to the multiband limiter section.

There are two additional controls here that are not in the Wideband AGC section: ***RTP Speed*** and ***RTP Level***, which determine what happens to the AGC gain when the ***Gate Threshold*** is reached and audio is gated. With the ***RTP Level*** set to -5, -10 or -15 dB of gain reduction, the gain will return to that pre-defined level when gated. How quickly the target gain reduction level is reached, is set by the remaining ***RTP Speed*** settings (Slow, Medium or Fast). If no RTP gain reduction is desired, use the ***RTP Speed*** setting ***Freeze***.

Note: The ***Freeze*** setting will keep the gain from *decreasing* when the AGC is gated (moving *down* on the bargraph meter toward the ***RTP Level*** setting) but will not keep it from *increasing* toward the ***RTP Level*** setting when the gate activates at a gain reduction level higher than the ***RTP Level*** setting. For example, if the ***RTP Level*** is set to -5 dB and the gate activates while the amount of gain reduction is 10 dB, the gain will recover to the -5 dB gain reduction level before it freezes.

Note also that due to the way in which the RTP 'circuit' works, the RTP Speed settings are somewhat affected by the setting of the Attack time control.

Multiband Limiter

The Limiters work faster than the AGC's and operate mostly on signal peaks that get through the slower AGC section(s). There are three bands in the net and fm Turbo styles and 4 bands in the am style. Drive to the limiters is controlled by the ***Xover*** in all styles except Omnia-3fm Turbo where there are ***Drive*** controls in each limiter block. Most menu items are identical to the corresponding AGC controls. The ***Hold Thresh*** is similar in function to the ***Gate Thresh*** in the AGC. It sets the threshold of where the limiter's ***Hold*** algorithm begins. When it's in the ***OFF*** position, the limiters will attack and release as you would expect them to. With ***Hold Thresh*** enabled, the limiters will momentarily stop and rest during very short pauses, especially during live speech. The ***Limit Thresh*** control adjust the level at which the limiters begin to operate. Higher dB values (CCW rotation) will result in less limiting action, and more audio signal getting to the clipper or final limiter section.

For the fm Turbo style, the limiter ***Drive*** and ***Limit Thresh*** controls should be used sparingly, with most frequency response contouring being done in the Xover.

Mixer

This performs the summation of the multiband sections before the final limiter/clipper. Be careful when adjusting this section, as too much level from any particular band could cause an excessive amount of distortion to that range of frequencies. If your desire is to “EQ” the sound, you should perform that using the drive levels in the ***XOver*** menu, the individual limiter ***Drive*** controls (Omnia-3 fm Turbo style only), or a combination of both. This final mixer is mainly for minor “EQ” changes to the overall sound. Adjustment of this section should be done as a last resort.

Clip (Omnia-3am and Omnia-3fm Turbo only)

Drive: Here is where the loudness versus quality trade-off is most evident. Generally you want to set this control to the lowest value possible to achieve the desired loudness level. A good strategy is to reduce it in 0.5 dB steps until loudness falls off perceptibly and then increase it one step. Adjustment is in 0.1 dB steps, so making minor changes will not create an abrupt overall change to the signal. Be careful with this one; there is a lot of available power here!

P.A.C.: (Omnia-3fm Turbo only) Set this to **ON only** when using an AES / EBU digital output connection from the Omnia-3 to a digital FM exciter.

This **Prediction Analysis Clipper** (P.A.C.) mode compensates for overshoots that invariably result when an AES/EBU interconnection, involving multiple stages of sample rate conversion and lowpass filtering, is used. Under these conditions:

- Overshoots occur whenever down-conversion of a 44.1 or 48 kHz sample rate to 32 kHz sampling is performed
- The tight transition slope of the 16 kHz filter in the sample rate converter is a significant contributor to overshoots
- The problem occurs only with signal components above 5 kHz.

Yet:

- We do not want to reduce the slope of the lowpass filter in the audio processor, as it degrades sound quality.
- Adding more clippers and filters only increases distortion.

Fortunately, it's possible to pre-compensate for predicted occurrences of overshoots by the use of supplementary control signals. These are applied to the upper audio spectrum by the Omnia-3's main clipper algorithm—the same one employed to eliminate *digital grunge!*

As a practical matter, the use of the *Prediction Analysis Clipper* reduces overshoots in the sample rate converted signal path from a worst case of 20% to less than 3%.

Final Limit (Omnia-3net/drm only)

This is the final limiter that operates in place of the clipper on all of the other Omnia-3 styles. There are two controls here: With the first you can turn the final limiter **ON** or **OFF**. This should normally be left **ON** unless the equipment following the Omnia-3net/drm has a non-defeatable limiter or otherwise requires non-limited audio.

The second is the **Drive** control, which controls the amount of final limiting. The gain-reduction of the final limiter can be monitored on the Process Bargraph screen.

Comp (Omnia-3fm Turbo only)

The **Drive** setting in this block controls the drive to the DSP-based composite clipper. A setting of 0.0 is the same as the clipper being “off “. This clipper operates on the entire baseband signal up to 53kHz, except for the 19kHz pilot. No matter how hard you drive the composite clipper, you cannot clip the stereo pilot. Embedded within the composite clipper is a 53Khz phase linear low pass filter for SCA protection.

Saving, Renaming and Deleting Presets

Upon completing a preset editing session, the processing changes should be stored. This writes the processing information to the PC Card through overwriting an existing preset or by creating a new one. It is also possible to delete presets that are not needed anymore. This frees up memory space for saving newer settings. Omnia-3 has the capacity to store up to 25 User Presets.

Saving Presets

When processing adjustments are completed, a choice should be made to either save the changes over the existing preset or create a new User Preset. This is done from the **Audio Processing** menu. If you want to save the changes using the current preset name, choose the option **Save to Card** from the menu. When selected, the system will save the latest changes to the current preset name. A dialog box appears on-screen to verify this. Note that factory presets cannot be overwritten – use **Save to Card as** instead.

To save the preset under a new name, thus keeping the original preset and creating a **new** preset that will be added to the bottom of the preset list, use the **Save to Card as** menu choice. When selected, a Preset Naming dialog box appears on the screen, so the characters in the new User Preset name can be entered.

For a detailed description of how to use these functions, see the “Audio Processing” subsection of the “Menu Descriptions” section in Chapter 2.

Renaming A Preset

Renaming presets is not done under the **Audio Processing** menu, but rather is done under the **Utility** menu located off of the **Main Menu**. To rename a preset, select **Utility** from the **Main Menu**. From the sub-menu list, select **Preset**, then select **Rename**. This opens up the Name Preset Dialog Box so that a new name can be entered. For a detailed description of how to use this function, see the “Audio Processing” subsection of the “Menu Descriptions” section in Chapter 2.

Deleting A Preset

Using the **Preset** sub-menus under the **Utility** menus, as discussed in the previous section, the **Delete** option can be accessed. For a detailed description of how to use this function, see the “Audio Processing” subsection of the “Menu Descriptions” section in Chapter 2.

Getting The Sound You Want

If you believe that you’re in a loudness war and you need to react, here are some suggestions that should help. Conversely, if you have the luxury to strive for increased sound quality, we’ve got suggestions for you, too! Please be advised that there will always be a subjective *compromise* whenever the desire is to shift to a *louder* personality on the dial. Omnia-3 is designed to minimize the qualitative trade-offs that one needs to make.

We recommend that before starting the process of *cranking it up* just for the sake of it, try to figure out what sonic characteristics you feel are needed in order to be more competitive. In many instances it’s not just increasing the drive to the limiters, clipper, or composite clipper. It can be as simple as creating an *illusion* of added loudness by changing a time constant parameter. There are known situations where the use of *stereo enhancement* can also create apparent loudness. Please don’t bite at the first temptation to *crank* the system. Sometimes the old adage of *less is more* really applies!

Before delving into alternative processing possibilities, please give the next brief section some thought. It may help provide you with direction to your overall plan.

A Word About Loudness

Making this confession is a little like telling your parents you dented the car. But here it goes: It's OK for your station to be loud. *Very loud.*

In the past, loudness was a problem due to the limitations of the processors you had available to you. If you processed more heavily, then you either had to adjust your single processor outside of its "safe" range or use multiple boxes and risk conflicts among each other.

Omnia-3 has changed all of that. It knows how to get a station sounding loud without the artifacts or grunge created by your current processor when you try to make it loud. And Omnia-3 makes loudness an option for *all* formats.

One more confession. It's also OK for your station to *not* sound loud, yet sound incredibly musical and grunge-free, because the Omnia-3 has given you the choice. Our intention is to provide you with a system that will maximize the audio quality of your signal, yet at the same time satisfy your competitive requirements.

Quality Versus Loudness

The trade-off between quality and loudness is primarily affected by the use of the limiting and clipping sections. While either function will generate more "dial presence," they both offer differing artifacts and side effects. With increased use of limiting, intermodulation distortion is increased. The added dynamic activity of the limiters causes the audio to sound as if it is "tight" or "squashed." This can be perceived to the ear as "pumping," "breathing," "dense," or "mushy."

When clipping is increased, harmonic distortion is increased. The audio level is in effect "running into the brick wall." This may cause the audio to sound "broken-up," "torn," "rough," or "edgy." As you might imagine, the harder limiters and clippers are driven, the louder the perception...and the more likely you have increased intermodulation and/or harmonic distortion.

The following sections are provided to assist you in designing the personality of your station's sound. As said earlier, there is no precise recipe for setting audio processing. There are a few basics that can get you more along the line of your desire. In the end, it will require a concerted effort of extended listening and subtle changes over time to achieve the desired results. And remember the guidelines discussed at the beginning of this section: know your goals, take your time, adjust methodically.

Increasing Loudness

Try to resist the temptation to *crank* on the aggressive processing sections. Those will add loudness, but usually at the cost of quality. Many times, building a little more RMS level in the AGC sections will do the trick. The following are some suggestions on where to begin to make changes. Try them in the order described.

Increasing loudness can be accomplished in four ways:

1. Alter the following parameters in the AGC:

- Increase the *Drive* to the AGC sections.
- Increase the *Release* time settings to operate faster.
- Increase the amount of *Make-Up Gain*.

2. Modify the Multiband Limiter sections:

- Increase the *Drive* to each section.
- Increase the *Release* time settings to operate faster.

- Set the **Hold** threshold to a low value.

3. Drive the Clipper sections harder.

4. A combination of all of the above! Sounds crazy, but it's true! In this situation, resist the temptation to make too many changes at once. When that occurs, it becomes difficult to determine why, or why not, an adjustment made sense. Let one specific area at a time be the main focus. After that area is satisfactory, then move the focus to another area, as needed.

Based upon the above suggestions and theories, experiment with different styles of processing. Some broadcasters prefer to have their processing be perceptibly loud, but dynamic. This may not result in the loudest station on the dial, but it gives the illusion of loudness, yet retains detail and clarity. This can be done by centering the efforts in the Limiter sections, and avoiding the heavy use of the clipper. A trick to consider here is to use very fast attack and release times in the multiband limiters, but make sure that they do not produce more than 5 dB - 7 dB of gain reduction. This keeps the IM distortion of the limiters to a minimum. Here the Limiter sections are relied upon to generate higher RMS levels, which translates into increases in perceived loudness.

If the quest is to produce the “loud and proud” appearance of the “big boys” in town, then the limiters and clippers should be leaned upon a bit more. *Loudness at all costs* is usually the reason for moving the processing in a direction like this. Using larger amounts of drive to the multiband limiters, along with faster release times will generate a signal of consistent density. Also, an increase in clipping will further aid this. The effect of the processing set in this manner is that the audio is consistently loud at all times. The drawback is that the *density* can cause listener fatigue over a prolonged period of time. While Omnia-3 is designed to minimize listener fatigue, it is capable of generating large amounts of density that could eventually lead to fatigue. Be careful!

Adding More Detail—When Loudness Isn't The Last Word

Now that we've “squished the grape,” lets look at what it takes to undo a heavily processed signal. Basically, just reversing the procedures listed above will do the trick:

1. Reduce the drive to the Clipper.
2. Back off on the influence of the Limiter stages:
 - Reduce the amount of **Drive**.
 - Reduce the **Release** time to slow down recovery.
 - Raise the threshold of the **Hold** function.
3. Ease up on the Wideband-AGC sections:
 - Reduce the **Drive** to the Wideband-AGC.
 - Reduce the **Release** time to operate slower.
 - Reduce the amount of **Make-Up Gain**.

Backing off the clipping sections first will allow the processing to still retain a level of loudness while restoring quality. Start with reducing the **Clipper** amount in 0.5 dB steps. It's surprising how much detail can be restored from just a small change of 0.5 dB. Generally, a change in the **Clipper** amount will have the most noticeable effect on quality, but it will also affect the relative loudness level, too. You'll need to find a “happy medium” that's right for you.

EQ Changes

Tailoring the shape of the overall audio spectrum can be done in three different sections:

1. The drive settings in the **X-Over** menu. This sets the drive to the multiband AGC sections.
2. The relative amount of **Drive** to the multiband limiters.
3. The setting of the final **Mixer**.

All three options will provide noticeable change in EQ. We suggest you use the first two listed options. In either case, an EQ change is still followed by a *dynamically* controlled stage. Therefore any excessive EQ change can be countered by either the subsequent AGC or Limiter. The last option, the *Mixer*, is designed to provide a final *minor* trim to the spectrum. Since this stage is *after* all of the dynamic AGC and Limiting, a radical change in level in the *Mixer* will result in excessive clipping in that respective band. We suggest that any changes implemented here be limited to about 0.5 dB to 1.0 dB of boost. Naturally, any decrease in level can be done to any desired amount.

Thunder Bass

Omnia-3 has the power to shake the walls with low end! If your source material has it, Omnia-3 will process it and put it on the air with muscle! Making changes to this characteristic is done using these parameters, in the order listed:

1. Increase the amount of **Bass** boost.
2. Increase the drive to LF Lim with the appropriate control in the **X-Over** stage.
3. Speed up the **Release** time in the **LF Limiter** section.

Again, moderation is the key! If all of the above are utilized, then the possibility of causing severe low frequency buildup can occur. This would then produce the illusion of “lost” presence and high frequencies. Another concern is the creation of unwanted bass-induced IM distortion in the clipper. This can be perceived on midrange/presence frequencies whenever a sustained bass note is occurring. An example of this would be a strong bass signal “underneath” a sustained vocal passage. The vocal passage will begin to sound as if it “warbles” a little bit. This is caused by the heavily processed bass energy pushing the vocal frequencies in and out of the clipper unnecessarily.

Generally, an increase in the Bass boost function alone will provide a substantial and sufficient enhancement to the low end.

Chapter 8: Remote Control for v3.4.x (FM Turbo Style)

This chapter only covers Omnia-3 Remote Control version 3.4.0 and greater, which only supports the fm Turbo style running release software 3.4.1 and higher. Please see chapter 9 for a description of the Remote Control for **am** and **net** styles running release v3.3.x and earlier.

The Omnia Remote Control software is a Windows (Windows 95, 98, NT 4.0, Win2k, WinXP) software program that allows remote access to the Omnia-3 processor adjustment using any PC running the aforementioned versions of Microsoft Windows®. Note that remote software for the Omnia-3 is unique to that product, and versions of Omnia Remote Control for our other audio processors will not work with Omnia-3. Further, any older version of the Remote will not work with the Omnia-3fm Turbo. The latest version of Omnia-3 Remote Control Software is always available free of charge by pointing your web browser to the “Support” page of our web site: (www.omniaaudio.com).

The Omnia-3fm Turbo Remote Control application has a very similar look-and-feel to the Remotes for the Omnia-5 and Omnia-6. Before it connects to the Omnia, the words “OFF LINE” will be displayed where the Preset Name and System Time will be displayed once the remote connection is made. All metering activity is also at idle.



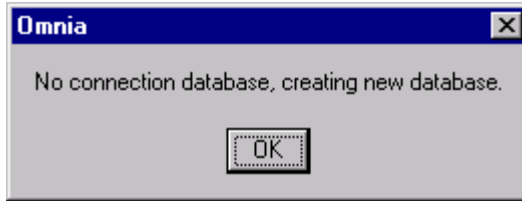
Omnia-3fm Turbo Remote Control as it appears on your computer screen

Software Installation

Installation is simply a matter of putting a copy of **O3remoteXXX.exe** into the folder name of your choosing, and running it from that location. This file is the actual raw executable so there is no “installer” and no permanent changes are made to your computer system or to your Windows registry.

Using standard Windows procedures, create a new folder by the name you wish to use, and place a copy of “**O3remoteXXX.exe**” in that folder. You can then also create a desktop shortcut to that executable if desired.

When the program is freshly installed but has not yet been run, “**O3remoteXXX.exe**” is the only file in the specified folder. However, the first time that the program is run, it will create a small new file called “connect.dat”, which contains your connection type information. When you first run the Omnia-3fm Turbo Remote Control program, there is no “connect.dat” file yet, so you will receive the error message “No connection database. Creating new database”. This is normal and is no cause for concern.



This message is normal the first time the program is started!

Note: When you install Omnia Remote Control software updates, you should move the old version and its associated connect.dat file to a new folder. This way, conflicts with different versions of the connect.dat database will be avoided. If you wish, the old version's folder can be safely deleted once the update is complete. You will also want to use unique folder names for each copy of other Omnia remote control programs if you have those installed. Please note that the remote control programs themselves, as well as their associated connect.dat files are unique for each version of the Omnia Classic, Omnia 3, Omnia-5EX, Omnia-6EX and Omnia Toolvox.

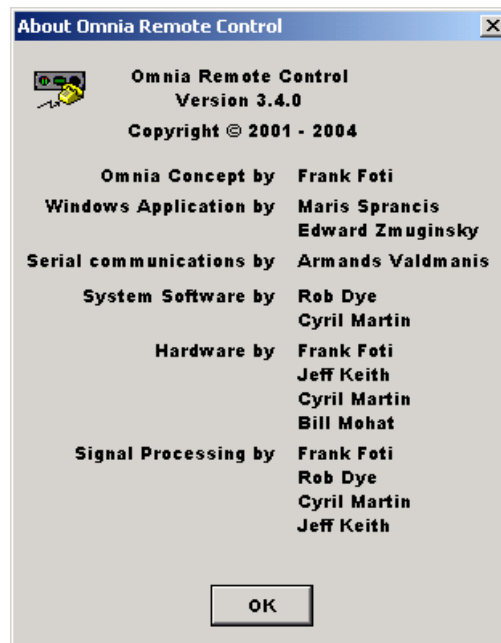
Setting Up and Configuring Omnia Remote Control

The Remote Control Program for the Omnia-3fm Turbo is specific to the Omnia-3fm Turbo. As stated earlier, Omnia Remote Control programs designed for our other Omnia family of products will not work with Omnia 3. The latest versions of all Omnia remote control programs are always available free of charge through the "Support" page of our web site: www.omniaaudio.com

Start the **O3remoteXXX.exe** program. As mentioned earlier, when the program is run for the first time, you will get an error message saying: "No connection database, creating new database." This is normal.

Checking the Version Number of your Omnia-3 Remote Control Program

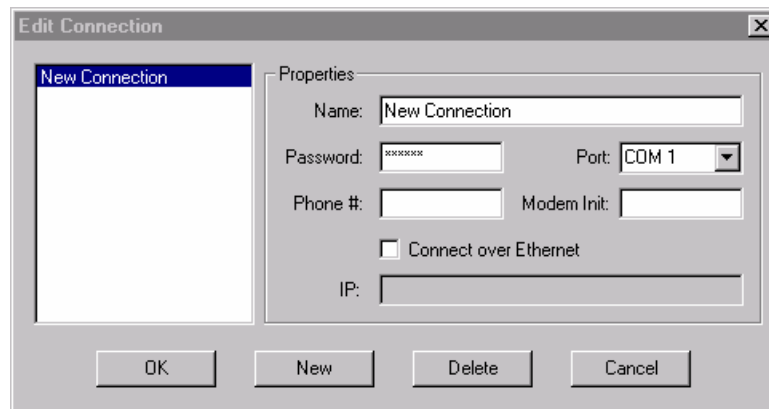
You can check the version of your Omnia Remote control program by clicking on the "About" option under the "Help" menu option.



←
The Omnia-3 Remote Control version number is shown here.

The Edit Connection Dialog Box

Under the Options Menu, select “Edit Connection”. A new window will open, and a default “New Connection” option will be displayed. Enter required information into each of the configuration boxes.



Edit Connection Menu in Omnia-3 Remote Control

In the left side of the “Edit Connection” window will be the list of any connections that are currently contained in the 'connect.dat' configuration file. Connect.dat will be created in whatever folder the Omnia remote program is started from. The specific names in the list are derived from the information that was entered into the “Name:” box when each connection was first set up. In the Properties Window of the dialog box, it's a good idea to edit the connection name to match the type of connection you wish to configure. The three available connection types are:

- via Direct Serial
- via Modem
- via TCP/IP Ethernet (if optional Ethernet interface is installed in the Omnia-3)

Connection names such as “Serial” if using the RS-232 port, “Network” if using the Ethernet port or “Dialup” if using a modem may be used. This naming convention is not mandatory, but it will help keep things tidy if you decide to use Omnia-3 Remote Control to connect to several Omnia-3 units.

(Note: Use **New** to create any additional connection entries. Use **Delete** to remove any unused entries. Select any entry in the connection list to edit its fields. Use **Cancel** to exit without making changes.)

To set up a connection:

1. Enter the name of the connection in the “Name” box. It is helpful to name the connections you create according to the Omnia they connect to, or even by the method of connection. For instance, the name box could contain entries like “WXXX Omnia”, “WYYY Omnia”, “WXXX Omnia by Modem”, “WYYY Omnia by Network”, etc.
2. In the password box, enter the login password for the Omnia-3 that you wish to make a connection to. The factory default password is “tomtom” (all lower case). If you leave the password box blank, the Omnia will prompt you for the password each time you try to connect.
3. If you wish to connect over a network (using the optional Ethernet interface), you must check the box “Connect over Ethernet”. When you do this, the parameters required for direct serial or dial-in via modem will be grayed out. Then, only the TCP/IP address of the Omnia that you wish to connect to must be entered. Note: If you are connecting via Direct Serial or Modem, you should not check the “Connect over Ethernet” box!

4. If connecting via Direct Serial or Modem, then select the COM port that you wish to use on your PC. This COM port should be configured in Windows for the highest baud rate that your PC will support, but in any case, should be set to at least 57,600 bps.
5. If connecting via Direct Serial, no other information is required.
6. If connecting via Modem, in the “Phone #” box, enter the telephone number of the modem that is connected to the Omnia at the remote site. Any characters present in the “Phone #” box signal the Omnia Remote program to attempt a connection via modem!
7. Click on **OK** to save all the changes and close the Edit Connection dialog.

If you need to use a Modem Initialization string, you may enter it into the “*Modem Init*” string box. If you require a modem initialization string and feel more comfortable building the entire connect string within the “Phone #” box you may do this. See “Using Custom Modem Initialization Strings” for more information.

If your connection attempt times out before the Omnia can answer, you can increase the value (in seconds) of the “*Connection Timeout*” setting. This value sets the amount of time the software will wait for the carrier tone from the Omnia’s modem before timing out and hanging up the computer’s modem.

Omnia Remote Control supports a wide variety of Hayes command set compatible modems. If you have difficulty using your modem, you may call Omnia Customer Support for assistance, but please gather as much information about your modem as possible before doing so.

On the Omnia Side...

Remote Control Using the Optional Omnia PCMCIA Modem

Before use, ensure that the Omnia-approved PCMCIA modem card is fully inserted into the lower PC Card slot on the back of the Omnia. Press on the modem card’s “XJACK” connector to extend the modular telephone jack. Using a standard RJ-11 cable, connect your telephone line to the Omnia modem. Make a note of the telephone number corresponding to this line, as you will need it later when you configure the Omnia Remote.

Note: The modem card can only be safely installed and removed when the Omnia’s power is *off*. Only the PCMCIA modem card supplied by Telos Omnia has been tested and approved by Telos Omnia. We cannot ensure correct operation of any other modem card with the Omnia-3, nor can we provide support for such non-approved cards.

Remote Control Using a External Hayes Compatible Modem

The Omnia supports nearly every Hayes command set compatible modem available. Please note that in order to support the widest possible variety of externally connected serial devices the Omnia-3’s RS-232 port does not support hardware or software handshaking. This is of no concern, and we are aware of no instances where this has prevented an externally connected modem from operating properly. The externally connected modem will need to auto-detect one of the Omnia’s three rear panel serial port’s baud rates (9,600, 19200, and 57,600). Because the Omnia and the modem are both DCE devices, you will need to use a crossover (null modem) cable between them.

Remote Control Using a Direct RS-232 Connection for Local Communications

When a computer can be located near the Omnia-3, it may be convenient to use a direct serial cable connection rather than dial up. Use a standard, straight-through serial cable -- null-modem cables will not work! A typical serial cable will need a DB-25 male connector for the Omnia-3 end, and probably a DB-9 female connector on the computer end. You should verify the exact type required by your computer.

Remote Control Using Ethernet

The Omnia-3 can be controlled via Ethernet using the optional Omnia-3 Ethernet hardware interface (Part number 2091-00013). This part supports connection via 10-base-T or 100-base-T Ethernet. Installation and configuration of this hardware is covered in separate instructions included with the hardware interface. During initial configuration, the interface must be set up to respond to connections on port 3002. No other port is supported by the Remote Control software. Once configuration is complete, connections behave identically to any other method.

Connecting via Direct Serial Connection

In the Edit Connection window, create a New Connection and name it. Then fill in the Password box (the default password is “tomtom”-lower case only!). The password may be changed at any time using the File Menu “Change Password” option. Note that you must be connected to the Omnia in order to change the password, and that the password change becomes valid the next time you attempt to log in with Omnia Remote control. Changing the password here also affects the front panel password used to unlock or login to the unit.

Select the COM port that your computer will use under the drop down list box labeled “Port”. If the Omnia and computer are connected by a straight through serial cable, you should be able to connect and control the Omnia-3 locally using the remote control program.

The Omnia is designated as a DCE serial device, and has a DB-25 female RS-232 port connector. Your computer will typically be a DTE device, and will usually have either a DB-9 or DB-25 male connector. Since only connections between the same type of equipment require a null modem cable (DCE to DCE, or DTE to DTE), the Omnia to PC cable should be a straight-through type! A null modem cable will not work!

Connecting via Modem

Configure a new connection, also entering the telephone number to which the Omnia-3's optional Modem Card is connected. Then fill in the Password box (the default password is “tomtom”-lower case only!). The password may be changed at any time using the File Menu “Change Password” option. Note that you must be connected to the Omnia in order to change the password, and that the password change becomes valid the next time you attempt to log in with Omnia Remote control. Changing the password here also affects the front panel password used to unlock or login to the unit.

If your computer needs to dial an access code (such as “9”) to get an outside line, that digit must be entered as well. Sometimes if the outgoing connection passes through a PBX, it might require a short pause between the outside line access code and the telephone number you're dialing. In this case, the telephone number will need to have a comma inserted into it after the '9'. (In the standard Hayes command set, a comma is a “pause” character). You may use as many commas (pauses) in the dialing string as necessary to get whatever delay you require for your situation.

Example: suppose you need to connect to a remotely located Omnia and it is connected to telephone number 555-1234 in Area code 717. To make things more interesting, your local PBX system requires you to dial a “9” to get an outside line. In this case, you'll need to dial “9” to get an outside line, as well as a “1” because it is a long distance call. In this situation, the correct entry for the “Phone #” box would be:

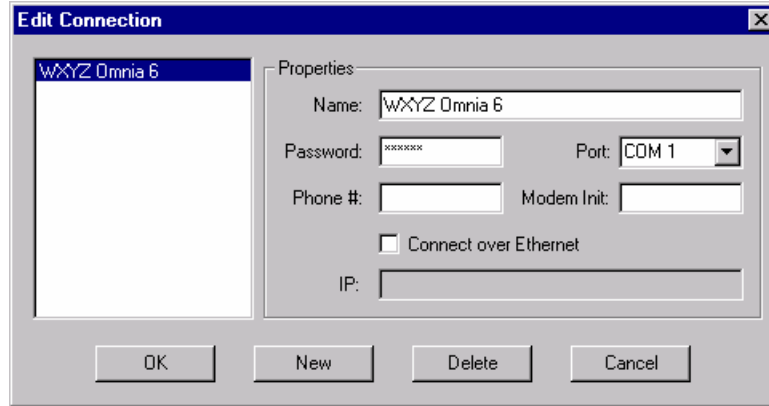
9,17175551234

To enhance 'human readability', you could parse the telephone number entry with hyphens. Doing this has no effect on the ability of the program to dial out. The entry in the Phone # box entry would then be:

9,1-717-555-1234

Using a Custom Modem Initialization String

A custom Modem Initialization String is sometimes required in order to control the behavior of the modem in special circumstances. While there are many different initialization string possibilities, the most common one modifies how the modem handles dial tone. Sometimes the modem may be connected to a circuit that does not provide the US standard 350/440 Hz dial tone, and in this case, you need to tell the modem to ignore it.



Edit Connection dialog box with “Modem Initialization String” edit box

The extra dialing commands that modify modem behavior should be entered into the “Modem Init:” box in the Edit Connections menu. If you are “modem init string savvy”, you could ignore the “Modem Init:” box altogether and place the complete dialing command string into the Phone # box. The choice is yours.

As pointed out earlier, a common customer need is the ability to tell the modem to ignore a non-standard dial tone. For that situation, the most commonly used options are:

- X0 - Disables both busy and dial tone detection.
- X1 - Disable busy and dial tone detection.
- X2 - Disable busy detection, enable dial tone detection.
- X3 - Enable busy detection, disable dial tone detection.
- X4 - Busy and dial tone detection enabled.

Given this information, a possible initialization string example configured to ignore the dial tone before dialing, could be:

ATX0w,xyyyzzzz or **ATX0w-,x-yyy-zzz**

- Where “AT” is the start of the standard modem command string, and;
- Where “X0” tells the modem to ignore busy and dial tone detection, and.
- Where “x” is the number to dial to reach an outside line (if required), and;
- Where “,” is a pause, and;
- Where “yyy” is the dialing prefix, and;
- Where “zzzz” is the dialing suffix.

There are many resources on the World Wide Web pertaining to the possible Hayes command set initialization string options. You can locate such resources by using the search text “Hayes Command Set” in your Internet browser. Two such sites with resources that have been helpful are:

<http://www.modemhelp.net/basicatcommand.shtml>

<http://www.modemexpress.com/>

Connecting via Ethernet Network

For Network connections, check the **Connect over Ethernet** box and enter the IP address of the Omnia-3fm Turbo in the box provided. The TCP/IP address entry format is: xxx.xxx.xxx.xxx. The TCP/IP address of the Omnia-3 Ethernet hardware interface is set during initial configuration.

Technical note: the Omnia 3 Remote Control communicates with the Omnia 3 using a Telnet session on Port 23. If you are unable to communicate with the Omnia through a network firewall, the first thing to check is whether traffic on port 23 is being permitted.

Enter the password for the unit in the Password box. If nothing is entered, you will be asked for the password at the time you connect to the remote Omnia. The default passwords for Ethernet remote connections are the same as the front panel passwords:

Normal: "vito" (all lower case)

Engineer: "tomtom" (all lower case)

The Remote Control software allows multiple connection profiles to be created so that a mix of connection types (Direct, Serial, TCP/IP) may be used. This allows the program to easily support communicating with different Omnias at different locations, connected by different means.

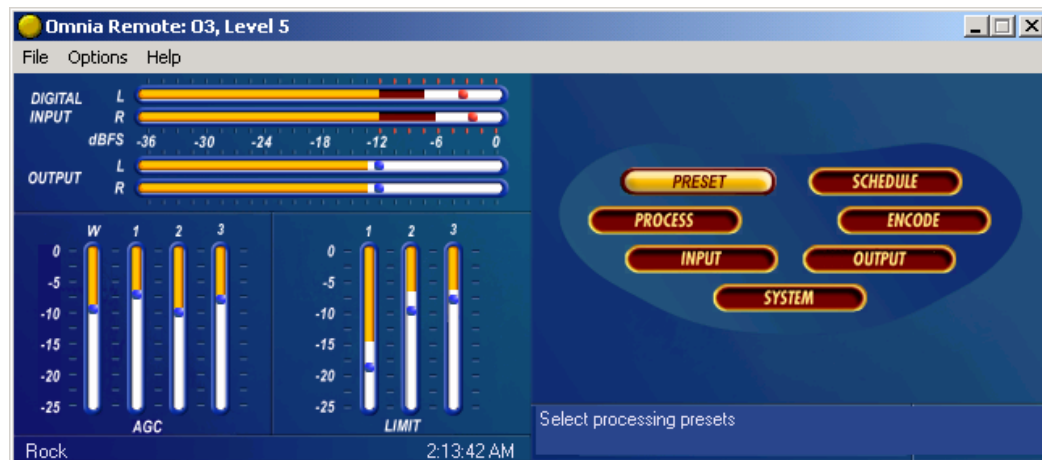
When all items have been entered, select OK.

Note: These connection settings are stored in a small binary file named *connect.dat* located in the same folder as the remote program.

Using the Remote Control

Establishing a Remote Connection

To establish a connection with the remotely located Omnia-3, return to the Options Menu and select Connect, which brings up a list of connections you have defined. Double-click on the name of the desired connection, or highlight it to select it and press OK. The connection will be established after a short pause, and you should see the bargraph meters become active when a connection has been established.



Omnia-3 Remote Control after connection is made. Note that the currently selected Preset and the Omnia's actual System time are being displayed.

Use Cancel to leave the dialog box without making any connection.

You can choose to have the program automatically establish a connection by going to the Options Menu, selecting Auto-Connect to Last. Then the program will always connect to the Omnia-3 using the last-used startup connection entry.

Note that if you have not entered a Password while editing the connection type, you will be prompted for it each time you connect to the Omnia!

Terminating a Connection

From the Options Menu, select Disconnect. Closing the program will also terminate any connections.

Remote Features

The Remote Control Program for Omnia-3 provides all the features of the front panel, displayed in an easy-to-use format. It adds these enhancements:

- Multiple control windows may be open at the same time.
- The scroll wheel on mice so equipped is supported for fast, easy adjustment of parameters.
- The ability to save, load, and print presets and system parameters to the computer. (in the File Menu) This is very handy for reference and backup purposes.
- The ability to edit and load Trigger Scripts as described starting on Page 66.

Using a Terminal Program and Direct Connection

It is sometimes useful to use a Direct Serial Connection and a terminal program such as Windows HyperTerminal to gain access to the Omnia's command line interface. While operating the Omnia in this manner is certainly not for beginners, the information that can be captured from the rear-panel RS-232 port, especially during system boot-up, can be very useful for troubleshooting purposes. Upon occasion, Omnia Customer Support personnel may ask you to capture such data from the rear port if it seems necessary.

The serial communications parameters of the terminal program should be set to:

- 8 Data Bits
- No Data Parity (None)
- 1 Stop Bit
- Flow Control (None)

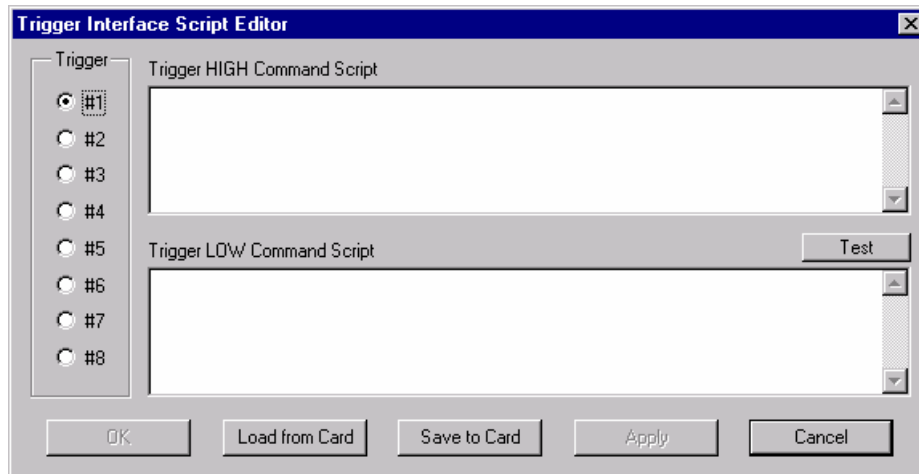
The Baud rate (bits per second) must be set to match the setting in the Omnia-3's Utility Menu. Make sure however that the maximum allowed baud rate (set in the Windows Device Manager) of the serial port being used is set *at least* as high as the desired baud rate. Setting this to the highest available setting is fine.

Once these parameters have been set, one can now log onto the Omnia-3 by typing "login tomtom" (enter) at the >> prompt. If the >> prompt does not show up, try typing "echo on" (enter).

Trigger Interface and Script Editor

Overview of the Trigger Script Editor

The Omnia-3 Remote Control software contains a special script editor that allows the programming of complicated system parameter changes, which can be “triggered” by logic state changes on the rear-panel “Interface” connector.



“Edit Trigger Scripts” dialog box as opened under “Options”, “Edit Trigger Scripts”

Using Trigger Scripts, you can make the Omnia-3 do things with contact closures that would normally need to be done either by manual intervention at the front panel, or via Omnia-3 remote control. There are EIGHT Trigger Inputs available, and they respond to voltage levels on the rear-panel “Interface” connector.

Trigger Control by Dry Contact Closures

The simplest way to manipulate a Trigger Input is through simple contact closures to ground. Connecting a Trigger Input to ground initiates the programmed function associated with the “Trigger LOW” command, and moving the connector pin from a grounded to a floating condition issues the “Trigger HIGH” command.

Trigger Control by Applied Voltages

The Trigger Inputs are also capable of operating with a DC voltage applied, as long as such voltage does not exceed 25 volts DC. Applied voltages that are more than +1.25 volts DC on the trigger input result in a Trigger HIGH state, while voltages less than +1.25 volts result in a Trigger LOW state. Therefore, if +12 volts DC is applied, a logic “1”, or Trigger HIGH is sensed. If –12 volts DC is applied, a logic “0”, or Trigger LOW is sensed. When nothing is connected to the Trigger Inputs, they normally float at approximately 3.5 volts, which is a logic HIGH.

What Can Trigger Scripts Control?

Virtually any aspect of the Omnia-3 operation can be controlled using the Trigger Script function. Therefore, we’ll explain some of the different types of operations that can be performed, and the different types of commands that are required to perform each one.

Some Common Uses of Trigger Scripts

- Switch from Stereo to L+R Mono
- Switch from L+R Mono to Stereo
- Switch the Stereo Pilot off
- Switch the Stereo Pilot back on and at 9% injection
- Switch the Omnia's audio input source from Analog to Digital
- Switch the Omnia's audio input from Digital to Analog

The Para, The Syspara, and Command Line Entries

What Is a “Para”?

In general*, a 'para' is a variable that corresponds to one of the adjustable controls available within a Processing Block. For instance, the Wide Band AGC Release Time is a 'para', in fact, it happens to be 'para' 3.

What Is a “Syspara”?

In general*, a 'syspara' is a system parameter assigned to the basic operation of the “System”. Controls such as the one for audio source selection, the mono operating mode, and the stereo pilot state and its injection level, each have a “syspara” value associated with it. A complete list of Omnia-3fm Turbo 'syspara' values can be found on Page 69.

* In the above explanation, we used the disclaimer “in general” because there are certain exceptions.

What About Command Line Entries?

Just as 'paras' and 'sysparas' can manipulate the processing controls and system adjustments, there are higher level commands available which do even more special things. Later, we'll discuss how the command line can be used to manipulate the Daypart Scheduler.

Using The Trigger Script Editor

A Trigger Script is “written” using the Trigger Interface Script Editor that is contained within the Omnia Remote Control software. The Script Editor runs in a separate window from the Remote Control window. The Editor window is opened under the Options menu (Edit Trigger Scripts). To open the Script Editor window, the computer running the Remote Software must be connected to and communicating with the Omnia-3.

Starting the Script Editor (Options / Edit Trigger Scripts) opens up the Script Editor window. The eight radio buttons along the left side select which trigger script number to display and edit. The top edit box shows the script for the Trigger HIGH Command Script (contact open) for the selected input. The bottom edit box shows the script for the Trigger LOW Command Script (contact closure) for that input.

Once a script has been entered, clicking the Test button checks the script syntax, and if correct, sends the displayed script to the Omnia-3 for immediate execution. Use the command line window and/or any alert dialogs that pop up to view the success or failure of the script. Note that executing the script in this manner does not result in the script being downloaded or saved as a trigger script, it is simply run once to see if the script, as written, actually works.

The buttons along the bottom of the window load, save, or download the current scripts being edited to the PC Card. Click “Save to Card” to permanently store the current scripts on the PC Card in one file. Click “Load from Card” to retrieve previously saved scripts. To download the scripts for use in the processor without saving to the PC Card, click “Apply” if further script editing will be done. Click “OK” to download the current scripts

and close the Script Editor window. Click “Cancel” to close the window, discarding any changes made since the last “Apply” or “Save to Card.”

Note: If you have created Trigger Scripts and clicked “Apply” but not “Save to Card”, the Omnia will only remember your scripts until you power it off.

Once the scripts are downloaded into the processor, they are executed when the appropriate logic transition occurs on their assigned trigger input. Neither the Remote Control application nor the Script Editor needs to be connected for the trigger scripts to execute.

Note: When a trigger script is actually executed, any problems that may be encountered in the execution of it will not be noted to the user.

Script Command Definitions

The scripting commands available for use with the Daypart Scheduler are listed in bold lettering (e.g., **parts**). Their definitions (e.g., Displays the current daypart table) and usage examples are also listed. The commands have been divided by general functions (Dayparts, Presets, System parameters, etc.). In use, a command is typed in and then the enter or return key is pressed. If the command is executable (e.g., **parts**), then the command is run (e.g., a table of the dayparts is displayed), otherwise the cursor simply moves to the next entry line.

Dayparts

parts Displays the current daypart table
partadd <day> <time> Adds a daypart to the daypart table.

The “day” parameter can be assigned the following days: Sun, Mon, Tue, Wed, Thu, Fri, Sat, M-F, S-S, All. The “time” parameter must be defined using the following format: <hour>:<min>:<sec><am | pm> . As an example, typing **Partadd Mon 5:00:00am <enter>** commands the Omnia-3 to add a daypart on Monday at 5:00:00am.

partremove Removes a daypart from the current daypart list.

Example: **partremove Mon 5:00:00am <enter>**

partload Loads a daypart from the PC Card.
partsave Saves the current daypart to the PC Card.

Presets

Note: After a preset is saved to the system, the Omnia knows them by their Index Number, not by their Preset Name. Therefore, when selecting a preset, you use its index number. When saving presets, you use its name!

presets Lists all the currently available factory and user presets by index #.

preset <preset index #> Selects the preset by index # from the list of available presets

Example: **preset 21 <enter>** commands the Omnia-3 to load preset number 21 in the index list.

delete <preset index #> Deletes a preset from the preset index list by its index number.

Example: **delete 21 <enter>** commands the Omnia-3 to remove preset number 21 from the index list.

rename <preset index #><name> Renames the preset by its index number.

Example: **rename 21 BOOGY <enter>** commands the Omnia-3 to rename preset number 2.

save Saves the preset under its current name.

Note: Factory presets are permanent and cannot be written over. You must use the 'saveas' command when saving changes made to a factory preset in order to save it as a unique name.

saveas Saves the preset under a different name.

Example: **saveas BOOGY <enter>** Commands the Omnia to save the current settings as preset BOOGY.

Non-System Parameters (paras)

paras Lists the modifiable parameters available for the current preset in a table format.

Example: **paras <enter>** displays the parameters for the current preset:

paravalues <index #> Lists all possible values for the parameter at the given index number.

para <para index #> <paravalue>Sets a new value for the selected parameter.

Omnia-3fm Turbo System Parameters

A 'syspara' is an Omnia-3 System parameter. The System Parameters are assigned to controls which govern overall operation, such as Input and Output Gains, Pre-emphasis/De-emphasis, etc. These parameters would NOT be saved with individual presets, but instead are saved using the Save To Card option in the System menu.

To obtain a list of all System parameters, you use the command 'sysparas', which lists all of the adjustable parameters in a table format with their current setting value in brackets. Example: typing **sysparas <enter>** displays the following table:

1) Input Source [AES/EBU]	2) Mono Mode [Stereo]
3) Input Phase [INVERT]	4) Input Master [+6.0dB]
5) Left Trim [+0.0dB]	6) Right Trim [+0.0dB]
8) Input LPF [15kHz]	17) Output Master [+10.0dB]
18) Left Trim [+0.0dB]	19) Right Trim [+0.0dB]
26) Headphones [-10.0dB]	33) Daypart State [ENABLED]
34) Ctrl Port Baud [19200]	48) Contrast [90]
49) Backlight [60]	50) Editing Mode [EXPERT]
51) Composite 1 [3.60 V]	52) Composite 2 [3.60 V]
53) SCA Level [-20.0dB]	54) Pilot Level [8.0%]
55) Separation [STEREO]	56) Phase Adjust [0 deg]
57) Analog Phase [1]	58) Preemphasis [75uS]
59) Deemphasis [75uS]	60) BS412 [OFF]
61) Ave. Power ['no-disp']	

Setting New Syspara Values

To find the new value you wish to use for a particular Syspara:

sysparavalues <syspara index #> Lists all the possible values for any parameter.)

Example: **sysparavalues 54 <enter>** Displays a table listing the possible Pilot Level values.

To set a new value for a Syspara:

syspara <syspara index #>[<sysparavalue index #>]

To reset all System parameters back to their factory defaults:

sysdefaults Restores the system attributes back to their factory defaults.

To save all System settings to the rear-panel memory card.

syssave Saves the system attributes to the Omnia PC Card.

To load the saved setting from the rear-panel memory card:

sysload Loads the system attributes from the currently inserted Omnia PC Card.

Creating a Trigger Script

Now that the scripting commands have been defined, let's put them to work to create a Trigger Script. We'll use one of the most commonly requested operations that FM broadcasters want to easily accomplish: switching between mono and stereo operation.

This procedure can of course be done by manually using the Omnia-3 front panel controls to turn off the 19 kHz pilot tone and to switch the input from stereo to mono left. But a far easier method is to use the Trigger Script Editor to create two scripts that can be loaded into the processor to run in response to a single relay contact closure or open. The following scripts do just that—set the Omnia-3fm Turbo to automatically switch to mono in response to a sustained contact closure and to then return to stereo operation when that same contact is opened.

In scripts, all lines that begin with "syspara" must be followed by two numbers that identify the parameter ID number that is being set and that ID number's new value. The value numbers and their settings for the Pilot Level were also shown. To list the values and parameter settings for any parameter, type in **sysparavalues** followed by a space and then the parameter's "syspara" number.

(The above "sysparas" table lists all of the available system parameter numbers.)

Trigger Script Example for Switching to Mono Operation

In this example, we'll configure Trigger Input # 1 to switch the Omnia-3fm Turbo into mono operation when the contact closes and switch back to stereo when it opens again. To create this script, open up the Script Editor and click radio button #1. Now click in the lower edit box to begin entering the Trigger 1 "Trigger Low" script. Type:

syspara 54 1 <enter>

This command sets the processor to turn off the 19 kHz pilot tone when it is run. "**syspara 54**" says to edit the Pilot Level. The "**1**" says select Off. Next, type in:

syspara 2 2 <enter>

This command sets the processor to switch the input to "mono left" when run. "**syspara 2**" says to edit the Mono Mode setting. The "**2**" says select mono left.

When you are finished, the contents of the Trigger LOW Command Script box should look like:

syspara 54 1

syspara 2 2

If you wanted to use the sum of Left and Right channels for your mono source, we would have entered the command **'syspara 2 4'** instead of **'syspara 2 2'**.

Trigger Script Example for Switching to Stereo Operation

Now we'll create a Trigger High Command Script, which will return the Omnia to stereo operation and put the pilot back to 9% injection when the switch contacts open. In the Trigger HIGH Command Script box type in:

syspara 54 32 <enter>

This tells the processor to activate the 19 kHz pilot with the injection level set to 9.0%. **"syspara 54"** says to edit the Pilot Level. The **"32"** says select 9.0% pilot level. Now type in:

syspara 2 1 <enter>

This tells the processor to switch the input to "Stereo." **"syspara 2"** says to edit the Mono Mode setting. The **"1"** says to select stereo mode.

When you are finished, the contents of the Trigger HIGH Command Script box should look like:

syspara 54 32

syspara 2 1

These four commands are now a completed script for Trigger 1. To test the scripts, click the Test button above each edit box. If no errors or other displays are shown, then your script is ready to be used or saved. An error indication typically indicates you have a "typo" in one of your command lines. Verify the command is correct and that the index numbers for the parameters or parameter values are correct.

In order to use the scripts, they must be loaded into the Omnia-3. This is done by clicking Apply. Previously entered scripts in the Omnia-3's memory are then replaced by your new scripts. To save the edited Script Editor scripts to the PC Card, click Save to Card. To recall previously edited scripts, click Load From Card. These can then be sent to the Omnia-3 by clicking Apply.

To actually use the scripts you have just written requires that a sustained relay or a switch be connected between trigger input 1 (pin 1) and ground (pin 5) on the Interface connector on the processor's back panel. Setting the relay or switch on (shorting pins 1 and 5 together), then causes the Omnia-3 to follow the script for go low (the unit switches to Mono Left/Pilot off operation). Opening the switch or relay will then cause the processor to follow the go high script (the unit switches to stereo/pilot on operation).

Multiple operations, including ones that are vastly more complicated than what we have presented here, such as simultaneously changing to different presets when changing from stereo to mono, can be completed at the flip of any one of the eight switches or relays connected to the Omnia-3. And the eight relays or switches do not have to be switched locally: Commands can even be initiated by a network satellite when a receiver with contact closures is being used.

Different Ways to Use the Script Commands

There are two methods of using the script we just created. One is to use the scripts as Trigger Scripts, responding to contact closures and opens as previously discussed. The other involves integrating the scripts into the Omnia-3's daypart table. Because the processor is flexible, it allows one to use the same script for both options.

Initiating Trigger Scripts via the Interface Connector

As we mentioned, trigger scripts give the user the ability to tie a series of commands to a simple high/low logic change occurring on a pin of the 9-pin D-sub Interface connector on the unit's rear panel.

The *Pinout* of the Omnia-3 rear-panel DB-9 Interface connector is as follows:

PIN 1 activates Trigger Script 1	PIN 6 activates Trigger Script 2
PIN 2 activates Trigger Script 3	PIN 7 activates Trigger Script 4
PIN 3 activates Trigger Script 8	PIN 8 activates Trigger Script 7
PIN 4 activates Trigger Script 6	PIN 9 activates Trigger Script 5
PIN 5 is connected to ground	

Each pin that is to be used must first be programmed with a trigger script for the desired Go High and Go Low logic. To execute the Go Low script, a trigger input pin is connected via a sustained contact closure to pin 5 (ground). To execute a Go High script, the ground is removed from that pin. Each of the trigger pins (1, 2, 3, 4, 6, 7, 8, 9) is thus connected through a switch or relay to the Omnia-3's ground on Pin 5.

Let's review what we created for the example we showed you under "Using the Script Editor". Whenever pin 1 is held low (the contact or switch is in a closed state), the Omnia-3fm Turbo will switch to and stay in mono mode (no Pilot and only the left input channel is used). When the pin 1 contact is subsequently opened, the Omnia-3fm Turbo will switch back to and stay in stereo operation (pilot on and both left and right input channels being used) as long as the contact is open.

"One Way Script" Functions

You may also create scripting functions that do NOT return to another value when the remote contacts are opened. To do this, you use the Go LOW script only, and do not put any entries into the Go HIGH script.

Two possible uses for this very useful "Go LOW Only" Trigger Script trick are periodically setting the Omnia's system time to an external standard, and remote re-booting of the Omnia.

To use the Omnia's command line "Time" function to reset the Omnia's System Clock to midnight based on an external contact closure (such as from an automation system or other time reference), the Trigger Script script syntax would be:

Time 00 00 00 Sets the Omnia time to midnight. Note that colons are not used as delimiters in this entry!

Although time is displayed by the front panel display and its controller, it is actually being kept by the Omnia motherboard. When resetting the System Time using trigger scripts, the change takes effect immediately at the motherboard. Because the front panel 'fetches' time synchronization from the motherboard every few seconds, the front panel's confirmation of the time change may lag by a few seconds but the two will agree with each other when updating takes place.

Another possible use of the one way Trigger Script script capability (although not strongly recommended) is the remote 're-booting' of the Omnia. In that special case, there would be no Go High script entry. The Go Low script for that function would simply read: **warmboot**

Remote re-booting of the unit carries with it several caveats:

- There will be a loss of audio while the system restarts. Analog and composite audio will continue to run for approximately nine seconds, and then nine seconds of no audio will elapse while the DSP code is reloaded.

- If Omnia Remote Control is connected by a modem or direct serial connection at the time, it will be disconnected and manual intervention will be required to reconnect.
- If Omnia Remote Control is connected by Ethernet at the time, the meters on Omnia Remote and Omnia front panel will freeze. However, when the Omnia Remote control session is disconnected, normal Omnia front panel operation will be restored. Manual intervention will be required to restart Omnia Remote Control.
- If you have not saved the System or Trigger Script settings, they may be permanently lost. Preset adjustments are saved in NVRAM and are not lost at power down.

Initiating Scripts via the Daypart Scheduler

The Daypart Scheduler is typically used to change a Preset at a set day and time. But, when a script is added to the Daypart table, the script can dynamically change one or multiple attributes when the Daypart is executed. A script for use by the Daypart functions is written using the special script editor built into the New or Modify Schedule window in the Remote Software (Only) and the syntax is the same as for the Trigger Scripts described in the previous section.

The Daypart Scripts editor is accessed from the New or Modify Schedule window by highlighting and clicking on the ***Scripts*** button. There are also ***Test*** buttons on the page to force the Omnia-3 to immediately run the current Start Script or End Script.

At the bottom of each editor window is a check box to enable or disable the use of the script. A script may be entered but will not be executed until the enable box is checked. The ***Preset*** check box can be used to disable the action of changing the preset when the daypart executes. Un-check this box when you want a daypart to execute *only* the given scripts and *not* change the preset. A daypart can actually be disabled completely by un-checking the ***Preset, Enable Start Script Execution*** and ***Enable End Script Execution*** check boxes.

Start scripts execute at the beginning of a daypart, before making a preset change (if any). End scripts execute at the end of the daypart, after making any preset changes. The script information is stored and retrieved in the same means as other daypart information.

Dayparts can still be selected, etc. from the Omnia-3 front panel interface. However, dayparts with scripts cannot be modified in any way from the front panel.

Note: Remember not to include any commands that may potentially prompt the user, since a user may not be at the Omnia-3 when the commands are executed.

Note: The remote control application does not have to be connected in order for the scripts to execute.

Chapter 9: Remote Control for v3.3.x and Earlier (NET, AM and FM Styles)

This chapter only covers Omnia-3 Remote version 3.3.2, which is for units running older release versions 3.3.x and earlier, net, am and fm styles. Please see chapter 8 for a description of the Remote Control for the **fm Turbo** style.

The Omnia Remote Control software is a Windows (Windows 95, 98, NT 4.0, Win2k, WinXP) software program that allows remote access to the Omnia-3 processor adjustment using any PC running the aforementioned versions of Microsoft Windows®. Note that remote software for the Omnia-3 is unique to that product, and versions of Omnia Remote Control for our other audio processors will not work with Omnia-3. Further, version 3.4.0 and above of the Remote will not work with Omnia-3 net or am. The applicable version of Omnia-3 Remote Control Software is always available free of charge by pointing your web browser to the “Support” page of our web site: <http://www.omniaaudio.com/>

The Omnia-3 Remote Control application presents the controls and meter in two separate window panes, and has several options available from the drop-down menus. Before it connects to the Omnia, the words “offline” will be displayed where the Preset Name and Omnia Time will be displayed once the remote connection is made.



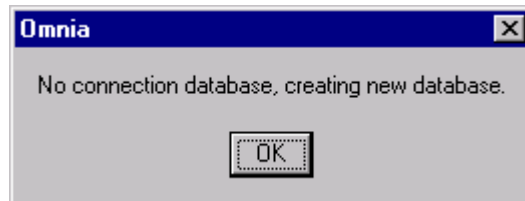
Omnia 3 Remote Control as it appears on your computer screen

Software Installation

Installation is simply a matter of putting a copy of **O3remoteXXX.exe** into the folder name of your choosing, and running it from that location. This file is the actual raw executable so there is no “installer” and no permanent changes are made to your computer system or to your Windows registry.

Using standard Windows procedures, create a new folder by the name you wish to use, and place a copy of “**O3remoteXXX.exe**” in that folder. You can then also create a desktop shortcut to that executable if desired.

When the program is freshly installed but has not yet been run, “**O3remoteXXX.exe**” is the only file in the specified folder. However, the first time that the program is run, it will create a small new file called “connect.dat”, which contains your connection type information. When you first run the Omnia-3 Remote Control program, there is no “connect.dat” file yet, so you will receive the error message “No connection database. Creating new database”. This is normal and is no cause for concern.



This message is normal the first time the program is started!

Note: When you install Omnia Remote Control software updates, you should move the old version and its associated connect.dat file to a new folder. This way, conflicts with different versions of the connect.dat database will be avoided. If you wish, the old version’s folder can be safely deleted once the update is complete. You will also want to use unique folder names for each copy of other Omnia remote control programs if you have those installed. Please note that the remote control programs themselves, as well as their associated connect.dat files are unique for each version of the Omnia Classic, Omnia 3, Omnia-5EX, Omnia-6EX and Omnia Toolvox.

Setting Up and Configuring Omnia Remote Control

The Remote Control Program for the Omnia-3 am and net works only with the am and net styles. As stated earlier, Omnia Remote Control programs designed for our other Omnia family of products will not work with Omnia 3. The latest versions of all Omnia remote control programs are always available free of charge through the “Support” page of our web site: www.omniaaudio.com

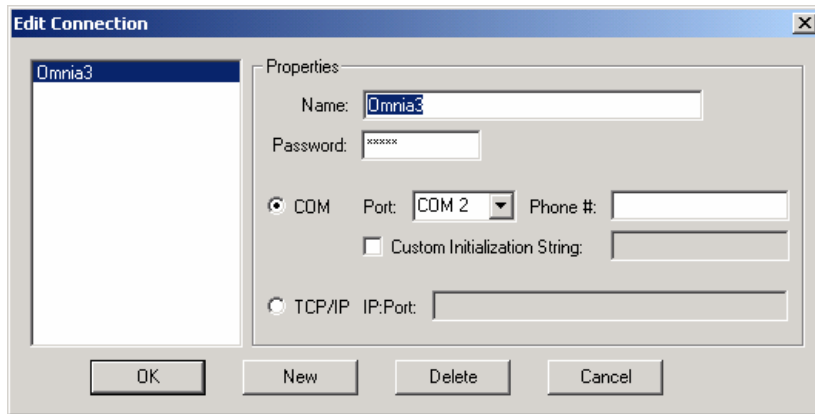
Start the **O3remoteXXX.exe** program. As mentioned earlier, when the program is run for the first time, you will get an error message saying: “No connection database, creating new database.” This is normal.

Checking the Version Number of your Omnia-3 Remote Control Program

You can check the version of your Omnia Remote control program by clicking on the “About” option under the “Help” menu option.

The Edit Connection Dialog Box

Under the Options Menu, select “Edit Connection”. A new window will open, and a default “New Connection” option will be displayed. Enter required information into each of the configuration boxes.



Edit Connection Dialog in Omnia-3 Remote Control

In the left side of the “Edit Connection” window will be the list of any connections that are currently contained in the 'connect.dat' configuration file. Connect.dat will be created in whatever folder the Omnia remote program is started from. The specific names in the list are derived from the information that was entered into the “Name:” box when each connection was first set up. In the Properties Window of the dialog box, it's a good idea to edit the connection name to match the type of connection you wish to configure. The three available connection types are:

- via Direct Serial
- via Modem
- via TCP/IP Ethernet (if optional Ethernet interface is installed in the Omnia-3)

Connection names such as “Serial” if using the RS-232 port, “Network” if using the Ethernet port or “Dialup” if using a modem may be used. This naming convention is not mandatory, but it will help keep things tidy if you decide to use Omnia-3 Remote Control to connect to several Omnia-3 units.

(Note: Use **New** to create additional connection entries. Use **Delete** to remove any unused entries. Select any entry in the connection list to edit its fields. Use **Cancel** to exit without making changes.)

To set up a connection:

1. Enter the name of the connection in the “Name” box. It is helpful to name the connections you create according to the Omnia they connect to, or even by the method of connection. For instance, the name box could contain entries like “WXXX Omnia”, “WYYY Omnia”, “WXXX Omnia by Modem”, “WYYY Omnia by Network”, etc.
2. In the password box, enter the login password for the Omnia-3 that you wish to make a connection to. The factory default password is “tomtom” (all lower case). If you leave the password box blank, the Omnia will prompt you for the password each time you try to connect.
3. Choose either the “COM” or “TCP/IP” radio buttons. Use “COM” for modem or direct serial connections. If you wish to connect over a network (using the optional Ethernet interface), choose “TCP/IP”. When you do this, the parameters required for the other connection method will be grayed out. You need only supply the parameter required for the selected connection method.

4. If connecting via network, enter the IP address and port number of the Omnia-3. These were configured during installation of the optional Ethernet interface. The format is xxx.xxx.xxx.xxx:pppp.
5. If connecting via Direct Serial or Modem, then select the COM port that you wish to use on your PC. This COM port should be configured in Windows for the highest baud rate that your PC will support, but in any case, should be set to at least 57,600 bps.
6. If connecting via Direct Serial, no other information is required.
7. If connecting via Modem, in the "Phone #" box, enter the telephone number of the modem that is connected to the Omnia at the remote site. Any characters present in the "Phone #" box signal the Omnia Remote program to attempt a connection via modem!
8. Click on **OK** to save all the changes and close the Edit Connection dialog.

If you need to use a Modem Initialization string, check the "*Custom Initialization String*" string box, and enter it in the . If you require a modem initialization string and feel more comfortable building the entire connect string within the "Phone #" box you may do this. See "Using Custom Modem Initialization Strings" for more information.

Omnia Remote Control supports a wide variety of Hayes command set compatible modems. If you have difficulty using your modem, you may call Omnia Customer Support for assistance, but please gather as much information about your modem as possible before doing so.

On the Omnia Side...

Remote Control Using the Optional Omnia PCMCIA Modem

Before use, ensure that the Omnia-approved PCMCIA modem card is fully inserted into the lower PC Card slot on the back of the Omnia. Press on the modem card's "XJACK" connector to extend the modular telephone jack. Using a standard RJ-11 cable, connect your telephone line to the Omnia modem. Make a note of the telephone number corresponding to this line, as you will need it later when you configure the Omnia Remote Control program.

Note: The modem card can only be safely installed and removed when the Omnia's power is *off*. Only the PCMCIA modem card supplied by Telos Omnia has been tested and approved by Telos Omnia. We cannot ensure correct operation of any other modem card with the Omnia-3, nor can we provide support for such non-approved cards.

Remote Control Using a External Hayes Compatible Modem

The Omnia supports nearly every Hayes command set compatible modem available. Please note that in order to support the widest possible variety of externally connected serial devices the Omnia-3's RS-232 port does not support hardware or software handshaking. This is of no concern, and we are aware of no instances where this has prevented an externally connected modem from operating properly. The externally connected modem will need to auto-detect one of the Omnia's three rear panel serial port's baud rates (9,600, 19200, and 57,600). Because the Omnia and the modem are both DCE devices, you will need to use a crossover (null modem) cable between them.

Remote Control Using a Direct RS-232 Connection for Local Communications

When a computer can be located near the Omnia-3, it may be convenient to use a direct serial cable connection rather than dial up. Use a standard, straight-through serial cable -- null-modem cables will not work! A typical serial cable will need a DB-25 male connector for the Omnia-3 end, and probably a DB-9 female connector on the computer end. You should verify the exact type required by your computer.

Remote Control Using Ethernet

The Omnia-3 can be controlled via Ethernet using the optional Omnia-3 Ethernet hardware interface (Part number 2091-00013). This part supports connection via 10-base-T or 100-base-T Ethernet. Installation and configuration of this hardware is covered in separate instructions included with the hardware interface. Once configuration is complete, connections behave identically to any other method.

Connecting via Direct Serial Connection

In the Edit Connection window, create a New Connection and name it. Then fill in the Password box (the default password is “tomtom”-lower case only!). The password may be changed at any time using the File Menu “Change Password” option. Note that you must be connected to the Omnia in order to change the password, and that the password change becomes valid the next time you attempt to log in with Omnia Remote control. Changing the password here also affects the front panel password used to unlock or login to the unit.

Select the COM port that your computer will use under the drop down list box labeled “Port”. If the Omnia and computer are connected by a straight through serial cable, you should be able to connect and control the Omnia-3 locally using the remote control program.

The Omnia is designated as a DCE serial device, and has a DB-25 female RS-232 port connector. Your computer will typically be a DTE device, and will usually have either a DB-9 or DB-25 male connector. Since only connections between the same type of equipment require a null modem cable (DCE to DCE, or DTE to DTE), the Omnia to PC cable should be a straight-through type! A null modem cable will not work!

Connecting via Modem

Configure a new connection, also entering the telephone number to which the Omnia-3’s optional Modem Card is connected. Then fill in the Password box (the default password is “tomtom”-lower case only!). The password may be changed at any time using the File Menu “Change Password” option. Note that you must be connected to the Omnia in order to change the password, and that the password change becomes valid the next time you attempt to log in with Omnia Remote control. Changing the password here also affects the front panel password used to unlock or login to the unit.

If your computer needs to dial an access code (such as “9”) to get an outside line, that digit must be entered as well. Sometimes if the outgoing connection passes through a PBX, it might require a short pause between the outside line access code and the telephone number you're dialing. In this case, the telephone number will need to have a comma inserted into it after the '9'. (In the standard Hayes command set, a comma is a “pause” character). You may use as many commas (pauses) in the dialing string as necessary to get whatever delay you require for your situation.

Example: suppose you need to connect to a remotely located Omnia and it is connected to telephone number 555-1234 in Area code 717. To make things more interesting, your local PBX system requires you to dial a “9” to get an outside line. In this case, you'll need to dial “9” to get an outside line, as well as a “1” because it is a long distance call. In this situation, the correct entry for the “Phone #” box would be:

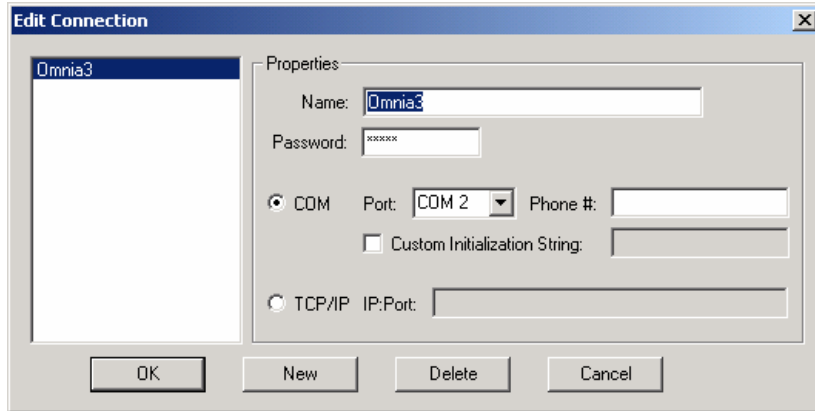
9,17175551234

To enhance 'human readability', you could parse the telephone number entry with hyphens. Doing this has no effect on the ability of the program to dial out. The entry in the Phone # box entry would then be:

9,1-717-555-1234

Using a Custom Modem Initialization String

A custom Modem Initialization String is sometimes required in order to control the behavior of the modem in special circumstances. While there are many different initialization string possibilities, the most common one modifies how the modem handles dial tone. Sometimes the modem may be connected to a circuit that does not provide the US standard 350/440 Hz dial tone, and in this case, you need to tell the modem to ignore it.



Edit Connection dialog box with “Modem Initialization String” edit box

The extra dialing commands that modify modem behavior should be entered into the “Custom Initialization String:” box in the Edit Connections menu. If you are “modem init string savvy”, you could ignore the “Custom Initialization String:” box altogether and place the complete dialing command string into the Phone # box. The choice is yours.

As pointed out earlier, a common customer need is the ability to tell the modem to ignore a non-standard dial tone. For that situation, the most commonly used options are:

- X0 - Disables both busy and dial tone detection.
- X1 - Disable busy and dial tone detection.
- X2 - Disable busy detection, enable dial tone detection.
- X3 - Enable busy detection, disable dial tone detection.
- X4 - Busy and dial tone detection enabled.

Given this information, a possible initialization string example configured to ignore the dial tone before dialing, could be:

ATX0w,xyyyzzzz or ATX0w-,x-yyy-zzz

- Where “**AT**” is the start of the standard modem command string, and;
- Where “**X0**” tells the modem to ignore busy and dial tone detection, and.
- Where “**x**” is the number to dial to reach an outside line (if required), and;
- Where “**;**” is a pause, and;
- Where “**yyy**” is the dialing prefix, and;
- Where “**zzzz**” is the dialing suffix.

There are many resources on the World Wide Web pertaining to the possible Hayes command set initialization string options. You can locate such resources by using the search text “Hayes Command Set” in your Internet browser. Two such sites with resources that have been helpful are:

<http://www.modemhelp.net/basicatcommand.shtml>

<http://www.modemexpress.com/>

Connecting via Ethernet Network

For Network connections, check the **Connect over Ethernet** box and enter the IP address of the Omnia-3fm Turbo in the box provided. The TCP/IP address entry format is: xxx.xxx.xxx.xxx. The TCP/IP address of the Omnia-3 Ethernet hardware interface is set during initial configuration.

Technical note: the Omnia 3 Remote Control communicates with the Omnia 3 using a Telnet session on Port 23. If you are unable to communicate with the Omnia through a network firewall, the first thing to check is whether traffic on port 23 is being permitted.

Enter the password for the unit in the Password box. If nothing is entered, you will be asked for the password at the time you connect to the remote Omnia. The default passwords for Ethernet remote connections are the same as the front panel passwords:

Normal: "vito" (all lower case)
Engineer: "tomtom" (all lower case)

The Remote Control software allows multiple connection profiles to be created so that a mix of connection types (Direct, Serial, TCP/IP) may be used. This allows the program to easily support communicating with different Omnias at different locations, connected by different means.

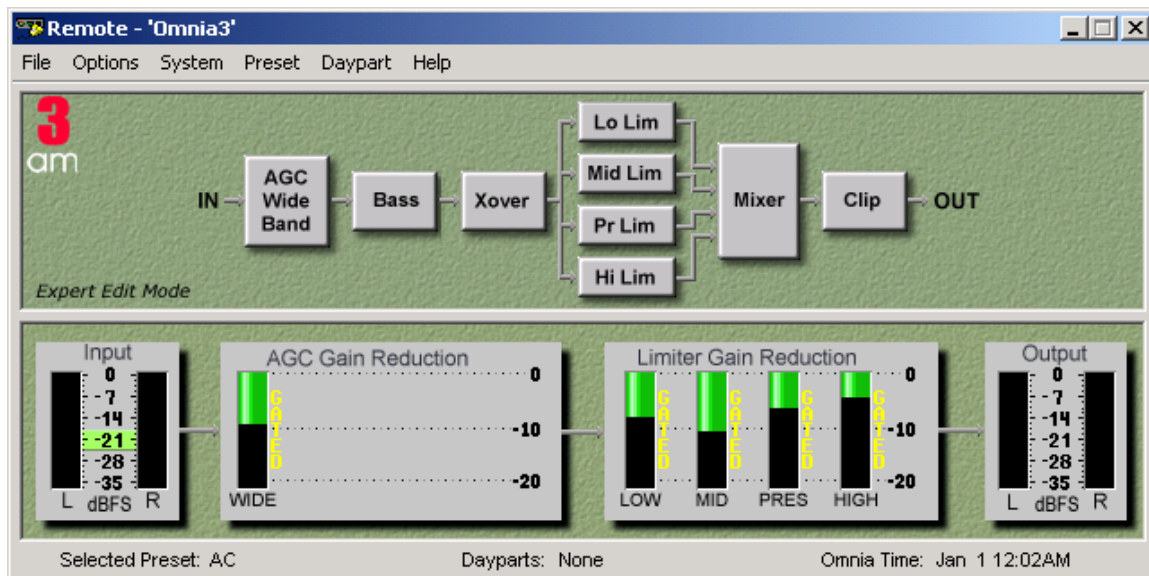
When all items have been entered, select OK.

Note: These connection settings are stored in a small binary file named *connect.dat* located in the same folder as the remote program.

Using the Remote Control

Establishing a Remote Connection

To establish a connection with the remotely located Omnia-3, return to the Options Menu and select Connect, which brings up a list of connections you have defined. Double-click on the name of the desired connection, or highlight it to select it and press OK. The connection will be established after a short pause, and you should see the bargraph meters become active when a connection has been established.



Omnia-3 Remote Control after connection is made. Note that the currently selected Preset and the Omnia's actual System time are being displayed.

Use Cancel to leave the dialog box without making any connection.

You can choose to have the program automatically establish a connection by going to the Options Menu, selecting Auto-Connect to Last. Then the program will always connect to the Omnia-3 using the last-used startup connection entry.

Note that if you have not entered a Password while editing the connection type, you will be prompted for it each time you connect to the Omnia!

Terminating a Connection

From the Options Menu, select Disconnect. Closing the program will also terminate any connections.

Remote Features

The Remote Control Program for Omnia-3 provides all the features of the front panel, displayed in an easy-to-use format. It adds these enhancements:

- Multiple control windows may be open at the same time.
- The ability to save, load, and print presets and system parameters to the computer. (in the File Menu) This is very handy for reference and backup purposes.
- The ability to edit and load Trigger Scripts as described starting on Page 83.

Using a Terminal Program and Direct Connection

It is sometimes useful to use a Direct Serial Connection and a terminal program such as Windows HyperTerminal to gain access to the Omnia's command line interface. While operating the Omnia in this manner is certainly not for beginners, the information that can be captured from the rear-panel RS-232 port, especially during system boot-up, can be very useful for troubleshooting purposes. Upon occasion, Omnia Customer Support personnel may ask you to capture such data from the rear port if it seems necessary.

The serial communications parameters of the terminal program should be set to:

- 8 Data Bits
- No Data Parity (None)
- 1 Stop Bit
- Flow Control (None)

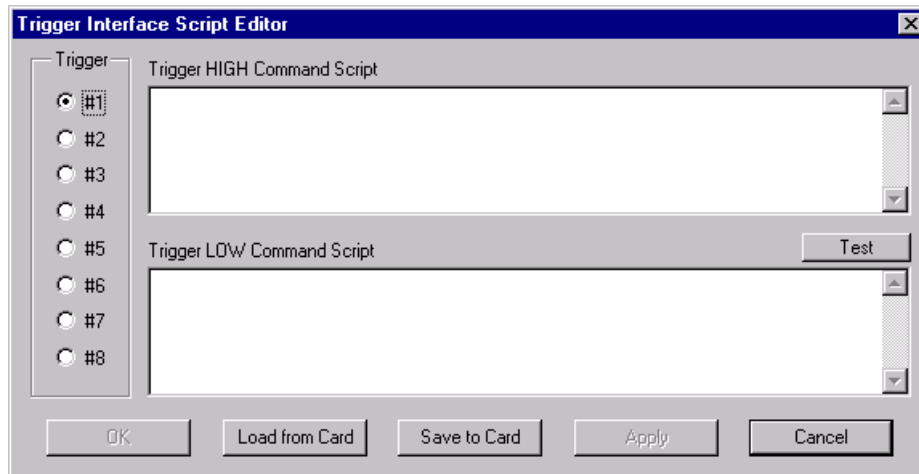
The Baud rate (bits per second) must be set to match the setting in the Omnia-3's Utility Menu. Make sure however that the maximum allowed baud rate (set in the Windows Device Manager) of the serial port being used is set *at least* as high as the desired baud rate. Setting this to the highest available setting is fine.

Once these parameters have been set, one can now log onto the Omnia-3 by typing "login tomtom" (enter) at the >> prompt. If the >> prompt does not show up, try typing "echo on" (enter).

Trigger Interface and Script Editor

Overview of the Trigger Script Editor

The Omnia-3 Remote Control software contains a special script editor that allows the programming of complicated system parameter changes, which can be “triggered” by logic state changes on the rear-panel “Interface” connector.



“Edit Trigger Scripts” dialog box as opened under “Options”, “Edit Trigger Scripts”

Using Trigger Scripts, you can make the Omnia-3 do things with contact closures that would normally need to be done either by manual intervention at the front panel, or via Omnia-3 remote control. There are EIGHT Trigger Inputs available, and they respond to voltage levels on the rear-panel “Interface” connector.

Trigger Control by Dry Contact Closures

The simplest way to manipulate a Trigger Input is through simple contact closures to ground. Connecting a Trigger Input to ground initiates the programmed function associated with the “Trigger LOW” command, and moving the connector pin from a grounded to a floating condition issues the “Trigger HIGH” command.

Trigger Control by Applied Voltages

The Trigger Inputs are also capable of operating with a DC voltage applied, as long as such voltage does not exceed 25 volts DC. Applied voltages that are more than +1.25 volts DC on the trigger input result in a Trigger HIGH state, while voltages less than +1.25 volts result in a Trigger LOW state. Therefore, if +12 volts DC is applied, a logic “1”, or Trigger HIGH is sensed. If –12 volts DC is applied, a logic “0”, or Trigger LOW is sensed. When nothing is connected to the Trigger Inputs, they normally float at approximately 3.5 volts, which is a logic HIGH.

What Can Trigger Scripts Control?

Virtually any aspect of the Omnia-3 operation can be controlled using the Trigger Script function. Therefore, we’ll explain some of the different types of operations that can be performed, and the different types of commands that are required to perform each one.

Some Common Uses of Trigger Scripts

- Switch from Stereo to L+R Mono
- Switch from L+R Mono to Stereo
- Switch the Omnia's audio input source from Analog to Digital
- Switch the Omnia's audio input from Digital to Analog

The Para, The Syspara, and Command Line Entries

What Is a “Para”?

In general*, a 'para' is a variable that corresponds to one of the adjustable controls available within a Processing Block. For instance, the Wide Band AGC Release Time is a 'para', in fact, it happens to be 'para' 3.

What Is a “Syspara”?

In general*, a 'syspara' is a system parameter assigned to the basic operation of the “System”. Controls such as the one for audio source selection, the mono operating mode, and the stereo pilot state and its injection level, each have a “syspara” value associated with it. Complete lists of Omnia-3am and Omnia-3net/drm 'syspara' values can be found on Pages 87 and 88.

* In the above explanation, we used the disclaimer “in general” because there are certain exceptions.

What About Command Line Entries?

Just as 'paras' and 'sysparas' can manipulate the processing controls and system adjustments, there are higher level commands available which do even more special things. Later, we'll discuss how the command line can be used to manipulate the Daypart Scheduler.

Using The Trigger Script Editor

A Trigger Script is “written” using the Trigger Interface Script Editor that is contained within the Omnia Remote Control software. The Script Editor runs in a separate window from the Remote Control window. The Editor window is opened under the Options menu (Edit Trigger Scripts). To open the Script Editor window, the computer running the Remote Software must be connected to and communicating with the Omnia-3.

Starting the Script Editor (Options / Edit Trigger Scripts) opens up the Script Editor window. The eight radio buttons along the left side select which trigger script number to display and edit. The top edit box shows the script for the Trigger HIGH Command Script (contact open) for the selected input. The bottom edit box shows the script for the Trigger LOW Command Script (contact closure) for that input.

Once a script has been entered, clicking the Test button checks the script syntax, and if correct, sends the displayed script to the Omnia-3 for immediate execution. Use the command line window and/or any alert dialogs that pop up to view the success or failure of the script. Note that executing the script in this manner does not result in the script being downloaded or saved as a trigger script, it is simply run once to see if the script, as written, actually works.

The buttons along the bottom of the window load, save, or download the current scripts being edited to the PC Card. Click “Save to Card” to permanently store the current scripts on the PC Card in one file. Click “Load from Card” to retrieve previously saved scripts. To download the scripts for use in the processor without saving to the PC Card, click “Apply” if further script editing will be done. Click “OK” to download the current scripts and close the Script Editor window. Click “Cancel” to close the window, discarding any changes made since the last “Apply” or “Save to Card.”

Note: If you have created Trigger Scripts and clicked “Apply” but not “Save to Card”, the Omnia will only remember your scripts until you power it off.

Once the scripts are downloaded into the processor, they are executed when the appropriate logic transition occurs on their assigned trigger input. Neither the Remote Control application nor the Script Editor needs to be connected for the trigger scripts to execute.

Note: When a trigger script is actually executed, any problems that may be encountered in the execution of it will not be noted to the user.

Script Command Definitions

The scripting commands available for use with the Daypart Scheduler are listed in bold lettering (e.g., **parts**). Their definitions (e.g., Displays the current daypart table) and usage examples are also listed. The commands have been divided by general functions (Dayparts, Presets, System parameters, etc.). In use, a command is typed in and then the enter or return key is pressed. If the command is executable (e.g., **parts**), then the command is run (e.g., a table of the dayparts is displayed), otherwise the cursor simply moves to the next entry line.

Dayparts

parts Displays the current daypart table
partadd <day> <time> Adds a daypart to the daypart table.

The “day” parameter can be assigned the following days: Sun, Mon, Tue, Wed, Thu, Fri, Sat, M-F, S-S, All. The “time” parameter must be defined using the following format: <hour>:<min>:<sec><am | pm> . As an example, typing **Partadd Mon 5:00:00am <enter>** commands the Omnia-3 to add a daypart on Monday at 5:00:00am.

partremove Removes a daypart from the current daypart list.

Example: **partremove Mon 5:00:00am <enter>**

partload Loads a daypart from the PC Card.
partsave Saves the current daypart to the PC Card.

Presets

Note: After a preset is saved to the system, the Omnia knows them by their Index Number, not by their Preset Name. Therefore, when selecting a preset, you use its index number. When saving presets, you use its name!

presets Lists all the currently available factory and user presets by index #.
preset <preset index #> Selects the preset by index # from the list of available presets

Example: **preset 21 <enter>** commands the Omnia-3 to load preset number 21 in the index list.

delete <preset index #> Deletes a preset from the preset index list by its index number.

Example: **delete 21 <enter>** commands the Omnia-3 to remove preset number 21 from the index list.

rename <preset index #><name> Renames the preset by its index number.

Example: **rename 21 BOOGY <enter>** commands the Omnia-3 to rename preset number 2.

save Saves the preset under its current name.

Note: Factory presets are permanent and cannot be written over. You must use the ‘**saveas**’ command when saving changes made to a factory preset in order to save it as a unique name.

saveas Saves the preset under a different name.

Example: **saveas BOOGY <enter>** Commands the Omnia to save the current settings as preset BOOGY.

Non-System Parameters (paras)

paras Lists the modifiable parameters available for the current preset in a table format.

Example: **paras <enter>** displays the parameters for the current preset:

paravalues <index #> Lists all possible values for the parameter at the given index number.

para <para index #> <paravalue>Sets a new value for the selected parameter.

Omnia-3 System Parameters

A 'syspara' is an Omnia-3 System parameter. The System Parameters are assigned to controls which govern overall operation, such as Input and Output Gains, Pre-emphasis/De-emphasis, etc. These parameters would NOT be saved with individual presets, but instead are saved using the Save To Card option in the System menu.

To obtain a list of all System parameters, you use the command '**sysparas**', which lists all of the adjustable parameters in a table format with their current setting value in brackets. On the Omnia-3am typing **sysparas <enter>** displays the following table:

- | | |
|---------------------------|-----------------------------|
| 1) Input Source [AES/EBU] | 2) Analog Gain [0] |
| 3) Input Left [0.0dB] | 4) Input Right [0.0dB] |
| 5) Output Left [+4.0dB] | 6) Output Right [+4.0dB] |
| 7) SCA Level [-20.0dB] | 8) Composite 1 [3.60 V] |
| 9) Pilot Level ['n/a'] | 10) Phase Adjust ['n/a'] |
| 11) Deemphasis ['n/a'] | 12) Preemphasis ['n/a'] |
| 13) Analog Phase [1] | 14) LED Source [0] |
| 15) Backlight [70] | 16) Contrast [50] |
| 17) Headphones [-10.0dB] | 18) Separation ['n/a'] |
| 19) Editing Mode [EXPERT] | 20) Current State [ENABLED] |
| 21) Composite 2 [3.60 V] | 22) Input Phase [NORMAL] |
| 23) Preemphasis ['n/a'] | 24) Ctrl Port Baud [19200] |
| 25) Mono Mode [Stereo] | 26) Asym Mod [100%] |
| 27) Tilt Eq [None] | 28) Tilt Freq [5] |
| 29) HP Filter [OFF] | 30) Meta ['n/a'] |
| 31) LPF Freq [10kHz] | 32) LPF Freq ['n/a'] |
| 33) BS412 ['n/a'] | 34) Ref. Headroom ['n/a'] |
| 35) Ave. Power ['n/a'] | 36) WB AGC ['n/a'] |
| 37) Phase Rot. ['n/a'] | |

A value of 'n/a' indicates that this parameter is not applicable to the am style.

On the Omnia-3net/drm typing **sysparas** <enter> displays the following table:

1) Input Source [ANALOG]	2) Analog Gain [0]
3) Input Left [0.0dB]	4) Input Right [0.0dB]
5) Output Left [+4.0dB]	6) Output Right [+4.0dB]
7) SCA Level [-20.0dB]	8) Composite 1 [3.60 V]
9) Pilot Level ['n/a']	10) Phase Adjust ['n/a']
11) Deemphasis ['n/a']	12) Preemphasis ['n/a']
13) Analog Phase [1]	14) LED Source [0]
15) Backlight [70]	16) Contrast [50]
17) Headphones [-10.0dB]	18) Separation ['n/a']
19) Editing Mode [EXPERT]	20) Current State [ENABLED]
21) Composite 2 [3.60 V]	22) Input Phase [NORMAL]
23) Preemphasis ['n/a']	24) Ctrl Port Baud [19200]
25) Mono Mode [Stereo]	26) Asym Mod ['n/a']
27) Tilt Eq ['n/a']	28) Tilt Freq ['n/a']
29) HP Filter ['n/a']	30) Meta ['n/a']
31) LPF Freq ['n/a']	32) LPF Freq [16kHz]
33) BS412 ['n/a']	34) Ref. Headroom ['n/a']
35) Ave. Power ['n/a']	36) WB AGC ['n/a']
37) Phase Rot. ['n/a']	

A value of 'n/a' indicates that this parameter is not applicable to the net style.

Setting New Syspara Values

To find the new value you wish to use for a particular Syspara:

sysparavalues <syspara index #> Lists all the possible values for any parameter.)

Example: **sysparavalues 3** <enter> Displays a table listing the possible Input Left values.

To set a new value for a Syspara:

syspara <syspara index #>[<sysparavalue index #>]

To reset all System parameters back to their factory defaults:

sysdefaults Restores the system attributes back to their factory defaults.

To save all System settings to the rear-panel memory card.

syssave Saves the system attributes to the Omnia PC Card.

To load the saved setting from the rear-panel memory card:

sysload Loads the system attributes from the currently inserted Omnia PC Card.

Creating a Trigger Script

Now that the scripting commands have been defined, let's put them to work to create a Trigger Script. We'll make a script to simultaneously change the input source and input levels of both channels.

This procedure can of course be done by manually using the Omnia-3 front panel controls to select a new input source, then individually adjust the left and right input levels. But a more useful method is to use the Trigger Script Editor to create two scripts that can be loaded into the processor to run in response to a single relay contact closure or open. The following scripts do just that.

In scripts, all lines that begin with "syspara" must be followed by two numbers that identify the parameter ID number that is being set and that ID number's new value. The ID numbers and their settings for the Input controls are shown in the example below. To list the values and parameter settings for any parameter, type in **sysparavalues** followed by a space and then the parameter's "syspara" number.

(The above "sysparas" table lists all of the available system parameter numbers.)

Trigger Script Example for Switching to AES/EBU Input

In this example, we'll configure Trigger Input # 1 to switch the Omnia-3 to the AES digital input when the contact closes and switch back to the analog input when it opens again. To compensate for (hypothetical) level differences between the signals fed to each input, we also set the input levels to -3dB when the AES input is in use and restore it to 0dB for the analog input. To create this script, open up the Script Editor and click radio button #1. Now click in the lower edit box to begin entering the Trigger 1 "Trigger Low" script. Type:

syspara 1 2 <enter>

This command sets the processor to use the AES/EBU digital input when it is run. "**syspara 1**" says to edit the Input Source. The "**2**" says to select AES/EBU. Next, type in:

syspara 3 76 <enter>

This command sets the processor's left input level to -3.0dB when run. "**syspara 3**" says to edit the Input Left setting. The "**76**" says to select -3.0dB. Finally, type in:

syspara 4 76 <enter>

This command sets the processor's right input level to -3.0dB when run. "**syspara 4**" says to edit the Input Right setting. The "**76**" says to select -3.0dB.

When you are finished, the contents of the Trigger LOW Command Script box should look like:

syspara 1 2

syspara 3 76

syspara 4 76

Trigger Script Example for Switching to Analog Input

Now we'll create a Trigger High Command Script, which will return the Omnia to analog input and set the input gain to 0.0dB when the switch contacts open. In the Trigger HIGH Command Script box type in:

syspara 1 1 <enter>

This tells the processor to use the Analog input. "**syspara 1**" says to edit the Input Source. The "**1**" says to select Analog. Now type in:

syspara 3 91 <enter>

This tells the processor to set the Left Input level to 0.0dB. “**syspara 3**” says to edit the Input Left setting. The “**91**” says to select 0.0dB. Finally, type in:

syspara 4 91 <enter>

This tells the processor to set the right input level to 0.0dB. “**syspara 4**” says to edit the Input Right setting. The “**91**” says to select 0.0dB.

When you are finished, the contents of the Trigger HIGH Command Script box should look like:

syspara 1 1

syspara 3 91

syspara 4 91

These six commands are now a completed script for Trigger 1. To test the scripts, click the Test button above each edit box. If no errors or other displays are shown, then your script is ready to be used or saved. An error indication typically indicates you have a “typo” in one of your command lines. Verify the command is correct and that the index numbers for the parameters or parameter values are correct.

In order to use the scripts, they must be loaded into the Omnia-3. This is done by clicking Apply. Your new scripts then replace previously entered scripts in the Omnia-3’s memory. To save the edited Script Editor scripts to the PC Card, click Save to Card. To recall previously edited scripts, click Load From Card. These can then be sent to the Omnia-3 by clicking Apply.

To actually use the scripts you have just written requires that a sustained relay or a switch be connected between trigger input 1 (pin 1) and ground (pin 5) on the Interface connector on the processor's back panel. Setting the relay or switch on (shorting pins 1 and 5 together), then causes the Omnia-3 to follow the script for go low (the unit switches to AES/EBU and reduced input gain). Opening the switch or relay will then cause the processor to follow the go high script (the unit switches to Analog and normal input gain).

Multiple operations, including ones that are vastly more complicated than what we have presented here, such as simultaneously changing to different presets when changing inputs, can be completed at the flip of any one of the eight switches or relays connected to the Omnia-3. And the eight relays or switches do not have to be switched locally: Commands can even be initiated by a network satellite when a receiver with contact closures is being used.

Different Ways to Use the Script Commands

There are two methods of using the script we just created. One is to use the scripts as Trigger Scripts, responding to contact closures and opens as previously discussed. The other involves integrating the scripts into the Omnia-3's daypart table. Because the processor is flexible, it allows one to use the same script for both options.

Initiating Trigger Scripts via the Interface Connector

As we mentioned, trigger scripts give the user the ability to tie a series of commands to a simple high/low logic change occurring on a pin of the 9-pin D-sub Interface connector on the unit's rear panel.

The *Pinout* of the Omnia-3 rear-panel DB-9 Interface connector is as follows:

PIN 1 activates Trigger Script 1	PIN 6 activates Trigger Script 2
PIN 2 activates Trigger Script 3	PIN 7 activates Trigger Script 4
PIN 3 activates Trigger Script 8	PIN 8 activates Trigger Script 7
PIN 4 activates Trigger Script 6	PIN 9 activates Trigger Script 5
PIN 5 is connected to ground	

Each pin that is to be used must first be programmed with a trigger script for the desired Go High and Go Low logic. To execute the Go Low script, a trigger input pin is connected via a sustained contact closure to pin 5 (ground). To execute a Go High script, the ground is removed from that pin. Each of the trigger pins (1, 2, 3, 4, 6, 7, 8, 9) is thus connected through a switch or relay to the Omnia-3's ground on Pin 5.

Let's review what we created for the example we showed you under "Using the Script Editor". Whenever pin 1 is held low (the contact or switch is in a closed state), the Omnia-3fm Turbo will switch to and stay in mono mode (no Pilot and only the left input channel is used). When the pin 1 contact is subsequently opened, the Omnia-3fm Turbo will switch back to and stay in stereo operation (pilot on and both left and right input channels being used) as long as the contact is open.

"One Way Script" Functions

You may also create scripting functions that do NOT return to another value when the remote contacts are opened. To do this, you use the Go LOW script only, and do not put any entries into the Go HIGH script.

Two possible uses for this very useful "Go LOW Only" Trigger Script trick are periodically setting the Omnia's system time to an external standard, and remote re-booting of the Omnia.

To use the Omnia's command line "Time" function to reset the Omnia's System Clock to midnight based on an external contact closure (such as from an automation system or other time reference), the Trigger Script script syntax would be:

Time 00 00 00 Sets the Omnia time to midnight. Note that colons are not used as delimiters in this entry!

Although time is displayed by the front panel display and its controller, it is actually being kept by the Omnia motherboard. When resetting the System Time using trigger scripts, the change takes effect immediately at the motherboard. Because the front panel 'fetches' time synchronization from the motherboard every few seconds, the front panel's confirmation of the time change may lag by a few seconds but the two will agree with each other when updating takes place.

Another possible use of the one way Trigger Script script capability (although not strongly recommended) is the remote 're-booting' of the Omnia. In that special case, there would be no Go High script entry. The Go Low script for that function would simply read: **warmboot**

Remote re-booting of the unit carries with it several caveats:

- There will be a loss of audio while the system restarts. Analog and composite audio will continue to run for approximately nine seconds, and then nine seconds of no audio will elapse while the DSP code is reloaded.
- If Omnia Remote Control is connected by a modem or direct serial connection at the time, it will be disconnected and manual intervention will be required to reconnect.
- If Omnia Remote Control is connected by Ethernet at the time, the meters on Omnia Remote and Omnia front panel will freeze. However, when the Omnia Remote control session is disconnected, normal Omnia front panel operation will be restored. Manual intervention will be required to restart Omnia Remote Control.
- If you have not saved the System or Trigger Script settings, they may be permanently lost. Preset adjustments are saved in NVRAM and are not lost at power down.

Initiating Scripts via the Daypart Scheduler

The Daypart Scheduler is typically used to change a Preset at a set day and time. But, when a script is added to the Daypart table, the script can dynamically change one or multiple attributes when the Daypart is executed. A script for use by the Daypart functions is written using the special script editor built into the New or Modify Schedule window in the Remote Software (Only) and the syntax is the same as for the Trigger Scripts described in the previous section.

The Daypart Scripts editor is accessed from the New or Modify Schedule window by highlighting and clicking on the *Scripts* button. There are also *Test* buttons on the page to force the Omnia-3 to immediately run the current Start Script or End Script.

At the bottom of each editor window is a check box to enable or disable the use of the script. A script may be entered but will not be executed until the enable box is checked. The *Preset* check box can be used to disable the action of changing the preset when the daypart executes. Un-check this box when you want a daypart to execute *only* the given scripts and *not* change the preset. A daypart can actually be disabled completely by un-checking the *Preset*, *Enable Start Script Execution* and *Enable End Script Execution* check boxes.

Start scripts execute at the beginning of a daypart, before making a preset change (if any). End scripts execute at the end of the daypart, after making any preset changes. The script information is stored and retrieved in the same means as other daypart information.

Dayparts can still be selected, etc. from the Omnia-3 front panel interface. However, dayparts with scripts cannot be modified in any way from the front panel.

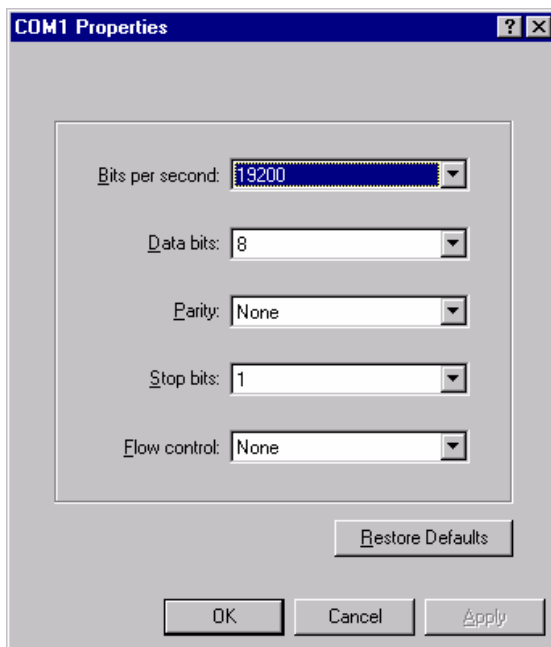
Note: Remember not to include any commands that may potentially prompt the user, since a user may not be at the Omnia-3 when the commands are executed.

Note: The remote control application does not have to be connected in order for the scripts to execute.

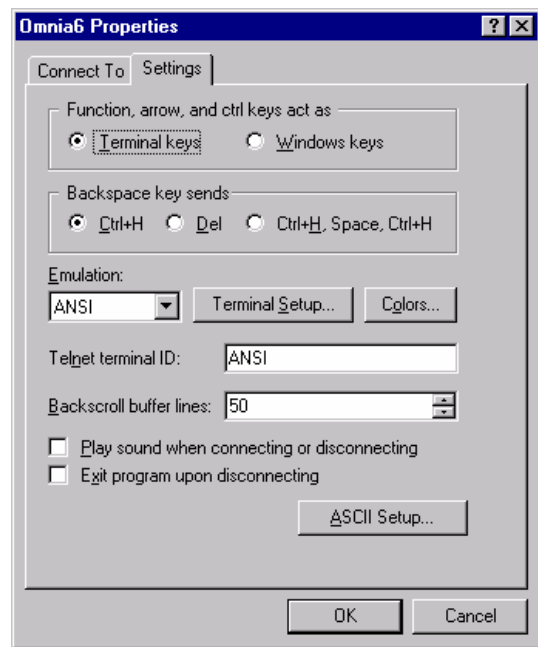
Chapter 10: Troubleshooting

Operational problems with the Omnia-3 can sometimes be diagnosed using the rear-panel RS-232 port and a common terminal communications program. Detailed information about the Omnia's boot-up progress may be observed at its rear-panel RS-232 port, as well as viewing of any error messages that may be encountered. This chapter explains the various boot up and error messages that may be encountered while troubleshooting the unit. We'll cover some basic troubleshooting techniques for isolating possible Omnia-3 problems in the field, and also how to obtain help or repair service from Omnia.

To take complete advantage of this functionality, you only need a standard terminal program for DOS, Windows, or other operating system. It must be configured for a default baud rate of 19200, no hardware handshaking, and using a terminal emulation for VT100. At Omnia, we commonly use the Hyperterminal® program that ships with Microsoft Windows®, but you can use whatever program you are familiar with. Please see the examples below for how we've set up our connection:



Port Setup Parameters



Terminal Emulation Parameters

Once these parameters have been entered and saved as a connection profile, they can be used to capture and display (and print) the output of the Omnia 3's RS-232 serial port during boot up. See the next page for an example of a normal Omnia-3 boot up...

Omnia Messages

Normal Boot-up Message

A healthy Omnia-3 running v 3.4.1 (FM Turbo style) will transmit the following text on the rear panel serial port during boot up:

```
Omnia BIOS Software 1.13
Work : BIOS v1.13...
Work: Downloading OS...
Work: Downloading OS...
Work: Downloading OS...
Work: Downloading OS...
Work: Downloading OS...
Work: Downloading OS...
Work: Downloading OS...
Work: Downloading OS...
Querying motherboard...Rev. G or higher motherboard detected.
Work: Omnia 3.04.01...
Msg : Omnia 3.04.01...
Work: Omnia 3.04.01...
Work: System Storage...
Work: Omnia Card...
Work: Preset Table...
Msg: System: FM3 -- common: 1 specific: 1
Msg : set preset Rock (alg old:(null) alg new:Omnia3_fm)
Work: Load Algorithm...
Work: Load Algorithm...
Work: Load Algorithm...
Work: Load Algorithm...
Work: Load DSPs...0
Work: Load DSPs...1
Work: Load DSPs...2
Work: Load DSPs...3
Work: Load DSPs...3
Msg: AES/EBU: Unable to read 8420, probably a rev G board. (version 3.4.0 or greater on a rev. G only)
Work: Load DSPs...3
Work: Preset Table...
Work: Done!
Work: AES/EBU...
Work: IO Card...
Work: Command System...
Work: Graphics...
Work: Graphics...
```

Audio Failure Alarm

If no audio is applied to the Omnia, the following messages will be transmitted next on the RS-232 port, approximately twenty seconds after boot up:

Flr : Audio failure: left input
Flr : Audio failure: right input
Flr : Audio failure: left output
Flr : Audio failure: right output

In the absence of an audio source, these “Audio failure” messages are normal. Note that the Omnia's audio failure trigger level is -37.5dBFS , and the signal must remain at or below that level in order for the silence detect algorithm to time out. It is possible to see these messages during normal programming if the audio input level happens to fall below -37.5dBFS and remains there until the audio fail algorithm times out.

Audio Restoration Alarm

Approximately five seconds after audio has been restored to levels above -37.5dBFS , the following messages will be seen:

Flr : Audio restored: left input
Flr : Audio restored: right input
Flr : Audio restored: left output
Flr : Audio restored: right output

Note that it is possible for there to be audio *Output* failure messages but no audio *Input* failure message. This means that the unit is detecting applied audio at its Inputs, but that there is no output from the DSP chain.

From the perspective of signal flow, the Input meters follow the input level adjustment controls (Input Menu). This is also where the input to the Input Audio Failure comes from.

Diagnostic and Error Messages

In the event that you need to contact Telos / Omnia Customer Support for assistance, please see the section entitled [Obtaining Service](#) on Page 97 for contact information.

The following error messages will appear on the front panel screen:

Insufficient Memory! Save As Failed.

Description: This error will occur when trying to save a new preset while there are already 50 presets (including factory presets) on the rear-panel PCMCIA card.

Cause: Too many presets are saved to the rear-panel software card.

Resolution: Delete a preset or two and then try the save operation again.

The following messages will only appear on the rear panel RS-232 Serial Port. See page 92 for instructions on how to access the serial port messages.

Work: Insert card to continue!!!

Description: The operating system cannot see the rear-panel PCMCIA memory card.

Cause: The rear-panel PCMCIA card is missing or not fully seated.

Resolution: Turn the power off and make sure that the card is fully inserted into the *top* card slot with the large Omnia label facing up and the version number sticker facing down. The PC Card is keyed to prevent improper insertion. Gently press the card into the slot until the black release button, to the right of the card, pops out about 1/2” [12.70 mm]. This indicates the card is properly seated in the PCMCIA slot. If the card is properly seated and this error still appears, contact Telos / Omnia Customer Support for assistance.

Card does not have valid OS!!!

Description: The contents of the rear-panel memory card do not match what the operating system expects or there is no bootable image on the card.

Cause: The card may be damaged, its data corrupted or it may contain the wrong software version.

Resolution: Try a new rear-panel memory card of the correct software version for your unit.

No previous system found in memory

Description: The contents of the non-volatile RAM on the motherboard do not match what is on the rear-panel memory card.

Cause: This error may show up when the Omnia is booted up for the first time with a new rear-panel software card or when the Omnia booted up for the first time after the non-volatile memory (NVRAM) has been cleared, such as after replacement of the battery.

Resolution: Simply click OK in the error dialog box and the error should clear. If not and the Omnia continues to show this error at each boot-up, contact Telos / Omnia Customer Support for assistance.

NVRAM failure

Description: The operating system was unable to write to the non-volatile RAM on the motherboard.

Cause: The NVRAM on the motherboard may have failed.

Resolution: Contact Telos / Omnia Customer Support for assistance.

Failed to initialize RTC

Description: The operating system could not initialize the Real Time Clock on the motherboard.

Cause: The Real Time Clock chip on the motherboard may have failed.

Resolution: Contact Telos / Omnia Customer Support for assistance.

Dead battery, data lost.

Description: The Lithium battery used for system configuration backup is being reported as dead or battery voltage is too low for reliable operation.

Resolution: Contact Telos / Omnia Customer Support for assistance.

Timed out loading DSP.

Failed DSP #x Bootstrap, contact CE.

Description: The operating system was not able to initialize one of the Omnia's DSP cards or one of the two DSP IC's on the card.

Cause: One of the DSP cards or DSP chips may have failed.

Resolution: Contact Telos / Omnia Customer Support for assistance.

Host command bit not clear

ERROR: read failed write address, DSP #x

Description: The operating system was unable to communicate with the DSP's host port.

Cause: Possible failure of DSP or motherboard DSP controller / router chain components.

Resolution: Contact Telos / Omnia Customer Support for assistance.

Failed Routing, contact CE.

Description: The operating system was unable to establish the correct signal path routing through the DSP chain.

Cause: Possible failure of motherboard DSP controller / router chain components.

Resolution: Contact Telos / Omnia Customer Support for assistance.

Electrical and mechanical safety note!

When the Omnia is operated with its chassis top cover removed, you are exposed to potentially lethal voltages and high speed rotating fan blades.

Before attempting to make voltage measurements, be forewarned that the power supply heat sinks are connected to the AC power line. Avoid these areas whenever the AC power cable is attached to the Omnia. Never attempt to make measurements when the power supply's safety cover is removed.

Be forewarned that the two fans present a serious hazard to fingers, tools, and meter probes. The fan blades rotate at high speed and have very sharp edges. They can quickly and easily remove a fingertip (gee ... how do we know this?) Coming into contact with a rotating fan blade will cause serious injury.

When reinstalling the top cover, make certain that all thirty screws are replaced, and that they are tightened to a snug fit. Operating the unit with its cover removed or without all of the retaining screws will void your warranty and may compromise the ability of the Omnia to operate in high RF environments.

Narrowing down problems

When actually troubleshooting your Omnia-3, try to ascertain some preliminary information first before embarking on an in-depth problem-solving mission. Take time to carefully consider whether your unit falls into any of the following states:

1. The unit is totally dead. Is the power on? Is the line cord plugged into an outlet that has AC power? Is there an audio input level? Is there an audio output level? Is there a power indication? Are the LCD screens blank, scrambled, or not illuminated? Symptoms like these might indicate a power supply problem. If you wish to examine the power supply, be aware that it is *switching* type, and therefore requires a load in order to start up and operate properly. Voltages measured when the power supply is not connected to the Omnia motherboard may not be correct.

2. The unit has power, but there is no audio output although the processing bargraphs are working. The first thing to verify is whether the front panel jog-wheel is operational. Verification of front panel operation helps narrow down where the problem is. Look at the levels display. If there is input audio but no output audio indications, try cycling the unit's power. If that doesn't bring the operation back to normal, then a hardware failure of some sort has occurred. If you get output levels but have no output audio, verify that the outputs are connected correctly. An analog output connected to a digital device, or a digital output connected to an analog device won't pass audio! Connect the appropriate test generator to the output cables to verify analog/digital audio is making it to the next device.

The next condition to check is to see if the failure has caused the processing to cease. Using program material, check to see if the processing bargraphs are operating. If they are, then it's a good indication that the basic DSP structure is sound and the system's host processor is working. At this point, it would be a good idea to see if the loss of audio is confined to only one output port, e.g. a composite output, the discrete left/right outputs or the AES/EBU output. Check the signal at each of these locations. If the signal is dead at all three, then this points to a digital audio problem after the dynamic processing DSP chips. If one of the output sections is not operating, then it can be localized to that specific section.

Note: The composite outputs and the discrete left/right outputs are operated from their own specialized Digital to Analog converters. Therefore, it's possible for one type of output to fail without affecting the other. Likewise, a failure in the AES/EBU driver section could result in the digital output being dead, while the rest of the system is operational.

4. Unit will not boot and "Downloading OS" is displayed over and over. This usually indicates a corrupt rear-panel PC software card. Try a different PC card containing the same style of Omnia software (fm Turbo, net, or am) if one is available. Contact Omnia Customer Support or your dealer to obtain a replacement card.

Obtaining Service

- Omnia Customer Support personnel are available in Cleveland, Ohio, USA, Monday through Friday between 9:00 A.M. and 6:00 P.M., Eastern Time. If outside the U.S.A., see below.
- Before contacting Omnia Customer Support, please have the serial number of the unit (located on a small barcode sticker on the rear panel in this format: 4300XXYYYY) and a description of the symptoms/problems ready for the technician.
- All units being returned to for service MUST have a Return Authorization (RA) number assigned to them first. Units that are returned without a RA number will experience delays in service.
- Return the Omnia in its original shipping carton. For best treatment, shipping the Omnia in its original factory box protects it as well as possible. Damage caused by improper packaging is not covered under your warranty!
- Loaner units are usually available on a first come, first served basis. Your Omnia Customer Support engineer will assist you with the necessary arrangements

Note: To ensure prompt service, the Return Authorization number must be written prominently on or near the shipping label on the box!

Via the World Wide Web

The Omnia Web site has a wide variety of information that may be useful for product support, applications information, software updates, etc. The URL is: <http://www.omniaaudio.com/>

Via E-Mail

The customer service e-mail address for Omnia is: support@omniaaudio.com.

Via Phone & Mail (USA and non-European Countries)

Customer service is available by telephone, Monday – Friday between 9:00 A.M. and 6:00 P.M., USA Eastern time zone.

Phone: +1.216.241.7225 **Fax:** +1.216. 241.4103

Shipping Information: Omnia Customer Service
2101 Superior Avenue
Cleveland, Ohio 44114 USA

Via Phone & Mail for Europe

Service is available from the Omnia Europe office in Freising, Germany.

Phone: +49 8161 42467 **Fax:** +49 8161 42402

Shipping Information: * Omnia Europe
Johannstraße 6
D-85354 Freising, Germany

WARRANTY

This Warranty covers “the Products,” which are defined as the various audio equipment, parts, software and accessories manufactured, sold and/or distributed by TLS Corp., d/b/a Omnia (hereinafter “Omnia”).

With the exception of software-only items, the Products are warranted to be free from defects in material and workmanship for a period of two years from the date of receipt by the end-user.

Software-only items are warranted to be free from defects in material and workmanship for a period of 90 days from the date of receipt by the end-user.

This warranty is void if the Products are subject to Acts of God, including (without limitation) lightning; improper installation or misuse, including (without limitation) the failure to use telephone and power line surge protection devices; accident; neglect or damage.

EXCEPT FOR THE ABOVE-STATED WARRANTY, OMNIA MAKES NO WARRANTIES, EXPRESS OR IMPLIED (INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE).

In no event will Omnia, its employees, agents or authorized dealers be liable for incidental or consequential damages, or for loss, damage, or expense directly or indirectly arising from the use of any of the Products or the inability to use any of the Products either separately or in combination with other equipment or materials, or from any other cause.

In order to invoke this Warranty, notice of a warranty claim must be received by Omnia within the above-stated warranty period and warranty coverage must be authorized by Omnia.

If Omnia authorizes the performance of warranty service, the defective Product must be delivered, shipping prepaid, to: Omnia, 2101 Superior Avenue, Cleveland, Ohio 44114.

Omnia, at its option will either repair or replace the Products and such action shall be the full extent of Omnia’s obligation under this Warranty. After the Products are repaired or replaced Omnia will return them to the party that sent the Products, and Omnia will pay for the cost of shipping.

Omnia’s authorized dealers are not authorized to assume for Omnia any additional obligations or liabilities in connection with the dealers’ sale of the Products.

Omnia products are to be used with registered protective interface devices which satisfy regulatory requirements in their country of use.