

# Maestro

MULTI-CHANNEL MASTER CONTROL

Installation and Service Manual

Software Version 2.0



Affiliate with the N.V. KEMA in The Netherlands

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GRASS VALLEY**

**Headquarters**  
400 Providence Mine Rd  
Nevada City, CA 95959  
United States

15655 SW Greystone Ct.  
Beaverton, OR 97006  
United States

10 Presidential Way  
Suite 300  
Woburn, MA 01801  
United States

Kapittelweg 10  
4827 HG Breda  
The Netherlands

7140 Baymeadows Way  
Ste 101  
Jacksonville, FL 32256  
United States

2300 So. Decker Lake Blvd.  
Salt Lake City, UT 84119  
United States

Rue du Clos Courtel  
CS 31719  
35517 Cesson-Sevigné Cedex  
France

1 rue de l'Hautil  
Z.I. des Boutries BP 150  
78702 Conflans-Sainte  
Honorine Cedex  
France

Technopole Brest-Iroise  
Site de la Pointe du Diable  
CS 73808  
29238 Brest Cedex 3  
France

40 Rue de Bray  
2 Rue des Landelles  
35510 Cesson Sevigné  
France

Spinnereistrasse 5  
CH-5300 Turgi  
Switzerland

Brunnenweg 9  
D-64331 Weiterstadt  
Germany

Carl-Benz-Strasse 6-8  
67105 Schifferstadt  
Germany

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Ph: (215)997-4519  
Fax: (215)997-3809  
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# Maestro

MULTI-CHANNEL MASTER CONTROL

## Installation and Service Manual

Software Version 2.0

# Contacting Grass Valley

<b>International Support Centers</b>	<b>France 24 x 7</b>	+800 8080 2020 or +33 1 48 25 20 20	<b>United States/Canada 24 x 7</b>	+1 800 547 8949 or +1 530 478 4148
<b>Local Support Centers (available during normal business hours)</b>	<b>Asia</b>	<b>Hong Kong, Taiwan, Korea, Macau:</b> +852 2531 3058 <b>Indian Subcontinent:</b> +91 22 24933476 <b>Southeast Asia/Malaysia:</b> +603 7805 3884 <b>Southeast Asia/Singapore:</b> +65 6379 1313 <b>China:</b> +861 0660 159 450 <b>Japan:</b> +81 3 5484 6868		
		<b>Australia and New Zealand:</b> +61 1300 721 495		<b>Central/South America:</b> +55 11 5509 3443
		<b>Middle East:</b> +971 4 299 64 40 <b>Near East and Africa:</b> +800 8080 2020 or +33 1 48 25 20 20		
	<b>Europe</b>	<b>Belarus, Russia, Tadzikistan, Ukraine, Uzbekistan:</b> +7 095 2580924 225 <b>Switzerland:</b> +41 1 487 80 02 <b>S. Europe/Italy-Roma:</b> +39 06 87 20 35 28 <b>-Milan:</b> +39 02 48 41 46 58 <b>S. Europe/Spain:</b> +34 91 512 03 50 <b>Benelux/Belgium:</b> +32 (0) 2 334 90 30 <b>Benelux/Netherlands:</b> +31 (0) 35 62 38 42 1 <b>N. Europe:</b> +45 45 96 88 70 <b>Germany, Austria, Eastern Europe:</b> +49 6150 104 444 <b>UK, Ireland, Israel:</b> +44 118 923 0499		

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**Online User Documentation** — Current versions of product catalogs, brochures, data sheets, ordering guides, planning guides, manuals, and release notes in .pdf format can be downloaded.

**FAQ Database** — Solutions to problems and troubleshooting efforts can be found by searching our Frequently Asked Questions (FAQ) database.

**Software Downloads** — Download software updates, drivers, and patches.



## END-OF-LIFE PRODUCT RECYCLING NOTICE

Grass Valley's innovation and excellence in product design also extends to the programs we've established to manage the recycling of our products. Grass Valley has developed a comprehensive end-of-life product take back program for recycle or disposal of end-of-life products. Our program meets the requirements of the European Union's WEEE Directive, the United States Environmental Protection Agency, and U.S. state and local agencies.

Grass Valley's end-of-life product take back program assures proper disposal by use of Best Available Technology. This program accepts any Grass Valley branded equipment. Upon request, a Certificate of Recycling or a Certificate of Destruction, depending on the ultimate disposition of the product, can be sent to the requester.

Grass Valley will be responsible for all costs associated with recycling and disposal, including freight. However, you are responsible for the removal of the equipment from your facility and packing the equipment to make it ready for pickup.



For further information on the Grass Valley product take back system please contact Grass Valley at + 800 80 80 20 20 or +33 1 48 25 20 20 from most other countries. In the U.S. and Canada please call 800-547-8949 or 530-478-4148, and ask to be connected to the EH&S Department. Additional information concerning the program can be found at: [www.thomsongrassvalley.com/environment](http://www.thomsongrassvalley.com/environment)





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# *Preface*

## **About This Manual**

This Installation manual provides system planning, hardware installation, software configuration, operating information, and specifications for the Maestro Master Control System.

This manual also covers the installation, configuration, deployment, and verification of all hardware and software associated with the Maestro DVE and Dual Channel DVE options.

The 1.7.0 release of Maestro was the first version to support the Enhanced DVE features. DVE is an optional feature that requires the purchase of one or more DVE mezzanine boards and disk drives. The 1.7.0 software release enables the DVE features only if the appropriate hardware is installed.

DVE hardware supports only the Maestro channel processor on which it is installed. Each Maestro channel on which DVE features are desired must have at least one DVE mezzanine board and one hard disk drive installed. The contents of a DVE disk drive are not shared on multiple Maestro channel processors.

The 2.0 release of Maestro was the first version to support the Dual Channel DVE option. Dual Channel DVE is an optional feature that requires the purchase of a Dual Channel DVE mezzanine board.

## **Additional Documentation**

Copies of this manual and the User manual are normally provided with the system. Individual manuals may be ordered by contacting Technical Support. For contact information, see the *Contacting Grass Valley* [on page 2](#).

For more information on additional features supported in the DVE option, see the version 1.7.0 Release Notes.

For more information on additional features supported in the Dual Channel DVE option, see the version 2.0 Release Notes.

Automation programming is described in the Maestro Automation Interface Protocol Technical Reference Manual, 0718472xx. This manual is included on the documentation CD supplied with the system.

A separate Installation Planning Guide, 0718384xx, is also available. (This guide has the same contents as Section 2 of the manual you are now reading.)

The Maestro system can be controlled by the Grass Valley Encore or Jupiter Control System. Configuration information for the control system itself is contained in the control system's documentation set:

- Encore Control System Release Notes series, 071 8153 xx.
- Encore Installation and Service Manual, 071 8103 xx.
- Encore Control System User Manual, 071 8104 xx.

- Jupiter Control System Release Notes series, 071 8275 xx.
- Jupiter VM-3000 Installation and Operating Manual, 071 8305 xx.
- Jupiter CM-4000 Installation and Operating Manual, 071 8261 xx.
- Jupiter Getting Started Guide, 04-045707-003.

- NetCentral IV TV Facility Monitoring System User Guide, 071 8338 xx

Electronic copies of other routing products documents are available on the following documentation CDs:

- CD 071 8130 xx. Includes Encore Control System manuals.

- CD 071 8274 xx. Includes Jupiter VM-3000 and Jupiter CM-4000 manuals.

These documents are also available on the Grass Valley web site. See [page 2](#).



# Safety Summary

Read and follow the important safety information below, noting especially those instructions related to risk of fire, electric shock or injury to persons. Additional specific warnings not listed here may be found throughout the manual.

**WARNING** Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

## Safety Terms and Symbols

### Terms in This Manual

Safety-related statements may appear in this manual in the following form:

**WARNING** Warning statements identify conditions or practices that may result in personal injury or loss of life.

**CAUTION** Caution statements identify conditions or practices that may result in damage to equipment or other property, or which may cause equipment crucial to your business environment to become temporarily non-operational.

### Terms on the Product

The following terms may appear on the product:

**DANGER** — A personal injury hazard is immediately accessible as you read the marking.

**WARNING** — A personal injury hazard exists but is not immediately accessible as you read the marking.

**CAUTION** — A hazard to property, product, and other equipment is present.

## Symbols on the Product

The following symbols may appear on the product:



Indicates that dangerous high voltage is present within the equipment enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



Indicates that user, operator or service technician should refer to product manual(s) for important operating, maintenance, or service instructions.



This is a prompt to note fuse rating when replacing fuse(s). The fuse referenced in the text must be replaced with one having the ratings indicated.



Identifies a protective grounding terminal which must be connected to earth ground prior to making any other equipment connections.



Identifies an external protective grounding terminal which may be connected to earth ground as a supplement to an internal grounding terminal.



Indicates that static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

## Warnings

The following warning statements identify conditions or practices that can result in personal injury or loss of life:

**Dangerous voltage or current may be present** — Disconnect power and remove battery (if applicable) before removing protective panels, soldering, or replacing components.

**Do not service alone** — Do not internally service this product unless another person capable of rendering first aid and resuscitation is present.

**Remove jewelry** — Prior to servicing, remove jewelry such as rings, watches, and other metallic objects.

**Avoid exposed circuitry** — Do not touch exposed connections, components or circuitry when power is present.

**Use proper power cord** — Use only the power cord supplied or specified for this product.

**Ground product** — Connect the grounding conductor of the power cord to earth ground.

**Operate only with covers and enclosure panels in place** — Do not operate this product when covers or enclosure panels are removed.

**Use correct fuse** — Use only the fuse type and rating specified for this product.

**Use only in dry environment** — Do not operate in wet or damp conditions.

**Use only in non-explosive environment** — Do not operate this product in an explosive atmosphere.

**High leakage current may be present** — Earth connection of product is essential before connecting power.

**Dual power supplies may be present** — Be certain to plug each power supply cord into a separate branch circuit employing a separate service ground. Disconnect both power supply cords prior to servicing.

**Double pole neutral fusing** — Disconnect mains power prior to servicing.

**Use proper lift points** — Do not use door latches to lift or move equipment.

**Avoid mechanical hazards** — Allow all rotating devices to come to a stop before servicing.

## Cautions

The following caution statements identify conditions or practices that can result in damage to equipment or other property:

**Use correct power source** — Do not operate this product from a power source that applies more than the voltage specified for the product.

**Use correct voltage setting** — If this product lacks auto-ranging power supplies, before applying power ensure that the each power supply is set to match the power source.

**Provide proper ventilation** — To prevent product overheating, provide equipment ventilation in accordance with installation instructions.

**Use anti-static procedures** — Static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

**Do not operate with suspected equipment failure** — If you suspect product damage or equipment failure, have the equipment inspected by qualified service personnel.

**Ensure mains disconnect** — If mains switch is not provided, the power cord(s) of this equipment provide the means of disconnection. The socket outlet must be installed near the equipment and must be easily accessible. Verify that all mains power is disconnected before installing or removing power supplies and/or options.

**Route cable properly** — Route power cords and other cables so that they are not likely to be damaged. Properly support heavy cable bundles to avoid connector damage.

**Use correct power supply cords** — Power cords for this equipment, if provided, meet all North American electrical codes. Operation of this equipment at voltages exceeding 130 VAC requires power supply cords which comply with NEMA configurations. International power cords, if provided, have the approval of the country of use.

**Use correct replacement battery** — This product may contain batteries. To reduce the risk of explosion, check polarity and replace only with the same or equivalent type recommended by manufacturer. Dispose of used batteries according to the manufacturer's instructions.

**Troubleshoot only to board level** — Circuit boards in this product are densely populated with surface mount technology (SMT) components and application specific integrated circuits (ASICs). As a result, circuit board repair at the component level is very difficult in the field, if not impossible. For warranty compliance, do not troubleshoot systems beyond the board level.

# Sicherheit – Überblick

Lesen und befolgen Sie die wichtigen Sicherheitsinformationen dieses Abschnitts. Beachten Sie insbesondere die Anweisungen bezüglich Brand-, Stromschlag- und Verletzungsgefahren. Weitere spezifische, hier nicht aufgeführte Warnungen finden Sie im gesamten Handbuch.

**WARNUNG** Alle Anweisungen in diesem Handbuch, die das Abnehmen der Geräteabdeckung oder des Gerätegehäuses erfordern, dürfen nur von qualifiziertem Servicepersonal ausgeführt werden. Um die Stromschlaggefahr zu verringern, führen Sie keine Wartungsarbeiten außer den in den Bedienungsanleitungen genannten Arbeiten aus, es sei denn, Sie besitzen die entsprechende Qualifikationen für diese Arbeiten.

## Sicherheit – Begriffe und Symbole

### In diesem Handbuch verwendete Begriffe

Sicherheitsrelevante Hinweise können in diesem Handbuch in der folgenden Form auftauchen:

**WARNUNG** Warnungen weisen auf Situationen oder Vorgehensweisen hin, die Verletzungs- oder Lebensgefahr bergen.

**VORSICHT** Vorsichtshinweise weisen auf Situationen oder Vorgehensweisen hin, die zu Schäden an Ausrüstungskomponenten oder anderen Gegenständen oder zum zeitweisen Ausfall wichtiger Komponenten in der Arbeitsumgebung führen können.

### Hinweise am Produkt

Die folgenden Hinweise können sich am Produkt befinden:

**GEFAHR** — Wenn Sie diesen Begriff lesen, besteht ein unmittelbares Verletzungsrisiko.

**WARNUNG** — Wenn Sie diesen Begriff lesen, besteht ein mittelbares Verletzungsrisiko.

**VORSICHT** — Es besteht ein Risiko für Objekte in der Umgebung, den Mixer selbst oder andere Ausrüstungskomponenten.

## Symbole am Produkt

Die folgenden Symbole können sich am Produkt befinden:



Weist auf eine gefährliche Hochspannung im Gerätegehäuse hin, die stark genug sein kann, um eine Stromschlaggefahr darzustellen.



Weist darauf hin, dass der Benutzer, Bediener oder Servicetechniker wichtige Bedienungs-, Wartungs- oder Serviceanweisungen in den Produkthandbüchern lesen sollte.



Dies ist eine Aufforderung, beim Wechsel von Sicherungen auf deren Nennwert zu achten. Die im Text angegebene Sicherung muss durch eine Sicherung ersetzt werden, die die angegebenen Nennwerte besitzt.



Weist auf eine Schutzerdungsklemme hin, die mit dem Erdungskontakt verbunden werden muss, bevor weitere Ausrüstungskomponenten angeschlossen werden.



Weist auf eine externe Schutzerdungsklemme hin, die als Ergänzung zu einem internen Erdungskontakt an die Erde angeschlossen werden kann.



Weist darauf hin, dass es statisch empfindliche Komponenten gibt, die durch eine elektrostatische Entladung beschädigt werden können. Verwenden Sie antistatische Prozeduren, Ausrüstung und Oberflächen während der Wartung.

## Warnungen

Die folgenden Warnungen weisen auf Bedingungen oder Vorgehensweisen hin, die Verletzungs- oder Lebensgefahr bergen:

**Gefährliche Spannungen oder Ströme** — Schalten Sie den Strom ab, und entfernen Sie ggf. die Batterie, bevor sie Schutzabdeckungen abnehmen, löten oder Komponenten austauschen.

**Servicearbeiten nicht alleine ausführen** — Führen Sie interne Servicearbeiten nur aus, wenn eine weitere Person anwesend ist, die erste Hilfe leisten und Wiederbelebungsmaßnahmen einleiten kann.

**Schmuck abnehmen** — Legen Sie vor Servicearbeiten Schmuck wie Ringe, Uhren und andere metallische Objekte ab.

**Keine offen liegenden Leiter berühren** — Berühren Sie bei eingeschalteter Stromzufuhr keine offen liegenden Leitungen, Komponenten oder Schaltungen.

**Richtiges Netzkabel verwenden** — Verwenden Sie nur das mitgelieferte Netzkabel oder ein Netzkabel, das den Spezifikationen für dieses Produkt entspricht.

**Gerät erden** — Schließen Sie den Erdleiter des Netzkabels an den Erdungskontakt an.

**Gerät nur mit angebrachten Abdeckungen und Gehäuseseiten betreiben** — Schalten Sie dieses Gerät nicht ein, wenn die Abdeckungen oder Gehäuseseiten entfernt wurden.

**Richtige Sicherung verwenden** — Verwenden Sie nur Sicherungen, deren Typ und Nennwert den Spezifikationen für dieses Produkt entsprechen.

**Gerät nur in trockener Umgebung verwenden** — Betreiben Sie das Gerät nicht in nassen oder feuchten Umgebungen.

**Gerät nur verwenden, wenn keine Explosionsgefahr besteht** — Verwenden Sie dieses Produkt nur in Umgebungen, in denen keinerlei Explosionsgefahr besteht.

**Hohe Kriechströme** — Das Gerät muss vor dem Einschalten unbedingt geerdet werden.

**Doppelte Spannungsversorgung kann vorhanden sein** — Schließen Sie die beiden Anschlußkabel an getrennte Stromkreise an. Vor Servicearbeiten sind beide Anschlußkabel vom Netz zu trennen.

**Zweipolige, neutrale Sicherung** — Schalten Sie den Netzstrom ab, bevor Sie mit den Servicearbeiten beginnen.

**Fassen Sie das Gerät beim Transport richtig an** — Halten Sie das Gerät beim Transport nicht an Türen oder anderen beweglichen Teilen fest.

**Gefahr durch mechanische Teile** — Warten Sie, bis der Lüfter vollständig zum Halt gekommen ist, bevor Sie mit den Servicearbeiten beginnen.

## Vorsicht

Die folgenden Vorsichtshinweise weisen auf Bedingungen oder Vorgehensweisen hin, die zu Schäden an Ausrüstungskomponenten oder anderen Gegenständen führen können:

**Gerät nicht öffnen** — Durch das unbefugte Öffnen wird die Garantie ungültig.

**Richtige Spannungsquelle verwenden** — Betreiben Sie das Gerät nicht an einer Spannungsquelle, die eine höhere Spannung liefert als in den Spezifikationen für dieses Produkt angegeben.

**Gerät ausreichend belüften** — Um eine Überhitzung des Geräts zu vermeiden, müssen die Ausrüstungskomponenten entsprechend den Installationsanweisungen belüftet werden. Legen Sie kein Papier unter das Gerät. Es könnte die Belüftung behindern. Platzieren Sie das Gerät auf einer ebenen Oberfläche.

**Antistatische Vorkehrungen treffen** — Es gibt statisch empfindliche Komponenten, die durch eine elektrostatische Entladung beschädigt werden können. Verwenden Sie antistatische Prozeduren, Ausrüstung und Oberflächen während der Wartung.

**CF-Karte nicht mit einem PC verwenden** — Die CF-Karte ist speziell formatiert. Die auf der CF-Karte gespeicherte Software könnte gelöscht werden.

**Gerät nicht bei eventuellem Ausrüstungsfehler betreiben** — Wenn Sie einen Produktschaden oder Ausrüstungsfehler vermuten, lassen Sie die Komponente von einem qualifizierten Servicetechniker untersuchen.

**Kabel richtig verlegen** — Verlegen Sie Netzkabel und andere Kabel so, dass Sie nicht beschädigt werden. Stützen Sie schwere Kabelbündel ordnungsgemäß ab, damit die Anschlüsse nicht beschädigt werden.

**Richtige Netzkabel verwenden** — Wenn Netzkabel mitgeliefert wurden, erfüllen diese alle nationalen elektrischen Normen. Der Betrieb dieses Geräts mit Spannungen über 130 V AC erfordert Netzkabel, die NEMA-Konfigurationen entsprechen. Wenn internationale Netzkabel mitgeliefert wurden, sind diese für das Verwendungsland zugelassen.

**Richtige Ersatzbatterie verwenden** — Dieses Gerät enthält eine Batterie. Um die Explosionsgefahr zu verringern, prüfen Sie die Polarität und tauschen die Batterie nur gegen eine Batterie desselben Typs oder eines gleichwertigen, vom Hersteller empfohlenen Typs aus. Entsorgen Sie gebrauchte Batterien entsprechend den Anweisungen des Batterieherstellers.

Das Gerät enthält keine Teile, die vom Benutzer gewartet werden können. Wenden Sie sich bei Problemen bitte an den nächsten Händler.



# Consignes de sécurité

Il est recommandé de lire, de bien comprendre et surtout de respecter les informations relatives à la sécurité qui sont exposées ci-après, notamment les consignes destinées à prévenir les risques d'incendie, les décharges électriques et les blessures aux personnes. Les avertissements complémentaires, qui ne sont pas nécessairement repris ci-dessous, mais présents dans toutes les sections du manuel, sont également à prendre en considération.

**AVERTISSEMENT** Toutes les instructions présentes dans ce manuel qui concernent l'ouverture des capots ou des logements de cet équipement sont destinées exclusivement à des membres qualifiés du personnel de maintenance. Afin de diminuer les risques de décharges électriques, ne procédez à aucune intervention d'entretien autre que celles contenues dans le manuel de l'utilisateur, à moins que vous ne soyez habilité pour le faire.

## Consignes et symboles de sécurité

### Termes utilisés dans ce manuel

Les consignes de sécurité présentées dans ce manuel peuvent apparaître sous les formes suivantes:

**AVERTISSEMENT** Les avertissements signalent des conditions ou des pratiques susceptibles d'occasionner des blessures graves, voire même fatales.

**ATTENTION** Les mises en garde signalent des conditions ou des pratiques susceptibles d'occasionner un endommagement à l'équipement ou aux installations, ou de rendre l'équipement temporairement non opérationnel, ce qui peut porter préjudice à vos activités.

### Signalétique apposée sur le produit

La signalétique suivante peut être apposée sur le produit:

**DANGER** — risque de danger imminent pour l'utilisateur.

**AVERTISSEMENT** — Risque de danger non imminent pour l'utilisateur.

**MISE EN GARDE** — Risque d'endommagement du produit, des installations ou des autres équipements.

## Symboles apposés sur le produit

Les symboles suivants peuvent être apposés sur le produit:



Signale la présence d'une tension élevée et dangereuse dans le boîtier de l'équipement ; cette tension peut être suffisante pour constituer un risque de décharge électrique.



Signale que l'utilisateur, l'opérateur ou le technicien de maintenance doit faire référence au(x) manuel(s) pour prendre connaissance des instructions d'utilisation, de maintenance ou d'entretien.



Il s'agit d'une invite à prendre note du calibre du fusible lors du remplacement de ce dernier. Le fusible auquel il est fait référence dans le texte doit être remplacé par un fusible du même calibre.



Identifie une borne de protection de mise à la masse qui doit être raccordée correctement avant de procéder au raccordement des autres équipements.



Identifie une borne de protection de mise à la masse qui peut être connectée en tant que borne de mise à la masse supplémentaire.



Signale la présence de composants sensibles à l'électricité statique et qui sont susceptibles d'être endommagés par une décharge électrostatique. Utilisez des procédures, des équipements et des surfaces antistatiques durant les interventions d'entretien.

## Avertissements

Les avertissements suivants signalent des conditions ou des pratiques susceptibles d'occasionner des blessures graves, voire même fatales:

**Présence possible de tensions ou de courants dangereux** — Mettez hors tension, débranchez et retirez la pile (le cas échéant) avant de déposer les couvercles de protection, de défaire une soudure ou de remplacer des composants.

**Ne procédez pas seul à une intervention d'entretien** — Ne réalisez pas une intervention d'entretien interne sur ce produit si une personne n'est pas présente pour fournir les premiers soins en cas d'accident.

**Retirez tous vos bijoux** — Avant de procéder à une intervention d'entretien, retirez tous vos bijoux, notamment les bagues, la montre ou tout autre objet métallique.

**Évitez tout contact avec les circuits exposés** — Évitez tout contact avec les connexions, les composants ou les circuits exposés s'ils sont sous tension.

**Utilisez le cordon d'alimentation approprié** — Utilisez exclusivement le cordon d'alimentation fourni avec ce produit ou spécifié pour ce produit.

**Raccordez le produit à la masse** — Raccordez le conducteur de masse du cordon d'alimentation à la borne de masse de la prise secteur.

**Utilisez le produit lorsque les couvercles et les capots sont en place** — N'utilisez pas ce produit si les couvercles et les capots sont déposés.

**Utilisez le bon fusible** — Utilisez exclusivement un fusible du type et du calibre spécifiés pour ce produit.

**Utilisez ce produit exclusivement dans un environnement sec** — N'utilisez pas ce produit dans un environnement humide.

**Utilisez ce produit exclusivement dans un environnement non explosible** — N'utilisez pas ce produit dans un environnement dont l'atmosphère est explosible.

**Présence possible de courants de fuite** — Un raccordement à la masse est indispensable avant la mise sous tension.

**Deux alimentations peuvent être présentes dans l'équipement** — Assurez vous que chaque cordon d'alimentation est raccordé à des circuits de terre séparés. Débranchez les deux cordons d'alimentation avant toute intervention.

**Fusion neutre bipolaire** — Débranchez l'alimentation principale avant de procéder à une intervention d'entretien.

**Utilisez les points de levage appropriés** — Ne pas utiliser les verrous de la porte pour lever ou déplacer l'équipement.

**Évitez les dangers mécaniques** — Laissez le ventilateur s'arrêter avant de procéder à une intervention d'entretien.

## Mises en garde

Les mises en garde suivantes signalent les conditions et les pratiques susceptibles d'occasionner des endommagements à l'équipement et aux installations:

**N'ouvrez pas l'appareil** — Toute ouverture prohibée de l'appareil aura pour effet d'annuler la garantie.

**Utilisez la source d'alimentation adéquate** — Ne branchez pas ce produit à une source d'alimentation qui utilise une tension supérieure à la tension nominale spécifiée pour ce produit.

**Assurez une ventilation adéquate** — Pour éviter toute surchauffe du produit, assurez une ventilation de l'équipement conformément aux instructions d'installation. Ne déposez aucun document sous l'appareil — ils peuvent gêner la ventilation. Placez l'appareil sur une surface plane.

**Utilisez des procédures antistatiques** - Les composants sensibles à l'électricité statique présents dans l'équipement sont susceptibles d'être endommagés par une décharge électrostatique. Utilisez des procédures, des équipements et des surfaces antistatiques durant les interventions d'entretien.

**N'utilisez pas la carte CF avec un PC** — La carte CF a été spécialement formatée. Le logiciel enregistré sur la carte CF risque d'être effacé.

**N'utilisez pas l'équipement si un dysfonctionnement est suspecté** — Si vous suspectez un dysfonctionnement du produit, faites inspecter celui-ci par un membre qualifié du personnel d'entretien.

**Acheminez les câbles correctement** — Acheminez les câbles d'alimentation et les autres câbles de manière à ce qu'ils ne risquent pas d'être endommagés. Supportez correctement les enroulements de câbles afin de ne pas endommager les connecteurs.

**Utilisez les cordons d'alimentation adéquats** — Les cordons d'alimentation de cet équipement, s'ils sont fournis, satisfont aux exigences de toutes les réglementations régionales. L'utilisation de cet équipement à des tensions dépassant les 130 V en c.a. requiert des cordons d'alimentation qui satisfont aux exigences des configurations NEMA. Les cordons internationaux, s'ils sont fournis, ont reçu l'approbation du pays dans lequel l'équipement est utilisé.

**Utilisez une pile de remplacement adéquate** — Ce produit renferme une pile. Pour réduire le risque d'explosion, vérifiez la polarité et ne remplacez la pile que par une pile du même type, recommandée par le fabricant. Mettez les piles usagées au rebut conformément aux instructions du fabricant des piles.

Cette unité ne contient aucune partie qui peut faire l'objet d'un entretien par l'utilisateur. Si un problème survient, veuillez contacter votre distributeur local.

# *Regulatory Notices*

## **Certifications and Compliances**

### **FCC Emission Control**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by Grass Valley Group can affect emission compliance and could void the user's authority to operate this equipment.

### **Canadian EMC Notice of Compliance**

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

### **EN55022 Class A Warning**

In a domestic environment, products that comply with Class A may cause radio interference in which case the user may be required to take adequate measures.

## Canadian Certified Power Cords

Canadian approval includes the products and power cords appropriate for use in the North America power network. All other power cords supplied are approved for the country of use.

## Canadian Certified AC Adapter

Canadian approval includes the AC adapters appropriate for use in the North America power network. All other AC adapters supplied are approved for the country of use.

## Laser Compliance

### Laser Safety Requirements

The device used in this product is a Class 1 certified laser product. Operating this product outside specifications or altering from its original design may result in hazardous radiation exposure, and may be considered an act of modifying or new manufacturing of a laser product under U.S. regulations contained in 21CFR Chapter 1, subchapter J or CENELEC regulations in HD 482 S1. People performing such an act are required by law to recertify and reidentify this product in accordance with provisions of 21CFR subchapter J for distribution within the U.S.A., and in accordance with CENELEC HD 482 S1 for distribution within countries using the IEC 825 standard.

### Laser Safety

Laser safety in the United States is regulated by the Center for Devices and Radiological Health (CDRH). The laser safety regulations are published in the “Laser Product Performance Standard,” Code of Federal Regulation (CFR), Title 21, Subchapter J.

The International Electrotechnical Commission (IEC) Standard 825, “Radiation of Laser Products, Equipment Classification, Requirements and User’s Guide,” governs laser products outside the United States. Europe and member nations of the European Free Trade Association fall under the jurisdiction of the Comité Européen de Normalization Electrotechnique (CENELEC).

For the CDRH: The radiant power is detected through a 7 mm aperture at a distance of 200 mm from the source focused through a lens with a focal length of 100 mm.

For IEC compliance: The radiant power is detected through a 7 mm aperture at a distance of 100 mm from the source focused through a lens with a focal length of 100 mm.

## FCC Emission Limits

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation. This device has been tested and found to comply with FCC Part 15 Class B limits for a digital device when tested with a representative laser-based fiber optical system that complies with ANSI X3T11 Fiber Channel Standard.

## Certifications:

Category	Standard	Designed/tested for compliance with:
Safety	ANSI / UL60950	"Standard for Safety of Information Technology Equipment - Safety - Part 1: General Requirements", (ANSI/UL 60950-1, First Edition, Dated April 1, 2003, with revision through and including November 26, 2003.)
	IEC 60950	"Standard for Safety of Information Technology Equipment - Safety - Part 1: General Requirements", (IEC 60950-1, First Edition, 2001, Corrigendum 1:10-2002)
	CAN/CSA C22.2, No. 60950	"Standard for Safety of Information Technology Equipment - Safety - Part 1: General Requirements", (CAN/CSA-C22.2 No. 60950-1-03, First Edition Dated April 1, 2003, with revisions through and including November 26, 2003)
	EN60950	Safety of Information Technology Equipment, including Electrical Business Equipment.
	73/23/EEC	Low Voltage Directive
EMI	EMC Directive 89/336/EEC via EN 55103-1 and 2	Audio, Video and Entertainment Lighting Control for the European Community.
	EN 55103-1 standards	Electromagnetic compatibility. Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1 Emissions, Environment E1/E2 EN 55022: Class A Radiated and Conducted Emissions EN 61000-3-2: Power Line Harmonic Emissions, Radiated Magnetic Field Emissions, Peak Inrush Current
	EN55103-2 standards	Electromagnetic compatibility--Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2 Immunity, Environment E1/E2 EN 50082-1: Immunity EN 61000-4-2: Electrostatic Discharge "ESD" Immunity EN 61000-4-3: Radiated RF Electromagnetic Field Immunity EN 61000-4-4: Electrical Fast Transient/Burst "EFT" Immunity EN 61000-4-5: Surge Immunity EN 61000-4-6: Conducted RF Immunity EN 61000-4-11: Voltage Dips, Short Interruptions and Voltage Variations Annex A - Radiated Magnetic Field Immunity Note: This only applies to assemblies sensitive to magnetic fields
	US FCC Class A Canada FCC Industry Canada	CISPR Pub. 22 (1985)
	Australia & New Zealand:	AS/NZS 3548





# System Overview

The Maestro Master control switcher is a multi-channel, digital video and audio, switching system that is designed for network and broadcast master control room applications. The basic Maestro functionality is enhanced through available options.

## System Features

The Maestro Master control switcher has the following features:

- Multiple-channel, multiple control panel operation
- Possible four (4) (A/B/C/D) inputs from Encore- or Jupiter-controlled matrix router.
- Mix and match with Concerto router boards in same frame
- Possible four (4) external key cut/ fill inputs; linear/self key; border/ shadow key
- Outputs: Program, Preview, 2 Clean Feed video. 1 Clean Feed audio
- 16 channel audio processing for embedded and MADI I/O expansion. 8 channel AES/EBU I/O included on rear panel.
- Four (4) audio mixers for MADI I/O expansion and branding option audio overs. 2 AES/EBU inputs included on rear panel
- Embedded/MADI audio: up to 16 channels
- Dolby E pass-through
- Each audio source can be “derived” automatically (up/down converted), with programmable gain control on every audio channel. For example:
  - A stereo source can be configured to up-mix to a Dolby 5.1 output
  - A Dolby 5.1 source can be configured to down-mix to a left/right stereo pair
- Automation, GUI, and hardware panel control
- Source tally (“GPIO tally”) for Encore and Jupiter controlled systems
- Dual Channel DVE (option)

- Enhanced DVE (option)

## Primary On-air Transitions

Maestro includes the following transitions:

- Standard transitions: Cut-fade, Fade-cut, V-fade, Cross-fade, and Wipe
- Configurable transition: Timing, Type, and Rate
- Configured independent Video and Audio transitions
- Key inputs can be inserted “upstream” (paired with the background video) or “downstream” (operated independently from background video)
- Two independent 8-channel audio overs (Four 16-channel audio overs are available if a Sonata AES-to-MADI converter is used for audio overs).

## Maestro Master Control and a Controller System

The Maestro system must be used with a router that is controlled by a Grass Valley router control system. The following figures show how the Maestro Master Control can be inserted into an Encore controller ([Figure 1](#)) and a Jupiter CM-4000 controller ([Figure 2](#)) system.

Figure 1. Single-Channel HD Maestro, Encore Controller, Concerto Router

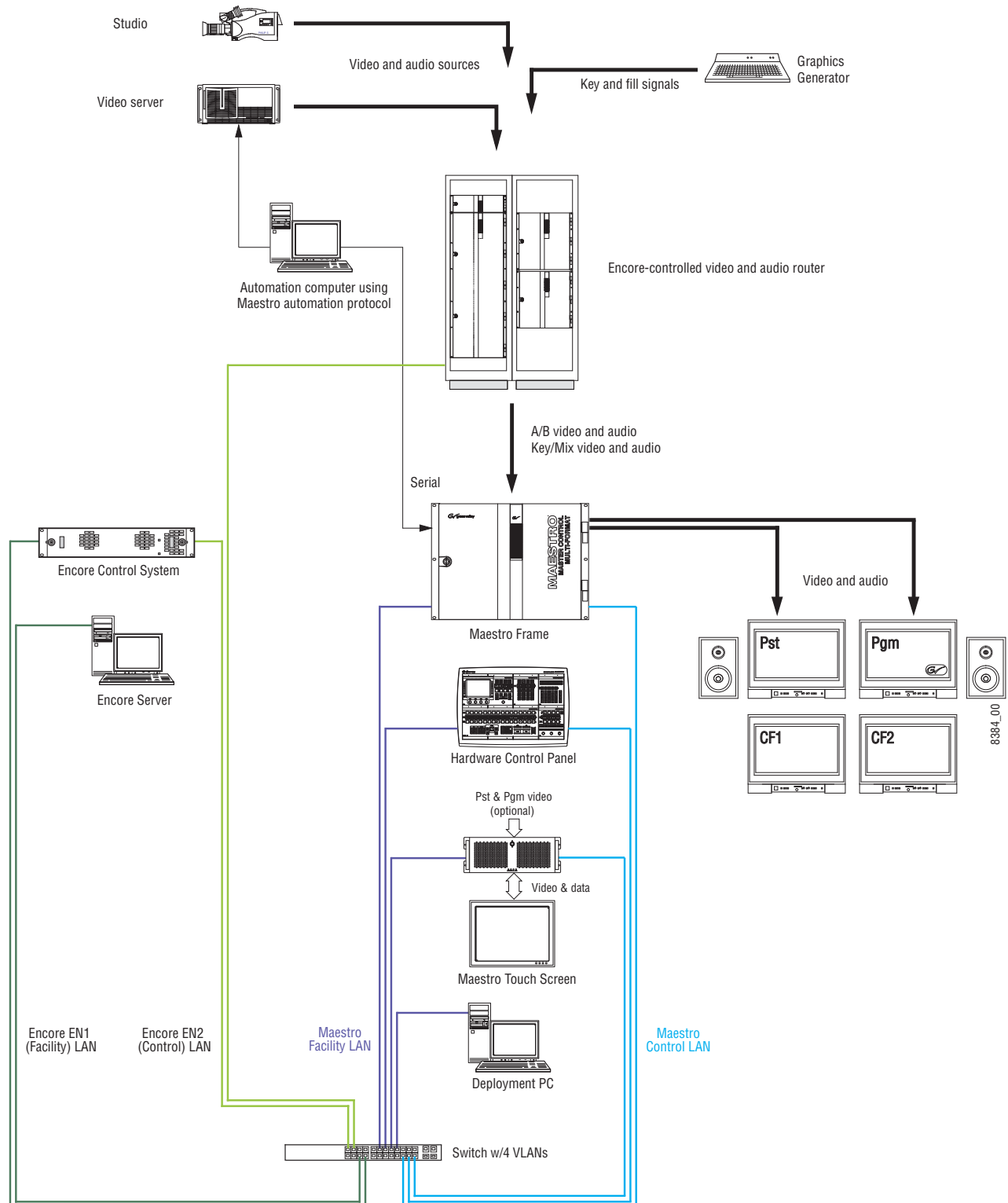
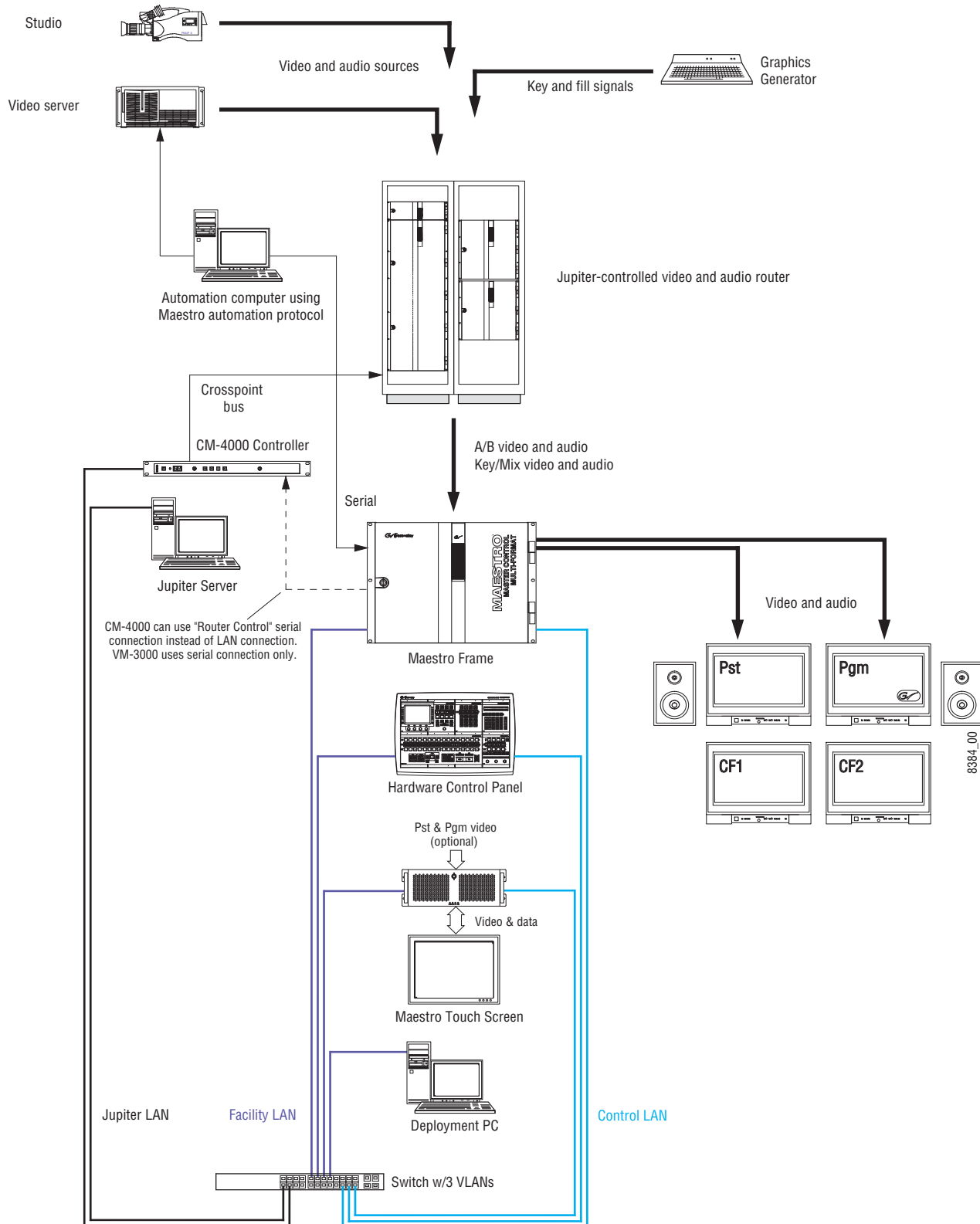


Figure 2. Single-channel HD Maestro, Jupiter CM-4000 Controller, Trinix/Apex Router



# Major Components

Maestro hardware components consist of the following:

- A Maestro/Concerto+ rack mount frame.
- The Maestro circuit boards and rear panels.
- A Control panel. The control panel may include a hardware control panel, a GUI control panel, or both; however, at least one control panel is recommended regardless of how many channels are in a Maestro system.
- A Windows PC, which is used for software installation, configuration, and updates.

## Maestro/Concerto Frames

Maestro/Concerto frames contain one or more Maestro Main (Processor) boards, which may be configured for standard definition (SD) or high definition (HD) operation. Each Processor board provides one “channel” consisting of one video and eight AES audio channels (for example, four stereo pairs) or up to 16 embedded audio channels.

**Note** Up to 16 AES audio channels per video source are supported with external AES-to-MADI conversion.

The Maestro system must be used with a router controlled by a Grass Valley router control system (for example, using Encore as shown in [Figure 1](#) or Jupiter as shown in [Figure 2](#)).

If a Grass Valley Concerto router is used, and depending on system size, the Concerto boards may be mounted in the Maestro/Concerto frame.

The following Maestro/Concerto frames are available:

### **8 RU Maestro/Concerto frame (MAE-FRM128)**

This frame, which is also known as the “Concerto Plus” frame, accepts a total of four Maestro/Concerto boards in any combination.

### **4 RU M/C frame (CRS-FRM64)**

This frame, which is also known as the “Concerto 64” frame, accepts 1 Concerto board plus 1 Maestro SD or Maestro HD Processor board. If present, the Maestro board must be mounted in the bottom slot.

**Note** If you are planning on installing the Maestro Branding Engine in the bottom slot of either the 4RU or 7RU Concerto chassis, please contact Customer support before proceeding with the installation process. The original 7 RU Concerto rack frame is similar to the 8 RU Maestro/Concerto frame, but due to power and space limitations is not recommended for Maestro systems.

8 RU M/C Frame

The 8 RU frame, shown in [Figure 3](#), accepts a total of four Maestro/Concerto boards in any combination. This example shows two Maestro channels: both are video + 75 ohm audio.

Figure 3. 8 RU Maestro/Concerto Frame with Two Maestro Channels

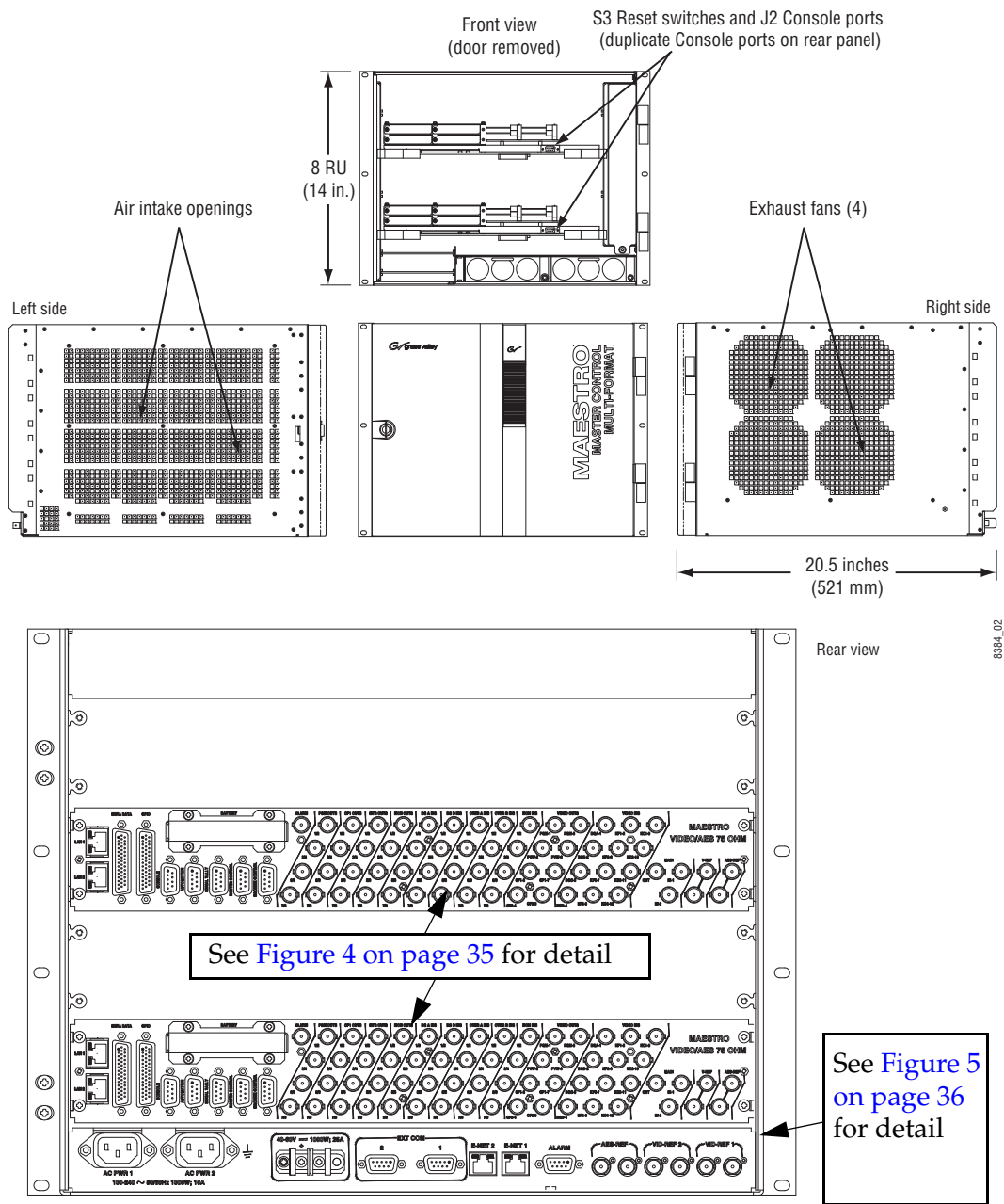


Figure 4. Maestro Rear Panel, Showing 75- and 110-Ohm Audio Variants

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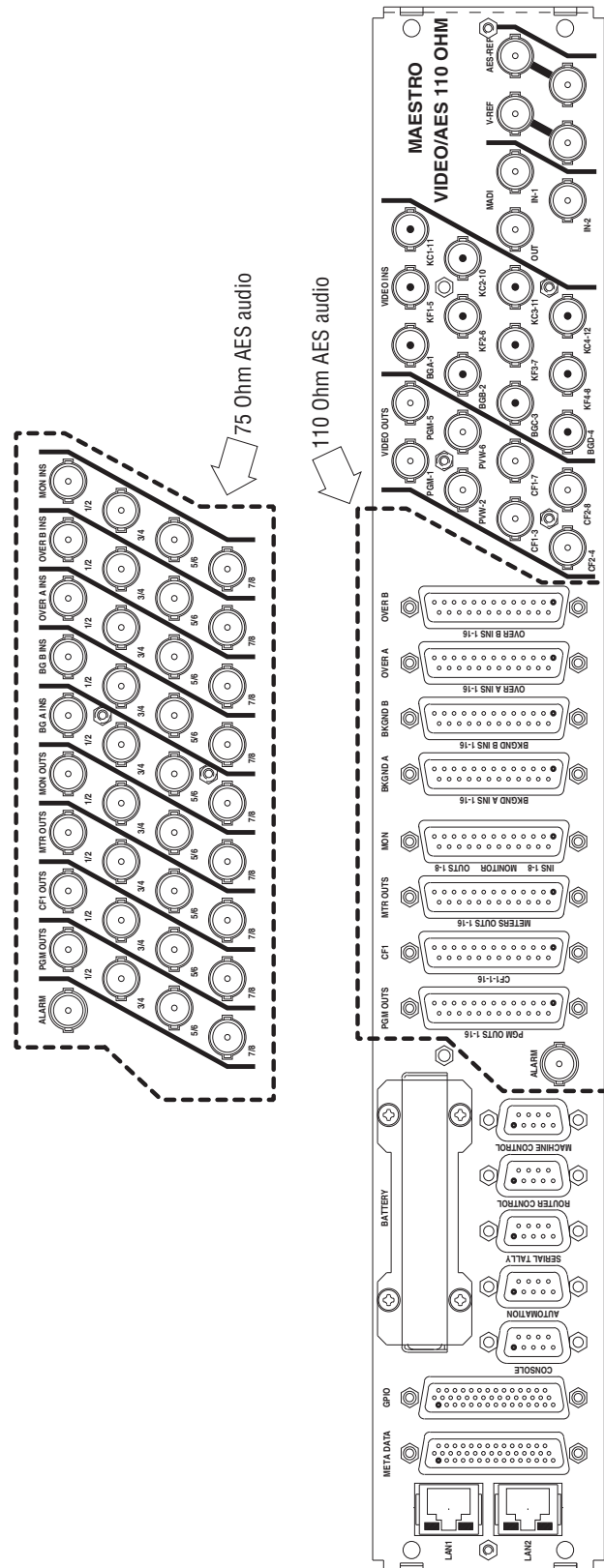
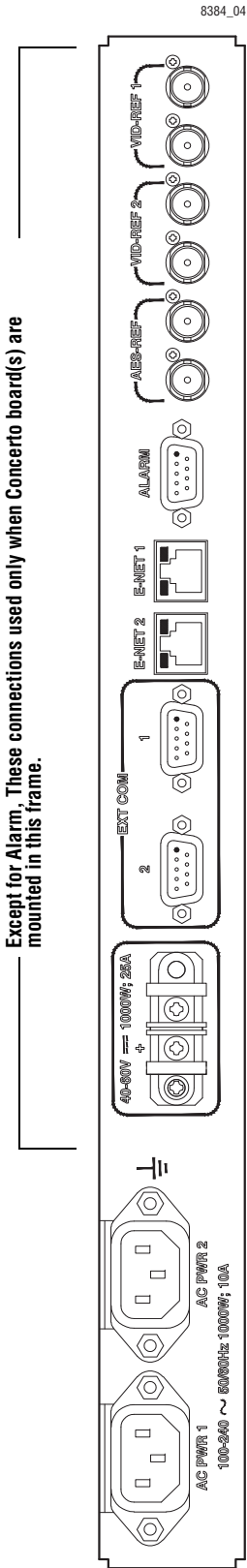


Figure 5. 8 RU Maestro/Concerto Frame Rear Panel

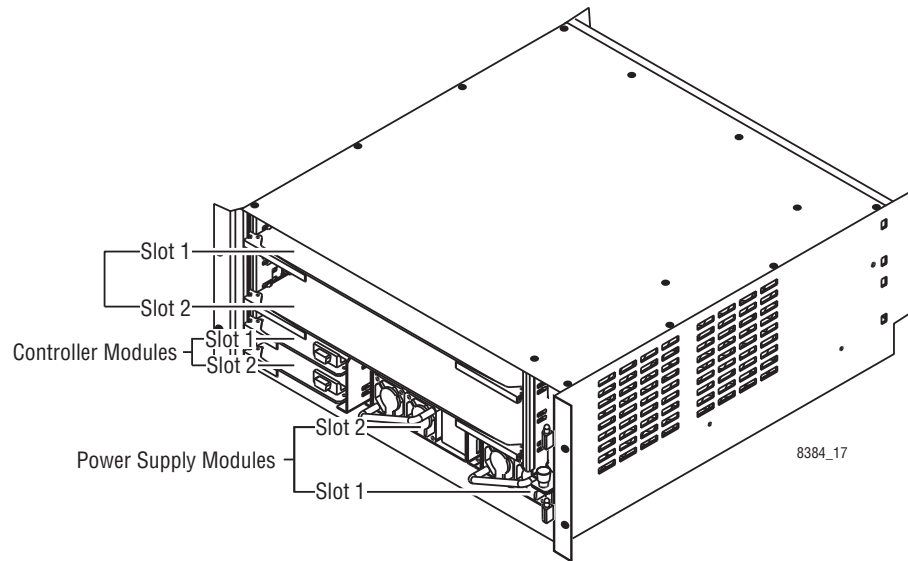




## 4 RU M/C Frame

The 4 RU M/C frame can handle one (1) Maestro board at maximum. The Maestro board must only be mounted in the bottom slot (Slot 2).

Figure 6. 4 RU M/C Frame



## Automation Interface

The Maestro can be controlled by a third-party automation computer that is connected to the Automation port. The automation computer must send commands as described in the Maestro automation protocol manual, part no. 0718472xx. For more information, contact Grass Valley Technical Support.

The current Maestro automation protocol manual can be found at

<http://www.grassvalley.com/products/mcontrol/maestro/>

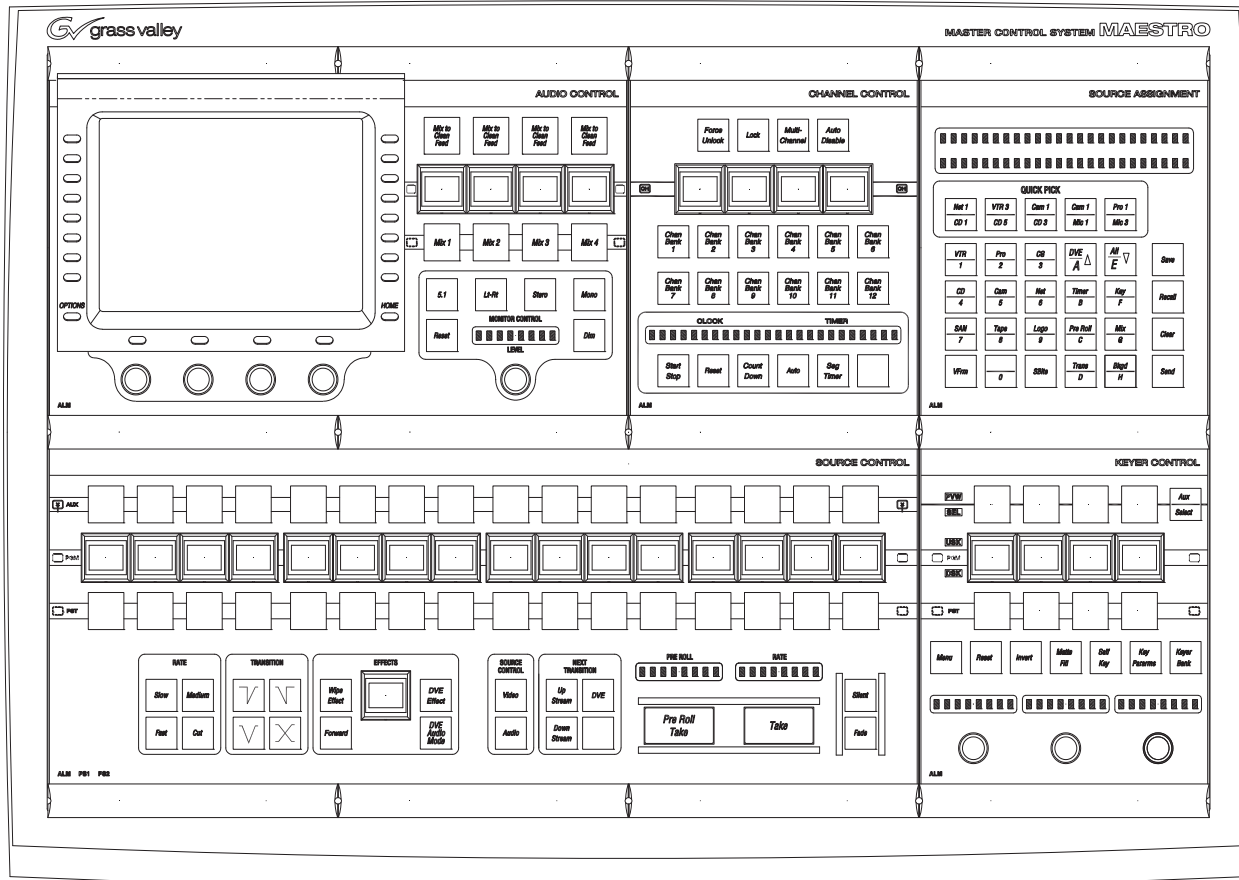
- Click the **Library** button at the top of the page and then the Manuals hyperlink.

## Hardware Control Panel

The Maestro hardware control panels are available in two standard versions: the MAE-4X2STD-CP (shown in Figure 7) and the MAE-5X2STD-CP.

The MAE-5X2STD-CP provides space for a second MAE-KEY-CP Keyer Control Sub Panel (described below) or other optional sub panels which may be added at a later time.

Figure 7. MAE-4X2STD-CP Hardware Control Panel



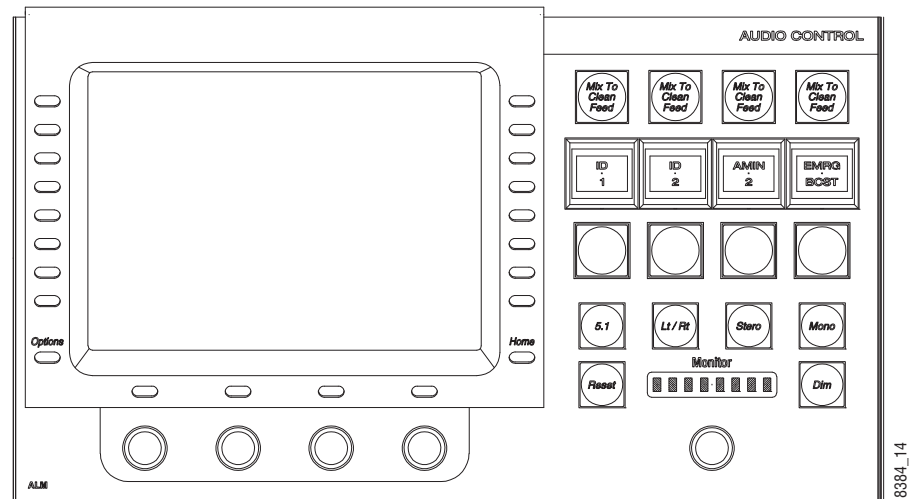
The hardware control panel can be used to select video and audio sources for live transmission. The panel can be used for manual intervention in systems that are normally controlled by an automation computer or as the primary on-air control device.

Machine control commands must currently be provided by the facility router control system (Encore, Jupiter, etc.) or by the automation computer.

Each sub panel is described in the following sections.

## MAE-AUD2-CP Audio Control Sub Panel

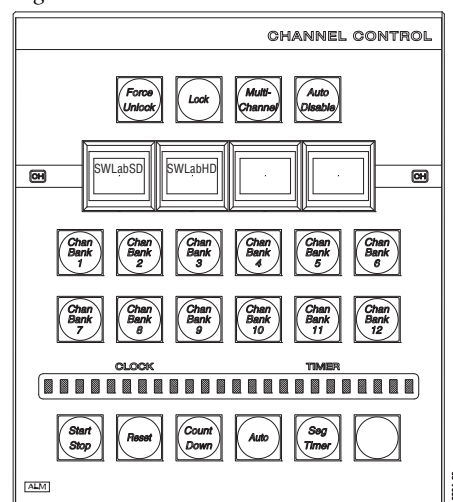
Figure 8. MAE-AUD2-CP Audio Control Sub Panel



The Audio Control sub panel is used to switch the four audio mixers in or out of the audio signal, set the audio levels for each source, selects and adjusts the level of audio signals for monitoring on the control room speakers, and performs channel remapping and other audio functions.

## MAE-CHN-CP Channel Control Sub Panel

Figure 9. MAE-CHN-CP Channel Control Sub Panel

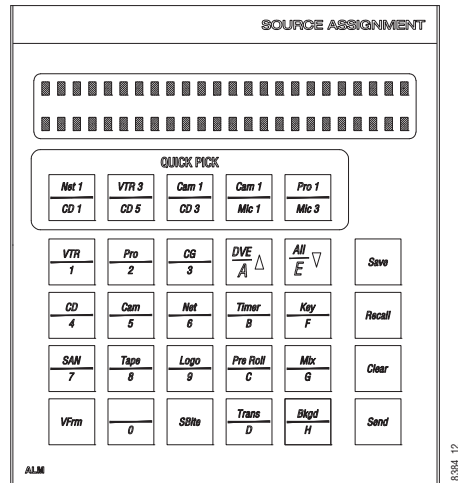


The Channel Control Sub panel is used to select the Maestro channel that is to be controlled using this panel. Enabling and disabling the automation control for a particular channel can also be done from this panel. On late-

model control panels, the clock/timer displays and associated controls are also included with this panel.

## MAE-ASN-CP Source Assignment Control Sub Panel

Figure 10. MAE-ASN-CP Source Assignment Control Sub Panel



The Source Assignment Control Sub panel is used to:

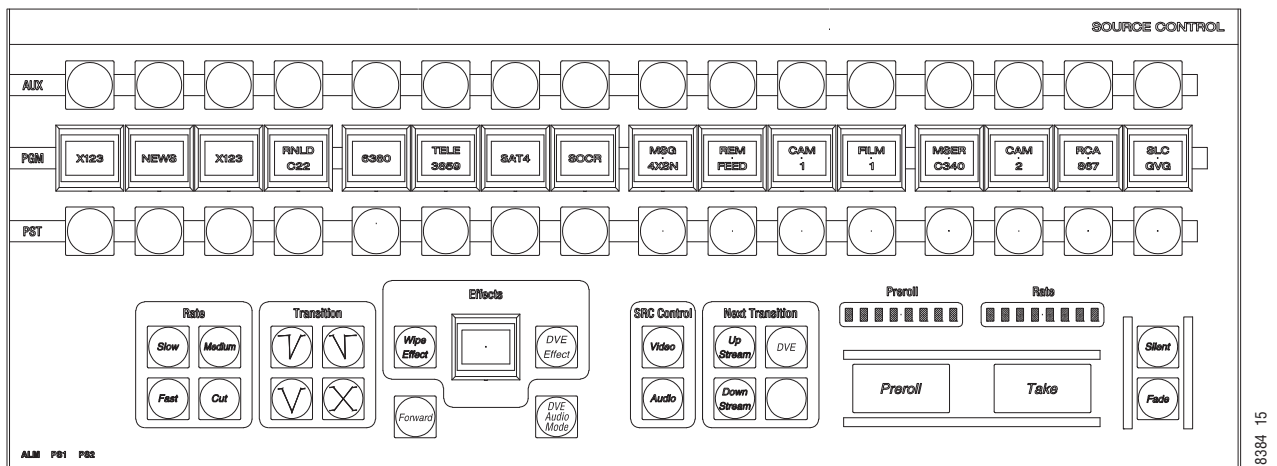
- Assign Input Set sources to the 16 input positions in the Source Control Main Panel.
- Assign the Input Set Key sources to the eight positions on the Keyer Control panel.
- Assign the Input Set Audio Mixer signals to the four positions in the Audio module.

This sub panel is also used to perform the following functions:

- To set a user-defined transition rate or timer value.
- To save and recall background buttons, keyer and audio mix over source assignments.
- To recall configured independent transitions.

## MAE-SRC-CP Source Control Sub Panel

Figure 11. MAE-SRC-CP Source Control Sub Panel



The Source Control sub panel is used to select the next source on the Preset bus and perform Takes on the source to Program (Pgm) or “on Air.”

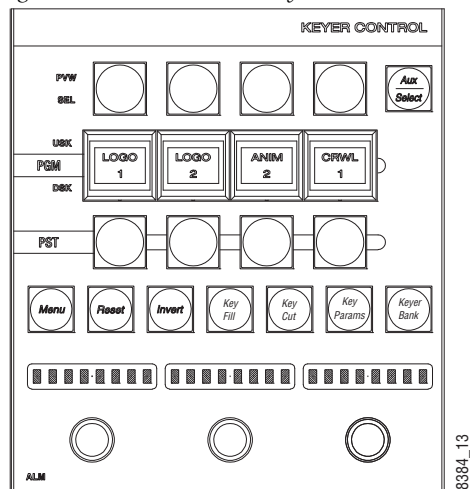
The AUX bus is used to select a second source for the DVE option.

The panel is also used to:

- Select transition speed and type.
- Select wipe effects.
- Select digital video effects.
- Create audio or video breakaways.
- Select any combination of upstream, downstream or DVE transition operations.
- Perform emergency actions such as fade to silence or fade to black (matte).

## MAE-KEY-CP Keyer Control Sub Panel

Figure 12. MAE-KEY-CP Keyer Control Sub Panel



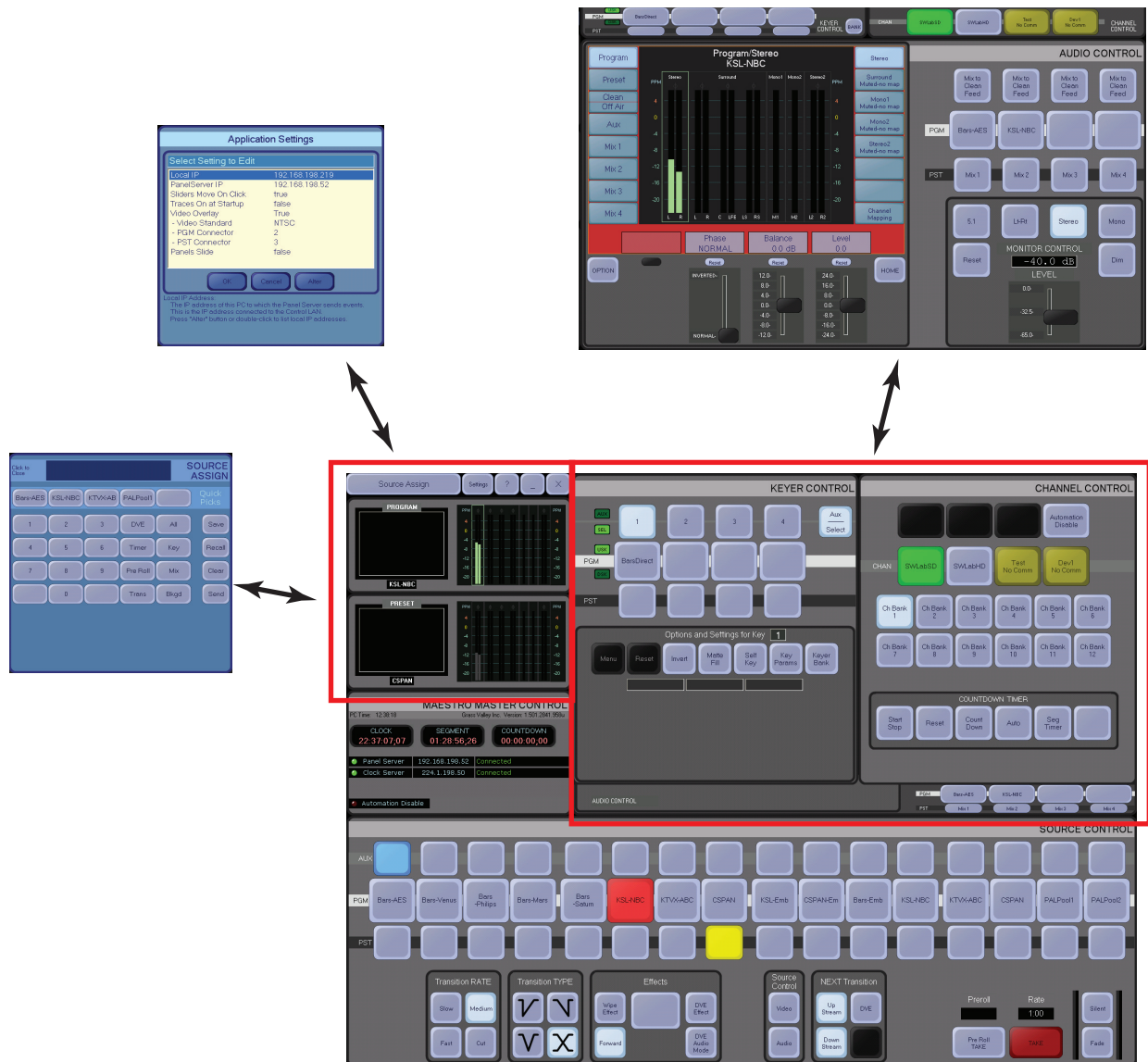
The Keyer Control panel is used to switch the keyers in/out of the video signal and to modify keyer parameters such as clip, gain and opacity.

Operation of each of these sub panels is detailed in the Operation chapter in the User manual.

## GUI Control Panel

The GUI control panel can be used for manual intervention in systems controlled by an automation computer, or as the primary on-air control device. See [Figure 13](#).

Figure 13. GUI Control Panel



The upper-right area is used to display the Audio Panel or the Keyer and Channel Control Panels. The upper-left corner is used to display the Source Assign Panel, the Application Settings panel or the video overlay option (showing Preset and Program video) and audio metering.

## Configuration/Deployment PC

This computer is used for loading software, configuration of the various system components, and system monitoring.

**Note** In some systems, the configuration and /or deployment applications may be supplied on the GUI control panel PC.

## Specifications

For mechanical, environmental, and electrical specifications, refer to [Appendix A-Specifications](#).



# *Installation Planning*

This section provides information that should be considered before proceeding with the Maestro installation process.

## **Customer Requirements**

The system planner/integrator should consider the following customer requirements when designing a Maestro installation.

### **SD or HD**

The MAE-SD Processor board is licensed to operate with standard definition video only. After installation, the license can be upgraded to HD operation if desired.

The MAE-HD Processor board will accept standard or high definition digital video. However, re-configuration (by the user) is required to switch from SD to HD. Also, HD operation consumes more power than SD.

Supported SD and HD video standards are listed in [Appendix A-Specifications](#).

### **Video Channels**

Each Processor board provides one on-air “channel”<sup>1</sup> consisting of one video channel and up to 16 digital audio channels.

A maximum of four SD or HD Processor boards can be installed in each 8 RU Maestro/Concerto+ frame.

A maximum of one SD or HD Processor board can be installed in a 4 RU frame. Due to headroom limitations, a Maestro board cannot be installed in the top slot of the 4RU Concerto frame.

---

<sup>1</sup> In this manual, the term “channel” used by itself generally refers to an “on-air” channel, that is, a video channel and its associated audio channels. “Channel” is thus equivalent to a single Maestro Processor board.

**Note** If you are planning on installing the Maestro Branding Engine in the bottom slot of either the 4RU or 7RU Concerto chassis, please contact Customer support before proceeding with the installation process.

For multi-channel (multi-Processor) operation, a separate control panel can be installed to control each channel; or, a control panel can be used to control more than one channel.

**Note** A single control panel can control only one channel at a time. The Channel Control sub panel is used to select the channel to be controlled.

## Audio Channels and Groups

The operation of the audio portion of the Maestro Processor is based upon an "audio group" concept. An audio group is defined as a set of related audio channels that can be presented to a listener simultaneously. For example, a left and a right audio channel together form a pair that is considered a group, with the type of "stereo." When sent to a pair of speakers a stereo audio image is presented to the listener. Either audio channel alone is incomplete. (However, two audio channels of two different languages even though presented with one in the left speaker and the other in the right speaker do not represent an audio group because the signals are not related and in fact would cause nothing but confusion for the listener.) Another example of an audio group would be a set of six audio channels arranged as a Dolby 5.1 surround set of signals.

The Maestro Processor is designed to handle each group of audio channels as a single object that is switched, mixed, faded, and remapped as a group. This concept reduces greatly the complexity of doing multi-audio channel broadcasting. All of the configuration and operational features of the Maestro switcher use the audio group concept.

The standard version of each Maestro Processor supports 16 audio channels internally. AES audio is limited to only eight audio channels due to limited rear panel space for connectors. However, for embedded audio in video all 16 audio channels are supported. Sixteen audio channels are also supported through the MADI standard. For more information about MADI I/O, please refer to the *Sonata Series Planning and Installation Manual*, part no. 071-8609-xx.

Each Processor can be configured with from 1 to 16 audio channels in from 1 to 16 audio groups. A mixture of mono, stereo, Dolby 5.1 surround and Dolby E audio group types arranged in any order is possible with a few restrictions based upon pairs of audio channels.

Dolby E metadata switching is also supported via the rear panel RS-422 Metadata connector.

## MADI Audio Expansion

Due to limited rear panel space, the number of audio channels supported by each AES audio input and output is eight (8). Rear panel space limitations also limit the number of AES background audio inputs to two (2) and the number of AES audio over inputs to two (2). Internally, Maestro supports 16 channels of audio per background video source and four audio mixers. MADI (multiplexed digital audio interface) audio expansion allows the full audio capabilities of Maestro to be utilized by converting AES audio to the MADI standard which allows up to 64 audio channels to be input or output on a single coaxial cable.

MADI audio can be input to Maestro in one of two ways:

- From a Grass Valley Apex audio router. This will limit the number of cables between the audio router and Maestro to a maximum of three.

**Note** Contact Grass Valley Technical Support for assistance in determining if your Apex router is capable of AES-to-MADI conversion.

- From a Sonata AES-to-MADI converter.

**Note** For complete Sonata planning and installation information, please refer to publication 071-8609-xx, *Sonata Series Planning and Installation Manual*.

The MADI expansion discussion in this manual will focus on the Sonata solution.

## Interfacing to Maestro

As shown in [Figure 14](#), the Sonata AES-to-MADI converters can be used with the Maestro master control switcher for two primary purposes:

- Expansion of the basic 8-channel I/O of the Maestro frame to 16-channels
- Addition of Background C and D inputs, and addition of Mix over C and D inputs, not available on the standard Maestro rear panel. The Background C inputs are required for full DVE functionality of the Maestro product

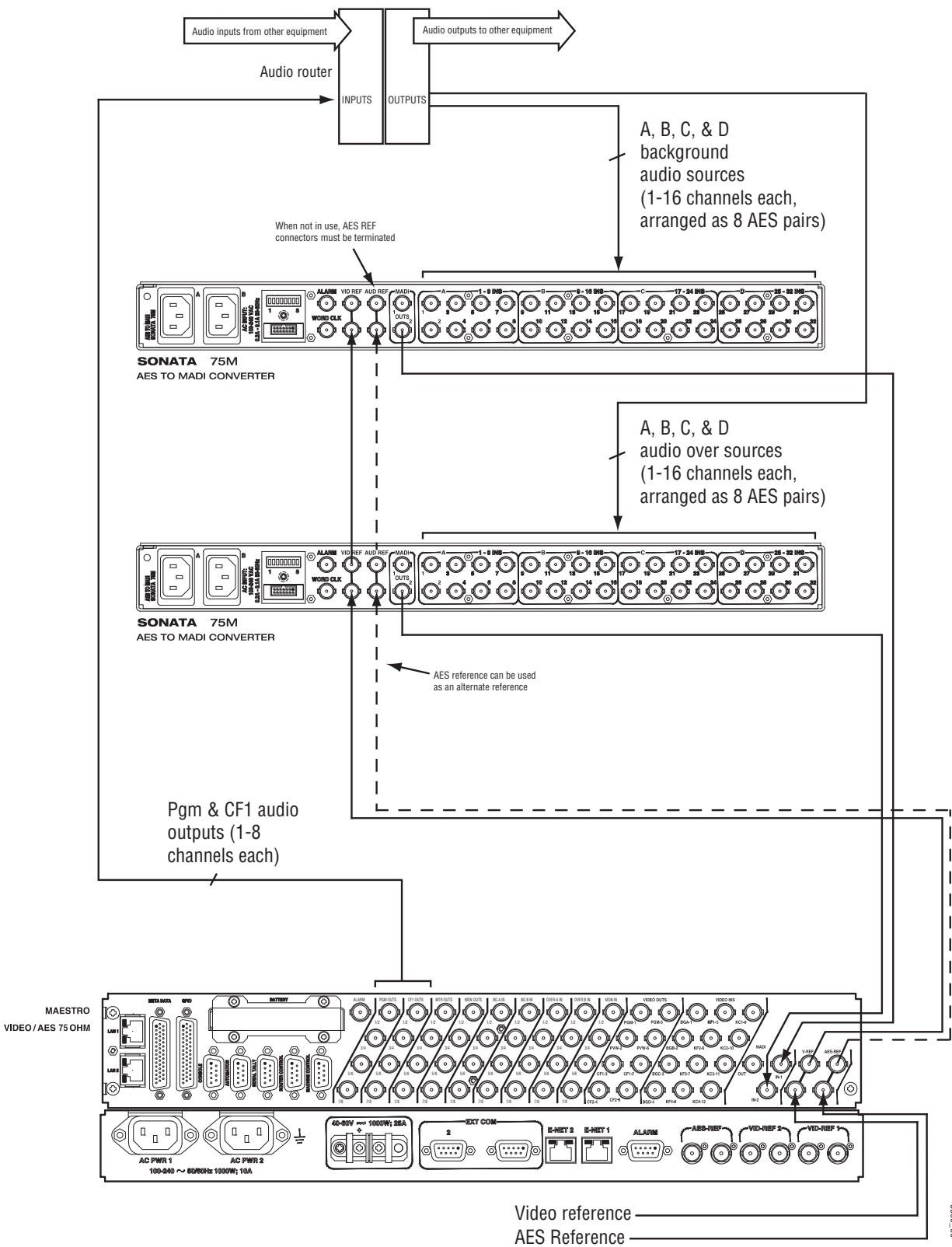
### Audio Input Expansion

The Maestro master control switcher maps the various channels of its MADI inputs in a very specific order which is hard wired. As such, when using the Sonata AES-to-MADI converter with the Maestro product the inputs must be connected according to [Table 1 on page 52](#) and [Table 2 on page 53](#). When less than the full 16 channels are used on a given Maestro input, the unused channels are simply skipped and left empty.

To help in wiring and monitoring the operation of the Sonata AES-to-MADI converter, both the front and rear panels are grouped into 8-pair sections

labeled A, B, C, and D. These correspond to the Background and Mix Over inputs of the Maestro master control switcher.

Figure 14. Sonata-to-Maestro Application with Fully-expanded Audio Inputs



Two MADI inputs are provided on the rear panel of the Maestro chassis, numbered 1 and 2. MADI IN 1 is used for Background signals A, B, C, and D, each supporting 16 audio channels as 8 AES pairs. MADI IN2 is used for Audio Mix Over signals A, B, C, & D, each also supporting 16 audio channels as 8 AES pairs.

It is not possible to share Background and Mix Over inputs on a single MADI converter box, but it is possible to use a Sonata AES-to-MADI converter for only the background signals while using the Maestro rear panel AES connectors for Mix over signals (see [Figure 15](#)). However, for full 16 channel support for either background or mix over signals, a Sonata AES-to-MADI converter or an Apex router with MADI connections is required.

Figure 15. Sonata-to-Maestro Application Showing Minimum Audio Inputs Required for DVE Operation

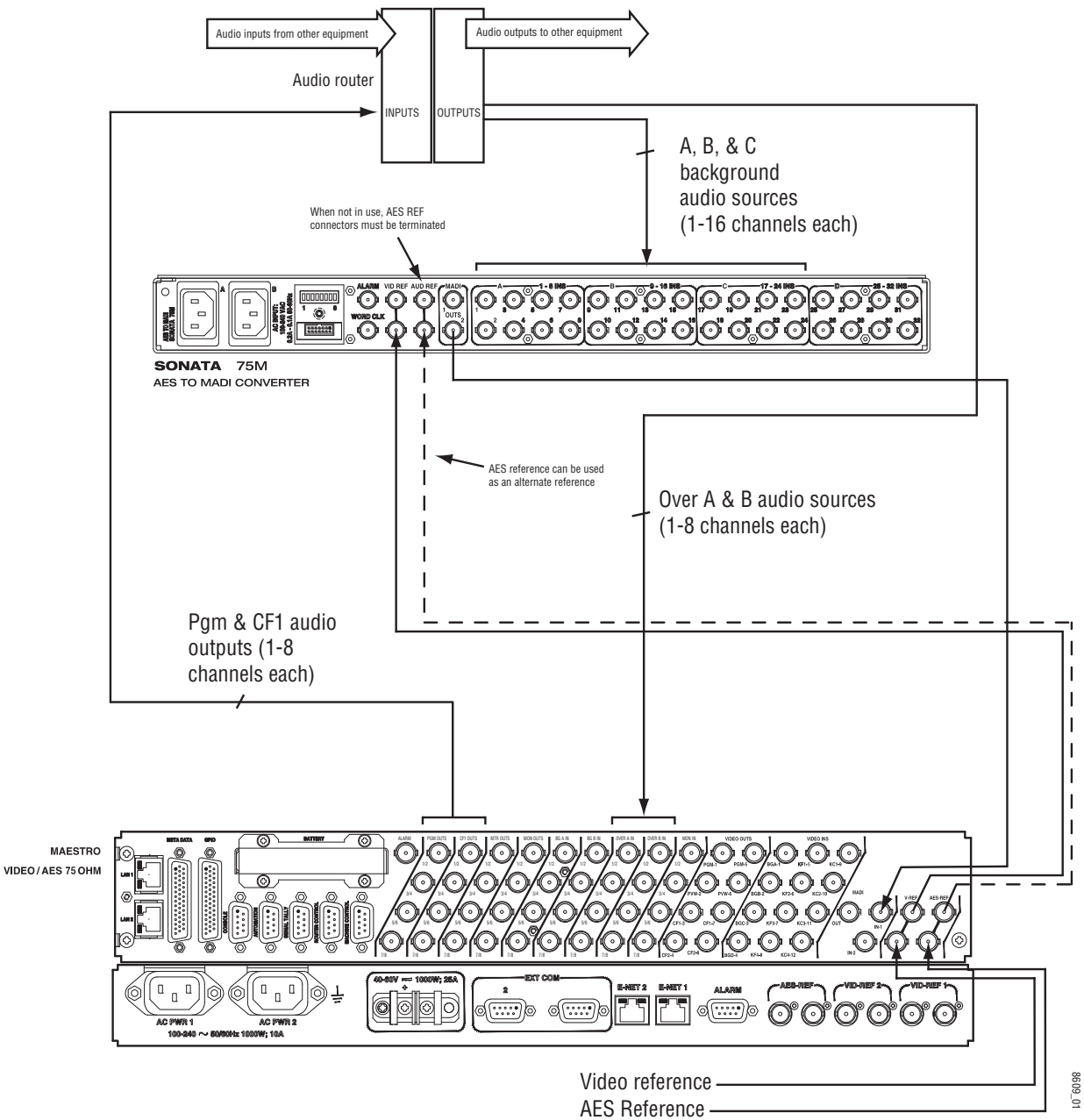


Table 1. Sonata-to-Maestro Background Input Mapping

Sonata Input Connector	Signal Name	Maestro Input
A1	Input 1 (L&R)	Background A Ch 1&2
A2	Input 2 (L&R)	Background A Ch 3&4
A3	Input 3 (L&R)	Background A Ch 5&6
A4	Input 4 (L&R)	Background A Ch 7&8
A5	Input 5 (L&R)	Background A Ch 9&10
A6	Input 6 (L&R)	Background A Ch 11&12
A7	Input 7 (L&R)	Background A Ch 13&14
A8	Input 8 (L&R)	Background A Ch 15&16
B9	Input 9 (L&R)	Background B Ch 1&2
B10	Input 10 (L&R)	Background B Ch 3&4
B11	Input 11 (L&R)	Background B Ch 5&6
B12	Input 12 (L&R)	Background B Ch 7&8
B13	Input 13 (L&R)	Background B Ch 9&10
B14	Input 14 (L&R)	Background B Ch 11&12
B15	Input 15 (L&R)	Background B Ch 13&14
B16	Input 16 (L&R)	Background B Ch 15&16
C17	Input 17 (L&R)	Background C Ch 1&2
C18	Input 18 (L&R)	Background C Ch 3&4
C19	Input 19 (L&R)	Background C Ch 5&6
C20	Input 20 (L&R)	Background C Ch 7&8
C21	Input 21 (L&R)	Background C Ch 9&10
C22	Input 22 (L&R)	Background C Ch 11&12
C23	Input 23 (L&R)	Background C Ch 13&14
C24	Input 24 (L&R)	Background C Ch 15&16
D25	Input 25 (L&R)	Background D Ch 1&2
D26	Input 26 (L&R)	Background D Ch 3&4
D27	Input 27 (L&R)	Background D Ch 5&6
D28	Input 28 (L&R)	Background D Ch 7&8
D29	Input 29 (L&R)	Background D Ch 9&10
D30	Input 30 (L&R)	Background D Ch 11&12
D31	Input 31 (L&R)	Background D Ch 13&14
D32	Input 32 (L&R)	Background D Ch 15&16



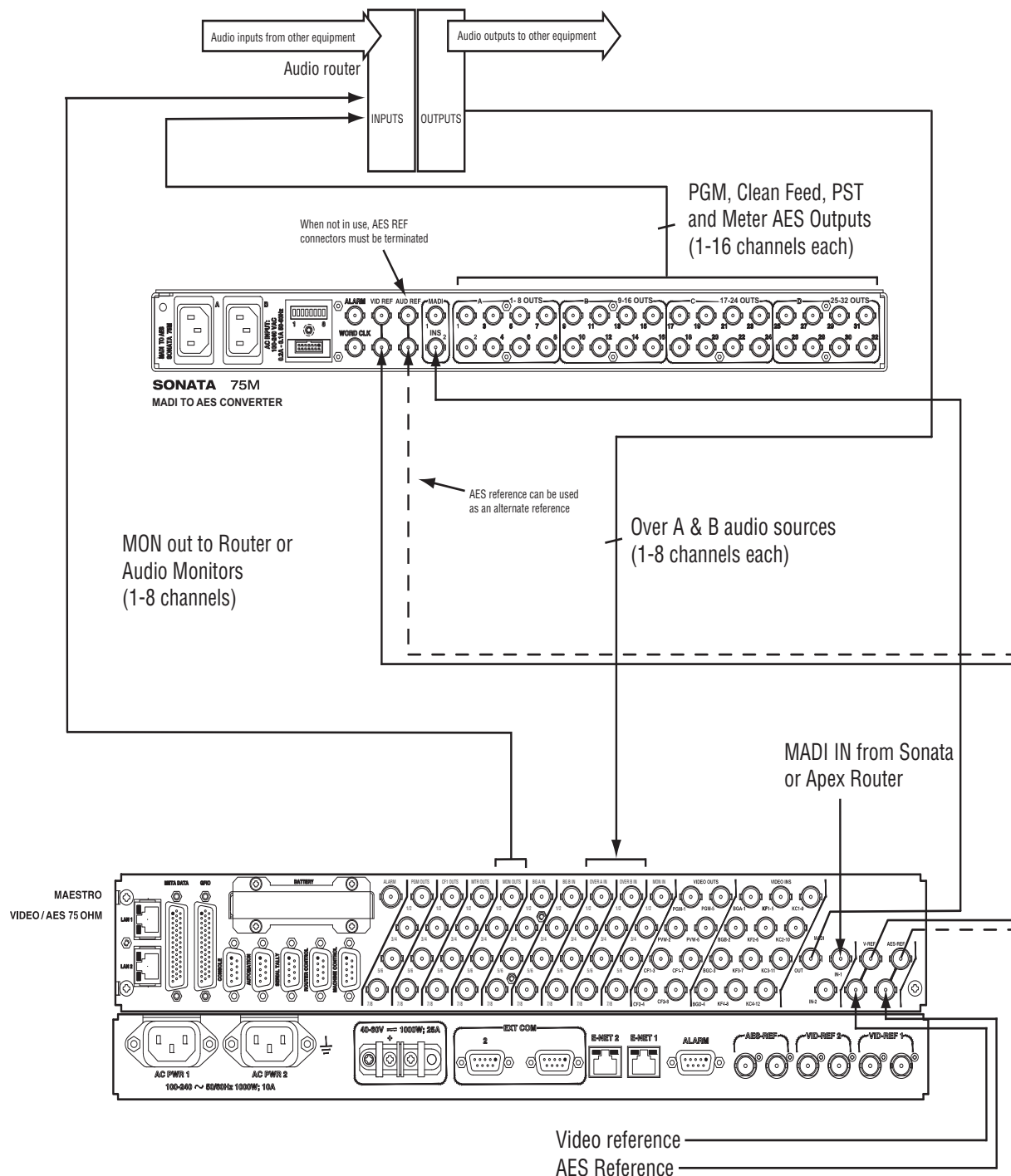
Table 2. Sonata-to-Maestro Mix Over Input Mapping

Sonata Input Connector	Signal Name	Maestro Input
A1	Input 1 (L&R)	Mix Over A Ch 1&2
A2	Input 2 (L&R)	Mix Over A Ch 3&4
A3	Input 3 (L&R)	Mix Over A Ch 5&6
A4	Input 4 (L&R)	Mix Over A Ch 7&8
A5	Input 5 (L&R)	Mix Over A Ch 9&10
A6	Input 6 (L&R)	Mix Over A Ch 11&12
A7	Input 7 (L&R)	Mix Over A Ch 13&14
A8	Input 8 (L&R)	Mix Over A Ch 15&16
B9	Input 9 (L&R)	Mix Over B Ch 1&2
B10	Input 10 (L&R)	Mix Over B Ch 3&4
B11	Input 11 (L&R)	Mix Over B Ch 5&6
B12	Input 12 (L&R)	Mix Over B Ch 7&8
B13	Input 13 (L&R)	Mix Over B Ch 9&10
B14	Input 14 (L&R)	Mix Over B Ch 11&12
B15	Input 15 (L&R)	Mix Over B Ch 13&14
B16	Input 16 (L&R)	Mix Over B Ch 15&16
C17	Input 17 (L&R)	Mix Over C Ch 1&2
C18	Input 18 (L&R)	Mix Over C Ch 3&4
C19	Input 19 (L&R)	Mix Over C Ch 5&6
C20	Input 20 (L&R)	Mix Over C Ch 7&8
C21	Input 21 (L&R)	Mix Over C Ch 9&10
C22	Input 22 (L&R)	Mix Over C Ch 11&12
C23	Input 23 (L&R)	Mix Over C Ch 13&14
C24	Input 24 (L&R)	Mix Over C Ch 15&16
D25	Input 25 (L&R)	Mix Over D Ch 1&2
D26	Input 26 (L&R)	Mix Over D Ch 3&4
D27	Input 27 (L&R)	Mix Over D Ch 5&6
D28	Input 28 (L&R)	Mix Over D Ch 7&8
D29	Input 29 (L&R)	Mix Over D Ch 9&10
D30	Input 30 (L&R)	Mix Over D Ch 11&12
D31	Input 31 (L&R)	Mix Over D Ch 13&14
D32	Input 32 (L&R)	Mix Over D Ch 15&16

## Audio Output Expansion

Sonata converters may also be used to expand the Maestro audio output capabilities. Sonata converters are available to convert MADI to AES. Using the MADI Out connector on the rear panel, up to 16 channels of audio for the Program, Clean Feed, Preset and Metering outputs can be input into a Sonata MADI-to-AES converter as illustrated in [Figure 16](#).

Figure 16. Maestro to Sonata Audio Output Expansion - MADI-to-AES



### Note

The Maestro rear panel provides up to eight-channel output for Program, Clean Feed and Metering; however, no dedicated Preset output is provided. Using a Sonata MADI-to-AES converter provides a Preset audio output in addition to the 16-channel expansion of the Program, Clean Feed and Metering outputs.

The Maestro master control switcher maps the various channels of its MADI outputs in a very specific order which is hard wired. As such, when using the Sonata MADI-to-AES converter with the Maestro product the outputs must be connected according to [Table 3](#). When less than the full 16 channels are used on a given Maestro input, the unused channels are simply skipped and left empty.

Table 3. *Maestro-to-Sonata Output Mapping*

Sonata Output Connector	Signal Name	Maestro Output
A1	Input 1 (L&R)	Program Ch 1&2
A2	Input 2 (L&R)	Program Ch 3&4
A3	Input 3 (L&R)	Program Ch 5&6
A4	Input 4 (L&R)	Program Ch 7&8
A5	Input 5 (L&R)	Program Ch 9&10
A6	Input 6 (L&R)	Program Ch 11&12
A7	Input 7 (L&R)	Program Ch 13&14
A8	Input 8 (L&R)	Program Ch 15&16
B9	Input 9 (L&R)	Clean Feed Ch 1&2
B10	Input 10 (L&R)	Clean Feed Ch 3&4
B11	Input 11 (L&R)	Clean Feed Ch 5&6
B12	Input 12 (L&R)	Clean Feed Ch 7&8
B13	Input 13 (L&R)	Clean Feed Ch 9&10
B14	Input 14 (L&R)	Clean Feed Ch 11&12
B15	Input 15 (L&R)	Clean Feed Ch 13&14
B16	Input 16 (L&R)	Clean Feed Ch 15&16
C17	Input 17 (L&R)	Preset Ch 1&2
C18	Input 18 (L&R)	Preset Ch 3&4
C19	Input 19 (L&R)	Preset Ch 5&6
C20	Input 20 (L&R)	Preset Ch 7&8
C21	Input 21 (L&R)	Preset Ch 9&10
C22	Input 22 (L&R)	Preset Ch 11&12
C23	Input 23 (L&R)	Preset Ch 13&14
C24	Input 24 (L&R)	Preset Ch 15&16
D25	Input 25 (L&R)	Metering Ch 1&2
D26	Input 26 (L&R)	Metering Ch 3&4
D27	Input 27 (L&R)	Metering Ch 5&6
D28	Input 28 (L&R)	Metering Ch 7&8
D29	Input 29 (L&R)	Metering Ch 9&10
D30	Input 30 (L&R)	Metering Ch 11&12
D31	Input 31 (L&R)	Metering Ch 13&14
D32	Input 32 (L&R)	Metering Ch 15&16

## Automation

All control panel functions can be executed using a third party automation computer sending commands as described in the Maestro automation protocol manual, part no. 071-8472-xx.

For more information, contact Grass Valley Technical Support.

## Manual Control

The hardware control panel and/or GUI control panel can be used for manual intervention in systems controlled by an automation computer, or as the primary on-air control device. As a minimum, at least one control panel (GUI or hardware control panel) must be included with each Maestro system.

### Manual Control via GUI Control Panel

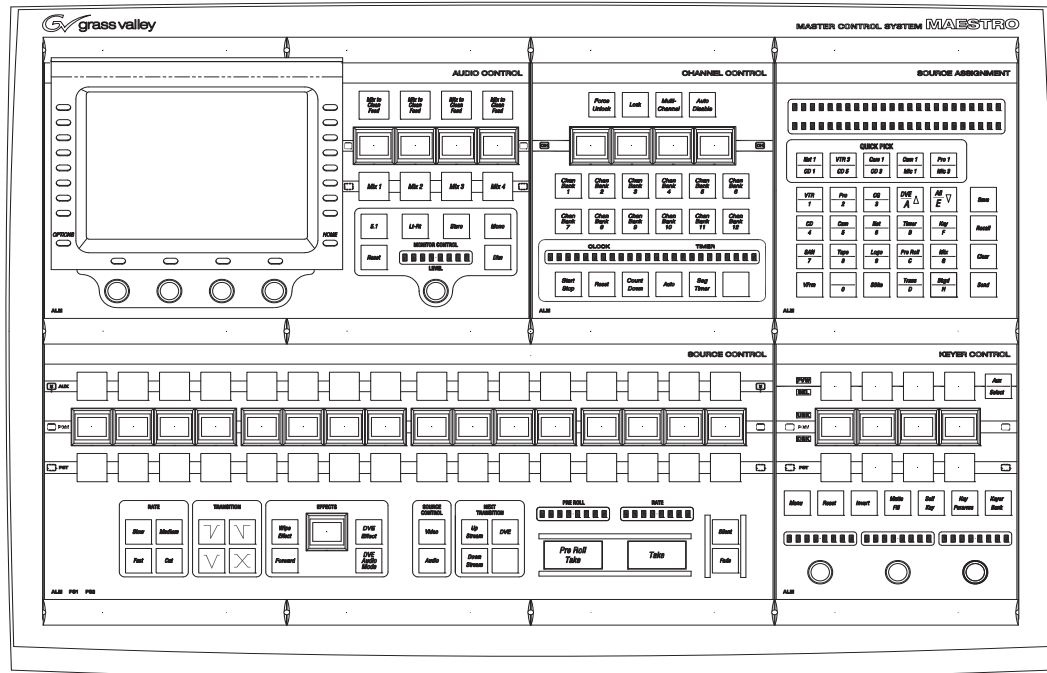
The GUI control panel, which consists of a 1600 x 1200 desk mounted monitor, a rack mounted PC, and a desk mounted/rack mounted keyboard, is available as a turn-key package from Grass Valley. (Rack mounting the monitor requires the MAE-GUI-BRKT option.) Most Maestro control functions are available on the GUI panel. A “video overlay” option can be added to display Preset and Program video on the GUI screen if desired. For ordering information, see [page 95](#).

Use of a customer-supplied PC and monitor as a GUI control panel is not recommended.

## Manual Control via Hardware Control Panel

Maestro hardware control panels are available in two standard versions: the MAE-4X2STD-CP (shown in [Figure 17](#)) and the MAE-5X2STD-CP.

Figure 17. MAE-4X2STD-CP Hardware Control Panel



The 4X2STD-CP includes the following:

- MAE-AUD-CP Audio Control Panel
- MAE-CHN-CP Channel Control and Clock/Timer Sub Panel
- MAE-ASN-CP Source Assignment Control Sub Panel
- MAE-SRC-CP Source Control Sub Panel
- MAE-KEY-CP Keyer Control Sub Panel

The MAE-5X2STD-CP has space for an additional two sub panels: an additional MAE-KEY-CP Keyer Control Sub Panel and a blank sub panel, or two blank panels. For more information about optional sub panels, see [Table 13](#) on page 96.

The hardware control panel is designed to be flush-mounted in a custom console (see [Figure 18](#) and [Figure 19](#)). The console should be angled toward the operator to provide better readability of the displays and front panel markings. The control panel should not be mounted in such a way as to block the ventilation holes on the sides, bottom, and rear of the chassis. Due to cooling and mechanical requirements, the panel cannot be installed as a “tabletop” device.

Figure 18. Cabinet Cutout Dimensions for MAE-4X2STD-CP Hardware Control Panel.

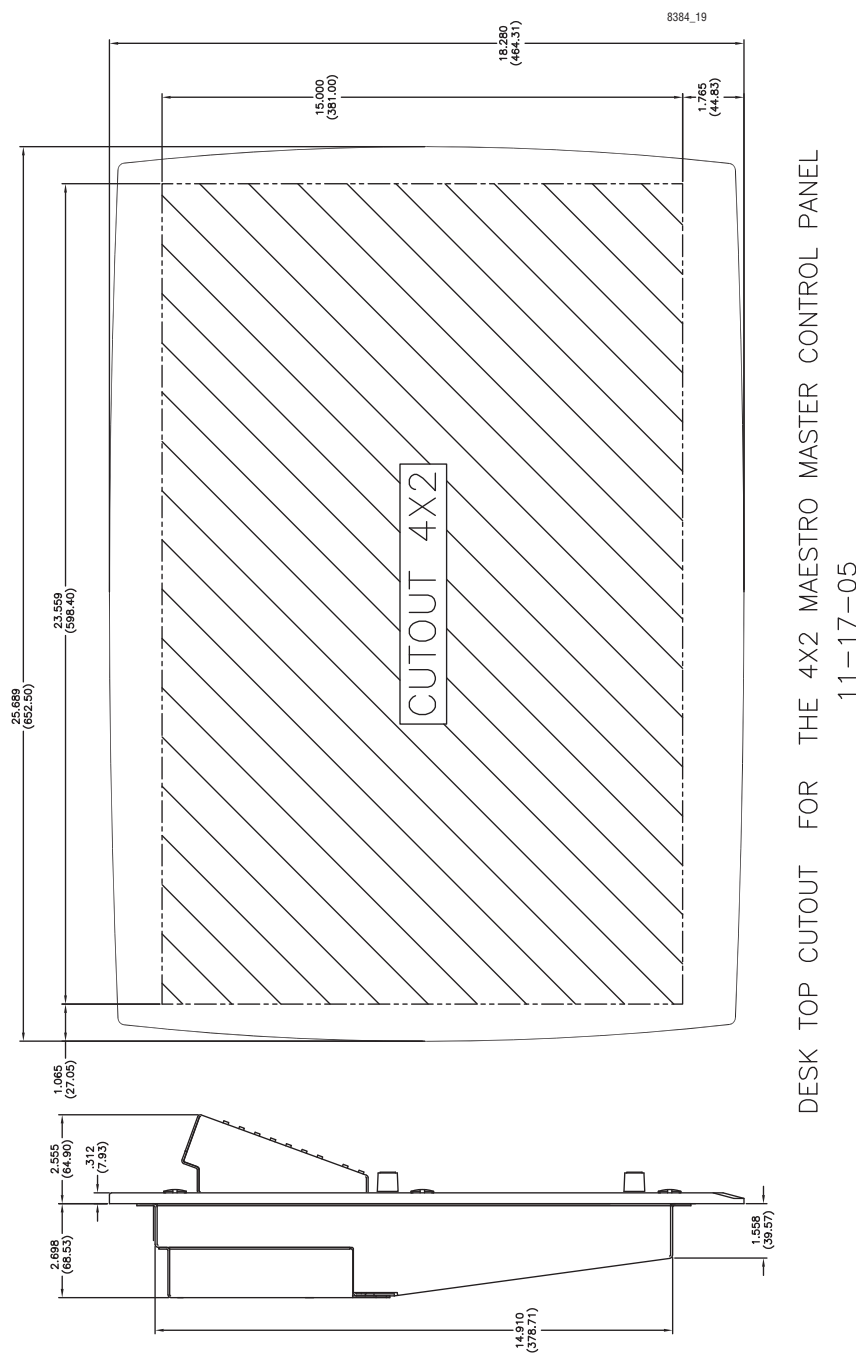
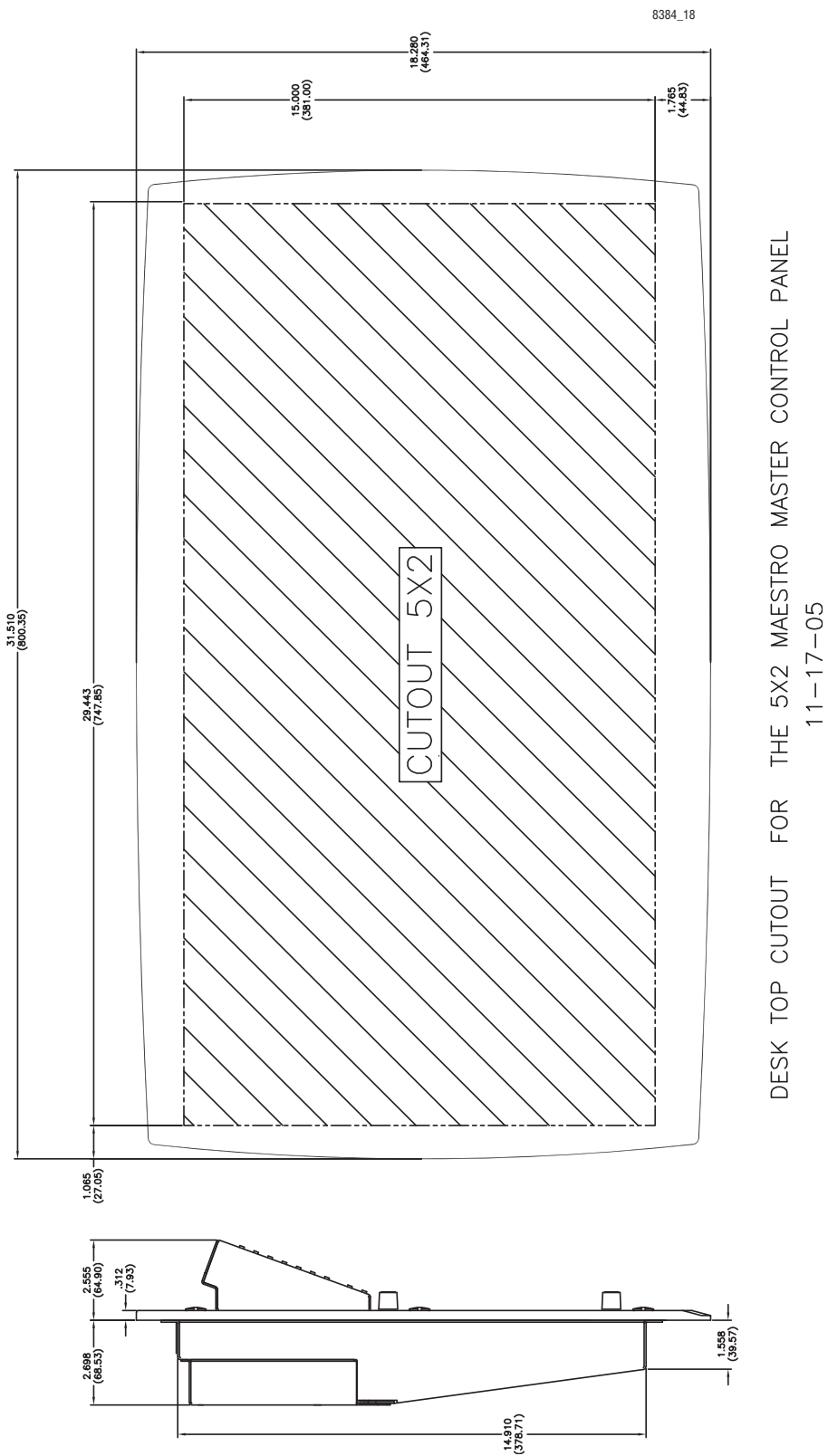


Figure 19. Cabinet Cutout Dimensions for MAE-5X2STD-CP Hardware Control Panel



## Router Control

Encore is connected using Ethernet LAN.

Jupiter is connected using either Ethernet LAN (CM-4000) or serial cable (VM-3000).

## Router type

All Maestro systems require the use of a GV-controlled matrix router (there is no “internal matrix” option).

If a Concerto board is installed in a Maestro/Concerto frame, it should be understood that there are no inter-frame connections between the Maestro board(s) and the Concerto board(s) other than a power bus. Video, audio, LAN, etc. cables must therefore be installed to connect Concerto rear panels to Maestro rear panels.

## Keyers

All systems include four key inputs. Keys can be inserted “upstream” (paired with the background video) or “downstream” (not affected by background video transitions).

**Note** Maestro includes eight keyers. Sources from the four key cut/key fill inputs may be assigned to any of the eight keyers; however, only four keyers can be on air simultaneously. A future branding engine option will provide internal storage of additional key sources which may also be assigned to any of the eight keyers. With the branding engine installed, it will be possible to have all eight keyers on air simultaneously.

When a key is operated in “external” mode (that is, using a fill signal with a cut signal), the fill and cut connectors are operated as fixed pairs. For example, KF1 (Key Fill 1) will always be paired with KC1 (Key Cut 1), KF2 will always be paired with KC2, etc. See [Figure 32 on page 79](#). Typically, the key and fill signals arrive from a Maestro-controlled router, and the Key Fill Association table is used to configure the Key/Fill pairs. For example, if a character generator fill signal is selected for KF1, the CG’s cut signal will be routed automatically to KC1.

If instead the key signals do not pass through a Maestro-controlled router, they are referred to as “direct key” inputs; in this case the operator must manually switch the fill and key signals to the appropriate connector pairs. For example, if the fill signal is switched to KF1, then the cut signal must be switched to KC1. (Unlike Saturn, there is no special configuration entry to permit other associations such as KF1 to KC2, etc.)



## Audio Mixers

All systems include two audio mix-over inputs and four audio mixers

**Note** Maestro includes four audio mixers. Sources from the two external audio over inputs may be assigned to any of the four audio mixers; however, only two mixers can be on air simultaneously. A future branding engine option will provide internal storage of additional audio sources which may also be assigned to any of the four mixers. With the branding engine or MADI expansion, it is possible to have all four mixers on air simultaneously

All four audio mixers may also be utilized by installing a Sonata AES-to-MADI or analog-to-MADI converter. These 1RU converters accept up to 16 channels of audio per mixer and inputs this audio into Maestro via the MADI In connector on the rear panel. The planner should specify one of the Sonata units listed in [Table 4](#).

Table 4. Sonata Audio Converters

Part Number	Description
SON-AU2MADI	75 ohm unbalanced AES to MADI Converter
SON-AB2MADI	110 ohm balanced AES to MADI Converter
SON-AA2MADI	Analog audio to MADI Converter

For more information, please refer to the *Sonata Series Planning and Installation Manual*, part no. 071-8609-xx.

**Note** Audio mixers support AES or MADI audio input only. Embedded audio is not supported for audio mix overs. The Branding Engine option will allow the use of stored .WAV or .MP3 files for audio overs.

## 75 or 110 Ohm Audio Wiring

For 75 ohm systems, a MAE-BNC-RP Rear I/O panel should be specified for each Processor.

For 110 ohm systems, a MAE-DB25-RP Rear I/O panel should be specified for each Processor.

## Branding Engine

For graphics that are used repeatedly (such as a station logo), an internal graphic storage option is available.

## Digital Video Effects

The DVE option allows one video signal to be inserted into another. Effects transitions can be made using cuts, fades, or wipes. Transition speed is selected using the control panel.

The DVE hardware consists of a mezzanine board that mounts on the main processor board, and, in some cases, an AES-to-MADI converter.

For more information about the DVE option, please refer to [Section 5 DVE Configuration on page 229](#).

## System Monitoring

### Video

For monitoring purposes, duplicate outputs are provided for the Program, Preview, Clean Feed 1, and Clean Feed 2 video outputs.

### Audio

Maestro supports stereo and 5.1 surround audio monitoring. A system diagram for stereo monitoring is shown on [page 84](#); a diagram for 5.1 surround monitoring is shown on [page 85](#).

### Monitor Follow

In multi-Processor (multi-channel) systems, the control room monitors can switch automatically to the channel being controlled. This requires the video outputs and audio monitor outputs, and control room monitors, to be connected to the router.

For a diagram showing monitor follow wiring, see [page 86](#).

## General Purpose Inputs and Outputs (GPIO)

The Maestro GPIO connector presently supports the following applications:

- Source tally mode (Encore- or Jupiter-controlled systems)
- Bus tally mode (Jupiter/MI-3040 systems only)
- Maestro controlled by or controlling an external device, including another Maestro system, for receiving and sending transition status signals
- Insertion of Keys and Audio Mix Overs (see *Appendix B-Insertion of Keys and Audio Overs via GPI*)

For information on wiring the GPIO connector, see [44-pin Control Connectors on page 88](#)

### Tally

The Maestro identifies which input bus has been selected for the Program (Air) output, and this information can be used to operate an external tally light. Two tally modes are available:

- “Source tally” mode (stand-alone tally), and
- “Bus tally” mode (Jupiter/MI-3040 tally).

Source tally mode can be used with Encore or Jupiter-controlled systems but is limited to 16 GPO closures. Bus tally mode can be used to operate tally lights for any or all sources controlled by a Jupiter system equipped with an MI-3040 General Purpose/Tally Interface.

#### Source Tally Mode (Stand-alone Tally)

In source tally mode, Maestro will identify which of up to 16 specified sources is on air and turn on a tally light located next to that source. The tally light is connected to the rear-panel GPIO connector on the Maestro. See [Figure 20](#).

Figure 20. Hardware Connections for Source Tally Mode

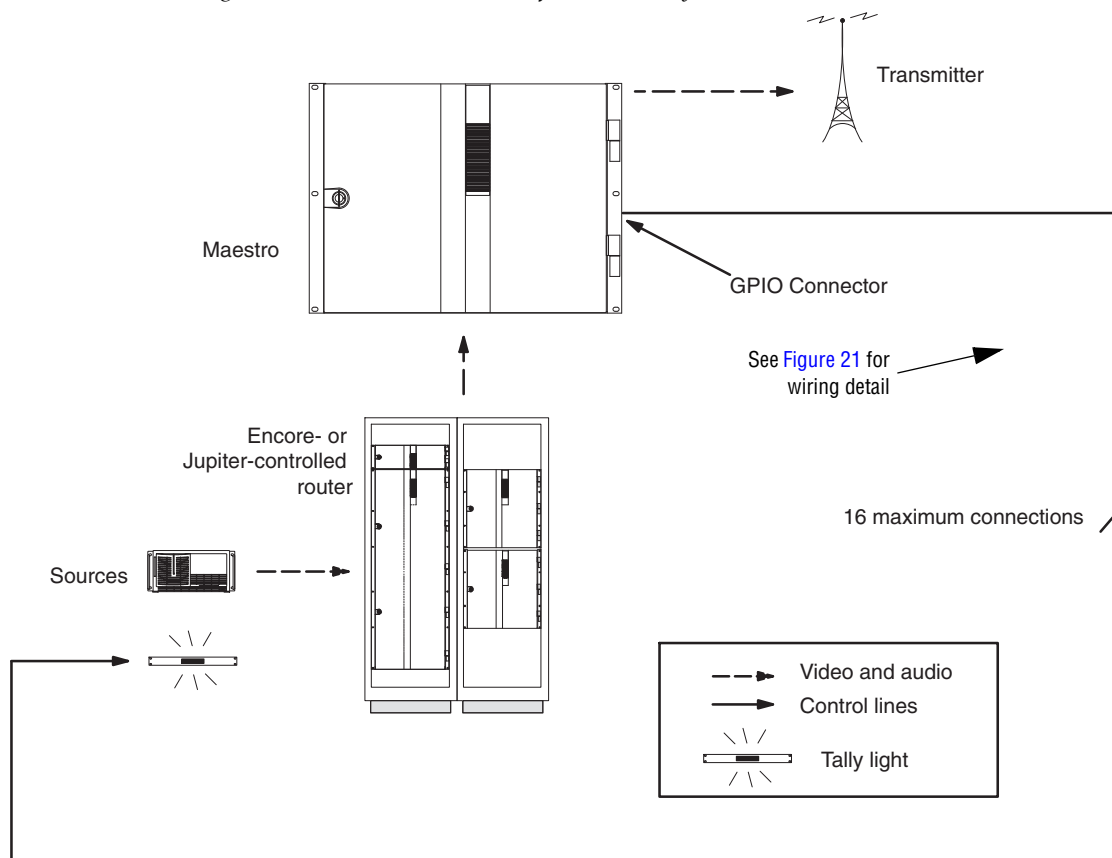
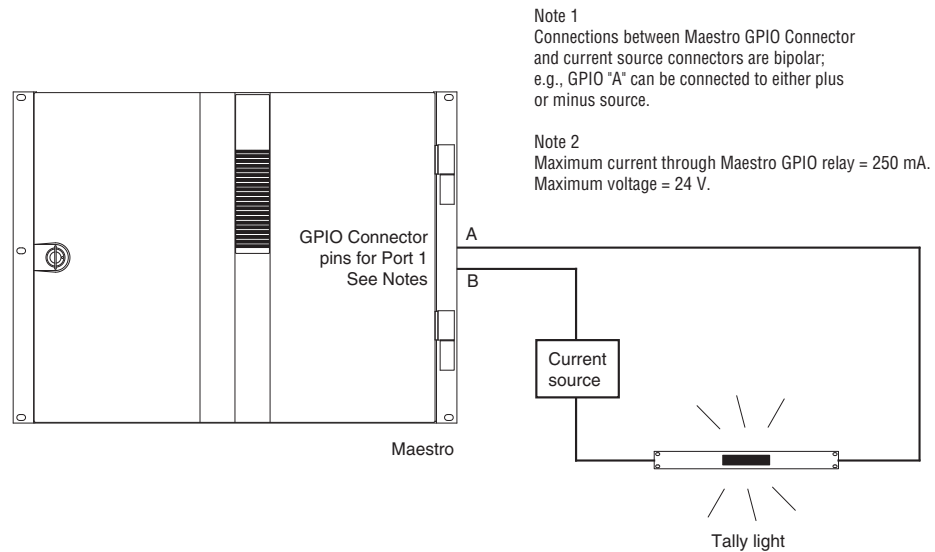


Figure 21. Example of Wiring for Single Port Connection between Maestro and Tally Light



For pinouts of the GPIO connector, see [Table 7 on page 88](#). For a diagram of the GPIO port circuitry, see [page 89](#).

### Bus Tally Mode (Jupiter Systems with MI-3040)

The GPIO connector on the Maestro rear panel can be configured to provide an indication as to which Maestro input bus has been selected for the Program (Air) output. The GPIO connector can be connected to a Jupiter Control System MI-3040 General Purpose/Tally Interface. The Jupiter Control System can be configured to determine which router input (source) is currently switched to the Maestro input bus that is on Air; Jupiter can then activate the appropriate MI-3040 relay connector in order to illuminate a tally light. See [Figure 22](#) and [Figure 23](#).

Figure 22. Hardware Connections for Jupiter/MI-3040 Tally

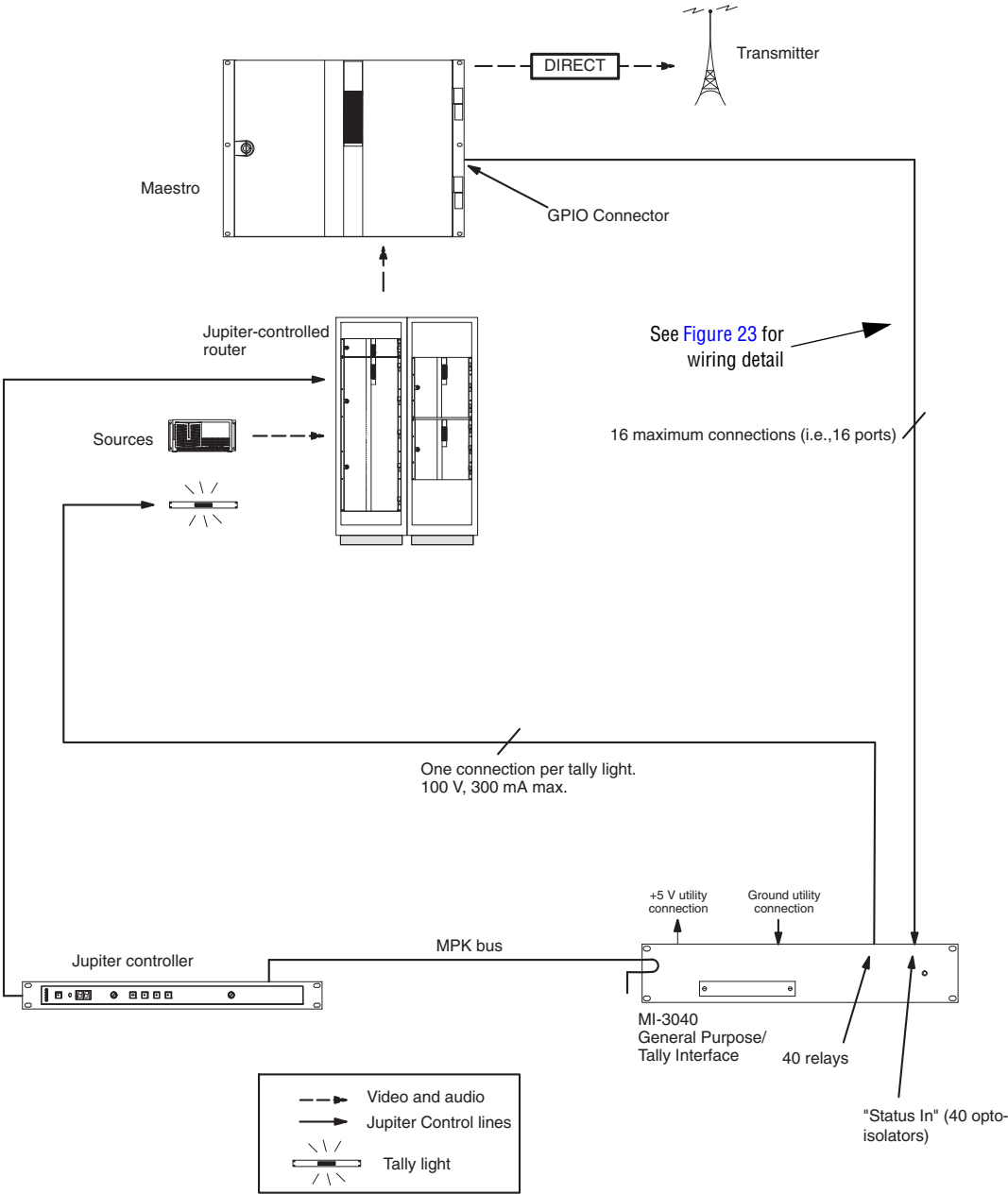
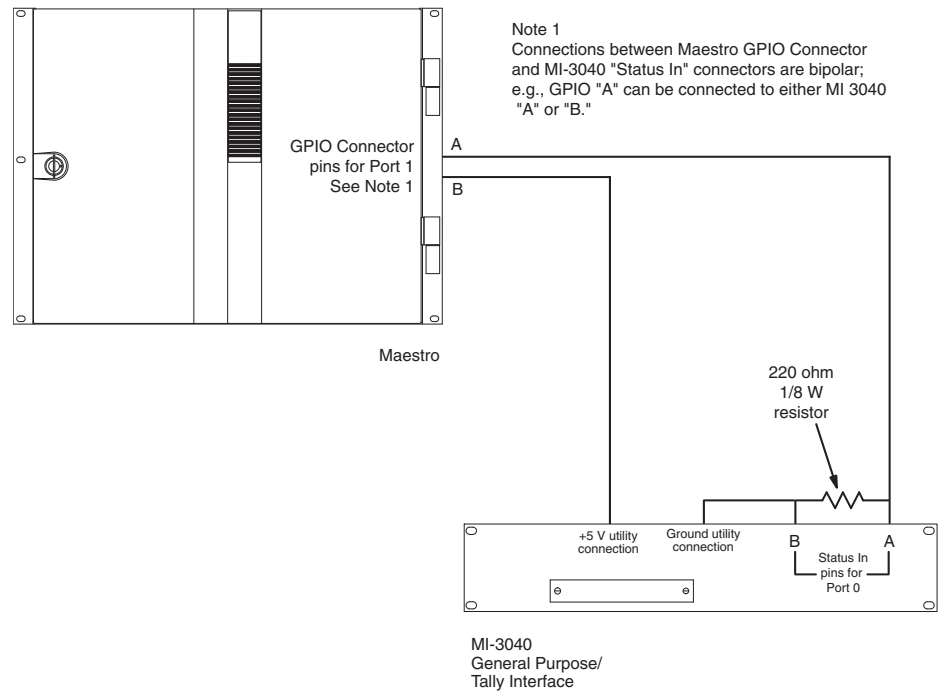


Figure 23. Example of Wiring for Single Port Connection between Maestro and MI-3040



The number of GPIO ports connected to the MI-3040 will vary according to system requirements; the maximum number is 16. Connections can be made in any order since the connectors are configured in software.

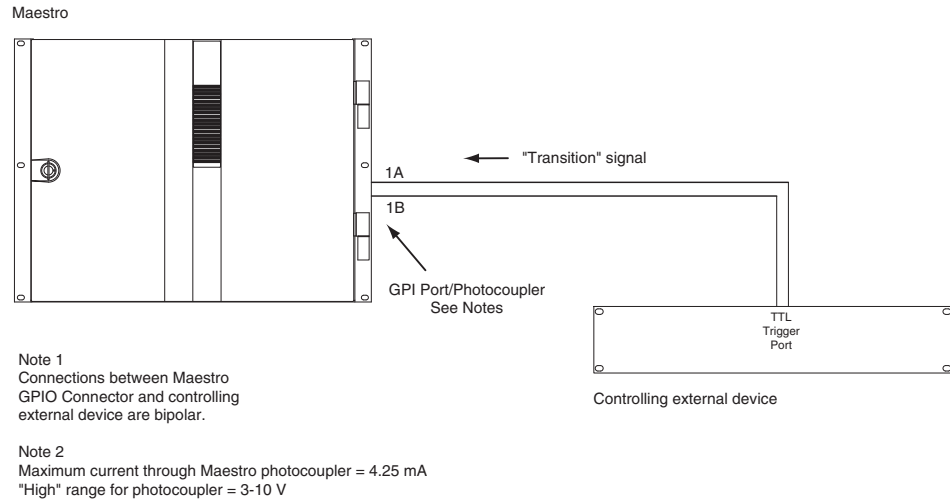
For pinouts of the GPIO connector, see [Table 7 on page 88](#). For a diagram of the GPIO port circuitry, see [page 89](#).

For pinouts of the MI-3040, and a description of the MI-3040 hardware, refer to the Jupiter manual.

## Maestro Controlled By or Controlling An External Device

The GPIO connector on the Maestro rear panel can be used to receive an “Action: Transition” signal from a controlling external device (Figure 24), or to transmit an “Action: Transition in Progress” signal to a controlled external device (Figure 25).

Figure 24. GPI Connections to External Controlling Device



When used to control an external device, Maestro systems require installation of a leakage-current swamping resistor in the GPO circuit. This resistor is used to prevent leakage current from reaching the external device when the Maestro photocoupler relay is open. The resistor is always placed across the input relay of the external device.

Figure 25 and Figure 26 show examples of connections to controlled external devices containing a small mechanical or solid-state relay, along with a suggested location and value for the swamping resistor. A supply voltage greater than +5 V can be used (up to + 10 V), but in that case the power rating of the resistor would need to be increased accordingly.



Figure 25. GPO Connections to External Controlled Device (Example1)

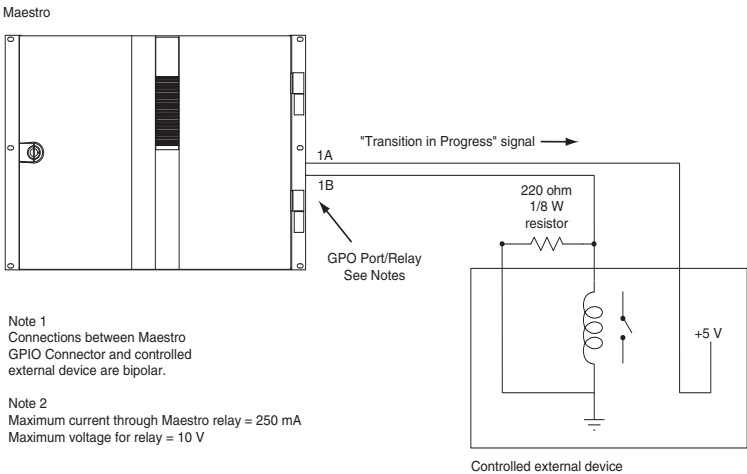
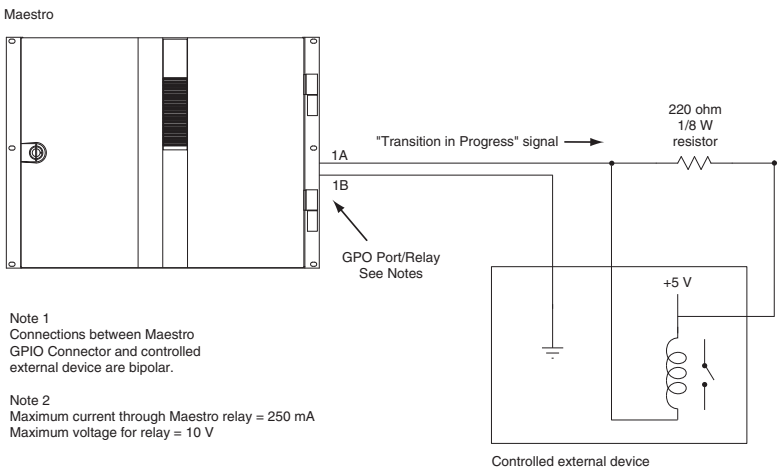


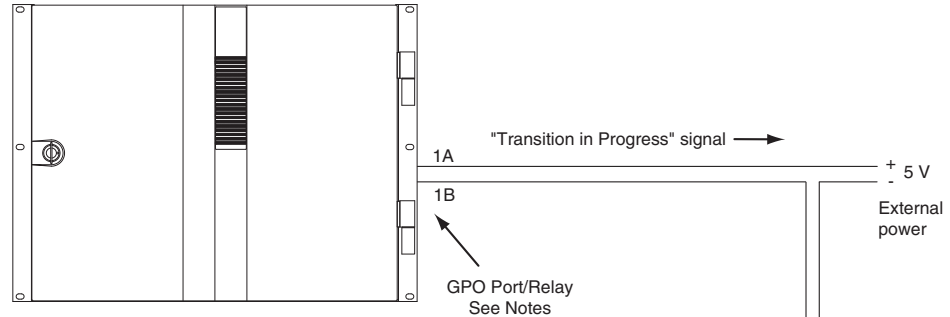
Figure 26. GPO Connections to External Controlled Device (Example 2)



It is also possible for one Maestro processor to control another. See [Figure 27](#).

Figure 27. Maestro-to-Maestro GPIO Connections

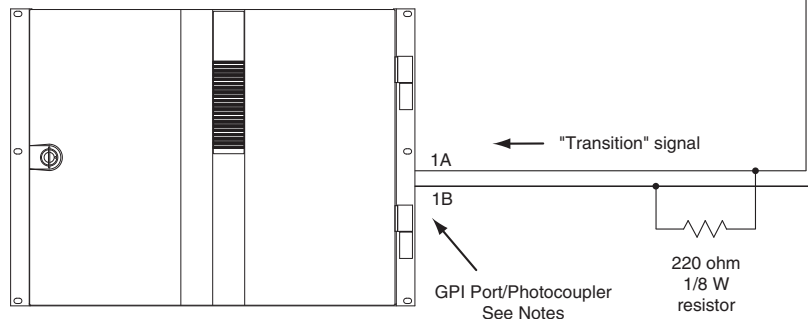
Controlling Maestro



Note 1  
Connections between Maestro  
GPIO Connector and controlled  
external device are bipolar.

Note 2  
Maximum current through Maestro relay = 250 mA  
Maximum voltage for relay = 10 V

Controlled Maestro



Note 3  
Maximum current through Maestro photocoupler = 4.25 mA  
"High" range for photocoupler = 3-10 V

**Note** Although the diagram above depicts two separate Maestro frames, the controlling and controlled Maestro processor may be located in same frame

The controlling Maestro would be configured to send a "Transition in Progress" signal (that is, by closing a GPO port relay) to indicate that the Maestro has initiated a Take.

The controlled Maestro would be configured to accept a "Transition" signal and respond by executing a Take command.

## **Insertion of Keys and Audio Overs**

Any of the eight keyers and four audio over mixers can be triggered by an external GPO (GPI in Maestro) signal. The GPI sub-system in Maestro that enables this functionality is called the EAS (Emergency Alert System) sub-system; however, any application in which external triggering of keyers and audio over mixers is required may use the EAS sub-system as defined in *Appendix B-Insertion of Keys and Audio Overs via GPI*

## **Emergency Alert System Switching**

In US installations, the GPIO connector on the Maestro rear panel can be connected to an Emergency Alert System (EAS) receiver and configured to switch the EAS video and audio automatically to the Program output when a trigger signal is received. For more information, please refer to *Appendix B-Insertion of Keys and Audio Overs via GPI*.

## System Protection

The hardware control panel is equipped with redundant power supplies.

A second power supply is available for the Processor frame as an option.

### Processor Backup Battery

Each Maestro Processor rear panel is equipped with a plug-in, rechargeable lithium-ion battery used to back up on-board Synchronous DRAM.

The battery is rated for approximately 36 hours or 500 power cycles.

The charge status of the battery can be checked in the Deployment Control Center. For the location of this battery, see [page 79](#).

### Alarm System

**Note** There is no electrical connection between the Processor, frame, and hardware control panel alarm systems.

#### Processor Alarm

Each Maestro Processor board has an independent alarm system for monitoring the following elements:

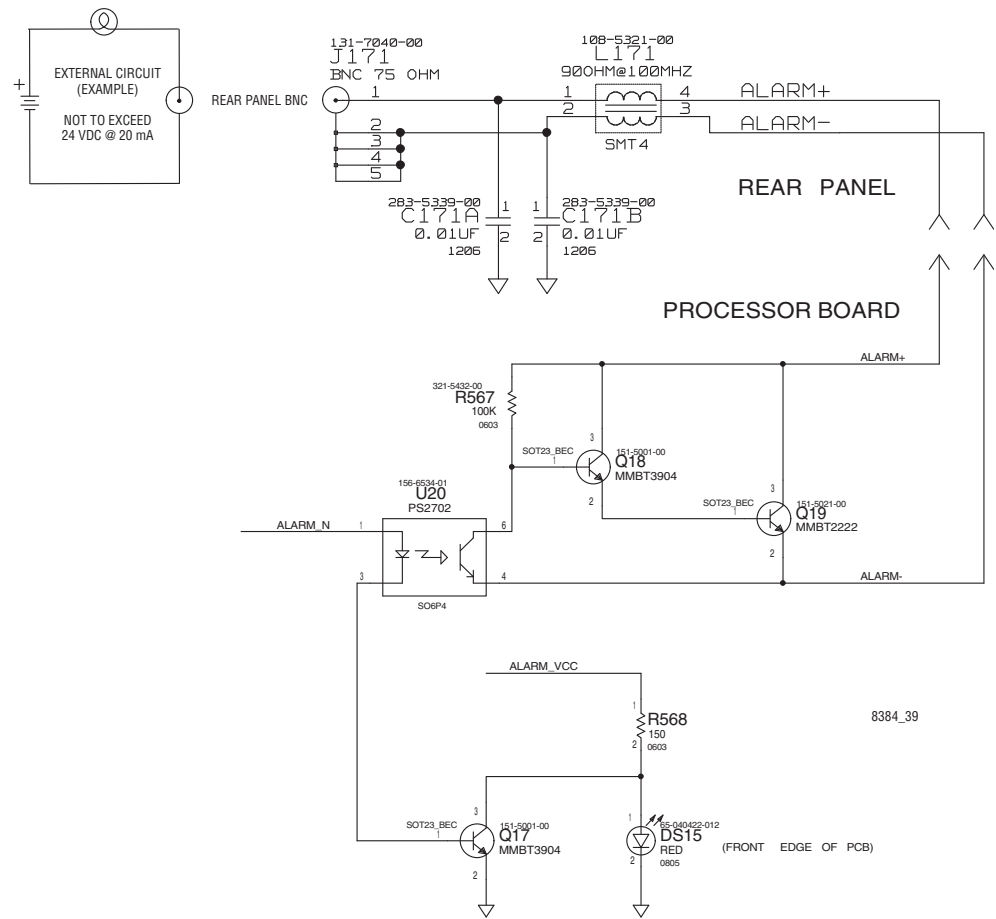
- On-board power supply voltage
- Board temperature
- CPU submodule running
- Genesis FPGA loaded
- Configuration FPGAs loaded

The alarm condition is indicated by a red LED on the front edge of the Processor board, and by a state change on the rear panel “Alarm” BNC.

#### Alarm BNC

Electrically, the Alarm BNC operates according to SMPTE standard 269M-1999. When an alarm is asserted, the circuit associated with the Alarm connector will present low impedance to an external current source circuit provided by the customer. See [Figure 28](#).

Figure 28. Example of Customer-supplied Indicator Circuit (Top Left) and Portions of Processor Alarm Circuit



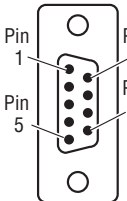
Frame Alarm

A separate alarm system is used to monitor the frame components other than the Maestro Processor.

Frame alarm conditions are: frame fan failure, frame power supply failure, or Concerto Matrix Controller module Reset.

Pinouts for the 9-pin D “Alarm” connector on the lower rear frame panel are shown in [Table 5](#).

Table 5. Alarm Pinouts

ALARM <sup>a</sup>	Pin	Function	Pin	Function
	1	-	6	ALARM1_COM
	2	ALARM1_NO	7	-
	3	-	8	-
	4	ALARM2_COM	9	ALARM2_NO
	5	GND	-	-

<sup>a</sup> Alarm contact closures are separate relay contacts.

“Alarm 1” is generated by Matrix Controller board 1, which is located in the top controller slot. “Alarm 2” is generated by the redundant controller in the bottom slot (if present).

The location of this connector is shown on [page 80](#).

The power supply alarm condition is also indicated by a red LED on the front of the supply.

Hardware Control Panel Alarms

Each of the Maestro hardware control panel sub panels includes a red LED indicator labeled “ALM”. This LED will be turned on for any of the following events:

- Improper initialization of the logic (This means that the FPGA did not load)
- Any of the sub panel’s power supplies being out of range.
- Receiving a command from the Control Panel Server to turn the alarm LED on.

In addition to the above, the Source Control panel has two additional red LEDs labeled “PS1” and “PS2”. These LEDs will be turned on if the corresponding DC-DC converter modules indicate a power fault.

The Maestro hardware control panel tub includes a SMPTE-type Alarm BNC that will indicate and alarm for any of the above conditions. In addition, the Alarm BNC will indicate an alarm condition if the Control Panel Server fails to properly initialize or any of its voltages are out of range. For more information about the Alarm BNC, see [page 72](#).

## Rack Space, Cooling, and Power Requirements

For mechanical, environmental, and electrical specifications, see [Appendix A-Specifications](#).

## Cabling Requirements

Figure 29. Single-channel HD Maestro, Encore Controller, Concerto Router

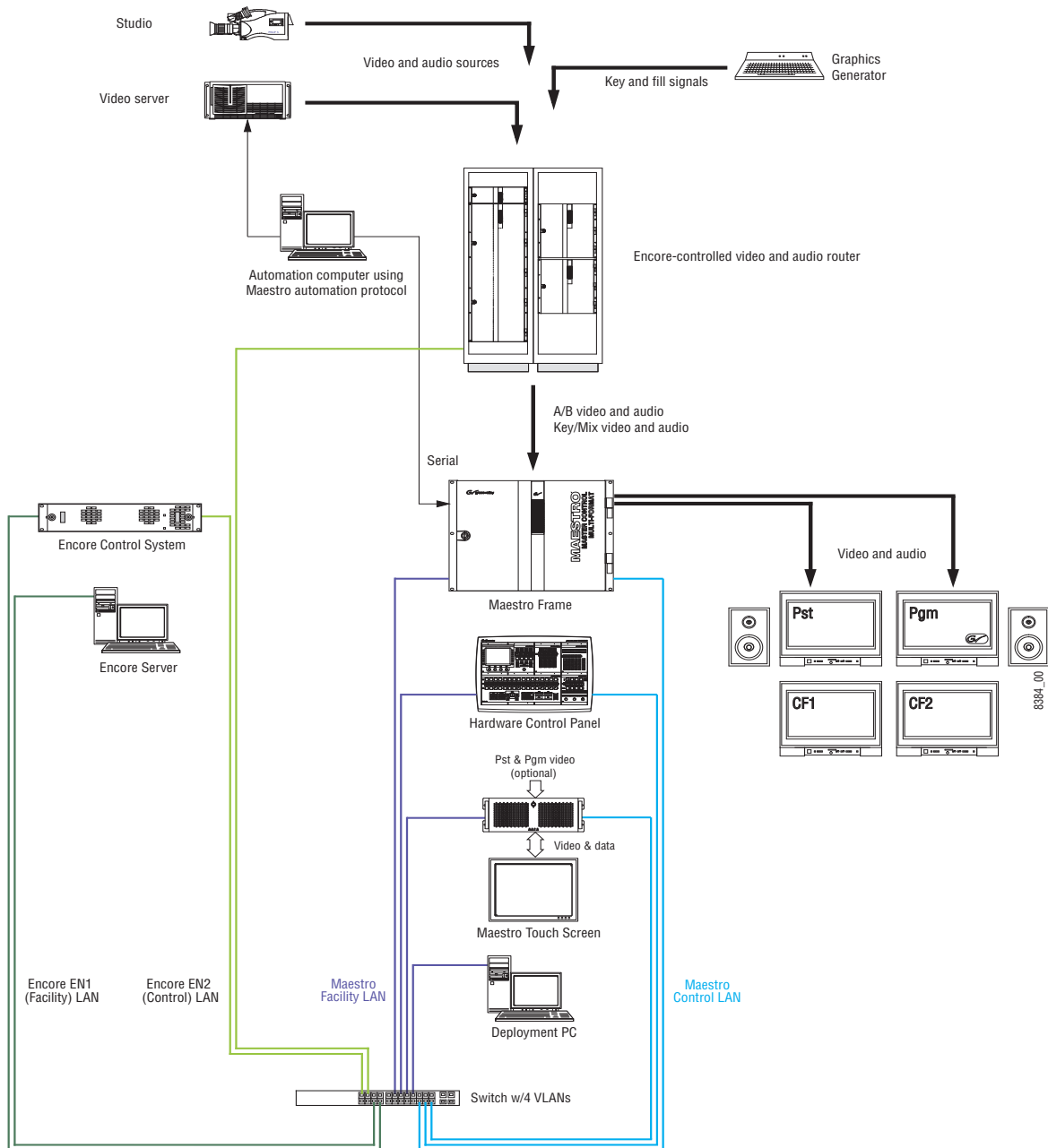




Figure 30. Single-channel HD Maestro, Jupiter Controller, Trinix/Apex Router

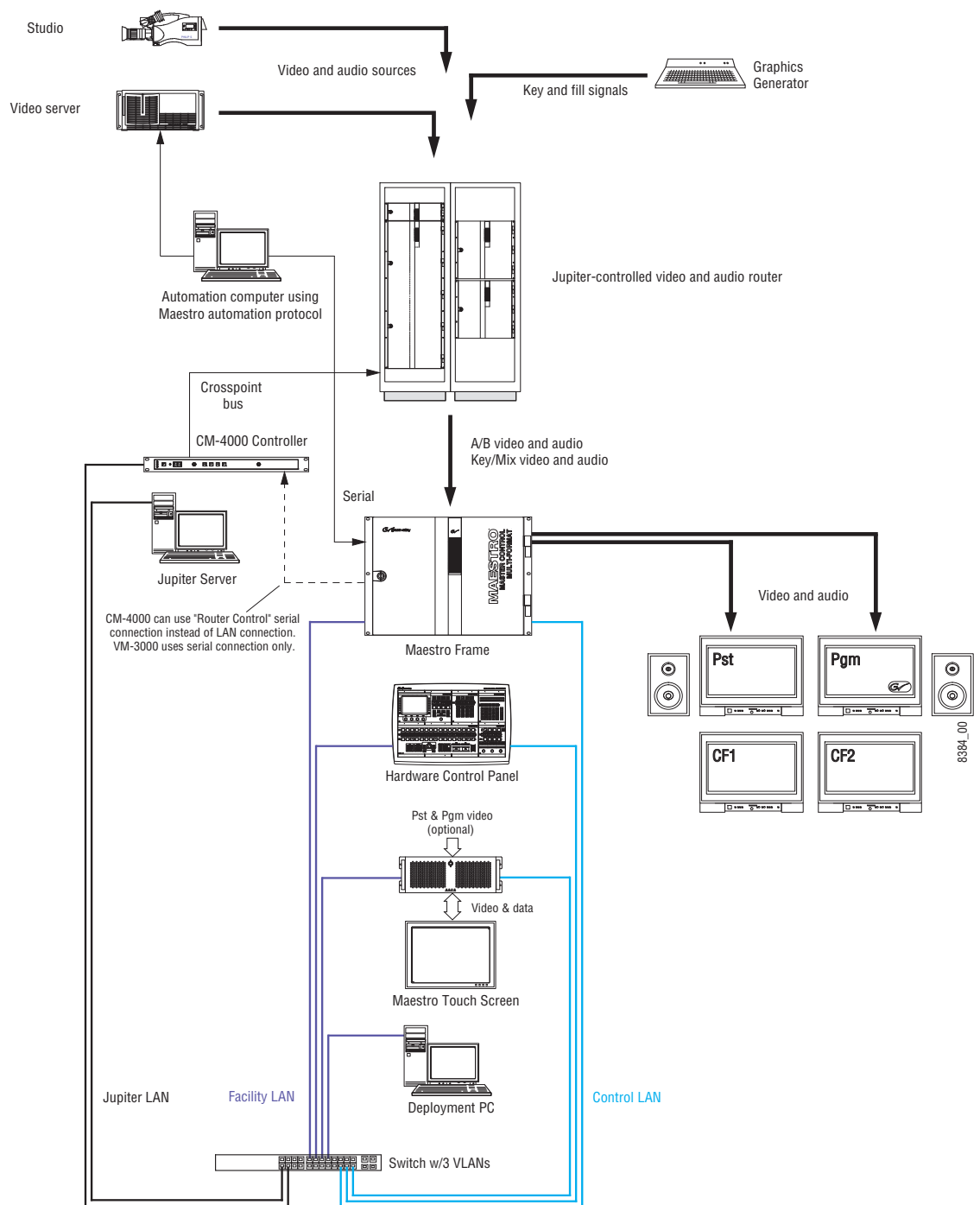
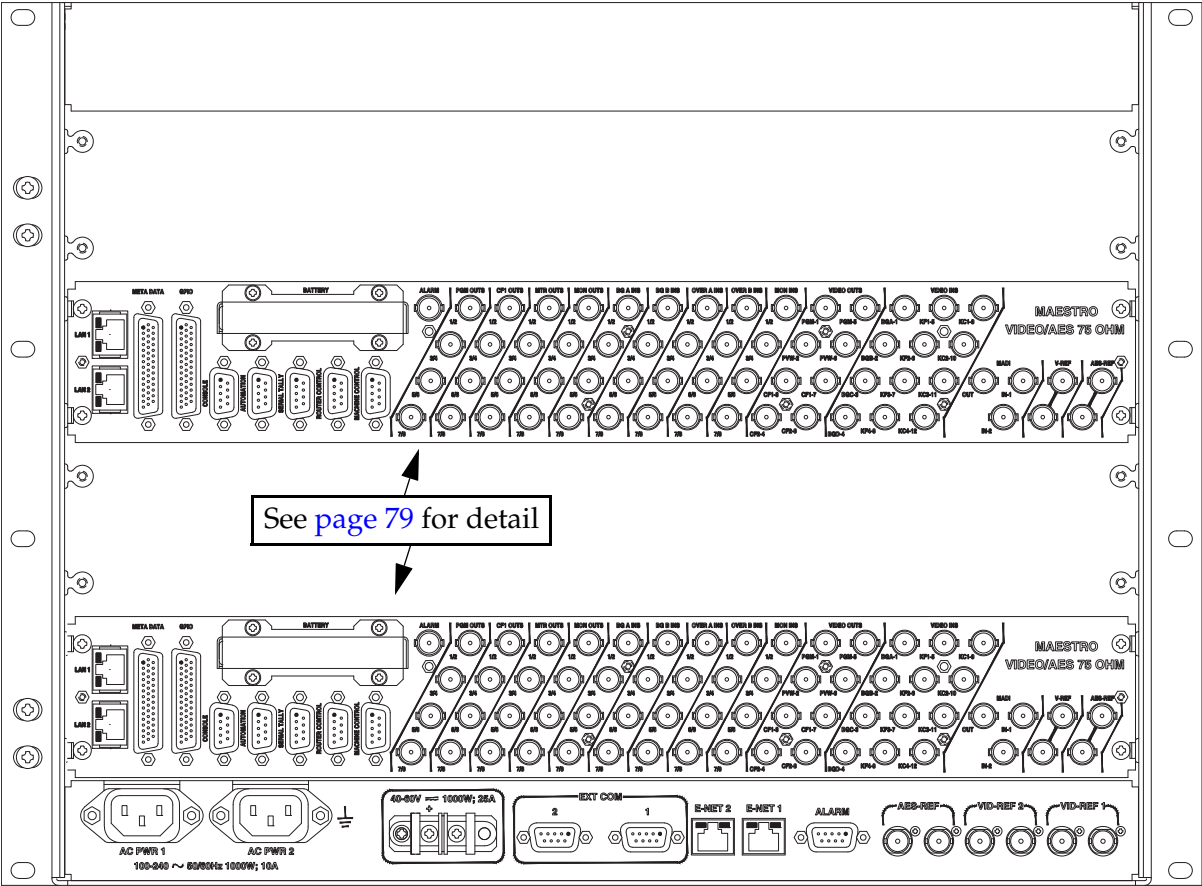


Figure 31. 8 RU Maestro/Concerto Frame with Two Maestro Processors (Channels)



8384\_09

Figure 32. Maestro Rear Panel, Showing 75- and 110-Ohm Audio Variants

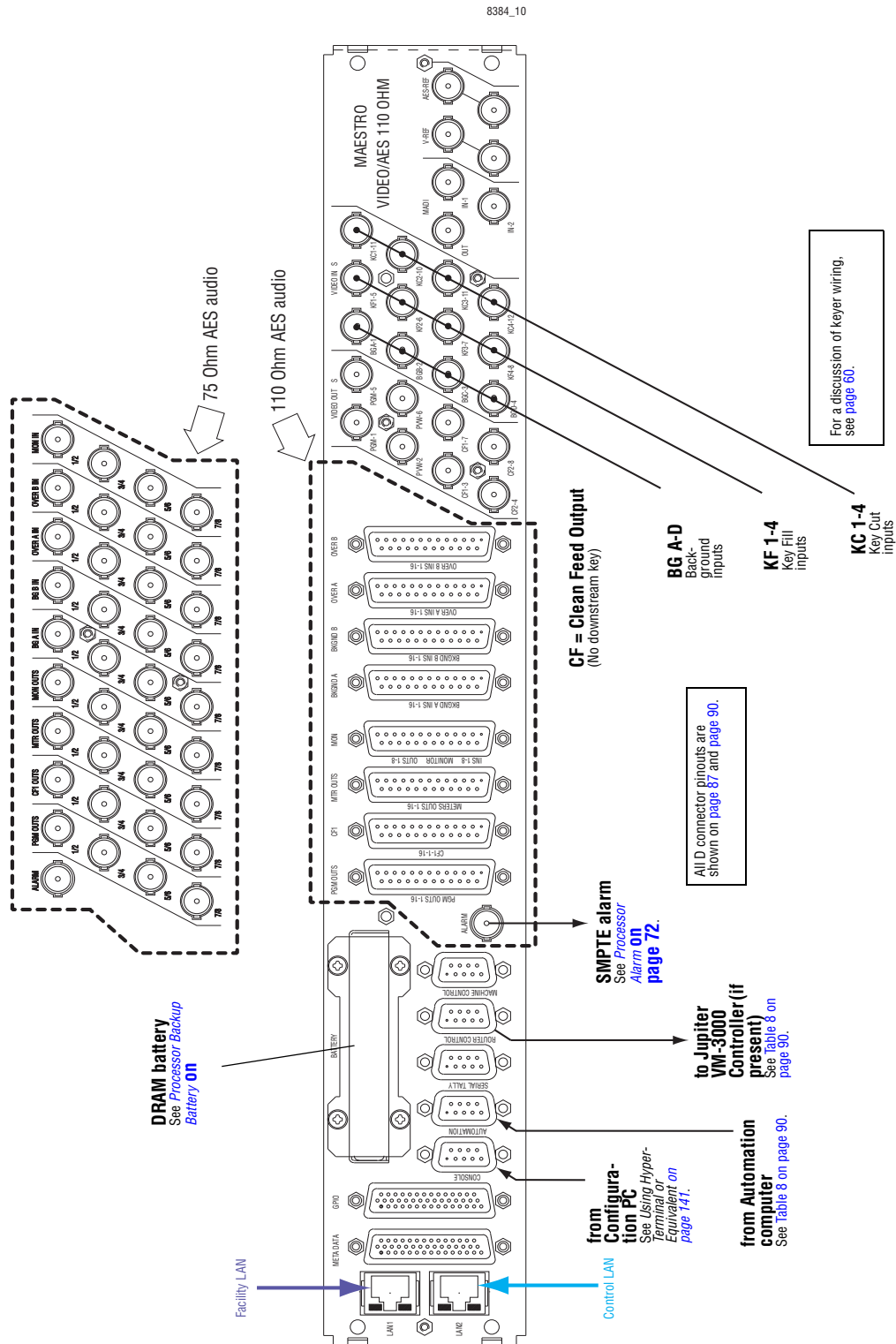


Figure 33. 8 RU Maestro/Concerto Frame Rear Panel

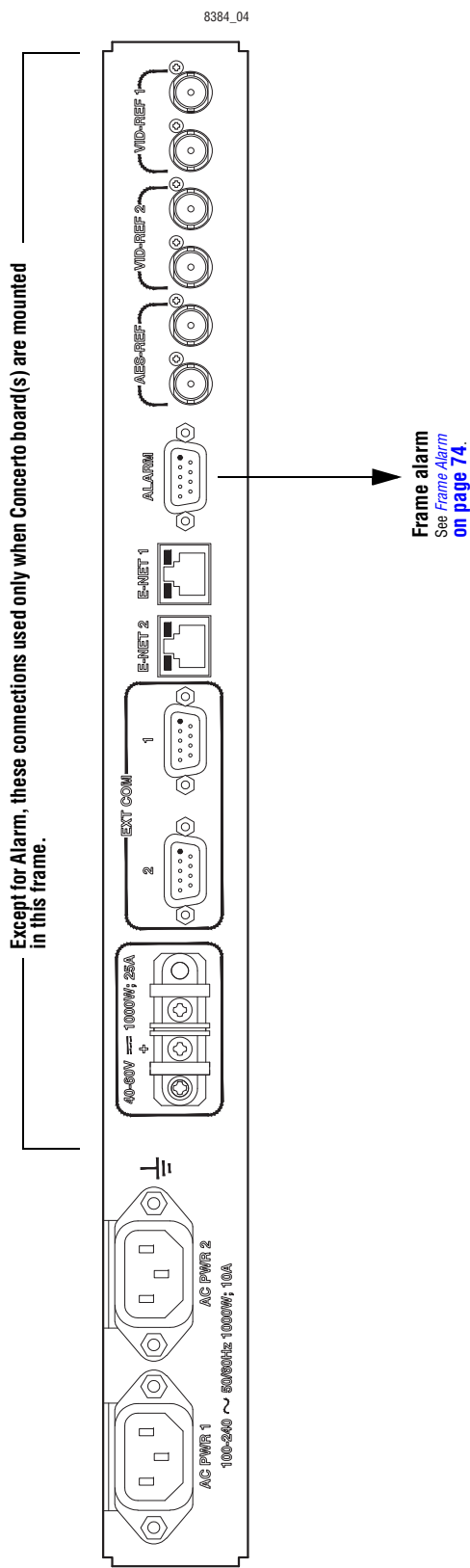


Figure 34. Video, Audio, and Reference Connections

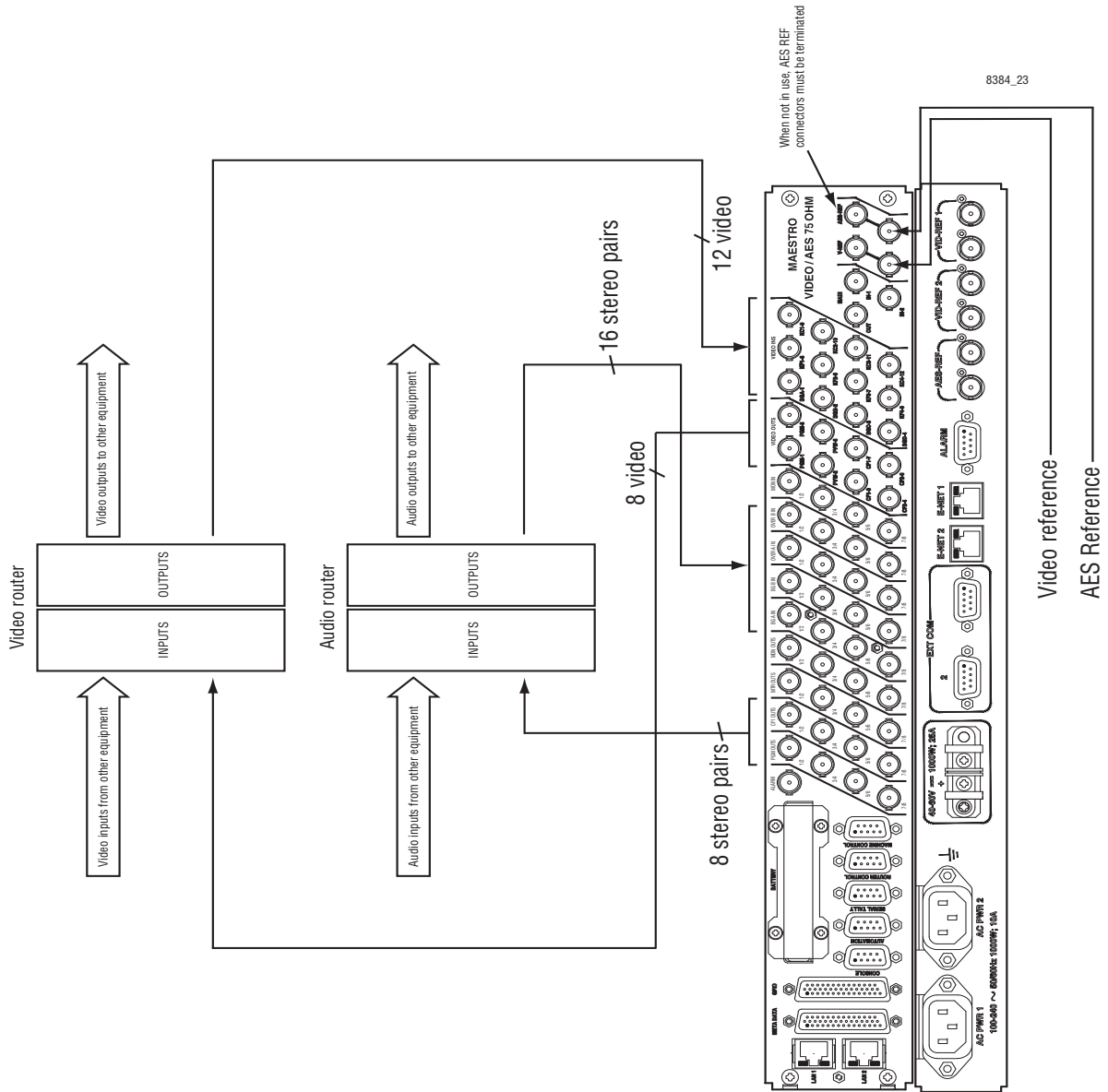
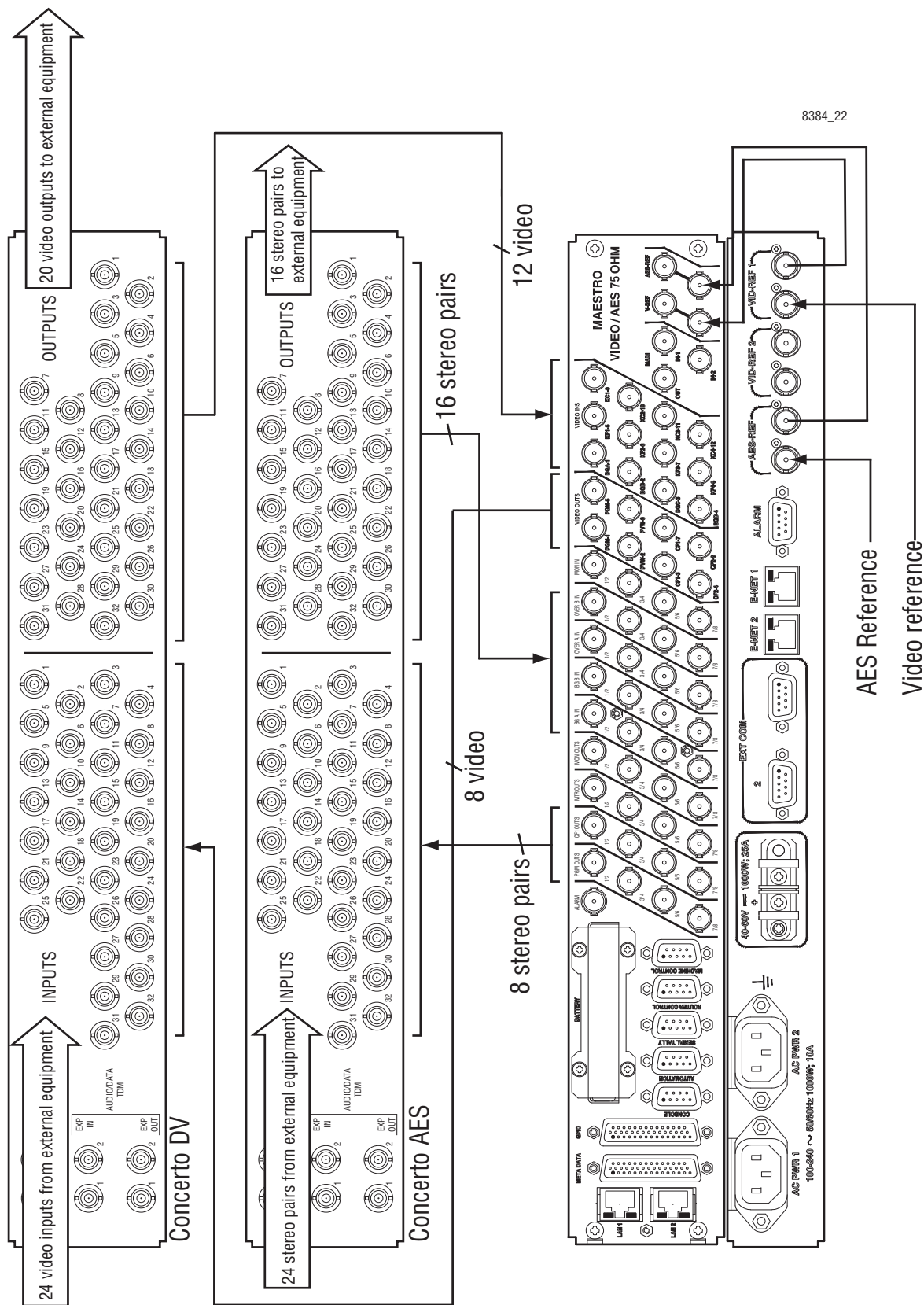


Figure 35. Example of Maestro-Concerto Interconnections (75 ohm AES)



8384\_22

## Dolby E Metadata Connections

Figure 36. Example of Metadata Connections for Systems with A & B Background Inputs. For Pinouts see [page 88](#).

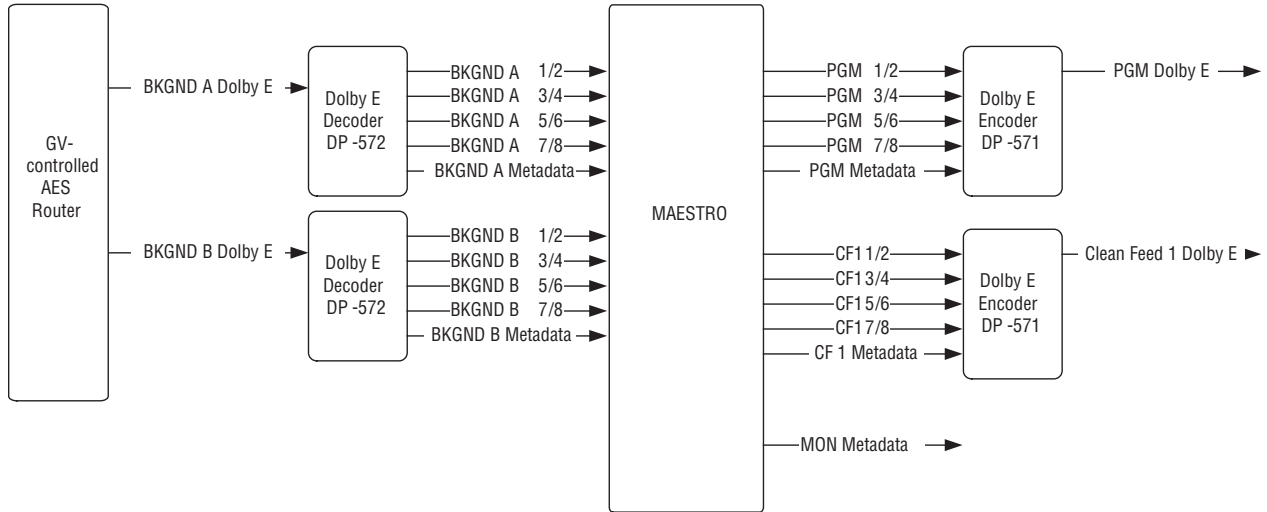


Figure 37. Example of Metadata Connections for Systems with A, B, and C Background Inputs (for example, Systems with DVE Option). For Pinouts see [page 88](#).

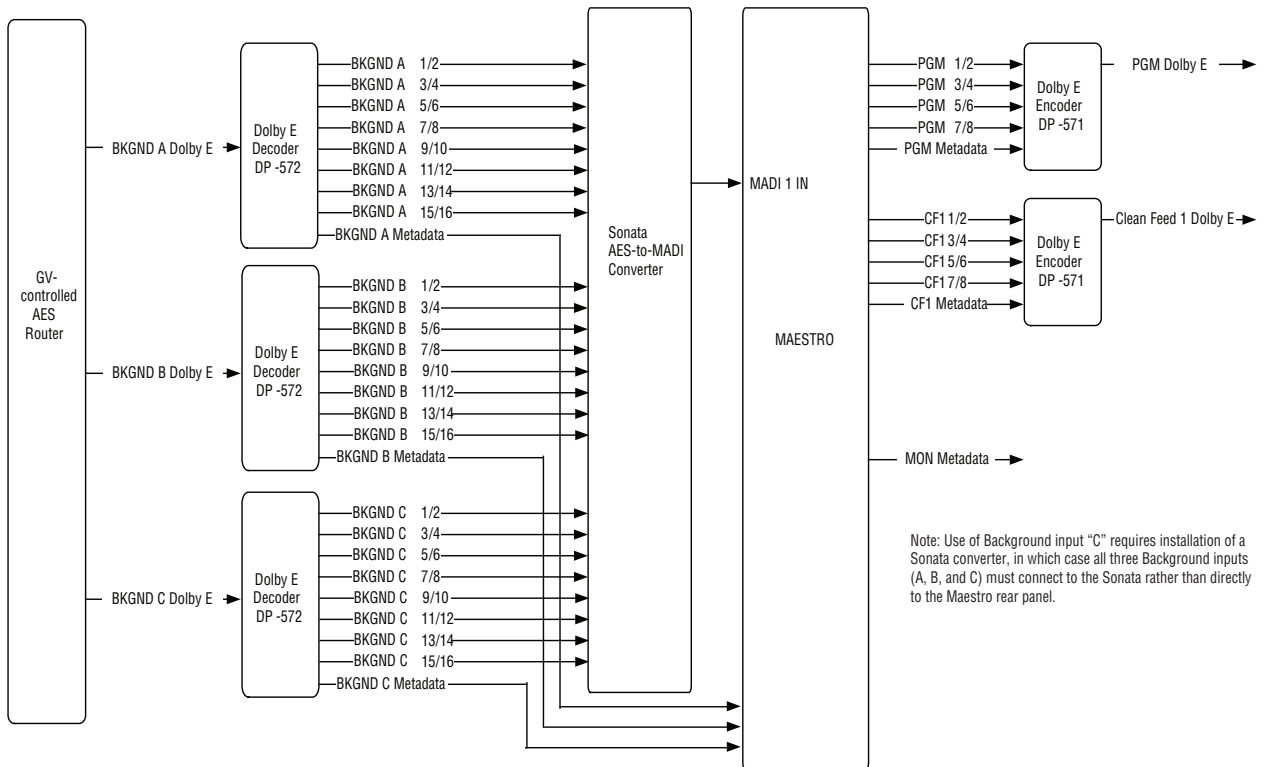


Figure 38. Audio Monitor Installation for 2-Channel Stereo

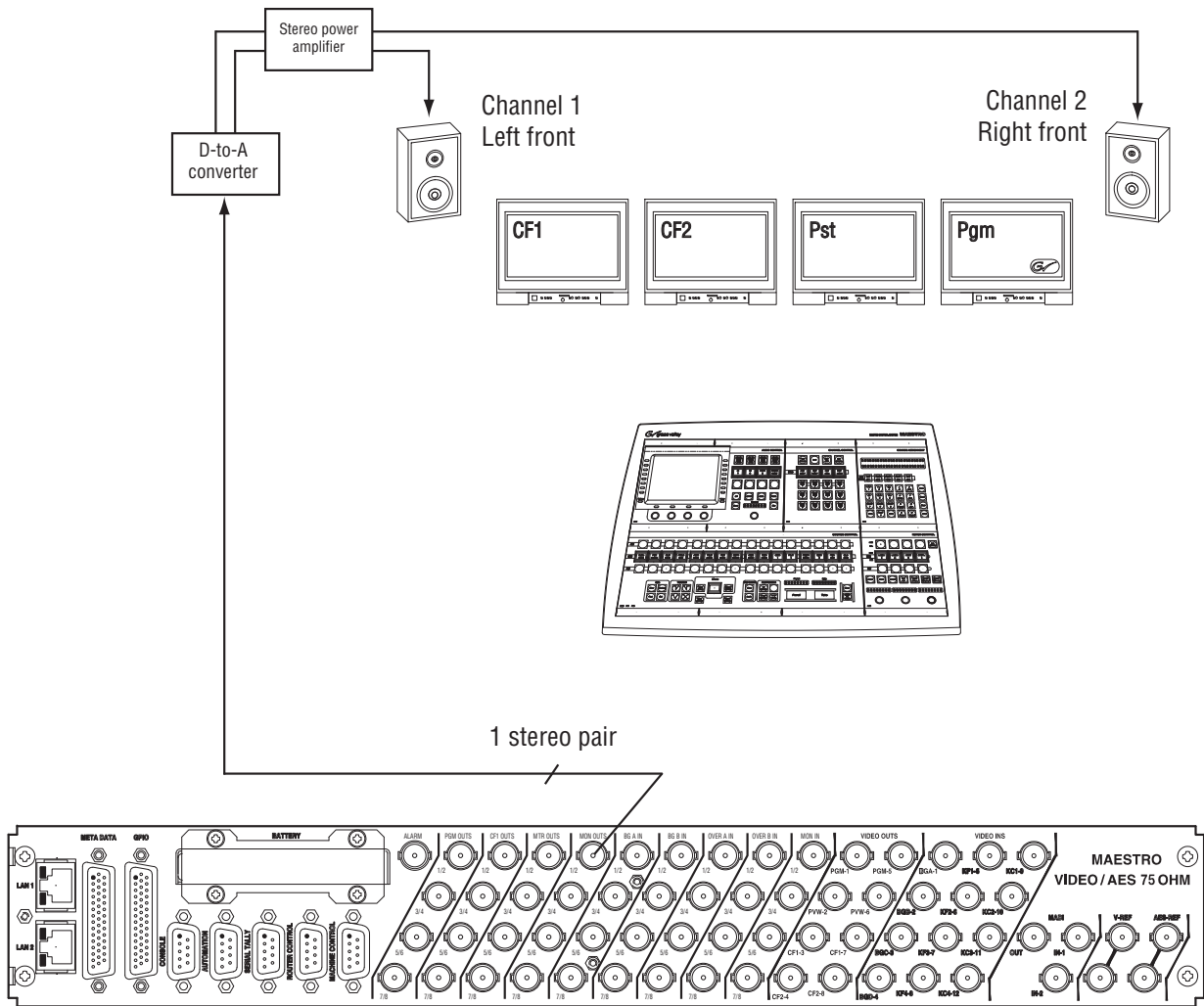
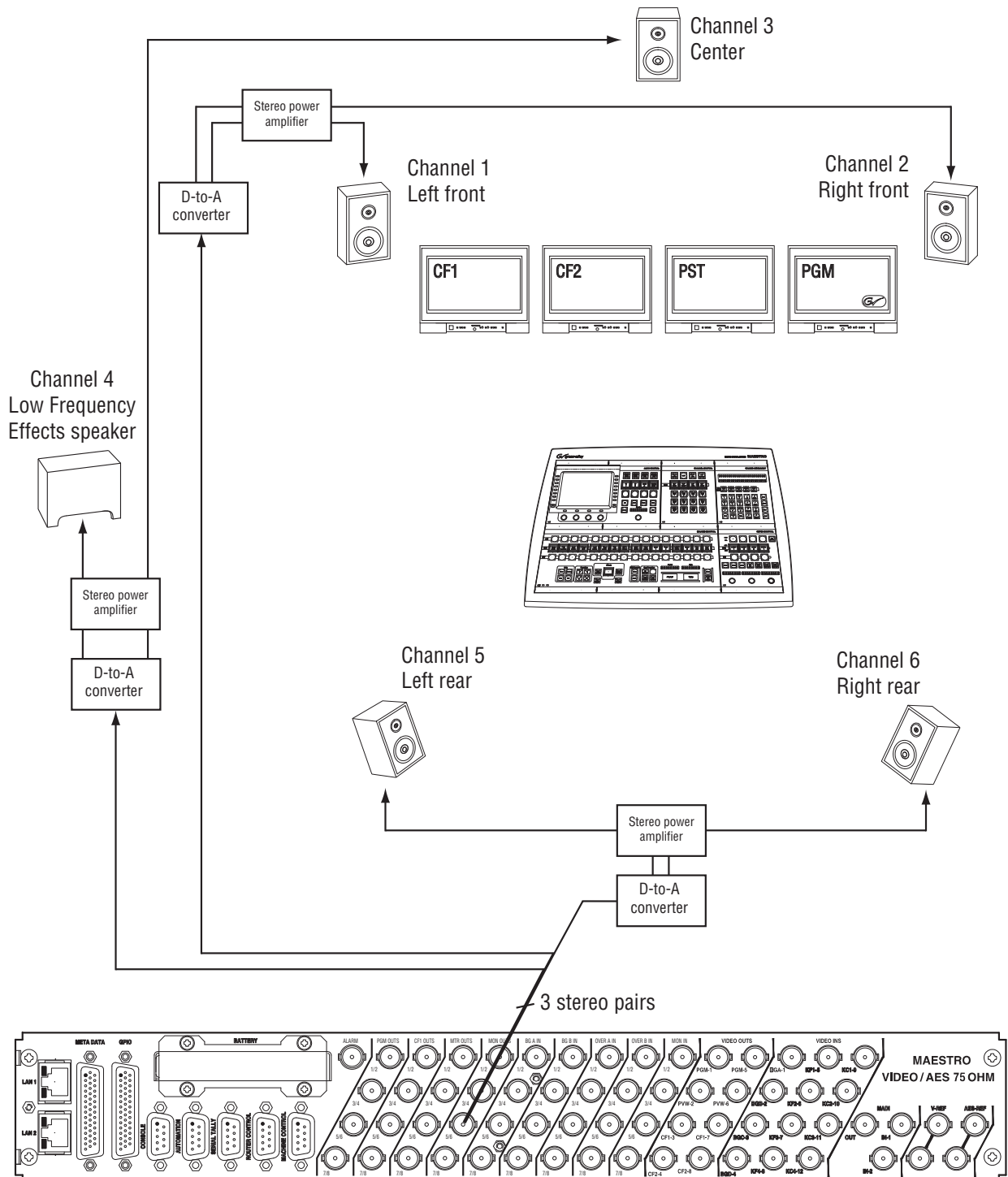




Figure 39. Audio Monitor Installation for 5.1 Surround Channels

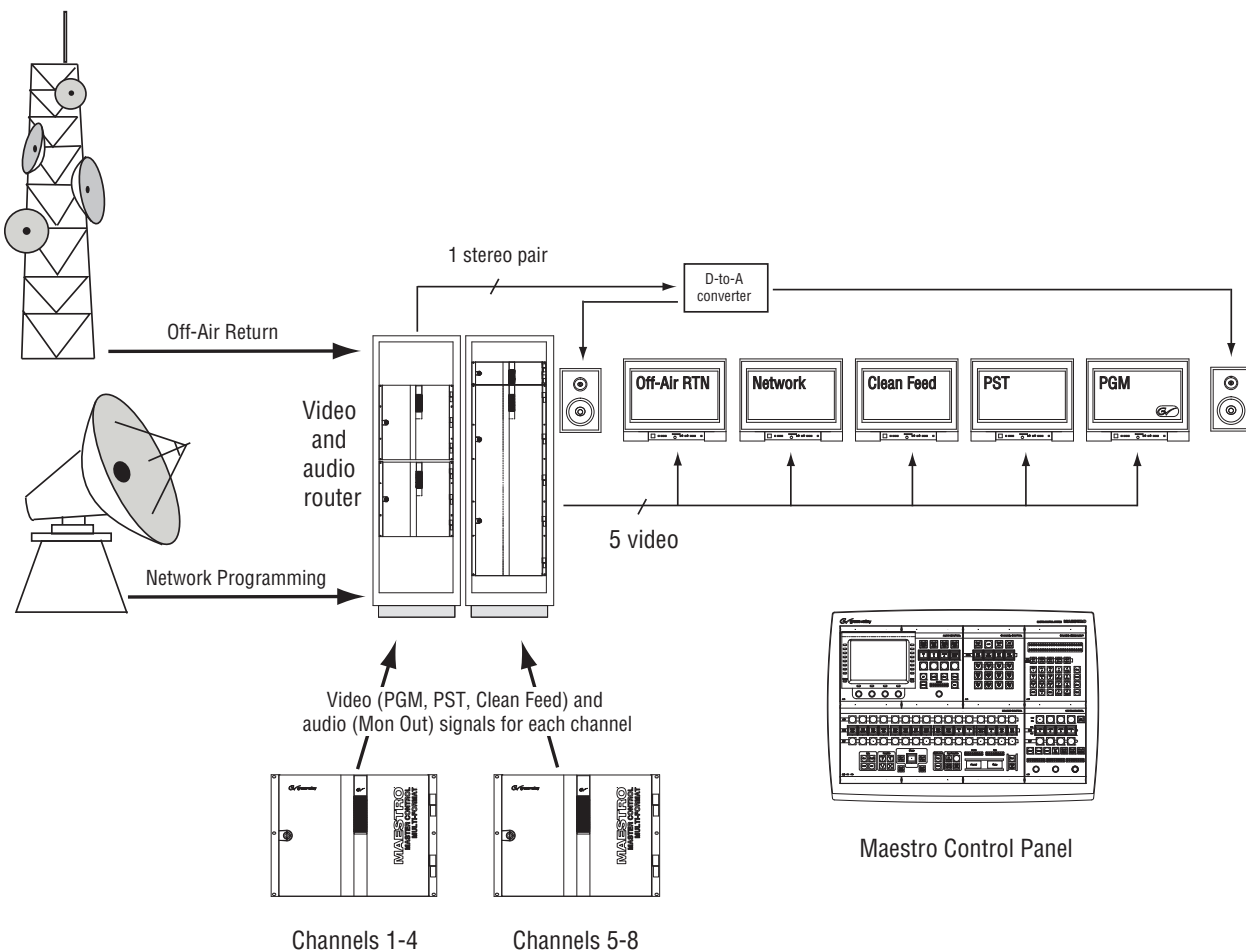


## Monitor Follow

In multi-Processor (multi-channel) systems, the control room monitors can switch automatically to the channel being controlled. This requires the video outputs and audio monitor outputs, and control room monitors, to be connected to the router.

In the example shown in [Figure 40](#), the operator is controlling eight Maestro channels from a single hardware control panel. During monitor follow operation, the monitor outputs of the channel being controlled are automatically switched to the control room monitors. Other router inputs, such as the off-air return, can be controlled as well.

Figure 40. Monitor Follow Operation



Although this example shows a control room equipped with stereo monitors, more speakers can be added (for example, to allow Dolby 5.1 monitoring).

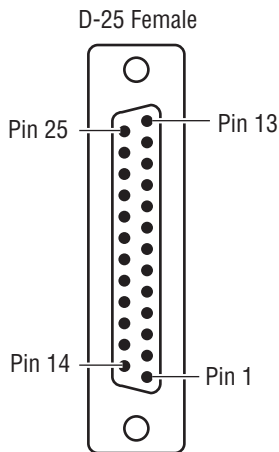
# 110 Ohm AES Audio Cables

Each 110 ohm AES connector accommodates balanced lines one through four (four stereo pairs). Pinouts for the 110 Ohm connectors are shown in [Table 6](#).

**Note** Although the 110-ohm 25-pin audio connector can accommodate wiring for up to eight stereo pairs (16 channels), only four stereo pairs (8 channels) are supported by Maestro. Up to 16 channels of audio per input (Background A, Background B, Background C and Background D) are supported by the Sonata AES-to-MADI converter. For more information, please refer to the *Sonata Series Planning and Installation Manual*, part no. 071-8609-xx.

Table 6. AES 110-ohm Audio Rear Panel, 25-pin Connector Pinouts

Shielded 25-Pin D; socket contacts	Pin	PROGRAM OUT	CF1 OUT	MTR OUT	MON IN MON OUT	BKGND A IN	BKGND B IN	OVER A IN	OVER B IN
	1	Pgm 8+	8+	Mtr 8+	Air mon in 4+	8+	8+	8+	8+
	2	GND	GND	GND	GND	GND	GND	GND	GND
	3	Pgm 7–	7–	Mtr 7–	Air mon in 3–	7–	7–	7–	7–
	4	Pgm 6+	6+	Mtr 6+	Air mon in 2+	6+	6+	6+	6+
	5	GND	GND	GND	GND	GND	GND	GND	GND
	6	Pgm 5–	5–	Mtr 5–	Air mon in 1–	5–	5–	5–	5–
	7	Pgm 4+	4+	Mtr 4+	Mon out 4+	4+	4+	4+	4+
	8	GND	GND	GND	GND	GND	GND	GND	GND
	9	Pgm 3–	3–	Mtr 3–	Mon out 3–	3–	3–	3–	3–
	10	Pgm 2+	2+	Mtr 2+	Mon out 2+	2+	2+	2+	2+
	11	GND	GND	GND	GND	GND	GND	GND	GND
	12	Pgm 1–	1–	Mtr 1–	Mon out 1–	1–	1–	1–	1–
	13	NC	NC	NC	NC	NC	NC	NC	NC
	14	Pgm 8–	8–	Mtr 8–	Air mon in 4–	8–	8–	8–	8–
	15	Pgm 7+	7+	Mtr 7+	Air mon in 3+	7+	7+	7+	7+
	16	GND	GND	GND	GND	GND	GND	GND	GND
	17	Pgm 6–	6–	Mtr 6–	Air mon in 2–	6–	6–	6–	6–
	18	Pgm 5+	5+	Mtr 5+	Air mon in 1+	5+	5+	5+	5+
	19	GND	GND	GND	GND	GND	GND	GND	GND
	20	Pgm 4–	4–	Mtr 4–	Mon out 4–	4–	4–	4–	4–
	21	Pgm 3+	3+	Mtr 3+	Mon out 3+	3+	3+	3+	3+
	22	GND	GND	GND	GND	GND	GND	GND	GND
	23	Pgm 2–	2–	Mtr 2–	Mon out 2–	2–	2–	2–	2–
	24	Pgm 1+	1+	Mtr 1+	Mon out 1+	1+	1+	1+	1+
	25	GND	GND	GND	GND	GND	GND	GND	GND



## Control Cables

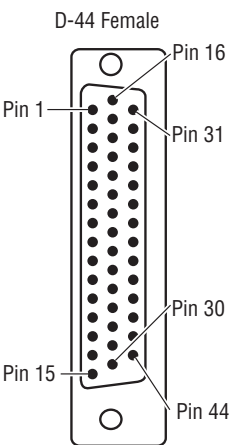
Most control cables must be built locally. Exceptions include the CAT5 network cables, which are available from third-party suppliers, and certain RS-422 serial control cables, which can be purchased from Grass Valley.

### 44-pin Control Connectors

Pinouts for 44-pin control connectors are shown in [Table 7](#). For Dolby E Metadata wiring diagrams, see [page 83](#). The GPIO pins can be used for connection to a **Jupiter/MI-3040 tally** system; for more information, refer to [page 65](#). For a diagram of the GPIO port circuitry, see [page 89](#).

**Note** Pins 43 and 44 of the “GPIO” connector are reserved for **linear time code** connection.

Table 7. Maestro Rear Panel, 44-pin Connector Pinouts

Shielded 44-Pin D; socket contacts	Pin	Metadata	GPIO	Pin	Metadata	GPIO
	1	Program TX+	1A	23	NC	10A
	2	Program TX-	1B	24	NC	10B
	3	Background A RX+	2A	25	NC	GND
	4	Background A RX-	2B	26	NC	11A
	5	PGM/BGA FG/SHIELD	GND	27	NC	11B
	6	Preset TX+	3A	28	NC	12A
	7	Preset TX-	3B	29	NC	12B
	8	Background B RX+	4A	30	NC	GND
	9	Background B RX-	4B	31	NC	13A
	10	PST/BGB FG/SHIELD	GND	32	NC	13B
	11	Clean Feed 1 TX+	5A	33	NC	14A
	12	Clean Feed 1 TX-	5B	34	NC	14B
	13	Background C RX+	6A	35	NC	GND
	14	Background C RX-	6B	36	NC	15A
	15	CF1/BGC FG/SHIELD	GND	37	NC	15B
	16	Pre Listen TX+	7A	38	NC	16A
	17	Pre Listen TX-	7B	39	Over D RX-NC	16B
	18	Background D RX+	8A	40	NC	GND
	19	Background D RX-	8B	41	NC	NC
	20	PRL/BGD FG/SHIELD	GND	42	NC	NC
	21	Monitor TX+	9A	43	NC	LTC RX IN+
	22	Monitor TX-	9B	44	NC	LTC RX IN-

Although other suppliers may be available, the 44-pin connector housing and pins may be obtained from:

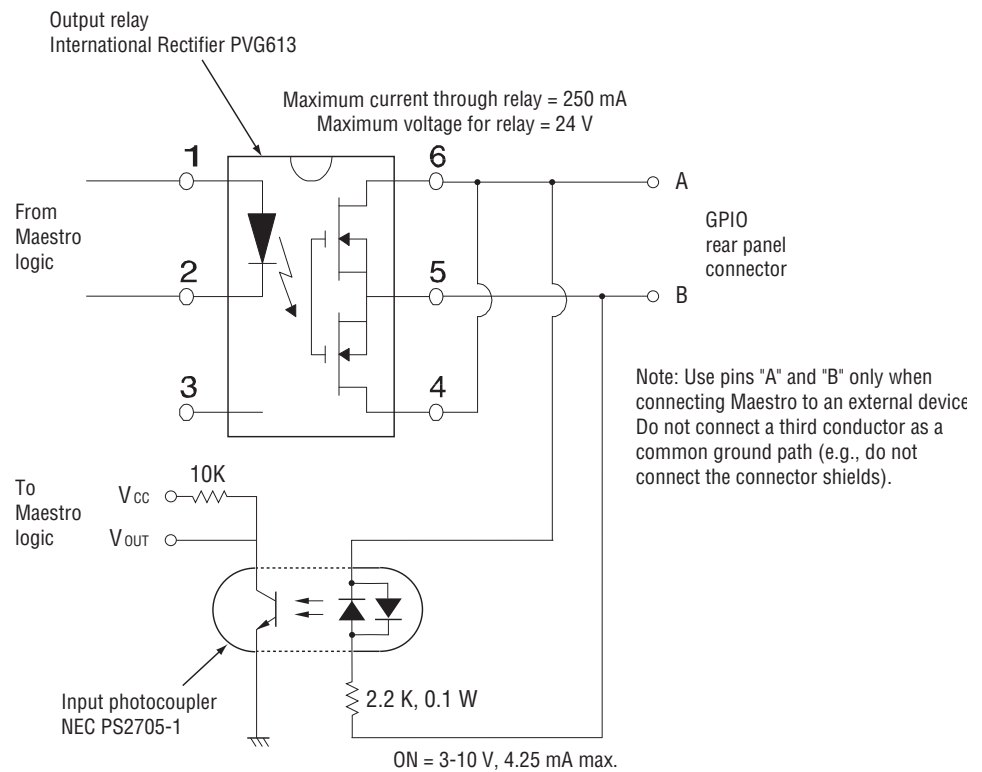
Positronic Industries

Connector housing description - CONN F/M Cable 44PIN DSUB; part number - DD44M00GEX/AA

Connector pins description - CONN O/M PIN 22-30AWG CRIMP; part number - MC8022D/AA

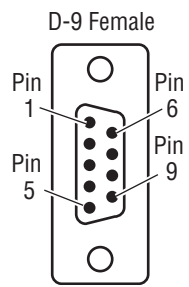
## GPIO Port

Figure 41. GPIO Port Circuitry. For Pinouts see [page 88](#).



# 9-pin Control Connectors

Table 8. Maestro Rear Panel, 9-pin Connector Pinouts

Shielded 9-Pin D; socket contacts	Pin	Console	Automation	Serial Tally†	Router Control*	Machine Control†
	1		GND	GND	GND	GND
	2	Console TX	Serial TX–	Serial TX–	Serial TX–	Serial TX–
	3	Console RX	Serial RX+	Serial RX+	Serial RX+	Serial RX+
	4		GND	GND	GND	GND
	5	Logic GND				
	6		GND	GND	GND	GND
	7	Console CTS	Serial TX+	Serial TX+	Serial TX+	Serial TX+
	8	Console RTS	Serial RX–	Serial RX–	Serial RX–	Serial RX–
	9	Remote RST	GND	GND	GND	GND
	Shield					

\*For connection to Jupiter VM-3000 (if present). Factory cable available. See [page 91](#).

†Not supported.

# Factory cables

## “MPK” Control Cables

Factory-made Control System Serial Data Cables for Router Control connections to Jupiter CM-4000 or VM-3000 are available. This cable may also be suitable for other RS-422 connections; please refer to [Table 8 on page 90](#).

JUP-SRLDCBL 1MPK Serial Cable 1 m01-048591-001

JUP-SRLDCBL 2MPK Serial Cable 2 m01-048591-002

JUP-SRLDCBL 4MPK Serial Cable 4 m01-048591-004

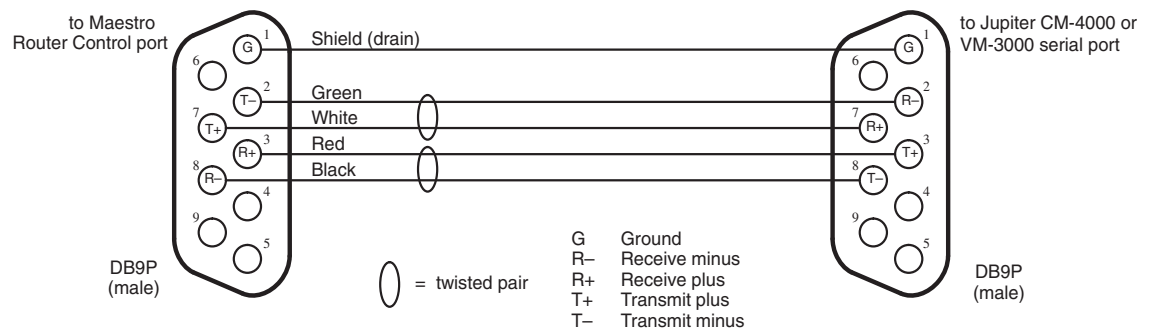
JUP-SRLDCBL 8MPK Serial Cable 8 m01-048591-008

JUP-SRLDCBL 16MPK Serial Cable 16 m01-048591-016

JUP-SRLDCBL 32MPK Serial Cable 32 m01-048591-032

For those who wish to prepare their own cables, the pin-outs are shown below. The cable itself should be Belden 1422 or equivalent.

Figure 42. MPK Serial Cable

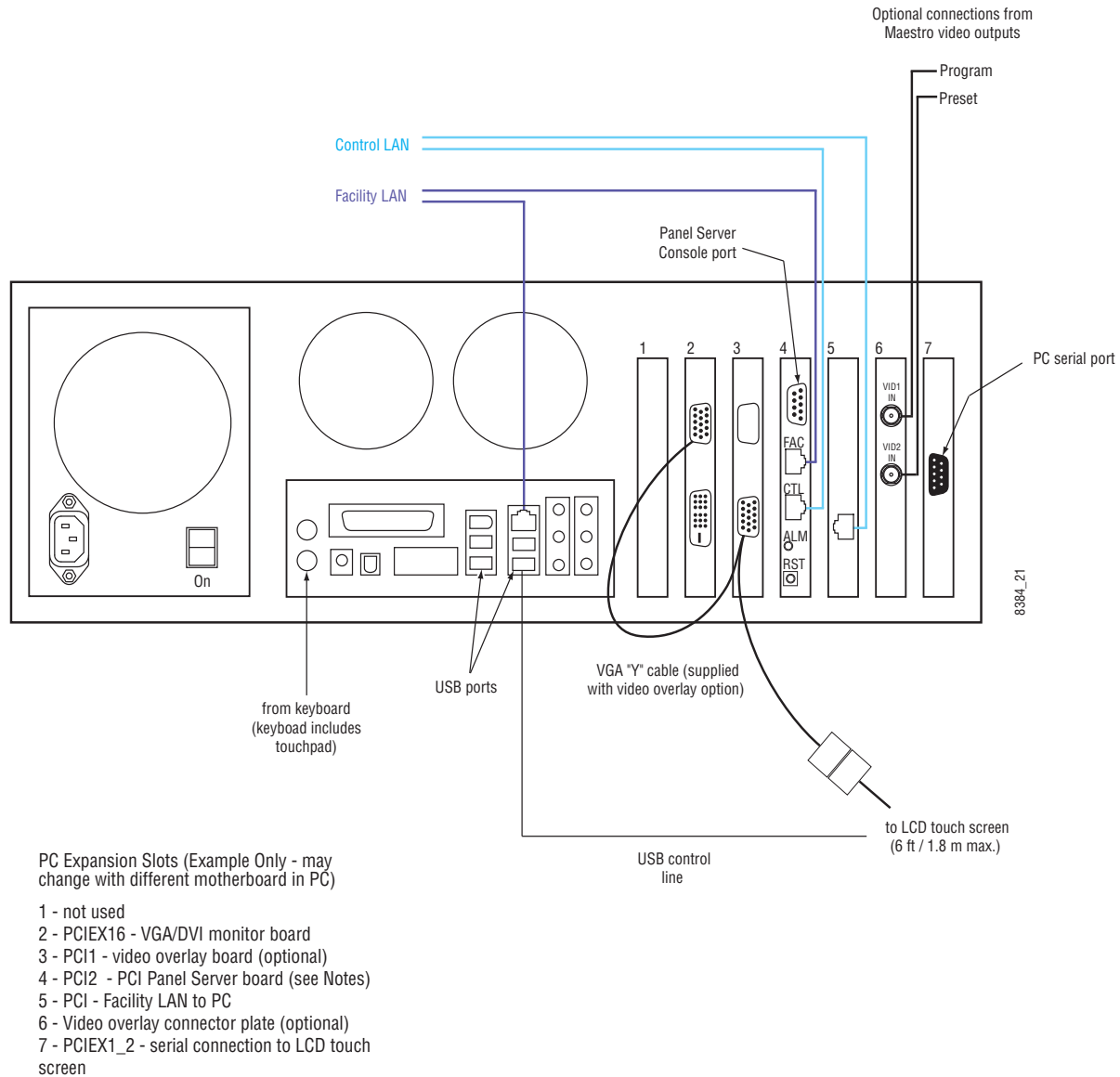


JUP-CNTLRTRBTYES-Bus Controller/Tributary Adapter Cable01-041420-001

# GUI Panel Server Cabling

Cabling for the GV-supplied GUI PC with all options is shown in [Figure 43](#).

Figure 43. GUI Panel Server Cabling



## Notes

1. PCI Panel Server board (MAE-GUI-PS) may or may not be required; see [page 97](#).

2. If the video overlay option is not installed, the equipment shown in slots 3 and 6 will not be present. The cable to the LCD touch screen will be the standard type (not "Y").



## Configuration/Deployment PC

This PC is used for loading software, configuration of the various system components, and system monitoring. In systems that include a Grass Valley-supplied GUI PC, the configuration and/or deployment applications may be supplied on the GUI control panel PC. For ordering information, see [page 95](#).

The Configuration/Deployment PC may be supplied by the customer; however, this practice is not recommended because it does not provide the user with a factory-tested system. In any case, the PC is subject to performance specifications as stipulated by Grass Valley in the next section.

## Customer-Supplied PC Specifications (Minimum)

A customer-supplied computer can be used as the configuration/deployment PC; however, this practice is not recommended because it does not provide the user with a factory-tested system.

If circumstances require a customer-supplied computer, it must meet or exceed the following minimum specifications.

### Basic Requirements

- Processor: Pentium 4 @ 3.0 GHz or higher
- RAM: 512 Mbytes high-speed DDR
- 80 Gigabyte hard drive
- CD-ROM drive
- 2 LAN ports
- Keyboard / mouse
- 15-inch or larger monitor capable of 1280 x 1024 x 256 resolution
- Windows XP Professional Service Pack 2 (English version)

## IP Network Requirements

As shown on [page 76](#) and [page 77](#), the IP switch used in Maestro installations should be divided into four VLANs (for Encore systems) or three VLANs (for Jupiter systems).

For this application, Grass Valley recommends the Hewlett Packard ProCurve 2610 48-port, 10/100 Layer 3 managed switch.

This switch replaces the obsolete Hewlett Packard ProCurve 2626 and 2650 switches.

Both 1 RU switches measure 17.32 x 12.8 x 1.75 in. (43.99 x 32.51 x 4.45 cm). (For product details, go to <http://www.hp.com/rnd/products/switches/switch2600series/overview.htm>).

IP Routing (forwarding) is enabled to permit inter-network communication. The switch must allow IP multicasting.

# Ordering Information

Table 9. Frames and Options

Maestro/Concerto frames and options		
MAE-FRM128-XPT	8 RU Maestro/Concerto frame with single power supply, matrix control board, fan module, and XPT (Jupiter) control	Accepts up to a total of 4 MAE-SD, MAE-HD, or Concerto boards in any combination
MAE-FRM128-CPL	8 RU Maestro/Concerto frame with single power supply, matrix control board, fan module, and CPL (Encore) control	Accepts up to a total of 4 MAE-SD, MAE-HD, or Concerto boards in any combination
CRS-PS1200	1200 W power supply for 8 RU frames only	
CRS-FRM64-XPT	4 RU Maestro/Concerto frame with single power supply, matrix control board, fan module, and XPT (Jupiter) control	Bottom slot: accepts one MAE-SD or one MAE-HD board. Top slot: accepts one Concerto board.
CRS-FRM64-CPL	4 RU Maestro/Concerto frame with single power supply, matrix control board, fan module, and CPL (Encore) control	Bottom slot: accepts one MAE-SD or one MAE-HD board. Top slot: accepts one Concerto board.

Table 10. Processor Boards

Main Processor Boards (Hardware + Software)		
MAE-SD	Maestro SD Master Control board, with A/B video inputs, 4 AES audio streams (8 channels), 4 external keyers, S/W license	Requires Main Board Rear Panel
MAE-HD	Maestro SD/HD Master Control board, with A/B video inputs, 4 AES audio streams (8 channels), 4 external keyers, S/W license	Requires Main Board Rear Panel

Table 11. Rear Panels

Main Board Rear Panels		
MAE-BNC-RP	Single-height rear I/O panel with 75 Ohm BNC audio connectors. Provides 4 AES audio pairs (8 channels).	For 16-channel configuration, a 1RU Sonata audio converter is required. See <a href="#">Table 14</a> .
MAE-DB25-RP	Single-height rear I/O panel with 110 Ohm DB25 audio connectors. Provides 4 AES audio pairs (8 channels) in standard configuration	For 16-channel configuration, a 1RU Sonata audio converter is required. See <a href="#">Table 14</a> .

Table 12. GUI PC and Options

Touch Screen GUI		
GUI w/GV-supplied PC		
MAE-GUI-HW	Maestro Touch Screen Control Panel, includes: rack-mountable industrial-grade PC, desk mount LCD screen, keyboard with touchpad, rack mount sliding drawer for keyboard, and GUI software license	May require MAE-GUI-PS; see <a href="#">page 97</a> . Note: Rack mounting the LCD screen requires MAE-GUI-BRKT (see below).
MAE-GUI-VIDEO	(Optional) PCI Card for providing video overlays on GUI screen	Includes software
MAE-GUI-BRKT	(Optional) LCD Screen Rack Mount Bracket	
MAE-GUI-PS	PCI Panel Server board for interface to Maestro Processor	See <a href="#">page 97</a>

Table 13. Hardware Control Panels

Hardware Control Panels		
Standard Control Panel Configuration		
MAE-4X2STD-CP	4X2 Control Panel Frame with: 1 MAE-AUD2-CP Audio Control Sub Panel 1 MAE-CHCLK-CP Channel Control and Clock/Timer Sub Panel 1 MAE-ASN-CP Source Assignment Control Sub Panel 1 MAE-SRC-CP Source Control Sub Panel 1 MAE-KEY-CP Keyer Control Sub Panel Designed for recessed table-top mounting. Includes dual power supplies	
MAE-5X2STD-CP	5X2 Control Panel Frame with: 1 MAE-AUD2-CP Audio Control Sub Panel 1 MAE-CHCLK-CP Channel Control and Clock/Timer Sub Panel 1 MAE-ASN-CP Source Assignment Control Sub Panel 1 MAE-SRC-CP Source Control Sub Panel 1 MAE-KEY-CP Keyer Control Sub Panel Designed for recessed table-top mounting. Includes dual power supplies	5X2 control panel has slots for two additional sub panels which must be specified with each 5X2 control panel order. These slots can be occupied by two blanks, or one blank and an additional MAE-KEY-CP sub panel (see below)
Additional Sub Panels (for MAE-5X2STD-CP only)		
MAE-KEY-CP	Maestro Keyer Control Sub Panel	Second MAE-KEY-CP provides dedicated keyer controls for the upstream and downstream keyer banks if this is desired. (All eight keyers can be controlled from a single Keyer Control sub panel; a second MAE-KEY-CP is not absolutely necessary)
MAE-BLNK-CP	Maestro Blank Sub Panel	Blank panel for a slot not occupied by a functional sub panel.

Table 14. Hardware Options

Hardware Options		
DVE Options		
MAE-DVE-SD	SD Single-Channel 2D DVE Option	
MAE-DVE-HD	HD Single-Channel 2D DVE Option	
Audio Options		
SON-AU2MADI	Sonata 75 ohm unbalanced AES to MADI converter	
SON-AB2MADI	Sonata 110 ohm balanced AES to MADI converter	
SON-MADI2AU	Sonata MADI to 75 ohm unbalanced converter	
SON-MADI2AB	Sonata MADI to 110 ohm unbalanced converter	
SON-AA2MADI	Sonata analog audio to MADI converter	
SON-MADI2AA	Sonata MADI to analog audio converter	
MAE-KIT	Maestro spare parts kit	

## PCI Panel Server Board (MAE-GUI-PS)

The terms “panel server” and “channel server” refer to a hardware board that functions as an interface between a control device and the frame processor. One version of this board, referred to as a “CP Panel Server,” is a standard part of every hardware control panel. If the hardware control panel and the GUI will be used to control the same channel, the CP Panel Server in the hardware control panel will service both control devices. However, in some cases another version of the board, referred to as a “PCI Panel Server,” must be ordered separately. These cases are as follows:

- If no hardware control panel is present (that is, the system is controlled using a GUI only) the user must specifically order a PCI Panel Server (MAE-GUI-PS). In these systems, the board is typically installed in the GUI PC.
- If this is a multi-channel system, the GUI may be used to control one channel while the hardware control panel is controlling another channel. In this case, a dedicated PCI Panel Server board must be present on the network to service the GUI. If there are multiple GUIs, and they are to control multiple channels independently, then a PCI Panel Server must be ordered for each GUI.



# *Hardware Installation*

This section is intended for studio engineers who are actually installing the standard Maestro system. That is, a system with out the Channel Branding and Dual Channel DVE options. The Installation steps for the options can be found later on in this manual.

System integrators or others who are developing a system plan should refer to the Installation Planning section of this manual.

## **Summary of Installation Procedure**

The following is a summary of the steps needed for installation of the Maestro Master Control Switcher. Additional details may be found elsewhere in this manual as indicated.

### **Pre-Installation Steps**

Follow these steps before installing the standard Maestro system:

1. Inspect the shipping carton for evidence of freight damage before unpacking the system. Carefully unpack and inspect all equipment for freight damage.

If the contents have been damaged, notify the carrier and Thomson. Retain all shipping cartons and padding material for inspection by the carrier.

Do not return damaged merchandise to Grass Valley until an appropriate claim has been filed with the carrier and a Material Return Authorization number has been received from Grass Valley.

2. Verify the installation and operation of the external matrix router (for example, Trinix or Concerto) and facility control system (for example, Encore or Jupiter) that is associated with the Maestro system.
3. Check the line voltage settings as follows:

**WARNING** Some Maestro components use a manual switch to adjust the power supply according to the local mains voltage level. Observe the following steps carefully to avoid equipment damage and personal injury.

- a. Check the 115/230 VAC selector switch on the rear of the GUI PC. This switch can be changed using a small flat-blade screwdriver.
- b. Check the wall-mount power supply provided with the touch screen LCD for a voltage selector switch. If there is no switch, verify that the supply's auto-sensing is suitable for the local power mains.
- c. Check any other PC provided with the system (such as a configuration PC) for correct power switch settings.
- The Maestro/Concerto 8 RU frame, 4 RU frame, and hardware control panel power supplies are auto-ranging from 100 to 240 V, 50/60 Hz.

## Installing the Maestro Master Control Panel

Follow these steps to install the Maestro Master Control panel:

1. Mount the Maestro/Concerto frame in a rack or other suitable enclosure that provides power and cooling facilities for the equipment.

The frame is designed for mounting in a standard 19-inch (48 centimeter) wide equipment rack having a depth of 24 -30 inches (61- 76 centimeters). Rear support is recommended, especially in a remote equipment truck or in other locations subject to vibration and stress.

Proper attention should also be given to ventilation and cooling of the frame. See [Air Intake/Exhaust Locations on page 348](#). The Maestro Processor boards can be installed in any order in the 8 RU frame. For the 4 RU frame, the Maestro board must only be mounted in the bottom slot (Slot 2).

The rear-panel battery is installed at the factory and does not require activation by the end-user. (For more information about the rear-panel battery, see [Processor Backup Battery on page 72](#).)

2. Connect the required video and audio cables.

Please refer to the drawings starting with [Figure 44 on page 104](#) for the following discussion. If the system has an integrated Concerto router (that is, has Concerto boards mounted in the Maestro/Concerto frame), see also [Figure 47 on page 107](#).

- a. Inputs

The Maestro inputs must be provided by a GV-controlled matrix router. During operation, the operator assigns a subset of the router's inputs to Maestro's control surface. As the operator performs transitions between these sources, Maestro sends switching commands to the control system/router so that the next source is always available on the



Maestro Preset bus. Transitions will occur within the Maestro Master control itself.

Video - a maximum of 12 router outputs can be dedicated for connection to Maestro: four for use as background video, and 4 key signal pairs. The background signals are named Background A, B, C, and D. Inputs A, B and C are the primary background inputs and provide video for the Pgm, Pst, and Aux busses. There is no one-to-one-correspondence between a particular input and a particular video bus.

Background D is for a video source with embedded audio for use in audio/video breakaways with embedded audio. Each key signal pair will consist of a key fill and a key cut. Any set of 12 router outputs can be used since they are identified during software configuration and are switched dynamically as needed.

**Note** For additional keyer wiring information, see [Keyers on page 60](#).

Audio - The audio inputs used are dependent upon the audio formats. AES audio that is paired with background video uses the BG A In and the BG B In inputs. Over A In and Over B In are used for AES audio overs. Each input supports up to four AES pairs.

The AES-to-MADI conversion with the Sonata converters is needed to supply up to 16 channels of audio for video Background A, B, C and D and up to four audio over mixers. These converters use the MADI In 1 and MADI In 2 inputs.

Embedded audio uses no audio inputs as the audio is carried with the video signal. If the rear panel is the 110 Ohm type (25-pin D connectors), refer to the pinout table on [Table 6 on page 87](#).

**Note** Up to 16 channels of audio per background video bus and audio over mixer can be supplied by a 1RU Sonata MADI Converter. Audio for background video buses and audio over mixers each require a separate Sonata converter for a total of two Sonata converters per Maestro transmission channel for full 16-channel audio support.

## **b. Outputs**

Video - Maestro has four video outputs: Program, Preview, Clean Feed 1, and Clean Feed 2. Two copies of each signal are provided. Clean Feed 1 has background video only (no key inserts); Clean Feed 2 has background video plus any key signals inserted by the upstream keyer (no downstream key material is shown).

AES Audio - the four audio outputs are: Program, Clean Feed 1, Metering, and Monitoring. Each of these outputs consist of four AES pairs.

The Monitoring outputs should be connected to the control room speakers. The audio Monitor Out 1/2 connector provides left and right stereo monitoring (see [Figure 48 on page 108](#)). Monitor Out 1/

2, 3/4, and 5/6 connectors provide 5.1 surround monitoring (see [Figure 49 on page 109](#)). For a discussion of “monitor follow” see [Monitor Follow on page 86](#).

**3.** Connect the required reference cables.

Video - please see [Video Reference on page 349](#) and [Figure 46 on page 106](#).

Audio - please see [AES Reference on page 351](#) and [Figure 46 on page 106](#).

**Note** When not in use, the AES Reference connector must be terminated.

## Installing the GUI Control Panel

Follow these steps to install the GUI Control panel:

**1.** Install the GUI control panel PC, PCI panel server and monitor.

Please refer to [Figure 43 on page 92](#) for cabling information.

**2.** Install the hardware control panel (if supplied).

**a.** Mechanical installation:

The hardware control panel is designed to be flush-mounted in a custom console. The console should be angled toward the operator to provide better readability of the displays and front panel markings.

Cutout dimensions are shown in [Figure 18 on page 58](#) (MAE-4X2STD-CP) and [Figure 19 on page 59](#) (MAE-5X2STD-CP).

The control panel should not be mounted in such a way as to block the ventilation holes on the sides, bottom, and rear of the chassis.

Due to cooling and mechanical requirements, the panel cannot be installed as a “tabletop” device.

**b.** Please refer to [Figure 50 on page 110](#) for cabling information.

The hardware control panel will be powered up when either of the two redundant external power supplies are connected (there is no power switch).

**3.** Position the Maestro configuration/deployment PC in the desired location.

If the configuration/deployment PC is supplied by the customer, it must meet performance specifications as stipulated by Grass Valley. See [Customer-Supplied PC Specifications \(Minimum\) on page 93](#). For configuration instructions, see [page 114](#).

**Note** In some systems, the configuration and /or deployment applications may be supplied on the GUI control panel PC.

#### 4. Connect the facility LAN and system control LAN cables.

The LAN uses standard 10/100BaseT Ethernet Cat 5E cabling. Please refer to the drawing on [Figure 29 on page 76](#).

The LAN is operated on separate cables and on separate networks (that is, with different class C network numbers).

**Note** The Maestro “Control LAN” should be connected to Maestro-related equipment only. It should not be part of a general-purpose LAN such as an IT network.

**Note** Some early model Processors and control panels have the facility LAN port labeled as “LAN1” and the control LAN port labeled as “LAN2.”

It is recommended that the facility LAN is connected to the GUI PC motherboard (built-in) LAN port; the control LAN is connected to the PCI (expansion) LAN port (see [page 92](#)). In some cases, the LANs must also be connected to a PCI Panel Server board in the PC (see [page 92](#)).

The facility LAN is also connected to the Configuration/Deployment PC.

**Note** In some systems, the configuration and /or deployment applications may be supplied on the GUI control panel PC. In that case, the “configuration/deployment” PC would have both LANs connected.

In a Jupiter-controlled system, the CM-4000 controller can use a serial or a LAN connection; VM-3000 controllers must use a serial connection. See [page 77](#). For details about serial connections, see “*MPK Control Cables* on [page 91](#).”

#### 5. (Optional) Install alarm connections. For more information, see [page 72](#).

#### 6. (Optional) Install tally connections. For more information, see [page 63](#).

#### 7. Power up the system.

- a. The Maestro/Concerto frame is powered up by connecting the power cords.
- b. The hardware control panel is powered up by connecting the power cords.
- c. The GUI PC has a power switch on the rear panel.

#### 8. Configure the system using the configuration/deployment PC (as described in *Section 5-Software Configuration*). For operating procedures, see *Section 7-Maestro Operation*.

#### 9. (Optional - for automation-controlled systems) The automation computer should be connected to the Processor Automation port after the Maestro system is operational. See [page 104](#).

Figure 44. Maestro Rear Panel, Showing 75- and 110-Ohm Audio Variants

8384\_10

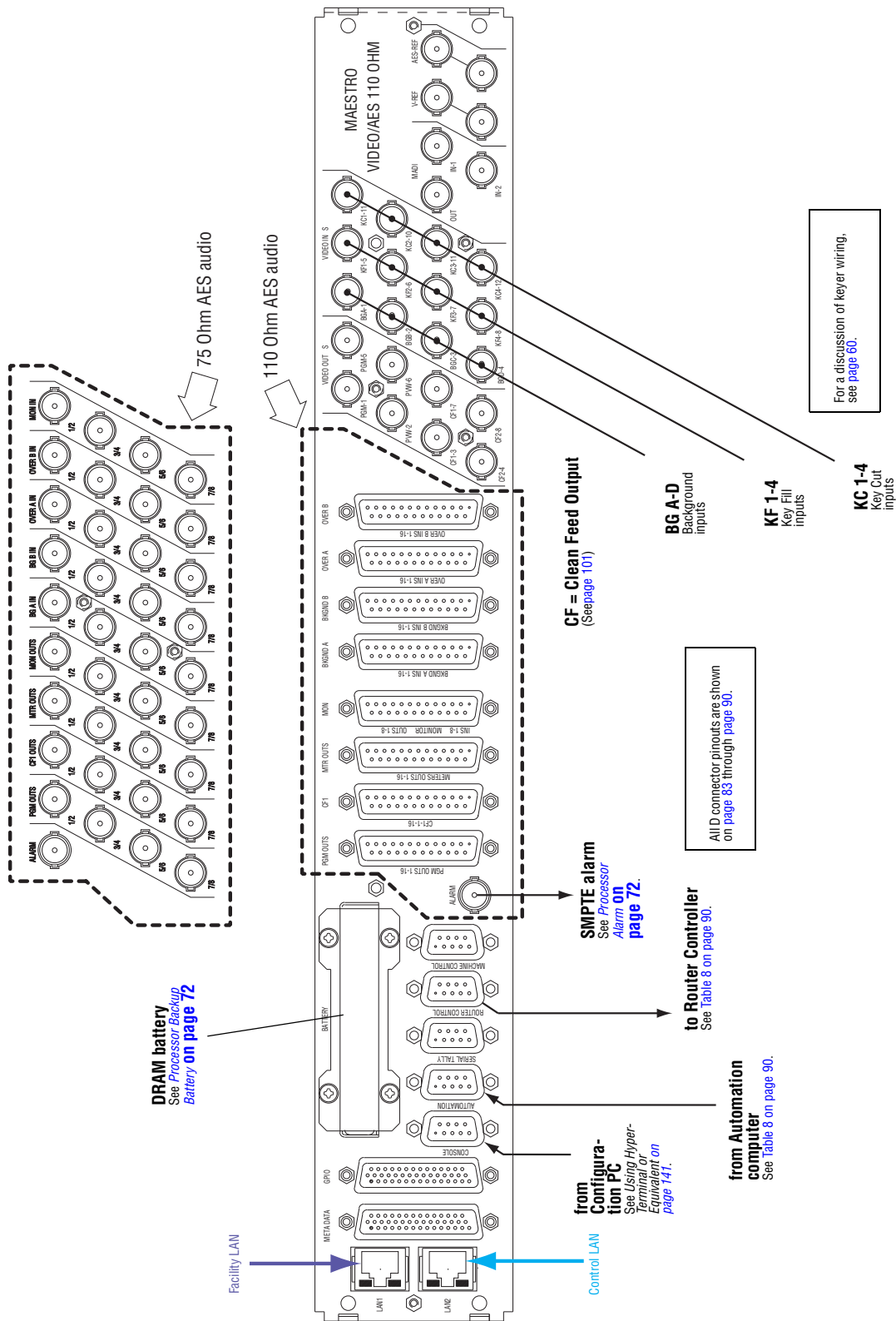


Figure 45. 8 RU Maestro/Concerto Frame Rear Panel

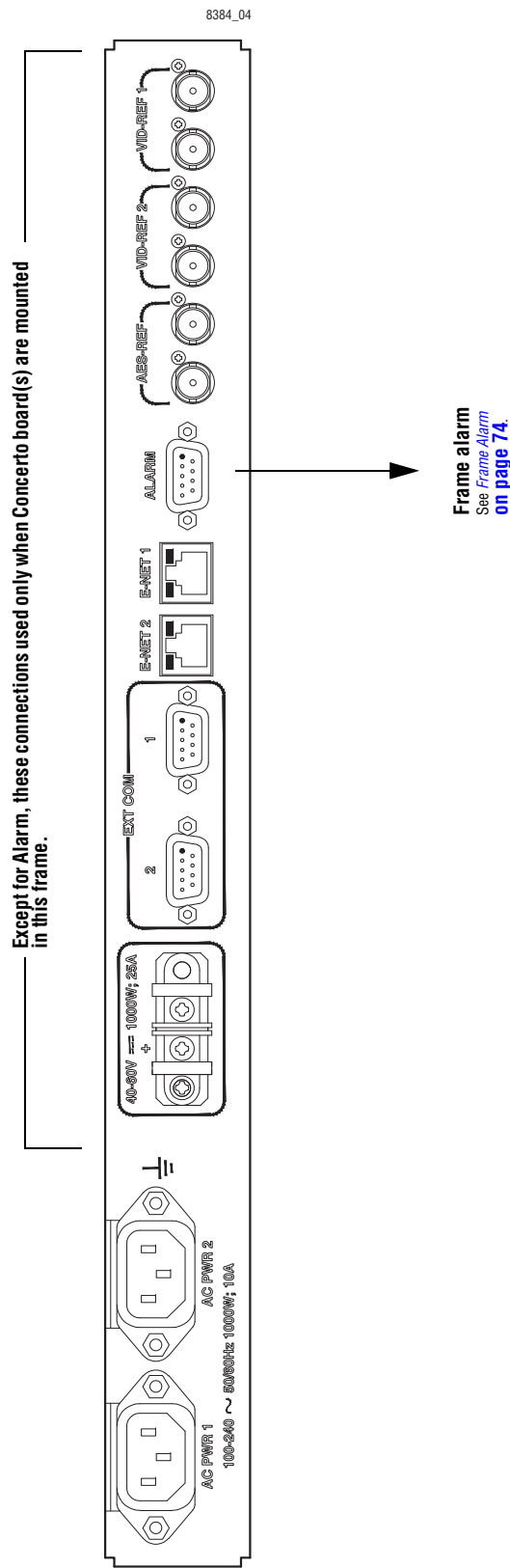


Figure 46. Video, Audio, and Reference Connections

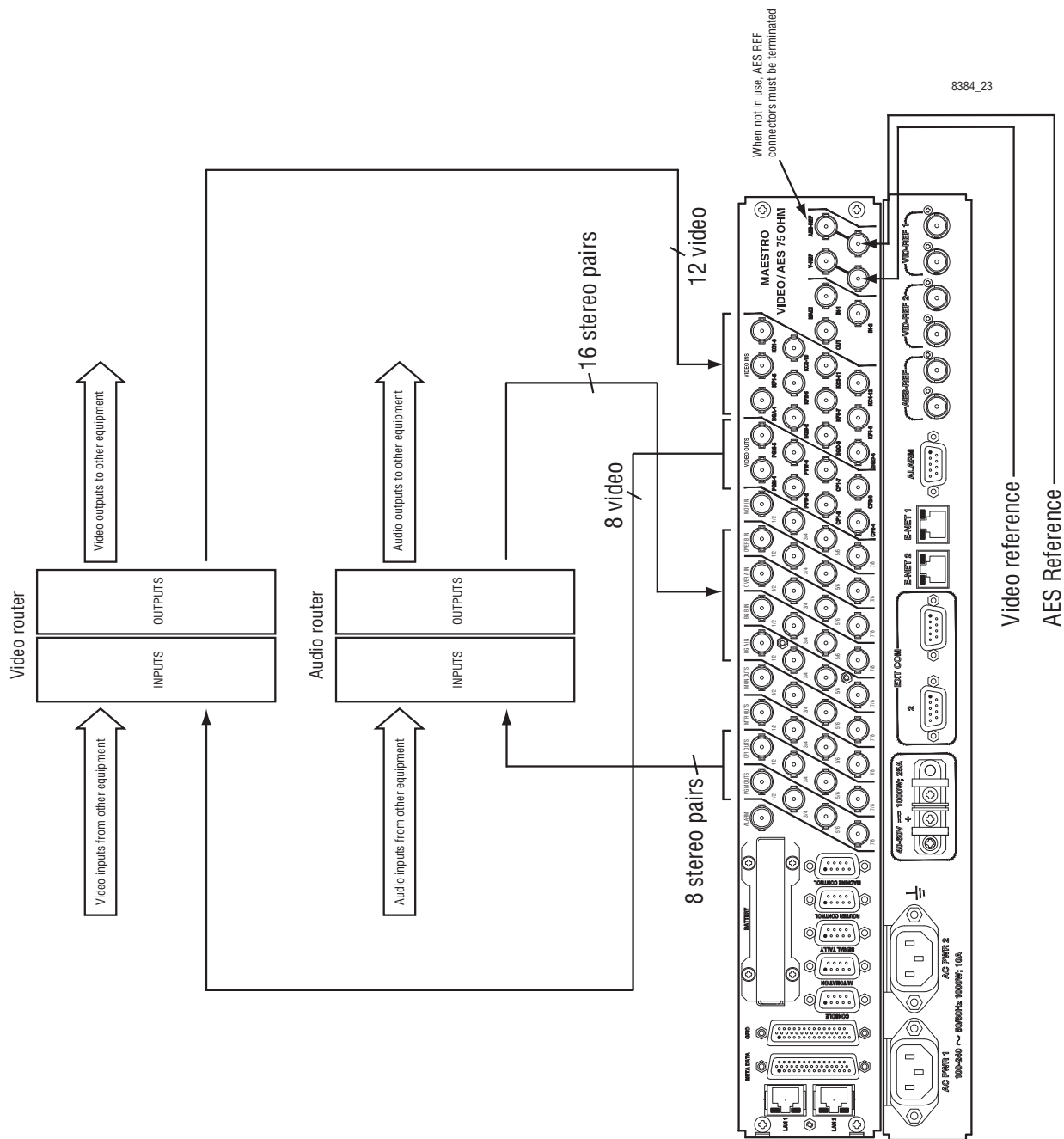


Figure 47. Video, Audio, and Reference Connections (Shown with Integrated Concerto Router)

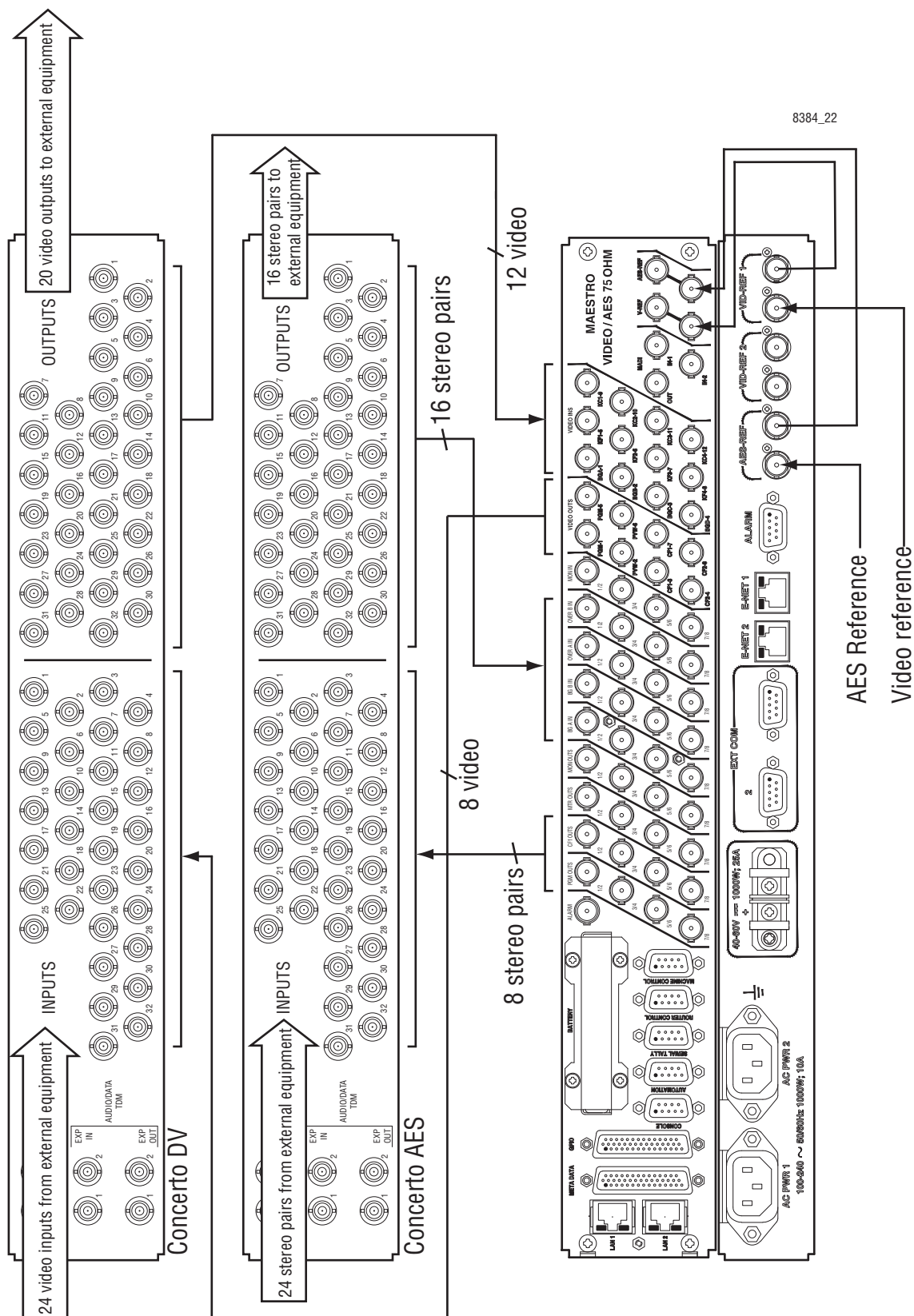


Figure 48. Audio Monitor Installation for 2-Channel Stereo

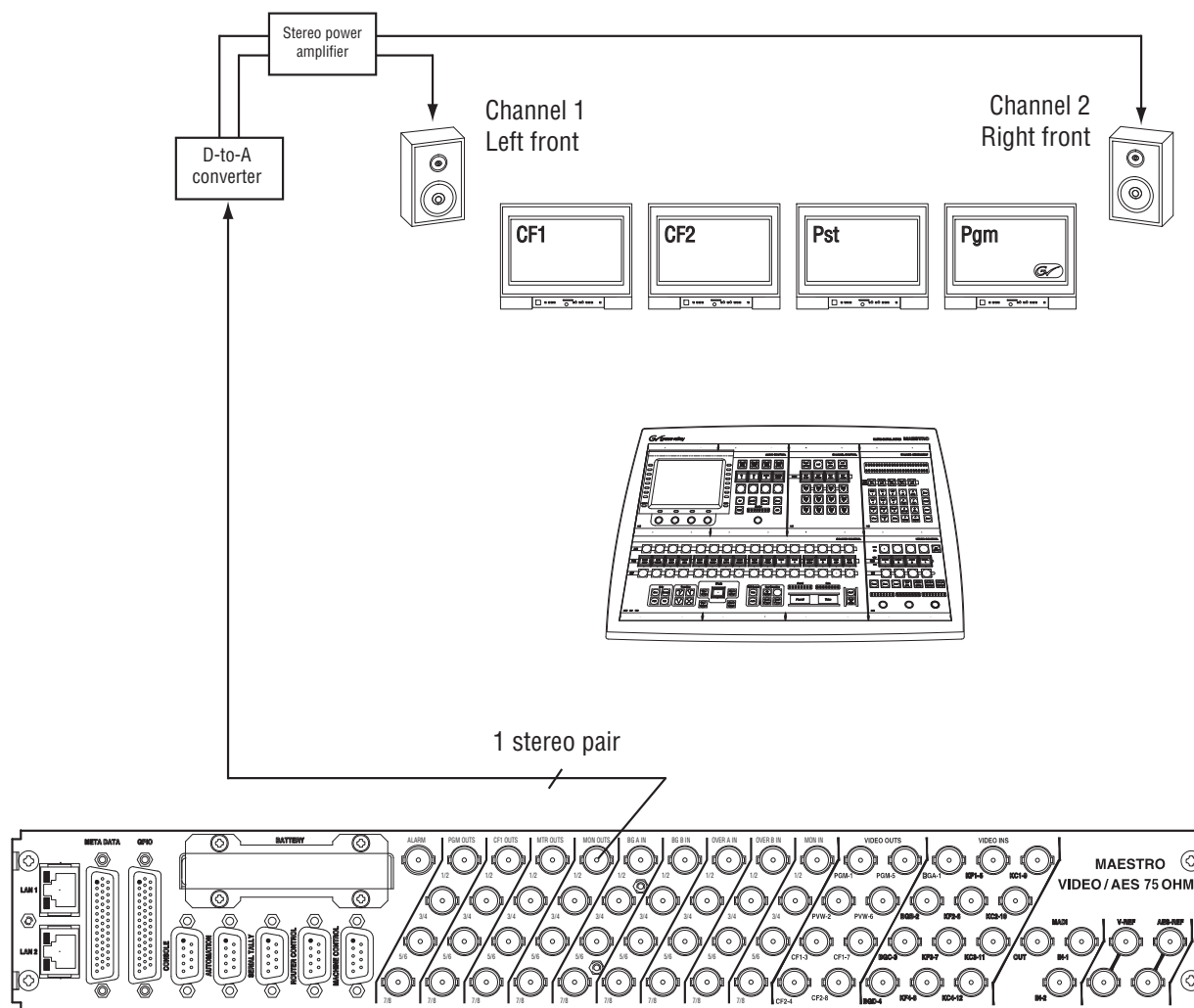




Figure 49. Audio Monitor Installation for 5.1 Surround Channels

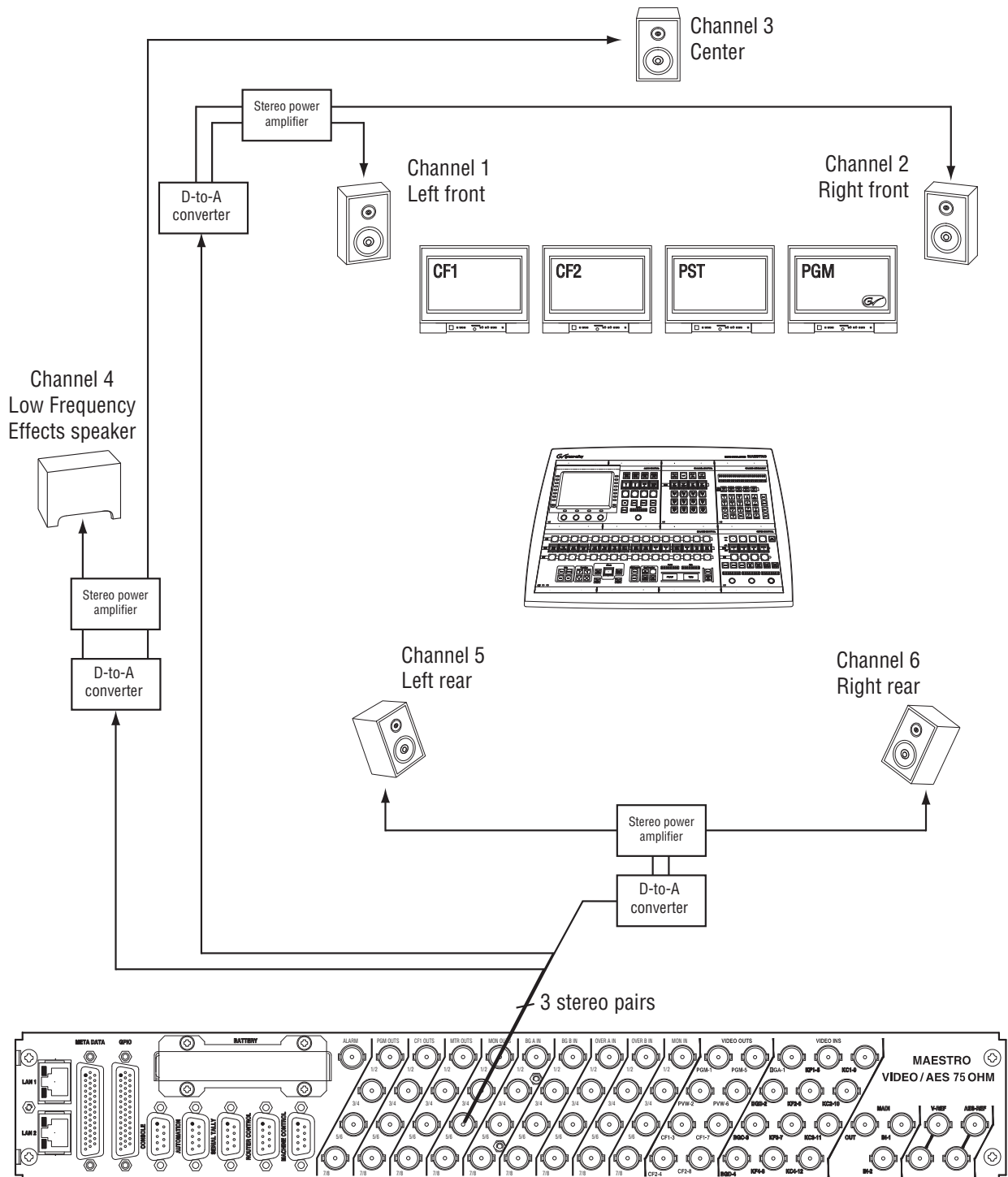
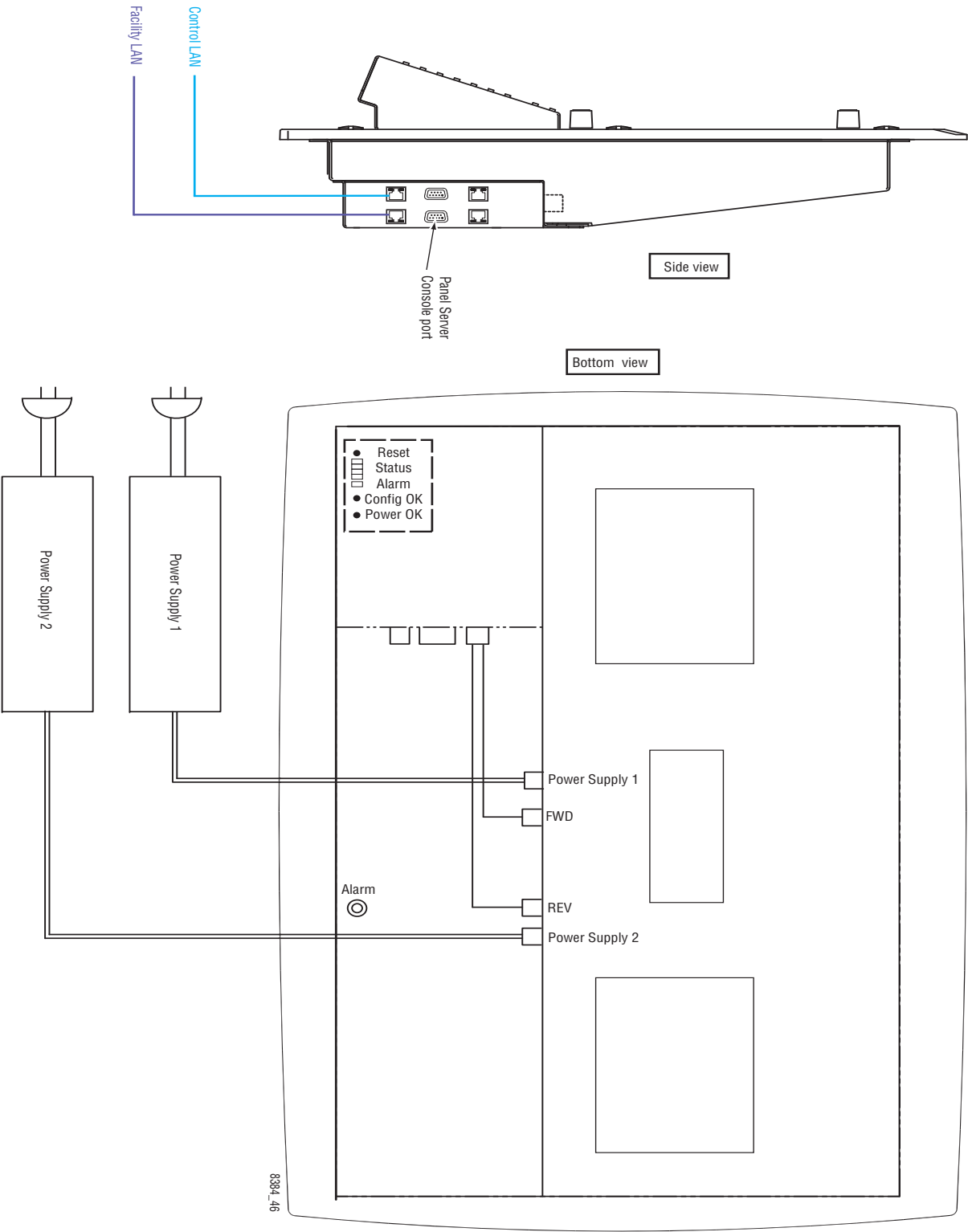


Figure 50. Control/Facility LAN Connections and Console Connector on Hardware Control Panel



## Tally

The GPIO connector on the Maestro rear panel can be configured to provide an indication as to which Maestro input has been selected for the Program (Air) output. The GPIO connector can be connected, directly or indirectly, to a tally light associated with the input.

Tally hardware connections are described on [page 63](#).

Software configuration for Source Tally is described on [page 210](#).

Software configuration for Bus Tally is described on [page 212](#).

## Space and Ventilation Requirements

See [Appendix A-Specifications](#).

## Specifications

See [Appendix A-Specifications](#).

## Installing the Video Overlay Option

The video overlay option boards may be installed in the Grass Valley supplied GUI PC only. If this option was purchased separately from the GUI PC, follow the instructions below to install the video overlay option.

**Note** The GUI Video Overlay PCI Card supports standard definition SDI video only. High definition video is not supported at this time.

1. Power off the PC. Open the computer case. Remove the cover plate of an unused PCI expansion slot.

Refer to [page 92](#) for suggested positions for GUI PC boards.

2. Align the bus connector on the board with the PCI expansion slot. Gently press the board down into the slot until you feel the edge of the bus connector reach the bottom of the PCI slot
3. Secure the rear metal bracket of the board to your computer case.
4. Install the “Vid 1 In / Vid 2 In” BNC connector rear panel. Connect the “Vid 1 In” miniature coax cable to the mezzanine input board on the video overlay board that is nearest to the PC rear panel. Connect the “Vid 2 In” miniature coax cable to the mezzanine input board on the video overlay board that is farthest from the PC rear panel.
5. Install the software driver supplied for the video overlay option. See *GUI Video Overlay Driver Installation* on [page 128](#).

## Installing the PCI Panel Server Option

The PCI Panel Server option may be installed in the Grass Valley supplied GUI PC. If this option was purchased separately from the GUI PC, See [page 97](#) for a discussion of the PCI Panel Server.

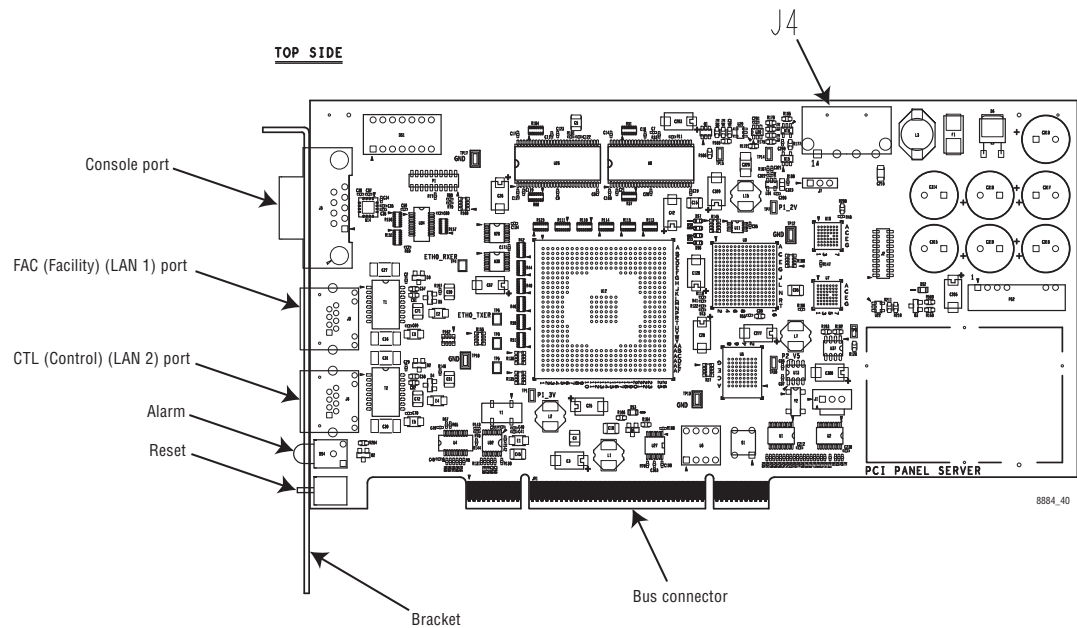
Follow the instructions below to install the PCI Panel Server:

1. Power off the PC. Open the computer case. Remove the cover plate of an unused PCI expansion slot.

Refer to [page 92](#) for suggested positions for GUI PC boards.

2. Align the bus connector on the board with the PCI expansion slot. See [Figure 51](#).

Figure 51. PCI Panel Server Board



3. Press the PCI Panel Server gently down into the slot until you feel the edge of the bus connector reach the bottom of the PCI slot.
4. Connect a PC power cable (a 4-pin molex connector) to the panel server power connector J4. Note that the molex connector is keyed to be inserted into the panel server's power connector in only one direction.
5. Secure the rear metal bracket of the board to your computer case and close the case.
6. Connect the PC to the system LAN as shown on [page 92](#).

## Touch Screen Calibration

If a touch screen LCD and driver are installed, calibrate the touch screen as follows:

1. Go to the Windows desktop and launch the TouchWare application.
2. Select Calibrate and then touch your finger on the target that appears.
3. Continue touching all targets that appear until calibration is complete.
4. Test the touch screen calibration. Repeat the above steps if needed.

## Using a Customer-supplied PC as a Configuration/ Deployment Computer

If the configuration/deployment PC is supplied by the customer, it must meet configuration and performance specifications as stipulated by Grass Valley. See [page 93](#).

Follow these steps to use a non-Grass Valley supplied PC:

1. Connect to the LAN as shown on [page 92](#).
2. Install the preferred Maestro software release from the Maestro Software release CD.

Refer to release notes provided with software for software installation instructions.

# *Software Installation*

The Maestro Configuration Editor and Deployment Control Center applications must be installed on the same PC. This PC is commonly referred to as “The Maestro deployment PC.”

Other applications such as the GUI Control Console may be installed on a separate PC. If using the Jupiter Router Control System, the Jupiter Router Service must be installed on the Jupiter server (if using the Jupiter Router Control System) which should not be the same PC on which the Maestro Configuration Editor and Deployment Control Center applications are installed.

If the Maestro deployment PC was purchased from Grass Valley, the software may have been installed at the factory.

If the Maestro software is being upgraded from a previous version, follow the upgrade instructions in the appropriate Grass Valley Release Notes. Failure to do so could result in loss of user data or system failure. For more information, please contact Grass Valley Technical Support (see [page 2](#) in this manual).

If the software is being installed for the first time, follow the procedure in the Release Notes.

As a matter of reference, a typical software upgrade procedure is presented in the remainder of this section. To ensure proper installation of software, always follow the procedure documented in the Release Notes that accompany any version of Maestro software.

# Software Upgrade Procedure

**CAUTION** Portions of this procedure will interrupt video and audio signals passing through the system. Users of this equipment should consult with Grass Valley Technical Support personnel before proceeding.

## Maestro Deployment PC

**Note** In some installations, the “Deployment PC” will be the same as the GUI PC.

### Requirements

- A period of time when the Maestro system can be taken off-line (externally bypassed).
- Windows XP Service Pack 2 (English version).
- In order to upgrade the Maestro software, the Maestro Configuration computer will need access to the Installation CD or downloaded installation files.
- The configuration from the existing operational Maestro system will be used to complete the Maestro upgrade.

### Installing the Maestro Software Package

**Note** It is recommended that all default values be used during the installation.

#### Making a copy of the current configuration set

Follow these steps to make a copy of the current configuration set:

1. Launch the Maestro Configuration Editor by going to “Start > All Programs > Thomson > Maestro Configuration Editor.”
2. Use “File > Open” to open the current configuration set.
3. Use “File > Save As” to create a copy of the set. As a suggestion, add “v17” to the name.
4. Use “File > Save As” again to create another copy of the set. As a suggestion, add “v20” to the name.
5. Close all Maestro applications.

#### Removing the Previous Version of Maestro

The previous version of Maestro software must be removed from the computer before a new version can be installed. The software can be manually



removed by following the steps below. It can also be automatically removed by initiating the new software installation procedure.

**CAUTION** If you are uninstalling v1.3, v1.4 or v1.5 software, you must use the Administrator account (login). If you are uninstalling v1.2 or prior software, you must use the account (login) used when that software was installed.

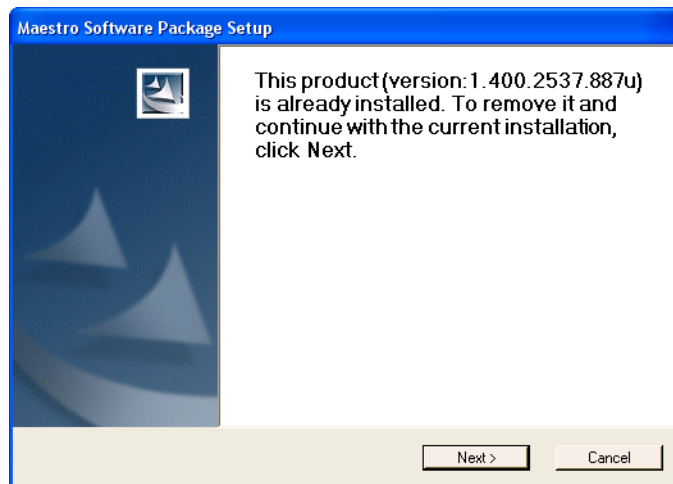
Follow these steps to remove the previous version of Maestro:

1. Using the Windows Control Panel, select Add or Remove Programs.
2. Remove the Maestro Software Package from the computer. This will not remove user data.
3. Close the Windows Control Panel.

### Inserting the new Maestro Software CD.

As shown in [Figure 52](#), when the installation auto runs from the CD, or is started manually, the previously installed Maestro software will be automatically detected. You will be prompted to confirm the removal of the software before proceeding with the installation of the new software.

Figure 52. Automatic Detection of Prior Software Version

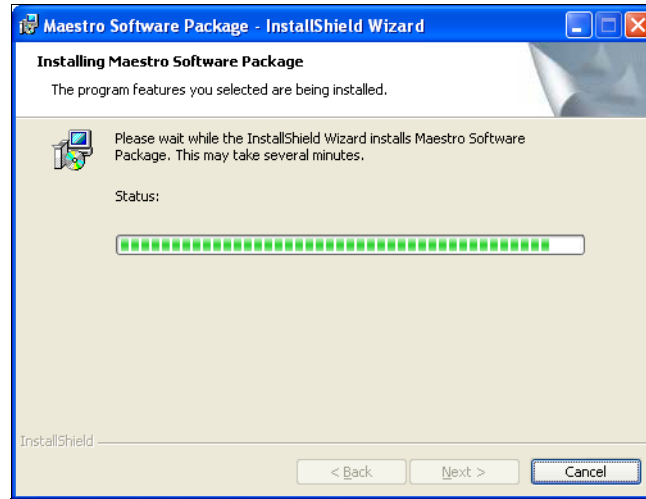


1. Click the **Next** button to proceed with removal of the previous software version.
  - A popup will appear that asks if the install should continue. Click **Next**.
  - A popup will then indicate the default destination folder. Select **Next**.

2. Select **Complete** for the Setup type.
3. Select **Install** when the “Ready to Install” menu appears.

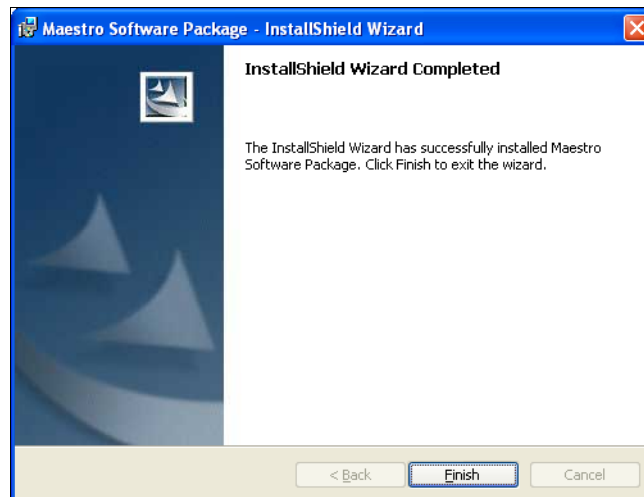
The window shown in Figure 53 will appear.

Figure 53. Installing Maestro Software Package



The window shown in Figure 54 will appear when the software installation is complete.

Figure 54. Maestro Software Package Installation Complete



4. Select **Finish**.

Installation of the Maestro Software Package on the PC is now complete.

**Note** If the installation fails to complete and you see the error message “Error 1001 -- the specified service already exists,” you may need to manually remove the Maestro Jupiter Router Service software. Refer to [Manually Removing the Maestro Jupiter Router Service Software](#) on page 120.

Proceed to *Section 5-Software Configuration* for information on creating and compiling Maestro configurations.

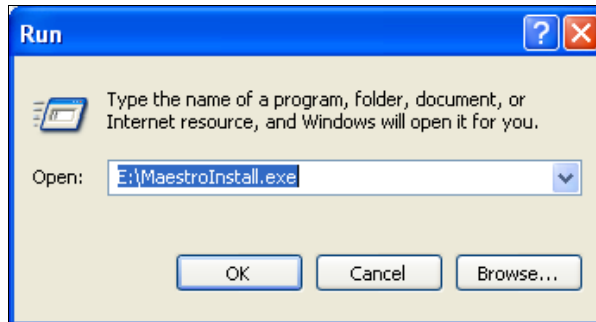
## Manually Installing Software

The process will have to be started manually if the installation does not automatically start:

1. Select **Start > Run**.

A window similar to that shown in [Figure 55](#) should appear.

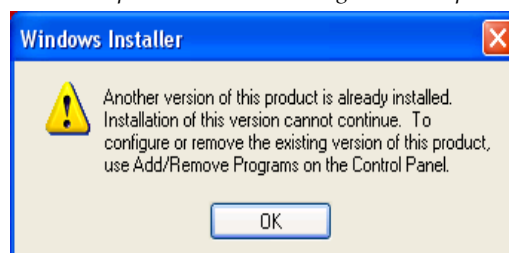
Figure 55. Run Dialog Box



2. Enter “E:\MaestroInstall.exe” where E: is the CD Drive.
3. Click the **OK** button.

**Note** If you enter “Setup.exe” in the Run dialog box instead of ‘MaestroInstall.exe,’ the window in [Figure 56](#) appears and the prior Maestro software version must be manually removed through Add/Remove Programs in the Windows Control Panel. If this window appears, click the **OK** button and return to [Step](#) on [page 116](#).

Figure 56. Setup.exe Add/Remove Programs Prompt



A popup will appear that asks if the install should continue; select **Next**.

## Manually Removing the Maestro Jupiter Router Service Software

Perform this procedure only if you see the error message “Error 1001 -- the specified service already exists” referred to in the Note on [page 119](#).

Follow these steps to manually remove the Maestro Jupiter Router Service:

1. Go to “Control Panel > Administrative Tools > Services.”
2. Right click on “MaestroJupiterRouterService” and select **Stop**.
3. Go to “Start > Run” and enter “regedit.”
4. Go to “HKEY\_LOCAL\_MACHINE > SYSTEM > CurrentControlSet > Services.”
5. Highlight “MaestroJupiterRouterService.” Right click and delete this item.
6. Close all windows and reboot. Repeat [Step 1](#) above and confirm that MaestroJupiterRouterService is not listed.
7. Proceed with re-installation of the new software.

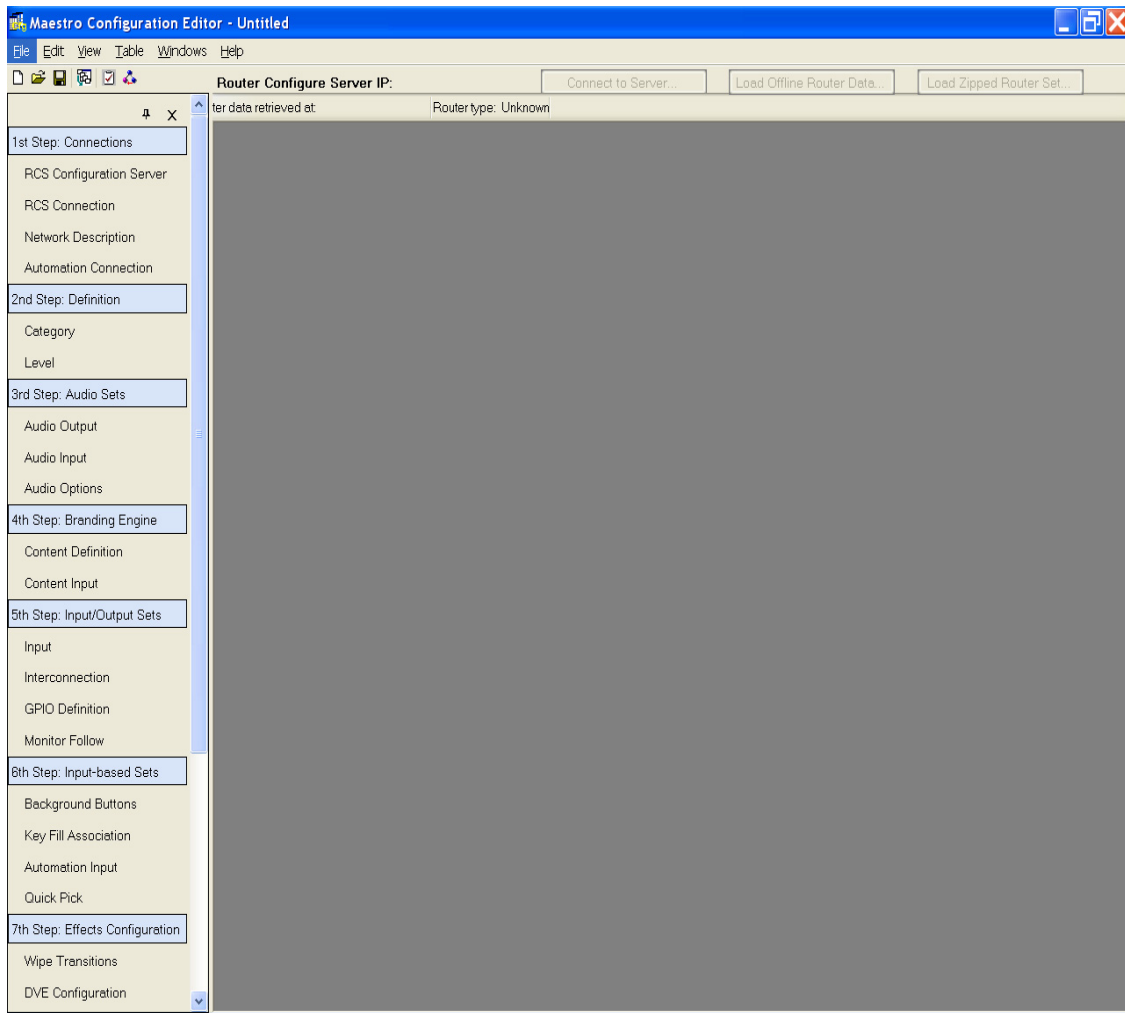
Proceed to *Section 5-Software Configuration* for information on creating and compiling Maestro configurations.

# *The Maestro Configuration Editor*

This section describes the Maestro Configuration Editor application. The interface of the application has a panel on the left-hand side. The steps in this panel should be followed in descending order. That is, the 1st step, then the 2nd step and so forth.

When the Maestro Configuration Editor is launched the following window ([Figure 57](#)) will be displayed:

Figure 57. Maestro Configuration Editor Main Window



Use the File > Open menu option to select the set if you want to edit an existing set.

**Note** The **Help** pull-down button on the top of the Configuration Editor screen may or may not indicate the software version that is currently active as the currently installed version may not have been deployed to the Maestro Frame Processors. The Deployment Control Center screen should be used to check the active software version.

## Configuration Editor Guidelines

The following paragraphs are guidelines that can be used for each step as needed and where appropriate.

## Automatic Table Entry

This function is designed to expedite the data entry process and eliminate errors due to differences in spelling and entry of inappropriate data.

In cases where a device must be entered on more than one table, the Configuration editor will automatically copy (or offer as a selectable item) the data entered on the “initial entry” table to all “secondary” tables. Entering information in the same order as the tables appear on the Select Panel (left side of the screen) will therefore eliminate most of the repeat entries. For example, when the name of a Frame Processor is entered on the Network Description table, the same name will be available as a selection on the Channel Setup table.

**Note** You must enter data on the primary table before entering data on the secondary tables. For example, you must enter a new Processor on the Network Description table before it will be available for selection in other tables.

When certain items are modified, the editor will automatically modify, when appropriate, the corresponding selections on other tables. For example, if the name of an input is changed on the Input table, the new name will be available as a selection on the Quick Pick table.

## Find Text

Each table includes a **Find Text** button, which can be used to search for a text string in the selected table.

## Cursor Movement

The cursor can be moved using the keys on the PC’s keyboard.

- To move to the preferred field, use the mouse, cursor keys, TAB, or SHIFT+TAB keys.
- To accept the change and then move to the next field, press TAB.
- To jump to the boundaries of a table, press the HOME, CTRL+ HOME, END, or CTRL+END keys on your keyboard. You can’t send the cursor to a read-only field.
- To scroll to the top or bottom of a long table, press the PAGE UP or PAGE DOWN keys. You can also “drag” the scroll box by clicking in the scroll bar, or by clicking and then holding on the scroll arrows.
- To create a new row at the bottom of a table, press the INSERT key or move the cursor to the last row and then press the ENTER key.

## Entry/Edit Within a Table

When a field requires a selection to be made from a fixed list, clicking on the drop-down arrow will show the available choices (or press SPACE BAR or ALT+DOWN). Click on the preferred choice. (You can also enter the first

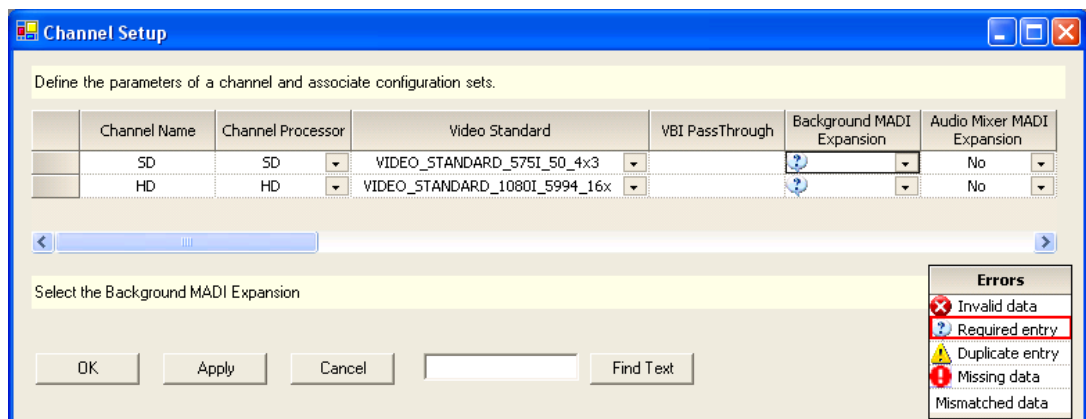
letter in the list item name; enter the letter again to move to the next item that starts with that letter, then press TAB to move to the next field.)

**Spaces are not allowed in some cases.** In tables where this is the case, the editor will not allow them to be entered.

When creating a name for a Maestro configuration file, it's a good practice to use letters and numbers only. See [Configuration Set Naming Rules on page 127](#) for the punctuation that can be used in names.

**Error Detection and Explanation** - Fields that contain insufficient or inappropriate information are flagged. An error message will appear on the bottom of the window with the error type highlighted in red. See [Figure 58](#).

Figure 58. Example Error Message



## Row Editing

The rows can be added and cleared using the following rules.

### Adding a Row

To add a row (or rows) at the bottom of a table:

1. Position the cursor anywhere within the table.
2. Right-click, and then select the Add Row(s) option.

To add one row on the bottom of the table:

1. Position the cursor on the bottom of the table.
2. Press the **Insert** key on your keyboard.

### Clearing a Row

To clear a row of user data:

1. Select the blank box on the left end of the row.



2. Right-click and then select the Cut option.

To clear a row of all data:

1. Press the **Delete** key on your keyboard.
2. Right-click and select the Delete Row(s) option to delete the row entirely.

## Saving

Press “**Apply**” to save the changes in memory (they are not saved to disk until you select File > Save). If you attempt to close the Configuration File before applying your changes, a pop up message will appear asking you to confirm or abandon the changes before editing a new file.

You can exit without writing even after changes have been Applied and the table closed by selecting "File > Exit." and answering "No" to the "Save?" question.

## Fill / Increment

### Fill

The Fill option (Edit > Fill) is a copy/paste function for use with tables containing repetitive material. For example, on the Input table you could enter Category “VTR,” then add four new rows below the VTR row. Select the VTR field and the fields below to receive the fill material. Select “Edit > Fill Down.” This will fill the rest of the selected fields in this column with “VTR.”

### Increment

The Increment option (Edit > Increment) is similar to the Fill option (Edit > Fill) except that incrementing numbers are automatically created in columns to the right or rows below as preferred. To continue with the above example, on the Input table you could enter Entry “1” for the first VTR. Then select the “1” field and the following four Entry fields. Select Edit > Increment Down from the menu. This will increment the fields in the rest of the selected column with “2” through “5.”

It is also possible to mix letters and numbers within a column and still automate the process. For example, “VT1” could be entered in the Mnemonic field. Select the four fields below and then select Edit > Increment Down from the menu. This step will produce fields that are labeled “VT2” through “VT5.”

When the increment operation is applied to a drop-down list cell, the increment value must be valid for that cell (that is, the value must be selectable on the drop-down list). Otherwise the increment instruction will be ignored for that cell.

## **Copying and Pasting a Block**

Blocks can be copied and then pasted.

To copy a block:

1. Drag the cursor to select the block of the source fields (the selected fields must form a single rectangle).
2. Select Edit > Copy from the menu.
3. Select the top left field of the destination area and then Paste the information.

## **Sorting**

The Maestro Input table columns can be sorted alphabetically (or numerically) by clicking the column headings. Clicking the column heading a second time will sort the column in reverse.

## Configuration Set Naming Rules

The following rules should be observed when creating a name for a Maestro configuration set:

- The following characters are OK to use:
  - Letters A through Z
  - Numbers 0 through 9
  - Hyphen -
  - Underscore \_
- Do not use any of the following characters:
  - Ampersand &
  - Brackets [ ]
  - Comma ,
  - Colon :
  - Double quotes "
  - Equal =
  - Forward or back slash / \
  - Less or Greater than < >
  - Period .
  - Plus +
  - Question mark ?
  - Semicolon ;
  - Single quote mark '
  - Space
  - Vertical bar (pipe) |
- Do not create a filename that is identical to another file (or subdirectory) in the same directory.

## 1st Step: Connections

The 1st Step: Connections section contains the following steps:

- RCS Configuration Server
- RCS Connection
- Network Description
- Automation Connection

Each of these steps is described below.

## RCS (Router Control System) Configuration Server

The abbreviation “RCS” refers to the Encore or Jupiter Router Control System.

Start by clicking the **RCS Configuration Server** hyperlink. This step will display the RCS Configuration Server screen. The screen has a table that will define the RCS information. The features of this table are described below.

Figure 59. RCS Configuration Server Table

Name	Type	IP Address
Encore	Encore	192.168.0.102

### Name

Create a name for the RCS server. This is an arbitrary name used only within the Maestro system.

### Type

Select either “Encore” or “Jupiter.”

### IP Address

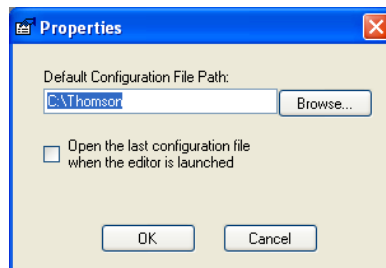
1. Enter the IP address for the control system. For example:
  - For Encore, enter the IP address of the Primary System Control Board (SCB). This entry will typically be an “EN1” (Encore facility LAN) address. This address was defined during Encore configuration.
  - For Jupiter, enter the IP address of the Jupiter file server PC. This address was defined during Jupiter configuration.
2. Select the **Apply** button (to leave the table open) or the **OK** button (to close the table). If there are entry errors (such as blank fields) they will be indicated at this time.
3. Notice that when this table is completed, the control system server IP is indicated along the top of the editor screen and the **Connect to Server** button is enabled. By selecting **Connect to Server** the editor will retrieve configuration data already entered on the router control system.

- Continue by selecting another table to edit, or **Save the set** as built so far by selecting “File > Save As” and creating a name for the configuration set. This filename must follow standard Windows filename rules. As a convention, you may wish to name the set “[Station ID]-[Date of Creation or Edit].” For example, “WXYZ-10-APR-08.”

After all the configuration tables are edited and saved you must “compile” the set before it can be downloaded using the Deployment Control Center.

- Set the Configuration file’s management options by selecting Properties from the File menu (File > Properties). This step will open the dialog that is shown in [Figure 60](#).

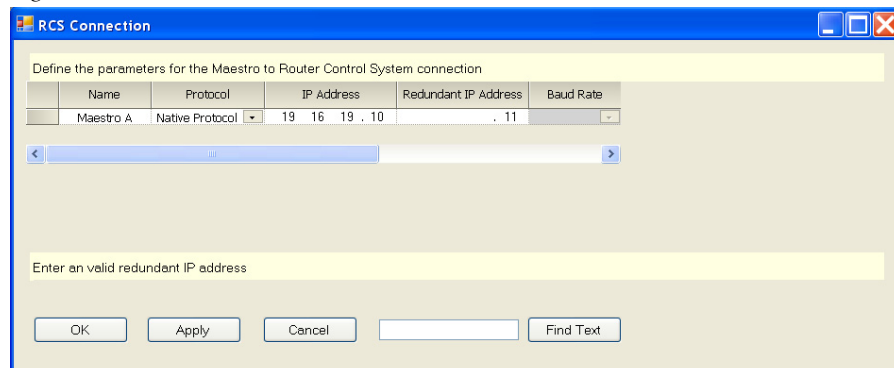
Figure 60. Properties Menu



## RCS Connection

This screen has a table that is used to identify the Encore System Control Board (SCB) or the Jupiter controller (CM-4000 or VM-3000) that will be receiving commands from Maestro. Each feature of the screen is described below.

Figure 61. RCS Connection Table



## Name

Create a name for the controller. This is an arbitrary name that is only used within the Maestro system.

This is the source of the RCS Connection name on the Channel Setup table, as described on [page 221](#).

## Protocol

Select the appropriate protocol from the drop-down list. The options are:

- Select the “Native Protocol” for Encore control.
- Select “ES-Control (Serial)” for Jupiter control using a serial connection.

**Note** For Jupiter, the corresponding protocol setting for the target VM/CM port (on the Serial Protocol table) is “ES Switch.”

- Select “ES-Control (LAN)” for Jupiter control using a LAN connection.

The “Mock” option is for factory testing.

## IP Address

Enter the IP address for the control system. For example:

- Encore control - enter the facility LAN (typically EN1) address for the primary Encore SCB.
- Jupiter control using serial connection - no entry.
- Jupiter control using LAN connection - enter the IP address of the primary CM-4000.

## Redundant IP Address

Enter the alternative IP address for the control system. For example:

- Encore - enter the facility LAN (typically EN1) address of the redundant Encore SCB (if any).
- Jupiter control using serial connection - no entry.
- Jupiter control using LAN connection - enter the IP address of the redundant CM-4000.

## Baud Rate

Enter the Baud rate for the Jupiter serial connection.

Encore - no entry.

Jupiter serial connection - select the baud rate for the Maestro “Router Control” port connection to the VM/CM serial port. The normal rate is “38400.”

This must agree with the VM/CM value established during Jupiter configuration.

Jupiter LAN connection - no entry.

### **Data Bits**

Enter the Data bits for the Jupiter serial connection.

Encore - no entry.

Jupiter serial - select "8."

Jupiter LAN - no entry.

### **Stop Bits**

Enter the Stop bits for the Jupiter serial connection.

Encore - no entry.

Jupiter serial - select "1."

Jupiter LAN - no entry.

### **Parity**

Enter the Parity for the Jupiter serial connection.

Encore - no entry.

Jupiter serial - select "ODD."

Jupiter LAN - no entry.

### **Switch Frame Delay**

(Required entry) - Enter the control system switch latency in frames. The following are default values.

Encore - 12.

Jupiter CM-4000/AccuSwitch - 2

Jupiter CM-4000/JupiterXPress - 4

Jupiter VM-3000 - 6

**Note** These values are system-dependent. The above defaults are suggested in advance of empirical testing using specific systems under defined conditions.

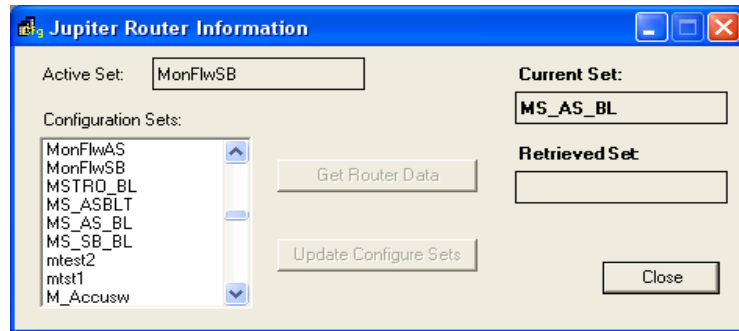
### **ES-Control RCS Device Name**

Encore - no entry.

Jupiter - Select the name of the appropriate configuration set to be used with Maestro. The source of these names is the Jupiter MPK Devices table. If you do not see the names expected on the drop-down list, it may be that the connection to the control system server has not been established. By selecting “Connect to Server” the editor will retrieve configuration data already entered on the router control system.

For example, if the router control system is Jupiter, a screen similar to the following screen will appear:

Figure 62. Jupiter Router Information (Example)



**Note** On the Connect to Server menu, the “Active” set field indicates the active set on the Jupiter system. “Current Set” refers to the active Jupiter configuration file that is being used with the Maestro configuration currently being edited.

When finished, Click the **Apply** button, and then the **OK** button to save.

**Note** After all the configuration tables are edited and saved you must “compile” the set before it can be downloaded using the Deployment Control Center. This process is described in [Compile Current Configuration](#).

## Network Description

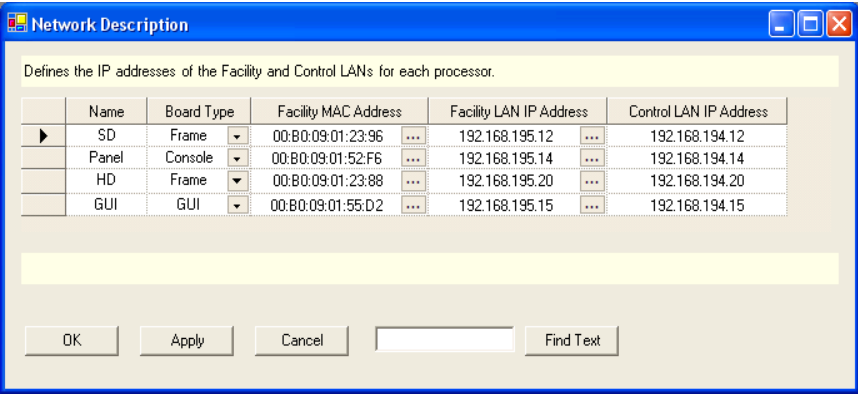
This screen has a table that is used to enter the facility and control LAN IP addresses for each Maestro channel and control panel.

In some cases, these entries will vary. For example:

- If no hardware control panel is present, addresses must be entered for the GUI (actually, the addresses will apply to a PCI Panel Server board, which acts as an interface between the GUI and the Processor). In these systems, the PCI Panel Server is typically installed in the GUI PC.
- If this is a multi-channel system, and the GUI will be used to control a channel independently from any hardware control panel, then a dedicated PCI Panel Server board must be present on the network to service the GUI. The address of the PCI Panel Server would then be added to this table. If there are multiple GUIs, and they will be used to control channels independently, each must be served by a dedicated PCI Panel Server board.



Figure 63. Network Description Table (Example)



### Name

In the Name field, create a name for the first board. For example, “Channel 1” for the Processor in the Maestro/Concerto frame.

The name can be up to 16 characters and is subject to Microsoft Windows filename rules.

This entry is the source for the Channel Processor names on the Channel Setup table (page 221), the Board Name on the Channel Server table (page 230), and the GUI Name on the GUI Configuration table (page 231).

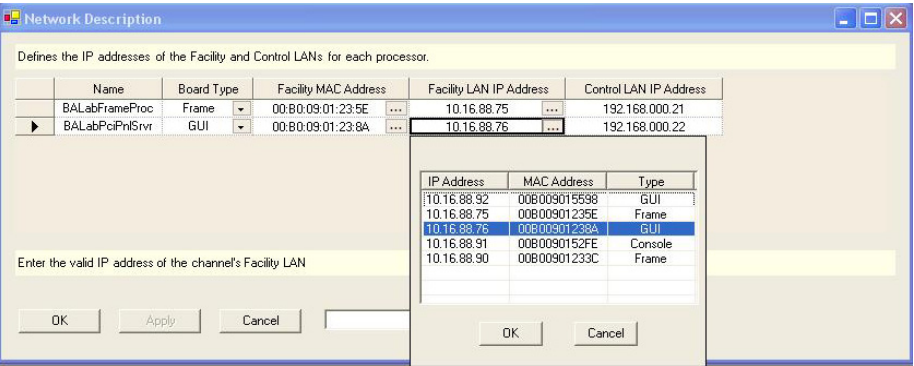
### Board Type

Select the Board Type from the drop-down list. The options are, Frame (Processor), Console (hardware control panel), or GUI control panel.

### Facility MAC Address

Click on the “...” button and select the MAC address of the component being named. Figure 64 shows an example of the window that appears after clicking the “...” button.

Figure 64. Board Discovery in Network Description Table



The 12-character MAC (physical hardware) address is shown on a label attached to each component.

**Note** If a component does not appear in the drop-down menu, it may be that the facility LAN address of the Configuration PC was not set properly, the device is not powered on, or the Configuration PC is not present on the Facility LAN.

### Facility LAN IP Address

This field will be filled in automatically when the facility MAC Address is selected.

### Control LAN IP Address

Enter a corresponding IP address for use on the control LAN.

**Note** If a control LAN address is entered for the GUI, that address must also be entered on the GUI Application Settings menu as the “Panel Server IP.”

Repeat the above steps for each Maestro component.

When finished, Click the **Apply** button, and then the **OK** button to save the information.

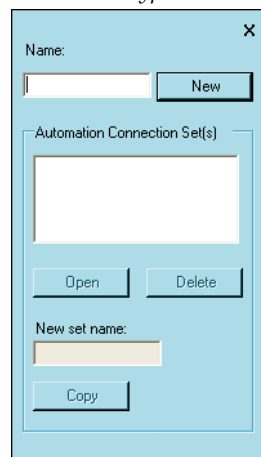
**Note** After all the configuration tables are edited and saved you must “compile” the set before it can be downloaded using the Deployment Control Center. This process is described in [Compile Current Configuration on page 235](#).

## Automation Connection

This window has a table that defines the connection parameters that connect the Maestro Master Control system to an Automation system.

When the Automation Connection hyperlink is selected, the “set panel” will then open.

Figure 65. Set Panel (typical)



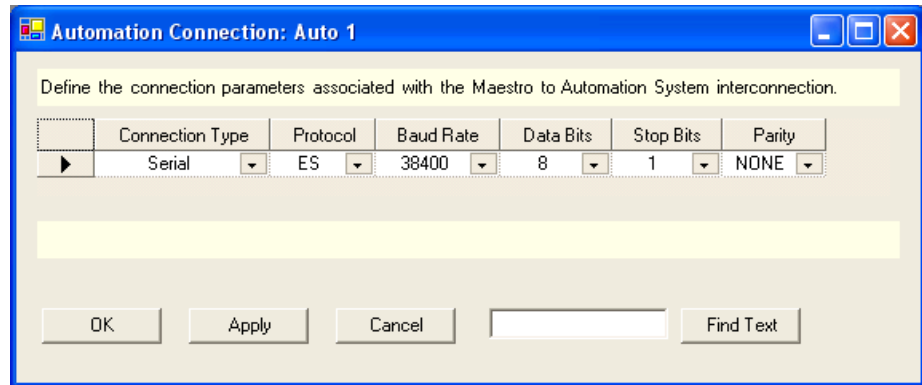
The screenshot shows a dialog box titled "Set Panel" with a close button (X) in the top right corner. The dialog contains the following elements:

- A "Name:" label followed by a text input field and a "New" button.
- A section titled "Automation Connection Set(s)" containing a large empty rectangular area for a table.
- Below the table area are two buttons: "Open" and "Delete".
- A "New set name:" label followed by a text input field.
- Below the "New set name:" field is a "Copy" button.

## Name

Enter a name for the Automation Connection set. Then select the **New** button, an Automation Connection window with a set table, will then appear.

Figure 66. The Automation Connection Window



## Connection Type

Select "Serial." This identifies the Maestro's rear-panel "Automation" port.

## Protocol

Select "ES."

## Baud Rate, Data Bits, Stop Bit, Parity

These entries must agree with those used by the automation computer's control port.

When finished select **Apply** or **OK**. The Name of the Automation Connection set will now appear in the set panel. The Connection set is assigned to a Maestro channel using the Channel Setup table ([page 221](#)).

## Multiple Channels

If additional Maestro channels will be controlled by an automation system, and for some reason the connection protocol will be different from one channel to another, then additional Connection sets must be created.

# 2nd Step: Definition

The 2nd Step: Definition section contains the following steps:

- Category
- Level

Each of these steps is described below.

## Category

Categories are a set of classes for inputs and outputs. For example, “SERV,” “CAM,” and “VTR” and so forth.

When the Category table is first opened, use the set panel (Figure 67) to create a name for the set, and then select the **New** button (This name will appear in a pull-down menu on the Input table, as described on page 172.)

Selecting the **New** button will display a 20-category table (Figure 68):

Figure 67. Set Panel

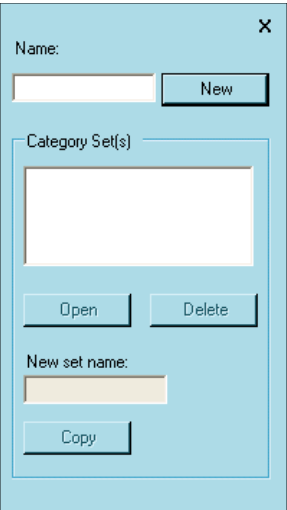
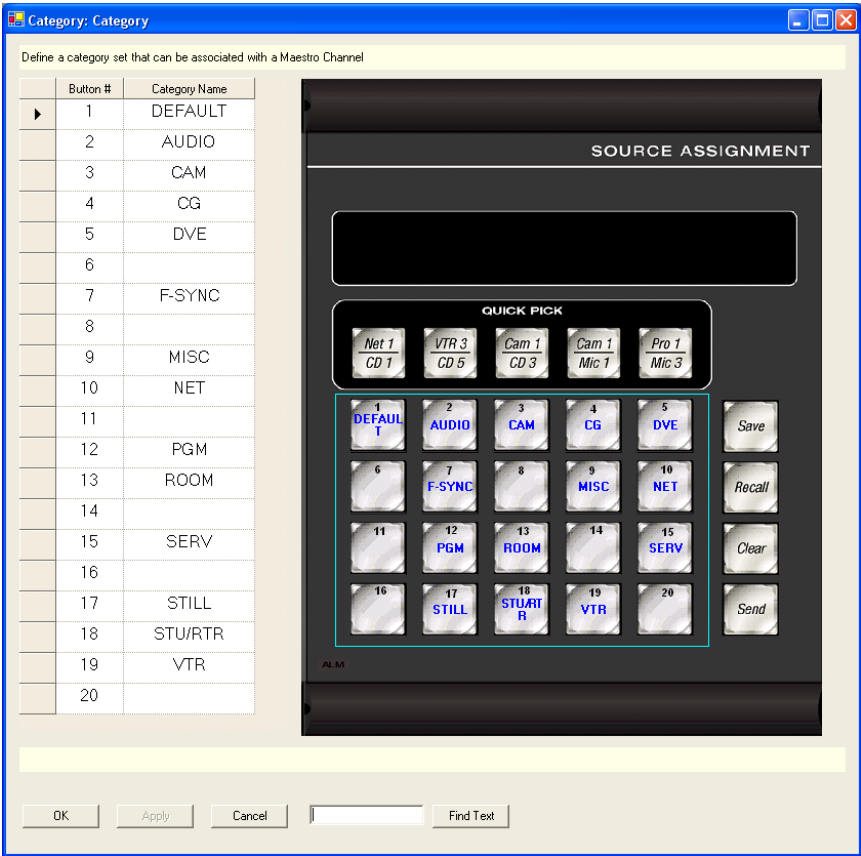


Figure 68. Category Menu



## Category Name

Create a name for each of the Maestro category buttons. The button #s are shown in the left column. These are the numbered buttons that are on the Source Assignment sub panel.

Examples for the Category names are “VTR,” “Pro,” “CG,” “SERV,” “CAM,” etc. Each category name can be up to 16 characters and is subject to Microsoft Windows filename rules.

**Note** Up to 20 categories can be defined. Buttons may also be left blank.

When finished, Click the **Apply** button, and then the **OK** button to save.

## Level

“Levels” are signal types, such as “Video,” “Audio CH 1,” and so forth. Audio levels can be carried within the video signal (“embedded”) or carried on separate cabling (“discrete”).

When this item is selected, the editor will first open a set panel.

## Dependencies

The term “dependencies” refers to the need for Maestro to be able to retrieve configuration data from other Maestro tables or from the router control system (Encore or Jupiter).

For example, before the Maestro Level table can be created the system will need to download an existing level set from the control system. For Jupiter controlled systems, the required set will be the CP Level set assigned to Maestro on the Jupiter MPK Devices table.

If the message “Router Data Required” appears, it means the connection to the control system server has not been established (or has been lost). See [page 128](#).

As before, you will need to create a name for the set. Then select “New.” This will display the Level table.

## Signal

These names are generated by the Maestro software.

## Maestro Level

Create a name for the level for use by the Maestro Configuration Editor. (Level names are not needed for embedded audio.)

This column is the source for the Level column headings on the 5th Step “Input” table ([page 173](#)) and “Interconnections” table ([page 175](#)).

## Router Level

Select a level name as retrieved from the control system. (Level names are not needed for embedded audio.)

## Examples

### Embedded

For Embedded audio, the audio is contained within the video signal. Therefore there are no entries on the audio rows. See [Figure 69](#).

Figure 69. Example of Level Set For Embedded Audio Systems

Level: SWLabLvIE

Define the set of RCS levels and give them a Maestro Level name.

	Signal	Maestro Level	Router Level
▶	Video	SDV	SDV
	Audio CH 1		
	Audio CH 2		
	Audio CH 3		
	Audio CH 4		
	Audio CH 5		
	Audio CH 6		
	Audio CH 7		
	Audio CH 8		
	Audio CH 9		
	Audio CH 10		
	Audio CH 11		
	Audio CH 12		
	Audio CH 13		
	Audio CH 14		
	Audio CH 15		
	Audio CH 16		

OK Apply Cancel Find Text Show Source Information

### Encore AES

For Encore AES audio systems, AES digital audio pairs may be entered as shown in [Figure 70](#).

Figure 70. Example of Level Set For Encore

Define the set of RCS levels and give them a Maestro Level name.

	Signal	Maestro Level	Router Level
▶	Video	SDV	SDV ▼
	Audio CH 1	AES CH1	AESCH12 ▼
	Audio CH 2	AES CH2	AESCH12 ▼
	Audio CH 3	AES CH3	AESCH34 ▼
	Audio CH 4	AES CH4	AESCH34 ▼
	Audio CH 5	AES CH5	AESCH56 ▼
	Audio CH 6	AES CH6	AESCH56 ▼
	Audio CH 7	AES CH7	AESCH78 ▼
	Audio CH 8	AES CH8	AESCH78 ▼
	Audio CH 9		▼
	Audio CH 10		▼
	Audio CH 11		▼
	Audio CH 12		▼
	Audio CH 13		▼
	Audio CH 14		▼
	Audio CH 15		▼
	Audio CH 16		▼

OK Apply Cancel Find Text Show Source Information

Jupiter AES

For Jupiter, an AES digital audio channel may be shown as a single level named “A1.” As an example, this level could be selected for the “A1 (VENUS\_1)” Signal on the table. See [Figure 71](#).

Figure 71. Example of Level Set for Jupiter Discrete System

Level: Maestro1

Define the set of RCS levels and give them a Maestro Level name.

	Signal	Maestro Level	Router Level
▶	Video	SDV	SDV(VENUS_1) ▾
	Audio CH 1	A1	A1(VENUS_1) ▾
	Audio CH 2	A2	A2(VENUS_1) ▾
	Audio CH 3	A3	A3(VENUS_1) ▾
	Audio CH 4	A4	A4(VENUS_1) ▾
	Audio CH 5	A5	A5(VENUS_1) ▾
	Audio CH 6	A6	A6(VENUS_1) ▾
	Audio CH 7	A7	A7(VENUS_1) ▾
	Audio CH 8	A8	A8(VENUS_1) ▾
	Audio CH 9		▾
	Audio CH 10		▾
	Audio CH 11		▾
	Audio CH 12		▾
	Audio CH 13		▾
	Audio CH 14		▾
	Audio CH 15		▾
	Audio CH 16		▾

OK

Apply

Cancel

Find Text

Show Source Information



## 3rd Step: Audio Sets

The 3rd Step: Audio Sets section contains the following steps:

- Audio Output
- Audio Input
- Audio Options

Each of these steps is described below.

### Audio Output

The concept of the Maestro audio processing model is to provide a consistent set of audio output signals regardless of the type of input source. The Audio output screen uses a table that defines this set of output audio groups which is carried through to subsequent configuration tables.

When the Audio Output table is first opened, use the set panel to create a name for the set, and then select “New.” (The set is assigned to a channel, that is, Processor, using the Channel Setup table, as described on [page 221](#).)

An example of an Audio Output table is shown in [Figure 72](#).

Figure 72. Audio Set - Audio Output Table (Example)

Channel	Group Name	Group Type	Metadata Group Name	Channel Name	Channel Description	Force Pass-through	Bit Depth
1	Stereo	Stereo		L	Stereo Left	false	20
2	Stereo	Stereo		R	Stereo Right	false	20
3	Surround	Dolby 5.1		LF	Left Front	false	20
4	Surround	Dolby 5.1		RF	Right Front	false	20
5	Surround	Dolby 5.1		C	Center	false	20
6	Surround	Dolby 5.1		LFE	Low Frequency Effect	false	20
7	Surround	Dolby 5.1		LS	Left Surround	false	20
8	Surround	Dolby 5.1		RS	Right Surround	false	20
9	Mandarin	Mono		CM	Chinese Mandarin	false	20
10	Cantonese	Mono		CC	Chinese Cantonese	false	20
11							20
12							20
13							20
14							20
15							20
16							20

The Audio Output table is used to divide the audio channels into the audio groups. Up to eight channels of audio per source are supported with AES (discrete) audio. If the Grass Valley Sonata AES-to-MADI converter or the Grass Valley Apex audio router is used with Maestro, up to 16 channels of AES audio per source are supported. With an embedded audio infrastruc-

ture, 16 channels of audio per source are supported in Maestro without any additional hardware.

## Channel

Assign a channel for each output. The numbers refer to the 16 audio channels that are handled by the Maestro Processor.

## Group Name

Create a name for the first audio group, for example, “Stereo.”

These names are the source for several headings that are used elsewhere in the system:

- Column headings in the right-hand portion of the Audio Input Table (Figure 73).
- Group selection “cluster” names on the audio control panel.
- Group names at the top of the audio meter bars.

**Note** These names are likely to be truncated when they appear on the tables and displays due to space limitations. For example, “Stereo” may be shortened to “Ster.” The actual number of characters shown will depend on the number of groups and channels that are being displayed on the audio panel. For this reason, it’s a good practice to keep these names as short as practical.

## Group Type

The Group type choices are:

- Mono (fully supported in v1.3 or later)
- Stereo (fully supported in v1.3 or later)
- Dolby 5.1 (fully supported in v1.5 or later)
- Dolby 7.1 (not supported)
- Dolby E pass-through (partially supported in v1.3 or later)

These selections are the source of column headings in the right-hand portion of the Audio Input Table (Figure 73).

Supported types are described below.

### Mono

A mono audio group will reserve two channels in the table, as every audio channel in the Maestro processor is really a pair of channels for I/O purposes (AES, embedded, etc). If only one mono audio group is defined, the Maestro processor will always use the first channel of an audio pair. The second channel can be used for another mono audio group or it can be left empty. The empty audio channel cannot be used by any other audio group type.

**Stereo**

A stereo audio group always uses two audio channels; when selected, the second audio channel will automatically be associated with the first channel.

Maestro can also handle Dolby E or other non-audio signals in a stereo audio group. The presence of a non-audio bit stream is automatically detected and will then bypass the audio processing hardware. This step ensures that the signal cannot be disturbed or destroyed. The hardware will automatically revert to normal operation if a normal audio signal is fed to the Maestro Processor.

A forced pass-through can be configured by setting the Force Pass-through mode in the Audio Output table to “true.” The Force Pass-through mode will inhibit any gain or balance adjustments, fading, mixing, or other audio operations on the audio group whether normal audio is passed or Dolby E signals are present.

**Note** For most installations, automatic detection will provide the best signal quality (that is, when Force Pass-through is set to “false”). “False” is the recommended setting as setting Force Pass-through to “true” will disable all audio level adjustments even on valid audio signals.

**Dolby 5.1**

The Dolby 5.1 audio group will reserve six contiguous audio channels and then support them in a recommended channel order as defined below. The three pairs of audio channels are always assigned on pair boundaries in the table.

**Dolby E Pass-through**

The purpose of this group type is to provide a full time Dolby E channel that cannot be altered, faded, or mixed in any way.

**Note** This group type is not fully implemented. Operation status reported back to the control panel is incorrect and could cause confusion. Until such time as this group type is fully implemented, the Stereo group can be configured for pass through operations as explained above.

**Metadata Group Name**

Not supported. No entry is required.

**Channel Name**

Create a Channel Name.

These names should be kept as short as practical. See Note on [page 142](#).

Suggested names are:

- for a Stereo group:

L  
R

- for a Dolby 5.1 group:

LF (for left front)  
RF (for right front)  
C (for center)  
LFE (for low frequency effects)  
LS (for left surround)  
RS (for right surround)

These names are the source of headings used elsewhere in the system:

- Column headings in the right-hand portion of the Audio Input Table (Figure 73).
- Channel names at the bottom of the audio meter bars of the panel.

### Channel Description

(Optional) Create a channel description.

### Force Pass Through

This setting is used to force the Maestro Processor to pass all digital audio data without mixing, fading, or any other processing. It is normally used only when it is preferred to pass a non-audio signal such as Dolby E or Dolby AC-3 through the Processor.

The choices are:

- False (default)
- True

**Note** For most installations, automatic detection will provide the best signal quality (that is, when Force Pass-through is set to “false”). “False” is the recommended setting as setting Force Pass-through to “true” will disable all audio level adjustments even on valid audio signals.

If used, this setting must always be done in pairs since both sides of an audio channel pair carry non-audio or compressed data. Force pass-through mode can be used on any audio pair, but it is usually reserved only for stereo pairs specifically dedicated for compressed audio signals.

### Bit Depth

Audio bit depth may be set at 16, 20 or 24 bits. This selection is dependent upon the equipment that is used to process the audio. The default bit depth is 20.

Selections are:

- 16
- 20 (default)
- 24

## Audio Input

When this configuration item is selected, the editor will open a set management window. The previously-defined Audio Input sets appear in the Dependencies block.

When the Audio Input table is first opened, create a name for the set, then select “New.” (Audio Input sets are assigned to inputs using the Input table, [page 172.](#))

Figure 73. Audio Set - Audio Input Table (Example)

Audio Input: Standard

Configure the Audio Input mapping to the Audio Output Configuration.

Channel

Group Name

Group Type

Channel Name

1

Stereo

Stereo

L

2

Stereo

Stereo

R

3

Surround

Dolby 5.1

LF

4

Surround

Dolby 5.1

RF

5

Surround

Dolby 5.1

C

6

Surround

Dolby 5.1

LFE

7

Surround

Dolby 5.1

LS

8

Surround

Dolby 5.1

RS

9

Mandarin

Mono

CM

10

Cantonese

Mono

CC

11

12

13

14

15

16

Audio Output Configuration

Stereo		Surround						Mandarin	Cantonese
Stereo		Dolby 5.1						Mono	Mono
L	R	LF	RF	C	LFE	LS	RS	CM	CC
0									
	0								
		0							
			0						
				0					
					0				
						0			
							0		
								0	
									0

OK

Apply

Cancel

Find Text

\* Denotes Phase Invert

### Channel

Assign a channel for each input. The numbers refer to the 16 audio channels handled by the Maestro Processor.

### Group Name

Create a name for the first audio input group, for example, “Main Stereo.” These names should resemble the group names previously created for the output table.

## Group Type

Choices are:

- Mono (fully supported in v1.3 or higher)
- Stereo (fully supported in v1.3 or higher)
- Dolby 5.1 (fully supported in v1.5 or higher)
- Dolby 7.1 (not supported)
- Dolby E pass-through (partially supported in v1.3 or higher)

For a description of these group types, see [Group Type](#) in the Audio Output section.

## Channel Name

Create a Channel Name.

Suggested names are:

- for a Stereo group:
  - L (Left)
  - R (Right)
- for a Dolby 5.1 group:
  - LF (for left front)
  - RF (for right front)
  - C (for center)
  - LFE (for low frequency effects)
  - LS (for left surround)
  - RS (for right surround)

## Derived Group Definitions

The source of the column names used in this section is the Audio Output table ([page 141](#)).

The audio input table is designed to provide mapping of audio channels from a source to the audio output groups as defined in the Audio Output table. Software version 1.3 and above fully implement the Audio Input tables. Previous versions were hard coded in a 1:1 channel mapping.

Many different Audio Input tables are allowed; theoretically, every source feeding the Maestro switcher could have a different Audio Input table. It is recommended that a small set of standard audio input tables be created and used for most sources. A few specialty tables can then be created if special audio mapping is required.

The Audio Input tables provide “static” channel remapping, meaning that the audio channels are mapped in configuration and are set in advance. On-the-fly or “dynamic” remapping is accomplished through the audio group drill-down screens or the Channel Mapping Screen. The decision as to

which to use depends upon planned operation and philosophy of a given installation.

**Note** Input mapping of audio sources is done completely within the Maestro Processor. This is especially useful for embedded sources where the audio and video are locked together. When an external audio router is used, some mapping functions can be done in the router rather than in the Maestro product. Careful planning must be done to determine where the mapping is best done in a given installation.

In general, remapping in the Audio Input tables is used for sources that do not change dynamically or for those sources that have a few possible configurations. (Audio Input sets are assigned to sources using the Input table, [page 173](#).)

There are a number of primary uses for the Audio Input tables:

- Standard input mapping (1:1)
- Correcting format differences
- Audio group substitution
- Down-mix / up-mix mapping
- Combinations of all the above

These categories are described below.

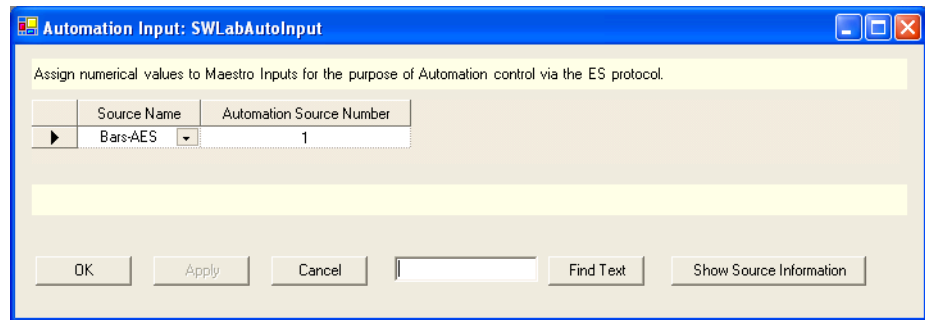
#### **Standard Input Mapping (1:1)**

The Audio Input table is really a matrix of inputs and outputs representing the 16 input and 16 output channels. Each cell in the table can contain a gain value in dB. A value of "0" means a unity gain value for that input/output combination. The values are the contribution of the input channel to the output channel. The range of values is blank or OFF, or from -51.1 dB to 0 dB (Unity gain) with 0.1 dB resolution.

Standard or 1:1 input mapping has been the default input mapping in all software versions before 1.3. This method maps the input channels to the output channels one-to-one. [Figure 74](#) shows 10 audio channels spread across four audio groups, the input table maps each input channel to the corresponding output channel.



Figure 74. 1:1 Input Mapping

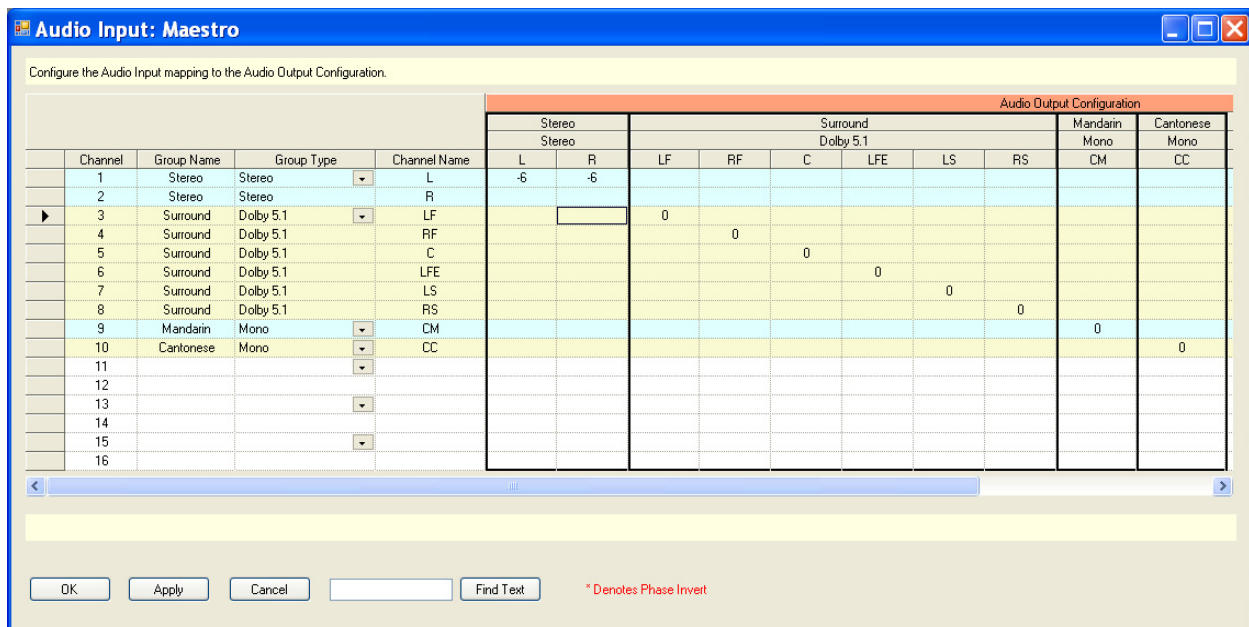


### Correcting Format Differences

The input tables can be used to fix format differences in sources. A good example is a VTR or disk server that may have many different programs with different audio channels but is always connected to the Maestro as a stereo pair of channels. For example, it is standard in many facilities to use the left channel only for mono programs.

The Audio Input table can be used to correct this format difference as shown in [Figure 75](#):

Figure 75. Audio Format Correction



In this table, a left-only signal coming in on the Stereo input is sent to the Left and Right outputs of the Stereo output group. The -6 dB value divides up the signal equally into both sides of the stereo pair. Using this gain value insures that the mono sum is the same as the original signal level.

### Audio Group Substitution

The Audio Input table can be used to pre-configure an audio group substitution. In [Figure 76](#) three stereo audio groups are defined. The source may have normal stereo for the main program and the Cantonese output, but the Mandarin channel is not available. In this case, it is desirable to substitute the original stereo audio for the Mandarin rather than leave it silent.

Figure 76. Audio Group Substitution

Channel	Group Name	Group Type	Channel Name	Stereo Stereo		Mandarin Stereo		Cantonese Stereo	
				L	R	ML	MR	CL	CR
1	Stereo	Stereo	L	0		0			
2	Stereo	Stereo	R		0		0		
3	Mandarin	Stereo	ML						
4	Mandarin	Stereo	MR						
5	Cantonese	Stereo	CL					0	
6	Cantonese	Stereo	CR						0
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

OK Apply Cancel Find Text \* Denotes Phase Invert

### Down-mix / Up-mix Mapping

The audio input tables can also be used to down-mix or up-mix a program. A down-mix is defined as creating a new signal from an audio group with many channels to a group with fewer channels. An up-mix is creating a new signal from an audio group with a few channels to a group with more channels.

[Figure 77](#) shows a down-mix of stereo to mono as well as an audio group substitution. Here the original stereo program is down-mixed to a mono version and sent out the Mandarin output. The values of -6 dB are used so that the mono sum will be at unity gain.

Figure 77. Stereo to Mono Down Mix

**Audio Input: Maestro**

Configure the Audio Input mapping to the Audio Output Configuration.

Channel	Group Name	Group Type	Channel Name	Audio Output Configuration								Mandarin Mono	Cantonese Mono		
				Stereo Stereo		Surround Dolby 5.1									
				L	R	LF	RF	C	LFE	LS	RS				
1	Stereo	Stereo	L	0											
2	Stereo	Stereo	R		0										
3	Surround	Dolby 5.1	LF			0									
4	Surround	Dolby 5.1	RF				0								
5	Surround	Dolby 5.1	C					0							
6	Surround	Dolby 5.1	LFE						0						
7	Surround	Dolby 5.1	LS							0					
8	Surround	Dolby 5.1	RS								0				
9	Mandarin	Mono	CM												
10	Cantonese	Mono	CC											0	
11															
12															
13															
14															
15															
16															

OK Apply Cancel Find Text \* Denotes Phase Invert

In Figure 78, only the main stereo signal is available, with no surround sound and no Mandarin or Cantonese versions. The table is used to up-mix the stereo to the surround outputs, as well as down-mix the stereo program to both the Mandarin and Cantonese mono outputs. The stereo-to-surround up-mix is set up to provide signals from the left and right speakers as well as create a center channel signal.

Figure 78. Stereo to All Output Groups Mix

Audio Input: Maestro

Configure the Audio Input mapping to the Audio Output Configuration.

				Audio Output Configuration										
				Stereo		Surround							Mandarin	Cantonese
				Stereo		Dolby 5.1							Mono	Mono
	Channel	Group Name	Group Type	Channel Name	L	R	LF	RF	C	LFE	LS	RS	CM	CC
	1	Stereo	Stereo	L	0		-3		-9				-6	-6
	2	Stereo	Stereo	R		0		-3	-9				-6	-6
	3	Surround	Dolby 5.1	LF										
	4	Surround	Dolby 5.1	RF										
	5	Surround	Dolby 5.1	C										
	6	Surround	Dolby 5.1	LFE										
	7	Surround	Dolby 5.1	LS										
	8	Surround	Dolby 5.1	RS										
▶	9	Mandarin	Mono	CM										
	10	Cantonese	Mono	CC										
	11													
	12													
	13													
	14													
	15													
	16													

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>

OKApplyCancelFind Text

\* Denotes Phase Invert

Figure 79 shows an input table where there is only a surround audio source available, and a stereo down-mix is created. The values used for the down-mix create a Lo-Ro (Left only/Right only) mix for the stereo output, while passing the Surround version with 1:1 mapping.

Figure 79. 5.1 Surround to Stereo Down Mix

Channel	Group Name	Group Type	Channel Name	Audio Output Configuration							
				Stereo		Surround					
				L	R	LF	RF	C	LFE	LS	RS
1	Stereo	Stereo	L								
2	Stereo	Stereo	R								
3	Surround	Dolby 5.1	LF	0		0					
4	Surround	Dolby 5.1	RF		0		0				
5	Surround	Dolby 5.1	C	-3	-3			0			
6	Surround	Dolby 5.1	LFE						0		
7	Surround	Dolby 5.1	LS	-1.2	-6.2					0	
8	Surround	Dolby 5.1	RS	-6.2	-1.2						0
9											
10											
11											
12											
13											
14											
15											
16											

OK Apply Cancel Find Text \* Denotes Phase Invert

## Recommended Audio Mapping Values

The following section outlines recommended values for up-mixing and down-mixing various kinds of audio groups. These values have been carefully tested and represent a good compromise of performance over a wide variety of program material. Other mappings are possible, but we recommend that you start with these values.

### Mono Sources

Figure 80 shows surround mixing with a mono source mapped to the center or dialog channel of the surround output. This is the recommended practice by many surround producers. However, some listeners prefer to hear something from the left and right speakers even with mono sources. Others prefer to always have something in the center or dialog channel. In Figure 81 and Figure 82 are shown two other approaches to mono up-mixing.

The choices are:

- Mono-to-stereo (mono spread equally over left and right)
- Mono-to-surround (mono mapped to surround three different ways)
- Mono-to-mono (1:1 mapping)

Figure 80. Mono to Center Surround and Stereo Up Mix

**Audio Input: Mono**

Configure the Audio Input mapping to the Audio Output Configuration.

	Channel	Group Name	Group Type	Channel Name	Audio Output Configuration									
					Stereo		Surround						Mono	
					L	R	LF	RF	C	LFE	LS	RS	M	
1	1	Mono	Mono	M	-6	-6			0					0
2	2													
3	3													
4	4													
5	5													
6	6													
7	7													
8	8													
9	9													
10	10													
11	11													
12	12													
13	13													
14	14													
15	15													
16	16													

OK Apply Cancel Find Text \* Denotes Phase Invert

Figure 81 shows the mono source mapped to the left front and right front outputs equally.

Figure 81. Mono to Left and Right Front Surround and Stereo Up Mix

**Audio Input: Mono**

Configure the Audio Input mapping to the Audio Output Configuration.

	Channel	Group Name	Group Type	Channel Name	Audio Output Configuration									
					Stereo		Surround						Mono	
					L	R	LF	RF	C	LFE	LS	RS	M	
1	1	Mono	Mono	M	-6	-6	-6	-6						0
2	2													
3	3													
4	4													
5	5													
6	6													
7	7													
8	8													
9	9													
10	10													
11	11													
12	12													
13	13													
14	14													
15	15													
16	16													

OK Apply Cancel Find Text \* Denotes Phase Invert

Figure 82 shows mapping to all three front speakers.

Figure 82. Mono to Left Front, Right Front and Center Surround and Stereo Up Mix

**Audio Input: Mono**

Configure the Audio Input mapping to the Audio Output Configuration.

Channel	Group Name	Group Type	Channel Name	Audio Output Configuration									
				Stereo		Surround							Mono
				L	R	LF	RF	C	LFE	LS	RS	M	
1	Mono	Mono	M	-6	-6	-3	-3	0				0	
2													
3													
4													
5													
6													
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OK Apply Cancel  Find Text \* Denotes Phase Invert

## Stereo Sources

The following examples show different approaches for up-mixing stereo sources to surround outputs as well as showing a down-mix of stereo-to-mono.

The choices are:

- Stereo-to-stereo (1:1 mapping)
- Stereo-to-surround (up-mixing two different ways)
- Stereo-to-mono (down-mixing)

Figure 83 shows the traditional mapping of the left and right channels to the left front and right front output channels. This method is preferred by some users.

Figure 83. Stereo to Left and Right Front Surround Up Mix

[illegible]

However some customers report that their listeners prefer to always have something in the center channel. In [Figure 84](#), a center channel is created by mixing the left and right signals together. The gain values are adjusted lower in this case to present a consistent sound level.



Figure 84. Stereo to Left Front, Right Front and Center Surround Up Mix

[illegible]

## Surround Sources

The surround source choices are:

- Surround-to-stereo (down-mixing one of two different ways)
- Surround-to-surround (1:1 mapping)
- Surround-to-mono (complete mono down-mix two different ways)

The following examples show different approaches for down-mixing stereo sources to stereo and mono outputs. [Figure 85](#) shows a down-mix that emulates a mix called Left total/Right total, or Lt-Rt down-mix. This method captures some of the surround information by using the *phase inversion* feature of the audio input tables (as determined by the asterisk following the gain value). A Phase Inversion is created by selecting the preferred cell, then right clicking the selected cell, and then selecting “Phase Invert” from the context sensitive menu. This method creates a mix similar to a Dolby Pro Logic mix. Some users, however, feel that this mix captures too much of the surround information and causes muddiness and thickness in the stereo version.

Figure 85. Left Total/Right Total Down Mix

Audio Input: Dolby

Configure the Audio Input mapping to the Audio Output Configuration.

Channel	Group Name	Group Type	Channel Name	Audio Output Configuration									
				Stereo Stereo		Surround Dolby 5.1							
				L	R	LF	RF	C	LFE	LS	RS	M	
1	Surround	Dolby 5.1	LF	0		0							-6
2	Surround	Dolby 5.1	RF		0		0						-6
3	Surround	Dolby 5.1	C	-3	-3			0					-3
4	Surround	Dolby 5.1	LFE						0				
5	Surround	Dolby 5.1	LS	-1.2*	-6.2					0			-3.3*
6	Surround	Dolby 5.1	RS	-6.2*	-1.2						0		-3.3
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													

OK Apply Cancel Find Text \* Denotes Phase Invert

[Figure 86](#) shows what is usually called a Left only/Right only or Lo-Ro down-mix, which is preferred by most listeners. In both cases the Low Frequency Effects or LFE channel is left out of the down-mix which is recommended.

Figure 86. Left Only/Right Only Down Mix

**Audio Input: Dolby**

Configure the Audio Input mapping to the Audio Output Configuration.

Channel	Group Name	Group Type	Channel Name	Audio Output Configuration									
				Stereo		Surround							Mono
				L	R	LF	RF	C	LFE	LS	RS	M	
1	Surround	Dolby 5.1	LF	0	0	0	0	0	0	0	0	-6	
2	Surround	Dolby 5.1	RF		0		0					-6	
3	Surround	Dolby 5.1	C	-3	-3			0				-3	
4	Surround	Dolby 5.1	LFE					0					
5	Surround	Dolby 5.1	LS	-1.2	-6.2					0		-3.3	
6	Surround	Dolby 5.1	RS	-6.2	-1.2						0	-3.3	
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													

OK Apply Cancel Find Text \* Denotes Phase Invert

## Audio Options

When the Audio Options table is first opened, the editor will open a set panel. Create a name for the Audio Options set, then select “New.” (The set is assigned to a Maestro channel using the Channel Setup table.) See [Figure 87](#).

Figure 87. Audio Options Table

The figure shows three screenshots of the 'Audio Options: SD' dialog box, which is used to configure various audio options for a channel in the Channel Setup table. Each screenshot shows a different tab of the dialog.

**Top Screenshot: Rate Conversion on AES Inputs**

	Rate Conversion on AES Inputs	Embedded Audio Options	VU Meter Ref Level	PPM Meter Ref Level	Default Mix Over Ratio	Default DIM Value
▶	Auto	Embed	-20 dBFS	-20 dBFS	12 dB	-20 dB

**Middle Screenshot: Embedded Audio Options**

	Default Monitor Maximum Level	Default Monitor Reference Level	Default Monitor Minimum Level	Monitor Level Display	Monitor Speaker Configuration
▶	0 dB	-20 dB	0 dB	Atten dB	2-Ch Stereo

**Bottom Screenshot: Monitor Bit Depth**

	Monitor Bit Depth	Dolby-E Support Mode	Dolby 5.1 Upmix Mode	Mute Dolby-E on Monitor Output
▶	24	PassThrough	Center Channel Mono Mode	Yes

### Rate Conversion on AES Inputs

Choices are:

- Yes - see discussion below.
- No - see discussion below.
- Auto - this is the default and preferred setting. See discussion below.

High quality sample-rate converters are provided on the AES digital audio inputs of the Maestro Processor. These rate converters effectively remove jitter and synchronize any sources that are asynchronous. The use of this feature allows non-synchronous devices like a CD player or a computer sound card to play audio into the Processor.

**Note** Maestro rate converters are only available on the AES/EBU inputs. They will not function for embedded audio signals or the MADI inputs. Embedded signals by definition (and by industry standard) must be synchronous.

The Grass Valley Sonata AES to MADI converters include rate converters. A wide range of sample rates may be fed into the Sonata AES inputs and they will be converted to 48 KHz on the MADI output. The Sonata AES to MADI converters also provide access to all 16 audio channels of the Processor. The Sonata sample rate converters are bypassed only when configured to be bypassed or when a Dolby-E signal is present on the input.

#### **Yes mode**

This mode turns on the sample rate converters full-time. In this mode there is no auto detection. Non-audio signals such as Dolby E or AC-3 will NOT pass through the AES/EBU inputs. This mode is useful when only audio signals are used, as all AES/EBU signals will be synchronized regardless of whether they are synchronous with reference or running at the same sample rate.

#### **No mode**

This mode bypasses the sample rate converters full-time providing a full 24-bit-accurate path into the Maestro Processor. This mode can be used for both audio and non-audio signals as long as all signals are synchronous with the reference applied to the Maestro Processor.

#### **Auto mode**

This mode provides full-time sample rate conversion for all AES/EBU input signals unless they are marked as non-audio signals, such as Dolby E or AC-3. When non-audio signals are present, the Maestro processor automatically bypasses the sample rate converters and passes the non-audio signals bit-accurate. This is the default mode and will be the easiest to use for most users.

**Note** All non-audio signals are required to be synchronous with the reference applied to the Maestro processor as they do not pass through the sample-rate converters.

### **Embedded Audio Options**

Choices are:

- Embed (default)
- Pass Through

This menu choice allows the user to decide whether to embed the audio processed in the Maestro Processor or just pass through the embedded audio that comes in with the video sources. Most users will prefer to re-embed the audio created in the Processor as otherwise the fading/mixing/gain control functions of Maestro will not appear on the video outputs.

One possible reason for using pass through is when the user doesn't want any changes to the audio signals at all (this is not common). In pass through mode embedded audio will be switched simultaneously with the video.

### **VU Meter Reference Level**

Choices range from -12 dBFS to -24 dBFS in 1 dBFS increments.

Default: -20 dBFS.

This option selects the reference level that results in a "0" VU reading on the meters. The default is -20 dBFS which corresponds to the SMPTE recommended practice and is usually used in the United States. Another commonly used value is -18 dBFS which is used in some European countries.

### **PPM Meter Reference Level**

Choices range from -12 dBFS to -24 dBFS in 1 dBFS increments.

Default: -20 dBFS.

This option selects the reference level that results in a mid-scale or reference reading on the PPM meters. The default is -20 dBFS which corresponds to the SMPTE recommended practice and is usually used in the United States. Another commonly used value is -18 dBFS.

### **Default Mix-Over Ratio**

Choices range from 0 dB to -24 dB in 1 dB increments.

Default: -12 dB.

This option selects the mix-over ratio for an audio mix-over. This value defaults to -12 dB, which means the background audio will drop by the selected value (-12 dB for the default value) when a mix-over is enabled. This value applies to all mix-overs and is the default when a mix over-source is assigned to a mixer.

**Note** A 0 dB mix-over means that both the background and mix-over source will be mixed together at full level.

### **Default DIM Value**

Choices range from -10 dB to -30 dB in 1 dB increments.

Default: -20 dB.

This option selects the amount the audio monitor output is attenuated when the **DIM** button is pushed on the control surface. This option is typically used when the operator answers the telephone or intercom and needs to quiet the audio monitors but does not wish to change the level control.

### Default Monitor Maximum Level

Choices range from 0 dB to -20 dB in 1 dB increments. The Default is 0 dB. This is also the value that the Audio Monitor section will default to after NVRam is cleared. After an NVRamClear, the frame processor will default audio monitoring to this level.

**Note**      The channel will also default to Master Fade after an NVRamClear, so no audio will be heard.

This option selects the maximum output level of the audio monitor outputs. Some users prefer to limit the maximum volume permitted in a control room. Limiting the maximum volume is not suggested since, in a digital system, optimum signal-to-noise performance is compromised if the maximum level is not equal to digital full scale (dBFS).

### Default Monitor Reference Level

Choices range from -10 dB to -30 dB in 1 dB increments.

Default: -20 dB.

This option selects the default monitor reference level. This level is achieved when the **Reset** button located next to the audio level control is pushed. The purpose of this button is to provide a reference or standard level of audio for monitoring. This is especially important in a Dolby Surround system. The default level is -20 dBFS, meaning that the output monitors will have 20 dB of gain above the standard reference level.

Setting this value below -20 dB is not recommended. The preferred monitor reference level is between -12 dB and -20 dB. In a digital system, maintaining maximum signal-to-noise ratio requires that normal listening levels are within 20 dB of digital full scale (dBFS).

Many Dolby Surround systems are designed so that the listening level is -20 dB below full scale, and power amplifiers are set so that this output level results in a listening level of between 75 and 85 dB SPL.

### Default Monitor Minimum Level

Choices are:

- Range from -30 dB to -60 dB in 5 dB increments
- Off (default)

This option sets the minimum audio monitor output level. The default is OFF, but a minimum level can be set so that an operator can be prevented from turning the monitor speakers all the way off, thereby not listening to the transmitted program.

### Monitor Level Display

Choices are:

- Atten dB (default)
- Absolute dB

This option allows the user to select how the audio monitor level is displayed on the control surfaces. The default mode is as an attenuator, meaning that 0 dB is the loudest possible and that all other levels are displayed as -XX.X dB.

### Monitor Speaker Configuration

Choices are:

- 2-Channel stereo
- 5.1 Surround with Mono in Center
- 5.1 Surround with Mono in L-R

This option allows the user to select the type of monitor speakers connected to the Maestro processor. Three different options are provided. The Maestro processor will automatically map the audio group being monitored to the monitor speaker configuration. In previous versions of the software, only a stereo pair of speakers was supported. Now, two new options are provided, 5.1 surround with mono signals presented in the Center speaker, or 5.1 surround with mono signals presented in the Left-Right pair of speakers.

The user should select the option that matches their audio monitor speakers with a preference as to how mono signals are monitored.

### Monitor Bit Depth

Choices are:

- 24 (default)
- 20
- 16

All data is currently formatted into 24-bit depth. Other selections are not currently supported.

### Dolby E Support Modes

Choices are:

- Pass Through (default)
- External Decode Without Metadata
- External Decode with Metadata Pass Through



This option allows the user to select how the Maestro product will support and process Dolby E type signals. Although several options are shown in this menu, only Pass Through mode is currently supported.

### **Dolby 5.1 Up-Mix Mode**

Choices are:

- Center Channel Mono Mode (default) (see below)
- 2-Channel Mono Mode (see below)
- 3-Channel Mono Mode (see below)

This option allows the user to determine how Dolby 5.1 audio groups behave and especially the way in which mono up-mixing behaves. Up-mixing refers to the operation of taking a signal with fewer channels and presenting them in a format with many channels. In this case it is how mono and stereo signals are presented on a 5.1 surround audio group. (By contrast, down-mixing is many channels to fewer, such as 5.1 mixed down to stereo.)

#### **Center Channel Mono Mode (default)**

This version maps the 5.1 channels normally, but favors the Center Channel of the group when mono type signals are mapped to a surround group. The difference between this mode and the others is that when mono signals are presented, the drill-down selections on the control surface will map them to the center channel. In addition, when a mono down-mix of surround is selected it also maps the audio to the center channel.

This is done based upon some customer and press information that many customers that routinely listen to surround sound presentations expect the primary dialogue to be presented in the center channel. So, for example, if a mono source, such as an old movie, is presented it is best mapped to the center channel thus preserving the dialogue sound source customers are used to. This is in accordance with Dolby recommendations and is the default.

#### **Two-Channel Mono Mode**

This version maps the 5.1 channels normally, but favors the left and right front channels of the group when mono type signals are mapped to a surround group. The differences between this mode and the others is that when mono signals are presented, the drill down selections will map them to both speakers of a stereo pair leaving the center channel silent. In addition, when a mono down-mix of surround is selected it also maps the audio to both the left and right front channels.

This mode was created based upon some customer and press information that this mapping is the default behavior in the industry and what most customers expect from Maestro. However this is contrary to Dolby recommendations.

### **Three-Channel Mono Mode**

This version maps the 5.1 channels normally, but favors all three front channels of the group when mono type signals are mapped to a surround group. In addition, it creates a center channel from a stereo pair. The difference between this mode and the others is that when mono signals are presented, the drill down selections on the control surface will map them to all three front channels.

This is done based upon some customer and press information that many customers that routinely listen to surround sound presentations expect the primary dialogue to be presented in the center channel. So, for example, if a mono source, such as an old movie, is presented it is best mapped to the center channel thus preserving the dialogue sound source customers are used to. The other modes either use the center channel exclusively or not at all for certain input group types. This mode seeks to always map some audio to the center speaker.

### **Mute Dolby E on Monitor Output**

Choices are:

- Yes (default)
- No

This option allows the user to select what happens when a Dolby E type signal routed through Maestro in a pass-through mode is selected on the audio monitor speakers. Dolby E and other non-audio signals sound very loud and harsh (white noise) when heard on speakers. This option causes the Maestro hardware to detect the presence of a non-audio signal which then mutes the audio monitor outputs. Normally the user will want to mute the monitor outputs, unless they use some outboard monitoring equipment for example and wish to have the non-audio signals such as Dolby E pass to the downstream audio equipment.

### **Router Status Audio Mute**

Choices are:

- Yes (default)
- No

## **4th Step: Branding Engine**

The 4th Step: Branding Engine:

- Content Definition
- Content Input

Each of these steps is described below.

## Content Definition

The Content Definition configuration editor table includes definition parameters required by Branding Engine sources. After a Source Type has been selected the applicable fields will become active, all fields that do not pertain to the source type will be grayed out.

Start by clicking the **Content Definition** hyperlink. This step will display the Content Definition screen. The screen has a table that will define the content information. The features of this table are described below.

Figure 88. Content Definition Configuration Editor Table

Source Name	Source Type	Levels	Update Mode	Template	Update Period	Loop Mode	Join in Progress	Horizontal Position(%)
TV-G	Still Image	video	Manual					10

OK Apply Cancel Find Text

### Source Name

Enter a name for the source. This is an arbitrary name used only within the Maestro system.

### Source Type

Select the type of branding element from the drop-down list. The choices are:

- Still Image - still graphic image
- Animation - animation sequence clips
- Audio Voice Over - audio clips
- Text Crawl - text crawl described by a text format template
- CG Text - auto-update text display

**Note** The selected Branding Source type will affect the available options in the remainder of the input configuration

## Levels

This selection defines the video and audio levels that are associated with the branding element. This list will be grayed out for every source but Audio Voice over. When the Audio Voice over option is selected, a parameter drop-down checklist with all possible audio levels is available.

## Update Mode

Select the update Mode. The choices are Manual or Automatic. Two general types of branding element configurations are supported:

### Manual

Branding elements that are defined as manual are updated whenever a configuration is loaded that contains those branding elements or when the **Show Contents** button is clicked in the Deployment Center.

### Automatic

Branding elements that are defined as “automatic” are monitored automatically in the Content Gateway and anytime the file is changed, it is automatically ingested, converted to the proper format and deployed with no manual intervention required.

## Template

Assigns a template to the element if a template is applicable. Selecting the graphic in the field will launch the Template editing screen. See Template for more information.

## Update Period

Update Period

## Loop Mode

Select the preferred loop mode from the drop-down list. The options are Play Once or Loop. A Still Image or a CG Text element will play until they are removed. For animation sequences, audio voice over clips and text crawl elements the parameter has the following effects:

- Play Once - The element is played its entire length and then stops.
- Loop - The Loop mode will play the entire element constantly looping from the end of the element to the beginning of the element.

## Join in Progress

Select either True or False for the status of a join. Select True to join the content in progress or False to start the content from the beginning each time it is presented to air.

### Horizontal Position (%)

Enter the left-hand screen insertion position of the associated video element defined in percentage of screen width.

### Vertical Position (%)

Enter the upper screen insertion position of the associated video element defined in percentage of screen height.

### Opacity (%)

Enter the keyer insertion opacity in percentage of video keyer mix

### Audio Ratio

Select the Audio ratio in dBs from the drop-down list.

### Source File

Select the location of the Source file. Include the file path, filename and extension of the original branding element.

### Create Key

Select this check box if the source image does not have an Alpha channel and you want a default key to be created.

When finished, Click the **Apply** button, and then the **OK** button to save.

## Content Input

The Maestro DVE Content Input configuration editor is used to define video and audio levels that are available for DVE sources. The branding element definitions will appear in the Input editor table with the name extension of (Content) indicating an internal or branding source.

**Note** The Content Definition information must be defined to define the Content Input information.

Follow these steps to configure the Content Input settings:

1. Enter a name in the Name field.
2. Select the Content Definition dependency.
3. Click the **New** button.

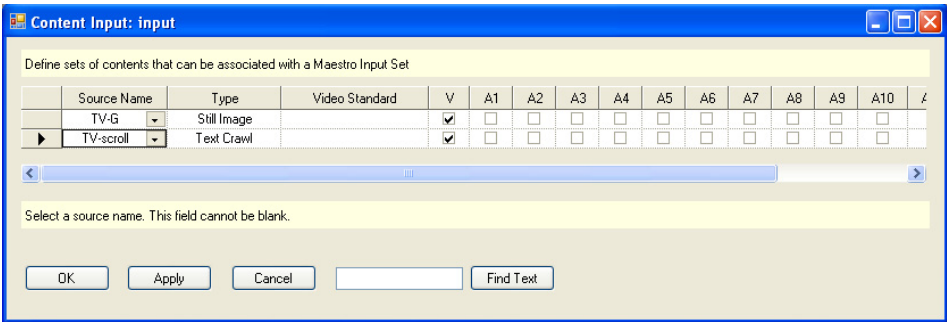
Figure 89. The Content Input Panel



The Content Input Panel is a vertical window with a blue header and footer. It contains the following elements from top to bottom: a 'Name:' label with a text box containing 'input test' and a 'New' button; a 'Dependencies' section with a 'Content Definition' dropdown menu set to 'test'; an 'Apply' button; a 'Content Input Set(s)' section with a large empty text box; 'Open' and 'Delete' buttons; a 'New set name:' label with a text box; and a 'Copy' button.

The Content Input window will then appear.

Figure 90. Content Input Configuration Editor Table



The Content Input Configuration Editor Table window has a blue title bar and a yellow header area. The header area contains the text 'Define sets of contents that can be associated with a Maestro Input Set'. Below this is a table with the following columns: Source Name, Type, Video Standard, V, A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, and a final column with a right-pointing arrow. The table contains two rows: 'TV-G' with 'Still Image' type and 'TV-scroll' with 'Text Crawl' type. The 'V' column has checkboxes checked for both rows. The 'A1' through 'A10' columns have checkboxes that are unchecked for both rows. Below the table is a yellow area with the text 'Select a source name. This field cannot be blank.' and a text box. At the bottom are 'OK', 'Apply', and 'Cancel' buttons, followed by a text box and a 'Find Text' button.

Source Name	Type	Video Standard	V	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	
TV-G	Still Image		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
TV-scroll	Text Crawl		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

The Content Editor screen’s table parameters include:

### Source Name

Select a Source from the drop-down list. This name is the Branding element source name that was defined in the Content Definition editor.

### Type

Select the Branding element type that was entered in the Content Definition editor. This field is automatically updated when an element is selected in the Source Name field.

### **Video Standard**

The Video Standard will appear if applicable.

### **Video and Audio Levels**

These check boxes are for all of the supported video and audio levels (V, A1-A16) that are automatically selected when an element is selected in the Source Name field. These levels are based on the selections that were set in the Levels definition in [2nd Step: Definition](#).

## 5th Step: Input/Output Sets

The 5th Step: Input/Output Sets:

- Input
- Interconnection
- GPIO Definition
- Monitor Follow

Each of these steps is described below.

### Input

This table defines which router inputs are available to the Maestro, and specifies the Category and Number button combination that will appear on the Source Assign keypad.

When the Input table is first opened, create a name for the set, select the preferred configuration set dependencies, and then select the “New” option. (The set is assigned to a channel using the Channel Setup table, [page 221](#).)

An example of an Input set is shown in [Figure 91](#). In this example, all inputs or sources are either External, Embedded, or Direct. See the *Enable source type color coding* section of the interface.

### Dependencies

Several tables must already exist before continuing:

- Category set - from Maestro 2nd Step [Category](#).
- Level set - from Maestro 2nd Step [Level](#).
- Audio Input Configuration set - from Maestro 3rd Step [Audio Input](#).



Figure 91. Input Set Example

Input: 4StereoPairs

Define a set of RCS inputs that are available to an associated Maestro channel.

Category	Entry	Mnemonic	Audio Input Configuration	SDV	AES CH1	AES CH2	AES CH3	AES CH4	AES CH5	AES CH6	AES CH7	AES CH8
				Video	Stereo 1/2	Stereo 3/4	Stereo 5/6	Stereo 7/8				
Test	1	Bars-AES	4StereoPair	Bars	Bars	Bars						
Test	2	Bars-Venus	4StereoPair	Bars								
Test	3	Bars-Philips	4StereoPair	Bars								
Test	4	Bars-Mars	4StereoPair	Bars								
Test	5	Bars-Saturn	4StereoPair	Bars								
Net	1	KSL-NBC	4StereoPair	KSL-NBC	KSL-NBC	KSL-NBC						
Net	2	KTVX-ABC	4StereoPair	KTVX-ABC	KTVX-ABC	KTVX-ABC						
Net	3	CSPAN	4StereoPair	CSPAN	CSPAN	CSPAN						
Server	1	Pool	4StereoPair	PoolSrvr	PoolSrvr	PoolSrvr						
Aux	1	Venus	4StereoPair	Venus								
Aux	2	Philips	4StereoPair	Philips								
Aux	3	Mars	4StereoPair	Mars								
Aux	4	Saturn	4StereoPair	Saturn								
PAL	1	PALPool1	4StereoPair	Bars 13	Embedded	Embedded						
PAL	2	PALPool2	4StereoPair	Bars 14	Embedded	Embedded						
PAL	3	PALPool3	4StereoPair	Bars 15								
PAL	4	PAL-BARS	4StereoPair	Bars 16								
Aux	0	Tone	4StereoPair		Bars	Bars						
Embedded	0	KSL-Emb	4StereoPair	KSL-NBC	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded
Embedded	1	CSPAN-Emb	4StereoPair	CSPAN	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded
Embedded	2	Bars-Emb	4StereoPair	Bars	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded
Embedded	3	KTVX-Emb	4StereoPair	KTVX-ABC	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded
Embedded	4	Bars 2	4StereoPair	Bars 2	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded
Test	0	Test	4StereoPair	Bars								
Test	20	BarsDirect	4StereoPair	Direct-Key1								
Test	21	SaturnDirect	4StereoPair	Direct-Key1								

☒ Enable source type color coding

External Internal Embedded Direct Unknown

OK Apply Cancel Find Text Show Source Information

## Category

Select a category for each input (from [page 136](#)). This is the category name that will appear on the Source Assignment sub panel display.

## Entry

Create an entry number for each input. This number will appear on the Source Assignment sub panel display.

## Mnemonic

Create a mnemonic for this input.

This is the source for input names that will appear as a selection in several Configuration tables:

- Background Buttons table ([page 195](#))
- Key Fill Association table ([page 197](#))
- Automation Input table ([page 198](#))
- Quick Pick table ([page 198](#))

It is also the source for the name on the Program bus button when this input is assigned to the control panel.

## Audio Input Configuration

Select an Audio Input configuration (from [Audio Input](#)).

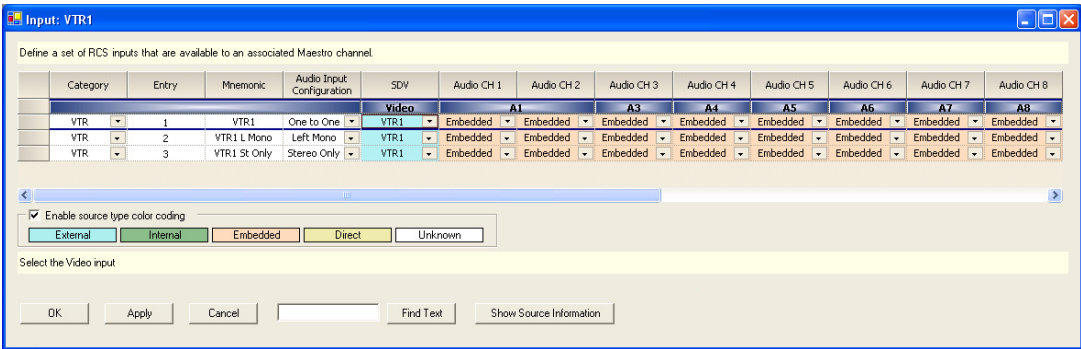
### Assigning Multiple Audio Maps to One Source

Different audio mappings can be created for the same physical source.

In [Figure 92](#) the source “VTR1” is defined as three different sources, each with a different audio input map. This allows the master control operator or automation system to select the same physical source pre-configured to match the format of the audio program being selected. This is one way to solve channel or audio group mismatches or to substitute one audio group for another from pre-configured audio maps.

Three different audio input tables are linked to the same source using three different names, Normal, Stereo Only, and Left-Channel Mono.

Figure 92. Assigning Multiple Audio Maps to One Source



### Level Columns

The remaining column headings of this table will show the Level names from the Level table ([page 137](#)). For each field, select the name of the input that will be associated with the category/number for the row. The background color will indicate the source type automatically if “Enable source type color coding” is selected.

If the input is **embedded**, select “Embedded audio” when configuring the audio levels (instead of selecting an input name).

### Source Types

External - The signal from a matrix router. For example, Concerto.

Internal - The sources that are defined in the Content Input set that this Input set is dependent upon.

Embedded - The audio signal is carried with the video.

Direct - The signal is wired directly to Maestro key cut, key fill or audio mix over inputs.

## Configured Split

The Input table can be arranged to provide split switching. That is, automatic selection of one input on one level (or group) and another input on another level (or group). For example, “Test 1” could be defined to select color bars on the video group and test tone on the audio groups.

## Interconnection

This table describes the connections between the router outputs and the Maestro inputs.

When this item is selected, the editor will open a Set Panel.

The set is assigned to a channel using the Channel Setup table, as described on [page 221](#).

## Dependencies

A Maestro Level set must already exist ([page 137](#)).

Figure 93. Interconnection Table (Example)

Define a set of RCS outputs that are connected to the fixed Maestro inputs.

Maestro RCS Interconnection	SDV	AES CH1	AES CH2	AES CH3	AES CH4	AES CH5	AES CH6	AES CH7	AES CH8
Bkgd A	M1_BGA	M1_BGA	M1_BGA						
Bkgd B	M1_BGB	M1_BGB	M1_BGB						
Bkgd C	M1_BGC	M1_BGC	M1_BGC						
Bkgd D	M1_BGD	M1_BGD	M1_BGD						
Key1Cut	M1_K1C								
Key1Fill	M1_K1FM1								
Key2Cut	M1_K2C								
Key2Fill	M1_K2FM2								
Key3Cut	M1_K3C								
Key3Fill	M1_K3F								
Key4Cut	M1_K4C								
Key4Fill	M1_K4F								
Audio Over 1		M1_K1FM1	M1_K1FM1						
Audio Over 2		M1_K2FM2	M1_K2FM2						
Audio Over 3									
Audio Over 4									
AssignSrc1									
AssignSrc2									
AssignSrc3									
AssignSrc4									
AssignSrc5									
AssignSrc6									
AssignSrc7									
AssignSrc8									
AssignSrc9									
AssignSrc10									
AssignSrc11									
AssignSrc12									
AssignSrc13									
AssignSrc14									
AssignSrc15									
AssignSrc16									

OK Apply Cancel Find Text Show Source Information

## Maestro RCS Interconnection

This column shows a software-generated list of all Maestro inputs. This list refers to the connectors on the rear panel.

### BkgdA-C

BkgdA, BkgdB, and BkgdC are the inputs for the Pgm, Pst and Aux buses; however, there is no one-to-one relationship between an input and a Maestro bus. For example, the selected source on the Pgm bus could be routed to Maestro through the BkgdA, Bkgd B or Bkgd C input, as needed. The same is true for the sources selected on the Pst and Aux buses.

### Bkgd D

This input is used to route a source which contains embedded audio for use in an audio breakaway. Embedded audio is contained in the video source and requires a video input. If the BkgdD interconnection is not defined, an audio breakaway, with embedded audio, will not be available.

### Key1-4 Cut/Key1-4 Fill

These inputs are for the four external key sources. A key cut/key fill input pair is available for each.

**Note** There are only four physical connections on the rear panel for the Key cut/Key fill pairs. Although these four connections may be assigned to any four of the eight available keyers.

### Audio Over 1-4

These inputs are used to route sources for audio overs.

**Note** There are only two physical connections on the rear panel for audio overs although these two connections may be associated with any two of the four available audio overs.

Although there are only two inputs on the rear panel for AES audio overs, all four audio mixers may be used if a Sonata AES-to-MADI converter is used to convert AES sources to MADI.

### AssignSRC 1-16

In some master control implementations, it is desirable to display the sources that are assigned to the 16 Maestro background buttons, which are on the monitor wall. Router outputs may be assigned to AssignSRC1 - AssignSRC16, which will display the source assigned to the corresponding background button on the monitor display connected to the designated router output.

### Other Columns

The remaining column headings of this table will show the Level names from the Step 2 “Level” table ([page 137](#)). For each field, select the name of the router output that will be associated with the Maestro input for the row.

For Jupiter systems, these names correspond to the output names in the CP Output Set previously assigned to the Maestro system.

**Note** If a source for key cut, key fill or audio overs is directly connected to a Maestro input (see [Source Types on page 174](#)), there should be no Interconnection definition for that input.

## General Purpose Input/Output (GPIO) Definition

GPIO connectors allow external devices to trigger Maestro events (Keyers on/off air, audio overs on/off air, etc.) or for Maestro to trigger external events such as source tally and bus tally.

GPIO actions are triggered by contact closures on the GPIO connector on the Maestro rear panel. For pinouts of the 44-pin GPIO connector, refer to [Table 15](#). For a representative schematic of the GPIO port, refer to [Figure 94](#).

Table 15. Maestro Rear Panel, GPIO 44-pin Connector Pinouts

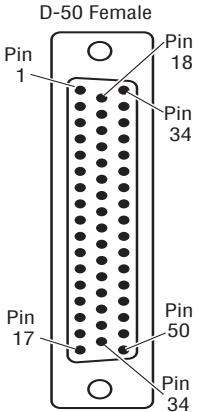
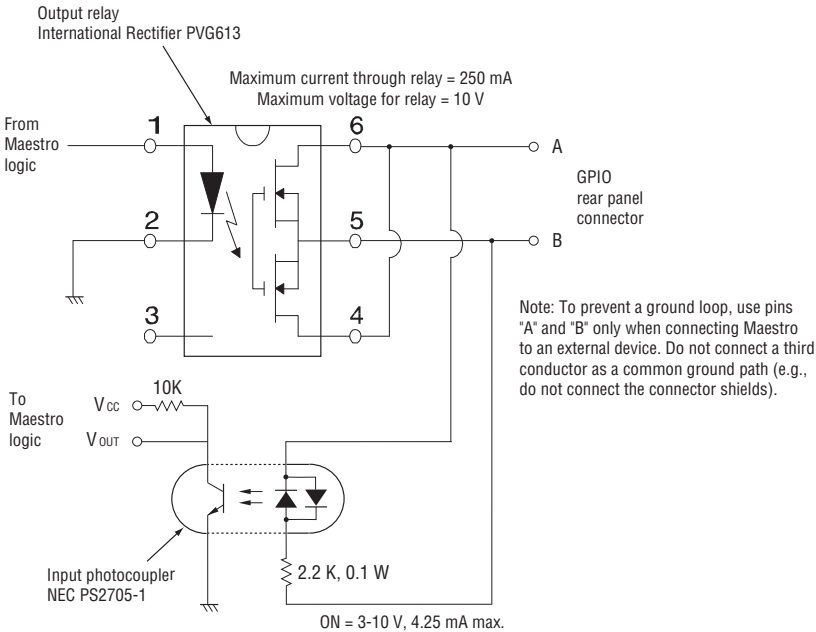
Shielded 44-Pin D; socket contacts	Pin	GPIO	Pin	GPIO
	1	1A	23	10A
	2	1B	24	10B
	3	2A	25	GND
	4	2B	26	11A
	5	GND	27	11B
	6	3A	28	12A
	7	3B	29	12B
	8	4A	30	GND
	9	4B	31	13A
	10	GND	32	13B
	11	5A	33	14A
	12	5B	34	14B
	13	6A	35	GND
	14	6B	36	15A
	15	GND	37	15B
	16	7A	38	16A
	17	7B	39	16B
	18	8A	40	GND
	19	8B	41	NC
	20	GND	42	NC
	21	9A	43	LTC RX IN+
	22	9B	44	LTC RX IN-

Figure 94. GPIO Port Circuitry



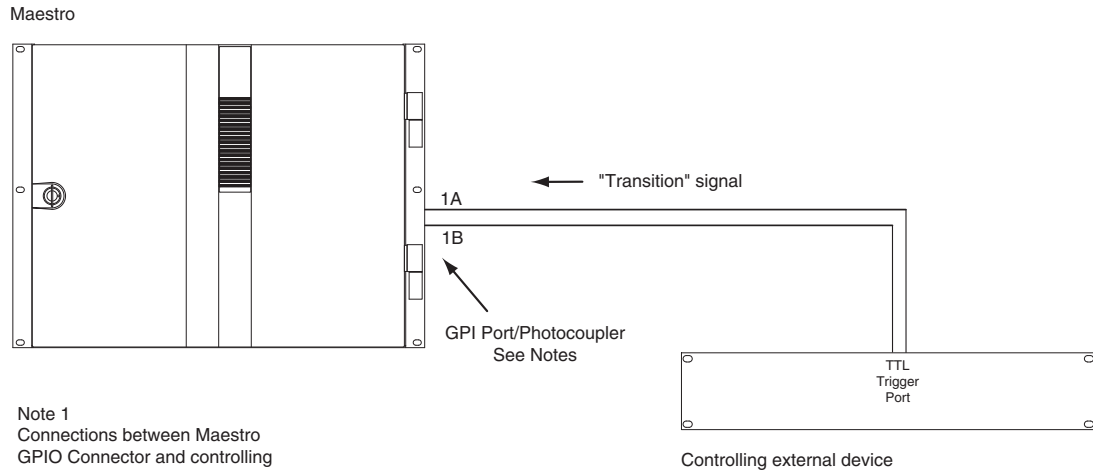
The GPIO Definition table is used to configure the GPIO connector on the rear panel of the Maestro. The GPIO connector presently supports the following applications:

- Maestro controlled by or controlling an external device, including another Maestro system, for receiving and sending transition status signals
- Source tally mode (Encore- or Jupiter-controlled systems)
- Bus tally mode (Jupiter/MI-3040 systems only)
- Insertion of Keyers and Audio Mix Overs.

## Maestro Controlled By or Controlling An External Device

The GPIO connector on the Maestro rear panel can be used to receive an “Action: Transition” signal from a controlling external device (Figure 95), or to transmit an “Action: Transition in Progress” signal to a controlled external device (Figure 96).

Figure 95. GPI Connections to External Controlling Device



When used to control an external device, Maestro systems require installation of a leakage-current swamping resistor in the GPO circuit. This resistor is used to prevent leakage current from reaching the external device when the Maestro photo-coupler relay is open. The resistor is always placed across the input relay of the external device.

Figure 96 and Figure 97 show examples of connections to controlled external devices containing a small mechanical or solid-state relay, along with a suggested location and value for the swamping resistor. A supply voltage greater than +5 V can be used (up to + 10 V), but in that case the power rating of the resistor would need to be increased accordingly.



Figure 96. GPO Connections to External Controlled Device (Example1)

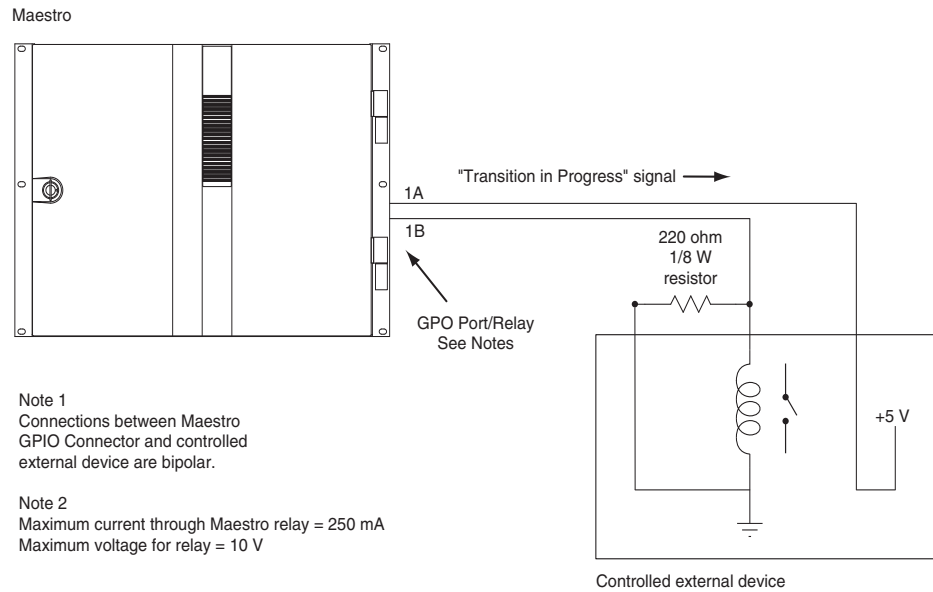
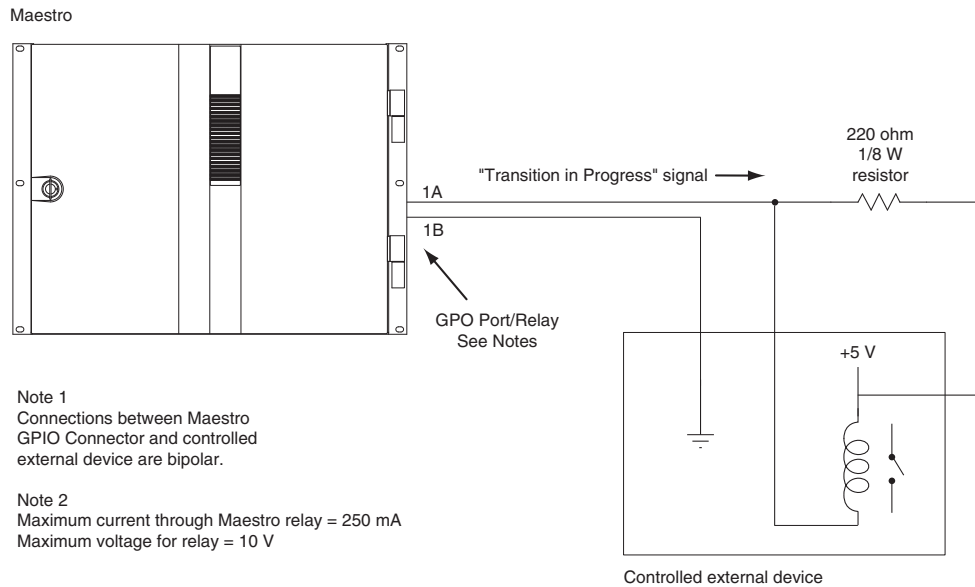


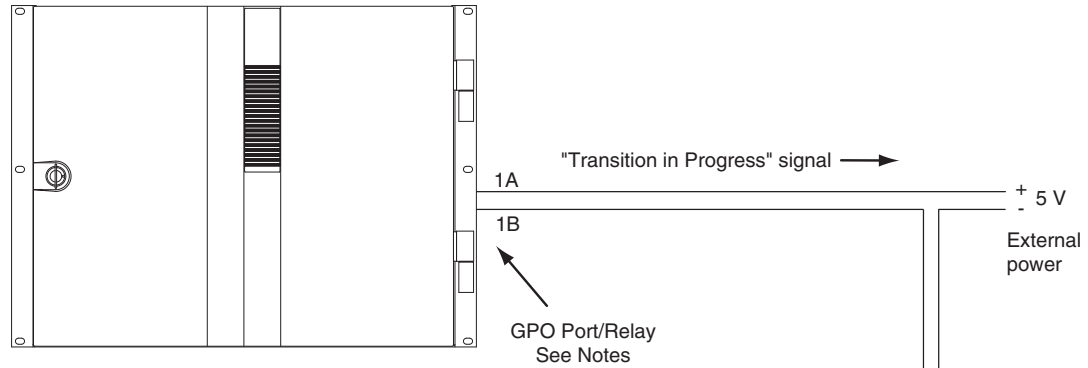
Figure 97. GPO Connections to External Controlled Device (Example 2)



It is also possible for one Maestro processor to control another. See [Figure 98](#).

Figure 98. Maestro-to-Maestro GPIO Connections

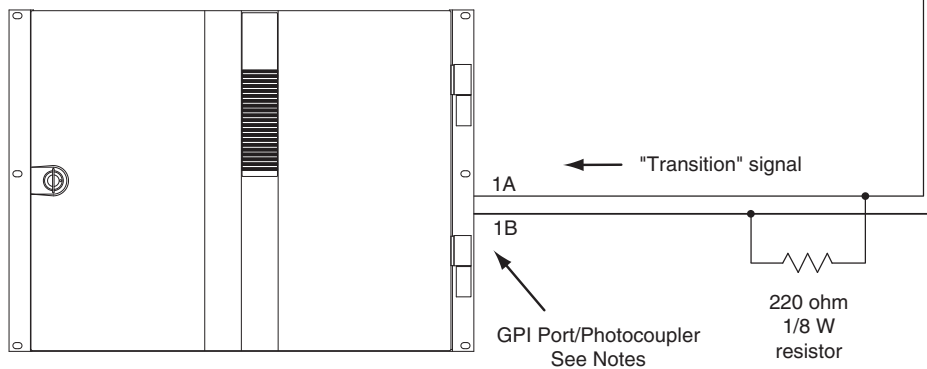
Controlling Maestro



Note 1  
Connections between Maestro  
GPIO Connector and controlled  
external device are bipolar.

Note 2  
Maximum current through Maestro relay = 250 mA  
Maximum voltage for relay = 10 V

Controlled Maestro



Note 3  
Maximum current through Maestro photocoupler = 4.25 mA  
"High" range for photocoupler = 3-10 V

**Note** Although the diagram above depicts two separate Maestro frames, the controlling and controlled Maestro processor may be located in the same frame

The controlling Maestro would be configured to send a “Transition in Progress” signal (that is, by closing a GPO port relay) to indicate that the Maestro has initiated a Take.

The controlled Maestro would be configured to accept a “Transition” signal and respond by executing a Take command.

## Maestro Configuration

The GPIO Definition table is used to configure the GPIO ports on the rear panel of the Maestro. The table is located in the Input/Output Sets group of the Maestro Configuration Editor. When the GPIO Definition table is first opened, the editor will open a set panel. Create a name for the GPIO table, select an Input Set (only required for Source Tally), then select “New.” (The table is assigned to a Maestro channel using the Channel Setup table.)

### External Device Control of Maestro (Action: Transition)

In this application, an external device can send a Transition (Take) command to the Maestro. See [Figure 99](#).

Figure 99. GPIO Definition table for “Transition” Trigger to Maestro

Device Type	Identifier	Sub System	Purpose	Trigger Type	Trigger Duration	Trigger Sense
MaestroGPI	1	Action	Transition	Level	0:00	High

OK Apply Cancel Find Text

#### Device Type

Select the MaestroGPI option from the drop-down list for this application.

#### Identifier

The numbers in this column refer to the 16 ports on the GPIO connector. Any port from 1 to 16 can be selected in any order. The 16 available ports can be assigned only once, either as a GPI or a GPO depending upon its intended usage.

#### Sub System

Select the Action option from the drop-down list.

**Note** The other available sub system selection with the MaestroGPI device types is “EAS.” Although this implies it can only be used with Emergency Alert System implementations, it is generically used to externally trigger the insertion of keyers and audio overs.

### **Purpose**

Select the Transition option from the drop-down list.

**Note** Transition is the only choice when MaestroGPI is the device type.

### **Trigger Type**

Trigger Type can be “Level” or “Pulse.” If Pulse is selected, the input pulse duration must be one field or more.

### **Trigger Duration**

This column is not used in this application.

### **Trigger Sense**

Select “High” if the external device is normally low and will send between 3 and 10 V to assert “Transition.” Select “Low” if the external device is normally high and will present zero V to assert “Transition.”

When finished configuring the table, select the **Apply** or **OK** buttons. The Name of the GPIO Definition set will now appear in the set panel. The set is assigned to the appropriate Maestro channel (Processor) using the Channel Setup table.

## **Maestro Control of External Device (Action: Transition in Progress)**

In this application, Maestro can send a Transition in Progress signal to an external device. See [Figure 100](#).

**Note** Prior to v1.5.2, the GPO was asserted when a source began to transition. In v1.5.2 and later the GPO is asserted as soon as the transition is triggered whether the source begins to transition immediately or is delayed.

Figure 100. GPIO Definition table for “Transition” Trigger to Maestro

Device Type	Identifier	Sub System	Purpose	Trigger Type	Trigger Duration	Trigger Sense
MaestroGPO	1	Action	Transition In Progress	Level	0:00	High
					0:00	

### Device Type

For this application, select “MaestroGPO.”

### Identifier

The numbers in this column refer to the 16 ports on the GPIO connector. Any port from 1 to 16 can be selected in any order.

### Sub System

Select “Action.”

### Purpose

“Transition in Progress” is the only choice when “MaestroGPO” is the device type.

### Trigger Type

“Level” is the only choice when “MaestroGPO” is the device type. When a transition begins, the GPIO contact will go to the state selected in the Trigger Sense column (described below).

### Trigger Duration

This column is not used in this application.

### Trigger Sense

Selections are:

- High - *close* the contact when a transition begins and *open* when the transition is complete, or
- Low - *open* the contact when a transition begins and *close* when the transition is complete.

When finished configuring the table, select the **Apply** or **OK** button. The Name of the GPIO Definition set will now appear in the set panel. The set is assigned to the appropriate Maestro channel (Processor) using the Channel Setup table.

## Source Tally Mode

Source tally mode, also referred to as “stand-alone tally,” can be used for either Encore- or Jupiter-controlled systems.

When the GPIO Definition table is first opened, the editor will open a set panel. Create a name for the GPIO table, then select an Input set, and then select “New.” (The table is assigned to a Maestro channel using the Channel Setup table.) See [Figure 101](#).

**Note** Source Tally mode will not be available unless an Input Set Dependency is applied to the GPIO Definition as illustrated in [Figure 101](#).

Figure 101. GPIO Definition Table for Source Tally Mode

Name:  
 New

Dependencies

Input

If no input set is selected, the Source Tally won't be available.

Apply

GPIO Definition Set(s)

GPIO

Open Delete

New set name:

Copy

GPIO Definition: GPIO1

Define GPIO functionalities.

	Device Type	Identifier	Sub System	Purpose	Trigger Type	Trigger Duration	Trigger Sense
	MaestroGPO	1	Source Tally	CD1	Level	0:00	High
	MaestroGPO	2	Source Tally	BARS	Level	0:00	High
	MaestroGPO	3	Source Tally	CSPAN	Level	0:00	High
	MaestroGPO	4	Source Tally	KSL	Level	0:00	High

OK Apply Cancel  Find Text

**Device Type**

Select “MaestroGPO.”

**Identifier**

The numbers in this column refer to the 16 GPIO ports on the connector. Any port from 1 to 16 can be selected in any order.

**Trigger Type**

Selections are Pulse or Level. When the defined source goes on-air, a “Level” selection will cause the GPIO contact to go to and remain at the state selected in the Trigger Sense column (described below).

**Trigger Duration**

This column applies only when “Pulse” has been selected as the Trigger Type.

**Trigger Sense**

Selections are High (that is, *close* the contact when the source is on Air) or Low (that is, *open* the contact when the source is on Air).

**Sub System**

Select “Source Tally.”

**Purpose**

When “Source Tally” has been selected, these entries refer to the sources to be tallied. Select the source that is to be associated with the GPO port being configured. In the example shown, when source “CD1” is contributing to the channel output, GPO port 1 on the rear panel will be activated.

When finished, select the **Apply** or the **OK** button. The name of the GPIO Definition set will now appear in the set panel. The set is assigned to the appropriate Maestro channel using the Channel Setup table.

**Bus Tally Mode (Jupiter/MI-3040 Systems)**

When the GPIO Definition table is first opened, the editor will open a set panel. Create a name for the GPIO table and then select the **New** button. See [Figure 102](#). (The table is assigned to a Maestro channel using the Channel Setup table as described on [page 221](#).)

Figure 102. GPIO Definition Table for Bus Tally

Device Type	Identifier	Sub System	Purpose	Trigger Type	Trigger Duration	Trigger Sense
MaestroGPO	1	Bus Tally	Bus A	Level	0:00	High
MaestroGPO	2	Bus Tally	Bus B	Level	0:00	High
MaestroGPO	3	Bus Tally	Bus C	Level	0:00	High
MaestroGPO	4	Bus Tally	Bus D	Level	0:00	High
MaestroGPO	5	Bus Tally	External Keyer Input 1	Level	0:00	High
MaestroGPO	6	Bus Tally	External Keyer Input 2	Level	0:00	High
MaestroGPO	7	Bus Tally	External Keyer Input 3	Level	0:00	High
MaestroGPO	8	Bus Tally	External Keyer Input 4	Level	0:00	High
MaestroGPO	9	Bus Tally	External Audio Over Input	Level	0:00	High
MaestroGPO	10	Bus Tally	External Audio Over Input	Level	0:00	High

OK Apply Cancel Find Text

### Device Type

Select “MaestroGPO.”

### Identifier

The numbers in this column refer to the 16 GPIO ports on the connector. Any port from 1 to 16 can be selected in any order.

### Trigger Type

Selections are Pulse or Level. For Jupiter/MI-3040 applications, select Level.

### Trigger Duration

This column applies only when “Pulse” has been selected as the Trigger Type. Not used for Jupiter applications.

### Trigger Sense

Selections are High (that is, bring line high when bus is on Air) or Low (that is, bring line low when bus is on Air). For Jupiter/MI-3040 applications, select High.

### Sub System

Select “Bus Tally.”

### Purpose

When “Bus Tally” has been selected, these selections refer to the various Maestro input busses. Select the input that is to be associated with the GPIO port being configured. In the example shown, when Maestro input “Bus A”



is contributing to the channel output, GPIO port 1 on the rear panel will be activated.

When finished select the **Apply** or the **OK** button. The Name of the GPIO Definition set will now appear in the set panel. The set is assigned to the appropriate Maestro channel using the Channel Setup table.

## Jupiter/MI-3040 Configuration

These notes assume that the installer is familiar with installation and configuration of the MI-3040 for use with tally systems, as described in the Jupiter manual. If not, the reader should review the MI-3040 Tally Installation instructions beginning with the Hardware Installation section of that manual. The Maestro application is similar to that described for “Jupiter Tally Systems.”

**Note** The Jupiter manual mentions a “Saturn Tally” system, but this applies only to Saturn Master Control systems with an internal switching matrix. The installer should follow the instructions for “Jupiter Tally Systems.”

In general, the MI-3040 must be established as an MPK device for tally use, after which it is referred to as an “MI-3040T.” The Jupiter Tally Relay and Tally Dependency tables must also be filled in, as described in the Jupiter manual.

## Special Notes for Jupiter Configuration

### MPK Devices Table

Enter the MI-3040 as described in the Jupiter manual. There is no entry for a device of type “MCS\_TLY.”

### Tally Relay Table

Make an entry for each tally light, as described in the manual.

### Tally Dependency Table

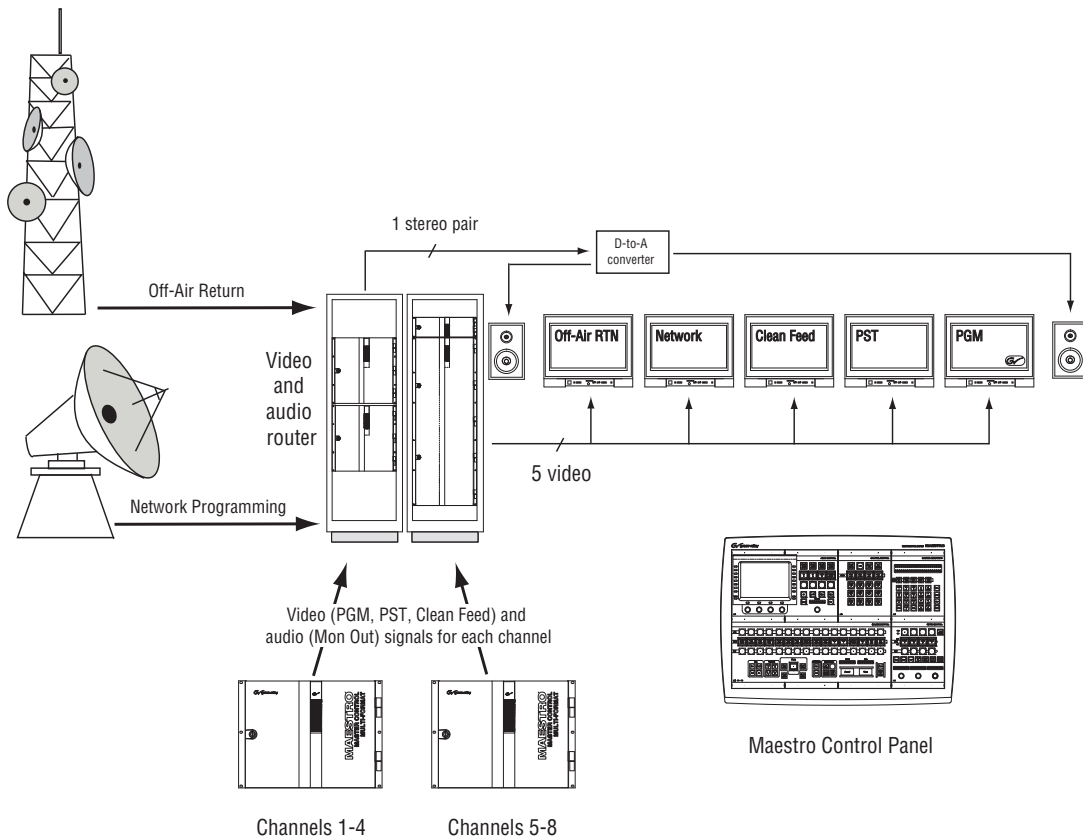
For the Tally Dependency Table, refer to the section “Configuration for Systems with a Non-Saturn Master Control Switcher.”

As described in the Jupiter manual, each opto-isolator input of the MI-3040 is associated in this table with the corresponding router output. For example, if Maestro “Bus A” has been associated with GPIO 1 (as shown on [page 188](#)), and GPIO 1 has been wired to MI-3040 opto 0, then the Tally Dependency Table will be used to associate opto 0 with the router output that is wired to Bus A.

## Monitor Follow

In multi-processor (multi-channel) systems, the control room monitors can switch automatically to the channel being controlled by the control panel. In the example shown in [Figure 103](#), the operator is controlling eight Maestro channels from a single hardware control panel. During monitor follow operation, the monitor outputs of the channel being controlled are automatically switched to the control room monitors.

Figure 103. Monitor Follow Operation



**Note** Although this example shows a control room equipped with stereo monitors, more speakers can be added (for example, to allow Dolby 5.1 monitoring).

Monitor follow configurations describe routing switcher actions that take place when a particular control panel (hardware control panel or GUI control panel) takes control of a specific Maestro channel.

### Monitor Follow Screen

The Monitor Follow screen uses a table to describe the connections between matrix-router inputs and matrix-router outputs when a channel delegation operation is performed from the control panel at the specified IP Address. Any router input may be switched to any router output. These router

inputs do not necessarily need to be connected to Maestro outputs although many of them will be Maestro-related as in the examples below.

A separate table must be created for each channel (that is, for each Maestro Processor). Each table is given a name and assigned to a channel using the Channel Setup table. The figures below represent two monitor follow tables, one named SD-MonFllw which will be assigned to the channel “WXYZ-SD” and another named HD-MonFllw which will be assigned to the channel “WXYZ-HD.”

Figure 104 shows a new Monitor Follow table. An explanation of the table entries appears below the table.

Figure 104. Monitor Follow Table

IP Address	Name	RCS Level	RCS Input	RCS Output	Refresh
					<input type="checkbox"/>

#### IP Address

The IP address of the control panel (hardware control panel or GUI PC panel server card) from which channel delegation operations may be performed which should cause monitor follow router switches. The source for the available selections is the Network Description table.

#### Name

A user-specified name for a router input/router output pair to be switched when a channel delegation operation is performed. Some examples are PGM, PST, Off-air Return, etc. Any name is valid but it should describe the source being directed to the monitors.

#### RCS Level

This is the Router Control System (RCS) Level that contains the router inputs and outputs. The inputs and outputs will be switched when a channel delegation operation is performed from the device at the specified

IP address. The RCS Level is selected from a list of all router levels defined in the router control system and made available for use in Maestro.

#### **RCS Input**

A named router input (as defined in the selected Router Control System Level) to which the source to be switched to the preferred monitor is connected.

#### **RCS Output**

A named router output (as defined in the selected Router Control System Level) which is connected to the monitor to which the designated source input should be switched. This switch will take place when a channel delegation operation is performed.

#### **Refresh**

If this box is checked, the router inputs and outputs will be refreshed approximately every 15 seconds and the designated routes will be re-established if they have changed.

**Note** If post-delegation operator control of what is routed to the monitors is preferred, this box should not be checked. With the box unchecked, a routing of monitor outputs as defined in the Monitor Follow table would take place on initial channel delegation; however, the operator could perform manual routes to the monitor outputs after the delegation operation. Maestro would only re-establish the Monitor Follow configured routes upon execution of another channel delegation operation.

### **Monitor Follow Configuration Examples**

[Figure 105](#) shows a sample Monitor Follow configuration for an SD channel with stereo audio.

Figure 105. "SD" Channel Monitor Follow Configuration

IP Address	Name	RCS Level	RCS Input	RCS Output	Refresh
CtrlPnl (192.168.197.63)	PGM	SDV(VENUS_1)	I020	D025	<input checked="" type="checkbox"/>
CtrlPnl (192.168.197.63)	PST	SDV(VENUS_1)	I021	D026	<input checked="" type="checkbox"/>
CtrlPnl (192.168.197.63)	Off-Air RTN	SDV(VENUS_1)	I022	D027	<input checked="" type="checkbox"/>
CtrlPnl (192.168.197.63)	Clean Feed	SDV(VENUS_1)	I023	D028	<input checked="" type="checkbox"/>
CtrlPnl (192.168.197.63)	Network SD Feed	SDV(VENUS_1)	I024	D029	<input checked="" type="checkbox"/>
CtrlPnl (192.168.197.63)	Audio Monitor	A1(VENUS_1)	I025	D030	<input checked="" type="checkbox"/>

In [Figure 105](#) sources defined as PGM, PST, Off-Air RTN, Clean Feed, Network SD Feed and Audio Monitor are switched to the Master Control room video and audio monitors when the channel "WXYZ-SD" is under the control of the control panel at IP address 192.168.197.63. PGM, PST and Clean Feed video as well as Audio Monitor are output from the SD Maestro channel. Off-Air Return and SD Network Feeds are not Maestro outputs; however they can be switched to the monitors whenever the "WXYZ-SD" channel is the active channel on the control panel.

The first entry in SD-MonFlw table describes the following actions, physical connections and result (assuming this table is the assigned Monitor Follow table for the channel "WXYZ-SD"):

- When the control panel with IP address 192.168.197.63 takes control of the channel "WXYZ-SD" the router will automatically perform the switches defined in this row.
- The PGM output on the Maestro rear panel for the channel "WXYZ-SD" is wired to the router input labeled I020 on the SDV level.
- Input I020 is switched to output D025 (also on the SDV level) which is wired to the PGM video monitor in the master control room.
- The video source currently active on the PGM bus of the Maestro "WXYZ-SD" channel thus appears on the PGM monitor in the master control room.

[Figure 106](#) shows a sample configuration for an HD channel with discrete 5.1 surround audio.

Figure 106. “HD” Channel Monitor Follow Configuration

IP Address	Name	RCS Level	RCS Input	RCS Output	Refresh
CtrlPnl (192.168.197.63)	PGM-HD	HDV(VENUS_2)	I022	D044	<input checked="" type="checkbox"/>
CtrlPnl (192.168.197.63)	PST-HD	HDV(VENUS_2)	I023	D045	<input checked="" type="checkbox"/>
CtrlPnl (192.168.197.63)	Off-Air RTN	HDV(VENUS_2)	I024	D046	<input checked="" type="checkbox"/>
CtrlPnl (192.168.197.63)	Clean Feed-HD	HDV(VENUS_2)	I025	D047	<input checked="" type="checkbox"/>
CtrlPnl (192.168.197.63)	Network HD Feed	HDV(VENUS_2)	I026	D048	<input checked="" type="checkbox"/>
CtrlPnl (192.168.197.63)	Audio Mon 1/2	A1(VENUS_1)	I027	D050	<input checked="" type="checkbox"/>
CtrlPnl (192.168.197.63)	Audio Mon 3/4	A2(VENUS_1)	I028	D051	<input checked="" type="checkbox"/>
CtrlPnl (192.168.197.63)	Audio Mon 5/6	A3(VENUS_1)	I029	D052	<input checked="" type="checkbox"/>

In [Figure 106](#) sources defined as PGM HD, PST HD, Off-Air RTN, Clean Feed HD, Network HD Feed and Audio Mon 1/2, Audio Mon 3/4 and Audio Mon 5/6 are switched to the Master Control room video and audio monitors when the channel “WXYZ-HD” is controlled by the control panel at IP address 192.168.197.63. PGM HD, PST HD and Clean Feed HD video as well as three AES audio pairs (for 5.1 surround sound) are output from the HD Maestro channel. Off-Air Return and HD Network Feeds are not Maestro outputs; however they are switched to the monitors whenever the channel “WXYZ-HD” is selected from the control panel.

The Monitor Follow set is assigned to a channel using the Channel Setup table as described on [page 221](#).

## 6th Step: Input-based Sets

The 6th Step: Input-based Sets, consists of the following:

- Background Buttons
- Key Fill Association
- Automation Input
- Quick Pick

Each of these steps is described below.

## Background Buttons

This screen can be used to assign specific sources to specific Program/ Preset/ Aux buttons, Keyers, and Audio Overs and to designate whether those source assignments are permanent or modifiable by the operator.

The Background Button set is assigned to a channel using the Channel Setup table, as described on [page 221](#).

### Dependencies

Input set Mnemonics (from Step 4 “Input,” [page 173](#)).

Figure 107. Background Buttons Set (Example)

Background Buttons: SWLabSD

Assign intended functionality to the Maestro Control Panel source assignable buttons.

Button	Purpose	Default Source
Background 1	Operator	
Background 2	Operator	
Background 3	Operator	
Background 4	Operator	
Background 5	Operator	
Background 6	Operator	
Background 7	Operator	
Background 8	Operator	
Background 9	Operator	
Background 10	Operator	
Background 11	Fixed Assignment	KSL-NBC
Background 12	Fixed Assignment	KTVX-ABC
Background 13	Fixed Assignment	CSPAN
Background 14	Automation	
Background 15	Automation	
Background 16	Automation	
Keyer 1	Operator	
Keyer 2	Operator	
Keyer 3	Operator	
Keyer 4	Operator	
Keyer 5	Operator	
Keyer 6	Operator	
Keyer 7	Operator	
Keyer 8	Operator	
Audio Over 1	Operator	
Audio Over 2	Operator	
Audio Over 3	Operator	
Audio Over 4	Operator	

OK Apply Cancel Find Text

### Button

This column shows a software-generated list of Maestro buttons including all eight keyers and all four audio mixers. This list includes all selectable LCD push buttons to which sources can be assigned.



## Purpose

Select a purpose from the drop-down menu. The possible selections are:

- Operator - The operator can assign any available router source to the selected button.
- Fixed Assignment - The source that is shown in the Default Source column will be permanently assigned to the background button when this option is selected. Buttons with fixed assignments cannot be re-assigned using the control panel. Fixed assignments can only be changed by modifying the Background Buttons set.
- Automation - Button positions can be reserved for systems under automation control. The number of buttons that are associated with Automation is installation dependent. These buttons are based upon the number of audio groups and whether or not breakaways are performed by automation. If no Automation associated buttons are specified, the automation system will be able to assign sources to any of the “Operator” positions as needed. Buttons that are assigned to Automation cannot be assigned using the control panel. This process is described in more detail in the [Automation Button Assignments](#) section below.

## Default Source

Select the default input name when a default source assignment is desired for this button.

**Note** A default assignment displays the default source name on system startup or after non-volatile RAM has been cleared. However, this source assignment can be changed at any time unless it is a fixed assignment.

## Automation Button Assignments

In a system under automation control, any of the 16 background button positions may be designated for automation use. One of these buttons will be selected on PGM for each defined Video/Audio group. One will be selected on PST for each defined Video/Audio group. Since these buses can't be disturbed when assigning/selecting a new source, a button must be available at all times. Any of the background buttons may be assigned for automation use.

By selecting “Automation” as the purpose of the button positions, automation activity will be constrained to the defined buttons. These buttons cannot be reassigned using the control panel.

If no background buttons are designated for automation use, automation functions in the manner described below:

1. The system will first check to see if the requested source has already been assigned to a button position. If a requested source has been assigned, no assignment change will be needed.



2. If the requested source has not been assigned, the automation system will then search the background buttons, from right to left, to find the first available Operator button that is not selected on the Program, Preset, or Aux buses. This available button will then be assigned to the requested source. As this process continues, the automation system may eventually replace many, if not all, sources that the user has manually assigned. If the replaced sources are needed later, the operator would have to re-assign them before they could be used.

## Key Fill Association

Maestro can be configured so that when a graphic source is selected the system will automatically select the appropriate key mode (SELF KEY or external) and, for external mode, route the appropriate cut signal to the associated key cut connector.

The set is assigned to a channel using the Channel Setup table, as described on [page 221](#).

## Dependencies

The Input set Mnemonics under the *Input* section must be defined to continue with this step.

Figure 108. Key Fill Association Table

Key Fill Source	Key Cut Source
SAT_FILL (External)	SAT_HOLE (External)
PHL_FILL (External)	PHL_HOLE (External)
BARS (External)	PHL_HOLE (External)

## Key Fill Source

Select the name of the router input supplying the fill for the key.

## Key Cut Source

Select the name of the router input supplying the cut signal for the key.

## Automation Input

This screen has a table that is used to map input names to index numbers used by the automation system.

The set is assigned to a channel using the Channel Setup table, as described on [page 221](#).

### Dependencies

The Input set Mnemonics under the *Input* section must be defined to continue with this step.

Figure 109. Automation Input Table (Example)

Source Name	Automation Source Number
Bars-AES	1

### Source Name

Select the Mnemonic of the input that is to be indexed from the drop-down list. This name was defined in the input Set ([Figure 91](#)).

### Automation Source Number

Enter an index number for the source (The range is 1-65535). The automation source number must match the index number assigned to the same source in the automation system.

## Quick Pick

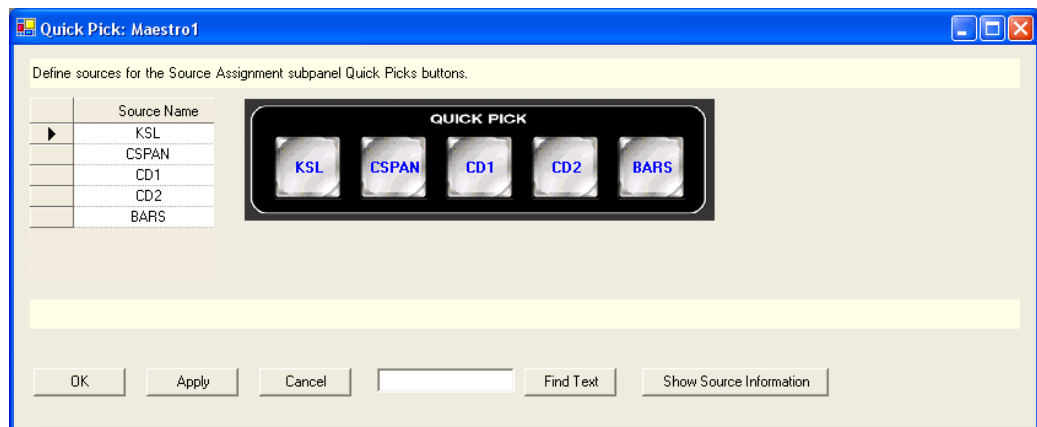
This screen uses a table to assign Input Set sources to the five Quick-Pick buttons on the control panel.

The set is assigned to a channel using the Channel Setup table, which is described in the [Channel Setup](#) section.

### Dependencies

The Input set Mnemonics under the *Input* section must be defined to continue with this step.

Figure 110. Quick Pick Table (Example)



### Source Name

Select an input Mnemonic for each Quick-Pick button (from [page 173](#)).

**Note** Quick Pick selections should be commonly used sources which are not Fixed Assignment sources in the Background Buttons Set.

### Quick Pick Buttons

This graphic shows a software-generated list of the Quick-Pick buttons that are on the Source Assign panel.

## 7th Step: Effects Configuration

The 7th Step: Effects Configuration:

- Wipe Transitions
- DVE Configuration
- Automation DVE Association
- Transition Configuration
- Transition Associations
- VBI Passthrough

Each of these steps is described below.

### Wipe Transitions

When a wipe effect is enabled, the standard video transitions (That is, fade-cut, cut-fade, V-fade, and cross-fade) are superseded.

The Wipe Transition table is assigned to a channel using the Channel Setup table. In most cases, the same Wipe table (set) will be assigned to each channel.

When Wipe Transitions is selected, the editor will open a set panel. After naming the table, select “New.” The system will display a table similar to that shown in [Figure 111](#).

Figure 111. Wipe Transitions Table

Wipe Transition Name	Wipe Transition Type	Audio Transition Type	Border Color	Border Softness	Border Width
▶	▼	Cross Fade	▼	0	0

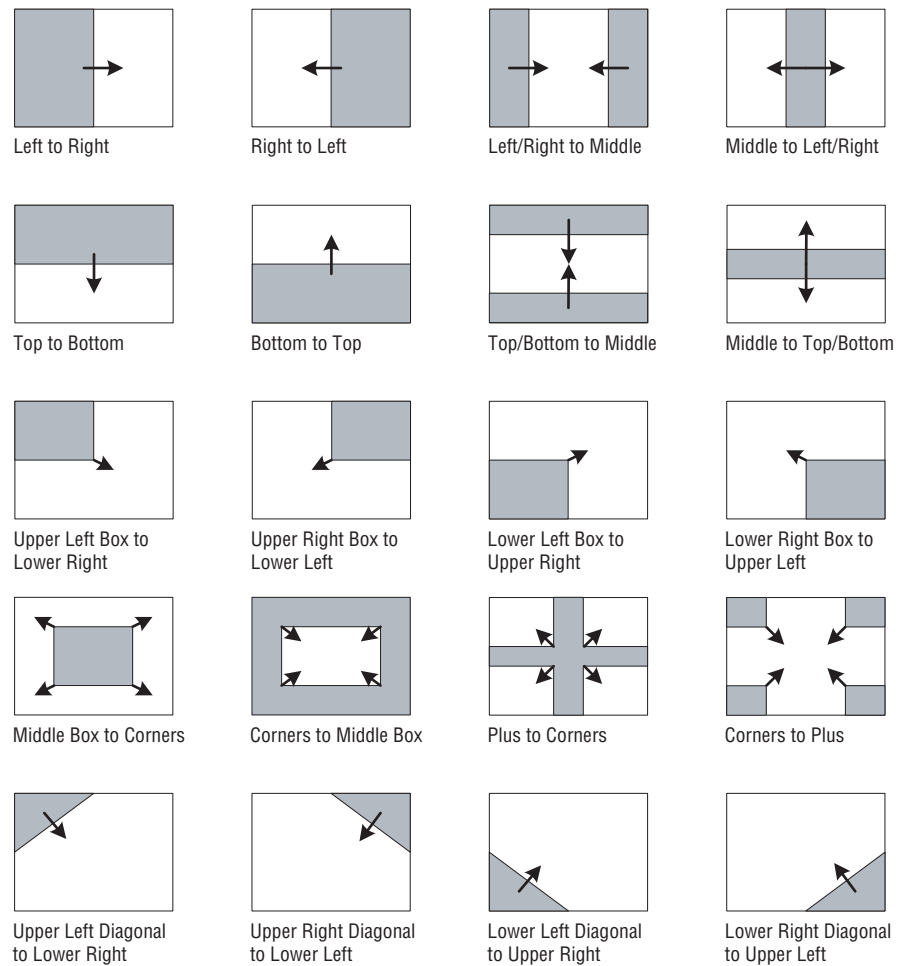
#### Wipe Transition Name

Enter or select a name for this wipe transition. The name should be similar to the wipe transition type selected in the next step as a suggestion.

#### Wipe Transition Type

Select a Wipe transition from the drop-down list. Choices are shown in [Figure 112](#).

Figure 112. Wipe Transition Types



### Audio Transition Type

Select the Audio Transition Type from the drop-down list. The audio will switch in the manner of the selected style. The choices are:

- Fade Cut
- Cut Fade
- V Fade
- Cross Fade

### Border Color

Select a Border color. Selecting this column displays a color palette for selecting a standard or a custom color for the wipe border ([Figure 113](#)).

Figure 113. The Color Palette



**Border Softness**

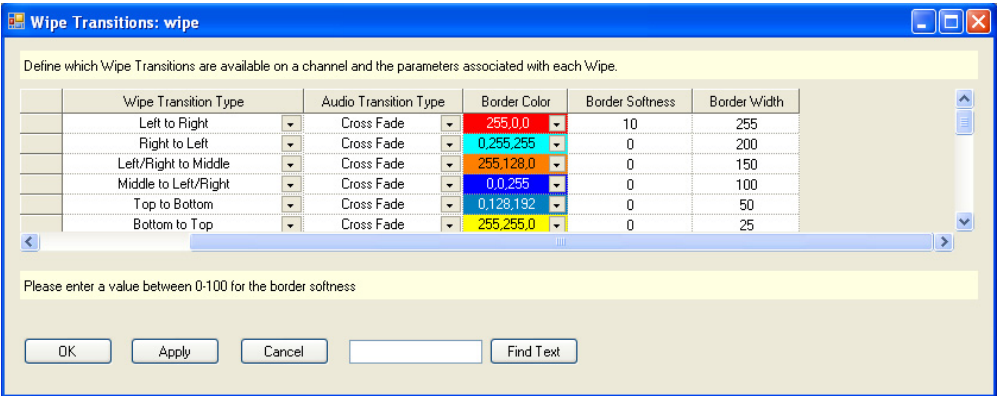
Enter a number between 0-100 for the Border Softness feature. The greater the number entered the softer the border’s edge will be.

**Border Width**

Enter a number between 0-255 for the Border width feature. The larger the number entered, the wider the border’s width will be.

A sample Wipe Transition set is shown in [Figure 114](#).

Figure 114. Wipe Transition Set (Example)

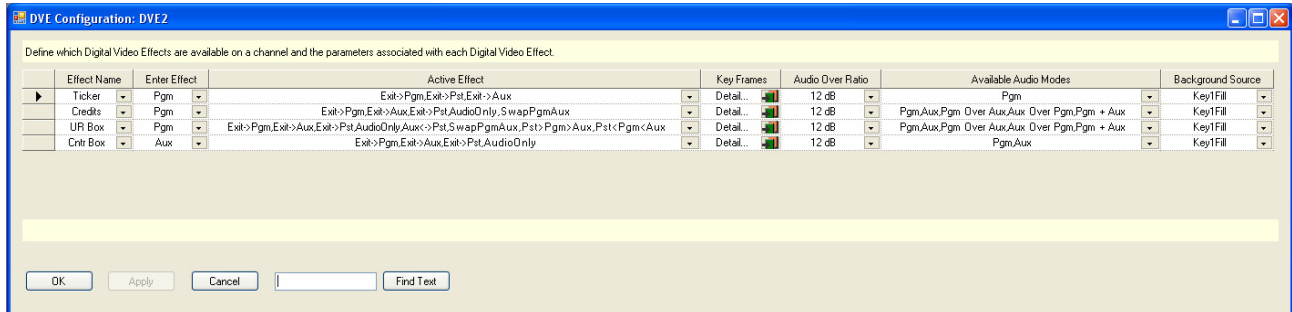


## DVE Configuration

**Note** For more information about the DVE option see the DVE section of the Maestro User manual (part # 0718482XX)

When the DVE Configuration option is selected, the editor will open a set panel. After naming the table, select “New.” The system will display a table similar to that shown in [Figure 115](#).

Figure 115. DVE Configuration



### Effect Name

Enter or select a name which describes the effect. This field is required and it cannot be blank. This name will appear on the top line of text in the **Effects** LCD button in the Effects section of the Control panel. Names that are longer than nine (9) characters will be truncated on the LCD button

### Enter Effect

Select an Enter effect from the drop-down list. The Enter Effect selection describes the way in which the effect will be presented as it transitions to air. The “Enter Effect” names describe which background video bus (Pgm, Aux, and Pst) will occupy the squeeze window and are on the Pgm bus at the end of the transition.

**Note** The source that occupies the squeeze window after entering an effect will always be on the Pgm bus regardless of which bus it was on when selected.

The available Enter effect choices are:

- Pgm - The Pgm source will end up in the Pgm effect window and the AUX source will end up in the Aux effect window. No sources interchange roles. This effect is often accomplished by PGM squeezing into the Pgm effect window revealing AUX squeezing into the Aux effect window.
- Aux - The AUX source will end up in the Pgm window and the PGM source will end up in the Aux effect window. The PGM source and AUX source will interchange roles, AUX source will become the PGM source and PGM source will become the AUX source. This effect is often accomplished by “un-squeezing” AUX on top of PGM with AUX ending up in the Pgm effect window and PGM squeezing into the Aux effect window.
- Pst - The PST source will end up in the Pgm effect window and PGM source will end up as PST. AUX will end up in the Aux effect window and remain as AUX. PST and PGM will interchange roles. This effect is often accomplished by performing a full screen transition from PGM to an existing effect on PST.

### **Active Effect**

Select an Active Effect. When an effect is active (on-air), the “active effect” selection will determine the available Exit modes.

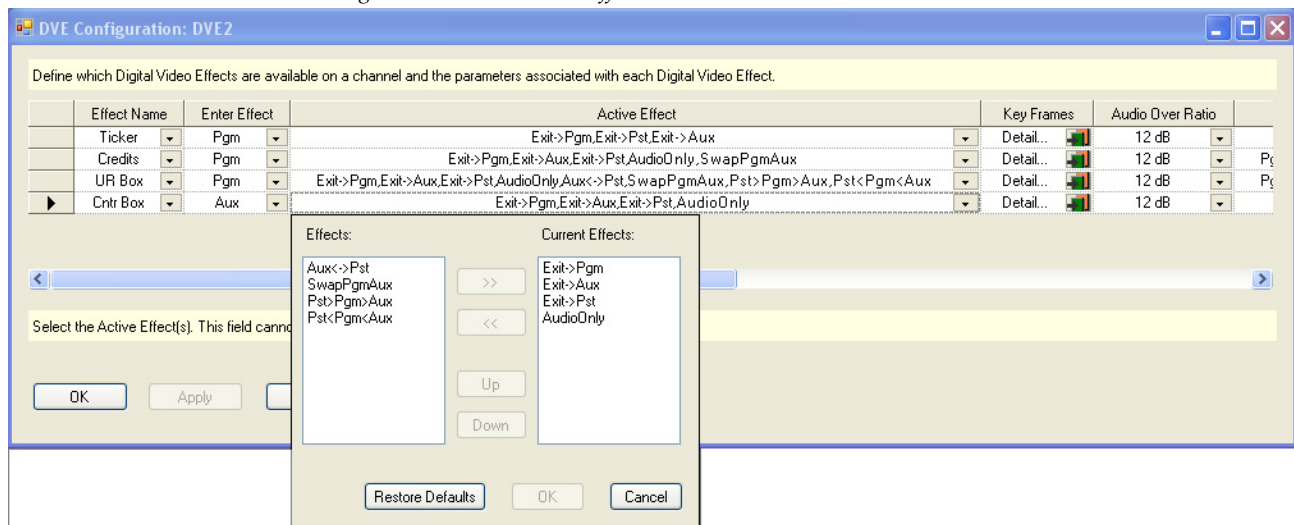
**Note** The default exit mode will be to reverse the process used to enter the effect. In other words, if program was squeezed revealing the Aux video, the default exit mode is to unsqueeze Pgm video and return to Pgm full screen. If Aux video was unsqueezed over Pgm, the default exit mode is to squeeze the Pgm (it was Aux when it was selected) until it disappears leaving the original Pgm video full screen. Other exit modes may be available depending on the choices selected from the list below.



The available choices are:

- Exit->Pgm - This exit mode typically transforms the Pgm effect window to full screen covering the Aux effect window.
- Exit->Pst - This exit mode replaces the on-air effect with the video selected on the Pst bus.
- Exit->Aux - This exit mode typically transforms the Pgm effect window away (either by scaling it to zero size or moving it off screen). Simultaneously, the Aux effect window transforms to full screen.
- AudioOnly - This mode transitions only the audio. The active video effect is unchanged. The audio that will be on-air after pressing the **TAKE** button is selected with the **DVE Audio Mode** button. Available audio modes are determined by the "Available Audio Mode" selections explained below.
- Aux<->Pst - This transition replaces the current background video (Aux) with the video selected on the Pst bus.
- SwapPgmAux - This cut-only transition swaps the contents of the Aux effect window and the Pgm effect window. The selected transition rate and type are disabled.
- Pst>Pgm>Aux - This cut-only transition rotates the sources on all three busses in the direction indicated by the ">." The selected transition rate and type are disabled.
- Pst<Pgm<Aux - This cut-only transition rotates the sources on all three busses in the direction indicated by the "<." The selected transition rate and type are disabled.

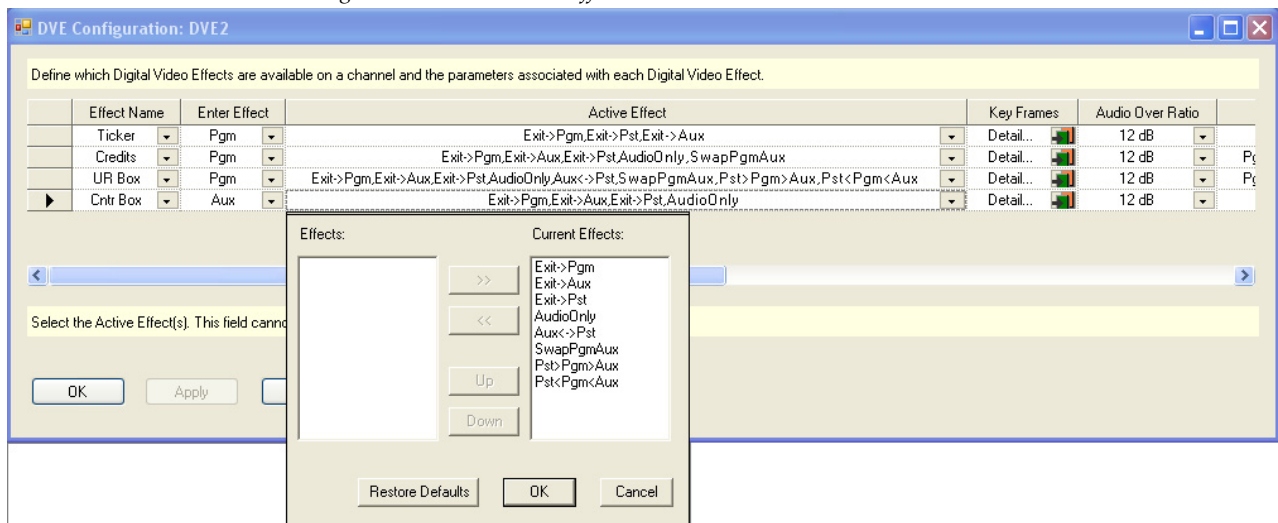
Figure 116. DVE Active Effect Selections



To make any or all of the choices above available once an effect is active, click on the preferred effects (Hold down the **CTRL** key while clicking to

make multiple selections) and click on the >> button to move the selections to the “Current Effects” window. See [Figure 117](#) for an example

Figure 117. DVE Active Effects Selected

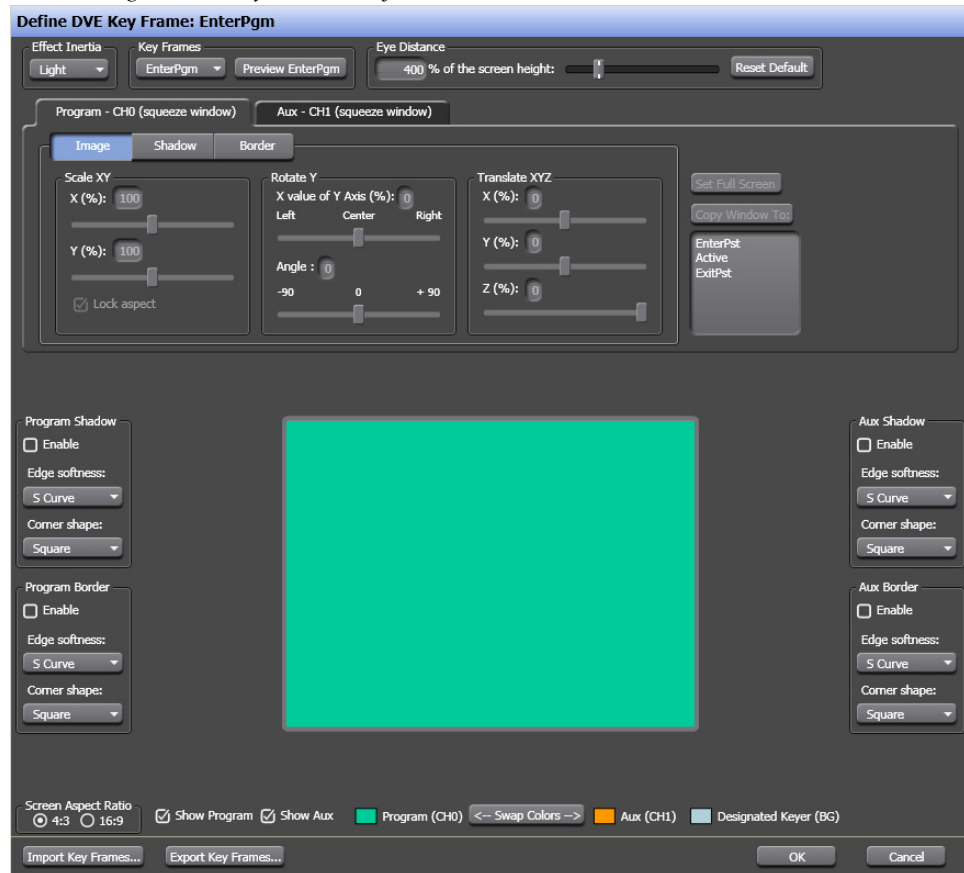


Click the **OK** button to make the selected effects the available active effects in the DVE configuration.

### Key Frame

Click the **Detail...** icon in the Key Frame column. The Define DVE Key Frame editor dialog will then appear ([Figure 118](#)).

Figure 118. Define DVE Key Frame Editor



The Define DVE Key Frame editor is used to create, edit, and assign key frame actions. This dialog's description and actions are described in the Maestro Visualization Tool section of the Maestro User manual (part# 071848202).

## Audio Over Ratio

Select the Audio Over Ratio from the drop-down list.

The audio over ratio sets the default mix-over ratio for the source designated as the "over". This value defaults to 12 dB, which means the "over" audio will be louder by this value (12 dB in this case) when a mix-over is enabled.

**Note** A 0 dB mix-over means the both the background (Aux) and squeeze window (Pgm) audio will be mixed together at full level.

Audio over ratio choices are from 0dB to 24dB in 1dB increments.

## Available Audio Modes

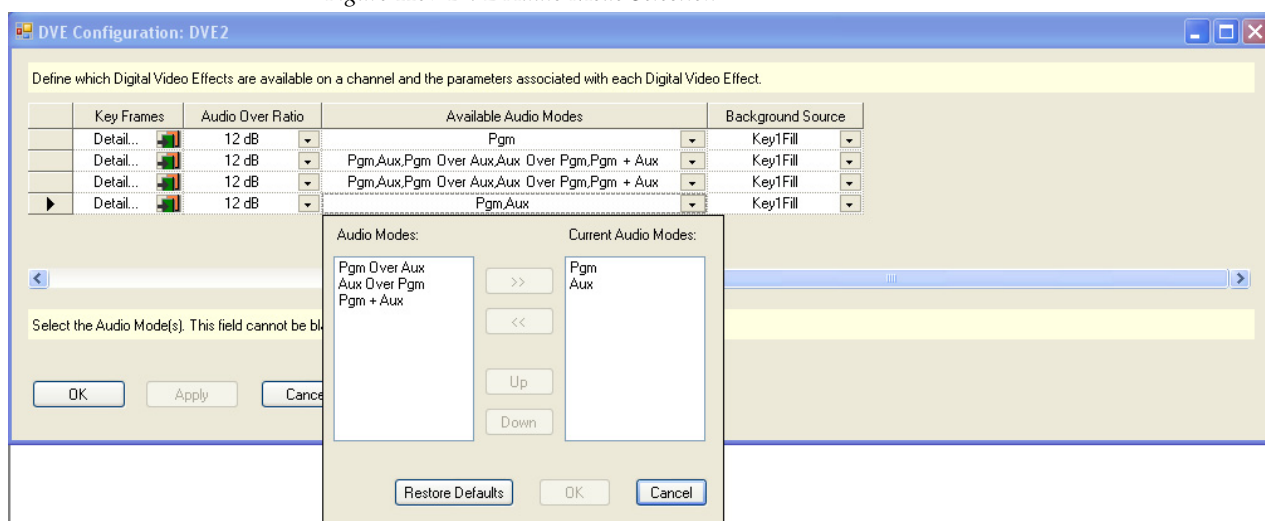
When an effect is active, audio from one or both on-air video sources may be selected. The audio mode may be selected before entering the effect or while the effect is active by selecting the Audio Only exit mode.

The available audio modes include the following:

- Pgm - Audio from the Pgm source only
- Aux - Audio from the Aux source only
- P/A - Pgm audio as an over to Aux audio
- A/P - Aux audio as an over to Pgm audio
- P+A - Pgm and Aux audio both at full level

Only the audio modes selected in the DVE configuration will be available for selection before entering an effect or as an Audio Only transition while in the effect. See [Figure 119](#) for an example.

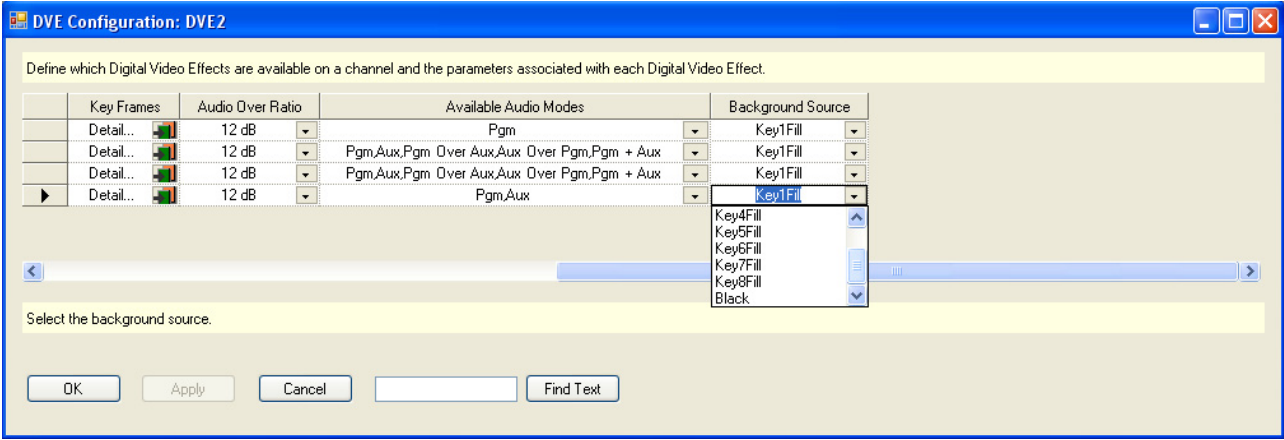
Figure 119. DVE Audio Mode Selection



## Background Source

Click the Background Source's arrow to open the drop-down list. The Background Source options will then appear ([Figure 120](#)). The options are Key1-8 fill and Black.

Figure 120. Background Sources

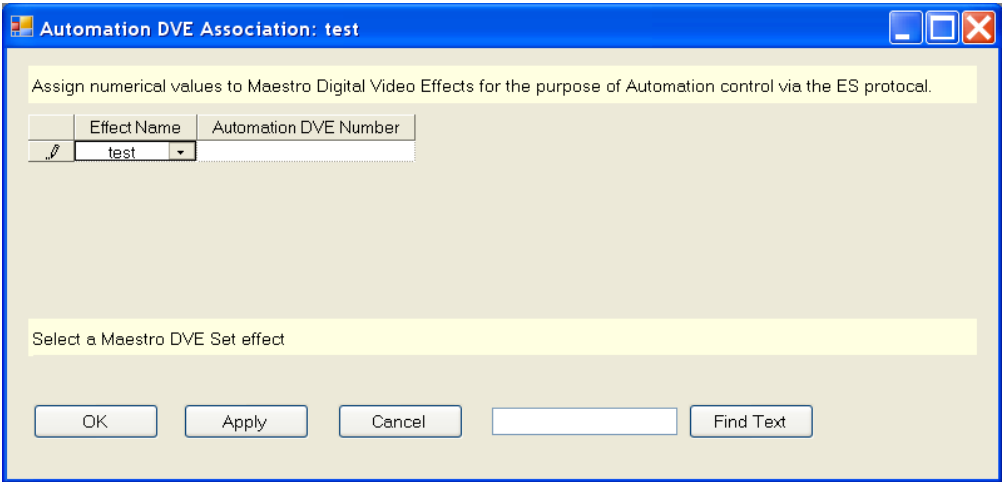


Select the preferred Background source.

## Automation DVE Association

The Automation DVE Association table is used to assign a numerical value to a Maestro Digital Video effect. This number is used for automation control through the ES protocol.

Figure 121. Automation DVE Association



### Effect Name

Select the preferred Maestro DVE Set effect from the Effect Name drop-down list.

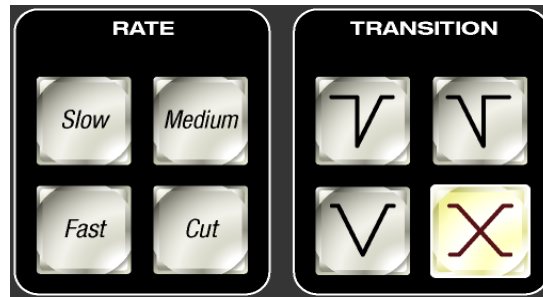
### Automation DVE Number

Enter a number in the Automation DVE Number field. The number can be between 1 and 255.

## Transition Configuration

Maestro includes standard transitions in which video and audio transitions at the same time, at the same rate, and in the same manner. These standard transitions are selected with the control panel buttons shown in [Figure 122](#).

Figure 122. Control Panel Transition Buttons



Maestro also includes the ability to create configured transitions in the Maestro Configuration Editor. With configured transitions, full control over the rates and transition styles is separately defined for video and audio signals. It is possible to create transitions in which video and audio begin and end their transitions independently of one another.

Independent transitions are configured with two tables in the Maestro Configuration Editor - the Transition Configuration table and the Transition Association table.

The Transition Configuration table is used to define the video and audio transition parameters for each configured transition.

The Transition Association table is used to assign a unique transition ID number to each configured transition. This number is used to recall a configured transition for use from the control panel and by automation to select a configured transition.

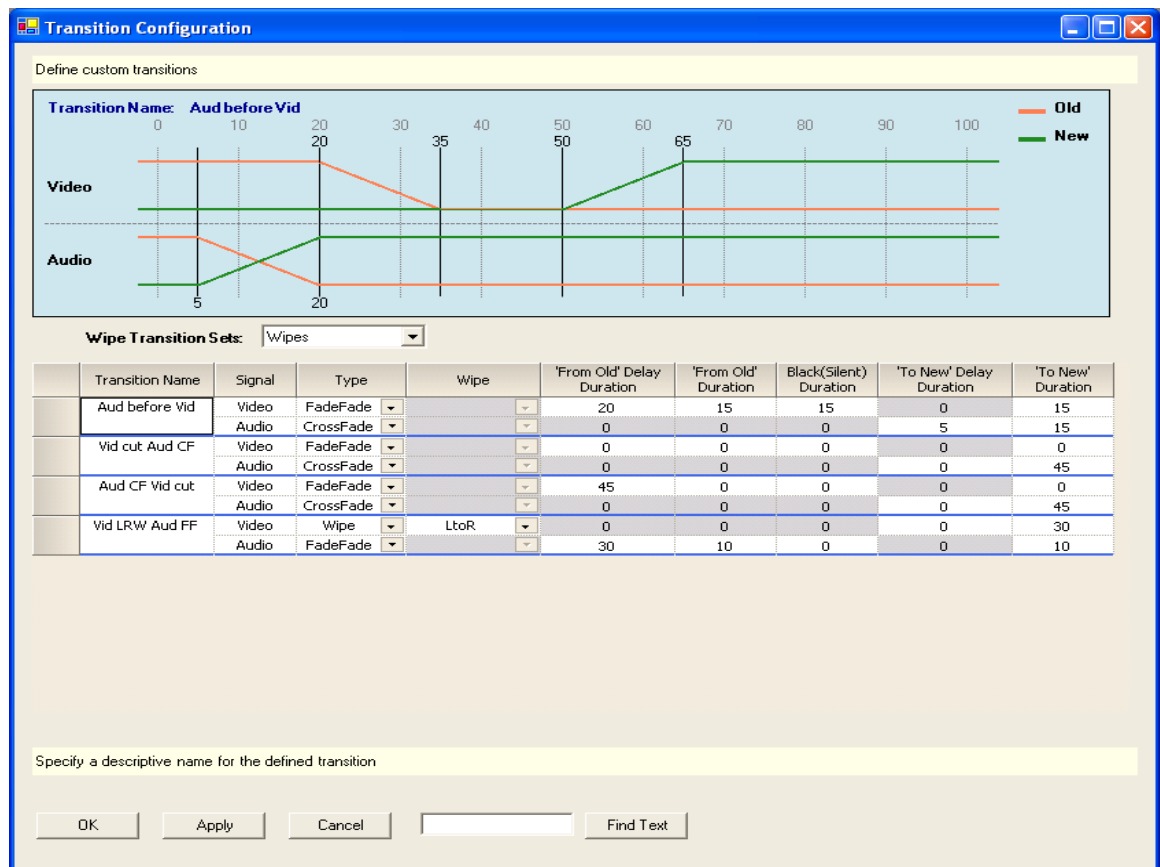
### Independent Transition Configuration

To configure independent transitions, select “Transition Configuration” in the Maestro Configuration Editor. The Transition Configuration table opens in which the preferred video and audio transition parameters are entered for each transition definition.

[Figure 123](#) shows a sample Transition Configuration table in which four independent transitions have been defined. Each parameter is explained in detail below.

**Note** When defining a new transition or modifying an existing transition configuration, the entry of the parameters builds a graphical representation of the delay, rate and type associated with the video and audio signals. The orange line represents the old (transitioning off air) signal and the green line represents the new (transitioning on air) signal.

Figure 123. Transition Configuration Table



### Wipe Transition Sets Drop-Down List

A wipe set may be selected for use in video signal transitions if one or more wipe transition sets have been defined. The defined sets are displayed in the drop-down list box under the graphical display area.

### Transition Name

Enter a descriptive name in this field that defines the actions performed by the named transition. In the example highlighted in Figure 123, the name of the first transition is "Aud before Vid." This transition will switch the audio from the old source to the new source before beginning the video transition.

### Signal

The transition parameters for video and audio signals are defined separately. Video parameters are defined in the upper section of each transition definition. Audio parameters are defined in the lower section.

### Type

A transition type is specified for both video and audio signals. The possible selections for the video signal are FadeFade, CrossFade and Wipe. The pos-

sible selections for the audio signal are FadeFade and CrossFade. The type selection enables or disables the entry of other transition parameters.

## Wipe

The preferred transitional wipe effect name is selected from the drop-down list box. This parameter applies to the video signal only and is not active for audio signals.

**Note** Wipes are represented graphically as a cross-fade in the video signal.

## ‘From Old’ Delay Duration

The delay period, expressed as a number of frames, from the time the transition begins (with a press of the **TAKE** button or via automation) until the transition of the indicated signal begins. In the example in [Figure 123](#), there is a 20 frame delay after the transition is initiated before the video signal begins to transition from the old to the new source. This allows the audio transition to complete before the video transition begins.

If CrossFade or Wipe is the selected transition type for a video signal, this field is disabled (grayed out) as it is not applicable.

If CrossFade is the selected transition type for an audio signal, this field is disabled (grayed out) as it is not applicable.

## ‘From Old’ Duration

If a FadeFade type was selected, this is the number of frames in which the old source will fade to black for a video signal or fade to silent for an audio signal.

If CrossFade or Wipe is the selected transition type for a video signal, this field is disabled (grayed out) as it is not applicable.

If CrossFade is the selected transition type for an audio signal, this field is disabled (grayed out) as it is not applicable.

## Black (Silent) Duration

If a FadeFade type is selected, this is the number of frames for which a video signal will remain at black or an audio signal will remain silent before the new source begins to fade in.

If CrossFade or Wipe is the selected transition type for a video signal, this field is disabled (grayed out) as it is not applicable.

If CrossFade is the selected transition type for an audio signal, this field is disabled (grayed out) as it is not applicable.



**‘To New’ Delay Duration**

If Wipe is the selected video type or CrossFade is the selected video or audio type, this is the number of frames of delay after the transition begins before the transition to the new source begins.

If FadeFade is the selected video or audio type, this field is disabled (grayed out) as it is not applicable.

**‘To New’ Duration**

Once the transition to the new video or audio source begins (regardless of type selected) this is the duration, in frames, from the beginning of the new source transition until the transition to the new source is complete.

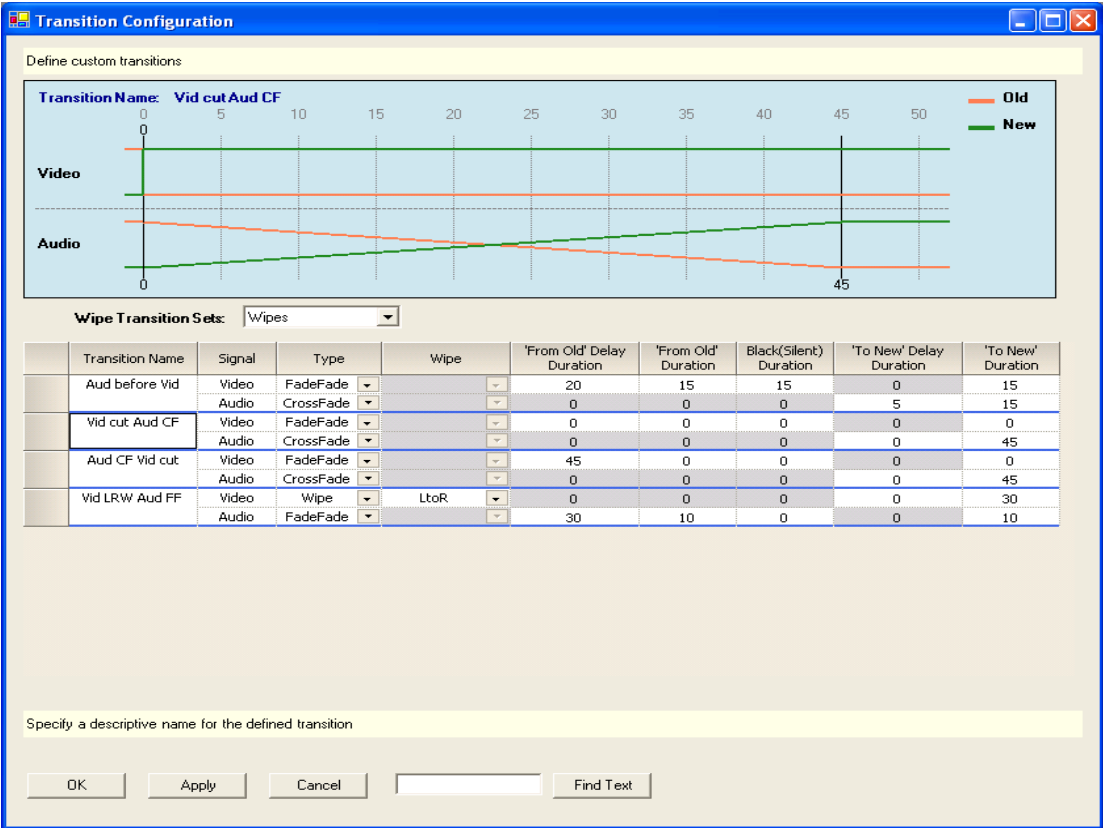
Looking at the configuration for the “Aud before Vid” transition in [Figure 123](#) above, we can see from the graphical representation that the entered parameters define a transition with the following characteristics:

- The video transitions as a FadeFade which means the old source fades out before the new source fades in.
- The audio transition is a cross fade between the old source and the new source.
- The video transition does not begin until 20 frames after the transition is initiated.
- The audio transition begins 5 frames after the transition is initiated.
- The audio cross fade transition from the old source to the new source takes a total time of 15 frames (1/2 second in 60 [59.94] Hz standards).
- The audio transition is complete before the video transition begins.
- When the video transition begins, the old source fades to black in 15 frames.
- The video remains at black for 15 frames.
- The new source fades in over 15 frames.
- The total time for both the audio and video transition is 65 frames (2 seconds and 5 frames in 60 [59.94] Hz standards).

**Independent Transition Examples**

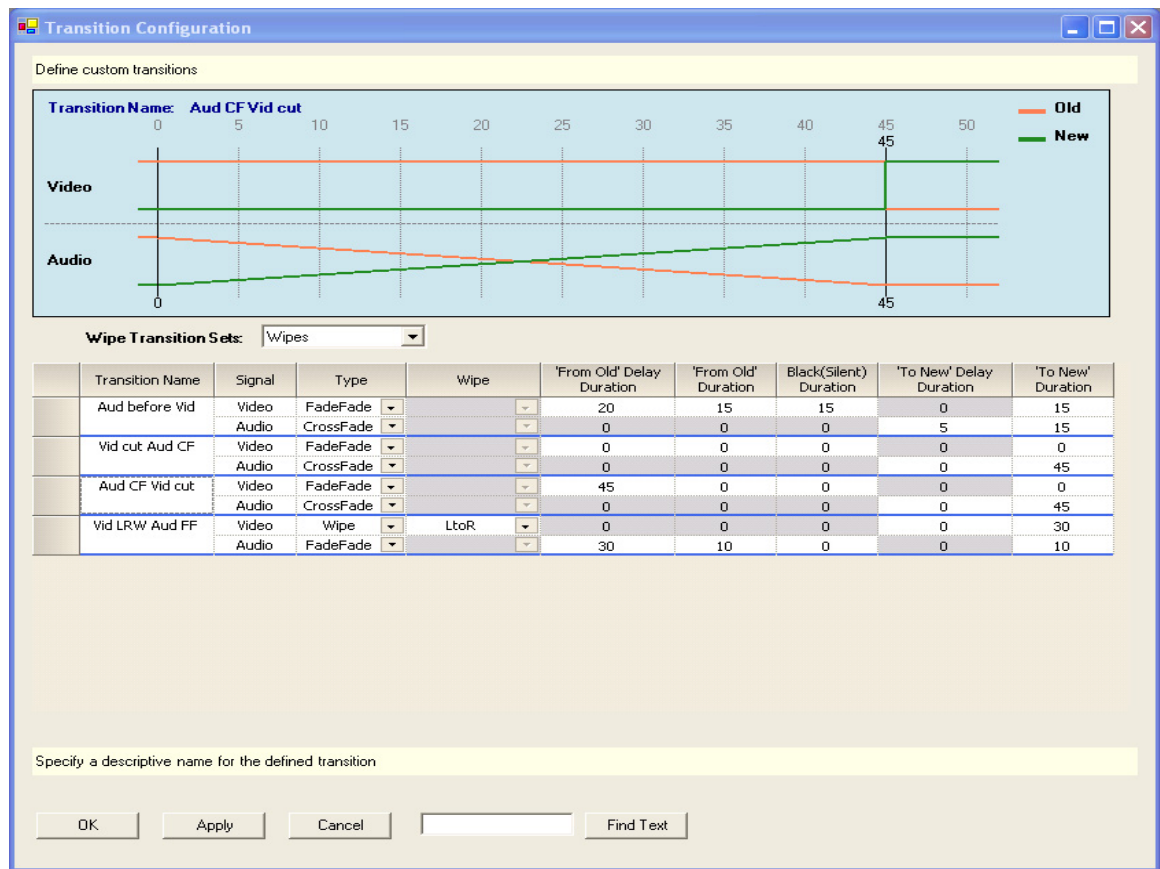
Additional sample transition configurations and descriptions are presented in [Figure 124](#), [Figure 125](#) and [Figure 126](#).

Figure 124. Video Cut - Audio Cross Fade Transition



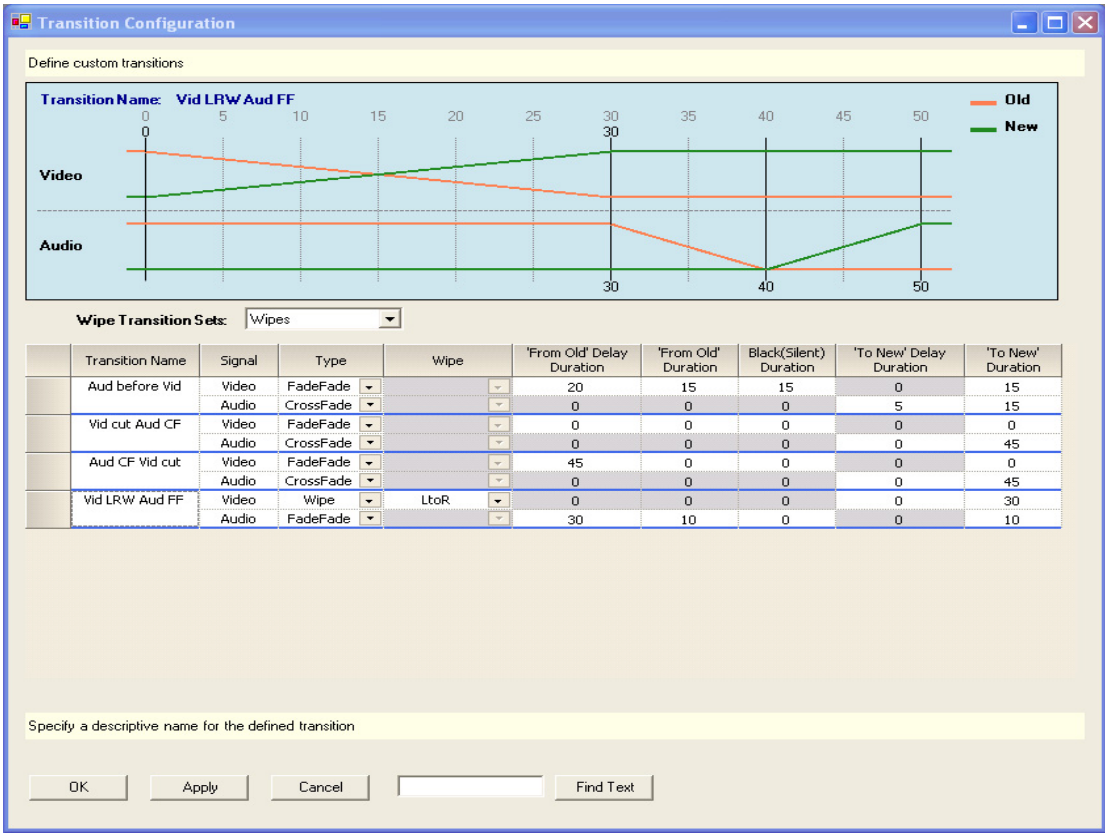
In this transition, video cuts from the old source to the new source immediately upon execution of the transition. The audio cross fades from the old to the new source in 45 frames (1 1/2 seconds in the 60 [59.94] Hz standard).

Figure 125. Audio Cross Fade - Video Cut Transition



In this transition, audio begins to cross fade immediately from the old to the new source upon execution of the transition. The cross fade takes 45 frames to complete (1 1/2 seconds in the 60 [59.94] Hz standards) after which video cuts from the old source to the new source.

Figure 126. Video Left to Right Wipe - Audio Fade Out/Fade In Transition



This transition starts with a video wipe from left to right across the screen. The wipe takes 30 frames to complete after which the old audio fades to silent in 10 frames and the new audio fades in over 10 frames. The total transition time is 50 frames.

**Note** Wipes are represented graphically as a cross-fade in the video signal.

All of the transitions in the above examples demonstrate configurations in which either the audio or video signal transitions after the other signal transition is complete. Of course, it is possible for a configured transition to transition both signals simultaneously, or to have one signal transition slightly offset from the other. Since the audio and video signal transitions are configured independent of one another, there is total flexibility in the transition definitions.

## Transition Associations

After configuring independent transitions, the transitions are assigned a unique identifying number, the transition association number, by which the configured transitions will be recalled from the control panel or activated by automation. Figure 127 shows the assignment of transition association numbers 10-13 to the four custom transitions in the above examples.

**Note** The standard transitions (Cross-Fade, Fade-Cut, Cut-Fade and Fade-Fade) have static transition association numbers (0-3) which may not be changed or reassigned to configured transitions. The standard transitions and their association numbers are grayed out and cannot be changed.

Figure 127. Transition Association Table

Assign numerical values to Maestro Transition Types for the purpose of manual recall from the Control Console and Automation selection via the ES protocol

Transition Name	Transition Association Number
Cross-Fade	0
Fade-Cut	1
Cut-Fade	2
Fade-Fade	3
Aud before Vid	10
Vid cut Aud CF	11
Aud CF Vid cut	12
Vid LRW Aud FF	13

OK Apply Cancel Find Text

In order to make configured transitions available for user activation from the control panel, the preferred Transition Association Set for each channel must be selected in the Channel Setup table. See [Figure 131](#) for an example.

**Note** It is possible to define multiple Transition Association Sets. A particular configured transition may be included in more than one Transition Association Set. If this is the case, it is possible that the same configured transition may have a different Transition Association Number in each set in which it is included. For example, the configured transition “Aud before Vid” may be number 10 in the “Trans Types” set, as seen in [Figure 127](#), and number 99 in another set.

## VBI Passthrough

You can decide which Vertical Blanking Interval (VBI) lines should pass through to Maestro output and which should be blocked. These configurations are Video Standard dependent.

To configure VBI passthrough, do the following:

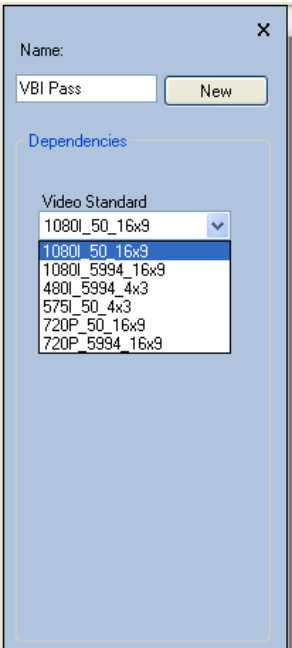
1. In the Configuration Editor, create one or more VBI Passthrough tables by selecting “VBI Passthrough” in the “7th Step: Effect Configuration” area of the Configuration Editor.

**Note** A different VBI passthrough definition can be assigned to each Maestro channel. Create a VBI Passthrough table for each desired VBI passthrough definition

2. As VBI passthrough configuration is dependent upon the video standard, select the appropriate video standard for the new VBI passthrough definition as shown in [Figure 128](#).

**Note** For 1080i 50, Line 8 is not defined.

Figure 128. VBI Passthrough Video Standard Selection



When a VBI Passthrough table is created, a table similar to that illustrated in [Figure 129](#) appears.

**Note** The VBI lines in the selected video standard are represented in the VBI Passthrough table. Depending on the video standard selected, the VBI Passthrough table may not be the same as illustrated in [Figure 129](#).

Figure 129. VBI Passthrough Table

	Field 1 Number	Field 1 Line (click header to uncheck all)	Field 2 Number	Field 2 Line (click header to check all)
	8	<input checked="" type="checkbox"/>	570	<input type="checkbox"/>
	9	<input checked="" type="checkbox"/>	571	<input type="checkbox"/>
	10	<input checked="" type="checkbox"/>	572	<input type="checkbox"/>
	11	<input checked="" type="checkbox"/>	573	<input type="checkbox"/>
	12	<input checked="" type="checkbox"/>	574	<input type="checkbox"/>
	13	<input checked="" type="checkbox"/>	575	<input type="checkbox"/>
	14	<input checked="" type="checkbox"/>	576	<input type="checkbox"/>
	15	<input checked="" type="checkbox"/>	577	<input type="checkbox"/>
	16	<input checked="" type="checkbox"/>	578	<input type="checkbox"/>
	17	<input checked="" type="checkbox"/>	579	<input type="checkbox"/>
	18	<input checked="" type="checkbox"/>	580	<input type="checkbox"/>
	19	<input checked="" type="checkbox"/>	581	<input type="checkbox"/>
	20	<input checked="" type="checkbox"/>	582	<input type="checkbox"/>
		<input type="checkbox"/>	583	<input type="checkbox"/>

3. Select the lines that you wish to enable to pass through Maestro by clicking on the check box.

**Note** To select all lines in a column, click on the column header.

Lines not selected will not pass through Maestro to the output.

4. In the Channel Setup table, under 8th Step: Channel Sets, assign the appropriate VBI Passthrough definition to the desired channel as illustrated in Figure 130.

**Note** The VBI Passthrough table configuration only applies to data contained within the Vertical Ancillary (VANC) space. Data contained within the Horizontal Ancillary (HANC) data space may be replaced by embedded audio data.

Figure 130. Channel Setup Table - VBI Passthrough

Channel Name	Channel Processor	Video Standard	VBI Passthrough	Clean Feed 1	Clean Feed 2
SDV	SDV Frame	VIDEO_STANDARD_480I_5994_4x3	vbipass	Clean Clean	Clean Clean
SD2	SD2	VIDEO_STANDARD_480I_5994_4x3	vbipass	Clean Clean	Clean Clean

**Note** Only those VBI Passthrough tables with same designated video standard as the specified channel will appear in the drop down list for that channel.



## 8th Step: Channel Sets

The 8th Step: Channel Sets has the following steps:

- Channel Setup
- Channel Delegation
- Channel Delegation Subpanel

Each of these steps is describe below.

The term “channel,” as it is used in Maestro, refers to the output of a single Maestro Processor, that is, one video channel and up to 16 associated audio channels.

### Channel Setup

The Channel Setup Screen uses a table that defines the parameters of a channel and the associated configuration sets. The following figures show the Channel Setup screen.

Figure 131. Channel Setup Table (Example)

Channel Setup

Define the parameters of a channel and associate configuration sets.

	Channel Name	Channel Processor	Video Standard	VBI PassThrough	Background MADI Expansion	Audio Mixer MADI Expansion	Audio Output Set	Audio Option Set	Input Set
	SD	SD	VIDEO_STANDARD_575I_50_4x3		Yes	No	SD	SD	SD
	HD	HD	VIDEO_STANDARD_1080I_5994_16x		Yes	No	HD	HD	HD

OK

Apply

Cancel

Find Text

Channel Setup

Define the parameters of a channel and associate configuration sets.

	Interconnection Set	Monitor Follow Set	Key Fill Association Set	Background Buttons Set	Automation Connection Set	Automation Input Set	Quick Pick Set	Wipe Transition Set	DVE Set	Automation DVE Association Set
	SD		SD	SD	SD	SD	SD	Wipes	DVE	
	HD		HD	HD	HD	HD	HD	Wipes	DVE	

OK

Apply

Cancel

Find Text

Channel Setup

Define the parameters of a channel and associate configuration sets.

	GPI0 Definition Set	Transition Association Set	Transition Field	Cut Transition Rate	Fast Transition Rate	Medium Transition Rate	Slow Transition Rate
	GPI0		FIELD_BOTH	0:00	0:10	1:00	2:00
	GPI0		FIELD_BOTH	0:00	0:10	1:00	2:00

OK

Apply

Cancel

Find Text

**Channel Name**

Create a name for this Processor.

This entry is the source for the Channel names on the Channel Delegation table (page 227).

**Channel Processor**

Select a Processor previously defined in the Network Description table (page 132).

### Video Standard

Select the preferred video standard for the Maestro channel process from the drop-down list. The Video Standard options are:

- 480I\_59.94\_4x3
- 575I\_50\_4x3
- 1080I\_59.94\_16x9
- 1080I\_50\_16x9
- 720P\_59.94\_16x9
- 720P\_50\_16x9

### VBI Pass Through

Select the preferred VBI Passthrough set for this channel.

### Clean Feed 1

There are five (5) internal tap points that can be selected to be used as the output on the Clean Feed 1 rear panel BNCs. Select the preferred tap point from the drop down list. The choices are:

**Clean Clean:** This option is background Cuts Only, No Video Keys.

**Downstream PGM Mixer:** This option is background Transitions, Upstream and Downstream Video Keys including DVE, same as Program Output.

**Downstream PST Mixer:** This option is a Look Ahead Preview, same as Preset output.

**Upstream Keys:** This option is background Cuts Only including Upstream Keys.

**Upstream Mixer:** This option is background Transitions, Upstream Video Keys including DVE.

### Clean Feed 2

There are five (5) internal tap points that can be selected to be used as the output on the Clean Feed 2 rear panel BNCs. Select the preferred tap point from the drop down list. The choices are:

**Clean Clean:** This option is background Cuts Only, No Video Keys.

**Downstream PGM Mixer:** This option is background Transitions, Upstream and Downstream Video Keys including DVE, same as Program Output.

**Downstream PST Mixer:** This option is a Look Ahead Preview, same as Preset output.

**Upstream Keys:** This option is background Cuts Only including Upstream Keys.

**Upstream Mixer:** This option is background Transitions, Upstream Video Keys including DVE.

### Background MADI Expansion

If the Sonata AES-to-MADI converter is used to provide audio for background video buses A, B, C and D, (or if the Apex MADI output is connected to Maestro for Background inputs) set the value in this column to “Yes.” If Sonata is not used, the value should be “no.”

**Note** When background MADI is set to “Yes”, the rear panel background AES inputs are deactivated. All background AES input is via the MADI-1 rear panel interface.

### Audio Mixer MADI Expansion

If a Sonata AES-to-MADI converter is used to provide up to four multi-channel routed audio over sources to the Maestro processor (or if the Apex MADI output is connected to Maestro for Audio Mixer inputs), set this value to “Yes.” If a Sonata converter is not used for audio over sources, this value should be set to “No.”

**Note** When Audio Mixer MADI is selected, the rear panel AES audio mix inputs are disabled. All AES mix audio input is via the MADI-2 rear panel input.

### Audio Output Set

Select an Audio Output set as previously defined ([page 141](#)).

### Audio Option Set

Select an Audio Option set as previously defined ([page 159](#)).

### Input Set

Select an Input set as previously defined ([page 172](#)).

### Interconnection Set

Select an Interconnection set as previously defined ([page 175](#)).

### Monitor Follow Set

Select a Monitor Follow set as previously defined ([page 190](#)).

### Key Fill Association Set

Select a Key Fill Association set as previously defined ([page 197](#)).

### **Background Buttons Set**

Select a Background Buttons set as previously defined ([page 195](#)).

### **Automation Connection Set**

Select an Automation Connection set as previously defined ([page 134](#)).

### **Automation Input Set**

Select an Automation Input set as previously defined ([page 198](#)).

### **Quick Pick Set**

Select a Quick Pick set as previously defined ([page 198](#)).

### **Wipe Transition Set**

Select a Wipe Transition set as previously defined ([page 200](#)).

### **DVE Set**

Select a DVE set as previously defined ([page 203](#)).

### **Automation DVE Association Set**

Select an Automation DVE Association set as previously defined.

### **GPIO Definition Set**

Select a GPIO Definition set as previously defined ([page 177](#)).

### **Transition Association Set**

Select a Transition Association Set as previously defined ([page 216](#)).

### **Transition Field**

Enter the preferred transition field.

Selections are:

- Field 0 - default
- Field 1
- Field both

### **Cut Transition Rate**

Enter the preferred time for a cut transition in Seconds: frames - Default is 0:00 (Immediate cut with no delay)

### **Fast Transition Rate**

Enter the preferred time for a fast transition in Seconds: frames - Default is 0:10 (10 frames).

### **Medium Transition Rate**

Enter the preferred time for a medium transition in Seconds: frames - Default is 1:00 (1 second).

### **Slow Transition Rate**

Enter the preferred time for a slow transition in Seconds: frames - Default is 2:00 (2 seconds).

### **Keyer/Audio Mixer Transition Mode**

Keyers and Audio Overs can be configured in either Flip-Flop or Auto-Cancel mode.

- Flip-Flop mode does not deselect Keyers and Audio Overs when transitioning from the Pgm bus.
- Auto-Cancel mode automatically deselects Keyers and Audio Overs when transitioning from the Pgm bus.

## Channel Delegation

This table defines the set of Maestro channels (Processors) that will be available on the Channel Control sub panel. The channels are grouped in “banks” of four channels each. For example, a given frame containing four channels could be accessed by pressing “Bank 1,” which would cause the names of those four channels to appear on the four LCD buttons. The operator would then press an LCD button to take control of (“delegate”) that channel.

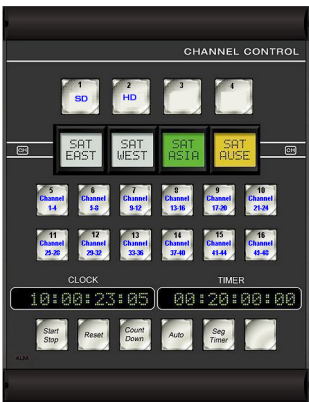
When this item is selected, the editor will open a Set Panel.

The set is assigned to a control panel using the Channel Server table, as described on [page 230](#).

Figure 132. Channel Delegation Table (Example)

Delegation Channel Number	Channel
1	SD
2	HD

Figure 133. Channel Control Sub Panel



### Delegation Channel Number

Enter a Channel Number for this channel from 1-48. This number identifies the Channel Bank and one of the four LCD buttons on the Channel Control sub panel.

In [Figure 132](#), “Delegation Channel Number 1” identifies Channel Bank 1, LCD button 1 in [Figure 133](#).

As another example, Delegation Channel Number “5” would identify Channel Bank 2, LCD button 1.

**Note** Buttons may be left unassigned (blank). For example, the channel SD could be assigned to button number 1 and the channel HD to button number 4. This would leave buttons 2 and 3 blank with no channel assignment.

**Channel**

Select a Channel Name as previously defined on the Channel Setup table (page 221). This channel name will appear on the LCD button to which the channel is assigned.

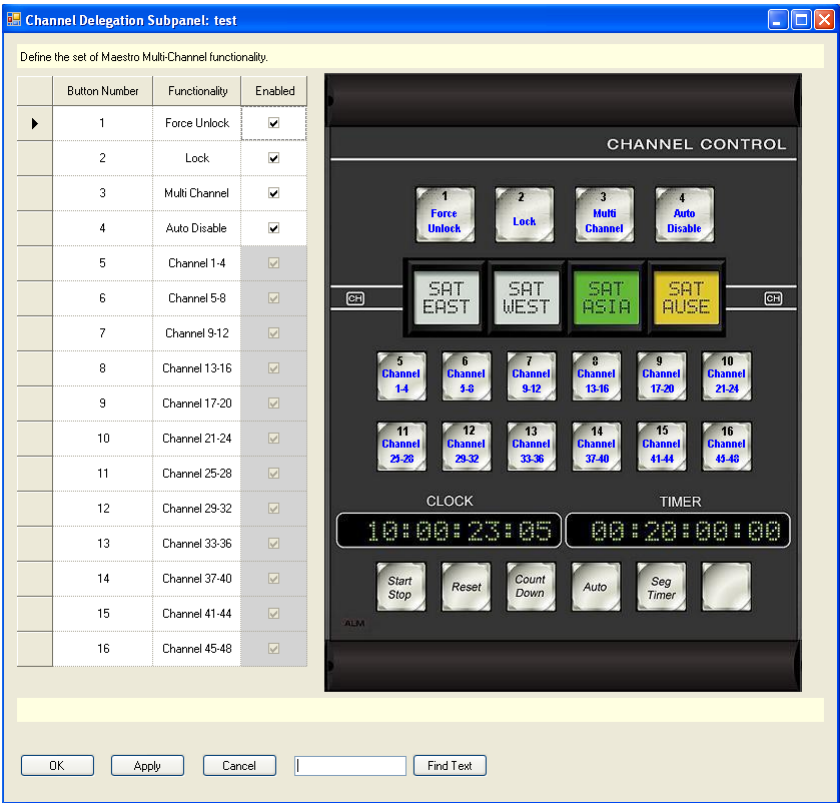
**Channel Delegation (Control) Sub Panel**

This table is used to define the 16 fixed-legend buttons on the Channel Control sub panel.

When this item is selected, the editor will open a set panel. The set is assigned to a control panel using the Channel Server table, as described on page 230.

**Note** The hardware panel is shipped with legends already installed as shown on page 227. Making entries other than those shown in Figure 134 will require changing those legends.

Figure 134. Channel Delegation Sub Panel table (Example)



**Button Number**

These numbers correspond to the 16 fixed-legend buttons.



## Functionality

Choices are:

- Channel Bank - Each channel bank consists of four channels, corresponding to the four LCD “CHAN” buttons.

**Note** Each Channel Bank button will display up to four channel IDs on the LCD buttons. With four or fewer channels, only one channel bank button needs to be assigned. Up to 12 channel bank buttons are available.

- Auto Disable - Disables automation system control for the delegated channel.
- Lock - Prevents other control panels from operating the selected channel.
- Force Unlock - Overrides a lock set by another control panel.
- Multi Channel - When the **Multi Channel** button is illuminated, selecting a new **CHAN** button will toggle the controlled state of the selected channel to the control panel. When the Multi Channel button is OFF, the system is in the Single Channel Delegation mode. In this case selecting a new **CHAN** button will *release* control of the old channel and then take control of the new channel.

## Enable Check Box

Selecting the Enable check box will allow the button to be used. If the check box is selected, that is it has a check mark, the Functionality text on the button will be blue. The functionality text will be gray if it is not selected.

# 9th Step: General

The 9th Step: General has the following steps:

- Channel Server
- GUI Configuration

These steps are explained in detail below.

## Channel Server

“Channel server” refers to the CP Panel Server board and/or the PCI Panel Server board. The CP Panel Server board is contained within the hardware control panel; the PCI Panel Server may or not be present.

Figure 135. Channel Server Table (Example)

	Channel Server Name	Board Name	Channel Delegation Set	Channel Delegation Subpanel Configuration Set
▶	MASTER	Panel	DELEGATION	SUB-PANEL
	GUI PS	GUI	DELEGATION	SUB-PANEL

### Channel Server Name

Create a Channel Server Name.

This is the source of the name that appears on the GUI Configuration table (page 231).

### Board Name

Select a previously defined control panel from the Network Description table (page 132).

If there is no hardware control panel, this will be the name of the PCI Panel Server board.

### Channel Delegation Set

Select a previously defined Channel Delegation set (page 227).

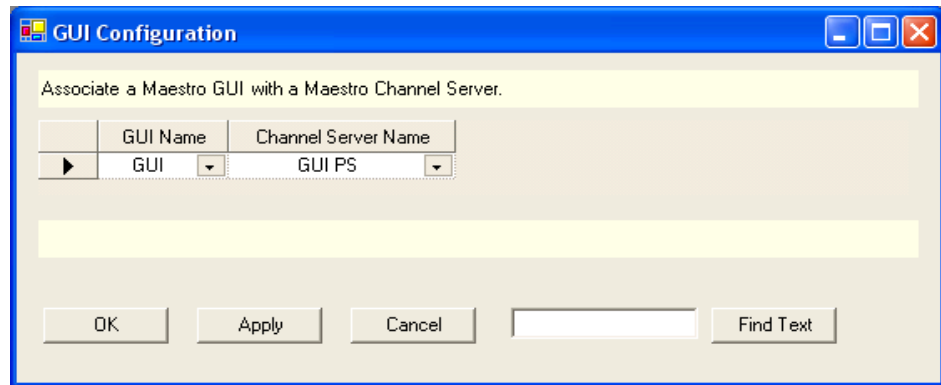
## Channel Delegation Sub Panel Configuration Set

Select a previously defined Channel Delegation Sub Panel set ([page 228](#)).

## GUI Configuration

This table is used to associate a GUI control panel with a Channel Server.

Figure 136. GUI Configuration Table (Example)



### GUI Name

Select a name previously defined on the Network Description table ([page 132](#)).

### Channel Server Name

Select a name previously defined on the Channel Server table ([page 230](#)).

**Note** If the GUI PC contains a PCI Panel Server card, that Panel server is normally assigned to the GUI PC. This makes the GUI PC an independent control panel capable of controlling any channel in its assigned channel delegation set. It is possible to assign the Panel server from a hardware control panel to the GUI PC. If this is done, the GUI becomes a slave to the hardware control panel and exactly mirrors the state of that control panel only. In this case, the GUI PC would be incapable of independently controlling Maestro channels.

## Compiling the Completed Set

After all the configuration tables are created or edited and saved, the configuration file must be compiled before it can be downloaded to the Maestro hardware and activated as the running configuration using the Deployment Control Center (as described in the next section of this manual).

The Configuration Editor menus and shortcut icons are shown in [Figure 137](#) and an explanation of the icons appears in [Table 16](#).

To compile a configuration set, see [Compile Current Configuration on page 235](#).

Figure 137. Configuration Editor Menus and Shortcut Icons

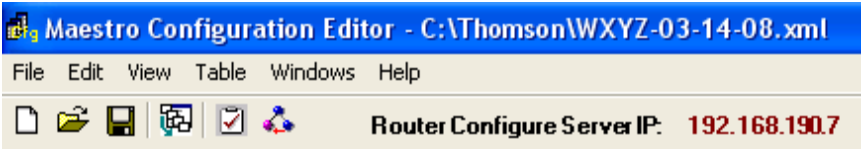


Table 16. Configuration Editor Icons

Icon	Description
	Create New Configuration
	Open Existing Configuration
	Save Current Configuration
	Show Configuration Workflow
	Validate Current Configuration
	Compile Current Configuration

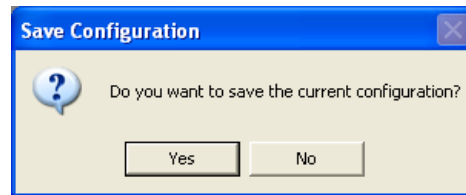
# Configuration Editor Shortcut Icons

The shortcut icons perform the functions described.

## Create New Configuration

Closes any open configuration file, prompts to save changes if there are unsaved changes in the open file (see [Figure 138](#)) and creates a new blank configuration.

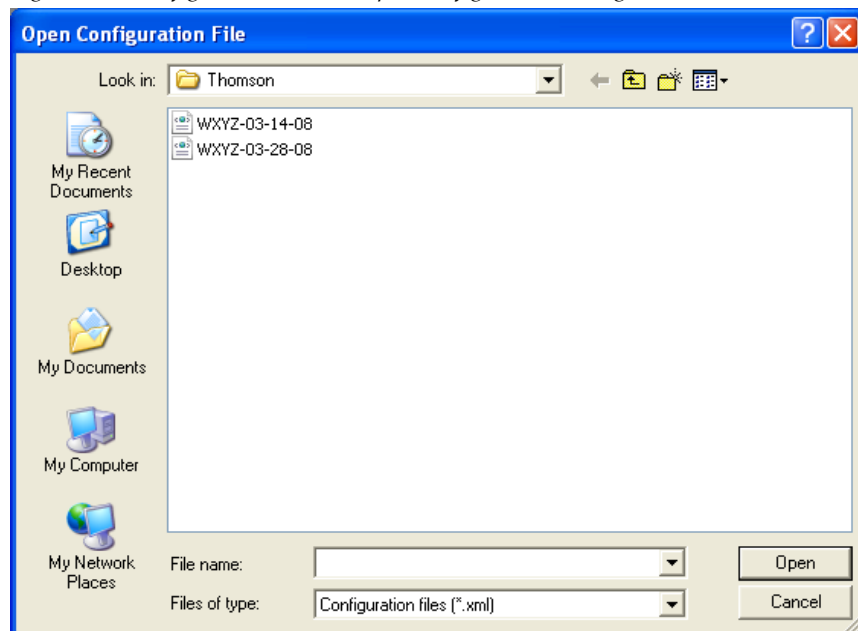
Figure 138. Configuration Editor - Save Open File



## Open Existing Configuration

Opens a dialog box listing the saved configuration files (see [Figure 139](#)) from which the configuration to be opened is selected.

Figure 139. Configuration Editor - Open Configuration Dialog



## Save Current Configuration

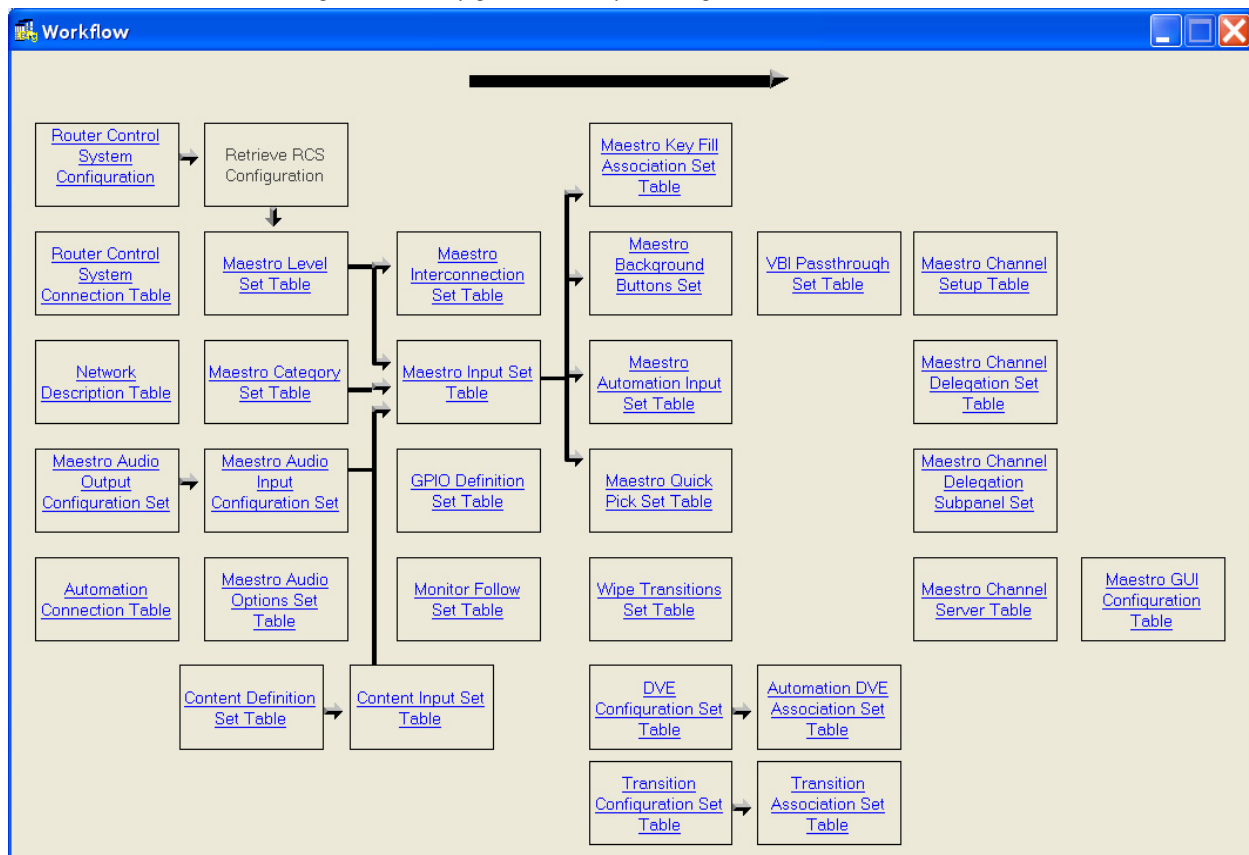
Saves the current configuration file, overwriting the file on disk with any unsaved changes.

**Note** If significant changes have been made to the configuration file since it was opened, it is a good practice to select File>Save As and save the file with a new name. This makes it easy to return to a prior configuration without the need to remember and remove all the changes that were made should the new configuration not perform as expected. It is also a good practice to append the date the file was modified and saved to the file name.

## Show Configuration Workflow

Displays a workflow diagram showing the dependencies between individual configuration tables. This diagram is shown in [Figure 140](#).

Figure 140. Configuration Workflow Diagram



**Note** The configuration table names are links that, when clicked, will either open that table or the dependency/set list if there are multiple tables.

## Validate Current Configuration

If there are unsaved changes in the current configuration, the dialog box in [Figure 141](#) opens prompting for a Yes/No response to saving the file. If there are errors in the configuration, the validation report in [Figure 142](#) is produced listing all errors.

Figure 141. Validate Configuration Save File Dialog

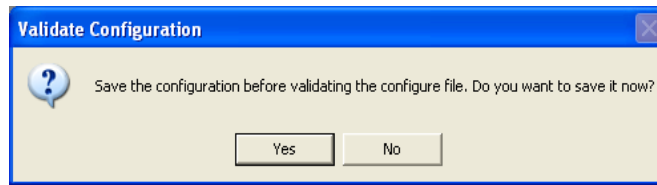
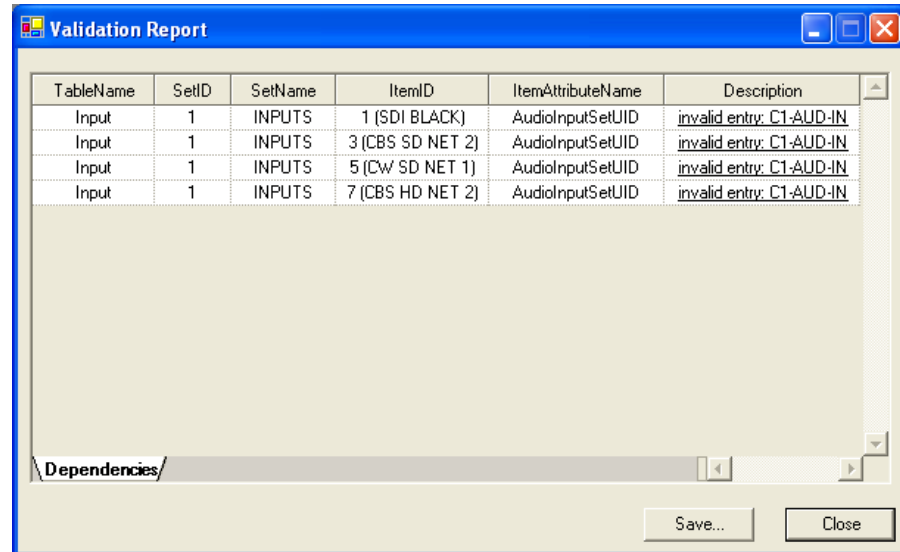


Figure 142. Configuration Editor Validation Report



**Note** The invalid entries listed in the description column are links to the invalid data; clicking on the link takes you directly to the error in the indicated table.

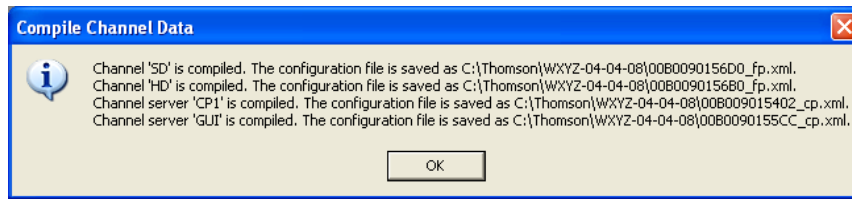
## Compile Current Configuration

Once a configuration set has been validated and saved it is ready to be compiled. The configuration must be compiled before it can be downloaded to Maestro hardware and applied as the running configuration.

To compile a configuration set, click on the Compile icon. If the configuration has not already been saved, you will be prompted to save the file before compiling. Compiling a configuration file also validates that file. If there are any validation errors, an error window will appear (see [Figure 142](#) for an example) indicating what items in the configuration need to be corrected before the configuration set can be successfully validated and compiled for use.

If the configuration file is successfully compiled, a window similar to the one seen in [Figure 143](#) appears. A successful compile of a configuration set creates an XML file for each Maestro component in the Network Description table. These are the files that are deployed to the Maestro hardware with the Deployment Center.

Figure 143. Configuration Editor Compile Channel Data



## Configuration Files

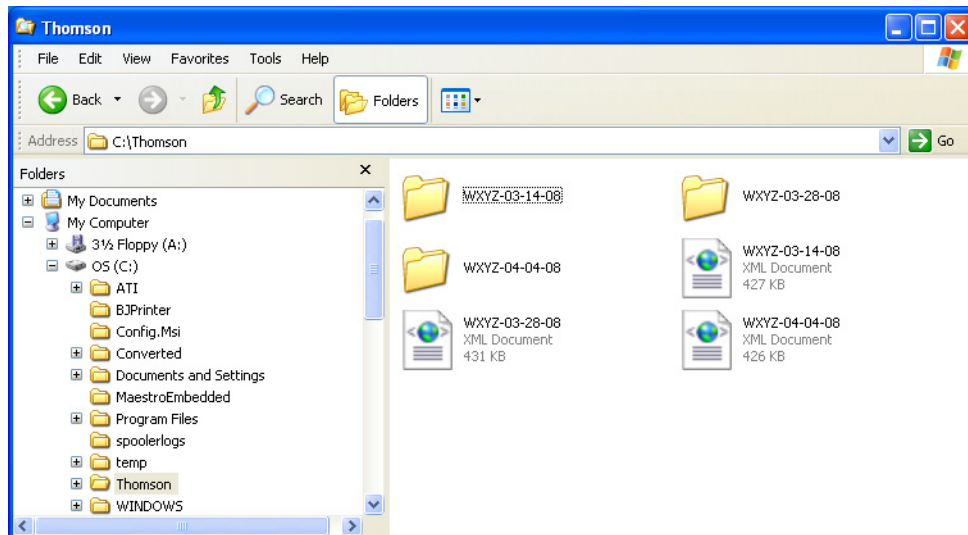
When a configuration is saved, an .xml file with the name of the saved file is created in:

C:\Thomson (this is the default location unless another location is specified)

For example, a configuration file named WXYZ-04-04-08 would be saved as C:\Thomson\WXYZ-04-04-08.xml

Figure 144 shows a directory listing for C:\Thomson in which three .xml files exist, indicating that three configurations have been saved.

Figure 144. Saved Configuration Files



When a configuration file is compiled, a subdirectory with the same name as the saved configuration is created. This subdirectory contains individual .xml files for each component in the Network Description table as seen in Figure 143.

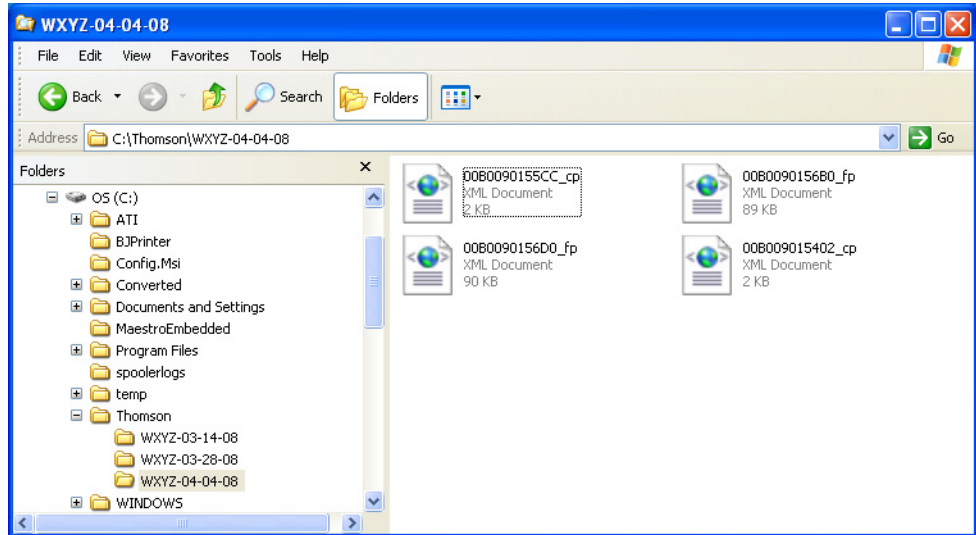
If a configuration was saved with the name WXYZ-04-04-08 and then compiled, the location of the compiled files is:



C:\Thomson\WXYZ-04-04-08

Figure 145 shows the compiled .xml files in this directory.

Figure 145. Compiled Configuration Files



These are the files that are downloaded and applied to the Maestro components using the Deployment Control Center application.

## Re-compiling a Prior Version Configuration File

All configuration sets to be used with Maestro created with earlier versions of the Configuration Editor must be recompiled with the latest version configuration Editor. This will ensure that tables which support new features are properly added and that any changes made to existing tables are added.

**Note** It is highly recommended that each table in a configuration be opened and saved with a new software version. Even if a particular configuration table will not be used, it should be selected and closed in the editor in order to ensure that default entries are created.

**WARNING** Failure to recompile configuration sets created with previous software versions could result in some Maestro features being non-functional or even a non-functional Maestro channel.

1. Launch the Maestro Configuration Editor by going to "Start > All Programs > Thomson > Maestro Configuration Editor" or clicking on the "Maestro Configuration Editor" shortcut icon on the desktop.
2. Select the Maestro configuration set to be re-compiled by going to "File > Open" or clicking on the Open icon and selecting the preferred set to be recompiled.

3. If the system displays a Validation Report, you must check the indicated table(s) and make corrections as indicated.

You can use the links in the Description column to display the table(s) with errors.

4. As an added precaution, it is recommended that each table in the set be opened before recompiling the set.
5. Save the configuration file.
6. Compile the file by going to “File > Compile Channel Data” or clicking on the Compile icon.

# Deployment Control Center

The Deployment Control Center application is used to download and apply software updates, FPGA code updates, and configuration files to the Maestro hardware. The hardware components that may need these updates are the following:

- Maestro Processor Boards
- Panel Server in a Hardware Control Panel
- Hardware Control Panel sub-panels (FPGA updates only)
- PCI Panel Servers in GUI PCs (if present)

The Deployment Control Center is also used to perform administrative tasks and monitor the operational status of the components listed above.

The Configuration Editor and the Deployment Control Center applications must be installed on the same PC. See [Section 4-Software Installation](#) for more information.

**Note** In some systems, the configuration and /or deployment applications may be supplied on the GUI control panel PC.

## Maestro Applications Files

When a new version of Maestro software is installed, directories and files are created on the deployment PC hard drive. If the recommended defaults were used during installation, the Maestro software applications are located in:

C:\Program Files\Thomson\Maestro Software Package

This directory contains the following sub-directories:

- Control Center (Deployment Control Center Application)
- Control Center Service (files for running Control Center as a Windows service)
- Editor (Configuration Editor application)
- GUI Control Console (Maestro GUI Control Console application)

**Note** The GUI software is only licensed for use on a GUI PC supplied by Grass Valley. See [Table 12 on page 95](#) for ordering information.

**Note** It is highly recommended that a PCI Panel Server card be installed in the Maestro GUI PC if you intend to use the GUI Control Console application for controlling Maestro channel processors. See Section 3 - Hardware for more information.

- Jupiter Router Service (must be installed on the Jupiter server if using the Jupiter Router Control System).

## Software Application Files

When a new version of Maestro software is installed, the directories and files are created on the deployment PC hard drive. If the recommended defaults are used during an installation, the Maestro software update files are located in:

C:\MaestroEmbedded

Each installed software release will create three files on the PC with the following name format:

- MaestroCP\_X.XXX.XXXX.XXX.tar
- MaestroMC\_X.XXX.XXXX.XXX.LTC.tar
- MaestroMC\_X.XXX.XXXX.XXX.VITC.tar

**Note** To simplify the update process, the distribution files are consolidated in a “.tar” format, which is similar to a “.zip” file. (The term “tar” originally stood for “tape archive.”)

The “X.XXX.XXXX.XXX” text in the above file names represents the long version number of the software release.

For example, for the 2.0 release these files are:

- MaestroCP\_2.000.3656.1134.tar
- MaestroMC\_2.000.3656.1134.LTC.tar
- MaestroMC\_2.000.3656.1134.VITC.tar

The .LTC.tar file is used for systems that are utilizing the LTC time code. The .VITC.tar file is loaded on to the systems that are using the VITC time code.

**Note** The removal of Maestro software does not remove the .tar files created by the installation of that software version. It is possible that several sets of .tar files may be present in the MaestroEmbedded directory. You may want to manually delete the oldest of those files; however, keeping one or two prior versions will make it possible to roll back to a prior version, if needed.

## Software Application Box

This portion of the Control Center screen allows selection of software distribution files that are located on the deployment PC. After selection, these files can be downloaded to the system hardware in preparation for activation at an appropriate time.

## Configuration Files

See *Configuration Files* [on page 262](#) for more information on the location and structure of configuration files.

## Configuration Box

This portion of the screen shows the name of the configuration set that is currently active (running on the hardware). The configuration set is created and edited using the configuration editor (as described in the previous section of this manual). The preferred set is selected in the “File” drop-down field. The **Update Only** button is used to download the selected set to the hardware. If the Update Only mode is used, the configuration set will be downloaded but not executed. If the Update and Apply mode is used, the configuration will be downloaded and activated on Maestro system.

**CAUTION** If the **Update and Apply** button is chosen, all signals passing through the Maestro system will be a briefly interrupted while the configuration is activated on the Maestro processors.

## Board List

This table shows the software status of the system.

The fields showing the software status for the deployment PC have a blue background. These fields show the software version of programs that are available for download to the system hardware. There are four classes of software shown: the Application software, the FPGA gateway, the VXWorks operating system, and the Configuration set.

The remainder of the list shows the software status of the hardware boards:

- Board name – this column is filled in automatically, based on the names already entered on the Network Description table.
- Facility LAN IP address – this column is also filled in automatically, based on the Network Description table.<sup>1</sup>
- Status
- Uptime – displays how long the board has been running, or, if the “Show StartTime” box is checked, the date and time when the board was started.
- Board Configuration – this section displays the current (“running”) configuration file and the “pending” configuration file. The pending file is loaded on the board and can be activated when “Active Pending” is selected. “Parent Name” refers to the global configuration file used to create the board file. (The name of the global configuration file is also shown on the right-hand section of the table.)

**CAUTION** Activation of downloaded software will interrupt signals passing through the system. Depending on the nature of the software upgrade, this interruption may last for several minutes. For more information, including specific download procedures, refer to the release notes supplied with the software.

If there is a Maestro board installed in a Maestro/Concerto+ frame that is not defined in the Network Description table for the active configuration, the **Unmanaged Boards** button appears in the lower left corner.

Figure 146. Deployment Center Unmanaged Boards Button



Clicking this button will display information about all boards not currently defined in the Network Description table. The presence of unmanaged boards indicates the potential of “rogue” boards in the system that could potentially cause a conflict and interfere with the configured Maestro processors due to disparate software versions or configurations. If this is the case, The Network Description table should be updated and the configuration recompiled and redeployed.

<sup>1</sup> In some cases, the Facility LAN IP Address field for the Deployment PC may be filled in incorrectly by the system software. Check to make sure it indicates the *facility* LAN address (not the control LAN address)

## Function Buttons

All function button operations apply to the selected board(s) from the board list. By clicking on the row, you toggle between selecting and de-selecting the board. There is a button located below the list, which allows the user to select/de-select all boards.

**Reboot** – press this button to reboot the board.

**Telnet** – press this button to telnet to the board; a telnet window will be opened.

**Update** – press this button to download files to the board. The user can specify file types for update:

- *Software* – the tar file will contain FPGA, VxWorks and Application files. If this is checked, the software tar file residing in the deployment folder on the deployment PC will be downloaded to the board and installed in a pending state;
- *Configuration* – if this is checked, the board configuration compiled from the current configuration located in the deployment folder on the deployment PC will be downloaded to the board in a pending state.

**Activate Pending** – press this button to activate pending files including software and configuration. The control center will communicate with the state machine which is running on each board and will bring the board to the state which allows this operation to take effect.

## Auto-communication

When the control center is launched, it will request status every 30 seconds. It will try to bring the board all the way to the “Started” state using the current configuration. If there are files and configuration files pending on the board, they will be activated.

However, some boards may stop at “Loading” before reaching the “Started” state. In this case, the board may need to be manually reset with the reset button on the board or reset through the Deployment Center application. See [Board Communication on page 244](#).

## Log View

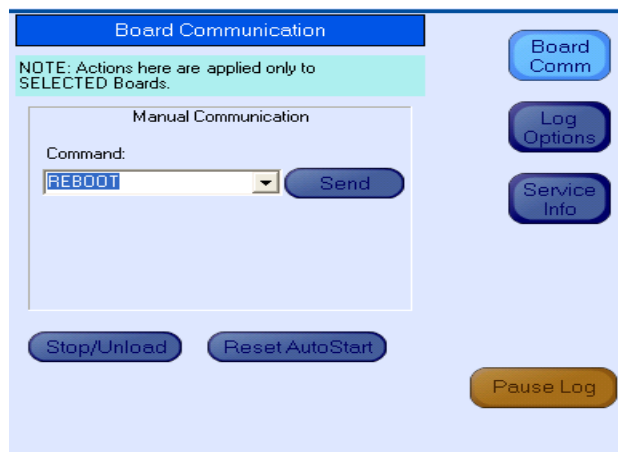
The user can show or hide the log view. The log view panel shows the activity log and three buttons. [Figure 6](#) shows the Deployment Center with the log view enabled.

## Board Communication

**Note** Direct Board Communication via the Board Comm interface is NOT an operation that is typically performed by the end user. This functionality should ONLY be attempted under the direction of Grass Valley's Technical Support or Engineering personnel.

When the **Board Comm** button is selected, the following section will be shown next to the button:

Figure 147. Deployment Center Board Communication



The command drop-down list contains available commands that can be sent to the board according to the current board state. Select a command and click the **Send** button to send the command. If a command requires parameters, parameter text boxes will be displayed to allow the user to enter the information.

To reboot a board, for example, do the following:

1. Select the preferred board(s) in the board list.
2. Select REBOOT from the Board Communication drop-down list.
3. Click **Send** to send the reboot command to the selected boards.

The control center always tries to push the board to the “Started” state. If the user wants to manually stop the system, press the **Stop/Unload** button.

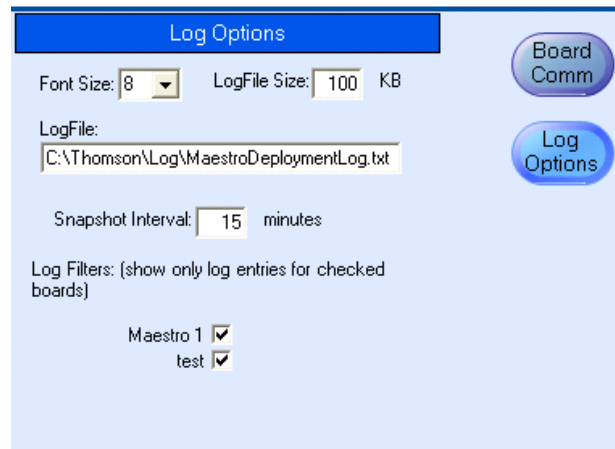


The board AutoStart flag will be turned off. Press the **Reset AutoStart** button to reset it.

## Log Options

When the **Log Options** button is pressed, the following will be shown next to the button:

Figure 148. Deployment Center Log Options

The screenshot shows a dialog box titled "Log Options" with a blue header bar. On the right side of the dialog, there are two buttons: "Board Comm" and "Log Options". The "Log Options" button is highlighted. Inside the dialog, there are several settings: "Font Size:" with a dropdown menu showing "8", "LogFile Size:" with a text box showing "100" and "KB" to its right, "LogFile:" with a text box showing "C:\Thomson\Log\MaestroDeploymentLog.txt", "Snapshot Interval:" with a text box showing "15" and "minutes" to its right, and "Log Filters: (show only log entries for checked boards)" with two checkboxes: "Maestro 1" and "test", both of which are checked.

The user can change the font size of the displayed log.

When the application is launched, the log file is created (or opens) and begins saving (or appending) text. The user can change the log file name and its size from the default values. These values are saved if the application exits.

The snapshot interval can be changed here and the value will be saved.

The last part is the log filter. By checking or un-checking the board, the displayed log will show or filter out entries for the board.

## Service Info

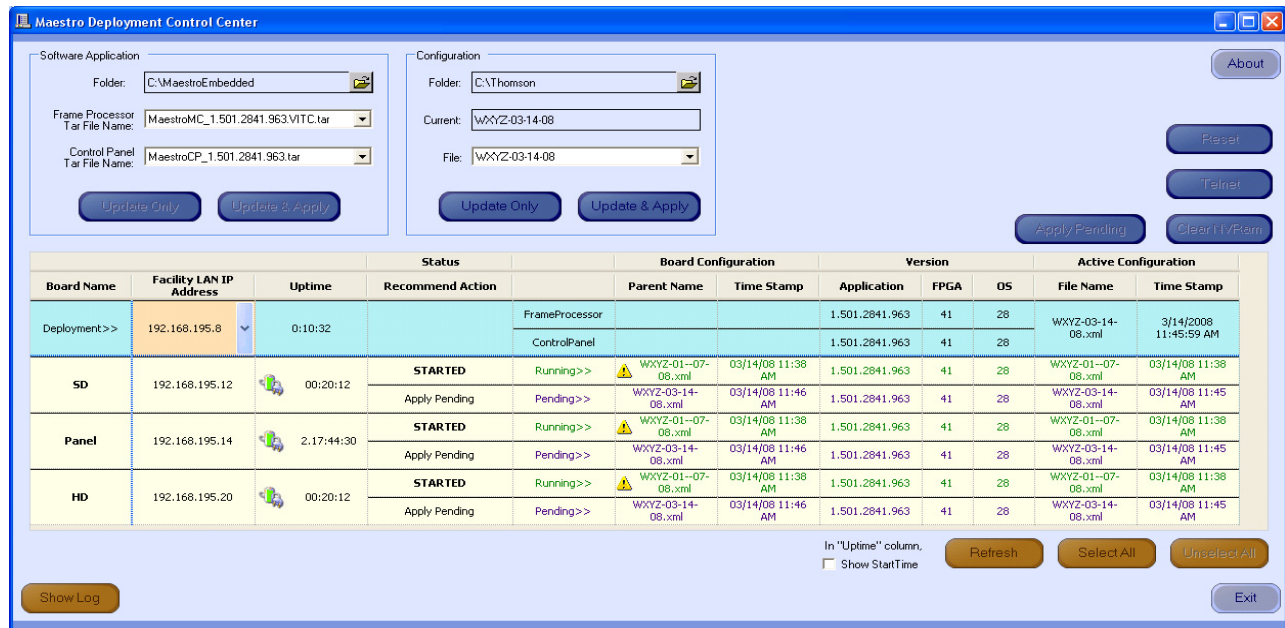
Press the **Service Info** button. This will display information useful to Grass Valley Technical Support in diagnosing issues with a Maestro board.

# Updating the System Configuration and Software

1. Launch the Maestro Deployment control center by selecting “Start > All Programs > Thomson > Maestro Deployment Center.

A Maestro Deployment Control Center window similar to that shown in [Figure 149](#) appears.

Figure 149. Maestro Deployment Control Center (example)



2. (Optional) Select **Show Log** to provide detailed monitoring of the update process.
3. In the Configuration box:
  - a. Verify that the Folder field has the correct path to the Maestro configuration directory. (Default = C:\Thomson)
  - b. In the “File:” drop down field, select the Maestro configuration set to be activated.

This should be the configuration set updated and compiled for v2.0 use (See *Re-compiling a Prior Version Configuration File* [on page 264](#)).

- c. The Configuration box contains two buttons: **Update Only** and **Update & Apply**.

- **Update Only** - Downloads the selected configuration file to the boards, but, does not apply it as the running configuration. The selected configuration files appears in the "Pending>>" row. The currently active configuration appears in the "Running>>" rows.
- **Update & Apply** - Downloads the selected configuration file to the boards and applies it as the running configuration.

Click the **Update & Apply** button.

This will update the contents of the "Pending>>" and "Running>>" rows in the Board Configuration and Active Configuration columns and make the selected configuration the active configuration.

**Note** If the **Update Only** button is clicked, the configuration file does not become the active configuration until the **Apply Pending** button is clicked to activate the "pending" configuration.

**CAUTION** The following step will interrupt the video and audio signals passing through the system for about 1 minute.

4. In the Software Application box:

- a. The "Folder" field should indicate "C:\MaestroEmbedded."
- b. In the Frame Processor Tar File Name field:
- For LTC systems (those using Linear Time Code) select "MaestroMC\_1.501.2841.963.LTC.tar." (When used, LTC is connected to pins 43 and 44 of the GPIO connector on the rear panel.)
  - For VITC systems (those using Vertical Interval Time Code) select "MaestroMC\_1.501.2841.963.VITC.tar."
- c. In the **Control Panel Tar File Name**, field, select "MaestroCP\_1.501.2841.963.tar."

5. Click the **Select All** button (lower right corner of menu).

Alternatively, each board can be updated independently by clicking on the "Board Name" field or all at the same time by using the **Select All** button.

6. The Software Application box contains two buttons: **Update Only** and **Update and Apply**.
  - **Update Only** - Downloads the selected configuration file to the boards, but, does not apply it as the running configuration. The selected configuration files appears in the "Pending>>" row. The currently active configuration appears in the "Running>>" rows.
  - **Update & Apply** - Downloads the selected configuration file to the boards and applies it as the running configuration.

**CAUTION** The following step will interrupt the video and audio signals passing through the system for about 1 minute.

Click on the **Update & Apply** button.

This will update the contents of the "Pending>>" and "Running>>" rows in the Board Configuration and Active Configuration columns and make the selected configuration the active configuration.

This will update the contents of the "Running>>" rows in the Version columns.

**Note** If the **Update Only** button is clicked, the configuration file does not become the active configuration until the **Apply Pending** button is clicked to activate the "pending" configuration.

7. Verify that the new Configuration and Application versions are "Running" as seen in [Figure 150](#).
8. Proceed to [Checking the Boot ROM Versions on page 251](#).

Figure 150. Maestro Deployment Control Center Software Version Status

Maestro Deployment Control Center

Software Application

Folder: C:\MaestroEmbedded

Frame Processor Tar File Name: MaestroMC\_1.501.2841.963.VITC.tar

Control Panel Tar File Name: MaestroCP\_1.501.2841.963.tar

Update Only

Update & Apply

Configuration

Folder: C:\Thomson

Current: WXYZ-03-14-08

File: WXYZ-03-14-08

Update Only

Update & Apply

About

Reset

Telnet

Apply Pending

Clear NVRam

Board Name	Facility LAN IP Address	Uptime	Status	Recommend Action	Board Configuration			Version		Active Configuration	
					Parent Name	Time Stamp	Application	FPGA	OS	File Name	Time Stamp
Deployment>>	192.168.195.8	0:12:32			FrameProcessor		1.501.2841.963	41	28	WXYZ-03-14-08.xml	3/14/2008 11:45:59 AM
					ControlPanel		1.501.2841.963	41	28		
SD	192.168.195.12	1.23:01:54	STARTED	Running>>	WXYZ-03-14-08.xml	03/14/08 11:46 AM	1.501.2841.963	41	28	WXYZ-03-14-08.xml	03/14/08 11:45 AM
					Pending>>	WXYZ-03-14-08.xml	03/14/08 11:46 AM	1.501.2841.963	41	28	WXYZ-03-14-08.xml
Panel	192.168.195.14	10:17:04:06	STARTED	Running>>	WXYZ-03-14-08.xml	03/14/08 11:46 AM	1.501.2841.963	41	28	WXYZ-03-14-08.xml	03/14/08 11:45 AM
					Pending>>	WXYZ-03-14-08.xml	03/14/08 11:46 AM	1.501.2841.963	41	28	WXYZ-03-14-08.xml
HD	192.168.195.20	10:17:04:06	STARTED	Running>>	WXYZ-03-14-08.xml	03/14/08 11:46 AM	1.501.2841.963	41	28	WXYZ-03-14-08.xml	03/14/08 11:45 AM
					Pending>>	WXYZ-03-14-08.xml	03/14/08 11:46 AM	1.501.2841.963	41	28	WXYZ-03-14-08.xml

Show Log

In "Uptime" column, ☐ Show StartTime

Refresh

Select All

Unselect All

Exit

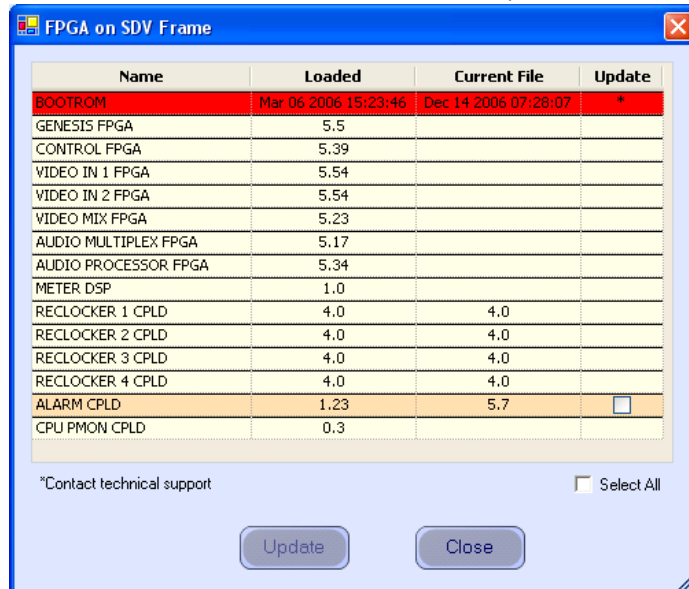
## Checking the Boot ROM Versions

Maestro software version 1.4 and above require the Processor and hardware control panel boot ROMs to be current. (Older versions of the boot ROMs will operate under v1.4 and above but this would require the deployment PC and system software to be active at all times.)

**Note** The procedure documented in this section can only be done after upgrading to v1.5 or higher of the Maestro Software Package and updating the software following the instructions in the prior section. Previous software versions do not support checking the Boot ROM version in the manner described below. If you have not upgraded to the v1.5 or higher software, you must use the Telnet procedure documented in the v1.4 Release Notes.

1. In the Maestro Deployment Control Center window, select the Processor for which you wish to check the Boot ROM version. The row for the selected Processor will have a dark background.
2. Right-click on the FPGA version number in the “Running>>” row of the selected Processor. A window similar to the one seen in [Figure 151](#) appears.

Figure 151. Processor Board Boot ROM and FPGA/CPLD Update Window



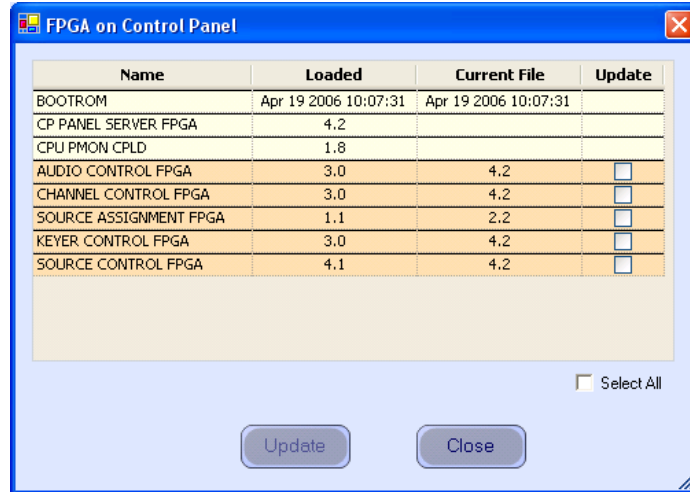
3. Verify that the date that appears in the “Loaded” column for the BOOTROM is Dec 14 2006.
  - If, as in the example in [Figure 151](#), you see an older date (or no date at all) the Boot ROM should be updated. Contact Grass Valley Technical Support for update instructions.
4. If there is another Processor (channel) in the system, repeat [Step 1](#) above and following steps. If not, go to [Step 5](#).

5. In the Maestro Deployment Control Center window, select the control panel for which you wish to check the Boot ROM version.

For a hardware control panel, this will be a CP Panel Server board. For a GUI control panel, this will be a PCI Panel Server board.

6. Right-click on the FPGA version number in the “Running>>” row of the selected Control Panel. A window similar to the one seen in [Figure 152](#) appears.

Figure 152. Control Panel Boot ROM and FPGA/CPLD Update Window



7. Verify that the date that appears in the “Loaded” column for the BOOTROM is Apr 19 2006.
  - If you see an older date, or no date at all, the Boot ROM should be updated. Contact Grass Valley Technical Support for update instructions.
  - If the Boot ROM version checks OK, go to [Step 8](#).
8. If there is another control panel in the system, repeat [Step 5](#) above and following steps. If all boot ROMs check OK, proceed to [Updating FPGAs/CPLDs on page 253](#).



## Updating FPGAs/CPLDs

(FPGA = Field Programmable Gate Array. CPLD = Complex Programmable Logic Device.)

### 1. Updating FPGAs/CPLDs on the Processor board(s):

**Note** Some of the FPGAs on the Processor are updated using the Software Version **Update and Apply** procedure described above. The remaining FPGAs on the Processor are updated using the procedure below.

- a. In the board Status section of the Maestro Deployment control center, select the Processor to update.
- b. Right-click on the “Running” FPGA field for this Processor. See [Figure 153](#).

Figure 153. “Running” FPGA Version

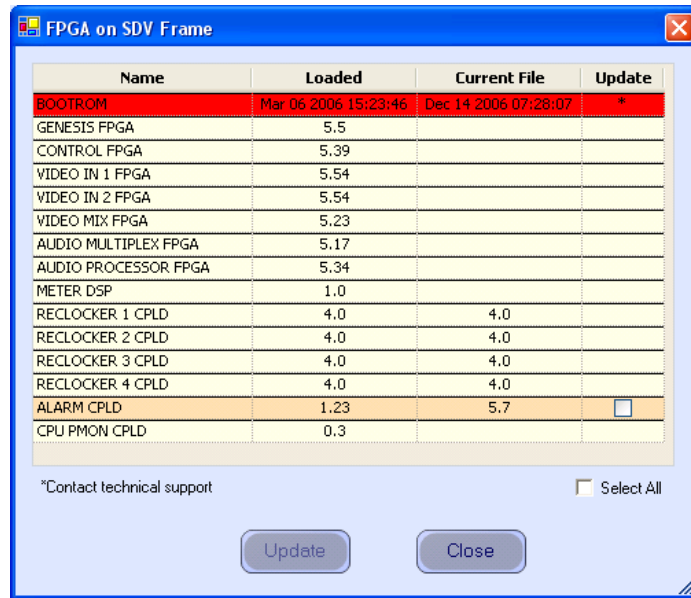
The screenshot shows the Maestro Deployment Control Center interface. The top section contains configuration fields for Software Application and Configuration. The bottom section is a table with columns: Board Name, Facility LAN IP Address, Uptime, Status, Recommend Action, Board Configuration (Parent Name, Time Stamp), Version (Application, FPGA, OS), and Active Configuration (File Name, Time Stamp).

Board Name	Facility LAN IP Address	Uptime	Status	Recommend Action	Board Configuration		Version			Active Configuration		
					Parent Name	Time Stamp	Application	FPGA	OS	File Name	Time Stamp	
Deployment>>	192.168.195.8	0:12:32			FrameProcessor		1.501.2841.963	41	28	WXYZ-03-14-08.xml	3/14/2008 11:45:59 AM	
					ControlPanel		1.501.2841.963	41	28			
SD	192.168.195.12	00:22:30	STARTED		Running>>	WXYZ-03-14-08.xml	03/14/08 11:46 AM	1.501.2841.963	41	28	WXYZ-03-14-08.xml	03/14/08 11:45 AM
					Pending>>	WXYZ-03-14-08.xml	03/14/08 11:46 AM	1.501.2841.963	41	28	WXYZ-03-14-08.xml	03/14/08 11:45 AM
Panel	192.168.195.14	2:17:46:46	STARTED		Running>>	WXYZ-03-14-08.xml	03/14/08 11:46 AM	1.501.2841.963	41	28	WXYZ-03-14-08.xml	03/14/08 11:45 AM
					Pending>>	WXYZ-03-14-08.xml	03/14/08 11:46 AM	1.501.2841.963	41	28	WXYZ-03-14-08.xml	03/14/08 11:45 AM
HD	192.168.195.20	2:17:46:46	STARTED		Running>>	WXYZ-03-14-08.xml	03/14/08 11:46 AM	1.501.2841.963	41	28	WXYZ-03-14-08.xml	03/14/08 11:45 AM
					Pending>>	WXYZ-03-14-08.xml	03/14/08 11:46 AM	1.501.2841.963	41	28	WXYZ-03-14-08.xml	03/14/08 11:45 AM

Buttons at the bottom: Show Log, Refresh, Select All, Unselect All, Exit. A checkbox for 'Show StartTime' is also present.

This will display the FPGA/CPLD update menu. See [Figure 154](#).

Figure 154. Processor Board FPGA/CPLD Update Menu



This menu shows the names of all FPGAs/CPLDs on the Processor and the version number of the gateway currently running (“Loaded”) in each device. Certain of the FPGA-type components and all of the CPLD-type components can be updated using this menu, and if a newer (“current”) version of gateway is available for those components the menu will indicate the new version number and display a check box.

**Note** A Current version may have a smaller number than the corresponding Loaded version. A Current version may have a smaller number than the corresponding Loaded version. If FPGA/CPLD updates were performed with Maestro software versions 1.500, there will be no available FPGA/CPLD updates with v1.5.1

- c. Check the “Select All” box if there are available updates.

**Note** Do not check “Gennum A” or “Gennum B” if no DVE board is installed. Doing so will cause the update to fail.

- d. Select **Update**.

You will be asked to confirm the update.

**CAUTION** The following step will interrupt the video and audio signals passing through the system.

- e. Answer **Yes**.

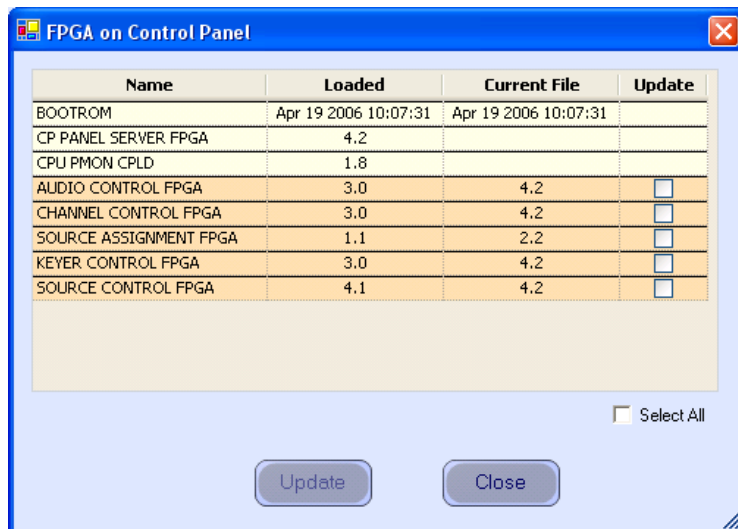
- f. From this point there are two possibilities:
  - A popup will show that the Processor update was successful. Repeat [Step 1](#) above if another Processor is present. Otherwise, go to [Step 2](#) below.
  - An error message may indicate that the “physical JTAG chain is broken.” If this message appears, the FPGAs/CPLDs on the Processor cannot be updated. Discontinue the v2.0 installation and contact Technical Support.

2. Updating FPGAs/CPLDs on the hardware control panel(s):

- a. In the board Status section of the screen, select the hardware control panel to update.
- b. Right-click on the FPGA field for this control panel.

This will display the FPGA/CPLD update menu. See [Figure 155](#)

Figure 155. Control Panel FPGA/CPLD Update Menu



This menu shows the names of all FPGAs/CPLDs on the control panel and the version number of the gateway now running (“loaded”) in each device. Certain FPGA-type components and all of the CPLD-type components can be updated using this menu, and if a newer (“current”) version of gateway is available for those components the menu will indicate the new version number and display a check box.

- c. Check the “Select All” box.
- d. Select **Update**.

You will be asked to confirm the update.

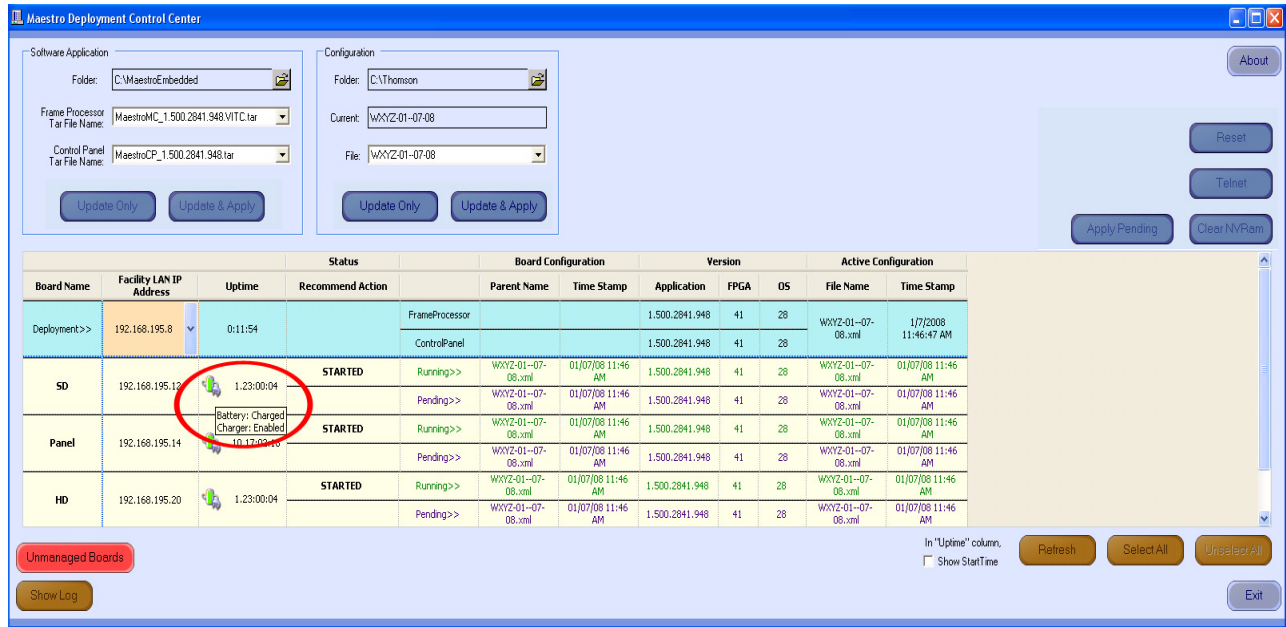
**CAUTION** The following step will cause the control panel to become inoperative while the update is in progress.

- e. Answer **Yes**.
- f. From this point there are several possibilities:
  - A popup will show that the control panel update was successful. Repeat [Step 2](#) above if another control panel is present. When all FPGAs/CPLDs have been updated, the v2.0 upgrade is complete.
  - An error message may indicate that the “physical JTAG chain is broken.” The CP Panel Server board, which is located within the control panel, may need to be replaced. This procedure is described in Field Modification Note 075079500, *Maestro Processor Backup Battery, CP Server, and CP FPGA Upgrade*. For more information, contact Technical Support.
- g. An error message may indicate that a module (sub panel) on the hardware control panel “reported an incorrect module ID.” In this case, refer to Field Modification Note 075079500, *Maestro Processor Backup Battery, CP Server, and CP FPGA Upgrade*.

# Battery Charging Status

The Maestro Deployment Control Center displays the battery charging status of each Maestro component in the Network Description table. See [Figure 156](#).












Figure 156. Maestro Deployment Control Center Battery Charging Status Display



Placing the cursor over the **battery status icon** for a Maestro component will display the battery status and battery charger status for that particular component.

The battery status icons and their descriptions appear in [Table 17](#).

Table 17. Battery Charging Status Icons and Descriptions

Icon	Description	Icon	Description	Icon	Description
	Battery: Charged Charger: Enabled		Battery: Present Charger: Unknown		Battery: Not Present Charger: Unknown
	Battery: Charging Charger: Enabled		Battery: Charged Charger: Disabled		Battery: Unknown Charger: Enabled
	Battery: Discharged Charger: Enabled		Battery: Discharged Charger: Disabled		Battery: Unknown Charger: Disabled
	Battery: Not Present Charger: Enabled		Battery: Not Present Charger: Disabled		



# Software Installation

This section describes the installation procedure for the Maestro software. The 2.0 version of the software includes the Dual-Channel DVE option, as well as previously released features.

When installing the Maestro software, particular attention must be given to the section [Checking the Boot ROM Versions on page 260](#). The boot ROM must be current before installing the Maestro Channel branding hardware.

## Software Upgrade Procedure

**CAUTION** Portions of this procedure **will interrupt** video and audio signals passing through the system. The steps that will interrupt video and audio signals are identified by the word **CAUTION**. You should plan for this upgrade and take the necessary precautions during the installation and verification Processes.

Grass Valley recommends that you follow the Software Upgrade procedure steps exactly. The Upgrade procedure includes the following steps:

1. [Checking the Boot ROM Versions](#).
2. [Making a Copy of the Maestro Configuration File](#).
3. [Installing the Maestro Software Package](#).
4. [Re-compiling the Configuration File](#).
5. [Updating the System Configuration and Software](#).
6. [Checking the GUI Control Panel for Proper LAN Settings](#).
7. [Updating FPGAs/CPLDs](#).

## Maestro Deployment PC

**Note** In some installations, the “Deployment PC” will be the same as the GUI PC.

## Requirements

Before installing the 2.0 version of Maestro the following requirements must be observed:

- A period of time where the Maestro system can be taken off-line (externally bypassed).
- Maestro is only compatible with the English version of Windows XP with Service Pack 2 or greater.
- In order to upgrade the Maestro software, the Maestro configuration computer will need access to the installation CD or downloaded installation files.
- The configuration from the existing operational Maestro system will be used to complete the Maestro upgrade.
- It is recommended that the Maestro Configuration computer be upgraded to contain at least 2GB of RAM and have a Core 2 Duo processor.

## Checking the Boot ROM Versions

Before proceeding with the installation of the Maestro DVE hardware, you must verify the boot ROM version that is installed on the Maestro processor board. The boot ROM must be updated to the current version or the processor board will not boot properly with the DVE hardware installed. See [Section 8-Channel Branding Hardware Installation](#) for DVE hardware installation instructions.

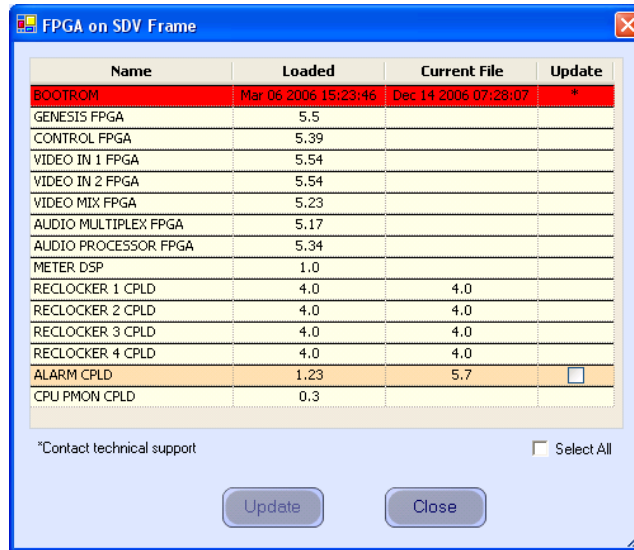
**Note** Most Maestro processor boards will have the current boot ROM installed. Only early board shipments will have the older boot ROM installed.

Maestro software versions 1.4 and higher require the Processor and hardware control panel's boot ROM to be current.

1. Open the Maestro Deployment Control Center window.
2. Select the Processor, in the Deployment column, that you wish to check the Boot ROM version. The row for the selected Processor will have a dark background.
3. Right-click on the FPGA version number in the "Running>>" row and in the FPGA column, of the selected Processor. A window similar to the one seen in [Figure 157](#) appears.



Figure 157. Processor Board Boot ROM and FPGA/CPLD Update Window

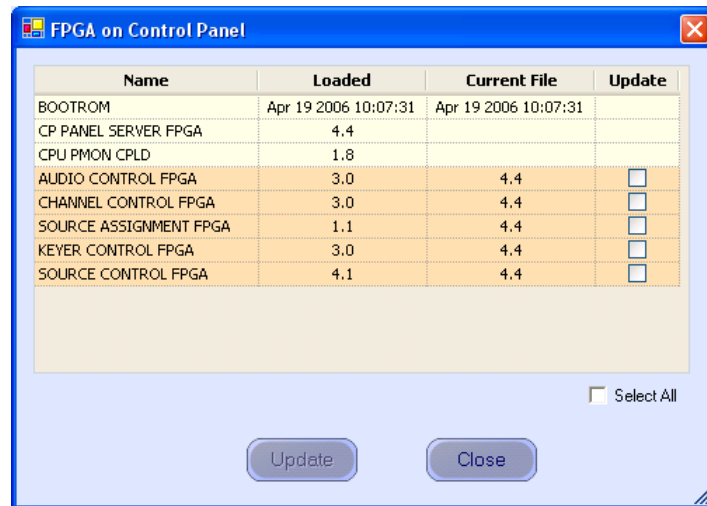


4. Verify that the date that appears in the "Loaded" column for the boot ROM is Dec. 14 2006.

**Note** If you see an older date or no date at all, the Boot ROM should be updated (See the example in [Figure 157](#)). Stop the Installation process and then contact Grass Valley Technical Support if the Boot ROM is not current.

5. Repeat [Step 1](#) above and following steps if there is another Processor (channel) in the system, . If not, go to [Step 6](#).
6. In the Maestro Deployment Control Center window, select the control panel for which you wish to check the Boot ROM version.  
For a hardware control panel, this will be a CP Panel Server board.  
For a GUI control panel, this will be a PCI Panel Server board.
7. Right-click on the FPGA version number in the "Running>>" row of the selected Control Panel. A window similar to the one seen in [Figure 158](#) appears.

Figure 158. Control Panel Boot ROM and FPGA/CPLD Update Window



8. Verify that the date that appears in the “Loaded” column for the BOOTROM is Apr. 19 2006.

**Note** If you see an older date or no date at all, the Boot ROM should be updated. Stop the Installation process and then contact Grass Valley Technical Support for update instructions.

- If the Boot ROM version is current, go to [Step 9](#).
9. If there is another control panel in the system, repeat [Step 6](#) above and following steps. If all boot ROMs are current, proceed to [Installing the Maestro Software Package](#).

## Making a Copy of the Maestro Configuration File

Grass Valley recommends you make a copy of your Maestro Configuration file. This step will help with a rollback should something go wrong.

To make a copy of the current configuration set:

1. Launch the Maestro Configuration Editor by going to “Start > All Programs > Thomson > Maestro Configuration Editor.”
2. Select “File > Open” from the Menu bar to open the current configuration set.
3. Select the current configuration file and then click the **Open** button.
4. Select “File > Save As” to create a copy of the set.
5. Add the version number that you are upgrading from to the name. For example, v151.

6. Select “File > Save As” again to create another copy of the set.
7. Add the current version to the name. For example, add “v17”.
8. Close all Maestro applications.

## Installing the Maestro Software Package

The following instructions show the steps that are needed to install Maestro. The installation process will check if a previous version is installed on the computer. You must remove the previous version of Maestro to install the latest version. These steps are explained below.

Follow these steps to start the Maestro application installation process:

1. Insert the supplied software CDROM into the computer’s CD Drive and follow the prompts.

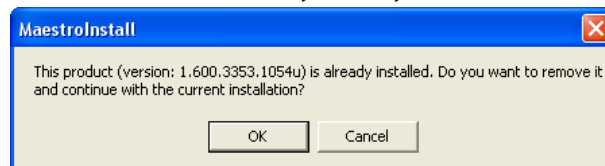
The CD should automatically start the installation process. If not, browse to the CD, using Window Explorer, and then click the setup.exe icon.

**Note** If this is an Initial installation, you may see a message asking if you want to install Microsoft .NET Framework. If so, select the **Yes** button. (The 3.5 SP1 version of .NET is located on the CD.)

## Automatically Removing the Previous Version of Maestro

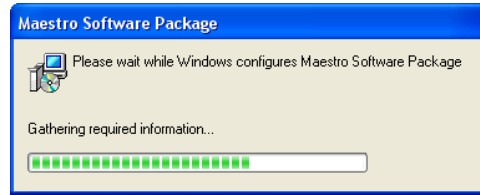
When the installation auto runs from the CD, or is started manually by running the MaestroInstall.exe file, the previously installed Maestro software is automatically detected as shown in [Figure 159](#). You will then be prompted to remove the older version of the software before proceeding with the installation of the new software.

Figure 159. Automatic Detection of Prior Software Version



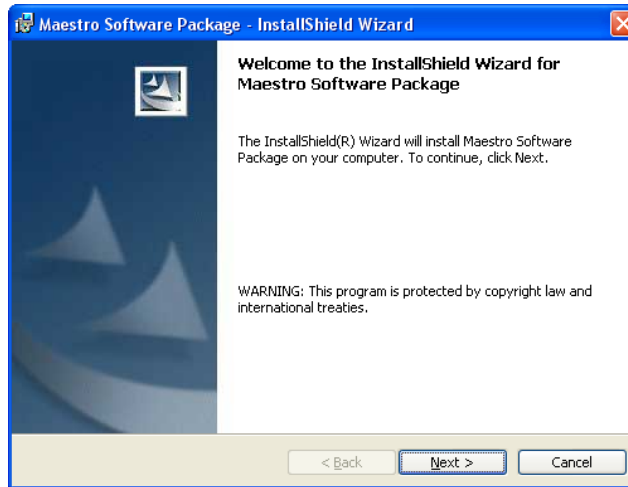
2. Click the **OK** button to proceed with removal of the previous software version. A new popup will then appear that will show the progress of the removal status ([Figure 160](#)).

Figure 160. Removal Progress Pop-up



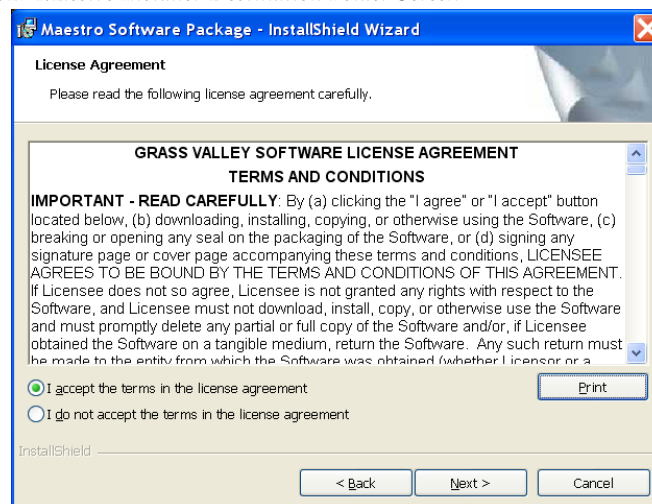
The Maestro Welcome screen will then appear (Figure 161).

Figure 161. Maestro Installer Welcome Screen



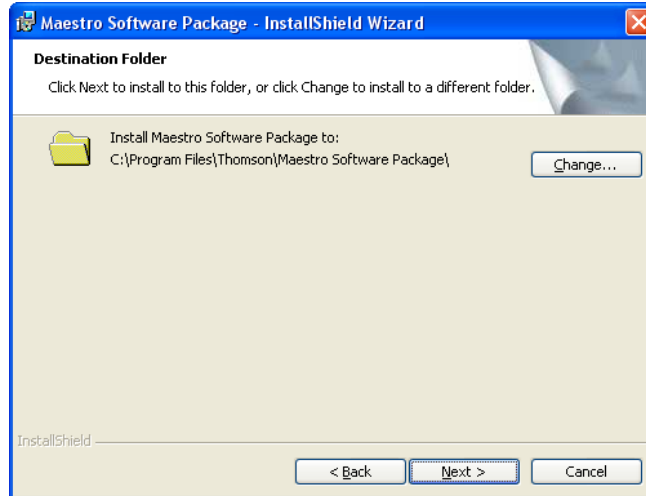
3. Click the **Next>** button to begin the installation process. The License Agreement screen will then appear (Figure 162).

Figure 162. Maestro Installer Destination Folder Screen



4. Select the **I accept the terms in the license agreement** radio button and then click the **Next>** button. The Destination Folder screen will then appear (Figure 163).

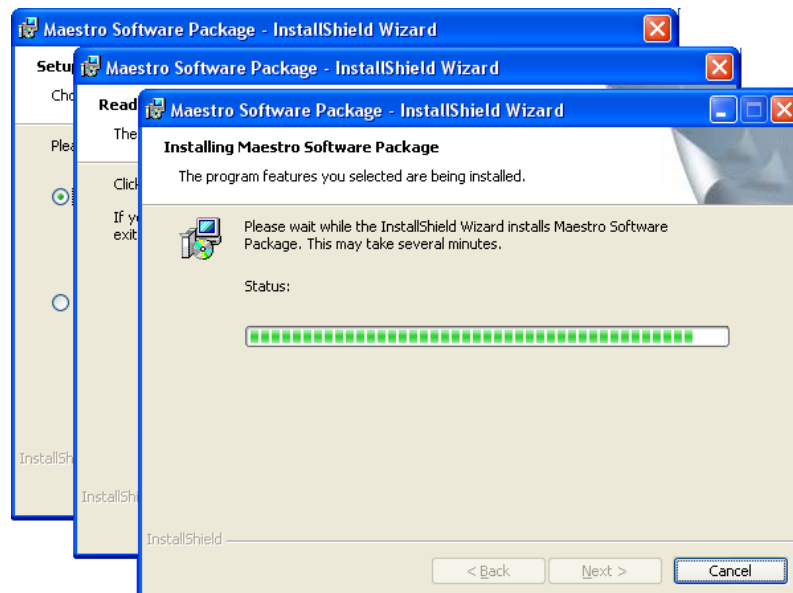
Figure 163. Maestro Installer Destination Folder Screen



5. Click the **Next>** button to begin the installation process.
6. Follow the instructions on the following installation screens. Click the **Next** button as needed (Figure 164).

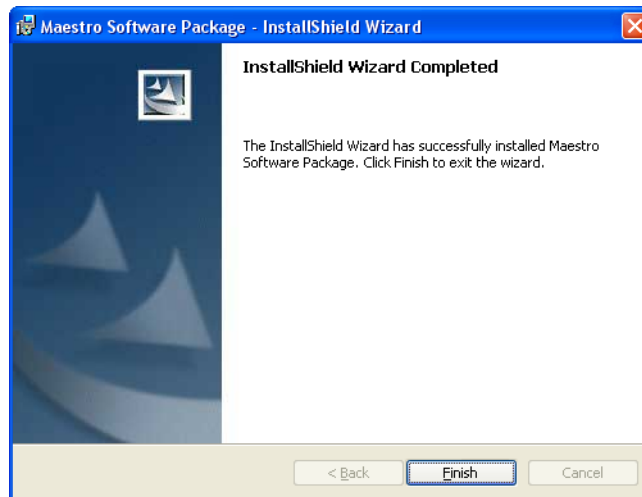
**Note** It is recommended that all default values be used during the installation.

Figure 164. Maestro Installation Screens



The InstallShield Wizard Completed screen will then appear when the installation process is finished (Figure 165).

Figure 165. Installation Completed Screen



7. Click the **Finish** button. The Installation application will then close.

Maestro must then be configured to meet your needs. See [The Maestro Configuration Editor](#) section on [page 121](#) for more information.

### Maestro Desktop Icon

As part of the installation process three Maestro shortcuts will be displayed on the PC's desktop. These Icons are, Maestro Configuration Editor, Maestro Deployment Center, and Maestro GUI Control Panel. Clicking a program's shortcut will launch that program.

**Note** If the installation fails to complete and you see the error message "Error 1001 -- the specified service already exists," you may need to manually remove the Maestro Jupiter Router Service software. Refer to [Manually Removing the Maestro Jupiter Router Service Software](#) on [page 272](#).

## Installing the Maestro Jupiter-Router Service

The Maestro Jupiter-Router Service must be installed on the Jupiter PC if you are using the Jupiter Control system. This process is similar to installing the Maestro Software.

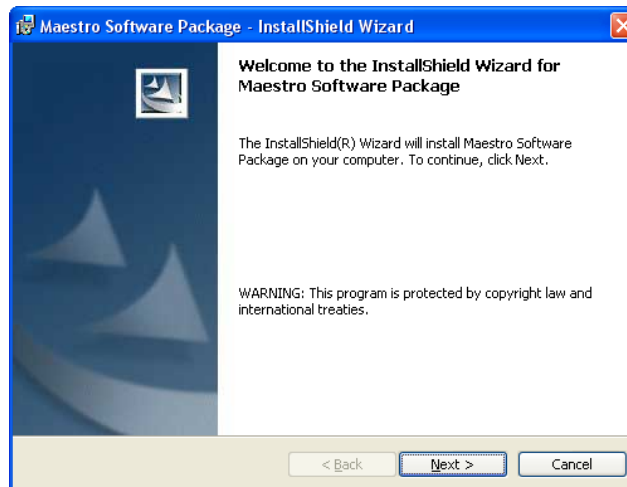
Follow these steps to start the Maestro Jupiter-Router Service installation process:

1. Insert the Maestro software CDROM into the computer's CD Drive and follow the prompts.

The CD should automatically start the installation process. If not, browse to the CD, using Window Explorer, and then click the MaestroInstall.exe icon.

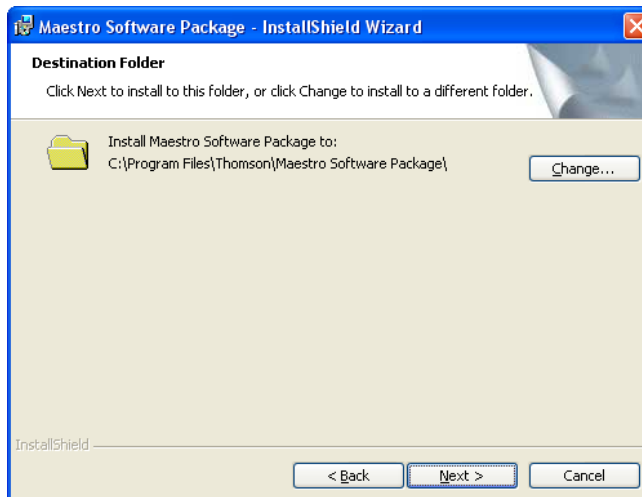
The Maestro Welcome screen will then appear ([Figure 166](#)).

Figure 166. Maestro Installer Welcome Screen



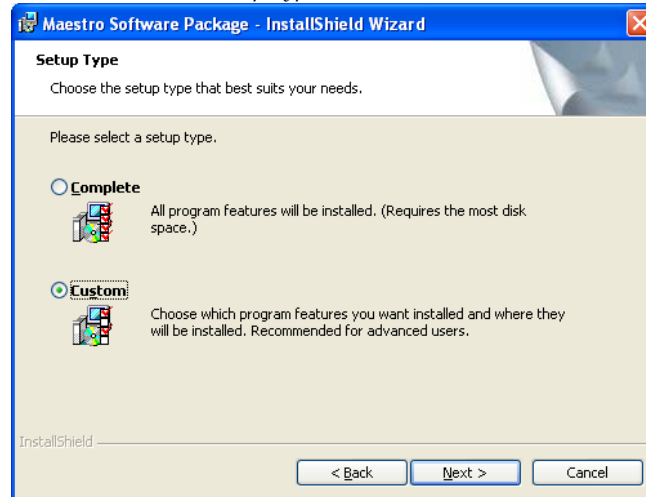
2. Click the **Next>** button to begin the installation process. The Destination Folder screen will then appear (Figure 163).

Figure 167. Maestro Installer Destination Folder Screen



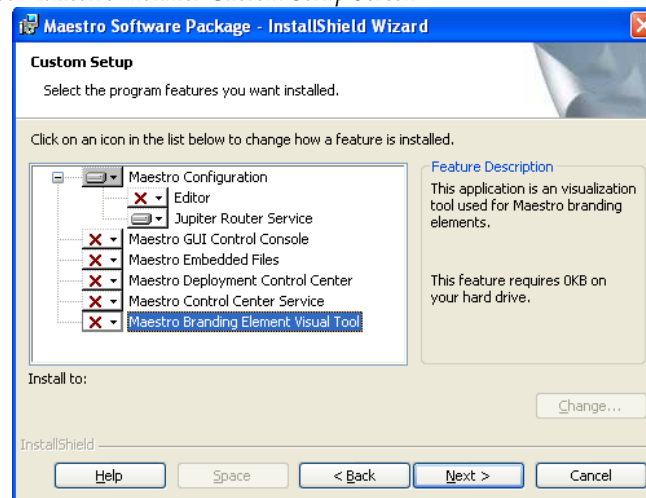
3. Click the **Next>** button to begin the installation process. The Setup Type screen will then appear.

Figure 168. Maestro Installer Setup Type Screen



4. Click the **Custom** radio button and then click the **Next>** button.

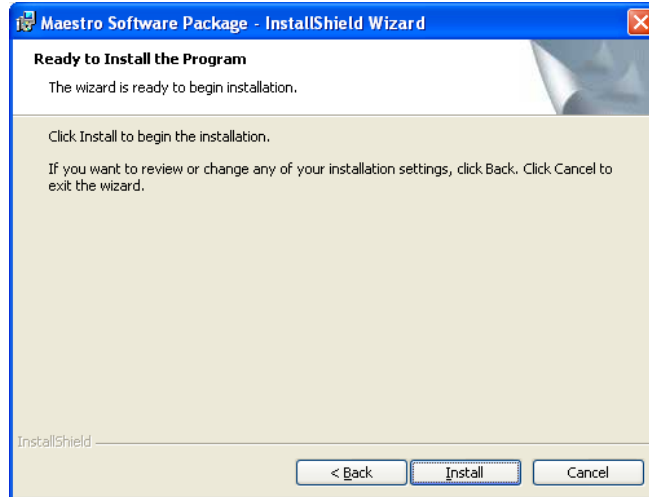
Figure 169. Maestro Installer Custom Setup Screen



5. Click the drop-down arrow and then select the **This feature will not be available** option for all of the features but the Jupiter Router Service. A red "x" will appear by the features (Figure 169).
6. Click the **Next>** button. The Ready to Install the Program screen will then appear (Figure 170).

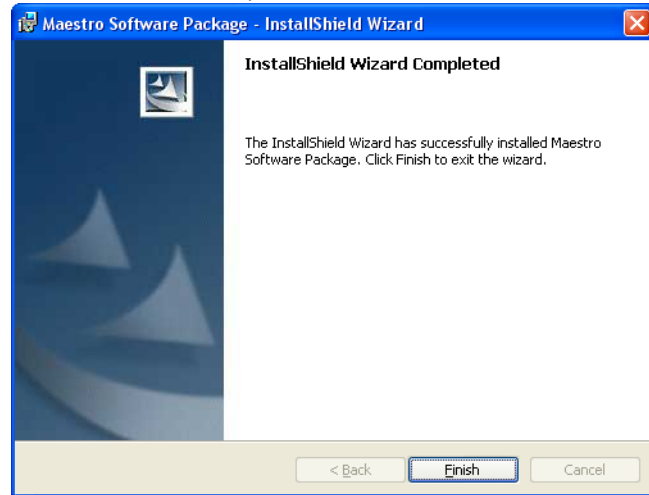


Figure 170. Maestro Installer Ready to Install the Program Screen



7. Click the **Install** button. The installation process will then begin. The InstallShield Wizard Completed screen will appear when the installation process is finished (Figure 171).

Figure 171. Installation Completed Screen



8. Click the **Finish** button. The Installation application will then close.

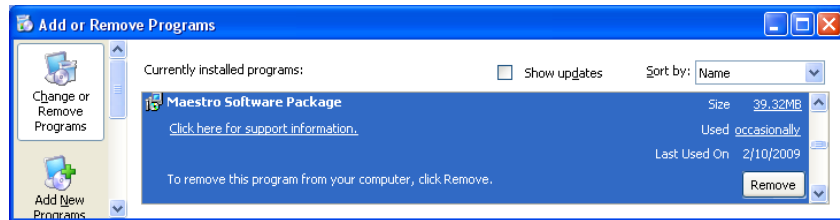
## Manually Removing the Previous Version of Maestro

The previous version of Maestro software must be removed from the computer before a new version can be installed. The software can be manually removed by following the steps below.

**CAUTION** If you are removing v1.3, v1.4, v1.5, or v1.5.1 software, you must use the Administrator account (login). If you are removing v1.2 or prior software, you must use the account (login) used when that software was installed.

1. Using the Windows Control Panel, select Add or Remove Programs.
2. Select the Maestro Software Package.

Figure 172. Removing the Maestro Software Package



3. Click the **Remove** button. This step will not remove user data.
4. Close the Windows Control Panel.

It can also be automatically removed by initiating the new software installation procedure in Step 2.

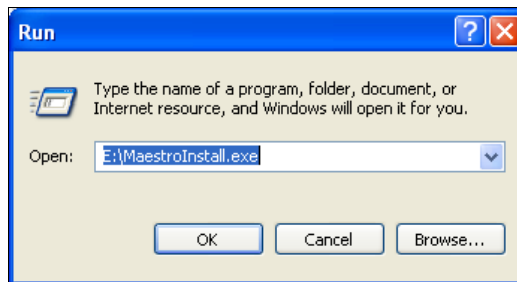
## Manually Installing Maestro

If the installation does not start automatically, the process can be started manually:

1. Select the Run command from the start menu > **Run**).

A window similar to that shown in Figure 173 should appear.

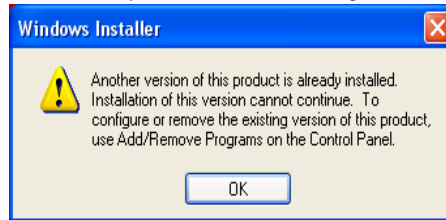
Figure 173. Run Dialog Box



2. Enter "E:\MaestroInstall.exe" where E: is the CD Drive.

**Note** If you enter E:\setup.exe (where “E” is the name of the PC’s CD ROM) in the Run dialog box (instead of ‘MaestroInstall.exe’) the dialog in [Figure 174](#) Will appear. Click the **OK** button. The prior Maestro software version must then be manually removed using the Add/Remove Programs in the Windows Control Panel.

Figure 174. Setup.exe Add/Remove Programs Prompt



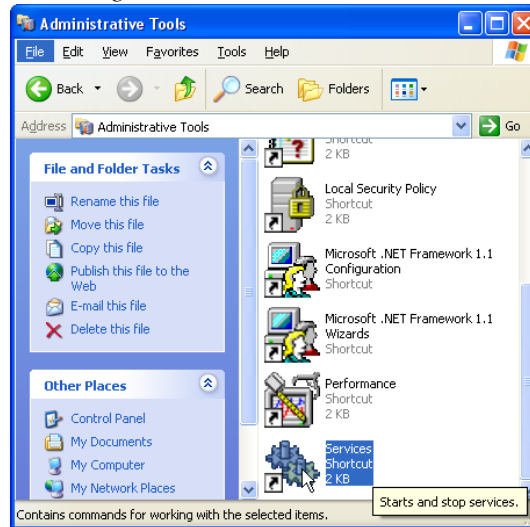
3. Click the **OK** button. The installation as described in the [Installing the Maestro Software Package](#) section will then begin.

## Manually Removing the Maestro Jupiter Router Service Software

Only perform this procedure if you see the error message “Error 1001 -- the specified service already exists” referred to in the Note on [page 266](#).

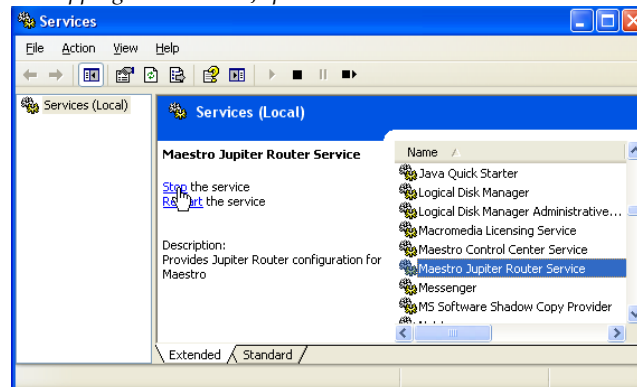
1. Select the Services by navigating to Control Panel > Administrative Tools > Services.

Figure 175. Selecting the Services Icon



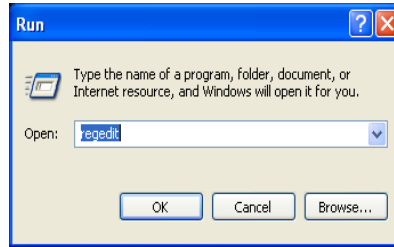
2. Select the Maestro Jupiter Router Service option
3. Select **Stop the service** or right click the service and select **Stop** ([Figure 176](#)).

Figure 176. Stopping the Maestro Jupiter Router Service



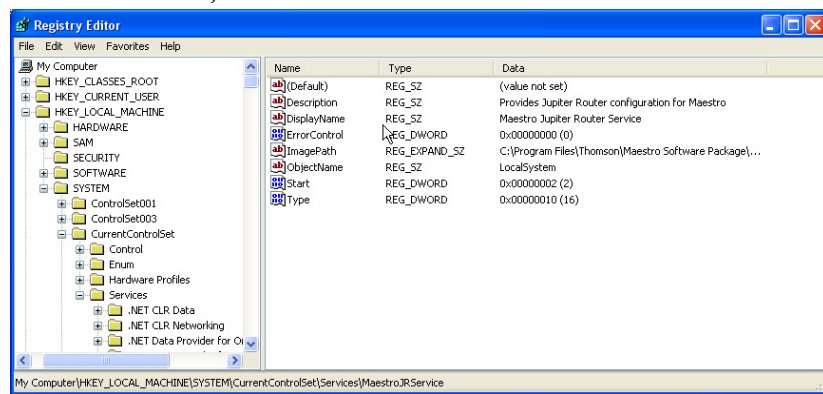
4. Go to **Start** button> Run and enter the phrase “regedit” in the text field ([Figure 177](#)).

Figure 177. Example of the Regedit Command



5. Go to “HKEY\_LOCAL\_MACHINE > SYSTEM > CurrentControlSet > Services.”

Figure 178. The Maestro JRService



6. Highlight “MaestroJRService” and then right click and delete this item.
7. Close all windows and reboot. Repeat [Step 1](#) above and confirm that MaestroJupiterRouterService is not listed.
8. Proceed with re-installation of the new software, starting with [Step](#) on [page 263](#).

## Re-compiling the Configuration File

It is required that ALL configuration sets that are to be used with the 2.0 version of the Maestro application be recompiled with the 2.0 Configuration Editor. This requirement includes upgrading from ALL previous versions of Maestro. Changes have been made to numerous configuration tables to support 2.0 functionality. Re-compiling the Configuration file will perform all necessary additions and modifications to the Maestro configuration file to support version 2.0.

1. Launch the Maestro Configuration Editor by going to “Start > All Programs > Thomson > Maestro Configuration Editor.”

2. Select the Maestro configuration set to be re-compiled by going to “File > Open > Thomson” and selecting the set.

This should be the configuration set that was created for v2.0 use (see [Step 6](#) in the [Making a Copy of the Maestro Configuration File](#) section).

3. Check the indicated table(s) and make corrections as indicated if the system displays a Validation Report.

You can use the links in the Description column to display the table(s).

4. Save the configuration file.
5. Compile the file by going to “File > Compile Channel Data.”
6. Proceed to [Updating the System Configuration and Software](#) below.

## Updating the System Configuration and Software

1. Launch the Maestro Deployment control center by selecting “Start > All Programs > Thomson > Maestro Deployment Center.”

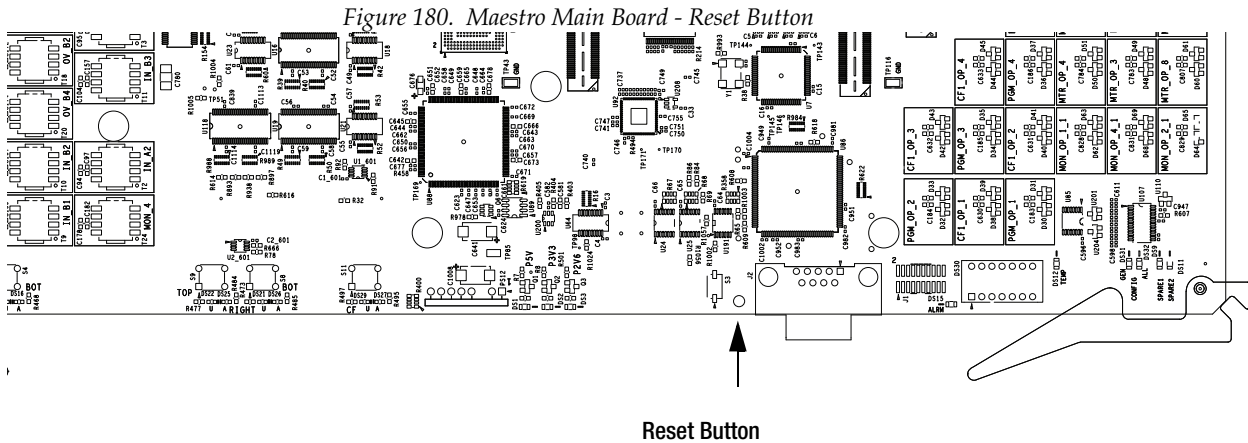
A Maestro Deployment Control Center window similar to that shown in [Figure 179](#) appears.

Figure 179. Maestro Deployment Control Center (Example)



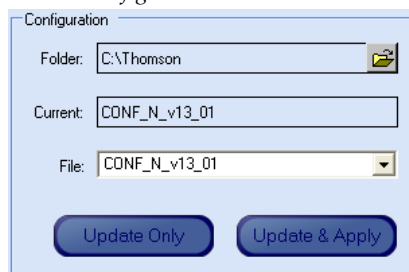
Other buttons may appear below the table if content has not been defined. For example, "Unmanaged Boards" will appear if a board has not been defined in the Configuration file.

2. Press the **Reset** button on the left side of the Serial port on the Main board ([Figure 180](#)) if the board hangs or does not come up in a reasonable time.



3. Click the **Show Log** button in the lower left-hand corner of the application, to provide detailed monitoring of the update process. This is an optional step.
4. In the Configuration box:

Figure 181. Configuration Box



- Verify that the *Folder* field has the correct path to the Maestro configuration directory. (Default = C:\Thomson)
- Select the Maestro configuration set that is to be activated in the File: drop-down list.

This file should be the configuration set that was updated and compiled to be for v2.0 ([Step 5 on page 274](#)). The background of a compatible configuration file (that is, one that was compiled with the current version of the Configuration Editor) will be highlighted green in the drop-down list.

The Configuration box contains two buttons: **Update Only** and **Update and Apply**.

- **Update Only** - Downloads the selected configuration file to the boards, but, does not apply it as the running configuration.

**Note** The selected configuration files appears in the “Pending>>” row. The currently active configuration appears in the “Running>>” rows.

- **Update & Apply** - Downloads the selected configuration file to the boards and applies it as the running configuration.

5. Click the **Update Only** button.

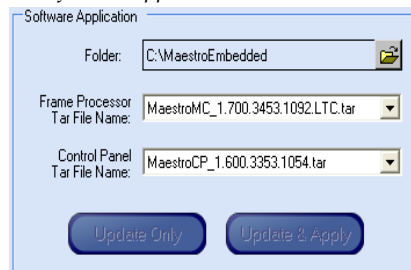
This action will update the contents of the “Pending>>” row in the Board Configuration and Active Configuration columns. See [Figure 179](#).

**Note** When the **Update Only** button is clicked, the configuration file does not become the active configuration until the **Apply Pending** button is clicked to activate the “pending” configuration.

**CAUTION** The following step **will interrupt** the video and audio signals passing through the system for up to one (1) minute.

6. In the Software Application box:

Figure 182. Software Application Box



- The *Folder* field should indicate “C:\MaestroEmbedded.”
- In the *Frame Processor Tar File Name* field:
  - For LTC systems (those using Linear Time Code) select the file that has .LTC in the name. For example, “MaestroMC\_1.700.aabb.ccdd.LTC.tar.” (When used, LTC is connected to pins 43 and 44 of the GPIO connector on the rear panel.)
  - For VITC systems (those using Vertical Interval Time Code) select the file that has .VITC in the name. For example, “MaestroMC\_1.700.aabb.ccdd.VITC.tar.”
- In the *Control Panel Tar File Name*, field, select the .TAR file. For example, “MaestroCP\_1.700.aabb.ccdd.tar.”



7. Click the **Select All** button (lower right corner of application).

Alternatively, each board can be updated independently by clicking on the *Board Name* field or all at the same time by using the **Select All** button.

The Software Application box contains two buttons: **Update Only** and **Update and Apply**.

- **Update Only** - Downloads the selected application software to the boards, but, does not apply it as the running application. The selected application software file appears in the “Pending>>” row. The currently active application software appears in the “Running>>” rows.
- **Update & Apply** - Downloads the selected application software to the boards and applies it as the running application software.

**CAUTION** The following step **will interrupt** the video and audio signals passing through the system for approximately one minute.

8. Click the **Update & Apply** button.

This action will update the contents of the “Running>>” rows in the Version columns and activate the application, FPGA and OS code.

**Note** If the **Update Only** button is clicked, the software application file does not become the active software application until the **Apply Pending** button is clicked. The “pending” software application will then be the active software.

9. Click the **Apply Pending** button to activate software and any pending configuration files.

**Note** Clicking the **Update & Apply** button in the respective section (as in step 7) will apply any pending updates for that section. Clicking the **Apply Pending** button will apply both the pending updates.

10. Verify that the new Configuration and Application versions are “Running” as seen in [Figure 183](#).
11. Proceed to [Checking the GUI Control Panel for Proper LAN Settings on page 279](#).

Figure 183. Maestro Deployment Control Center Software Version Status

**Maestro Deployment Control Center**

Software Application

Folder: C:\MaestroEmbedded

Frame Processor  
Tar File Name: MaestroMC\_1.600.3353.1054.VITC.tar

Control Panel  
Tar File Name: MaestroCP\_1.600.3353.1054.tar

Update Only    Update & Apply

Configuration

Folder: C:\Thomson

Current: WZQV 11-25-08

File: WZQV 11-25-08

Update Only    Update & Apply

About

Reset

Telnet

Apply Pending

Clear NVRom

Board Name	Facility LAN IP Address	Uptime	Status	Recommend Action	Board Configuration		Version			Active Configuration	
					Parent Name	Time Stamp	Application	FPGA	OS	File Name	Time Stamp
Deployment>>	10.16.86.154	0:30:28			FrameProcessor		1.600.3353.1054	53	33	WZQV 11-25-08.xml	11/25/2008 11:42:28 AM
					ControlPanel		1.600.3353.1054	53	33		
WZQV SD	10.16.86.50	4:00:47:06	STARTED	Running>>	WZQV 11-25-08.xml	11/25/08 11:42 AM	1.600.3353.1054	53	33	WZQV 11-25-08.xml	11/25/08 11:42 AM
				Pending>>	WZQV 11-25-08.xml	11/25/08 11:42 AM	1.600.3353.1054	53	33	WZQV 11-25-08.xml	11/25/08 11:42 AM
WZQV HD	10.16.86.51	4:00:47:12	STARTED	Running>>	WZQV 11-25-08.xml	11/25/08 11:42 AM	1.600.3353.1054	53	33	WZQV 11-25-08.xml	11/25/08 11:42 AM
				Pending>>	WZQV 11-25-08.xml	11/25/08 11:42 AM	1.600.3353.1054	53	33	WZQV 11-25-08.xml	11/25/08 11:42 AM
GUI CP	10.16.86.52	4:00:47:08	STARTED	Running>>	WZQV 11-25-08.xml	11/25/08 11:42 AM	1.600.3353.1054	53	33	WZQV 11-25-08.xml	11/25/08 11:42 AM
				Pending>>	WZQV 11-25-08.xml	11/25/08 11:42 AM	1.600.3353.1054	53	33	WZQV 11-25-08.xml	11/25/08 11:42 AM
HW CP	10.16.86.53	4:00:47:10	STARTED	Running>>	WZQV 11-25-08.xml	11/25/08 11:42 AM	1.600.3353.1054	53	33	WZQV 11-25-08.xml	11/25/08 11:42 AM
				Pending>>	WZQV 11-25-08.xml	11/25/08 11:42 AM	1.600.3353.1054	53	33	WZQV 11-25-08.xml	11/25/08 11:42 AM

Content Download Status    Show Contents

In "Uptime" column, ☐ Show StartTime

Refresh    Select All    Unselect All

Show Log

Exit

## Checking the GUI Control Panel for Proper LAN Settings

Beginning with Maestro software version 1.4, the “Panel Server IP” address and the “Local IP” address for the Maestro GUI must now use control LAN addresses only. In releases prior to 1.4, the GUI application would connect and run over the facility LAN; this is no longer possible in version 1.6.0 and later versions.

The following steps should be taken to ensure that the GUI application is set for the correct addresses:

1. With Maestro’s GUI up and running, click the **Settings** button. This will open the Application Settings window.
2. Double-click (or select and click the **Alter** button) the **Panel Server IP** setting.
3. Specify the control LAN address of the Panel Server card associated with the GUI.

This will switch the view back to the first Application Settings window.

To look up the GUI control LAN address, go to “Maestro Configuration Editor > Network Description Table.” Then check the Board Type “GUI” row and the “Control LAN IP Address” column.

4. Double-click (or select and press Alter) the **Local IP** setting.
5. Select the control LAN address of the PC associated with the GUI.

This will switch the view back to the first Application Settings window.

To look up the PC control LAN address, go to “Start > Control Panel > Network Connections.” Double-click on the card used for the control LAN. Then go to Properties > Internet Protocol > Properties.

6. Close the Application Settings window. The GUI should then connect and work properly.

**Note** If you have difficulty making this change or if the GUI is not functioning properly after this change, please contact Technical Support.

7. Proceed to [Updating FPGAs/CPLDs on page 280](#).

# Updating FPGAs/CPLDs

This section will describe the steps needed to update the FPGAs/CPLDs on the Processor boards and on the hardware control panel. (FPGA = Field Programmable Gate Array. CPLD = Complex Programmable Logic Device.)

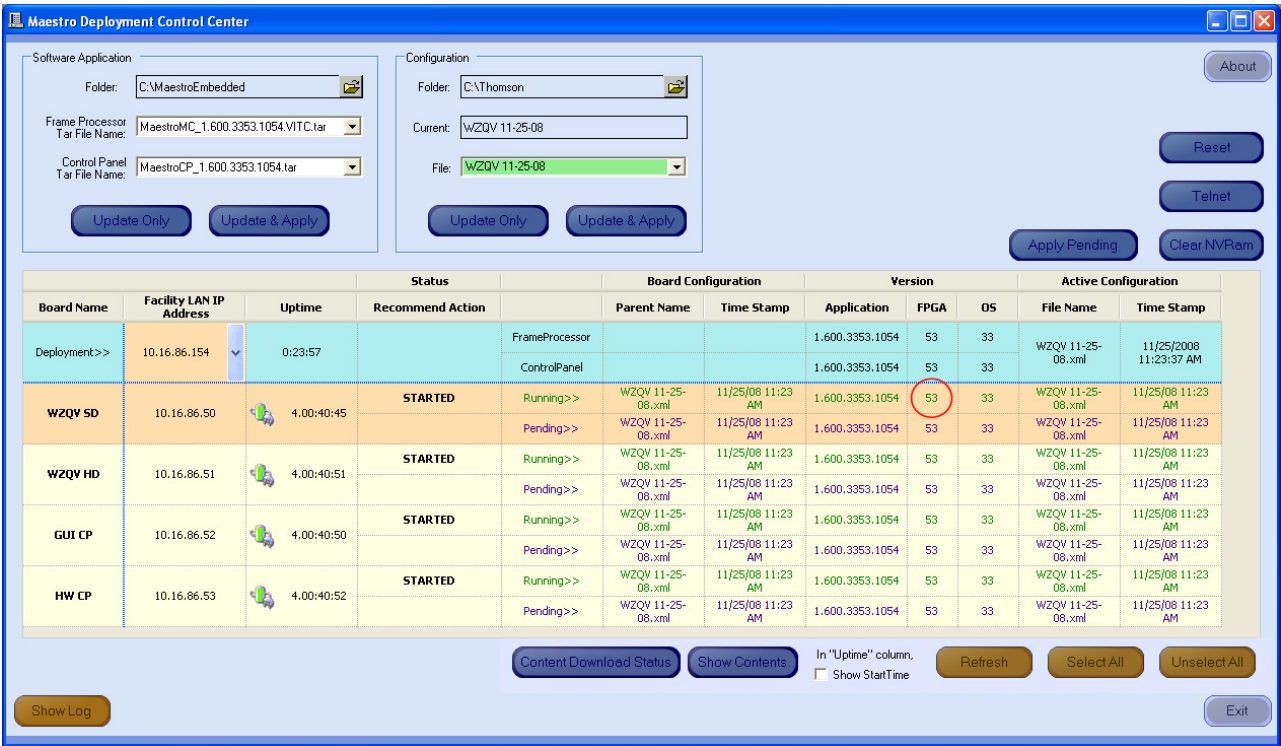
## Updating FPGAs/CPLDs on the Processor Boards

**Note** Some of the FPGAs on the Processor are updated using the Software Version **Update and Apply** procedure described above. The remaining FPGAs on the Processor are updated using the procedure below.

Follow these steps to update the FPGAs/CPLDs on the Processor boards:

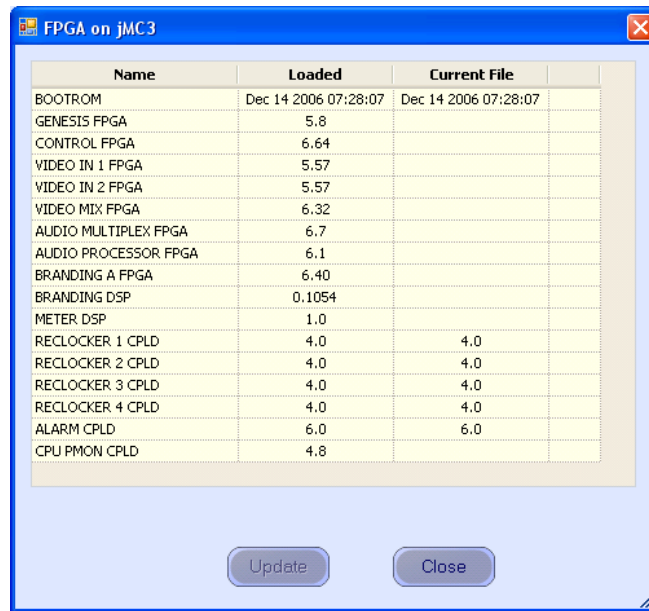
- 1. In the board Status section of the Maestro Deployment control center, select the Processor to update.
- 2. Right-click on the “Running” FPGA field for this Processor. See [Figure 184](#).

Figure 184. “Running” FPGA Version



The FPGA/CPLD update menu will then appear. See [Figure 185](#).

Figure 185. Processor Board FPGA/CPLD Update Menu



This menu shows the names of all FPGAs/CPLDs on the Processor and the version number of the gateware currently running ("Loaded") in each device. Certain of the FPGA-type components and all of the CPLD-type components can be updated using this menu, and if a newer ("current") version of gateware is available for those components the menu will indicate the new version number and display a check box.

**Note** A Current version may have a smaller number than the corresponding Loaded version. If FPGA/CPLD updates were performed with prior Maestro software versions, there may be no available FPGA/CPLD updates with the current version.

3. Check the "Select All" box if there are available updates.

**Note** Do not check "Gennum A" or "Gennum B" if no DVE board is installed. Doing so will cause the update to fail.

4. Select **Update**.

You will be asked to confirm the update.

**CAUTION** The following step **will interrupt** the video and audio signals passing through the system.

5. Click the **Yes** button.

6. From this point there are two possibilities:

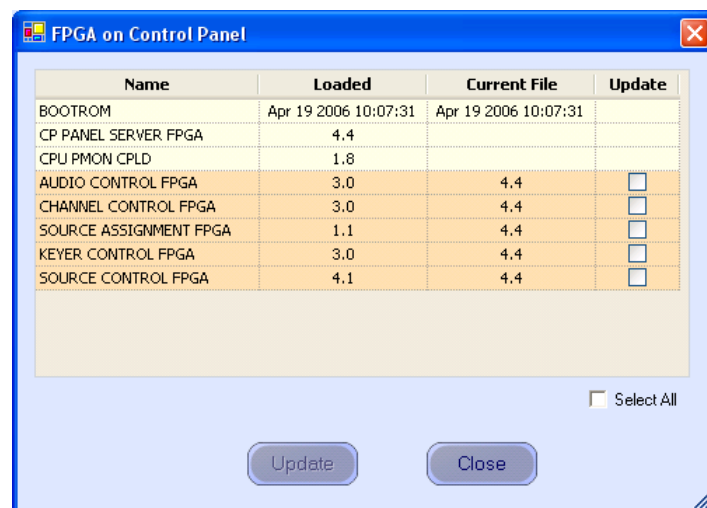
- A popup will show that the Processor update was successful. Repeat [Step](#) above if another Processor is present. Otherwise, go to [Step](#) below.
- An error message may indicate that the “physical JTAG chain is broken.” If this message appears, the FPGAs/CPLDs on the Processor cannot be updated. Stop the installation process and then contact Technical Support.

## Updating FPGAs/CPLDs on the Hardware Control Panels

Follow these steps to update the FPGAs/CPLDs on the Hardware Control panels

1. In the board Status section of the screen, select the hardware control panel to update.
2. Right-click on the *FPGA* field for this control panel. The FPGA/CPLD update menu will then appear. See [Figure 186](#)

Figure 186. Control Panel FPGA/CPLD Update Menu



This menu shows the names of all FPGAs/CPLDs on the control panel and the version number of the gateway now running (“loaded”) in each device. Certain FPGA-type components and all of the CPLD-type components can be updated using this menu, and if a newer (“current”) version of gateway is available for those components the menu will indicate the new version number and display a check box.

3. Check the “Select All” box.
4. Select **Update**. You will be asked to confirm the update.

**CAUTION** The following step **will cause** the control panel to become inoperative while the update is in progress.

5. Select **Yes**. From this point there are several possibilities:

- A popup will show that the control panel update was successful. Repeat the process for additional control panels. When all FPGAs/CPLDs have been updated, the upgrade is complete.
  - An error message may indicate that the “physical JTAG chain is broken.” The CP Panel Server board, which is located within the control panel, may need to be replaced. This procedure is described in Field Modification Note 075079500, *Maestro Processor Backup Battery, CP Server, and CP FPGA Upgrade*. For more information, contact Technical Support.
- a. An error message may indicate that a module (sub panel) on the hardware control panel “reported an incorrect module ID.” In this case, refer to Field Modification Note 075079500, *Maestro Processor Backup Battery, CP Server, and CP FPGA Upgrade*.





# Channel Branding Hardware Installation

This section describes the procedures for installing the Channel Branding option's hardware which includes the Channel Branding mezzanine board and disk drives.

**CAUTION** Before proceeding with the hardware installation, the software installation procedures documented in the previous section must be followed. Of particular importance is [Checking the Boot ROM Versions](#). The boot ROM must be the current version or the Maestro processor board may not start properly with the Channel Branding Hardware installed.

Grass Valley recommends that you follow the Hardware Installation procedure steps exactly. The procedure includes the following steps:

1. [Channel Branding Board Installation](#).
  - [Removing the Channel Branding Boards from the Packaging](#).
  - [Fastening the Channel Branding Board to the Base Board](#).
2. [Channel Branding Hard Drives Installation](#).
  - [Mounting and Formatting Drives](#) (optional).
  - [Partitioning and Formatting a Drive](#) (optional).
3. [Installing the Content Gateway](#).

## Channel Branding Board Installation

The following two sections will describe the Channel Branding Board Installation process. You will need to remove the boards from the shipping packaging and use the suspension trays during the installation process. You must align the connectors and the screw hole on the Channel Branding board with the connectors and screw post on the Maestro processor board; then fasten them together.

## Removing the Channel Branding Boards from the Packaging

Follow these steps to remove the Channel Branding boards from the packaging:

1. Locate the box in which the Channel Branding board(s) and software were shipped.
2. Open the box and remove the contents.

The box contains two suspension trays and an anti-static bag which will be used in the installation process. See [Figure 187](#).

Figure 187. Channel Branding Shipping Box



The suspension tray is designed to cushion and protect the processor board while the Channel Branding mezzanine board is installed. As illustrated in [Figure 188](#), the suspension tray is a stiff cardboard frame with a strong plastic suspension film covering the tray.

Figure 188. Shipping Box Suspension Tray



3. Place one suspension tray in the box with the suspension film facing upwards as shown in [Figure 189](#).

Figure 189. Shipping Box with Suspension Tray Inserted



4. Open the velcro closure on the anti-static bag and open and position the bag over the suspension tray as illustrated in [Figure 190](#).



Figure 190. Anti-Static Bag Open On the Suspension Tray



5. Remove the Maestro processor board from its frame and place it upside down on the anti-static bag as shown in [Figure 191](#).

Figure 191. Maestro Processor Board on Anti-Static Bag



## Fastening the Channel Branding Board to the Base Board

The connectors and the Mounting Screw hole locations will be identified for each of the Channel Branding boards in the following figures (Figure 192). The location of where Channel Branding boards are installed on the Maestro Base board is also identified (Figure 193).

The Channel Branding board front and back views are shown in Figure 192.

Figure 192. Channel Branding Board - Front and Back Views

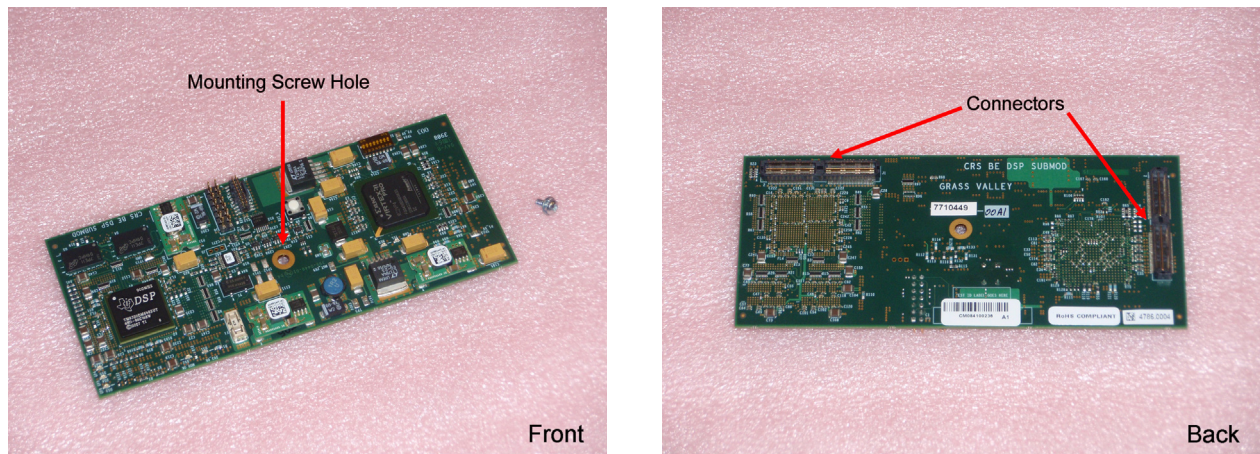
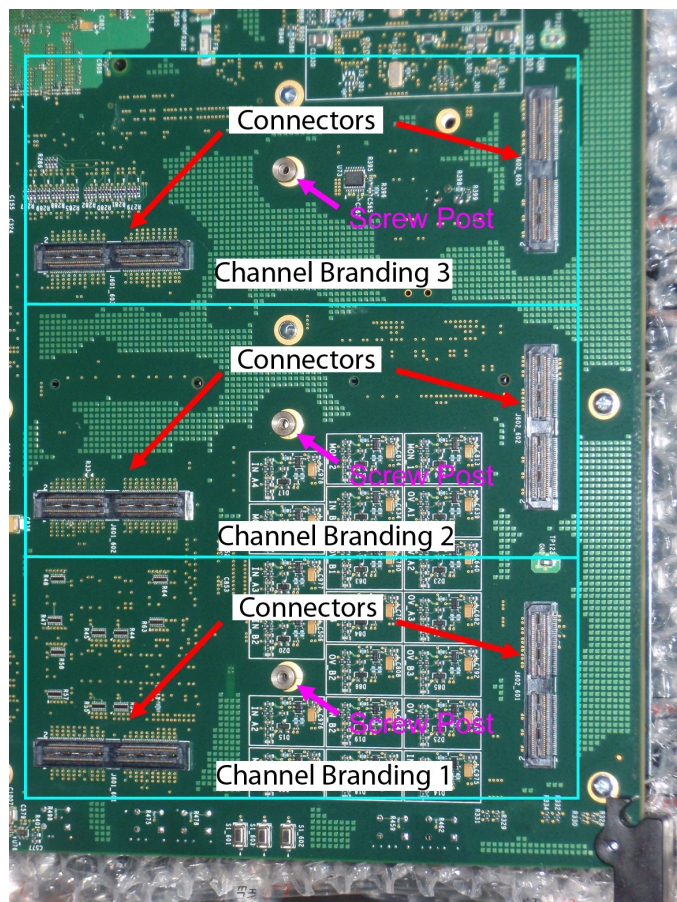


Figure 193 shows the Maestro Processor board and indicates the mounting location for the Channel Branding boards.



Figure 193. Channel Branding Mounting Location



With the board turned so the back side is facing up and the extractors and compact flash slot at the bottom edge (see [Figure 191](#)), the Channel Branding mounting locations are in the bottom right corner of the board.

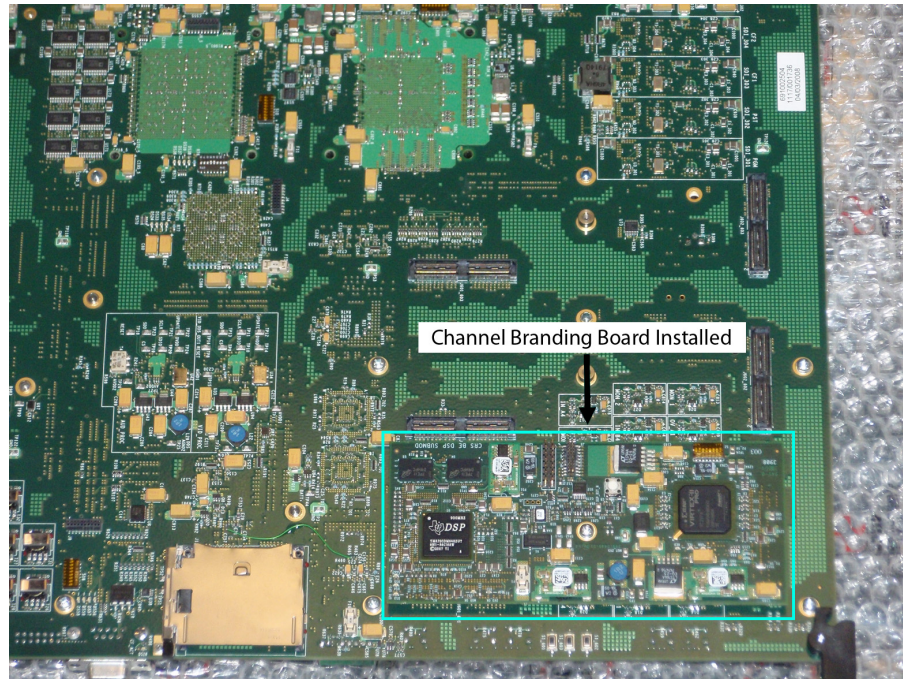
**Note** The Enhanced Channel Branding solution, which includes support for still images, audio, CG text, text crawls, animation sequences and motion video, is shipped with the required three Channel Branding boards. The previous release of the basic solution, which only supported still images and audio files, only required one Channel Branding board mounted in position number one (1). See [Figure 193](#).

Follow these steps to install the Channel Branding mezzanine board on the Maestro frame processor board:

1. Align the connectors and screw hole on the Channel Branding board with the connectors and screw post on the Maestro processor board and then press down firmly to interlock the connectors.
2. Fasten the Channel Branding board in place on the Maestro Processor board using the included mounting screw.

**Figure 194** illustrates a Channel Branding board installed in position number one (1) on the Maestro Processor board.

*Figure 194. Channel Branding Board Installed on the Maestro Processor Board*



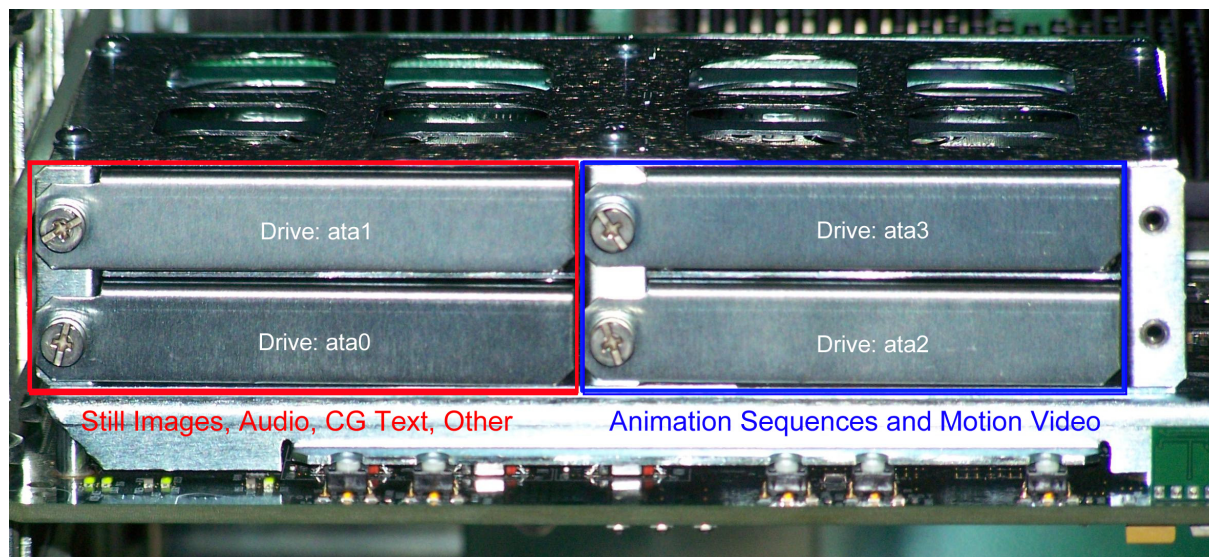
Proceed to *Channel Branding Hard Drives Installation*.



## Channel Branding Hard Drives Installation

Channel Branding storage is provided by one or more hard disk drives. As illustrated in [Figure 195](#), up to four 2.5 inch (6.35 cm) drives can be mounted on each Maestro channel processor board.

Figure 195. Channel Branding Disk Drives Installed



There are two separate PCI busses, each of which can support one (1) or two (2) hard disk drives. The first PCI bus supports storage and playback of still images, audio and CG text. The second PCI bus supports storage for animation sequences and motion video.

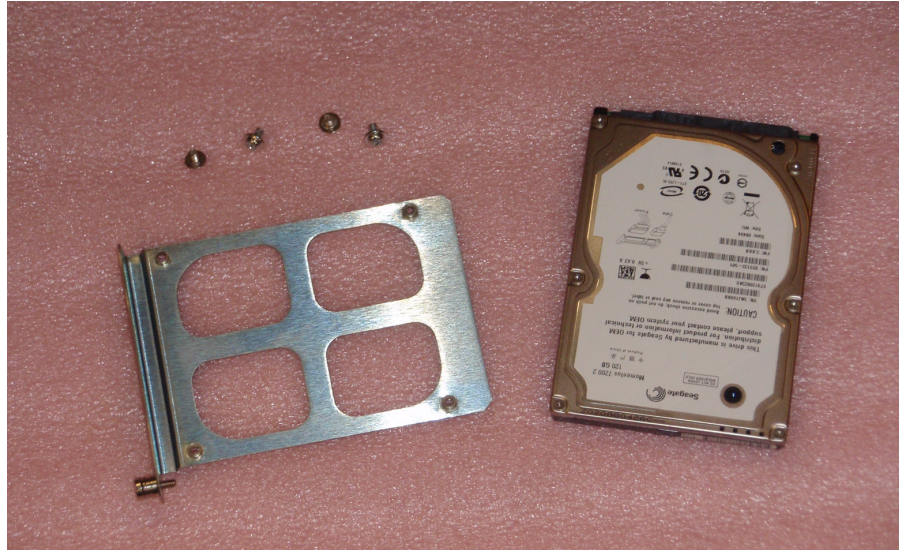
Maestro Enhanced Channel Branding version 1.7, supports still images, audio, CG text, text crawls, animation sequences and motion video. When installing disk drives for the basic Channel Branding, the first drive must be installed in the lower left position that is labeled “Drive: ata0” in [Figure 195](#). If a second drive is installed to support the basic Channel Branding, it should be installed in the upper left position labeled “Drive: ata1.” “Drive: ata2” should be installed in the lower right position and “Drive: ata3” should be installed in the upper right position.

[Figure 196](#) shows the hardware used in mounting the Channel Branding disk drive in the drive cage.

**Note** If the hard disk drive was received from Grass Valley, the drive sled will already be mounted on the drive. In this case, proceed directly to [Step 4](#)



Figure 196. Channel Branding Disk Drive Mounting Hardware

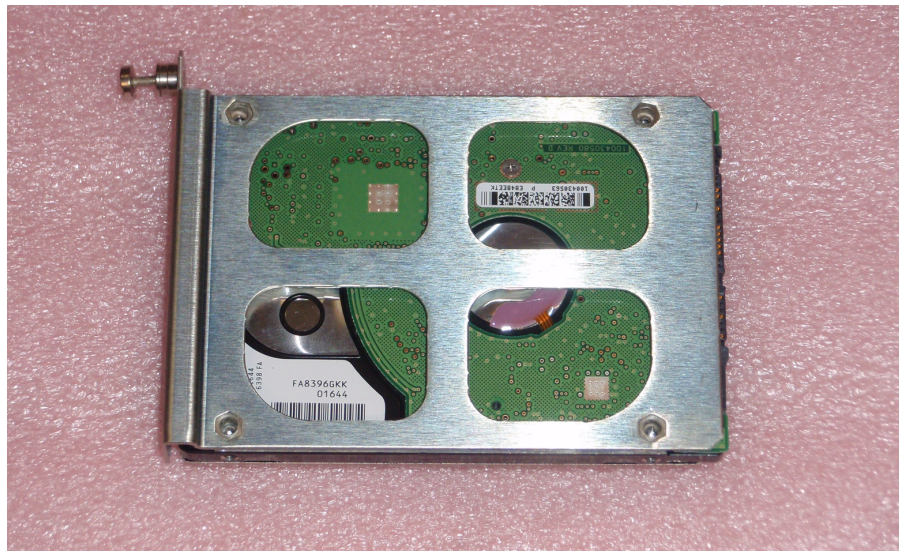


Follow these steps to install a Channel Branding disk drive:

**Note** Steps 1-3 are necessary only if replacing the drive supplied by Grass Valley with a different drive. In this case, the mounting sled must be removed from the old drive and mounted on the new drive.

1. Position the hard drive with the circuit board side facing up.
2. Position the drive sled on the drive so that the four screw holes in the sled are aligned with the screw holes in the drive. See [Figure 197](#).

Figure 197. Drive Sled Aligned on Disk Drive



**Note** The drive sled face plate is positioned at the closed end of the drive. Make sure the drive connectors at the back of the drive are not covered.

3. Attach the drive sled to the disk drive with the included screws.

The drive mounting sled properly attached to a disk drive is illustrated in [Figure 198](#)

Figure 198. Mounting Sled Attached to Disk Drive



4. Insert the mounting sled and drive assembly into the desired slot in the disk drive cage on the Maestro Processor board. Push gently to make sure the drive connector and interface board connectors at the rear of the drive cage are well connected.

**Note** If installing only one drive, it should be installed in the lower left slot (ata0).

5. Tighten the mounting screw on the sled to securely hold the disk drive in the drive cage.

[Figure 199](#) shows the drive assembly installed in the drive cage on the Maestro Processor board. To see how all four hard drives look in the drive cage see [Figure 195](#).



Figure 199. Drive Assembly Installed in Drive Cage



With the Channel Branding board mounted on the Maestro Processor board and the disk drive(s) installed:

6. Reinsert the Maestro Processor board into the frame carefully.
7. Verify that the board starts properly with no errors in the Deployment Center.

As illustrated in [Figure 200](#), “Started” will appear in the “Status” column if the board loads with no errors.

Figure 200. Maestro Processor Boards Started



If any errors occur and the board fails to load after mounting the Channel Branding hardware, make note of these errors and contact Grass Valley Technical Support.

Proceed to [Mounting and Formatting Drives](#) on page 297.

## Mounting and Formatting Drives

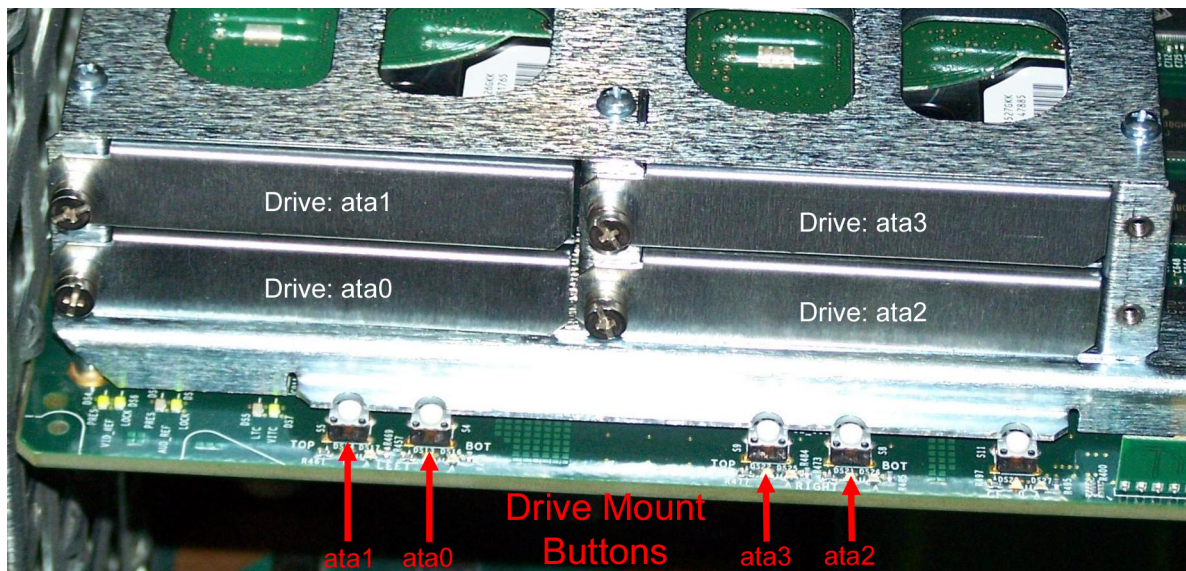
Hard drives installed in the drive cage must be mounted and formatted before branding content can be copied to the drives. A new drive can be installed in the frame while the Maestro Processor board is running. There is no need to remove the board in order to install a drive. Drives received from Grass Valley have been formatted and tested prior to shipment.

**Note** If you received the hard drive from Grass Valley, it is already formatted. You can proceed to the [Installing the Content Gateway](#) section.

### Mounting a Drive

Each drive has a push button for mounting the drive as illustrated in [Figure 201](#).

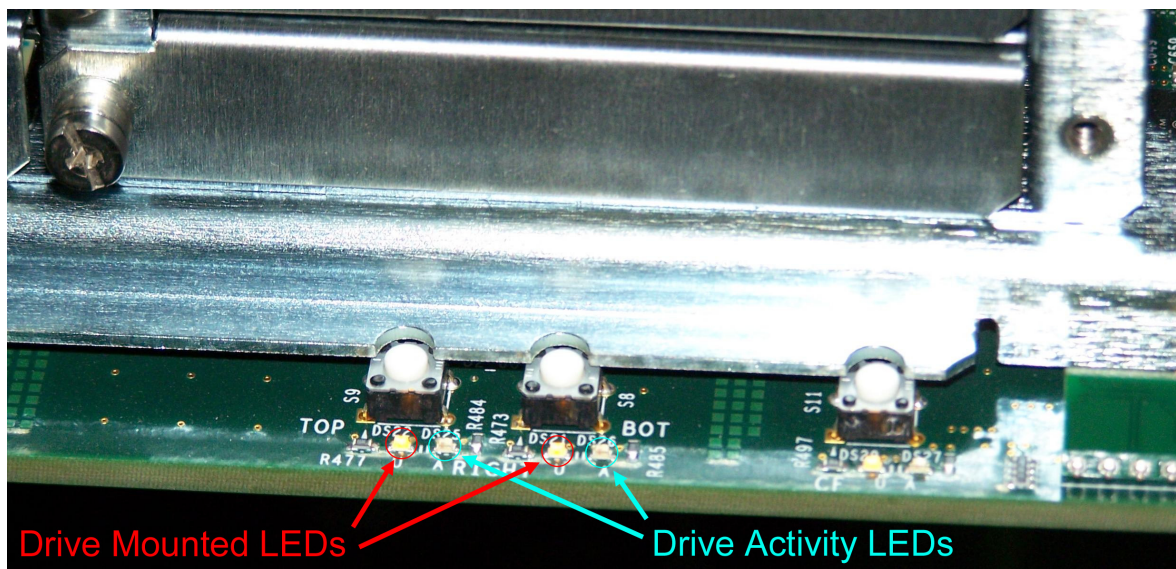
Figure 201. Channel Branding Drive Mount Buttons



To mount a drive, push the mount button that is associated with that drive. If the drive mounts successfully, the mount LED for that drive will be illuminated (see [Figure 202](#)).



Figure 202. Drive Mount and Activity LEDs



If the mounted drive was received from Grass Valley, proceed to [Installing the Content Gateway on page 301](#). Partitioning and formatting the drive is only necessary if replacing a Grass Valley supplied drive.

## Partitioning and Formatting a Drive

**Note** Partitioning and formatting a drive is necessary only if replacing a drive provided by Grass Valley. Drives received from Grass Valley have been partitioned, formatted and tested prior to shipment.

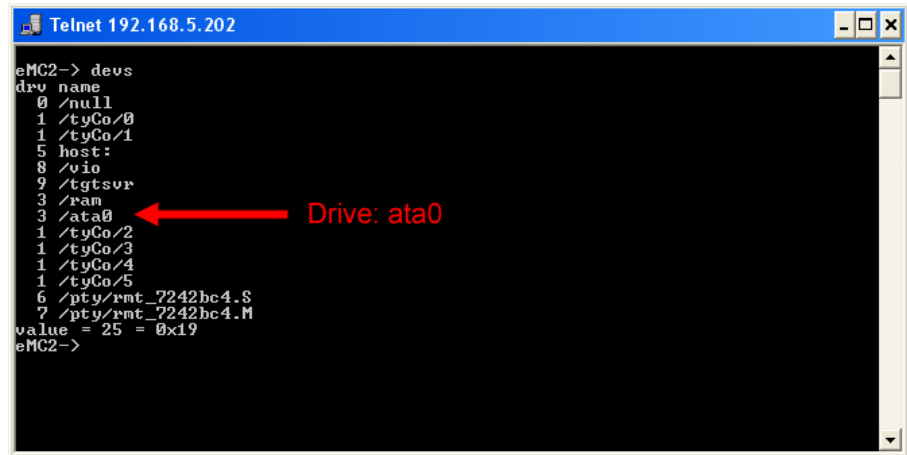
Once a drive has been installed and mounted, it must be partitioned and formatted in order for the Content Gateway to create the necessary folders and then copy the branding elements to those folders.

Follow these steps to partition and format a drive:

1. Initiate a Telnet session to the IP address of the Maestro Processor board on which the drive is mounted.
2. Type the word, “devs” at the prompt to display all devices.

All mounted drives will then appear in the list as illustrated in [Figure 203](#).

Figure 203. Maestro Processor Device List



```

Telnet 192.168.5.202
eMC2-> devs
dev name
0 /null
1 /tyCo/0
1 /tyCo/1
5 host:
8 /vio
9 /tgtsvr
3 /ram
3 /ata0 ← Drive: ata0
1 /tyCo/2
1 /tyCo/3
1 /tyCo/4
1 /tyCo/5
6 /pty/rmt_7242bc4.S
7 /pty/rmt_7242bc4.M
value = 25 = 0x19
eMC2->

```

3. Enter the command (without the quotation marks) “altaDiskPart X” at the prompt where X is the ata disk number. Disk numbers can be 0-3.

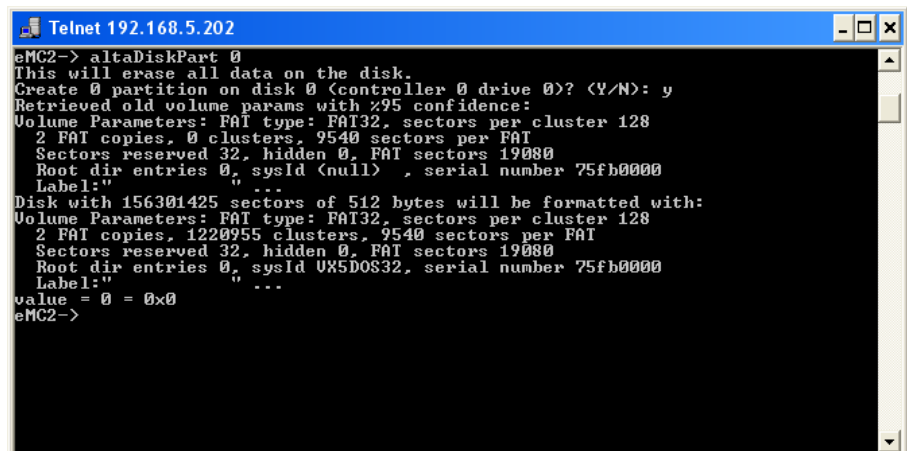
**Note** The command is case sensitive and must be entered as shown above, without the quotation marks.

A confirmation prompt will then appear. If this prompt does not appear, re-enter the command.

4. Enter “y” at the confirmation prompt to proceed with partitioning and formatting

When partitioning and formatting is complete, the status information is then displayed. See [Figure 204](#).

Figure 204. Disk Partitioning Command and Status



```

Telnet 192.168.5.202
eMC2-> altaDiskPart 0
This will erase all data on the disk.
Create 0 partition on disk 0 (controller 0 drive 0)? <Y/N>: y
Retrieved old volume params with 95 confidence:
Volume Parameters: FAT type: FAT32, sectors per cluster 128
2 FAT copies, 0 clusters, 9540 sectors per FAT
Sectors reserved 32, hidden 0, FAT sectors 19080
Root dir entries 0, sysId <null>, serial number 75fb0000
Label:" "
Disk with 156301425 sectors of 512 bytes will be formatted with:
Volume Parameters: FAT type: FAT32, sectors per cluster 128
2 FAT copies, 1220955 clusters, 9540 sectors per FAT
Sectors reserved 32, hidden 0, FAT sectors 19080
Root dir entries 0, sysId UX5DOS32, serial number 75fb0000
Label:" "
value = 0 = 0x0
eMC2->

```

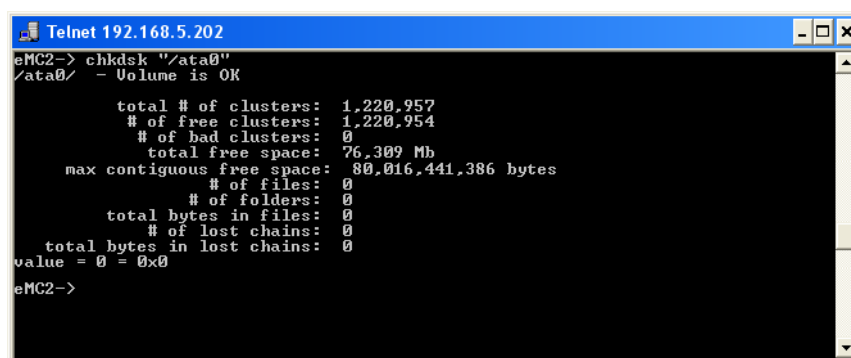
5. Verify the partition by entering the following at the command prompt (This step is optional):

chkdsk “/ataX” where X is the ata disk number (0-3) of the disk.

**Note** The quotation marks around the ata disk designator are required.

Verifying the partition may take a while to complete. After verification, information, which is similar to that shown in [Figure 205](#), will be displayed.

Figure 205. Partition Verification Information



```

Telnet 192.168.5.202
eMC2-> chkdsk "/ata0"
/ata0/ - Volume is OK

        total # of clusters: 1,220,957
        # of free clusters: 1,220,954
        # of bad clusters: 0
        total free space: 76,309 Mb
        max contiguous free space: 80,016,441,386 bytes
        # of files: 0
        # of folders: 0
        total bytes in files: 0
        # of lost chains: 0
        total bytes in lost chains: 0
value = 0 = 0x0
eMC2->

```

**Note** Disk verification may cause the Maestro Processor to temporarily lose communications with the Deployment Center. However, channel service is not interrupted during the loss of communications.



# Installing the Content Gateway

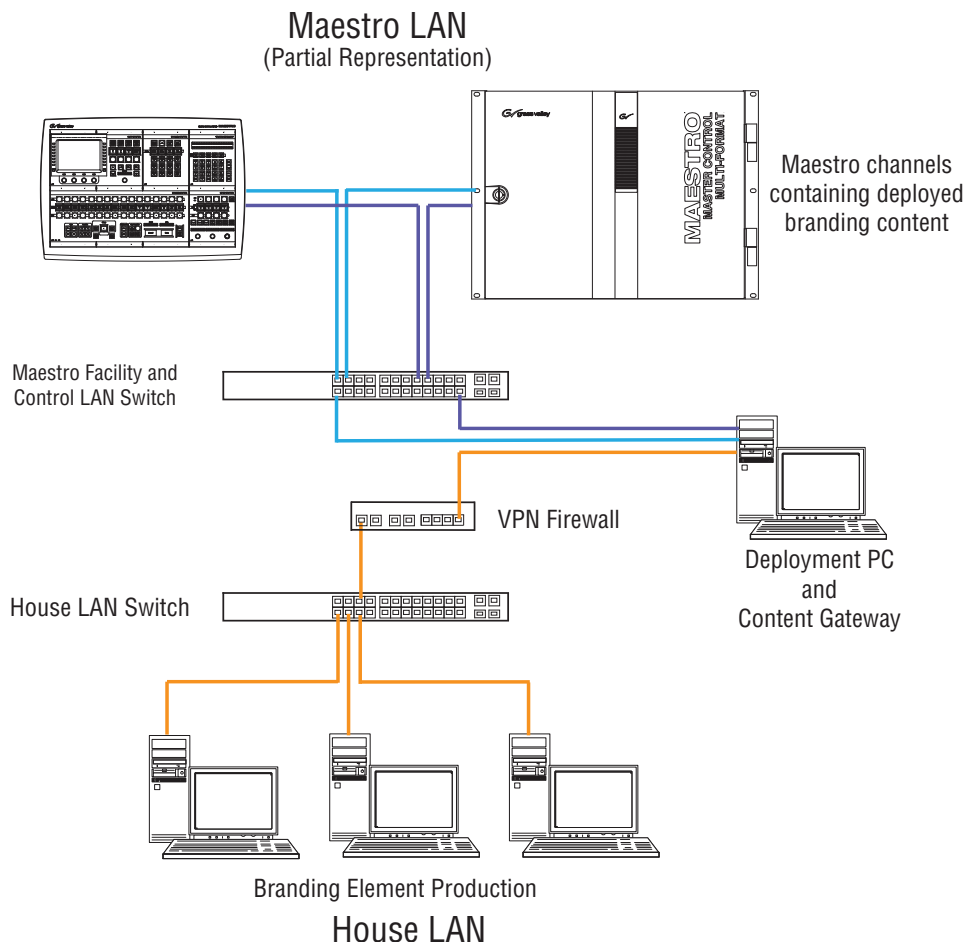
The Content Gateway is one or more customer-provided PCs and folders in which branding elements are stored. These branding elements may be defined for use by Maestro channels and deployed to those channels with the Maestro Configuration Editor and Maestro Deployment Center applications. It is recommended that a single PC be used to host the Content Gateway; although, it is possible to use more than one.

For simplicity, it may be desirable to install the Content Gateway on the Maestro Deployment PC. The information which follows assumes the Deployment PC is used as the Content Gateway.

**Note** Content Gateway folders may be installed on one or more PCs, including the Deployment PC, if desired; however, to protect the Maestro LAN, all Content Gateway PC(s) should be behind the VPN firewall as illustrated in [Figure 206](#).

[Figure 206](#) shows an example of the LAN configuration which connects the Deployment PC and Content Gateway to the House LAN on which branding element production takes place. This is an example, the actual installation will vary depending on your (that is the customer's) facilities and IT resources.

Figure 206. Branding Exchange Gateway LAN Configuration



**Note** The LAN configuration in [Figure 206](#) is an example only. Please note that the installation and configuration of the Content Gateway and the interfaces between the Branding Element Production LAN and the Content Gateway uses customer-supplied equipment which is not included with Maestro or the Channel Branding hardware.

In order to minimize the impact to both the house branding element production network and the Maestro network, the Deployment/Content Gateway PC is the only machine that has access to both the Branding Element Production LAN and the Maestro LAN.

The Content Gateway requires the configuration of a LAN that is separate from the Maestro Facility and Control LANs. If the GUI control panel is also installed on the Deployment PC, it will be necessary to add a third Network Interface Card (NIC) to the Deployment PC/Content Gateway in order for the Branding Element Production LAN to have access to the Content Gateway for storing branding elements.

**Note** For simplicity, Grass Valley recommends the Belkin Gigabit USB 2.0 Network Adapter (Belkin part number F5D5055 shown in [Figure 207](#)) as it can be added easily without opening the PC. This hardware has been tested in a configuration similar to that illustrated in [Figure 206](#).

Figure 207. Belkin Gigabit USB 2.0 Network Adapter

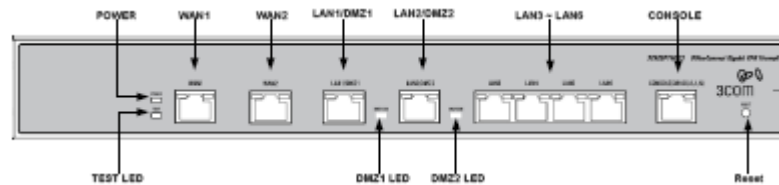


The VPN firewall protects the Deployment PC (or other PCs) on which the Content Gateway resides and the Maestro LAN from unauthorized local or remote access.

**Note** Grass Valley recommends the 3COM OfficeConnect Gigabit VPN Firewall Appliance (3COM part number 3CREVF100-73). This hardware has been tested in a configuration similar to that illustrated in [Figure 206](#).

The 3COM OfficeConnect Gigabit VPN Firewall Appliance has two (2) WAN ports and six (6) LAN ports as illustrated in [Figure 208](#).

Figure 208. 3COM OfficeConnect Gigabit VPN Firewall Ports



Connect the Deployment/Content Gateway PC, VPN Firewall and House LAN as follows:

1. Connect the House LAN to the VPN Firewall WAN 1 port with a CAT6 Ethernet cable.
2. Attach the Gigabit USB NIC to a rear panel USB port on the Deployment/Content Gateway PC.

**Note** Actual network performance is limited by the USB bus speed and traffic on the USB bus.

3. Connect the Deployment/Content Gateway USB NIC to a VPN Firewall LAN port with a CAT6 Ethernet cable.

**Note** The default IP address of the 3COM VPN Firewall appliance is 192.168.1.1. It is configured as a DHCP server and will assign a 192.168.1.x address to the USB NIC. If you desire a different subnet range for the VPN Firewall, consult the 3COM OfficeConnect documentation for instructions on changing the default IP address and DHCP address assignment range.

Consult the 3COM OfficeConnect VPN Firewall documentation for instructions on configuring the LAN/DMZ ports, firewall settings and other features of interest in the VPN Firewall appliance.

Once the LAN connections and firewall are properly configured as illustrated in [Figure 206](#), the Content Gateway may be installed and accessed from the branding element production LAN.

## Content Gateway Configuration Process

The Content Gateway folders must be configured so that the content can be accessed. You will need to create a shared folder on the Deployment/Content Gateway PC and then map this shared folder. The steps to create a shared drive and map a drive are explained below.

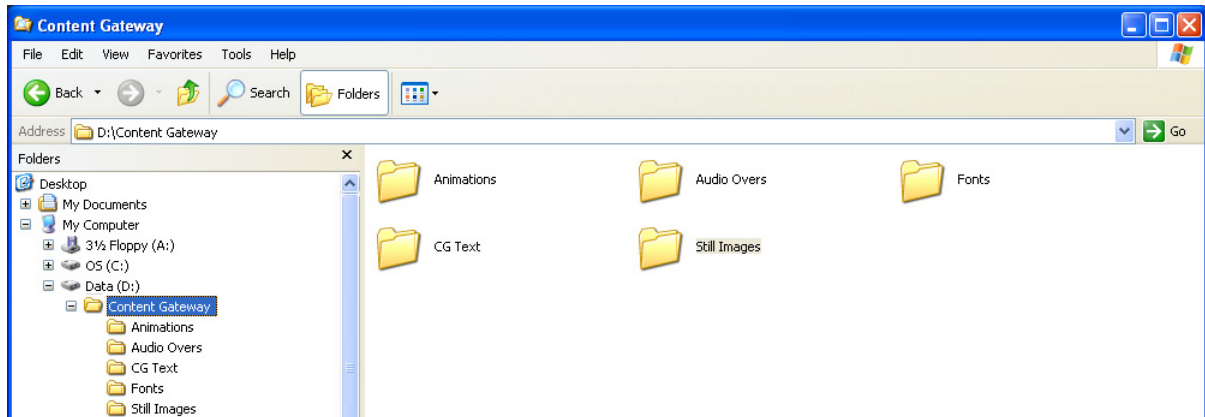
Follow these steps to configure the Content Gateway:

1. On the Deployment/Content Gateway PC, create the folders in which you wish to store branding content transferred from the branding element production computers.

**Note** Depending on the number and size of branding elements you anticipate storing and deploying to Maestro channels, if using the Deployment PC as the Content Gateway, you may wish to install a separate hard drive specifically for this purpose.

The folder structure in which branding elements are stored on the Content Gateway is not fixed; Any folder structure that allows for the logical organization of branding elements and makes it easy to transfer them from the production LAN to the Content Gateway can be used; however, the folder structure illustrated in [Figure 209](#) (or something similar) is recommended.

Figure 209. Content Gateway Folder Structure Example



2. Share the Content Gateway directories on the Deployment/Content Gateway PC(s) so they are accessible on the network. See the [Creating a Shared Folder](#) section for instructions for sharing a folder.
3. Map a drive to the shared drive/directory on the Deployment/Content Gateway PC From the Branding Element Production computer(s) on the local Branding Element Production LAN. See the [Mapping a Network Drive](#) section for instructions for mapping a folder.
4. Copy all the branding element files, which you wish to make available to Maestro channels, to the appropriate folders on the mapped Content Gateway drive (drive X: in [Figure 211](#)).

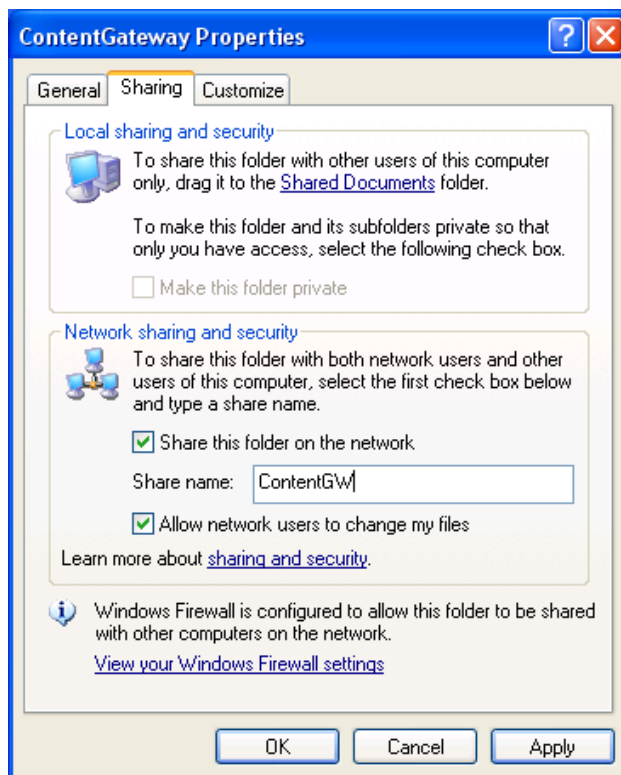
Branding elements stored in the Content Gateway folders are configured for use by Maestro channels in the next section. Proceed to [Section 9-Channel Branding Configuration](#).

## Creating a Shared Folder

Follow these steps to create a share in Windows XP:

1. Select the top level Content Gateway folder in the Windows Explorer folder view.
2. Right-click on the folder name and select "Sharing and Security" from the menu. The sharing properties dialog illustrated in [Figure 210](#) will then appear.

Figure 210. Content Gateway Shared Folder Settings



3. Select the **Share this folder on the network** check box.
4. Enter a share name for the shared folder. This name will be used when mapping a drive to the Content Gateway from computers on the branding element production LAN.

**Note** Share names longer than 12 characters are not supported in Windows operating systems other than Windows XP and Windows Vista.

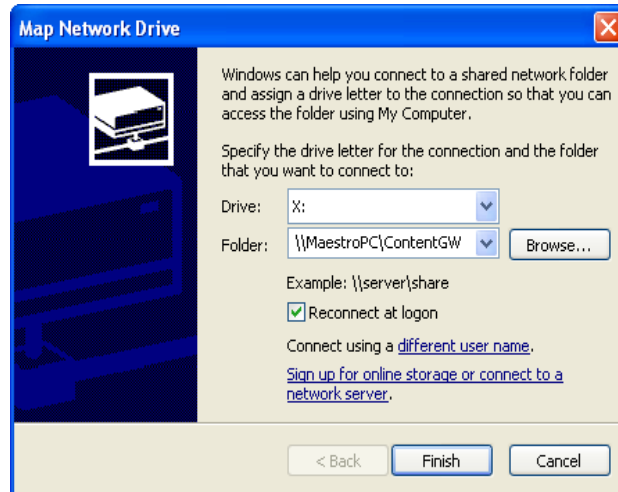
5. Enable the “Allow network users to change my files” option by clicking in the check box.
6. Click the **OK** button to apply the share settings and close the dialog.

## Mapping a Network Drive

Follow these steps to map the shared directory:

1. From Windows Explorer, select Tools>Map Network Drive from the menu bar. The Map Network Drive dialog will then appear (Figure 211).

Figure 211. Map Network Drive Dialog



2. Select the drive letter you want to map to the Content Gateway shared folder from the Drive: drop-down list.
3. Enter the name of the computer that contains the Content Gateway folders, and the share name that was entered when you created the shared folder (Step 4), in the *Folder:* field. The **Browse...** button may also be used to locate the desired computer and shared folder.

**Note** The format is \\{computer name}\\{share name} for example \\MaestroPC\\ContentGW.

4. Check the “Reconnect at Logon” box if you wish to re-establish this drive mapping each time you logon to the branding element production computer.
5. Click the **Finish** button to map the drive to the shared Content Gateway directory.





# Channel Branding Configuration

This section describes the process of making Channel branding elements available for use on Maestro channels. Before proceeding with the configuration and deployment of branding elements, the following (as described in the preceding sections) must be done:

- The DVE mezzanine board and hard drive(s) must be properly installed on the Maestro Processor board.
- The Content Gateway must be installed.
- The Branding Elements will be saved in the designated Content Gateway folders.

**Note** The location of the content that does not yet exist may be entered in the Configuration Editor.

## Content Definition Table

Branding elements to be used in Maestro are defined in the Configuration Editor Branding Content Definition table as illustrated in [Figure 212](#) and [Figure 213](#).

**Note** Multiple Content Definition tables may be created in order to accommodate different video output standards or different content sets for different channels. Content definitions are not assigned directly to channels; however, they contain the sources from which branding inputs are made available to a Maestro channel.

Figure 212. Branding Content Definition Table - Part 1

Source Name	Source Type	Levels	Update Mode	Template	Update Period	Loop Mode	Join in Progress	Horizontal Position(%)
test	Animation	video	Manual			Play Once	false	10

Figure 213. Branding Content Definition Table - Part 2

Vertical Position(%)	Opacity(%)	Audio Ratio	Source File	Create Key
10	100		C:\Documents and Settings\weaver\Desktop\Maestro Elements\Chess.GIF	<input type="checkbox"/>

**Note** The original images must be in the proper resolution, size and aspect ratio for the intended usage in either an SD or HD channel. Maestro does not do any resizing or aspect ratio conversion.

When defining branding content, the following information is entered in the Content Definition tables.

**Source Name**

Identifies the branding element. This name will appear in the Input table source selection drop-down list.

## Source Type

Select the source type for the branding element from the drop-down list containing the following selections

- Animation
- Audio Voice Over
- CG Text
- Still Image
- Text Crawl

Select the appropriate type for the branding element being entered into the Content Definition table.

## Levels

Designates the Maestro level(s) on which the branding element will be available. From the drop-down list, select the desired Maestro level(s), the choices are video and audio 1-16. Click the **OK** button to close the list after making the level selection(s).

## Update Mode

From the drop-down list, select the desired branding element update mode. Choices are:

- Manual

Branding elements defined as “manual” are updated whenever a configuration is loaded that contains those elements or when the **Update Now** button is clicked in the Deployment Center.

- Automatic

Branding elements defined as “automatic” are monitored automatically in the Content Gateway and anytime the file is changed, it is automatically ingested, converted to the proper format and deployed with no manual intervention required.

To prevent on-air discontinuities, content that is loaded according to assignment is not automatically updated when the hard disk drive is updated. The Update Mode only applies to the updating of content on the Maestro Frame Processor hard disk drive. Maestro internal content is loaded from the Frame Processor hard disk drive when it is assigned.

**Note** If content that has been assigned the “automatic” update mode on Maestro, the content on the hard disk drive will be automatically be updated. However, to use the updated content, the source must be unassigned and then re-assigned.

## Loop Mode

Specifies how audio files and animation clips are played. Select from the drop-down list box one of the following:

- Loop

Plays the audio file for its entire length then loops back to the beginning and plays it again. This is repeated until playback is stopped by removing the source from air.

- Play Once

Plays the audio file through one time and ends playback when the end of the file is reached.

## Horizontal Position (%)

Designates the default horizontal position on the screen for the upper left corner of the branding element, which is expressed as a percentage of the screen width. The horizontal position can be changed manually once the branding element is assigned to a keyer.

## Vertical Position (%)

Designates the default vertical position on the screen for the upper left corner of the branding element, which is expressed as a percentage of the screen height. The vertical position can be changed manually or through automation once the branding element is assigned to a video keyer.

**Note** These changes will be stored in the Source Memory.

## Opacity (%)

Designates how obscure or unclear the branding element is displayed, which is expressed as a percentage. Fully transparent is 0% opacity. Completely “solid” is 100% opacity. The opacity can be changed manually once the branding element is assigned to a video keyer.

**Note** Any changes made to the default position and opacity will be saved in source memory. Any time the source is assigned and active, it will have the position and opacity values as defined in source memory.

## Audio Ratio

Designates the default audio mix over ratio when an audio element is assigned to an audio over mixer. For example, if 12 dB is selected as the default, Program audio level will be reduced by 12 dB and Branding audio will be inserted at normal playback level. The range is 0 db to 24 db and +Inf dB.

**Note** If the value “+Inf dB” is selected, the Program audio level will be fully attenuated.

**Source File**

Specifies the source file location on the Content Gateway for the branding element. The “...” button is clicked to browse for the desired source file on the Content Gateway or the complete file path may be entered.

**Create Key**

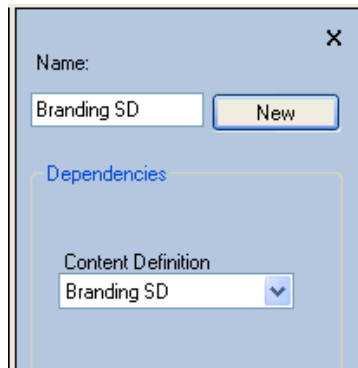
Generates an alpha (key) channel for the still image, if the “Create Key” check box is selected. Ideally, still image branding elements should be created with an alpha channel before being ingested in the Content Gateway. For elements that do not have an alpha channel, Maestro can create one if this option is selected. If the ‘Create Key’ option is not selected and the branding element does not have a key channel, it will be presented as is and may not appear correctly on air.

## Content Input Table

After creating the desired Content Definition tables, one or more Content Input tables may be created. The Content Input table contains the branding elements that will be available as inputs in any Input table with which the Content Input is associated.

When creating a Content Input table, the Content Definition table association is designated as illustrated in [Figure 214](#).

Figure 214. Branding Content Input Table - Content Definition Association



Branding elements defined in the Content Definition table are added to the Content Input table as illustrated in [Figure 215](#).

Figure 215. Branding Content Input Table

Content Input: Branding SD

Define sets of contents that can be associated with a Maestro Input Set

Source Name	Type	V	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A
GV90	Still Image	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ref_Tone	Audio Voice Over	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SMPTE_Bars	Still Image	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TV PG		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Select a source name. This field cannot be blank.

OK Apply Cancel Find Text

The Content Input table is a way of “filtering” all available branding elements and designating only certain ones to be available as channel inputs.

# Input Table

The final step in making branding elements available to Maestro channels is to define them in the Input table.

To add branding elements to the Input table, a Content Input table is first associated with the Input table as illustrated in [Figure 216](#).

Figure 216. Input Table - Content Input Table Association

Name:

Dependencies

Level:

Category:

Audio Input:

Content Input:

Input Set(s)

New set name:

Figure 217 shows an example of an Input table with branding elements defined as inputs.

Figure 217. Input Table with Branding Elements Added

Input: 4StereoPairs

Define a set of RCS inputs that are available to an associated Maestro channel.

Category	Entry	Mnemonic	Audio Input Configuration	SDV	AES CH1	AES CH2	AES CH3	AES CH4	AES CH5	AES CH6	AES CH7	AES CH8
				Video	Stereo 1/2	Stereo 3/4	Stereo 5/6	Stereo 7/8				
Test	1	Bars-AES	4StereoPair	Bars	Bars	Bars						
Test	2	Bars-Venus	4StereoPair	Bars								
Test	3	Bars-Philips	4StereoPair	Bars								
Test	4	Bars-Mars	4StereoPair	Bars								
Test	5	Bars-Saturn	4StereoPair	Bars								
Net	1	KSL-NBC	4StereoPair	KSL-NBC	KSL-NBC	KSL-NBC						
Net	2	KTVX-ABC	4StereoPair	KTVX-ABC	KTVX-ABC	KTVX-ABC						
Net	3	CSPAN	4StereoPair	CSPAN	CSPAN	CSPAN						
Server	1	Pool	4StereoPair	PoolSrvr	PoolSrvr	PoolSrvr						
Aux	1	Venus	4StereoPair	Venus								
Aux	2	Philips	4StereoPair	Philips								
Aux	3	Mars	4StereoPair	Mars								
Aux	4	Saturn	4StereoPair	Saturn								
PAL	1	PALPool1	4StereoPair	Bars 13	Embedded	Embedded						
PAL	2	PALPool2	4StereoPair	Bars 14	Embedded	Embedded						
PAL	3	PALPool3	4StereoPair	Bars 15								
PAL	4	PAL-BARS	4StereoPair	Bars 16								
Aux	0	Tone	4StereoPair	Bars	Bars							
Embedded	0	KSL-Emb	4StereoPair	KSL-NBC	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded
Embedded	1	CSPAN-Emb	4StereoPair	CSPAN	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded
Embedded	2	Bars-Emb	4StereoPair	Bars	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded
Embedded	3	KTVX-Emb	4StereoPair	KTVX-ABC	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded
Embedded	4	Foo	4StereoPair	Bars 2	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded	Embedded
Test	0	TEST 0 Agai	4StereoPair	Bars								
Test	20	BarsDirect	4StereoPair	Direct-Key1								
Test	21	SaturnDirec	4StereoPair	Direct-Key1								
LOGO	10	GV 90	Audio Input	GV90(Conte	Ref_Tone(C	Ref_Tone(C						
LOGO	11	SMPTE Bars	Audio Input	SMPTE_Bar								
LOGO	12	TV PG	Audio Input	TV_PG(Cont								

☒ Enable source type color coding

External Internal Embedded Direct Unknown

OK Apply Cancel Find Text Show Source Information

Branding elements are entered into the input table in the same manner as routed (external) or direct connect sources. When a branding element source is selected from the drop-down list, it is identified as such with the word (Content) following the source name. See [Figure 218](#) for an example.

Figure 218. Branding Content Input Selection

TEST	5	CD3	Audio Input		Embedded	Embedded	Embedded
LOGO	10	GV 90	Audio Input	GV90(Conte			
LOGO	11	SMPTE Bars	Audio Input	SMPTE_Bar	Ref_Tone(C	Ref_Tone(C	
LOGO	12	TV PG	Audio Input	TV PG(Conte			

☒ Enable source type color coding

External Internal Embedded Direct Unknown

Select the Video input

OK Apply Cancel Find Text Show Source Information

PHIL\_FILL

PHIL\_HOLE

SAT\_FILL

SAT\_HOLE

SMPTE\_Bars(Content)

TV PG(Content)



Branding elements are considered “Internal” sources. They are stored on the DVE hard drive(s) located on the Maestro channel processor board. A cable connected to a rear panel input is not required to access the source.

When a branding element is added to the Input table, the video and audio sources are highlighted in green (see [Figure 218](#)). The color highlight indicates that they are internal sources.

**Note** Highlighting of sources in colors that designate the source type is active only if the “Enable source type color coding” option is selected in the Input table. See [Figure 218](#).

Only the branding elements defined in the Input table will be deployed to and be available on the channel(s) which utilize a particular Input table. The presence of the branding element in the Branding Content tables does not mean that the element is applied to any Maestro channels. The Input table source definitions make that determination.

Save and compile the configuration with the branding content definition.

Proceed to [Section 10-Deploy and Verify Content](#).



## *Deploy and Verify Content*

This section describes the process of deploying configured branding elements to Maestro channels, verifying that they can be assigned to video keyers and audio over mixers and that they display and playout as desired on air.

### **Branding Element Deployment**

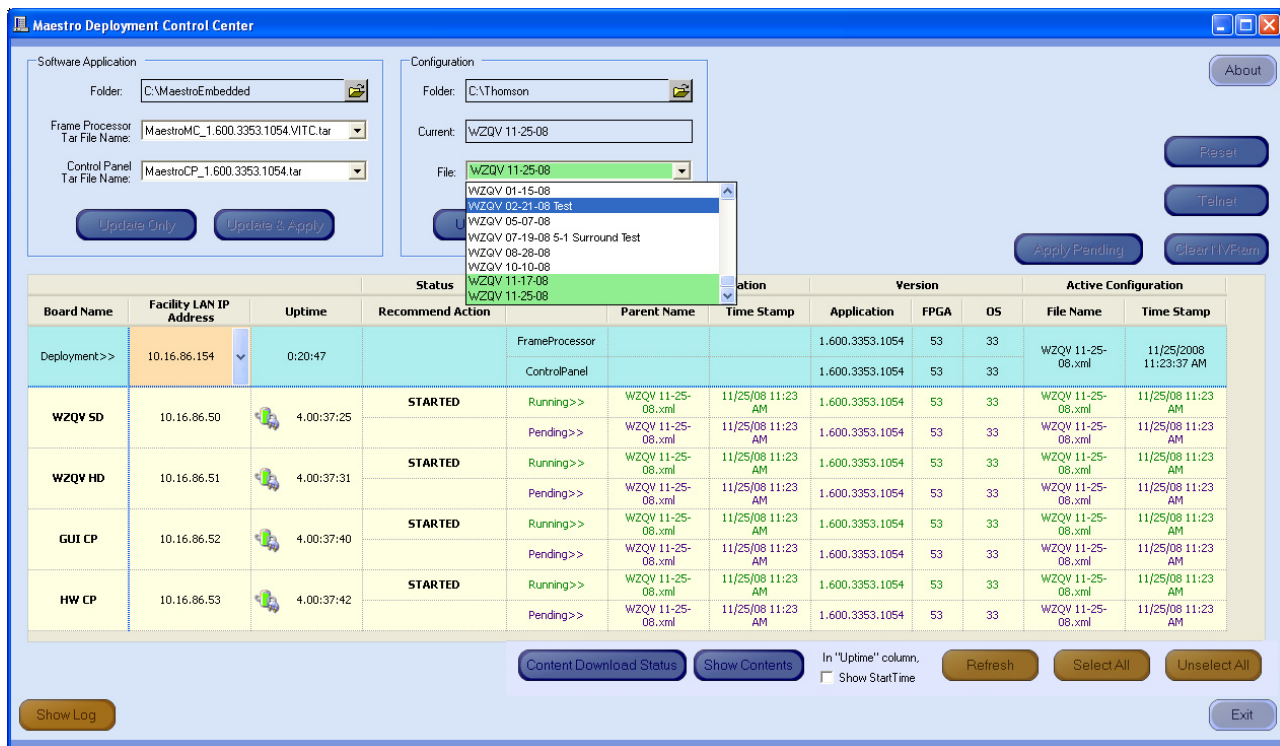
A configuration file that contains the branding content definitions to a Maestro channel must be deployed.

Follow these steps to deploy a configuration file:

1. Open the Deployment Center application on the Deployment PC.
2. Select the desired configuration file from the File drop-down list in the Configuration section. See [Figure 219](#).

**Note** Only configurations that are highlighted in green should be selected. Those configurations not highlighted in green have not been compiled with the current software version and may not contain branding definitions. Only the current software version (1.7.0) supports branding elements.

Figure 219. Configuration File Selection



3. Click the **Update Only** button. This step will download the selected configuration file to all of the components that are defined in the selected configurations Network Description table. However, this configuration will not be applied or activated, until the **Apply Pending** button is clicked or Maestro is restarted.

4. Click on one of the Maestro channel processors to select just that channel. Make sure that only the selected channel is highlighted.

**Note** Before selecting a channel processor, you may need to first click the **Unselect All** button if other Maestro network components are already selected.

5. Click the **Apply Pending** button to apply the configuration file only to the selected Maestro channel.

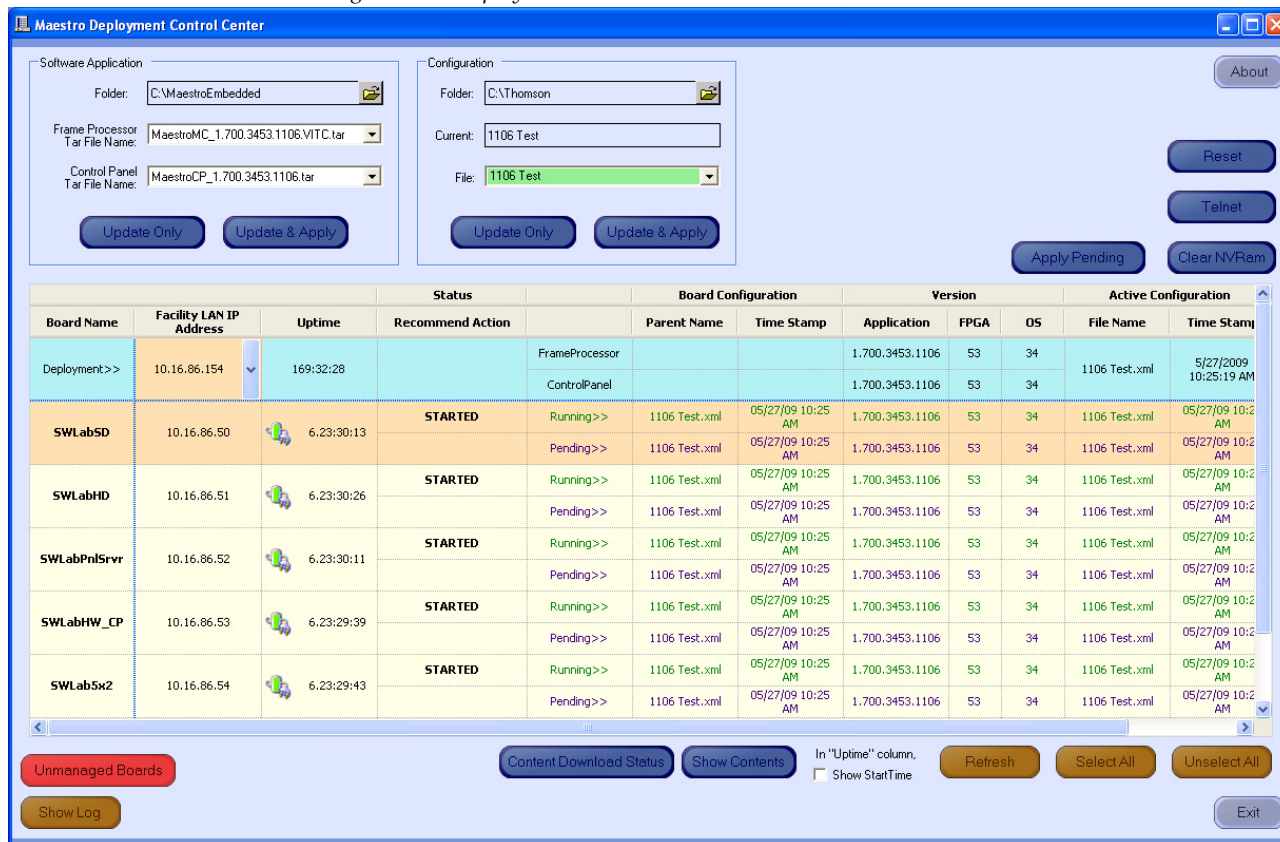
If there are any errors, note these errors and then contact Grass Valley support for assistance.

# Verify Branding Element Deployment

Follow these steps to verify the deployment of branding elements to the selected Maestro channel:

1. Verify that the branding elements were properly deployed to the Maestro channel by clicking the **Show Contents** button as illustrated in Figure 220.

Figure 220. Deployment Center - Show Contents

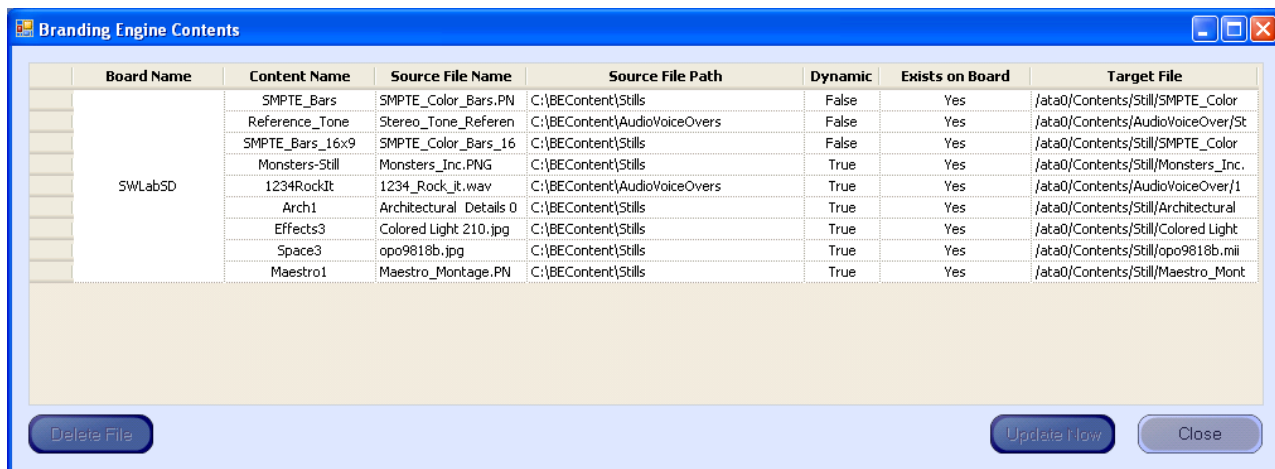


When the **Show Contents** button is clicked, the DVE Content window shown in Figure 221 appears.

## Note

If a new content definition is included in an applied configuration (depending on the number of content definitions associated with a channel) it may take a period of time before the change is detected and the new content is loaded to the channel hard disk drive. Attempting to load a new content definition before the content is available on the channel disk drive will result in a failure to load the desired content. The user may use the Show Contents dialog to view the available content on the channel disk drive.

Figure 221. DVE Contents



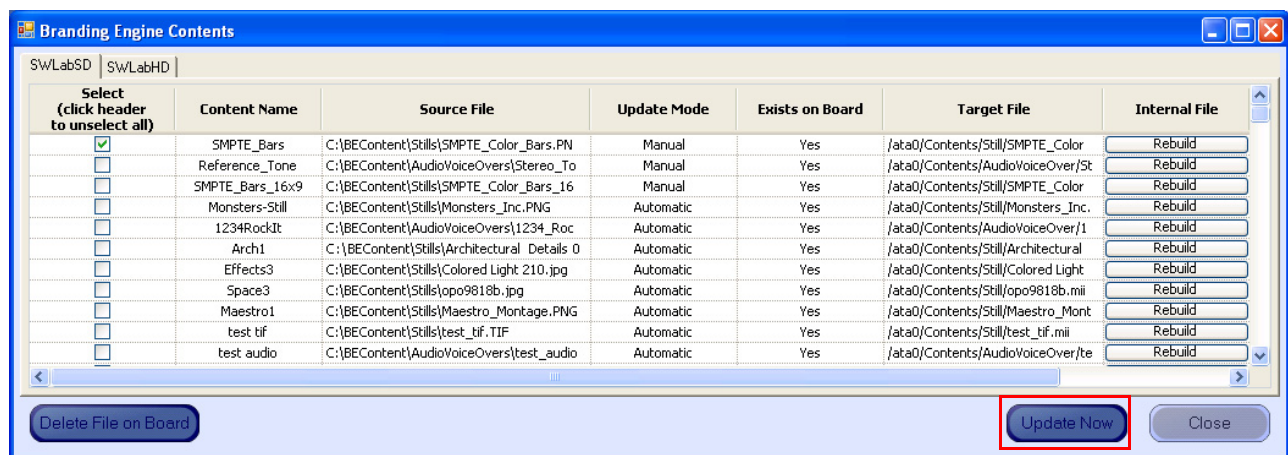
Board Name	Content Name	Source File Name	Source File Path	Dynamic	Exists on Board	Target File
SWLabSD	SMPTE_Bars	SMPTE_Color_Bars.PNG	C:\BEContent\Stills	False	Yes	/ata0/Contents/Still/SMPTE_Color
	Reference_Tone	Stereo_Tone_Referen	C:\BEContent\AudioVoiceOvers	False	Yes	/ata0/Contents/AudioVoiceOver/St
	SMPTE_Bars_16x9	SMPTE_Color_Bars_16	C:\BEContent\Stills	False	Yes	/ata0/Contents/Still/SMPTE_Color
	Monsters-Still	Monsters_Inc.PNG	C:\BEContent\Stills	True	Yes	/ata0/Contents/Still/Monsters_Inc.
	1234RockIt	1234_Rock_it.wav	C:\BEContent\AudioVoiceOvers	True	Yes	/ata0/Contents/AudioVoiceOver/1
	Arch1	Architectural_Details 0	C:\BEContent\Stills	True	Yes	/ata0/Contents/Still/Architectural
	Effects3	Colored Light 210.jpg	C:\BEContent\Stills	True	Yes	/ata0/Contents/Still/Colored Light
	Space3	opo9818b.jpg	C:\BEContent\Stills	True	Yes	/ata0/Contents/Still/opo9818b.mii
	Maestro1	Maestro_Montage.PNG	C:\BEContent\Stills	True	Yes	/ata0/Contents/Still/Maestro_Mont

Buttons: Delete File, Update Now, Close

- Click the **Update Now** button to manually update the branding elements. This step may be done regardless of the Manual / Automatic (Dynamic) setting (Figure 222).

If you need to rebuild, reload, or update content because the content file has become corrupted, select the check box for the content and then click the **Rebuild** button. The content located at the Source file location will be uploaded.

Figure 222. Select and Update Branding Elements



Select (click header to unselect all)	Content Name	Source File	Update Mode	Exists on Board	Target File	Internal File
<input checked="" type="checkbox"/>	SMPTE_Bars	C:\BEContent\Stills\SMPTE_Color_Bars.PNG	Manual	Yes	/ata0/Contents/Still/SMPTE_Color	Rebuild
<input type="checkbox"/>	Reference_Tone	C:\BEContent\AudioVoiceOvers\Stereo_To	Manual	Yes	/ata0/Contents/AudioVoiceOver/St	Rebuild
<input type="checkbox"/>	SMPTE_Bars_16x9	C:\BEContent\Stills\SMPTE_Color_Bars_16	Manual	Yes	/ata0/Contents/Still/SMPTE_Color	Rebuild
<input type="checkbox"/>	Monsters-Still	C:\BEContent\Stills\Monsters_Inc.PNG	Automatic	Yes	/ata0/Contents/Still/Monsters_Inc.	Rebuild
<input type="checkbox"/>	1234RockIt	C:\BEContent\AudioVoiceOvers\1234_Roc	Automatic	Yes	/ata0/Contents/AudioVoiceOver/1	Rebuild
<input type="checkbox"/>	Arch1	C:\BEContent\Stills\Architectural_Details 0	Automatic	Yes	/ata0/Contents/Still/Architectural	Rebuild
<input type="checkbox"/>	Effects3	C:\BEContent\Stills\Colored Light 210.jpg	Automatic	Yes	/ata0/Contents/Still/Colored Light	Rebuild
<input type="checkbox"/>	Space3	C:\BEContent\Stills\opo9818b.jpg	Automatic	Yes	/ata0/Contents/Still/opo9818b.mii	Rebuild
<input type="checkbox"/>	Maestro1	C:\BEContent\Stills\Maestro_Montage.PNG	Automatic	Yes	/ata0/Contents/Still/Maestro_Mont	Rebuild
<input type="checkbox"/>	test.tif	C:\BEContent\Stills\test.tif.TIF	Automatic	Yes	/ata0/Contents/Still/test.tif.mii	Rebuild
<input type="checkbox"/>	test audio	C:\BEContent\AudioVoiceOvers\test_audio	Automatic	Yes	/ata0/Contents/AudioVoiceOver/te	Rebuild

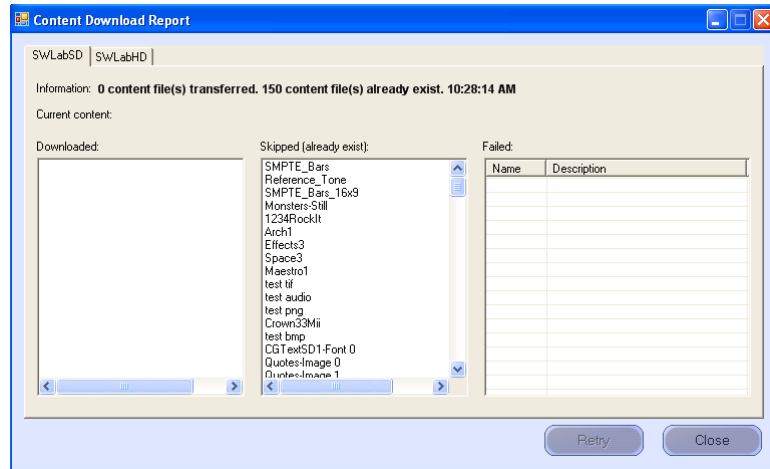
Buttons: Delete File on Board, Update Now, Close

**Note** Elements are selected by clicking the far left column of the element to be selected. Multiple elements may be selected by holding down the [CTRL] key while clicking on the select column.

- Click the **Update and Apply** button to deploy the configuration to all components in the Maestro network if the branding content appears to have deployed properly on the tested channel.

4. Click the **Content Download Status** button to see the download report. The Content Download Report dialog will then appear (Figure 223).

Figure 223. The Content Download Report Dialog



The Content Download Report dialog has the different channels assigned to tabs along the top of the dialog. There are three windows in the dialog, Downloaded, Skipped (already exists), and Failed. Make sure that the content that was downloaded is shown in the Downloaded column. If it is listed in the Failed column, select the file and then click the **Retry** button.

## Verify Branding Element Assignment

The deployed branding content should be verified to ensure that it can be assigned properly to the video keyers or audio over mixers.

Follow these steps to verify the Branding element assignment:

1. Press the **Send** button on a control panel Source Assignment panel (hardware or GUI) .
2. Select the **Category** button to which a still image or audio mix over branding source has been assigned.
3. Enter the source number that designates the desired source.

**Note** As an example, in [Figure 217 on page 316](#), “SMPTE Bars” is source number 11 in the Logo category.

4. Press any of the PST buttons on the Keyer or Audio panel (depending on the source type you wish to assign) that is illuminated in green to assign the selected source to that button.

The button will then display “Loading...” while the internal content is being loaded and will then display the source mnemonic upon successful load.

5. Press the appropriate PST button to activate the source on the PST monitor.
6. Verify the presence of the selected DVE source on the PST monitor or the presence of an audio over source by selecting the appropriate audio over mixer as the monitor point in the Audio sub-panel.



# Dual-Channel DVE Hardware Installation

This section describes the procedures for installing the Dual-Channel DVE (DVE) hardware which includes the DVE mezzanine board.

Grass Valley recommends that you follow the Hardware Installation procedure steps exactly. The procedure includes the following steps:

- [\*Removing the DVE Boards from the Packaging.\*](#)
- [\*Removing the Old DVE Board.\*](#)
- [\*Fastening the DVE Board to the Base Board.\*](#)

## DVE Board Installation

The following two sections will describe the DVE Board Installation process. You will need to remove the boards from the shipping packaging and use the suspension trays during the installation process. You will need to remove the old DVE board if this is an upgrade. You must align the connectors and the screw hole on the DVE board with the connectors and screw post on the Maestro processor board; then fasten them together.

### Removing the DVE Boards from the Packaging

Follow these steps to remove the DVE boards from the packaging:

1. Locate the box in which the DVE board(s) and software were shipped.
2. Open the box and remove the contents.

The box contains two suspension trays and an anti-static bag which will be used in the installation process. See [Figure 224](#).

Figure 224. DVE Shipping Box



The suspension tray is designed to cushion and protect the processor board while the DVE mezzanine board is installed. As illustrated in [Figure 225](#), the suspension tray is a stiff cardboard frame with a strong plastic suspension film covering the tray.

Figure 225. Shipping Box Suspension Tray





3. Place one suspension tray in the box with the suspension film facing upwards as shown in [Figure 226](#).

*Figure 226. Shipping Box with Suspension Tray Inserted*



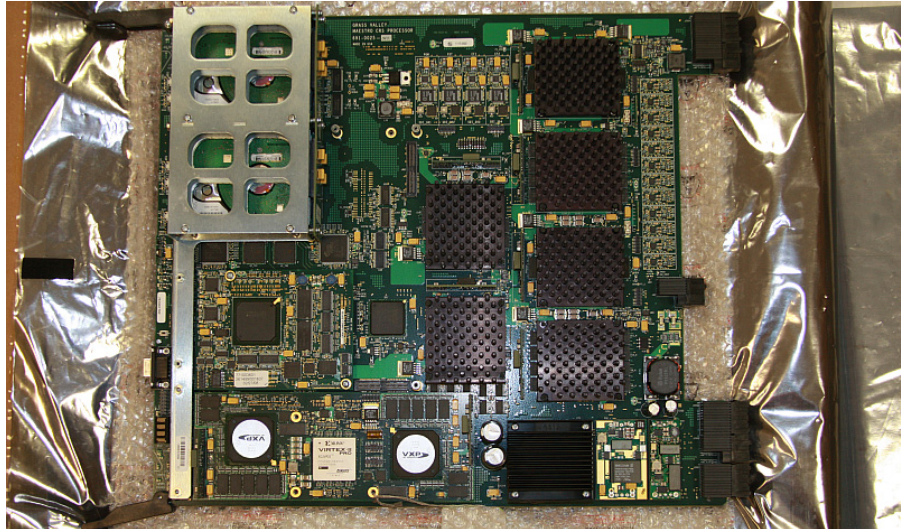
4. Open the velcro closure on the anti-static bag and open and position the bag over the suspension tray as illustrated in [Figure 227](#).

*Figure 227. Anti-Static Bag Open On the Suspension Tray*



5. Remove the Maestro processor board from its frame and place it on the anti-static bag as shown in [Figure 228](#).

Figure 228. Maestro Processor Board on Anti-Static Bag

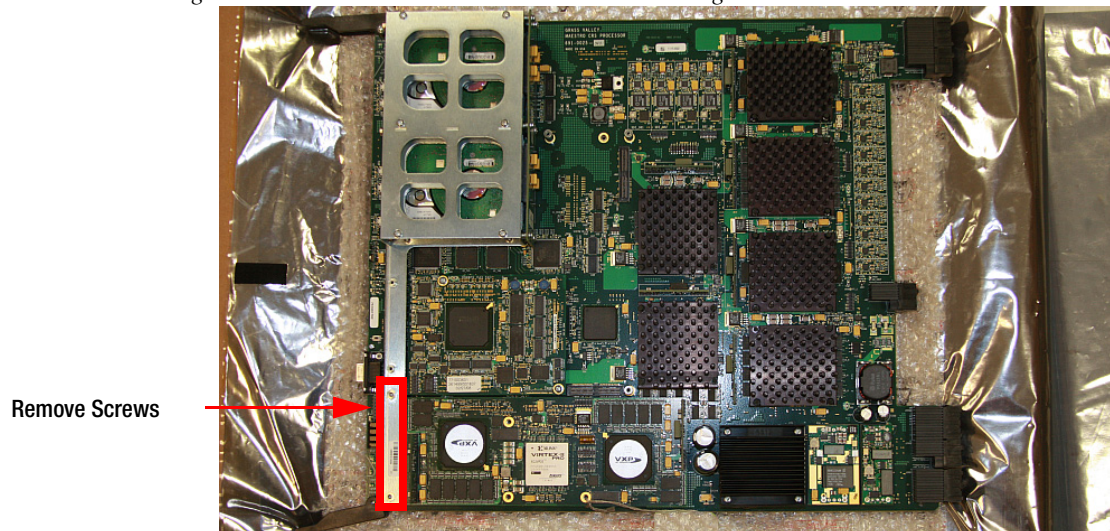


## Removing the Old DVE Board

You must remove the old DVE board if this is an upgrade. When the board has been removed place it in an anti-static bag and send it to Grass Valley. Contact Grass Valley Support for the complete instructions (see [page 4](#)).

1. Remove the Maestro processor board from its frame and place it on the anti-static bag as shown in [Figure 228](#).

Figure 229. Maestro Processor Board on Anti-Static Bag



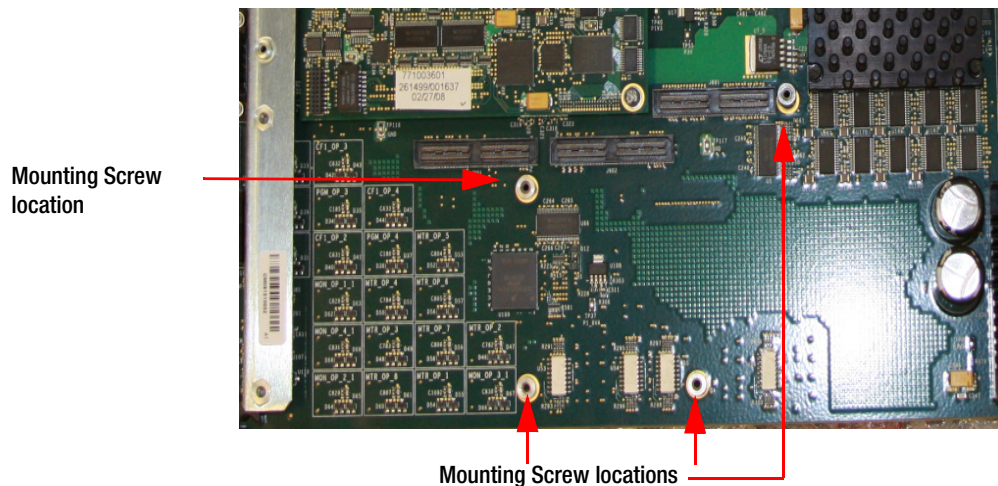


2. Remove the old DVE board carefully by removing the screws. Place the old DVE board in another anti-static bag.
3. Contact Grass Valley Support for instructions to return the board.

## Fastening the DVE Board to the Base Board

The connectors and the Mounting screw locations will be identified for the DVE board in the following figure (Figure 230). The DVE board should have been shipped with three (3) standoffs (one (1) short and two (2) long) and five (5) screws, which will be used to fasten the DVE board to the Base board.

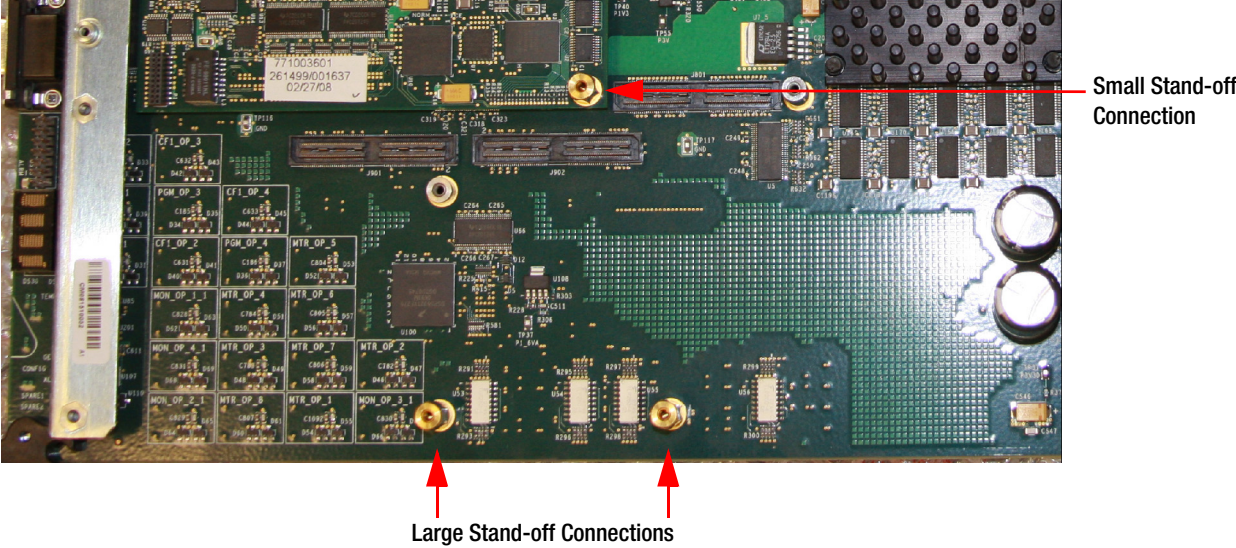
Figure 230. Old DVE Board



Follow these steps to install the DVE mezzanine board on the Maestro frame processor board:

1. Insert the stand-offs into the locations that are shown in Figure 231.
  - The small stand-off must be installed in the corner of the Processor board.
  - The large stand-offs must be installed on connections to the edge of the Main board.

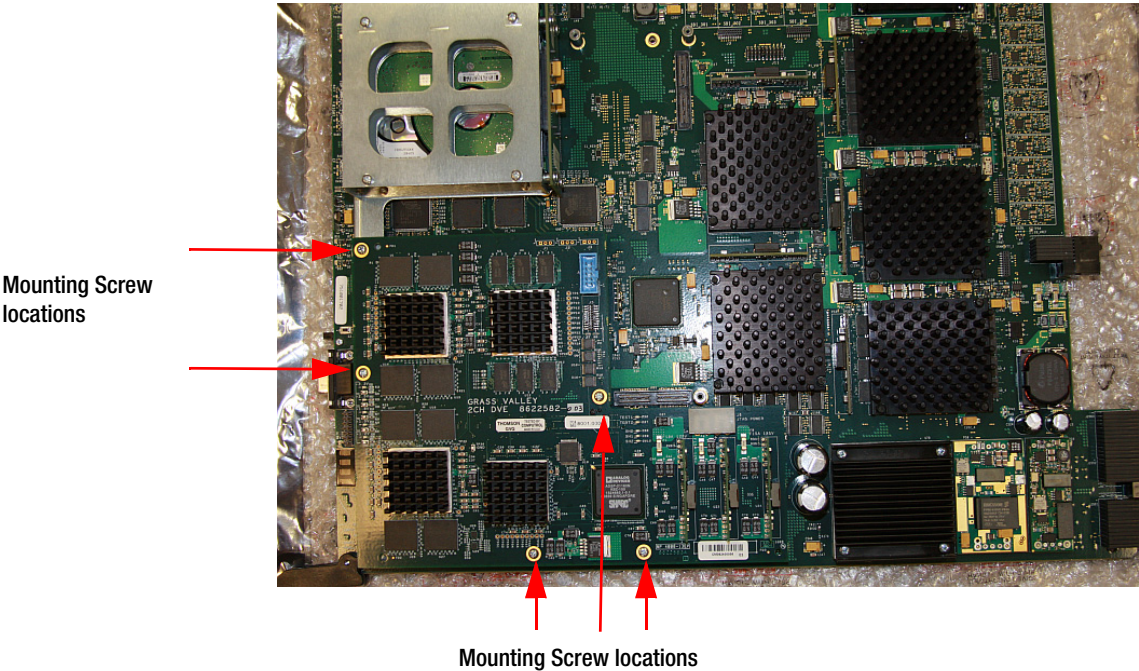
Figure 231. DVE Stand-off Locations



2. Place the DVE board over the Main board and align the connectors and screw holes on the DVE board with the connectors and stand-offs on the Maestro Main board.
3. Fasten the DVE board in place on the Maestro Main board using the mounting screws.

Figure 232 illustrates a DVE board installed.

Figure 232. DVE Board Installed on the Maestro Main Board



# DVE Configuration

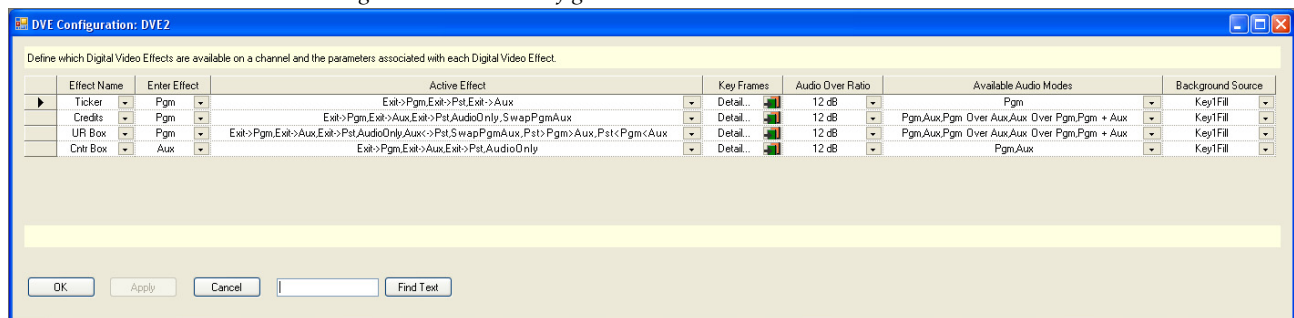
This section describes the steps that are needed to use the DVE option.

## DVE Configuration

**Note** For more information about the DVE option see the DVE section of the Maestro User manual (part # 0718482XX)

When the DVE Configuration option is selected, the editor will open a set panel. After naming the table, select “New.” The system will display a table similar to that shown in [Figure 233](#).

Figure 233. DVE Configuration



### Effect Name

Enter or select a name which describes the effect. This field is required and it cannot be blank. This name will appear on the top line of text in the **Effects** LCD button in the Effects section of the Control panel. Names that are longer than nine (9) characters will be truncated on the LCD button

### Enter Effect

Select an Enter effect from the drop-down list. The Enter Effect selection describes the way in which the effect will be presented as it transitions to air. The “Enter Effect” names describe which background video bus (Pgm, Aux, and Pst) will occupy the squeeze window and are on the Pgm bus at the end of the transition.

**Note** The source that occupies the squeeze window after entering an effect will always be on the Pgm bus regardless of which bus it was on when selected.

The available Enter effect choices are:

- **Pgm** - The Pgm source will end in the Pgm effect window and the AUX source will end up in the Aux effect window. No sources interchange roles. This effect is accomplished by PGM squeezing into the Pgm effect window revealing AUX squeezing into the Aux effect window.
- **Aux** - The AUX source will end up in the Pgm window and the PGM source will end up in the Aux effect window. The PGM source and AUX source will interchange roles, AUX source will become the PGM source and PGM source will become AUX source. This is effect is accomplished by “un-squeezing” AUX on top of PGM with AUX ending up in the Pgm effect window and PGM squeezing into the Aux effect window.
- **Pst** - The PST source will end up in the Pgm effect window and PGM source will end up as PST. AUX will end up in the Aux effect window and remain as AUX. PST and PGM will interchange roles. This is effect is accomplished by performing a full screen transition from PGM to an existing effect on PST.

### Active Effect

Select an Active Effect. When an effect is active (on-air), the “active effect” selection will determine the available Exit modes.

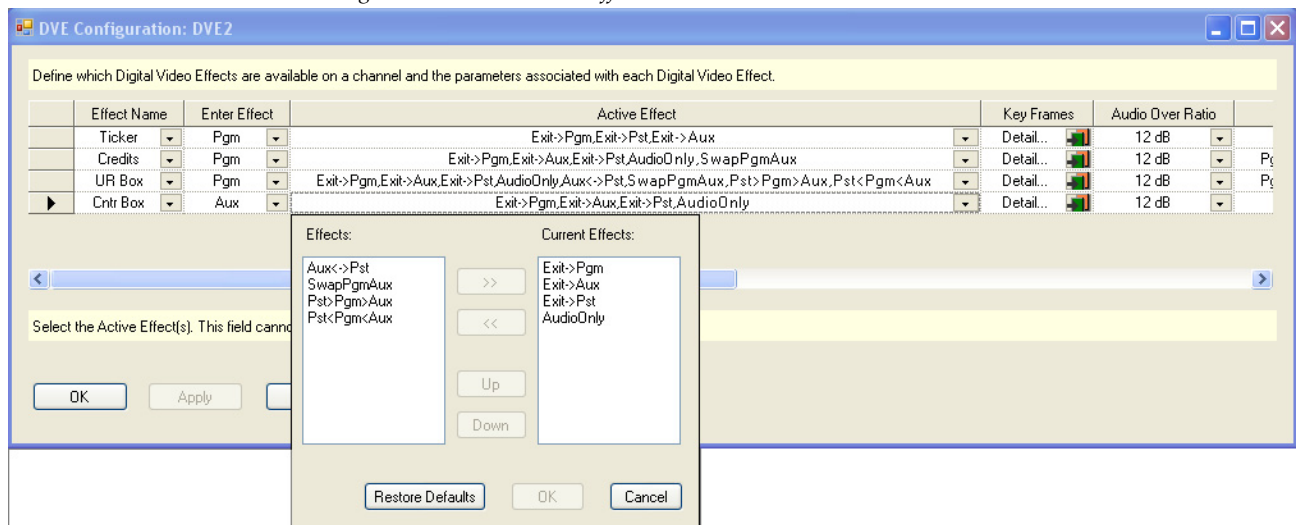
**Note** The default exit mode will be to reverse the process used to enter the effect. In other words, if program was squeezed revealing the Aux video, the default exit mode is to unsqueeze Pgm video and return to Pgm full screen. If Aux video was unsqueezed over Pgm, the default exit mode is to squeeze the Pgm (it was Aux when it was selected) until it disappears leaving the original Pgm video full screen. Other exit modes may be available depending on the choices selected from the list below.



The available choices are:

- Exit->Pgm - This exit mode unsqueezes the source in the squeeze window (Pgm) leaving the Pgm video full screen.
- Exit->Pst - This exit mode replaces the on-air effect with the video selected on the Pst bus.
- Exit->Aux - This exit mode squeezes the squeeze window (Pgm) until it disappears leaving only the background video (Aux) on screen. At the end of the transition, Aux video moves to the Pgm bus.
- AudioOnly - This exit mode transitions only the audio. The active video effect is unchanged. The audio that will be on-air after pressing the **TAKE** button is selected with the **DVE Audio Mode** button. Available audio modes are determined by the "Available Audio Mode" selections explained below.
- Aux<->Pst - This is a transition that replaces the current background video (Aux) with the video selected on the Pst bus.
- SwapPgmAux - This is a cut-only transition that swaps the background (Aux) and squeeze window (pgm) video. The selected transition rate and type are disabled.
- Pst>Pgm>Aux - This cut-only transition rotates the sources on all three busses in the direction indicated by the ">." The selected transition rate and type are disabled.
- Pst<Pgm<Aux - This cut-only transition rotates the sources on all three busses in the direction indicated by the ">." The selected transition rate and type are disabled.

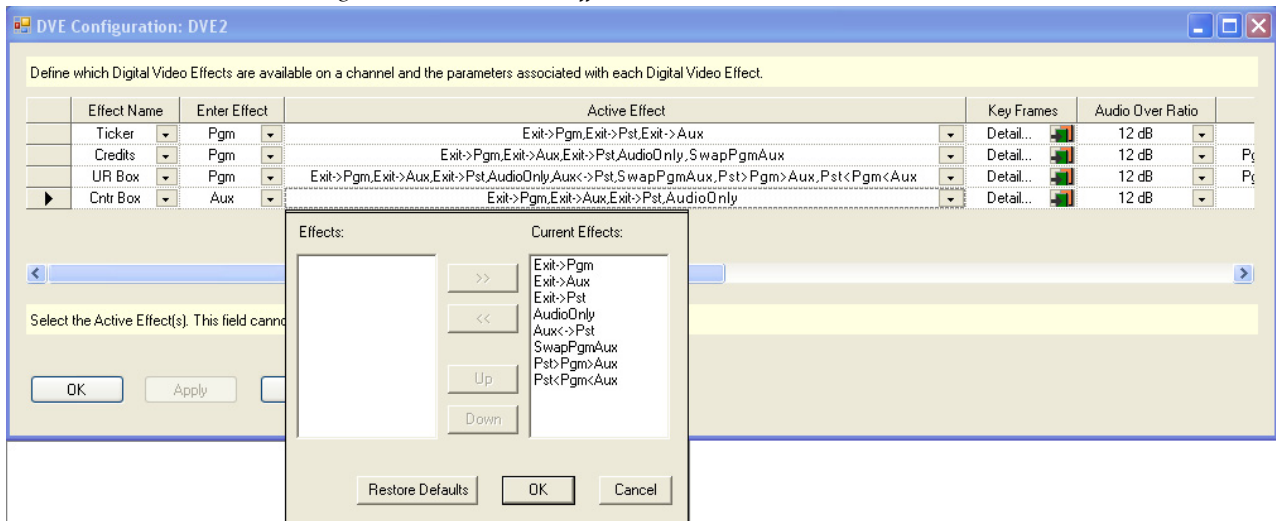
Figure 234. DVE Active Effect Selections



To make any or all of the choices above available once an effect is active, click on the preferred effects (Hold down the **CTRL** key while clicking to

make multiple selections) and click on the >> button to move the selections to the “Current Effects” window. See [Figure 235](#) for an example

Figure 235. DVE Active Effects Selected

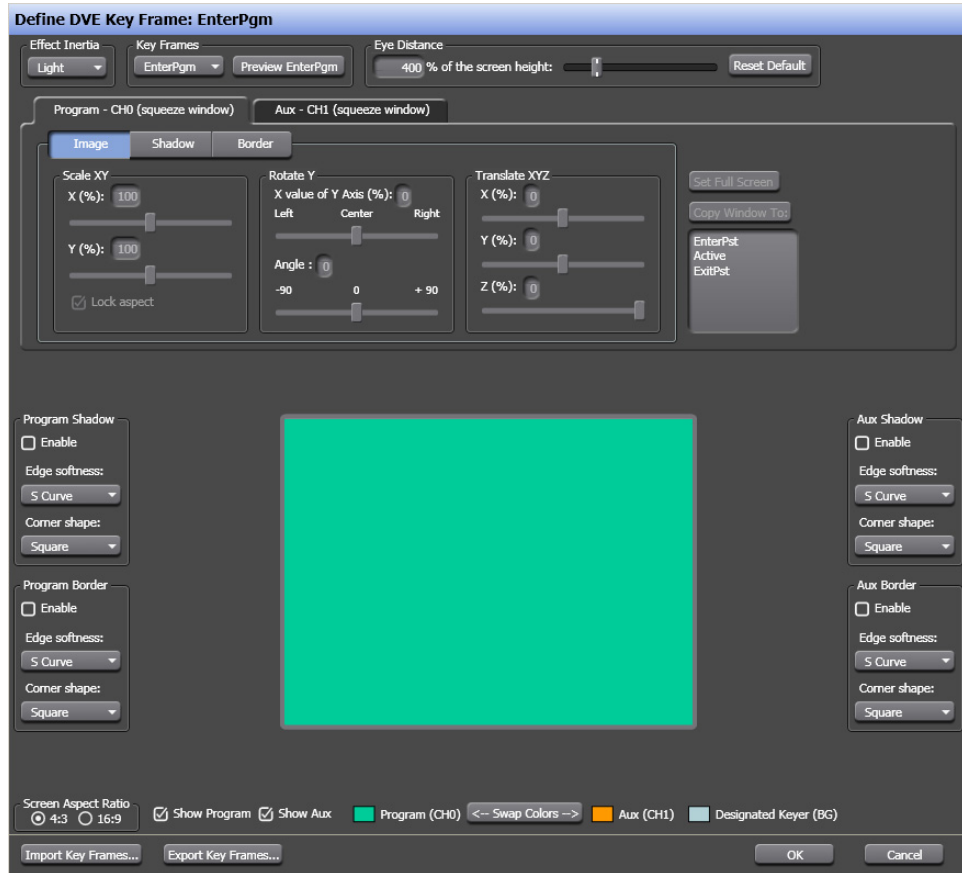


Click the **OK** button to make the selected effects the available active effects in the DVE configuration.

### Key Frame

Click the **Detail...** icon in the Key Frame column. The Define DVE Key Frame editor dialog will then appear ([Figure 236](#)).

Figure 236. Define DVE Key Frame Editor



The Define DVE Key Frame editor is used to create, edit, and assign key frame actions. This dialog's description and actions are described in the Maestro Visualization Tool section of the Maestro User manual (part# 071848202).

## Audio Over Ratio

Select the Audio Over Ratio from the drop-down list.

The audio over ratio sets the default mix-over ratio for the source designated as the “over”. This value defaults to 12 dB, which means the “over” audio will be louder by this value (12 dB in this case) when a mix-over is enabled.

**Note** A 0 dB mix-over means the both the background (Aux) and squeeze window (Pgm) audio will be mixed together at full level.

Audio over ratio choices are from 0dB to 24dB in 1dB increments.

Available Audio Modes

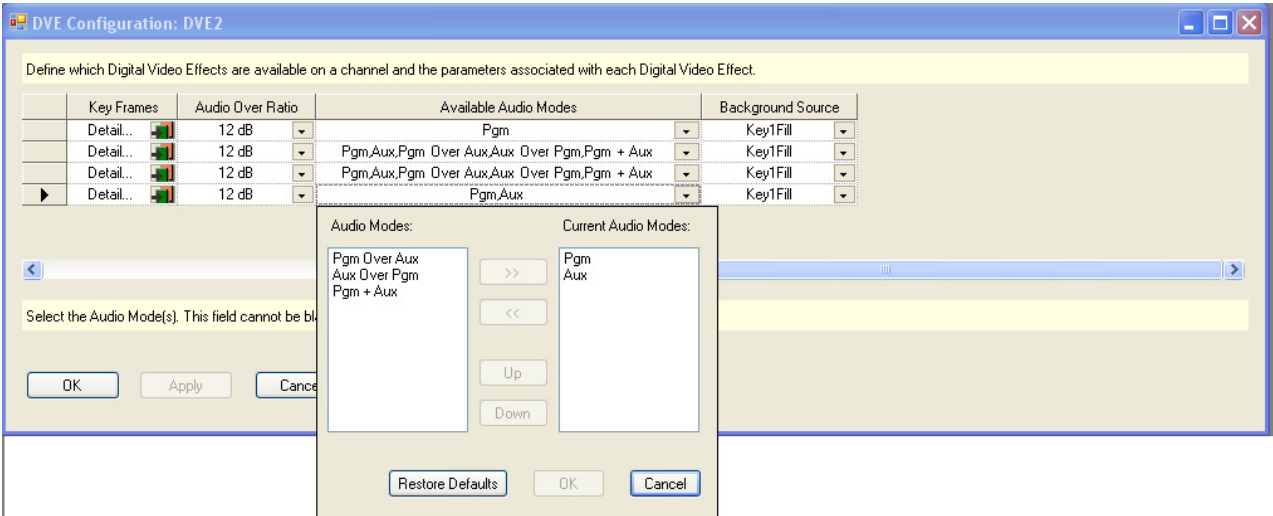
When an effect is active, audio from one or both on-air video sources may be selected. The audio mode may be selected before entering the effect or while the effect is active by selecting the Audio Only exit mode.

The available audio modes include the following:

- Pgm - Audio from the Pgm source only
- Aux - Audio from the Aux source only
- P/A - Pgm audio as an over to Aux audio
- A/P - Aux audio as an over to Pgm audio
- P+A - Pgm and Aux audio both at full level

Only the audio modes selected in the DVE configuration will be available for selection before entering an effect or as an Audio Only transition while in the effect. See [Figure 237](#) for an example.

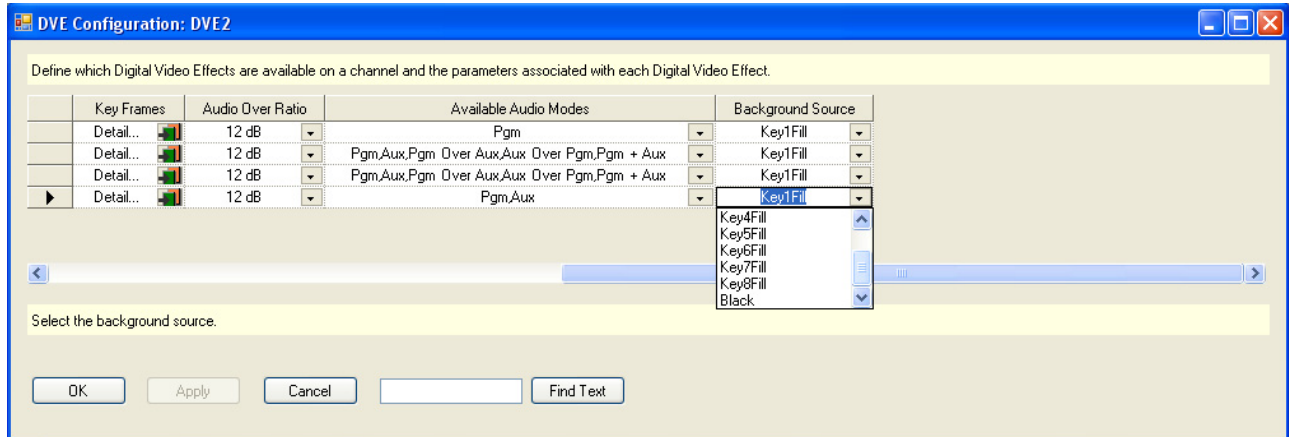
Figure 237. DVE Audio Mode Selection



Background Sources

Click the Background Sources arrow. The Background Source options will then appear ([Figure 238](#)). The options are Key1-8 fill and Black.

Figure 238. Background Sources

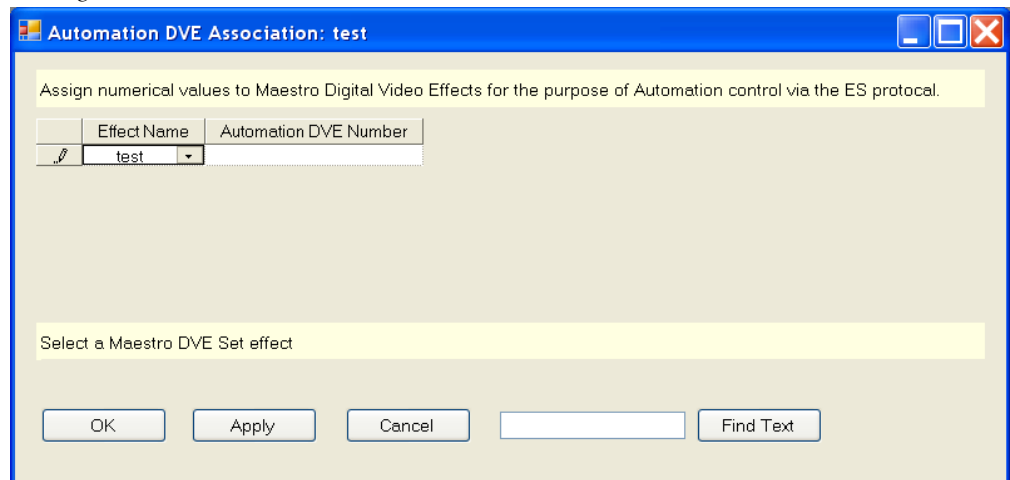


Select the preferred Background source.

## Automation DVE Association

The Automation DVE Association table is used to assign a numerical value to a Maestro Digital Video effect. This number is used for automation control through the ES protocol.

Figure 239. Automation DVE Association



### Effect Name

Select the preferred Maestro DVE Set effect from the Effect Name drop-down list.

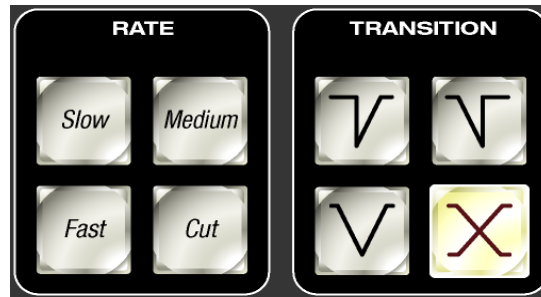
### Automation DVE Number

Enter a number in the Automation DVE Number field. The number can be between 1 and 255.

## Transition Configuration

Maestro includes standard transitions in which video and audio transitions at the same time, at the same rate, and in the same manner. These standard transitions are selected with the control panel buttons shown in [Figure 240](#).

Figure 240. Control Panel Transition Buttons



Maestro also includes the ability to create configured transitions in the Maestro Configuration Editor. With configured transitions, full control over the rates and transition styles is separately defined for video and audio signals. It is possible to create transitions in which video and audio begin and end their transitions independently of one another.

Independent transitions are configured with two tables in the Maestro Configuration Editor - the Transition Configuration table and the Transition Association table.

The Transition Configuration table is used to define the video and audio transition parameters for each configured transition.

The Transition Association table is used to assign a unique transition ID number to each configured transition. This number is used to recall a configured transition for use from the control panel and by automation to select a configured transition.

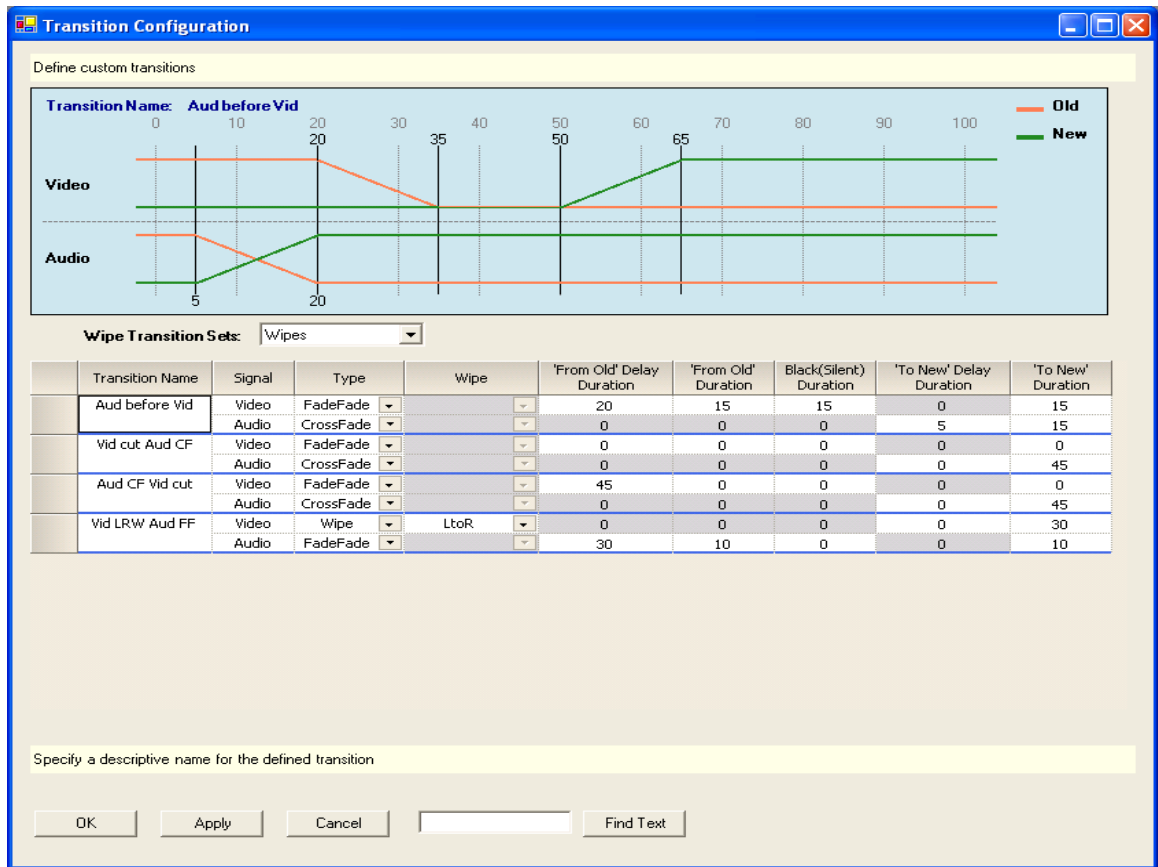
### Independent Transition Configuration

To configure independent transitions, select “Transition Configuration” in the Maestro Configuration Editor. The Transition Configuration table opens in which the preferred video and audio transition parameters are entered for each transition definition.

[Figure 241](#) shows a sample Transition Configuration table in which four independent transitions have been defined. Each parameter is explained in detail below.

**Note** When defining a new transition or modifying an existing transition configuration, the entry of the parameters builds a graphical representation of the delay, rate and type associated with the video and audio signals. The orange line represents the old (transitioning off air) signal and the green line represents the new (transitioning on air) signal.

Figure 241. Transition Configuration Table



## Wipe Transition Sets Drop-Down List

A wipe set may be selected for use in video signal transitions if one or more wipe transition sets have been defined. The defined sets are displayed in the drop-down list box under the graphical display area.

## Transition Name

Enter a descriptive name in this field that defines the actions performed by the named transition. In the example highlighted in Figure 241, the name of the first transition is "Aud before Vid." This transition will switch the audio from the old source to the new source before beginning the video transition.

## Signal

The transition parameters for video and audio signals are defined separately. Video parameters are defined in the upper section of each transition definition. Audio parameters are defined in the lower section.

## Type

A transition type is specified for both video and audio signals. The possible selections for the video signal are FadeFade, CrossFade and Wipe. The pos-

sible selections for the audio signal are FadeFade and CrossFade. The type selection enables or disables the entry of other transition parameters.

### **Wipe**

The preferred transitional wipe effect name is selected from the drop-down list box. This parameter applies to the video signal only and is not active for audio signals.

**Note** Wipes are represented graphically as a cross-fade in the video signal.

### **‘From Old’ Delay Duration**

The delay period, expressed as a number of frames, from the time the transition begins (with a press of the **TAKE** button or via automation) until the transition of the indicated signal begins. In the example in [Figure 241](#), there is a 20 frame delay after the transition is initiated before the video signal begins to transition from the old to the new source. This allows the audio transition to complete before the video transition begins.

If CrossFade or Wipe is the selected transition type for a video signal, this field is disabled (grayed out) as it is not applicable.

If CrossFade is the selected transition type for an audio signal, this field is disabled (grayed out) as it is not applicable.

### **‘From Old’ Duration**

If a FadeFade type was selected, this is the number of frames in which the old source will fade to black for a video signal or fade to silent for an audio signal.

If CrossFade or Wipe is the selected transition type for a video signal, this field is disabled (grayed out) as it is not applicable.

If CrossFade is the selected transition type for an audio signal, this field is disabled (grayed out) as it is not applicable.

### **Black (Silent) Duration**

If a FadeFade type is selected, this is the number of frames for which a video signal will remain at black or an audio signal will remain silent before the new source begins to fade in.

If CrossFade or Wipe is the selected transition type for a video signal, this field is disabled (grayed out) as it is not applicable.

If CrossFade is the selected transition type for an audio signal, this field is disabled (grayed out) as it is not applicable.



### **‘To New’ Delay Duration**

If Wipe is the selected video type or CrossFade is the selected video or audio type, this is the number of frames of delay after the transition begins before the transition to the new source begins.

If FadeFade is the selected video or audio type, this field is disabled (grayed out) as it is not applicable.

### **‘To New’ Duration**

Once the transition to the new video or audio source begins (regardless of type selected) this is the duration, in frames, from the beginning of the new source transition until the transition to the new source is complete.

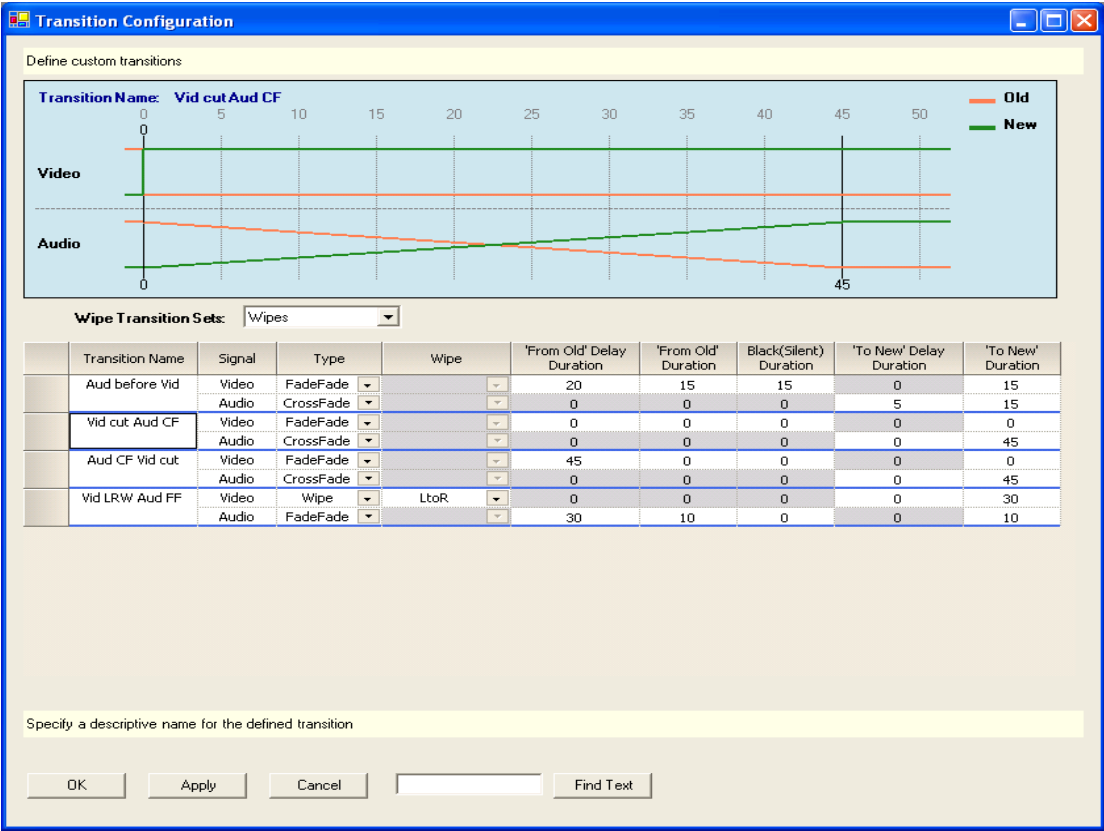
Looking at the configuration for the “Aud before Vid” transition in [Figure 241](#) above, we can see from the graphical representation that the entered parameters define a transition with the following characteristics:

- The video transitions as a FadeFade which means the old source fades out before the new source fades in.
- The audio transition is a cross fade between the old source and the new source.
- The video transition does not begin until 20 frames after the transition is initiated.
- The audio transition begins 5 frames after the transition is initiated.
- The audio cross fade transition from the old source to the new source takes a total time of 15 frames (1/2 second in 60 [59.94] Hz standards).
- The audio transition is complete before the video transition begins.
- When the video transition begins, the old source fades to black in 15 frames.
- The video remains at black for 15 frames.
- The new source fades in over 15 frames.
- The total time for both the audio and video transition is 65 frames (2 seconds and 5 frames in 60 [59.94] Hz standards).

## **Independent Transition Examples**

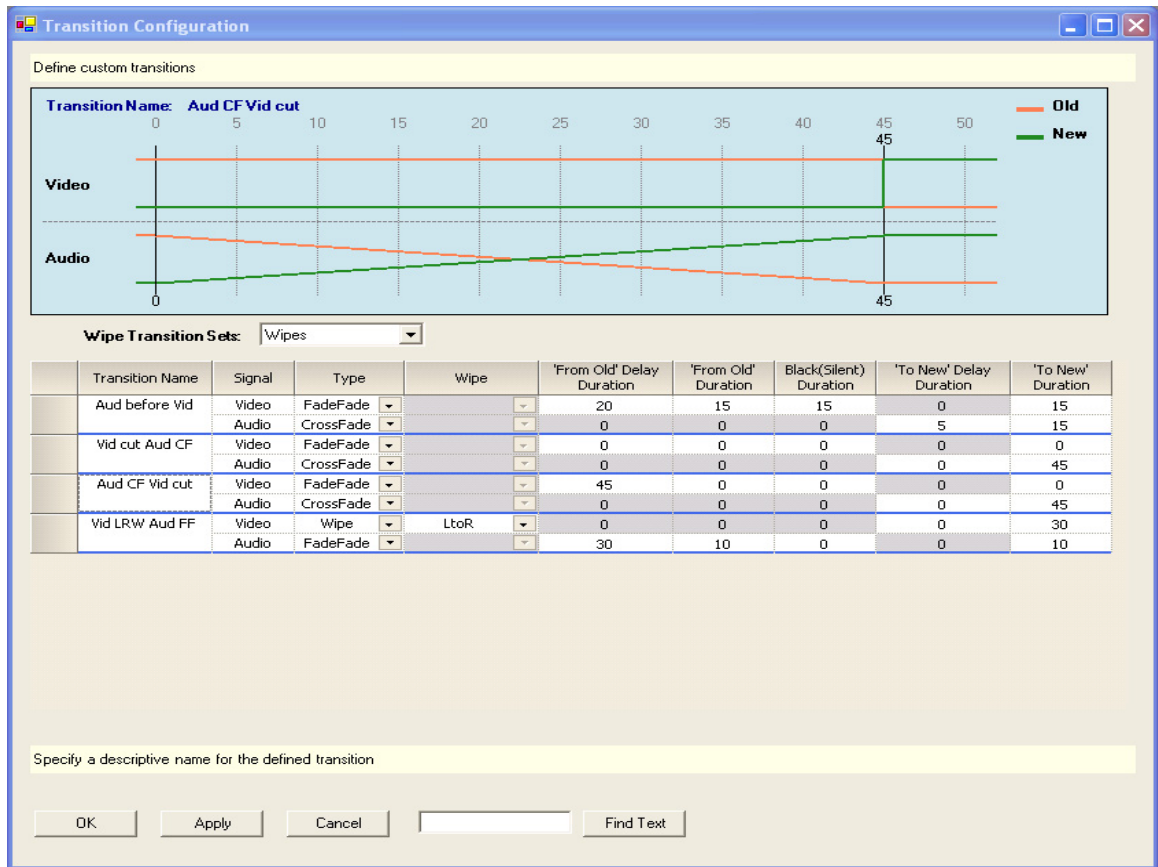
Additional sample transition configurations and descriptions are presented in [Figure 242](#), [Figure 243](#) and [Figure 244](#).

Figure 242. Video Cut - Audio Cross Fade Transition



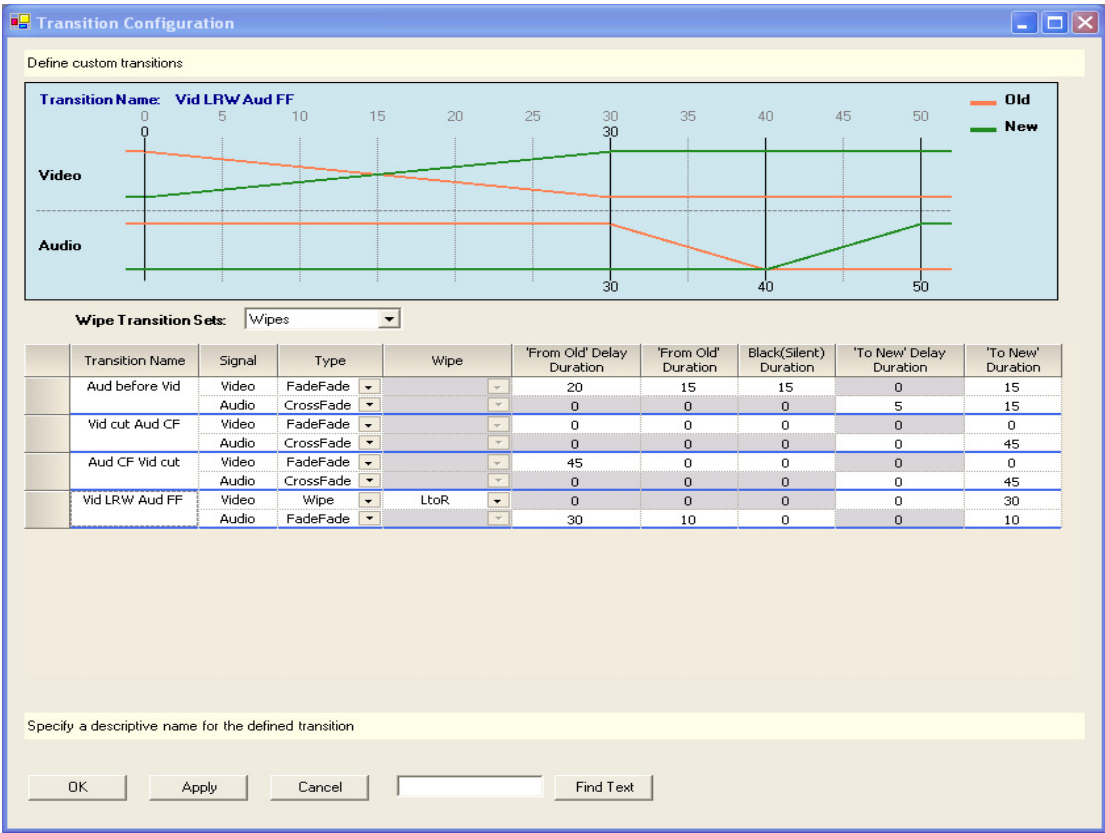
In this transition, video cuts from the old source to the new source immediately upon execution of the transition. The audio cross fades from the old to the new source in 45 frames (1 1/2 seconds in the 60 [59.94] Hz standard).

Figure 243. Audio Cross Fade - Video Cut Transition



In this transition, audio begins to cross fade immediately from the old to the new source upon execution of the transition. The cross fade takes 45 frames to complete (1 1/2 seconds in the 60 [59.94] Hz standards) after which video cuts from the old source to the new source.

Figure 244. Video Left to Right Wipe - Audio Fade Out/Fade In Transition



This transition starts with a video wipe from left to right across the screen. The wipe takes 30 frames to complete after which the old audio fades to silent in 10 frames and the new audio fades in over 10 frames. The total transition time is 50 frames.

**Note** Wipes are represented graphically as a cross-fade in the video signal.

All of the transitions in the above examples demonstrate configurations in which either the audio or video signal transitions after the other signal transition is complete. Of course, it is possible for a configured transition to transition both signals simultaneously, or to have one signal transition slightly offset from the other. Since the audio and video signal transitions are configured independent of one another, there is total flexibility in the transition definitions.

## Transition Associations

After configuring independent transitions, the transitions are assigned a unique identifying number, the transition association number, by which the configured transitions will be recalled from the control panel or activated by automation. Figure 245 shows the assignment of transition association numbers 10-13 to the four custom transitions in the above examples.

**Note** The standard transitions (Cross-Fade, Fade-Cut, Cut-Fade and Fade-Fade) have static transition association numbers (0-3) which may not be changed or reassigned to configured transitions. The standard transitions and their association numbers are grayed out and cannot be changed.

Figure 245. Transition Association Table

Assign numerical values to Maestro Transition Types for the purpose of manual recall from the Control Console and Automation selection via the ES protocol

Transition Name	Transition Association Number
Cross-Fade	0
Fade-Cut	1
Cut-Fade	2
Fade-Fade	3
Aud before Vid	10
Vid cut Aud CF	11
Aud CF Vid cut	12
Vid LRW Aud FF	13

OK Apply Cancel Find Text

In order to make configured transitions available for user activation from the control panel, the preferred Transition Association Set for each channel must be selected in the Channel Setup table.

**Note** It is possible to define multiple Transition Association Sets. A particular configured transition may be included in more than one Transition Association Set. If this is the case, it is possible that the same configured transition may have a different Transition Association Number in each set in which it is included. For example, the configured transition “Aud before Vid” may be number 10 in the “Trans Types” set, as seen in [Figure 245](#), and number 99 in another set.

## VBI Passthrough

You can decide which Vertical Blanking Interval (VBI) lines should pass through to Maestro output and which should be blocked. These configurations are Video Standard dependent.

To configure VBI passthrough, do the following:

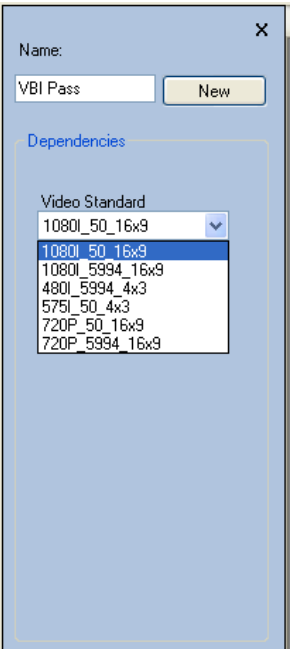
1. In the Configuration Editor, create one or more VBI Passthrough tables by selecting “VBI Passthrough” in the “7th Step: Effect Configuration” area of the Configuration Editor.

**Note** A different VBI passthrough definition can be assigned to each Maestro channel. Create a VBI Passthrough table for each desired VBI passthrough definition

2. As VBI passthrough configuration is dependent upon the video standard, select the appropriate video standard for the new VBI passthrough definition as shown in [Figure 246](#).

**Note** There is a known issue when configuring VBI Pass-through settings for the 575i50, 1080i50 and 1080i5994 standards. See the VBI Pass-Through Offset Workaround section in the 2.0 version of the Maestro Release Notes (Part # 071850609)

Figure 246. VBI Passthrough Video Standard Selection



When a VBI Passthrough table is created, a table similar to that illustrated in [Figure 129 on page 219](#) appears.

**Note** The VBI lines in the selected video standard are represented in the VBI Passthrough table. Depending on the video standard selected, the VBI Passthrough table may not be the same as illustrated in [Figure 129 on page 219](#).

# Specifications

## Mechanical

Table 18. Maestro Mechanical Specifications

	Depth <sup>a</sup>	Width	Height	Weight <sup>b</sup>	Rack Units
<b>Main frames</b>					
4 RU Maestro/Concerto Frame	19 in. / 483 mm	19 in. / 483 mm	7 in. / 178 mm	35 lb. / 16 kg	4
8 RU Maestro/Concerto+ Frame	20.5 in. / 521 mm	19 in. / 483 mm	14 in. / 356 mm	70 lb. / 32 kg	8
<b>MADI conversion frames</b>					
AES In / MADI Out	TBD	19 in. / 483 mm	1.75 in. / 45mm	TBD	1
MADI In / AES Out	TBD	19 in. / 483 mm	1.75 in. / 45mm	TBD	1
Analog audio In / MADI Out	TBD	19 in. / 483 mm	1.75 in. / 45mm	TBD	1
MADI In / Analog Audio Out	TBD	19 in. / 483 mm	1.75 in. / 45mm	TBD	1
<b>Hardware control panels</b>					
MAE-4X2STD-CP	approx. 5.3 in. / 133 mm	approx. 25.7 in. / 653 mm <sup>c</sup>	approx. 18.3 in. / 464 mm <sup>c</sup>	25 lb. / 12 kg	N/A
MAE-5X2STD-CP	approx. 5.3 in. / 133 mm	approx. 31.5 in. / 800 mm <sup>d</sup>	approx. 18.3 in. / 464 mm <sup>d</sup>	33 lb. / 15 kg	N/A
<b>GUI Control Panel</b>					
Touch screen LCD display (when desk mounted)	8 in. / 203 mm	17.5 in. / 445 mm	Minimum: 14.5 in. / 368 mm Extended: 19.75 in. / 502 mm	TBD	N/A
Touch screen LCD display (when rack mounted)	3.75 in. / 95 mm	19 in. / 483 mm	14 in. / 356 mm	TBD	8
CPU	24 in. / 610 mm	19 in. / 483 mm	7 in. / 178 mm	TBD	4
Keyboard with built-in touchpad (when desk mounted)	9.5 in. / 241 mm	15.75 in. / 400 mm	1.75 in. / 45 mm	TBD	N/A
Keyboard with built-in touchpad (when rack mounted)	13.5 in. / 343 mm	19 in. / 483 mm	1.75 in. / 45 mm	TBD	1

<sup>a</sup> Allow a minimum of four inches behind the frames for cabling

<sup>b</sup> All weights approximate.

<sup>c</sup> Indicated measurement is for top surface of panel. For cabinet cutout dimensions, see [page 58](#).

<sup>d</sup> Indicated measurement is for top surface of panel. For cabinet cutout dimensions, see [page 59](#).

# Environmental

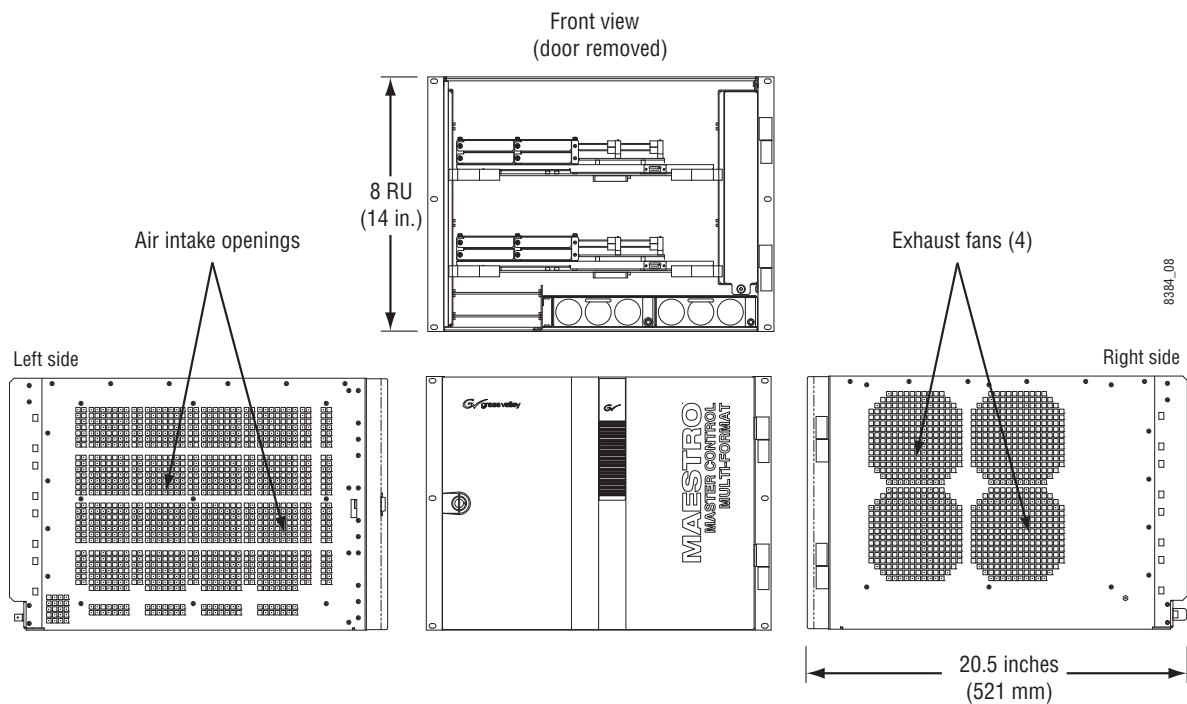
Table 19.

Environmental Characteristics (SD and HD operation with required forced air cooling)	
Operating temperature	32 to 106 degrees F (0 to 40 degrees C)
Storage temperature	-13 to 185 degrees F (-25 to 85 degrees C)
Full specifications met	60 to 95 degrees F (15 to 35 degrees C) (after 30 minute warm-up)
Relative humidity	Up to 95% (noncondensing)

## Air Intake/Exhaust Locations

### 8 RU Frame

Figure 247. Two-channel Maestro system in 8 RU frame



The Maestro 8 RU frame ventilation system draws cooling air through openings on the left side. Warm air is exhausted through four fans located on the right side. The left and right sides must therefore be kept clear of obstructions. It is not necessary to leave open space above or below the chassis.

**Note** Heat-generating equipment must not be mounted beneath the Maestro chassis.



## 4 RU Frame

Air intake is on the left, exhaust on the right.

# Electrical

Unless specified otherwise, the following specifications apply to a single channel (that is, one video plus associated audio channels)

Table 20. Electrical Specifications

Power	
8 RU Maestro/Concerto Frame	100-240 V, 10-5 A, 50/60 Hz, auto-sensing
4 RU Maestro/Concerto Frame	100-240 V, 5-2.5 A, 50/60 Hz, auto-sensing
Hardware Control Panels	
MAE-4X2STD-CP	100-240 V, 0.5-0.2 A, 50/60 Hz, auto-sensing
MAE-5X2STD-CP	100-240 V, 0.6-0.25 A, 50/60 Hz, auto-sensing
Touch Screen (GUI) PC	Antec SP-450 Power Supply: 115 V, 9 A / 230 V, 5 A (manual voltage adjustment required). 50/60 Hz
Touch Screen (GUI) Monitor	100-240 V, 0.7-0.35 A, 50/60 Hz, auto-sensing
Video Standards	
Interlaced Scan	
1080/I, 59.94 Hz, 16x9 HD (ATSC)	SMPTE 274M-2005, ATSC Table 3 @ 1.5 Gb/s
1080/I, 50 Hz, 16x9 HD	SMPTE 274M-2005 @ 1.5 Gb/s
575/I, 50 Hz, 4x3 SD (PAL)	BT.601-4 (normal 625/50 @ 270 Mb/s)
480/I, 59.94 Hz, 4x3 SD (NTSC)	SMPTE 125M, SMPTE 259M, ATSC Table 3, (normal 525/60 @ 270 Mb/s)
Progressive Scan	
720/P, 59.94 Hz, 16x9 HD (ATSC)	SMPTE 296M-2001, ATSC Table 3 @ 1.5 Gb/s
720/P, 50 Hz, 16x9 HD	SMPTE 296M-2001
Transport	SMPTE 259M*, SMPTE 292M *Except rise and fall times are according to SMPTE 292M
Video Reference	
SD Operation	Analog black burst (preferred). Must be compatible with input video standard (as listed above). Although any constant APL color test signal may be used for SD sync, the preferred reference signal is analog black burst.
HD Operation	Analog black burst preferred. Use of HD tri-level sync (as appropriate for video standard) is acceptable but does not support VITC or 10-field ID

Table 20. Electrical Specifications

VITC / 10-Field ID	SMPTE 318M-A, 318M-B, and 318M-AB are supported. For 480/59.94 (NTSC) operation, VITC must be on line 14 or 277 (or both) per SMPTE RP 164-1996. For 575/50 (PAL) operation, VITC must be on line 19 or 332 (or both) per EBU Tech Std N14-1998.
Connector	1 - 75 ohm BNC, looping
<b>Video Inputs</b>	
Number and type	3 primary (Background A, Background B, Background C) for PGM, PSt and Aux buses 1 video for embedded breakaways (Background D) 4 Key Cut 4 Key Fill
Connector	75 ohm BNC
Return loss	> 15 dB 270 Mbps
Amplitude	800 mV +/- 10%
<b>Video Outputs</b>	
Number and type	2 Program 2 Preview 2 Clean Feed 1 (background video only) 2 Clean Feed 2 (background video plus upstream keying)
<b>Keyers</b>	
Key signal inputs	4, each with Cut and Fill. Keys can be inserted "upstream" (paired with the background video) or "downstream" (can persist even when background video is changed).
Key Type	Additive
<b>Timing</b>	
Input timing requirement	+/- 1/2 line with respect to reference input
<b>Video Delay</b>	
With DVE option	1 frame plus approximately 1 line
Without DVE option	Approximately 1 line
<b>Audio Specifications</b>	
Audio Standard	AES-1992 (r1997) 1999-11-23 printing
Dolby E	
Pass through	Standard  For NTSC, Dolby E Pass through is switched on line 10. For PAL, Dolby E Pass through is switched on line 6.
Rear Panel Types	75 ohm (BNC connectors) or 110 ohm (25-pin D connectors)
<b>Audio Inputs</b>	
Signal Type	48 kHz AES3. All AES inputs will accept synchronous/asynchronous signals from 30 to 50 kHz sample rate. Dolby E must be synchronous with video reference

Table 20. Electrical Specifications

Number and Type	4 stereo pairs, Background A 4 stereo pairs, Background B 4 stereo pairs, Audio Over A 4 stereo pairs, Audio Over B 4 stereo pairs, Monitoring
Audio Outputs	
Signal Type	48 kHz AES3
Number and Type	AES: 8 channels standard, each with Program, Clean Feed, Metering, and Monitoring  Embedded: 16 channels, each with Program, Clean Feed, and Preset  MADI: 16 channels, each with Program, Clean Feed, Preset, and Metering
Analog Audio	Requires external A-D/D-A converter
Embedded Audio	SMPTE 272M (SD) and SMPTE 299M (HD)
AES Reference	
Sample rate	48 kHz sample rate only. Use of AES reference is recommended for all applications except Dolby E systems (Dolby E uses the video reference). Using the AES reference preserves correct audio phasing in multi-channel systems.
Connector	BNC, looping, 1 V. <i>Note: when not in use, this connector must be terminated.</i>
<b>Control</b>	
LAN	10/100 Ethernet: 2 ports – one for facility LAN, one for control LAN
Console RS-232 Serial	Two: One DB-9F connector port on rear panel, one at front edge of Processor PCB, connected in parallel
Automation RS-422	One DB-9F connector port
Tally	Via GPIO port:  Source tally mode for Encore and Jupiter-controlled systems (16 contact closures maximum). Current source required for each tally lamp; 24 V, 250 mA maximum.  Bus tally mode for Jupiter/MI-3040 systems (40 tally lights per MI-3040)
Router Control	RS-422, One DB-9F connector port.
Meta Data	Automatic switching of Dolby E metadata arriving with background audio A and B to the Program, Clean Feed 1, and Monitor outputs. Note: the functions of this connector are not yet implemented.
EAS switching	Via TTL trigger from EAS receiver to Maestro GPIO port. 3-10 VDC, 4.25 mA maximum
Linear Time Code Input	Balanced, Hi-Z, accessed thru DB-44 "GPIO" connector
Vertical Interval Time Code Input	As supplied on video reference signal
Alarm	SMPTE 269M-1999 (rear-panel BNC)
<b>Concerto Input/Output Boards</b>	
For Concerto specifications, refer to the Concerto manual	

## Operating Transitions

For a summary of operating transitions, please see [Primary On-air Transitions on page 30](#).

# *Start and Reset Procedures*

## **Frame Processor**

To start or reset the Processor board:

1. Power on.
2. Press the Reset switch S3 (this is a small black momentary switch on the front edge of processor board, just left of the 9-pin D connector).
3. Telnet to the Processor board. Run the following script commands:

```
<ixld_sdkw  
<loadaltabase  
<loadalta  
nvRAMmessageclear  
startSystem
```

## **PCI Panel Server**

To reset the PCI Panel Server board, press the “Reset” button on the rear plate.

The PCI Panel Server board must be mounted in a PC (and connected to the Maestro networks) when there is no hardware control panel in the system.



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