CV™-20 Mixing Console
Owner's Manual

Important Precautions

1. **Save the carton and packing materials!** Should you ever need to ship the unit, use only the original factory packing.

   For replacement packaging, call Crest Audio's Customer Service Department directly.

2. **Read all documentation before operating your equipment.** Retain all documentation for future reference.

3. **Follow all instructions printed on unit chassis for proper operation.**

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4. **Never hold a power switch or circuit breaker in the "on" position, if it won't stay there by itself!**

5. **Do not use the unit if the electrical power cord is frayed or broken.** The power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them.

6. **Always operate the unit with the AC ground wire connected to the electrical system ground.** Precautions should be taken so that the means of grounding of a piece of equipment is not defeated.

7. **Damage caused by connection to improper AC voltage is not covered by any warranty.** Mains voltage must be correct and the same as that printed on the rear of the unit.

8. **Do not ground any hot** (red) **terminal.**

   Never connect a hot (red) **output to ground or to another hot** (red) **output!**

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9. **Power down and disconnect units from mains voltage before making connections.**

10. **Do not drive the inputs with a signal level greater than that required to enable equipment to reach full output.**

11. **Do not run the output of any amplifier channel back into another channel's input.**

    Do not parallel- or series-connect an amplifier output with any other amplifier output.

    Crest Audio is not responsible for damage to loudspeakers for any reason.

12. **Do not connect the inputs or outputs of amplifiers to any other voltage source:** such as a battery, mains source, or power supply, regardless of whether the amplifier is turned on or off.

13. **Connecting amplifier outputs to oscilloscopes or other test equipment while the amplifier is in bridged mono mode may damage both the amplifier and test equipment!**

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14. **Do not spill water or other liquids into or on the unit, or operate the unit while standing in liquid.**

15. **Do not block fan intake or exhaust ports.**

    Do not operate equipment on a surface or in an environment which may impede the normal flow of air around the unit: such as a bed, rug, weathersheet, carpet, or completely enclosed rack.

16. **If the unit is used in an extremely dusty or smoky environment:** the unit should be periodically blown free of foreign matter.

17. **Do not use the unit near stoves, heat registers, radiators, or other heat producing devices.**

18. **The power cord of equipment should be unplugged from the outlet when left unused for a long period of time.**

Service Information

Do not remove the cover!
Removing the cover will expose you to potentially dangerous voltages. There are no user serviceable parts inside.

Equipment should be serviced by qualified service personnel when:

A. The power supply cord or the plug has been damaged.

B. The equipment has been exposed to rain.

C. The equipment does not appear to operate normally, or exhibits a marked change in performance.

D. The equipment has been dropped, or the enclosure damaged.

To obtain service:
Contact your nearest Crest Audio Service Center, Distributor, Dealer, or Crest Audio at 201.909.8700 USA or visit www.crestaudio.com for additional information.

email techserve@crestaudio.com

This symbol is used to alert the operator to follow important procedures and precautions detailed in documentation.

This symbol is used to warn operators that uninsulated "dangerous voltages" are present within the equipment enclosure that may pose a risk of electric shock.

CV™-20
Owner's Manual

Model Number : _____

Serial Number : _____

opt- external PSU Serial Number : _____

Owner : _____

Purchase Date : _____

Dealer Name : _____

Dealer Number : _____

Install Date : _____

Installed By : _____

Contact Number : _____

Intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

Intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

CAUTION: Risk of electrical shock — DO NOT OPEN!
CAUTION: To reduce the risk of electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

WARNING: To prevent electrical shock or fire hazard, this apparatus should not be exposed to rain or moisture, and objects filled with liquids, such as vases, should not be placed on this apparatus. Before using this apparatus, read the operating guide for further warnings.

Este símbolo tiene el propósito, de alertar al usuario de la presencia de “(voltaje) peligroso” sin aislamiento dentro de la caja del producto y que puede tener una magnitud suficiente como para constituir riesgo de descarga eléctrica.

Este símbolo tiene el propósito de alertar al usario de la presencia de instruccones importantes sobre la operación y mantenimiento en la información que viene con el producto.

PRECAUCION: Riesgo de descarga eléctrica ¡NO ABRIR!
PRECAUCION: Para disminuír el riesgo de descarga eléctrica, no abra la cubierta. No hay piezas útiles dentro. Deje todo mantenimiento en manos del personal técnico cualificado.

ADVERTENCIA: Para prevenir choque electrico o riesgo de incendios, este aparato no se debe exponer a la lluvia o a la humedad. Los objetos llenos de liquidos, como los floreros, no se deben colocar encima de este aparato. Antes de usar este aparato, lea la guia de funcionamiento para otras advertencias.

Ce symbole est utilisé dans ce manuel pour indiquer à l’utilisateur la présence d’une tension dangereuse pouvant être d’amplitude suffisante pour constituer un risque de choc électrique.

Ce symbole est utilisé dans ce manuel pour indiquer à l’utilisateur qu’il ou qu’elle trouvera d’importantes instructions concernant l’utilisation et l’entretien de l’appareil dans le paragraphe signalé.

ATTENTION: Risques de choc électrique — NE PAS OUVRIR!
ATTENTION: Afin de réduire le risque de choc électrique, ne pas enlever le couvercle. Il ne se trouve à l’intérieur aucune pièce pouvant être reparée par l’utilisateur. Confiez l’entretien et la réparation de l’appareil à un réparateur Peavey agréé.

AVIS: Dans le but de reduire les risques d’incendie ou de decharge electrique, cet appareil ne doit pas etre expose a la pluie ou a l’humidite et aucun objet rempli de liquide, tel qu’un vase, ne doit etre pose sur celui-ci. Avant d’utiliser de cet appareil, lisez attentivement le guide fonctionnant pour avertissements supplémentaires.

Dieses Symbol soll den Anwender vor unisolierten gefährlichen Spannungen innerhalb des Gehäuses warnen, die von Ausreichender Stärke sind, um einen elektrischen Schlag verursachen zu können.

Dieses Symbol soll den Benutzer auf wichtige Instruktionen in der Bedienungsanleitung aufmerksam machen, die Handhabung und Wartung des Produkts betreffen.

VORSICHT: Risiko — Elektrischer Schlag! Nicht öffnen!
VORSICHT: Um das Risiko eines elektrischen Schlages zu vermeiden, nicht die Abdeckung enfernen. Es befinden sich keine Teile darin, die vom Anwender repariert werden könnten. Reparaturen nur von qualifiziertem Fachpersonal durchführen lassen.

WARNUNG: Um elektrischen Schlag oder Brandgefahr zu verhindern, sollte dieser Apparat nicht Regen oder Feuchtigkeit ausgesetzt werden und Gegenstände mit Flüssigkeiten gefuellt, wie Vasen, nicht auf diesen Apparat gesetzt werden. Bevor dieser Apparat verwendet wird, lesen Sie bitte den Funktionsführer für weitere Warnungen.

Important Safety Instructions

WARNING: When using electrical products, basic cautions should always be followed, including the following:

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any of the ventilation openings. Install in accordance with manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding plug. The wide blade or third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point they exit from the apparatus.
11. Only use attachments/accessories provided by the manufacturer.
12. Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Never break off the ground pin. Write for our free booklet "Shock Hazard and Grounding." Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
16. If this product is to be mounted in an equipment rack, rear support should be provided.
17. Note for UK only: If the colors of the wires in the mains lead of this unit do not correspond with the terminals in your plug, proceed as follows:

    a) The wire that is colored green and yellow must be connected to the terminal that is marked by the letter E, the earth symbol, colored green or colored green and yellow.

    b) The wire that is colored blue must be connected to the terminal that is marked with the letter N or the color black.

    c) The wire that is colored brown must be connected to the terminal that is marked with the letter L or the color red.
18. This electrical apparatus should not be exposed to dripping or splashing and care should be taken not to place objects containing liquids, such as vases, upon the apparatus.
19. The on/off switch in this unit does not break both sides of the primary mains. Hazardous energy can be present inside the chassis when the on/off switch is in the off position. The mains plug or appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.
20. Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably in susceptibility to noise-induced hearing loss, but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time. The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the following permissible noise level exposures:

Duration Per Day In Hours	Sound Level dBA, Slow Response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

According to OSHA, any exposure in excess of the above permissible limits could result in some hearing loss. Ear plugs or protectors to the ear canals or over the ears must be worn when operating this amplification system in order to prevent a permanent hearing loss, if exposure is in excess of the limits as set forth above. To ensure against potentially dangerous exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of producing high sound pressure levels such as this amplification system be protected by hearing protectors while this unit is in operation.

SAVE THESE INSTRUCTIONS!

Wichtige Sicherheitshinweise

ACHTUNG: Beim Einsatz von Elektrogeräten müssen u.a. grundlegende Vorsichtsmaßnahmen befolgt werden:

1. Lesen Sie sich diese Anweisungen durch.
2. Bewahren Sie diese Anweisungen auf.
3. Beachten Sie alle Warnungen.
4. Befolgen Sie alle Anweisungen.
5. Setzen Sie dieses Gerät nicht in der Nähe von Wasser ein.
6. Reinigen Sie es nur mit einem trockenen Tuch.
7. Blockieren Sie keine der Lüftungsöffnungen. Führen Sie die Installation gemäß den Anweisungen des Herstellers durch.
8. Installieren Sie das Gerät nicht neben Wärmequellen wie Heizungen, Heizgeräten, Öfen oder anderen Geräten (auch Verstärkern), die Wärme erzeugen.
9. Beeinträchtigen Sie nicht die Sicherheitswirkung des gepolten Steckers bzw. des Erdungssteckers. Ein gepolter Stecker weist zwei Stifte auf, von denen einer breiter ist als der andere. Ein Erdungsstecker weist zwei Stifte und einen dritten Erdungsstift auf. Der breite Stift bzw. der dritte Stift dient Ihrer Sicherheit. Sollte der beiliegende Stecker nicht in Ihre Steckdose passen, wenden Sie sich bitte an einen Elektriker, um die ungeeignete Steckdose austauschen zu lassen.
10. Schützen Sie das Netzkabel, sodass niemand darauf tritt oder es geknickt wird, insbesondere an Steckern oder Buchsen und ihren Austrittsstellen aus dem Gerät.
11. Verwenden Sie nur die vom Hersteller erhältlichen Zubehörgeräte oder Zubehörteile.
12. Verwenden Sie nur einen Wagen, Stativ, Dreifuß, Träger oder Tisch, der den Angaben des Herstellers entspricht oder zusammen mit dem Gerät verkauft wurde. Wird ein Wagen verwendet, bewegen Sie den Wagen mit dem darauf befindlichen Gerät besonders vorsichtig, damit er nicht umkippt und möglicherweise jemand verletzt wird.
13. Trennen Sie das Gerät während eines Gewitters oder während längerer Zeiträume, in denen es nicht benutzt wird, von der Stromversorgung.
14. Lassen Sie sämtliche Wartungsarbeiten von qualifizierten Kundendiensttechnikern durchführen. Eine Wartung ist erforderlich, wenn das Gerät in irgendeiner Art beschädigt wurde, etwa wenn das Netzkabel oder der Netzstecker beschädigt wurden, Flüssigkeit oder Gegenstände in das Gerät gelangt sind, das Gerät Regen oder Feuchtigkeit ausgesetzt wurde, nicht normal arbeitet oder heruntergefallen ist.
15. Der Erdungsstift darf nie entfernt werden. Auf Wunsch senden wir Ihnen gerne unsere kostenlose Broschüre „Shock Hazard and Grounding“ (Gefahr durch elektrischen Schlag und Erdung) zu. Schließen Sie nur an die Stromversorgung der Art an, die am Gerät neben dem Netzkabel angegeben ist.
16. Wenn dieses Produkt in ein Geräte-Rack eingebaut werden soll, muss eine Versorgung über die Rückseite eingerichtet werden.
17. Hinweis – Nur für Großbritannien: Sollte die Farbe der Drähte in der Netzleitung dieses Geräts nicht mit den Klemmen in Ihrem Stecker übereinstimmen, gehen Sie folgendermaßen vor:

    a) Der grün-gelbe Draht muss an die mit E (Symbol für Erde) markierte bzw. grüne oder grün-gelbe Klemme angeschlossen werden.

    b) Der blaue Draht muss an die mit N markierte bzw. schwarze Klemme angeschlossen werden.

    c) Der braune Draht muss an die mit L markierte bzw. rote Klemme angeschlossen werden.
18. Dieses Gerät darf nicht ungeschützt Wassertropfen und Wasserspritzern ausgesetzt werden und es muss darauf geachtet werden, dass keine mit Flüssigkeiten gefüllte Gegenstände, wie z. B. Blumenvasen, auf dem Gerät abgestellt werden.
19. Der Netzschalter in dieser Einheit bricht beide Seiten von den primären Haupleitungen nicht. Gerfährliche Energie kann anwesend innerhalb des Chassis sein, wenn her Netzschalter im ab Poistion ist. Die Hauptleitungen stöpseln zu oder Gerätkupplung ist benutzt, während das Vorrichtung abschaltet, das schaltet Vorrichtung wird bleiben sogleich hantierbar ab.
20. Belastung durch extrem hohe Lärmpegel kann zu dauerhaftem Gehörverlust führen. Die Anfälligkeit für durch Lärm bedingten Gehörverlust ist von Mensch zu Mensch verschieden, das Gehör wird jedoch bei jedem in gewissem Maße geschädigt, der über einen bestimmten Zeitraum ausreichend starkem Lärm ausgesetzt ist. Die US-Arbeitsschutzbehörde (Occupational and Health Administration, OSHA) hat die folgenden zulässigen Pegel für Lärmbelastung festgelegt:

Dauer pro Tag in Stunden	Geräuschpegel dBA, langsame Reaktion
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 oder weniger	115

Laut OSHA kann jede Belastung über den obenstehenden zulässigen Grenzwerten zu einem gewissen Gehörverlust führen. Sollte die Belastung die obenstehenden Grenzwerte übersteigen, müssen beim Betrieb dieses Verstärkungssystems Ohrenstopfen oder Schutzvorrichtungen im Gehörgang oder über den Ohren getragen werden, um einen dauerhaften Gehörverlust zu verhindern. Um sich vor einer möglicherweise gefährlichen Belastung durch hohe Schalldruckpegel zu schützen, wird allen Personen empfohlen, die mit Geräten arbeiten, die wie dieses Verstärkungssystem hohe Schalldruckpegel erzeugen können, beim Betrieb dieses Geräts einen Gehörschutz zu tragen.

BEWAHREN SIE DIESE SICHERHEITSHINWEISE AUF!

Instructions Importantes De Securite

ATTENTION: L'utilisation de tout appareil électrique doit être soumise aux precautions d'usage incluant:

1. Lire ces instructions.
2. Gardez ce manuel pour de futures références.
3. Prétez attention aux messages de précautions de ce manuel.
4. Suivez ces instructions.
5. N'utilisez pas cette unité proche de plans d'eau.
6. N'utilisez qu'un tissu sec pour le nettoyage de votre unité.
7. N'obstruez pas les systèmes de refroidissement de votre unité et installez votre unité en fonction des instructions de ce manuel.
8. Ne positionnez pas votre unité à proximité de toute source de chaleur.
9. Connectez toujours votre unité sur une alimentation munie de prise de terre utilisant le cordon d'alimentation fourni.
10. Protégez les connecteurs de votre unité et positionnez les cablages pour éviter toutes déconnexions accidentelles.
11. N'utilisez que des fixations approuvées par le fabriquant.
12. Lors de l'utilsation sur pied ou pole de support, assurez dans le cas de déplacement de l'ensemble enceinte/support de prévenir tout basculement intempestif de celui-ci.
13. Il est conseillé de déconnecter du secteur votre unité en cas d'orage ou de durée prolongée sans utilisation.
14. Seul un technicien agréé par le fabriquant est à même de réparer/contrôler votre unité. Celle-ci doit être contrôlée si elle a subit des dommages de manipulation, d'utilisation ou de stockage (humidité,…).
15. Ne déconnectez jamais la prise de terre de votre unité.
16. Si votre unité est destinée a etre montée en rack, des supports arriere doivent etre utilises.
17. Note pour les Royaumes-Unis: Si les couleurs de connecteurs du cable d'alimentation ne correspond pas au guide de la prise secteur, procédez comme suit:

    a) Le connecteur vert et jaune doit être connectrer au terminal noté E, indiquant la prise de terre ou correspondant aux couleurs verte ou verte et jaune du guide.

    b) Le connecteur Bleu doit être connectrer au terminal noté N, correspondnat à la couleur noire du guide.

    c) Le connecteur marron doit être connectrer au terminal noté L, correspondant à la couleur rouge du guide.
18. Cet équipement électrique ne doit en aucun cas être en contact avec un quelconque liquide et aucun objet contenant un liquide, vase ou autre ne devrait être posé sur celui-ci.
19. L'interrupter (on-off) dans cette unité ne casse pas les deux côtés du primaire principal. L'énergie hasardeuse peut être preésente dans châssis quand l'interrupter (on-off) est dans le de la position. Le bouchon principal ou atelage d'appareil est utilisé comme le débrancher l'appareil restera facilement opérable.
20. Une exposition à de hauts niveaux sonores peut conduire à des dommages de l'écoute irréversibles. La susceptibilité au bruit varie considérablement d'un individu à l'autre, mais une large majorité de la population expériencera une perte de l'écoute après une exposition à une forte puissance sonore pour une durée prolongée. L'organisme de la santé américaine (OSHA) a produit le guide ci-dessous en rapport à la perte occasionnée:

Durée par Jour (heures)	Niveau sonore moyen (dBA)
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 ou inférieur	115

D'après les études menées par le OSHA, toute exposition au delà des limites décrites ce-dessus entrainera des pertes de l'écoute chez la plupart des sujets. Le port de système de protection (casque, oreilette de filtrage,…) doit être observé lors de l'opération cette unité ou des dommages irréversibles peuvent être occasionnés. Le port de ces systèmes doit être observé par toutes personnes susceptibles d'être exposées à des conditions au delà des limites décrites ci-dessus.

GARDEZ CES INSTRUCTIONS!

Instrucciones Importantes Para Su Seguridad

CUIDADO: Cuando use productos electrónicos, debe tomar precauciones básicas, incluyendo las siguientes:

1. Lea estas instrucciones.
2. Guarde estas instrucciones.
3. Haga caso de todos los consejos.
4. Siga todas las instrucciones.
5. No usar este aparato cerca del agua.
6. Limpiar solamente con una tela seca.
7. No bloquear ninguna de las salidas de ventilación. Instalar de acuerdo a las instrucciones del fabricante.
8. No instalar cerca de ninguna fuente de calor como radiadores, estufas, hornos u otros aparatos (incluyendo amplificadores) que produzcan calor.
9. No retire la patilla protectora del enchufe polarizado o de tipo “a Tierra”. Un enchufe polarizado tiene dos puntas, una de ellas más ancha que la otra. Un enchufe de tipo “a Tierra” tiene dos puntas y una tercera “a Tierra”. La punta ancha (la tercera) se proporciona para su seguridad. Si el enchufe proporcionado no encaja en su enchufe de red, consulte a un electricista para que reemplaze su enchufe obsoleto.
10. Proteja el cable de alimentación para que no sea pisado o pinchado, particularmente en los enchufes, huecos, y los puntos que salen del aparato.
11. Usar solamente añadidos/accesorios proporcionados por el fabricante.
12. Usar solamente un carro, pie, trípode, o soporte especificado por el fabricante, o vendido junto al aparato. Cuando se use un carro, tenga cuidado al mover el conjunto carro/aparato para evitar que se dañe en un vuelco. No suspenda esta caja de ninguna manera.
13. Desenchufe este aparato durante tormentas o cuando no sea usado durante largos periodos de tiempo.
14. Para cualquier reparación, acuda a personal de servicio cualificado. Se requieren reparaciones cuando el aparato ha sido dañado de alguna manera, como cuando el cable de alimentación o el enchufe se han dañado, algún líquido ha sido derramado o algún objeto ha caído dentro del aparato, el aparato ha sido expuesto a la lluvia o la humedad, no funciona de manera normal, o ha sufrido una caída.
15. Nunca retire la patilla de Tierra.Escríbanos para obtener nuestro folleto gratuito “Shock Hazard and Grounding” (“Peligro de Electrocución y Toma a Tierra”). Conecte el aparato sólo a una fuente de alimentación del tipo marcado al lado del cable de alimentación.
16. Si este producto va a ser enracado con más equipo, use algún tipo de apoyo trasero.
17. Nota para el Reino Unido solamente: Si los colores de los cables en el enchufe principal de esta unidad no corresponden con los terminales en su enchufe, proceda de la siguiente manera:

    a) El cable de color verde y azul debe ser conectado al terminal que está marcado con la letra E, el símbolo de Tierra (earth), coloreado en verde o en verde y amarillo.

    b) El cable coloreado en azul debe ser conectado al terminal que está marcado con la letra N o el color negro.

    c) El cable coloreado en marrón debe ser conectado al terminal que está marcado con la letra L o el color rojo.
18. Este aparato eléctrico no debe ser sometido a ningún tipo de goteo o salpicadura y se debe tener cuidado para no poner objetos que contengan líquidos, como vasos, sobre el aparato.
19. El interruptor de en/lejos en esta unidad no rompe ambos lados de la red primaria. La energía peligrosa puede ser presente dentro del chasis cuando el interruptor de en/lejos está en el de la posición. El tapón de la red o el acoplador del aparato son utilizados como el desconecta dispositivo, el desconecta dispositivo se quedará fácilmente operable.
20. La exposición a altos niveles de ruido puede causar una pérdida permanente en la audición. La susceptibilidad a la pérdida de audición provocada por el ruido varía según la persona, pero casi todo el mundo perderá algo de audición si se expone a un nivel de ruido suficientemante intenso durante un tiempo determinado. El Departamento para la Salud y para la Seguridad del Gobierno de los Estados Unidos (OSHA) ha especificado las siguientes exposiciones al ruido permisibles:

Duración por Día en Horas	Nivel de Sonido dBA, Respuesta Lenta
8	**90**
6	**92**
4	**95**
3	**97**
2	**100**
1 1⁄2	**102**
1	**105**
1⁄2	**110**
1⁄4 or less	**115**

De acuerdo al OSHA, cualquier exposición que exceda los límites arriba indicados puede producir algún tipo de pérdida en la audición. Protectores para los canales auditivos o tapones para los oídos deben ser usados cuando se opere con este sistema de sonido para prevenir una pérdida permanente en la audición, si la exposición excede los límites indicados más arriba. Para protegerse de una exposición a altos niveles de sonido potencialmente peligrosa, se recomienda que todas las personas expuestas a equipamiento capaz de producir altos niveles de presión sonora, tales como este sistema de amplificación, se encuentren protegidas por protectores auditivos mientras esta unidad esté operando.

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6 Block Diagrams p.40

Introduction

Crest Audio has had a long tradition of manufacturing large format Mixing consoles since the advent of the Gamble EX 56 series console. In 1992, Crest released the Century series console, which became a workhorse for concert hall venue sound (Irving Plaza NYC) and regional sound companies. In 1994, Crest Audio secured its name in tour sound for mixing consoles with the release of the VX console for front of house and the LMX console for monitors. 1997 saw the release of V-12 that expanded Crest Audio's market into high-end church sound and cruise ships. This tradition continued with the X-Series that gave most of the features in the consoles above at a more affordable price. In 2004, Crest Consoles established another milestone, with the HP-8 offering solid Crest design at an attractive price. In 2006, the HPW added groundbreaking features for install, corporate and house of worship markets to the popular Crest Console line. The CV-20 family of consoles continues this proud tradition of performance and reliability. The CV-20 boasts a rich set of features including 8 groups and 12 auxiliaries, 12 channels of dynamics processing and an expandable matrix, all in a clean and quiet VCA console.

Mono Input Channel Module

The Mono input module consists of 8 mono input channels. These modules are easily removed if service is required and they self configure in the console. (The master section automatically makes channel assignments when the module is installed.)

Each input channel consists of the following:

The 48V switch should not be engaged when using standard (dynamic) microphones or other sources that do not use phantom power.

1 **+48V -** Depressing the +48 volt button applies phantom power to the mic-input XLR connector. This feature is used with condenser microphones and active direct boxes that require an external DC voltage (phantom power) to operate. For dynamic or ribbon mics, phantom voltage is not required and phantom power should be switched OFF.

NOTE: Turning phantom power on or off causes large voltage swings to occur at the input of the mic preamp. Care should be taken to insure that the channel is muted, or the main faders are pulled down, to prevent a "pop" sound from reaching the audience.

If the channel peak LED is illuminated, first try lowering the input gain control.

Only when this method is unsuccessful should the pad switch be engaged.

2 **Line Switch -** Depressing this switch disconnects the XLR mic input and connects the 1/4 inch TRS line-input jack. The line input uses the same channel gain control but has 20 dB less gain than the mic input.

3 **Pad -** When engaged, the XLR mic input signal is attenuated by 20 dB to prevent strong signals (from kick drums or lead vocals, for example) from overloading the preamp. The pad is used to bring a hot signal, present at the XLR input jack, down to a controllable level. The pad switch does not affect the line input.

4 **Polarity (Reverse) -** This feature reverses the polarity of both the microphone and line input signals and is used for correcting or minimizing polarity and phase related errors. For example, if two microphones are used on opposite sides of a drumhead, reversing the polarity of one mic can correct the polarity inversion. Sometimes inverting the polarity of a vocal microphone in front of back line instruments can help cancel leakage of those instruments into the mix.

When similar signals from different channels are combined, phase cancellations can occur.

Reversing the polarity of an input signal can often minimize such phasing errors.

5 **Insert -** The insert switch must be depressed to activate the insert send and return signal path. It can be used to bypass an inserted processor when it is not needed. Although the switch contacts on the return jack will "normal" the send signal to the return to maintain the signal path, leaving the INSERT switch in the "up" position bypasses the send-and-return circuitry when not in use. The Send jack is always active, however.

6 **Direct Output Pre/Post Switch -** This switch configures the Direct Output to be Pre-Fader (Switch In) or Post-Fader (Switch Out). Changing this switch requires the use of a bent paper clip, pencil, toothpick, "multi-tool" punch or some other pointed, preferably non-conductive object, to activate this "Poke Switch." This is done to prevent accidental changing of this switch during a performance. The direct output "Pre" signal can be set internally to either pre or post EQ. (See the section on internal jumper options below.) The Default setting is Post EQ. Channel mute does not affect the direct output signal when the pre-fader source is selected.

Although the high-pass filter is often used to reduce low-frequency wind and handling noise, most inputs can benefit from this valuable EQ tool. For example, settings of 150 Hz or higher can improve the sound of vocal inputs.

7 **Gain Control -** The gain control adjusts the input gain for proper signal level. Gain is adjustable from 0 to 65 dB on the mic input and –20 to + 45 dB on the line input.

8 **Variable High-Pass Filter/Switch -** The high-pass filter can be an important EQ tool allowing significant attenuation of low-frequency energy. Engaging the high-pass filter reduces low frequency content at a rate of 12 dB per octave and is adjustable from 20 Hz to 400 Hz (-3 dB down point). The high-pass filter is active when the switch is down. It is located at the beginning of the channel audio chain, after the preamp and before the insert and EQ.

EQ Section - 4-band sweepable, parametric EQ

Although careful attention to microphone choice and placement is always the best place to start, most audio signals coming into the console require some degree of corrective equalization in order to be part of a good-sounding mix. In using these controls, the best results are generally obtained by cutting the response. However, it is often easier to set the frequency control by first setting the EQ to boost, then sweeping the frequency control to emphasize the sound you wish to cut, and adjusting the EQ level for the desired amount of cut.

In addition to the variable high-pass filter described above, the EQ section consists of four sweepable, bands: high, high-mid, low-mid and low. The high and low bands can be switched between shelving and peak/dip response, while the high-mid and low-mid bands are fully parametric peak/dip filters with variable Q.

9 **High EQ**
- Up to 15 dB of boost or cut available.
- The frequency is sweepable from 1 kHz to 20 kHz.
- Engaging the Peak/Shelve switch changes the filter response from shelving to a peak/dip response with a Q of 1.5

10 **High Mid EQ**
- Up to 15 dB of boost or cut available.
- The frequency is sweep-able from 400 Hz to 8 KHz.
- The Q of the peak/dip response is adjustable from 3 to 0.7

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11 **Low Mid EQ**
- Up to 15 dB of boost or cut available
- The frequency is sweepable from 100 Hz to 2 kHz
- The Q of the peak/dip response is adjustable from 3 to 0.7

12 **Low EQ**
- Up to 15 dB of boost or cut available
- The frequency is sweepable from 40 Hz to 800 Hz
- Engaging the Peak/Shelve switch changes the filter response from shelving to a peak/dip response with a Q of 1.5

13 **EQ On**
Depressing the EQ On switch activates all 4 bands of equalization.

Auxiliary Sends - Twelve aux sends are available for creating individual output mixes. These mixes can be used for driving effects processors, providing monitor mixes, creating broadcast or recording mixes, providing a send to subwoofers, or other special requirements. With the corresponding PRE switches in the "OUT" position, the Aux sends are fed from the post-fader channel signal. When the PRE switch is depressed ("IN"), the corresponding Aux sends are fed from the channel's pre-fader, post-EQ signal.

Note: By changing internal jumpers, the PRE selection switches on each channel can be changed. See the section on internal changes below for details.

14 **Aux Sends 1-4**
Depressing the PRE Switch: Changes these Aux send signals from post-fader audio to pre-fader, post-EQ audio.

15 **Aux Sends (5&6, 7&8, 9&10) -** Depressing the PRE Switch: Changes these Aux send signals from post-fader audio to pre-fader, post-EQ audio.

16 **Stereo Switch -** In Stereo mode, the odd channel Aux send control (5, 7 or 9) becomes the level pot for Aux send pair and the even channel Aux send control (6, 8 or 10) becomes the PAN.

17 **Aux Sends 11&12 -** Depressing the PRE Switch: Sets Aux sends 11 & 12 to send pre-fader, post-EQ audio.

Auxiliaries 11 & 12 are stereo only with level control and Pan.

**It is important to note that Auxiliary outputs 11 & 12 can also be fed by Matrix outputs 3 & 4, making them an excellent choice when an independent stereo mix is required for recording, broadcast or other purposes. This feature allows processed group signals (mixed in the matrix) to be combined with individual channel sends to create a superior mix.

Main Bus Assignments

18 **PAN Control -** This control positions the channel image between left and right or between LCR (left-center-right) buses depending on the assignment switches. The pan control also positions the image between odd and even subgroups when the group pan switch is depressed. (See LCR and Pan Switches).

19 **LCR -** Pressing the LCR button assigns the channel to the left, right and center mix buses. The L-R and M/C buttons are disabled in this mode. This also sets the pan control for LCR panning. In LCR mode, turning the pan control from the full counterclockwise position moves the image from left bus toward the center until it only goes to the M/C bus when in the center position. Continuing to rotate the control clockwise moves the image toward the right until the signal only goes to the right bus in the extreme clockwise position.

20 **L-R -** Pressing the L-R assignment button when the LCR button is not engaged assigns the channel to the Left and Right output buses and sets the pan control for Left/Right panning.

21 **M/C -** Pressing the M/C assignment button when the LCR button is not engaged assigns the channel to the Mono/Center output bus. The pan control has no affect on the signal going to this bus.

22 **Subgroup Assignment (1-8) -** The channel signal can be easily assigned to any subgroup using the eight bus-assignment buttons. The signal is not affected by the pan control unless the group pan switch is depressed.

23 **Group PAN Switch -** When the group pan switch is depressed, the Subgroup sends will be affected by the PAN control in odd/even pairs. Selecting LCR panning for the main buses does not affect subgroup panning.

Channel Control And Monitoring

24 **Mute Switch w/LED -** The mute LED and Mute button perform several roles relating to the channel mute function. In normal operating mode, the mute switch is used to mute and un-mute the channel audio. Muting the channel blocks the audio to the main buses, subgroups and auxiliary sends. The direct output is only muted if the post-fader source is selected. The channel mute can be activated locally using the channel mute button as part of a mute group/scene or as part of a VCA group. Users with experience working with traditional analog consoles will feel right at home with mute switches that engage when pressed won't not un-mute until the button is released.

The Channel Mute LED Indicates Channel Mute Status.

LED Off - indicates that the channel is active.

LED Solid Red - indicates that the channel is muted.

LED Blinking Red - indicates the channel is part of the mute group being edited.

LED Solid Green - indicates the channel is part of the Mute Safe scene and cannot be muted by the mute scenes. It can still be muted locally.

LED Blinking Green - indicates the channel is part of the mute-safe scene being edited.

When editing a Mute or Mute Safe scene, pressing the mute button adds and removes the channel from that scene.

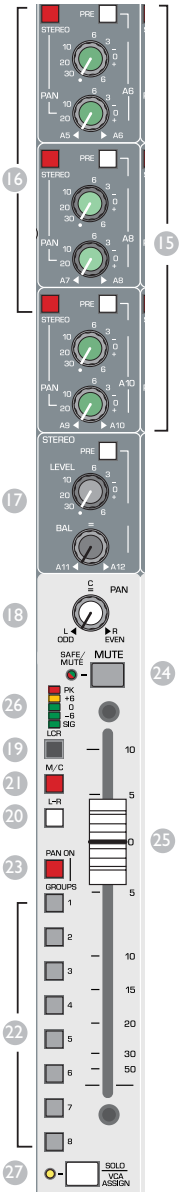
25 **Fader -** The 100 mm linear VCA level control, adjusts the level to all post-fader outputs (i.e., auxiliaries 1-12 selected post), AFL, Group assigns 1-8 and L, R & Mono output mixes.

26 **5-Segment LED Meter Array -** This LED meter array monitors the level of the channel pre-fader, post-EQ signal. (See Channel Jumper options on pg. 14 to convert to post-fader monitoring) The red Peak LED responds to audio levels pre-EQ, post-EQ and post-fader by lighting before clipping occurs at any of those points.

27 **Solo/VCA Assignment Switch With LED -** This switch serves two functions. The first function is to activate the console monitor system (SOLO). When engaged, the channel audio is routed to the headphones, Solo meters and monitor outputs. Choice of PFL (Pre Fader Listen) or AFL (After Fader Listen) is made at the master section. AFL is post fader, post PAN pot and post mute. The Solo LED is lit when the solo is active.

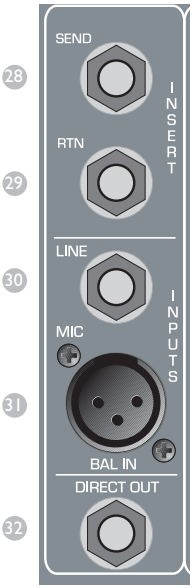
The second function is for VCA group assignments. After the "EDIT VCA" button has been pressed and a VCA master fader selected for editing, the channel Solo button is used to add or remove the channel from VCA master control. The Solo LED will flash when it is assigned to a VCA master.

CAUTION! The edit change takes affect immediately and there can be a sudden gain change unless the VCA master is set at "Unity." See the section on VCA editing for more information.



The meter circuitry is sensed at the top of the channel fader so it sees the audio path, which runs from the preamp, into the lo-cut filter, through the insert jack and then through the EQ. The signal path must be intact through all these stages for the meter to illuminate. Any gain changes or audio processing is reflected in the meter array. Also, since the PFL feed is taken from this same, pre-fader point, the Solo meters and Solo headphones will monitor this overall channel signal.

Rear Panel Features



Insert - Many times the channel signal can benefit from additional signal processing. The channel insert allows external processing equipment to be connected via the insert Send and Return jacks. The insert switch (5) must be pressed to route the signal through the channel insert loop.

28 **Insert Send -** This 1/4" TRS jack is an impedance-balanced output that is connected after the Hi-Pass filter. The signal is always present regardless of the position of the channel Insert switch. The nominal output impedance is 100 Ohms with a nominal level of +4 dBu. This jack can also be used to provide a direct channel output from a point immediately after the input preamplifier and Hi-pass filter.

29 **Insert Return -** This 1/4" TRS jack is a balanced input that returns the externally processed signal to the channel. The insert switch (5) must be pressed to activate this input. To prevent the loss of signal if the Insert switch is pressed accidentally the Return jack returns the "Send" signal when no external processor is connected. The input impedance is >20K Ohms with a nominal input level of +4 dBu.

30 **Line In -** The Line Input is a 1/4" balanced (TRS) input with an impedance >10k Ohms. The tip is the positive input and can be used for balanced or unbalanced inputs. The line input has 20 dB less gain than the XLR input and does not have Phantom Power available. The "Line" switch (2) at the top of the channel must be depressed to disconnect the mic input and connect the line input.

31 **Balanced XLR Input Connector -** This balanced female XLR accepts a low-impedance microphone signal or a line-level signal, depending on the position of the PAD switch on the front panel. NOTE: Pin 2 on Crest Products is always Hot for both input and output connections unless the polarity reverse switch is engaged. Phantom power (+48 Volt) can be applied to this input for sources requiring it by engaging the +48 V switch at the top of the channel strip.

32 **Direct Out 1/4" TRS jack -** The input channel's signal is available at this output jack. The default signal routing is derived Post-fader/Post-EQ. The DIR PRE switch (6) at the top of the channel strip changes the signal source to Pre-Fader/Post-EQ. Unlike the auxiliary bus sends, the channel mute does not mute the pre-fader direct output. The "PRE" position routing can be changed with an internal jumper to Post-insert/Pre-EQ. The output jack is TRS, impedance-balanced.

Channel Internal Jumper Options

In addition to the many front-panel options for selecting the signal source for the aux sends, direct outputs and more, there are other internal options available for the Mono inputs. These are implemented by way of solder pads on the backside of the Mono Input circuit boards (upper EQ board of the pair). These solder-pads consist of split-circles of tinned copper. Applying a "blob" (technical term) of solder across the two halves completes the circuit and implements the desired option. For the default setting, there is already a thin copper trace that connects the two halves, completing the default connection. This existing trace MUST be cut (use an X-acto knife) before an option is implemented.

To change back to the default operation after an option was implemented, remove the blobbed solder from the option solder pads (use a solder-sucker or solder wick). Add a blob-link across the original, default pads to replace the thin trace that was previously cut when the option was first implemented. It is important that only one option be selected at a time. Otherwise, extremely erratic operation will result.

Note: This work must be performed by qualified personnel.

Aux "PRE" source option - The Aux Sends on the Mono Input channels are normally fed by the Post-Fader/Post-Mute signal in the channel. There is a PRE switch associated with each set of Aux Sends that change the feed to a Pre-Fader point in the channel's signal path. There are three choices for this PRE point: Pre-Fader/Post-EQ, Pre-Fader/Pre-EQ and Pre-Fader/Pre-insert. This change is done on a channel-by-channel basis; each channel has its own set of solder pads. All five of the PRE switches within that channel will be affected by the option change.

Aux Pre-Fader/Post-EQ - This is the default setting for the PRE switch. The aux send signal is derived before the fader but after the channel EQ. This selection is post High-Pass Filter if active.

Aux Pre-Fader/Pre-EQ - This is one of the options for the PRE switch. The aux send signal is derived before the EQ, but after the Insert Send jack so any external processing gear will affect the Aux sends but the channel EQ does not affect it. This selection is also post High-Pass Filter if active.

Aux Pre-Fader/Pre-Insert -This is one of the options for the PRE switch. The aux send signal is derived before the EQ and before the Insert Send jack, so any external processing gear will NOT affect the Aux sends. This selection is post High-Pass Filter if active.

Aux "PRE" Mute Option -The default setting for the auxiliary pre-fader sends is for them to mute whenever the channel is muted. However, by using solder jumpers, the mute can be defeated. Making this change will affect all pre-fader aux send on that channel.

NOTE: Defeating the channel MUTE applies to any of the Pre-fader selections. The post-fader aux sends will always mute when the channel is muted.

Direct Out Option -The Direct Output on the Mono Input channels is normally fed by the Post-Fader/Post-Mute signal in the channel. The PRE switch changes the feed to a Pre-Fader point in the channel's signal path. There are two choices for this PRE point: Pre-Fader/Post-EQ and Pre-Fader/Pre-EQ. This change is done on a channel-by-channel basis; each channel has its own set of solder pads.

NOTE: When the pre-fader signal is selected, the channel MUTE does NOT affect the Direct Out jack. The channel insert and high-pass filter, if engaged, DOES affect the Direct Out jack.

Pre-Fader/Post-EQ - This is the default setting for the direct output jack. The signal is derived before the fader but after the channel EQ.

Pre-Fader/Pre-EQ - This is the option for the direct output jack. The direct output signal is derived before the fader and before the channel EQ.

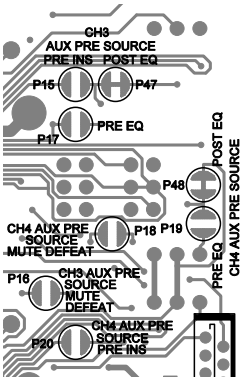
5-Segment LED Meter - This option changes the signal source for the 5-segment level meter found on each mono channel. The jumper changes only 4 of the 5, meter segments. The red Peak LED always samples audio pre-EQ, post-EQ and post-fader.

With the default jumper in place, the meter indicates Pre-fader Post-EQ. When the jumper is changed, the meter indicates the Post-fader level.

The specified Solder-Blob (Pxx) shown in the table should be linked (by solder-bridging) to complete the circuit and implement the indicated option. The table below shows the specific (Pxx) for each of the eight channels on a circuit board. Before implementing an option (by blobbing), be SURE to cut the existing thin copper trace linking the two halves of the default solder blob. Failure to do so will result in channel operation problems and possible circuit damage.

	Aux Pre-fader			Mute	Direct Output		Meter	
Channel	*Post EQ	Pre EQ	Pre Ins	Defeat	*Post-EQ	Pre-EQ	*Pre-fader	Post-fader
1	P43	P9	P7	P8	P41	P5	P13	P5
2	P44	P11	P12	P10	P42	P6	P14	P6
3	P47	P17	P15	P16	P45	P13	P15	P7
4	P48	P19	P20	P18	P46	P14	P16	P8
5	P51	P25	P23	P24	P49	P21	P17	P9
6	P52	P27	P28	P26	P50	P22	P18	P10
7	P55	P33	P31	P32	P53	P29	P19	P11
8	P56	P35	P36	P34	P54	P30	P20	P12

Default Jumper Setting
The Aux, Mute and Direct output jumpers are located on the upper "EQ" circuit board. The meter jumpers are located on the lower "Fader" circuit board.



Typical Jumper Configuration

Stereo Input Module

The Stereo Input Module consists of two different channel types; the first four channels (1-4) feature stereo mic/line inputs while the next 4 channels (5-8) are dual-stereo line. Each input on the mic/line channels (Left and Right) has its own gain control. These inputs lend themselves to applications where stereo signals are sent from stage but work with local sources as well (mic or line level).

The next four channels are dual stereo line channels intended for line-level sources like effects returns and playback sources. Each of these channels has two sets of input jacks, with their own stereo gain trim control. The Line 2 switch with its own stereo gain trim allows seldom-used sources to be patched to the console and selected when needed without tying up an additional channel.

NOTE: Most of the controls in the Stereo module are the same for all eight channels and are described only once. Features that are unique to channels 1-4 or 5-8 will be denoted as such.

The 48V switch should not be engaged when using standard (dynamic) microphones or other sources that do not use phantom power.

If the channel peak LED is illuminated, first try lowering the input gain control.

Only when this method is unsuccessful should the pad switch be engaged.

Input Controls

Stereo Channels 1-4 (Mic/Line Input Unique Controls)

33 **+48V (Stereo Channels 1-4 Only) -** Depressing the +48 volt button applies phantom power to the mic-input XLR connector. This feature is used with condenser microphones and active direct boxes that require an external DC voltage (phantom power) in order to operate. For dynamic or ribbon mics, phantom voltage is not required and phantom power should be switched OFF.

NOTE: Turning phantom power on or off causes large voltage swings to occur at the input of the mic preamp. Care should be taken to insure that the channel is muted, or the main faders are pulled down, to prevent a "pop" sound from reaching the audience.

34 **Pad (Stereo Channels 1-4 Only) -** When engaged, the XLR mic input signal is attenuated by 20 dB to prevent strong signals (from kick drums or lead vocals, for example) from overloading the preamp. The pad is used to bring a hot signal that is present at the XLR input jack down to a controllable level. The pad switch does not affect the line input.

When similar signals from different channels are combined, phase cancellations can occur.

Reversing the polarity of an input signal can often minimize such phasing errors.

35 **Polarity Reverse (Stereo Channels 1-4 Only) -** This feature reverses the polarity of both the left and right microphone and the left and right line input signals and is used for correcting or minimizing polarity and phase-related errors.

36 **High-Pass Filter 100 Hz (Stereo Channels 1-4 Only) -** Depressing this switch engages a 100 Hz 18 dB/Octave High-Pass (Low-Cut) Filter. Engaging this filter has little impact on most signal sources but reduces the level of low-frequency noise. Unless the input source has low-frequency content like keyboard, etc., most inputs will benefit from use of this filter.

The high-pass filter augments the other EQ by cutting low frequency wind and stage noise from the main inputs.

On line inputs it can help remove low-frequency rumble from effects.

37 **Gain Control Left and Right (Stereo channels 1-4 only) -** These controls adjust input gain for proper signal level for the left and right inputs respectively. Gain is adjustable between 0 to 65 dB on the mic input and -20 to +45 dB on the line input.

Stereo Channels 5-8 (Dual-Line, Input Unique Controls)

38 **Line 2 Switch (Stereo Channels 5-8 Only) -** Depressing the Line 2 switch disconnects the Line 1 stereo inputs and connects the Line 2 stereo inputs. Line 1 has TRS balanced input connectors controlled by Gain 1 while Line 2 has RCA input connectors controlled by Gain 2 Control. Channel 8 also has a 3.5 mm mini TRS (38A) phone jack on the top panel connected to Line 2.

NOTE: Do not connect devices to both the Line 2 RCA jacks and the 3.5 mm jack at the same time.

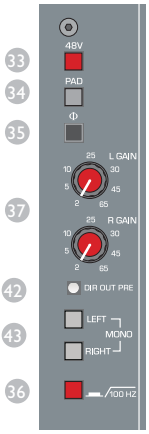
39 **High-Pass Filter (HPF): (Stereo Channels 5-8 Only) -** Depressing this switch engages a 12 dB/octave High-Pass (Low-Cut) filter at the frequency selected and can reduce low-frequency noise and some of the muddiness from some signals. The corner frequency of this filter is set by switch (40).

40 **High-Pass Filter 75 Hz/150 Hz (Stereo Channels 5-8 Only) -** This switch is used to select the corner frequency of the High-Pass Filter.

41 **Aux Mono Pre-fade Balance (Stereo Channels 5-8 Only) -** This control is an "Auxiliary bus" companion control to the Left/Right Mono switches described below and is used when the input signal is something other than a tradition two-channel stereo signal. This works weel with split-accompaniment track sources with the accompaniment recorded on one channel and vocals are on the other. Where the Left/Right/Mono switches would be used to select the Input channel with the accompaniment for the main fader bus feeds, the Aux Mono Prefade Balance is used to control the mix of the two tracks going to the Pre-Fade Auxiliary sends. A small amount of the vocals mixed with the accompaniment in the singer's monitor can often help.

If the source is a traditional stereo signal, leave this control in the center to get an equal mix of the left and right channels for the mono auxiliary sends.

This same feature can be implemented for the main bus feeds using the balance control. (See the LR Sum button (57) on pg. 19)

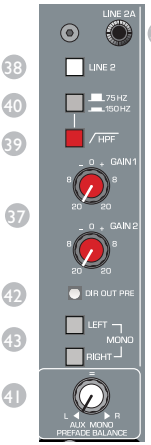


Stereo Channels 1-4

Input Controls Common To All Eight Stereo Channels

42 **Direct Output Pre/Post Switch -** This switch configures the Direct Output to be Pre-Fader (Switch In) or Post-Fader (Switch Out). Changing this switch requires the use of a bent paper clip, pencil, toothpick, "multi-tool" punch or some other pointed, preferably non-conductive object, to activate this "Poke Switch." This is done to prevent accidental changing of this switch during a of performance. Channel mute does not affect the direct output signal when the pre-fader source is selected.

43 **Left, Right Mono -** The Left and Right switches are used when other than straight stereo routing is needed. Leaving both switches in the "up" position routes the left and right stereo signals through this stereo channel as expected. Pressing the "Left" button (which is actually above, not to the left of the Right button) routes the left input signal to both the left and right signal paths in the channel. In other words, you now appear to have a mono signal with the Left input as its source. Pressing the "Right" button instead of the left does the same thing except that the right signal is now the mono source. Pressing both buttons combines the left and right signals equally into a mono signal. These switches do not affect the pre-fade aux send, which is controlled by the pre-fade balance control (41). On stereo channels 1-4, this allows the channel to be used as an additional mono input if desired.



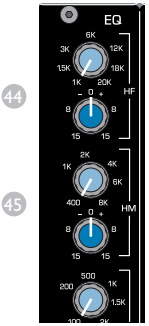
Stereo Channels 5-8

EQ Section

The EQ section provides the user with powerful and responsive control of the stereo signals in these channels. In addition to the high-pass filters described above, the EQ section consists of four, sweepable bands: high, high-mid, low-mid and low.

44 **Hi EQ -** Up to 15 dB of boost or cut available with this shelving filter. The frequency is adjustable from 1 kHz to 20 kHz.

45 **High Mid EQ -** Up to 15 dB of boost or cut available with this peak/dip filter. The frequency is adjustable from 400 Hz to 8 kHz.



45 **Low-Mid EQ -** Up to 15 dB of boost or cut available with this peak/dip filter. The frequency is adjustable from 100 Hz to 2 KHz.

46 **Low EQ -** Up to 15 dB of boost or cut available with this shelving filter. The frequency is adjustable from 40 Hz to 800 Hz.

47 **EQ On -** Depressing this switch activates the four bands of equalization.

Auxiliary Sends Overview - Twelve aux sends are available for creating individual output mixes. These mixes can be used to drive effects processors, provide monitor mixes, create broadcast or recording mixes, provide a send to subwoofers or other special requirements. With the corresponding PRE switches in the "OUT" position, the Aux sends are fed from the Post-Fader channel signal. When the PRE switch is depressed ("IN"), the corresponding Aux sends are fed from the channel's Post-EQ, Pre-Fader signal. The auxiliary sends in the stereo input module also have the capability to send signals to matrix mix buses.

Because these channels are stereo, the aux sends work somewhat differently than on the mono channels. Whenever the aux send is mono, as are Aux 1-4 and auxes 5-10 when stereo button is not engaged, the send is a mono sum of the left and right signals. The mono pre-fader signal is post Left/Right switches on the mic/line channel (1-4) and set by the pre-fader balance control on the dual-stereo line channels (5-8).

On the aux sends pairs that are set for stereo, the two odd/even send controls become level and balance.

NOTE: By changing internal jumpers, the "Pre" selection Switches on each channel can be changed. See the section on internal changes below for details.

Aux Sends 1-4

48 **Pre Switch -** Pressing this switch changes Aux sends 1-4 from post-fader audio to pre-fader audio. These sends are always mono. The default pre-fader source is post-EQ. See jumper options below for other sources.

The pre-fader source is determined by the Left & Right, Mono switches on the mic/line channels (1-4) and by the pre-fader balance control on the dual line channels (5-8).

49 **MTX - Send To Matrix Switch -** When the MTX 1-2 switch is pressed, Aux sends 1 & 2 become sends to Matrix mixes 1- 2 instead. Pressing the MTX button located near Aux sends 3 & 4 redirects those sends to Matrix mixes 3 & 4. This feature allows additional signals to be sent directly to the matrix mix.

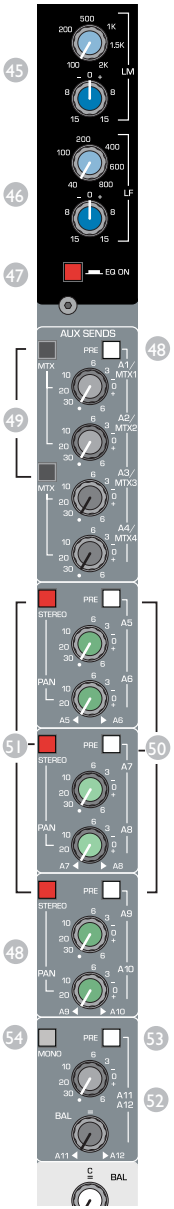
Aux Sends (5&6, 7&8, 9&10)

50 **Pre Switch -** Changes the Aux send signal(s) from post-fader to Pre-Fader, post-EQ. The default pre-fader source is post-EQ. See jumper options below for other sources.

The Mono Pre-Fader source is determined by the Left & Right Mono switches on the mic/line channels (1-4) and by the pre-fader balance control on the dual-line channels (5-8).

51 **Stereo Switch -** In Stereo mode, the Left input signal is sent on auxiliaries 5, 7 or 9 and the Right input signal on Aux sends 6, 8 or 10. The send controls are balance and level in odd/even pairs.

On the mic/line channels, the pre-fader signal is affected by the Left & Right Mono switches, but the dual-line channels are not.



52 **Aux Sends 11&12 (Stereo) -** Aux sends 11 and 12 are connected to a dedicated stereo bus where Aux send 11 sends the left channel signal and Aux 12 sends the right.

53 **Pre Switch -** Changes the Aux send signal(s) from post-fader to pre-fader, post-EQ.

The default pre-fader source is post-EQ. See jumper options below for other sources.

On the mic/line channels, the pre-fader signal is affected by the Left & Right Mono switches, but the dual-line channels are not.

54 **Mono Aux 11&12 (Channels 5-8 Only) -** Pressing the mono switch on stereo line channels (5-8) selects the mono signal from the pre-fade balance control as the source for Aux 11 & 12.

55 **Balance Control -** The Balance control on the stereo channels changes the relative volume of the left and right inputs going to the L/R, M/C and Subgroup buses.

56 **LR Sum (Stereo Channels 1-4 Only) -** On the mic/line channels (1-4), if the LR Sum button is pressed then a mono signal is sent to the subgroups. The mono sum is affected by the balance control.

57 **LR Sum (Stereo Channels 5-8 Only) -** On the dual-line channels, pressing the LR Sum button sends a mono signal to the subgroups and the L/R buses. The mono sum is affected by the balance control. This allows the balance of the left and right channels in the mix to be adjusted. For example, one can use this feature to control the mix of vocals and accompaniment in the house system when a split-accompaniment track is played.

Main Bus Assignments

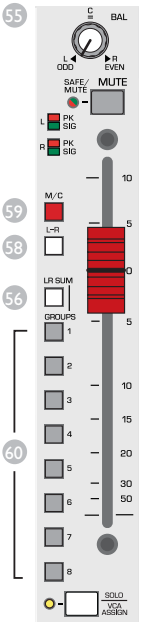
Note: Because these channels are for two-channel sources, LCR panning is not available on these channels.

58 **L-R -** Pressing the L/R assignment button routes the Left channel signal to the Left bus and the Right to the Right bus.

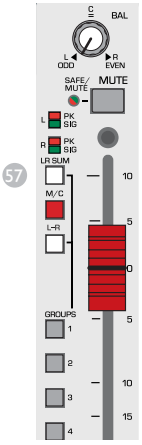
59 **M/C -** Pressing the M/C assignment button assigns a mono sum of the channel Left and Right signals to the Mono/Center output bus. The Balance control affects the mono/center signal on all stereo channels.

60 **Subgroup Assignment (1-8) -** The channel signal can be easily assigned to any subgroup using the eight bus-assignment buttons. The left channel is routed to the odd subgroups and right to the even unless the LR mono switch is engaged. The signal is affected by the balance control on all stereo channels.

61 **Mute Switch w/LED -** The Mute LED and Mute button perform several roles relating to the channel mute function. In normal operating mode, the mute switch is used to mute and unmute the channel audio. Muting the channel blocks the audio to the main buses, subgroups and auxiliary sends. The direct output is only muted if the post-fader source is selected. The channel mute can be activated locally using the channel mute button as part of a mute group/scene or as part of a VCA group. Users with experience working with traditional analog consoles will feel right at home with mute switches that engage when pressed but will not unmute until the button is released.



Inputs 1-4



Inputs 5-8

The Channel Mute LED Indicates Channel Mute Status.

LED Off indicates that the channel is active.

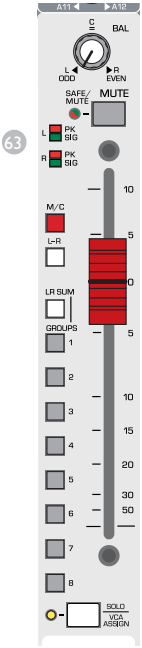
LED Solid Red indicates that the channel is muted.

LED Blinking Red indicates the channel is part of the mute group being edited.

LED Solid Green indicates the channel is part of the Mute Safe scene and cannot be muted by the mute scenes. It can still be muted locally.

LED Blinking Green indicates the channel is part of the Mute-Safe scene being edited.

When editing a Mute or Mute Safe scene, pressing the mute button adds and removes the channel from that scene.



62 **Fader -** The 100 mm linear VCA level control adjusts the level to all "Post" fader outputs (i.e., auxiliaries 1-12 selected post), AFL, Group assigns 1-8, L, R & M/C output mixes.

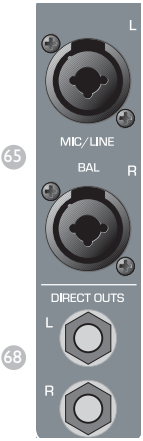
63 **2-Segment LED Array -** Dedicated stereo channel meters (one array each for L&R) connected pre-fader, post-EQ. The top red Peak LED responds to audio levels pre-EQ, post-EQ and post-fader. The green LED indicates the presence of signal.

64 **Solo/VCA Assignment Switch w/LED -** This switch serves two functions. The first function is to activate the console monitor system (SOLO). When switched, the channel audio is routed to the headphones, solo meters and monitor outputs. Choice of PFL (Pre Fader Listen) or AFL (After Fader Listen) is made in the master section. The AFL signal is post-fader, post-PAN pot and post-mute. The Solo LED is lit when the solo is active.

The second solo button function is for the assignment to VCA masters. After the "EDIT VCA" button has been pressed and a VCA master fader selected for editing, the channel Solo button is used to add or remove the channel from VCA master control. The Solo LED will flash when it is assigned to a VCA master.

CAUTION! The edit change takes affect immediately and there can be a sudden gain change unless the VCA master is set at "Unity." See the section on VCA editing for more information.

Rear Panel Features

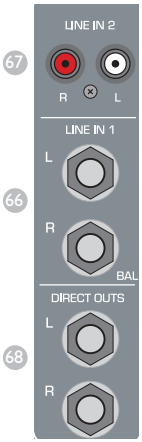


65 **Left And Right Balanced XLR Mic/TRS Line Input Combo - Connector (Stereo Channels 1-4 Only) -** The balanced female XLR inputs accept a low-impedance microphone signal, or a line-level signal. NOTE: Pin 2 on Crest Products is always Hot for both in and out connections unless the polarity reverse switch is engaged. Phantom power (+48 volt) can be applied to this input for sources requiring it by engaging the +48V switch at the top of the channel strip.

The Line Input is a 1/4" balanced (TRS) input located in the middle of the XLR connector with an impedance >10k Ohms. The tip is the positive input, which should be used for unbalanced inputs. The line inputs have 20 dB less gain than the XLR inputs and do not have phantom power available.

66 **Left & Right Line 1 Inputs (Stereo Channels 5-8 Only) -** Stereo Line 1 Inputs are 1/4" balanced (TRS) inputs with an impedance >10k Ohms. The tip is the positive input, which should be used for unbalanced inputs.

67 **Left & Right Line 2 Inputs (Stereo Channels 5-8 Only) -** Stereo Line Inputs 2 are RCA unbalanced inputs with an impedance >10k Ohms. Stereo channel 8 also has a 3.5 mm TRS stereo input connector on the front panel near the gain controls that can be used with MP3 players or similar devices.



68 **Left & Right Direct Out 1/4" TRS Jacks -** The input channel's signals are available at these output jacks. The default signal routing is derived Post-fader/Post-EQ. The switch at the top of the channel strip, changes the signal source to Pre-Fader/Post-EQ. This can be changed by an internal option to Post-insert/Pre-EQ. The output jacks are TRS, impedance-balanced.

Channel Internal Jumper Options (Aux Pre, Direct Out Pre)

In addition to the many front-panel options for selecting the signal source for the aux sends, direct outputs, etc., there are other internal options available for the stereo inputs. These are implemented by way of solder pads on the backside of the stereo input circuit boards (upper EQ board of the pair). Because these are stereo channels, you must change the solder-blob jumpers for both the left and right channels. These solder pads consist of split circles of tinned copper. Applying a blob (technical term) of solder across the two halves completes the circuit and implements the desired option. For the default setting, there is already a thin copper trace that connects the two halves, completing the default connection. This existing trace MUST be cut (use an X-acto knife) before an option is implemented.

To change back to the default operation after an option was performed, remove the blobbed solder from the option solder-pads (use a solder sucker or solder wick). Add a blob-link across the original default pads to replace the thin trace that was previously cut when the option was first performed. It is important that only one option be selected at a time. Otherwise, extremely erratic operation will result.

Aux Pre Source Option - The Aux Sends on the Stereo Input channels are normally fed by the Post-Fader/Post-Mute signal in the channel. There is a PRE switch associated with each set of Aux Sends that change the feed to a Pre-Fader point in the channel's signal path. There are two choices for this PRE point: Pre-Fader/Post-EQ and Pre-Fader/Pre-EQ. This change is done on a channel-by-channel basis; each channel has its own set of solder pads. All five of the PRE switches within that channel will be affected by the option change.

Pre-Fader/Post-EQ - This is the default setting for the PRE switch. The Aux Send signal is derived before the fader but after the channel EQ. This selection is post High-Pass Filter if active.

Pre-Fader/Pre-EQ - This is one of the options for the PRE switch. The Aux Send signal is derived before the EQ, but after the Insert Send jack, so any external processing gear will affect the Aux sends but the channel EQ does not affect it. This selection is also post High-Pass Filter if active.

Aux Pre Mute Option - With the default jumper setting, the auxiliary pre-fader sends mute when the channel mute is engaged. However, using solder jumpers, the mute can be defeated. Making this change will affect all pre-fader aux sends on that channel.
NOTE: Defeating the channel MUTE applies to any of the Pre-fader selections. The post-fader aux sends will always mute when the channel is muted.

Direct Out (D.O.) Option - The Direct Outputs on the Stereo Input channels are normally fed by the Post-Fader/Post-Mute signals in the channel. The PRE switch changes the feed to a Pre-Fader point in the channel's signal path. There are two choices for this PRE point: Pre-Fader/Post-EQ and Pre-Fader/Pre-EQ. This change is done on a channel-by-channel basis; each channel has its own set of solder pads.

NOTE: When the pre-fader signal is selected, the channel MUTE does NOT affect the Direct Out jacks. The channel insert and high-pass filter, if engaged, do affect the Direct Out jacks.

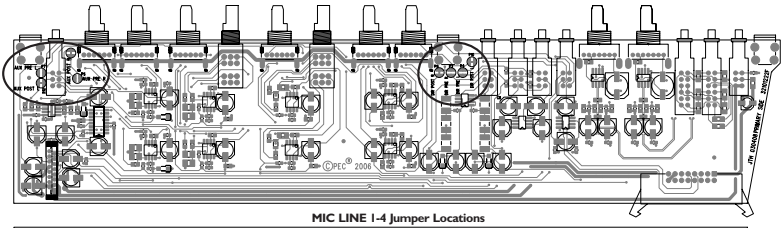
Pre-Fader/Post-EQ - This is the default setting for the direct out jacks. The signal is derived before the fader but after the channel EQ.

Pre-Fader/Pre-EQ - This is the option for the direct out jacks. The direct out signal is derived before the fader and before the channel EQ.

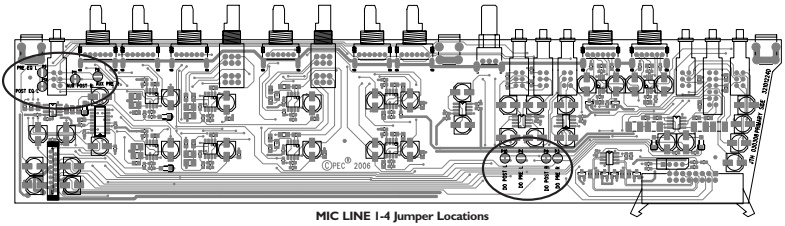
The specified Solder-Blob (Pxx) shown in the table should be linked (by solder-bridging) to complete the circuit and implement the indicated option. The table below shows the specific (Pxx) for each of the eight channels on a circuit board. Before implementing an option (by blobbing), be SURE to cut the existing thin copper trace linking the two halves of the default solder blob. Failure to do so will result in channel operation problems and possible circuit damage.

	Aux Pre-fader		Mute	Direct Output	
Channel	*Post EQ	Pre EQ	Defeat	*Post-EQ	Pre-EQ
1-4	P12, P11	P7, P5	P8, P6	P10, P9	P4, P3
5-8	P12, P11	P5, P6	P7, P8	P10, P9	P4, P3

***Default Jumper Setting**
The Aux, Mute and Direct output jumpers are located on the upper "EQ" circuit board.



MIC LINE 1-4 Jumper Locations

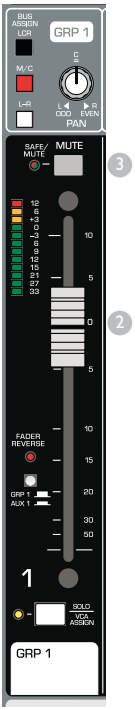


MIC LINE 1-4 Jumper Locations

MASTER SECTION

Group/Auxiliary Section Features

Because of the "Fader Reverse" feature and assignable dynamics, it is difficult to separate the features of the Subgroup, Master and Auxiliary section so they will be presented together. Feature functions are discussed with the "reverse" switch in the normal position, but the alternate functions are noted.



1 **Fader Reverse w/LED -** The Fader Reverse switch provides a convenience feature to the user. Subgroups are generally used for sub mixing a group of inputs, applying signal processing to a group of inputs and/or providing a sub-mix for other uses like tailored matrix mixes. In applications such as monitor mixing, it is more convenient to have faders instead of rotary master controls and to have those masters closer to the mix engineer.

Engaging the Fader Reverse switch lights the adjacent LED and swaps the Master Level, Mute, Solo and 12-segment Meter functions between the group or main outputs and the auxiliary outputs. None of the rear-panel connections change as a result of this function; all output and insert send and return jack signals remain the same. Only the master controls and meters reverse. This feature can be activated on a channel-by-channel basis and is independent of the dynamics processing section.

2 **Group & Main Bus Control & Monitoring -** Group and Main Master Faders: These 100 mm VCA faders control the level of the Group or main outputs. The matrix send-level is also affected when post-fader source is selected. When Fader Reverse is engaged, these controls adjust the corresponding auxiliary output level.

3 **Mute Switch w/LED (Group, Main Or Aux) -** The Mute LED and Mute button perform several roles relating to the group mute function. In normal operating mode, the Mute switch is used to mute and unmute the audio of the associated output. Muting these output channels blocks the audio to the output connectors and all post-fader sends. The subgroup, main and auxiliary outputs can be muted locally or as part of a mute group/scene. The main and subgroups can also be muted as part of a VCA group.

The Mute LED Indicates Output Mute Status.

LED Off indicates that the output is active.

LED Solid Red indicates that the output is muted.

LED Blinking Red indicates the output is part of the mute group being edited.

LED Solid Green indicates the output is part of the Mute Safe scene and cannot be muted by the mute scenes. It can still be muted locally.

LED Blinking Green indicates the output is part of the Mute Safe scene being edited.

When editing a Mute Scene, pressing the Mute button adds and removes the output from that scene.

When the Fader Reverse is activated, this control mutes the signal for the corresponding fader or control.

4 **Solo/VCA Assignment Switch w/LED -** This switch serves two functions. The first function is to activate the console monitor system (SOLO). When switched, the channel audio is routed to the headphones, solo meters and monitor outputs. Choice of PFL (Pre Fader Listen) or AFL (After Fader Listen) is made at the master section. AFL is post-fader, post-PAN pot and post-mute. The Solo LED is lit when the solo is active. When Fader Reverse is engaged, this control Solos the signal for the corresponding fader or control.

The second function is for VCA group assignments. After the "EDIT VCA" button has been pressed and a VCA master fader selected for editing, the Group Solo button is used to add or remove the channel from VCA master control. The Solo LED will flash when it is assigned to a VCA master. If the fader is reversed, the VCA control function stays with the fader. So in reverse mode, VCA masters can be used to control the Aux Master Fader.

5 **12-Segment LED Group Meter Array -** This meter array monitors the Post-Fader Group Output Level. 0 dB on the meter corresponds to a nominal +4 dB output level. The top red peak LED responds to audio levels pre- and post-fader by lighting before clipping occurs at either of those points.

When Fader Reverse is engaged, the meter monitors the level of the corresponding fader or control.

NOTE: If the Mono/Center output and Aux 11/12 are reversed, a mono sum of Aux 11/12 is displayed on the meter next to the fader and the Mono output signal is displayed on both the Aux 11 and 12 meters.

Group Bus Assignment
Main Bus Assignment of Subgroup audio. These controls are not affected by the Fader Reverse switch.

6 **Group PAN Control -** This control positions the subgroup image between left and right or between left-center-right outputs depending on the position of the LCR and assignment switches. (See LCR Switch)

In LCR mode, continuous variation is available between full level to left only (pan full counterclockwise position), full level to right only (pan full clockwise), and center position (full level to mono/center, no output to left or right).

7 **LCR Switch -** LCR changes the PAN function from L-R to L-C-R operation. When LCR panning is selected, adjusting the pan control adjusts the level to L, R & Mono buses. This switch not only changes the pan function but also assigns the group to the Left, Center and Right output buses. When the LCR button is engaged, the L-R and Mono assignment buttons are inoperative.

8 **MONO Bus Assign Switch -** This switch assigns the subgroup signal to the Mono/Center bus.

9 **LR Bus Assign Switch -** Assigns the subgroup signal to the Left and Right Bus. The PAN control adjusts the Left/Right image position.

10 **Matrix Sends - Send Level (1-4)**
The four Matrix sends associated with each subgroup and the main outputs allow alternate mixes to be developed. Each of these controls adjust the level in their respective matrix mixes.

11 **Matrix Post Switch -** When depressed, the four Matrix send signals will change from pre-fader to post-subgroup or master level control.

NOTE: The pre-fader default signal source is taken after the subgroup insert. Internal jumpers are available to change this signal to a point before the insert. The pre-fader signal is not muted with the subgroup mute.

12 **Stereo -** Depressing the stereo button in the matrix section changes the Matrix 3 and 4 send controls from mono level to stereo level and pan. The Matrix 3 control adjusts the matrix 3-4 level and the Matrix 4 control becomes a Matrix 3-4 pan.

13 **Aux Master Control -** These rotary controls set the level of the auxiliary outputs. The master control for auxiliaries 11 and 12 is a stereo control changing both outputs with a single knob.

When Fader Reverse is engaged, this control adjusts the corresponding group or main output.

14 **12-Segment LED Aux Meter Array -**These meter arrays monitor the Post-Fader Aux Output Level. 0 dB on the meter corresponds to a nominal +4 dB output level. The top red peak LED responds to audio levels pre- and post-fader by lighting before clipping occurs at any of those points.

When Fader Reverse is engaged, the meter monitors the corresponding post-fader group or master output.

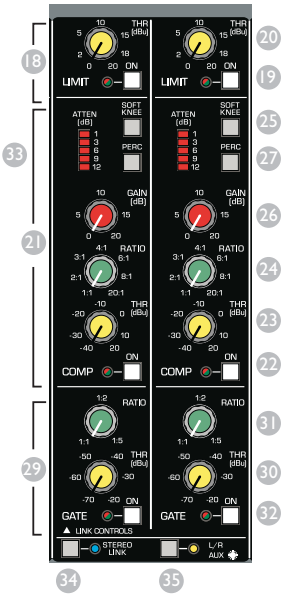
NOTE: If the Mono/Center output and Aux 11/12 are reversed, the Mono output signal is displayed on both the Aux 11 and 12 meters, and a mono sum of Aux 11/12 is displayed on the meter next to the master fader.

15 **Group, Aux and Main, Rear Panel I/O -** Main, Subgroup and Aux outputs Balanced output XLR jack (+4 dBu nominal output level) Pin 2 is +.

16 **Main, Subgroup and Aux Send -** Impedance-balanced output 1/4" TRS jack. This pre-fader output is always active and can be used without interrupting the signal path. (0 dBu nominal output level)

17 **Main, Subgroup and Aux Return -** Balanced return 1/4" TRS jack. The switch contacts on this jack "Normalize" the Send signal to the return input whenever the jack is unused. (0 dBu nominal input level)

Dynamics Processing
The dynamics section is yet another powerful and flexible portion of the CV-20 console. The CV-20 has 12 channels of dynamics processing, each capable of Limiting, Compression and Downward Expansion (Gating) depending on signal level. These processors are normally assigned to the subgroups and main outputs but can be switched in pairs to the auxiliary outputs.



18 **Limiter -** The limiter is used to set an absolute maximum output level. This can be useful for setting a maximum sound system sound pressure level or to reduce the chance of hearing damage from-in-ear monitors.

19 **Limiter ON Switch w/LED -** When depressed, the "Limiter ON" switch will illuminate the LED green to indicate that the Limiter is engaged. When the signal level exceeds the limit threshold, the limit LED turns red and the gain reduction meter indicates the amount of attenuation.

20 **Limit Threshold -** This control sets the point above which the gain is reduced to limit the output signal level. The threshold range is 0 to 20 dBu. This reference level is only accurate if the output fader is set to 0 (Unity) and the dynamics gain is set to 0. If the absolute output level is not important, then set for desired operation.

21 **Compressor -** The Compressor is the central part of the dynamics processor and is used to reduce dynamic range. Whenever the signal exceeds the level set by the compressor threshold control, the gain is reduced. The selected ratio and the amplitude of the signal above the threshold controls the amount of gain reduction.

22 **Compressor ON Switch w/LED -** When depressed, the "Compressor ON" switch will illuminate the LED green to indicate that the Compressor is engaged. When the signal level exceeds the Compressor threshold, the gain reduction meter indicates the amount of attenuation.

23 **Compressor Threshold -** The Threshold Control is used to set the point above which the compressor section will cause a reduction in output level. The amount of overall compression is determined by how much the signal exceeds the threshold and the ratio setting. The threshold can be set between –40 dB and +20 dB.

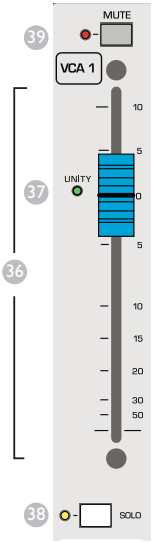
24 **Ratio -** The Ratio control determines how aggressively the compressor attenuates the signal. The Ratio is the relationship between how many dB of input signal change is required to change the output 1 dB. The Ratio can be set from 1:1 (no change) to greater than 20:1 (hard limiting). The compressor is most often used in the 3:1 to 6:1 range.

25 **Soft Knee -** This compressor has two different operating modes. The default mode is hard knee where the compressor strictly applies compression at the ratio set by the ratio control as soon as the threshold is exceeded. Engaging the Soft Knee switch smooths the transition into compression by letting the ratio slide from 1:1 into the preset ratio over a several dB range. Using this approach and setting a higher ratio allow the compressor to start with small changes and then compress more aggressively the more the threshold is exceeded.

26 **Gain (Make Up) -** Adjust to make up for apparent gain loss due to compression of the input signals. The input level to the dynamics sections can by viewed by using the appropriate output Solo in the "Pre" position. The gain control range is from 0 dB to +20 dB. The gain control is only active when the compressor is on.

27 **Perc Switch -** The default attack and release times are optimized for vocal and other general instrument applications. Depressing the Perc Switch decreases the attack and release times for percussive applications.

29 **Noise Gate -** The Noise Gate is used to attenuate or silence the signal when its level falls below a selected point (threshold). The Noise Gate in the CV-20 is actually a flexible soft-knee downward expander that can be easily adjusted for transparent low-level noise reduction.



30 **Threshold -** The Threshold control is used to set the point below which the gate will cause a reduction in output level. The amount of overall reduction is determined by how far the signal drops below the threshold and by the ratio setting. The threshold can be set between –20 dB and –70 dB.

31 **Ratio -** The Ratio control determines how aggressively the gate attenuates the signal. The Ratio is the relationship between how many dB the output is reduced for each dB the signal drops below the threshold. The Ratio can be set from 1:1 (no change) to greater than 1:5 (gating). The soft-knee function is always active on the gate. A setting of 1:2 is a starting point for the ratio control.

32 **Gate On Switch/LED -** Depressing the Gate switch enables the gate circuitry and the LED turns green. When the signal drops below the gate threshold, the LED turns red and the amount of gain reduction is displayed on the Gain Reduction Meter.

33 **Gain Reduction Meter -** The Gain Reduction Meter indicates the overall gain reduction applied to the input signals by the limiter, compressor or gate. The LED in the Limiter and Gate sections turn red whenever they are actively reducing the gain.

34 **Dynamics "Stereo Link" Switch -** When adjacent odd/even channels are used to process a stereo signal, the dynamics processors can be linked so that the same gain reduction is applied to both channels. When odd/even dynamics processors are linked, the processor responds to the RMS sum of the odd/even signals. To simplify control, the even channel controls and meter are disconnected and all adjustments are made with the odd channel controls.

35 **Dynamics Routing Switch -** The Dynamics Routing switch selects the signals the dynamics section will process. When the switch is in the "up" position, the group or main output signals are processed. Depressing the routing switch moves the processing to the Auxiliary outputs in odd/even pairs. The routing of the dynamics is not affected by reversing the faders.

36 **VCA Masters -** The eight VCA master faders in the CV-20 console can be easily assigned to control input channel, subgroup and master fader levels. The VCA masters do not pass audio but generate control signals that modify the gain of the channels and outputs assigned to it. In addition to the adjustment of gain, the VCA mute and Solo buttons also activate the mute and solo of all channels assigned to that master.

37 **Unity LED Indicator -** The VCA master Unity LED illuminates when the fader is at its unity gain position. Setting the fader at unity gain allows channels to be assigned (or removed) without a change of level.

38 **VCA Solo Switch -** When selected, this switch illuminates and activates the Solo function on all channels assigned to that VCA group. Solo mode switches in the master section control the Solo function that is activated.

Of special note, when the console Solo mode is set for AFL and if input priority (PFL) is enabled, the VCA master Solo buttons engage the AFL function on the channels assigned to that master allowing the user to hear the resulting mix.

Pressing a VCA Master's Solo button is also a quick way to review VCA assignments. Solo LEDs on all assigned channels will light.

39 **VCA Mute Switch -** Pressing the Mute switch for a VCA master mutes all channels assigned to that master unless that channel is in Mute Safe mode. The local channel mute buttons can override the VCA master group mute and un-mute a channel at any time.

40 **Matrix Masters -**The Matrix master section provides the user with control of level, monitoring and routing for the Matrix Mixes (1-4).

41 **Level Control -** Controls the level of the Matrix output.

42 **Mute Switch w/LED -** The Matrix Mute controls are part of the CV-20 soft mute system. The Mute LED and Mute switch perform several roles relating to the group mute function. In normal operating mode, the Mute switch is used to mute and unmute the matrix output audio. The matrix mute can be activated locally using the group mute button as part of a mute group/scene.

The Mute LED Indicates Output Mute Status.

LED off indicates that the output is active.

LED Solid Red indicates that the output is muted.

LED Blinking Red indicates the output is part of the mute group being edited.

LED Solid Green indicates the output is part of the Mute Safe scene and cannot be muted by the mute scenes. It can still be muted locally.

LED Blinking Green indicates the output is part of the Mute Safe scene being edited.

When editing a mute scene, pressing the mute button adds and removes the output from that scene.

43 **Solo Switch -** This switch is used to activate the console monitor system (SOLO). When engaged, the channel audio is routed to the headphones, solo meters and monitor outputs. Choice of PFL (Pre Fader Listen) or AFL (After Fader Listen) is made at the master section. AFL is post-fader, and post-mute.

44 **Matrix 3/4 to Aux 11/12 -** Creating the desired mix in the matrix section can sometimes be difficult when input channels are VCA controlled and routed directly to the Left, Right and Center outputs. In a similar way, an auxiliary bus mix provides a blend of channel signals but does not include subgroup signals and their processing. By routing Matrix 3/4 into Aux 11/12 you can create a mix that allows channel and subgroup channel signals to be combined into an independent stereo mix. The dynamics processor can be switched to Aux 11/12 to further enhance the mix.

45 **Matrix 1-4 Rear Panel Connections -** Balanced 1/4" TRS Jack outputs (+4 dBu nominal output level). Tip is +.

46 **Alternate Output -** The Alternate Output is useful when you need to send one of the main or matrix mix signals to a second location and need a separate level control of that output.

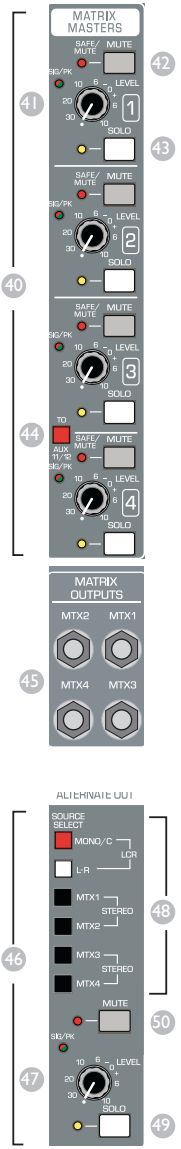
47 **Alternate Out Level -** This control is used to adjust the output level. Pressing the Solo button allows the user to listen to the alternate output in the headphone or monitor outputs and to observe the output level on the Monitor meters.

48 **Alternate Output Source Select -** These buttons are used to select the post-fader source for the alternate output.

Mono/C: Selects the Mono/C main signal and routes it to the Left and Right outputs.

L-R: Selects the Left and Right main signals and routes them to the Left and Right outputs.

NOTE: Pressing both the L-R and Mono/C buttons provides a Left-Right mix of these three signals for use in LCR applications.



MTX 1 MTX 2 MTX 3 MTX 4
Pressing any of these buttons individually routes that matrix signal to the Left and Right alternate outputs.

NOTE: Pressing both the MTX 1 and MTX 2 buttons or the MTX 3 and MTX 4 buttons routes the odd MTX signal to the Left output and the even MTX signal to the Right output.

49 **Solo Switch -** This switch is used to activate the console monitor system (SOLO). When activated, the alternate output audio is routed to the headphones, solo meters and monitor outputs. Choice of PFL (Pre Fader Listen) or AFL (After Fader Listen) is made at the master section. AFL is post-output level control and post-mute. The Solo LED lights when activated.

50 **Mute Switch and LED -** When the Mute switch is activated, the mute LED lights and the alternate output audio is muted. This Mute button is independent of all mute groups and scenes.

51 **Alternate Output Rear Panel Connections -** Balanced 1/4" TRS Jack Left and Right outputs (+4 dBu nominal output level). Tip is +.

52 **Monitor EXT Input -** This input is designed for monitoring an external stereo signal, such as a recorder or broadcast monitor. The input accepts balanced or unbalanced signals and is designed for a +4 dBu nominal level. It cannot be routed to any of the main outputs.

53 **EXT IN Left and Right -** The External Monitor inputs are balanced inputs using 1/4" TRS phone jacks. (+4 dBu nominal input level)

54 **Talkback** - The Talkback section is provided so that the engineer can communicate to stage or other locations by routing the talkback mic to any of the available outputs.

55 **Talkback Mic Input -** The XLR mic input connector is a balanced input with phantom power. An internal jumper is provided to defeat phantom power on this input if desired.

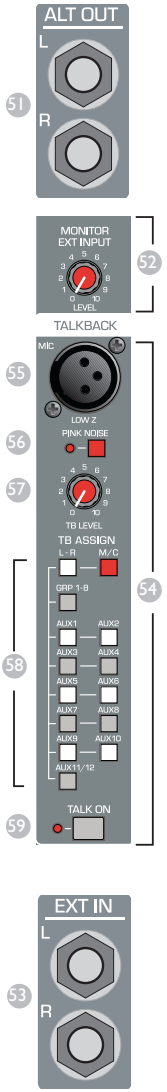
56 **Pink Noise Switch -** Pressing the Pink Noise switch disables the talkback mic input and replaces it with a pink noise. The Pink Noise LED illuminates to warn that the pink noise source has been selected.

57 **Level Control -** The Talkback Level control sets the level of the talkback mic or the pink noise generator.

58 **TB Assignment -** These switches select where the talkback signal is sent. The options are:

Mono/Center Output
L/R Output
Subgroups 1-8
Aux 1
Aux 2
Aux 3
Aux 4
Aux 5
Aux 6
Aux 7
Aux 8
Aux 9
Aux 10
Aux 11&12

59 **Talkback ON switch with LED -** This latching switch activates the talkback mic or pink noise source. The Talkback LED lights when active.



60 **Monitor Section (Headphone, Monitor and Solo system) -** The Monitor Section provides the user with a flexible set of tools to assist in the mixing process. Independent control is provided for both the headphone and monitor outputs. The user is able to listen to audio from the solo bus and can select a source to monitor when a solo source is not selected.

61 **Monitor Source -** If none of the Monitor Source buttons are pressed, there will not be a signal in the headphone or monitor outputs until a source is soloed.

Selecting a Monitor Source routes the selected post fader signal to the monitor outputs, headphone output and monitor meters. Selecting more than one source combines those sources in these outputs. Selecting both M/C and L-R allows for monitoring LCR signals. The level of the M/C signal is reduced to better represent a true LCR balance.

The Monitor Sources Are:

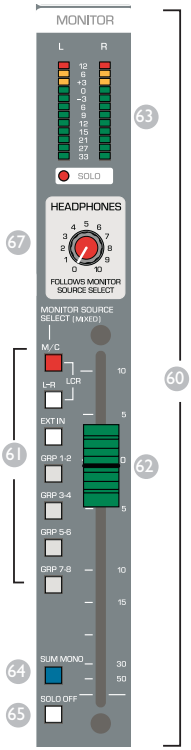
M/C Mono/Center main output

L-R Left and Right main outputs

EXT IN Monitor External input. This input is designed for monitoring external signal sources. The level control is located above the talkback mic in the master section.

GRP 1-2
GRP 3-4
GRP 5-6
GRP 7-8

These buttons allow the subgroup outputs to be monitored in odd/even stereo pairs.



Monitor Output

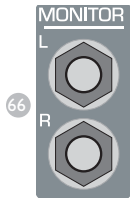
62 **Monitor Fader -** The Monitor Fader controls the level of the rear panel monitor outputs. The monitor output and headphone outputs share the same signal source except when Solo Off is selected.

63 **Monitor Meter -** The 12-Segment stereo meter displays the level of the signal in the monitor section. The input source selected for monitoring is normally displayed. When a source is soloed, the Solo LED will flash and meter displays the pre- or post-fader level of that signal.

64 **Sum Mono -** The Sum Mono switch only affects the monitor outputs and is used for mono monitor systems.

65 **Solo Off -** This button disables the Solo function in the monitor output. The selected monitor source will remain active in the monitor output when a solo source is engaged. NOTE: This button DOES NOT affect the headphone output.

66 **Monitor Rear Panel I/O -** Monitor output Left and Right: Balanced output via 1/4" phone jack. (+4 dBu nominal output level). Tip is +.



Headphone Output

67 **Headphone Level -** This control adjusts the Headphone Output level. The headphone output shares the same source as the monitor output except when Solo Off is selected. The headphone jack is located below the wrist rest in the master section.

Solo System - The Solo System in the CV-20 has features that allow the user to easily listen to signals at any point within the console and see their level using the Monitor Meter array.

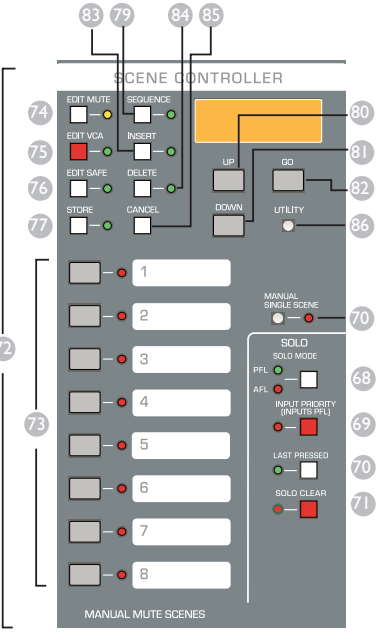
68 **Solo Mode -**The Solo Mode switch sets the console for PFL or AFL signal monitoring. When set to PFL (Pre Fader Listen), the source selected for Solo is monitored before the fader or output level control and before the mute. Except for the stereo inputs, the PFL signal is mono. When AFL is selected, the channel or output is monitored after the fader so that the level in the headphones and displayed on the meter represent the signal level at the output. If the source being soloed has a pan control, it will be monitored after the pan in Left/Right stereo. In most cases the "Input Priority" switch also affects the operation of the Solo Mode switch.

69 **Input Priority (PFL) -** This switch provides two additional solo functions. Any output that is soloed will first be cleared when an input solo button is pressed. Second, inputs will always be monitored in PFL mode. It is important to note that the VCA-Master solo buttons are treated as output solos. If the solo mode is set to AFL, pressing a VCA master solo will solo all of the signals under control of that VCA master in AFL mode, allowing the mix to be monitored.

70 **Last Pressed -**When the Last Pressed button is engaged all previously Soloed sources are cleared before engaging the newly selected source.

71 **Solo Clear -** This button can be pressed to clear all solo buttons engaged. The LED next to this button flashes when the solo function is engaged.

72 **Scene Controller -**The Scene Controller in the CV-20 simplifies the operation of the console by allowing mute groups or scenes to be stored and recalled as needed. VCA assignment and the mute safe scene are also edited and stored using the scene controller.



All of the mute functions within the CV-20 are digitally controlled. There are 144 mute scenes within the console that can each activate combinations of mutes. The eight manual mute scenes are intended for often-used mute operations. They can be activated individually or set where only one scene can be active at a time. The 128 scenes that make up the sequence scene system can be recalled in sequence or selected for recall as required from the console or via MIDI. The mute buttons associated with the VCA masters serve as eight additional mute scenes by muting channels assigned to each master.

Editing Mute and VCA scenes follows the same intuitive approach used in previous Crest consoles. Flashing lights lead you through the process of editing and storing changes.

A mute safe feature is also included. Any channels added to the mute safe scene cannot be muted by any of the mute scenes. This does not remove these channels from any of the programmed mute scenes, but simply inhibits muting. Channels that are part of the mute safe scene can still be muted locally. The mute LED on the channels light green to indicate that they are part of the mute safe scene.

Manual Mute Scenes - The eight buttons in the scene controller give the user direct access to eight mute scenes. The LED adjacent to the button lights when the scene is active. Each scene can be used to mute any combination of channels, subgroups and outputs. Use of mute scenes can tremendously simplify console
73 operation by making complex transitions possible with a press of a button.

74 **Editing Quick Start -** Mute Scene Edit Quick Start:

77 Editing is done offline. Channel mutes are not affected during editing.

Press Edit Mute (74). (Edit mute and eight scene LEDs will flash)

Press a manual Mute scene button to select it for editing (73) or use the up/down buttons to select a sequence scene to edit and press the sequence button to begin editing. Channel mute LEDs that are part of that scene will flash).

Press channel mute buttons to add or delete them from the scene.

Press Store (77). Store LED will flash along with the manual mute scene LEDs and sequence LED. The scene you selected for editing will be lit remain illuminated.

Press any Manual Scene button (73) to store in that location or use the up/down buttons to select a scene followed by pressing the sequence button to complete the store operation. To exit without storing, press Cancel.

VCA Assignment Quick Start - To edit and store the VCA assignment, use the procedure below. VCA assignment is done much like mute scene editing.

Remember - You can view the channels assigned to a VCA master by pressing the VCA master's SOLO button.

75 **NOTE:** VCA assignments become active as you edit.

77 Press VCA Edit (75) (The VCA master Solo LEDs will flash).

38 Press a VCA Solo button (38) to select that master for editing.

Press channel Solo buttons to add or delete them from that VCA master.

To edit another master, press its Solo button (75).

To end editing, press either the flashing VCA master Solo button or Store (75 or 77).

Manual Single Scene - There are two different modes of operation of the manual scenes. Multiple mute group mode or single scene mode. In multi-mute group mode, each of the eight mute scenes can be independently toggled on or off. This mode is generally used to control functional groups of microphones. You could mute all of the back-up vocal mics as a group, for example.

In "single scene" mode, only one manual mute scene can be active at a time. In this mode, you could create a scene for an acoustic song, another for an electric set, etc. Engaging a mute scene in this mode cancels any of the other manual mute scenes that are active. Pressing the button for an active mute scene cancels that scene.

73 Depress button (73) to engage Single Scene mode.

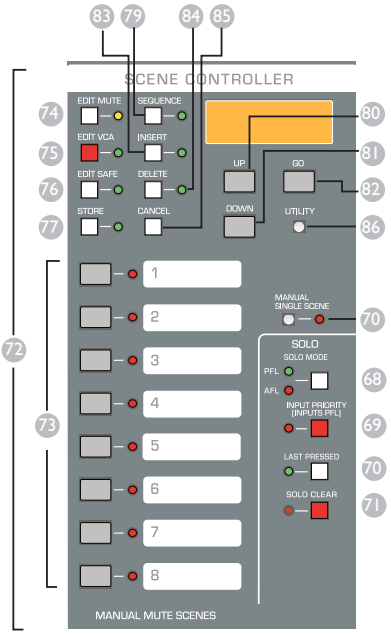
To prevent accidental activation of the Single Scene switch, it must be activated using a bent paper clip, pencil, toothpick, "multi-tool" punch or some other pointed, preferably non-conductive object.

VCA Group Mute - Activating the mute button for any of the VCA masters, mutes all channels assigned to that master. These VCA mute groups are created automatically when the VCA group is edited. Again, the local mute button can always override the group mute if desired.

Sequenced Scenes - Engaging the "SEQUENCE" button enables Sequence Scene operation and activates the selected mute scene. There are 128 Sequence Scenes that can be stored in the CV-20 console at one time. However, banks of 128 scenes can be saved to or loaded from a USB memory device (see the Utility section for instructions.) Although only one Sequence Scene can be active at a time, the manual mute scenes can also be used.

The Sequence Scenes are designed so that the operator can step through a show or event in scene order. However, scenes can be manually recalled in any order. Sequenced scenes can also be recalled via MIDI by sending a program change command to the CV-20. The MIDI command recalls the specific scene desired by scene number.

So why use Sequenced Mute Scenes? A good application for Sequence Mute Scenes is mixing sound for a theatre production. As you step through the scenes, wireless and area mics can be turned on and off as appropriate for that scene. But not every performance is identical. The CV-20 makes it easy to adapt on the fly and to edit scenes.



79 82 **Sequenced Scene Recall -** Engaging the Sequence button (79) will activate the selected scene and light the Sequence LED. The display will also change from "CV20" to the active scene number. Once Sequence Scenes are engaged, the "Go" button is used to initiate the recall of new scenes. Pressing the "Go" button causes the number in the display to be incremented and the resulting scene recalled. To recall a scene other than the next scene, use the Up/Down buttons to select the desired scene. The display will show a '*' to the left of the scene number, indicating the number displayed is not the current scene. Pressing the "Go" button will cause the selected scene to be recalled. The '*' will disappear when the scene is recalled or the display is returned to the currently active scene.

80 81 82 **NOTE:** The "SEQUENCE" button must be engaged for the sequence scene to be active. When "SEQUENCE" is not selected, the display will default to "CV20." Pressing the "UP," "DOWN" or "GO" (80, 81, 82) button will switch the display to the currently selected scene number without changing the selection. Once the display has changed, these buttons can be used to change the selected scene. A "-" to the left of the number indicates the Sequence Scene is not active. After a short time the display will return to "CV20" unless the Sequence button is pressed to activate the scene.

Editing, Preview, Storing and Copying of Scenes: An Overview

To preview a Mute Scene, press Edit Mute and select the desired scene. Press CANCEL to exit without saving.

74 **Editing a mute Scene -** Editing/previewing or copying a Mute Scene is initiated by the Edit Mute button in the master section (74).

73 When the Edit Mute button is pressed, the LEDs associated with the eight Manual Mute Scenes will flash (73) along with the Sequence and Edit Mute LEDs.

79 80 The user selects a Manual Mute scene to edit by pressing one of the eight buttons. To edit a Sequence Scene, first use the up/down buttons (80/81) to select the desired scene in the display and then press the Sequence Button (79).

81 85 Once the mute scene is selected for editing, its LED will flash along with the Mute LEDs that are part of that group and the Edit Mute LED. Pressing a channel, subgroup or master mute button will add or remove that mute from the group. Editing is done off line; the actual mute status is not changed until the store process is complete. The EDIT MUTE LED will continue to flash during the editing process, indicating the current edit mode.

To copy a scene, press Edit and select the scene you wish to copy. Press Store and select the desired "copy" to location.

To exit without storing, press the Cancel button (85).

77 **Storage -** Once you have the desired channel and output mutes selected, the mute scene can be stored. To store, first press the "Store" button (77). If you edited a manual scene, seven of the manual mute LEDs will flash along with the scene number display and Sequence LED. The LED will stay lit on the manual scene that was edited. Pressing a Manual Scene button will cause the scene to be stored in that location. To store in one of the 128 sequence locations, use the Up/Down buttons to select the desired scene number, then press the Sequence button to complete storage.

As you may have noticed, the scene you edit does not need to be from the location where the scene is stored. This allows scenes to be copied as well as edited.

Snapshot Mute Scene Storage - The current mute settings can be stored as a scene using snapshot storage. Press the "Store" button and then select the scene location to complete the "store" operation.

83 **Insert -** The Insert button (83) works, similar to the Store button. It can be used to store a scene that has been edited or can be used to store a snapshot of the current console settings. The Insert button differs from the Store button in that the scene will be inserted into the scene sequence at the selected location. The scene previously stored at that location and all the scenes above it are incremented to make room for the new scene. The last scene in the sequence (128) will be lost.

To insert a scene, you just finish editing and press the INSERT button (instead of Store). The scene number display and sequence scene LED will flash along with the Insert LED. Use the Up and Down buttons to select the storage location. Press the Sequence Scene button to complete the insert/storage operation.

To insert a snapshot, press the Insert button, use the up and down buttons to select the desired location and press the sequence scene button to complete the operation. The Insert button cannot be used to store a setting into the manual scenes.

84 **Delete Scene -** The delete scene button (84) is used to remove a scene from the sequence and move the scenes above that scene number to fill the hole. To delete a scene, first press the Delete button, causing the Delete and Sequence Scene LEDs to flash. Use the up and down buttons to select the scene to be deleted. Pressing the sequence scene button completes the operation.

85 **Pressing Cancel Will Exit Without Deleting A Scene (85).**

74 **Mute Safe**

76 **Editing The Mute Safe Scene -** Adding channels to the Mute Safe scene prevents those channels from being muted by mute scenes. They can still be locally muted, however. To edit the Mute Safe scene, press the "Edit Safe" button. All of the channels that are part of the safe scene will begin flashing green. Press the Mute button on channels to add or remove them from the group. Press the Store button to complete the operation. Because there is only one safe scene, editing begins immediately after pressing Edit and Store completes the operation.

To Exit Without Storing, Press The Cancel Button.

VCA Assignment - The VCA masters in the CV-20 console can be set to control any combination of channel, sub-master and master faders. The Unity Gain LED adjacent to the fader indicates when the fader is within +/-1 dB of unity. Setting the master to unity gain before assigning channels to that master prevents an abrupt change in channel level.

To Get Going Quickly, See The VCA Assignment Quick Start Section.

NOTE: When editing the local VCA assignment, the assignment becomes active immediately when the assignment is made.

VCA Editing - Editing VCA assignment is similar to editing mute groups. VCA assignment is always active and can be directly edited. Because the VCA edit system uses the Solo buttons on the console, console solos cannot be changed while in VCA edit mode.

75 **Edit VCA -** To edit the current VCA assignment, begin by pressing the VCA edit button. The VCA master solo LEDs will begin flashing along with the EDIT VCA LED. Pressing one of the VCA-master Solo buttons selects that master for editing. The solo LED for that master will continue to flash along with the EDIT VCA LED and the solo LEDs for all channels currently assigned to that master. Pressing channel, group or master solo buttons will add or remove that channel from the VCA group. When editing is complete, either:

Press another VCA Master Solo button to continue the edit process for another master.

Press the cancel button to exit without saving.

Store and exit edit mode by pressing the flashing VCA Master Solo button OR pressing the store button.

When editing, the assignment and resulting gain changes will be applied immediately. To prevent abrupt changes in volume, make sure that the VCA master being edited is set to the unity gain position.

To see what channels are assigned to a VCA master, press the Solo button for that master.

Utility Functions

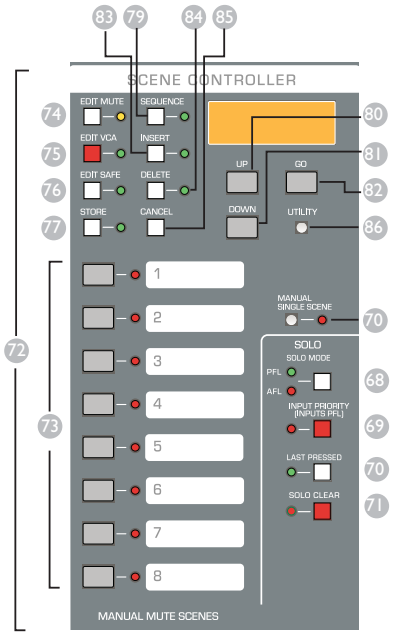
86 **Micro Utility Switch -** The Utility mode is used to set up MIDI operation, Save and Recall Sequence and to reset all of the console mute and VCA assignments.

Because the Utility functions are seldom used and changes made in this section could have far-reaching impacts, the Utility switch must be activated using a bent paper clip, pencil, toothpick, "multi-tool" punch or some other pointed, preferably non-conductive object. Once the user enters the Utility mode, the up, down, go and cancel buttons are used to navigate the screens and to modify settings. The initial display will show "UTIL".

Press the Utility button at any time to return to normal operation.

There are five main menu screens that are accessed using the UP or DOWN arrow buttons.

UTIL
MIDI
SAVE
RECL
CLR



UTIL - This display has no underlying function but simply announces that you have arrived at the Utility Menu.

MIDI - The CV-20 can send and respond to MIDI program change instructions. MIDI program change commands can be sent whenever a sequence scene is recalled or scenes can be recalled in response to incoming MIDI instructions. Recalling Sequence Scene 3 will send a program change 3 command. Those familiar with MIDI may recognize that some products use the actual command value of 0 to 127 in the display. The CV-20 uses the common practice of numbering the scenes from 1 to 128 so the displayed value is one greater than the actual transmitted value.

The MIDI section of the utility section allows the MIDI functions to be enabled or disabled and the MIDI channel set.

MIDI Enable - From the MIDI screen, press the GO button to get to the screen enabling or disabling MIDI functions. The screen will display "ON" or "OFF" showing the current status. Press the UP or DOWN buttons to change. Pressing cancel will return you to the main Utility Menu without saving any edits. If MIDI is enabled "ON," pressing the GO button will take you to the MIDI channel screen.

MIDI channel - Use the UP/DOWN buttons to change the MIDI Transmit/Receive channel. If OMNI receive mode is selected, the CV-20 will transmit on channel 1. Pressing the GO button will save the setting and return to Utility Menu. Pressing Cancel will return without saving.

SAVE - The Save function allows all 128 Sequence Scenes to be saved as a file onto a USB thumb drive. Pressing GO from the SAVE screen brings up the first available unused storage file name. The file name is CV20MEMx.bin and is stored in a folder named CV 20. The file number (x) can range from 1 to 9. The display will show MEMx. Use the UP/DOWN buttons to change the file number and press GO to save. Press CANCEL to exit without saving.

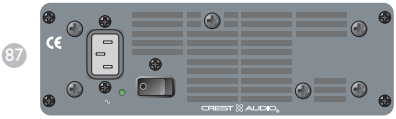
RECL - The Recall function allows a previously saved set of 128 Sequence Scenes to be recalled from a thumb drive file and saved to the CV-20 console. Recalling a Sequence Scene file will overwrite the scenes currently saved within the console. If you want to keep the current scenes, be sure to save them to a new file first. If there are no files stored on the thumb drive, the display will show "----".

Use the UP/DOWN buttons to select the file to recall. Press GO to recall. Press CANCEL to return to the main Utility Menu without recalling a file.

CLR - The Clear function allows all of the settings stored within the CV-20 to be cleared. Press GO to continue. The default "NO" must first be changed to "YES" using the UP/DOWN buttons. Press GO to clear. Pressing CANCEL or GO with "NO" selected will return to the main Utility Menu without clearing.

87 **CV-20 Power Supply-** The CV-20 power supply is an efficient, power-factor corrected design that easily handles the requirements of the CV-20 console. The switch mode design used in this supply generates very little electrical noise so that it is well suited to installation inside the CV-20 chassis. The supply is power-factor corrected and designed to operate from nominal mains of 100V to 240V, 50/60Hz.

The internal power supply(s) are located in the rear of the CV-20. The power switch, power LED and IEC power inlet are located on the face of the supply. Use the appropriate IEC power cable for your local mains.



IEC Inlet

U.S. Domestic AC Mains Cord - The mains cord supplied with the unit is a heavy-duty, three-conductor type with a conventional 120VAC plug with ground pin. If the outlet used does not have a ground pin, a suitable adapter should be used and the third wire grounded properly. All apparatus with class 1 construction shall be connected to a mains socket with a protective earthing connection.

Never break off the grounding pin on any equipment. It is provided for your safety. The use of extension cords should be avoided but, if necessary, always use a three wire type with at least #14 AWG wire size. Always use a qualified electrician to install any electrical equipment. To prevent the risk of shock or fire hazard, always be sure the console and all associated equipment is properly grounded.

NOTE: For UK Only - If the colors of the wires in the mains lead of this unit do not correspond with the colored markings identifying the terminals in your plug, proceed as follows: (1) The wire that is colored green and yellow must be connected to the terminal that is marked by the letter E, the Earth symbol, colored green or green and yellow. (2) The wire that is colored blue must be connected to the terminal that is marked with the letter N or the color black. (3) The wire that is colored brown must be connected to the terminal that is marked with the letter L or the color red.

Important: Make sure that the air exhaust vent on the power supply(s) and the air intake vents located under the wrist rest are not blocked to prevent overheating.

IMPORTANT: At no time should the mains safety ground be defeated either by cutting off the ground pin or by improperly using a ground lift adapter.

88

88 **Voltage Present LEDs -** There are 5 LEDs in the CV-20 master section to indicate presence of each voltage rail. All 5 LEDs should be green when the power supplies are working properly. There is also an LED adjacent to the power switch on each power supply to indicate that it is on and working. The +6V supply is regulated internally from the +12V supply.

Redundant Power Supplies - The CV-20 console is fitted with two internal power supplies in its standard configuration. These are installed in the power supply bays on the rear of the console below the left-of-master, channel input connectors. Either or both of these supplies can be used for powering the console. The power supplies contain circuitry for redundant operation, which automatically disconnects a supply from the CV-20 internal power buses if it is not powered or fails.

There are several ways to take advantage of the redundant supply capability. Powering both supplies assures that console will continue to work even if one of the supplies fail. Powering only one supply and disconnecting the AC line cord from the second provides a ready to go backup in case a power surge causes failure of the first supply.

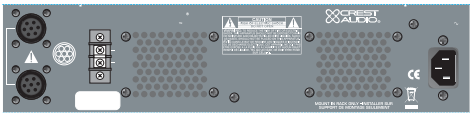
Replacing An Internal Power Supply - Disconnect power from the CV-20. Remove the four mounting screws that hold the existing power supply in place. Slide the power supply out and press the two latches on the eight-conductor power connector at rear of the unit to remove. Connect the eight-conductor cable from inside the power supply bay to the rear of the power supply. The connector is keyed to assure correct connection. Slide the power supply into place and secure with the four mounting screws.

IMPORTANT: Install and tighten ALL four screws for safe operation.

89 **The EPS-8 External Power Supply (Optional) -** The EPS-8 is a rack-mount version of the internal power supply for the CV-20. The 2U chassis has a front-panel power switch, LED power indicator and four-LED output voltage indicators. Two seven-pin connectors are located on the rear of the console for connection to the console or a second external supply.

The EPS-8 power supply is connected using the seven-conductor cable provided (03003170). The cable connects the seven-pin circular connector on the rear of the console labeled Ext DC to one of the seven-pin connectors on the rear of the EPS-8. Part number 03003160 is a short cable used to link two EPS-8 power supplies for external redundant operation.

89



DC Outputs - There are two circular seven-pin DC output connectors on the rear panel wired in parallel. These connect through the DC power cable to the DC input connector of an approved Crest console, or to another EPS-8 or Crest-5A (redundant) power supply. The supply may not function properly (or could be damaged) if it is used to power other devices.

PINOUT:

PIN 1: +12VDC @ 8A max

PIN 2: +18VDC @ 8A max

PIN 3, 4: COMMON GND

PIN 5: +12V GND

PIN 6: +48VDC @ 0.75A max

PIN 7: -18VDC @ 8A max

Ground Link - If you experience a low level hum when using an external redundant supply, it may be the result of a ground loop between the supplies. Removing the ground jumper from the barrier strip on the rear of ONE EPS-8 will eliminate this path. Removing this jumper does not disconnect the EPS-8 chassis from ground but only lifts the chassis ground connection to the console. Crest consoles with internal power supplies are always connected to the AC mains ground and cannot be lifted.

IMPORTANT: At least one supply must provide an Earth ground to the console for safe operation. At no time should the mains safety ground be defeated either by cutting off the ground pin or by improperly using a power cord ground lift adapter.

Optional Meter Bridge - The optional meter bridge has 17 backlit, analog VU meters allowing nearly every output of the console to be monitored. The meters are divided into two groups. The first 12 meters monitor the four matrix outputs and eight subgroups but they can be switched to monitor the 12 auxiliary outputs. Three of the five remaining meters are dedicated to monitoring the Left, Right and Mono/Center outputs while the last two display the monitor/Solo left and right levels.

Optional Console Link - The console link option consists of two module pairs for linking two CV-20 consoles together. When linked, one console becomes the master over the second.

The module installed in the master console provides balanced inputs to all of the buses while the module installed in the second provides bus outputs. The signals linked are the Left, Right and Mono/Center main buses, 12 aux buses and 8 groups. When the output link board is installed, it can be connected either pre or post master fader. The solo link connections are a standard part of the console. The solo link system is also compatible with the Crest X Series and consoles.

Specifications:

Frequency Response:	20 Hz–20 kHz • +0/-0.5 dB Any input to any output (Ref 1kHz @ +15dBu output level)
THD+Noise	Chan Input to Group or Main Output (Left/Right/Mono) <0.01% THD 20 Hz to 20 kHz at +4 dBu out (0.005% Typical)
Noise	(22 Hz to 22 kHz Bandwidth) Mic EIN: <-128 dBu (Measured @+60 dB gain, 150Ω source) Bus Noise: Below –85 dBu (w/32 Channels Routed)
Crosstalk	(Measured 20 Hz-20 kHz, Ref to +4 dBu output) Channel Mute >90 dB Channel Routing >85 dB Channel fader attenuation >85 dB Aux Send attenuation >80 dB
Phase Shift	<+/-30 degrees 20 Hz to 20 kHz Mic in to Main out
XLR Inputs	2.5k Ohms Balanced
Max Voltage Gain:	Mic-In To Group To Left/Right Balanced Out = 92 dB
Main Outputs	Male XLR, 100Ω Balanced, +26 dBu Max Output Level
Group Outputs	Male XLR, 100Ω Balanced, +26 dBu Max Output Level
Auxiliary Outputs	Male XLR, 100Ω Balanced, +26 dBu Max Output Level
Matrix Outputs	1/4" TRS Phone, 100Ω Balanced, +26 dBu Max Output Level
Alt Outputs	1/4" TRS Phone, 100Ω Balanced, +26 dBu Max Output Level

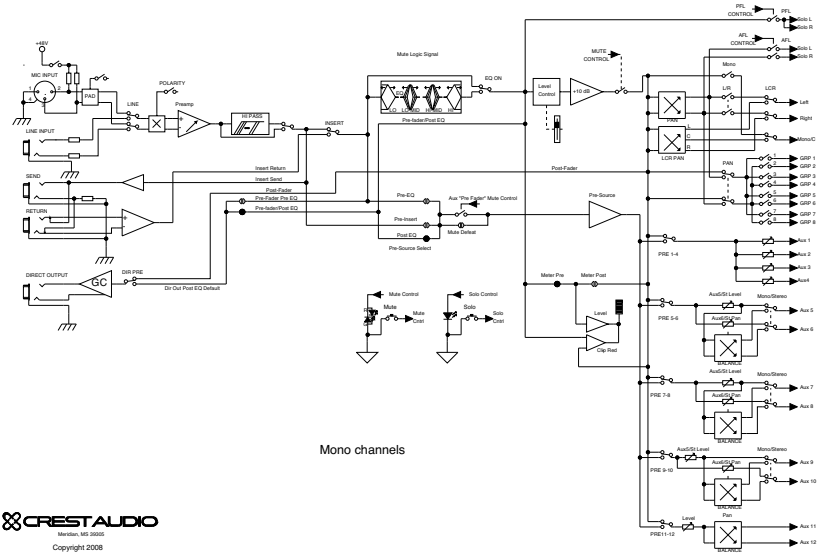
Monitor Outputs	1/4" TRS Phone, 100 Ohms, ground-compensated/ Impedance Balanced Max Out = +21 dBu
Channel Direct Out	100 Ohms, Impedance-Balanced, TRS • Max Out = +21 dBu
Insert Send	100 Ohms, Impedance-Balanced, TRS • Max Out = +21 dBu
Insert Return	1/4" TRS Phone, 10K Ohms Balanced Channel Insert Level = +4 dBu Bus Insert Level = 0 dBu
Internal Power Supply	AC Input: 100-240 VAC, 50/60 Hz via 15A IEC Mains connector Power-Factor corrected 7-Pin DC connector provided for external (redundant) PSU Maximum power consumption (64-chan): 450 watts Power consumption varies with frame size and installed options.
Ext DC Power Requirements	+/- 18 volts @ 7 amps (main analog rails) (Max for 64-channel model) +12 volts @ 6 amps (logic and lamp circuits) +48 volts @ .6 amps (phantom voltage)
NOTE:	Use ONLY Crest approved power supplies for the CV-20

Weight And Dimensions:

CV-20 32Ch	Inches: 61.9 X 34.6 X 12.4	MM: 1572 X 879 X 315
Weight: CV-20 32Ch	153 lbs 70 kg	
CV-20 40Ch	Inches: 72.7 X 34.6 X 12.4	MM: 1847 X 879 X 315
Weight: CV-20 40Ch	179 lbs 81 kg	
CV-20 48Ch	Inches: 83.4 X 34.6 X 12.4	MM: 2118 X 879 X 315
Weight: CV-20 48Ch	209 lbs 95 kg	
CV-20/56	Inches: 94.2 X 34.6 X 12.4	MM: 2393 X 879 X 315
Weight CV-20/56	232 lbs 106 kg	
CV-20/64	Inches: 104.9 X 34.6 X 12.4	MM: 2665 X 879 X 315
Weight: CV-20/24	265 lbs 120 kg	

Dimensions are Width X Depth (Front-to-Back) X Height

NOTE: Call for detailed chassis drawings before attempting to build a road case.



Mono channels

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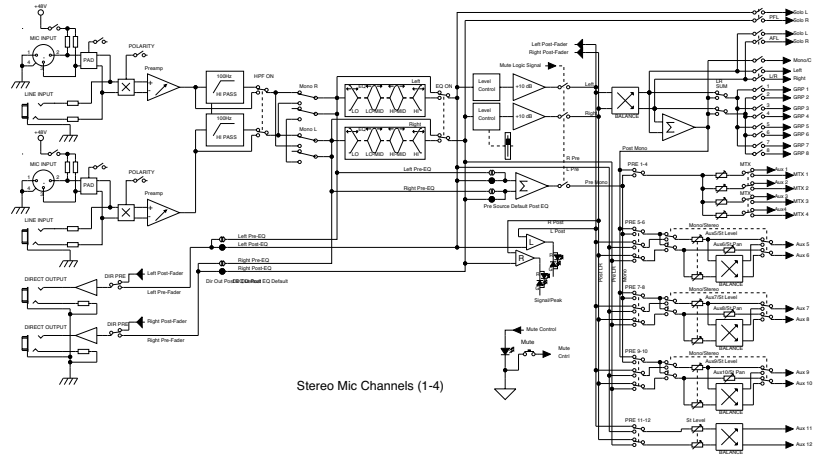

Stereo Mic Channels (1-4)

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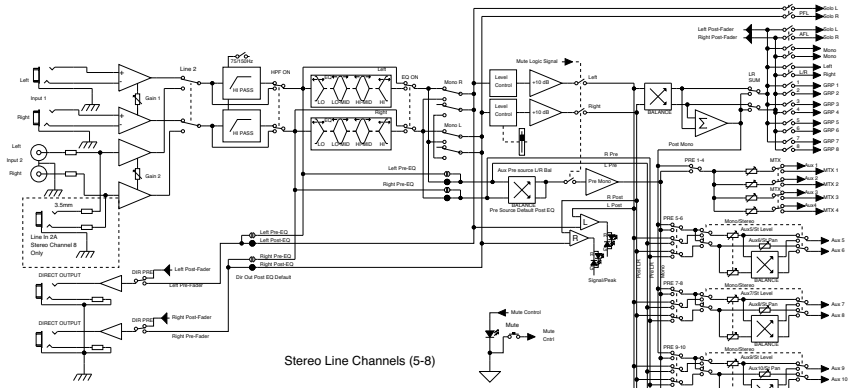
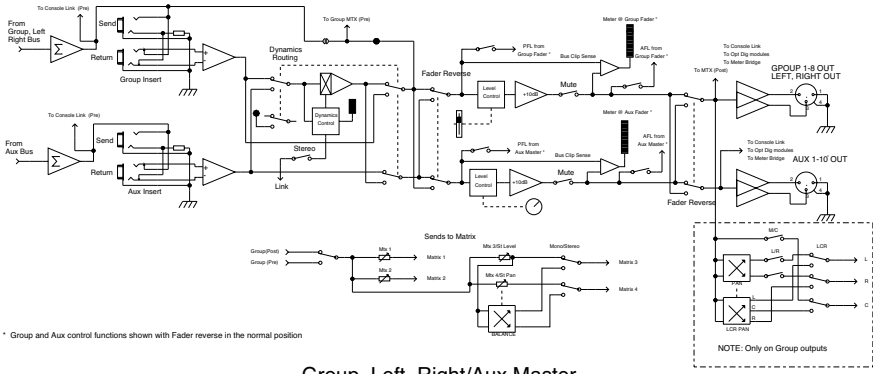
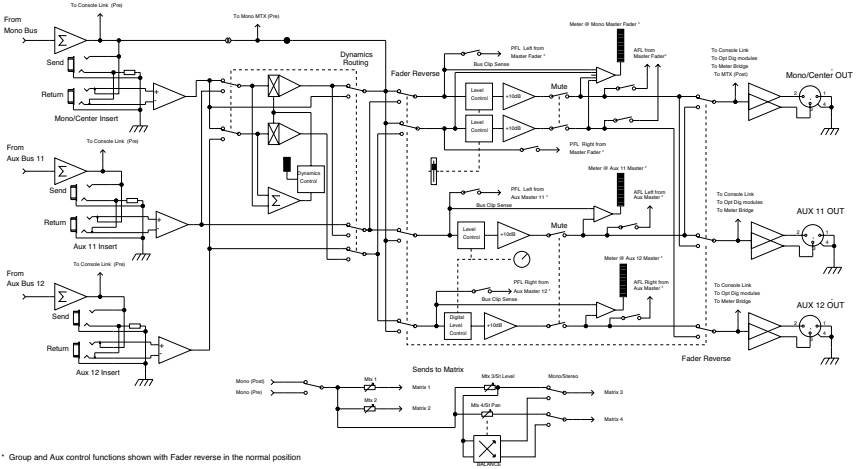


Stereo Line Channels (5-8)



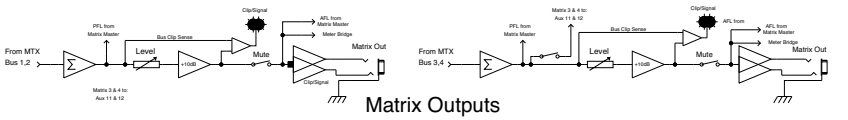
* Group and Aux control functions shown with Fader reverse in the normal position

Group, Left, Right/Aux Master

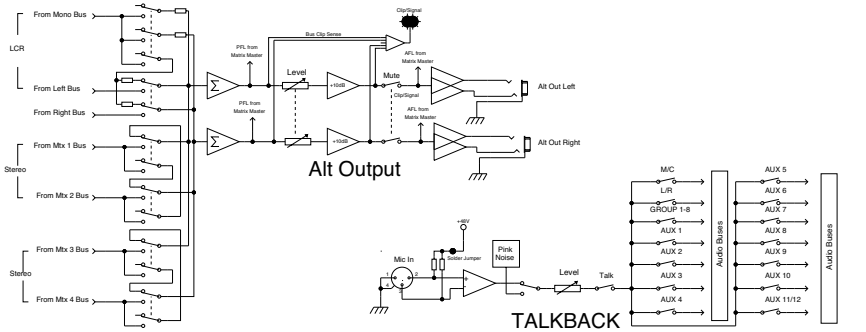


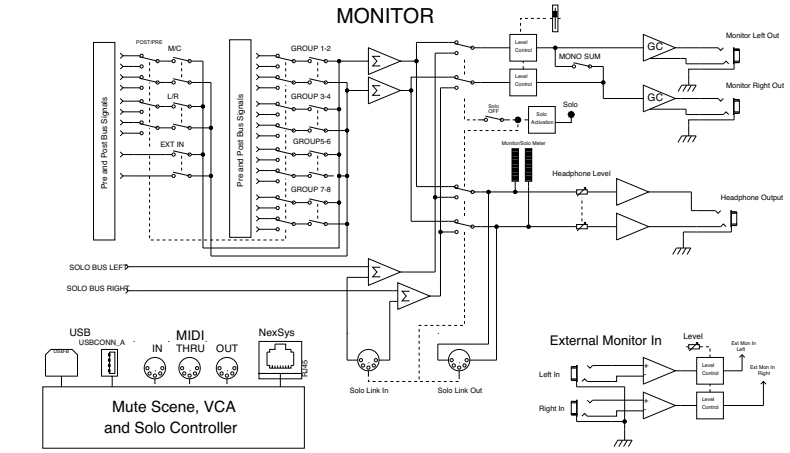
* Group and Aux control functions shown with Fader reverse in the normal position

Mono-Center/ Aux 11/12 Master



Matrix Outputs





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