TRM8

Installation & Operation

Hafler®

trans•nova

DESIGNED AND ASSEMBLED IN THE USA

MONITORING SYSTEM

CE

Declaration of Conformity

Application of Council Directive: **73/23/EEC (low voltage directive)**

Standard(s) to which Conformity is Declared: **EN55013**

EN55020

EN60065

Manufacturer's Name: **Hafler**

Manufacturer's Address: **546 South Rockford Drive, Tempe, Arizona 85281**

Importer's Name: _____

Importer's Address: _____

Type of Equipment: **2-channel Audio Power Amplifier/Speaker**

Model No.: **TRM8**

Serial No. _____ Year of Mfg. ☐ '96 ☐ '97 ☐ '98

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s)

Place: **Hafler**

Date: **12/11/96**

James C. Strickland

James C. Strickland, VP Engineering

NOTICE - IMPORTANT SAFETY INFORMATION

WARNING: TO PREVENT FIRE OR SHOCK HAZARD DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

The lightning flash with arrowhead symbol within an equilateral triangle is 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.

The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. **READ INSTRUCTIONS**
   All the safety and operating instructions of your Hafler equipment should be read before power is applied to the equipment.

2. **RETAIN OWNER'S MANUAL**
   These safety and operating instructions should be retained for future reference.

3. **HEED WARNINGS**
   All warnings on the equipment and in the operating instructions are important and should be followed.

4. **FOLLOW INSTRUCTIONS**
   All operating and use instructions are important and should be followed.

5. **HEAT**
   The equipment should be kept away from areas of high temperature, i.e., heater vents, radiators, stoves/ovens, fireplaces, etc.

6. **VENTILATION**
   The equipment should be used in an area suitable for proper ventilation. Care should be taken not to impede airflow in and around the cabinet.

7. **WATER AND MOISTURE**
   The equipment should not be used in or around water, such as a bathtub, sink, or swimming area. Also, the equipment should not be used in areas prone to flooding, such as a basement.

8. **POWER SOURCES**
   The equipment should be connected only to a power source of the same voltage and frequency as that listed on the rear panel above the power cord entry point.

9. **POWER CORD PROTECTION**
   Power cords should be arranged so they do not interfere with the movement of objects in the room: people, fan blades, utility carts, etc. Also, care should be taken that the cord is not pinched or cut, and placed so it is not in danger of being pinched or cut, as in under a rug, around a tight corner, etc.

10. **POWER CORD GROUNDING**
    The power supply cord is of a three wire grounded type, designed to reduce the risk of electric shock sustained from a live cabinet. It is assumed to be of suitable length for most uses of the equipment. The use of extension cords and power strips is discouraged unless they are of suitable rating to deliver the required total current for safe operation of all connected equipment. Furthermore, extension cords or power strips must provide the same three wire grounded connection. It is important that the blades of the equipment's plug be able to fully insert into the mating receptacle. **Never remove the round grounding pin on the plug in an attempt to mate to a two wire ungrounded receptacle:** use a grounding adaptor with the grounding tab or wire suitably connected to earth ground.

11. **NON-USE PERIODS**
    During periods of extended non-use, the power cord should be unplugged from the power source.

12. **CLEANING**
    The equipment should be cleaned only as detailed in the operating instructions.

13. **OBJECT AND LIQUID ENTRY**
    Care should be taken so that objects and/or liquids, such as cleaning fluids or beverages, are not spilled into the enclosure of the equipment.

14. **DAMAGE REQUIRING SERVICE**
    Hafler equipment should be serviced by qualified service personnel when:

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

    B. Objects have fallen onto, or liquid has been spilled into the equipment, or

    C. The equipment has been exposed to rain, or

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

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

15. **SERVICING**
    The user should not attempt to service the equipment beyond that which is described in the operating instructions. All other service should be referred to qualified service personnel.

16. **CARTS AND STANDS**
    The equipment should be used with carts or stands only of sufficient strength and stability for the use intended.

    An equipment and cart combination should be moved with care. Quick stops and starts, excessive force, and uneven surfaces may cause the equipment and cart combination to topple.

ESPAÑOL

ADVERTENCIA – INFORMACION DE SEGURIDAD IMPORTANTE

El símbolo de flecha relámpago dentro de un triángulo equilátero, es para alertar al usario de la presencia de "voltajes peligrosos" no aislados en el interior del aparato, los cuales pueden ser de suficiente magnitud para constituir un riesgo de choque eléctrico a las personas.

El símbolo de exclamación dentro de un triángulo equilátero, es para alertar al usuario de la presencia de instrucciones importantes de operación y mantenimiento (servicio) en la documentación que acompaña al equipo.

1. **LEA LAS INSTRUCCIONES**
   Todas las instrucciones de seguidad y operación de su equipo Hafler, deben ser leídas antes de que el equipo sea conectado dléctricamente.

2. **CONSERVE EL MANUAL DEL PROPIETARIO**
   Estas instrucciones de seguridad y operación, deben ser conservadas para futuras referencias.

3. **CUADROS DE ADVERTENCIAS**
   Todas las advertencias en el equipo y en las instrucciones de operación, son importantes y deben ser seguidas.

4. **SIGA LAS INSTRUCCIONES**
   Todas las instrucciones de uso y operación son importantes y deben ser seguidas.

5. **CALOR**
   El equipo debe ser mantenido lejos de areas de alta temperatura, como por ejemplo: ventilaciones de calentadores, radiadores, estufas/hornos, hogueras, etc.

6. **VENTILACION**
   El equip debe ser usado en áreas con ventilación adecuada. Deben er tornadas las precauciones necesarias para no impedir el flujo de aire dentro y alrededor del aparato.

7. **AGUA Y HUMEDAD**
   El equipo no debe ser usado en el agua ó alrededor de ésta, tales como en una bañera, tanque o áreas de nado. También, el equipo no debe ser usado en áreas propensas a inundaciones, tales como en un sótano.

8. **FUENTES DE PODER**
   El equipo debe ser conectado a una fuente de poder del mismo voltaje y frecuencia que el indicado en el panel trasero sobre el punto de entrada del cable de corriente.

9. **PROTECCION DEL CABLE DE CORRIENTE**
   Los cables de corriente deben ser dispuestos de forma tal que no interfieran con el movimiento de objetos en la sala: personas, aspas de ventilación, carretillas, etc. También, es necesario tener cuidado de que el cable no esté punzado o cortado, y debe estar ubicado de forma tal que esto no ocurra, como podría suceder debajo de una alfombra o al pasar el cable por una esquina aguda, etc.

10. **ATERRAMIENTO DEL CABLE DE CORRIENTE**
    El cable de corriente es del tipo aterrado de tres hilos, diseñado para reducir el riesgo de una descarga eléctrica procendent de un chasis energizado. Se asume que su longitud es suficiente para la mayoría de usos del equipo. El uso de extensiones y multienchufes no es recomendado, a menos que tengan el amperaje adecuado para poder suministrar la corrioente requerida pra la operación segura de todo el equipo conectado. Aun más, las extensiones deben proveer de la misma conección aterrada de tres hiles. Es importante que el enchufe se pueda introducir completamente en el receptáculo. Nunca remeva el pin de aterramiento en un intento por conectar el cable en un receptáculo de dos hilos no aterrado: use un adaptador de aterramiento que esté adecuadamente conectado a un punto de tierra.

11. **PERIODOS SIN USO**
    Durante períodos prolongados sin uso del equipo, el cable de corriente debe ser desconectado de la fuente de electrixidad.

12. **LIMPIEZA**
    El equip debe ser limpiado solo en la forma que se detalla en las instrucciones de operación.

13. **INTRODUCCIÓN DE OBJETOS Y LIQUIDO**
    Deben ser tornadas precauciones con el fin de que objetos y/ó líquidos, tales como fluidos de limpieza y gaseosas, no sean derramados dentro del chassis del aparato.

14. **DAÑOS QUE REQUIEREN DE SERVICIO**
    Los equipos Hafler deben ser llevados a servicio por personal calificado cuando:

    A. El cable de corriente ó el enchufe haya sido dañado, ó

    B. Objetos ó líquido hayan sido introducidos ó derramado en el equipo, ó

    C. El equipo haya sido expuesto a lluvia, ó

    D. El equipo aparenta no operar normalmente ó exhibe un marcado cambio en su desempeño, ó

    E. El equipo se ha caído, o el chassis ha sido golpeado.

15. **SERVICIO**
    El usuario no deberá intentar darle servicio al equipo más allá de lo que está descrito en el instructivo de operación. Todo lo demás, deberá ser referido a servicio por personal calificado.

16. **CARRETILLAS Y SOPORTES**
    El equipo podrá ser usado con carretillas y soportes que tengan la fortaleza y estabilidad suficiente para el uso previsto.

    La combinación equipo/carretilla deberá ser movida con cuidado. Rápidas paradas y arranques, excesiva fuerza y superficies imparejas, pueden causar el volcamiento del conjunto de carretilla/equipo.

FRANÇAIS

ATTENTION: INFORMATIONS IMPORTANTES DE SÉCURITÉ

La lumière clignotante du symbole de la flêche à l'intérieur d'un triangle équilatéral, à pour objet d'alerter l'utilisateur de la présence “d'un voltage dangereux” non-isolé à l'intérieur du produit, qui pourrait être de magnitude suffisante au risque d'éléctrocution.

Le point d'exclamation, à l'intériur d'un triangle équilatéral, à pour objet de prévenir l'utilisateur de l'importance des instructions de fonctionement et de maintenance, jointes à l'appareil.

1. **LIRE LES INSTRUCTIONS**
   Le mode d'emploi et les mesures de sécurité de votre équipement Hafler devraient être consultés avant sa mise en marche.

2. **CONSERVER LE GUIDE DE L'UTILISATEUR**
   Le mode e'emploi et les mesures de sécurité devraient être conservés pour des références futures.

3. **CONSIDÉRATIONS DE MISE EN GARDE**
   Le mode d'emploi et les mises en garde concernant cet équipement sont de grande importance et devraient être suivis.

4. **SUIVRE LE MODE E'EMPLOI**
   Le mode d'emploi et les conseils d'utilisation sont importants et devraient être suivis.

5. **CHALEUR**
   Le matériel devrait être préservé loin de toute source de chaleur: radiateurs, cuisinière/fours, cheminées,…etc.

6. **VENTILATION**
   Le matériel devrait être utilisé dans un endroit à bonne ventilation. Il reste nécessaire de respecter la circulation de flux d'air à l'intérier et autour du meuble.

7. **EAU ET HUMIDITÉ**
   Le matériel ne devrait pas être utilisé près d'une source d'eau, telle qu'une baignoire, un évier, ou une aire de baignade. De plus, le matériel ne devrait pas être utilisé dans des lieux sujets aux innondations, tels que les sous-sols.

8. **SOURCES D'ÉNERGIE**
   Le matériel devrait seulement être relié à une source d'énergie de même voltage et fréquence que celle indiquée sur le tableau arrière, au dessus de la fiche d'entrée de la prise de courant.

9. **PROTECTION DE LA PRISE DE COURANT**
   La prise de courant devrait être arrangée de façon à ne pas interférer avec le déplacement d'objets (chariots, pales de ventillateurs…etc.) ou de personnes à l'intérieur de la pièce. D'autre part, il faudrait faire tres attention à ce que la prise ne soit pas percée ou coupée, ou disposée de façon à risquer de l'être, comme sous un tapis, autour d'un angle pointu…etc.

10. **PRISE DE COURANT ÀTROIS FICHES**
    La prise de courant est composée de trois fiches, désignées à réduire le risque de décharge électrique de l'appareil.

    Elle devrait être de longueur suffisante pour la plupart des utilisations de ce matériel. L'utilisation de rallonge t d'adaptateur est déconsellée à moins dêtre en mesure de fournir la charge électrique requise à un fonctionement sans risque, de tout matériel relié.

11. **PÉRIODES DE NON-UTILISATON**
    Durant les périodes de non-utilisation, la prise de courant ne devrait pas être branchée à une source d'energie.

12. **NETTOYAGE**
    Le matériel devrait être nettoyé en respectant les instructions indiquées.

13. **PENETRATION DES LIQUIDES**
    Un attention particulière est éxigée quant à la dispersion de liquides tels que les produits de nettoyage et boissons, de façcon à éviter toute pénetration dans l'enceinte du matériel.

14. **DÉGÂT NÉCESSITANT UNE RÉVISION**
    Le matériel Hafler devrait être révisé par des personnes qualifées de service après-vente, lorsque:

    A. Les fiches ou la prise de courant ont été endommagé, ou:

    B. De objets sont tombés sur le matériel, ou des liquides s'y sont dispersés, ou:

    C. Le matériel a été exposé à la pluie, ou:

    D. Le matériel ne semble pas fonctioner correctement, ou affiche un changement de performance, ou:

    E. Le matériel a été renversé à terre, ou l'enceinte a été endommagée.

15. **REVISION**
    L'utilisateur ne devrait pas essayer de réviser le matériel en allant plus loin que ce qui a été décrit dans le mode d'emploi. Toute autre réviion devrait être confiée à un personnel qualifié.

16. **CHARRIOTS ET MEUBLES**
    Le matériel devriat être utilisé avec des charriots et meubles de qualité et stabilité suffisante à son utilisation préconçue.

    L'ensemble du matériel et du charriot devrait être déplacé avec précaution. Des mises en marche et arrêts brusques, des collisions excessives ainsi que des surfaces inégales peuvent renverser l'ensemble du matériel et du charriot.

DEUTSCH

ACHTUNG – WICHTIGE SICHERHEITS – INFORMATIONEN

Der Blitz mit dem Pfeil, in einem gleihschenkligen Dreieck, soll den benutzer vor unisolierter “gefährlicher Spannung” innerhalb des Gerätes warnen.

Das Ausrufezeichen, in einem gleichschenkligen Dreieck, soll den Benutzer darauf aufmerksam machen, daβ dem Gerät wichtige Operations - und Service - Informationen beigefügt sind.

1. **INSTRUKTIONEN LESEN**
   Alle Sicherheits- und Operationshinweise Ihres Hafler Equipments sollten vor der Inbetriebnahme gelesen werden.

2. **BETRIEBSANLEITUNG AUFBEWAHREN**
   Bewahren Sie die Bedienungsanleitung sorgfältig auf, damit Sie in dieser auch in Zukunft nachschlagen können.

3. **WARNUNGEN BEACHTEN**
   Alle Warnungen des Gerätes und der Bedienungsanleitung sind extrem wichtig und müssen befolgt werden.

4. **INSTRUKTIONEN BEACHTEN**
   Alle Operations- und Gebrauchshinweise sind extrem wichtig und müssen beachtet werden.

5. **HITZE**
   Das Equipment sollte fern von Hitze ausstrahlenden Geräten aufgestellt werden, wie z.B. Heizungen, Öfen etc.

6. **VENTILATION**
   Das Equipment sollte so aufgestellt werden, daβ eine ausreichende Ventialition gewährt wird.

7. **WASSER UND FEUCHTIGKEIT**
   Das Equipment sollte nicht im oder in der Nähe von Wasser benutzt werden, wie z.B. in Schwimmbädem, Saunen etc. Es sollte ebenfalls nicht in Überschwämmungsgefährdeten Gebieten aufgestellt werden, wie z.B. Kellerräumen.

8. **STROMANSCHLUβ**
   Das Equipment darf nur an eine Stromversorgung angeschlossen werden, die die gleichen Parameter aufweist, welche auf der Rückseite, über em Anschluβterminal des Gerätes, aufgelistet sind.

9. **SCHUTZ DER ZULEITUNG**
   Die Zuletungen sollten so verlegt werden, daβ diese nicht in den Bewegungsbereich anderer Möbelstücke oder Personen hereinragen. Achten Sie darauf, das das Kabel nicht gequestscht oder durchschnittren wird, wie z.B. unter Schränken oder an scharfen Kanten etc.

10. **MASSEANSCHLUβ**
    Das dreiadrige Anschlubkabel ist mit einem Erdungsleiter ausgestattet, welcher die Risiken eines Elektroschocks verringert. Das Kabel hat eine Länge, welche für die meisten Anwendungen völlig ausreicht. Wenn Sie Verlängerungskabel benutzen, achten Sie darauf, das dies die erforderlichen Ströme bertragen können. Benutzen Sie immer dreiadrige Verlängerungskable.

11. **ZEITRÄUME IN DENE DAS GERÄT NICHT GENUTZT WIRD**
    Wird das Gerät über einen längeren Zeitraum nicht genutzt (z.B. Urlaub), ziehen Sie bitten den Netzstecker aus der Steckdose.

12. **REINIGEN**
    Reinigen Sie das Gerät nur, wie in der Bedienungsanleitung detailliert beschrieben.

13. **EINDRINGEN VON FREMDKÖRPERN**
    Achten Sie darauf, daβ weder Fremdkörper, noch Flüssigkeiten in das Gerät eindringen.

14. **ERFORDERLICHER REPARATURSERVICE**
    Hafler Equipment sollte nur von qualifizierten Service-Technikern instand gesetzt werden, wenn:

    A. Das Stromversorgungskabel beschädigt wurde

    B. Eine Flüssigkeit in das Gerät eingedrimgem ist

    C. Das Gerät Regen ausgesetzt wurde

    D. Das Gerät nicht mehr ordnungsgemäβ funktioniert, ggf. nicht mehr die volle Leistung abgibt

    E. Das Gerät runtergefallen ist oder das Gehäuse beschädigt wurde

15. **SERVICE**
    Der Benutzer sollte nur den Service ausführen, der in der Bedienungsanleitung für den Benutzer freigegeben wird. Den weiterführenden Service sollte nur von qualifizierten Tevhnikern durchgeführt werden.

16. **AUFSTELLUNG**
    Das Equipment sollte so aufgestellt werden, daβ der gewählte Untergrund die erforderliche Stabilität aufweist, so daβ eine gefahrlose Bnutzong gewährleistet wird.

    Das Equipment und der Untergrund sollte mit äuberster Vorsicht bewegt werden. Bei schnellen Bewegungen oder starkem Abbremsen, kann es zum Umkippen des Equipments kommen.

ITALIANO

NOTARE – IMPORTANTI INFORMAZIONI SULLA SICUREZZA

Il simbolo del fulmine in un triangolo equilatero vuole avvertire della presenza di tensioni elevate non isolate e di valore sufficiente per costituire rischio di shock elettrico alle persone.

Il punto esclamativo contentuto in un triangolo equilatero vuole avvertire l'utente della presenza di parti di servizio e di manutenzione che sono dettagliate nel manuale di istruzioni.

1. **LEGGETE LE ISTRUZIONI**
   Tutte le istruzioni riguardanti la sicurezza ed il funzionamento devono essere lette prima di applicare tensione all'apparato.

2. **CONSERVATE IL MANUALE**
   Queste istruzioni riguardanti la sicurezza ed il funzionamento devono essere conservate come riferimento futuro.

3. **AVVERTENZE**
   Tutte le avvertenze poste sull'apparato e sul libretto di istruzioni sono importanti e devono essere seguite.

4. **SEGUIRE LE ISTRUZIONI**
   Tuttle le istruzioni operative e di funzionamento devono essere seguite.

5. **TEMPERATURA**
   L'apparato deve essere mantenuto lontano da tuttle le zone ad alta temperature, termosifoni, termoconvettori, stufe e forni, caminetti ed altro.

6. **VENTILAZIONE**
   L'apparato deve essere posizionato in aree convenienti per una corretta ventilazione. Prestare attenzione che sia consentita circolazione d'aria attorno e dentro il cabinet.

7. **ACQUA E POLVERE**
   L'apparato deve essere posizionato lontano da zone contenenti acqua, come vasche a bagno, acquari e piscine. Inoltre non deve essere impiegato in aree soggette ad allagamento, come le cantine.

8. **REQUISITI DI ALIMENTAZIONE**
   L'apparato deve essere connesso solo ad un'alimentazione della stessa tensione e frequenza di quanto scritto sulla parte posteriore del telaio.

9. **PROTEZIONE DEL CAVO DI ALIMENTAZIONE**
   Il cavo di alimentazione deve essere posizionato in modo di non interferire con il movimento di oggetti nella stanza: persone, ventilatori, carrelli, ecc…prestate attenzione anche che il cavo non sia tagliato o spellato e che non possa tagliarsi e spellarsi.

10. **MESSA A TERRA**
    Il cavo di alimentazione è del tipo a tre fili con terra ed è progettato pr ridurre il rischio di shock elettrici. Si presume che sia della lunghezza sufficiente per la maggior parte degli impieghi. L'impiego di prolunghe e adattatori è sconsigliato se questi non garantiscono la potenza sufficiente per i corretto fuinzionamento degli apparati connessi. E altersì importante che vengano sempre impiegate prolunghe con la configurazaione a tre fili con terra.

11. **PERIODI DI NON UTILIZZO**
    Durante lunghi periodi di non utilizzo, staccare il cavo di alimentazione.

12. **PULIZIA**
    L'apparato deve essere pulito solo come indicato dalle istruzioni.

13. **INGRESSO DI OGGETTI E LIQUIDI**
    Si deve prestar attenzione che oggetti e liquidi, come fluidi detergenti e bibite, non vengano versati all'interno dell'apparato.

14. **RIPARAZIONI**
    Gli apparati Hafler devono essere riparati da personale qualificato quando:

    A. Il cavo di alimentazione o la spina sono danneggiati

    B. Oggetti sono caduti all'interno del telaio o quando del liquido è entrato

    C. Quando l'apparato è stato esposto a pioggia

    D. Quando l'apparato non sempra funzionare normalmente o quando esibisce un cambiamento di prestazioni o

    E. Quando è caduto o il telaio è stato danneggiato

15. **ASSISTENZA**
    L'utente non deve tentare di prestare assistenza all'apparato, se non per quanto esposto nelle istruzioni. Tutti gli altri interventi devono essere effettuati da un tecnico specializzato.

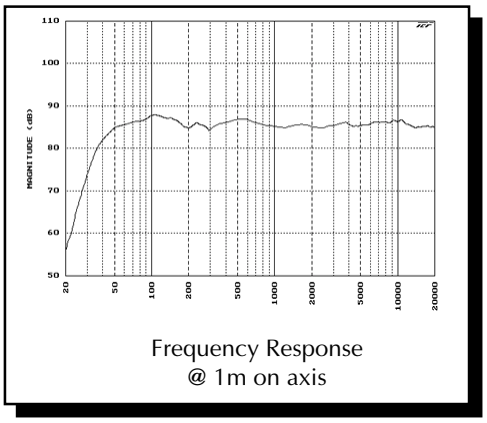
16. **CARRELLI E STAND**
    L'apparato deve essere impiegato su carrelli o stand solo se questi sono sufficientemente solidi e stabili per la funzione a cui si vuole dedicarli.

    La combinazione di carrello ed apparato deve essere mossa con cautela. Fermate e partenze improvvise, forze eccessiva e superfici irregolari, possono ribaltare la cominzione carrello e apparato.

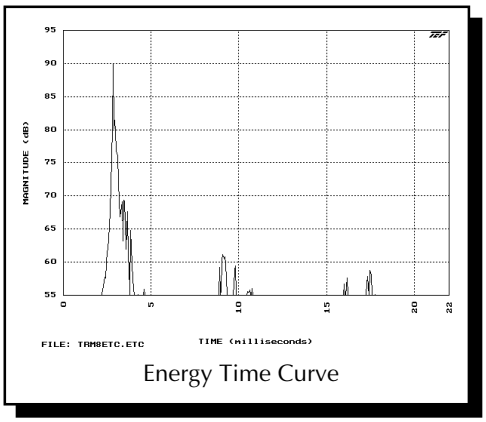
Performance Specifications

TRM8

Free Field Frequency Response	45Hz-21kHz, ±2dB
Peak Acoustic Output	≥123dB (per pair w/music @ 1m)
Total Harmonic Distortion (THD)	<0.5%, 100Hz-21kHz (90dB @ 1m on axis)
High Frequency Driver	1" (25mm) Soft Dome
Low Frequency Driver	8" (200mm) Polypropylene Cone/ Nitrile Rubber Surround
Cabinet	0.46 cu. ft. (13 liters) vented
Front Panel:	Power Switch
	High Frequency POWER/CLIP/THERMAL LED
	Low Frequency POWER/CLIP/THERMAL LED
Rear Panel:	Combination XLR-1/4" input jack
	RCA Input Jack
	Unbalanced/Balanced DIP Switch
	Input Sensitivity DIP Switches
	Tweeter/Woofer Mute DIP Switches
	Bass Shelving DIP Switches
	Treble Shelving DIP Switches
	IEC Standard Line Input / AC Line Fuse
Dimensions	10¼"W x 15 7/16"H x 13"D
	(26.04cm x 39.21cm x 33.02cm)
Net Weight	35 lbs. (15.88kg)



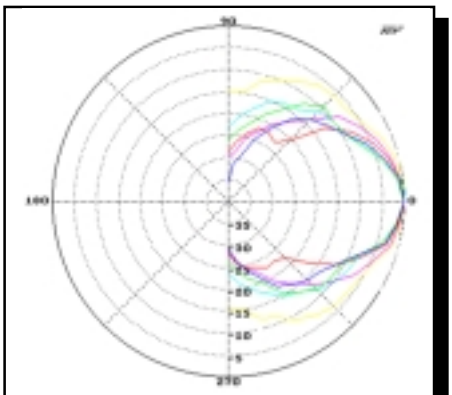
Frequency Response
@ 1m on axis



Energy Time Curve

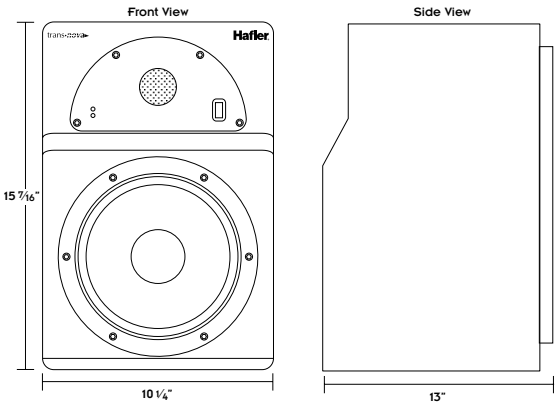
Amplifier

Power Rating	FTC (20Hz-20kHz, 0.1% THD)
	75 Watts @ 6 ohms (high frequency)
	150 Watts @ 4 ohms (low frequency)
Signal-to-Noise	>100dB
Slew Rate	100 V/µs
CMRR	70dB typical @ 1kHz
Input Impedance	47kΩ per phase balanced, 47kΩ unbalanced
Input Sensitivity Range	500mV to 3V (unbalanced)
	275mV to 1.5V (per phase balanced)
	(+4dB, +1dB, –2dB, –5dB, –8dB, –11dB)
Gain	+33dB max. to +18dB min.
Power Consumption	30W / 490mA @ 120 VAC (idle power)
(both channels driven)	154W / 1.9A @ 120 VAC (1/8 power)
	405W / 4.75A @ 120 VAC (full power)
	35W / 250mA @ 230VAC (idle power)
	150W / 900mA @ 230VAC (1/8 power)
	410W / 2.2A @ 230VAC (full power)


Horizontal Polar Response

Crossover

Crossover Frequency	2.5kHz
Crossover Slope	24dB/octave Linkwitz-Riley
Subsonic Filter	30Hz @ 12dB/octave
Bass Shelving	40Hz to 200Hz, ±4dB
	(+4dB, +2dB, 0dB, –2dB, –4dB)
Treble Shelving	3kHz to 20kHz, ±4dB
	(+4dB, +2dB, 0dB, –2dB, –4dB)



Specifications are subject to change without notice.

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Introduction

Thank You and congratulations on your purchase of the HAFLER TRM8 reference monitor, the world's finest brand in professional audio equipment.

The **TRM8** (**T**rans•nova **R**eference **M**onitor) is a bi-amplified, two-way near field monitor offering unmatched quality and performance in a truly professional grade product. The TRM8 is great for Professional Studios, Digital Work Stations, Broadcast Booths, and Home Project Studios.

Although we realize a professional such as yourself already knows a thing or two about pro audio, we urge you to read this manual to at least humor our technical writer. For ease of use, this manual is organized into three main sections: **Installation**, **Operation**, and **Service Reference**. "Installation" covers the set-up of your new HAFLER equipment in the system. "Operation" covers the controls and how to use them for optimum performance. "Service Reference" contains field service information useful for technicians and engineers.

Technical Design Features

The TRM8 amplifiers utilize our trans•nova circuit topology employing MOSFETS in the output and power supply stages combined with our DIAMOND transconductance driver stage resulting in superior sound quality.

An active 4th order Linkwitz-Riley crossover sends frequencies above 2.5kHz to a 75 watt amplifier driving a proprietary wave guide tweeter, and frequencies below 2.5kHz to a 150 watt amplifier driving an 8" transducer. The high frequency channel features up to ±4dB of Treble shelving, while the low frequency channel features up to ±4dB of Bass shelving. In addition, the low frequency channel includes an active 2nd order subsonic filter to limit harmful frequencies below 30Hz. Monitoring the status of each high and low frequency channel is done with an LED indicating Power On, Clipping and Thermal.

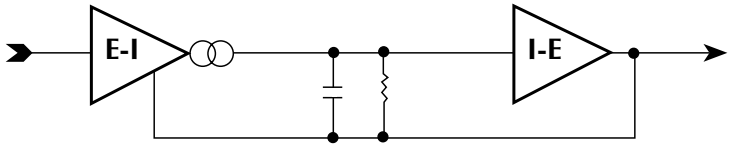
The high frequency transducer is a Ferrofluid cooled 1" (25mm) soft dome hemispherical tweeter utilizing a rigid but lightweight silk diaphragm. A Phase Lens and axis-symmetric exponential waveguide improve the transition of soundwaves from planar to spherical which result in excellent high frequency dispersion and coherent on-axis frequency response. The low frequency transducer is a proprietary 8" (200mm) diecast basket woofer utilizing a 20 mil polypropylene cone with a 20 mil dust cap. The suspension consists of a nitrile rubber surround and an extended collar flat spider. The motor is constructed from a 1.5" diameter voice coil on an anodized, aluminum former with an extended vented pole piece. The 44 oz. ferrite magnet is magnetically shielded to suppress stray leakage flux to only 4" – well within the confines of the monitor's walls making it great for use near CRT monitors.

The cabinet is made from acoustically dead 19mm MDF, internally lined with damping material and features a rear firing radiused Exoport for reduced turbulence. The outside features a semi-gloss finish and includes a rubber pad on the underside to control vibration.

Amplifier

Trans•*nova* (U.S. Patent 4,467,288)

The trans•*nova* (**TRAN**Sconductance **NO**dal **V**oltage **A**mplifier) is a patented circuit that allows the audio signal to pass through the amplifier at ***low voltage***. Each amplifier channel utilizes its own "fully floating" power supply and is configured to increase power gain. The increase in power gain allows the driver stage to operate at a lower voltage. A *low voltage* drive stage is the same principle used in high quality preamplifiers to produce high linearity and wide bandwidth.



trans•*nova* circuitry

The resulting design utilizes an output stage with a simpler gain structure and a shorter signal path than conventional high voltage (bi-polar) designs. The number of stages is reduced from five or more to three. The output stage is further refined into a trans-impedance stage (current to voltage converter) to achieve a short loop (fast) negative feedback. The output stage is driven cooperatively by a transconductance stage (voltage to current converter).

THE RESULT: Superior sound quality, greater efficiency and higher reliability.

DIAMOND (U.S. patent 5,673,000)

DIAMOND (**D**ynamically **I**nvariant **AM**plification **O**ptimized **N**odal **D**rive) is an important advance in circuit design which reduces high frequency distortion. DIAMOND combines the linearity of Class A operation with the current headroom of a Class B system by operating the MOSFET driver stage with 20dB or more of current headroom, whereas traditional drivers have only 6dB of current headroom. The result is a dramatic reduction in high frequency distortion, combined with improved ultrasonic stability.

THE RESULT: Colorless high frequency reproduction and greater inherent stability.

Tweeter

Wave Guide

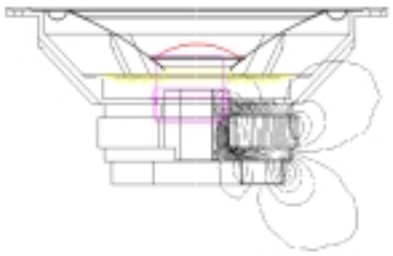
The wave guide is a proprietary axis-symmetrical form of horn mounted to the tweeter to increase efficiency. The wave guide improves the transition of sound waves (from planar to spherical) smoothly from the throat of the wave guide to the mouth. The unique shape and smooth surfaces improve the tweeter's off-axis frequency response as well as provide coherent on-axis response.

THE RESULT: Improves dispersion for a wider “sweet spot.”

Woofer

Shielded Magnet

A shielded magnet is used to reduce the radiation of high-strength magnetic fields from the woofer's motor assembly. Suppression is accomplished by attaching a “bucking” magnet to the motor assembly in order to keep stray leakage flux within the monitor cabinet. This type of shielding prevents color and image distortion when placing the woofer in close proximity to direct view (CRT) television receivers and computer monitors.



THE RESULT: Prevents distortion in TV and computer monitors.

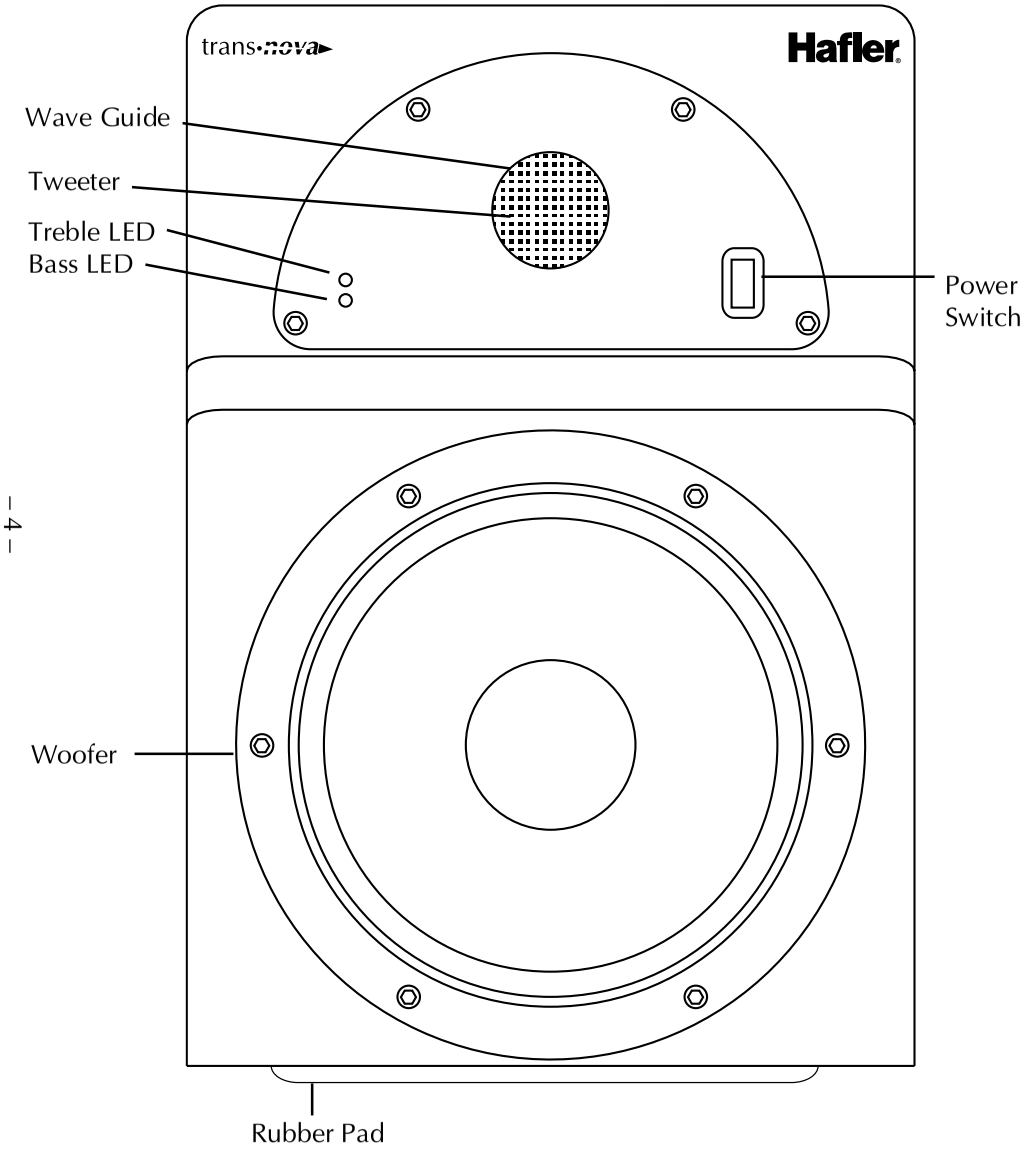
Cabinet

Phase Coherent

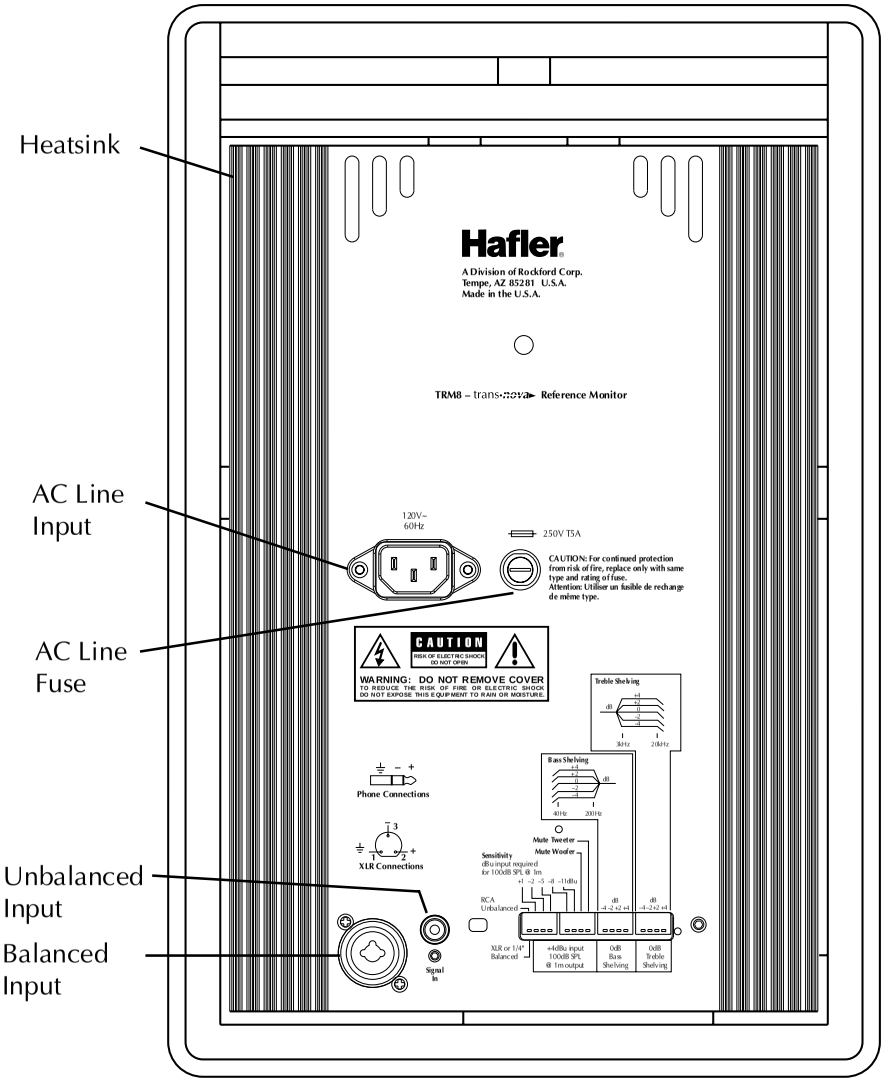
Each monitor is Phase Coherent in order to assure proper arrival times of all frequencies in the near field environment. This is accomplished by aligning both transducer's voice coils on a common ZDP (Zero Delay Plane) axis. The cabinet baffle positions the woofer forward and the waveguide displaces the tweeter back with an additional 43µs delay in the high frequency amplifier to precisely “tweak” the tweeter onto its ZDP axis. This allows the acoustic center, located midway between the high and low frequency transducers, to coherently deliver a flat frequency and phase response around the crossover point.

THE RESULT: Delivers a flat frequency and phase response.

Front Panel View



Rear Panel View



INSTALLATION

LOCATION

The location of your reference monitors in addition to the acoustics of the listening room will influence the system frequency response. In the near field environment, our ears are more sensitive to direct sound rather than the reverberation of sound. Below are some recommendations for the initial set-up which may help you optimize performance in complex acoustic environments. ***In any configuration, keep the rear of the monitor at least 5" (12.7cm) away from any wall or obstruction to reduce excessive boundary "loading" of the woofer vent and to optimize heat sink cooling.***

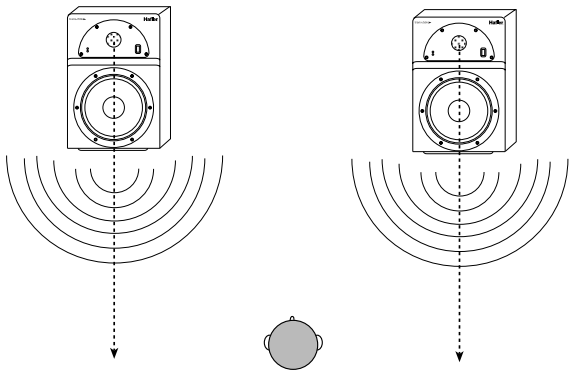


Fig. 1 **INADEQUATE**
Off-Axis Response

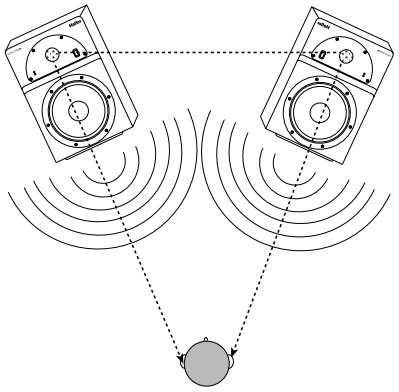


Fig. 2 **OPTIMUM**
On-Axis Response

Aiming the monitors directly forward (Fig. 1) may cause response problems resulting in inadequate stereo imaging. Aiming the monitors toward you and spaced equally like a triangle (Fig. 2) provides the best imaging and produces the flattest frequency response.

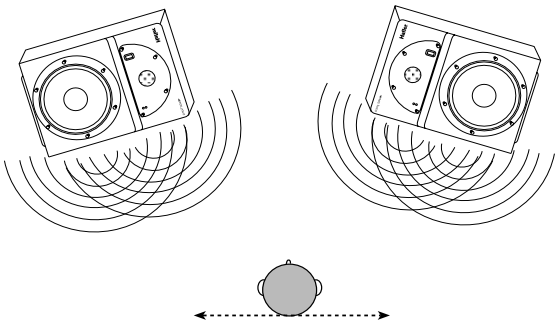


Fig. 3 **INADEQUATE**
Horizontal Alignment

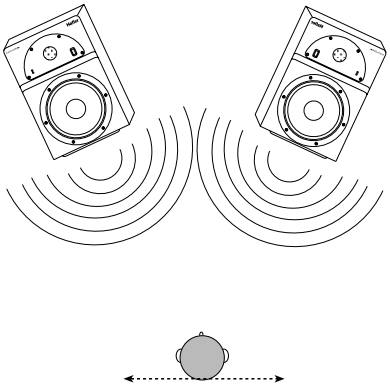
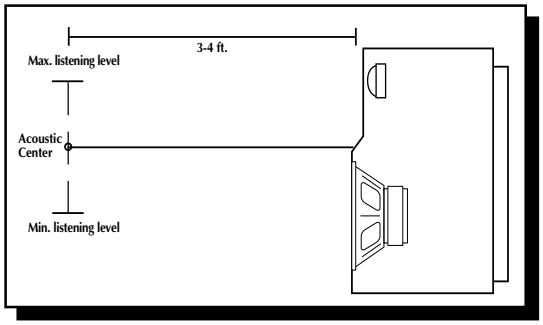


Fig. 4 **OPTIMUM**
Vertical Alignment

If you frequently move your chair from *side to side* in front of your mixing console, positioning the tweeter and woofer in horizontal alignment (Fig. 3) can create complex lobing patterns. Minimizing this effect can be achieved by placing the tweeter and woofer in vertical alignment (Fig. 4). If it is essential to position the monitors horizontally, place them with the tweeters toward the inside.

ACOUSTIC CENTER



Finding the "Acoustic Center" is accomplished by positioning the monitors so coherent arrival of the transducers occurs at ear level. The Acoustic Center is located 3 to 4 feet in front of the monitor, measuring perpendicularly from the center point of the cabinet (midway between the woofer and tweeter). Our tests have shown that a flat phase and frequency response occurs just above and below the Acoustic Center with the minimum and maximum height spanning between the tweeter dome and woofer dust cap.

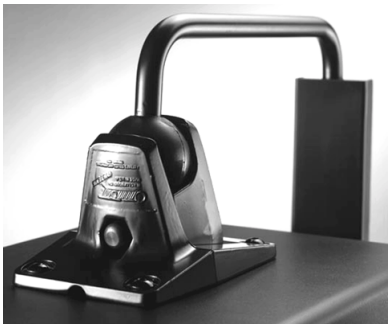
MOUNTING

The monitor may be mounted on a wall or ceiling, using suitable mounting hardware. The base of the monitor includes mounting inserts designed for use with "OmniMount Systems®" or equivalent mounting products[1].

If you mount the monitors to a wall or ceiling, you must take special care to mount them securely to prevent them from falling and causing damage or injury. Make sure that the mounting hardware (fasteners and connectors) and the surface you are mounting to are each capable of securely holding the monitor in place even if it is struck or moved. Make sure the mounting hardware, fasteners, and connectors are rated for an object at least as heavy and bulky as the monitor.

Use good judgement and common sense throughout all phases of the installation and use mounting techniques appropriate for the surface you select. Use the mounting hardware according to the manufacturer's recommendation and provide adequate reinforcement to the monitors if needed. Do not mount the monitor only to drywall – make sure the fasteners are secured to a stud, joist, or other structural support. If appropriate, use a secondary support for added safety – a properly installed safety cable provides an extra margin of safety and can be installed out of sight easily.

OmniMount Part #
100 ST-MP / 100 STX-MP



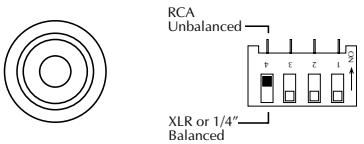
OmniMount Part #
100 WB / 100 WBX

[1] "**OmniMount Systems®**" is a registered trademark of OmniMount Systems, 1501 West 17th Street, Tempe, Arizona 85281-6255, TEL (602) 829-8000 FAX (602) 756-9000. OmniMount Systems is not affiliated with Hafler or Rockford Corporation.

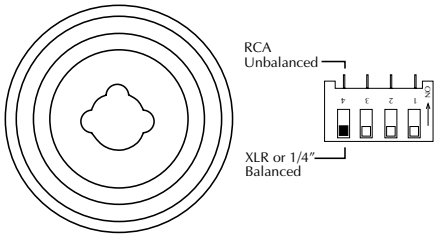
OPERATION

INPUT SWITCH
The unbalanced input uses a conventional RCA phone jack. Move the input switch UP to use this jack.

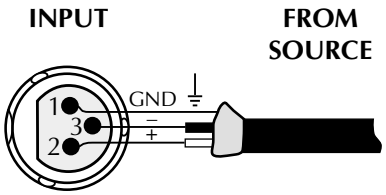
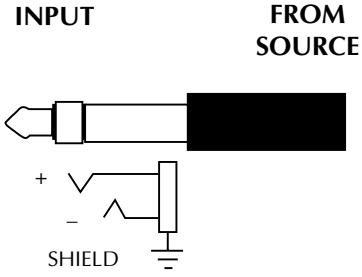
The balanced input jack is a dual function connector accepting a 1/4" Phone (Tip-Ring-Sleeve) or an XLR plug. The 1/4" Phone jack is connected according to conventional usage. The XLR jack is connected according to the IEC and AES standard. Move the input switch DOWN to use this jack.



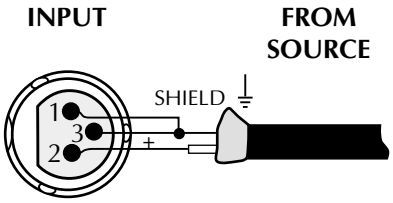
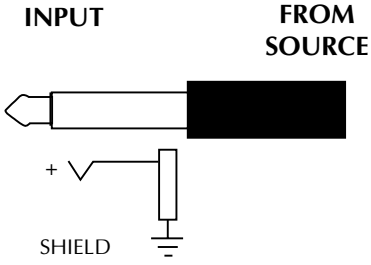
Unbalanced Input



Balanced Input

XLR Balanced Input Check output of source unit for proper signal polarity	**1/4" TRS Balanced Input** Check output of source unit for proper signal polarity
Pin 1 = GND **Pin 2** = (+) **Pin 3** = (–) 	**Tip** = (+) **Ring** = (–) **Sleeve** = GND 

Many popular mixers use unbalanced outputs and can be used with the balanced inputs. To minimize residual ground noise, we recommend using twisted pair cable or short cable lengths in this type of configuration.

XLR Unbalanced Input Connect (–) and GND (shield) terminals at *both ends* of cable to prevent unstable amplifier operation	**1/4" TRS Unbalanced Input**
Pin 1 = GND **Pin 2** = (+) **Pin 3** = GND 	**Tip** = (+) **Sleeve** = GND 

Qualified Service Personnel Only

Woofer Designators in Parentheses

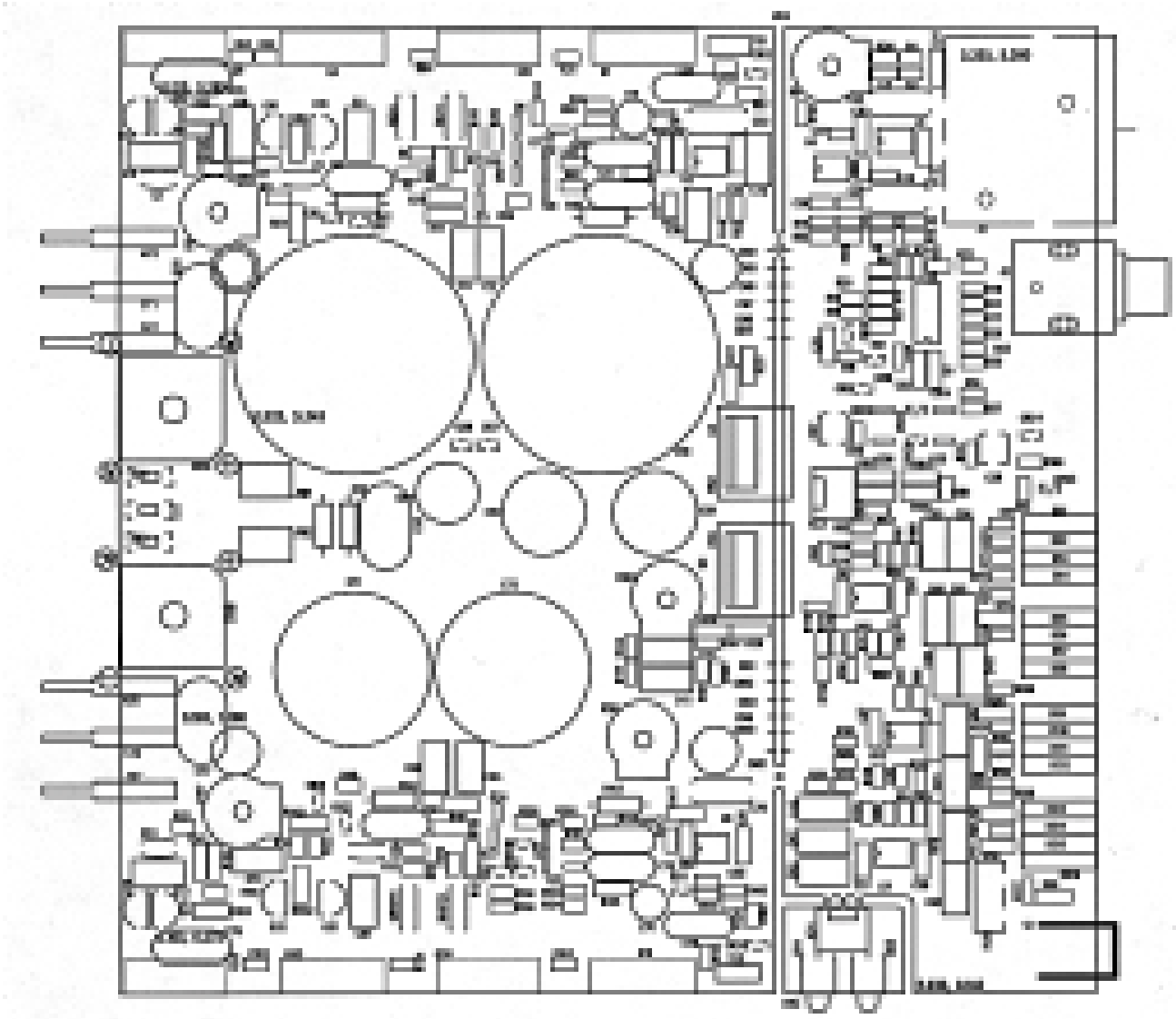
Removable Center Spread

Schematic Diagram

NOTES: Unless specified otherwise
1. All resistors in ohms.
2. All capacitors in microfarads.
3. Channel 1 only shown.

PC Board Layout

⚠ **Qualified Service Personnel Only**

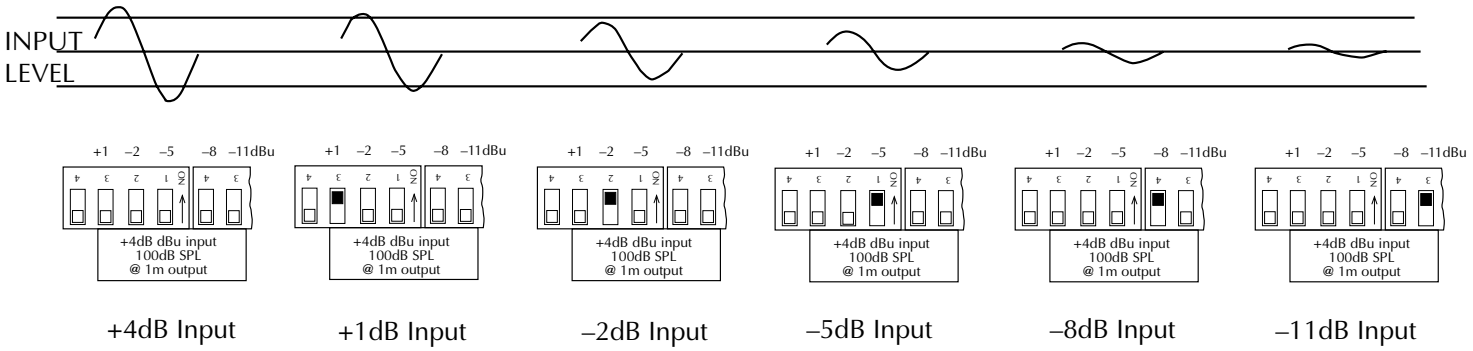


Removable Center Spread

NOTE: When using the INPUT SENSITIVITY, select only one switch configuration at a time. Engaging multiple switch configurations (i.e., moving two or more switches up) may cause undesirable operation and is NOT RECOMMENDED.

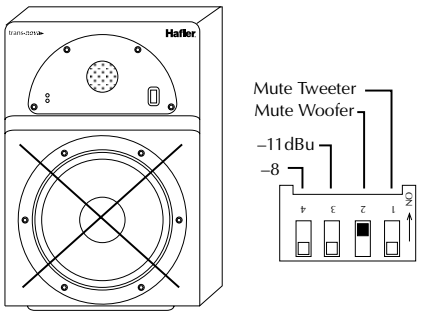
INPUT SENSITIVITY

The Input Sensitivity adjustment is used to match the monitor with signal levels from a variety of mixing consoles. The Input Sensitivity uses DIP switches to match input levels over a 15dB range and are marked +1dB, –2dB, –5dB, –8dB, and –11dB. These numbers indicate the input in dBu required to produce an output of 100dB SPL @ 1 meter. When all switches are in the DOWN position, the monitor is matched to +4dB input level. In the +4dB switch setting, the monitor is less sensitive to the input signal. In the –11dB switch setting, the monitor is more sensitive to the input signal.

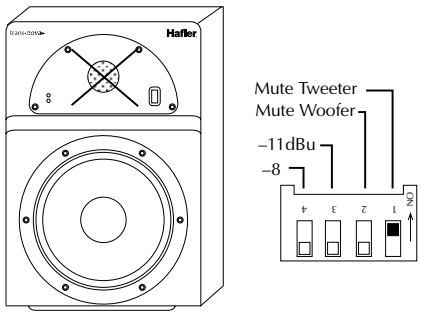


AMPLIFIER MUTE

The Amplifier Mute can be used to test system diagnostics by turning off the low frequency or high frequency amplifier. Although the low and/or high frequency amplifier can be disabled, the preamp and crossover portions of the circuit are still active. Move the "Mute Woofer" switch UP to turn off the low frequency amplifier. Move the "Mute Tweeter" switch UP to turn off the high frequency amplifier.



Mute Woofer

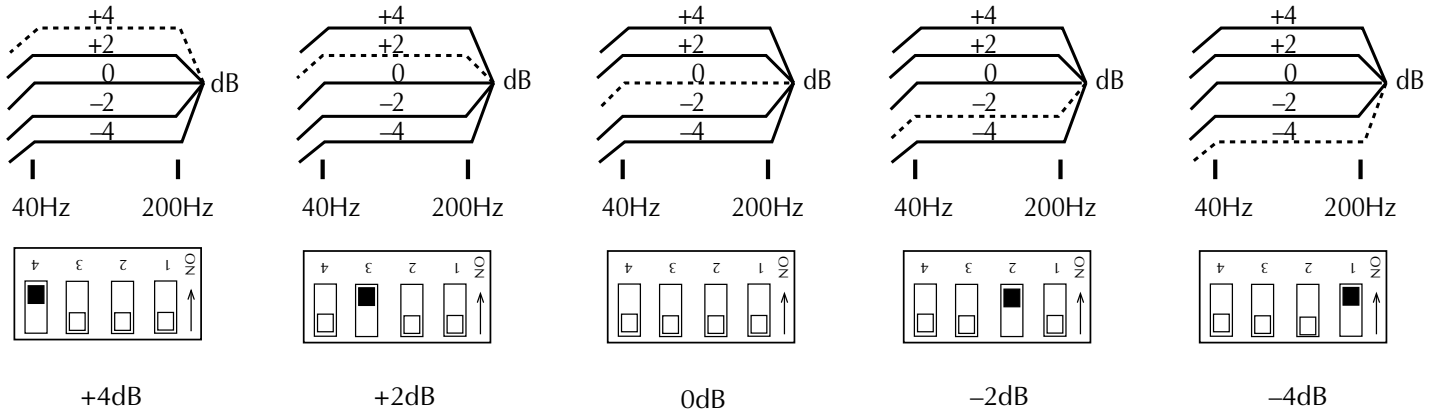


Mute Tweeter

NOTE: When using the BASS SHELVING & TREBLE SHELVING, select only one switch configuration at a time. Engaging multiple switch configurations (i.e., moving two or more switches up) may cause undesirable operation and is NOT RECOMMENDED.

BASS SHELVING

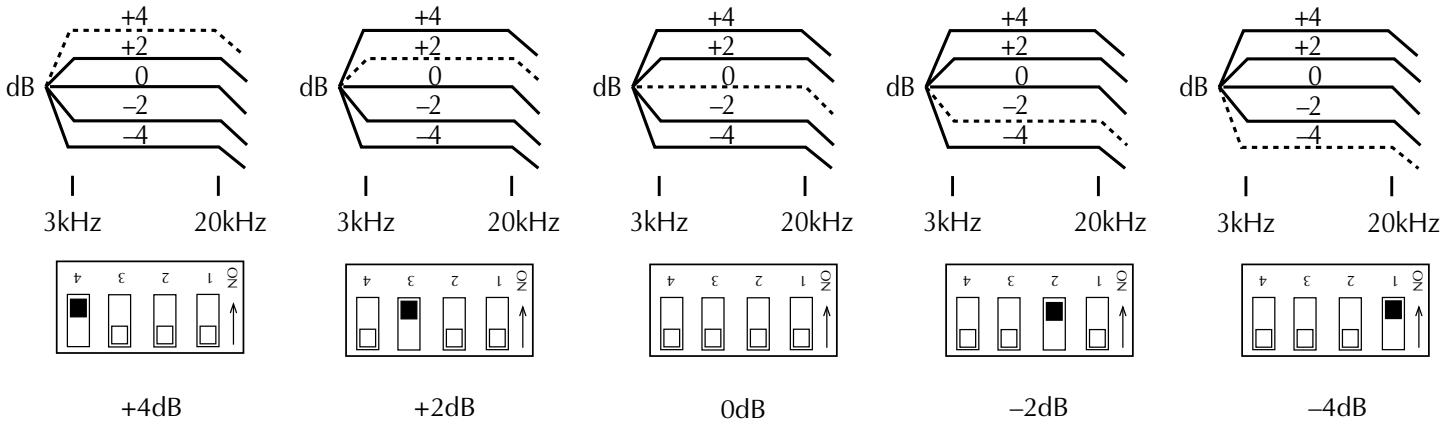
Bass Shelving is used to match the low frequency response of the monitor to the acoustic environment. Bass Shelving uses DIP switches to control frequencies from 40Hz to 200Hz over an 8dB range and are marked +4dB, +2dB, –2dB, and –4dB. When all switches are in the DOWN position, the bass level is at 0dB. In any configuration, a subsonic filter will provide woofer protection at 30Hz and below at a rate of 12dB/octave.



+4dB +2dB 0dB –2dB –4dB

TREBLE SHELVING

Treble Shelving uses DIP switches to control frequencies from 3kHz to 20kHz over an 8dB range and are marked +4dB, +2dB, –2dB, and –4dB. When all switches are in the DOWN position, the treble level is at 0dB.



+4dB +2dB 0dB –2dB –4dB

AC LINE

The TRM8 operates from a 115 VAC/60Hz power line. The TRM8 CE operates from a 230 VAC 50/60Hz power line. Connection is made by a 16 gauge, IEC Type 320, grounded line cord. For safety considerations only a properly grounded (earthed) receptacle should be used. If a grounded circuit is not available, do not break off the ground pin; use the proper adapter plug for a two wire receptacle with the grounding plug suitably connected to earth ground.

⚠ **IMPORTANT: The power line fuse is mounted on the rear panel. If this fuse blows, replace it only with the same type and rating as indicated in the parts list.**

POWER SWITCH

The POWER switch is located on the front panel. The TREBLE LED and BASS LED will illuminate GREEN, indicating those respective amplifier channels are on. It is possible to leave the power switch in the ON position and switch the monitor remotely through a power distribution block or switched outlet. When doing so, make sure the switch is rated for the current required by the monitor.

⚠ **Standard practice is to turn the amplifier on last and off first when switching components to prevent sending damaging transients to the speakers.**

⚠ **Es costumbre encender el amplificador de último y apagarlo de primero cuando se estan encendiendo/ apagando otros equipos, para así evitar el envío de transientes dañinas a los parlantes.**

⚠ **Il est de pratique courante de commencer par tourner l'amplificateur sur "off" et de terminer par "on," lorsqu'il s'agit de prévenir l'envoie de passages nuisible aux haut-parleurs.**

⚠ **Der Verstärker sollte als letztes Gerät eingeschaltet und als erstes Gerät wieder ausgeschaltet werden, um eine Beschädigung der Lautsprecher durch spannungsspitzen zu vermeiden.**

⚠ **L'uso comune consiglia l'accensione dell'amplificatore per ultimo e lo spegnimento per primo quando si accendono i vari componenti, per evitare l'invio di transitori danneggianti agli altoparlanti.**

LED INDICATORS

Amplifier operation is monitored internally and each channel has a status LED. These indicators can be used for system troubleshooting in case of aberrant behavior.

TREBLE LED – Monitors the status of the high frequency (treble) amplifier.
BASS LED – Monitors the status of the low frequency (bass) amplifier.

COLOR	STATUS
GREEN	Power on*
FLASHING RED	Clipping
RED	Thermal

*Indicates the amplifier is on regardless of input signal

RUBBER PAD

A large rubber pad is supplied to eliminate annoying buzzes and rattles when placing the monitors on mixing consoles or similar mounting surfaces. The pad is perforated with 4 holes to accommodate mounting brackets as discussed in the MOUNTING section of this manual. Attach the pad to the underside of the monitor in the following manner:

- Thoroughly clean area where pad will be positioned (i.e., with isopropyl alcohol)
- Remove paper liner from rubber pad (avoid touching adhesive with fingers)
- Position pad in desired location (be sure to align the mounting bracket holes)
- Press pad firmly to insure good contact

LOGO PROTECTIVE FILM

A clear protective film is left intact on the "TRANS•NOVA" and "HAFLER" logos to prevent scratches during shipment. After the monitors are installed, carefully remove the protective layer from the logos.

BREAK-IN and WARM-UP

We recommend initially breaking in the woofer for approximately 8 hours with musical information to establish the monitor's natural bass response. To achieve the best sonic performance and image stability from the internal amplifiers, we recommend letting them warm up for 1 hour before beginning any critical listening.

CLEANING & MAINTENANCE

There is no requirement for regular maintenance on the electronic components of the monitor. If the cabinet or woofer becomes soiled, it can be cleaned using a damp, soft cloth. If the monitor is located in a particularly dusty environment, cleaning the inside with compressed air or vacuuming every 18 to 24 months is sufficient.

Parts List

DESIGNATOR	VALUE	PART #
ALL RESISTORS IN OHMS		
R1	2k, 1/10W, 1%	RM/10-2001B
R2	1k, 1/10W, 1%	RM/10-1001B
R3	1k, 1/10W, 1%	RM/10-1001B
R4	47k, 1/10W, 5%	RM/10-473B
R5	2k, 1/10W, 1%	RM/10-2001B
R6	1k, 1/10W, 1%	RM/10-1001B
R7	1k, 1/10W, 1%	RM/10-1001B
R8	2k, Trimpot	RV-202
R9	200, Trimpot	RVH-201
R10	47k, 1/10W, 5%	RM/10-473B
R11	1k, 1/10W, 1%	RM/10-1001B
R12	10k, 1/10W, 5%	RM/10-103B
R13	100k, 1/10W, 5%	RM/10-104B
R14	470, 1/10W, 5%	RM/10-471B
R15	300k, 1/10W, 5%	RM/10-304B
R16	4.7k, 1/10W, 1%	RM/10-472B
R17	10k, 1/10W, 5%	RM/10-103B
R18	100k, 1/10W, 5%	RM/10-104B
R19	604k, 1/10W, 5%	RM/10-6043B
R20	47k, 1/10W, 5%	RM/10-473B
R21	2.2M, 1/10W, 5%	RM/10-225B
R22	100k, 1/10W, 5%	RM/10-104B
R23	100k, 1/10W, 5%	RM/10-104B
R24	470, 1/10W, 5%	RM/10-471B
R25	1k, 1/10W, 1%	RM/10-1001B
R26	1M, 1/10W, 5%	RM/10-105B
R27	316, 1/4W, 1%	RM/4-3160C
R28	316, 1/4W, 1%	RM/4-3160C
R29	3.92k, 1/4W, 1%	RM/4-3921C
R30	3.92k, 1/4W, 1%	RM/4-3921C
R31	220, 1/10W, 5%	RM/10-221B
R32	470, 1/10W, 5%	RM/10-471B
R33	100, 1/4W, 5%	RM/4-101C
R34	100, 1/4W, 5%	RM/4-101C
R35	820, 1/4W, 5%	RM/4-821C
R36	300k, 1/10W, 5%	RM/10-304B
R37	10, 1/10W, 5%	RM/10-100B
R38	100, 1/10W, 5%	RM/10-101B
R39	100, 1/10W, 5%	RM/10-101B
R40	2k, 1/10W, 1%	RM/10-2001B
R41	1.5k, 1/4W, 5%	RM/4-152C
R42	56.2k, 1/4W, 1%	RMP/4-5622-03
R43	1k, 1/10W, 1%	RM/10-1001B
R44	43.2k, 1/10W, 1%	RM/10-4322B
R45	1k, 1/10W, 1%	RM/10-1001B
R46	3.92k, 1/4W, 1%	RMP/4-3921-03
R47	2.2M, 1/10W, 5%	RM/10-225B
R48	3.92k, 1/4W, 1%	RM/4-3921C
R49	4.7k, 1/10W, 5%	RM/10-472B
R50	4.7k, 1/10W, 5%	RM/10-472B
R51	15k, 1/10W, 5%	RM/10-153B
R52	604, 1/10W, 1%	RM/10-6040B
R53	2.2M, 1/10W, 5%	RM/10-225B
R54	68, 1/4W, 5%	RM/4-680C
R55	220, 1/10W, 5%	RM/10-221B
R56	15k, 1/10W, 5%	RM/10-153B
R57	10k, 1/10W, 5%	RM/10-103B
R58	200, Trimpot	RVH-201
R59	43.2k, 1/10W, 1%	RM/10-4322B
R60	220, 1/10W, 5%	RM/10-221B
R61	10k, 1/10W, 5%	RM/10-103B
R62	2.2M, 1/10W, 5%	RM/10-225B
R63	470, 1/10W, 5%	RM/10-471B
R64	220, 1/10W, 5%	RM/10-221B
R65	1k, 1/10W, 1%	RM/10-1001B
R66	1.5k, 1/4W, 5%	RM/4-152C
R67	1k, 1/10W, 1%	RM/10-1001C
R68	68, 1/4W, 5%	RM/4-680C
R69	51, 1/10W, 5%	RM/10-510B
R70	51, 1/10W, 5%	RM/10-510B
R71	100, 1/4W, 5%	RM/4-101C
R72	100, 1/4W, 5%	RM/4-101C
R73	2.21k, 1/10W, 1%	RM/10-2211B
R74	2.21k, 1/10W, 1%	RM/10-2211B
R75	100k, 1/10W, 5%	RM/10-104B
R76	100k, 1/10W, 5%	RM/10-104B
R77	1M, 1/10W, 5%	RM/10-105B
R78	1M, 1/10W, 5%	RM/10-105B
R79	1M, 1/10W, 5%	RM/10-105B
R80	6.49k, 1/10W, 1%	RM/10-6491B
R81	6.49k, 1/10W, 1%	RM/10-6491B
R82	43.2k, 1/10W, 1%	RM/10-4322B
R83	470, 1/10W, 5%	RM/10-471B
R84	470, 1/10W, 5%	RM/10-471B
R85	43.2k, 1/10W, 1%	RM/10-4322B
R86	5.49k, 1/10W, 1%	RM/10-5491B
R87	1.62k, 1/4W, 1%	RM/4-1621C
R88	2k, 1/10W, 1%	RM/10-2001B
R89	2.21k, 1/10W, 1%	RM/10-2211B
R90	2.21k, 1/10W, 1%	RM/10-2211B
R91	9.09k, 1/10W, 1%	RM/10-9091B
R92	9.09k, 1/10W, 1%	RM/10-9091B
R93	3.32k, 1/10W, 1%	RM/10-3321B
R94	2k, 1/10W, 1%	RM/10-2001B
R95	3.24k, 1/4W, 1%	RM/4-3241
R96	1.62k, 1/4W, 1%	RM/4-1621C
R97	1.33k, 1/4W, 1%	RM/4-1331C
R98	43.2k, 1/10W, 1%	RM/10-4322B
R99	332, 1/4W, 1%	RM/4-3320C
R100	6.8k, 1/4W, 5%	RM/4-682C
R101	6.8k, 1/4W, 5%	RM/4-682C
R102	6.8k, 1/4W, 5%	RM/4-682C
R103	6.8k, 1/4W, 5%	RM/4-682C
R104	2k, Trimpot	RV-1073
R105	2k, 1/10W, 1%	RM/10-2001B
R106	43.2k, 1/10W, 1%	RM/10-4322B
R107	43.2k, 1/10W, 1%	RM/10-4322B
R108	43.2k, 1/10W, 1%	RM/10-4322B
R109	14k, 1/10W, 1%	RM/10-1402B
R110	14k, 1/10W, 1%	RM/10-1402B
R111	14k, 1/10W, 1%	RM/10-1402B
R112	13k, 1/10W, 5%	RM/10-133B
R113	2k, 1/10W, 1%	RM/10-2001B
R114	2k, 1/10W, 1%	RM/10-2001B
R115	1k, 1/10W, 1%	RM/10-1001B
R116	1k, 1/10W, 1%	RM/10-1001B
R117	200, Trimpot	RVH-201
R118	1k, 1/10W, 1%	RM/10-1001B
R119	332, 1/4W, 1%	RM/4-3320C
R120	3.92k, 1/4W, 1%	RM/4-3921C
R121	470, 1/10W, 5%	RM/10-471B
R122	470, 1/10W, 5%	RM/10-471B
R123	220, 1/10W, 5%	RM/10-221B
R124	470, 1/10W, 5%	RM/10-471B
R125	100, 1/4W, 5%	RM/4-101C
R126	0,1/10W, 1%	RM/10-000B
R128	3.32k, 1/10W, 1%	RM/10-3321B
R129	3.32k, 1/10W, 1%	RM/10-3321B
R130	150k, 1/10W, 5%	RM/10-154B
R131	9.76k, 1/10W, 1%	RM/10-9761B
R132	100, 1/4W, 1%	RM/4-101C
R133	820, 1/4W, 5%	RM/4-821C
R134	9.76k, 1/10W, 1%	RM/10-9761B
R135	10.5k, 1/10W, 1%	RM/10-1052B
R136	5k, Trimpot	RV-502Q
R137	1k, 1/10W, 1%	RM/10-1001B
R138	100, 1/10W, 5%	RM/10-101B
R139	100, 1/10W, 5%	RM/10-101B
R140	2k, 1/10W, 1%	RM/10-2001B
R141	1.5k, 1/10W, 1%	RM/4-152C
R142	56.2k, 1/4W, 1%	RM/4-5622-03

R143	3.24k, 1/10W, 1%	RM/10-3241B
R144	3.24k, 1/10W, 1%	RM/10-3241B
R145	28k, 1/4W, 1%	RM/4-2802
R146	2.2M, 1/10W, 5%	RM/10-225B
R147	28k, 1/4W, 1%	RM/4-2802C
R148	604, 1/10W, 1%	RM/10-6040B
R149	68, 1/4W, 5%	RM/4-680C
R150	220, 1/10W, 5%	RM/10-221B
R151	220, 1/10W, 5%	RM/10-221B
R152	470, 1/10W, 5%	RM/10-471B
R153	220, 1/10W, 5%	RM/10-221B
R154	1k, 1/10W, 1%	RM/10-1001B
R155	1.5k, 1/4W, 5%	RM/4-152C
R156	1k, 1/10W, 1%	RM/10-1001B
R157	68, 1/4W, 5%	RM/4-680C
R158	51, 1/10W, 5%	RM/10-510B
R159	51, 1/10W, 5%	RM/10-510B
R160	100, 1/4W, 5%	RM/4-101C
R161	100, 1/4W, 5%	RM/4-101C
R162	1k, 1/10W, 1%	RM/10-1001B
R163	8.25k, 1/10W, 1%	RM/10-8251B
R164	9.09k, 1/10W, 1%	RM/10-9091B
R165	0, 1/10W, 1%	RM/10-000B
R166	9.09k, 1/10W, 1%	RM/10-9091B
R167	6.49k, 1/10W, 1%	RM/10-6491B
R168	100k, 1/10W, 5%	RM/10-104B
R169	2k, 1/10W, 1%	RM/10-2001B
R170	9.76k, 1/10W, 1%	RM/10-9761B
R171	2k, 1/10W, 1%	RM/10-2001B
R172	2k, 1/10W, 1%	RM/10-2001B
R173	2.21k, 1/10W, 1%	RM/10-2211B
R174	1.33k, 1/4W, 1%	RM/4-1331C
R175	43.2k, 1/10W, 1%	RM/10-4322B
R176	909, 1/10W, 1%	RM/10-9090B
R177	43.2k, 1/10W, 1%	RM/10-4322B
R178	10k, 1/10W, 5%	RM/10-1002B
R179	20k, 1/10W, 1%	RM/10-2002B

C1	100pF, 100V, Disc	CD-101-034
C2	100pF, 100V, Disc	CD-101-034
C3	0.1µF, 50V	CYV-104-024
C4	0.1µF, 50V	CYV-104-024
C5	.047µF, 50V	CYV-473-033
C6	220pF, 50V	CDS-221CAAA
C7	220pF, 50V	CDS-221CAAA
C8	680pF, 500V, Mica	CM-681-030
C9	0.1µF, 50V	CDS-104CBBB
C10	47pF, 500V, Mica	CM-470-030
C11	10µF, 50V, Electrolytic	CER-106C-024
C12	6800µF, 80V, Electrolytic	CERS-688D
C13	6800µF, 80V, Electrolytic	CERS-688D
C14	0.47µF, 50V	CYV-474-024
C15	0.1µF, 50V	CYV-104-024
C16	0.1µF, 50V	CYV-104-024
C17	0.1µF, 50V	CDS-104CBBB
C18	0.1µF, 50V	CDS-104CBBB
C19	0.1µF, 50V	CDS-104CBBB
C20	0.1µF, 50V	CDS-104CBBB
C21	47pF, 500V, Mica	CM-470-030
C22	0.47µF, 50V	CYV-474-024
C23	0.47µF, 50V	CYV-474-024
C24	0.1µF, 50V	CDS-104CBBB
C25	0.1µF, 50V	CDS-104CBBB
C26	0.22µF, 250V	CY-224AC-024
C27	0.1µF, 50V	CDS-104CBBB
C28	2.2µF, 50V, Electrolytic	CER-225CSM
C29	470µF, 50V, Electrolytic	CER-477C
C30	0.1µF, 50V	CDS-104CBBB
C31	0.1µF, 50V	CDS-104CBBB
C32	470µF, 50V, Electrolytic	CER-477C
C33	0.22µF, 250V	CY-224AC-024
C34	22pF, 500V, Mica	CM-220-030
C35	47pF, 500V, Mica	CM-470-030
C36	.0022µF, 50V	CYV-222-024
C37	2.2µF, 50V	CER-225CSM
C38	47pF, 50V	CDS-470CAAA
C39	47pF, 50V	CDS-470CAAA
C40	.001µF, 50V	CYV-102-024
C41	.001µF, 50V	CYV-102-024
C42	.001µF, 50V	CYV-102-024
C43	.001µF, 50V	CYV-102-024
C44	220pF, 50V	CDS-221CAAA
C45	0.1µF, 50V	CYV-104-024
C46	0.1µF, 50V	CYV-104-024
C47	.001µF, 50V	CYV-102-024
C48	.001µF, 50V	CYV-102-024
C49	220pF, 50V	CDS-221CAAA
C50	.001µF, 50V	CDS-102CBAA
C51	100pF, 100V, Disc	CD-101-034
C52	100pF, 100V, Disc	CD-101-034
C53	0.1µF, 50V	CYV-104-024
C54	47pF, 50V	CDS-470CAAA
C55	.001µF, 50V	CYV-102-024
C56	.001µF, 50V	CYV-102-024
C57	0.1µF, 50V	CDS-104CBBB
C58	0.1µF, 50V	CDS-104CBBB
C59	47pF, 50V	CDS-470CAAA
C60	.001µF, 50V	CYV-102-024
C61	.001µF, 50V	CYV-102-024
C62	.022µF, 50V	CYV-223-024
C63	.022µF, 50V	CYV-223-024
C64	.0022µF, 50V	CYV-222-024
C65	220pF, 50V	CDS-221CAAA
C66	0.1µF, 50V	CYV-104-024
C67	.047µF, 50V	CYV-473-033
C68	680pF, 500V, Mica	CM-681-030
C69	7pF, 500V, Mica	CM-070-024
C70	10µF, 50V, Electrolytic	CER-106C-024
C71	3300µF, 63V, Electrolytic	CERS-338E
C72	3300µF, 63V, Electrolytic	CERS-338E
C73	0.1µF, 50V	CYV-104-024
C74	0.1µF, 50V	CYV-104-024
C75	7pF, 500V, Mica	CM-070-024
C76	0.47µF, 50V	CYV-474-024
C77	0.22,µF, 250V	CY-224AC-024
C80	0.1µF, 50V	CDS-104CBBB
C81	0.1µF, 50V	CDS-104CBBB
C82	0.1µF, 50V	CDS-104CBBB
C83	47pF, 50V	CDS-470CAAA
C84	0.1µF, 50V	CDS-104CBBB
C85	.22µF, 50V	CYV-224-024
C86	220pF, 50V	CDS-221CAAA

CR1	BAV99L Dual Diode	SS-260SM
CR2	BAV99L Dual Diode	SS-260SM
CR3	LED, BICLR RED/GREEN	SS-1664
CR4	LED, BICLR RED/GREEN	SS-1664
CR5	MMBD914L Diode	SS-803SM
CR6	MMBD914L Diode	SS-803SM
CR7	MMBD914L Diode	SS-803SM
CR8	MMBD914L Diode	SS-803SM
CR9	BAV99L Dual Diode	SS-260SM
CR10	Bridge Rectifier	SS-0799-030⚠
CR11	Bridge Rectifier	SS-0800-030⚠
CR12	MMBD914L Diode	SS-803SM
CR13	MMBD914L Diode	SS-803SM
CR14	MMBZ5240BL Zener Diode	SS-1052
CR15	BAV99L Dual Diode	SS-260SM
CR16	BAV99L Dual Diode	SS-260SM
CR17	BAV99L Dual Diode	SS-260SM
CR18	BAV99L Dual Diode	SS-260SM
CR19	Bridge Rectifier	SS-0799-030⚠
CR20	MMBD914L Diode	SS-803SM
CR21	MMBZ5240BL Zener Diode	SS-1052
CR22	MMBD914L Diode	SS-803SM
CR23	MMBD914L Diode	SS-803SM
CR24	MMBD914L Diode	SS-803SM

Q1	P Channel MOSFET	SSH-740T-069	⚠
Q2	LM-317, + Regulator	SS-1375-046	
Q3	LM-337, – Regulator	SS-1376-046	
Q4	N Channel MOSFET	SSH-741T-069	⚠
Q5	MMBTAO6L	SS-102SM	
Q6	MMBT3906L	SS-0791	
Q7	MMBT3906L	SS-0791	
Q8	MMBT3904L	SS-0792	
Q9	N Channel MOSFET	SSH-741T-069	⚠
Q10	P Channel MOSFET	SSH-740T-069	⚠
Q11	MMBT5088L	SS-0114	
Q12	MMBT5088L	SS-0114	
Q13	MPS-A56	SS-101A	
Q14	MPS-A56	SS-101A	
Q15	MPS-AO6	SS-102A	
Q16	MPS-AO6	SS-102A	
Q17	MMBT5088L	SS-0114	
Q18	MMBT5087L	SS-0115	
Q20	N Channel MOSFET	SSH-741T-069	⚠
Q21	MMBTAO6L	SS-102SM	
Q22	MMBT3906L	SS-0791	
Q23	MMBT3906L	SS-0791	
Q24	MMBT3906L	SS-0791	
Q26	P Channel MOSFET	SSH-740T-069	⚠
Q27	MMBT5088L	SS-0114	
Q28	MMBT5088L	SS-0114	
Q29	MPS-A56	SS-101A	
Q30	MPS-A56	SS-101A	
Q31	MPS-AO6	SS-102A	
Q32	MPS-AO6	SS-102A	
Q33	MMBT5088L	SS-0114	
Q34	MMBT5087L	SS-0115	
Q35	MMBT3906L	SS-0791	
Q36	MMBT3906L	SS-0791	
U1	LM-833D, Dual Opamp	SS-187SM	
U2	TLO72CD, Opamp	SS-1308	
U3	LM-833D, Dual Opamp	SS-187SM	
U4	LM-833D, Dual Opamp	SS-187SM	
U5	LM-339 Quad Comparator	SS-730SM	
U7	LM-833D, Dual Opamp	SS-187SM	
U8	TLO72CD, Opamp	SS-1308	
U112	LM-833D, Dual Opamp	SS-187SM	
JW1	2x3 Jumper	CC-648	
JW2	2x3 Jumper	CC-648	
J1	Neutrik Combo Jack XLR	CC-0588	
J2	RCA Jack	CCH-232	
TS1	Thermistor, 10k	SS-1519-A	⚠
TS2	Thermistor, 10k	SS-1519-A	⚠
	Thermistor Insulator	IN-1646	⚠
	Transformer	TT-1596	⚠
	IEC Line Cord	FAH-1464	⚠
	IEC Receptacle	CC-0918	⚠
	Fuse Holder Cap	FS-0828	⚠
	Fuse Holder Body	FS-0829	⚠
	5A Slo-Blo Fuse	FS-005SB	⚠
	Power Switch	SHW9840	⚠
	Tweeter	SPK9766	⚠
	Tweeter Dome	SHW10049	⚠
	Woofer	FG26326WP	⚠
	Wave Guide	SHW9816	
	Wave Guide Assembly	SPK9897	
	(Wave Guide/Tweeter/Power Switch/LEDs)		

⚠ Components marked with this symbol are safety critical and should only be replaced with identical components.

⚠ Los componentes marcados con el simbolo son ⚠ imprescindibles para la protección del equipo, por lo cual que solo sean reemplazados por los mismos componentes.

⚠ Les componsants marqués du symbole ⚠ sont indispensables à la sécuritée et ne peuvent être remplacés qu'avec des composants identiques.

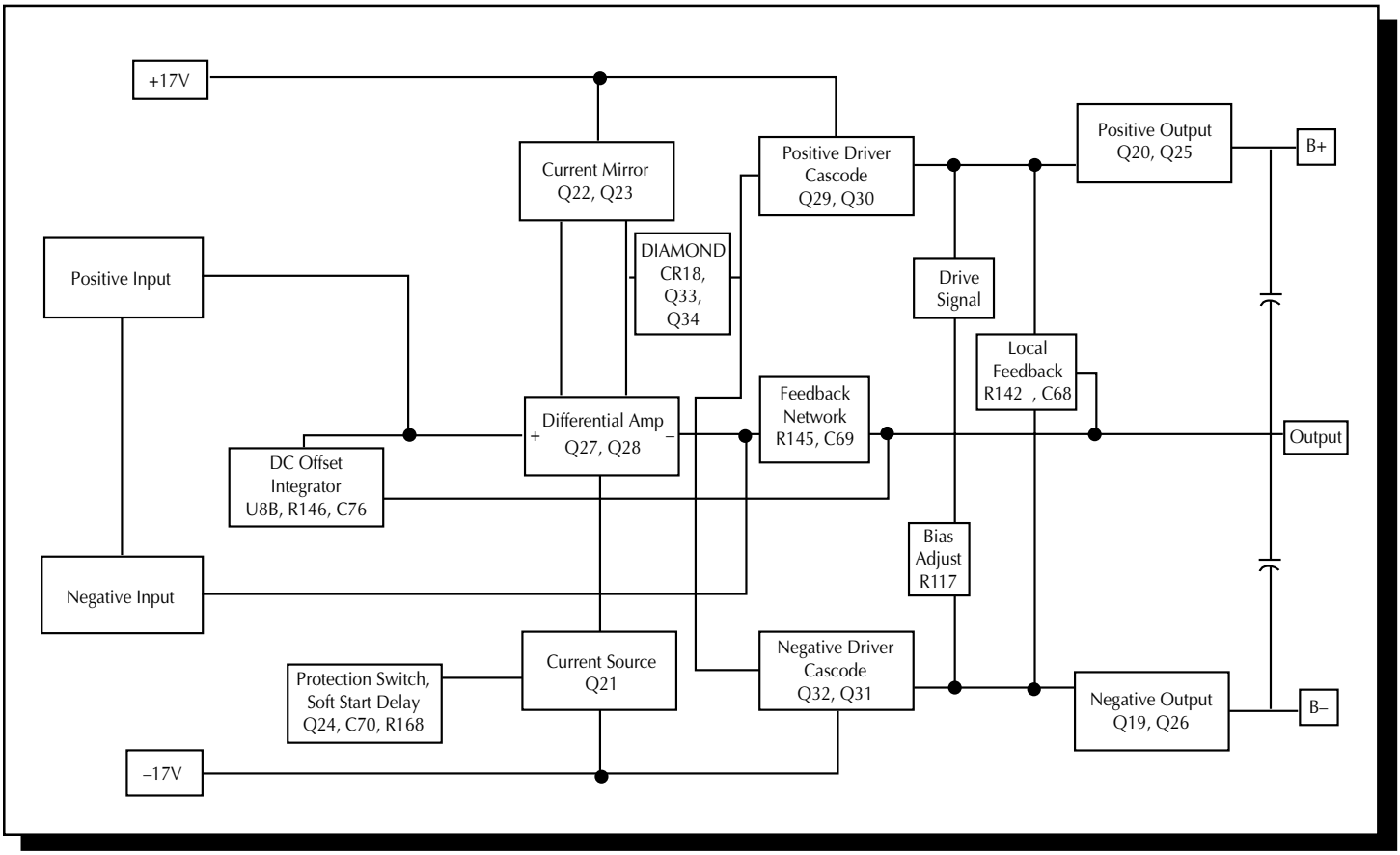
⚠ Bauteile, die mit einem ⚠ gekenzeichnet sind, sind sehr wichtig und dürfen nur mit den orginal Ersatzteilen ausgetauscht werden.

⚠ I componenti contrassegnati da ⚠ sono critici per la sicurezza e devono essere rimpiazzati solo con ricambi di valore identico.

MODEL TRM8CE 230 VAC 50/60Hz

Transformer	TT-1908	⚠
IEC European Line Cord <HAR>	FAH-1464-A	⚠
Fuse Holder Cap	FS-1125	⚠
1.25 Slo-Blo Fuse	FS-1474	⚠

TRM8 Functional Block Diagram



CIRCUIT OPERATION

Qualified Service Personnel Only

trans•nova Implementation

The transistor Q24 is configured to operate as a switch which controls the constant current source, Q21, of the input differential amp, Q27 and Q28. When Q24 is off the emitter voltage is low, turning off Q21. Timing of the Soft Start function is controlled by the charging time of C70 through R168. The THERMAL Protection circuit uses Q24 to shut down the channel when it activates.

The positive and negative input signals are connected to the differential amp transistors Q27 and Q28. U8B is configured as a DC servo-integrator to null the input offset currents.

The output of the differential amp is fed to the driver stage by Q33 and Q34 which perform the DIAMOND transconductance steering function. The cascode pairs Q29, Q30 and Q31, Q32 supply the signal voltage and current needed to drive the output stage Q20, Q25, and Q19, Q26.

Class AB bias current is controlled by R117.

Local feedback is supplied by the network R142 and C68, and global feedback by R145 and C69.

CALIBRATION

WARNING: Only a competent technician should attempt the following procedure.

Bias:

The bias control establishes the quiescent Class AB output current of the amplifier. The bias should not need readjustment from the factory setting; however, if the amplifier is repaired and output devices have been changed, calibrating the bias is necessary. **Disconnect the power to the amplifier before removing the heatsink assembly.** To adjust the bias, disconnect all wires from the heatsink assembly and remove the jumpers JW2 (tweeter) and JW1 (woofer). Connect an amp meter across the exposed pins. Adjust R117 to get a current reading of 100mA at JW2, and R9 to get a current reading of 200mA at JW1. Before reconnecting the power cord to the heatsink assembly, connect the loose brown wire from the power transformer to the remaining terminal of the IEC power connector.

WARNING: Only a competent technician should attempt the following procedure.

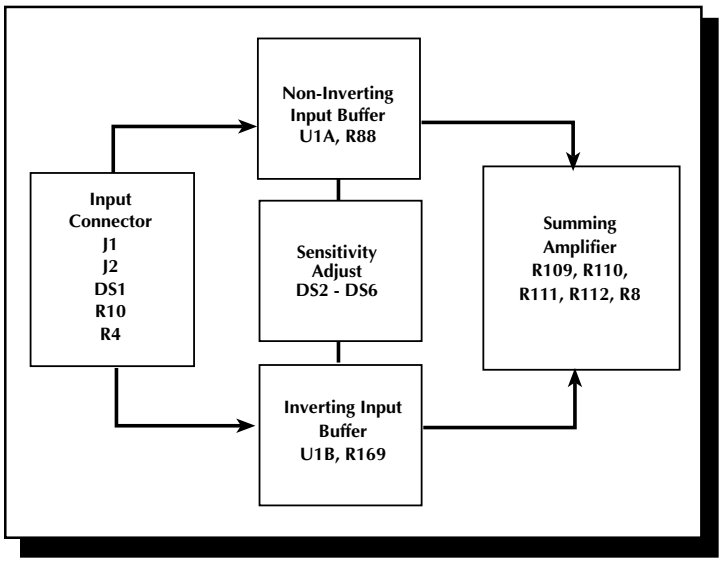
Calibrating Common Mode Rejection:

The common mode null is adjusted by R8 (woofer) and R58 (tweeter). If common mode adjustment is needed, follow this procedure. **Disconnect power to the amplifier before removing the heatsink assembly.** Disconnect all harnesses from the assembly. **Verify that the AC power cord has been disconnected from the amplifier**, then connect the loose brown wire from the power transformer to the remaining terminal of the IEC power connector. Reconnect power to the amplifier. Use a sinewave generator to provide a 100Hz common mode signal to the amplifier, making sure the DIP switch is configured for balanced input. A common mode signal can be accomplished by connecting the generator signal to the tip and ring of a 1/4" plug (or pins 2 and 3 of an XLR) and ground to the sleeve (or pin 1 of an XLR). Connect an AC voltmeter to the output terminal of either amplifier, and adjust its common mode potentiometer for minimum output voltage.

Input Circuit

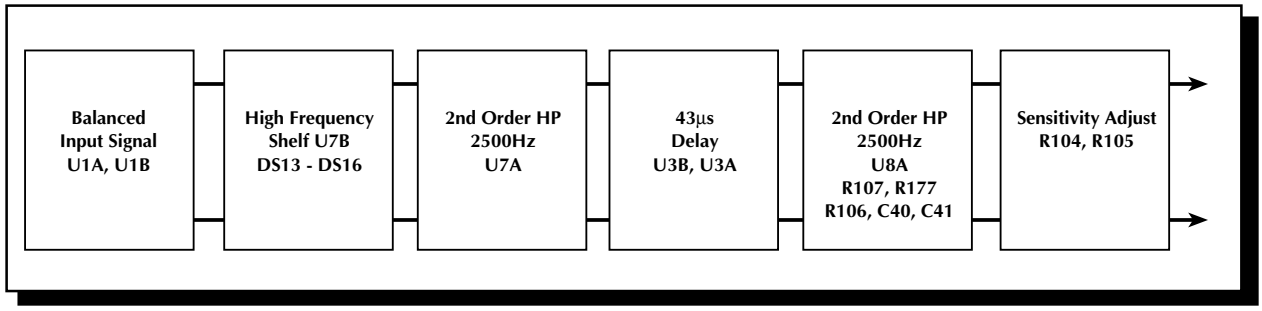
Qualified Service Personnel Only

The input signal is connected to the amplifier through the balanced 1/4" or XLR connector J1, or the unbalanced RCA connector J2. Balanced/unbalanced switch D1 will ground the inverting input buffer, allowing operation with an unbalanced signal on either connector. Input buffers U1A and U1B provide a stable input impedance, dominated by R10 and R4. The input circuit gain is set by switches DS2-DS6. Each switch inserts a different divider resistor for the feedback resistors R88 and R169, resulting in up to 15dB of additional input gain when DS6 is closed.



The non-inverting input signal from U1A pin 1, and the inverting input signal from U1B pin 7, are summed together to form an unbalanced signal at U4A pin 1.

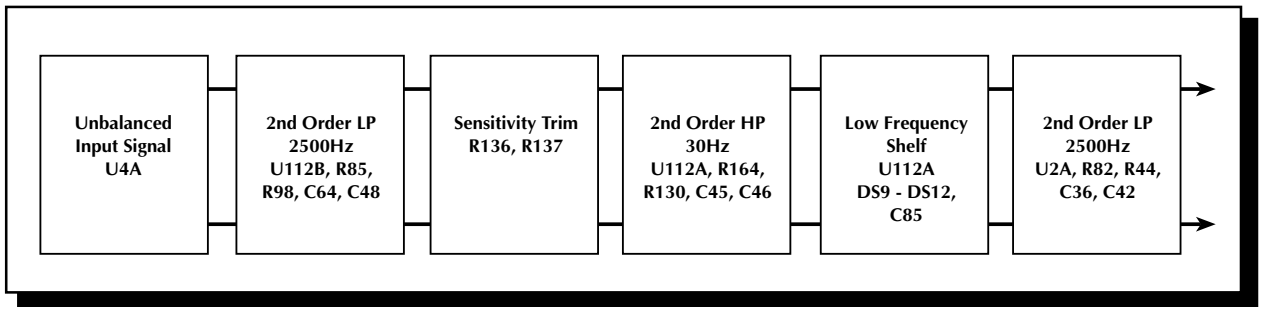
Tweeter Crossover



The balanced input signal at U1A pin 1 and U1B pin 7 connects to the high-frequency shelf circuit at U7B. Attenuator divider R179 and R178, and gain resistors R94 and R87 set the default gain of this stage at –4.4dB. Switches DS13-DS16 add various reactive components to the feedback network of U7B, resulting in +4dB, +2dB, –2dB, or –4dB of gain shelving above 3kHz. The next stage at U7A is a 2500Hz 2nd order high-pass filter. This is followed by a 2-stage 43µs delay, using U3A and U3B. The last stage consists of another 2500Hz 2nd order high-pass filter, bringing the overall tweeter crossover response to a 4th order 24dB/octave slope. The final components before the tweeter amplifier (R104 and R105) can provide up to 2dB of additional gain to the tweeter channel.

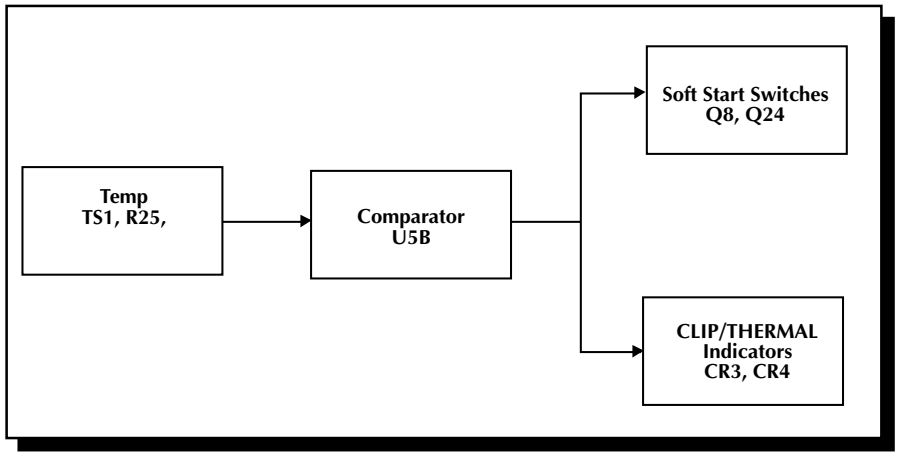
Woofer Crossover

Qualified Service Personnel Only



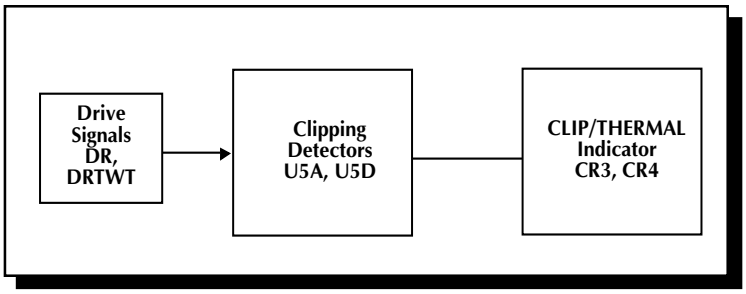
The input signal at U4A pin 1 connects to the 2500Hz 2nd order low-pass filter at U112B. Approximately 2dB of additional gain can be added to this stage by adjusting R136 against the divider resistor, R137. The next stage is a 30Hz sub-sonic high-pass filter. This is followed by an adjustable low-frequency shelving filter which defaults at +6dB gain, according to the feedback resistors R129 and R134, and dividers R131 and R128. DS9-DS12 will switch in various reactive feedback networks to accomplish +4dB, +2dB, –2dB, or –4dB of gain shelving below 200Hz. The last stage is another 2500Hz 2nd order low-pass filter at U2A, which cascades with the previous filter at U112B to produce an overall 4th order slope of 24dB/octave for the woofer amplifier.

Thermal Protection



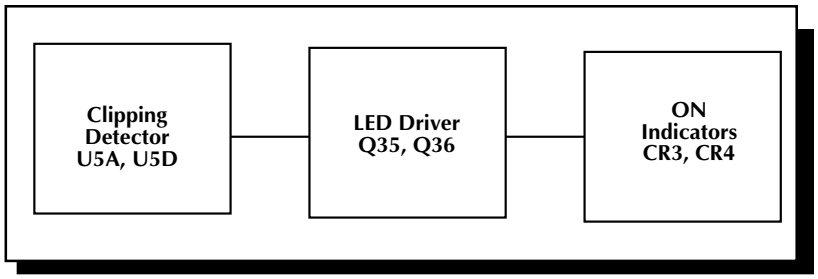
The thermal protection is activated, and shuts down audio operation, when the amplifier heatsink reaches an excessively high temperature. The voltage divider R22 and R23 establishes the reference voltage on pin 5 of U5B. The control voltage on pin 4 is established by the voltage divider TS1 in parallel with TS2, and R25 and R162. TS1 and TS2 are NTC (Negative Temperature Coefficient) thermistors mounted on the heatsink. As TS1 or TS2 warms and the resistance falls, the voltage on pin 4 rises. When the voltage on pin 4 exceeds the voltage on pin 5, the output on pin 2 goes low, shutting down the Soft Start switches Q8 and Q24, and lighting both CLIP/THERMAL indicators red.

Clipping Indicator



The CLIP indicators are driven by the comparator U5A and U5D. The voltage divider R56, R57, and R51, R61 establishes the reference voltage for the Clipping detector at pin 7 of U5A and pin 9 of U5D. Excessive drive signal at pin 6 or pin 8 will trigger its comparator low and light the CLIP/THERMAL indicator red.

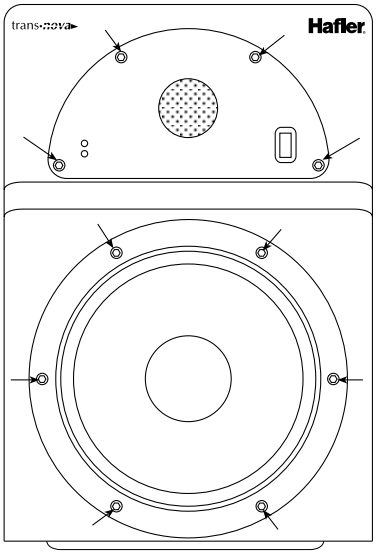
On Indicator



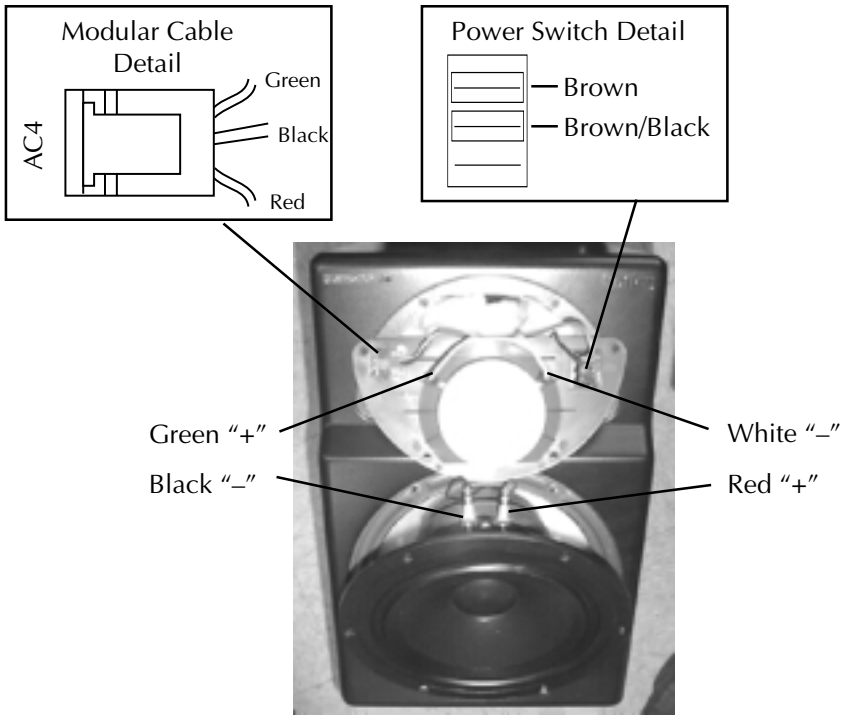
The bicolor LED, CR3 and CR4 will remain green unless a THERMAL or CLIP condition is detected. The outputs of comparators U5A and U5D will be high, and Q35 and Q36 will be off, allowing current to flow through the red LED of CR3 and CR4 from ground to –17V.

WAVEGUIDE/WOOFER REMOVAL

Qualified Service Personnel Only

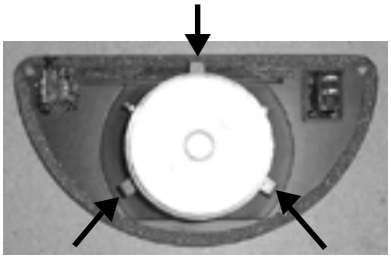


(10) 3/32"
Allen Sockets



COMPONENT	WIRE
Tweeter "+"	Green (female 1/8" spade)
Tweeter "–"	White (female 1/8" spade)
Woofer "+"	Red (female 1/4" spade)
Woofer "–"	Black (female 1/4" spade)
LEDs "AC4"	Gray Modular (female micro-molex)
Power Switch	Brown (female 1/4" spade)
Power Switch	Brown/Black (female 1/4" spade)

TWEETER REPLACEMENT DOME



Compression Clip Removal

Tweeter Removal
Motor/Dome Part #SPK9766

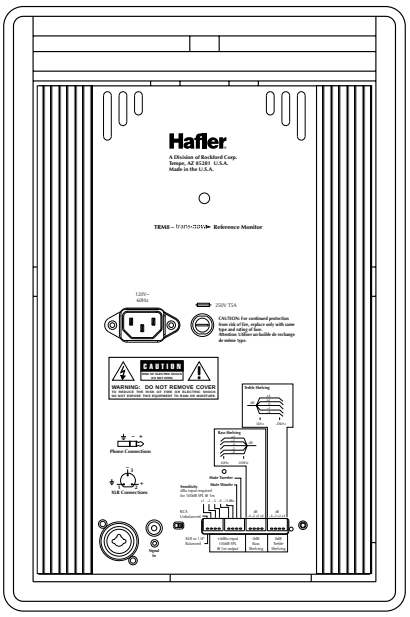
Tweeter Dome Placement
Part #SHW10049
(Replacement Dome only)

Wave Guide Assembly Part # SPK9897

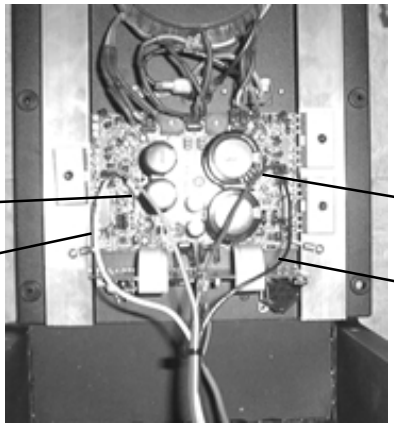
NOTE: The tweeter dome may be replaced up to 3 times without significant loss of magnetic fluid cooling. We recommend replacing the entire tweeter assembly when servicing thereafter.

AMPLIFIER REMOVAL

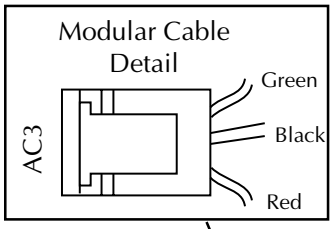
⚠ Qualified Service Personnel Only

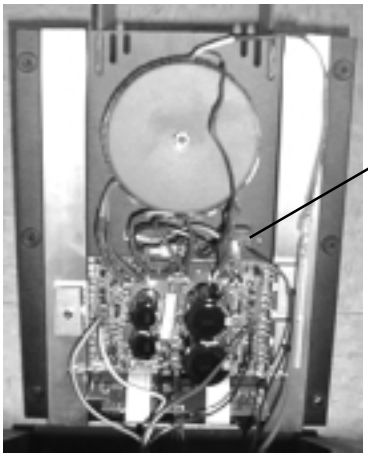


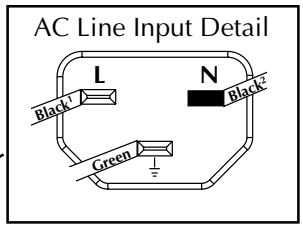
(6) Phillips Screws



COMPONENT	WIRE	AMPLIFIER DESIGNATOR
Tweeter "+"	Green (female 1/4" spade)	"Green1"
Tweeter "–"	White (female 1/4" spade)	"White1"
Woofer "+"	Red (female 1/4" spade)	"Red1"
Woofer "–"	Black (female 1/4" spade)	"Blk1"







Black[1] = to back panel fuse
Black[2] = to front panel switch
Green = chassis ground

COMPONENT	WIRE	AMPLIFIER DESIGNATOR
LEDs	Gray Mod (female micro-molex)	"AC3"
Transformer Primary	Brown (female 1/4" spade)	Transformer "Brown"
AC Line Neutral	Black[2] (female 1/4" spade)	AC Line Input "N"

Service Policy and Limited Warranty

Rockford Corporation (Hafler Division) offers a limited warranty on Hafler products on the following terms:

- **Length of Warranty**
  1 year on Reference Monitors

- **What is Covered**
  This warranty applies only to products sold to the original owner and is non-transferable. This warranty only applies to units sold in the continental United States. You are required to have a copy of the receipt stating the customer's name, dealer name, product purchased and date of purchase.

- **Products found to be defective during the warranty period** will be repaired or replaced (with product deemed to be equivalent) at Hafler's discretion.

- **What is NOT Covered**
  1. Damage caused by accident, abuse, improper operations, water, theft
  2. Service performed by anyone other than Hafler or an Authorized Hafler service center
  3. Any product purchased outside the United States (please contact your local dealer)
  4. Shipping charges to get the unit to Hafler
  5. Any product which has had the serial number defaced, altered, or removed

- **Limit on Implied Warranties**
  Any implied warranties including warranties of fitness for use and merchantability are limited in duration to the period of the express warranty set forth above. Some states do not allow limitations on the length of an implied warranty, so this limitation may not apply. No person is authorized to assume for Hafler any other liability in connection with the sale of the product.

- **How to obtain service or technical support**
  Please call 1-800-669-9899 for Rockford/Hafler support. You must obtain an RA # (return authorization number) to return any products to Hafler. You are responsible for shipment of product to Hafler.

Rockford Corporation
Hafler Division
2055 E. 5th Street
Tempe, Arizona 85281

HAFLER

A DIVISION OF

ROCKFORD CORPORATION

546 SOUTH ROCKFORD DRIVE

TEMPE, ARIZONA 85281 U.S.A.

1-888-HAFLER1

MADE IN THE USA

This product is designed, developed and assembled in the USA by a dedicated group of American workers. The majority of the components used in the construction of this product are produced by American companies. However, due to the global nature of their manufacturing facilities and the electronics parts industry in general, some parts may be manufactured in other countries.

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