9505

Installation & Operation

Hafler®

trans•nova

MADE IN THE USA

PROFESSIONAL POWER AMPLIFIER

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.

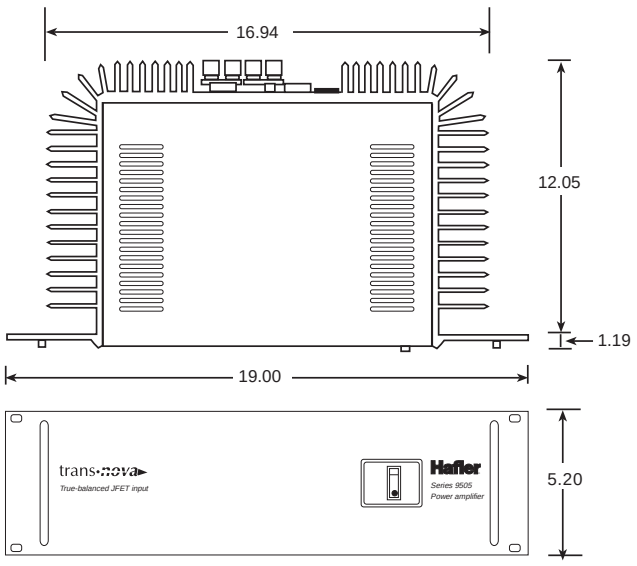
16. **CARTS AND STANDS**
    The equipment should be used with carts or stands only of sufficient strength and stability for the use intended.

    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.

PERFORMANCE SPECIFICATIONS

9505

Power Rating:	FTC (20Hz-20kHz, <0.2% THD)
	250 wpc into 8Ω
	375 wpc into 4Ω
	750 w into 8Ω (bridged mono)
Distortion:	<0.1% THD, typically 0.005% THD 1kHz at rated power into 8Ω
Signal-to-Noise Ratio:	100dB below rated output from 20Hz-20kHz "A" Weighted
Frequency Response:	20Hz-20kHz, ±0.1dB
Bandwidth:	0.15Hz-300kHz, +0/–3dB
Slew Rate:	150 V/µs
CMRR:	>75dB at 1kHz
Input Impedance:	47,000Ω per phase balanced
Input Sensitivity Range:	800mV (@ 8Ω) per phase balanced
	690mV (@ 4Ω) per phase balanced
In/Out Gain:	+29dB maximum
Damping Factor:	1000 (to 1kHz); 100 (to 10kHz); 20 (to 100kHz)
Power Consumption:	160W / 2A @ 120VAC (Idle Power)
(Both Channels Driven)	370W / 4.2A @ 120 VAC (1/8 Power – 8Ω)
	840W / 8.8A @ 120 VAC (Max. Power – 8Ω)
Controls & Switches:	Front Panel Power Switch
Indicators:	Line Power LED
Connectors:	XLR & 1/4" combo input
	Gold-plated RCA input
	5-way Binding Post output
	IEC Standard Line input
Dimensions:	19"W x 12-1/2"D* x 5-1/4"H (3-rack spaces)
	(48.26cm x 31.75cm x 13.34cm)
	*plus 1" (2.54cm) for handles
Net Weight:	50 lbs. (22.68kg)



CE

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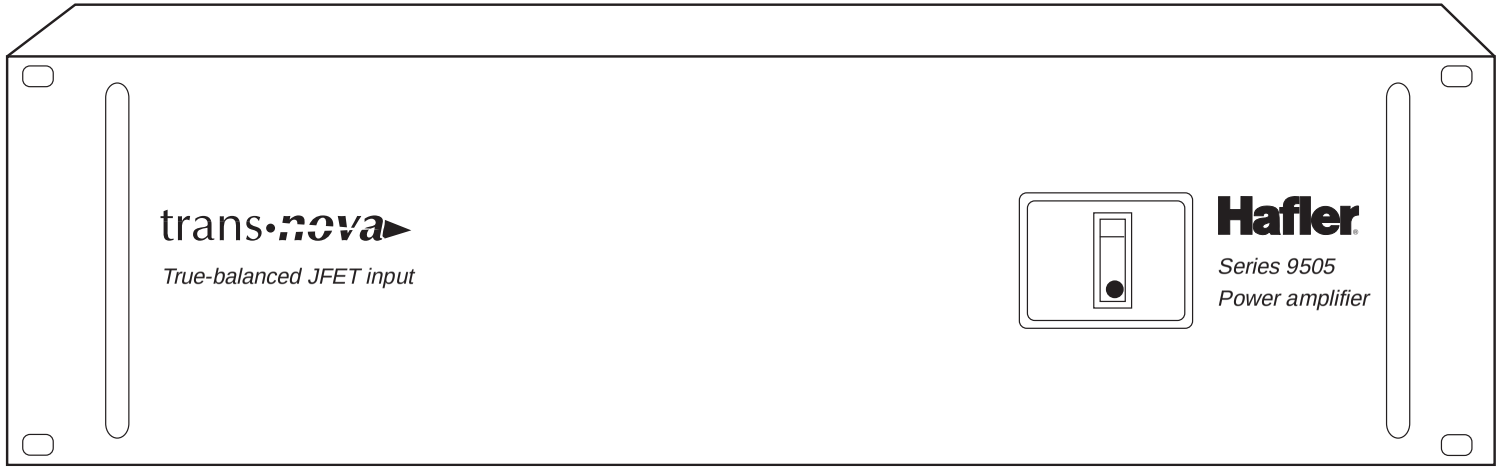
INTRODUCTION

The Hafler 9505 is a two channel professional power amplifier using passive cooling with a large heatsink for low mechanical noise. Our patented **trans•*nova*** circuit topology and MOSFET output stage ensures trouble-free, long term operation and is backed by our seven year warranty.

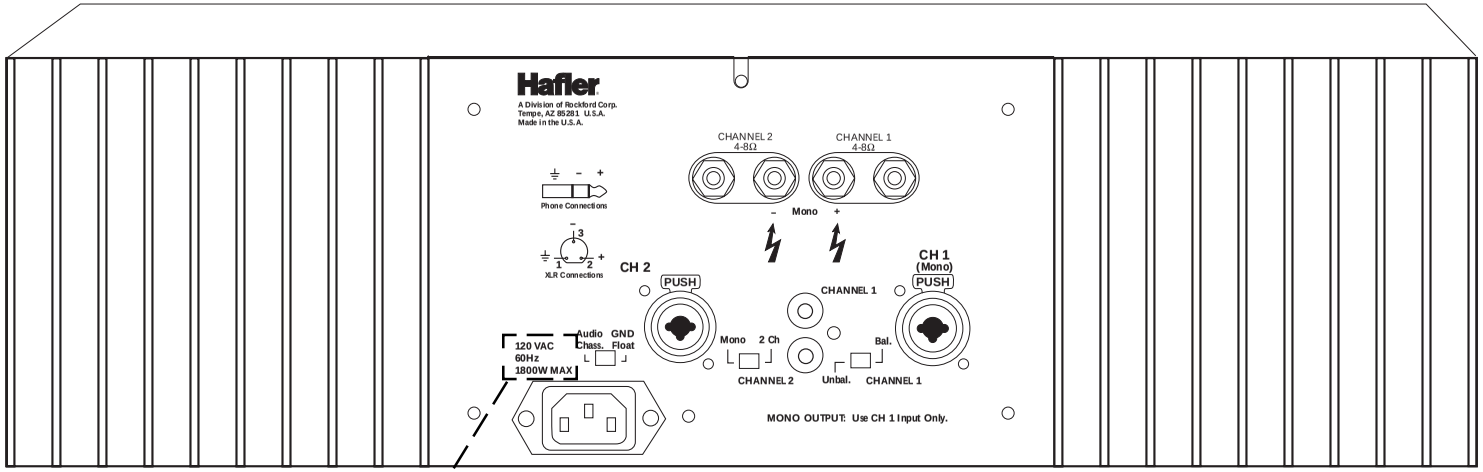
This manual contains information on using the 9505 amplifier and is organized into three main sections. **"Installation"** covers the location and connection of the amplifier in the system. Like many precision components, careful attention to the initial setup can yield dividends in higher performance and trouble-free use. **"Operation"** covers the controls and features of the amplifier and how to use them to get the best effect. The **"Technical Reference"** section contains information on the circuit implementation and the schematic diagram and parts list. We strongly urge reading over the Installation and Operation portions of this manual before putting the amplifier into service.

The circuitry used in the 9505 is the latest refinement of our **trans•*nova*** (TRANSconductance NOdal Voltage Amplifier, US Patent 4,467,288) circuit. The 9505 utilizes our proprietary DIAMOND (patent pending) transconductance driver stage which combines the linearity of Class A operation with the current headroom of a Class B system. When used in combination with the robust output stage featured in this model, DIAMOND yields lower high frequency distortion without the sonic penalties associated with increasing the negative feedback.

The 9505 has fully differential inputs for use in balanced line systems. The balanced input terminals work with either 1/4" TRS phone or XLR plugs. Gold-plated RCA phono jacks are available for use with unbalanced source components. The output terminals are gold-plated binding posts, spaced on 3/4" centers for use with dual banana plugs. For high power applications, the amplifier can run in bridged mono for double the output voltage.



Front Panel View



MODEL 9505CE

230 V~
50/60Hz
662W

T8A 250V

Rear Panel View

INSTALLATION

LOCATION

The 9505 power transformer can generate a substantial magnetic field, so caution should be exercised in the placement of low level components such as a tape deck, mixer or mic preamp to avoid inducing noise in the low level circuitry. The amplifiers can also produce considerable heat in normal operation so the primary consideration when determining a location for the amplifiers is to allow for adequate ventilation. The large heatsinks provide unrestricted airflow, but care must be taken to keep the slots in the bottom panel and top cover clear. If the amplifier is mounted in an equipment rack, make sure adjacent equipment does not impede cool air flow.

⚠ Rack systems should have two fans 4" to 5" in from the front of the amplifier blowing upward.

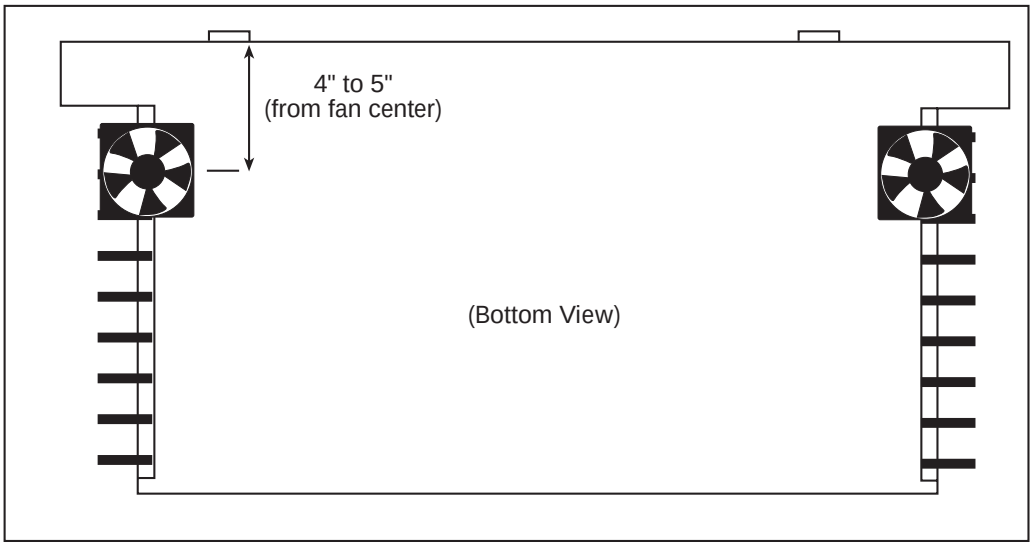
⚠ Los sistemas empotrados en gabinetes (rack), deben tener dos (2) ventiladores soplando hacia arriba, ubicados de 10 a 12.5 ctms. detrás del frente del amplificador.

⚠ Les chaines stéreo Rack devraient avoir deux ventillateurs placés à 4 ou 5 centimètres, en face de l'amplificateur.

⚠ Rack Systeme sollten zwei eingebaute Ventilatoren haben, die Luft von oben auf den Verstärker leiten. Die Ventilatoren sollten ca. 10-20cm hinter der Front des Verstärkers angebracht werden.

⚠ Per i sistemi ad armadio sono necessari due ventilatori direzionati in su collocati dai 10 ai 13 centimetri davanti all'amplificatore.

Inadequate ventilation can shorten component life, especially when other equipment raises the ambient air temperature, so circulating fans should be considered in tight quarters.



Fan center approximately in line with edge of unit and starting of heatsink fins

- Fans placed 4" to 5" from front of unit
- Fans placed under the unit pointing upwards
- Recommended 9505 fan is 50cfm x 2

AC LINE

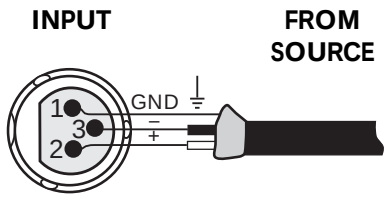
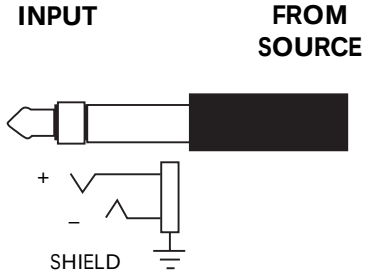
The 9505 amplifier operates from a 120 volt, 60Hz AC power line. Connection is made by a 16 gauge, IEC Type 320, grounded line cord. For safety considerations only a properly grounded (earthed) receptacle should be used. If a grounded circuit is not available, do not break off the ground pin; use the proper adapter plug for a two wire receptacle. Mounted on the rear panel is the line fuse which interrupts the power to the amplifier. If this fuse blows replace it only with the same type and rating fuse. The correct replacement fuse value is printed on the rear panel of the amplifier. If the new fuse blows, this is an indication of a fault with the amplifier. Servicing should be performed only by a qualified technician.

UNBALANCED INPUT

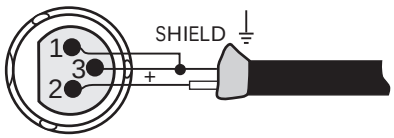
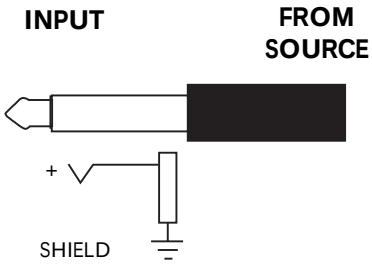
The unbalanced inputs use conventional RCA phone jacks. Set the BALANCED/UNBALANCED switch to the UNBALANCED position to use these jacks.

BALANCED INPUT

The input jacks located on the back of the amplifier are dual function connectors which accept 1/4" Phone (Tip Ring Sleeve) or XLR plugs. The 1/4" Phone jack is connected according to conventional usage. The XLR jack is connected according to the IEC and AES standard.

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 

OUTPUT CONNECTIONS

The speaker output connectors are dual binding posts. These binding posts will directly accept 12 AWG wire or banana plugs and are spaced on 3/4" centers to accept dual banana plugs.

MONOPHONIC USE

For systems with high power requirements, the amplifiers can be configured for single channel bridged mono operation. To bridge the amplifier, set the rear panel Mono/2 Ch switch to the Bridged Mono position. Only the Channel 1 input and level control is used. The speaker is connected to the RED output binding posts.

When the amplifier is bridged the output is floating. Any speaker which requires a common ground from the amplifier output cannot be used in this application.

Cuando el amplificador esté en modo puente (bridge), la salida del mismo es flotante (sin neutro). Cualquier parlante que necesite una tierra común de la salida del amplificador, no puede ser usado cuando el modo puente esté activado.

Lorsque l'amplificateur est relié, la puissance de rendement est émise. Tout haut-parleur nécessitant l'utilisation d'une même fiche que celle de l'amplificateur, ne peut pas être utilisé dans cette application.

Wenn der Verstärker gebrückt wird, ist der Ausgang schwimmend geerdet. Alle Lautsprecher, die allgemeine Masse vom Verstärker nutzen, können in dieser Konfiguration nicht eingesetzt werden.

Nel caso di un'amplificatore ostruito, l'uscita é fluttuante non utilizzare in questa applicazione un altoparlante che richiede la messa a terra in comune con l'uscita dell'amplificatore.

Since a bridged amplifier shares the load between the two channels, each channel will effectively drive half of the load. Therefore, for bridged mono operation we recommend using an eight ohm load as the minimum impedance.

Ya que un amplificador en puente comparte la carga entre los dos canales, cada canal manejará efectivamente la mitad de la carga. Por lo que, para la operación en modo puente (mono) recomendamos el uso de una carga de ocho ohmios como la mínima impedancia.

Étant donné que l'amplificateur, une fois connecté, distribue la même charge entre les deux canaux, chaque canal conduira, de façon efficace, la moitié de la charge. C'est pourquoi, pour les opérations conduites en “mono”, nous recommandons l'utilisation d'une charge de huit ohm comme impédance minimale.

Wird der Verstärker gebrückt, “sieht” dieser nur die halbe angelegte Last. Aus diesem Grund geben wir für die gebrückte mono Operation eine minimale Last von 8 Ohm vor.

Visto che un'amplificatore ostruito divide il carico tra i due canali, ogni singolo canale in effetti conduce meta del carico. Quindi, per il funzionamento monofonico ostruito dell'amplificatore si raccomanda l'utilizzo di un carico di 8 ohm impedenza minima.

OPERATION

POWER SWITCH

The POWER switch is located on the front panel of the amplifier. An internal lamp indicates when it is turned on.

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.

It is possible to leave the power switch in the on position and switch the amplifier remotely through a power distribution block or preamp switched outlet. When doing so make sure the switch is rated for the current required by the amplifier.

INPUT CONFIGURATION SWITCH

Mono / 2 Ch

The amplifier operates in two-channel mode when the rear panel Mono/2 Ch switch is in the 2 Ch position. To use the amplifier in single channel, bridged mono applications, the front panel switch must be in the Mono position. When in Mono, the Channel 1 (+) and (–) inputs are connected to Channel 2 in reversed polarity, which inverts the Channel 2 output. Only the Channel 1 input is used, and the speaker is connected to the two positive (+) output terminals.

For thermal considerations we do not recommend using less than a nominal eight ohm load on the amplifier when running it in bridged mono.

Por consideraciones térmicas, no recomendamos el uso de una carga nominal menor de ocho ohmios cuando el amplificador esté trabajando en el modo puente.

Pour des raisons thermales, nous ne recommandons pas d'envoyer à l'amplificateur, une charge de valeur nominale inférieure à huit ohm, au moment du fonctionement en mode "mono."

Um thermische Störungen zu vermeiden, empfehlen wir in der mono Brückenschaltung die minimale Last von 8 Ohm nicht zu unterschreiten.

Per ragioni di natura termale non consigliamo l'uso di un carico nominale dell'amplifiactore inferiore a 8 ohm nel caso di funzionamento monofonico ostruito.

GROUND SWITCH

Ground loops are characterized by a hum or buzz in the system and are caused by a voltage potential difference between two points in a ground circuit. Ground loops are aggravated when multiple paths exist for a given circuit. Mounting components in a rack with metal rails may introduce ground loops between associated equipment, because the rails can establish an additional ground path.

The CHASSIS/FLOAT switch allows you to select the amplifier grounding scheme for best system compatibility. With the switch in the CHASSIS position all signal grounds are referred to the chassis and power line ground.

In the FLOAT position the signal ground is decoupled from the chassis. The position of the switch is determined by the overall noise in the system; choose the position which gives the lowest hum.

LOAD FAULT PROTECTION

Because of the self-protecting properties and fault tolerance of the lateral MOSFETs used in the 9505, elaborate voltage and current limiting protection schemes are not necessary. To prevent damage to the amplifier from a fault in the loudspeaker load, the power supply B+ and B– rails are fused. Check these fuses if the sound is garbled or there is no output. The fuses should not blow under normal use and a blown fuse is usually an indication of a fault. The fault could be a bad connection, a problem with the speaker or a short in the speaker line. **Disconnect power to the amplifier before removing the cover**.

WARM UP

In order to achieve the best sonic performance from the amplifier, we recommend letting it warm up for 1 hour before beginning any critical listening. The amplifier will not deliver its full potential sound quality before this time has passed.

CLEANING AND MAINTENANCE

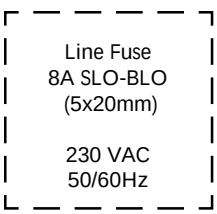
There is no requirement for regular maintenance on the electronic components of the amplifier. If the case becomes soiled it can be cleaned using a soft cloth and a mild detergent, such as spray window or glass cleaner. If the amplifier is located in a particularly dusty environment cleaning the inside with compressed air or vacuuming every 18 to 24 months is sufficient.

PC BOARD LAYOUT

SCHEMATIC DIAGRAM

NOTES: Unless specified otherwise
1. All resistors in ohms
2. All capacitors in microfarads
3. Component Designators:
   1-99: Left Channel
   101-199: Right Channel
   201-299: Common Parts
   301-399: Chassis/Power Supply
4. Left Channel Only Shown
5. Stereo/Mono Switch Shown in Stereo
6. Balanced/Unbalanced Switch Shown in Balanced Position
7. Chassis/Float Ground Switch Shown in Float Position

Model 9505 CE



PARTS LIST

DESIGNATOR	VALUE	PART #
ALL RESISTORS IN OHMS		
R1, R101	47.5k, 1/4W, 1%	RM/4-4752C
R2, R102	47.5k, 1/4W, 1%	RM/4-4752C
R3, R103	1k, 1/4W, 5%	RM/4-102C
R4, R104	1k, 1/4W, 5%	RM/4-102C
R5, R105	2.2M, 1/4W, 5%	RM/4-225C
R6, R106	100, 1/4W, 5%	RM/4-101C
R7, R107	22k, 1/4W, 5%	RM/4-223C
R8, R108	100, 1/4W, 5%	RM/4-101C
R9, R109	100, 1/4W, 5%	RM/4-101C
R10, R110	332, 1/4W, 1%	RM/4-3320C
R11, R111	100, 1/4W, 5%	RM/4-101C
R12, R112	332, 1/4W, 1%	RM/4-3320C
R13, R113	22.1, 1/4W, 1%	RM/4-0221C
R14, R114	22.1, 1/4W, 1%	RM/4-0221C
R15, R115	22.1, 1/4W, 1%	RM/4-0221C
R16, R116	22.1, 1/4W, 1%	RM/4-0221C
R17, R117	1k, 1/4W, 5%	RM/4-102C
R18, R118	28k, 1/4W, 1%	RMP/4-2802-03
R19, R119	909, 1/4W, 1%	RM/4-9090C
R20, R120	100, 1/4W, 5%	RM/4-101C
R21, R121	332, 1/4W, 1%	RM/4-3320C
R22, R122	1.33k, 1/4W, 1%	RM/4-1331C
R23, R123	332, 1/4W, 1%	RM/4-3320C
R24, R124	56, 1/4W, 5%	RM/4-560C
R25, R125	56, 1/4W, 5%	RM/4-560C
R26, R126	3.32k, 1/4W, 1%	RM/4-3321C
R27, R127	2k, 1/4W, 5%	RM/4-202C
R28, R128	3.32k, 1/4W, 5%	RM/4-3321C
R29, R129	100, 1/4W, 5%	RM/4-101C
R30, R130	1k, 1/4W, 5%	RM/4-102C
R31, R131	100, 1/4W, 5%	RM/4-101C
R32, R132	100, 1/4W, 5%	RM/4-101C
R33, R133	2k, 1/4W, 5%	RM/4-202C
R34, R134	1k, 1/4W, 5%	RM/4-102C
R35, R135	1k, 1/4W, 5%	RM/4-102C
R36, R136	1k, 1/4W, 5%	RM/4-102C
R37, R137	100, 1/4W, 5%	RM/4-101C
R38, R138	1k, 1/4W, 5%	RM/4-102C
R39, R139	100, 1/4W, 5%	RM/4-101C
R40, R140	28k, 1/4W, 5%	RMP/4-2802-03
R41, R141	100, 1/4W, 5%	RM/4-101C
R42, R142	100, 1/4W, 5%	RM/4-101C
R43, R143	1k, 1/4W, 5%	RM/4-102C
R44, R144	47.5, 1/4W, 1%	RM/4-0475C
R45, R145	1k, 1/4W, 5%	RM/4-102C
R46, R146	100, 1/4W, 5%	RM/4-101C
R47, R147	100, 1/4W, 5%	RM/4-101C
R48, R148	47.5, 1/4W, 1%	RM/4-0475C
R49, R149	475, 1/4W, 1%	RM/4-4750C
R50, R150	475, 1/4W, 1%	RM/4-4750C
R51, R151	475, 1/4W, 1%	RM/4-4750C
R52, 152	475, 1/4W, 1%	RM/4-4750C
R53, R153	56.2k, 1/4W, 1%	RMP/4-5622-03
R54, R154	220, 1/4W, 5%	RM/4-221C
R55, R155	220, 1/4W, 5%	RM/4-221C
R56, R156	220, 1/4W, 5%	RM/4-221C
R57, R157	220, 1/4W, 5%	RM/4-221C
R58, R158	0, 1/4W, 1%	RM/4-000C
R202	3.92k, 1/4W, 1%	RM/4-3921C
R203	3.92k, 1/4W, 1%	RM/4-3921C
R205	22k, 1/4W, 1%	RM/4-223C
R206	22k, 1/4W, 1%	RM/4-223C
R207	22k, 1/4W, 1%	RM/4-223C
R208	22k, 1/4W, 1%	RM/4-223C
R209	604k, 1/4W, 1%	RM/4-6043C
R210	470k, 1/4W, 4%	RM/4-474C
R211	1k, 1/4W, 5%	RM/4-102C
R212	1k, 1/4W, 5%	RM/4-102C

DESIGNATOR	VALUE	PART #
R213	220, 1/4W, 5%	RM/4-221C
R214	220, 1/4W, 5%	RM/4-221C
R215	10k, 1/4W, 5%	RM/4-103C
P1, P101	200, Trim Pot	RVH-201
P2, P202	200, Trim Pot	RVH-201
D1, D101	BAV99L	SS-260SM
D2, D102	BAV99L	SS-260SM
D3, D103	BAV99L	SS-260SM
D4, D104	BAV99L	SS-260SM
D5, D105	BAV99L	SS-260SM
D6, D106	BAV99L	SS-260SM
D7, D107	BAV99L	SS-260SM
D201	1N5245B 15V	SS-212
D202	BAV99L	SS-260SM
D203	1N5245B 15V	SS-212
D204	1N5245B 15V	SS-212
U1, U101	NPDS5566	SS-0865
U9, U109	NPDS5566	SS-0865
U201	TL072CD	SS-1308
U202	LM337	SS-1376-050
U203	LM317	SS-1375-056
C1, C101	330pF, 500V	CM-331-024
C2, C102	330pF, 500V	CM-331-024
C3, C103	0.47µF, 50V	CYV-474
C4, C104	0.1µF, 50V	CYV-104-024
C5, C105	100µF, 50V	CER-107C-024
C6, C106	0.1µF, 50V	CYV-104-024
C7, C107	100µF, 50V	CER-107C-024
C8, C108	0.1µF, 50V	CYV-104-024
C9, C109	0.1µF, 50V	CYV-104-024
C10, C110	7pF, 500V	CM-070-024
C11, C111	100pF, 500V	CM-101-024
C12, C112	100pF, 500V	CM-101-024
C13, C113	0.047µF, 50V	CYV-473-024
C14, C114	22pF, 500V	CM-220-024
C15, C115	680pF, 500V	CM-681-024
C16, C116	47pF, 500V	CM-470-024
C17, C117	4.7µF, 160V	CPP-475MC
C18, C118	4.7µF, 160V	CPP-475MC
C19, C119	20,000µF, 100V	CER-209E
C20, C120	20,000µF, 100V	CER-209E
C21	0.01µF, 1000V	CD-103/20-024
C201, 202	0.1µF, 50V	CDS-104CCDB
C203	1000µF, 50V	CER-108C-024
C204	1000µF, 50V	CER-108C-024
C205	0.1µF, 50V	CYV-104-024
C206	0.1µF, 50V	CYV-104-024
C207	100µF, 50V	CER-107C-024
C208	100µF, 50V	CER-107C-024
C209	10µF, 50V	CER-106C-024
C210	4.7µF, 160V	CTR-475A-024
C211	4.7µF, 160V	CTR-475A-024
C215	0.01µF, 1600V	CD-103A-024
SW1	DPDT Switch	SW-0280
SW2	DPDT Switch	SW-0280
SW3	DPDT Switch	SW-0280
S201	Power Switch	SWH-1009 ⚠
TS-201	Inrush Limiter	SSH-618 ⚠
Q2, Q102	MMBT5088L	SS-0114
Q3, Q103	MMBT5088L	SS-0114
Q4, Q104	MMBT5088L	SS-0114
Q5, Q105	MMBT5087L	SS-0115
Q6, Q106	MMBT5088L	SS-0114
Q7, Q107	MMBT5087L	SS-0115

DESIGNATOR	VALUE	PART #
Q8, Q108	MMBT5087L	SS-0115
Q10, Q110	MMBT5088L	SS-0114
Q11, Q111	MMBT5087L	SS-0115
Q12, Q112	MMBT5088L	SS-0114
Q13, Q113	MMBT5087L	SS-0115
Q14, Q114	MPS-A56	SS-101A
Q15, Q115	MPS-A56	SS-101A
Q16, Q116	MPS-A06	SS-102A
Q17, Q117	MPS-A06	SS-102A
Q45, Q145	2SK1058	SSH-741T ⚠
Q46 Q146	2SK1058	SSH-741T ⚠
Q47, Q147	2SK1058	SSH-741T ⚠
Q48, Q148	2SK1058	SSH-741T ⚠
Q49, Q149	2SJ162	SSH-740T ⚠
Q50, Q150	2SJ162	SSH-740T ⚠
Q51, Q151	2SJ162	SSH-740T ⚠
Q52, Q152	2SJ162	SSH-740T ⚠
Q201	MMBT5087L	SS-0115
Q202	MMBT5088L	SS-0114
Q203	MMBT5088L	SS-0114
F1, F101	AGC 10A Fuse	FS-010 ⚠
F2, F102	AGC 10A Fuse	FS-010 ⚠
F201	15A Slo/Blo	FS-015SB ⚠
F203, F204	2.5A Fast Mini	FS-0390 ⚠
	15A Slo/Blo	FS-1773 ⚠
BR201	Bridge Rectifier	SS-222
BR301	Bridge Rectifier	SSH-609 ⚠
BR-302	Bridge Rectifier	SSH-609 ⚠
	IEC Connector	CC-0918 ⚠
	IEC Line Cord	FA-0209 ⚠
	Dual Binding Post	CC-0867
	MOSFET Insulator	HWH-442 ⚠
J2, J102	XLR-1/4" Connector	CC-0588
J20	RCA Connector	CCH-228

⚠ 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.

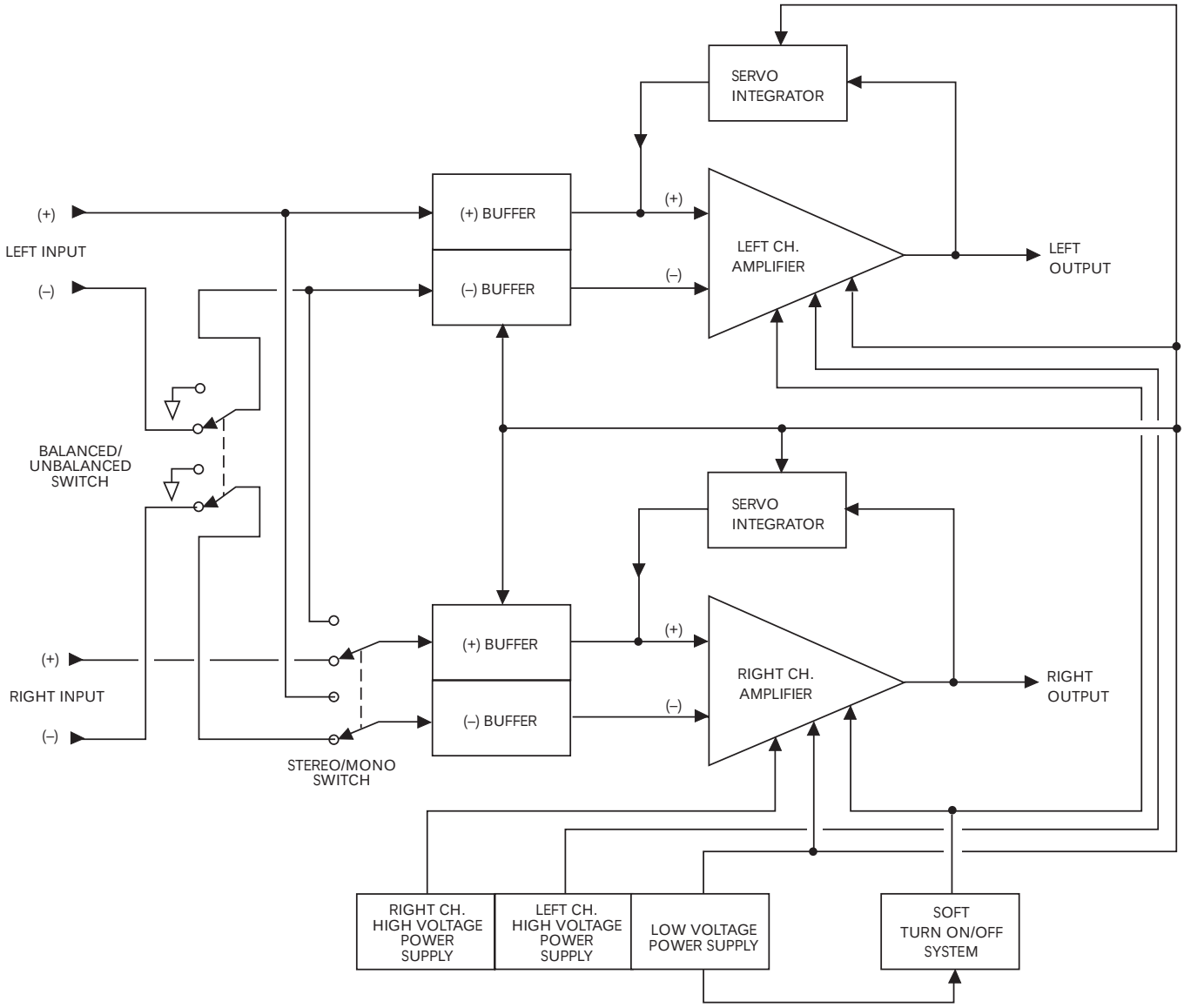
⚠ Bauteile, die mit einem ⚠ gekenzeichnet sind, sind sehr wichtig und dürfen nur mit den orginal Ersatzteilen ausgetauscht werden.

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

Model 9505CE

F1,F101	AGC 10A Fuse	FS-1123	⚠
F2, F102	AGC 10A Fuse	FS-1123	⚠
F201	8A Slo/Blo 5x20mm	FS-1122	⚠
	230V 50/60Hz	TT-0974-C	⚠
	Line Cord	FA-1464-A	⚠

9505 Functional Block Diagram



THEORY AND OPERATION OF trans•*nova*

The (TRANSconductance NOdal Voltage Amplifier) principle is based on our 1984 U.S. Patent 4,467,288. This patent describes the advantages of audio power amplifiers in which a MOSFET output stage is connected in a grounded source configuration. In this connection the output stage has its full voltage gain of typically 20dB (ten times), instead of the usual 1dB loss of voltage follower designs.

It is an inevitable result of electrical physics that this output with gain inherently increases the power gain (for the same bandwidth) of the output stage by typically ten times over the conventional follower connection, using exactly the same MOSFET devices.

The output stage is thus now ten times less wasteful of its incoming drive power. The driver stage can now be of a low voltage (±24 volts) nature and be designed along the same principles always used in high quality preamplifiers: Class A operation, high linearity, and wide bandwidth. A topology utilizing an output stage with gain yields a much simpler, shorter total signal path than that of the usual high voltage driver designs. The number of serial stages is reduced from five or more, to only three.

But all of the above does not make an amplifier trans•*nova*. The output stage is further refined into a trans-impedance stage (current-to-voltage converter), to achieve extremely short loop (fast) negative feedback. The output stage is driven cooperatively by a transconductance stage (voltage-to-current converter).

The 9505 is the most sophisticated amplifier we have yet developed utilizing the basic trans•*nova* principle. And, although the measured specifications are very good, the numbers do not describe the realistic sound of the amplifiers.

CIRCUIT IMPLEMENTATION

Earlier models of amplifiers we have offered using the trans•*nova* topology have earned the reputation for clean, natural sounding reproduction. A conservative, purist design approach was used to avoid compromising the desirable characteristics of the trans•*nova* circuits. Circuit innovation was not prevented by this conservatism; as is evident in the discoveries which resulted in development of the DIAMOND circuitry to be discussed shortly, and the novel balanced input system.

Many “balanced” amplifiers are merely conventional unbalanced designs with a Balanced-to-Unbalanced converter (usually IC op-amp based) preceding the power amplifier. The 9505, however, is a true differential input power amplifier. Each (+) and (–) input port has been buffered to allow direct signal access to the differential amplifier, without conversion to unbalanced form. Deactivating the Balanced Mode is accomplished via a rear panel switch that grounds the (–) inputs, effectively converting the amplifier to unbalanced operation.

The input stage is a JFET differential amplifier. This circuit configuration results in excellent front end headroom and extremely low intermodulation effects. The ultra low noise characteristic of the JFETs virtually eliminates noise “mixing” (intermodulation) with the music signal, reducing discordant product frequencies known as “noise grain” or “noise fuzz.” A servo integrator has been employed to establish minimal DC offset. This circuit monitors the DC offset at the output of the amplifier, and injects an equal but opposite DC voltage into the (+) port of the differential input, thereby cancelling the offset. This method eliminates the need for a sonically degrading electrolytic capacitor in the audio path, and provides superior subsonic frequency response.

The final output stage utilizes lateral MOSFETs; four pairs are used for each channel in the 9505. These devices, unlike conventional bipolar transistors do not exhibit "thermal runaway." Thermal runaway is a phenomenon whereby a transistor heats up as it draws more current, which causes it to get hotter, and conduct more current, and so on until the device self destructs. Since the MOSFETs are inherently self protecting, no sonically degrading, complex circuitry is required to monitor and protect the devices. The lateral MOSFETs also have a linear input to output transfer function. Their connection in circuits and their operating characteristics are very similar to vacuum tubes, which is perhaps responsible for their widely recognized sonic trait of being "musical" and non-fatiguing.

Operation of the transconductance stage is a major factor in the reproduction quality of the amplifier. The number of MOSFETs used at the output stage of the 9505 imposes sufficient capacitive load on the transconductance stage that if a conventional Class A stage were used (having intrinsically a 2:1 limit on peak-to-quiescent current) it would begin to show "stress" at the higher audio frequencies. The newly perfected DIAMOND (**D**ynamically **I**nvariant **AM**plification **O**ptimized **N**odal **D**rive [patent pending]) driver stage satisfies the current headroom requirement by smoothly and continuously varying the current transfer ratios of the two transconductance paths, under the control of the signal current itself. This implementation allows the current transfer ratio of one path to be smoothly and continuously reduced to zero while the other is smoothly and continuously increased by a factor of two. What is remarkably new here is that when this normally-limiting 2:1 value is reached there is now about 14dB of additional, perfectly linear current headroom left to drive the MOSFETs! The result is a dramatic decrease in high-frequency distortion combined with higher ultrasonic stability – the "Holy Grail" of amplifier design.

The power supply utilizes a UI style transformer with a separate primary for each channel. The transformer has a separate secondary for each channel high voltage power supply, each feeding a conventional split full wave bridge rectifier. High voltage power supply capacitance is 20,000µF per rail for each channel of the 9505. The third transformer secondary feeds a regulated supply for the input stage and driver circuitry. Low voltage power supply capacitance is 1,000µF per rail, with additional decoupling for each channel.

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

PRECAUCION: Sólo un técnico competente debe intentar efetuar el siguiente procedimiento.

MISE EN GARDE: Seul un technicien compétent devrait procéder à l'opération suivante.

WARNUNG: Nur ein speziell geschulter Techniker sollte die nachfolgende Prozedur durchführen.

AVVISO: La seguente procedura va eseguita soltanta da un tecnico di competenza.

CALIBRATION

Common Mode Rejection:

The input common mode null is adjusted by the trim pot R1 (R101 for the left channel). The CMRR should be greater than 75dB below rated output. If the CMRR requires adjustment, feed the amplifier input with a common mode signal and adjust R1. **Disconnect the power to the amplifier before removing the cover.** Use a sinewave generator set to 1 volt output at 1kHz. Connect the generator signal output to the tip and ring of a 1/4" plug and ground to the sleeve. Plug this into the amplifier input. Connect an AC voltmeter to the amplifier output binding posts. Adjust R1 to give the lowest voltage output from the amplifier. For a temporary adjustment when a signal generator and voltmeter are not available, use an FM tuner and tune it to an unused station as your signal source, and connect the output to the amplifier as described above. Connect the amplifier output to a small full range speaker and adjust R1 for the lowest output from the speaker.

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, or if the two channels of the amplifier do not run at the same temperature, calibrating the bias is necessary. **Disconnect the power to the amplifier before removing the cover.** To adjust the bias, disconnect the input and speakers and remove the B+ fuse for that channel. Connect an amp meter across the now vacant fuse clips and adjust R45 (R145 for the left channel) to get a current reading of 400mA for the 9505.

SERVICE POLICY AND LIMITED WARRANTY

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

- **Length of Warranty**
  5 years on P1000, P1500, P3000, P4000
  7 years on 9505 and P7000
  90 days on all B-Stock (receipts are required)

- **What is Covered**
  This warranty applies only to products sold to the original owner (non-transferable). This 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 Haflerany 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

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 equpo 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 comjpletamente 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 instruxxiones 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 Operaions - und Service - Informationen beigefügt sind.

1. **INSTSRUKTIONEN 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 and 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 GER¨AT 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.

NOTARE – IMPORTANTI INFORMAZIONI SULLA SICUREZZA

ITALIANO

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.

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