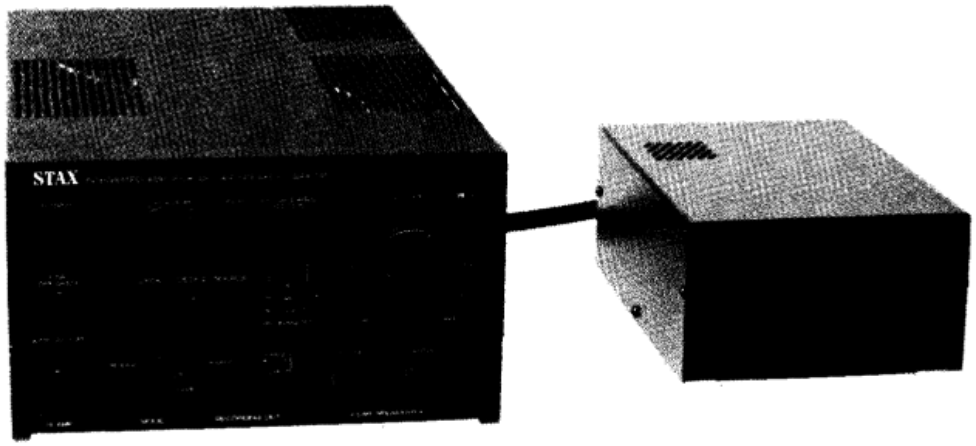
SRA-14S

Integrated Amplifier for Electrostatic Earspeakers.

Instruction Manual



STAX®

Congratulations for selecting the Stax **SRA-14S**, a superb example of today's high end audio engineering. To ensure optimum performance and many years of trouble-free service, please study this manual carefully and keep it handy for future reference.

Table of Contents

1 Features

● The **SRA-14S** is an integrated amplifier which can directly drive any Stax electrostatic earspeakers (headphones) of the SR series. It also serves as a top quality preamplifier. (It cannot directly drive dynamic headphones or loudspeakers, however.)

● Two earspeaker outlets (NORMAL, PRO ONLY) are provided, which supply different bias voltages. With the help of an extension cord (SRE-15, optional) and a connector box (SRE-B3, optional), up to 4 earspeakers can be connected.

● The **SRA-14S** accepts three optional phono equalizer circuit modules (EMM-1, EMC-1, ECC-1) and an additional line level input module (JB-1, optional), permitting direct connection of a variety of MC, MM and Stax electrostatic phono cartridges as well as analog and digital line level sources. Two modules can be installed at the same time for greater system flexibility.

● The power supply is housed in a separate unit to preclude any interference between power supply and signal path circuits.

● All circuit components have been selected with extreme care. Large-crystal, oxygen-free copper is used in the wiring. The seamless core power supply transformer has been designed with generous capacity and minimized flux leakage. Distortion is minimized by the use of purely ohmic resistors, while the chassis is made of non-magnetic aluminum. Sonic purity has been the absolute priority in every design aspect, down to the tiniest detail.

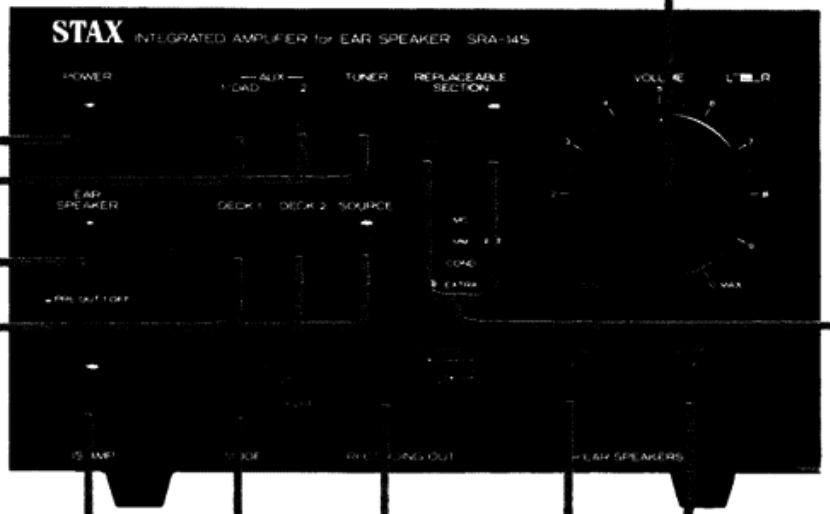
2 Front Panel Facilities

LINE INPUT SELECTOR SWITCH (AUX1, 2, TUNER)
Selects line (high) level program sources such as FM and TV tuner, CD player, etc.

POWER SWITCH
Make sure that the external power unit has been securely connected to the SRA-14S. Then depress this switch to turn the power on ; the pilot lamp will light.

VOLUME CONTROL
Clockwise rotation increases the volume. The front section of the knob controls the left stereo channel, the rear section, the right channel, permitting control of the stereo balance.
Turn the volume control fully counter-clockwise before switching the unit on and when making connections between components.

OPTIONAL INPUT MODULE SELECTOR (REPLACEABLE SECTION)
Four types of input modules –3 types of phono equalizer stages and 1 line level input module – are optionally available and can be selected with this switch. Indicator lights tell which module is being used.



Module Indicator Function

EMC-1	MC	High gain phono equalizer stage for low output MC cartridges. Dip switches on module select gain (55 or 64dB, respectively).
EMM-1	MM	Phono equalizer stage for MM and high output MC cartridges.
ECC-1	COND	Phono equalizer stage for Stax electrostatic (condenser) cartridges CP-Y/Type 2.
JB-1	EXTRA	Provides additional line level inputs for FM or TV tuners, etc.

EARSPEAKER SWITCH
When this switch is depressed, the power amp section operates for directly driving Stax electrostatic earspeakers. (The Pre Out 1 jacks are automatically switched off.)

TAPE/SOURCE SELECTOR SWITCH
A standard tape monitor switch. Selects the input signal from tape deck 1, deck 2 or another program source.

INTERSTAGE (IS) AMP SWITCH
When the input signal level is insufficient (sound volume too low), depress this switch to obtain additional amplifier gain. As a precaution, turn the volume control down before pressing this switch.

MODE SWITCH
Permits a choice between different stereo and mono listening modes.

REVERSE	···Stereo channels reversed
STEREO	·····Normal stereo listening
L+R	·····Mixed left+right signal to both output channels
L	·····Left (mono) input signal to both output channels
R	·····Right (mono) input signal to both output channels.

RECORDING OUT SELECTOR SWITCH
Selects the signal supplied to the REC OUT jacks on the rear panel.

SOURCE	·····Signal selected by LINE INPUT SELECTOR or selector on optional module is supplied to REC OUT jacks.
OFF	·····No signal at REC OUT jacks.
DUBBING 1>2	···Signal from TAPE PLAY 1 inputs supplied to REC OUT 2 jacks.
DUBBING 2>1	···Signal from TAPE PLAY 2 inputs supplied to REC OUT 1 jacks.

EARSPEAKER OUTLETS

NORMAL	····· Connect conventional electrostatic earspeakers here (bias voltage 230VDC)
PRO ONLY	··· Only for SR-Lambda Professional and other Stax professional series earspeakers (bias voltage 580VDC).

3 Rear Panel Connection

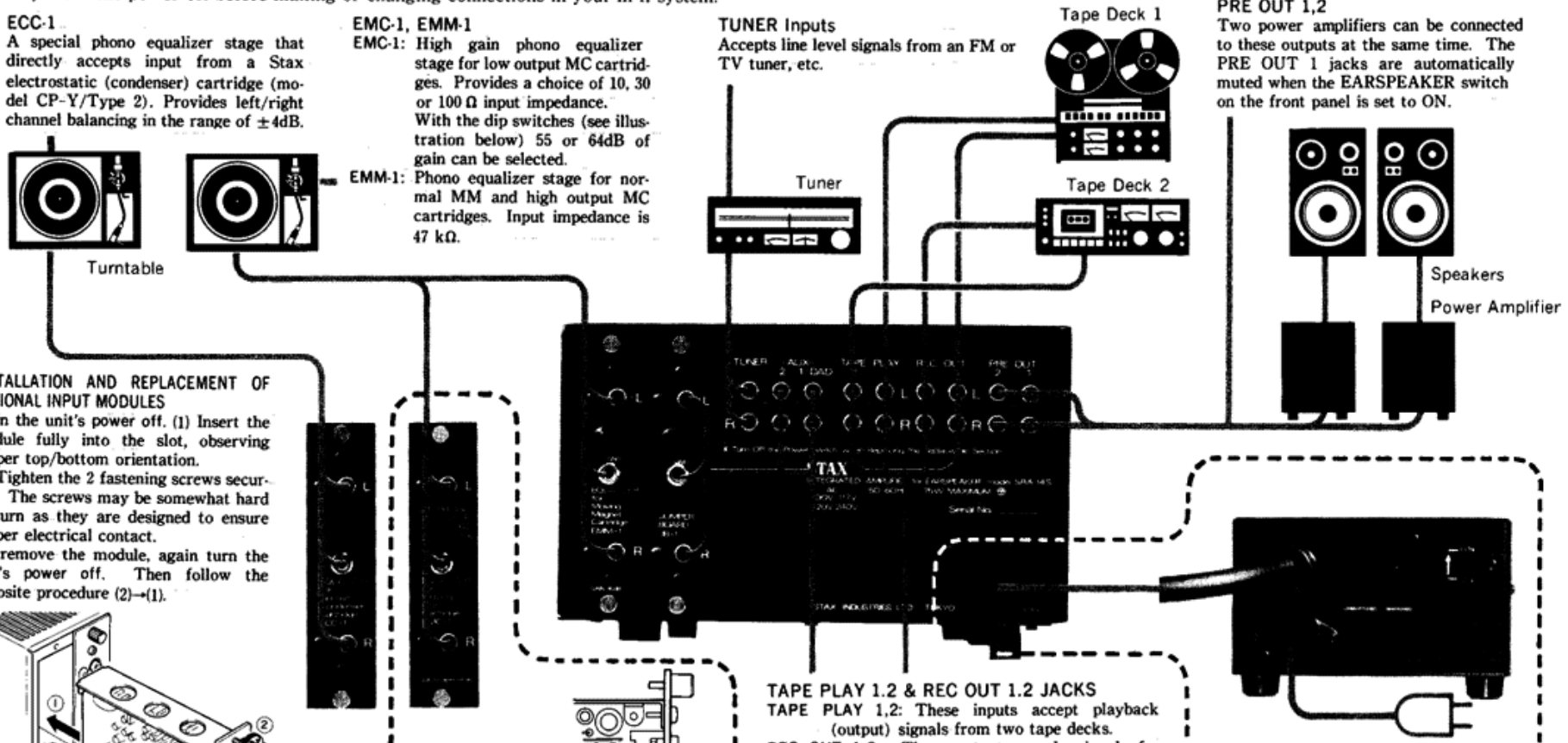
●Always turn the power off before making or changing connections in your hi-fi system.

ECC-1
A special phono equalizer stage that directly accepts input from a Stax electrostatic (condenser) cartridge (model CP-Y/Type 2). Provides left/right channel balancing in the range of ±4dB.

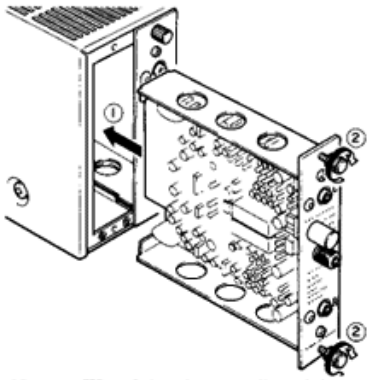
EMC-1, EMM-1
EMC-1: High gain phono equalizer stage for low output MC cartridges. Provides a choice of 10, 30 or 100 Ω input impedance. With the dip switches (see illustration below) 55 or 64dB of gain can be selected.
EMM-1: Phono equalizer stage for normal MM and high output MC cartridges. Input impedance is 47 kΩ.

TUNER Inputs
Accepts line level signals from an FM or TV tuner, etc.

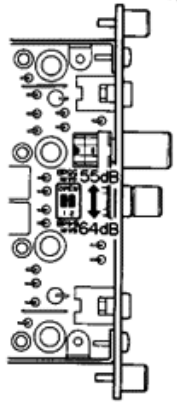
PRE OUT 1,2
Two power amplifiers can be connected to these outputs at the same time. The PRE OUT 1 jacks are automatically muted when the EARSPEAKER switch on the front panel is set to ON.



INSTALLATION AND REPLACEMENT OF OPTIONAL INPUT MODULES
Turn the unit's power off. (1) Insert the module fully into the slot, observing proper top/bottom orientation.
(2) Tighten the 2 fastening screws securely. The screws may be somewhat hard to turn as they are designed to ensure proper electrical contact.
To remove the module, again turn the unit's power off. Then follow the opposite procedure (2)→(1).



Note : We advise that you first tighten one screw completely, then slightly loosen it and tighten the other screw. Finally, tighten both screws once more.



Gain selection with dip switches on EMC-1 input module
Use the 64dB position of the two dip switches to obtain sufficiently high listening volume with MC cartridges of very low output voltage. (With most MC cartridges, the 55dB position should be sufficient.)

TAPE PLAY 1.2 & REC OUT 1.2 JACKS
TAPE PLAY 1,2: These inputs accept playback (output) signals from two tape decks.
REC OUT 1,2 : These outputs supply signals for recording to the inputs of two tape decks. The signal supplied is controlled by the RECORDING OUT selector on the front panel.

JB-1, AUX 1,2
JB-1 : An optional input module that provides additional line level inputs with the same characteristics as the TUNER and AUX 1,2 inputs.
AUX1,2: Electrically identical to the TUNER inputs, these inputs accept line level signals from sources such as a CD player, soundtrack from a video deck, etc.

External Power Supply
Supplies power to the SRA-14S main unit. Its connection cable must be connected, with proper plug orientation, to the power input in the lower right hand corner of the main unit. Connect the power supply unit to a wall outlet with the supplied power cord.
Auxiliary AC outlets (1 switched, 1 unswitched) are provided to power other system components.
* The power supply transformer remains inoperative unless the power supply unit is properly connected to the main unit.

4 Precautions during Operation

Connections

Be sure to always turn the power of the SRA-14S and the units connected to it OFF when making or changing connections. Also turn the power off when installing or removing input modules.

Earspeakers

Stax Professional type earspeakers can be connected to the NORMAL outlet, but will not achieve their optimum performance.

Conversely, conventional Stax electrostatic earspeakers must not be connected to the PRO ONLY outlet. Listening through earspeakers at excessively high volume levels for extended periods of time is detrimental to your hearing.

Installing and Exchanging Optional Input Modules

When installing an optional input module, make sure that secure electrical contact is established and that the two fastening screws are properly tightened. Loose contact can cause noise and hum due to improper grounding of the module and will otherwise affect its performance. For proper installation, see p. 4.

Connection Cables

All connections in a hi-fi system must be made with shielded connection cables, preferably those with low capacitance and low hot-side (inner core) resistance. Keep cable runs as short as possible. High cable capacitance can negatively affect high frequency response and cause noise problems. Amplifier operating stability may also be affected by improper cables.

Shock & Switching Noise

Momentary surge currents ("shock & switching noise") are caused when a phono cartridge is lowered on a record and when other system components are turned on and off, which could conceivably damage your speakers. Always turn the volume down before performing such operations. Turn the components on in the following order : (1) turntable(2) tuner and/or tape deck (3) SRA-14S (4) power amp. To turn them off, follow the reverse order.

Placement of The External Power Supply

Under certain circumstances, the location of the external power supply may slightly affect the signal-to-noise ratio. Find the position that results in the lowest noise.

Auxiliary AC Outlets

Only units of low power consumption (tuner, turntable, CD player, cassette deck) may be connected to the auxiliary AC outlets on the rear of the external power supply. Always connect your power amplifier(s) directly to an AC wall outlet. Power amplifiers, drawing considerable current, can cause line voltage drops which can negatively affect the performance of the SRA-14S.

Ventilation

The SRA-14S, containing a class A power stage for driving electrostatic earspeakers, develops some heat. Proper air circulation must be assured and the ventilation holes must not be obstructed. Never expose the unit to moisture – internal high voltages may pose a shock hazard. Never remove the cover or insert screwdrivers, paper clips or other objects through the ventilation holes.

Notice Concerning the SRA-14S Feet

To provide the best sound quality possible, the feet of the SRA-14S utilize the "tiptoe" concept to reduce the contact area between the unit's aluminum feet and the surface on which the unit is placed to the absolute minimum. This design is based on the belief that protecting an amplifier from vibrations results in better sonic performance. If, however, you prefer softer feet, these "tiptoe" feet can be replaced with the plastic feet which are also supplied with this unit.

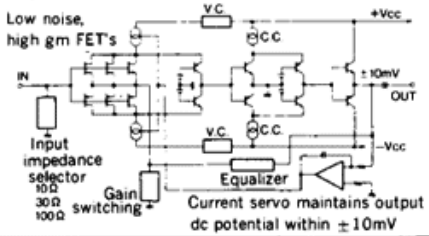
5 Trouble-shooting Guide

Trouble	Causes	Remedy
● Pilot lamp does not light, no sound when power is turned on.	Power cord or external power unit not properly connected.	Check connection to AC outlet and power unit to amp connection. If this doesn't help, turn power off and contact authorized Stax dealer or service station.
● Pilot lamp lights, but no sound from earspeakers.	(1)Volume control turned down. (2)Input selector in wrong position. (3)Earspeaker switch off.	(1)Turn volume higher. (2)Set input selector correctly. (3)Turn earspeaker switch on.
● Hum (low-pitched noise)	(1)Poor ground connection. (2)Electrical interference from a transformer, etc. (3)Optional input module not properly installed.	(1)Check turntable to GND terminal connection. Check optional input module for proper installation and securely tightened fastening screws. Also check all interconnects for proper contact and fit. (2)Change relative positions of turntable or tape deck and SRA-14S. Try different position of external power unit. (3)Tighten fastening screws of optional input module securely.
● Buzz (high-pitched noise)	Electrical interference from a fluorescent lamp or other electrical appliance. Also check under "hum," above.	Check under "hum," above. Turn off fluorescent lamp or other electrical appliances nearby.
● Distorted sound	(1)Poor program source. (2)Cartridge problem (worn or dirty stylus, etc). (3)Worn or dirty tape head. (4)Excessively high power driving earspeakers into distortion.	(1)Use better program material. (2)Clean stylus tip. Check arm and cartridge for proper geometry. Replace stylus if worn. (3)Clean tape head. (4)Turn volume down to normal listening level. If none of this helps, the unit or earspeakers may be damaged.

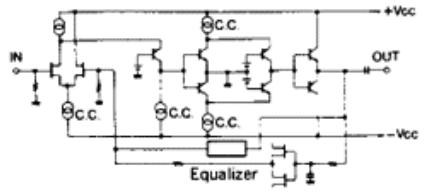
Trouble	Causes	Remedy
● Poor left/right channel balance (1)Balance shifts as volume is turned down. (2)Poor balance regardless of volume setting.	(1)Caused by different "tracking" of variable resistors (inevitable to a certain extent). (2)Poor stereo balance in program source. Other possible causes are faults in associated equipment, in SRA-14S or in earspeakers.	(1)Adjust channel balance with volume controls. Alternately, turn Interstage (IS) amp switch off and listen with volume controls turned up fairly high. (2)Switch to L+R mode. If sound appears centered, problem is located upstream of MODE selector, probably in cartridge, turntable, tape deck or other source equipment. Check again with different program source. If balance is shifted even in L+R mode, problem lies in SRA-14S or earspeakers. Contact Stax dealer or service center.
● No signal from REC OUT 1, 2 outputs.	REC OUT Selector in OFF position.	Set REC OUT Selector in position SOURCE **(or DUBBING** 1>2 or 2>1).
● No signal from PRE OUT 1 outputs.	EARSPEAKER Switch in ON position.	Turn EARSPEAKER Switch OFF.
● Unit gets hot.	Class-A power amp stage (for driving earspeakers) develops heat.	Ensure good ventilation around the unit. Avoid direct sunlight and the vicinity of heat sources.

6 Circuit Features

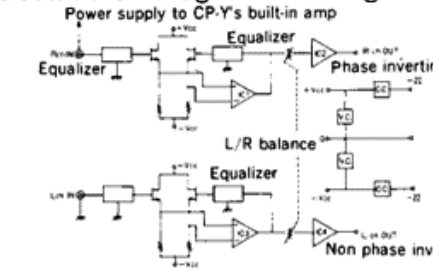
MC Equalizer Phono Stage



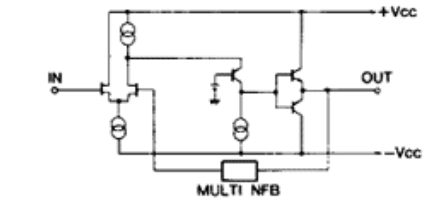
MM Equalizer Phono Stage



Electrostatic Cartridge Phono Stage



Interstage Amplifier



V.C. : Constant voltage circuit
C.C. : Constant current circuit

● Phono Equalizer Modules for MC and MM Cartridges, Models EMC-1, EMM-1

Model EMC-1 is a phono equalizer amp for MC cartridges. It uses parallel high-gain, low-noise FET's in a three-stage design. Dip switches on the EMC-1 module offer a choice of 55 or 64dB gain to accommodate MC cartridges of different output voltages.

"Ground reference amplification" (U.S.PAT, JAPAN. PAT.PEND.) is used in all stages of the EMC-1 and EMM-1 modules to prevent noise induced by the power supply and thereby improve the overall S/N ratio.

● Phono Equalizer Module for Electrostatic Cartridges, Model ECC-1

This phono equalizer module, specially designed for the Stax electrostatic (electret condenser) cartridge model CPY, is equipped with a super shunt power supply which considerably improves resolution of sonic detail.

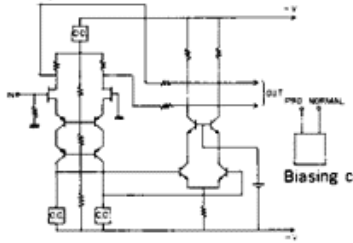
● Interstage (IS) Amplifier

A single-stage, "Ground reference" amplifier with multiple negative feedback loops but minimum negative feedback amount. Designed to avoid amp colorations.

● Power Amplifier for Earspeakers

A 2-stage, dc coupled design operating in pure class A and especially designed to fully display the excellent transient response of electrostatic earspeakers. Includes high voltage bias circuit for directly driving Stax Lambda Professional type earspeakers.

Power Amplifier for Earspeakers



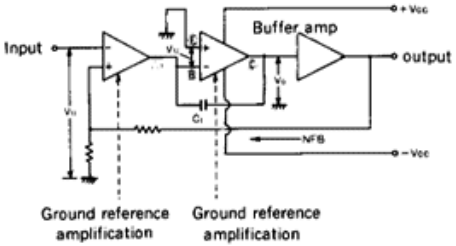
Ground Reference Amplification in All Stages

As shown in the circuit diagram, the cold side of the second amplifier stage is kept at ground potential, which helps prevent noise induced by the power supply – one of the most common problems afflicting sonic quality. Other benefits of this circuit design are stable operation in the high frequency range and the possibility to reduce NFB to an absolute minimum.

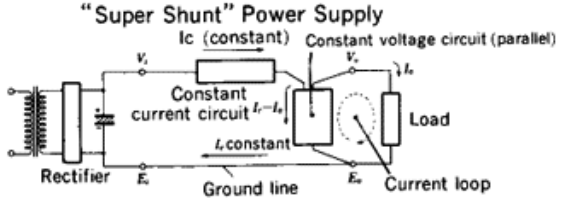
Super Shunt Power Supply

In the power supply circuitry of the ECC-1 module, Stax has incorporated a new development, the "Super Shunt" design. It prevents current fluctuations in the power supply and the ground lines under conditions of fluctuating load currents. As a result, resolution of fine sonic detail and inner musical structures is vastly improved.

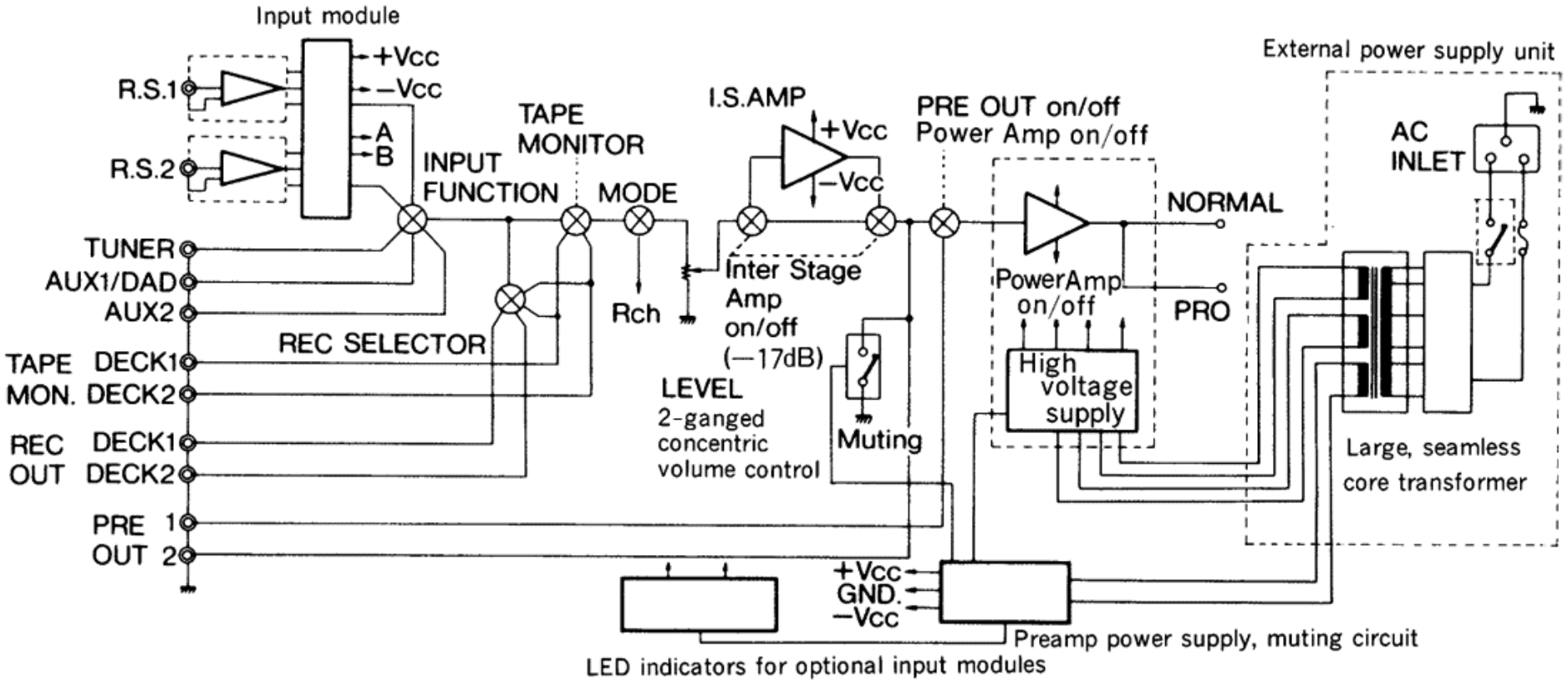
All-Stage "Ground reference" Amplifier Circuit



"Super Shunt" Power Supply



7 Block Diagram



8 Specifications

Model : ● Integrated amplifier for Stax Earspeakers (all models)

Circuit Systems : ● Pre-amp section—Can be used independently as a standard pre-amp

Phono equalizer modules — EMM-1 for MM cartridges
EMC-1 for MC cartridges
ECC-1 for Stax CP-Y and CP-Y/TYPE 2 cartridges
Interstage amp

● Power amp section-For use only with Stax Earspeakers

Power Supply : ● 117V, 220V, 240V/50-60Hz +−10%

Power Consumption : ● 75W (Max.)

Dimensions (W×H×D) : ● Main unit 225×147×412 mm
Power supply unit 147×96×213 mm

Weight : ● Main unit 3.8 kg
Power supply unit 2.5 kg (with cord)

Amplifier Spec. I PRE-AMP

● Frequency Response :
EMM-1/EMC-1/ECC-1 · 20Hz-20kHz ±0.2dB
TUNER/AUX1.2/DECK1.2/JB-1 · 0.5Hz-500kHz +0, −3dB

● Total Harmonic Distortion :
EMM-1/EMC-1 · 0.003% (3V output, 1kHz)
ECC-1 · 0.005% (3V output, 1kHz)
TUNER/AUX1.2/DECK1.2/JB-1 · 0.003% (3V output, 1kHz)

● Input Sensitivity and Impedance :
EMM-1 · 2.5mV/47kΩ
EMC-1 · Lo 0.1mV, Hi 0.25mV/10Ω 30Ω, 100Ω switchable
ECC-1 · 18mV/10kΩ
} at 1kHz
TUNER/AUX1.2/DECK1.2/JB-1 · 150mV/50kΩ

● Maximum Input Voltage :
EMM-1 · 200mV
EMC-1 · Lo 8mV Hi 20mV
TUNER/AUX1.2/DECK1.2/JB-1 : 1.2V
} at 1kHz

● Rated Output Level and Impedance :
EMM-1 · 150mV/220Ω
EMC-1 · 150mV/200Ω
ECC-1 · 150mV/200Ω
PRE-OUT1.2 (when IS amp is on) · 1V rms/220Ω

● SN Ratio (IHF-A network, shorted input) :
EMM-1 · 80dB (at 2.5mV rated input)
EMC-1 · 78dB (at 0.25mV rated input)
ECC-1 · 90dB (at 18mV rated input)
TUNER/AUX1.2/DECK1.2/JB-1 · 100dB (for 150mV input)

● Gain :
EMM-1 · 35dB
EMC-1 · 64dB/55dB switchable
ECC-1 · 18.6dB (with ±4dB balance control)
Interstage amp · 16.5dB
} at 1kHz

● REC OUT Rated Output Level : 150mV

● PRE OUT Rated Output Level : 1.0V rms

II POWER AMP

● Frequency Response : DC-30kHz, +0, −3dB (at 100Voutput into a load presented by one SR-Lambda Pro)

● Total Harmonic Distortion : 0.01% (100Hz−10kHz, 100V output into a load presented by one SR-Lambda Pro)

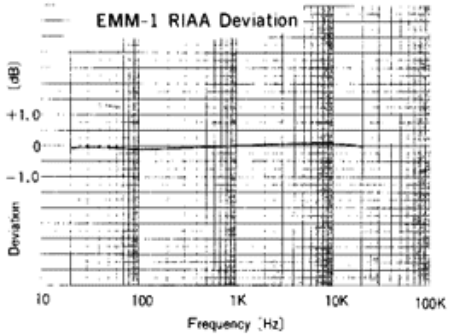
● Input Sensitivity : 150mV (for 150V output)

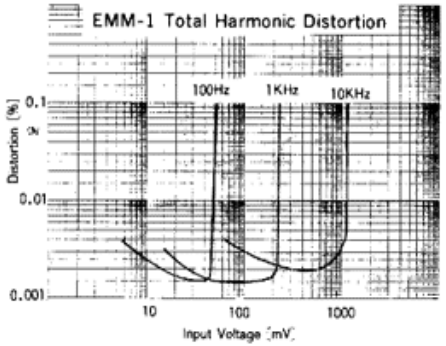
● Maximum Output : 400V rms

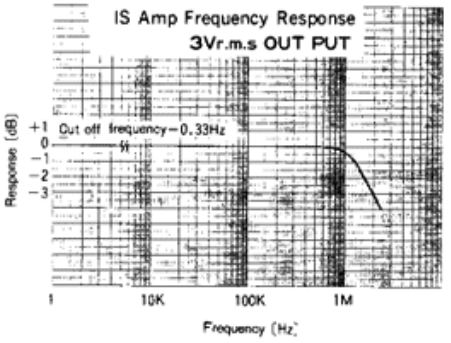
● Bias Voltage : Normal·230V DC, PRO·580V DC

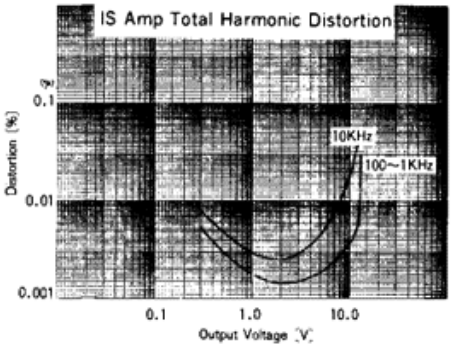
* Specifications are subject to change without notice.

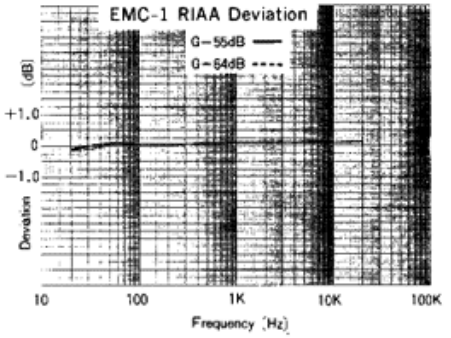
9 Performance Graphs

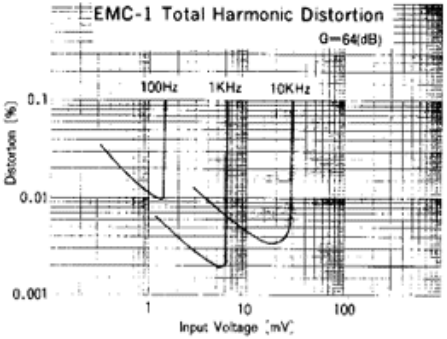


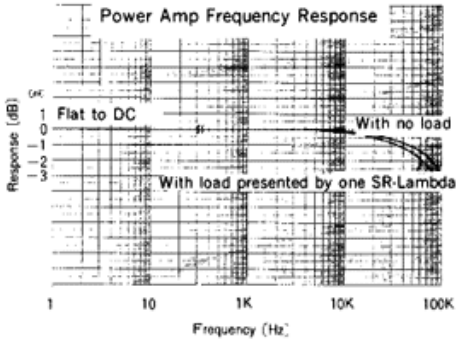


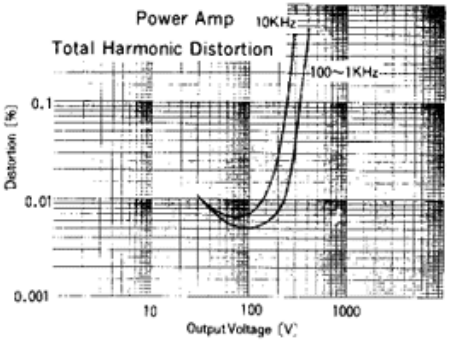


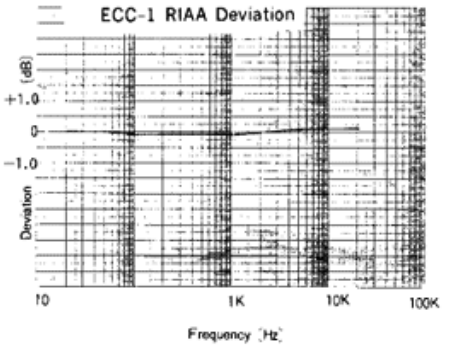


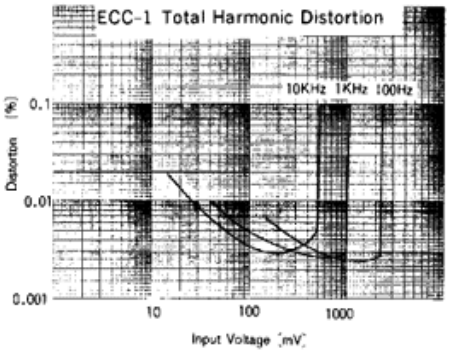












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