INTRODUCTION

We would like to take this opportunity to congratulate you on your purchase of our audio component. With the latest technology and workmanship that goes into making this equipment, you can be assured of its high quality performance for many years to come.

We have fitted a comprehensive range of controls and features for your convenience. Designed for both versatility and ease of operation, this piece of equipment will add professional studio flexibility to your Hi-Fi sound center. The performance is exceptional, allowing you to experience true high fidelity. Its full and natural sound reproduction offers you musical entertainment approaching that of live performances. We sincerely hope you will treasure this professional type component. In order to obtain the maximum use out of your equipment, we urge you to read the following pages of this Owner's Manual carefully.

WARNING — TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

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System Connections

POWER SUPPLY CONNECTION
For power the unit requires the normal house electrical current (AC). Simply plug the unit to a wall outlet.

CAUTION — Do not apply power to the equipment without first making sure that speakers are connected properly and that the unit’s VOLUME control is set to minimum. If you live in U.K., and your unit comes with 3-core cord without a plug, be sure to read the last page of this manual before connecting to power.

LOCATING THE UNIT
Although the unit normally does not develop high heat, it should be placed in such a way that its ventilation system will not be impeded. Place the unit on a hard surface - any conveniently located shelf or table where not affected by heat or moisture. Leave at least 5 cm (2 inches) clearance on each side and in the rear of the unit, and about 10 cm (4 inches) above the unit. Never directly place an object on the top of the unit.

SPEAKERS PLACEMENT
NOTE — Check speakers’ rated impedance as instructed on this page.

1. MAIN SPEAKERS — Refer to a pair of speakers connected to the SPEAKER 1 terminals on the unit’s rear panel. Place the main speakers against a wall or on a shelf so that they face your selected listening position and are equal distance from you. For optimum stereo effect, they should be 3 to 4 meters 110 to 15 feet) apart and, if possible, at about ear level height. You may determine best locations to suit your personal tastes and listening conditions.

2. REMOTE SPEAKERS — If you wish to enjoy stereo sound in another room, you can connect another pair of speakers to the SPEAKER 2 terminals. Though you may require long cables between the unit and the remote speakers, make sure they are not longer than 15 to 20 meters (50 to 60 feet) in length and that they are of heavy duty shielded type in order to prevent loss of volume level. Following the procedure described in the item 1 above for placing the remote speakers.

SPEAKER CONNECTION
Caution: Do not apply power to the unit until the speakers are connected properly as described below.

As shown in the second page of the manual, the speaker terminals are quick-connect push-in type, and are arranged into two banks, one for SPEAKER 1 (main) and the other for SPEAKER 2 (remote). Push back the tab on each terminal, slip the bare wire at the free end of the speaker lead into the opened jaw of the terminal, and release the tab to grip the bare wire in the jaw. (Note: If necessary, after stripping each end of speaker leads to obtain a bare wire, twist the bare strands together so it will be easy to insert and also prevent shorting among stray strands.) Make sure the positive (+) lead of each speaker is connected to the (+) terminal and the ground (–) lead to the (–) terminal, and right to RIGHT and left to LEFT.

GROUND (EARTH)
The GROUND screw terminal is provided on the rear panel to provide means for all equipment chassis to be at the same potential in a Hi-Fi installation.

CONVENIENCE AC OUTLET
The outlets marked SWITCHED on the rear panel provide power and switching control to whatever component you may wish to connect to the unit. For example, if you connect the power cord of your record player to the outlet, the record player will be activated and deactivated by the power switch on the unit. Caution: Do not connect components whose total power consumption exceeds the maximum power rating marked on the outlets.
**Specifications**

**POWER AMPLIFIER SECTION:**
- **Continuous Power Output:** 16 watts per channel, min. RMS, both channels driven into 8 ohms from 50 to 20,000 Hz with no more than 1% total harmonic distortion.
- **Intermodulation Distortion:** Less than 0.1% at rated output.
- **Frequency Response:** 5 to 60,000 Hz, ±3dB at 1 watt per channel.
- **Square Wave Rise Time:** 6 microseconds.
- **Damping Factor:** 40 at 1 kHz.
- **Signal to Noise Ratio:**
  - Line (HI-FI, 'A' closed circuit network): 70 dB
  - Tape, Aux, Tuner: 90 dB
  - Residual: 0.5 mV

**Input Sensitivity/Impedance**
- **(Rated output at 1 kHz):**
  - **Phono 1, 2:** 2.0 mV/47 kohms
  - **Tape:** 150 mV/50 kohms
  - **Aux, Tuner:** 150 mV/50 kohms

**Output Level**
- **Tape out (RCA jack):** 280 mV/3.3 kohms
- **Tape out (Din jack):** 100 mV/75 kohms
- **Phone Overload:** 110 mV
- **Phone Equalization:** R.I.A.A. STD +1.0 dB
- **Bass Control:** ±10 dB at 100 Hz
- **Treble Control:** ±10 dB at 10 kHz
- ** Loudness Control:** ±3 dB at 100 Hz, ±3 dB at 10 kHz
- **High Filter:** ±6 dB/oct at 10 kHz
- **Low Filter:** ±6 dB/oct at 100 Hz
- **Crutch:** 45 dB (Overall)

**GENERAL INFORMATION**
- **Power Consumption:** MAX120W
- **Dimensions (overall):** 400(H) x 110(W) x 240(D) mm
- **Weight (net):** 6 Kg ±1.2 lbs

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**Features & Function Controls**

**SPEAKERS CONTROL** — allows you to select your speaker systems for activation, OFF to deactivate all speakers in your system. To activate your speaker systems connected to SPKR-1 terminals on the rear panel, press SPEAKERS button 1 to activate your speakers systems. To activate your system connected to the SPKR-2 terminals, press SPEAKERS button 2 to activate your system's speaker matrix for simulated 4-channel sound using both SPKR-1 and SPKR-2 systems.

**BASS CONTROL** — regulates low frequency sounds, as desired, to suit personal taste, speaker characteristics, etc. This control's setting gives normal (flat) frequency response. Rotating clockwise increases the bass, and counterclockwise decreases the bass. You may adjust the bass control for each channel independently or individually. The outer ring adjusts the left channel and the inner knob adjusts the right channel. In order to adjust both channels turn both knobs together. In order to adjust one channel only, simply hold one knob while turning the other.

**BALANCE CONTROL** — regulates the relative sound outputs from each channel. Normally the control is adjusted to provide the effect of mono signal coming from a point midway between the speakers. When balanced in this way, the optimum stereo effect will be achieved. Rotate clockwise for increase in sound level from the right channel, and counter-clockwise for the left channel.

**TREBLE CONTROL** — regulates high frequency sounds, and operates in the same manner as the BASS CONTROL.

**MODE SWITCH** — selects between stereo-phonophonic and monophonic operation depending upon the program source. In ON position the program will be heard monophonic, and in OFF position it will be stereo-phonophonic. Normally, leave the switch in OFF position.

**POWER SWITCH** — performs the function as its name denotes. It supplies power to the unit and to any switched AC outlets. When the switch is ON the pilot light will be illuminated.

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**Block Diagrams**

**DIGITAL AMP**

**MONITOR SWITCHES** — allows you to playback, monitor and dub tape recorders. To select a tape recorder connected to the TAPE 1 terminals on the rear panel, press MONITOR button 1. To select the tape recorder connected to the TAPE 2 terminals, press MONITOR button 2. If you have the tape desk with DIN plug connected to the DIN socket on the rear panel, use TAPE 2 switch. Push in to MONITOR position to playback pre-recorded tapes, either TAPE 1 or TAPE 2 depending on which tape recorder you are using. When dubbing or duplicating the tape recorder connected to TAPE 2, degrees in TAPE 1 switch to MONITOR. Set both switches to SOURCE positions whenever tape recorder is not being operated but other program material is being played. If your tape recorders have isolated playback heads, MONITOR position also can be used as monitors during recording; setting to these positions will allow you to listen to program as actually being recorded. So, you can compare recording program playing SOURCE position (off-the-tape or A-and-B monitoring) with same program being actually recorded on the tape (MONITOR position).
COMPONENTS CONNECTIONS
This unit is designed to handle two record players with magnetic cartridges, two stereo tape recorders and two additional auxiliary components such as 8-track cartridge decks. We recommend that you familiarize yourself with the basic operations before connecting any such unit. Refer to the ADDITIONAL COMPONENTS section provided in this manual for connections and operations of these components.

TURNTABLE Connection
If your turntable comes with RCA-type plugs on output cables, connect them correctly to corresponding RIGHT and LEFT jacks of PHONO MAG inputs. If there is ground (earth) cable emerging from the turntable besides the output cables, connect it to the ground screw terminal marked GND or O. If your turntable comes with a DIN plug on output cable, simply plug in to the DIN socket marked PHONO MAG.

NOTE: To avoid loss of high frequency response due to excessively long output cables, shielded cables not exceeding 10 feet (3 meters) in length should be used to connect your turntable. Usually, cables supplied with your turntable are sufficient.

Operation
Turn the function selector control to PHONO and play your record disc, controlling volume and tone controls to suit your taste.

TAPE RECORDER Connection
A facility for tape recorder is referred to as TAPE MONITOR, and is used in conjunction with the monitor switches on the front panel. It is also used when your tape recorder has a separate playback head (i.e., tape recorder normally equipped with three heads).

Your tape recorder can be a reel-to-reel deck, a cassette recorder deck or a 4-track cartridge recorder deck. If the tape recorder comes with RCA-type plugs, connect input cables to corresponding TAPE MONITOR jacks marked OUT and output cables to the jacks marked IN. Input jacks IN are for playing back prerecorded tapes and output jacks OUT are for recording programs such as broadcasts, records and live sounds.

If the tape recorder comes with DIN plug, connect it to the DIN socket marked REC/PB at TAPE MONITOR 1.

TAPE PLAYBACK
To listen to playback of pre-recorded tape, flip either monitor switch to 1 or 2, depending on which TAPE MONITOR terminal the tape recorder is connected. The setting of the function selector control is irrelevant in this case and may be left at any position.

TAPE RECORDING
You may record with your tape recorder any program materials that can be played through this unit. Turn the function selector control to TUNER, PHONO or AUX depending on which program you wish to record, and operate the tape recorder while listening to the program.

Always leave the monitor switches off if your tape recorder has no separate playback head (look up its instruction manual to see if the tape recorder is equipped with separate playback and recording head).

If your tape recorder is equipped with a separate playback head, rotating the monitor control to 1 or 2 will cause the input source to be bypassed and will permit you to listen to the recording being made on the tape. Setting the off position will permit you to listen to the input source. Thus, with the monitor control you may monitor or compare the recording being made with the source being recorded. When dubbing, only the tape recorder that is recording will be monitored.

NOTE: You will not obtain any sound if either monitor switch is set at 1 or 2 unless tape recorder has a separate playback head. Also, volume, bass, treble and balance controls of this unit will have no effect upon the recording, so you should use the controls on the tape recorder.

TAPE DUBBING
To record off (dubbing) the tape recorder connected to TAPE 2, depress TAPE 1 switch to MONITOR, and operate both recorders. Note that you cannot dub the recorder connected to TAPE 2 by the one connected to TAPE 1; it can be done if you plug the output cables of tape recorder connected to TAPE 2 to AUX terminals on the rear panel. If your tape deck is equipped with a separate playback head, turning TAPE 1 or TAPE 2 switch to MONITOR will cause the input source to be bypassed and will permit you to listen to the recording being made on the tape. When dubbing, only the tape recorder that is recording will be monitored, so pushing in TAPE 2 switch will let you monitor program being played back by TAPE 1.

AUXILIARIES
1. Connection
One set of AUX input terminals is provided for connection of equipment such as tape deck without recording facility (e.g., 8-track player deck). Connect the output cables of such equipment to input terminals in the same manner as the TAPE RECORDER section.

2. Operation
Turn the function selector control to AUX. Adjust volume, balance, bass and treble controls to suit your personal tastes and listening conditions.
HUM AND NOISE
In any high fidelity installation, hum may be caused by the interconnection of a record player, tuner and amplifier, and speakers as result of the cables, different grounds or locations of components. If hum is experienced with your unit, disconnect everything but the speakers from the unit. If the hum persists, reverse the power plug at the power source. Plug in the record player and if hum or howling appears, reverse the record player power plug or re-mount the record player away from the speakers as much as possible. Note hum may also be induced by defective connecting cables or by running these cables too close to a strong AC field.

When your unit picks up noises during the reception of broadcasts, causes are mostly due to external objects such as fluorescent lamps and house appliances using motor or thermostat, or others that may induce the noises. Either relocating the unit away from the noise sources or using an improved outdoor antenna may readily solve the problem. In the event you cannot find causes, consult your dealer or a qualified electrician.

EXCLUSIVE NOTE FOR U.K.
If your unit comes with a 3-core cable without a plug, make certain live, neutral and (where appropriate) earth leads are connected to the proper terminals. Check that the terminals are screwed down firmly and no loose strands of wire are present.

WARNING: THIS APPARATUS MUST BE EARTHED

IMPORTANT: The wires in this mains lead are coloured in accordance with the following code:

GREEN/YELLOW: EARTH
BLUE: NEUTRAL
BROWN: LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows.
The wire which is coloured GREEN/YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol △ , or coloured GREEN or GREEN/YELLOW. The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLUE or BLACK. The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured BROWN or RED. The apparatus must be protected by a 3 Amp fuse if a 13 Amp (BS 1363) plug is used. If another type of plug is used a 5 Amp fuse or lower must be used, either in the plug or adapter or at the distribution board.

Note:
- Features and specifications are subject to change without notice.
- When production design improvements are made there may be case(s) that having slightly different photographs and/or illustrations.

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