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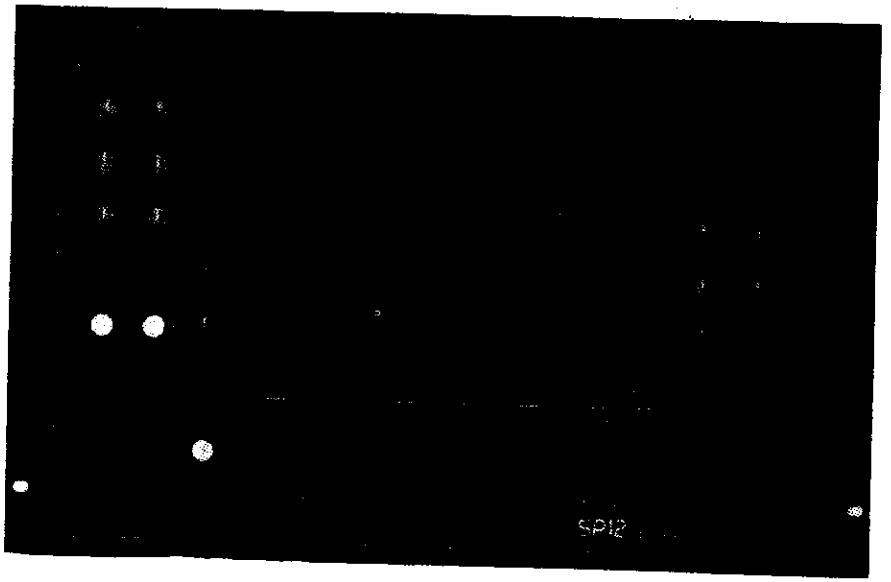
YOUR AUTHORISED HARRISON DEALER

SP-SERIES

PROFESSIONAL STEREO MIXERS

USER HANDBOOK

SP12



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INFORMATION TECHNOLOGY LTD

INTRODUCTION

Budget disco mixers designed down-to-a-price are simply not good enough for today's leading venues. In the 1980's the disco industry's professional operators and installation contractors demand top class audio components. Following many requests HARRISON have responded to the needs of the market and are proud to introduce the SP12 Professional Stereo Mixer. Now at last you can specify a control unit which reaches up to the highest standard of excellence. The SP12's sound performance is brilliant with control features that make it easy to keep your programme continuity and dynamics spot-on.

The SP12 matches perfectly with other system components.
As any sound engineer will tell you the overall performance of any system depends on the compatability of the various units involved. HARRISON engineers have concentrated their many years of experience in professional audio on detail circuit design in the SP12. As a result you can link up tape machines, C.D. players, record decks, graphic equalisers and power amplifiers to the SP12 with total confidence knowing that it will interface correctly to give you clean accurate sound.

The SP12 is proof against radio and H.F. interference. Painstaking attention was given to filter and suppress most forms of high-frequency signals that emanate from taxi radios for example and can break into sensitive audio equipment and cause embarassing interruptions to programmes. All Inputs and Outputs are de-coupled and shielded effectively minimising the risk of interference and ensuring low noise audio performance. It is this sort of professional attention to detail excellence that distinguishes the HARRISON SP12 from lesser Stereo Mixers.
Read the details contained in this User Handbook carefully before operating your HARRISON SP12 Mixer.
Used sensibly it will give you many years of excellent trouble free performance.

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SECTION 1 : INSTALLATION.

1.1 UNPACKING

As soon as you receive the SP12, please inspect for any damage incurred in transit. Since the SP12 was carefully inspected and tested at the factory, it left in perfect condition. If damage is found notify the transportation company immediately. Only the consignee may institute a claim with the carrier for damage during shipment. Be sure to retain the cartons as evidence of the damage for the carrier's inspection.

Even if the SP12 arrived in perfect condition it is advantageous to save the packing materials for use if you ever need to ship the unit. NOTE: the separate carton, outer and inner pack, each have been designed for protection during transport.

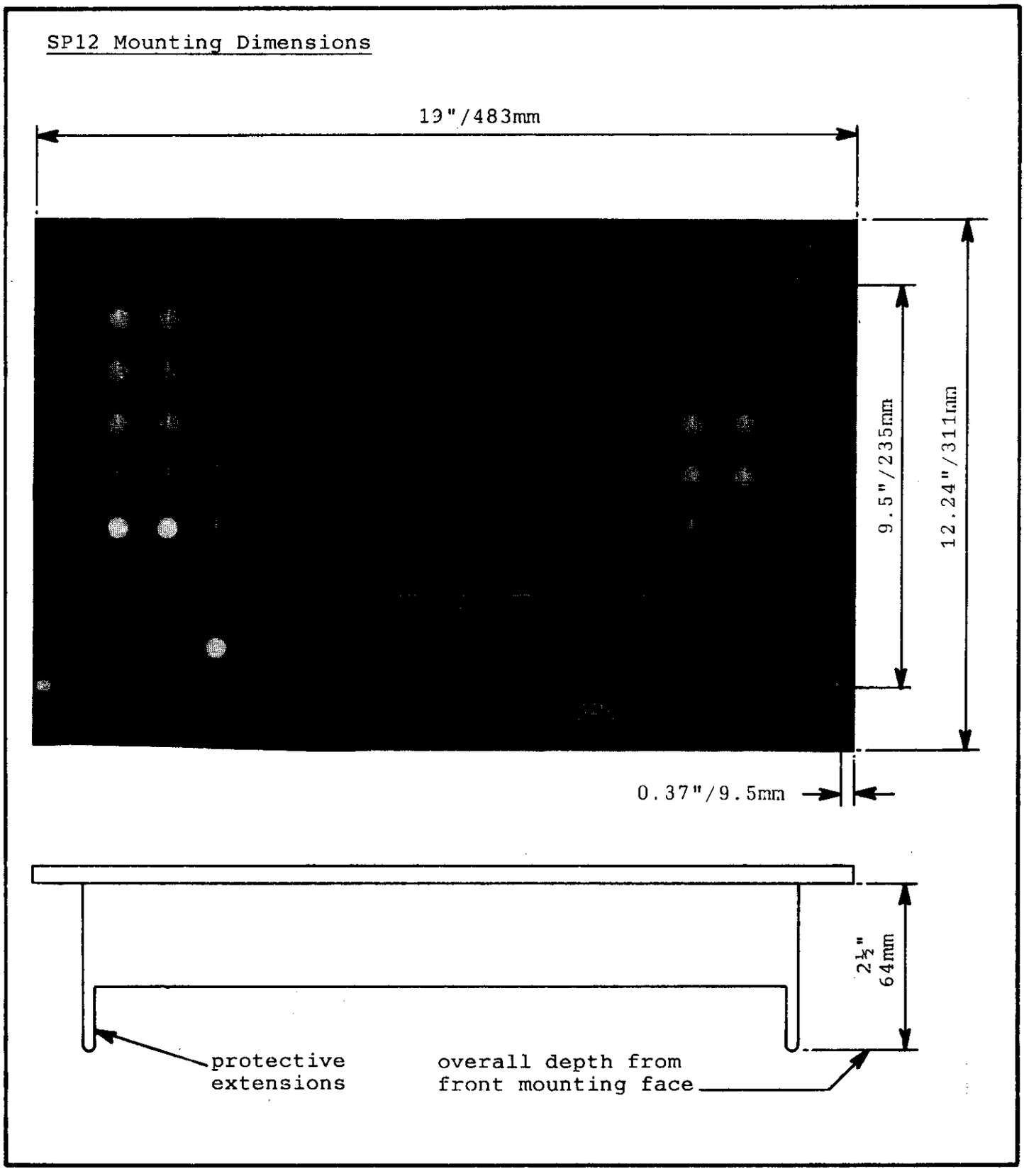
DO NOT SHIP THE UNIT WITHOUT THIS FACTORY PACK.

1.2 RACK OR CONSOLE MOUNTING.

The SP12 is designed for standard 19" rack mounting as well as installation in a desk top or free standing console. Overall dimensions are as shown in the diagram opposite..

The SP12's shallow overall depth allows the unit to be easily mounted in small consoles or in permanent installations with complete reliability.

The SP12 produces virtually no heat at all when operating and can therefore be installed in console and rack systems with complete confidence. However avoid mounting the SP12 above any other item of equipment which may produce heat, as this is not advisable.

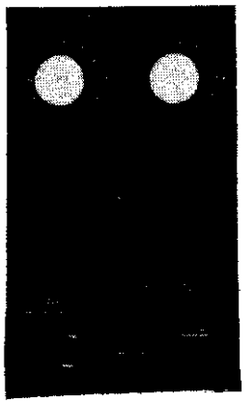


1.3 INPUT CONNECTIONS.

Input connections to the SP12 are made on the front panel for Microphone and Aux and on the rear panel for all other inputs.

A. FRONT PANEL INPUTS.

Front Panel Inputs.



- Aux 1 input via 5 way DIN connector. Intended for Cassette tape decks etc. Useful for playing sound effects or "jingles".
- Mic 1 input-Ring, Tip & Sleeve jack socket. Accepts High-Z or Low-Z Microphones.
- Mic 2 input-Ring, Tip & Sleeve jack socket. Accepts High-Z or Low-Z Microphones.

Connection Diagrams.

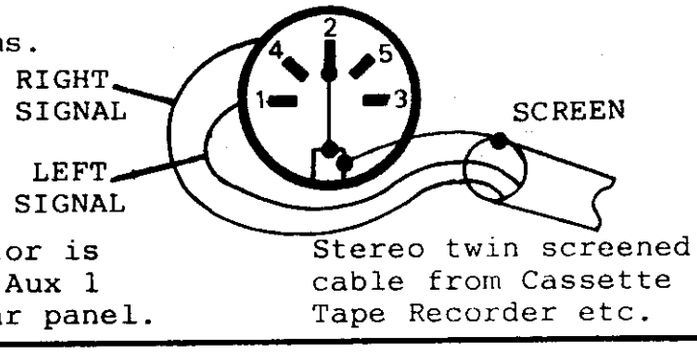
AUX-1 DIN CONNECTOR.

Input Sensitivity - 150mV.
Input Impedance - 30K Ohms.
PIN 1 - Left Input.
PIN 4 - Right Input.
PIN 2 - Ground (screen).

IMPORTANT NOTE:

The front panel DIN connector is wired in parallel with the Aux 1 input connectors on the rear panel.

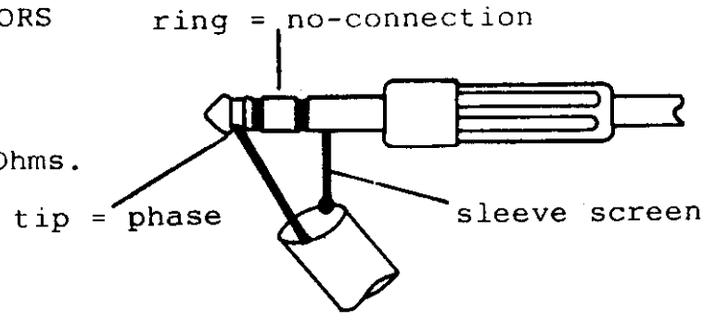
Connections on rear of plug.



MIC 1 & MIC 2 JACK CONNECTORS

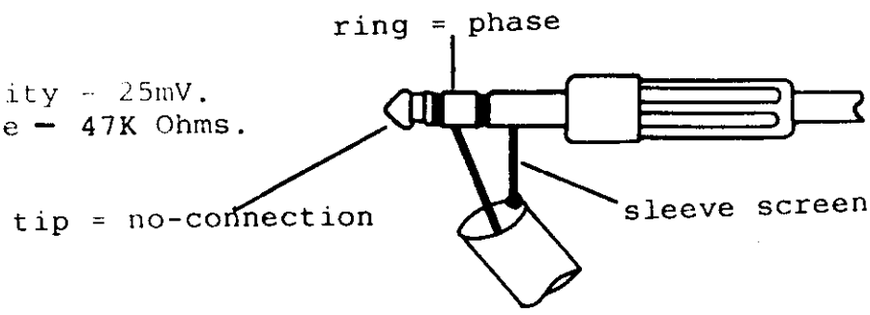
- Low-Z

Input sensitivity - 5mV.
Input impedance - 600 Ohms.



- High-Z

Input sensitivity - 25mV.
Input impedance - 47K Ohms.

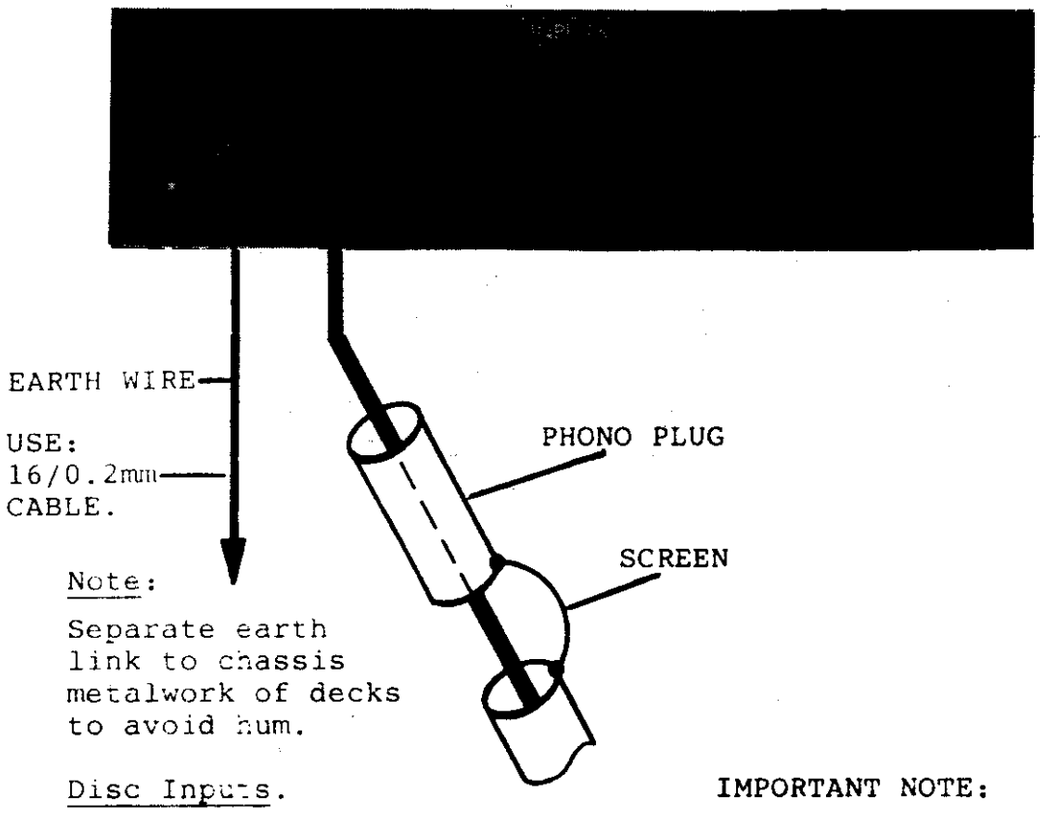


IMPORTANT NOTE:- Ensure connections are correct - otherwise loss of output and poor noise performance will result.

B. REAR PANEL INPUTS.

All inputs on the rear panel are made via "Phono" sockets as shown in the diagram below. Connections are self explanatory.

Input Connections.



Note:

Separate earth link to chassis metalwork of decks to avoid hum.

Disc Inputs.

Input sensitivity - 2mV (RIAA).
Input impedance - 47K Ohms.

Aux Inputs.

Input sensitivity - 150mV.
Input impedance - 30K Ohms.

IMPORTANT NOTE:

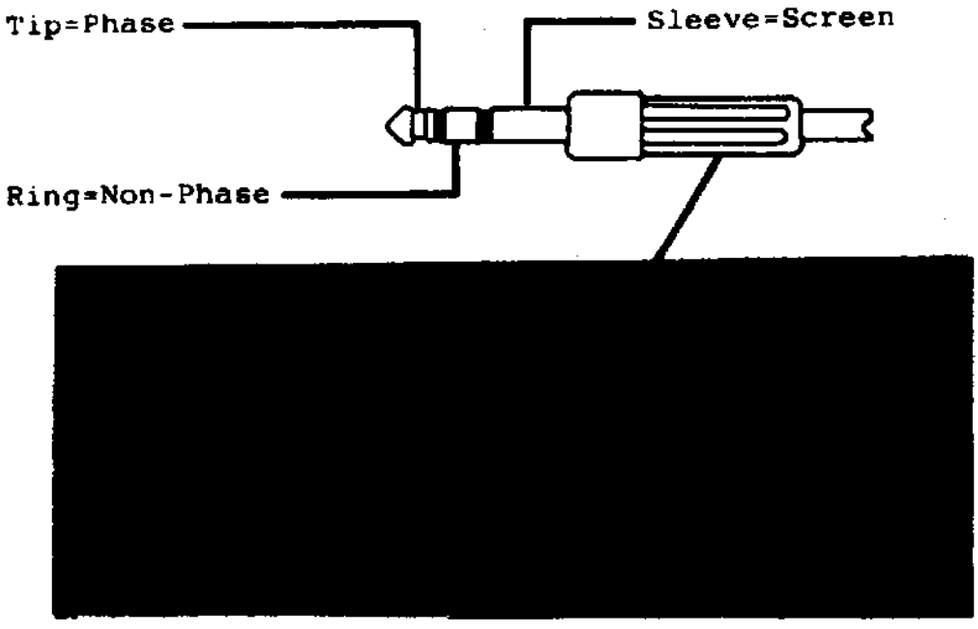
Ensure all connections are correct - otherwise loss of output and poor noise performance will result.

1.4 OUTPUT CONNECTONS.

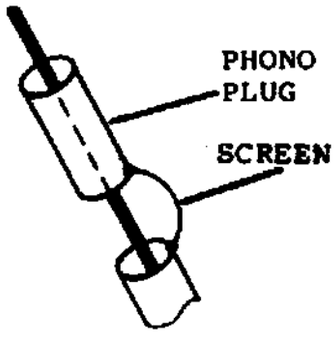
A. REAR PANEL OUTPUTS.

Output Connectors Wiring Detail.

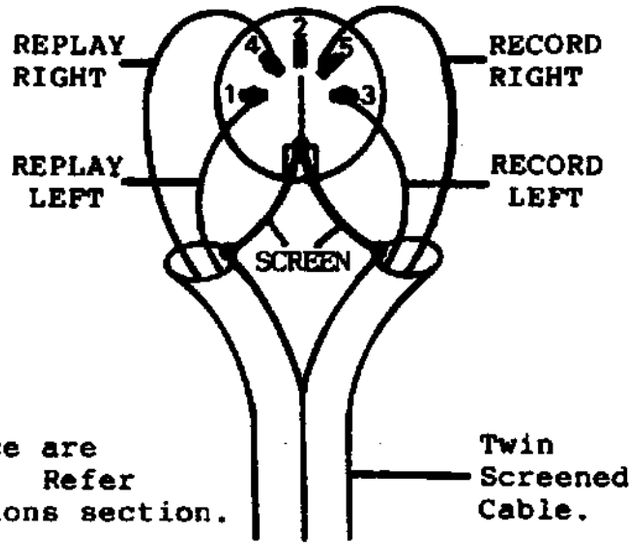
Balanced Master Output Jack Connectors.



All Phono Connectors



Connections on rear of DIN Plug.

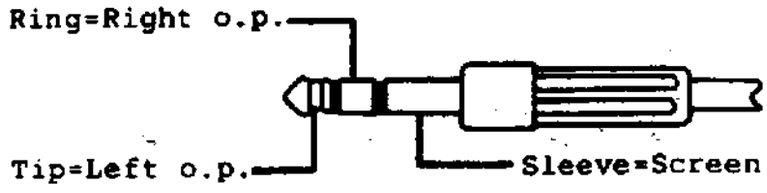


NOTE: All levels and impedance are as printed on the rear panel. Refer also to Technical Specifications section.

B. FRONT PANEL OUTPUTS.

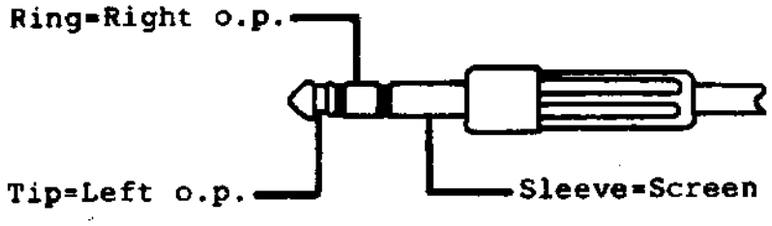
Output Connections Wiring Detail.

Stereo PHONES Jack Connections.



Note:Suitable for high and low impedance Headphones.
Phones Output: 120mW into 8 Ohms.

Stereo SLAVE Jack Connections.



Note:Output level: 0.775V (0dB).
Output impedance: 600 Ohms.

IMPORTANT NOTE:

- Take great care when making output connections that the wiring details are correct. If in doubt - check it.
- Use only good quality screened audio cable.

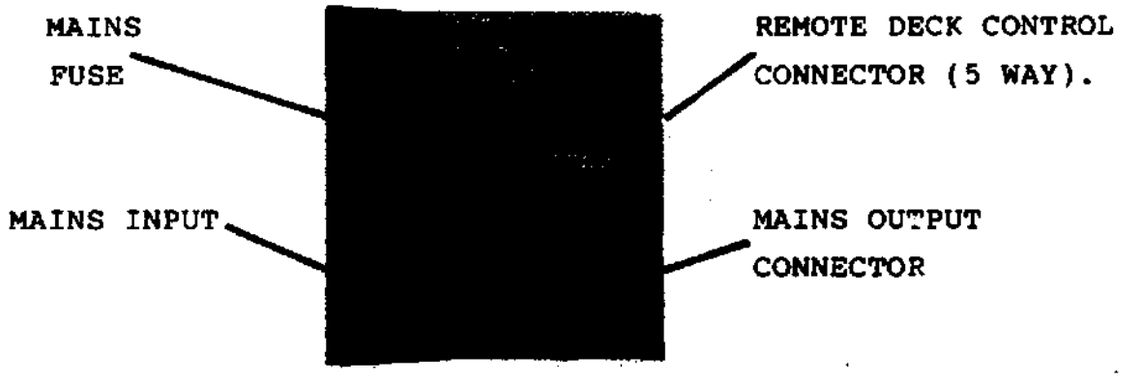
1.5 Mains Power Connections.

Once your input and output connections are organised you are ready to hook up the mains power input. This is achieved by fitting an appropriate mains plug to the captive mains cable provided.

Take care to follow the colour code of the wires in the cable as follows:-

LIVE -	BROWN
NEUTRAL -	BLUE
EARTH -	GREEN/YELLOW

Mains Power and Control Details.



Mains Output Connector

The connector provided on the rear panel is intended for use as a power feed to other items of audio equipment for example a Graphic Equaliser, Electronic Crossover or Power Amplifier in the HARRISON range. This feature eliminates the need for a separate mains lead back to the supply for each unit thus simplifies the installation.

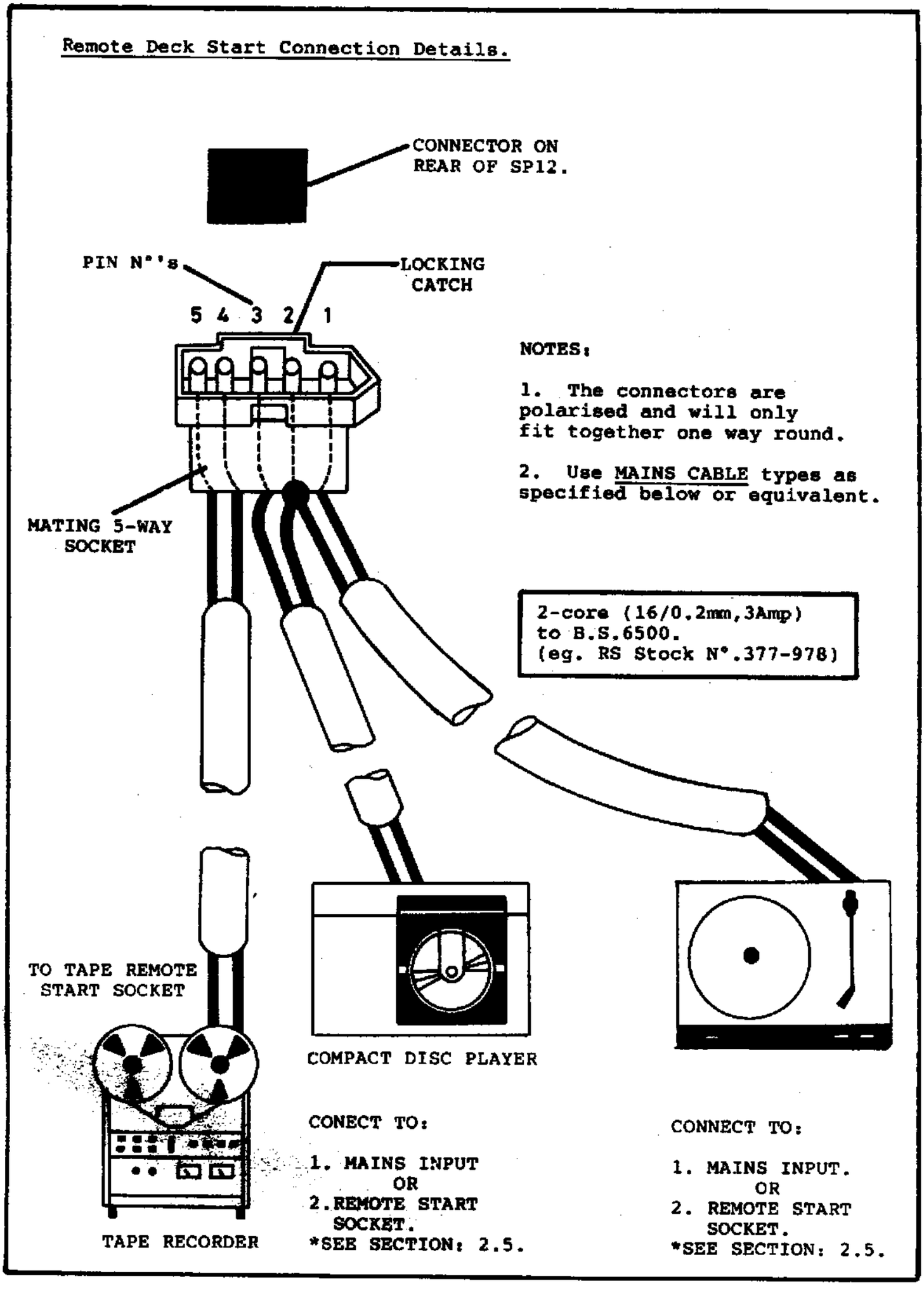
IMPORTANT NOTES:-

- The Mains Output connector is controlled by the front panel mains Power switch. This means that auxiliary units connected to the SP12 will go on and off with the SP12 acting as the master control unit.
- NEVER under any circumstances run the SP12 or other audio units without a properly connected mains earth.

1.6 REMOTE START DECK CONNECTIONS.

This feature allows record decks, C.D. players and tape machine to be controlled remotely by simply pressing the "Start" buttons on the front panel of the SP12.
The connector used is a special 5-way locking unit.
Take great care that connections are correct - check them carefully before switching on otherwise damage to the SP12 or your decks could result. Follow the details of the diagrams on the next page with care.
ALSO SEE SECTION 2.5 For full details of remote "deck start" operation.

Remote Deck Start Connection Details.



NOTES:

1. The connectors are polarised and will only fit together one way round.

2. Use MAINS CABLE types as specified below or equivalent.

2-core (16/0.2mm,3Amp) to B.S.6500. (eg. RS Stock N°.377-978)

SECTION 2 : OPERATING INSTRUCTIONS.

2.1 TYPICAL SET-UP.

The SP12 is so extremely versatile in use that it is impossibl to cover here all the numerous possible system set-ups. However the diagram on page 13 show a typical system.

2.2 TURNING ON.

It is wise to follow this sequence before turning the SP12 on:-

1. Connect all Inputs (see section 1.3).
2. Connect all Outputs (see section 1.4).
3. Connect up all external effects or equaliser systems (if any).
4. Set both Left and Right Master Level controls to 0(ccw)

When you are satisfied that all the above connections are correct then link up the mains power (see section 1.5) and switch the SP12 on.

5. Last of all switch on the Power Amplifier.

No sound should be heard through the speakers at this point. if there is a hum re-check all your connections.

2.3 INITIAL OPERATION

Set both the Mic Level controls at 0 (ccw), all the Music Mix faders down at 0.

Next set Level Left and Level Right controls half way at about 5. Apply a music signal to one of the Music Mix inputs and gradually increase the level on the appropriat channel fader. A clean stereo signal should now be heard on both left and right outputs. If it is distorted, hums or is not there re-check all connections.

2.4 MIC INPUTS SECTION.

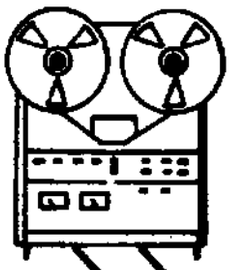
High & Low - Z Mic Inputs.

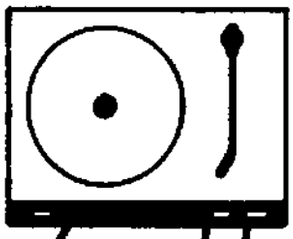
Two completely independant mic input jacks are provided with Level controls and connections for both high and low impedance mics. (see section 1.3).

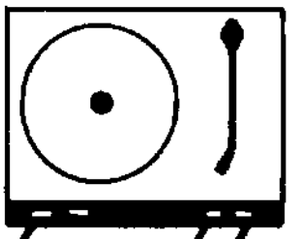
Mic Level Controls.

A separate level control for each mic allows input levels to be optimised and mixed to avoid feedback. If howl round occurs reduce the amount of Treble or Presence boost and/or reduce the Level setting slightly.

TYPICAL SPIZ DISCO SET-UP.







TURNTABLE

TURNTABLE

TAPE RECORDER

COMPACT DISC PLAYER

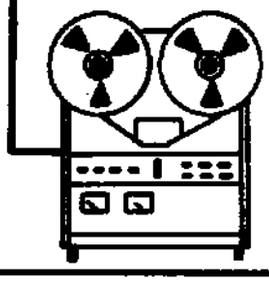
EARTH WIRES

[redacted]

TO CH.2 (RIGHT) INPUT

TO CH.1 (LEFT) INPUT

TAPE RECORDER FOR PROGRAM RECORDING



[redacted] POWER AMPLIFIER

[redacted]

Mic Equalisation.

Bass and Treble controls with ±13dB and ±16dB of lift and cut are provided. A Presence control giving a maximum of ±10dB boost @ 8KHz gives added penetration to vocals.

Equalisation should be used with care on vocals. As a general rule do not add to much bass boost otherwise the sound will be inclined to distort. Also take care not to add too much Treble and Presence boost or feedback could result.

Automatic Voice Override System.

This facility produces a reduction in the Music Mix output whenever a mic is used for speech allowing the operator to make automatic voice-over announcements.

AUTOMATIC VOICE OVERRIDE CONTROL OPERATION.

The AUTO OVERRIDE switch turns the system on and off. A red LED illuminates when the system is active.

The MANUAL OVERRIDE switch.

The DEPTH control allows you to set the amount of gain reduction applied to the Music Mix output when you speak into the mic.

The SENSITIVITY control determines the point at which the Override system becomes active.

The MIC ON/OFF switch lets you cut the mic off instantly allowing the music to continue uninterrupted. This also means that your Auto Override and Mic Level settings can remain undisturbed and can be instantly recalled when the Mic On/Off switch is touched again. A red LED illuminates when the Mic channels are on.

Once the Auto Override system is set-up all you need do is to touch the Auto Override switch and the whole system becomes active automatically.
Shortly after your speech stops the music signal will fade back up to its previously set level.
The whole process is smooth and natural sounding being free of sudden surges or drastic sound level changes.

2.5 MUSIC MIX SECTION.

Aux Inputs.

All five input channels can be configured to accept signals from Tape recorders, Cassette recorders, C.D. Players, Radio Tuners and Video Players. This is achieved by setting the front panel sensitivity switch to the "Line" position.
The Aux 1 input on the front panel is useful for disco applications where jingles are often played from a portable Cassette Recorder. This input is connected in parallel with the Aux 1 connectors on the back panel, so do not connect inputs to both sets of connectors at once- use only the front or rear connectors.

All Aux Inputs

Input Sensitivity - 150mV.
Input Impedance - 30K Ohms.

Disc Inputs.

Disc Inputs can be accommodated on channels 1,2 or 3 by setting the front panel sensitivity switch to the "Phono" position. Each input is RIAA equalised to match with high quality record players perfectly. Exact impedance match and frequency correction ensure that the sound quality is superb.

All Disc Inputs.

Input Sensitivity - 2mV @ 1KHz RIAA corrected.
Input Impedance - 47K Ohms.

On channels 1,2 and 3 fine gain control is available via the front panel gain controls. These allow ± 10dB of gain, to enable the levels of channels 1,2 and 3 to be matched. These controls are Screwdriver adjust type to prevent unauthorised adjustment of the controls.

Correct Earthing.

It is advisable to run a separate earth wire of minimum

16/0.2mm from your deck chassis to the deck Earth Link screw on the rear panel of the SP12.
This wire should run independantly of the mains and screened signal connections. This will prevent hum loops and poor noise performance. (see section 2.1)

Level Faders.

Five 100mm travel professional quality fader let you control signal levels smoothly and accurately. The faders have plastic film shields which helps prevent dust or spilled fluids from accidentally getting on to the resistive tracks. This feature ensures noise free operation and prolongs the life of the faders.

Deck Start System.

This system allows you to start and stop your Record Tape or C.D. players by the remote Start buttons on the front panel.
On the rear panel a five way "Molex" connector labelled "Tape/Disc Deck Control Links" is provided. This should be connected as described in section 1.6 Take great care that the connections are correct before applying mains power.
Once the system is correctly wired pressing a start button will cause the appropriate deck on channels 3,4 or 5 to run and a green LED will illuminate above each switch to confirm that the system is active.
Unless you have specifically requested otherwise this unit will be set-up to provide the 'pulse' start required by Technics SL 1200 decks on the Start 2 & Start 3 push buttons.
In case of confusion, the serial number printed on the packing carton will be followed by an identification code, like this:

1. T - For pulse start. (standard).
2. M - For switched mains start.
3. C - For closing contact start.

If you are in doubt, contact your dealer, who will be able to advise you how the unit is set-up.

Cue System.

Each input channel on the Music Mix section has a Cue switch which when pressed, feeds the audio signal through to the Phones amplifier. This allows you to monitor the

incoming sounds from your decks pre the channel faders. This feature lets you set-up your records or tapes and monitor the results without the audience hearing the process. Once the input is set all you have to do is bring up the appropriate channel fader to the desired level to feed the sound through to the audience.
When any particular Cue switch is pressed a red LED will illuminate to show that, that channel is active. Touch the switch again and channel cue will turn off and the LED will extinguish.

Crossfade.

There are two Crossfade sliders provided which allow a smooth transition to be made from:

a) Channel 1 to Channel 2 or vice versa.

b) Channel 3 to Channel 4 or vice versa.

These are all graduated 0 to 10 and operate smoothly so that crossfade action lets you blend from one sound to another without interruption. The Crossfade sliders are connected "post channel fade" which means that individual level settings of channels 1 to 4 will determine the output when the crossfade slider is at maximum travel on either end.

2.6 OUTPUT SECTION.

Master Level Controls.

Separate Master Level faders are provided for Left and Right Master Outputs. These control the signal level to the Master Outputs on the rear panel both Phono Left and Right and Jack (balanced) Left and Right at 0.775 (0dBm) levels.
For use with any HARRISON X-SERIES or DSA-SERIES power amplifier connected to the Master outputs the settings should be:
1. Set the amplifier Level controls to 0 on the scale (Fully Clockwise) (Note: the amplifiers have an input sensitivity of 0.775V (0dBm).
2. Use the SP12 Level controls to determine the overall volume level.
This will ensure that the optimum signal-to-noise ratio is achieved.

Output Equalisation.

Equalisation controls for Left and Right signals are provided as follows:- Bass - ± 13dB lift and cut.
Treble - ± 16dB lift and cut.

A word of caution here - Do not use too much equalisation. Most modern recordings if reproduced through good quality amplifiers and loudspeakers do not need large amounts of additional E.Q. Too much E.Q. particularly bass boost, only results in using up necessary amounts of amplifier power and headroom. In extremes, this can result in distorti The master E.Q. is intended to give a controlled amount of overall tone correction to particular records or tapes.

Mono Switch.

This switch when pressed configures the output from normal stereo into mono. This is useful where the original signal is mono - for example early records pre the 1960's were often recorded in mono.
When the switch is pressed a red LED will illuminate to confirm mono operation.
Press the switch again and the LED will extinguish - the SP12 is now in stereo mode.

Output and Split Cue.

If you press the Output Cue switch the total program (complet channel mix) will appear at the Phones jack in stereo and a r LED above the Output Cue switch will illuminate confirming th The Output Cue is pre the Level control. This lets you monito the program mix on Phones and make any adjustments before turning up the Level controls and feeding the sound to your audience.
Pressing the Split Cue switch results in the total program mi (output) being routed to the right Headphone and the individu channel signal (s) going to the left Headphone. This feature allows you to monitor both the individual channel (s) and als the main program mix at the same time.
This System is easy to use in practice and gives you maximum control over your final sound output. It also assists you in providing a smooth interruption free program without embarrassing gaps between tracks.

Disco Sound Control.

This is an active filter which enhances the bass and treble response providing +16dB at 90Hz and 12dB at 4KHz. The special shaping of the filter acts to give the drum and bass section more emphasis and also to boost the top end sounds. The level of boost is gradually increased by the turning the Disco Sound pot from 0 (flat response) up to 10 (max boost). Note: Care should be exercised in using the master Treble and Bass controls at +16dB whilst also setting the Disco Sound control at 10 (maximum) because this can result in an excessive amount of bass and treble boost giving rise to amplifier overload and/or distortion of the sound.

Monitors Section.

Led Output Displays.

A row of LED's in Bar graph form for Left and Right main outputs give a constant visual display of levels as controlled by the level pots.
Thr bar graphs are calibrated up to 0 (which is 0.775V at the output terminals) and then on to +12dBm. A red Clip LED illuminates when the SP12 outputs reach the supply rail voltage.

IMPORTANT: Do not run the SP12 with the clip LED on as this can result in damage to your speakers. If the Clip LED's illuminate turn down the master Left and Right controls.

Limiter.

The Limiter system is fast acting and is intended to prevent overload distortion and can prevent damage to speaker systems. Pressing the Limiter switch activates the Limiter and a red light will illuminate above the switch.
On the rear panel a three position Limiter slide swith allows you to pre-set the limit threshold depending on the input sensitivity of the power amplifiers in use with the system.
The rules are:-

1. For use with all HARRISON power amplifiers - X-Series, P-Series, DSA-Series set the Limiter switch to the 0dB position.

2. For use with power amplifiers with input sensitivities of +6dB (1.5V) or +12dB (3.0V) use the appropriate switch settings. Most American made amplifiers have sensitivities of this order.

Compressor.

The SP12 includes a Compressor circuit which reduces the dynamic range of music signals. This is very useful in allowing balancing of the widely differing types of recording media.

An example of this might be if a loud signal passage from a C.D. player pushed the SP12 bar-graph LED's into clipping then the Compressor could be switched on to control the peak and reduce the signal dynamic range.

The compressor three position switch on the back panel shoul be set-up in exactly the same way as the Limiter switch (see Limiter section).

Phones.

The Phones ¼" Jack on the front panel is a stereo output intended to drive most high quality headphone sets. A headphone amplifier is built-in to the SP12 capable of delivering up to 120mV into each phone (240mW total) at 8 Ohms. This ensures that you get clean undistorted sound in the Headphones which is loud enough to overcome the sound from the venue or loudspeakers.
An illuminated Phones slider volume control on the front panel allows you to optimise the sound level.

2.8 HIGH PASS FILTER.

The SP12 features a built-in Sub-Sonic or High-Pass filter which eliminates potentially dangerous and power consuming sub-sonic signals below 35Hz.
Most loudspeaker systems, with the exception of very large specially designed sub-bass units, do not reproduce signals below 30 to 40Hz. If a pre-amp/Power-amp system is allowed to drive power below 40Hz into such a speaker then large and inaudible speaker cone excursions take place which can have two results:-

1. Valuable amplifier power is wasted and distortion can result.
2. Speaker damage can occur in extreme cases.

On the back panel of the SP12 a switch labelled 35Hz High Pass Filter. WE STRONGLY RECOMMEND THAT THIS SWITCH IS SET ON IN MOST INSTALLATIONS.

This will result in a cleaner and better sounding performance and it will also afford a degree of protection to your bass speaker units.

2.9 SUB-BASS OUTPUT.

In many disco installations a sub-bass amplifier and speaker system is installed to give an earth shaking feel and beat to the bass line from disco music.

On the back panel a separate phono socket is provided labelled 70Hz Bass Out. This provides a sub-bass signal output to drive a completely separate power amplifier. The HARRISON X1000, X1200 or X1600 models are ideal.
This output is in mono because the human ear does not perceive low bass in stereo.

The Sub-Bass output level is the same as the main program output and is also controlled by the Left and Right Level pots.

2.10 MUSIC MIX OUTPUT.

A pair of phone connectors are provided on the rear of the SP12 labelled Music Mix. These are used to provide a signal from the Music Mix section of the SP12 only (This is a signal without the Mic Inputs).

This is useful in installations where a separate feed to another part of the building detached from the disco area is required. A separate power amplifier and speakers will be needed in this instance.

2.11 TAPE DUBBING.

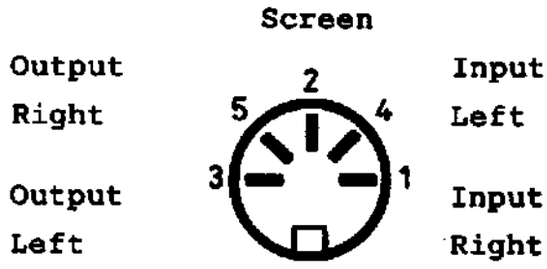
It is possible using the SP12 to dub from one tape machine to another, whilst mixing new sounds. This facility also allows a performance to be recorded, or for taped music or effects to be added. Inputs and outputs are via the tape 1 or tape 2 DIN sockets on the rear panel.

Tape Levels:

Record - DIN's 3 & 5: Level 400mV
600 Ohms.

Replay - DIN's 1 & 4: Input Level 400mV
Input Impedance 30K Ohms.

TAPE RECORD/REPLAY CONNECTIONS



IMPORTANT NOTES:-

1. The Tape Send and Returns are connected pre the Master Level control pots and are unaffected by Master Volume settings. The tape levels are set by the volume control on your tape machine.
2. Always use good quality screened audio cable for these connections.

Tape dubbing is controlled by the Rotary tape dubbing switch and the TAPE A and TAPE B RECORD REPLAY SWITCHES. In order to dub from the tape 1 input to the tape 2 input the rotary switch should be set to the A--B position and the TAPE b slide switch to "REC". The level of the Tape 1 signal is controlled by the channel 4 slider, and more signals can be mixed in using the channel 1,2,3 & 5 sliders. The channel 4 phono input will be inoperative.
In order to dub from tape 2 to tape 1 the rotary switch should be set to the B--A position, and the tape A slide switch to "REC". The tape 2 level will now be controlled by the channel 5 slider, and more signals mixed via channels 1-4. Channel 5 phono input will be inoperative.

2.12 OPERATING PRECAUTIONS.

Although your new SP12 mixer is well protected from any external faults, we recommend these precautions for safe operation:-

1. DO NOT short the ground lead of any output cable to the ground of an input siganl. This may form a ground loop and cause oscillations.
2. DO NOT operate the SP12 from AC mains of more than +10% above the selected line voltage. Failure to comply with this voltage limit will invalidate the warranty.

3. NEVER connect the output to a power supply output, battery or mains.
4. Tampering with the circuits by unqualified personnel or making unauthorised changes invalidates the warranty.
5. DO use good quality screened cables when connecting up any inputs or pre-amp low level signal sends.
6. DO take care in making connections, selecting signal sources and controlling the output level. The speaker you save may be your own.
7. DO NOT use speakers that are not adequately rated for the output levels. HARRISON will not accept any responsibility for damage to any loudspeaker or load.
8. NEVER remove the mains fuse with power connected.

2. 13 TECHNICAL SPECIFICATION

Technical specification

QUALITY ENGINEERED FOR SUPERIOR SOUNDS

INPUTS	SP12
Microphone Inputs:	Low-Z Sensitivity: 5mV Input impedance: 600ohms Signal-to-noise ratio: 65dB (0–30kHz) High-Z Sensitivity: 25mV Input impedance: 47 ohms Signal-to-noise ratio: 70dB (0–30kHz)
Mic Input Level Controls. Microphone Equalisation:	Bass control: ±15dB at 100Hz Presence control: +10dB 1kHz at 10kHz. Treble control: ±10dB at 10kHz.
Outside Depth control:	Control range: –30dB.
Outside Sensitivity control:	Variable threshold.
Disc Inputs:	Stereo Left and Right RIAA corrected Sensitivity at 1kHz: 2mV Signal-to-noise ratio: 70dB A Weighted
Aux. Inputs:	Sensitivity: Line – 150mV Input impedance: 30K ohms Tape – 400mV Input impedance: 47K ohms
Input Gain Pre-set controls:	Control range: 20dB. Pre-set on front panel

OUTPUTS	
Master Outputs:	Unbalanced phono connectors. Output impedance: 600ohms. Output level: 0.775V.
Balanced Master Outputs:	For Left and Right on ¼" jack sockets on rear panel. Output impedance: 600ohms Output level: 0.775V.
Aux. Outputs:	Unbalanced phono connectors. Output impedance: 600 ohms. Output level: 400mV.
Music-Mic Outputs:	Unbalanced phono connectors. Output impedance: 600ohms. Output level: 0.775V.
Tape Outputs:	Unbalanced phono and Din. connection. Output impedance: 600ohms. Output level: 400mV.
700Hz Bass Output:	Mono phono connector. Output impedance: 600ohms. Output level: 0.775V.

In pursuing a policy for continual improvement Harrison reserve the right to alter specifications without prior notice

FACILITIES	SP12
E.Q. Loops: Send and Return.	Right and Left phono connectors. Output impedance: 600ohms Output level: 400mV. Return impedance: 100ohms Return level: 400mV.
Noise Levels: (CCIR)	Disc Inputs: both –70dBV. Mic Inputs: Low-z –70dBV. High-z –75dBV. Aux. Inputs: All –70dBV.
Outputs Tone control Range:	Bass: ±15dB at 100Hz. Treble: ±10dB at 10kHz.
Slave Output:	Front panel ¼" stereo jack socket Left and Right. Output impedance: 600ohms Output levels: 0.775V.
Frequency Response:	12Hz to 25 kHz – +0, –3dB.
150Hz High Pass Filter:	–3dB at 150Hz Slope –18dB/Octave.
Phones Output:	120mW per channel into 8ohms.
700Hz Bass Outputs	Mono on phono connector. 700Hz low pass filter at –18dB/Octave slope.
Mains Power:	Mains input: Wired internally for: 220 to 240V. AC. 50–60 Hz. 110 to 120V. AC.
Dimensions:	Panel size: 482.6mm × 311mm. 19" × 7U. Mounting aperture: 450mm × 297mm Depth overall from front mounting face: 66mm
Weight:	11 kg. net.

SECTION 3 : SERVICE

3.1 SERVICE

In the unlikely event of service being required, it is recommended that your SP12 is returned to the factory or appointed HARRISON agent.

IMPORTANT - Your SP12 msut be shipped in the original packin carton. (or replacement carton, available from HARRISON).

HARRISON will not be liable for any damage whatsoever to any SP12 shipped in any carton other than the approved version.

The SP12's do not contain any user serviceable parts. Service work should only be carried out by qualified and experienced engineers.