Instruction Manual

STANTON

MODEL 310

Professional Stereo Phono Preamplifier

STANTON MAGNETICS INCORPORATED, TERMINAL DRIVE, PLAINVIEW, NEW YORK 11803

INSTRUCTION MANUAL FOR STANTON STEREO PHONO PREAMPLIFIER MODEL 310

Contents **Page**

I General Description

Stanton phono preamplifier model 310 was designed for professional applications, to provide correct interface for all magnetic phono pickups and to provide all the necessary controls and their functions.

The 310 preamplifier features:

a) adjustable gain from 30 - 60 db
b) instant selection of flat or NAB frequency response
c) switchable rumble filter
d) cartridge, capacitive load selector switch
e) HF response equalization trimming
f) universal bracket mounting
g) selection for 110V 60HZ or 220V 50HZ operation
h) input RF filtering

The Stanton 310 preamplifier was designed around the latest low noise, high output low distortion integrated circuits developed specifically for audio applications. A regulated power supply assures the stability of operation required for the most demanding applications and extreme line voltage fluctuations. An active rumble filter offers sharp cutoff of low frequencies below 30 Hz. The gain of the preamplifier is controlled by varying the amount of negative feedback in the output section. HF response trim is accomplished by adjusting the capacitance in the feedback loop of the first amplifier stage. Proper cartridge loading is achieved by inserting the required fixed capacitors across the preamplifier input using a miniature dip selector switch accessible through an opening in the back panel.

The LED pilot light is in series with the power supply output and shows when the power is turned on, and changes brightness when the amplifier demands additional current while processing large audio signals.

The single PC board construction of the preamplifier assures uniformity between units, easy inspection, maintenance, and if needed servicing. All IC devices are socket mounted and are easily accessible. All electronic components except the power transformer are commonly available values and types for ease in servicing.

Selection of the power line voltage is done through internal strapping of the power transformer primary windings or on later models by a voltage selector switch accessible through the opening in the back panel.

II Performance Specifications

OUTPUT	+ 20 dBm Maximum
FREQUENCY RESPONSE	7/8 dB from 20 Hz- 20Khz in FLAT or NAB positions of Mode Selector

DISTORTION	THD ‡ 0.05 @ 20 dBm
OUTPUT SOURCE IMPEDANCE	5 Ohms, Designed for loads 150 Ohms or Higher
GAIN	Adjustable 30 - 60 dB
RUMBLE FILTER	3dB Knee @ 28Hz (See curve page 7) -35dB @ 5Hz
MAXIMUM INPUT LEVEL @ 1KHz	120 mV
NOISE (Input Terminated by Cartridge)	-70 dB or better (Ref. 10 mV input @ 1Khz NAB curve, 44 DB Voltage gain). -74 dB or better with Rumble Filter in
INPUT RESISTANCE	47K ohms
INPUT CAPACITANCE	15 pF, Switchable in 50 pF steps to 350 pF Maximum
CHANNEL SEPARATION	60 dB Minimum (20 Hz-15 kHz)
INPUT CONNECTORS	RCA Phono Jacks
OUTPUT CONNECTOR	5 Terminal Barrier Strip
POWER REQUIREMENTS	Can be switched or strapped for 100 - 125 VAC, or 200 - 240 VAC, 50 - 60 Hz, 5 Watts Maximum
INDICATORS	LED Pilot Light
UNIT DIMENSIONS	2-1/4" x 5" x 7-1/4" (57 mm x 127 mm x 184 mm).

III Installation

CAUTION

The Stanton 310 preamp should be installed within the reach of the tone arm cables supplied with the turntable or extension cables, permitted by the cartridge design, with total capacity being equal to or less than the cartridge manufacturer's recommended value.

The 310 preamp is not sensitive to AC or RF fields, because it has no audio transformers, and because it has full metal enclosure. However in following good engineering practices, refrain from positioning the preamp next to power transformers, high current AC cables or sources of heat. Also it is not advisable to mount the unit with switch and connector openings facing upward which allows dust to accumulate and settle into the slots and contact areas.

The two brackets provided with the 310 preamp, can be attached in many different ways allowing unit to be mounted under the table, on the side walls -vertically, from the back, or from the front. By adding side panels the 310 can be rack mounted.

It is recommended that capacitive load selection be made before attaching the preamp permanently to the enclosure, since it will be less convenient to accomplish this adjustment later.

IV Electrical Connections and Adjustments

1) **The Power Line:** The Stanton 310 preamp can be set to operate from either 110V or 220V lines at 50/60 Hz AC. Before connecting the unit to the AC mains, check the markings in the back of the unit next to the line cord to match power line voltage, or set the 110-220 line voltage selector switch for proper voltage.

2) **Audio Input:** Inputs to the preamplifier are through the 2 phone jacks available in the back. The ground wire from the turntable should be connected to the center terminal of the barrier strip, marked GND. If hum exists in the system run a separate ground wire from the center terminal to the ground of the system amplifier.

3) **Preamp Output:** Output of the preamplifier is available on four terminals of the barrier strip as marked. Observe correct polarity in order to preserve proper phase relationship between channels and correct groundings. Reversed wires in unbalanced systems may result in shorted output and no signal.

4) **Ground Loops:** In order to prevent ground loops, observe carefully that grounding of several pieces of equipment be done at one place. Avoid parallel ground paths and separate low level signals from power grounds.

5) **Gain Adjustment:**
Connect the Turntable with the magnetic cartridge to be used to the input jacks. Connect a suitable AC voltmeter or VU meter across the output terminals of the preamp and turn the power on. Play a test record which has a 1 kHz reference signal at known velocity representing the average recorded levels found on records (about 3.8 cm/sec). Using a small screw driver set the output as read on the VU meter to zero dB by turning multiturn pot marked "Level Adjust" for each channel separately. Keep mode switch in NAB position. Perform the same adjustment with both channels to achieve perfect balance between channels.

6) **Adjustment of the Capacitive Pickup Loading:**
In order to establish correct capacitive load for the magnetic cartridge, total capacitance of the tone arm wiring and extension cables must be known. This measurement can be made only when the cartridge is disconnected from the tone arm and the extension cables are unplugged or disconnected from the preamplifier inputs. The combined capacitance of the tone arm and cables should be lower or at least equal to the capacitive load specified by the cartridge manufacturer.

The difference between the specified capacitance and the measured capacitance is made up by switching the necessary capacitors into the circuit using the switch accessible through the back panel adjacent to the phono output jacks. (When the switch levers, visible through rear access opening, is up, switch is in the "OUT" or no capacitance position). Reconnect both cables and attach the cartridge to the tone arm.

7) **Frequency Response Adjustments:**

Frequency response adjustments can be made at high frequencies where deviations due to loading, cartridge construction, temperature and test records normally occur.

It is strongly advised that all adjustments be performed in an area where temperature stays fairly constant near 20 °C or 68 °F. Equipment and the test records should be normalized at this temperature for at least 20 hours before adjustments are made.

Always work with fresh test records and know their exact calibration so that any deviations from standard response due to the inaccuracies in cutting can be accounted and compensated for.

All high frequency adjustments must be made in the NAB position of the mode switch where HF trimmers are operative. First play 1 kHz signal for reference and note the output level. Then play, starting with 10 kHz, all frequencies up to 20 kHz and write down the output levels. Adjust HF trimmers to achieve the flatest high frequency level in both channels.

When using test records which do not have an NAB standard recording response but are cut at constant velocity, follow NAB or RIAA playback curve for reference levels at high frequencies.

The low frequency response of the cartridge depends entirely on the matching of the tone arm mass and the cartridge compliance. If the tone arm is very light and compliance of the cartridge low, the resonant frequency of the tone arm - cartridge combination may move into the 20 Hz region, affecting sound quality. Massive tone arms when used with very high compliance cartridges have problems tracking warped records when the resonant frequency is shifted well below the 7-10 Hz region. It is generally desirable to maintain the stylus-arm resonance between 7-15 Hz.

V Troubleshooting and Service

Disassembly

CAUTION: Only technically competent and authorized personnel should service this unit. Never attempt to remove or loosen any screws on the unit with power cord connected to the line. Disconnect power cord from line.

To remove the preamplifier chassis from the cover housing, remove 4 screws from the bottom of the unit located at each corner. Then slide the unit toward the front (the two mounting brackets must also be removed to allow the chassis to clear the mounting bracket screws).

Troubleshooting:

Design of the Stanton 310 preamplifier offers good reliability with components that operate with ample safety margins. However at times replacement of worn or aging components may become necessary. Removal of resistors and capacitors should be avoided unless exact replacement is on hand.

Assembly techniques used on the 310 PC board for purposes of reliability do not allow indiscriminate unsoldering of components. Resistors and capacitor leads should be clipped for removal. Integrated circuits are easily unplugged and replaced. However, before removing any of the ICs, note position of the orientation dot in the IC. Defective ICs are to be replaced only with the identical replacement parts.

Special components, or components not readily available locally, can be obtained from Stanton Magnetics. For specific items refer to the parts list on page 8.

Troubleshooting Chart

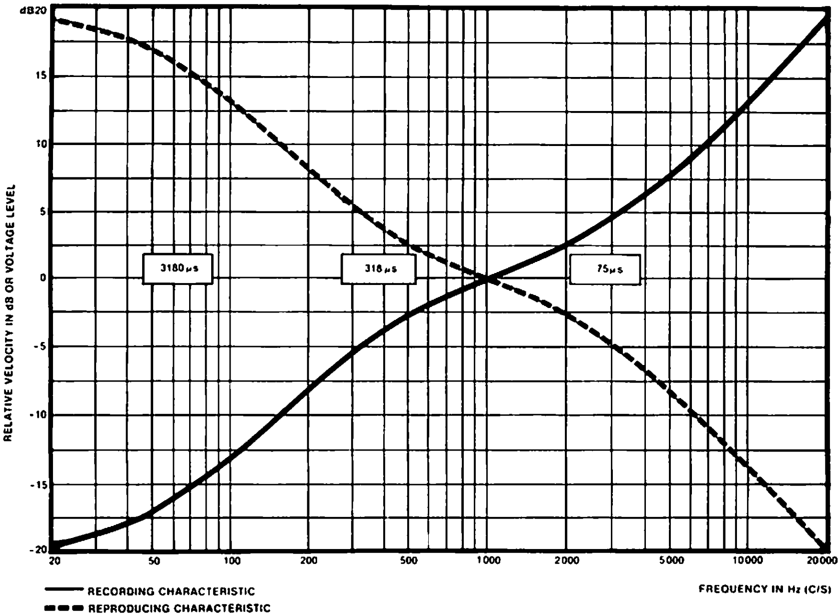
Power Supply	Symptom	Cure
	LED does not light but preamp operative	Replace LED Note: Both amplifier IC's must be operating to draw enough current to light the LED
	LED off-Unit inoperative	Replace fuse, check on-off switch, check power transformer, primary and line voltage selector switch.
	LED lights-Preamp not working	Check DC supply voltages
	DC voltages after voltage regular IC-3 are low or unmeasurable	Check for shorts on positive supply line Check voltage regulator IC Replace if necessary
	DC voltages are very high	Same
	Hum too high	Check filter capacitor C17, C18, C5 check IC, A3 check system grounding
Amplifier		
Signal Measurements	Signal at the output is distorted. Rumble switch in "In" position. Mode selector SW, in NAB or flat position.	Check DC voltages check input signal level and distortion. Check grounding. Look at the wave form with an oscilloscope at the output of IC-A1 on terminals 10 and 12. Push rumble switch to out position, check signal at the emitter of Q2. Check the output of IC-A2 terminals 10 and 12. Test voltage levels are listed on the unit schematic.

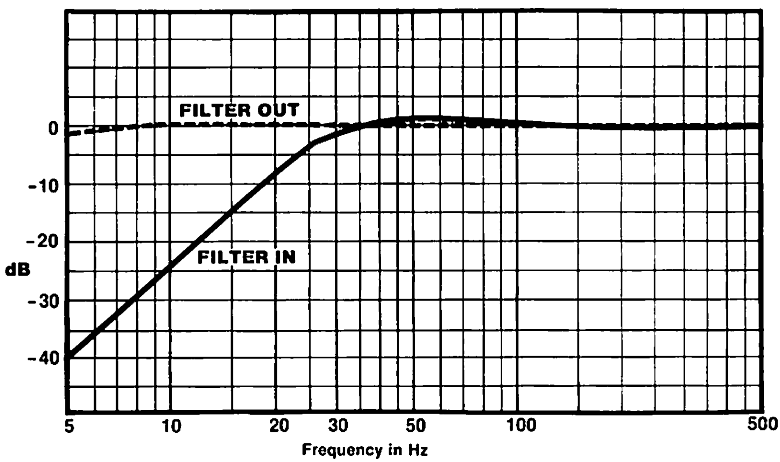
TABLE 1
RIAA - NAB DISC

Recording and Reproducting characteristics
Clauses D13 and E.3

Recording relative level (dB)	Frequency (Hz (c/s))	Reproducing relative level (dB)
— 19.3	20	+ 19.3
— 18.6	30	+ 18.6
— 17.8	40	+ 17.8
— 17.0	50	+ 17.0
— 16.1	60	+ 16.1
— 15.3	70	+ 15.3
— 14.5	80	+ 14.5
— 13.1	100	+ 13.1
— 12.4	110	+ 12.4
— 11.6	125	+ 11.6
— 10.2	150	+ 10.2
— 8.3	200	+ 8.3
— 6.7	250	+ 6.7
— 5.5	300	+ 5.5
— 3.8	400	+ 3.8
— 2.6	500	+ 2.6
— 1.9	600	+ 1.9
— 1.2	700	+ 1.2
— 0.7	800	+ 0.7
0	1000	0
+ 1.4	1500	— 1.4
+ 2.6	2000	— 2.6
+ 4.7	3000	— 4.7
+ 6.6	4000	— 6.6
+ 8.2	5000	— 8.2
+ 9.6	6000	— 9.6
+ 10.7	7000	— 10.7
+ 11.9	8000	— 11.9
+ 12.9	9000	— 12.9
+ 13.7	10000	— 13.7
+ 15.3	12000	— 15.3
+ 16.6	14000	— 16.6
+ 17.2	15000	— 17.2
+ 17.7	16000	— 17.7
+ 18.7	18000	— 18.7
+ 19.6	20000	— 19.6

CHARACTERISTICS FOR FINE GROOVE DISK RECORDS

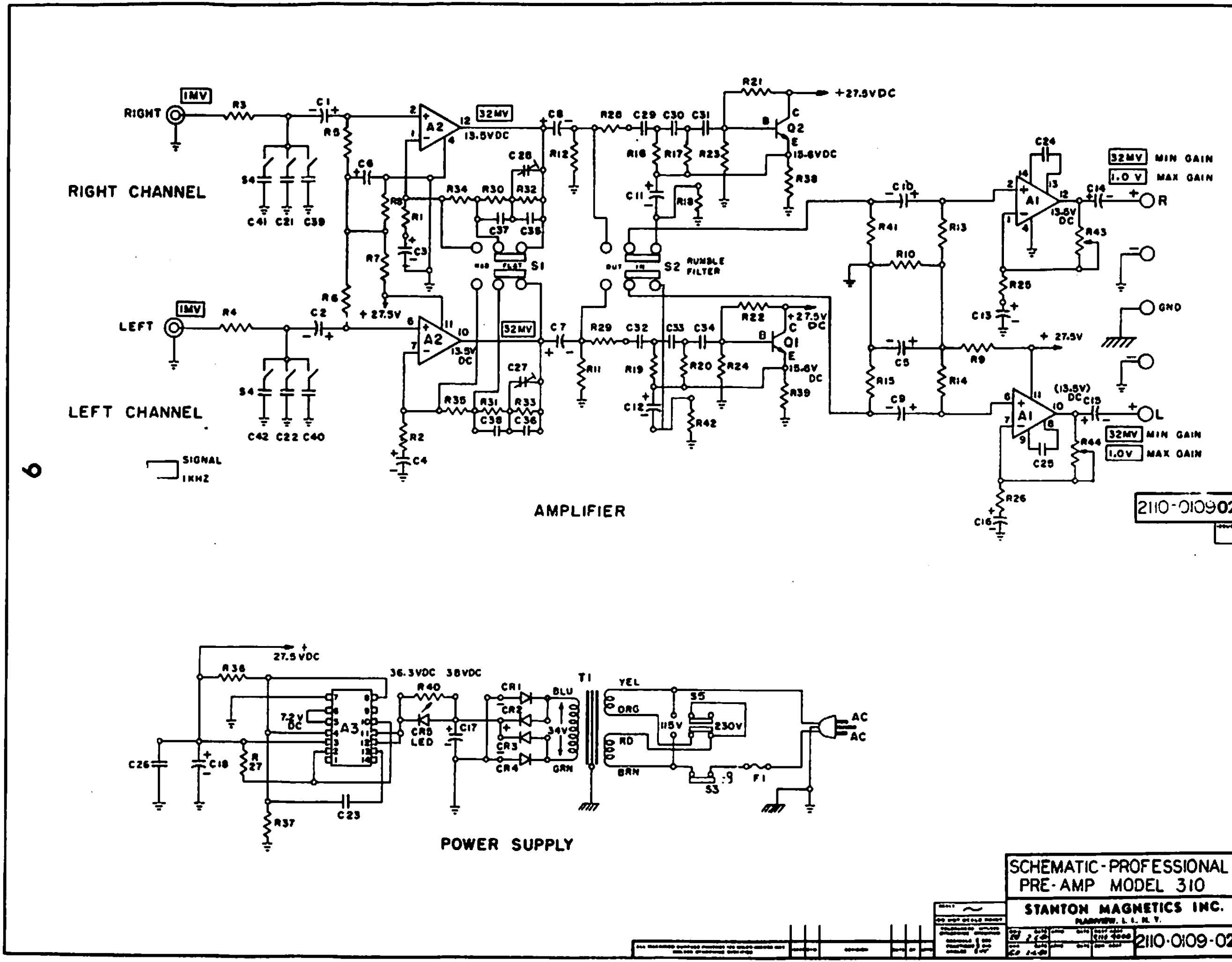




STANTON 310 FREQUENCY RESPONSE, WITH RUMBLE FILTER SWITCHED IN AND OUT.

TABLE OF REPLACEABLE PARTS
PRE-AMP MODEL 310

SYMBOL	DESCRIPTION	PART NO.
A1, A2	Integrated Circuit, Type NE5533N	0204-0009
A3	Integrated Circuit, Type UA723CN	0204-0008
C1, C2	Capacitor, Electrolytic 22UF, 50V	0003-0046
C3, C4	Capacitor, Electrolytic 47UF, 16V	0003-0040
C5, 6, 13, 16	Capacitor, Electrolytic 22UF, 16V	0003-0041
C7, 8, 9, 10	Capacitor, Electrolytic 10UF, 25V	0003-0039
C11, 12	Capacitor, Electrolytic 47UF, 50V	0003-0045
C14, 15	Capacitor, Electrolytic 100UF, 35V	0003-0042
C17	Capacitor, Electrolytic 470UF, 50V	0003-0043
C18	Capacitor, Electrolytic 22UF, 35V	0003-0044
C21, 22, 23	Capacitor, Ceramic 100PF, 1000V	0002-0026
C24, 25	Capacitor, Ceramic 22PF, 50V	0002-0021
C26	Capacitor, Ceramic 1UF, 50V	0002-0022
C27, C28	Capacitor, Var. 780 to 211 OPF	0203-0004
C29, 30, 31, 32, 33, 34	Capacitor, Mylar .06UF, 100V	0007-0013
C35, C36	Capacitor, Ceramic 820PF, 50V	0002-0023
C37, C38	Capacitor, Polystyrene .009UF, 63V	0007-0014
C39, C40	Capacitor, Ceramic 200PF, 50V	0002-0025
C41, C42	Capacitor, Ceramic 51PF, 50V	0002-0024
CR1, 2, 3, 4	Diode - IN 4002	0011-0006
CR5	Diode-Light emitting	0011-0007
F1	Fuse - 1/2 Amp-250V	0200-0009
Q1, Q2	Transistor 2N6428	0206-0006
R1, 2, 3, 4	Resistor, Carbon Film 1K, 1/4W, ±5%	0090-0004
R5, R6	Resistor, Carbon Film 47K, 1/4W, ±5%	0090-0009
R7, 8, 9, 10, 38, 39	Resistor, Carbon Film 33K, 1/4W, ±5%	0090-0008
R11 thru R20, R41, R42	Resistor, Carbon Film 100K, 1/4W, ±5%	0090-0010
R21, R22	Resistor, Carbon Film 330K, 1/4W, ±5%	0090-0011
R23, R24	Resistor, Carbon Film 470K, 1/4W, ±5%	0090-0012
R25, R26	Resistor, Carbon Film 3K, 1/4W, ±5%	0090-0006
R27	Resistor, Carbon Film 12 OHMS, 1/4W, ±10%	0090-0002
R28, R29	Resistor, Carbon Film 2.2K, 1/4W, ±10%	0090-0005
R30, R31	Resistor, Metal Film 374K, 1/4W, ±1%	0091-0012
R32, R33	Resistor, Metal Film 30.1K, 1/4W, ±1%	0091-0013
R34, R35	Resistor, Metal Film 37.4K, 1/4W, ±1%	0091-0016
R36	Resistor, Metal Film 20.0K, 1/4W, ±1%	0091-0015
R37	Resistor, Metal Film 7150 OHMS, 1/4W, ±1%	0091-0014
R40	Resistor, Carbon Film 100 OHMS, 1/4W, ±10%	0090-0003
R43, R44	Resistor, Variable 100K	0122-0016
S1, S2, S3	Switch, Push Button (2P-DT)	0116-0031
S4	Switch, P.C. 6 CKT DT.	0116-0039
S5	Switch, Slide (P.C.) Mounted)	2110-4130
T1	Transformer, Power	2110-4129


RIGHT CHANNEL
LEFT CHANNEL
RIGHT
LEFT
1MV
32MV
13.5VDC
+27.5VDC
15.6VDC
S1
S2 RUMBLE FILTER
32MV MIN GAIN
1.0 V MAX GAIN
GND
SIGNAL 1KHZ
AMPLIFIER
POWER SUPPLY
27.5 VDC
36.3VDC 38VDC
7.2 V DC
CR5 LED
34V
115V
230V
AC
2110-010902
SCHEMATIC-PROFESSIONAL PRE-AMP MODEL 310
STANTON MAGNETICS INC.
2110-0109-02

2110-9361-01