

Control unit 101

101 CONTROL UNIT:

1. DESCRIPTION.
2. DISMANTLING.
3. DC AND POWER SUPPLY CHECKS.
4. AC CHECKS.
5. CIRCUIT DIAGRAMS AND LAYOUT DIAGRAMS.
6. PARTS LIST.

1. DESCRIPTION.

The 101 is a high quality high fidelity self-powered stereophonic preamplifier-control unit for use in musical applications. There are facilities for

1. Replaying from disc with RIAA equalisation from phono cartridges.
2. Replaying from a radio tuner such as the MERIDIAN 104.
3. Replaying and recording with monitoring facility from a tape recorder or cassette deck.

The preamplifier is built on a modular basis with three plug-in modules having the functions of Cartridge Amplifier [3-2], Equalisation [3-3] and Output [3-4].

There are a number of different types of 3-2 to suit different cartridges, including moving coil types. In addition to this there is a newer range of 'double' modules taking the place of the 3-2 and 3-3 for use with moving coil cartridges only.

A 101 fitted with one of the moving coil modules or with a double module in the factory is designated 101 MC. There is no difference between a 101 MC and a 101 which has subsequently had its 3-2 module changed to a moving coil type of 3-2 or to a double module.

The output module [3-4] is available in either 600 ohm or 75 ohm output impedances. Standard units are fitted with 600 ohm modules. 75 ohm modules are marked as such.

In connection with the controls, it should be noted that to bring in the radio, the RADIO tab is depressed. Similarly to replay or monitor from a tape recorder the TAPE tab is depressed and monaural functioning is brought in by depressing the MONO tab.

The only other control is the rotary ON/OFF VOLUME control and a BALANCE control mounted concentrically behind the volume control.

The ON/OFF switch also controls a fused IEC type mains outlet at the back of the preamplifier for powering ancillary equipment.

All input and output connections are made via DIN sockets at the back of the preamplifier. Also on the back is the mains fuse, a 3.15 amp [slo blo,T] 20mm type fuse. This value fuse is common to

all voltage versions of the 101.

The 101 is made in three voltage types. 220-240 volt for Europe, 110-120 volt for USA and Canada and 100 volt for Japan. No 101 units are manufactured with a voltage selector. Altering the voltage can only be done by changing the transformer. If this is not practicable, the unit may be operated using an auto-transformer, but care should be taken to ensure that the transformer has a high enough VA rating to handle any ancillary equipment powered from the mains outlet. Feeding power amplifiers or interactive loudspeakers from a 101 fed from an auto-transformer will degrade the sound and should be avoided where possible.

2.
DISMANTLING:

Ensure that the unit is disconnected from the supply before dismantling.

To remove the OUTER SLEEVE [CASE], lay the unit upside down on a soft clean surface and remove the two brass screws in the front foot bar. The unit can now be slid out of the case forwards [fascia attached to the unit and not the case]. Do not pull the unit from the case by the panel. Push from the back with firm even pressure.

To remove the TRANSFORMER, undo the 4BA cross-headed screw [Pozi] underneath the transformer [see diagram 101A]. The fixing bush can then be easily removed from the transformer. The secondary connections [green, yellow, blue] from outside to inside are crimp-type tags and can be carefully withdrawn from the main PCB [see diagram 101B]. Pull the crimps not the wires. The primary connections go via the fat black sleeving to the mains outlet socket. It is necessary to cut the sleeves or slide them back and unsolder these wires.

To remove the PCB, using pliers which are sheathed with insulating tape or have their jaws otherwise protected, pull off the three tabs. A pulling and twisting action suffices. Depress the switches. The felt pads mounted on the tab levers can now be withdrawn using point-nose pliers [see diagram 101D]. Behind the felt pads are three small screws [cross-head, pozi] in the top right hand corner of each switch slot. Remove these taking care to extract them. Unscrew also the two cross-head pozi screws located just behind the 3-2 module. Depress the top retaining tab of the mains outlet socket at the back to enable the socket to be tilted outwards. It is now possible to ease the board out at the back by pushing the fat black sleeve outwards.

To remove the FASCIA or FRONT PANEL, take off the volume control knob and balance control knob using a 0.05" allen key [part number 1736]. Remove the nut retaining the volume control assembly using a 9/16" AF box spanner [part number 1965]. Using pliers which are sheathed with insulating tape or have their jaws otherwise protected, pull off the three tabs. A pulling and twisting action suffices. Carefully pull the right hand side of the panel forwards so that the left hand side may be unhooked. Great care is needed to ensure that the rubber hook is not unduly strained or sheared during this operation.

To remove the VOLUME CONTROL, take off the volume and balance control knobs using a 0.05" allen key [part number 1736]. Remove the nut retaining the volume control assembly using a 9/16" AF box spanner [part number 1965]. Unsolder the five wires [red black violet blue brown] noting which colour goes to which tag. The control can now be eased backwards over the transformer so that the mains connections may be unsoldered.

3.

DC AND POWER SUPPLY CHECKS:

The 101 power supply provides a regulated + and - 15 volts. These voltages appear at the points indicated on the layout diagram. They also appear at the 7-pin Din output socket at the back of the control unit. Pin 2 [centre pin] is ground, pin 6 has +15 volts and pin 7 has - 15 volts.

Should there be neither + nor - 15 volts, the secondary volts from the transformer should be checked. The three tags just behind the transformer on the PCB carry volts AC on blue and yellow wires. The green wire [outer tag] is the centre tap. Should EITHER the +15 volts OR the -15 volts be absent or severely reduced, remove each module in turn to see if removal restores the voltage. Switch off when removing or replacing modules.

In the event that module removal does not restore the regulated 15 volts the fault will probably lie in one or other of the voltage regulators [see layout diagram].

On earlier 101 units it is necessary to remove the PCB from the chassis to change the voltage regulators. On later 101 units holes will be found in the steel chassis under the regulators so that they may be replaced without removing the PCB.

4.

AC CHECKS:

Thorough investigation of the performance of the preamplifier can only be undertaken with the following equipment-
Low distortion oscillator [LDO]
Double beam oscilloscope
Millivoltmeter
Distortion measuring set [DMS]

First ascertain the type of pickup module fitted to the 101. The list below gives the approximate sensitivity at 1kHz for 0 dBm [775 mV] output. Before starting any measurements, ensure that the volume control is fully raised and that the balance control is in the central position and that all the flip switches are in the UP position.

Feeding a 1kHz signal of the appropriate voltage in to the PHONO socket on pin 3 [left] and 5 [right] should give 775 mV at the output socket pin 1 [left] and pin 4 [right].

Equalisation checks.

10 kHz signal in, output -14 dB [on 775 mV]

100 Hz signal in, output +13 dB [on 775 mV]

Radio sensitivity.

mV in at pin 3 [left] and pin 5 [right] of RADIO socket should give 775 mV output.

Tape sensitivity.

mV in at pin 3 [left] and pin 5 [right] of TAPE socket should give 775 mV output.

Distortion checks.

Distortion should be checked at +10 dB and at 10 kHz.

Distortion should measure < 0.02%, typically 0.017% for units fitted with output modules up to series 3 [identified by greenish PCB marked 3-4].

Distortion should measure < 0.01%, typically 0.008% for units fitted with output modules from series 4 [identified by blue PCB marked 1238 4 and up].

Distortion figures for the RADIO input are the same as for phono.

Noise checks.

Hum and Noise should be checked with a dummy input plug having a 2.7 ohm [2R7] resistor between each input pin and ground [3 to 2 and 5 to 2].

Phono [moving magnet] noise >-66 dBm

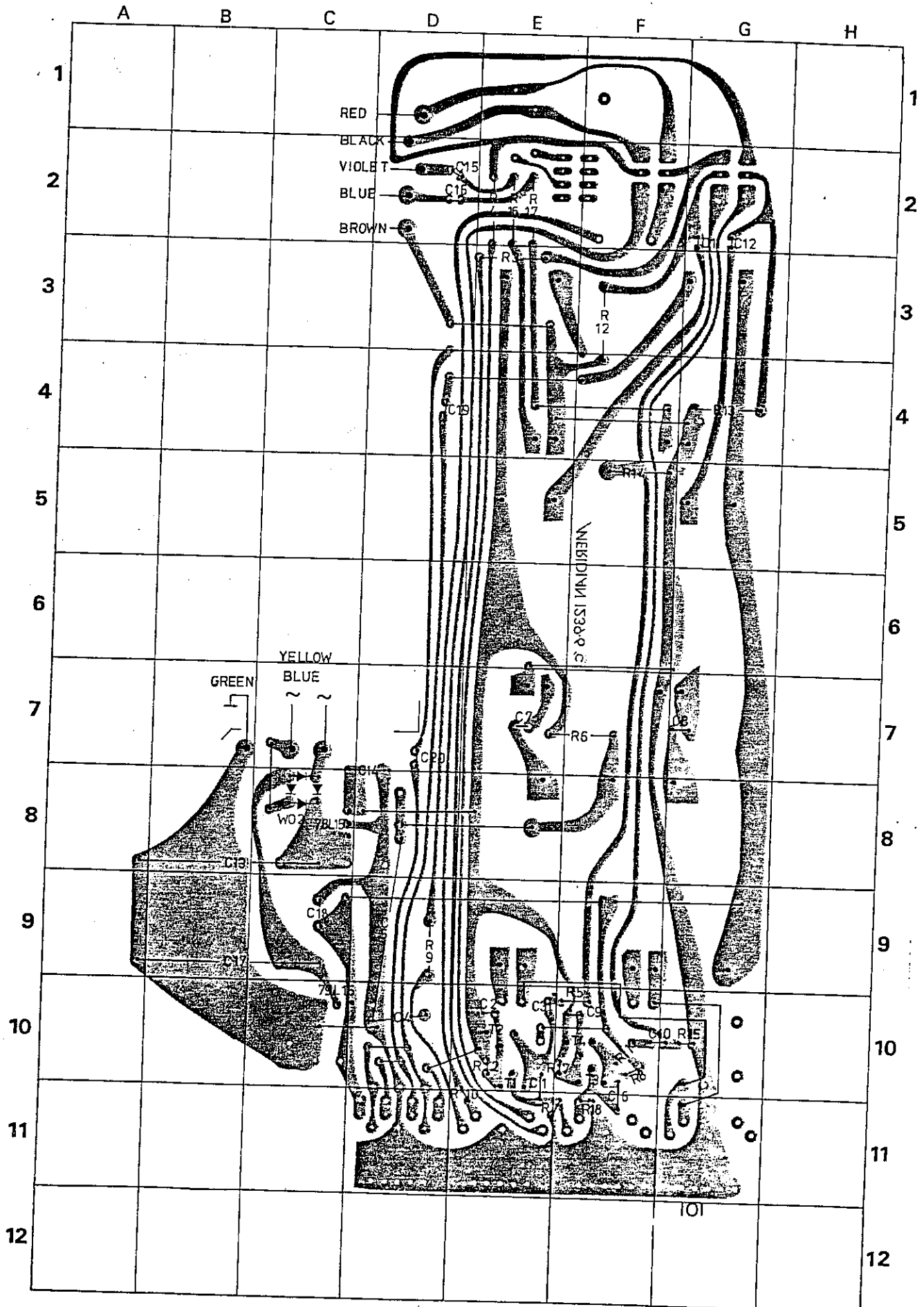
Phono [moving coil] noise >-61 dBm

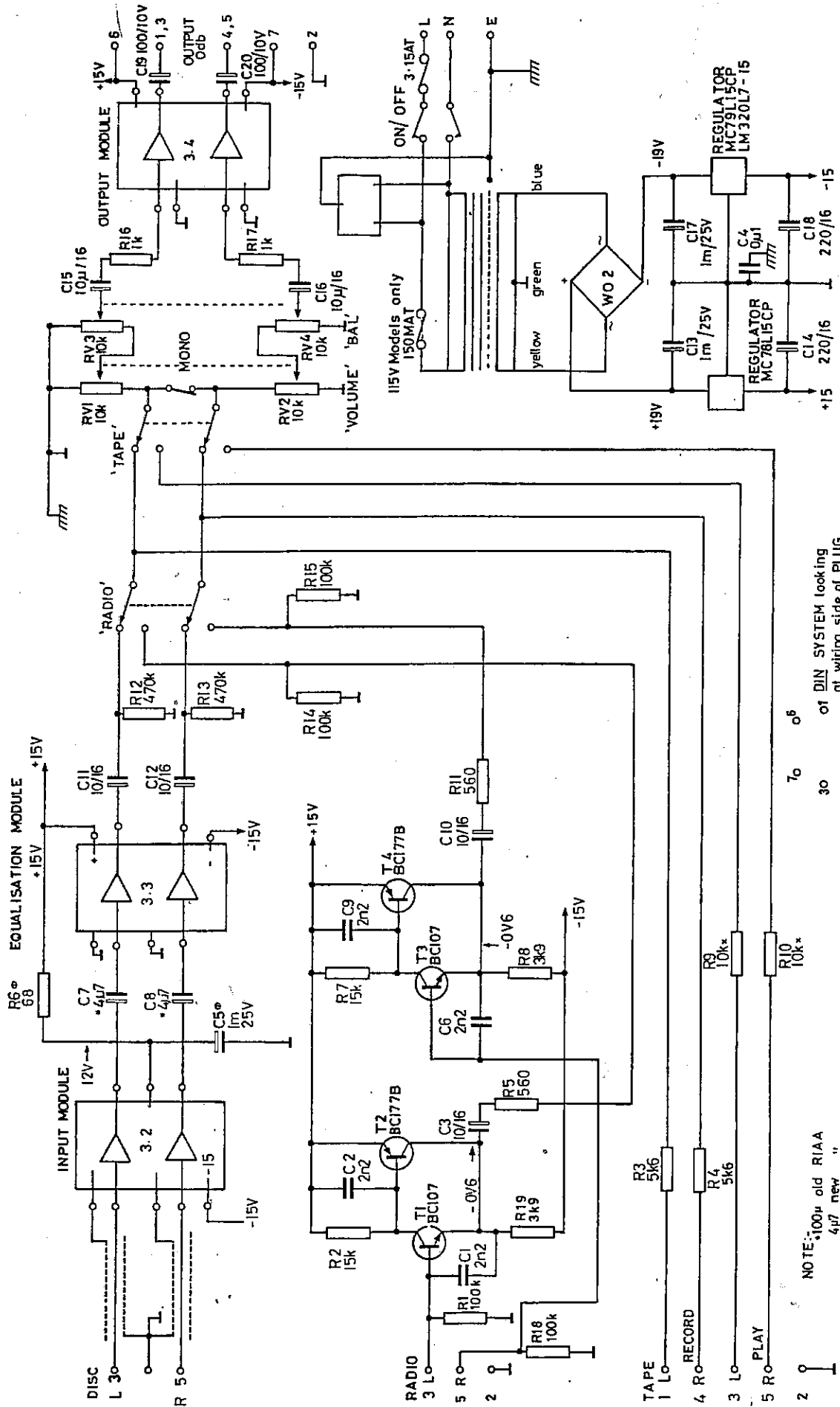
Phono [moving coil double module] noise >-61 dBm

Radio noise >-85 dBm

Tape noise >-85 dBm

If no signal is present at the output, check the signal at the TAPE output socket pin 1 [left] and pin 4 [right]. This will





NOTE: *100µ old R1AA
 4µ7 new "
 *Adjust for different tape input.
 4k7 gives 200mV sensitivity.
 • When output module series 3 is fitted (C5373 onwards) short R6 out and remove C5.

BOOTHROYD STUART MERIDIAN 101

101 Control unit Parts List

CASE ASSEMBLY

Part No	Qty	Description	Remarks/Location
1451NP	1	Case, Brown	
1452P	2	Foot Bar	Bottom of case
1259	4	Rubber Foot	Retained in 1452
1453P	3	Switch Flipper	Front panel
1458S	1	Front Panel	
1459PS	1	Balance Control Knob, inc screw	Front panel
1460PS	1	Volume Control Knob, Inc screw	Front panel
1485NP	1	Filler Plate, 101	Bottom of case
1760	3	Felt Piece	Behind 1453P
1805	1	Label	Back inside of case
1753	1	Front Panel Pin	Affixed to back LH side of front panel.
1712	4	Screw, 1/2" 6BA c/s pozi head	Under 1259
1744	5	Screw, 3/16" 6BA dome pozi head	3 behind 1760, 2 retaining PCB.
1717	1	Screw, 3/8" 6BA dome pozi head	Retains earth tag to chassis near transformer.
1722	4	Washers, 4BA Nylon	Under PCB
1721	2	Self-adhesive sponge squares	Under PCB
1701	2	Screw, 5/8" 6BA CH [brass] slot head	In front foot bar, retains unit in case.
1702	2	Washer, 6BA plain plated	Under 1701

101 Control Unit Parts List

CHASSIS ASSEMBLY

Part no	Qty	Description	Remarks/Location
1661P	1	Chassis, Steel, painted	
1268	1	Presspahn	Insulating sheet between chassis and PCB.
1243	1	Transformer, mains toroidal	* 220-240 volt
1276	1	Transformer, mains toroidal	* 110-120 volt
1477	1	Bush	Retains transformer
12120	1	O Ring	Between 1477 and 1243/1276
1236A	1	Mains Switch, Volume/Balance Control	* for Europe
1236B	1	Mains Switch, Volume/Balance Control	* For USA/Canada. CSA approved
1204	1	Fuseholder, Chassis mounted	* For Europe
1204A	1	Fuseholder, Chassis mounted	* For UAS/Canada. CSA approved
1201	1	3.15AT slo-blo fuse, 20mm type	For 1204 or 1204A
1232	1	Clamp for mains cord	add suffix A for Europe, B for Usa/Canada
1272	1	IEC Mains Outlet	* Mounted on back panel
1936	1	Mains Cord	* For Europe
1939	1	Mains Cord	* For USA/Canada
1755	1	Washer, M 12 shake proof	Between 1236 and 1661P
1706	1	Solder Tag, 6 BA	Grounding for chassis near transformer
1719	1	Screw, 4 BA dome pozi head	Secures transformer
1720	1	Washer, 4 BA split	Between 1719 and 1661P
1294	1	Line Fuse Connector	* Fitted only to models for USA/Canada
	1	150mAT slo blo fuse, 1 1/4" type	for 1294. USA/Canada only

IMPORTANT: * indicates safety approved part. Use only direct replacement.

TOOLS

1736	Allen Key	Fits grub screws in Vol/Bal knobs
1965	Box Spanner, 9/16 AF	Fits nut retaining volume/balance control

101 Control Unit Parts List

PCB, main

Part No	Cct.	Loc.	Descr.	Part No	Cct.	Loc.	Descr.	Part No	Cct.	Loc.	Descr.
1037	R1	11E	100k	1020	R8	10F	3k9	1037	R15	10G	100k
1046	R2	10E	15k	1026	R9	9D	10k	1015	R16	2E	1k0
1022	R3	3E	5k6	1026	R10	11D/E	10k	1015	R17	2E	1k0
1022	R4	2E	5k6	1011	R11	10F	560R	1037	R18	11F	100k
1011	R5	10F	560R	1042	R12	3F	470k	1020	R19		3k9
1048	R6	7E/F	68R	1042	R13	4G	470k	* 1236A		RV1-4	Vol/Bal Europe
1046	R7	10E	15k	1037	R14	5F	100k	* 1236B		RV1-4	Vol/Bal USA/Canada

All resistors, 1/4 W, 5%

1133	C1	10E	2n2,P	1140	C8	7G	4u7,10v,T	1110	C15	2D	10u,16v,E
1133	C2	10E	2n2,P	1133	C9	10F	2n2,P	1110	C16	2D	10u,16v,E
1110	C3	10E	10u,16v,E	1110	C10	10F/G	10u,16v,E	1127	C17	9B	1m0,25v,E
1137	C4	10D	0u1,C	1110	C11	2G	10u,16v,E	1132	C18	9C	220u,16v,E
1127	C5	9D	1m0,25v,E	1110	C12	2G	10u,16v,E	1112	C19	4D	100u,10v,E
1133	C6	11F	2n2,P	1127	C13	8B	1m0,25v,E	1112	C20	7D	100u,10v,E
1140	C7	7E	4u7,10v,T	1132	C14	8D	220u,16v,E				

P=polystyrene. E=electrolytic. C=ceramic. T=tantalum.

1301	T1	10E	BC107B	1306	REG1	8C	78L15	15	15	15	positive regulator
1302	T2	10E	BC177B	1307	REG2	10C	79L15	15	15	15	negative regulator
1301	T3	10F	BC107B	1324	W02	8C	W02	Bridge			rectifier
1302	T4	10F	BC177B	1222	3EFG			2-pole			2-way switch, qty 3

1239AT Fully assembled and tested Control Unit Main PCB.