

UNITRONICS SP200

MANUAL

I.C. stereo preamplifier

IMPORTANT

BEFORE ATTEMPTING ANY KIT CONSTRUCTION, READ THE INSTRUCTION MANUAL OVER THOROUGHLY

The construction of this Unitronics kit does not require any special instruments or tools; all you require is a good 25 - 35 watts soldering iron with a small tip, a medium size screwdriver, a pair of diagonal cutter and pliers. A sensitive multi-meter is of ideal help. Other equipments such as signal generators, distortion analyzers, oscilloscopes and AC voltmeters is only required if you intend to test your results.

We garentee the circuit design and the components supplied in this kit, please check all components and transistors before assembly and make replacements if found defective. We shall be unable to garentee individual kit-builders workmanship and their consequential results.

Much of the performance of this kit depends upon the degree of workmanship. Before a solder joint is make, the connecting parts must be clean and bright and mechanically strong; the soldering iron must also be clean and free from excessive solder. Apply enough heat for the solder to folw thoroughly into the joint, avoid using excess solder and NEVER use acid cored solder or soldering paste. Cheet for solder flashes which might bridge adjacent lands. Do not prolong solder as excessive heat can cause damage to parts; burn insulating materials and peeling of copper lands from the PC board. After soldering, each and every joint must be carefully examined. This is very important as a large percentage of failures are caused by improper soldered joints.

WARNING

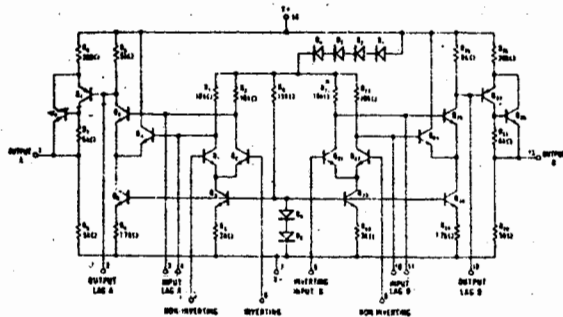
Do not use soldering paste flux or acid cored solder.
We shall not service any unit if this point is ignored.
Use only good quality solder.

I N T R O D U C T I O N

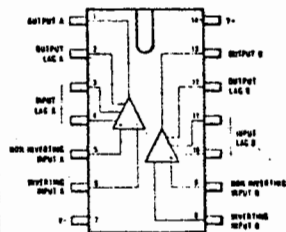
The Unitronics SP200IC preamplifier features state-of-art circuit design using a Fairchild uA739 stereo monolithic integrated circuit. Each channel consists of a 5 stage direct coupled amplifier using differential configuration. The I.C. features low noise figure (below 2db) and high open loop gain of over 20,000 times. Total transistors and diodes count are 16 and 6 respectively, a equivalent circuit of the uA739 is shown below.

By using special biasing technique for operational amplifiers, the SP200IC preamplifier can be operated from a single rail of power supply. Accurate RIAA phono equalization is applied from pin 1 and 13 to pin 6 and 8 via resistors and capacitors network R8, R9; C7, C8. Using specially selected precision capacitors and 5% tolerance resistors, equalization is accurate to ± 0.5 db. This with the inherent low noise and high gain characteristic of the I.C. makes the SP200IC preamplifier the most advanced phono preamplifier in the market. Noise and hum is negligible.

SCHEMATIC DIAGRAM



**CONNECTION DIAGRAM
(TOP VIEW)**



UNITRONICS SP200IC PREAMPLIFIER

SPECIFICATIONS

Output Voltage: maximum 8V r.m.s.
reference 0.5V r.m.s.

Input Sensitivity: (1KHz, at reference output) magnetic phono input 5.6 mV
microphone input 3.5 mV

Frequency Response: magnetic phono input ± 0.5 db to standard RIAA equalization
microphone input 20Hz to 30KHz (0db, -3db)

Overload capacity: (1KHz) phono input over 80mV

Total Harmonic Distortion: less than 0.03%; 1KHz at ref. output
..... less than 0.04%; 1KHz at 1V r.m.s. output

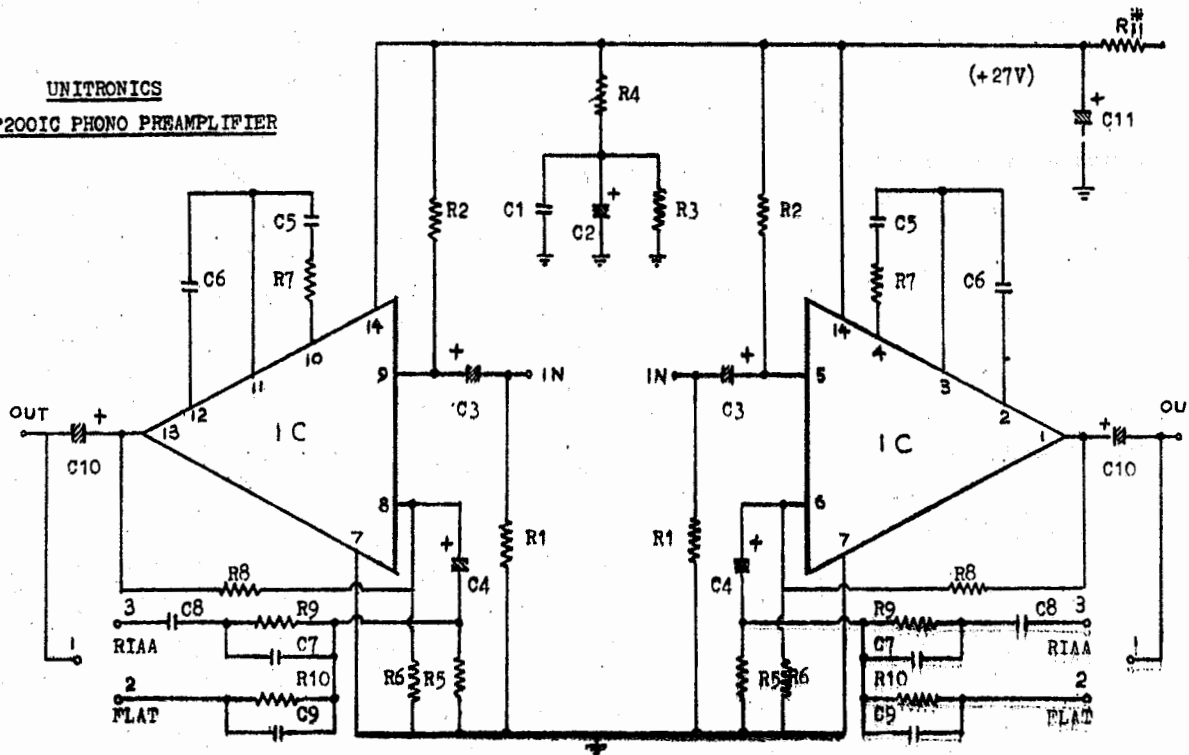
Intermodulation Distortion: (60Hz + 7KHz, mixed ratio 4:1).... less than 0.04% at ref. output

Signal to Noise ratio: phono input better than 74db
microphone input better than 80db

Channel separation:..... better than 80db

UNITRONICS

SP2001C PHONO PREAMPLIFIER



UNITRONICS SP200IC PARTS LIST

Integrated Circuit:

IC..... uA739L

Resistors:

R1..... 75K
R2..... 150K
R3..... 56K
R4..... 470K
R5..... 1K
R6..... 270K
R7..... 10 ohm
R8..... 1M
R9..... 82K
R10..... 100K

Condensers:

C1..... 0.1 mylar
C2..... 10mfd 6V electrolytic
C3..... 5mfd 25V electrolytic
C4..... 5mfd 6V electrolytic
C5..... 0.005 mylar
C6..... 0.005 mylar
C7..... 0.001 precision
C8..... 0.003 precision
C9..... 50pf ceramic
C10.... 5mfd 25V electrolytic
C11.. 100mfd 25V electrolytic
R11..... adjust according to
supply voltage.... (see text)

Miscellaneous:

Printed circuit board 1 piece
lead-out pins 1 pack
special radio solder..... 1 pack
mounting screws and nuts..... 1 pack

Instruction Manual..... 1 copy

IMPORTANT

Observe the polarity of the integrated circuit, pay attention to the polarity of electrolytic condensers before kit construction.

DO NOT USE ACID CORED SOLDERS

ASSEMBLY INSTRUCTION:

Preparation:

- () If there is an amendment to this manual, be sure that it is corrected at the appropriate places.
- () Please read this manual over before actual construction.
- () Check all parts against the part list, if any shortage is discovered, please make claims immediately. This procedure also make you get acquainted with the components.
- () Check all components, transistors, diodes, I.C. etc., if found defective, please return them unused for our replacements.

Printed Circuit Board Construction:

- () Check the printed circuit board lands and inspect if any flashes might be present between neighboring lands.
- () Install all resistors in their positions, and solder them in place; check for cold joints or loose connections.
- () Install the four precision capacitors C7 and C8 in position and solder.
- () Install all electrolytic capacitors, pay special attention to their polarities, solder in place and check as usual.
- () Position the Integrated Circuit in place, make sure that it is properly oriented, look for the indentation on the PC board and in the IC itself. While soldering, do not prolong than necessary.
- () Recheck after soldering the position of the IC and see if it is correct.
- () Check the lands between each IC leads, make sure they are not touching each other.
- () Install all leadout pins for in-out put points, power supply inputs and feedback equalizers.
- () This completes the whole PC board construction, recheck the complete circuit and see if all parts are in their proper positions, and all solder joints are securely soldered.

Testing the PC Board:

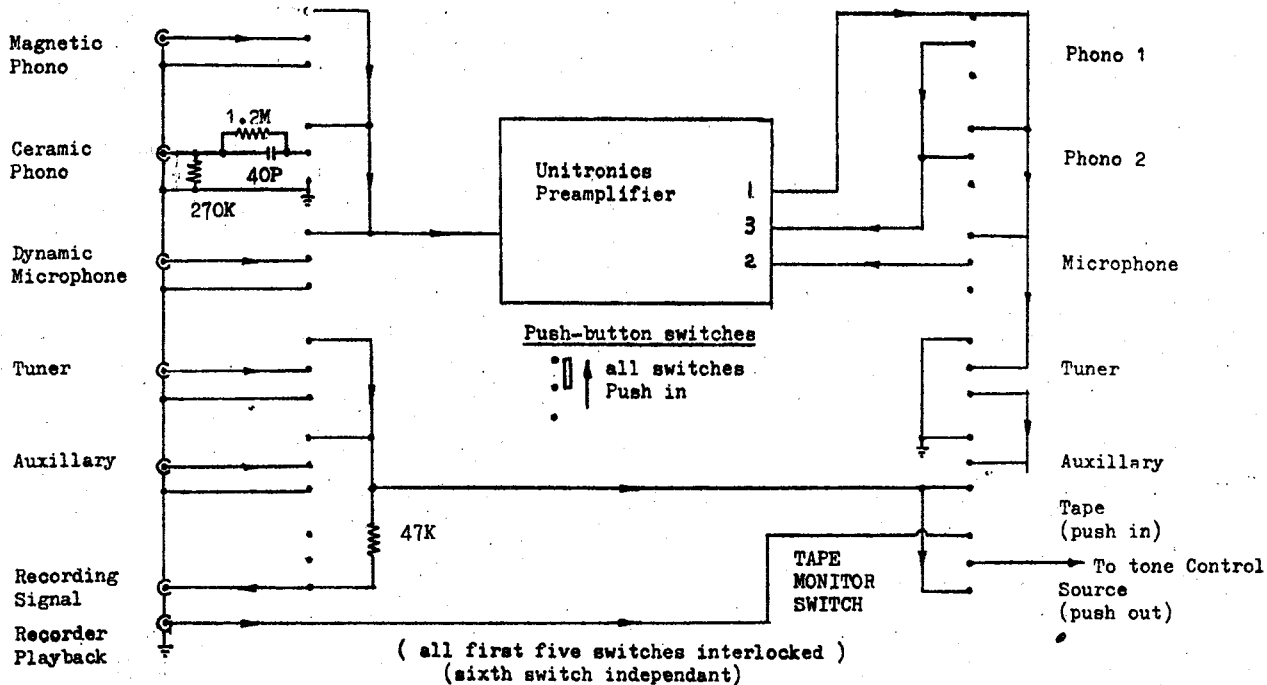
- () Apply 25V DC to the circuit, the power may be obtained from the main amplifier, with a suitable dropping resistor according to the following chart:

main amplifier DC voltage	R11 value
27V	150 ohm
30V	500 ohm
38V	1.5K ohm
54V	2.5K ohm

- () Measure the voltage between pin 1 and ground, which should be half supply voltage, if the supply voltage is accurate to 25V DC, then it should be 12.5V, slight tolerance is acceptable, between 10.5V to 14.5V.
- () Measure the voltage between pin 13 and ground, then should be as above.
- () The SP200IC preamplifier is ready for use.

Connecting inputs and selector assembly.

- () You may adopt push button type selector or using orthodox rotary type selectors, please refer to appropriate diagrams.
- () For connections with rotary selector, it is very straightforward, just follow the circuit and it is not intended to go into detail.
- () Push-button type selectors are a bit complicated, please read over the selector circuit and the switches interconnections, the connect with shield wires according to circuit, after connecting, go through thoroughly according to diagram. About 70% of returned units for service are because of incorrect selector connections.
- () After all external wirings is complete, you may connect the whole unit to tone control section, which Unitronics has two versions to go along, the TC180 three transistor tone control and the TC200IC tone control.



PREAMPLIFIER CONNECTIONS USING PUSH BUTTON SELECTOR

Magnetic
Phono

Ceramic
Phono

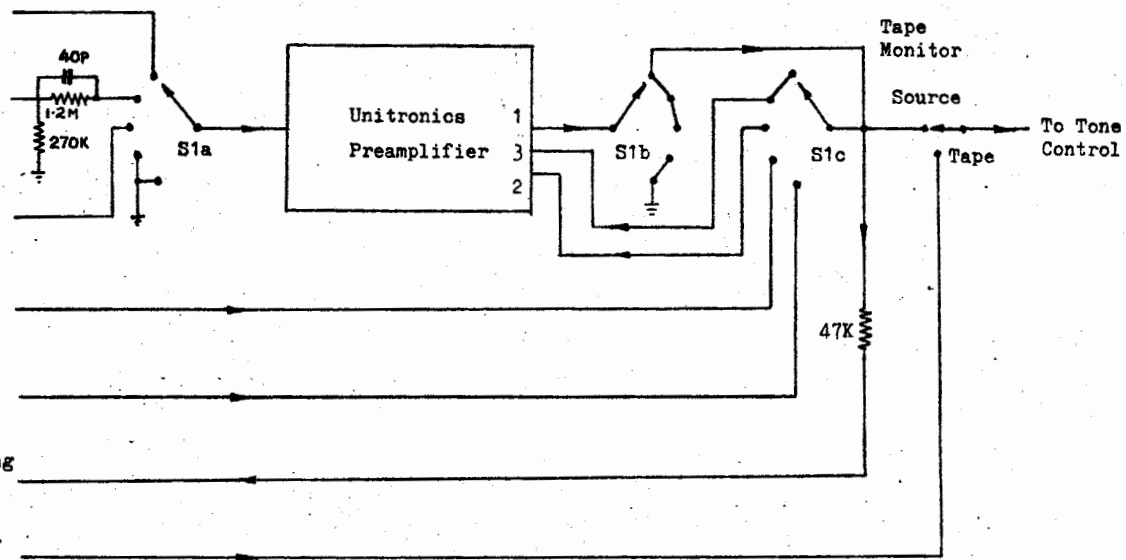
Dynamic
Mic.

Tuner

Aux.

Recording
Signal

Recorder
Playback



* S1a, S1b, S1c are in tandem

PREAMPLIFIER CONNECTIONS USING ROTARY SELECTORS