SS-221 "SOFT START" MODULE INSTALLATION INSTRUCTIONS

PARTS SUPPLIED WITH THIS KIT:

(1) SS-221 "Soft Start" Circuit Board
(2) 48VDC SPDT Relays
(1) #8 Bent Solder Lug
(1) 390V ZNR Transient Suppressor
(2) 20Ω 10-Watt Resistors
(1) #20 7" Black Wire
(1) 3kΩ 2-Watt Resistor
(1) Full-Wave Bridge Rectifier
(2) 200V ZNR Transient Suppressors
(2) 1N4005 Diodes
(1) #20 4" Red Wire
(2) #14 6" Black Wires

To start the installation, read these instructions very carefully. Now unplug the amplifier and remove any input, output and control cables that may be connected to the back of the amplifier. Place the amplifier on a book, front panel up, and remove the bottom screws holding the feet and case in place. Lift the case up and remove it from the amplifier. Place the amplifier upside down on the bench with the front panel facing you. The completed SS-221 module will be mounted in the open space on the chassis over the capacitor bank in front of the voltage selector strip. You are now ready to proceed with the installation.

( ) Assemble the Soft-Start 221 according to the parts layout diagram.

( ) Strip about ¼" of insulation from the ends of the two (2) 6" #14 **BLACK** wires, the 4" #20 **RED** wire and the 7" #20 **BLACK** wire. Tin the ends of each of the wires as this will help when soldering the wires to the "Soft Start" module or terminal lugs. Pass one end of each of the 6" #14 **BLACK** wires through the holes (pads) labeled **"A"** and **"B"** and solder. Pass one end of the 7" #20 **BLACK** wire through the hole labeled **"E"** and solder. Pass one end of the 4" #20 **RED** wire through the hole labeled **"F"** and solder.

( ) Cut the 2 cable ties on the power lead wiring that are nearest the back panel.

( ) Locate the large black wire coming from the right hand terminal of the lower circuit breaker (AB). Unsolder this wire and clean the hole in the terminal of the breaker.

( ) Cut ½" off of the end of this wire and strip about ¼" of insulation from the end of the wire. Tinning the end of the wire will help when soldering the wires to the "Soft Start" module. From the component side of the SS-221 circuit board, pass this wire through hole **"C"** and solder.

( ) Solder the large 6" #14 **BLACK** wire coming from hole **"A"** in the SS-221 circuit board to the circuit breaker terminal just vacated, trimming as necessary.

( ) In a like manner, remove the large black wire from the right hand terminal of the upper circuit breaker (AA). Prepare the terminal and wire as previously described.

( ) Pass this wire through hole **"D"** on the SS-221 circuit board and solder.

( ) Solder the large 6" #14 **BLACK** wire coming from hole **"B"** of the SS-221 circuit board to the circuit breaker terminal just vacated, trimming as necessary.

( ) Locate terminal strip **"BT"**. It has 2 resistors, a 20μF capacitor and a diode connected to it. It is located on the left side of the chassis, slightly forward of middle. Remove the diode.

Remove the red transformer wire connected to the center ground lug. Clean out the ground lug and the lug that has the "+" terminal of the capacitor soldered to it.

( ) Find the small bridge rectifier marked W04G supplied with the kit. Note that the (+) lead is marked on the top of the bridge. With the rectifier on the right side of the terminal strip (wires up), put the (+) through the most forward terminal (lug) on the strip (the one with the "+" lead of the capacitor going to it). Put the small 4" #20 **RED** wire from hole **"F"** of the SS-221 through the same terminal lug, trimming as necessary. Solder 5 wires (or 6 wires if the SK-220 is installed) at this lug.

( ) Put the (-) lead of the bridge rectifier that is opposite of the (+) lead through the center (ground) lug of the terminal strip. Put the small 7" #20 **BLACK** wire from hole **"E"** of the SS-221 through the same terminal lug, trimming as necessary. Solder 3 wires at this lug.

( ) Solder the left lead of the bridge rectifier to the terminal lug that has the red wire from the transformer soldered to it. This lead is marked with a (~) on the top of the bridge.

( ) Solder the loose red transformer wire (removed earlier) to the remaining lead of the bridge rectifier. This lead is also marked with a (~) on the top of the bridge.

( ) Position the bridge rectifier so that it is clear of any wiring. It will be held in place by its leads.

( ) Locate the #8-32 screw just forward and to the left of the line voltage selector strip. This holds down one corner of the HV transformer. Remove the nut and place the #8 solder lug (supplied) over the protruding screw. Replace the nut and hand-tighten.

( ) Take the 2 ZNR suppressors marked V1420IU or V1424IU and put one lead of each through the new solder lug. The other end of the ZNR suppressors goes to the end terminals of the voltage selector terminal strip (NOT to the screws holding the strip down).

( ) Position the ZNR suppressors and the ground lug so that the ZNR leads are in the clear. Solder the 2 leads to the ground lug and trim off any excess. Now fully tighten the #8-32 screw and nut holding the ground lug and transformer.

( ) The ZNR suppressor marked V1439IU is connected between the end terminals on the voltage selector terminal strip (the same strip where the 14K20IU suppressors are connected). Place the leads from the ZNR suppressors under the terminal screws and tighten.

( ) Dress the power leads back into the wire bundle and tie using lacing, cord, string or tie-wraps.

( ) Locate the T/R relay and identify the wires connected to the relay coil. There should be a red wire on the lug nearest the front panel. Solder the lead from the banded end (cathode) of one of the supplied diodes to the relay coil lug with the red wire soldered to it. Solder the lead from the unbanded end (anode) of the other diode to the opposite relay coil lug. Both free diode leads should be extending to the right, toward the output coax cable.

( ) Bend the two free diode leads so that they touch, but are clear of any other wiring. Solder these leads together.

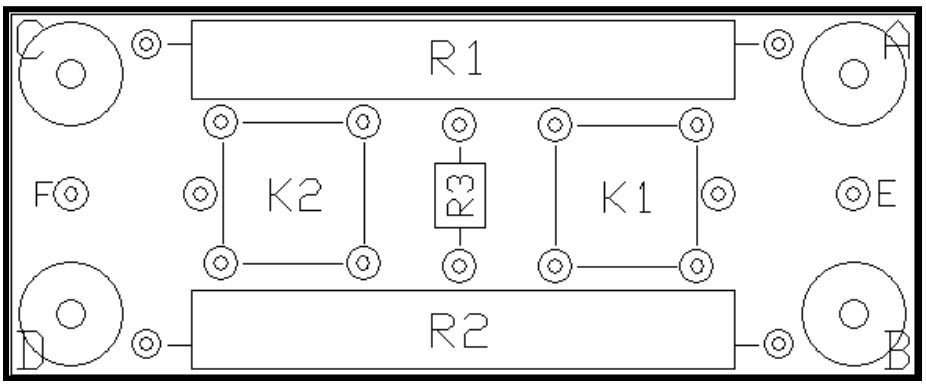
( ) Place the SS-221 module in the clear space in front of the input voltage selector terminal strip, relays down. When a good location has been found, lift the module and clean the chassis at this location with alcohol or other similar cleaning fluid.

( ) Place a small dab of **fresh** silicone adhesive on the top of each relay and place the SS-221 module back onto the chassis. Use a weight of some kind to hold the SS-221 module down. Let the silicone cure for at least 12 hours (24 hours is better) before reassembling the case to the amplifier. You may also mount of piece of rubber or other insulating material on the trace-side of the SS-221 if desired.

This completes the installation of the SS-221 "Soft Start" module. Before putting the case back onto the chassis, it would be wise to check the operation. **NOTE: MAKE SURE THE "SAFTY BRASS SPRING INTERLOCK" IS NOT GROUNDED BEFORE PLUGGING INTO AN AC OUTLET. FAILURE TO DO THIS WILL SHORT CIRCUIT THE HIGH VOLTAGE SUPPLY TO GROUND AND DAMAGE WILL RESULT IF POWER IS APPLIED!** To do this, right the amplifier and plug it in and place the multi-meter switch to the "HV" position. With the power selector switch in the "CW" position, turn the amplifier on. Observe the plate voltage. After about one half second, it should read its normal reading. You will hardly notice any difference in the operation of your SB-220/SB-221, but you will know it is very well protected from voltage transients and high inrush currents.

PC BOARD PARTS DESIGNATION:

K1-K2	48VDC SPDT Relays	**R1-R2**	10Ω/20Ω 10-Watt Resistors
R3	3kΩ 2-Watt Resistor		



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