

SK-401 SOFT KEY v3.1

ASSEMBLY & INSTALLATION INSTRUCTIONS

WARNING: Voltages inside the amplifier CAN & WILL KILL YOU! You MUST know how to work around HIGH VOLTAGE safely. If you do not, get assistance from someone who does. You MUST also be able to read your specific amplifier schematic and understand the design, theory and wiring of your amplifier to properly perform this upgrade.

SK-401 SOFT-KEY ASSEMBLY

- () **Read, re-read and fully understand these instructions prior to beginning this upgrade.** Make sure to perform the steps in the order they are listed. Also, be sure to label wires as they are disconnected from various points inside the amplifier. This will help when the time comes to re-attach the wires that will be disconnected during installation of the kit.
- () Go through the Bill of Materials (BOM) and compare that list with the parts in the kit to make sure all parts are present. If you are missing any parts, please contact Harbach Electronics, LLC.
- () Assemble the SK-401 according to the parts layout pictorial (top view of circuit board). There is no right or wrong assembly sequence, just be sure to observe correct polarity of diodes D1-D3 and the correct orientation of Q1-Q2.
- () After assembly, the connection wires can be soldered to the circuit board. Strip approximately ¼” of insulation from both ends of each wire and tin both ends. Solder one end of each wire to the SK-401 as shown on the parts layout pictorial.

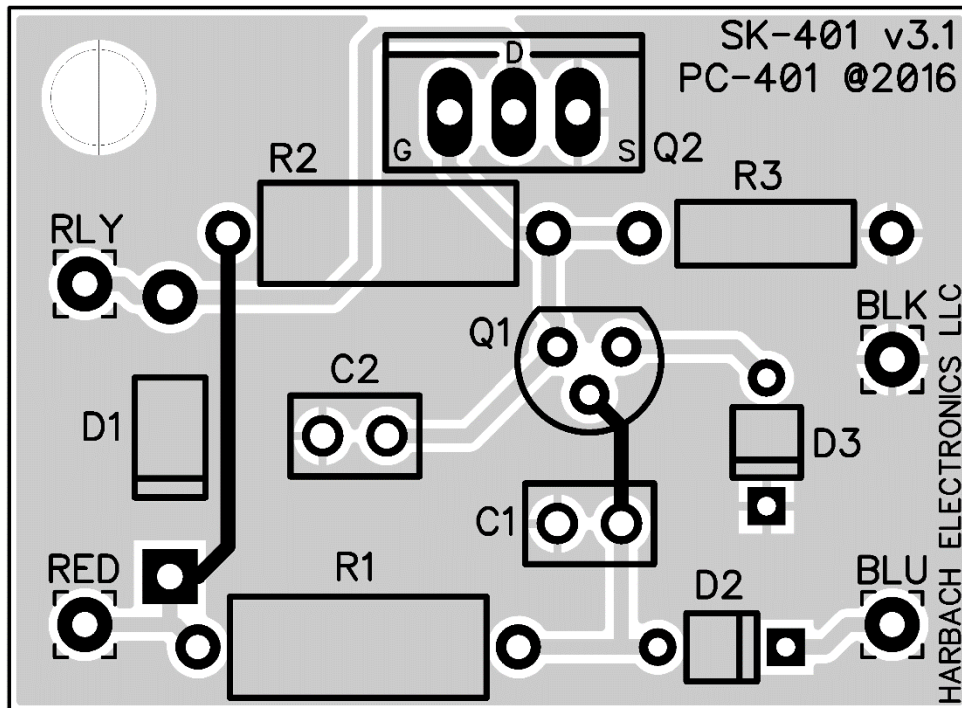
SK-401 SOFT-KEY INSTALLATION

- () Unplug the amplifier power cord from the AC mains and let any high voltage stored in the electrolytic capacitors bleed down. Verify the HV has bled down as shown on the HV meter. Remove any input, output, remote and HV cables that are connected to the back of the RF deck. Place the RF deck upside down with the rear panel facing you and remove 6 screws and the bottom cover. You are now ready to proceed with the installation
- () The exact mounting location of the SK-401 is not too critical. Be sure to keep the **RED** and **BLACK** leads as short as possible. The most convenient place I have found is just behind (or next to, depending on your version of the L-4B RF deck) the 24 volt supply terminal strip on the right side near the ON-OFF rocker switch. Try to align the unit such that the **BLUE** wire is nearest the wiring harness and the flat part of the large MOSFET transistor is facing the front of the RF deck.
- () **Be sure that all high voltage has been properly bled to ground before removing any covers or putting your hands inside the amplifier. You CAN BE KILLED by the high voltages inside this equipment!**
- () Once you have decided on a location, mark a location where the large hole in the SK-401 is. This is where the mounting spacer attaches to the SK-401 and also the location of the hole for the mounting screw. Very carefully drill a hole that will clear a #6-32 screw at the point you just marked (#27 drill). Do not use too much pressure because you want the drill to stop after just penetrating the chassis. Clean up any burrs from the hole.
- () Place the #6 lock washer onto one of the #6-32x¼” screws and place the screw through the hole you just drilled. Screw the threaded nylon spacer from the SK-401 kit onto the screw and tighten well without stripping the threads in the spacer.
- () Mount the SK-401 circuit board onto the nylon spacer using the other #6-32x¼” screw. Position the board as previously described.

- () Remove the small diode that is between 1 lug of the antenna relay jack and a small 1-lug terminal strip next to the antenna relay jack. You can discard the diode. Only the **WHITE & BLUE** wire should be connected to the 1-lug terminal after you removed the diode.
- () Route the **BLUE** and **YELLOW** wires from the SK-401 along (or in) the wiring harness so that both wires end up near the antenna relay jack.
- () Solder the **YELLOW** wire to the terminal of the 1-lug terminal strip next to the antenna relay jack where the **WHITE & BLUE** wire is connected. This effectively connects these wires together.
- () Solder the **BLUE** wire from the SK-401 to the lug of the antenna relay jack. This wire will be attached where the **BANDED END (CATHODE)** of the diode was unsoldered earlier.
- () Solder the **RED** wire from the SK-401 to the +24VDC lug of the terminal strip near where you mounted the SK-401. This lug has the positive (+) end of an electrolytic capacitor, the cathode (banded) end of a diode and a 2.2K Ω resistor soldered to it.
- () Solder the **BLACK** wire from the SK-401 to a convenient chassis ground. The terminal strip described above **USUALLY** has 1 or 2 ground lugs available for this. One or more lugs are directly connected to ground as they are used for mounting the large terminal strip.
- () Dress all wires close to the chassis.
- () Replace the bottom cover on the RF deck and reattach the input, output, remote and HV cables to the RF deck.

This completes the installation of the SK-401 Soft-Key module. You may not **SEE** any difference in the operation of your exciter or amplifier, but you will know that you have reduced the stress on the exciter's keying circuitry.

SK-401 SOFT-KEY PCB PARTS LAYOUT (PCB-401)



SK-401 BILL OF MATERIALS (BOM)

Verification	Part Number	Quantity	Description	Designation
[]	PCB-401	1	SK-401 Soft-Key PCB v3.1	N/A
[]	CAP-106	2	0.1 μ F 50VDC Capacitor	C1, C2
[]	DIO-101	1	1N4005 Diode	D1
[]	DIO-105	1	1N60A Diode	D2
[]	DIO-106	1	1N4148 Diode	D3
[]	SMI-101	1	PN2222A NPN Transistor	Q1
[]	SMI-102	1	IRF610 N-Channel MOSFET	Q2
[]	RES-124	2	22K Ω 1/4W Resistor	R1, R2
[]	RES-115	1	10K Ω 1/4W Resistor	R3
[]	SCR-105	2	#6-32 x 1/4" Steel Machine Screw	N/A
[]	SPA-102	1	#6-32 1/4" x 3/8" Nylon Hex Spacer	N/A
[]	WAS-105	1	#6 Lock Washer	N/A
[]	WIR-106	5"	#20 Stranded Black Wire	N/A
[]	WIR-107	26"	#22 Stranded Blue Wire	N/A
[]	WIR-108	5"	#22 Stranded Red Wire	N/A
[]	WIR-109	26"	#22 Stranded Red Wire	N/A

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