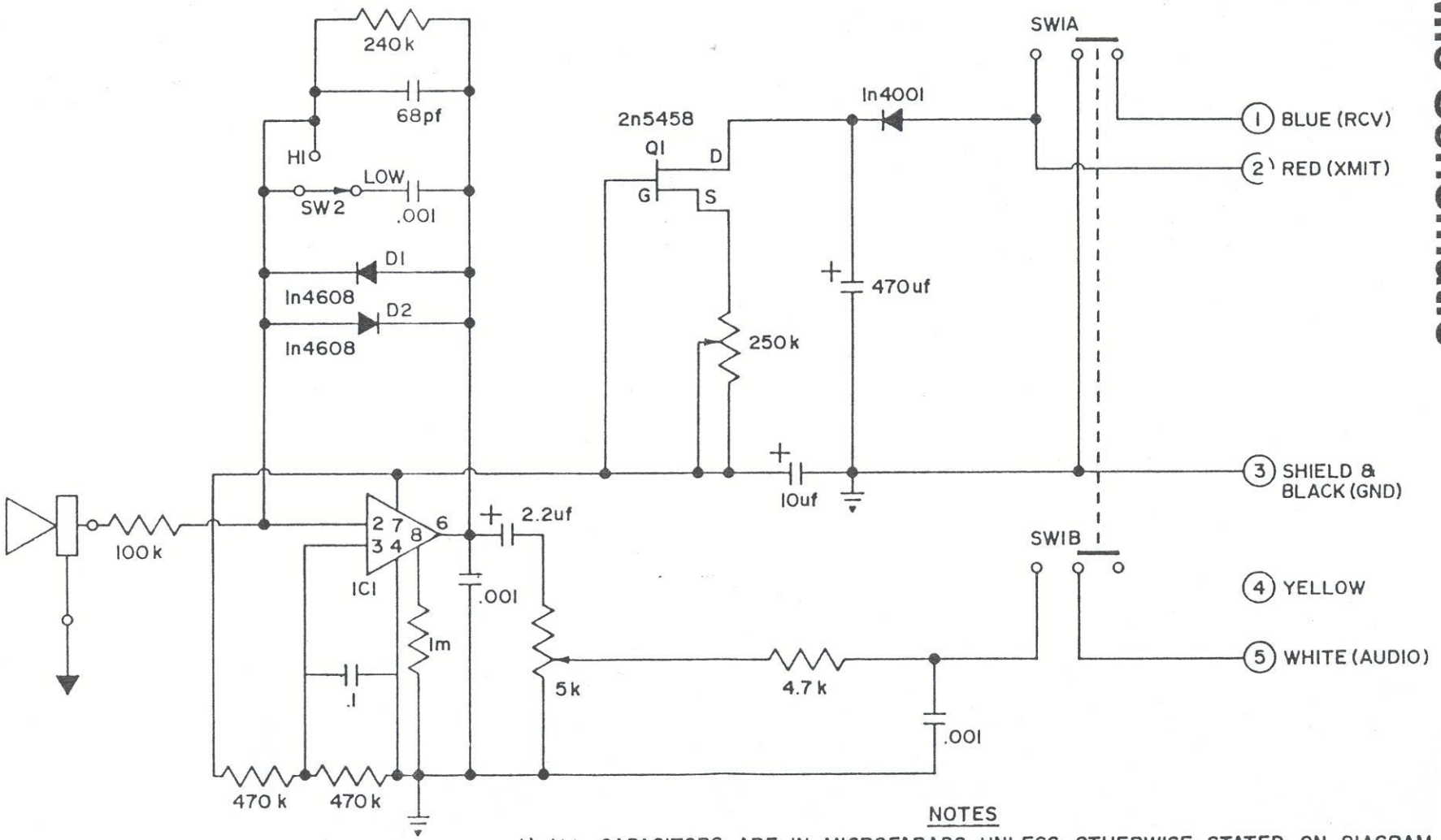
K40 Mic Schematic

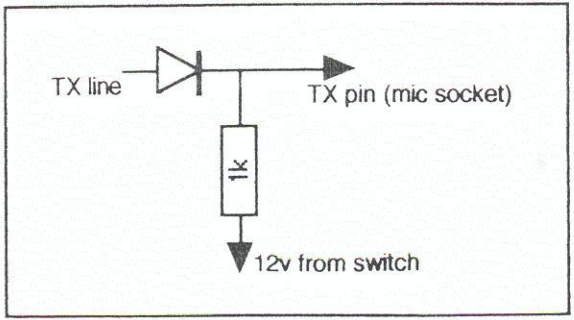
K40 SPEECH PROCESSOR MICROPHONE SCHEMATIC



NOTES

1) ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE STATED ON DIAGRAM.
2) CENTER TERMINAL OF THE 250k POT MUST BE SET FOR 4.0 VOLTS D.C.

K40 Microphone



Add this diode and resistor to supply the voltage from the rig. Virtually any diode will do. The resistor value is 1k Ohm (brown/black/red). Snip the TX wire from the mic socket inside the rig and connect this wire to the diode anode. Connect the diode cathode to the pin on the socket from which you snipped the wire. Connect the resistor from this pin to the on/off switch (the connection which has no volts when the rig is off!).

K40
DYNAMIC MICROPHONE

WIRED FOR USE WITH K40 CB RADIO WITH INTERNAL SPEECH PROCESSOR CIRCUIT. TO USE ON OTHER BRANDS OF CB RADIOS REWIRE AS NEEDED.

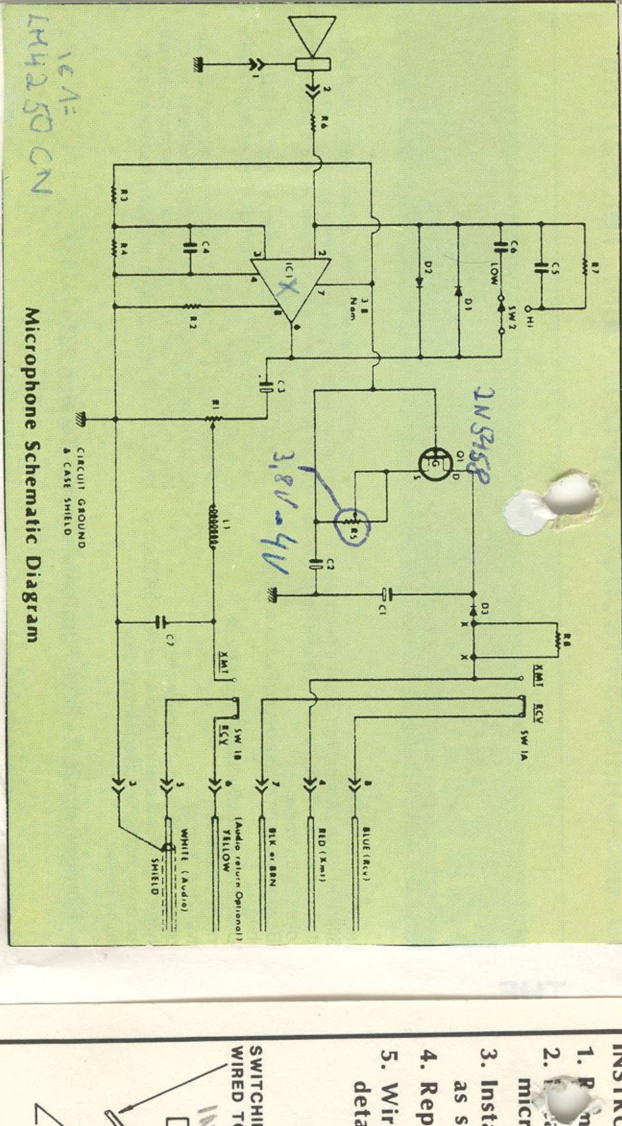
PIN 1 MIC AUDIO — WHITE (INSIDE SHIELD)
PIN 2 GROUND — BLACK & SHIELD
PIN 3 RECEIVE — BLUE
PIN 4 TRANSMIT — RED

K40 ELECTRONICS ELGIN, IL 60123

WIRING BOOKLET

THE *Speech Processor*

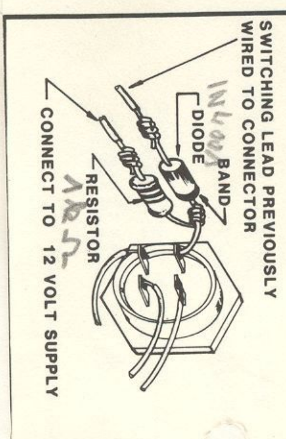
K40™



Microphone Schematic Diagram

INSTRUCTIONS

1. Remove case from transceiver.
2. Locate switching line at microphone connector.
3. Install diode and resistor as shown.
4. Replace case.
5. Wire microphone connector as detailed in instruction book.



THIS COMPUTER PRINTOUT CONTAINS THE LATEST INFORMATION ON THE CORRECT WIRING OF THE MICROPHONE PLUG FOR VARIOUS CITIZENS BAND AND AMATUER TRANSCEIVERS

THIS INFORMATION IS INTENDED FOR THE EXCLUSIVE USE OF REGISTERED *K40* DEALERS

PERIODIC UPDATES WILL BE FURNISHED TO *K40* DEALERS

ENGINEERING BULLETINS COVERING RECOMMENDED INSTALLATION TECHNIQUES AND SPECIAL APPLICATION NOTES WILL BE SUPPLIED FOR INCLUSION IN THIS MANUAL

PLEASE KEEP THIS INFORMATION FOR THE USE OF YOUR SERVICE PERSONNEL

HOW TO DETERMINE CORRECT PLUG WIRING WHEN A PARTICULAR MODEL IS NOT SHOWN IN THE FOLLOWING LIST

Spend a few minutes acquainting yourself with the hows and why of the K40 speech processor wiring. It will enable you to install the K40 speech processor on virtually any transceiver, in a matter of minutes.

There are two basic types of switching circuits employed in communications transceivers.

1- Electronic switching
2- Relay switching
   A- Direct Relay Switching
   B- Transistor Driven Relay Switching

FIRST—DETERMINE WHICH SYSTEM YOUR TRANSCEIVER EMPLOYS

1. Connect one lead of an ohmeter to the black (negative) D.C. input lead of the transceiver.
2. Using the other lead of the ohmeter determine which microphone pins are ground. The resistance measured should be almost zero. Some units will have more than one ground pin at the connector. The black and shield leads of the K40 cable connect to the mic ground pins.
3. Connect the negative lead of a D.C. voltmeter to the negative D.C. input lead. With the positive lead of the voltmeter measure the voltage on each of the pins, with the transceiver turned on. The switching line will have a positive voltage of from 6 to 14 volts. Turn the power off and with an ohmeter measure the resistance to ground of the switching pin. If the resistance is over 200 ohms the transceiver employs switching circuit type 1 or 2B, as referred to above. If it is type 1 or type 2B then the energy conversion kit should be installed. The red lead from the K40 cable should be connected to the switching pin of the microphone connector.
4. If it has been determined that the switching circuit is type 1 or 2B it is necessary to ascertain which circuit is utilized. With power applied to the transceiver, and the standard microphone plugged-in, make certain that the speaker is functioning. Remove the microphone and if the speaker remains on then the transceiver employs switching circuit type 2B. If the speaker goes off then the transceiver employs switching circuit type 1, in which case the blue lead must be used.
5. If the switching circuit is type 1 it is necessary to determine which pin is the speaker ground return. This is the pin to which the blue lead of the K40 mic cable will be wired. Turn the transceiver on and remove the mic. This will turn the speaker off. Connect a clip lead from the D.C. negative input to each of the mic connector pins, in order. The pin which activates the speaker is the pin to which the blue lead should be wired.
6. The white lead of the K40 speech processor is connected to the audio input of the transceiver. On transceivers which employ a four pin mic connector it will be the one remaining pin. In units which use another type of connector it will be necessary to determine which of the remaining pins is the audio input. It may be necessary to solder the white lead to each of the pins, in order, to ascertain which of the pins provides modulation of the transmitter.
7. The yellow lead is generally not required. In certain cases where the audio line must be grounded in the receive condition the yellow lead should be connected to the same ground pin as the black lead.

COMPUTER UPDATE FOR K40 SPEECH PROCESSOR

MFG. & MODEL	RED	BLU	BLK	WHT	YEL	SHD
MIDLAND						
100M	2	5	4	1	X	4
4001	4	3	2	1	X	2
7001	4	3	2	1	X	2
6001	4	3	2	1	X	2
5001	4	3	2	1	X	2
3001	4	3	2	1	X	2
78-999	4	3	2	1	X	2
76-860	4	3	2	1	X	2
79-891	4	3	2	1	X	2
78-574	4	3	2	1	X	2
CHALLENGER						
TRC460	4	2	3	1	X	2
COLT						
480	4	3	2	1	X	
GEN.ELECT						
MASTER 2	3	X	5	2	X	1
GE						
3-5830	3	X	1	4	X	5
KRACO						
KCB 2329A	4	3	2	1	X	2
KCB 2320B	4	3	2	1	X	2
MIDLAND						
13-882	3	5	2	1	X	4
REALISTIC						
TRC-448	3	X	1	4	X	1
REGENCY						
CR 142	4	3	2	1	X	2
ROYCE						
609	3	4	2	1	X	2
TEABERRY						
RACER "T"(23)	3	1	4	2	X	4
WARDS						
GEN 775A	4	3	2	1	X	2
ROYCE						
639	2	X	3	4	X	3
SPARKOMATIC						
CB5100	3	4	1	2	X	1
JC PENNY						
981.6248	3	X	1	4	X	1

WHY OUR MIC IS SO DIFFERENT

The heart of the K40 Speech Processor Microphone is our custom silicon integrated circuit operational amplifier. This chip does everything. It provides the functions of audio amplification, compressor amplifier, gain limiter and voltage regulator. We like our chip so much we named him Charlie. Charlie draws such a low current that we can run the mic with a capacitor instead of a battery. That's why we patented our circuit. Nobody else could do it before we invented it.

Every effort has been made to insure the accuracy of these model and connection listings.

SETTING MODULATION LEVEL

1. Connect modulation meter to radio at antenna connector.
2. Use a dummy load, as required.
3. Calibrate modulation meter with microphone keyed and no audit input.
4. Switch microphone to "high" position and talk at a normal level one to two inches away from microphone. Adjust output level control located on back or microphone (access through hole in case)—use jewelers screwdriver or miniature tuning tool.
5. Proper output level adjustment is achieved when average modulation equals 80%, and peak modulation equals just less than 100%.

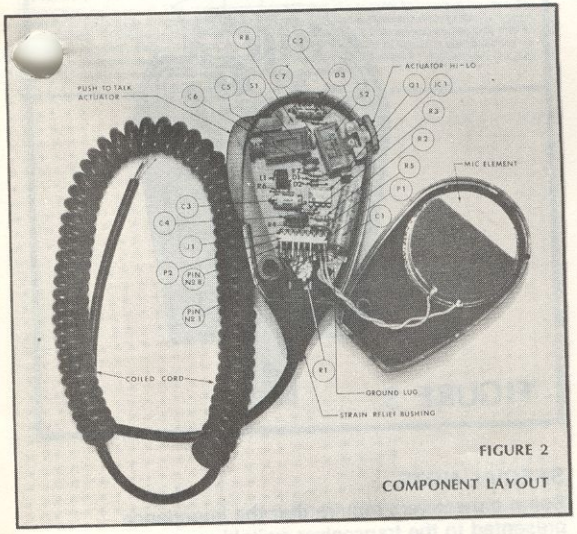
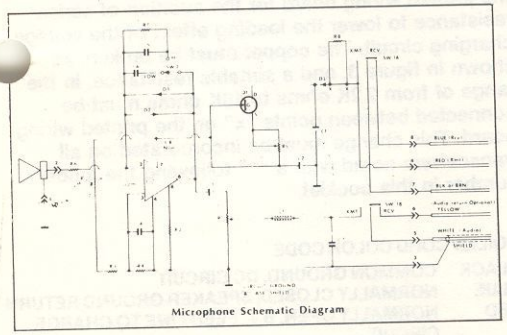


FIGURE 2

COMPONENT LAYOUT



Microphone Schematic Diagram

HERE'S HOW IT WORKS:

Supply voltage to the capacitor is fed from the transceiver (while in the receive mode) thru the red lead of the coiled cord. It goes through diode D3 to charge the capacitor, C1. The voltage stored in C1 is trickled into the Field Effect Transistor, Q1, which acts as a current regulator and monitors the supply of voltage necessary to operate our custom chip, IC1. Capacitor C2 and resistor R5 work in conjunction with Q1 to establish the voltage applied to pin 7 of IC1 to the proper voltage. R5 is factory adjusted to a level of 3.8 VDC and field adjustment should not be required.

The audio input developed by the high capacity ceramic cartridge is connected thru R6 to the input of IC1. Resistors R2, R3, and R4 along with capacitor C4 provide the necessary bias voltage to optimize the circuit performance.

Gain limiting levels, as well as desired frequency response characteristics, are automatically determined by diodes D1 and D2 along with resistor R7 and capacitors C6 and C7.

The audio output, after processing by the circuit, is fed thru capacitor C3 to the output gain control, R1, RF choke L1 and capacitor C7 act as RF filters to prevent RF from the transceiver from entering the amplifer circuit.

The entire amplifier is cased in a housing designed specifically to complement the acoustic characteristics of the microphone element. A complete RF shield of the circuit is provided by a special nickel silver coating.

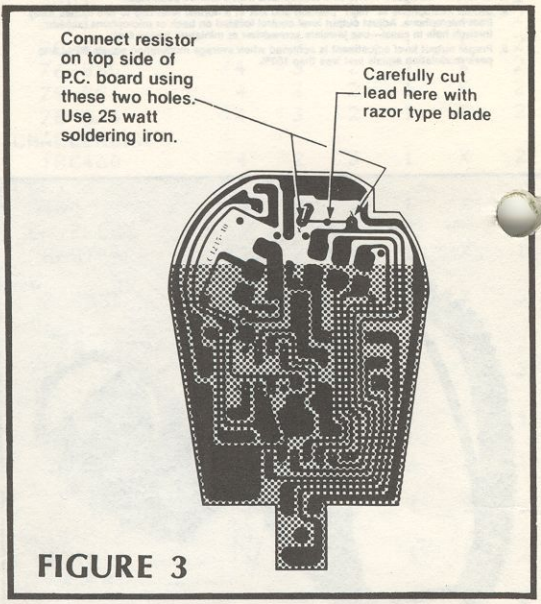


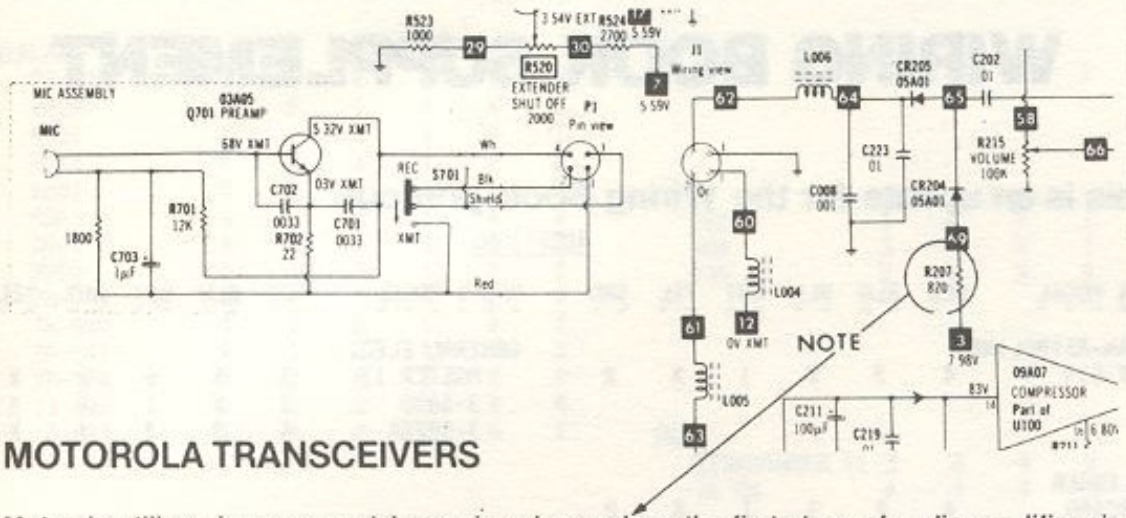
FIGURE 3

SPECIAL NOTE

Some transceivers require that the impedance presented to the transceiver switching circuitry be a higher impedance than that provided by the K40 Speech Processor Microphone. Provision is made on the printed wiring board for the addition of series resistance to lower the loading effect of the voltage charging circuit. The copper must be broken, as shown in figure 3, and a suitable resistance, in the range of from 2.2K ohms to 10K ohms must be connected between points "x" on the printed wiring board. This change must be incorporated on all transceivers noted with a "*" following the model number in this booklet.

COILED CORD COLOR CODE

BLACK	COMMON GROUND, DC CIRCUIT
BLUE	NORMALLY CLOSED, SPEAKER GROUND RETURN
RED	NORMALLY OPEN, B + FEED LINE TO CHARGE CIRCUIT
SHIELD	COMMON GROUND, AUDIO CIRCUIT
WHITE	NORMALLY CLOSED TO THE YELLOW LEAD: CONNECTED TO THE SPEECH PROCESSOR AUDIO OUTPUT IN THE TRANSMIT POSITION
YELLOW	NORMALLY CLOSED TO THE WHITE LEAD; OPEN IN THE TRANSMIT POSITION.



MOTOROLA TRANSCEIVERS

Motorola utilizes, in some models, a microphone where the first stage of audio amplifier circuitry is enclosed in the microphone case. This scheme requires that the DC supply voltages necessary to operate the transistor stages be fed along the coiled cord along with the audio output from the microphone.

The K40 Speech Processor Microphone can provide the same outstanding increases in performance as with conventional transceivers if a change is made in the Motorola basic transceiver audio circuit. This change only requires that one resistor be changed in value. The resistor which acts as the collector load for the transistor in the Motorola microphone is typical- ohms. This value is too low for the K40 Speech Processor to effectively operate into so ue must be increased to 220K ohms. This value is sufficient to keep the series diodes us- e Motorola chassis to be forward biased so the processed audio output from the K40 ch Processor can be fed to the transceiver audio circuits.