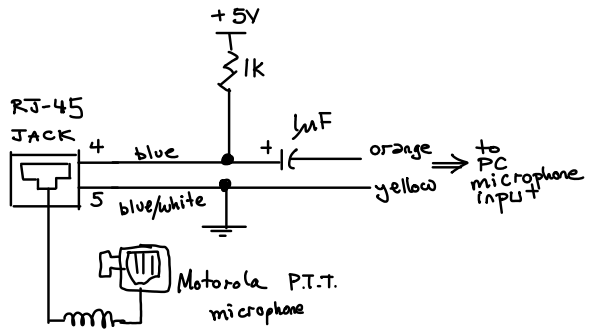
Lab 1 Addendum - Microphone Interface

Introduction

The microphones available in the telecommunications lab were designed for use with two-way VHF radios. For historical reasons many of these radios are designed to interface to "carbon" microphones whose resistance varies with the audio waveform. However, PC microphone circuits are designed to work with dynamic microphones that generate small (mV) voltages rather than varying their resistance.

Interface Circuit

You will have to build the following simple interface circuit to convert the time-varying microphone resistance to a voltage:



The 1k resistor limits the current and sets the output impedance to approximately the level of the PC input circuit (about 600 ohms). The 1 μF capacitor blocks the DC bias voltage but presents a low impedance to the audio signal. Observe polarity.

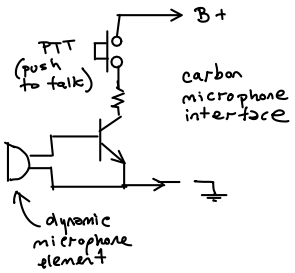
Pins 4 and 5 of the RJ-45 jack (8 position/conductor) are connected to the microphone's audio circuit. Connect the positive supply to pin 4 (marked solid blue on the connector) and ground to pin 5 (marked blue/white on the connector) as shown below:

Please double-check the voltages and polarity before connecting the microphone. The microphone could be damaged by an incorrect voltage and/or polarity.

If you are recording in mono mode and don't see an audio signal try the other channel on the microphone connector (the violet wire instead of the orange one).

Historical Background

You may be interested to know that these microphones actually use dynamic elements internally since carbon microphones are no longer widely available. The microphone incorporates a circuit similar to the following to convert a voltage to a resistance so that it is compatible with legacy radios that used carbon microphones:



So we actually end up doing two conversions: (a) from voltage to resistance in the microphone, and (b) from resistance back to voltage in the circuit above.

Note that the "push-to-talk" (PTT) switch is in series with the supply voltage so you will not get any sound out unless you press the button.