

KTUC03 - PICAXE Experimenter's Kit

1. General Description

A photo of a KTUC03 Experimenter's Kit appears in Figure 1.

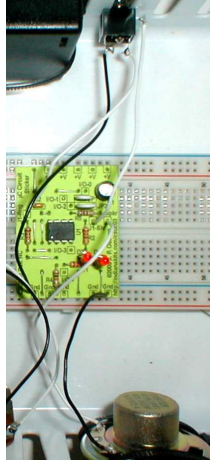


Figure 1 - KTUC03 PICAXE Experimenter's Kit

The KTUC03 Experimenter's Kit uses the ubiquitous PICAXE microcontroller chip.

2. Features

- ◇ Based on ubiquitous PICAXE microcontroller chip
- ◇ Programmable in the BASIC programming language
- ◇ Operates on 4.5 volts DC power
- ◇ 12 bit A/D converter with 3 channels
- ◇ 256 bytes nonvolatile memory
- ◇ Circuit Sticker construction on solderless breadboard
- ◇ Circuit Stickers reduce the chance of error compared to building on plain board
- ◇ Circuit Stickers look better compare to plain board
- ◇ Circuit Stickers make it easier to do repairs compared to plain board

3. Applications

- ◇ Numerous control and processing applications
- ◇ Tone generation
- ◇ Frequency counting
- ◇ Pulse length measurement
- ◇ Stepper motor control
- ◇ Data acquisition
- ◇ Timing
- ◇ Interface
- ◇ Something fun to build

4. Schematic

The schematic of the KTUC03 Experimenter's Kit appears in Figure 2.

5. Parts List

The parts list for KTUC03 Experimenter's Kit appears in Table 1.

6. Layout

The KTUC03 layout is shown in Figure 3.

7. Assembly Instructions

- ◇ Read all instructions before beginning assembly.
- ◇ Observe all safety precautions during assembly.
- ◇ Inventory parts before beginning assembly.
- ◇ Carefully remove the release paper from the Circuit Sticker and apply it to the solderless board properly aligned and orientated. See Figure 4..
- ◇ Using a sharp point make holes in the Circuit Sticker for the jumper and component leads.
- ◇ The bare wire jumpers are indicated on the Circuit Stickers by straight lines. Use recycled component leads or 22AWG solid wire to form the jumpers. See Figure 5 as an example.
- ◇ Install the resistors.
- ◇ Install the capacitors. Observe correct polarity on the electrolytic capacitor.
- ◇ Install the LEDs. One side of the LED is flat and should match the outline on the sticker.
- ◇ Inspect the board for wiring errors and incorrectly installed components. Correct any problems before proceeding.
- ◇ Install the solderless breadboard in the circuit tray. Remove the release paper from the back of the breadboard and stick it in centered in the tray.
- ◇ Install the battery holder in the circuit tray using 2 black wire ties in tandem. Make it so you can remove the battery holder by sliding the wire ties up to change the battery.
- ◇ Install the speaker in the circuit tray using 2 small white wire ties.
- ◇ Chassis wiring is summarized in Table 2. Use 22AWG solid wire. Determine wire lengths, cut, and strip wires. If any chassis parts require wires to be solder to them do so now. Make the connections per Table 2.
- ◇ The programming cable is wired as shown in Figure 6. After soldering the DB9 connector to the programming cable install the hood over the DB9 connector.
- ◇ Again inspect your work for incorrectly installed components, and incorrectly made connections.
- ◇ This completes assembly.

8. Test

- ◇ U1 is not installed.
- ◇ There are no batteries in the battery holder.
- ◇ Measure the resistance between +V and GND. What you measure will depend on what you're measuring with but it should be high indicating no shorts.
- ◇ Turn the switch off.
- ◇ Install fresh batteries in the battery holder observing correct polarity.
- ◇ Turn the switch on and measure the voltage between +V and GND. It should be the battery voltage,
- ◇ Turn the switch off.
- ◇ Install U1 observing correct orientation and being careful not to bend a pin.
- ◇ Download the PICAXE editor from <http://www.rev-ed.co.uk/picaxe/software.htm>
- ◇ Connect the programming cable to a computer running the PICAXE editor and to the J1 programming jack.

- ◇ Enter the test program shown in Figure 7 into the PICAXE editor.
- ◇ Turn the switch on.
- ◇ Load and run the test program. "Happy Birthday" should play continuously through the speaker while the LEDS toggle back and forth.
- ◇ Turn the switch off.
- ◇ This completes test.

9. Operation

Develop your programs using the PICAXE software. Load and run them as required. When finished don't forget to turn the unit off to keep from running the battery down.

To increase sound level decrease the value of R5. Increasing the value of R5 lowers the sound level.

Table 1 - KTUC03 PICAXE Experimenter's Kit Parts List

Item	Quantity	Reference	Description	Marking/Color
1	1	BT1	3AA holder	
2	1	C1	10uF	10uF
3	1	C2	0.01uF	103
4	2	D1,D2	LED	
5	1	J1	Program Jack	
6	1	LS1	SPEAKER	
7	2	R1,R2	220	red-red-brn
8	1	R3	22k	red-red-org
9	1	R4	10k	brn-blk-org
10	1	R5	100	brn-blk-brn
11	1	S1	SW SPST	part of BT1
12	1	U1	PICAXE-08M	12F683
13	1		Solderless Breadboard	
14	1		Circuit Sticker	CSUC03
15	1		Programming Cable	
16	1		DB9 female connector	
17	1		Hood for DB9 connector	
18	1		Circuit Tray	
19	2		Black Wire Ties	
20	2		Small White Wire Ties	

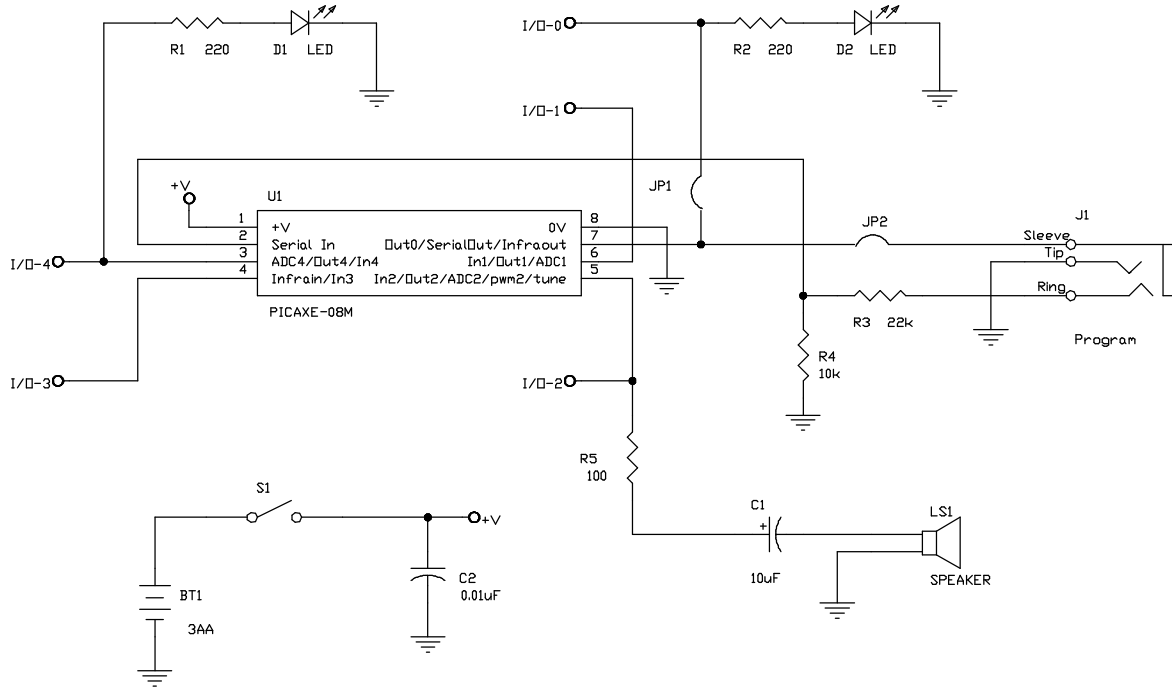


Figure 2 - KTUC03 PICAXE Experimenter's Kit Schematic

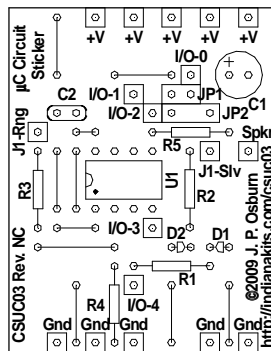


Figure 3 - CSUC03 Circuit Sticker

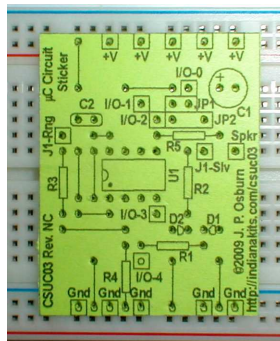


Figure 4 - CSUC03 Circuit Sticker on Solderless Breadboard

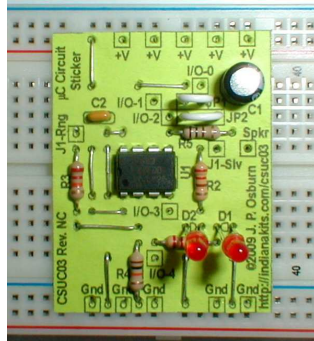


Figure 5 - CSUC03 Circuit Sticker Construction

Table 2 - Chassis Wiring

From	To	Wire Color
Battery Holder	+V	Red
Battery Holder	GND	Black
Speaker lug 1	SPKR	Yellow
Speaker lug 2	GND	Black
J1 tip lug	GND	Black
J1 ring lug	J1-Rng	White
J1 sleeve lug	J1-Slv	White

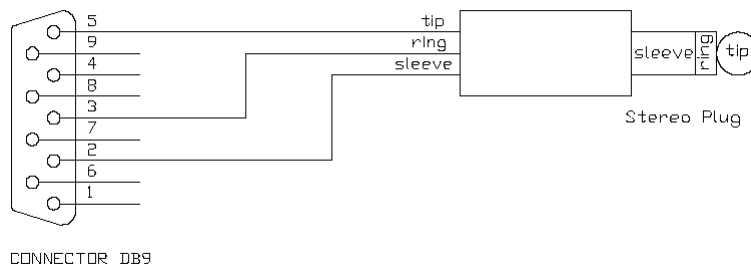


Figure 6 Programming Cable

Figure 7 - Test Program

```

test   play   0,3
       goto   test

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