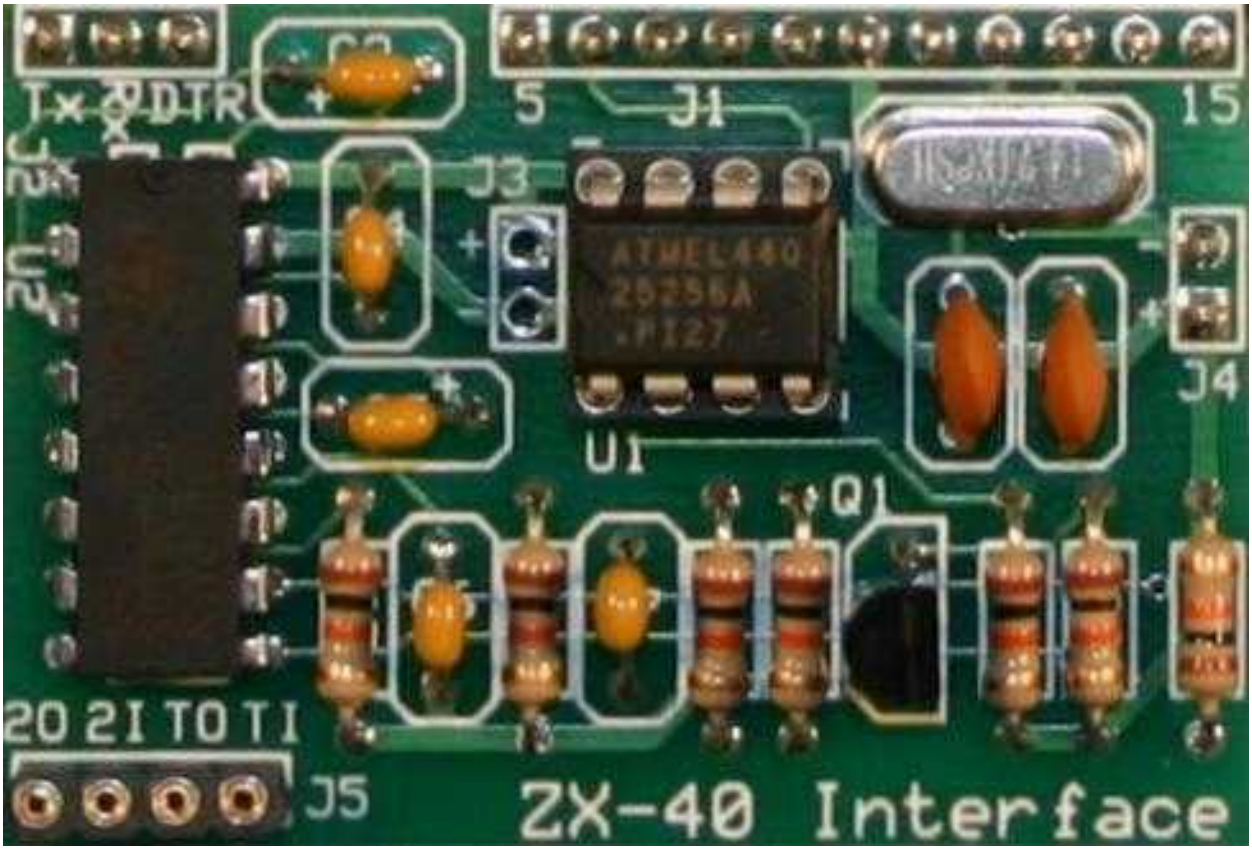
ZX-40 Interface Module
Reference Manual



Version 1.2

Publication History

January 2007 – First release
December 2008 – Minor corrections
March 2010 – Added additional assembly notes.

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ZX-40 Series Interface Module

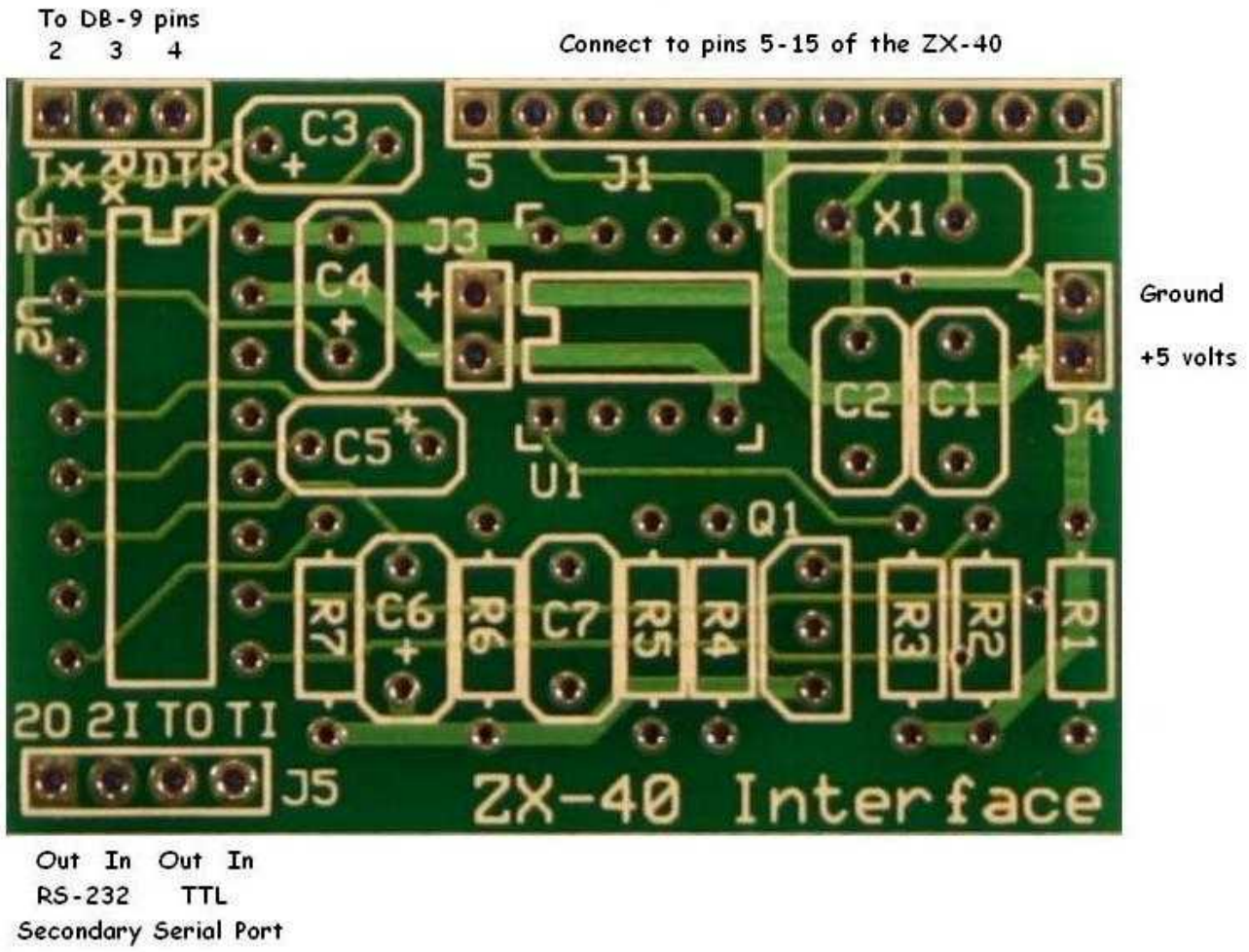
Introduction

The ZX-40 Interface Module (for brevity, Module hereafter) is intended to simplify the prototyping of a project using a ZX-40 series microcontroller. It provides most of the components (e.g. crystal, EEPROM, serial level converter) that are necessary to support a ZX-40 series device. It could also be used for a project employing a ZX-44 series device but it is more likely that one would use surface mount components in that case. Note that this Module may be used for ZX-40 series devices that require an external EEPROM as well as those that do not. In the latter case, U1 and R3 may be omitted.

The Module is provided as a kit to be assembled by the purchaser. It is designed to be plugged into a solderless breadboard but it may be wired directly to another circuit assembly if desired.

Connections and Jumpers

The Module connects to a ZX-40 series chip via J1. It also provides RS-232 signal level conversion for Com1 via J2 and supports two additional level conversion paths (one input and one output) via J5. The annotated image below illustrates the layout of the Module's PCB.



J1

The pins of J1, marked as 5 through 15, and are intended to be connected to the corresponding pins of a ZX-40 series device.

J2

These connections provide the RS-232 level signals which are usually connected to a DB-9 serial connector as indicated in the table. Note that pin 5 of the DB-9 must be connected to the same ground as the interface board itself.

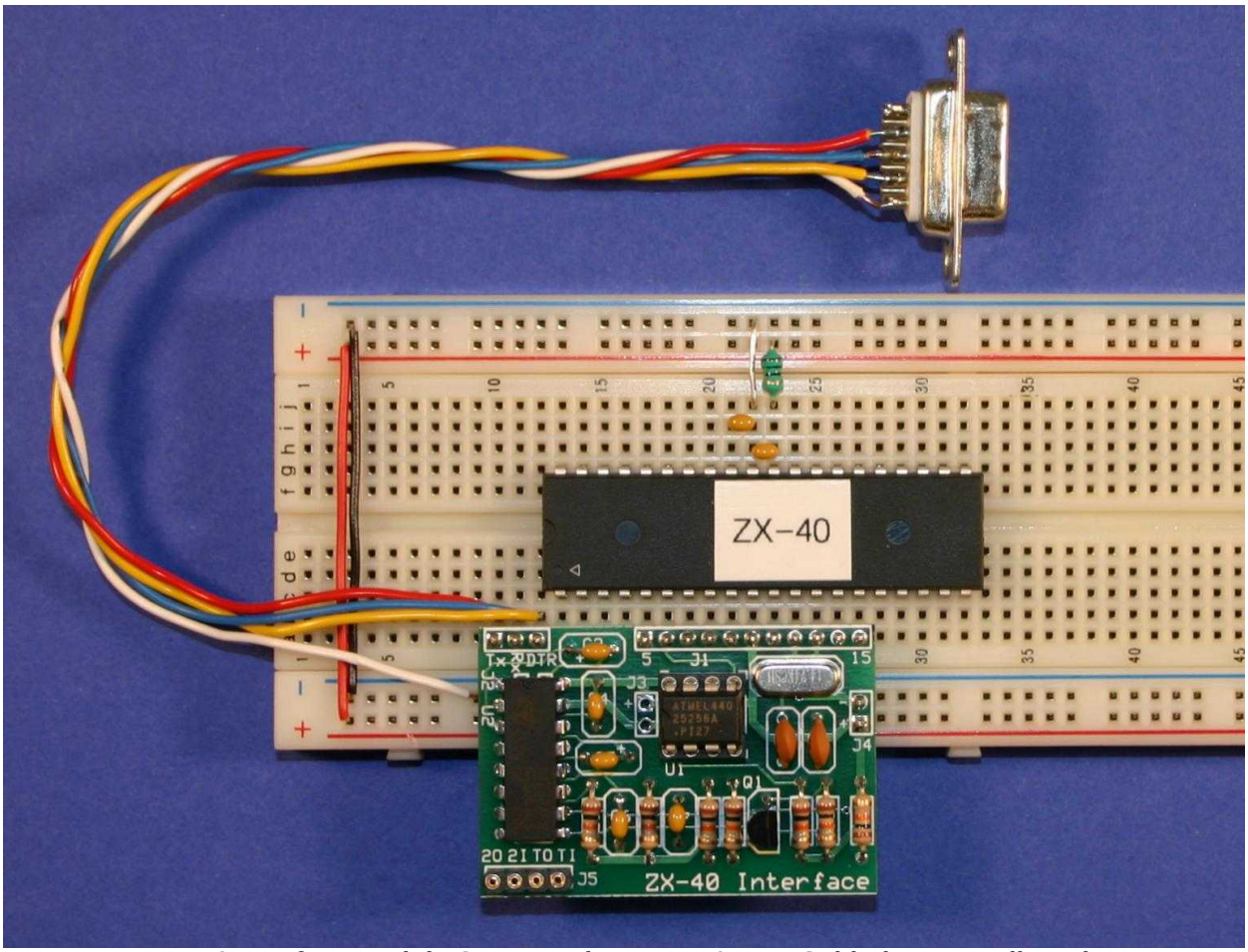
J2 Signals

Signal	Direction	DB-9 Pin	Description
TxD	Output	2	Transmit Data
RxD	Input	3	Receive Data
DTR	Input	4	ATN signal
	Common	5	RS-232 ground

J3, J4

Either of these connections may be used to convey power to the Module. Note that J3 and J4 are oriented backwards with respect to one another. In most cases, you will choose to use either J3 or J4, but not both, depending on how you connect the Module to the external circuitry.

The physical spacing of the holes of J1, J2, J3 and J4 is designed to mate to a standard solderless breadboard that has an array of holes on 0.100" centers. The spacing between the holes of J1/J2 and the closest hole of J3/J4 is 0.300". Note that the holes of J3/J4 align with the outermost holes of J2. Although many or most solderless breadboards are compatible with this physical layout, not all are so you'll need to check yours carefully before attempting to install the Module on the solderless breadboard. The picture below shows the Module with square pins installed and plugged into a compatible solderless breadboard.



ZX-40 Interface Module Connected to a ZX-40 on a Solderless Breadboard

J5

This connection may be used for the level conversion for a secondary serial. The TI and TO connections are the TTL input and output to the level converter while the 2I and 2O connections are the RS-232 level input and output. The picture on the preceding page shows the supplied SIP socket strip is installed in this connection. This facilitates connection by inserting wires (24 ga. maximum) into the sockets.

Assembly Procedure

The assembly sequence isn't critical so you may perform the steps in any convenient order. You may wish to use a socket (not included) for U1 and possibly for U2 as well. Doing so for U1 will make it easier to substitute a different EEPROM should you so choose. Note carefully the orientation marks for these ICs. Pin 1 of each has a square pad while the remaining ones are round. U1 and R3 may be omitted for ZX devices that do not need a serial EEPROM.

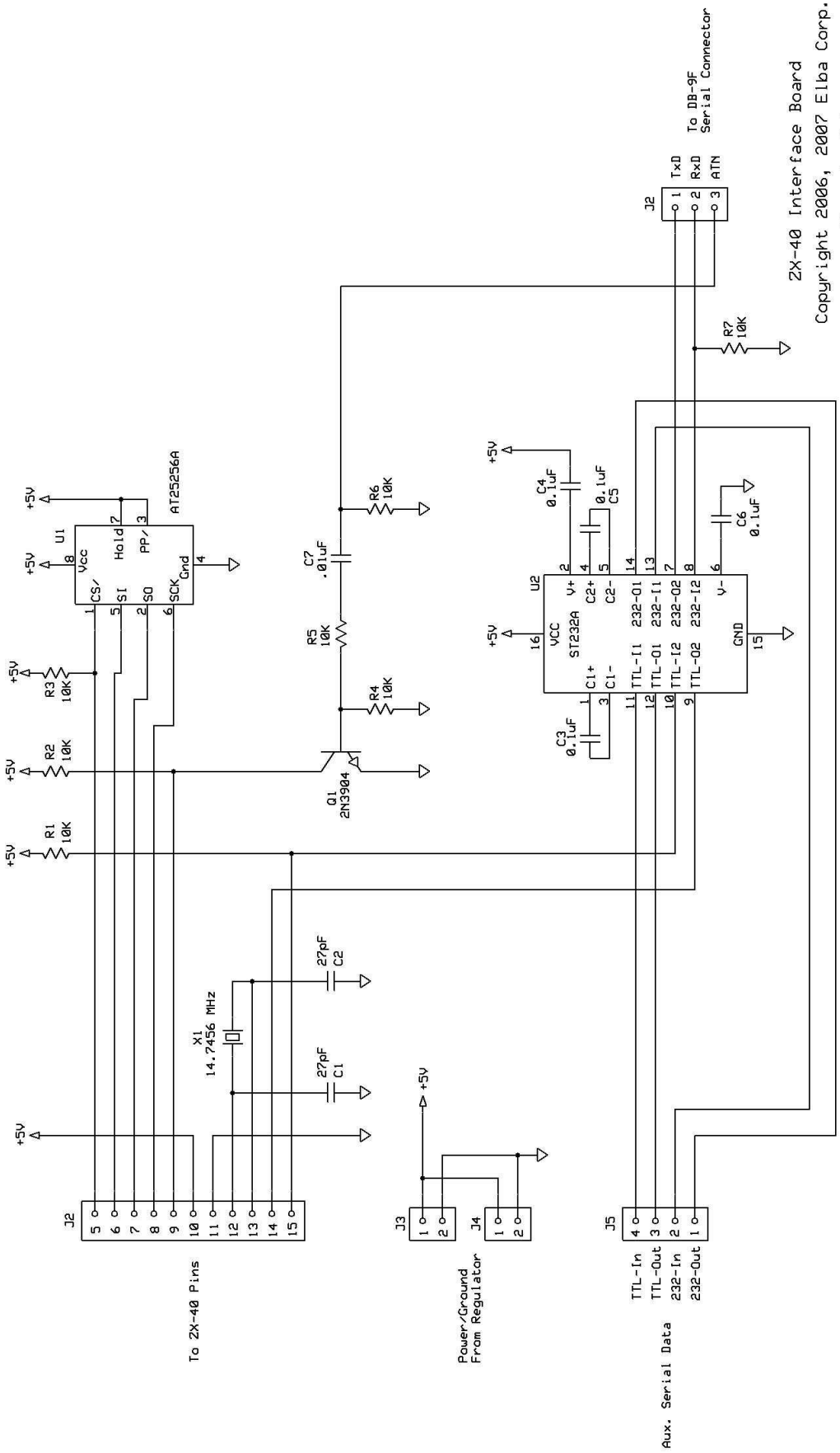
All resistors are the same value – 10K. The inductor, which looks similar to a resistor, is not mounted on the board. Rather, it is connected between +5 and pin 30 of the ZX-40/ZX-40a as shown in the photo on the previous page.

There are three different capacitor values in the kit. C1 and C2 are 27pF capacitors. They are marked simply with "27". C3 through C6 are 0.1uF capacitors, marked with "104". C7 is a 0.01uF capacitor, marked with "103". The remaining two capacitors, one 0.1uF and one 0.01uF, are filtering capacitors should be connected directly across pins of the ZX-40 on your breadboard as shown in the photo on the preceding page. The 0.1uF should be connected between pins 30 and 31 and the 0.01uF should be connected between pins 31 and 32. Pin 31 should also be grounded.

The transistor Q1 must be installed with its flat face toward R3. The crystal, X1, may be installed in either orientation.

If you plan to solder square pins to the board to connect the Module to a solderless breadboard, the simplest way to do so is to insert the square pins for J1, J2 and J3/J4 into the solderless breadboard and then place the board over the pins and solder them in place. This ensures that the pins are not misaligned. Whether you use J3 or J4 depends on how you configure the power and ground busses on your solderless breadboard.

Schematic



A larger version of this schematic is available at http://www.zbasic.net/doc/ZX-40_Interface/schematic.jpg.