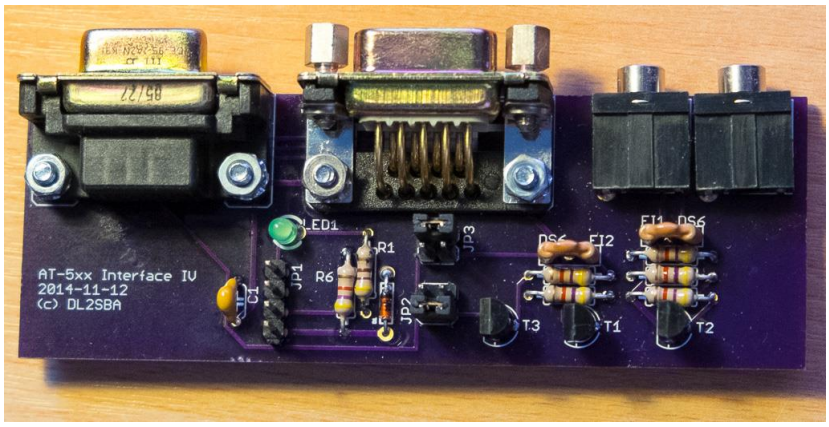

Serial transceiver interface for hamware tuners

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Content

Change history

Version	Date	Who	Changes
1.0	30. December 2014	DL2SBA	Initial version
1.1	14. April 2017	DL2SBA	Updated
1.2	4. February 2018	DL2SBA	Updated
1.3	10. February 2018	DL2SBA	Added images for new PCB layout

Remark: **Any changes that you make on the control unit of the AT-XXX, is at your own risk. Please note, in any case, the general guidelines for handling sensitive electronic equipment and components.**

Introduction

The original firmware for the HAMWARE AT-xxx tuner has a build in feature, which the frequency of a transmitter measures and according to the frequency, the correct memory channel is selected.

This feature works relatively well in CW mode, in SSB mode it's more or less useless. Using this feature in QRP modes did not work.

I have developed a new firmware for the AT-502/AT-515 and AT-615U controllers, which takes advantage of the computer interface of the transceiver to select the matching memory.

For this firmware, you can also get a PCB for a simple computer interface. You can integrate this PCB in the AT-XXX controller boxes.

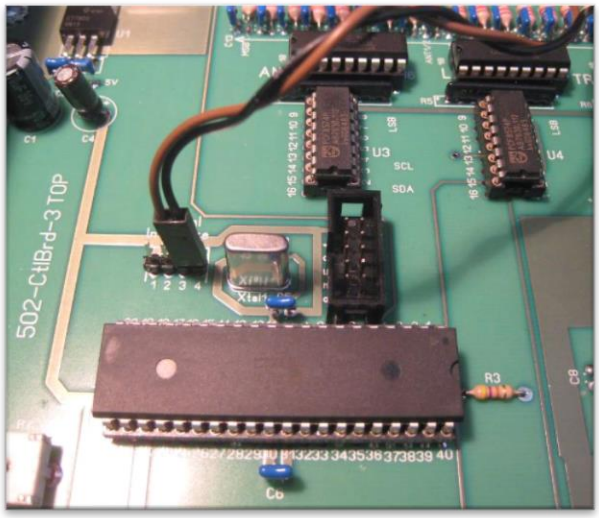
This interface is designed to communicate with transceivers either using an RS232/V.24[1] interface or using the ICOM CI-V[2] serial interface.

Note: It is not designed for other communication types like USB, LAN, …

Usage

Connect a 4-pin wire between JP1 on the interface board to the 4-pin connector on the controller board.

Ensure, that PIN1 of JP1 is connected to PIN1 on the controller board etc.



Place a jumper on JP2 whether a RS232 connection or a CI-V connection is needed. For location of JP2 see Figure 4 - PCB layout on page 8.

Place a jumper on JP3 whether the RS232 cable is wired as DTE or DCE. If you don't know, simply give it a try. For location of JP3 see Figure 4 - PCB layout on page 8.

[1] https://en.wikipedia.org/wiki/RS-232

[2] http://www.icomamerica.com/en/support/kb/article.aspx?ArticleNumber=63AE624429

Different board revisions

Some newer hardware revisions of the ATXXX control board do not have any more solder pads for the 4pin header available – I assume the manufacturer wants to reduce the copper on the board?!

Solution 1

For this type of board, three wires must be soldered directly to the board and connected to the interface board.

Signal	Pin of JP1 on interface board	Pin on ATMEGA controller chip on AT502 board
VCC (+5VDC)	1	10
RXD	3	14
GND	4	11

Note: Before soldering, remove the ATMEGA controller chip from the control board of the AT502 to avoid damages to the chip

Solution 2

For this solution, you must solder only one wire to the board. From PIN14 of the microcontroller to PIN3 on the ISP Connector.

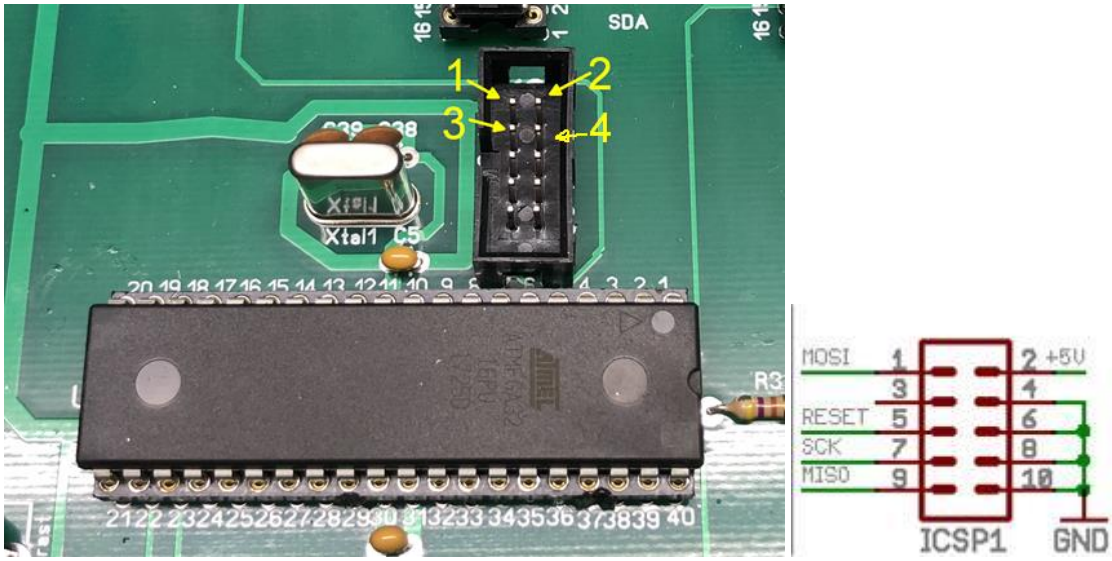


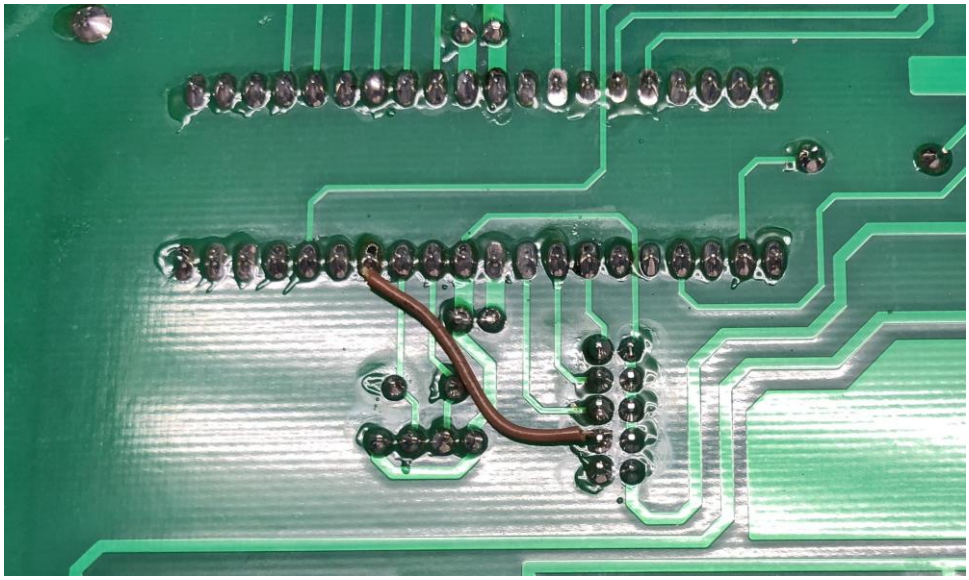
Figure 1 - Layout and PIN numbering of the ISP connector

Now connect the jumper wires like this:

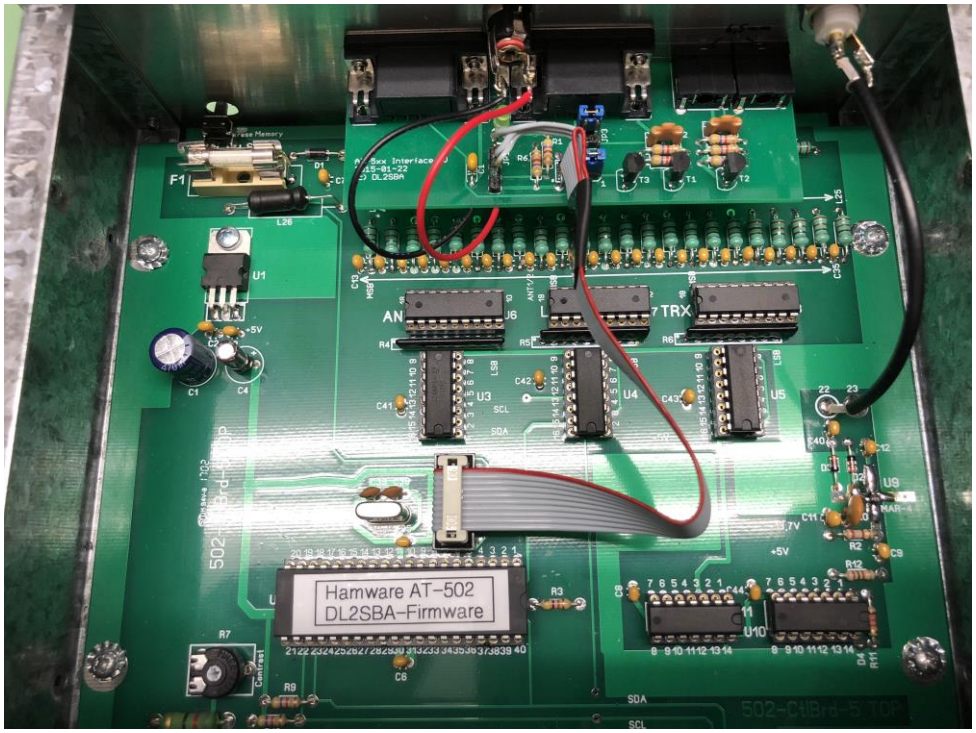
Signal	Pin of JP1 on interface board	Pin on ISP connector on AT502 board
VCC (+5VDC)	1	2
RXD	3	3
GND	4	4

Note: Before soldering, remove the ATMEGA controller chip from the control board of the AT502 to avoid damages to the chip

Here also some pictures showing this modification:



Picture © DL1SL



Picture © DL1SL

CI-V problems

If you've configured your transceiver and the interface board correctly but the LED1 is not flickering, it may be necessary to add an additional 1KOhm pullup resistor between R5 and +5V on the interface board.

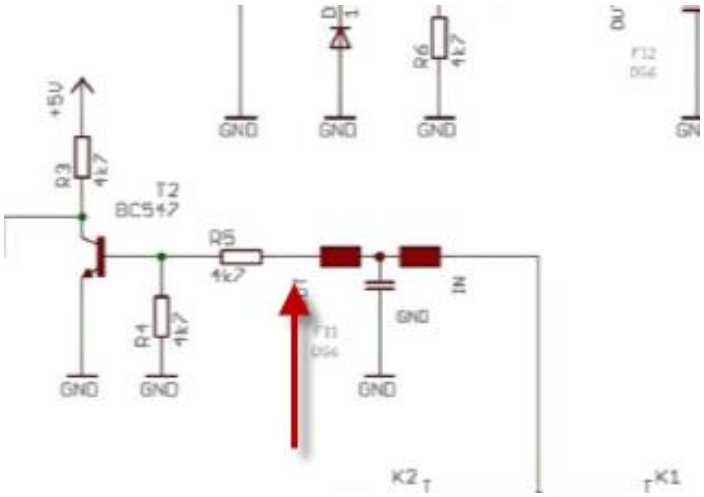


Figure 2 – Pullup resistor for CI-V bus

This usually has to be done, when the interface is the only device connected to the CI-V port of the transceiver. If there is already another (computer-) interface is connected to the transceiver, this pullup should not be necessary.

Circuit diagram

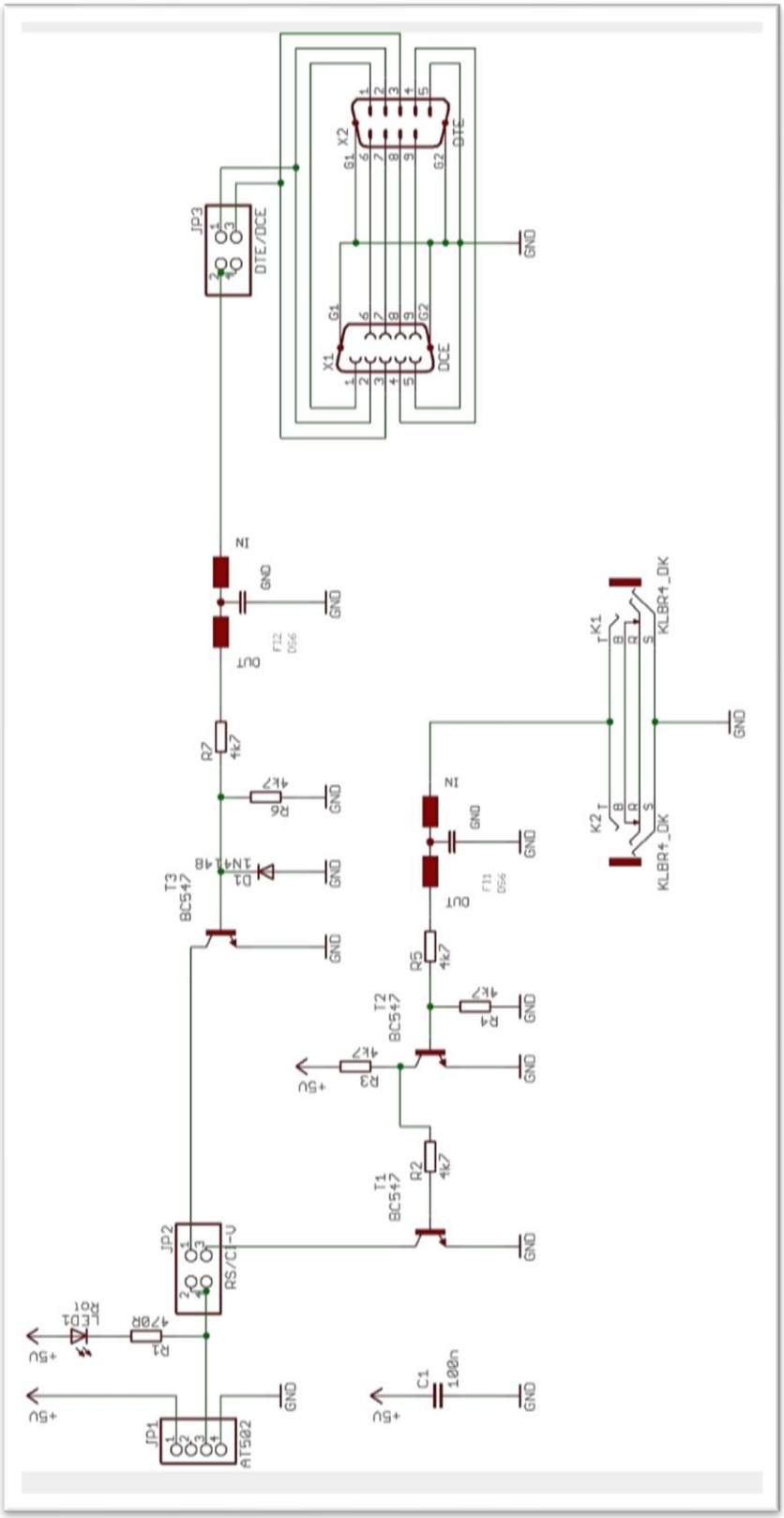


Figure 3 - Circuit diagram

PCB Layout

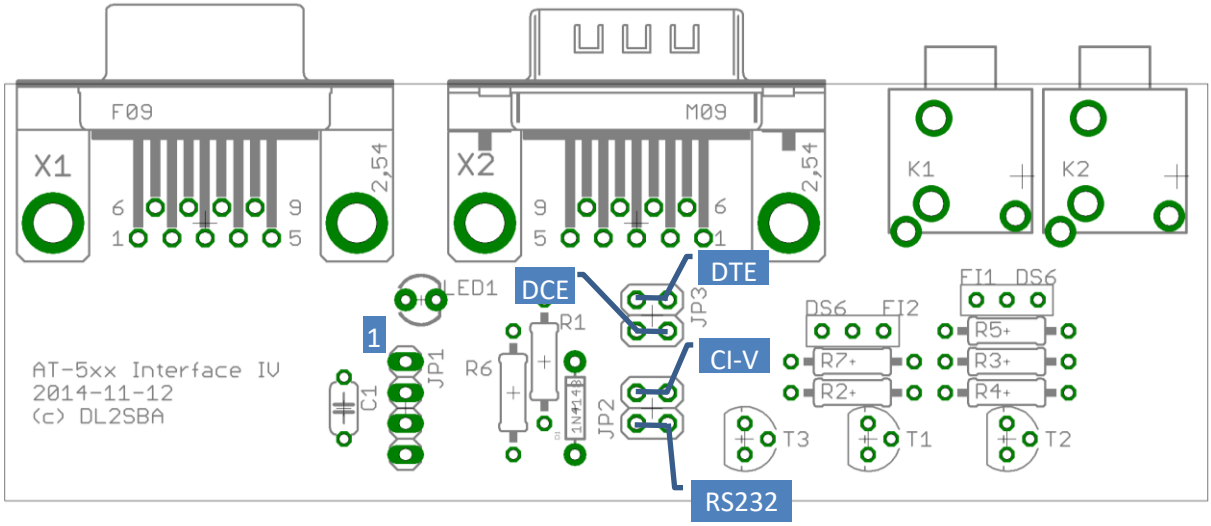


Figure 4 - PCB layout

Drill plan

You can use this plan, to integrate the interface in the backplane of your AT-XXX controller box:

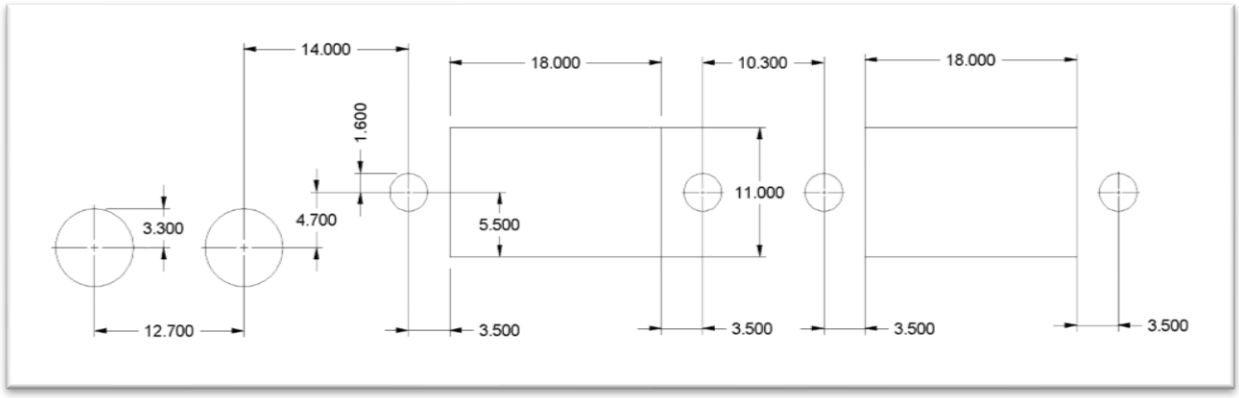


Figure 5 - Drill plan

Parts list

Part	*Value*	*Description*
C1	100n	Capacitor
D1	1N4148	Diode
FI1	DS6	RF filter
FI2	DS6	RF filter
JP1	AT502	Pin header 1X4
JP2	RS/CI-V	Pin header 2X2
JP3	DTE/DCE	Pin header 2X2
K1	KLBR4_DK	Lumberg 3.5mm stereo phone jack
K2	KLBR4_DK	Lumberg 3.5mm stereo phone jack
LED1	Rot	3mm led
R1	470R	Resistor
R2	4k7	Resistor
R3	4k7	Resistor
R4	4k7	Resistor
R5	4k7	Resistor
R6	4k7	Resistor
R7	4k7	Resistor
T1	BC547	Transistor
T2	BC547	Transistor
T3	BC547	Transistor
X1	DCE	DB9SUB Female
X2	DTE	DB9SUB Male
PCB	PCB	PCB Version 2014-11-12

Table 1 - Parts List

Links

http://hamware.de	Manufacturer of the tuner
http://www.dl2sba.de	Manufacturer of the new firmware for the hamware tuners