

# TrxAVR B INTERFACE BOARD

Combined TrxAVR-b and front panel board for graphics LCD's

01-08-09  
18-08-09  
26-08-09

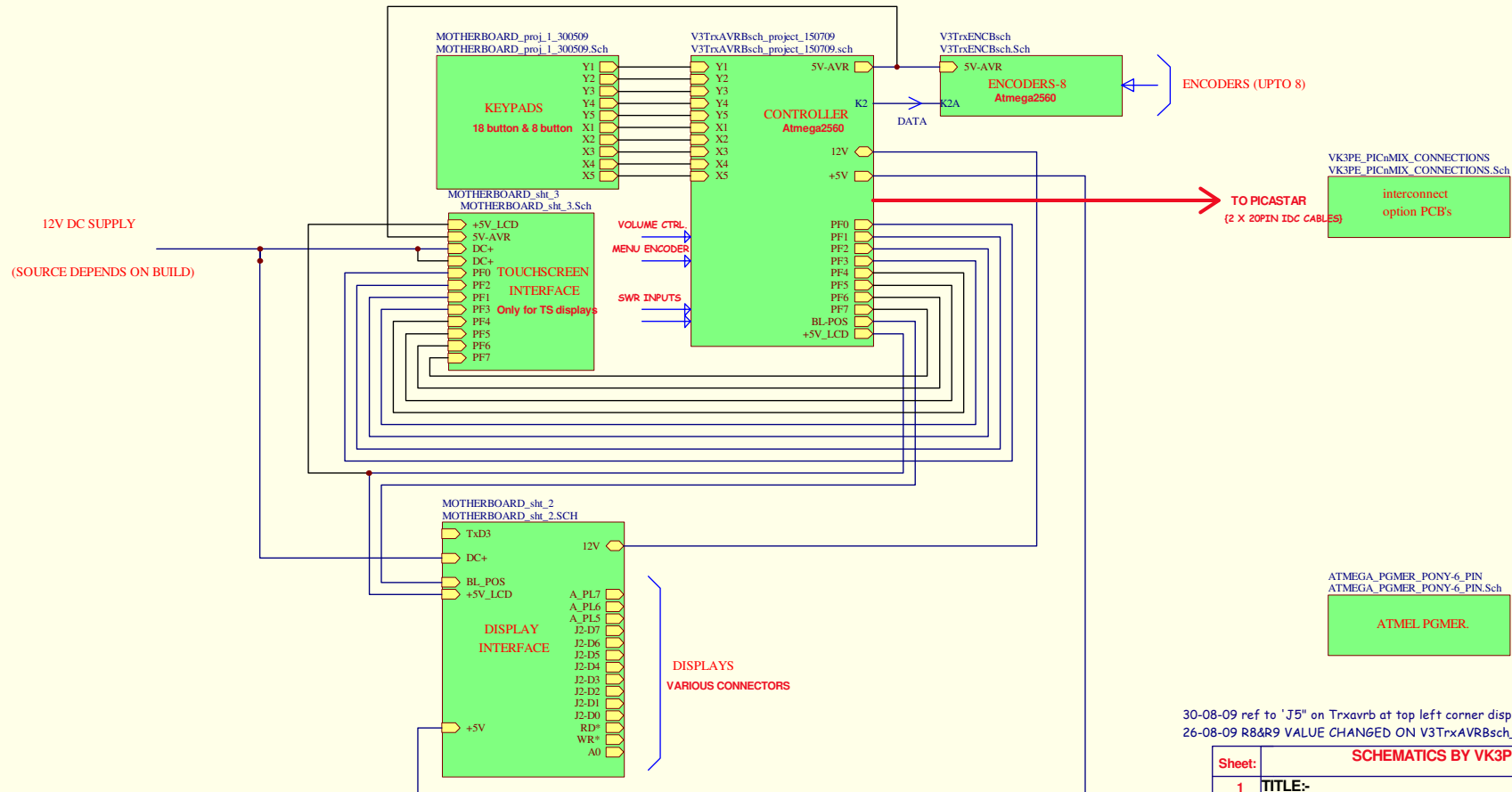
TrxAVRB and interface board for PICASTAR

TrxAVR is an exciting new development to allow the use of graphics or text based LCD modules to be used on PICaSTAR. The Picmix used in PICaSTAR is replaced by TrxAVR.

The design and software is by Ian, G3VPX. Ian has a web page detailing his TrxAVR design and software.  
[http://www.homebrew-radios.net/trxavr\\_picastar/trxavr\\_picastar.htm](http://www.homebrew-radios.net/trxavr_picastar/trxavr_picastar.htm)

THE SCHEMATICS GIVEN HERE ARE A COMPILATION SPECIFIC TO THE INTERFACE BOARD DESIGNED BY VK3PE IN JUNE 2009, BUT ARE BASED ON Ian's SCHEMATICS.

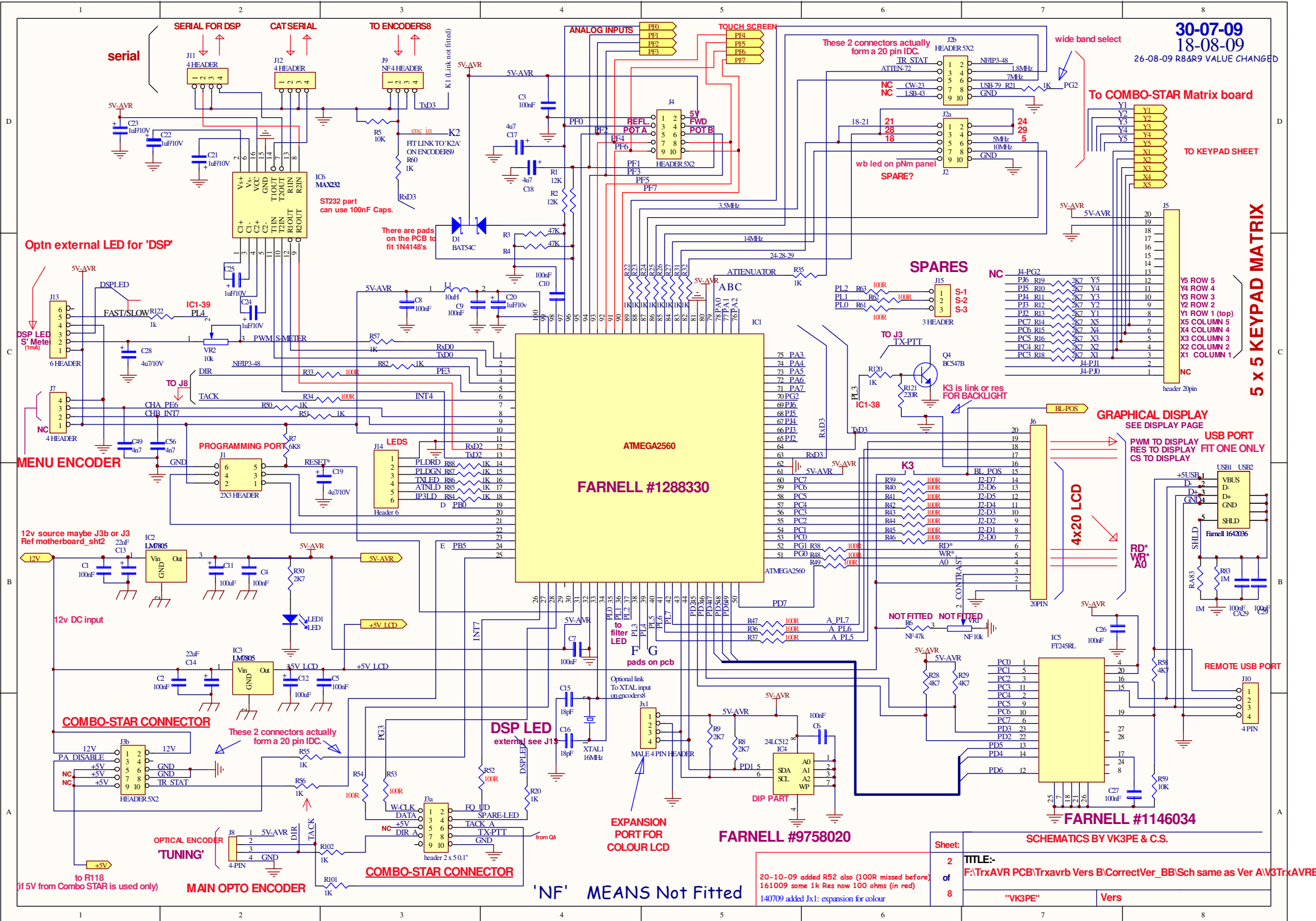
PLEASE NOTE: Any part numbers given in this document are believed to be correct but you should verify them before purchasing any items.



30-08-09 ref to 'J5' on Trxavrb at top left corner display connector sheet, is now J6  
26-08-09 R8&R9 VALUE CHANGED ON V3TrxAVRBsch\_PROJECT SHEET

Sheet:	SCHEMATICS BY VK3PE & C.S.	
1 of 6	TITLE:- F:\TrxAVR PCB\Trxavrb Vers B\CorrectVer_BB\Sch same as Ver A\TRXAVR-C_Pro	
	"VK3PE"	Vers

30-07-09  
18-08-09  
26-08-09 R8&R9 VALUE CHANGED



5 x 5 KEYPAD MATRIX

To COMBO-STAR Matrix board  
TO KEYPAD SHEET

Y5 ROW 5	Y1
Y4 ROW 4	Y2
Y3 ROW 3	Y3
Y2 ROW 2	Y4
Y1 ROW 1 (top)	Y5
X5 COLUMN 5	X1
X4 COLUMN 4	X2
X3 COLUMN 3	X3
X2 COLUMN 2	X4
X1 COLUMN 1	X5

GRAPHICAL DISPLAY  
SEE DISPLAY PAGE  
PWM TO DISPLAY  
RES TO DISPLAY  
CS TO DISPLAY

REMOTE USB PORT

Sheet:	2	TITLE:-	F:\TrxAVR PCB\Trxavr Vers B\CorrectVer_BB\Sch same as Ver A\V3TrxAVRBSch.p
of	8		
		"VK3PE"	Vers

20-10-09 added R52 also (100R missed before)  
161009 some 1k Res now 100 ohms (in red)  
140709 added Jx1: expansion for colour

'NF' MEANS Not Fitted

SCHMATICS BY VK3PE & C.S.

FARNELL #9758020

FARNELL #1146034

ATMEGA2560  
FARNELL #1288330

Optn external LED for 'DSP'

MENU ENCODER

COMBO-STAR CONNECTOR

OPTICAL ENCODER  
'TUNING'

COMBO-STAR CONNECTOR

DSP LED  
external see J13

EXPANSION PORT FOR COLOUR LCD

SPARES

TO J3 TX-PTT

TO J5 3-HEADER

TO J6 BL-POS

TO J7 PROGRAMMING PORT

TO J8 CHA PE6

TO J9 NF4-HEADER

TO J10 4-PIN

TO J11 4-HEADER

TO J12 4-HEADER

TO J13 6-HEADER

TO J14 6-HEADER

TO J15 20-PIN

TO J16 20-PIN

TO J17 20-PIN

TO J18 20-PIN

TO J19 20-PIN

TO J20 20-PIN

TO J21 20-PIN

TO J22 20-PIN

TO J23 20-PIN

TO J24 20-PIN

TO J25 20-PIN

TO J26 20-PIN

TO J27 20-PIN

TO J28 20-PIN

TO J29 20-PIN

TO J30 20-PIN

# G3VPX's TrxAVRB, OPTIONAL, FOR TOUCH SCREEN ONLY

31-08-09

IF TOUCH SCREEN IS NOT USED, THEN DO NOT LOAD THESE PARTS:

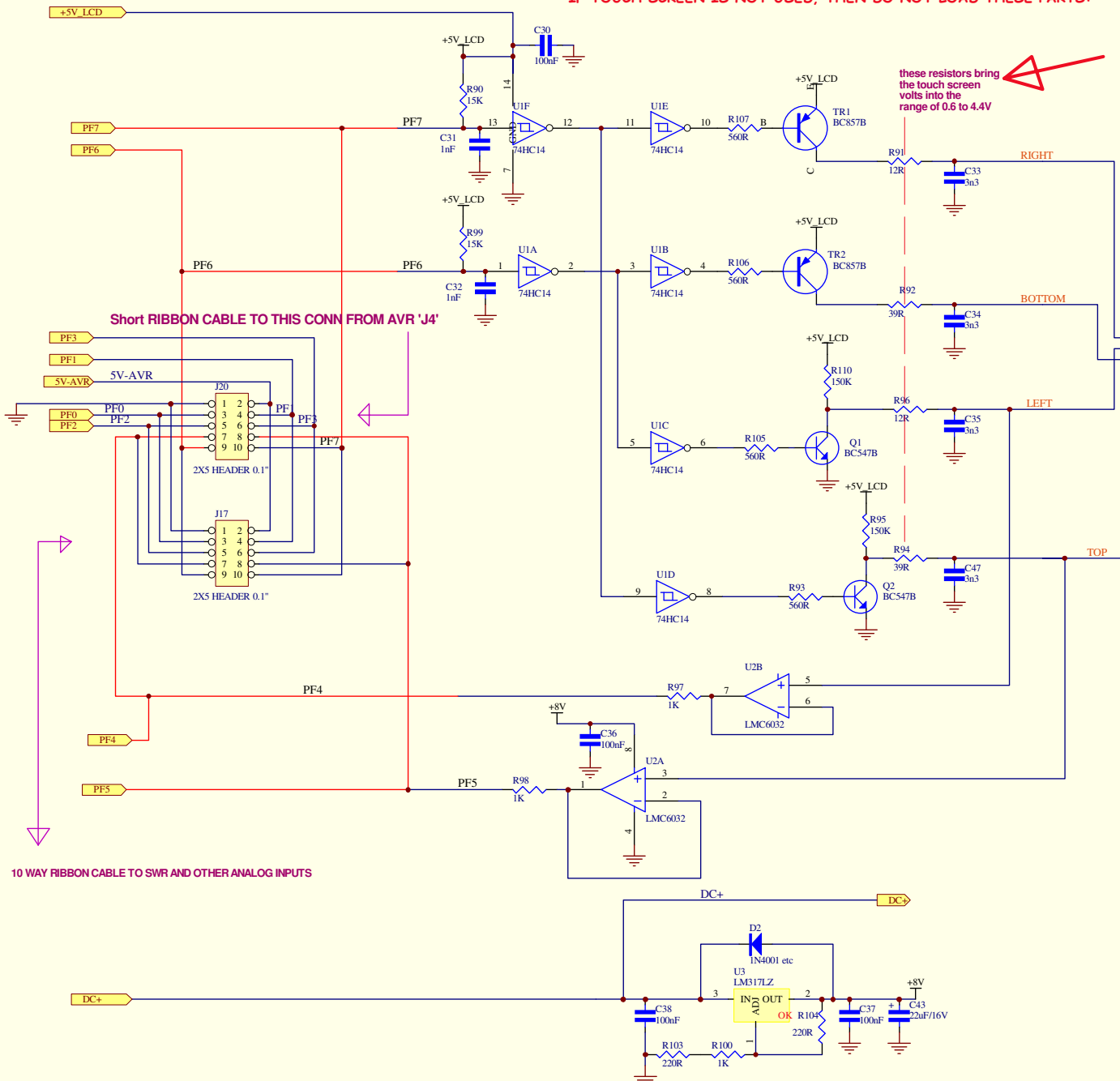
THE VALUES USED HERE MAY NEED CHANGING FOR THE DISPLAY YOU USE !

The calculation I use to get the approximate value of the resistors is the resistance of the touch screen divided by 10 (ie.  $(X2 - X1)/10$  and  $(Y2 - Y1)/10$ ).

For the CrystalFontz touchscreen display, the X resistance is about 666 ohms and the Y resistance about 374 ohms. I used R91 & R96 (R25 & R27 on Ian's PCB) = 680ohms and R92 & R94 (R24 & R26 on Ian's PCB) = 36 ohms. (I am still mystified why the X resistance is smaller than the Y resistance on the touch screen Ian used.)

For the touch screen's from IIIC, the X resistance is about 754 ohms and the Y resistance about 304 ohms. As I am swapping between various displays, I kept using the above values as it was "close" enough and saved me making changes. However, if I was only using this touch screen I would use R91 & R96 = 750ohms and R92 & R94 = 30 ohms (or close to these values).

Regards  
Gerard (vk3cg/vk3grs)  
31-08-09



TOUCH SCREEN

PINOUT ONLY FOR CF TS DISPLAY

NOTE:- CONNECTIONS MAY NOT BE IN CORRECT ORDER FOR YOUR Display!  
YOU MAY NEED TO MAKE A SHORT ADAPTER CABLE FOR YOUR DISPLAY TYPE. (REFER TO DISPLAY DATA SHEET)

0.1" X 4 PIN SIP RIGHT ANGLE MALE

REFERENCE:-  
'TrxAVRB 18-button board and motherboard' diagram by G3VPX

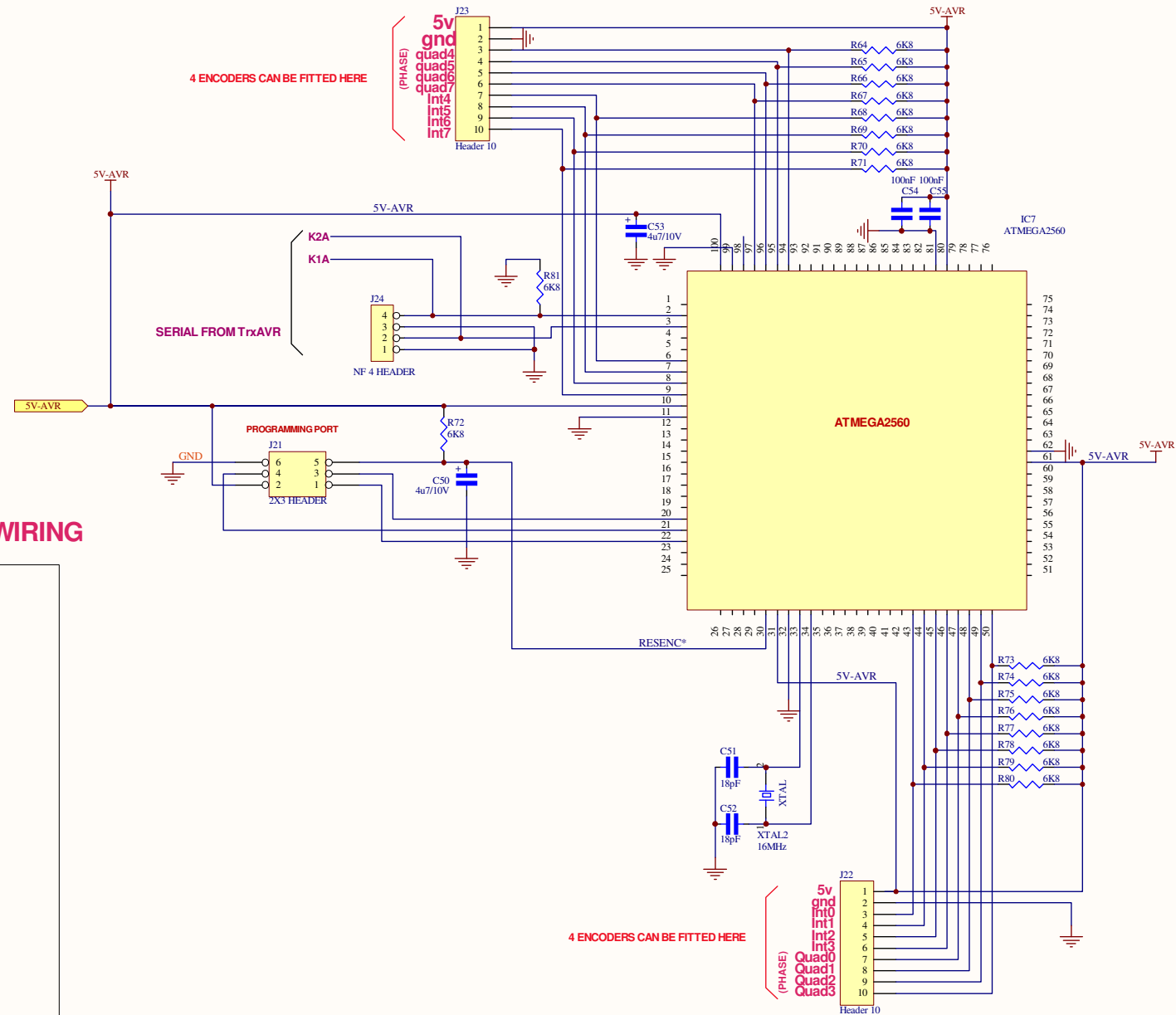
31-08-09 NOTE added re the Touchscreen 'X' and 'Y' values

Sheet:	SCHEMATICS BY VK3PE & C.S.	
5 of 8	TITLE:- F:\TrxAVRB PCB\Trxavrb Vers B\CorrectVer_BB\Sch same as Ver A\MOTHERBOARD	
	"VK3PE"	Vers

'NF' MEANS Not Fitted

# G3VPX's TRXAVR:- OPTIONAL: FOR ENCODER-8 INTERFACE

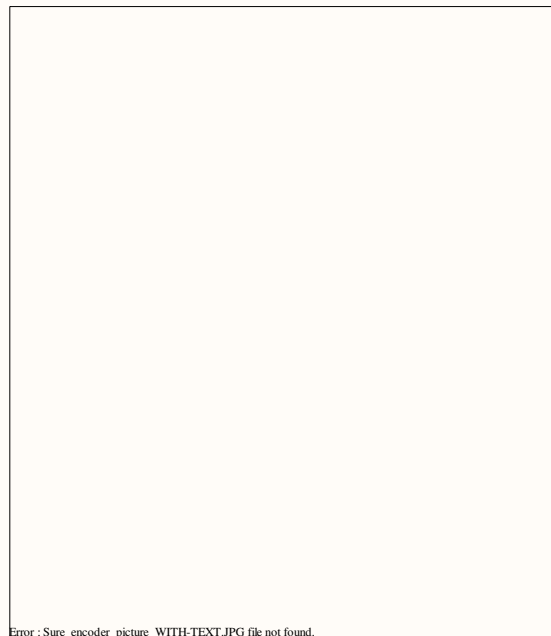
18-08-09



4 ENCODERS CAN BE FITTED HERE

4 ENCODERS CAN BE FITTED HERE

SURE ELECTRONICS ENCODER WIRING



Error : Sure\_encoder\_picture\_WITH-TEXT.JPG file not found.

'NF' MEANS Not Fitted

Sheet:	SCHEMATICS BY VK3PE & C.S.	
3	TITLE:-	
of	F:\TrxAVR PCB\Trxavr Vers B\CorrectVer_BB\Sch same as Ver A\V3TrxENCBSch	
8	"VK3PE"	Vers

0712080603 parts

# TrxAVRB DISPLAY CONNECTORS

Colour TFT displays connect to 'Jx1' connector on the TrxAVR sheet.

21-07-09  
19-08-09  
30-08-09

Connector for ebay Graphics display  
Also 2 X 40 LCD or 4 X 20  
and 128x64 types.

CRYSTALFONTZ 'LARGE' Touch Screen  
**DISPLAY HEADER**  
EQUIVALENT TO EA320  
eg. White on Blue & TouchScreen:- CFAG320240-CX-TFH-TS

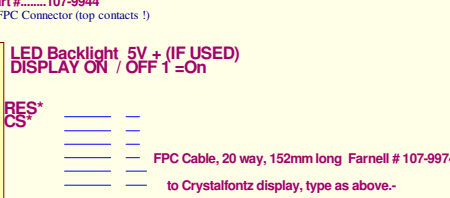
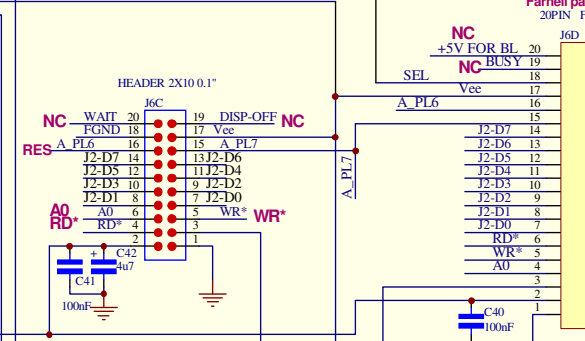
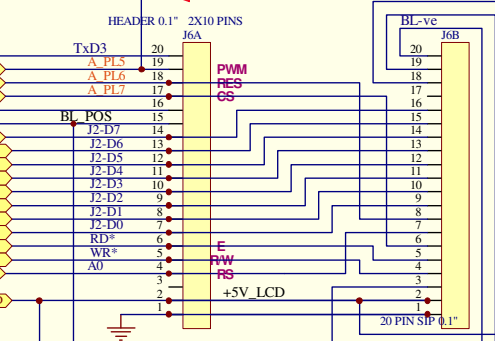
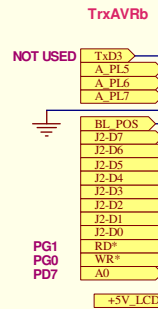
SMALLER NON TOUCH  
CRYSTALFONTZ 'FP' CONNECTOR  
TOP CONTACT TYPE OF FPC CONNECTOR.  
YELLOW/GREEN Display:- CFAG320240K-YYH-TZ?  
(NOT RECOMMENDED)

Refer to Bill of Material for other displays.

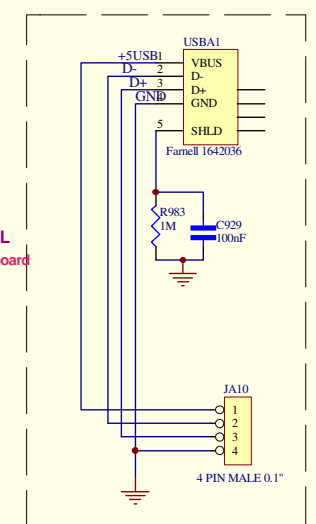
THERE IS A SHORT 20 WAY  
IDC CABLE FROM J6 ON TrxAVR SECTION  
TO J6A CONNECTOR  
NOT NEEDED IF COLOUR DISPLAY USED

this 2x20 pin IDC Conn duplicates the TrxAVRb conn

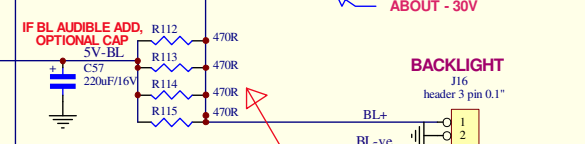
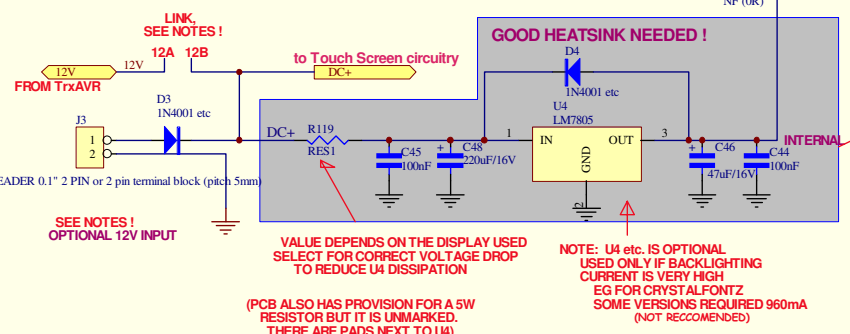
FROM TrxAVR, J6



ALTERNATE USB SUB-BOARD FOR REMOTE MOUNTING



FOR Combo STAR 'ONLY',  
'+5V' COMES FROM THE Combo 5V REGULATOR  
WHICH IS UNUSED when TrxAVRB is fitted.  
IF Combo, FIT 'R118' AND REMOVE 'U4'



BACKLIGHT  
CF LCD HAS SEPARATE INPUT FOR BL  
but must remove 2 x 0R resistors on the board  
RESISTOR VALUES DEPEND ON THE ACTUAL DISPLAY.  
THE VALUES HERE ARE FOR THE ebay DISPLAY.  
WHICH GIVES BACKLIGHT CURRENT OF ~54mA.  
(Absolute Max. current for the display is 220mA)  
Duty cycle sets the BL brightness.

COLOUR SCREEN IS UNDER DEVELOPMENT BY Ian, 63VPX  
AT TIME OF COMPILING THIS DOCUMENT IT I NOT FINISHED.  
HOWEVER, THE CONNECTION FOR THE COLOUR SCREEN IS BY 4 PIN CONNECTOR, Jx1  
ON THE TrxAVRB SHEET

30-08-09 ref to 'J5' on Trxavr at top left corner is now J6  
21-07-09 CORRECTED J6B A0/WR LINES & ADDED C57

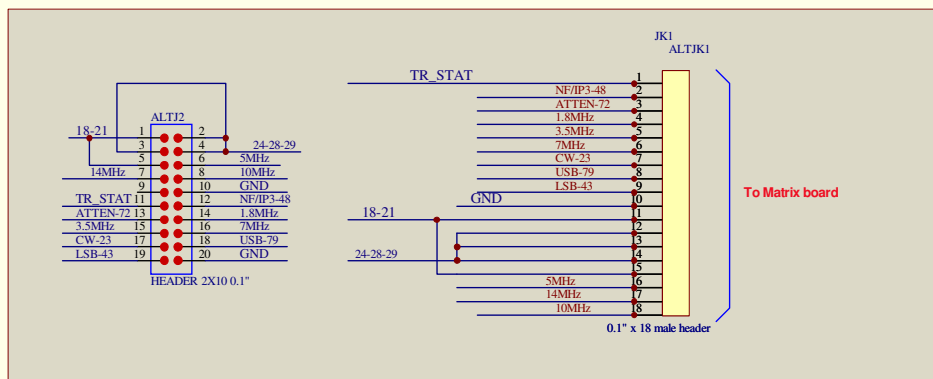
SCHEMATICS BY VK3PE & C.S.

Sheet:	6	TITLE:-	F:\TrxAVR PCB\Trxavr Vers B\CorrectVer_BB\Sch same as Ver A\MOTHERBOARD
of	8	"VK3PE"	Vers

'NF' MEANS Not Fitted

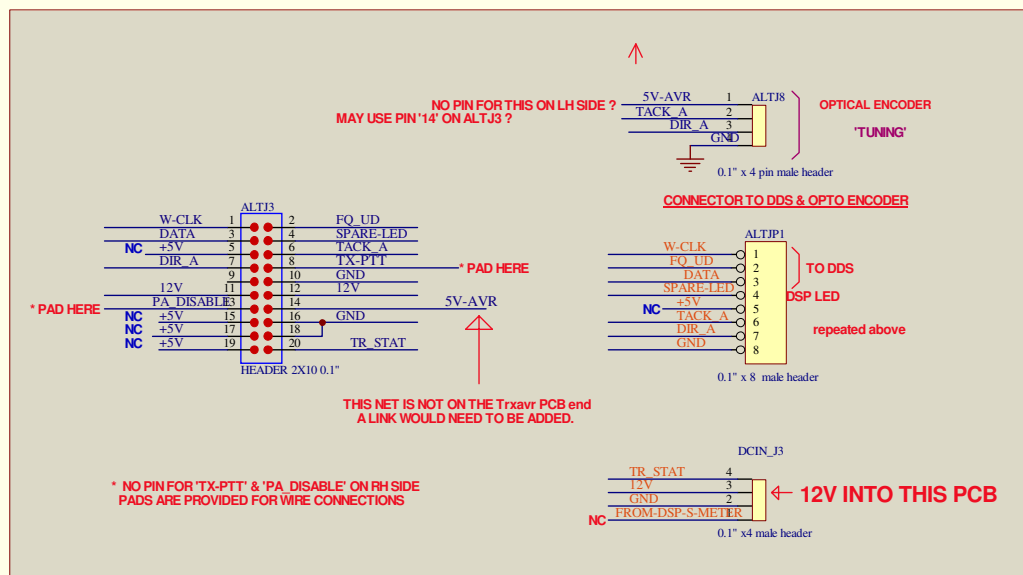
# PICNMIX (VK3PE VERSION) INTERFACE ADAPTER BOARDS FOR PICASTAR

30-07-09



2 x 20 way IDC cables to TrxAVRB

TrxAVR  
VK3PE interface



PICASTAR SIDE

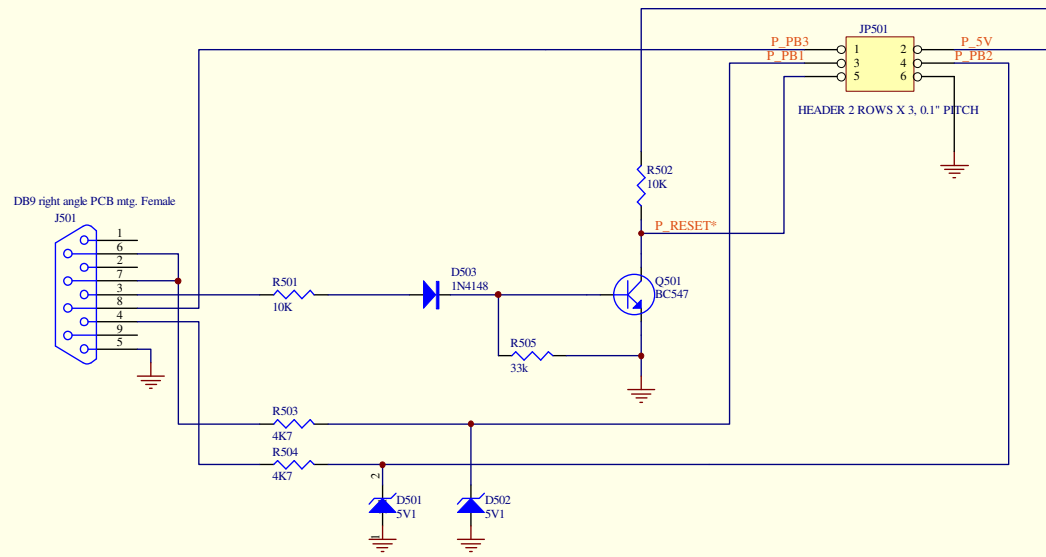
NOTE:- Connectors on right side suit VK3PE Picastar PCB's

for other PCB's,  
cables will need to be made  
or wires terminated into the 'connector' holes.

'NF' MEANS Not Fitted

Sheet:	SCHEMATICS BY VK3PE & C.S.	
7	TITLE:-	
of	F:\TrxAVR PCB\Trxavr Vers B\CorrectVer_BB\Sch same as Ver A\VK3PE_PICNMIX	
8	"VK3PE"	Vers

# ATMEL PROGRAMMER - PONYPROG



220609 6 PIN VERSION ONLY

'NF' MEANS Not Fitted

Sheet:	SCHEMATICS BY VK3PE & C.S.	
8	TITLE:-	
of	F:\TrxAVR PCB\Trxavrb Vers B\CorrectVer_BB\Sch same as Ver A\ATMEGA_PGM	
8	"VK3PE"	Vers

# KEYPADS FOR G3VPX's TrxAVR

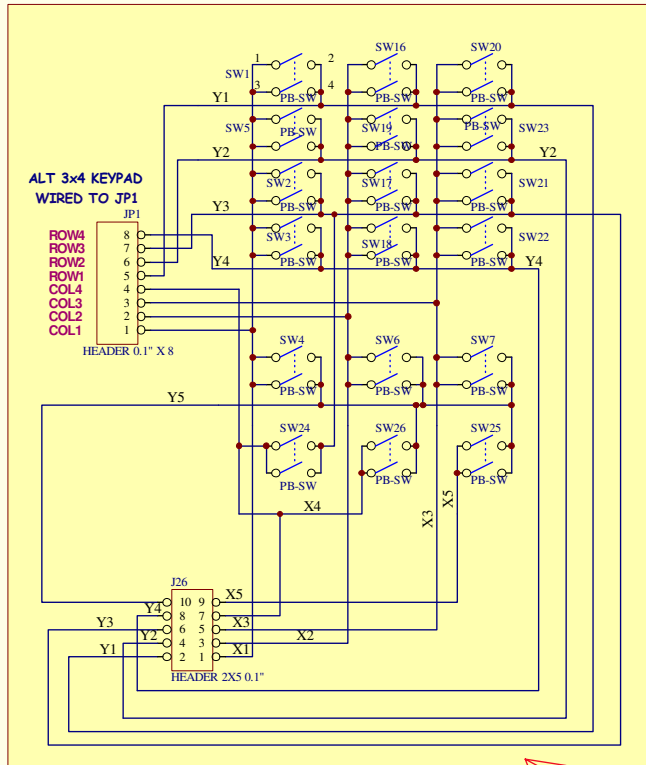
{ VK3PE }

21-07-09

## 16 KEYPAD (SUB PCB)

## 8 BUTTON SUB PCB (small display)

## 8 BUTTON SUB PCB (large display)

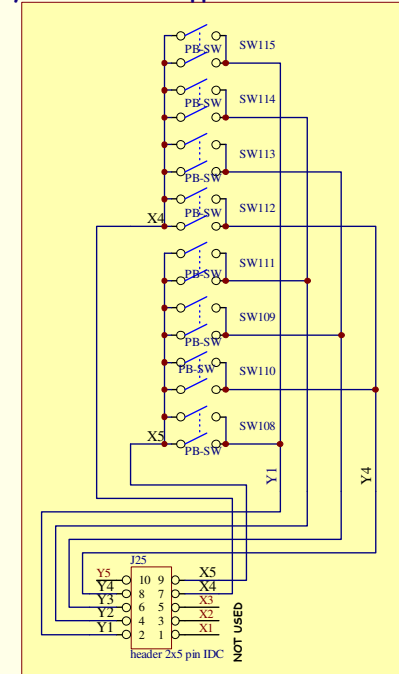
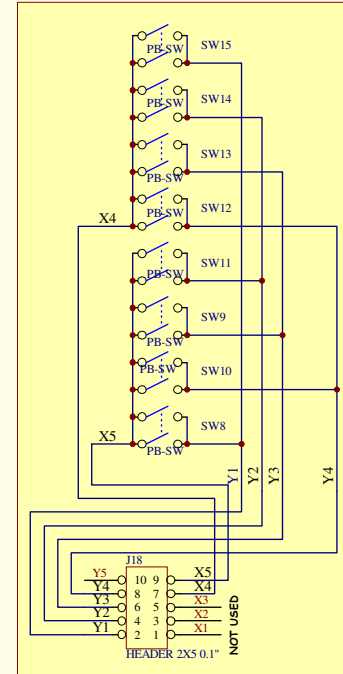


IF A COMMERCIAL 3x4 KEYPAD IS USED FOR THE UPPER 12 KEYS, THEN JP1 IS USED TO CONNECT TO THE 3x4 KEYPAD. (CHECK YOUR KEYPAD FOR DETAILS)

Wire links must be used, as keyboard pinout varies.

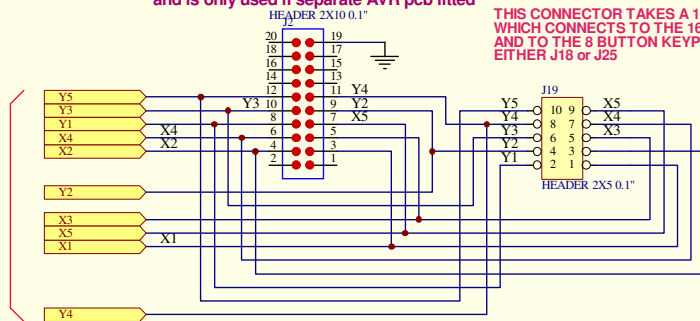
IF A COMMERCIAL 4x4 KEYPAD IS USED, THEN THIS PCB IS NOT REQUIRED. THE 4x4 KEYPAD WILL NEED TO BE WIRED TO J19.

NOTE ! This is the same PCB, simply loaded on the opposite side.



This conn. duplicates J5 on the AVR-B pcb and is only used if separate AVR pcb fitted

THIS CONNECTOR TAKES A 10 WAY RIBBON CABLE WHICH CONNECTS TO THE 16 KEYPAD, J26 AND TO THE 8 BUTTON KEYPAD (ONE ONLY) EITHER J18 or J25



FROM TrxAVRB, J5

I/F TO TrxAVR-B PCB

'NF' MEANS Not Fitted

F:\TrxAVR PCB\Trxavr Vers B\CorrectVer\_BB\Sch same as Ver A\MOTHERBOARD\_proj\_1\_300509.Sch

Sheet:	SCHEMATICS BY VK3PE & C.S.	
4 of 8	TITLE:-	F:\TrxAVR PCB\Trxavr Vers B\CorrectVer_BB\Sch same as Ver A\MOTHERBOARD
	"VK3PE"	Vers