

TrxAVR B INTERFACE BOARD

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

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

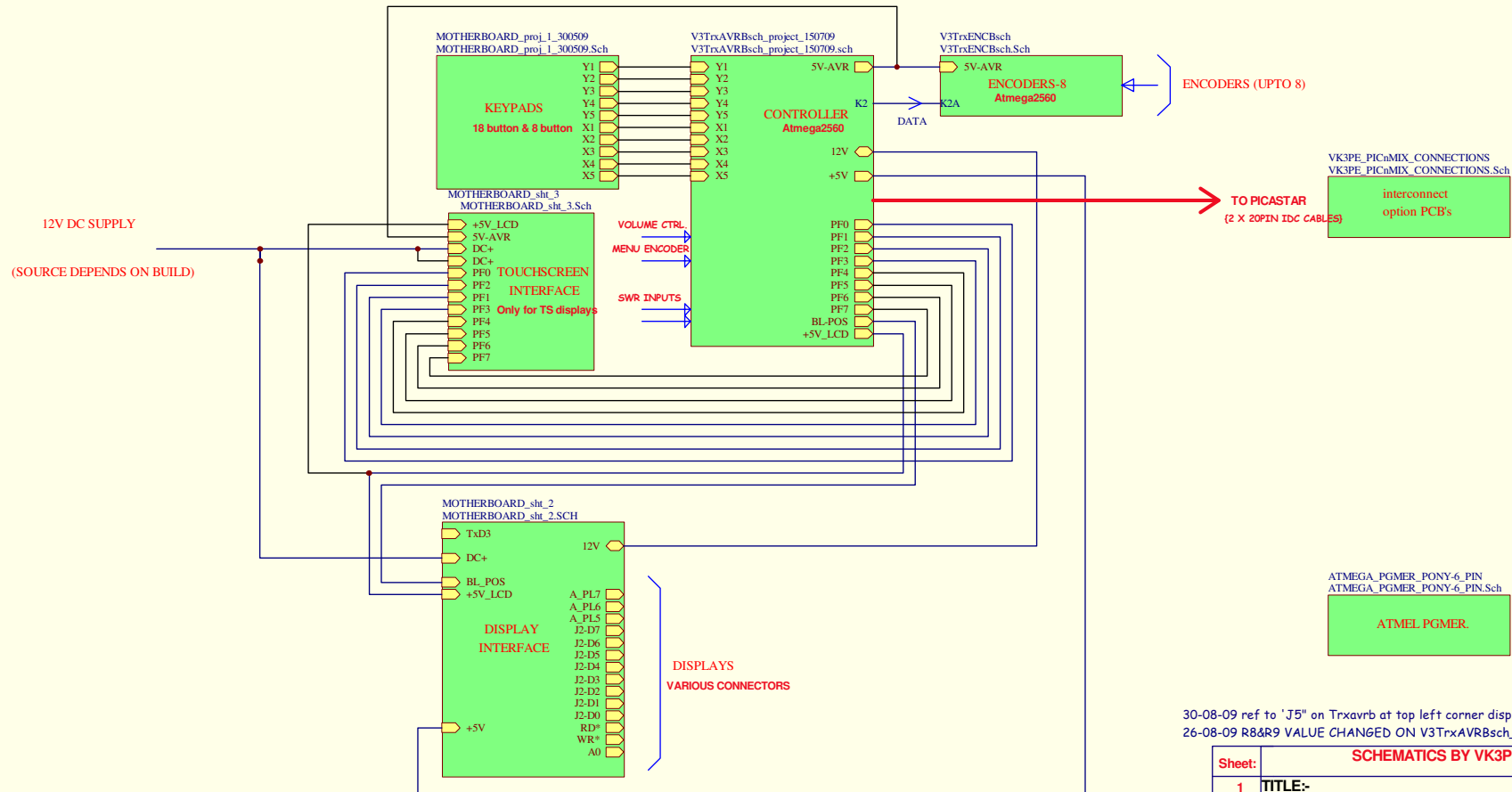
TrxAVRB and interface board for PICASTAR

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

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.

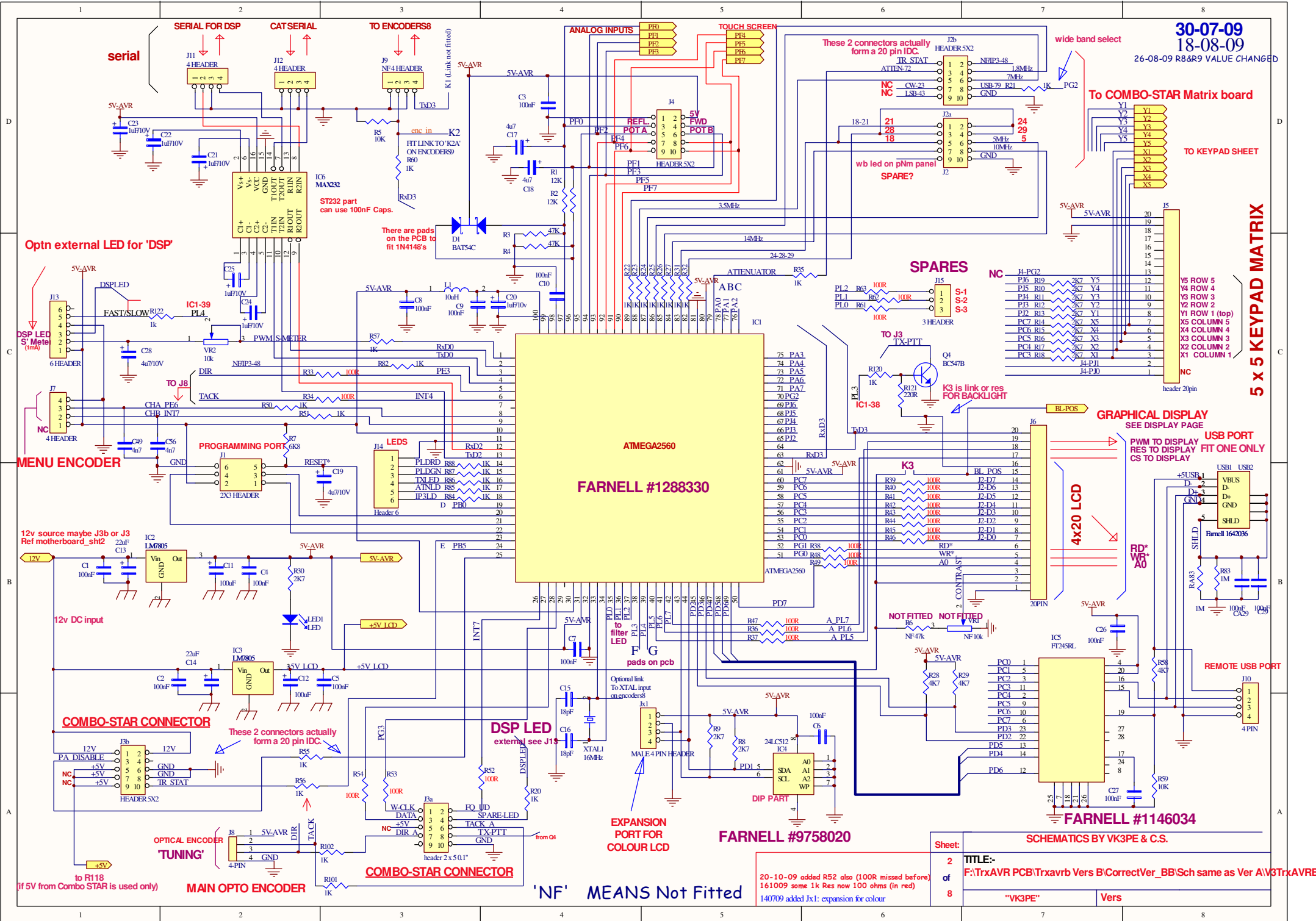
PLEASE NOTE: Any part numbers given in this document are believed to be correct but you should verify them before purchasing any items.



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



FARNELL #1288330
ATMEGA2560

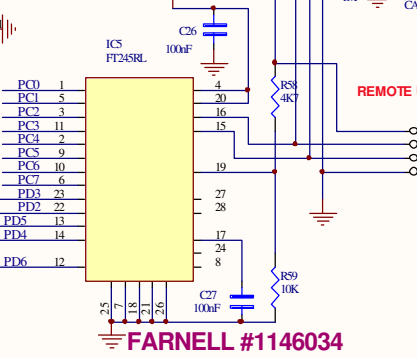
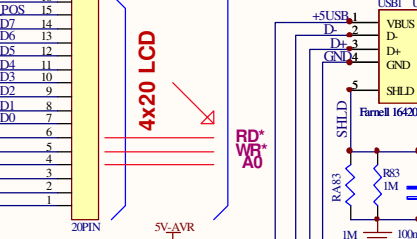
To COMBO-STAR Matrix board

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

header 20pin

5 x 5 KEYPAD MATRIX

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



FARNELL #1146034

FARNELL #9758020

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

Sheet:	2	TITLE:-	F:\TrxAVR PCB\Trxavr Vers B\CorrectVer_BB\Sch same as Ver AV3TrxAVRBSch.p
of	8		
		"VK3PE"	Vers

SCHEMATICS BY VK3PE & C.S.

G3VPX's TrxAVRB, OPTIONAL, FOR TOUCH SCREEN ONLY

31-08-09

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

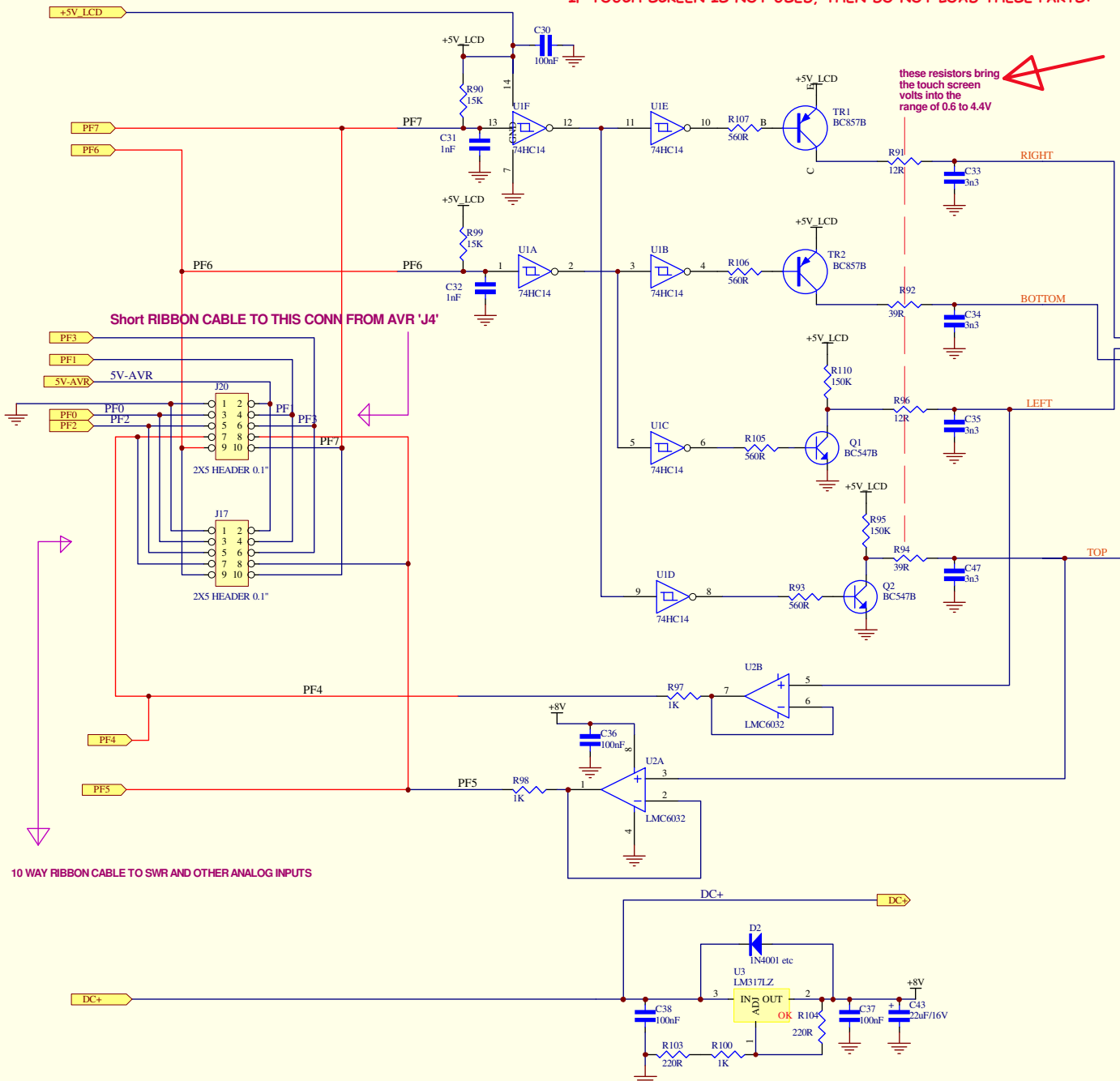
THE VALUES USED HERE MAY NEED CHANGING FOR THE DISPLAY YOU USE !

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) = 68ohms 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 = 75ohms and R92 & R94 = 30 ohms (or close to these values).

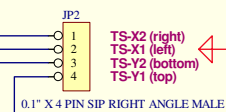
Regards
Gerard (vk3cg/vk3grs)
31-08-09



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)



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

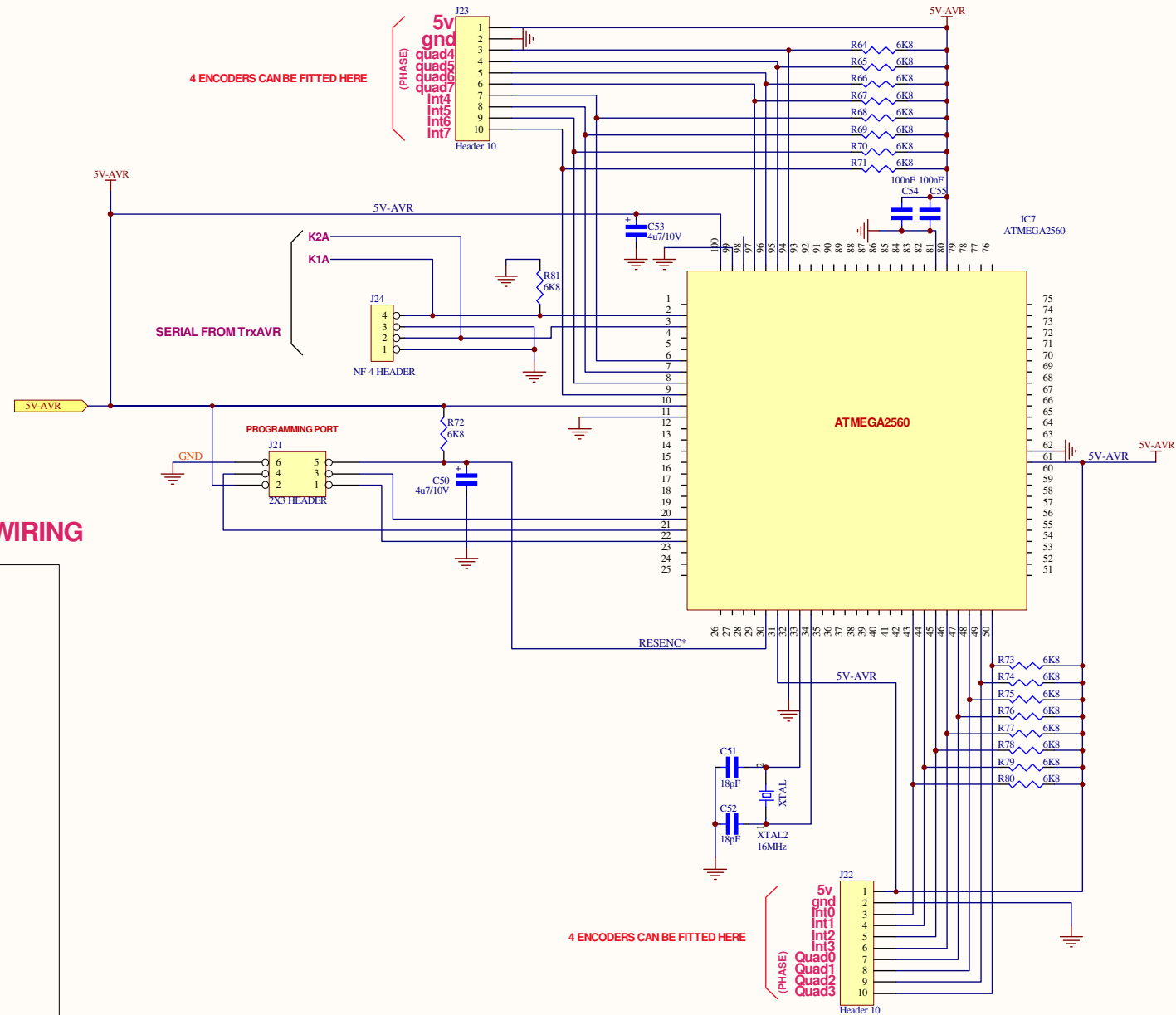
31-08-09 NOTE added re the Touchscreen 'X' and 'Y' values

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

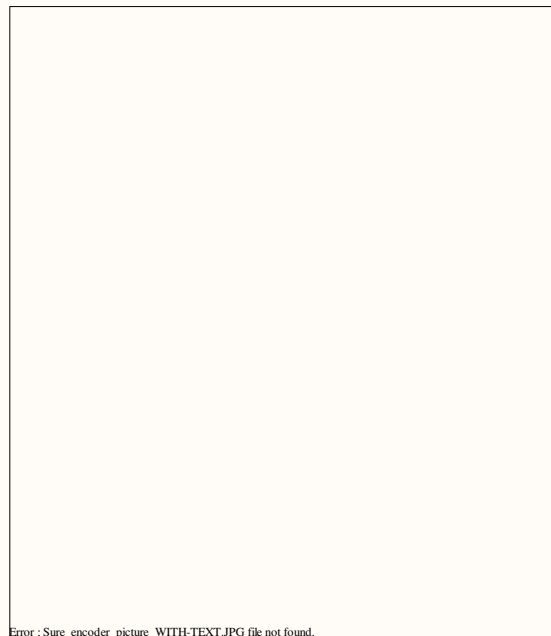
'NF' MEANS Not Fitted

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

18-08-09



SURE ELECTRONICS ENCODER WIRING



'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

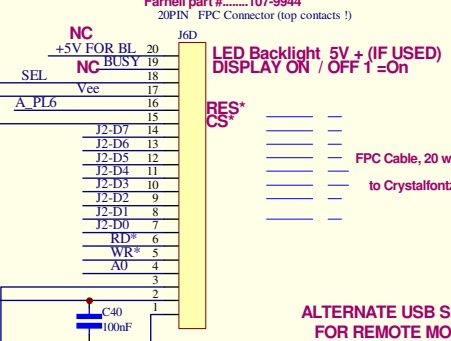
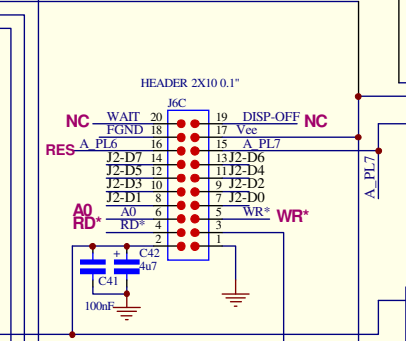
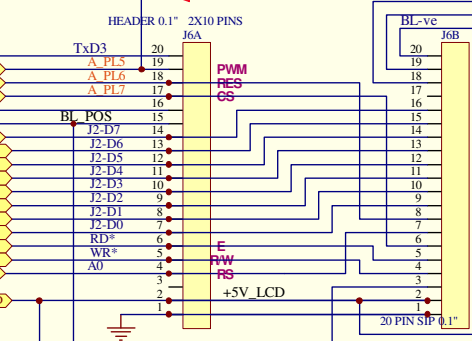
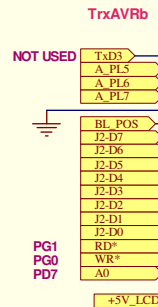
SMALLER NON TOUCH
CRYSTALFONTZ 'FP' CONNECTOR
TOP CONTACT TYPE OF FPC CONNECTOR.
YELLOW/GREEN Display:- CFAG320240K-YYH-TZ?
(NOT RECOMMENDED)

Refer to Bill of Material for other displays.

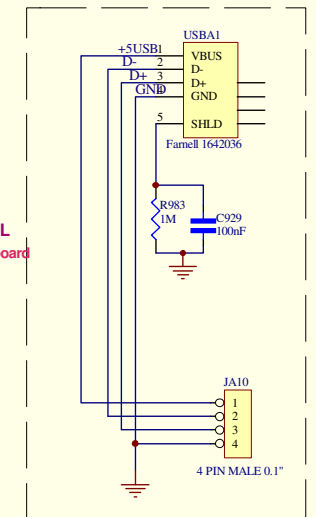
THERE IS A SHORT 20 WAY
IDC CABLE FROM J6 ON TrxAVR SECTION
TO J6A CONNECTOR
NOT NEEDED IF COLOUR DISPLAY USED

this 2x20 pin IDC Conn duplicates the TrxAVRb conn

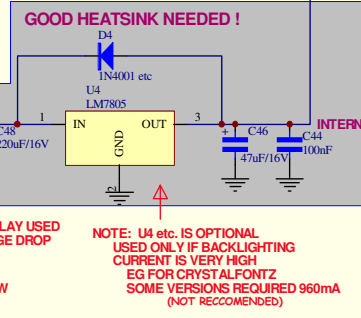
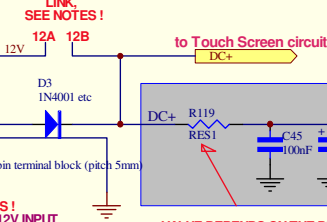
FROM TrxAVR, J6



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'



IF BL AUDIBLE ADD,
OPTIONAL CAP
5V-BL
C57
220uF/16V
R112
470R
R113
470R
R114
470R
R115
470R
BL+
header 3 pin 0.1"
BL-ve
PWM
Q3
IRLML2502PBF
(Farnell 9102981)
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.

BACKLIGHT

CF LCD HAS SEPARATE INPUT FOR BL
but must remove 2 x 0R resistors on the board

VALUE DEPENDS ON THE DISPLAY USED
SELECT FOR CORRECT VOLTAGE DROP
TO REDUCE U4 DISSIPATION

NOTE: U4 etc. IS OPTIONAL
USED ONLY IF BACKLIGHTING
CURRENT IS VERY HIGH
EG FOR CRYSTALFONTZ
SOME VERSIONS REQUIRED 960mA
(NOT RECOMMENDED)

(PCB ALSO HAS PROVISION FOR A 5W
RESISTOR BUT IT IS UNMARKED.
THERE ARE PADS NEXT TO U4)

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

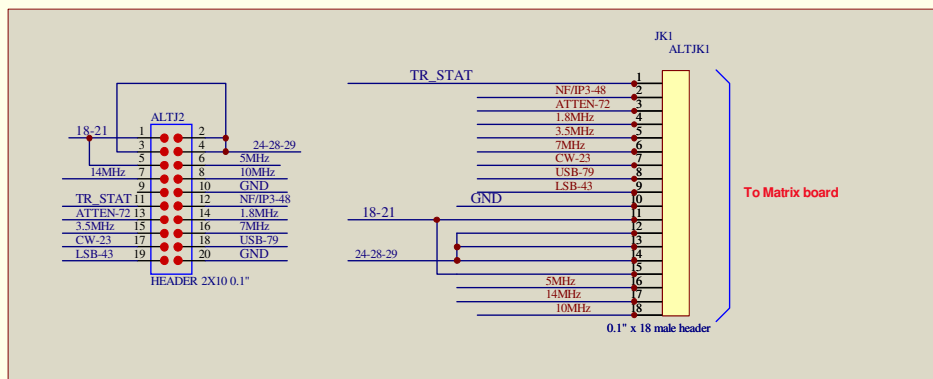
30-08-09 ref to 'J5' on Trxavr at top left corner is now J6
21-07-09 CORRECTED J6B A0/WR LINES & ADDED C57

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

'NF' MEANS Not Fitted

PICNMIX (VK3PE VERSION) INTERFACE ADAPTER BOARDS FOR PICASTAR

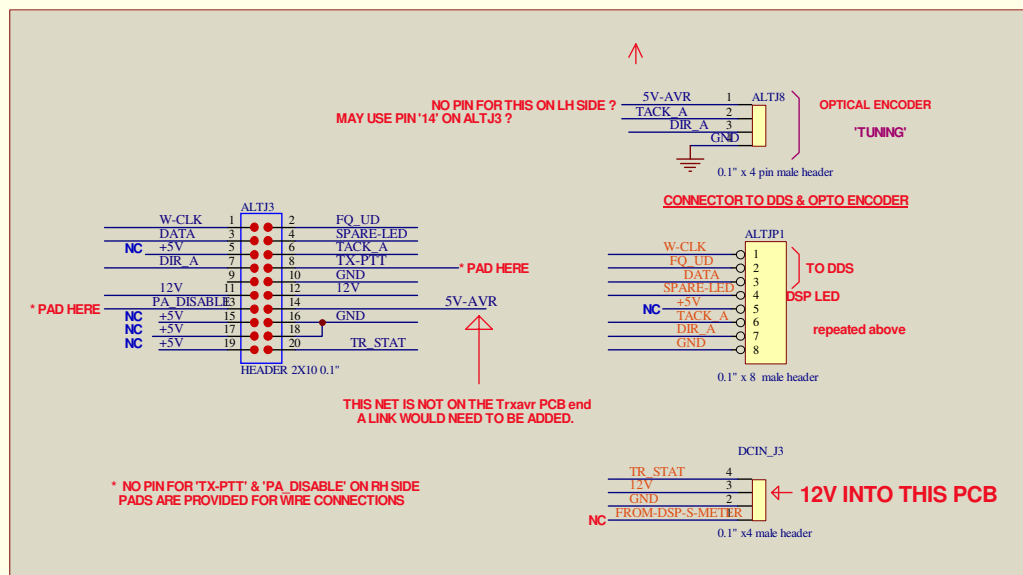
30-07-09



20 WAY IDC CABLE TO TrxAVRB

2 x 20 way IDC cables to TrxAVRB

TrxAVR
VK3PE interface



20 WAY IDC CABLE TO TrxAVRB

PICASTAR SIDE

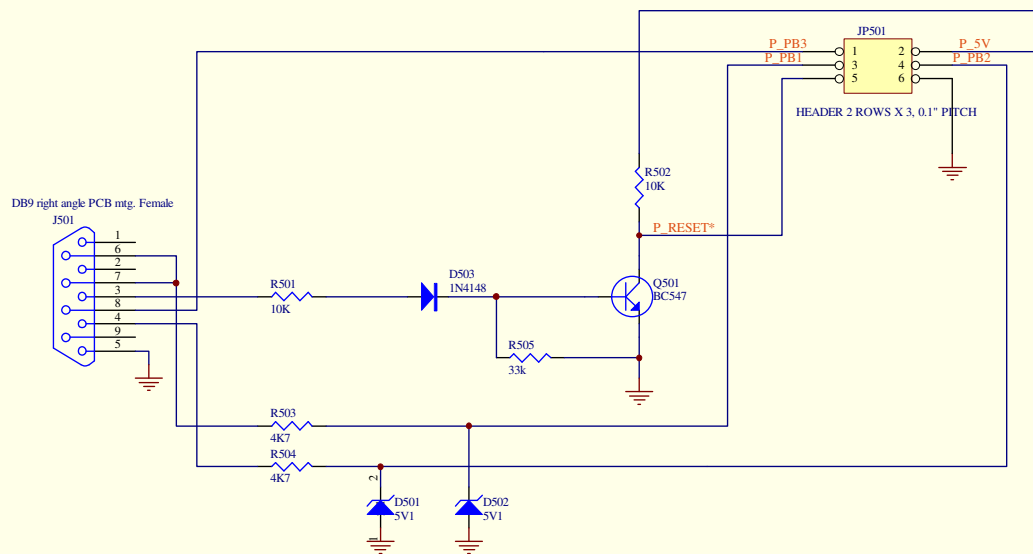
NOTE:- Connectors on right side suit VK3PE Picastar PCB's

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

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

'NF' MEANS Not Fitted

KEYPADS FOR G3VPX's TrxAVR

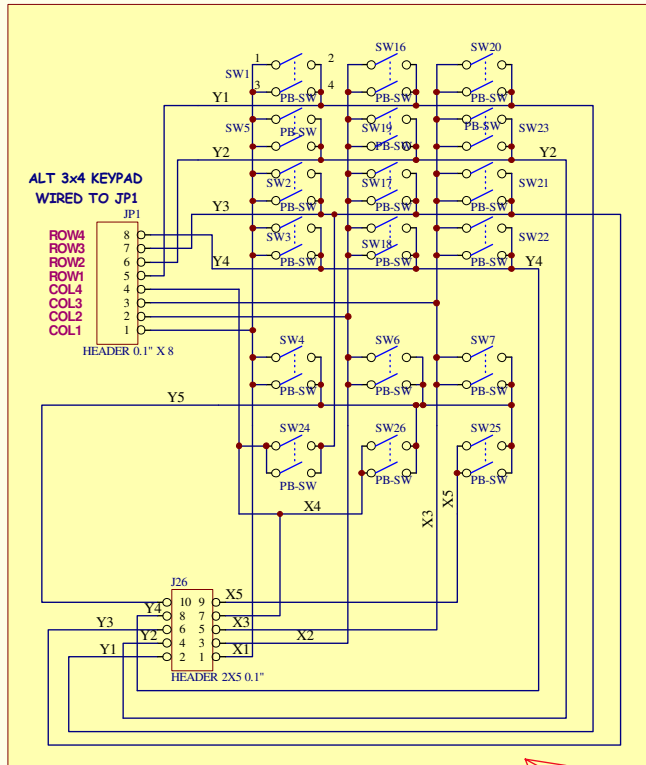
{ VK3PE }

21-07-09

16 KEYPAD (SUB PCB)

8 BUTTON SUB PCB (small display)

8 BUTTON SUB PCB (large display)

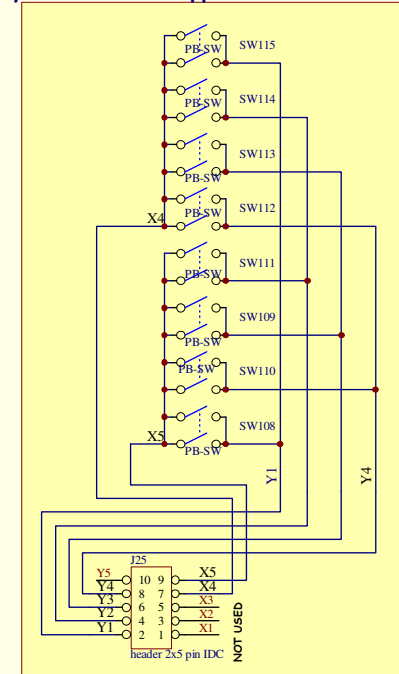
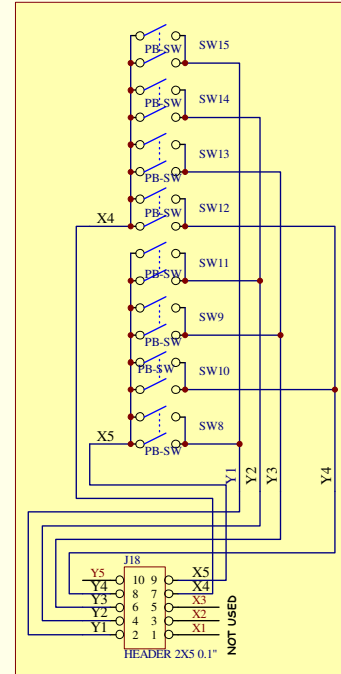


IF A COMMERCIAL 3x4 KEYPAD IS USED FOR THE UPPER 12 KEYS, THEN JP1 IS USED TO CONNECT TO THE 3x4 KEYPAD. (CHECK YOUR KEYPAD FOR DETAILS)

Wire links must be used, as keyboard pinout varies.

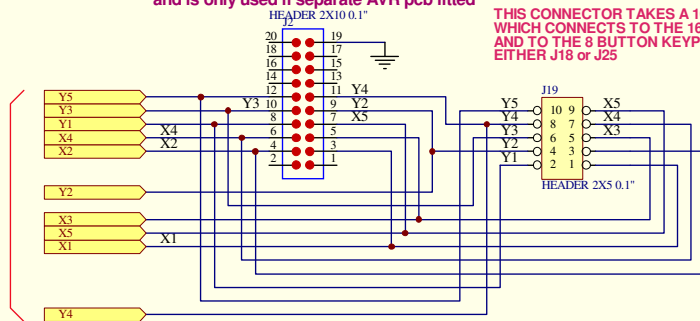
IF A COMMERCIAL 4x4 KEYPAD IS USED, THEN THIS PCB IS NOT REQUIRED. THE 4x4 KEYPAD WILL NEED TO BE WIRED TO J19.

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