

27th July, 2010.

DSP motherboard, (sheet 5) The RS232 switch Farnell part number has been corrected. Please verify all numbers given in these documents though by checking Data sheets etc.

5th July, 2010

No changes except make all pdf pages Landscape as pages were mixed landscape and portrait.

9th June, 2010

Clarified pinout of the Mini-Circuits T4-1 transformers in Magic Roundabout, sheet 8. (added pin numbers in red, of the T4-1, to the transformers. Also, a note in top right corner.)

NOTE: Re winding of "L3303" on the DDS 2N3866 buffer amp:

PnM Part three calls for 8 bifilar turns 32 swg on FT37-43. 30 gauge US would be fine. Or Metric equivalent.

28th March, 2010

The DSP motherboard area (sheet 5) has been updated to clarify the connections from the Serial Data switch routing to the Trxavrb PCB (or PICnMIX if used) See bottom area of the sheet.

4th March, 2010

TIMER:

Resistors R794 and R796 have been changed from 1k to 470R. This mainly affects those using Trxavrb and Ian, G3VPX's, Peak SWR with PA shutdown on high SWR.

31st Dec, 2009

The butler Osc. C306, value changed from 8.2pF (8p2) to 68pF to be in line with original value by G3XJP and ensures better output level at 10M. < ref Jay Cox >

Please also note that the 0603 LED's fitted to the PCB, in the BPF area do NOT all run in the same direction.

The LED for wide-band is fitted reverse to all of the others.

HINT: Test an LED with your multimeter on diode range to make sure of the polarity before fitting.

vk3pe

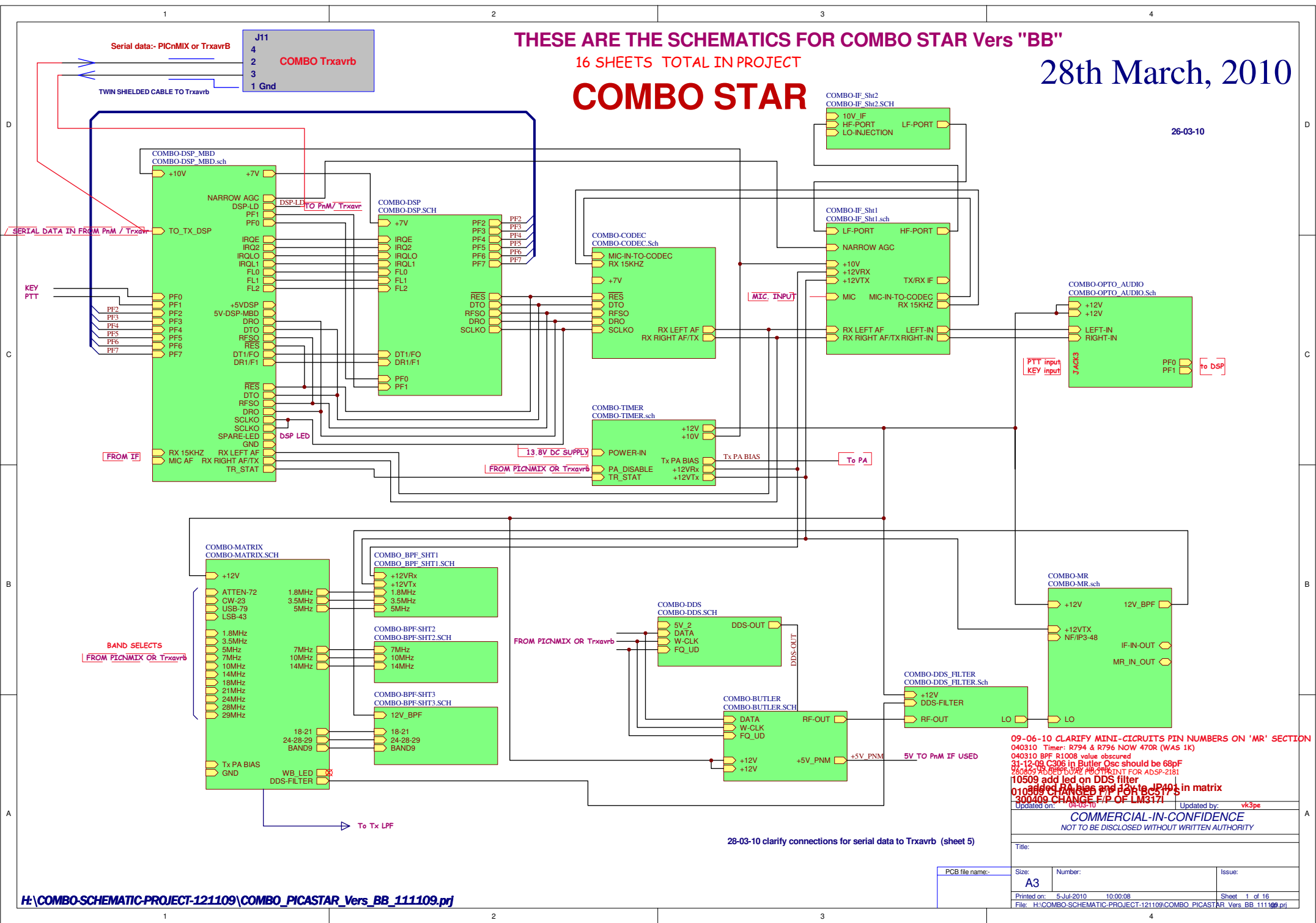
THESE ARE THE SCHEMATICS FOR COMBO STAR Vers "BB"

16 SHEETS TOTAL IN PROJECT

COMBO STAR

28th March, 2010

26-03-10



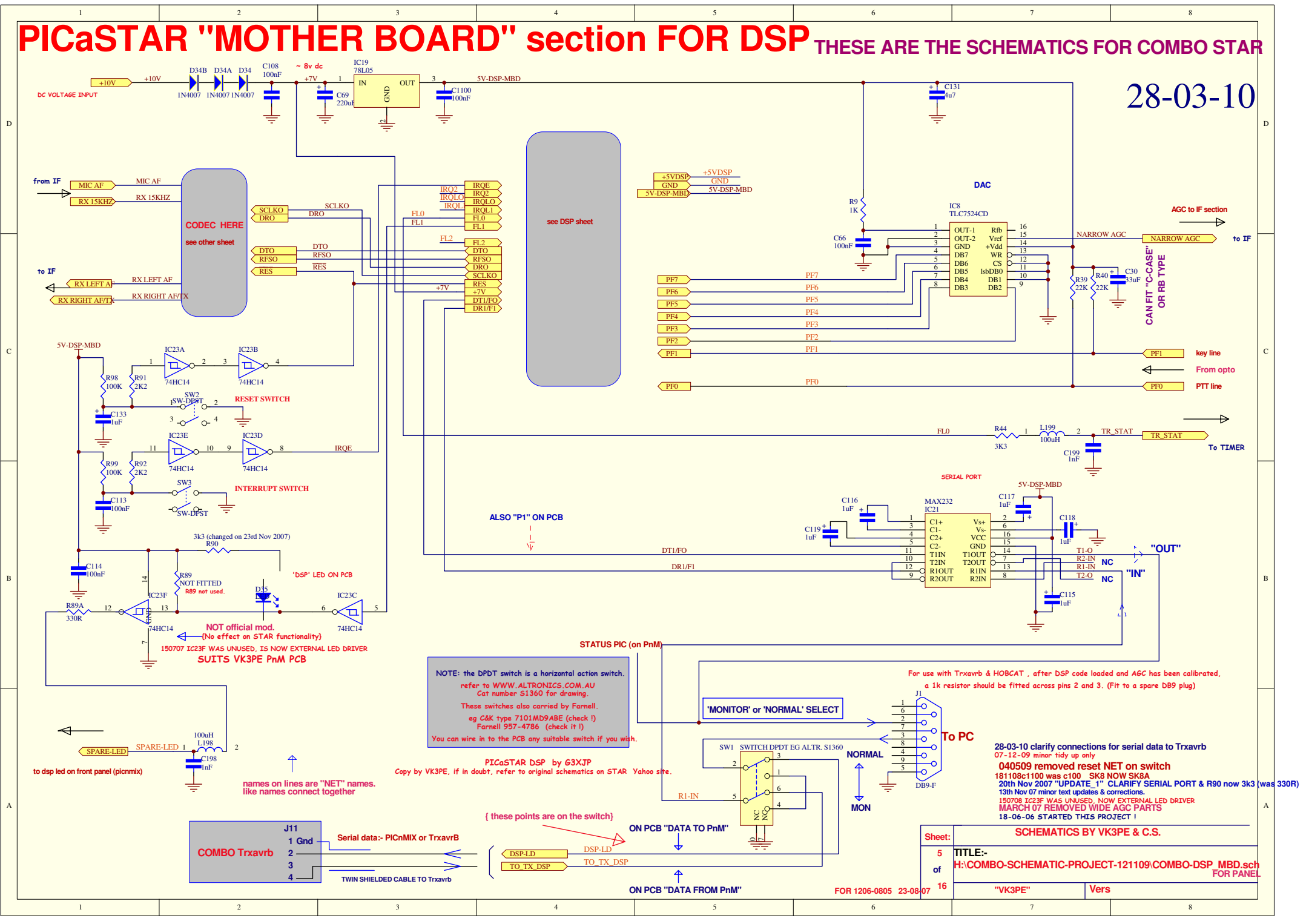
09-06-10 CLARIFY MINI-CIRCUITS PIN NUMBERS ON 'MR' SECTION
040310 Timer: R794 & R796 NOW 470R (WAS 1K)
040310 BPF R1008 value obscured
31-12-09 C306 in Butler Osc should be 68pF
980809 ADSP-2181 PLOT PRINT FOR ADSP-2181
10509 add led on DDS filter
01030904 AN885 #16 Pin 16 in matrix
300409 CHANGE F/P OF LM3171
Updated on: (date) Updated by: vk3pe

COMMERCIAL-IN-CONFIDENCE NOT TO BE DISCLOSED WITHOUT WRITTEN AUTHORITY			
Title:			
PCB file name:			
Size:	A3	Number:	
Issue:			
Printed on:	5-Jul-2010 10:00:08	Sheet	1 of 16
File:	H:\COMBO-SCHEMATIC-PROJECT-1211109\COMBO_PICASTAR_Vers_BB_111109.prj		

PICaSTAR "MOTHER BOARD" section FOR DSP

THESE ARE THE SCHEMATICS FOR COMBO STAR

28-03-10



see DSP sheet

ALSO "P1" ON PCB

NOTE: the DPDT switch is a horizontal action switch. refer to WWW.ALTRONICS.COM.AU Cat number S1360 for drawing. These switches also carried by Farnell. eg C&K type 7101MD9ABE (check it) Farnell 957-4786 (check it!) You can wire in to the PCB any suitable switch if you wish.

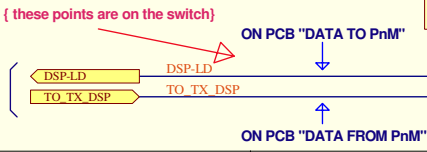
PICaSTAR DSP by G3XJP Copy by VK3PE, if in doubt, refer to original schematics on STAR Yahoo site.

For use with TrxavrB & HOBKAT, after DSP code loaded and AGC has been calibrated, a 1k resistor should be fitted across pins 2 and 3. (Fit to a spare DB9 plug)

28-03-10 clarify connections for serial data to TrxavrB
07-12-09 minor tidy up only
040509 removed reset NET on switch
181108c1100 was c100 SK8 NOW SK8A
20th Nov 2007 "UPDATE_1" CLARIFY SERIAL PORT & R90 now 3k3 (was 330R)
13th Nov 07 minor text updates & corrections.
150708 IC23F WAS UNUSED, NOW EXTERNAL LED DRIVER
MARCH 07 REMOVED WIDE AGC PARTS
18-06-06 STARTED THIS PROJECT!

Sheet:	SCHEMATICS BY VK3PE & C.S.	
5	TITLE:- H:COMBO-SCHEMATIC-PROJECT-121109/COMBO-DSP_MBD.sch FOR PANEL	
of	16	
	"VK3PE"	Vers

FOR 1206-0805 23-08-07



names on lines are "NET" names. like names connect together

NOT official mod. (No effect on STAR functionality) 150707 IC23F WAS UNUSED, IS NOW EXTERNAL LED DRIVER SUITS VK3PE PnM PCB

3k3 (changed on 23rd Nov 2007) R90

RESET SWITCH

INTERRUPT SWITCH

NOT FITTED R89 not used.

'dsp' LED ON PCB

NOT official mod. (No effect on STAR functionality) 150707 IC23F WAS UNUSED, IS NOW EXTERNAL LED DRIVER SUITS VK3PE PnM PCB

SPARE-LED

to dsp led on front panel (picnmx)

original build Vers 1.0 POWERED UP 17-07-06 !

MOTHER BOARD AND DSP ONLY

LED FLASHES !!!

DRAWS ABOUT 112mA

PRESS RESET, DRAWS ABOUT 33mA

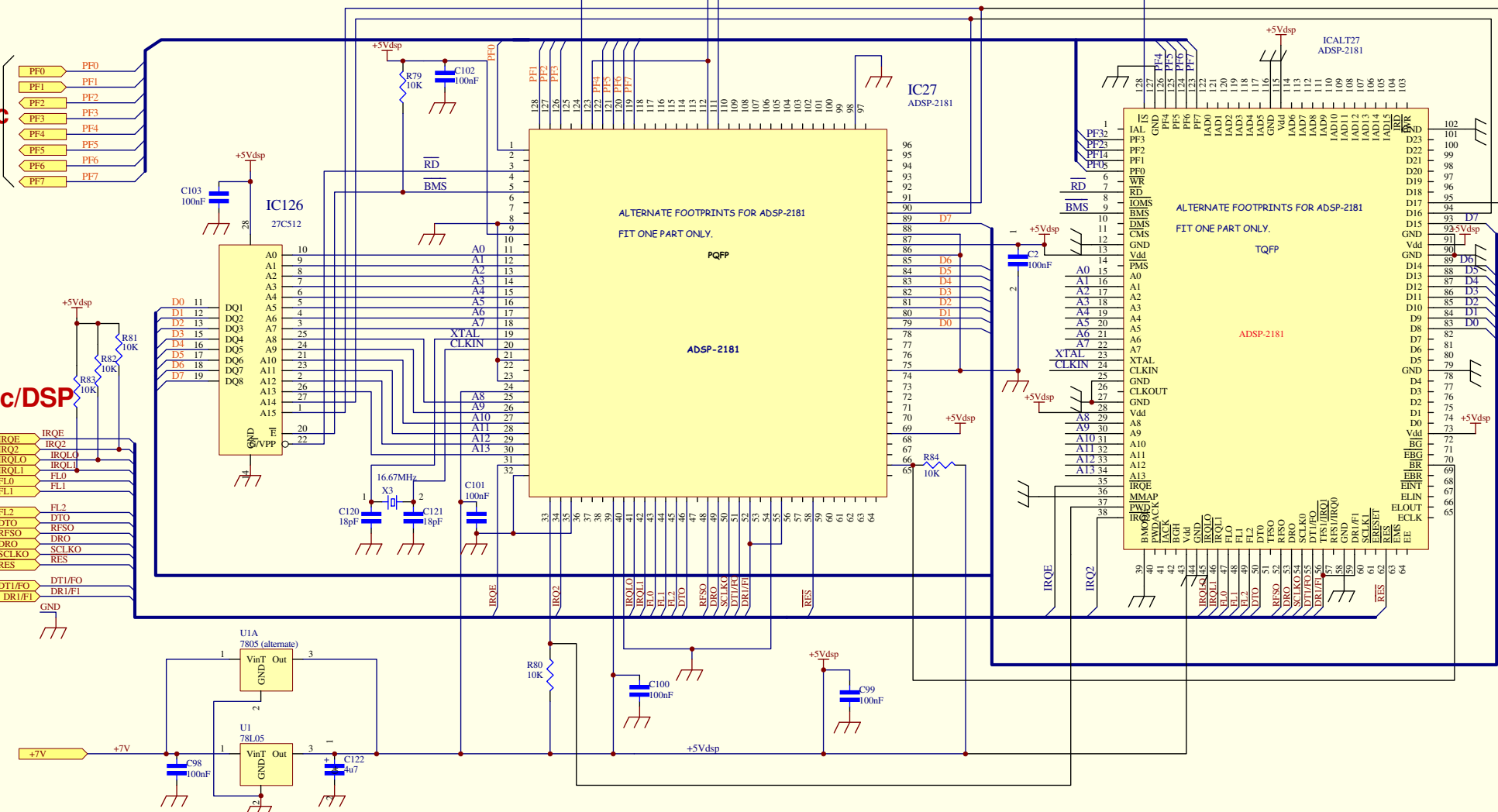
prefix 100

12-11-09

THESE ARE THE SCHEMATICS FOR COMBO STAR

codec

codec/DSP



050809 ADDED ALTERNATE DSP FOOTPRINT
 14-01-09
 181108 IC26 NOW IC126
 16-11-08 added alternate U1 device (7805)
 19-08-07 changed to dual 1206-0805 footprints
 230207 VER 2 UPDATES AFTER PROTO BUILD
 220606 drawn.

DSP section for PICaSTAR
 Copy by VK3PE, for Master, refer to original schematics on STAR Yahoo site.

Sheet:	SCHEMATICS BY VK3PE & C.S.		
3	TITLE:-	H:\COMBO-SCHEMATIC-PROJECT-121109\COMBO-DSP.SCH	
of	16	"VK3PE"	Vers

PICaSTAR CODEC section

ORIGINAL SCHEMATIC BY G3XJP

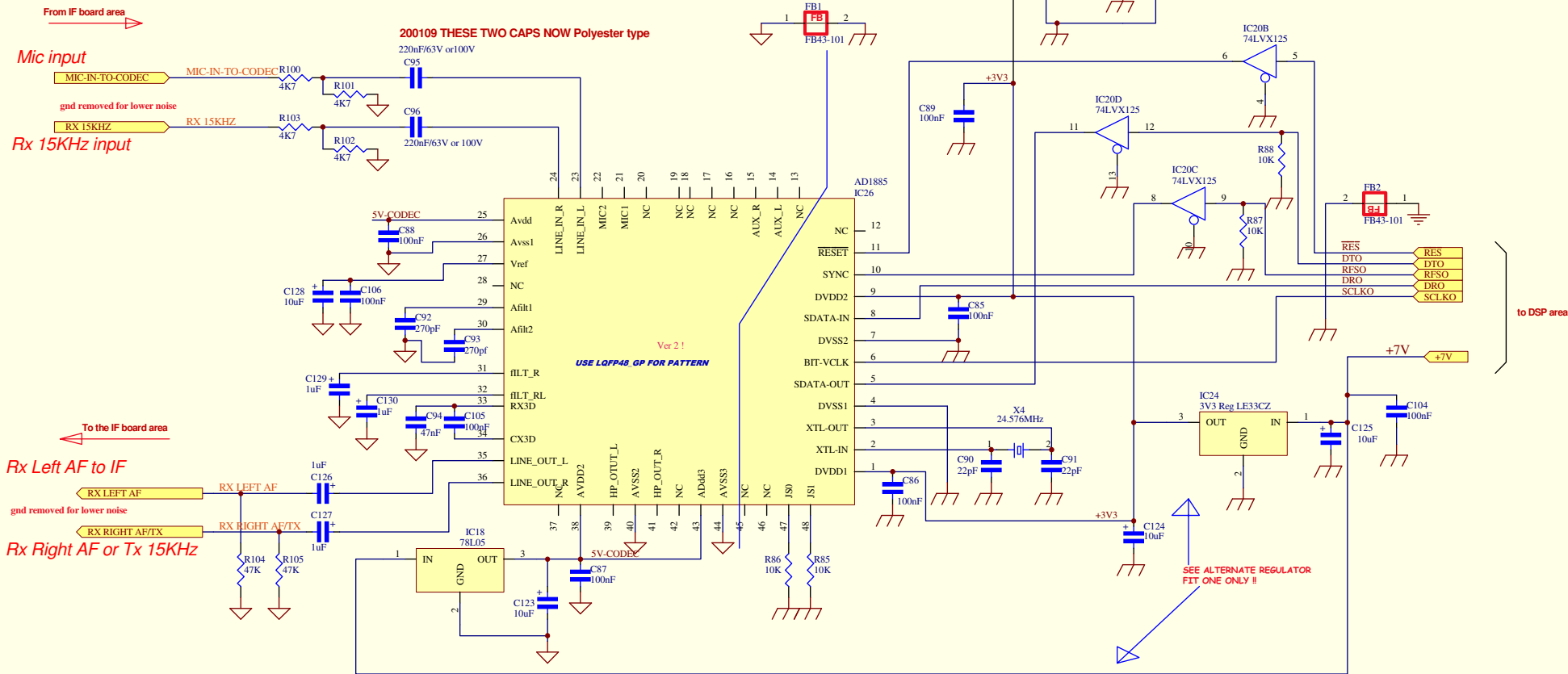
THIS VERSION BY VK3PE & C.S.

THESE ARE THE SCHEMATICS FOR COMBO STAR

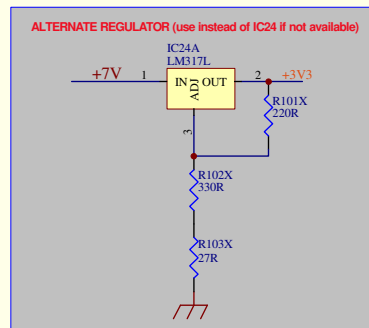
12-11-09

prefix mostly <100

FIT FERRITE BEAD here!



PLEASE DOUBLE CHECK VOLTAGES TO CODEC BEFORE FITTING THE CHIP !!



- 20-01-09 change 2 caps to poly at input
- 04-02-08 Vers "B"- fix LM317 and AD1885 footprints
- Update_1 31-10-07 IC24A PINOUT IS WRONG
- 290907 UPDATED TEXT ETC
- 040807 changed C123 to axial type cap AND added alternate 3v3 reg

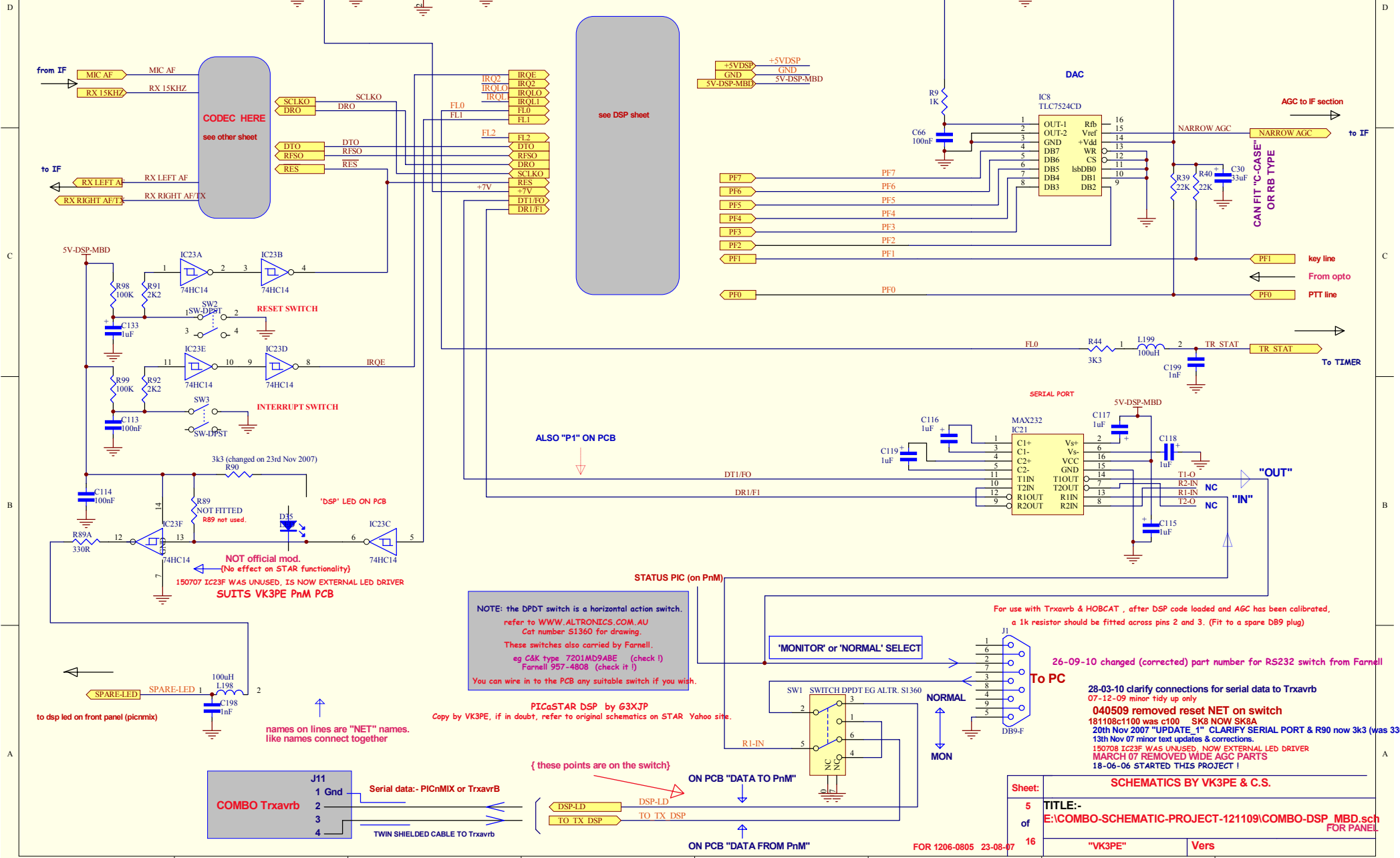
Schematic by VK3PE but please also refer to original by G3XJP on Yahoo STAR site
codec_ver_a_300807.pcb.PCB"

Sheet:	SCHEMATICS BY VK3PE & C.S.	
4 of 16	TITLE:-	H:\COMBO-SCHEMATIC-PROJECT-121109\COMBO-CODEC.Sch
	"VK3PE"	Vers

PICaSTAR "MOTHER BOARD" section FOR DSP

THESE ARE THE SCHEMATICS FOR COMBO STAR

26-09-10



NOTE: the DPDT switch is a horizontal action switch.
refer to WWW.ALTRONICS.COM.AU
Cat number S1360 for drawing.
These switches also carried by Farnell.
eg C&K type 7201MD9ABE (check I)
Farnell 957-4808 (check it I)
You can wire in to the PCB any suitable switch if you wish.

PICaSTAR DSP by 63XJP
Copy by VK3PE, if in doubt, refer to original schematics on STAR Yahoo site.

For use with TrxavrB & HOBCAT, after DSP code loaded and AGC has been calibrated,
a 1k resistor should be fitted across pins 2 and 3. (Fit to a spare DB9 plug)

26-09-10 changed (corrected) part number for RS232 switch from Farnell

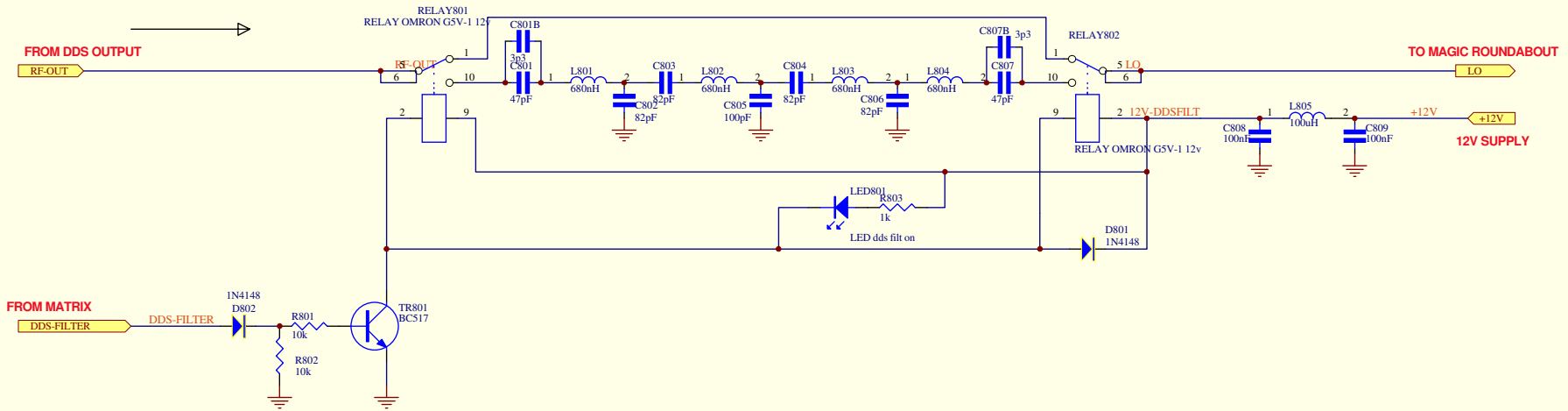
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5	TITLE:-	
of	E:\COMBO-SCHEMATIC-PROJECT-121109\COMBO-DSP_MBD.sch	
16	"VK3PE"	Vers

FOR 1206-0805 23-08-07

PICaSTAR DDS FILTER SECTION

for combo, prefix with 800



SHOULD GIVE:
AT LEAST 30dB ATTEN OF IF FREQ
AND A SIMILAR FIGURE AT 50MHz AND RISING
 (Ref Part 14 of documents for PICaSTAR)

ie. pass about 25 - 40MHz

010509 add led on filter
 010509CHANGED F/P FOR BC517'S
 14-01-09
 15-12-08 UPDATED FOR COMBO USE
 #994 9585 OMRON 65V-1 RELAY FROM FARNELL
 also Altronics (Aus) S4113
 01-10-09
 SEPT 2007 VK3PE * C.S.

Original schematic is by G3XJP, this version by VK3PE & C.S.

Sheet:	SCHEMATICS BY VK3PE & C.S.	
13 of 16	TITLE:- H:\COMBO-SCHEMATIC-PROJECT-121109\COMBO-DDS_FILTER.Sch	
	"VK3PE"	Vers A

NOW 1000 PREFIX FOR COMBO STAR

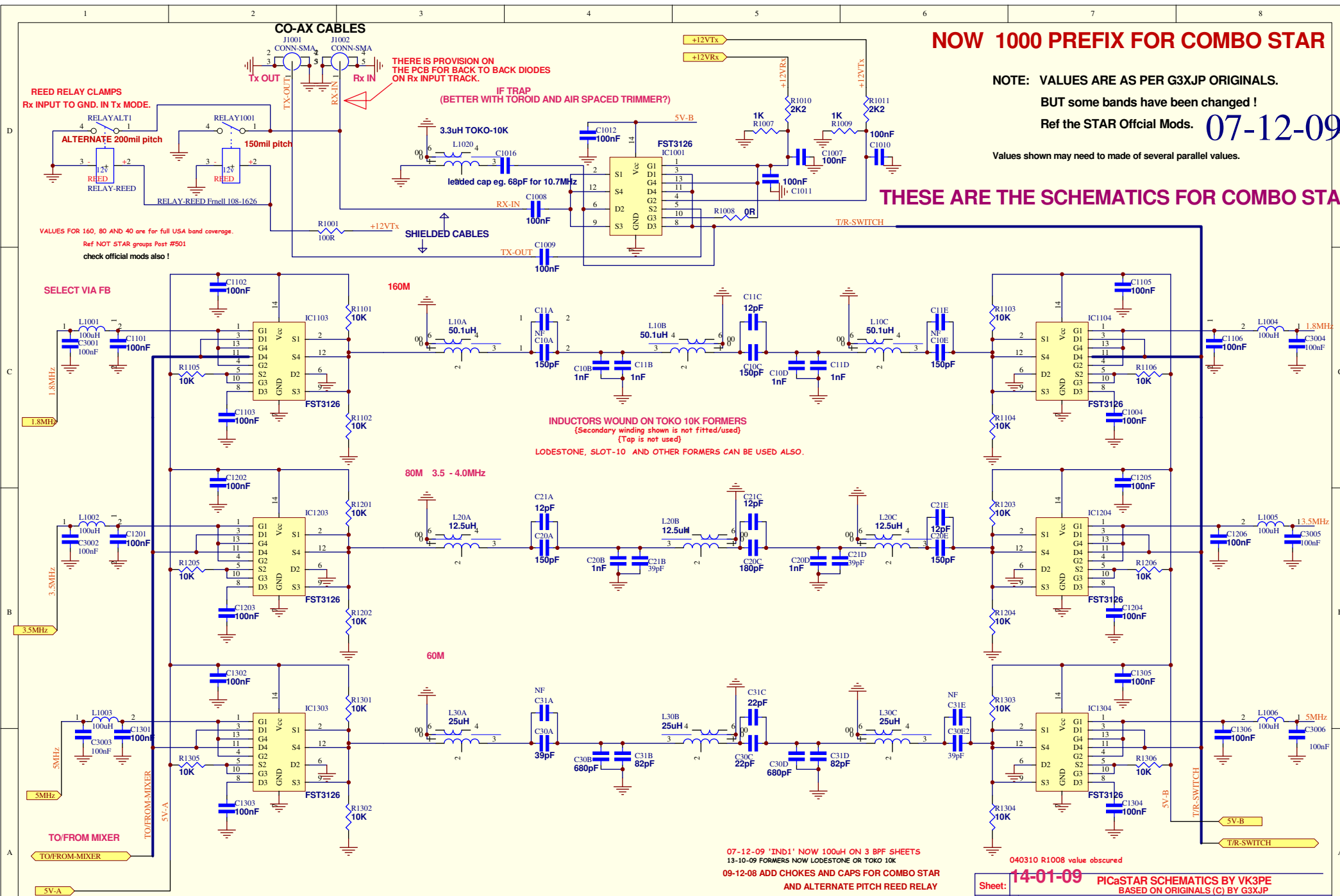
NOTE: VALUES ARE AS PER G3XJP ORIGINALS.

BUT some bands have been changed !

Ref the STAR Official Mods. **07-12-09**

Values shown may need to made of several parallel values.

THESE ARE THE SCHEMATICS FOR COMBO STAR



REED RELAY CLAMPS
Rx INPUT TO GND. IN Tx MODE.

ALTERNATE 200mil pitch
150mil pitch

VALUES FOR 160, 80 AND 40 are for full USA band coverage.
Ref NOT STAR groups Post #501
check official mods also !

SELECT VIA FB

1.8MHz

1.8MHz

3.5MHz

3.5MHz

5MHz

5MHz

TO/FROM MIXER

TO/FROM MIXER

5V-A

THERE IS PROVISION ON THE PCB FOR BACK TO BACK DIODES ON Rx IN INPUT TRACK.

IF TRAP (BETTER WITH TOROID AND AIR SPACED TRIMMER?)

INDUCTORS WOUND ON TOKO 10K FORMERS
(Secondary winding shown is not fitted/used)
(Tap is not used)

LODESTONE, SLOT-10 AND OTHER FORMERS CAN BE USED ALSO.

07-12-09 'IND1' NOW 100uH ON 3 BPF SHEETS

13-10-09 FORMERS NOW LODESTONE OR TOKO 10K

09-12-08 ADD CHOKES AND CAPS FOR COMBO STAR AND ALTERNATE PITCH REED RELAY

020508 changes to some incorrect values on sheet 3
13-02-08 added Reed relay to gnd on Rx AND PROVISION FOR DIODES.
11008 minor updates

ref msg # 26404 for Toko10k turns ?

040310 R1008 value obscured

Sheet: **14-01-09** PICASTAR SCHEMATICS BY VK3PE
BASED ON ORIGINALS (C) BY G3XJP

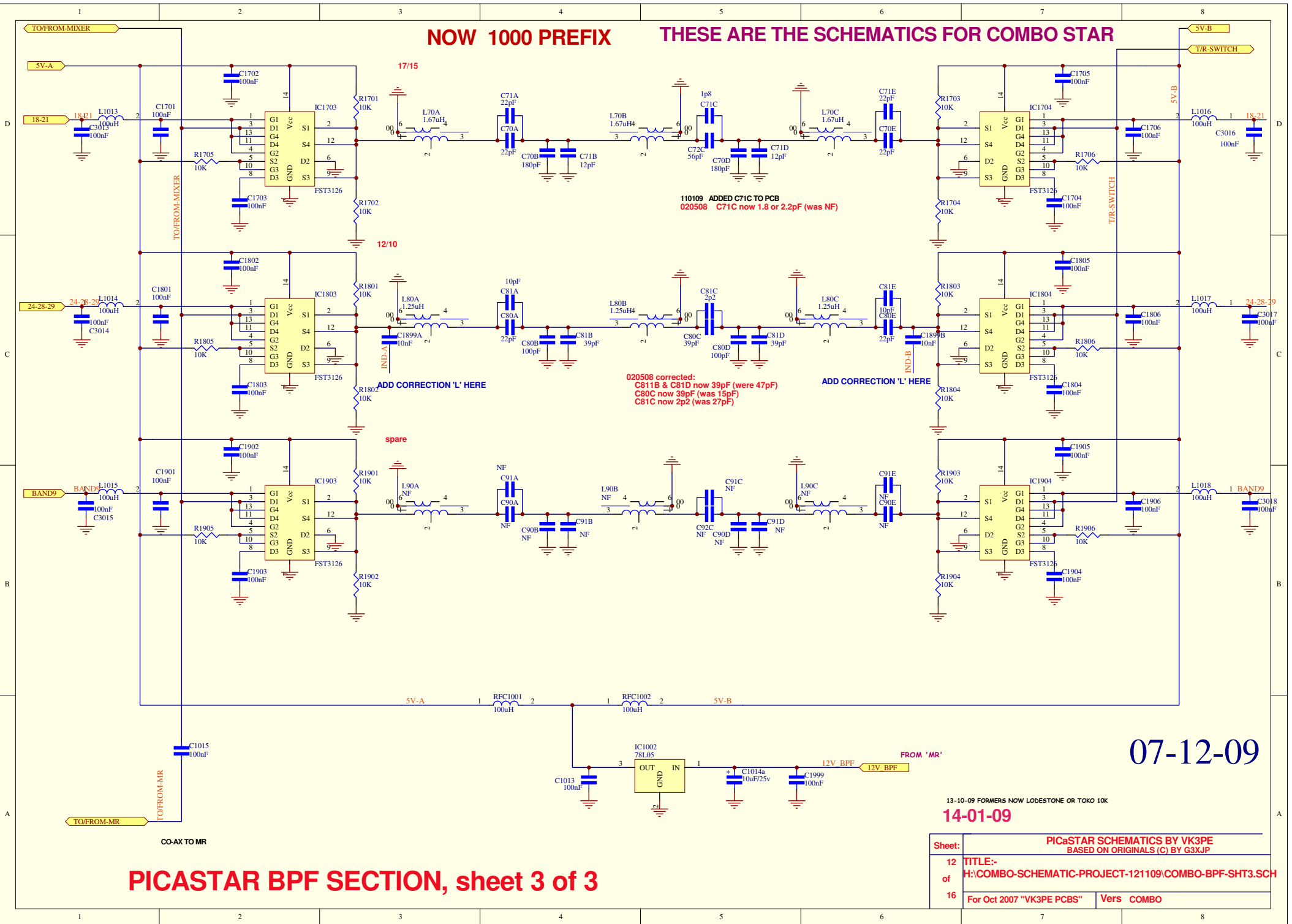
TITLE:-
H:COMBO-SCHEMATIC-PROJECT-121109/COMBO_BPF_SHT1.SCH

For Oct 2007 "VK3PE PCBs" Vers COMBO

PICASTAR BPF SECTION, sheet 1 of 3

NOW 1000 PREFIX

THESE ARE THE SCHEMATICS FOR COMBO STAR



PICASTAR BPF SECTION, sheet 3 of 3

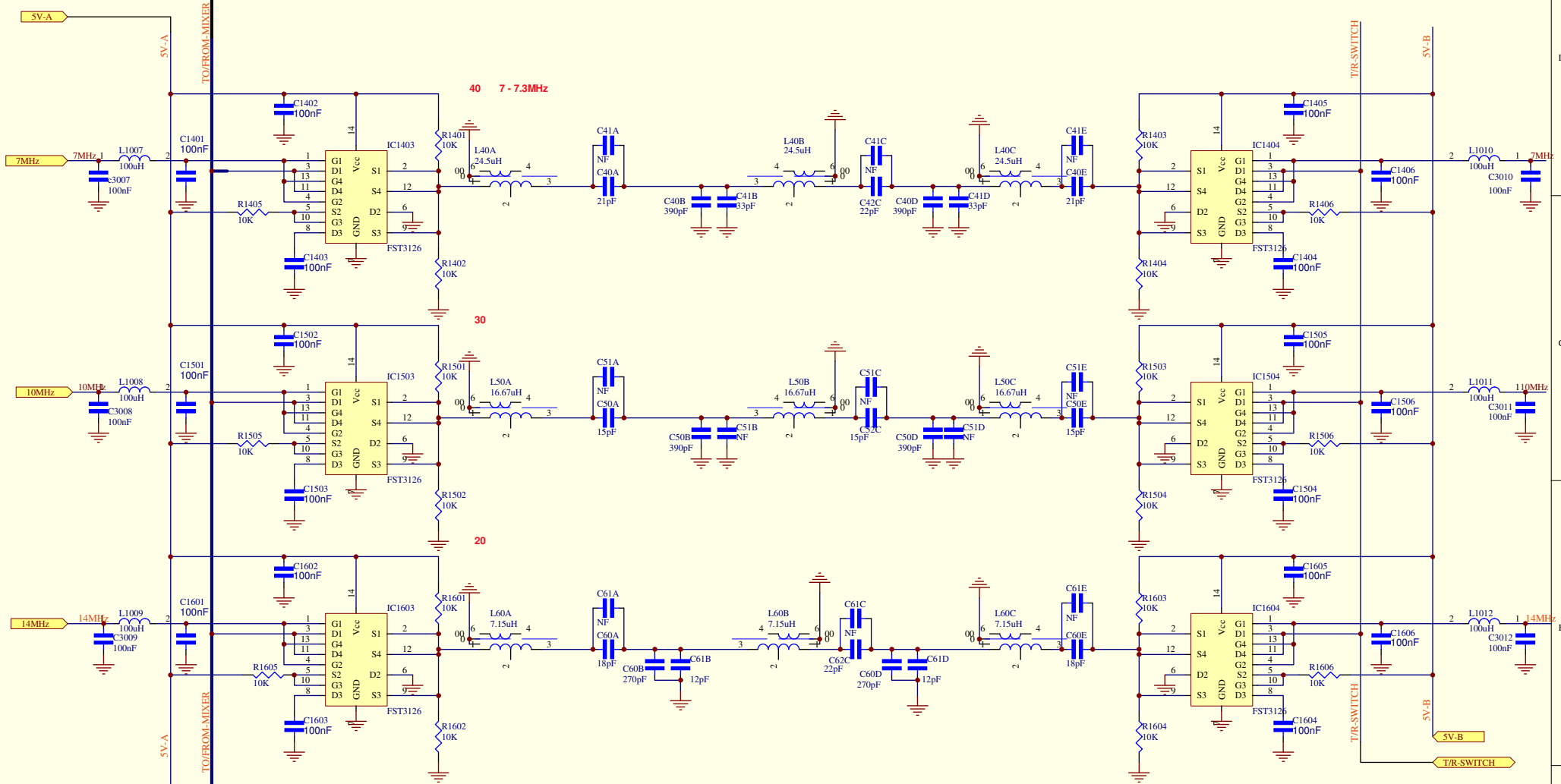
07-12-09

13-10-09 FORMERS NOW LODSTONE OR TOKO 10K

14-01-09

Sheet:	PICASTAR SCHEMATICS BY VK3PE BASED ON ORIGINALS (C) BY G3XJP	
12 of 16	TITLE:- H:\COMBO-SCHEMATIC-PROJECT-121109\COMBO-BPF-SHT3.SCH	
	For Oct 2007 "VK3PE PCBs"	Vers COMBO

NOW 1000 PREFIX



07-12-09

13-10-09 FORMERS NOW LODESTONE OR TOKO 10K

14-01-09

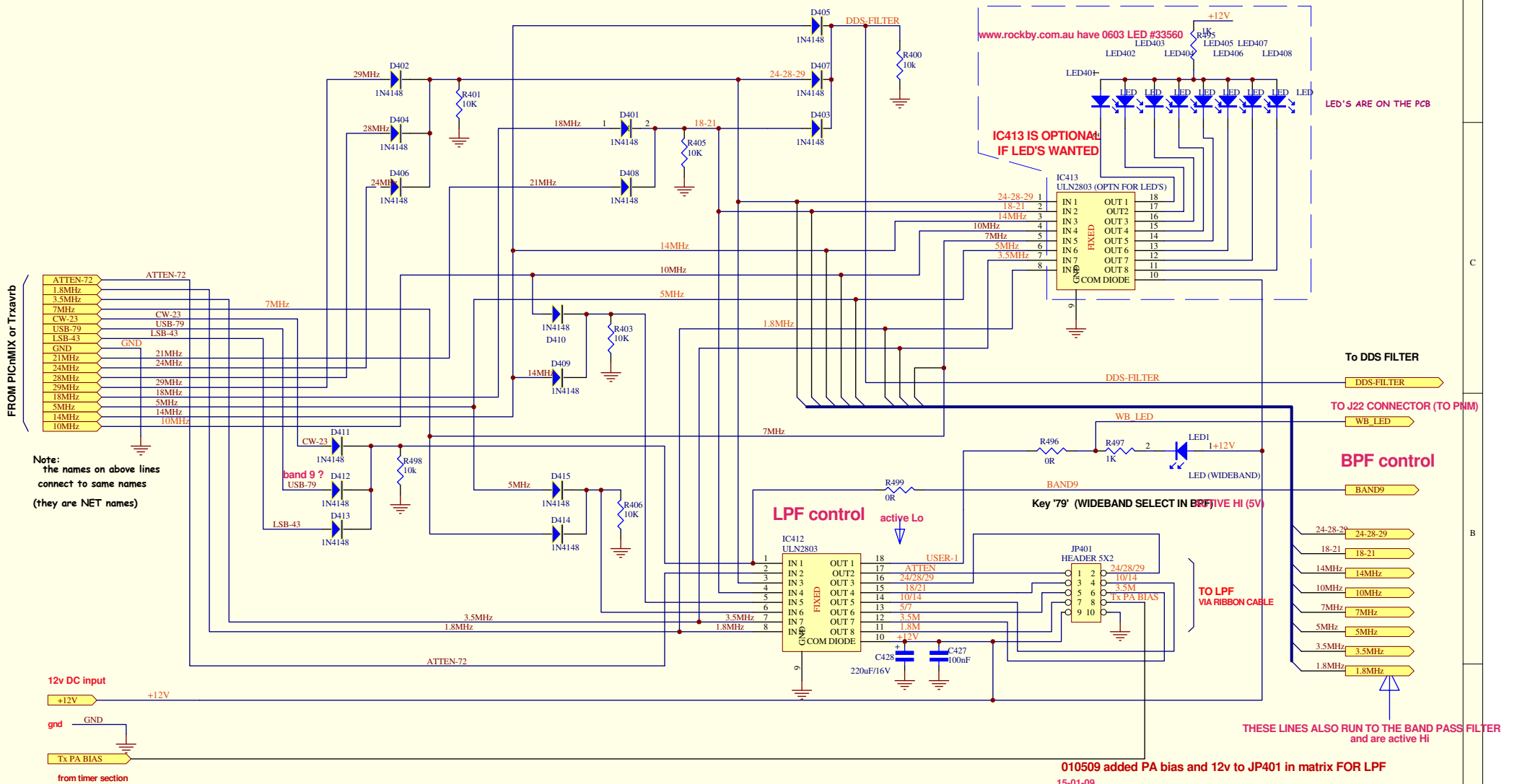
PICASTAR BPF SECTION, sheet 2 of 3

Sheet:	PICaSTAR SCHEMATICS BY VK3PE BASED ON ORIGINALS (C) BY G3XJP	
11 of 16	TITLE:- H:\COMBO-SCHEMATIC-PROJECT-121109\COMBO-BPF-SHT2.SCH	
	For Oct 2007 "VK3PE PCBs"	Vers COMBO

STAR DIODE MATRIX

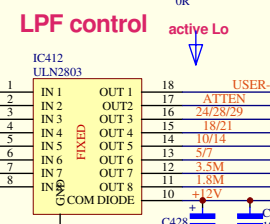
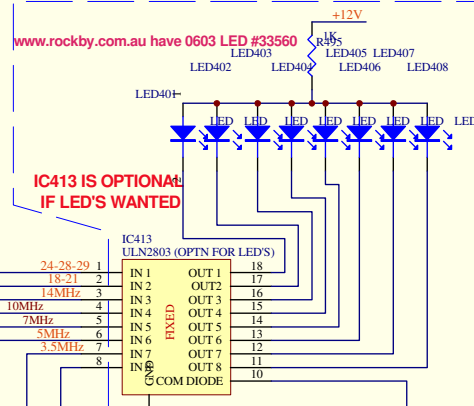
12-11-09

THESE ARE THE SCHEMATICS FOR COMBO STAR



- FROM PIC/MIX or TxavrB
- ATTEN-72
 - 1.8MHz
 - 3.5MHz
 - 7MHz
 - CW-23
 - USB-79
 - USB-79
 - LSB-43
 - GND
 - 21MHz
 - 24MHz
 - 28MHz
 - 29MHz
 - 18MHz
 - 5MHz
 - 14MHz
 - 10MHz
 - 7MHz
 - 21MHz
 - 24MHz
 - 28MHz
 - 29MHz
 - 18MHz
 - 5MHz
 - 14MHz
 - 10MHz

Note:
the names on above lines
connect to same names
(they are NET names)



- To DDS FILTER
- DDS-FILTER
- To J22 CONNECTOR (TO PIM)
- WB_LED
- BAND9
- BPF control
- LED (WIDEBAND)
- Key '79' (WIDEBAND SELECT IN BPF) FIVE HI (5V)
- 24-28-29
- 18-21
- 14MHz
- 10MHz
- 7MHz
- 5MHz
- 3.5MHz
- 1.8MHz

THESE LINES ALSO RUN TO THE BAND PASS FILTER and are active HI

VK3PE

ORIGINAL SCHEMATIC BY G6ALU

010509 added PA bias and 12v to JP401 in matrix FOR LPF
15-01-09
ULN2803'S CORRECTED
5th Dec 2007 Update_1:- error in LPF control designation
011207 cosmetic update only

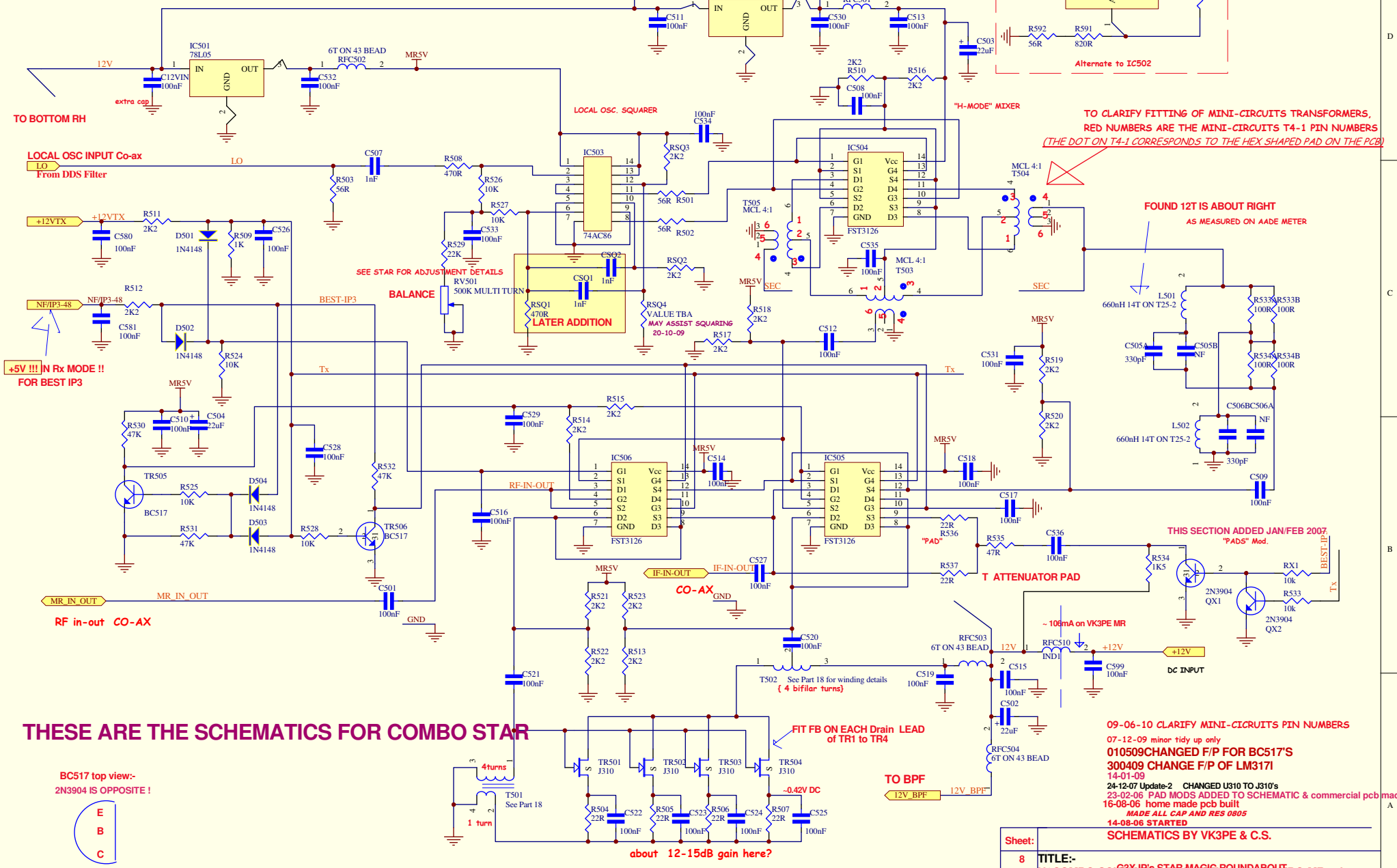
Sheet:	PICaSTAR SCHEMATICS BY VK3PE & C.S. BASED ON ORIGINALS (C) BY G3XJP	
9 of 16	TITLE:- H:COMBO-SCHEMATIC-PROJECT-121109:COMBO-MATRIX.SCH	
	For Oct 2007 "VK3PE PCBs"	Vers "A"

PICaSTAR MAGIC ROUNDABOUT

24-11-08 PREFIX ALL WITH 500

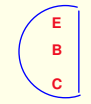
Version A 060907

07-12-09



THESE ARE THE SCHEMATICS FOR COMBO STAR

BC517 top view:-
2N3904 IS OPPOSITE !



09-06-10 CLARIFY MINI-CIRCUITS PIN NUMBERS
 07-12-09 minor tidy up only
 010509 CHANGED F/P FOR BC517'S
 300409 CHANGE F/P OF LM3171
 14-01-08
 24-12-07 Update-2 CHANGED U310 TO J310's
 23-02-06 PAD MODS ADDED TO SCHEMATIC & commercial pcb made
 16-08-06 home made pcb built
 MADE ALL CAP AND RES 0805
 14-08-06 STARTED
 SCHEMATICS BY VK3PE & C.S.

Post #3817 HAROLD USED BN61-302 CORES TO GET RESPONSE UP TO 6 METERS

Sheet:	8
of	16
TITLE:-	COMBO SCHEMATIC FOR PICaSTAR MAGIC ROUNDABOUT
File:	COMBO-MR.sch
Vers	Ver A panel

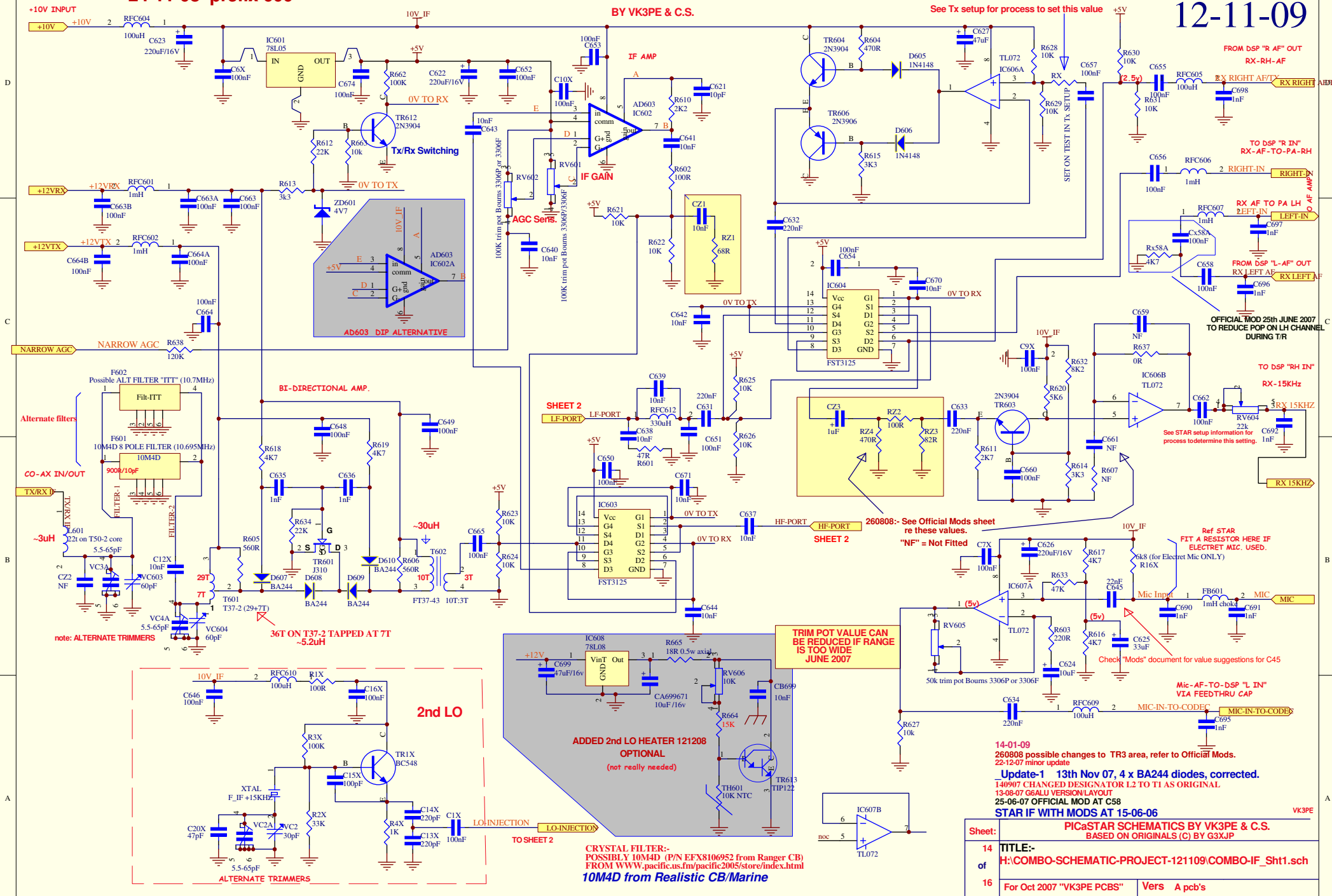
24-11-08 prefix 600

PICaSTAR IF BOARD section

BY VK3PE & C.S.

THESE ARE THE SCHEMATICS FOR COMBO STAR

12-11-09



FROM DSP "R AF" OUT
RX-RH-AF

RX RIGHT

TO DSP "R IN"
RX-AF-TO-PA-RH

RIGHT-IN

RX AF TO PA LH
O AF AMP

LEFT-IN

FROM DSP "L-AF" OUT
RX LEFT AF

RX LEFT AF

OFFICIAL MOD 25th JUNE 2007
TO REDUCE POP ON LH CHANNEL
DURING T/R

TO DSP "RH IN"
RX-15KHz

RX 15KHz

See STAR setup information for
process to determine this setting.

MIC

Ref STAR
FIT A RESISTOR HERE IF
ELECTRET MIC. USED.

MIC-IN-TO-DSP "L IN"
VIA FEEDTHRU CAP

MIC-IN-TO-CODEC

14-01-09
260808 possible changes to TR3 area, refer to Official Mods.
22-12-07 minor update

Update-1 13th Nov 07, 4 x BA244 diodes, corrected.
140907 CHANGED DESIGNATOR L2 TO T1 as ORIGINAL
13-08-07 G6ALU VERSION LAYOUT
25-06-07 OFFICIAL MOD AT C58
STAR IF WITH MODS AT 15-06-06

Sheet:	PICaSTAR SCHEMATICS BY VK3PE & C.S. BASED ON ORIGINALS (C) BY G3XJP	
14 of 16	TITLE:- H:COMBO-SCHEMATIC-PROJECT-121109/COMBO-IF_Sht1.sch	
	For Oct 2007 "VK3PE PCBs"	Vers A pcb's

CRYSTAL FILTER:-
POSSIBLY 10M4D (P/N EFX8106952 from Ranger CB)
FROM WWW.pacific.us.fm/pacific2005/store/index.html
10M4D from Realistic CB/Marine

NARROW AGC

Alternate filters

CO-AX IN/OUT

TX/RX

note: ALTERNATE TRIMMERS

36T ON T37-2 TAPPED AT 7T
-5.2uH

2nd LO

LO INJECTION

ALTERNATE TRIMMERS

TO SHEET 2

CRISTAL FILTER:-

POSSIBLY 10M4D (P/N EFX8106952 from Ranger CB)

FROM WWW.pacific.us.fm/pacific2005/store/index.html

10M4D from Realistic CB/Marine

CRYSTAL FILTER:-

POSSIBLY 10M4D (P/N EFX8106952 from Ranger CB)

FROM WWW.pacific.us.fm/pacific2005/store/index.html

10M4D from Realistic CB/Marine

CRYSTAL FILTER:-

POSSIBLY 10M4D (P/N EFX8106952 from Ranger CB)

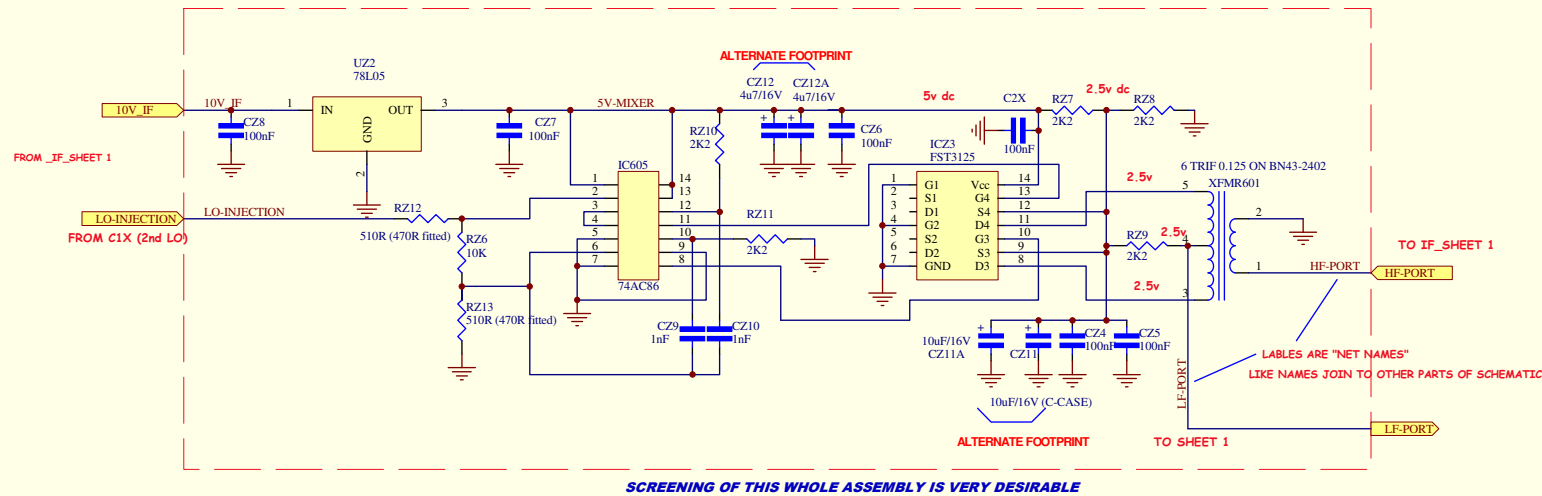
FROM WWW.pacific.us.fm/pacific2005/store/index.html

10M4D from Realistic CB/Marine

PICaSTAR IF BOARD for G6ALU LAYOUT

BY VK3PE & C.S.

"MIXADAPTER" FST3125 MIXER BOARD (NOW PART OF IF PCB)



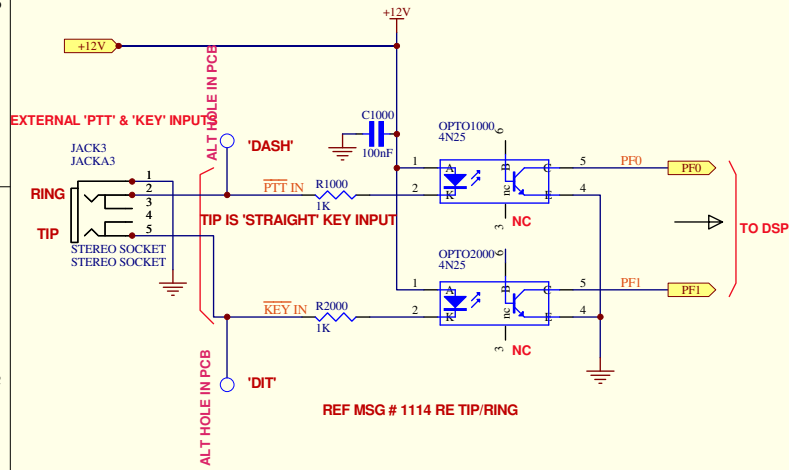
280909

14-01-09

300708 minor update.
22-12-07 minor update
10-07-07 CONVERT TO 0805 PARTS
DRAWN BY VK3PE

Sheet:	PICaSTAR SCHEMATICS BY VK3PE & C.S. BASED ON ORIGINALS (C) BY G3XJP	
15 of 16	TITLE:- H:\COMBO-SCHEMATIC-PROJECT-121109\COMBO-IF_Sht2.SCH	
	For Oct 2007 "VK3PE PCBs"	Vers A

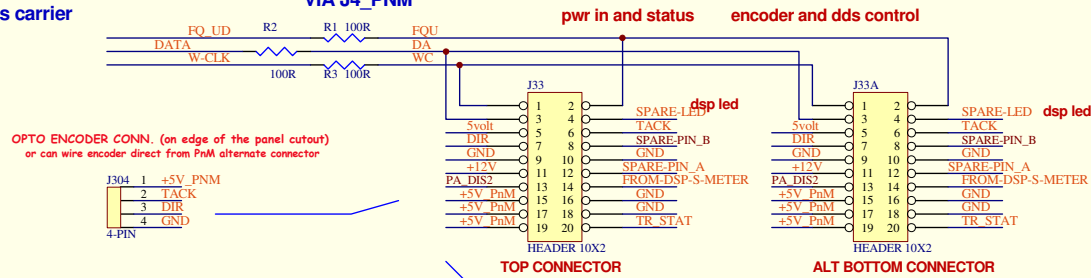
DSP OPTO ISOLATOR FOR PTT & KEY TO DSP prefix 1000



INTERCONNECT TO CONTROLLER

REMOVE RES BELOW FOR DIRECT CONNECT TO PnM VIA J4_PNM

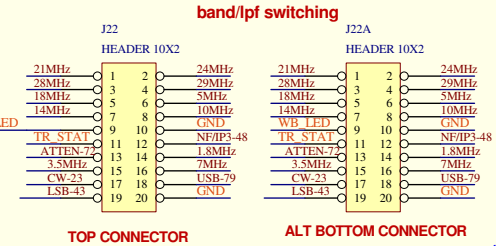
from dds carrier



TOP CONNECTOR

ALT BOTTOM CONNECTOR

ADDED 140109



TOP CONNECTOR

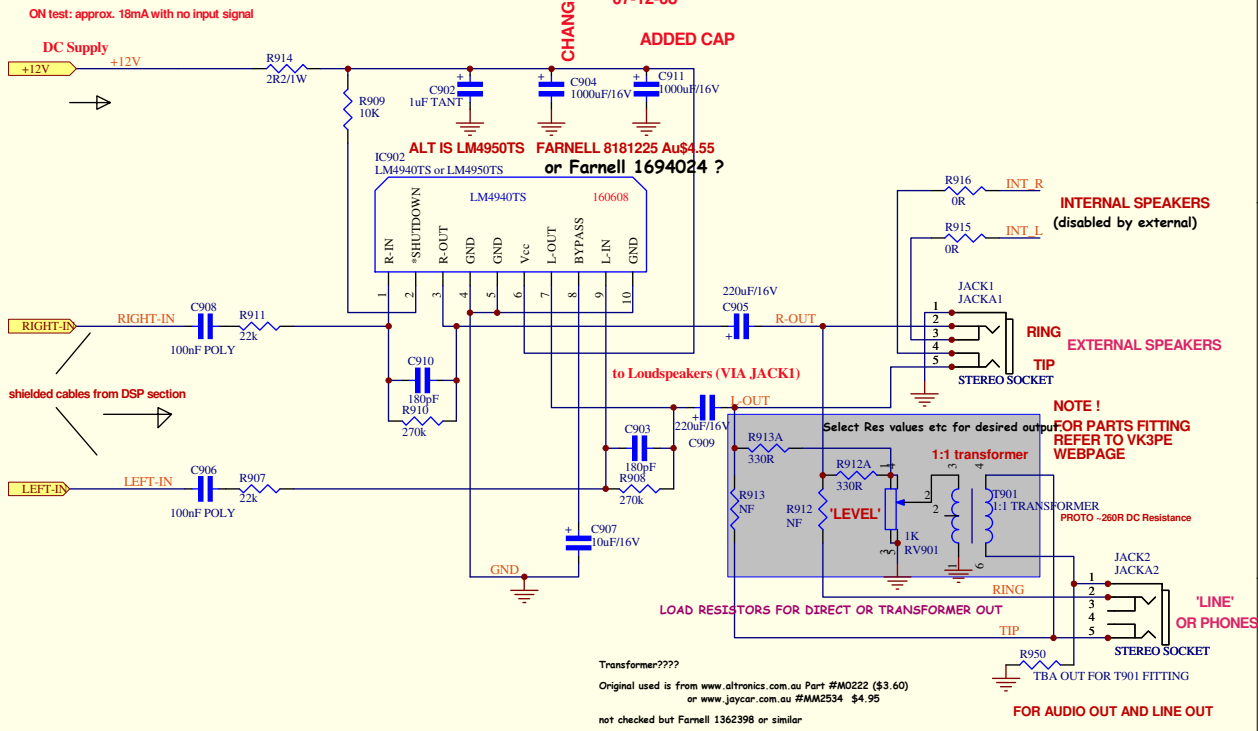
ALT BOTTOM CONNECTOR

THESE ARE THE SCHEMATICS FOR COMBO STAR

There are mating connectors on the Picninx board. and IDC ribbon cables are used to connect. Trxavrbb also has mating connector.

07-12-09 minor tidy up only
01 10 09 ADD ALT 'STEREO' JACKS

Audio Amp prefix 900 07-12-09



Transformer????
Original used is from www.altronics.com.au Part #M0222 (\$3.60)
or www.jaycar.com.au #MM2534 \$4.95
not checked but Farnell 1362398 or similar

FOR AUDIO OUT AND LINE OUT

14-01-09 ADDED ALTERNATE O/P XFMR
17-11-08 mods to ref numbers for inc into single pcb star
22-02-08 changed to 1k resistors. (was 2k2)

Sheet:	PICaSTAR SCHEMATICS BY VK3PE & C.S. —BASED ON ORIGINALS (C) BY G3XJP	
6	TITLE:-	H:\COMBO-SCHEMATIC-PROJECT-121109\COMBO-OPTO_AUDIO Sch
of		
16	For Oct 2007 "VK3PE PCBs"	Vers