

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

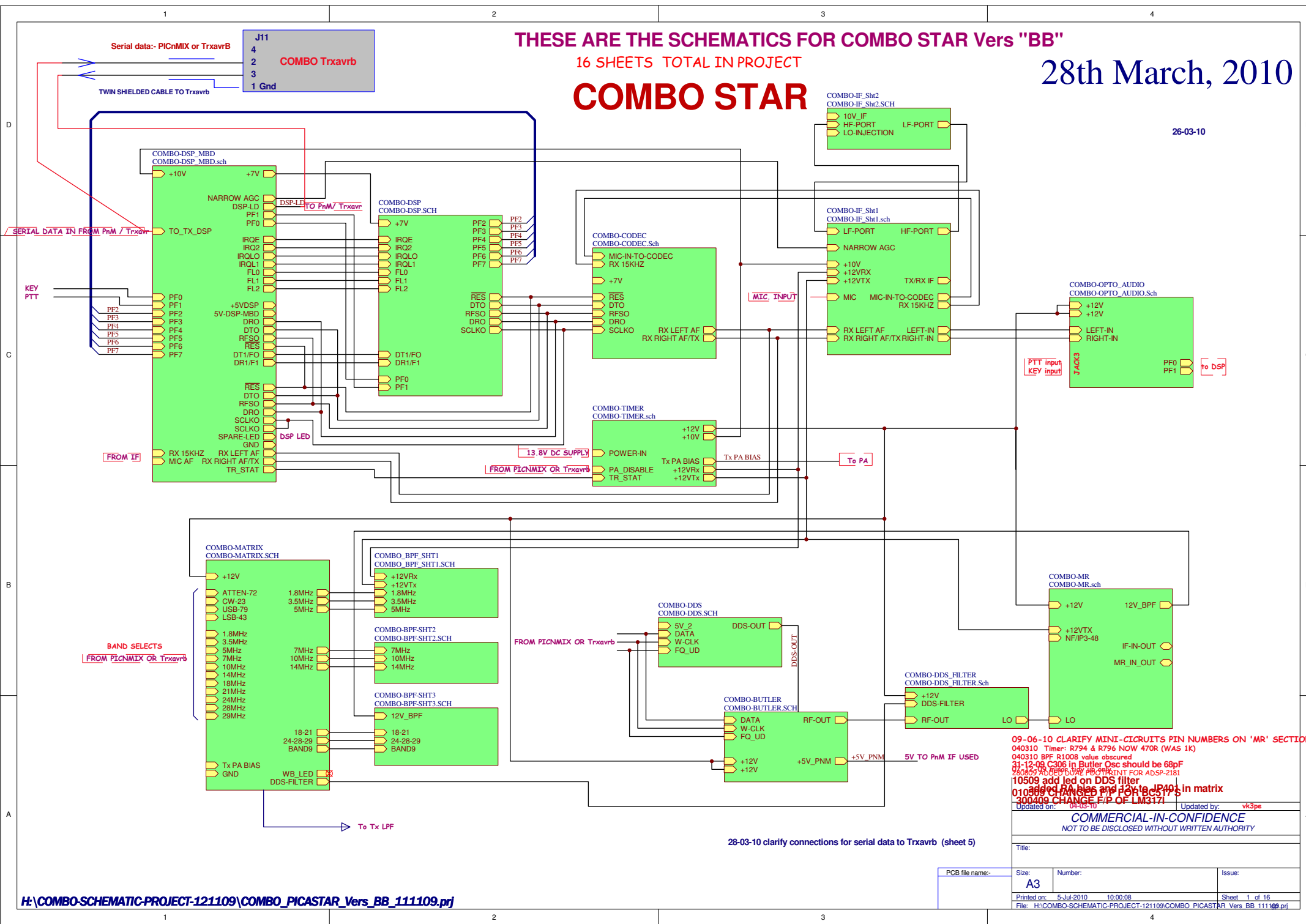
THESE ARE THE SCHEMATICS FOR COMBO STAR Vers "BB"

16 SHEETS TOTAL IN PROJECT

COMBO STAR

28th March, 2010

26-03-10



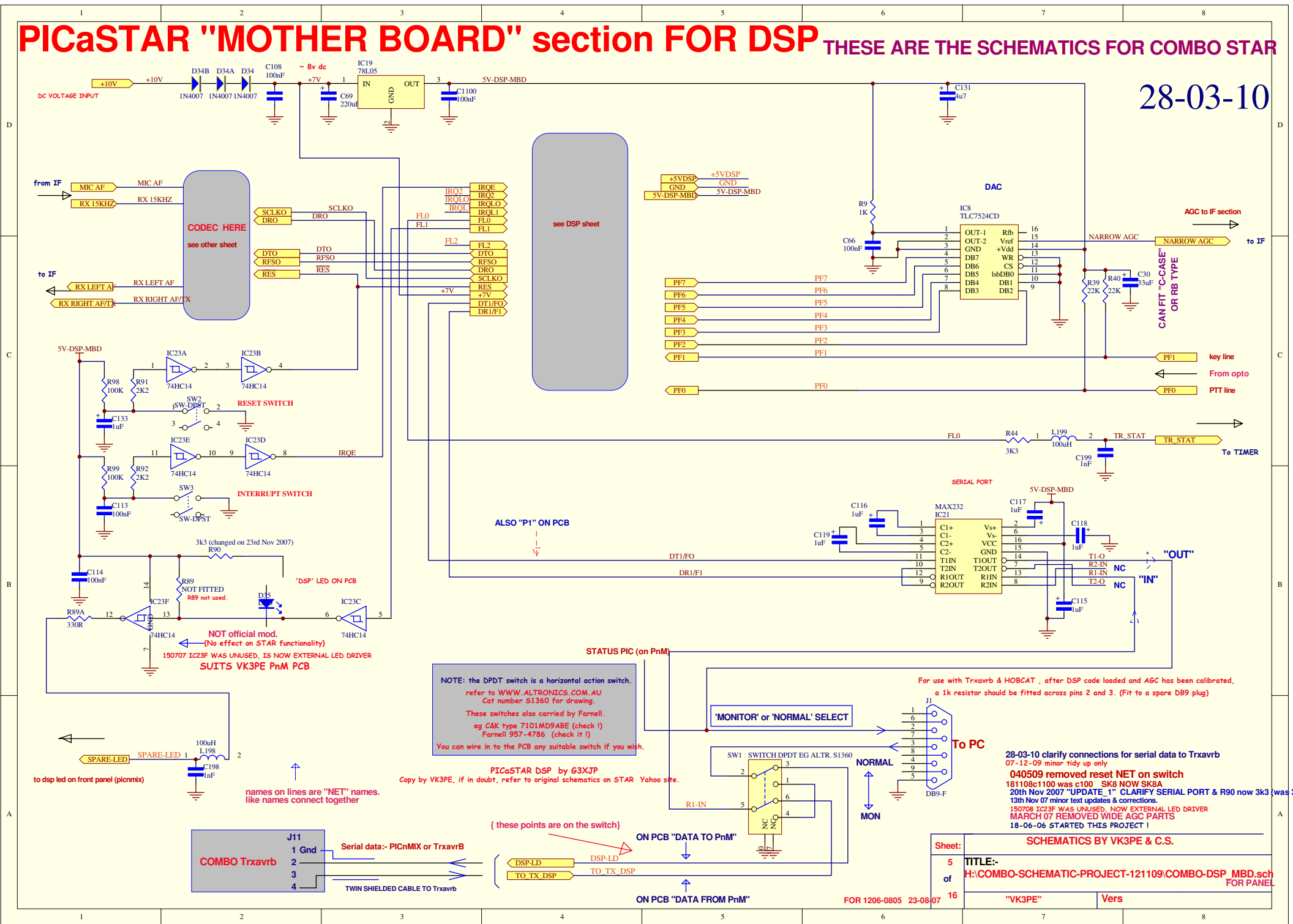
09-06-10 CLARIFY MINI-CIRCUITS PIN NUMBERS ON 'MR' SECTION
040310 Timer: R794 & R796 NOW 470R (WAS 1K)
040310 BPF R1008 value obscured
31-12-09 C306 in Butler Osc should be 68pF
980809 ADSP-2181 PART NUMBER PHOTO PRINT FOR ADSP-2181
10509 add led on DDS filter
01030904 AN885 #18 Pin 18 in matrix
300409 CHANGE F/P OF LM3171
Updated on: (date) Updated by: vk3pe

Title:			
COMMERCIAL-IN-CONFIDENCE NOT TO BE DISCLOSED WITHOUT WRITTEN AUTHORITY			
PCB file name: A3			
Size:	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



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 of 16	TITLE:- H:\COMBO-SCHEMATIC-PROJECT-121109\COMBO-DSP_MBD.sch FOR PANEL	
	"VK3PE"	Vers

FOR 1206-0805 23-08-07

PICaSTAR CODEC section

THESE ARE THE SCHEMATICS FOR COMBO STAR

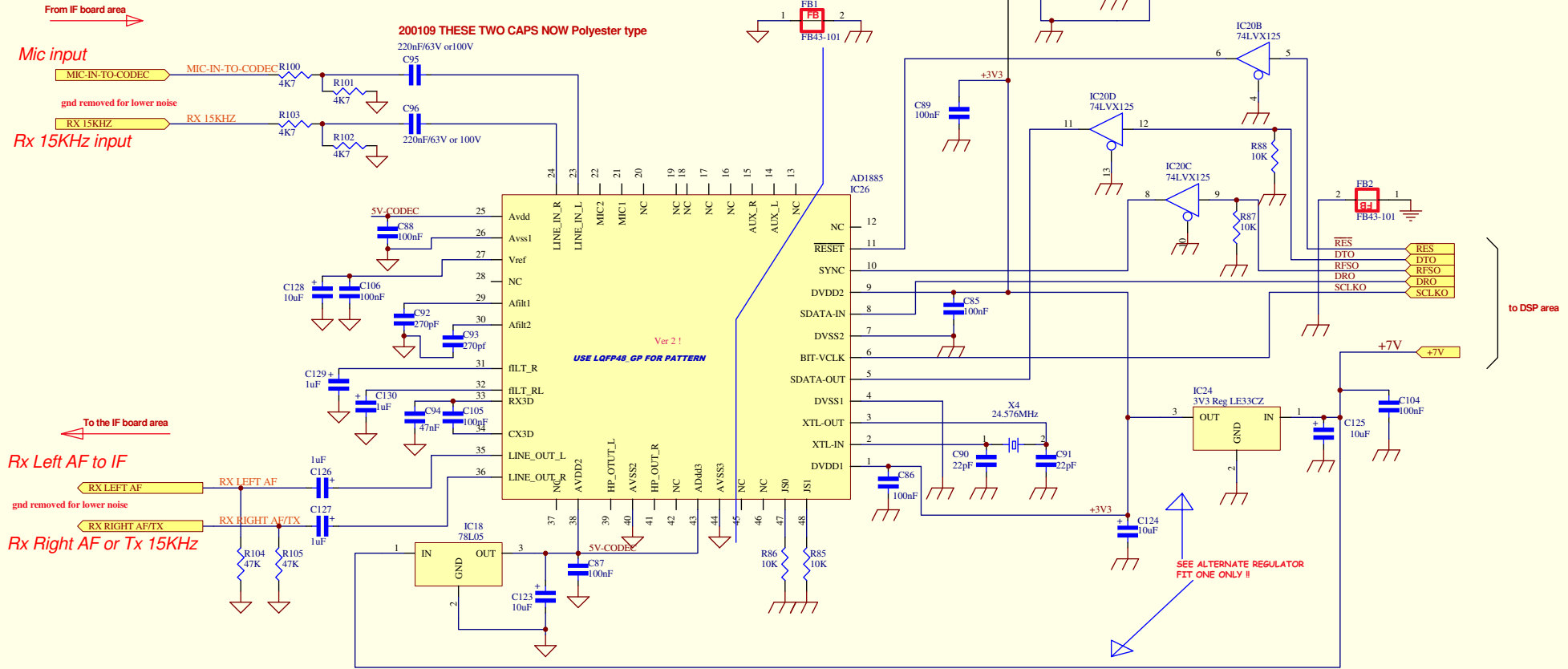
12-11-09

ORIGINAL SCHEMATIC BY G3XJP

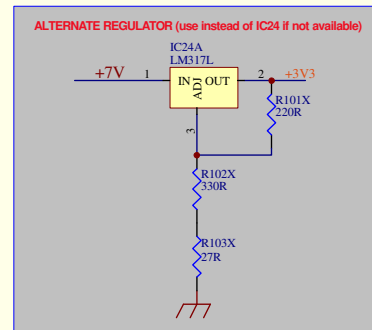
THIS VERSION BY VK3PE & C.S.

prefix mostly <100

FIT FERRITE BEAD here!



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



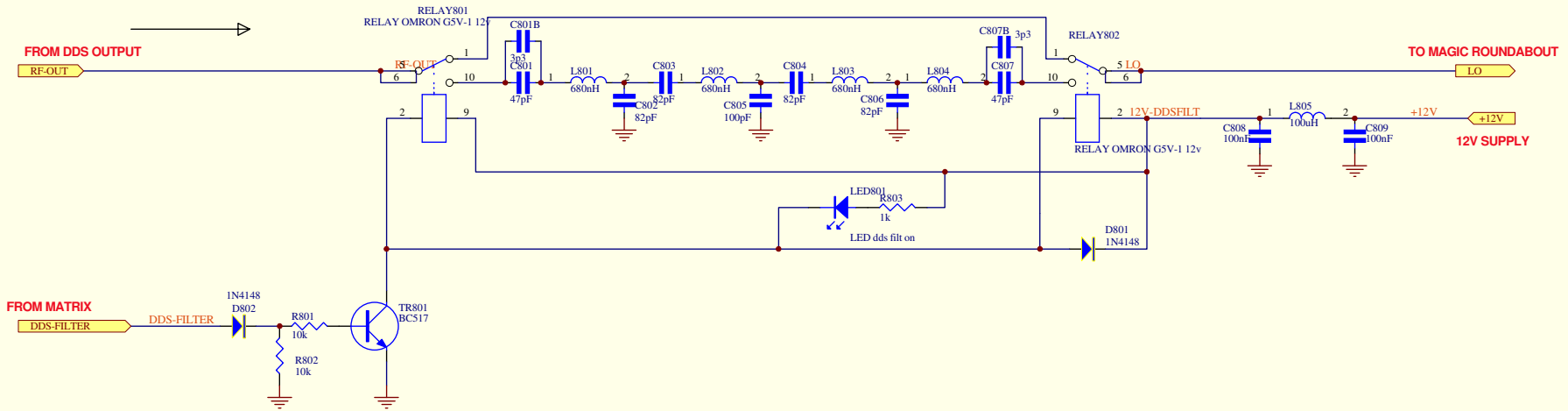
- 20-01-09 change 2 caps to poly at input
- 04-02-08 Vers "B"- fix LM317 and AD1885 footprints
- Update_1 31-10-07 IC24A PINOUT IS WRONG
- 290907 UPDATED TEXT ETC
- 040807 changed C123 to axial type cap AND added alternate 3v3 reg

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

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

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

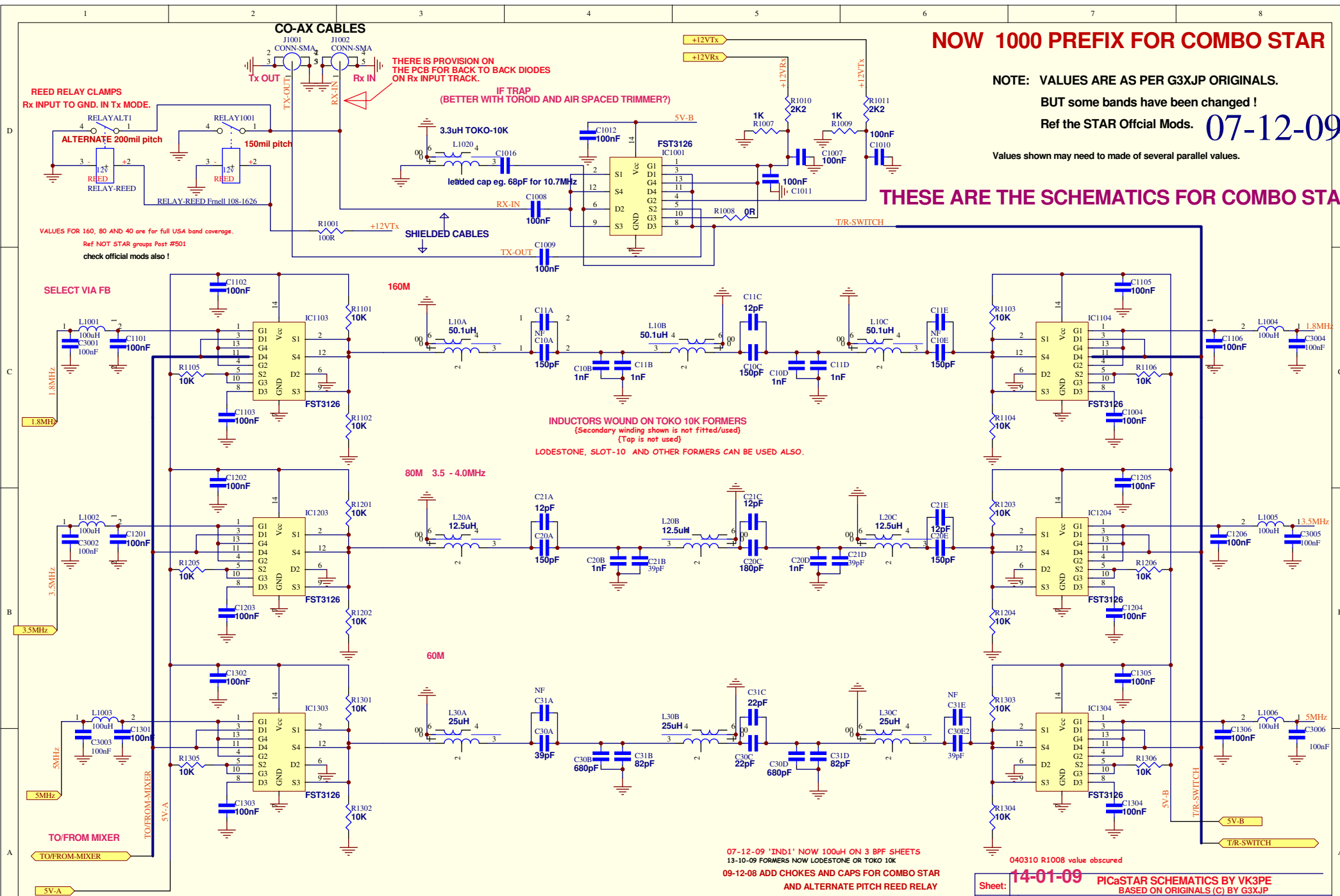
NOTE: VALUES ARE AS PER G3XJP ORIGINALS.

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



PICASTAR BPF SECTION, sheet 1 of 3

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

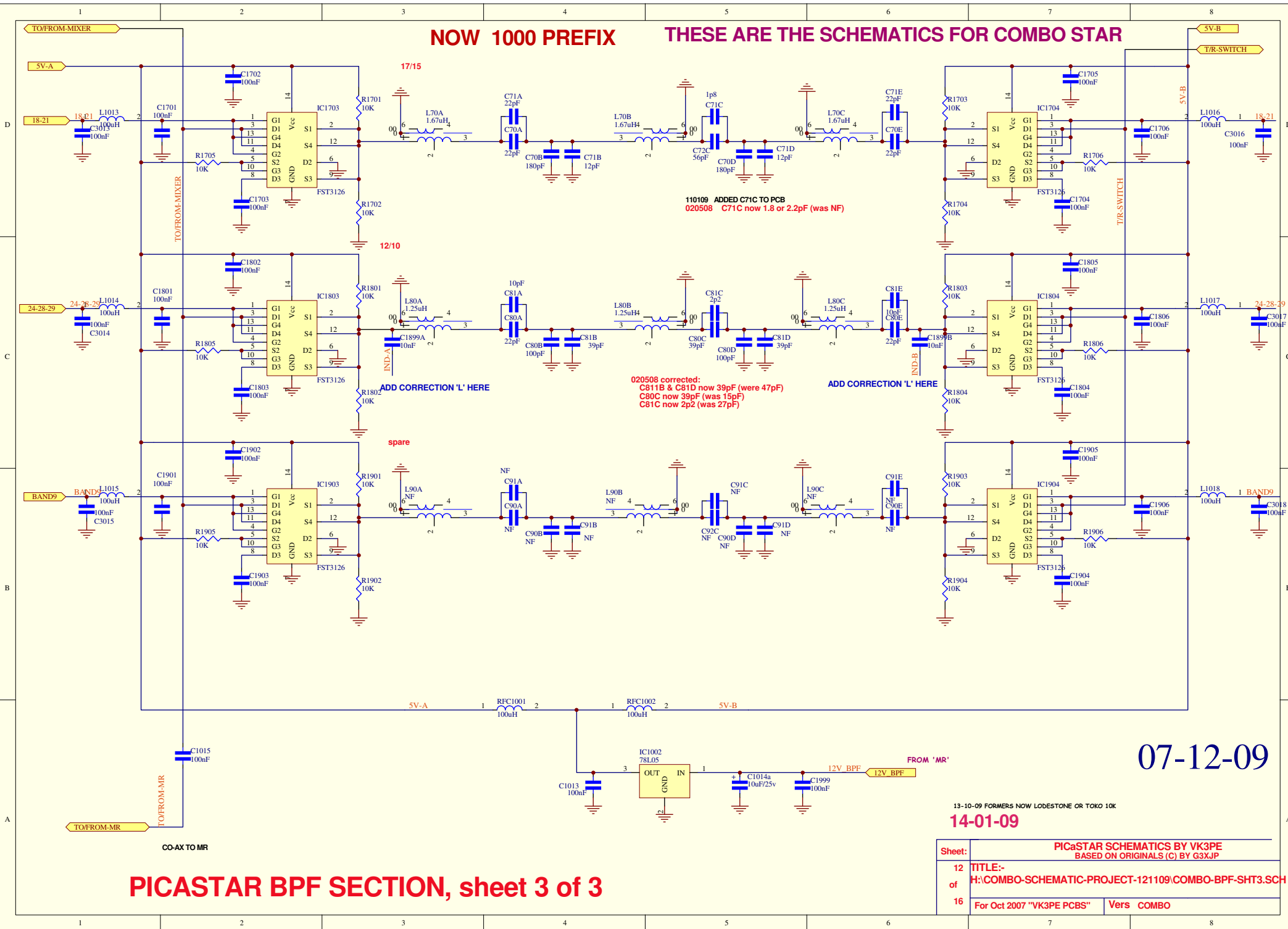
ref msg # 26404 for Toko10k turns ?

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	
10 of 16	For Oct 2007 "VK3PE PCBs"	Vers COMBO

NOW 1000 PREFIX

THESE ARE THE SCHEMATICS FOR COMBO STAR



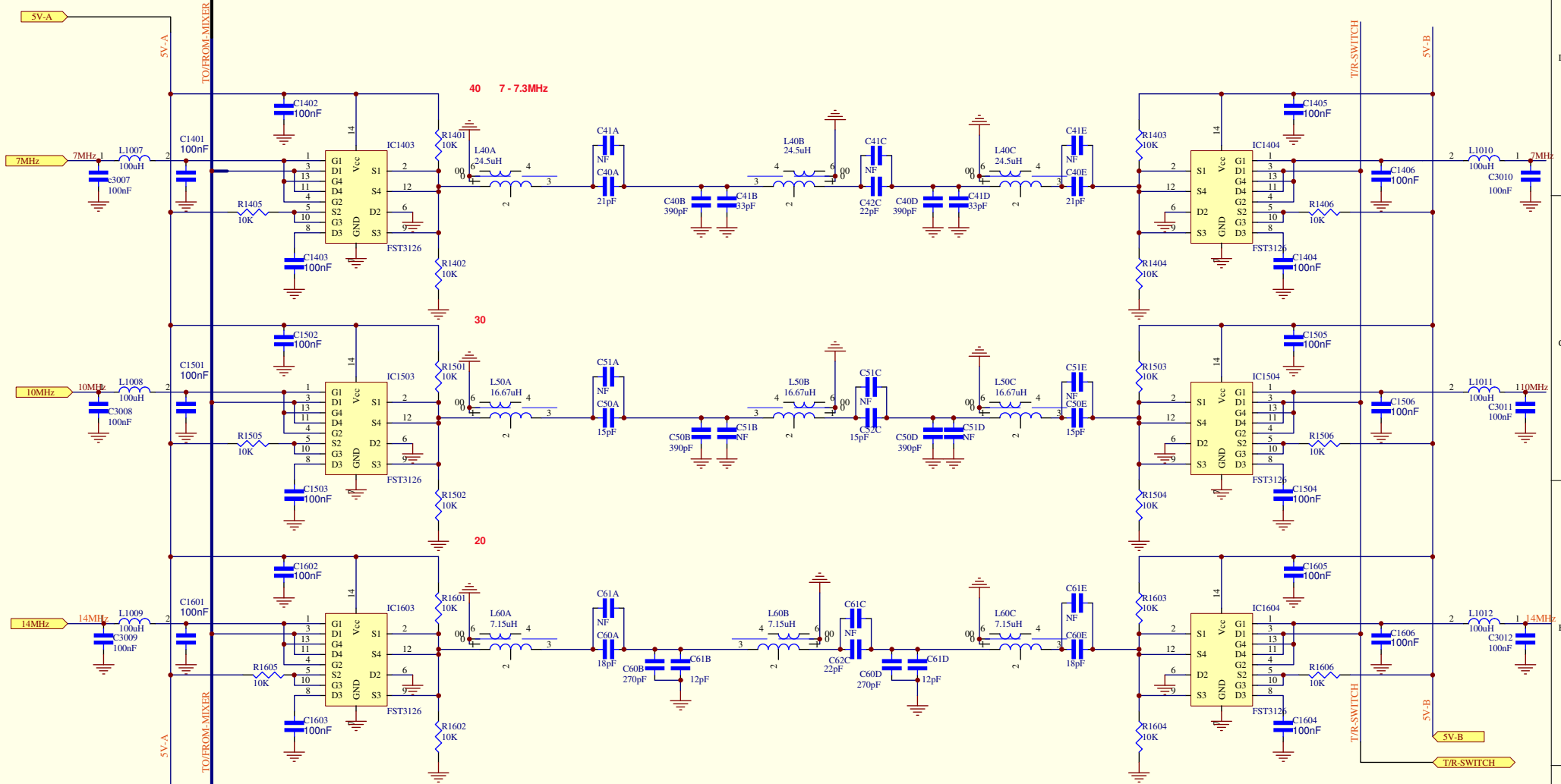
PICASTAR BPF SECTION, sheet 3 of 3

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

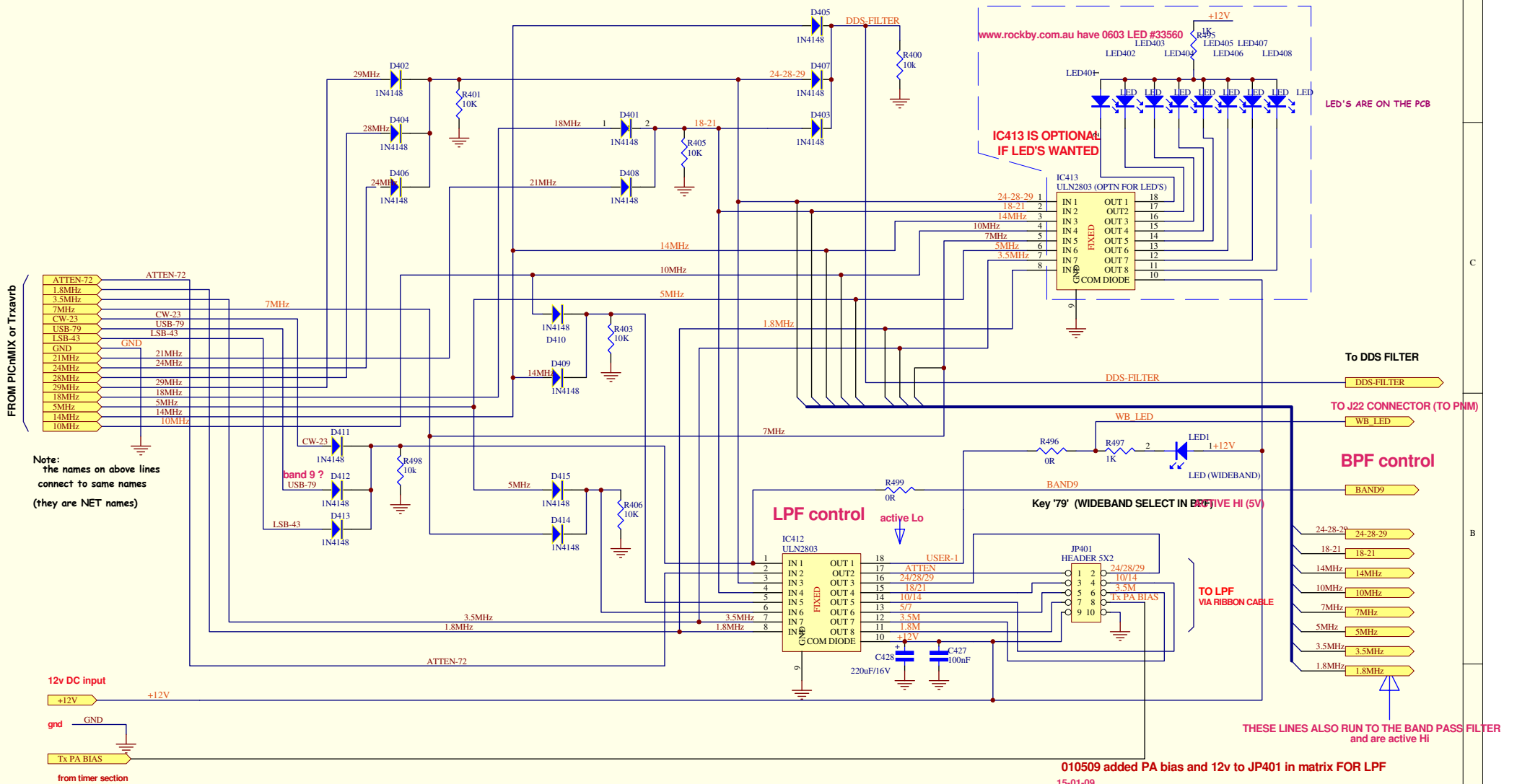
PICASTAR BPF SECTION, sheet 2 of 3

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
 - CW-23
 - USB-79
 - LSB-43
 - GND
 - 21MHz
 - 24MHz
 - 28MHz
 - 29MHz
 - 18MHz
 - 18MHz
 - 5MHz
 - 14MHz
 - 10MHz

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

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

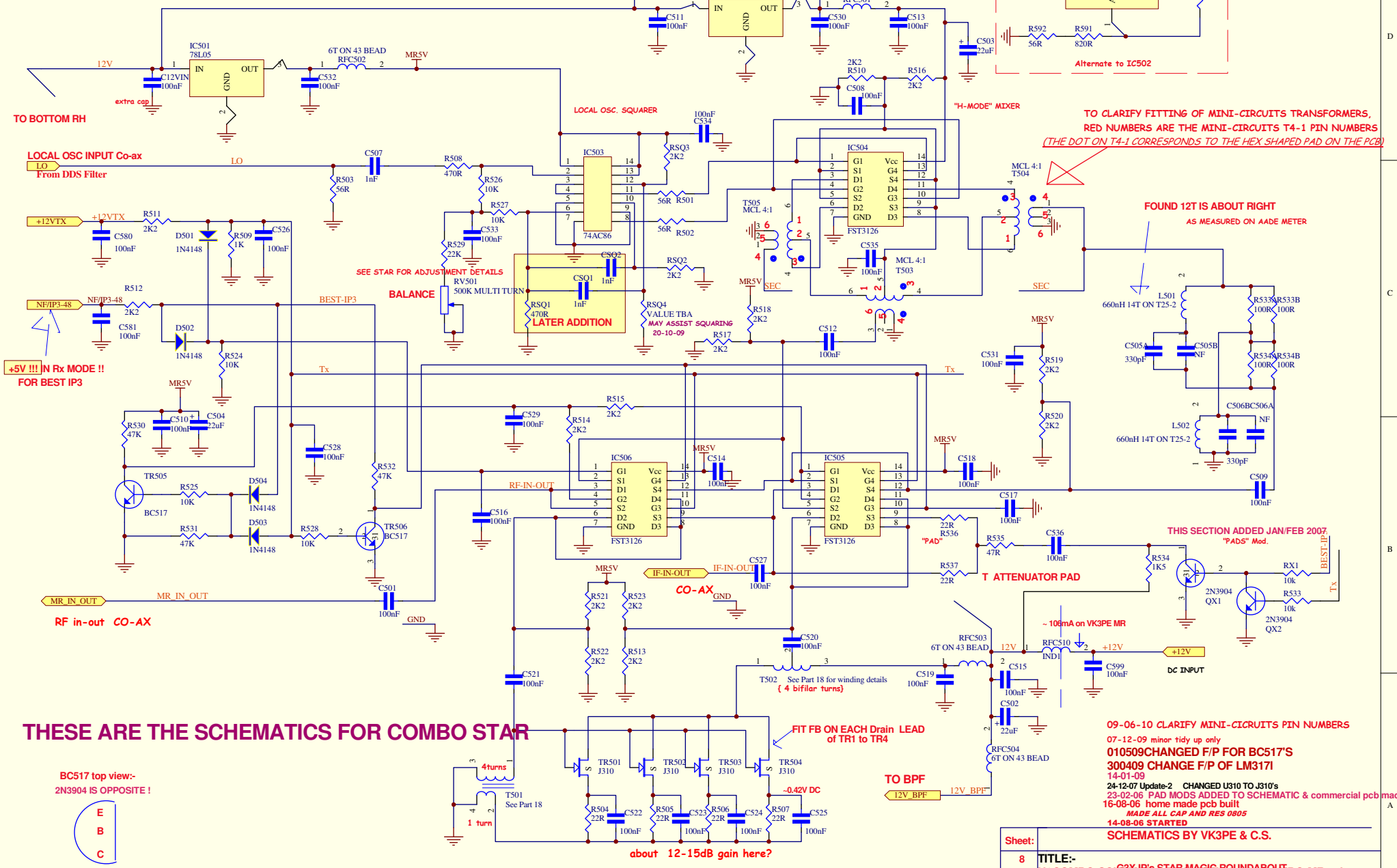
Sheet:	PICaSTAR SCHEMATICS BY VK3PE & C.S. BASED ON ORIGINALS (C) BY G3XJP	
9 of 16	TITLE:- H:\COMBO-SCHEMATIC-PROJECT-121109\COMBO-MATRIX.SCH	
	For Oct 2007 "VK3PE PCBs"	Vers "A"

PICaSTAR MAGIC ROUNDABOUT

24-11-08 PREFIX ALL WITH 500

Version A 060907

07-12-09



TO CLARIFY FITTING OF MINI-CIRCUITS TRANSFORMERS, RED NUMBERS ARE THE MINI-CIRCUITS T4-1 PIN NUMBERS (THE DOT ON T4-1 CORRESPONDS TO THE HEX SHAPED PAD ON THE PCB)

FOUND 12T IS ABOUT RIGHT AS MEASURED ON AADE METER

SEE STAR FOR ADJUSTMENT DETAILS
BALANCE
LATER ADDITION

+5V !!! IN Rx MODE !! FOR BEST IP3

THIS SECTION ADDED JAN/FEB 2007 "PADs" Mod.

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
14-01-09
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.

Sheet:	8
of	16
TITLE:-	COMBO SCHEMATIC FOR PICaSTAR MAGIC ROUNDABOUT
	Ref Parts 17 & 18
	"VK3PE"
Vers	Ver A panel

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

about 12-15dB gain here?

TO BPF
12V BPF 12V BPF

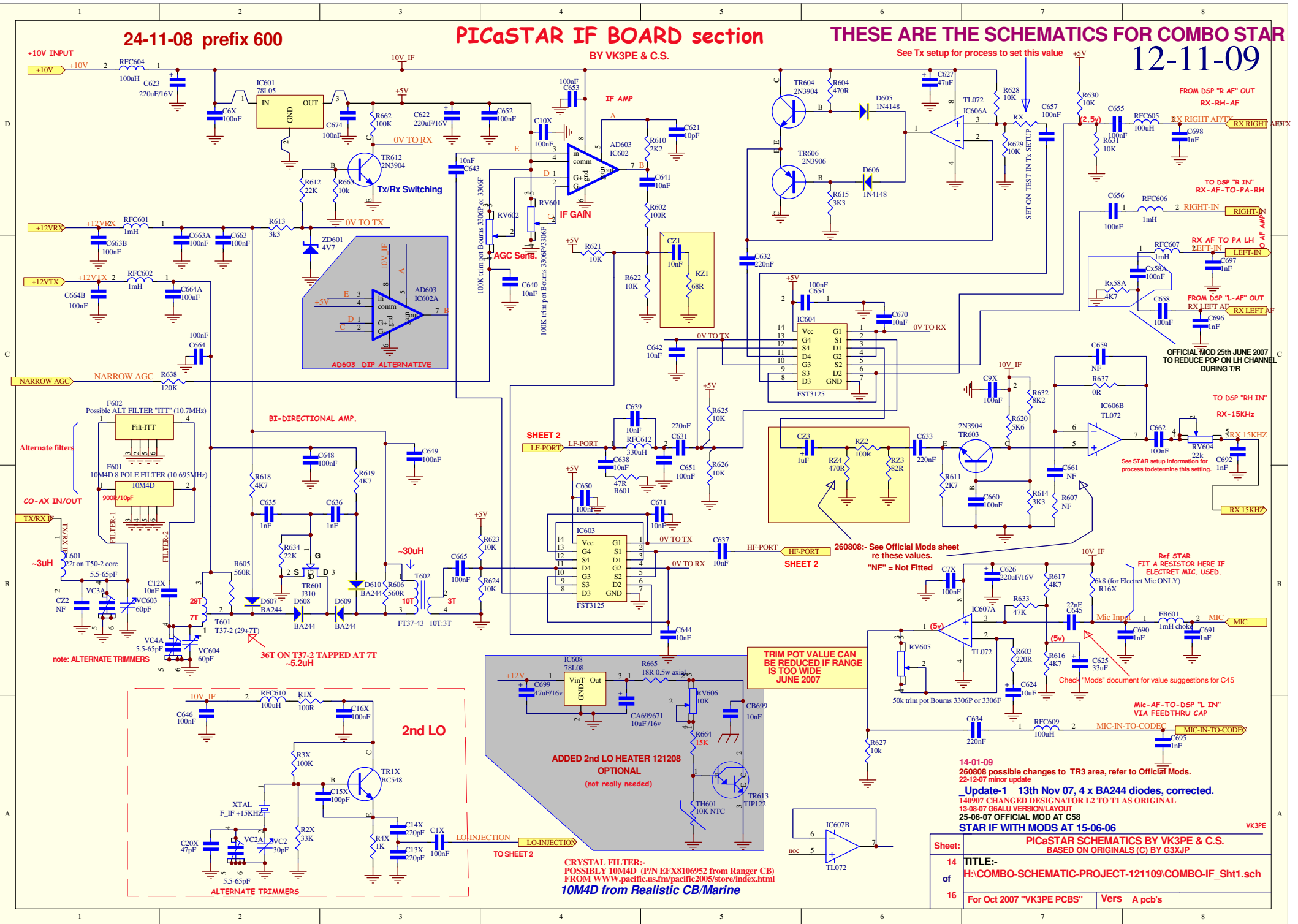
24-11-08 prefix 600

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

LEFT-IN

FROM DSP "L-AF" OUT
RX LEFT AF

RX LEFT AF

TO DSP "RH IN"
RX-15KHz

RX 15KHz

260808- See Official Mods sheet
re these values.

"NF" = Not Fitted

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

MIC

Mic-AF-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

TRIM POT VALUE CAN
BE REDUCED IF RANGE
IS TOO WIDE
JUNE 2007

NARROW AGC

Alternate filters

CO-AX IN/OUT

TX/RX

note: ALTERNATE TRIMMERS

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

2nd LO

ALTERNATE TRIMMERS

LO-INJECTION

TO SHEET 2

SHEET 2

LF-PORT

HF-PORT

ADDED 2nd LO HEATER 121208
OPTIONAL
(not really needed)

LO-INJECTION

TO SHEET 2

SHEET 2

HF-PORT

ADDED 2nd LO HEATER 121208
OPTIONAL
(not really needed)

LO-INJECTION

TO SHEET 2

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.

RX 15KHz

RX 15KHz

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

MIC

Mic-AF-TO-DSP "L IN"
VIA FEEDTHRU CAP

MIC-IN-TO-CODEC

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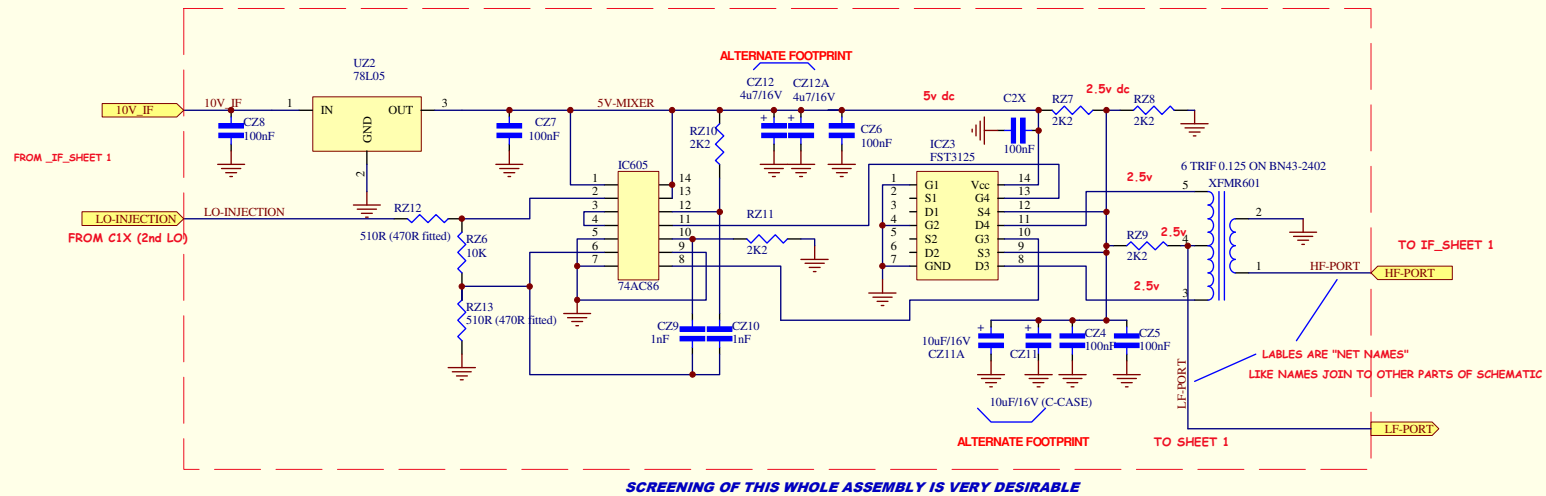
MIC-IN-TO-CODEC

MIC-IN-TO-CODEC

PICaSTAR IF BOARD for G6ALU LAYOUT

BY VK3PE & C.S.

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



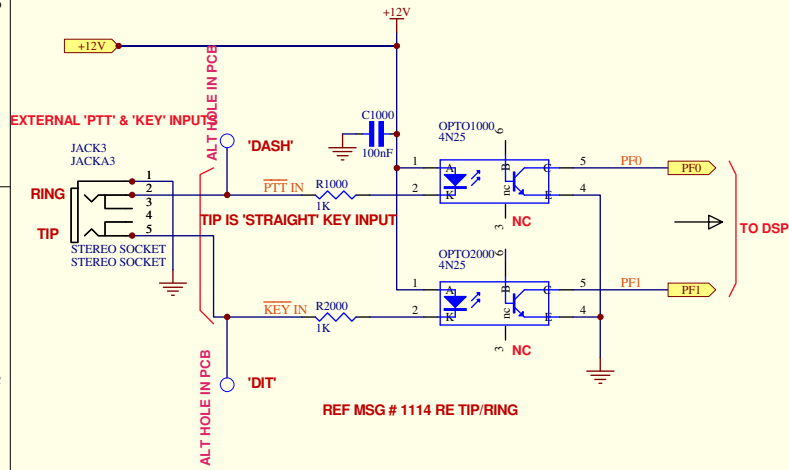
280909

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

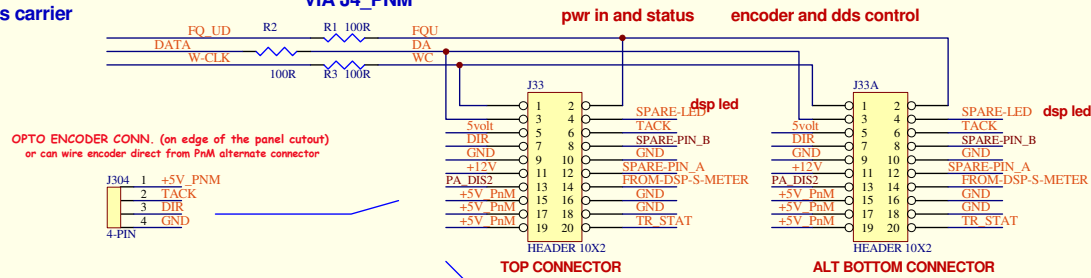
DSP OPTO ISOLATOR FOR PTT & KEY TO DSP prefix 1000



INTERCONNECT TO CONTROLLER

REMOVE RES BELOW FOR DIRECT CONNECT TO PnM VIA J4_PNM

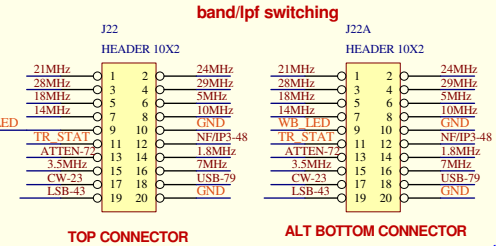
from dds carrier



TOP CONNECTOR

ALT BOTTOM CONNECTOR

ADDED 140109



TOP CONNECTOR

ALT BOTTOM CONNECTOR

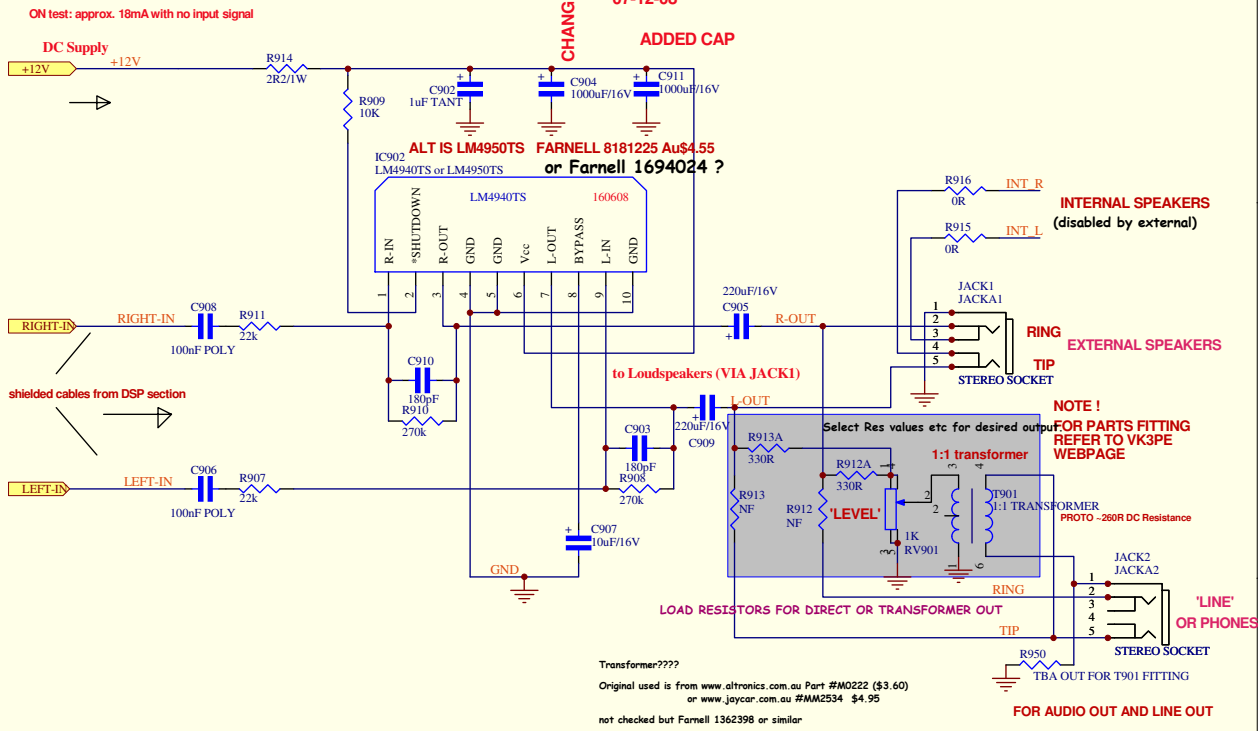
THESE ARE THE SCHEMATICS FOR COMBO STAR

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



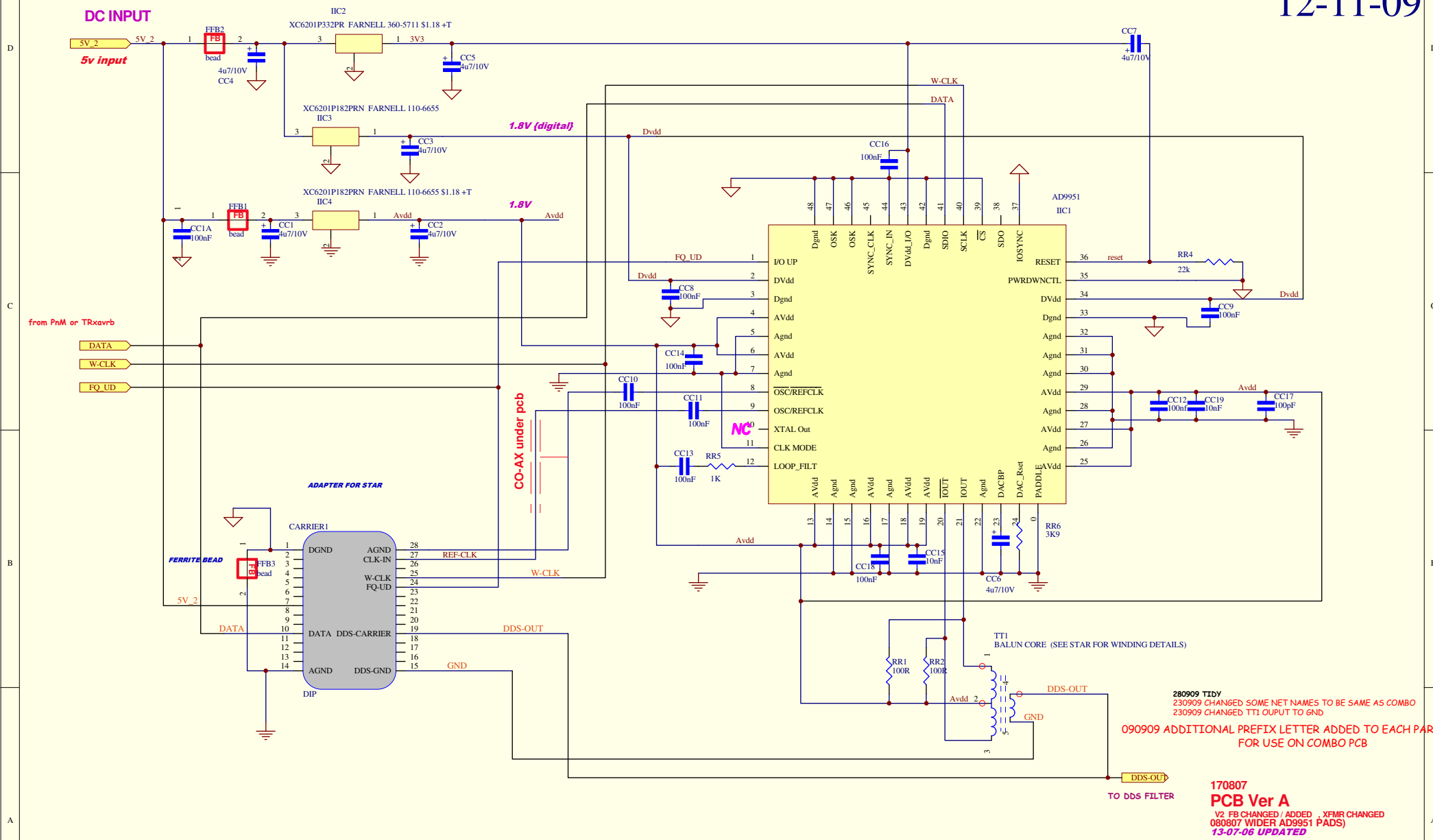
14-01-09 ADDED ALTERNATE O/P XFMR
17-11-08 mods to ref numbers for inc into single pcb star
22-02-08 changed to 1k resistors. (was 2k2)

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

G3XJP PICaSTAR

AD9951 DDS "PLL" (VK3PE PCB) 'COMBO' VERS.

12-11-09



280909 TIDY
230909 CHANGED SOME NET NAMES TO BE SAME AS COMBO
230909 CHANGED TTI1 OUTPUT TO GND
090909 ADDITIONAL PREFIX LETTER ADDED TO EACH PART
FOR USE ON COMBO PCB

170807
PCB Ver A
V2 FB CHANGED / ADDED XFMR CHANGED
080807 WIDER AD9951 PADS)
13-07-06 UPDATED

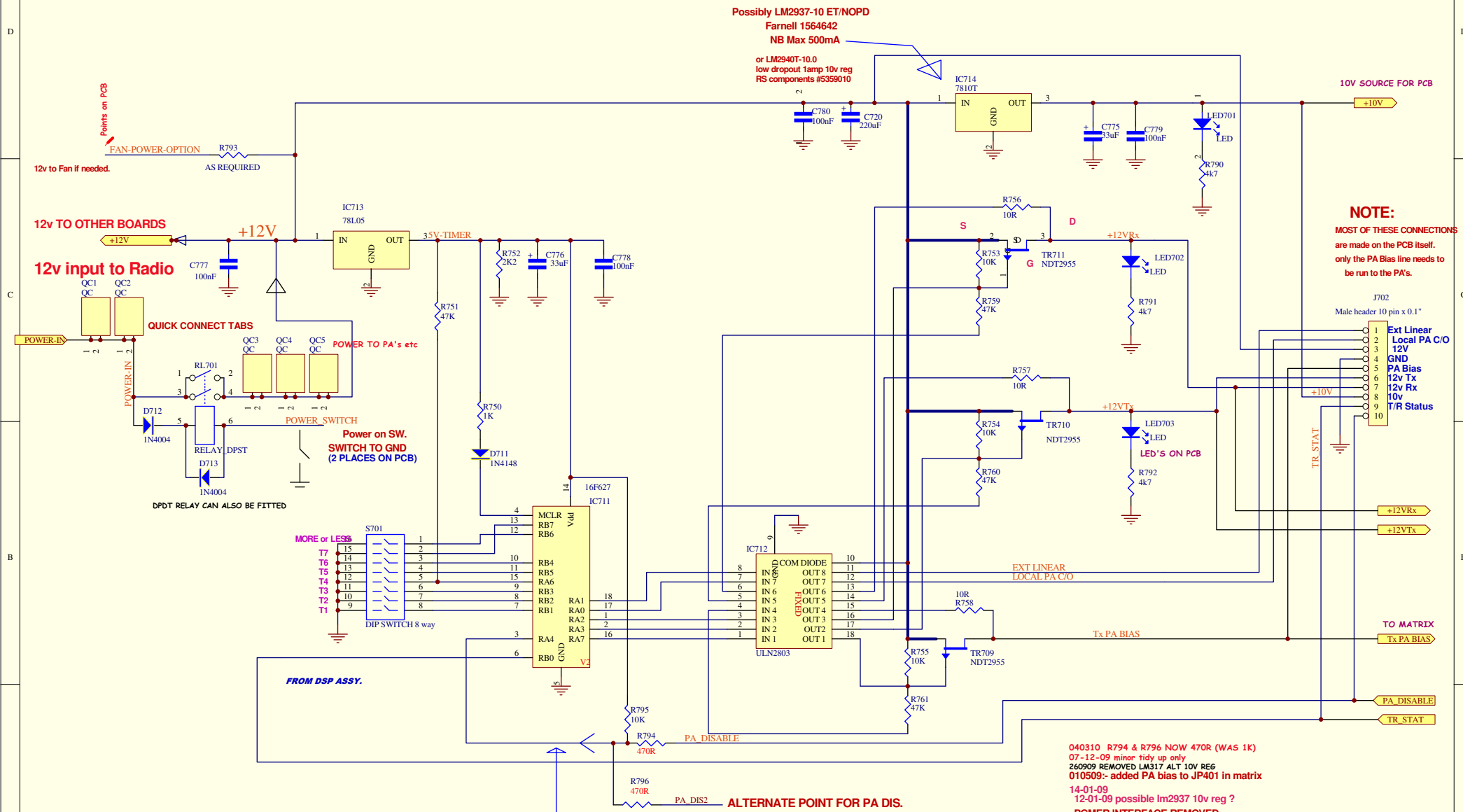
DDS IS NOW INTEGRATED ONTO THE SINGLE BOARD VERSION

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

STAR TIMER SECTION

THESE ARE THE SCHEMATICS FOR COMBO STAR
PREFIX ALL WITH 700 NOW FOR SINGLE BD STAR

07-12-09



Possibly LM2937-10 ET/NOPD
Farnell 1564642
NB Max 500mA

or LM2940T-10.0
low dropout 1amp 10v reg
RS components #S359010

NOTE:
MOST OF THESE CONNECTIONS
are made on the PCB itself.
only the PA Bias line needs to
be run to the PA's.

J702
Male header 10 pin x 0.1"

- 1 Ext Linear
- 2 Local PA C/O
- 3 12V
- 4 GND
- 5 PA Bias
- 6 12v Tx
- 7 12v Rx
- 8 10v
- 9 T/R Status
- 10

040310 R794 & R796 NOW 470R (WAS 1K)
07-12-09 minor tidy up only
260909 REMOVED LM317 ALT 10V REG
010509:- added PA bias to JP401 in matrix
14-01-09
12-01-09 possible lm2937 10v reg ?
PGMER INTERFACE REMOVED
01-10-09 J3 now 10 pins
040907 PCB BY CHRIS STAKE
07-07-06

REFER TO IAN G3VPX'S TIMER CHANGES
(USED IF HIGH SWR FOR SHUTDOWN OF PA)

ALTERNATE POINT FOR PA DIS.
LOCATED NEAR REG. FOR DDS.

PREFIX 700

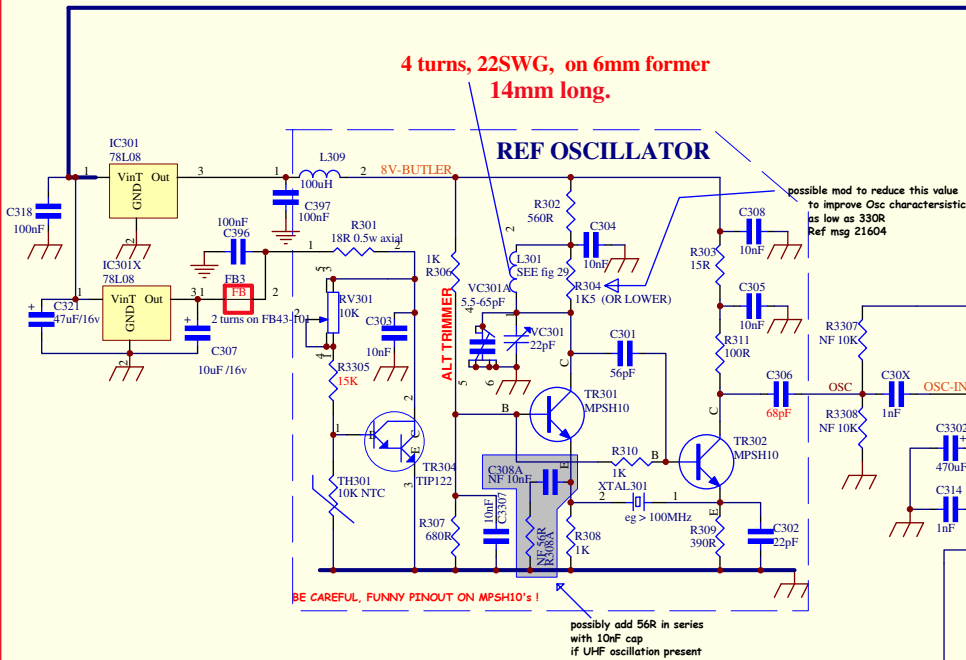
CORRECTED WIRING TO NEW FOOTPRINT OF IC712

Sheet:	SCHEMATICS BY VK3PE & C.S.		
7	TITLE:- STAR TIMER BY VK3PE & C.S.		
of	H:\COMBO-SCHEMATIC-PROJECT-121109\COMBO-TIMER.sch		
16	"VK3PE"	Vers	single pcb star

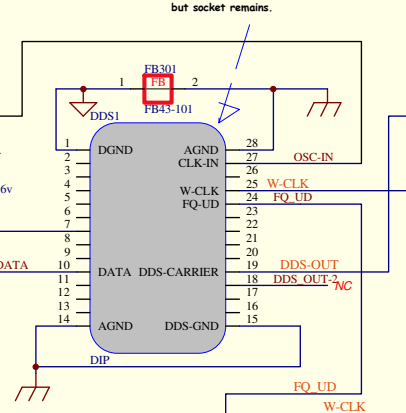
USE 1/2W Resistor minimum. 1 or 2W is better

4 turns, 22SWG, on 6mm former
14mm long.

REF OSCILLATOR



AD9951 DDS CARRIER PCB



THESE ARE THE SCHEMATICS FOR COMBO STAR

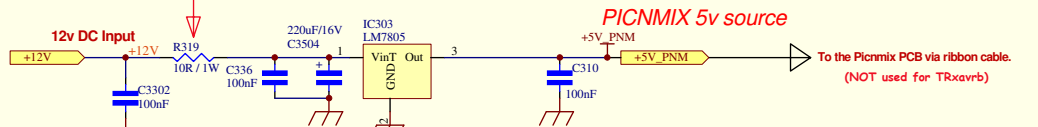
for combo panel change to prefix 300

BUTLER/DDS CARRIER/AMP SECTION

31-12-09

THIS IS THE 5V SUPPLY FOR THE PnMN (if used)

USE 1/2W Resistor minimum. 1 or 2W is better



31-12-09 C306 (Butler) SHOULD BE 68pF FOR CORRECT O/P LEVEL ESPECIALLY ON 10M

14-01-09 Update 2 26-11-07 TR103 is TIP122 not TIP123
31-10-07 C2 IS ON DISPLAY PCB

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

BUTLER OSC, DDS CARRIER AND AMP PCB

This schematic is a re-drawn version of the G3XJP PnM schematic who owns the (C). This schematic is provided for completeness only for the VK3PE & C.S. pcb.

OPTO TUNING ENCODER SECTION (Home made encoder)

