

# COMBO STAR

THESE ARE THE SCHEMATICS FOR COMBO STAR

Name  
DSP\_Ver-A\_190807.SCH

**PREFIX < 200**

Name  
CODIEC\_Ver-B\_040208.Sch

**PREFIX < 200**

Name  
DSP\_MBd\_Ver-A\_060907\_Update\_1.sch

**PREFIX < 200**

Name  
bM\_Ver-a\_BUTLER\_300.SCH

**BUTLER: 300**

Name  
MATRIX-4.SCH

**PREFIX 400**

Name  
MR\_Ver\_A\_060907\_Update\_1\_241108.sch

**MR:- PREFIX 500**

Name  
IF\_SHORT-VERS\_241108.sch

**IF:- PREFIX 600**

Name  
TIMER\_Ver-A\_040907\_120109\_1.sch

**PREFIX 700**

Name  
DDS\_FILTER\_DRAFT\_1\_800.Sch

**DDS FILTER 800**

Name  
OPTO-ISOLATE\_220208.Sch

**OPTO:- PREFIX 1000 !!!!! SEE bpf !!!**

Name  
BPF\_COMBO\_091208.SCH

**PREFIX 1000  
BPF**

**20-01-09**

Updated on:

**COMMERCIAL-IN-CONFIDENCE**  
NOT TO BE DISCLOSED WITHOUT WRITTEN AUTHORITY

Title:

Size  
**A3**

Number:

Issue

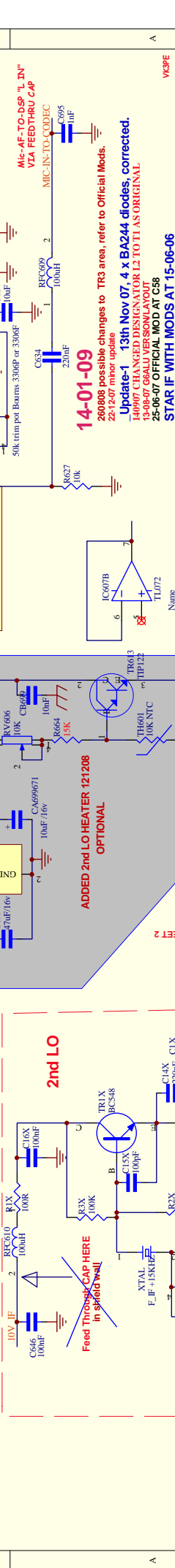
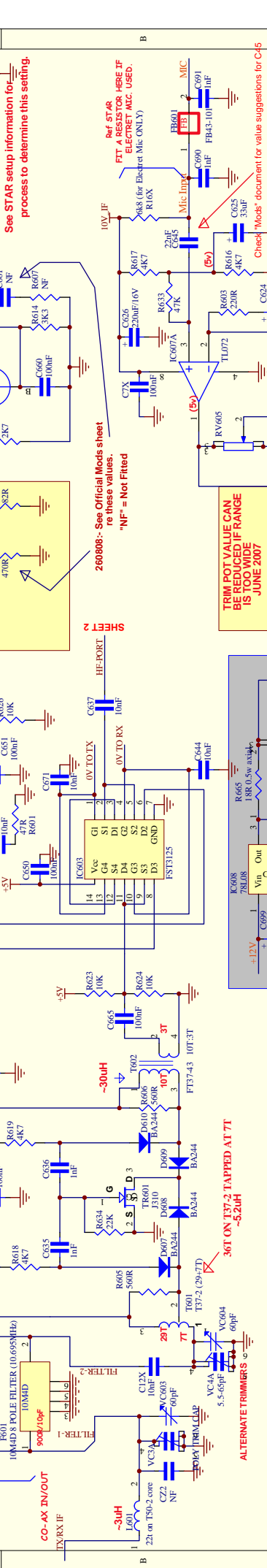
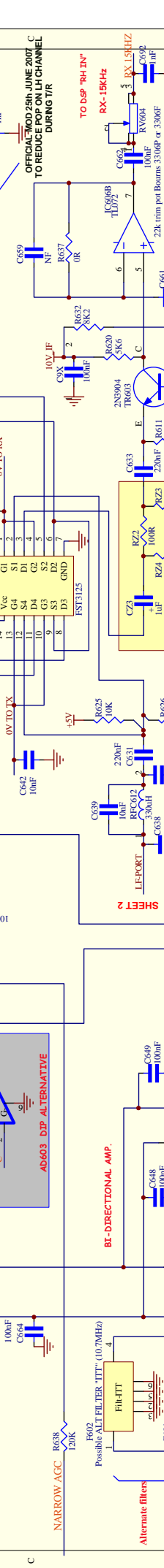
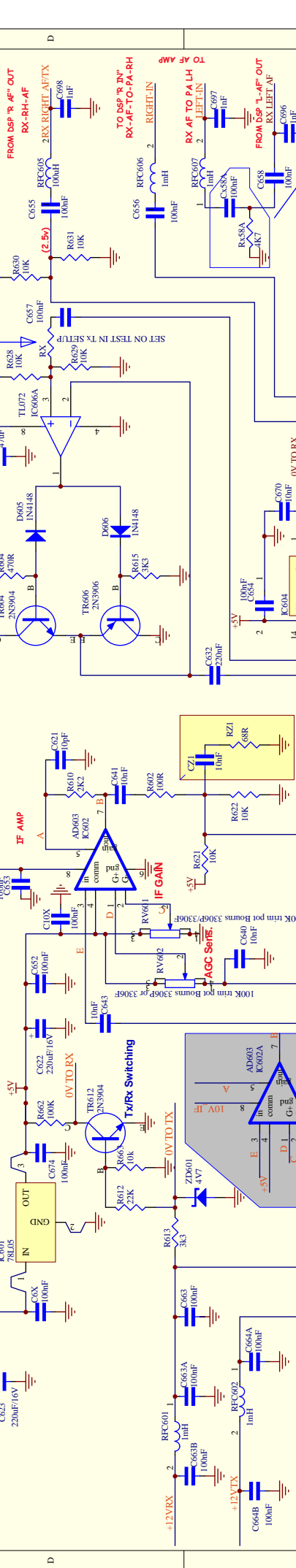
Printed on: 10-Feb-2009 20:37:49

Sheet 1 of 15

File: L:\STAR-single-pcb\Combo bd files\DSP-COMB.PRJ

**24-11-08 prefix 600**

**PICaSTAR IF BOARD section**  
BY VK3PE & C.S.



**THESE ARE THE SCHEMATICS FOR COMBO STAR**

See Tx setup for process to set this value

FROM DSP 'R' AF\* OUT  
RX-RH-AF  
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

OFFICIAL MOD 28th JUNE 2007  
TO REDUCE POP ON LH CHANNEL DURING TX

TO DSP 'RH' IN\*  
RX-15KHz

See STAR setup information for process to determine this setting.

2600808:- See Official mods sheet for these values.  
"NF" = Not Fitted

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

Check 'Mods' document for value suggestions for C45

MIC-IN-TO-CODEC  
VIA FEEDTHRU CAP

**14-01-09**  
2600808 possible changes to TR3 area, refer to Official Mods.  
22-12-07 minor update  
Update-1 13th Nov 07, 4 x BA244 diodes, corrected.  
14/09/07 CHANGED DESIGNATOR L2 TO T1 AS ORIGINAL  
13-08-07 GRALLU VERSION LAYOUT  
25-06-07 OFFICIAL MOD AT C58  
STAR IF WITH MODS AT 15-06-06

PICaSTAR SCHEMATICS BY VK3PE & C.S.  
BASED ON ORIGINALS (C) BY 63XJP

Sheet:	2	TITLE:-		Vers	A pb's
of	15				

For Oct 2007 "VK3PE PCBs"

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

**ADDED 2nd LO HEATER 121208**  
OPTIONAL

CRYSTAL FILTER:  
POSSIBLY 10MHz, (FN EF XSI 60952 from Ramper CB)  
FROM WWW.yes.com.au/pacific5005/store/index.html

**10MHz from Realistic CB/Marine**

Name: \_\_\_\_\_  
IF Ver-A, Sheet2, Update-1c, SCH

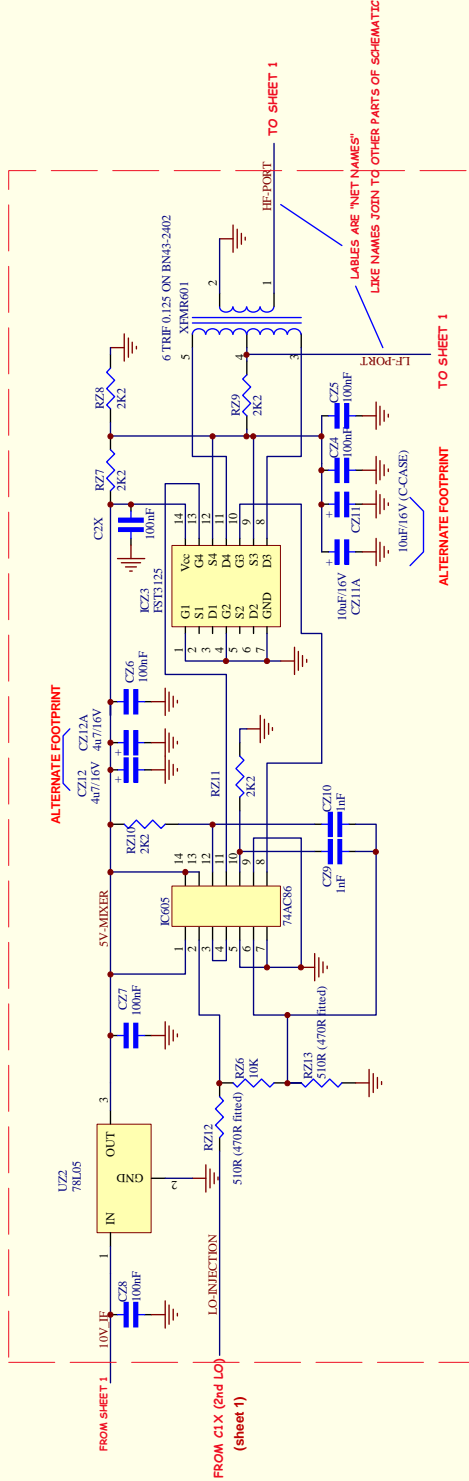
Page 1 of 8

# THESE ARE THE SCHEMATICS FOR COMBO STAR

## PICaSTAR IF BOARD for G6ALU LAYOUT

BY VK3PE & C.S.

"MIXADAPTER" EST13125 MIXER BOARD (NOW PART OF IF PCB)



SCREENING OF THIS WHOLE ASSEMBLY IS VERY DESIRABLE

14-01-09

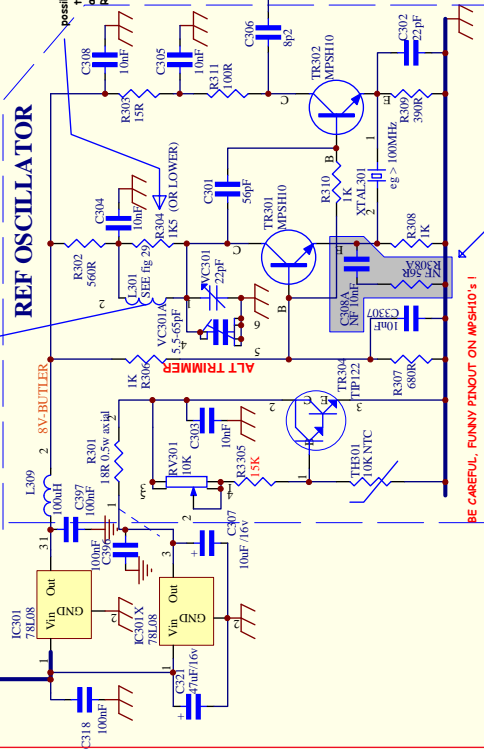
300708 minor update.  
22-12-07 minor update  
10-07-07 CONVERT TO 0805 PARTS  
DRAWN BY VK3PE  
PICaSTAR SCHEMATICS BY VK3PE & C.S.  
BASED ON ORIGINALS (C) BY G3XJP

Sheet:	3
TITLE:-	L:STAR-single-pcbCombo bd files\IF_Ver-A_Sheet2_Update-1c.SCH
of	15
For Oct 2007 "VK3PE PCBs"	Vers A

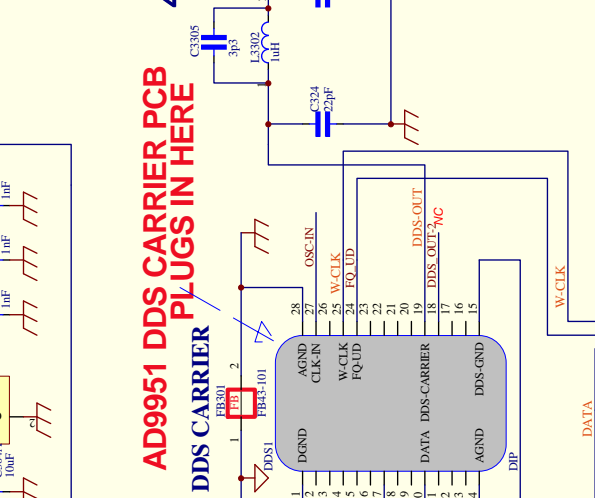
USE 1/2W Resistor minimum. 1 or 2W is better

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

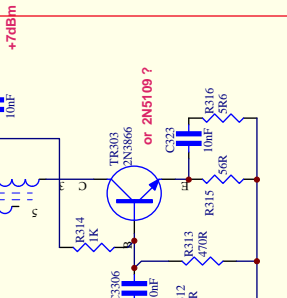
### REF OSCILLATOR



### AD9951 DDS CARRIER PCB PLUGS IN HERE



### 42MHz LPF (200R)



### BUFFER AMP

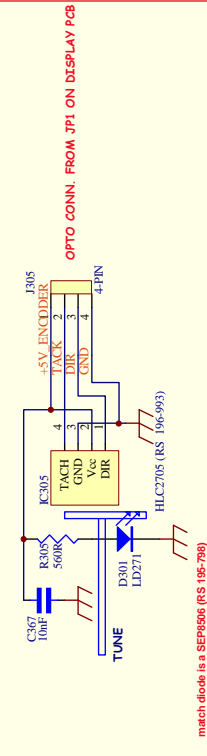


for combo panel change to prefix 300

THESE ARE THE SCHEMATICS FOR COMBO STAR

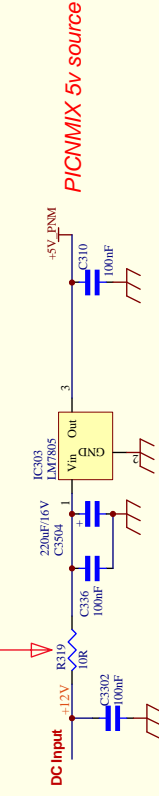
### BUTLER/DDS CARRIER/AMP SECTION

#### OPTO ENCODER SECTION



THIS IS THE 5V SUPPLY FOR THE PnM

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



match diode is a SEP8506 (RS 195-798)

14-01-09

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

PICaSTAR SCHEMATICS BY VK3PE & C.S.  
BASED ON ORIGINALS (C) BY G3XJP

TITLE:-

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.

BUTLER OSC, DDS CARRIER AND AMP PCB

Vers A

Sheet 4

of 15

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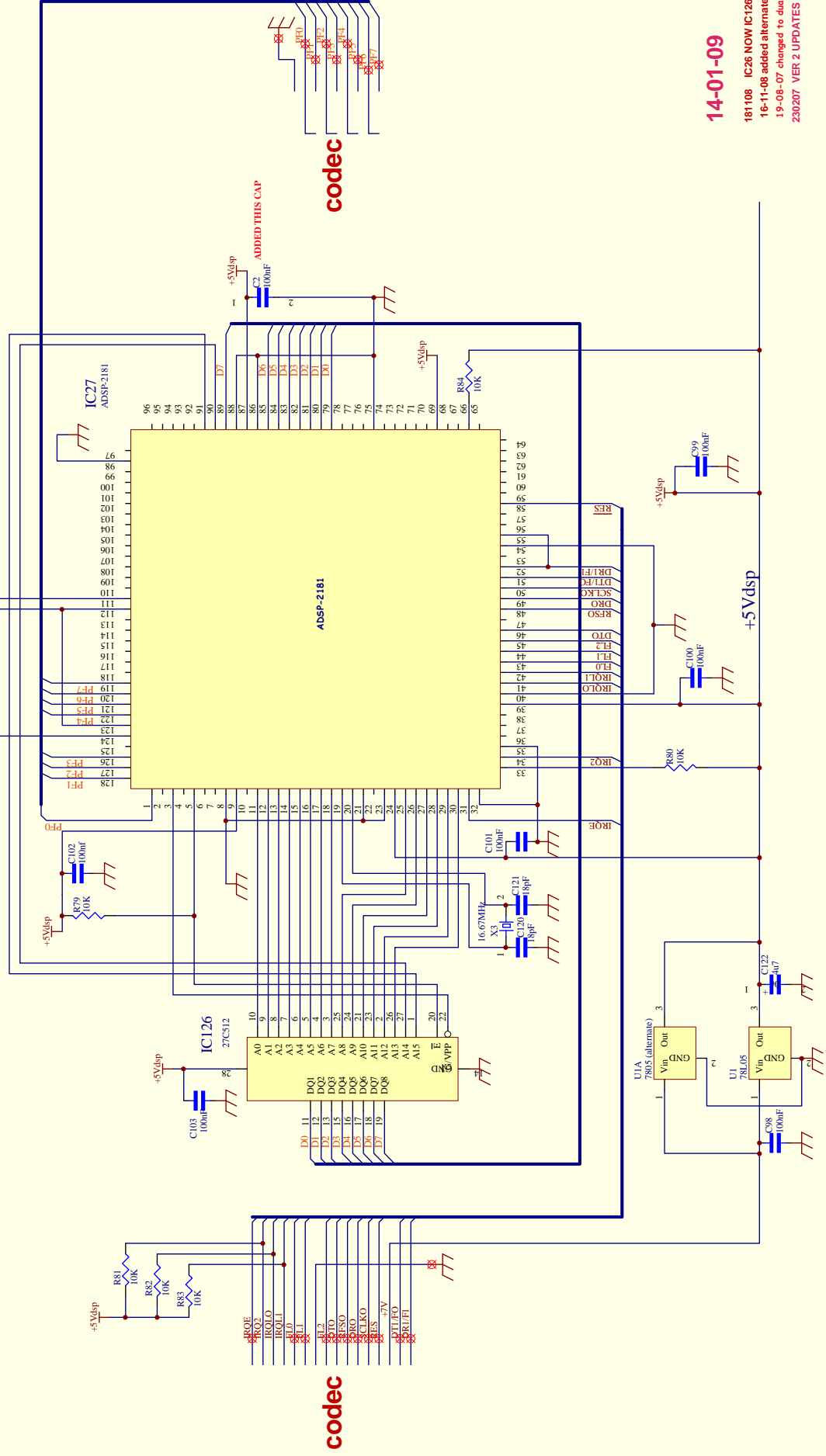
15

**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**

**THESE ARE THE SCHEMATICS FOR COMBO STAR**



**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  
 22/06/06 drawn.

Sheet:	5
TITLE:-	L:\STAR-single-pcb\Combo bd files\DSP_Ver-A_190807.SCH
of	15
Vers	"VK3PE"

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

# PICaSTAR CODEC section

THESE ARE THE SCHEMATICS FOR COMBO STAR

ORIGINAL SCHEMATIC BY G3XJP

THIS VERSION BY VK3PE & C.S.

prefix mostly <100

Mic input  
 →

200109 THESE TWO CAPS NOW Polyester type  
 220nF/63V or 100V

→  
 gnd removed for lower noise

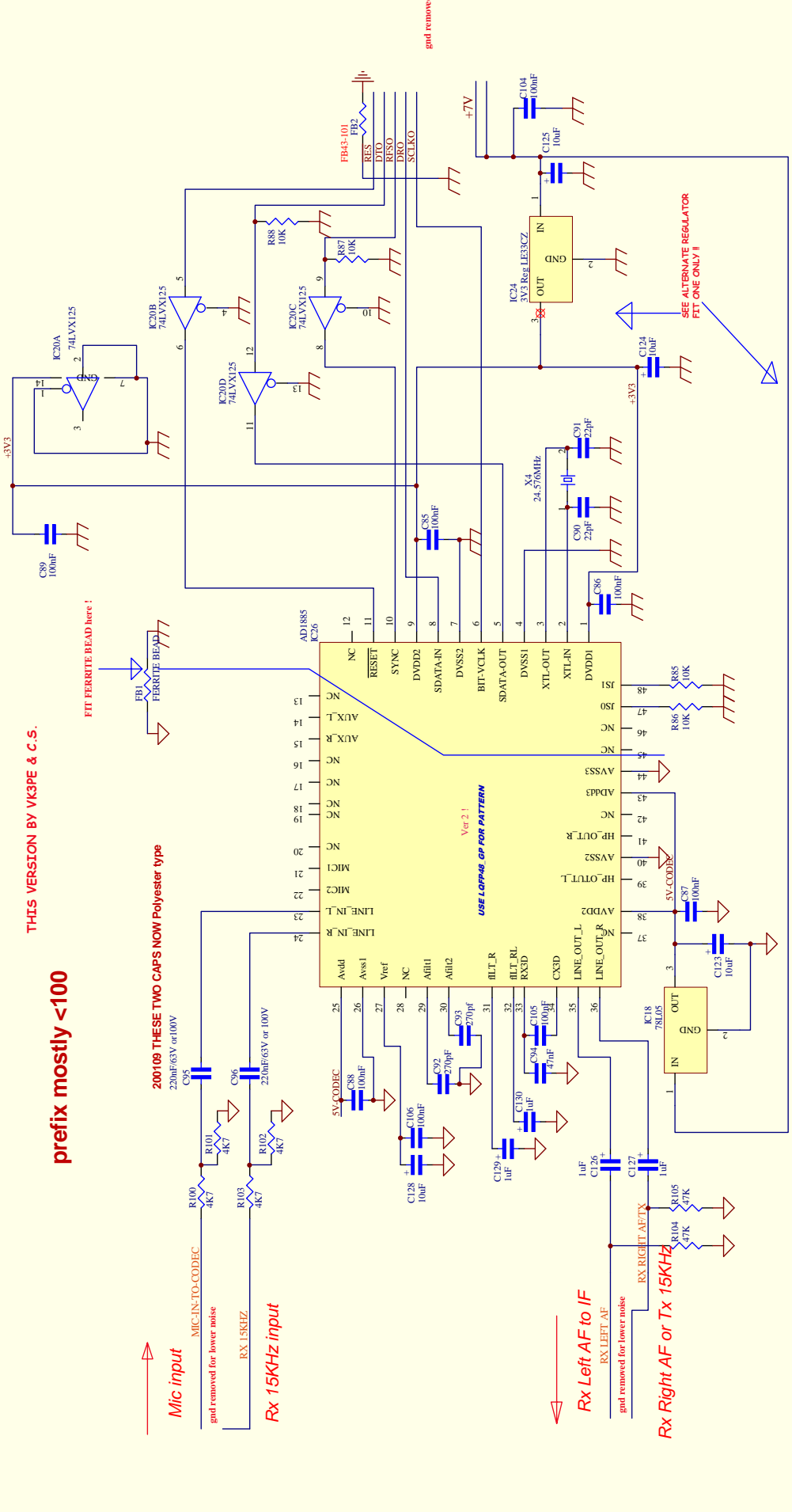
Rx 15KHz input  
 →

Rx Left AF to IF  
 →  
 gnd removed for lower noise

Rx Right AF or Tx 15KHz  
 →  
 gnd removed for lower noise

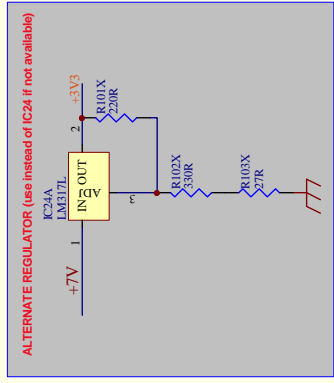
gnd removed for lower noise

SEE ALTERNATE REGULATOR  
 FIT ONE ONLY !!



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  
 Update 2 04-02-07  
 Update 3 04-02-07  
 Update 4 04-02-07  
 Update 5 04-02-07  
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 Update 100 04-02-07

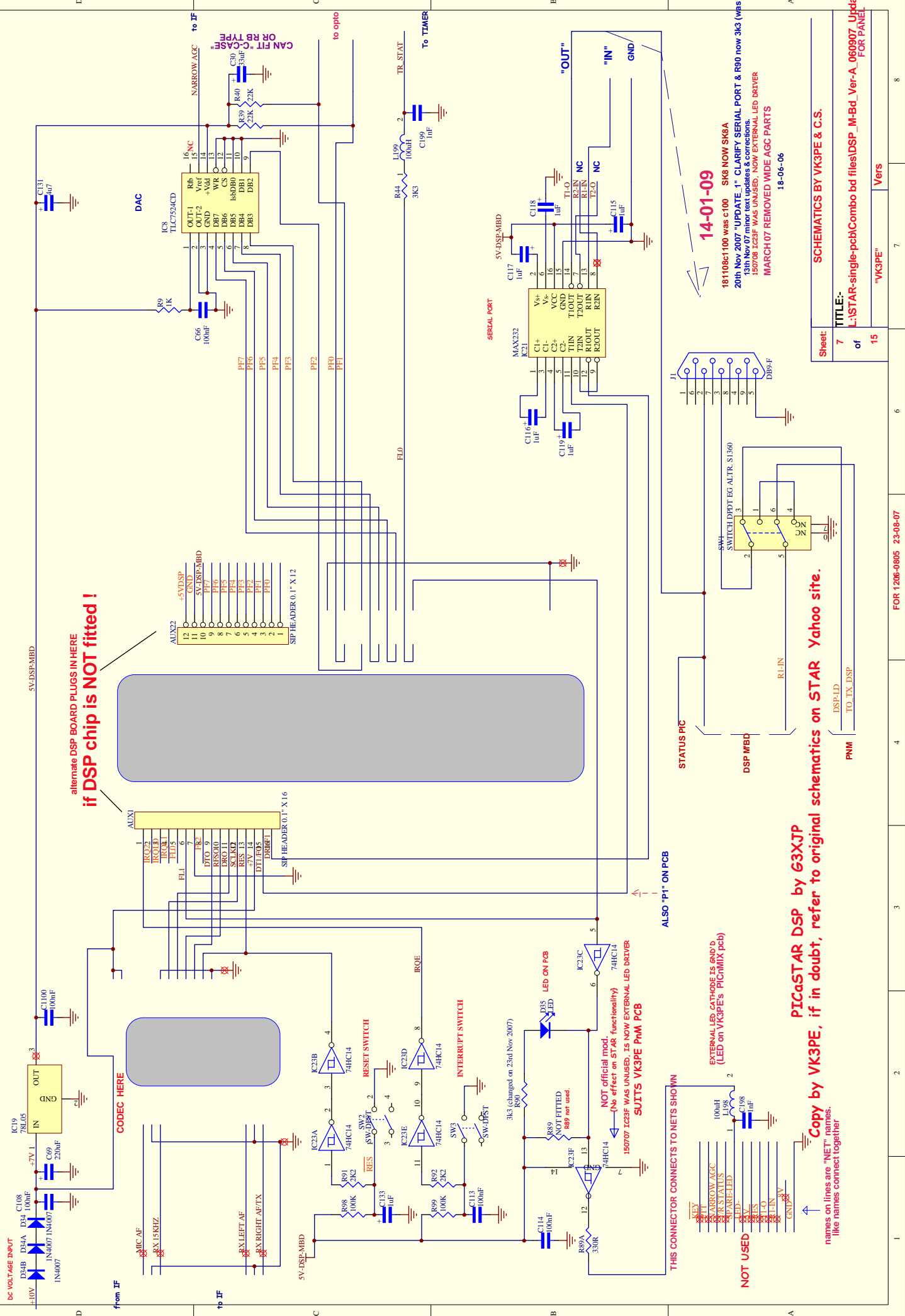


Sheet:	6
TITLE:-	L:STAR-single-pcbCombo bd files/CODEC_Ver-B_040208.Sch
of	15
Vers	"VK3PE"

SCHEMATICS BY VK3PE & C.S.

Schematic by VK3PE but please also refer to original by G3XJP on Yahoo STAR site  
 codec\_ver\_a\_300807\_pcb.PCB"

# PICaSTAR "MOTHER BOARD" section FOR DSP THESE ARE THE SCHEMATICS FOR COMBO STAR



14-01-09

181108c100 was c100 SK88 NOW SK84  
 20th Nov 2007 "UPDATE 1" CLARIFY SERIAL PORT & R80 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

PICaSTAR DSP by G3XJP

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

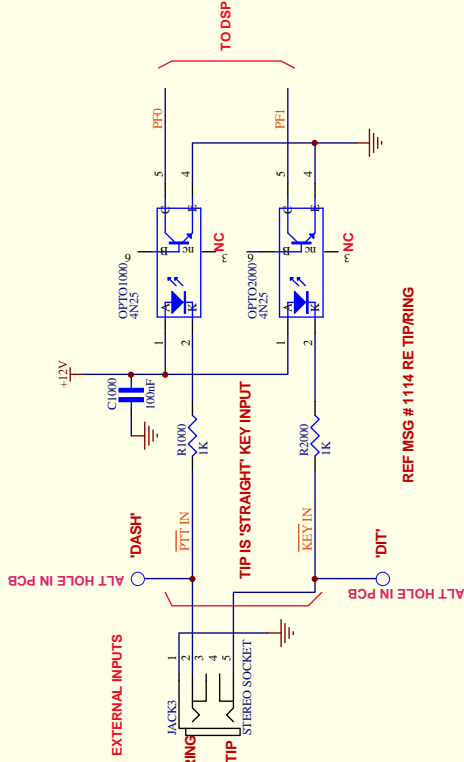
SCHEMATICS BY VK3PE & C.S.

Sheet:	7
TITLE:-	L:STAR-single-pcbCombo bd files/DSP_IM-Bd_Ver-A_060907_Update_1.sch
of	15
Vers	"VK3PE"

# DSP OPTO ISOLATOR FOR PTT & KEY TO DSP

D1 & D2 REMOVED FROM DSP MOTHER BOARD  
 THIS PCB ADDED TO "REPLACE" D1 & D2  
 ie. this PCB sits over where D1 & D2 were removed.  
 Wire links are then fitted thru the PCB into the DSP M'bd.

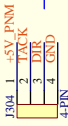
prefix 1000



REMOVE RES BELOW FOR  
 DIRECT CONNECT TO P1M  
 VIA J4\_P1M

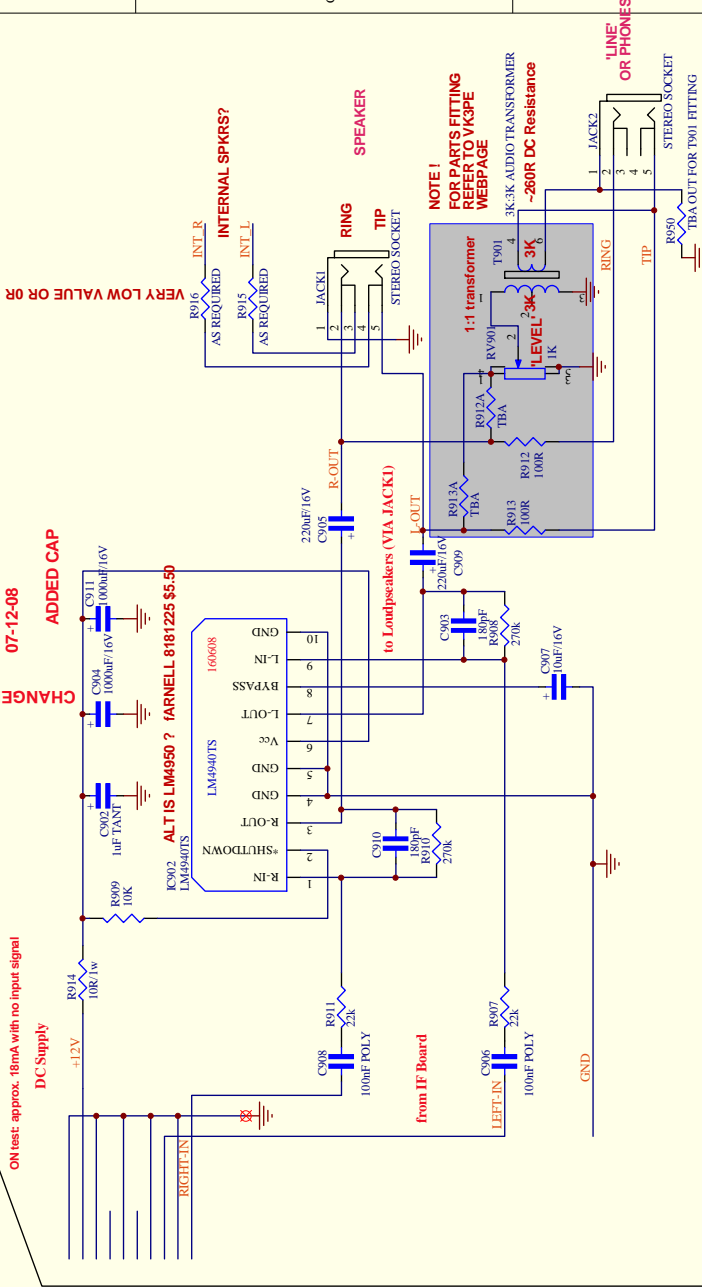
from dds carrier

OPTO ENCODER CONN. (on edge of the panel cutout)  
 or can wire encoder direct from P1M alternate connector



# audio amp prefix 900

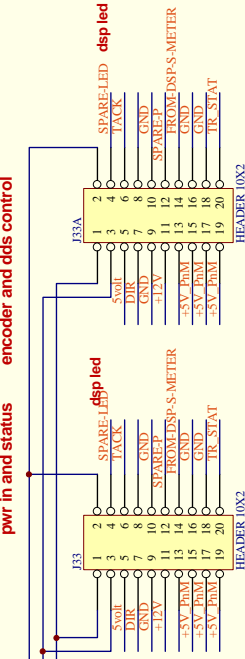
07-12-08  
 ADDED CAP  
 CHANGED TO 1000UF



FOR AUDIO OUT AND LINE OUT

pwr in and status

encoder and dds control



TOP CONNECTOR

ALT BOTTOM CONNECTOR

There are mating connectors on the Picmix board,  
 and IDC ribbon cables are used to connect.

14-01-09

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

Sheet: 8  
 of 15  
 TITLE:- L:STAR-single-pcb/Combo bd files/OPTO-ISOLATE\_220208.Sch  
 For Oct 2007 "VK3PE PCB" Vers

THESE ARE THE SCHEMATICS FOR COMBO STAR

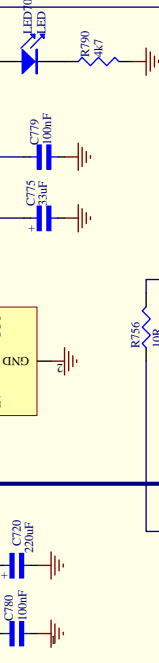
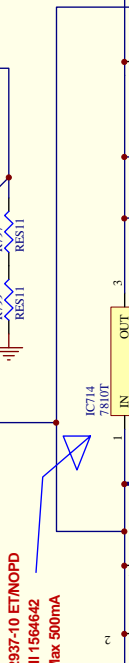
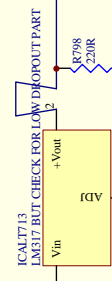


# THESE ARE THE SCHEMATICS FOR COMBO STAR PREFIX 700

PREFIX ALL WITH 700 NOW FOR SINGLE BD STAR

PREFIX 700

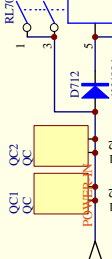
Possibly LM2937-10 ETNOPDP  
Farnell 1564642  
NB Max 500mA



TO OTHER BOARDS +12V

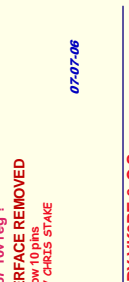
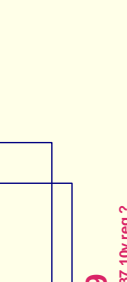
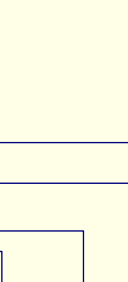
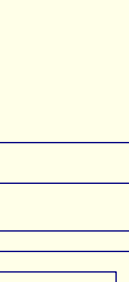
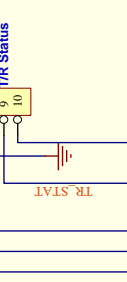
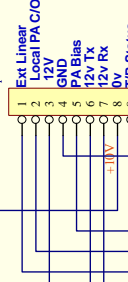
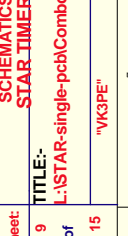
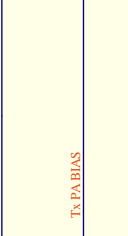
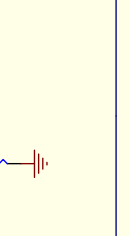
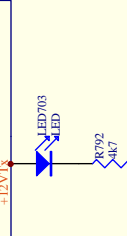
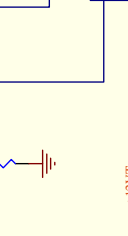
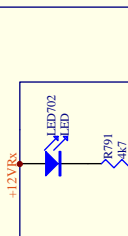
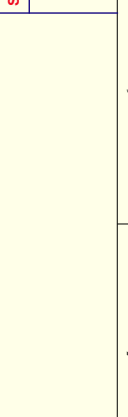
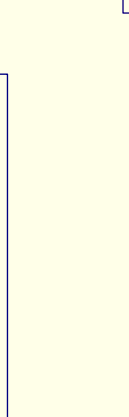
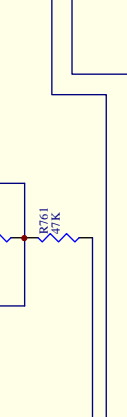
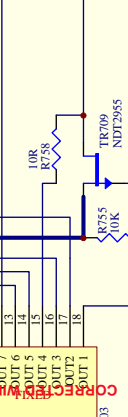
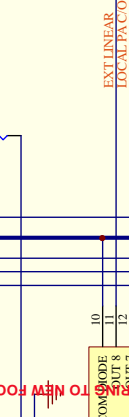
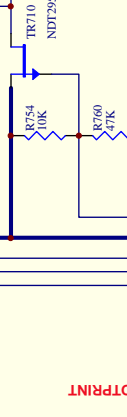
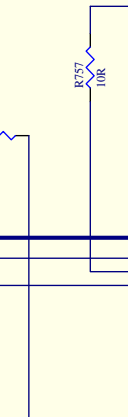
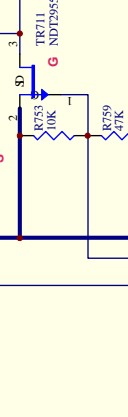
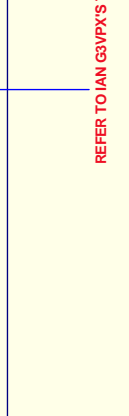
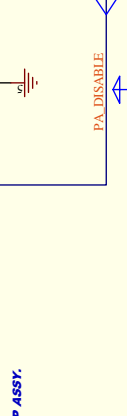
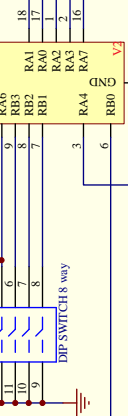
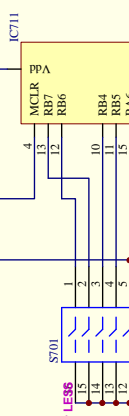
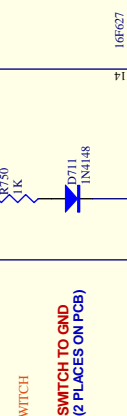
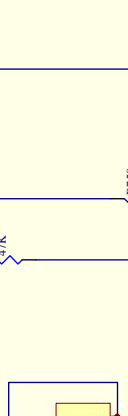
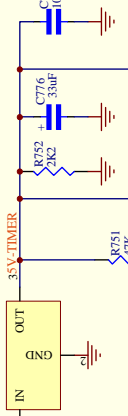
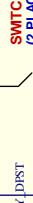


QUICK CONNECT TABS FOR DC INPUT



12v input

SWITCH TO GND (2 PLACES ON PCB)



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

REFER TO IAN G3VPX'S TIMER CHANGES

Sheet: 9  
TITLE:- L:STAR-single-pcbCombo bd files\TIMER\_Ver-A\_040907\_120109\_1.sch  
of 15

Vers "VK3PE"  
single pcb star

07-07-06

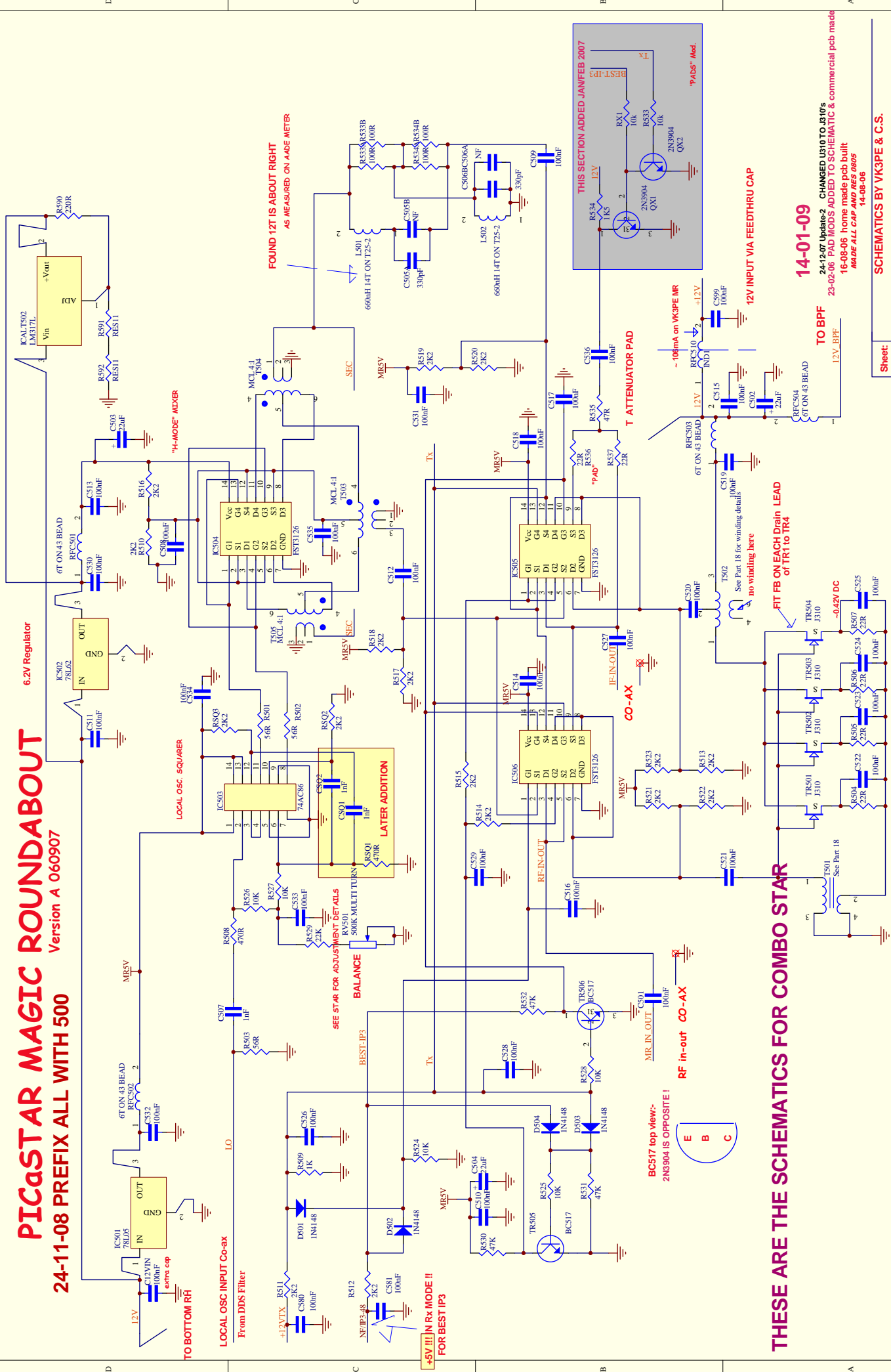
FROM DSP ASSY.

COMPONENTS TO NEW FOOTPRINT

# PICaSTAR MAGIC ROUNDABOUT

Version A 060907

24-11-08 PREFIX ALL WITH 500



**THESE ARE THE SCHEMATICS FOR COMBO STAR**

**14-01-09**

24-12-07 Update-2 CHANGED U310 TO J310s  
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

SCHEMATICS BY VK3PE & C.S.

Sheet 10

TITLE:-

L:STAR-single-pcb-060907-Ver-A 060907 Update-1 241108.sch

**PCB is MR Ver-A 060907.PCB**

STAR-YAHOQ-3029-MESSAGE-RE-6-METER-COVERAGE-MODS

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

Vers Ver A panel

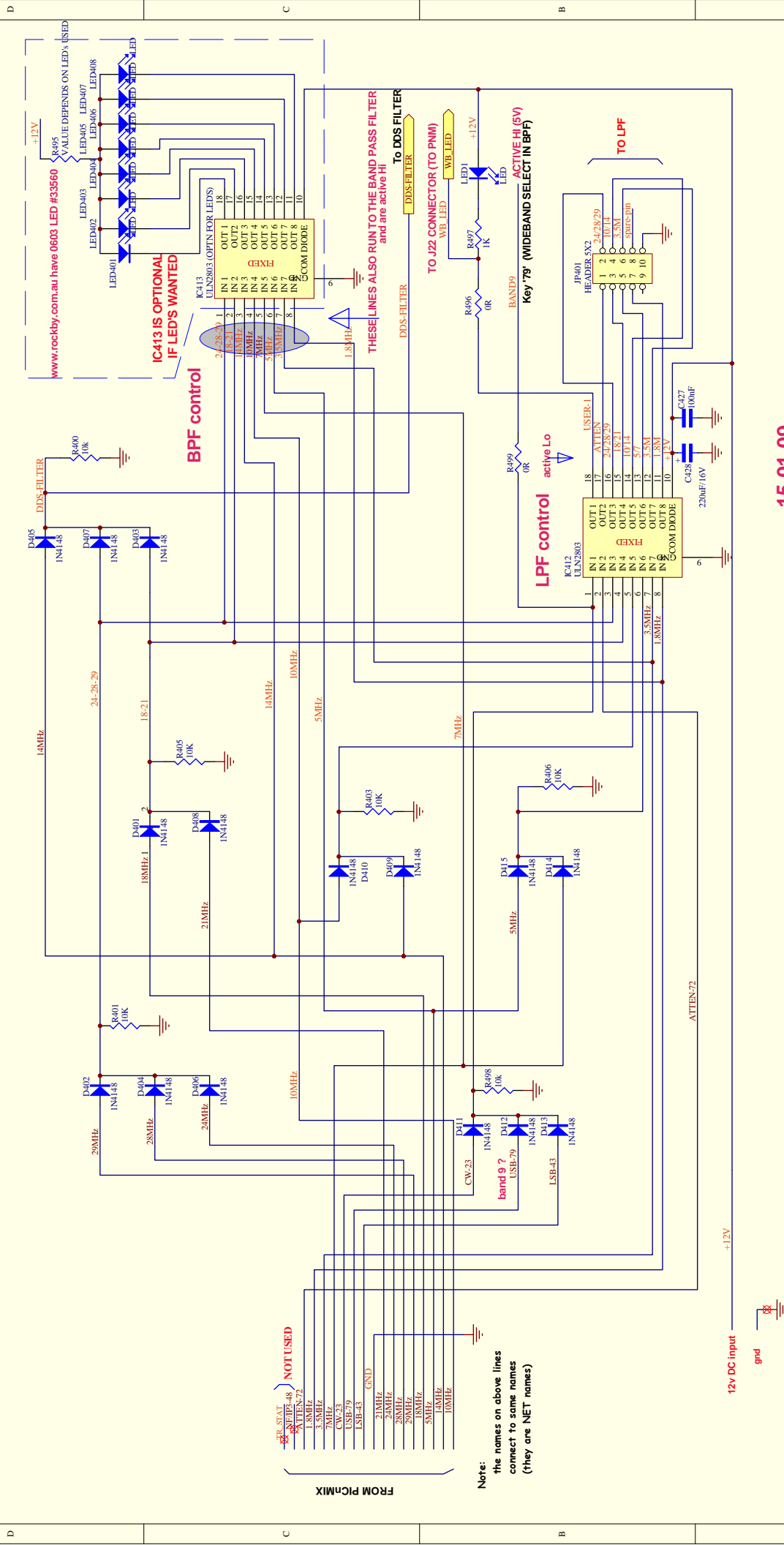
15

"VK3PE"

# STAR DIODE MATRIX

## COMBO VERSION

THESE ARE THE SCHEMATICS FOR COMBO STAR



15-01-09

ULN2803'S CORRECTED  
5th Dec 2007 Update\_1:- error in LPF control designation  
011207 cosmetic update only

# VK3PE

ORIGINAL SCHEMATIC BY G6ALU

Sheet:	11
of	15
TITLE:- L:STAR-single-pcbCombo bd files\MATRIX-4-SCH	
For Oct 2007 "VK3PE PCB" Vers "A"	

PICaSTAR SCHEMATICS BY VK3PE & C.S.  
BASED ON ORIGINALS (C) BY G3XJP

# NOW 1000 PREFIX FOR COMBO STAR

REED RELAY CLAMPS  
RX INPUT TO GND. IN TX MODE.  
ALTERNATE 200mil pitch  
RELAY-REED

IF TRAP  
(BETTER WITH TOROID AND AIR SPACED TRIMMER?)  
leaked cap eg. 68pF for 10.7MHz

3.3uH TOKO-10K  
SHIELDED CABLES  
TX-OUT

VALUES FOR 160, 80 AND 40 are for full USA band coverage.  
Ref NOT STAR groups Post #801  
check official mods also!

SELECT VIA FB

INDUCTORS WOUND ON TOKO 10K FORMERS

80M 3.5 - 4.0MHz

60M

TO FROM MIXER

TO FROM MIXER

TR-SWITCH

TR-SWITCH

TR-SWITCH

TR-SWITCH

TR-SWITCH

TR-SWITCH

TR-SWITCH

TR-SWITCH

TR-SWITCH

TR-SWITCH

TR-SWITCH

TR-SWITCH

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TR-SWITCH

TR-SWITCH

TR-SWITCH

TR-SWITCH

TR-SWITCH

TR-SWITCH

NOTE: VALUES ARE AS PER G3XJP ORIGINALS.  
BUT some bands have been changed!  
Ref the STAR Official Mods.

Values shown may need to made of several parallel values.

THESE ARE THE SCHEMATICS FOR COMBO STAR

14-01-09

PICASTAR SCHEMATICS BY VK3RPE  
BASED ON ORIGINALS (C) BY G3XJP

TITLE:-  
L:STAR-single-pcbCombo bd files/BPF\_COMBO\_091208.SCH

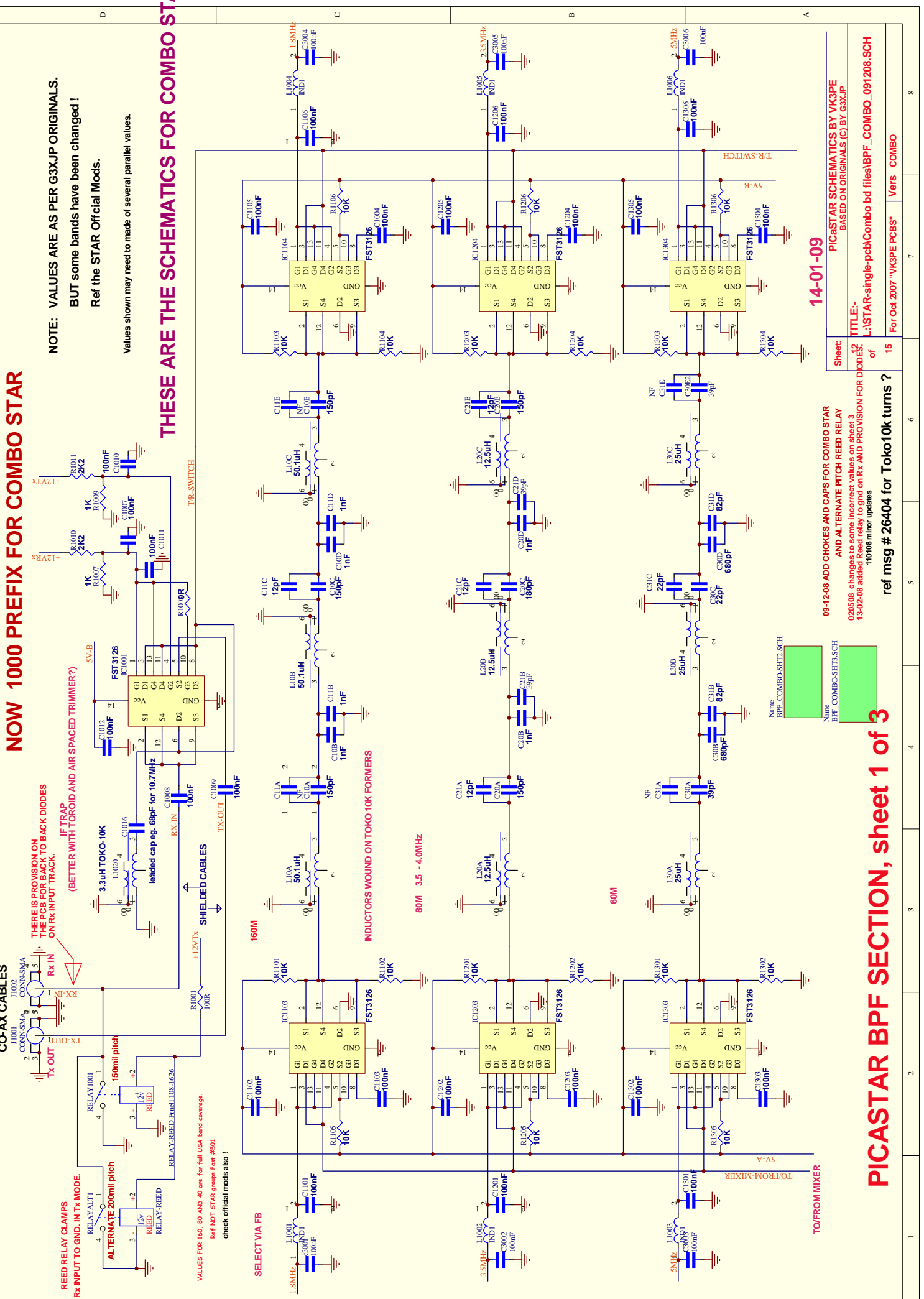
Sheet: 15 of 15

09-12-08 ADD CHOKES AND CAPS FOR COMBO STAR  
AND ALTERNATE PITCH REED RELAY  
020508 changed to some incorrect values on sheet 3  
13-02-08 added Reed relay to gnd on Rx AND PROVISION FOR DIODES  
110108 minor updates

ref msg # 26404 for Toko10k turns ?

Vers COMBO

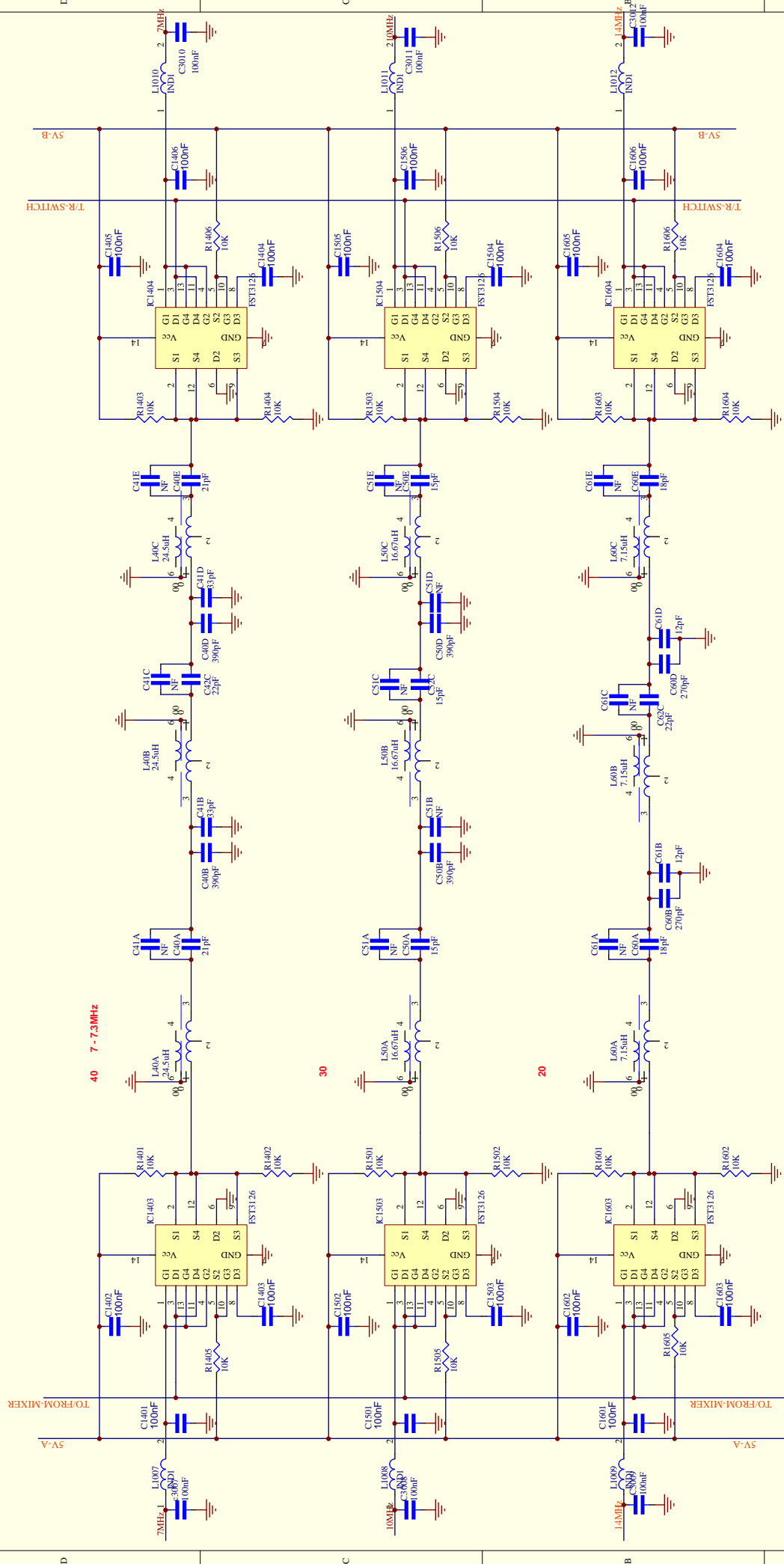
FOR OCT 2007 "VK3RPE PCB"



# PICASTAR BPF SECTION, sheet 1 of 3

THESE ARE THE SCHEMATICS FOR COMBO STAR

NOW 1000 PREFIX



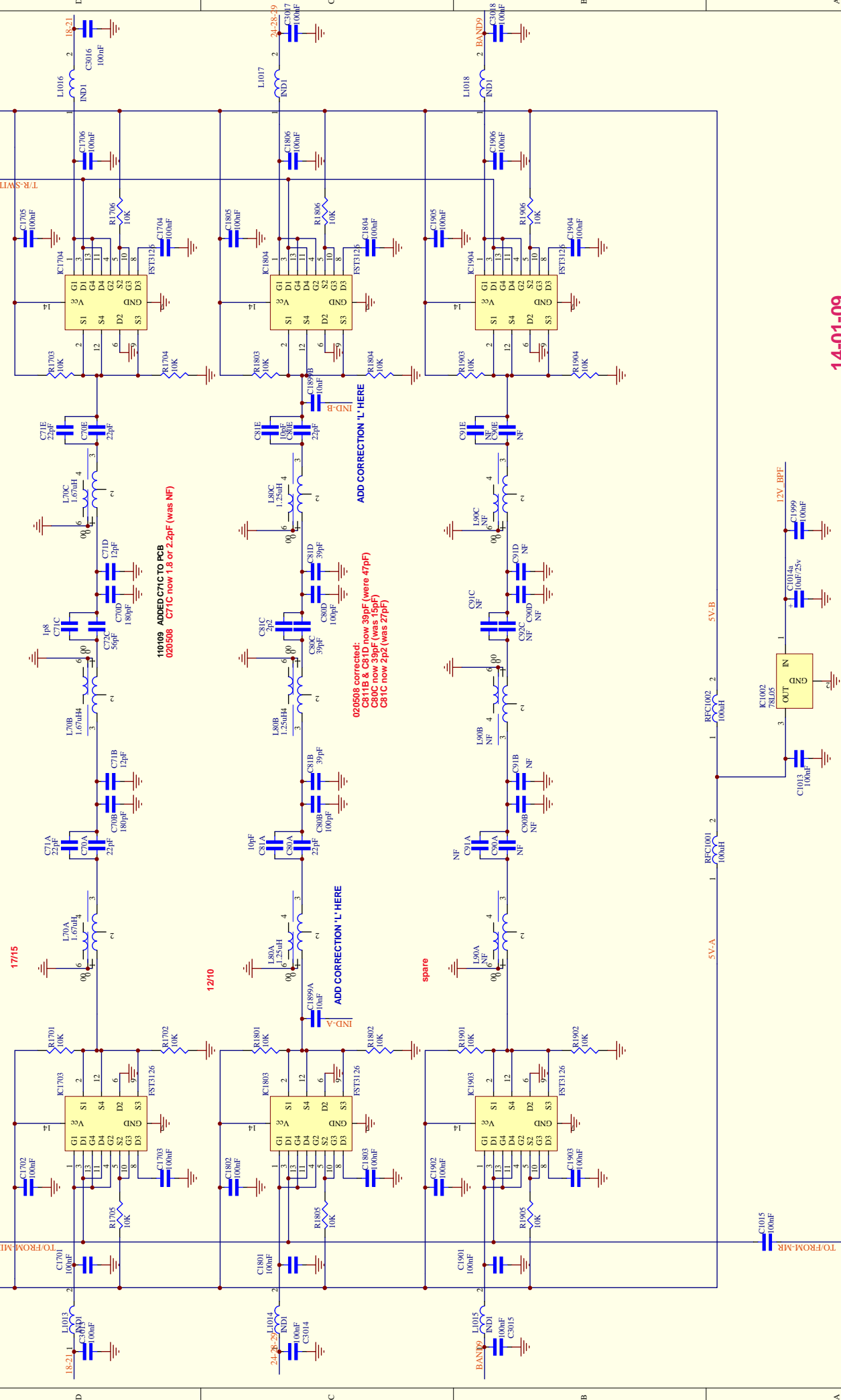
PICASTAR BPF SECTION, sheet 2 of 3

14-01-09

Sheet:	PICASTAR SCHEMATICS BY VK3PPE		
13	BASED ON ORIGINALS (C) BY G3XJP		
of	TITLE:- L:STAR-single-pcbCombo bd files\BPF_COMBO-SHT2.SCH		
15	For Oct 2007 "VK3PE PCBS" Vers COMBO		

**NOW 1000 PREFIX**

**THESE ARE THE SCHEMATICS FOR COMBO STAR**



14-01-09

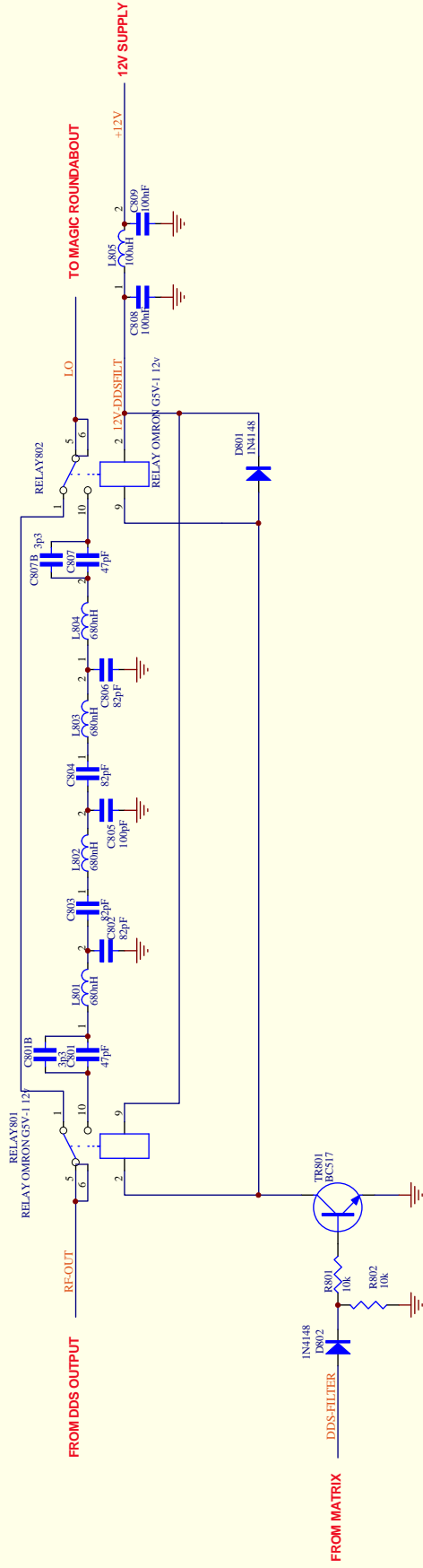
Sheet:	14
TITLE:-	L:STAR-single-pcbCombo bd files\BPF_COMBO-SHT3.SCH
of	15
Vers	COMBO

**PICASTAR BPF SECTION, sheet 3 of 3**

CO-AX TO MR

# 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)

i.e. pass about 25 - 40MHz

14-01-09

15-12-08 UPDATED FOR COMBO USE  
 #994 9585 OMRON G5V-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.

SCHEMATICS BY VK3PE & C.S.

Sheet:	15
TITLE:-	L:STAR-single-pcbCombo bd files/DDS_FILTER_DRAFT_1_800\$.sch
of	15
Vers	A