ORION

TV-777SI

MODEL

SERVICE MANUAL

Service Manual

Chassis Professional 8500   Version D

Rel 1.2: test point + waveform implemented	SEP. 2004

Rel 1.3: schematic update	NOV. 2004

Service notes
After a repair the cables must be laid out as originally fitted to save compliance with original approval and to avoid failures or disturbances.
The mains cable prevents interference from the mains supply and is part of the product approval. For replacement the original spare part only must be used.

Note di servizio
Dopo una riparazione i cavi devono essere disposti come posizionati all'origine per mantenere la corrispondenza con le approvazioni originali ed evitare guasti o disturbi.
Il cavo di alimentazione previene interferenze provenienti dalla rete elettrica ed è parte delle approvazioni del prodotto. Per la sostituzione deve essere utilizzato esclusivamente il ricambio originale.

Chassis Professional 8500 service procedure

Power supply

Using PP2, set the value of +VB at the terminals of CP31 (the values for different types of CRT are indicated in the table on the circuit diagram).

Entering service mode

1. Power up the appliance by pressing the on-off switch simultaneously pressing and holding the **MENU** button of the **cabinet controls** until the red LED lights up.

2. Release the MENU button at the cabinet and press the **stand-by** button on the **remote control**. The appliance will start up in service mode with a specific support menu.

3. The functions can be selected using the **UP/DOWN** buttons of the remote control then adjusted with the **Volume ±** buttons. It is advisable to note down the initial value of each parameter before making any adjustment, so that it can be restored easily if necessary.

If the memory NVM (ICR3) is replaced, it is essential to carry out all the adjustments required in service mode because the replacement memory is supplied NOT pre-programmed. These operations may take some time, so you must wait until they are complete.

Although the individual settings can be accessed and memorised individually and independently, it is advisable to carry them out in the sequence in which they appear when pressing the DOWN key.

Option byte

The correct value for the individual appliance is indicated on the label affixed to the rear of the cabinet alongside the words **Option byte**. The value can be entered using the number keys on the remote control.

Crystal Adjustment

The adjustment start pressing the Volume + or – of remote control and the setting will be made automatically. **(Warning: PAL signal is mandatory)**.

AGC tuner setting

Applying a signal of 1mV to the aerial input (UHF channel), adjust so as to give 4 V_{DC} at pin 1 of the tuner.

Screen grid voltage (Vg2)

Adjust the potentiometer G2 on the transformer EHT until the confirmation message appears. No particular signal set-up is required.

Vertical geometry

The **VS** (Vertical Slope) function must be adjusted in such a way that the central horizontal line in the test signal is exactly on the border between the visible image and the lower black part. **It must not subsequently be altered.**
Now set the remaining parameters as accurately as possible in the sequence in which they appear.

Horizontal geometry

Adjust as accurately as possible in the sequence in which they appear.

Adjusting white (Red/Green)

Using a B/W bar signal, adjust to obtain a grey image. The blue setting is fixed.

Exiting service mode

Once you have made the necessary adjustments, press the **OK** key on the remote control in one of the menus in which it is active to store all the functions and return to normal operation of the appliance.

Procedura servizio Chassis Professional 8500

Alimentatore

Regolare con PP2 il valore di +VB ai capi di CP31 (i valori per i diversi tipi di cinescopio sono indicati nella tabella riportata sullo schema elettrico).

Attivazione modo servizio

1. Accendendere l'apparecchio con l'interruttore di rete tenendo contemporaneamente premuto il tasto **MENU del comando locale** fino a quando non si illumina il LED rosso.

2. Rilasciare il tasto MENU del comando locale ed azionare il tasto **stand-by del telecomando**; l'apparecchio si accenderà in modo servizio con uno specifico menu di supporto.

3. La selezione delle varie funzioni è possibile con i tasti **UP/DOWN** del telecomando e la regolazione si effettua con i tasti **Volume +**. E' consigliabile annotare il valore iniziale prima di effettuare la regolazione per poterlo facilmente ripristinare in caso di necessità.

Nel caso di sostituzione della memoria NVM (ICR3) è indispensabile eseguire tutte le regolazioni previste dal modo servizio, in quanto la memoria di ricambio viene fornita NON pre-programmata. Il processo sopra indicato può richiedere tempi considerevoli; attendere fino al suo completamento.

E' consigliabile che le singole regolazioni, pur accessibili e memorizzabili singolarmente in modo indipendente, vengano eseguite nella sequenza in cui si presentano azionando il tasto DOWN.

Option byte

Il valore corretto da impostare per ogni apparecchio è riportato sull'etichetta dello schienale accanto alla scritta **Option byte**, il valore deve essere introdotto con i tasti numerici del telecomando.

Regolazione Oscillatore (Crystal Adjustment)

La regolazione si avvia con una breve pressione dei tasti Volume + oppure Volume – e procede quindi automaticamente fino al valore esatto. **(Attenzione: è indispensabile che il segnale sia PAL)**.

Regolazione AGC tuner

Con un segnale di 1mV all'ingresso d'antenna (su di un canale UHF), regolare per 4 V_{DC} al pin 1 del tuner..
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Tensione di griglia schermo (Vg2)

Regolare il potenziometro G2 del trasformatore EHT fino a quando compare il messaggio di conferma. Non è necessaria alcuna particolare predisposizione del segnale.

Geometria verticale

La regolazione della funzione **VS** (Vertical Slope) va effettuata regolando in modo tale che la riga orizzontale centrale del segnale test sia esattamente al confine fra immagine visibile e parte nera inferiore e **non deve venire successivamente modificata.**
Regolare quindi per il meglio i restanti parametri seguendo la successione proposta.
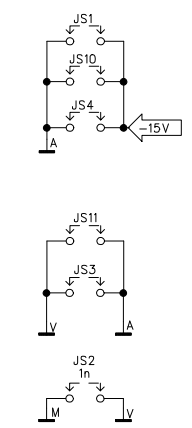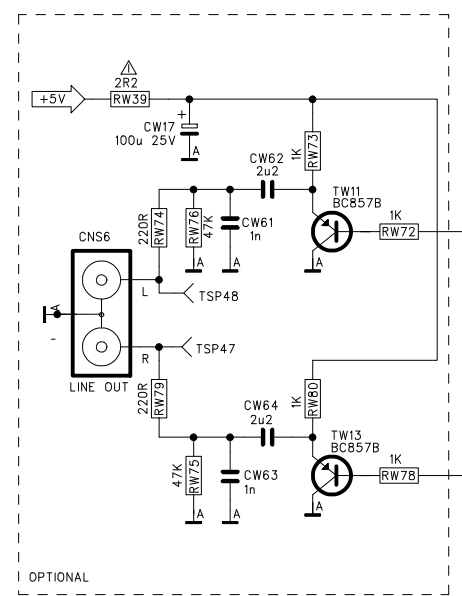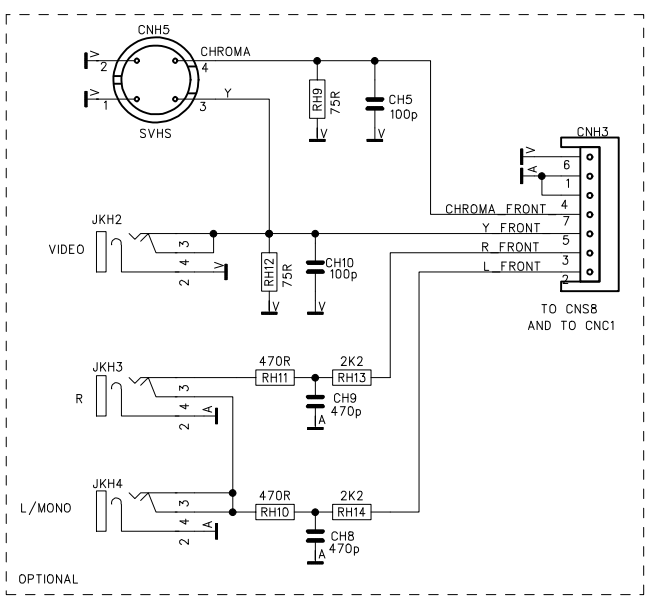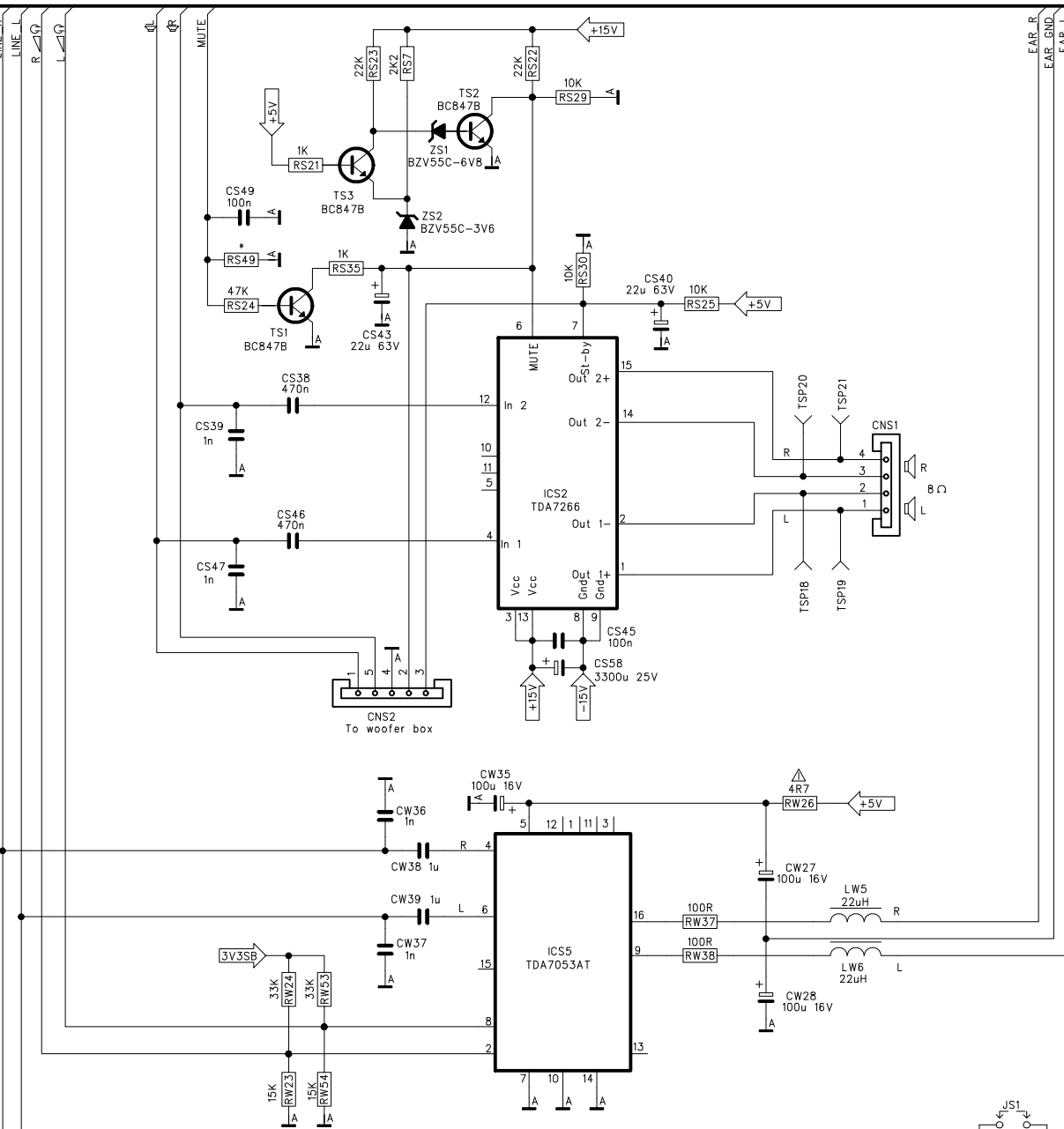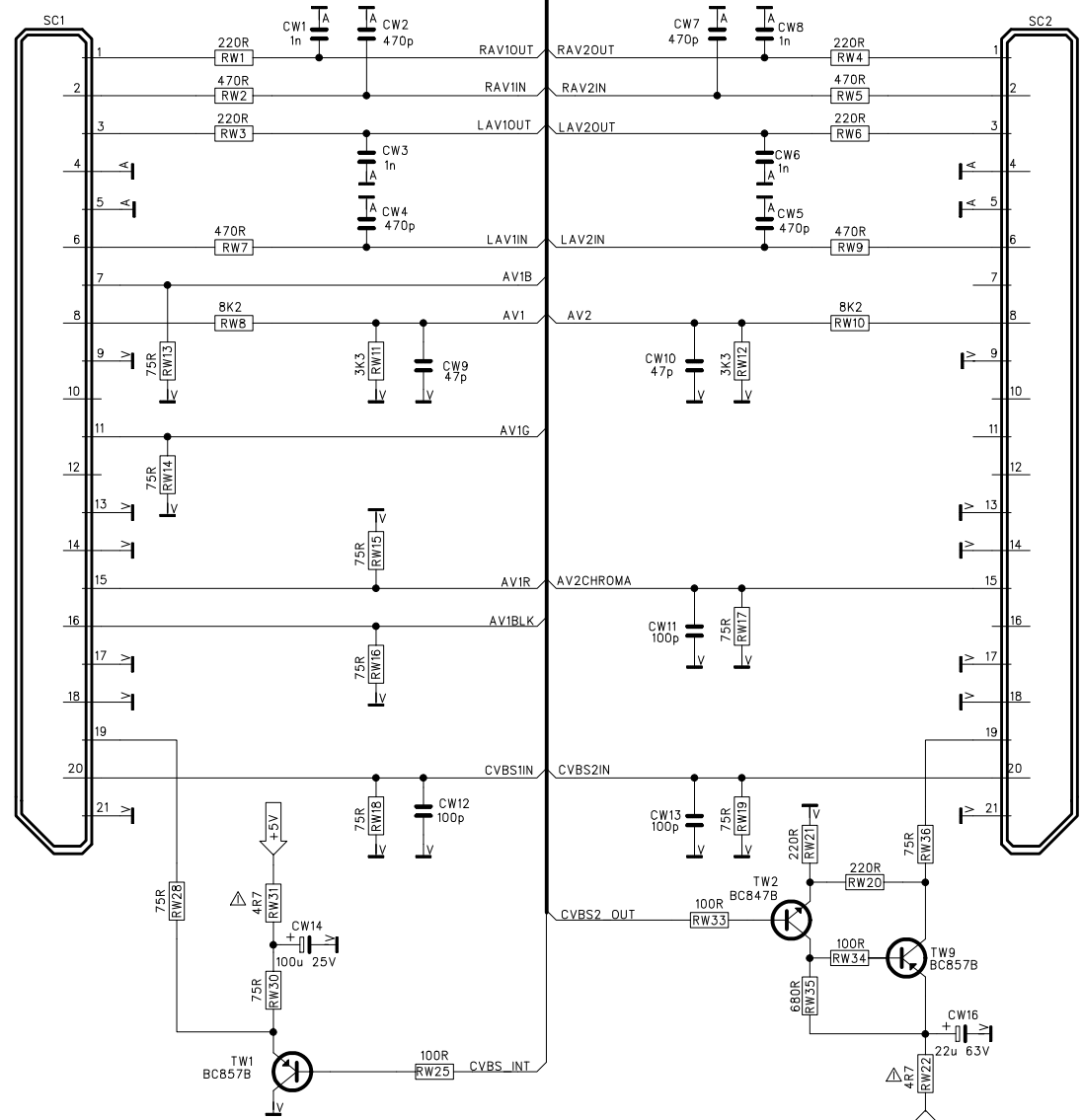
Geometria orizzontale

Regolare per il meglio seguendo la successione proposta.

Regolazione del bianco (Red/Green)

Con un segnale a barre B/N regolare per ottenere un'immagine grigia. La regolazione del blu è fissa.
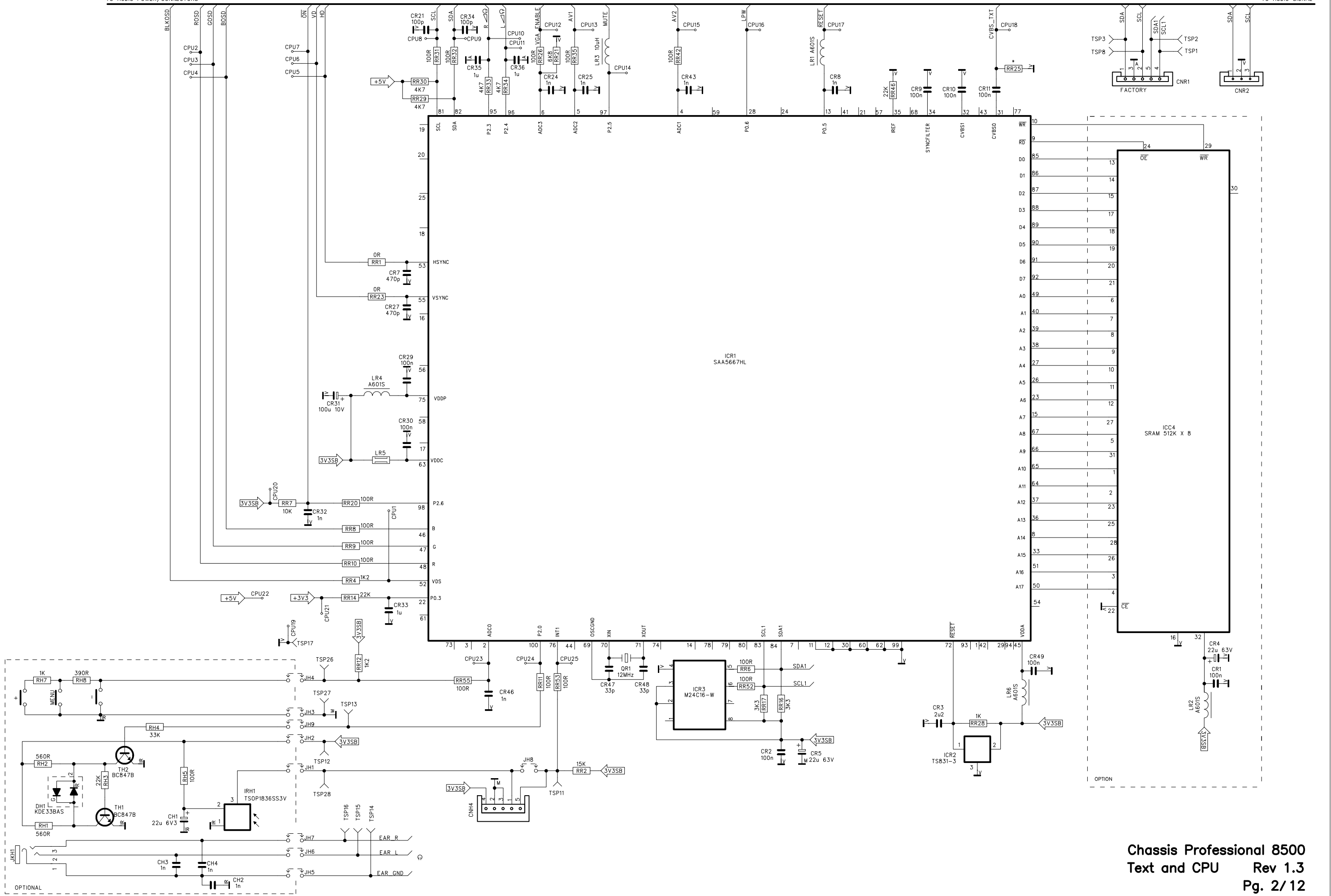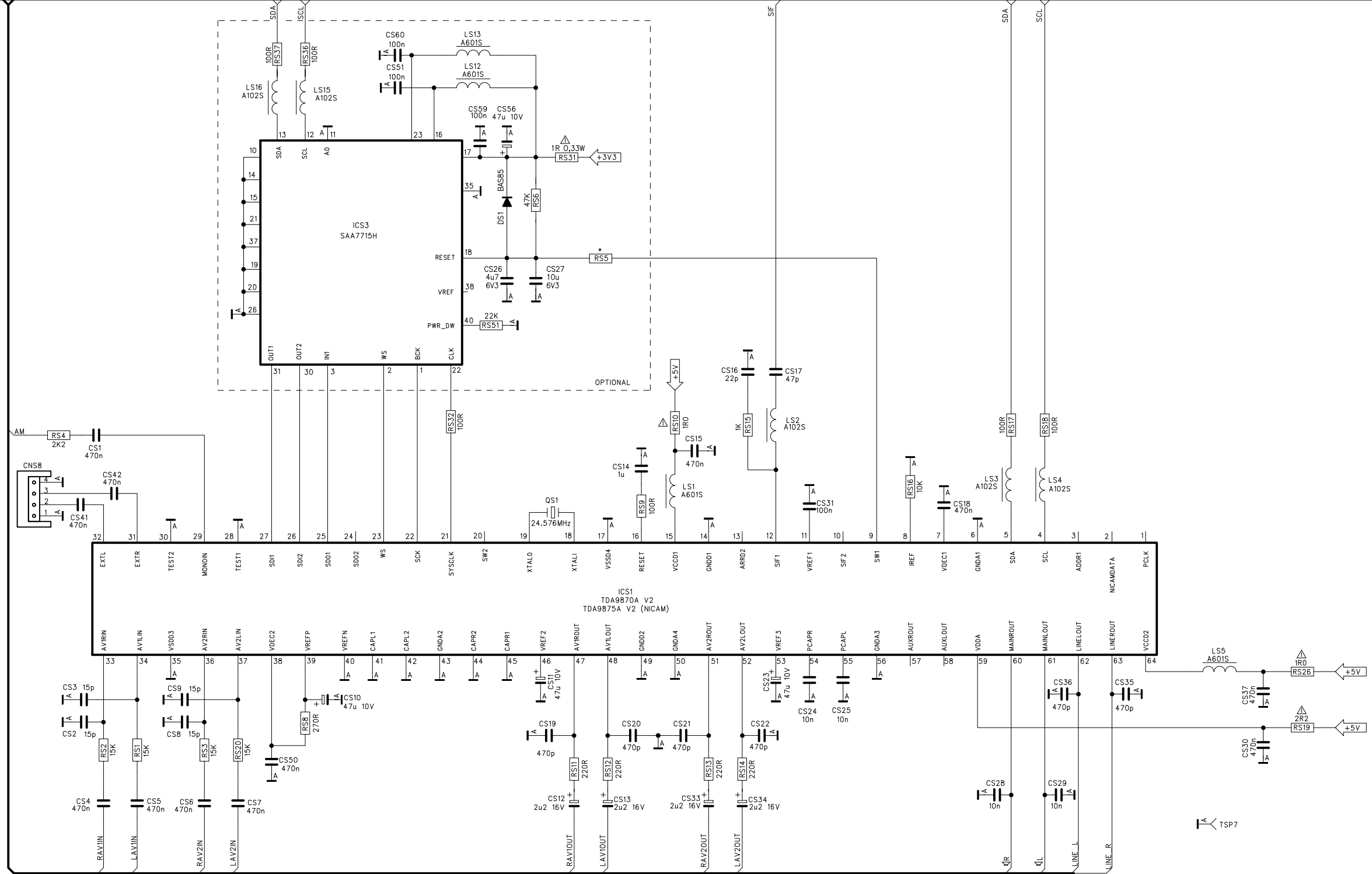
Disattivazione modo servizio

Una volta eseguite le regolazioni necessarie, l'azionamento del tasto **OK** sul telecomando in uno dei menu che lo prevedono, esegue la memorizzazione di tutte le funzioni e ripristina il funzionamento normale dell'apparecchio.

Chassis Professional 8500
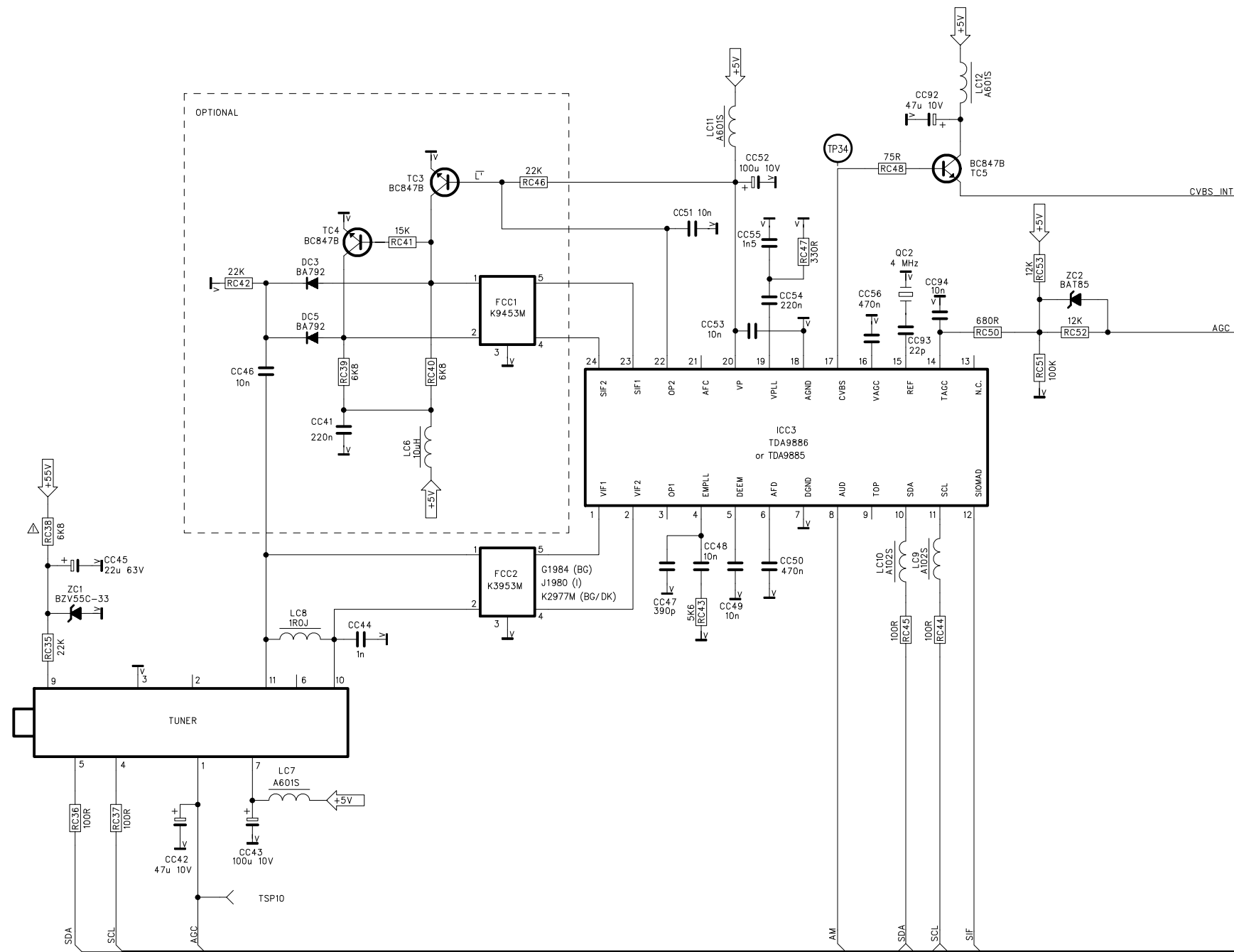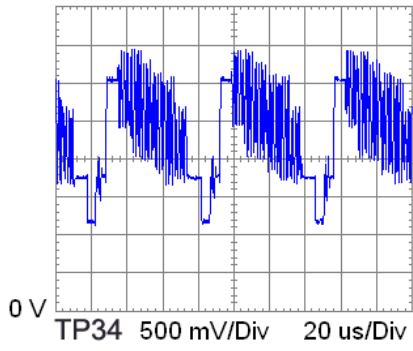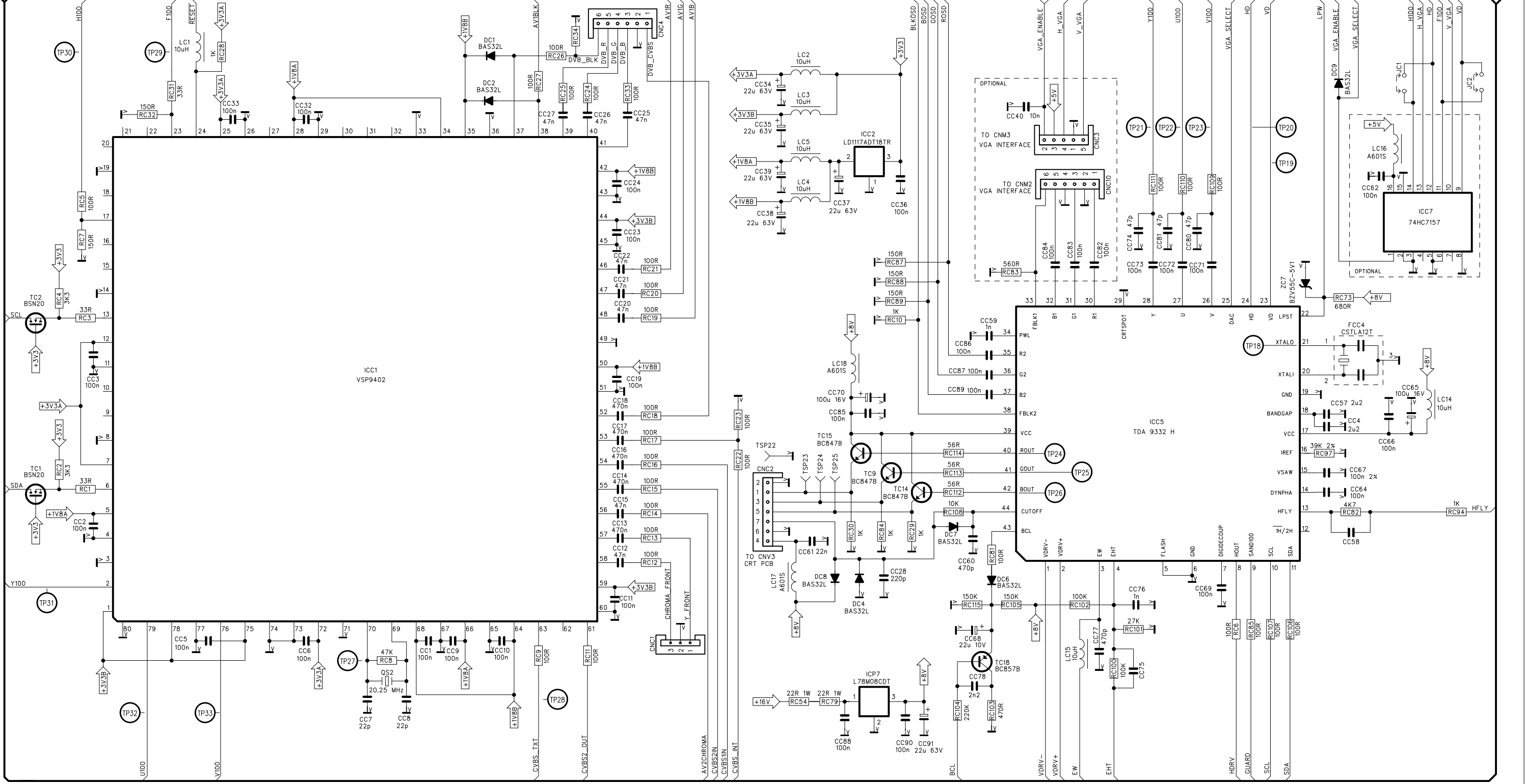**Audio Power   Rev 1.3**
Pg. 1/12

TO TEXT AND CPU

ICS2 TDA7266
ICS5 TDA7053AT

CNS2 To woofer box
CNS6 LINE OUT
CNH5 SVHS
CNH3 TO CNS8 AND TO CNC1

OPTIONAL

SC1
SC2

8 Ω

Chassis Professional 8500
Text and CPU   Rev 1.3
Pg. 2/12

TO AUDIO SIGNAL

TO VIDEO/SYNC

OPTIONAL

TC3
BC847B

TC4
BC847B

22K
RC46

15K
RC41

DC3
BA792

DC5
BA792

22K
RC42

CC46
10n

RC39
6K8

RC40
6K8

CC41
220n

LC6
10uH

+5V

FCC1
K9453M

FCC2
K3953M

G1984 (BG)
J1980 (I)
K2977M (BG/DK)

CC51 10n

CC52
100u 10V

LC11
A601S

+5V

CC55
1n5

RC47
330R

CC54
220n

CC53
10n

CC56
470n

QC2
4 MHz

CC94
10n

CC93
22p

TP34

CC92
47u 10V

LC12
A601S

+5V

75R
RC48

BC847B
TC5

CVBS_INT

12K
RC53

ZC2
BAT85

+5V

12K
RC52

680R
RC50

RC51
100K

AGC

SIF2 | SIF1 | OP2 | AFC | VP | VPLL | AGND | CVBS | VAGC | REF | TAGC | N.C.
24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13

ICC3
TDA9886
or TDA9885

VIF1 | VIF2 | OP1 | EMPLL | DEEM | AFD | DGND | AUD | TOP | SDA | SCL | SIGNAD
1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12

CC47
390p

CC48
10n

RC43
5K6

CC49
10n

CC50
470n

LC10
A102S

LC9
A102S

100R
RC45

100R
RC44

AM

SDA

SCL

SIF

+55V

RC38
6K8

CC45
22u 63V

ZC1
BZV55C-33

RC35
22K

LC8
1R0J

CC44
1n

TUNER

RC36
100R

RC37
100R

CC42
47u 10V

CC43
100u 10V

LC7
A601S

+5V

TSP10

SDA

SCL

AGC

9 | 3 | 2 | 11 | 6 | 10

5 | 4 | 1 | 7

Chassis Professional 8500
Front End   Rev 1.3
Pg. 4/12

TEST POINT WAVEFORM LIST

FRONT END 8500

0 V

TP34   500 mV/Div   20 us/Div

Rel. 1.3

Chassis Professional 8500
Video/Sync.   Rev 1.3
Pg. 5/12

TEST POINT WAVEFORM LIST
VIDEO/SYNC 8500

TP18 200 mV/Div 50 ns/Div

TP19 500 mV/Div 5 ms/Div

TP20 500 mV/Div 10 us/Div

TP21 200 mV/Div 10 us/Div

TP22 200 mV/Div 10 us/Div

TP23 200 mV/Div 10 us/Div

TP24 500 mV/Div 10 us/Div

TP25 500 mV/Div 10 us/Div

TP26 500 mV/Div 10 us/Div

TP27 200 mV/Div 50 ns/Div

TP28 500 mV/Div 20 us/Div

TP29 500 mV/Div 5 ms/Div

TP30 500 mV/Div 10 us/Div

TP31 200 mV/Div 10 us/Div

TP32 200 mV/Div 10 us/Div

TP33 200 mV/Div 10 us/Div

Rel. 1.3
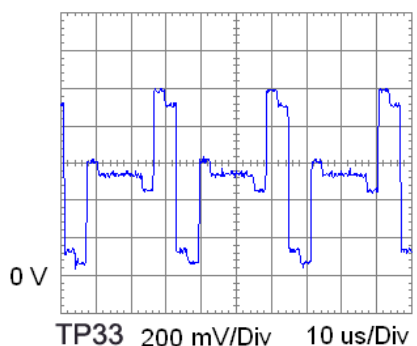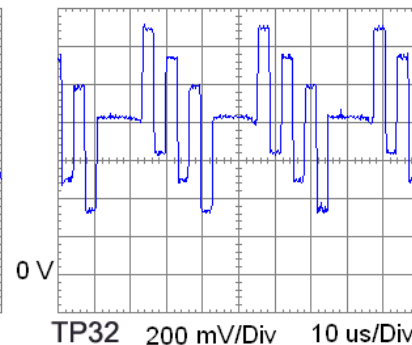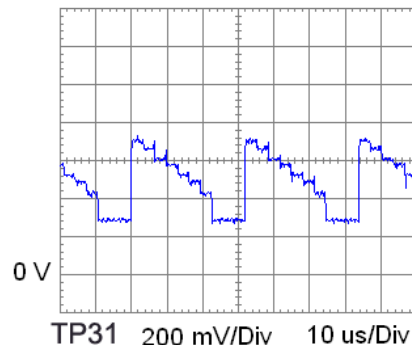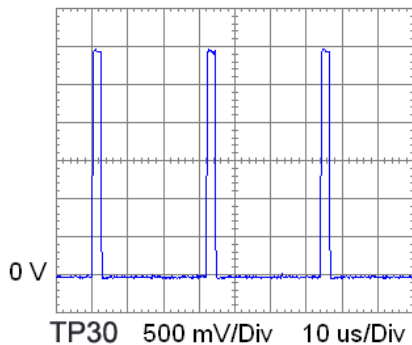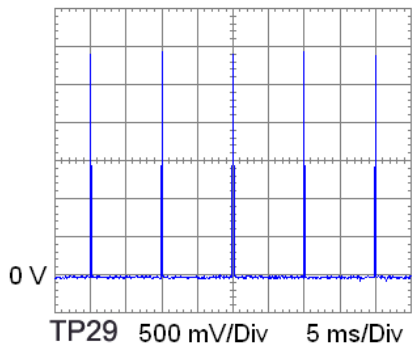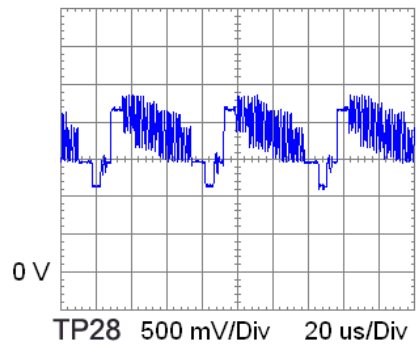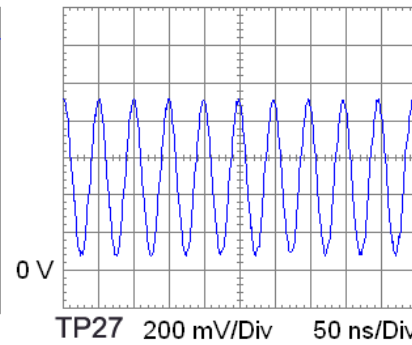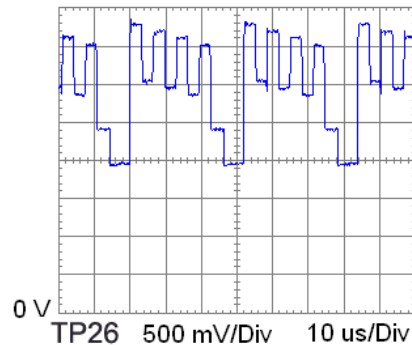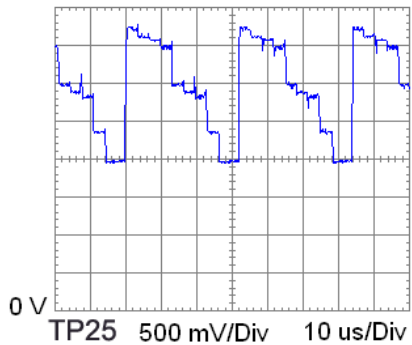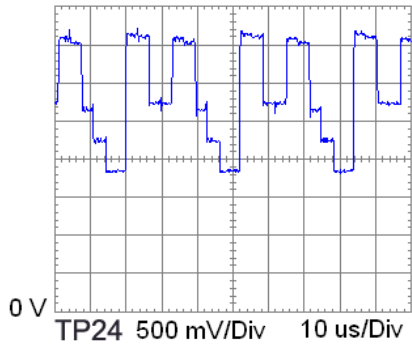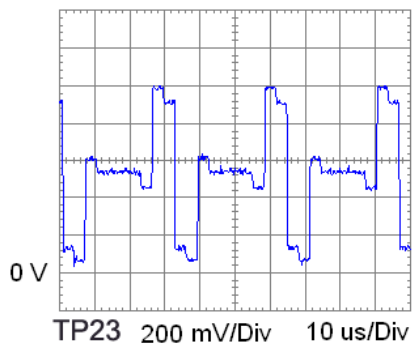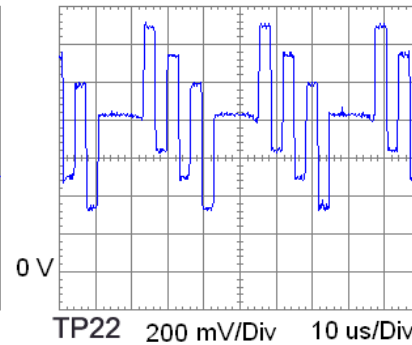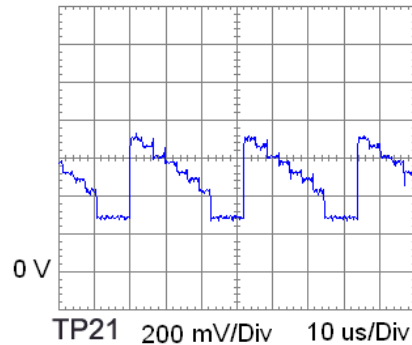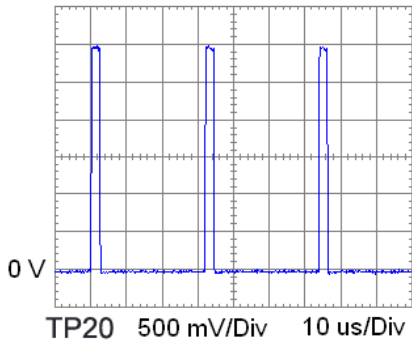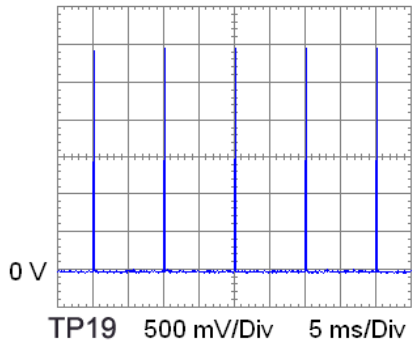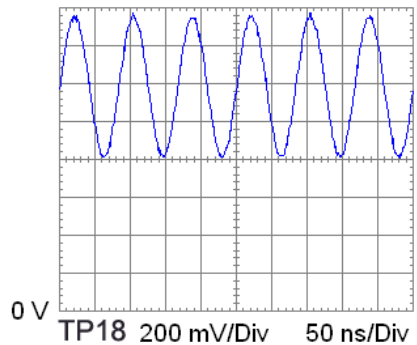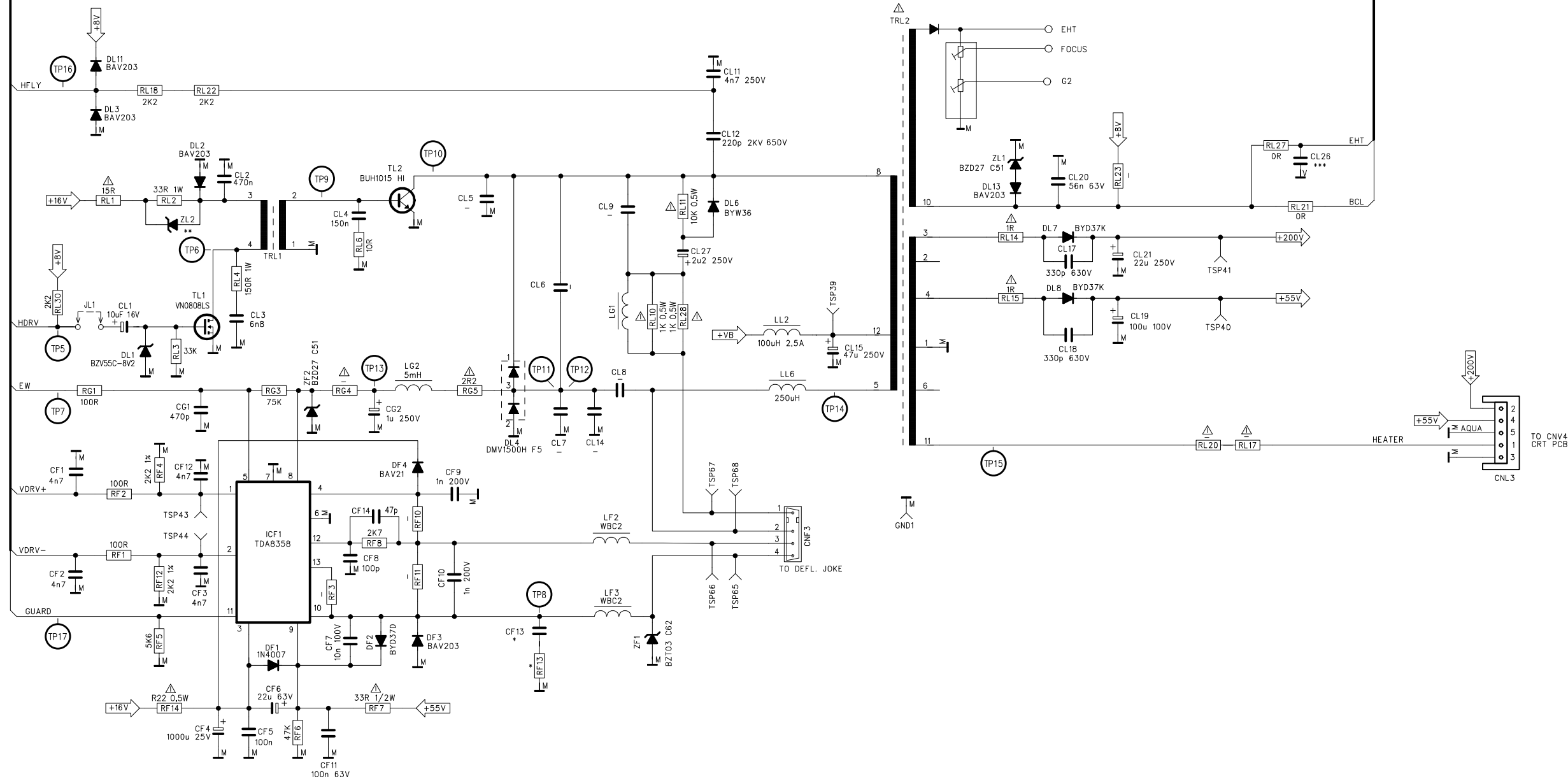
(connector)	+VB	RC79	RF3	RF10	RF11	LG1	RG3	CL5	CL6	CL7	CL8	CL9	RL17	RL20	RL23	RL27	LP4	LP5	RP32	RP34/TXT256
A66EAK071X44/5X54 (28" 4/3)	142V	22R 2W	390K	R82 2W	330R 2W	55331	82K	1nF 1600V	11nF 1600V 3,5%	22nF 630V	560nF 400V	680nF 250V	2R2 2W	2R2 2W	4K7	220K	/	YES	82K	33K	
A66EMZ43X51 (28" 4/3)	142V	22R 2W	390K	R75 2W	150R 2W	53571	82K	1nF 1600V	11nF 1600V 3,5%	22nF 630V	470nF 400V	560nF 250V	3R3 2W	1R5 2W	4K7	330K	/	YES	82K	33K	
A66QEW13X20 (28" 4/3)	133V	27R 2W	390K	R82 2W	150R 2W	55331	82K	1nF 1600V	12nF 1600V 2,5%	18nF 630V	680nF 400V	820nF 250V	R68 2W	R68 2W	4K7	220K	YES	/	68K	33K	
A66QEW13X38 (28" 4/3)	133V	27R 2W	390K	R82 2W	680R 2W	55331	82K	1nF 1600V	12nF 1600V 2,5%	18nF 630V	680nF 400V	820nF 250V	R68 2W	R68 2W	4K7	220K	YES	/	68K	33K	
A68QCP893X232/993X509 (29"4/3-RF)	133V	27R 2W	390K	R82 2W	150R 2W	53571	82K	1nF 1600V	10nF 1600V 3,5%	18nF 630V	560nF 400V	680nF 250V	1R8 2W	1R8 2W	4K7	330K	YES	/	68K	33K	
A68ERF012X044 (29"4/3-RF)	133V	27R 2W	390K	1R3 2W	150R 2W	55331	82K	1nF 1600V	10nF 1600V 3,5%	18nF 630V	560nF 400V	680nF 250V	1R5 2W	1R5 2W	4K7	330K	YES	/	68K	33K	
A68ELA011X121 (29"4/3-RF)	133V	27R 2W	390K	1R3 2W	150R 2W	53571	82K	1nF 1600V	10nF 1600V 3,5%	18nF 630V	560nF 400V	680nF 250V	R82 2W	R82 2W	4K7	330K	YES	/	68K	33K	
A68ERF182X044 (29"4/3-RF)	133V	27R 2W	390K	1R15 2W	/	55331	82K	/	11nF 1600V 3,5%	18nF 630V	560nF 400V	820nF 250V	1R8 2W	1R8 2W	3K9	330K	YES	/	68K	33K	
W66ECK001X44 (28"16/9-SF)	133V	27R 2W	390K	1R5 2W	330R 2W	55331	82K	1nF 1600V	11nF 1600V 3,5%	18nF 630V	560nF 400V	680nF 250V	1R8 2W	1R8 2W	4K7	220K	YES	/	68K	33K	
W66QDE993X214 (28"16/9-RF)	133V	27R 2W	390K	1R0 2W	150R 2W	53571	82K	1nF 1600V	10nF 1600V 3,5%	18nF 630V	560nF 400V	560nF 250V	2R2 2W	2R2 2W	4K7	220K	YES	/	68K	33K	
W66ERF022X044 (28"16/9-RF)	133V	27R 2W	390K	1R3 2W	330R 2W	55331	82K	1nF 1600V	10nF 1600V 3,5%	18nF 630V	560nF 400V	560nF 250V	2R2 2W	2R2 2W	3K9	220K	/	YES	68K	33K	
W76EGV023X522 (32"16/9-SF)	133V	27R 2W	390K	1R8 2W	/	55331	82K	1nF 1600V	11nF 1600V 3,5%	18nF 630V	560nF 400V	1,2uF 250V	1R0 2W	R82 2W	3K9	270K	YES	/	68K	33K	
W76ERF022X044 (32"16/9-RF)	133V	27R 2W	390K	1R3 2W	330R 2W	53571	82K	1nF 1600V	10nF 1600V 3,5%	18nF 630V	560nF 400V	560nF 250V	2R2 2W	2R2 2W	3K9	220K	YES	/	68K	33K	8K2
W76ELC011X121/124 (32"16/9-RF)	133V	27R 2W	390K	1R3 2W	/	55331	82K	1nF 1600V	11nF 1600V 3,5%	18nF 630V	560nF 400V	680nF 250V	R82 2W	R82 2W	3K9	220K	YES	/	68K	33K	
W76EJY011X121 (32"16/9-RF)	133V	27R 2W	390K	1R65 2W	/	55331	82K	1nF 1600V	10nF 1600V 3,5%	15nF 630V	470nF 400V	1,2uF 250V	1R8 2W	R82 2W	3K9	220K	YES	/	68K	33K	
W76QEN693X100/40 (32"16/9-RF)	133V	27R 2W	390K	1R5 2W	330R 2W	53571	82K	1nF 1600V	10nF 1600V 3,5%	18nF 630V	560nF 400V	680nF 250V	1R8 2W	1R8 2W	3K9	220K	YES	/	68K	33K	
W76ERF122X044 (32"16/9-RF)	142V	27R 2W	390K	1R3 2W	/	53571	82K	1nF 1600V	11nF 1600V 3,5%	18nF 630V	470nF 400V	820nF 250V	3R3 2W	2R2 2W	3K9	220K	/	YES	68K	33K	
A80EJA33X522 (34" 4/3)	142V	22R 2W	680K	R91 2W	330R 2W	55331	82K	1nF 1600V	11nF 1600V 3,5%	18nF 630V	560nF 400V	1,2uF 250V	1R0 2W	1R0 2W	3K9	390K	/	YES	82K	33K	

Chassis Professional 8500
Deflections   Rev 1.3
Pg. 6/12

TEST POINT WAVEFORM LIST
DEFLECTIONS 8500

TP5 1 V/Div 10 us/Div	**TP6** 5 V/Div 10 us/Div	**TP7** 500 mV/Div 5 ms/Div
TP8 10 V/Div 5 ms/Div	**TP9** 5 V/Div 10 us/Div	**TP10** 200 V/Div 10 us/Div
TP11 50 V/Div 10 us/Div	**TP12** 50 V/Div 5 ms/Div	**TP13** 5 V/Div 5 ms/Div
TP14 50 V/Div 10 us/Div	**TP15** 5 V/Div 10 us/Div	**TP16** 2 V/Div 10 us/Div
TP17 1 V/Div 10 us/Div		

Rel. 1.3

Chassis Professional 8500
Power Supply   Rev 1.3
Pg. 7/12
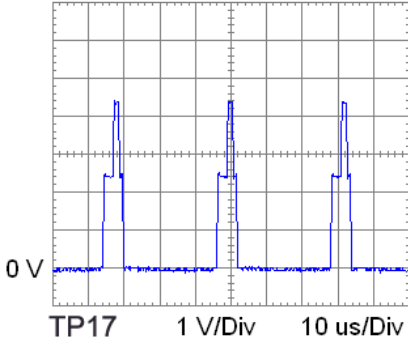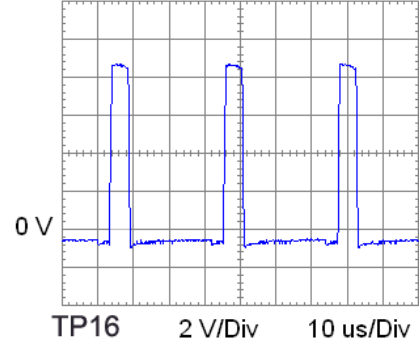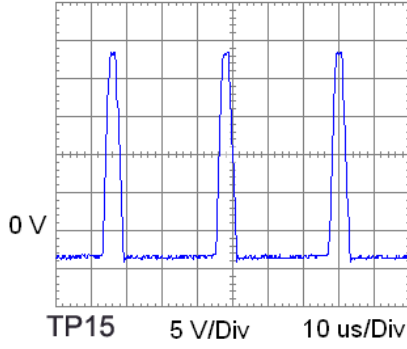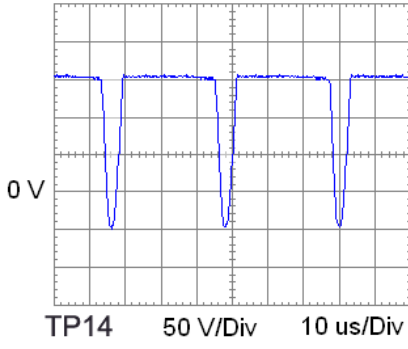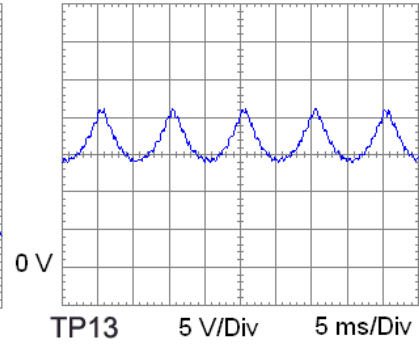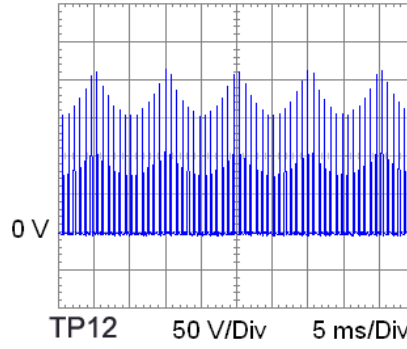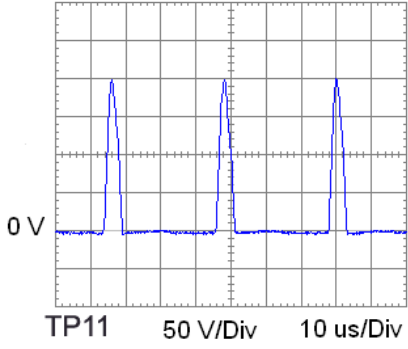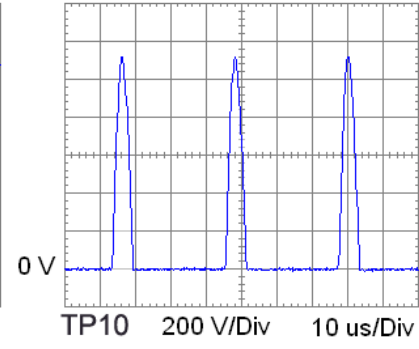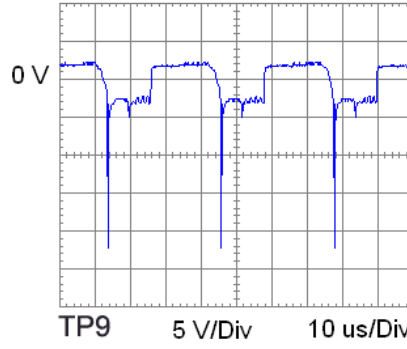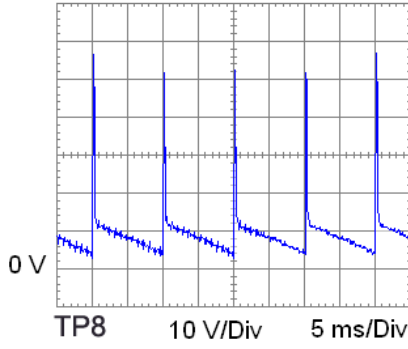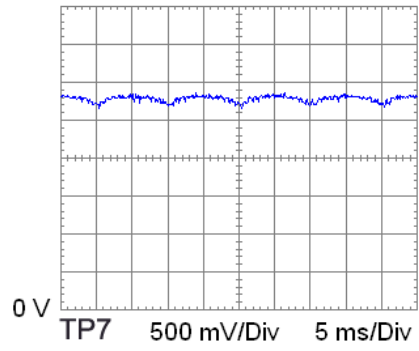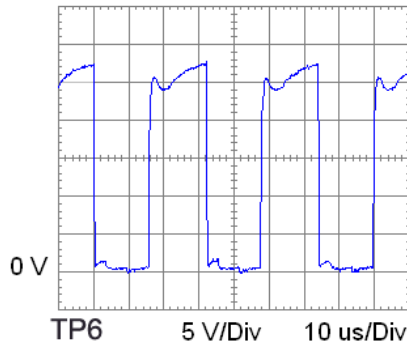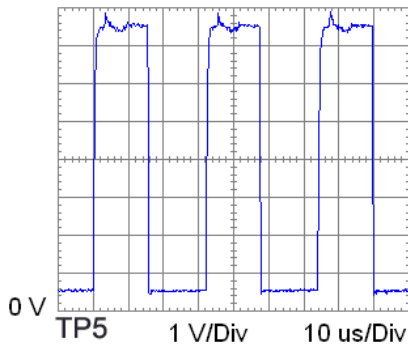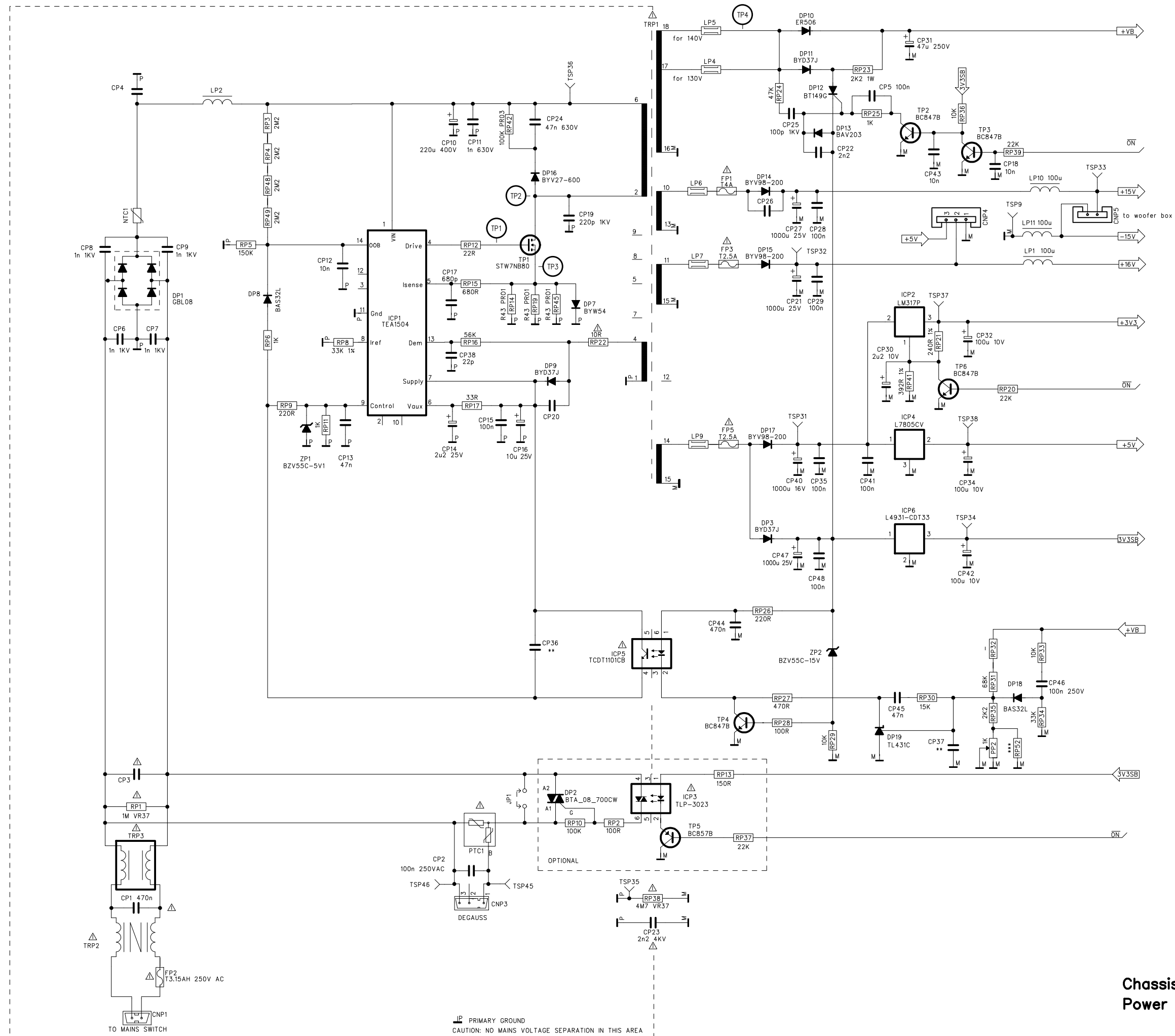
TEST POINT WAVEFORM LIST

POWER SUPPLY 8500

TP1 2 V/Div 5 us/Div

TP2 100 V/Div 5 us/Div

TP3 100 mV/Div 5 us/Div

TP4 100 V/Div 5 us/Div

Rel. 1.3

Chassis Professional 8500
RGB   Rev 1.3
Pg. 8/12
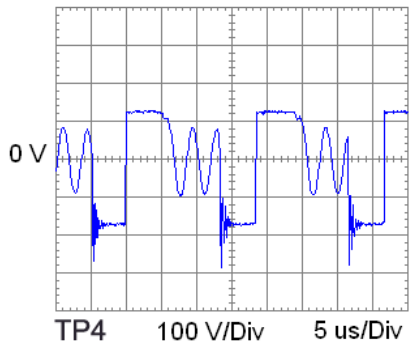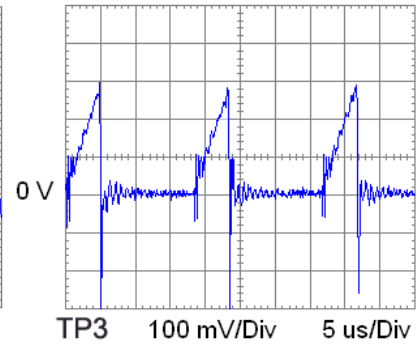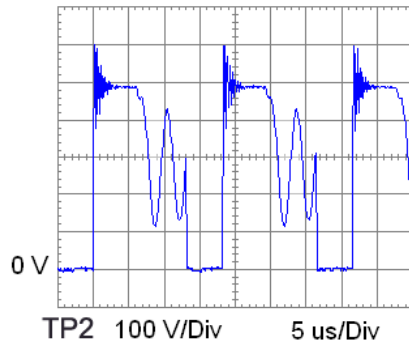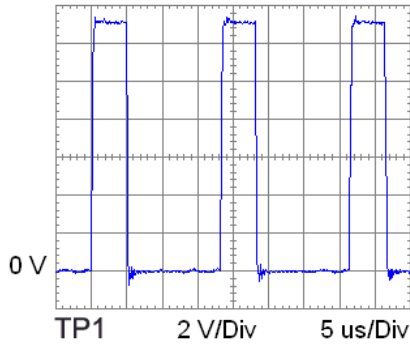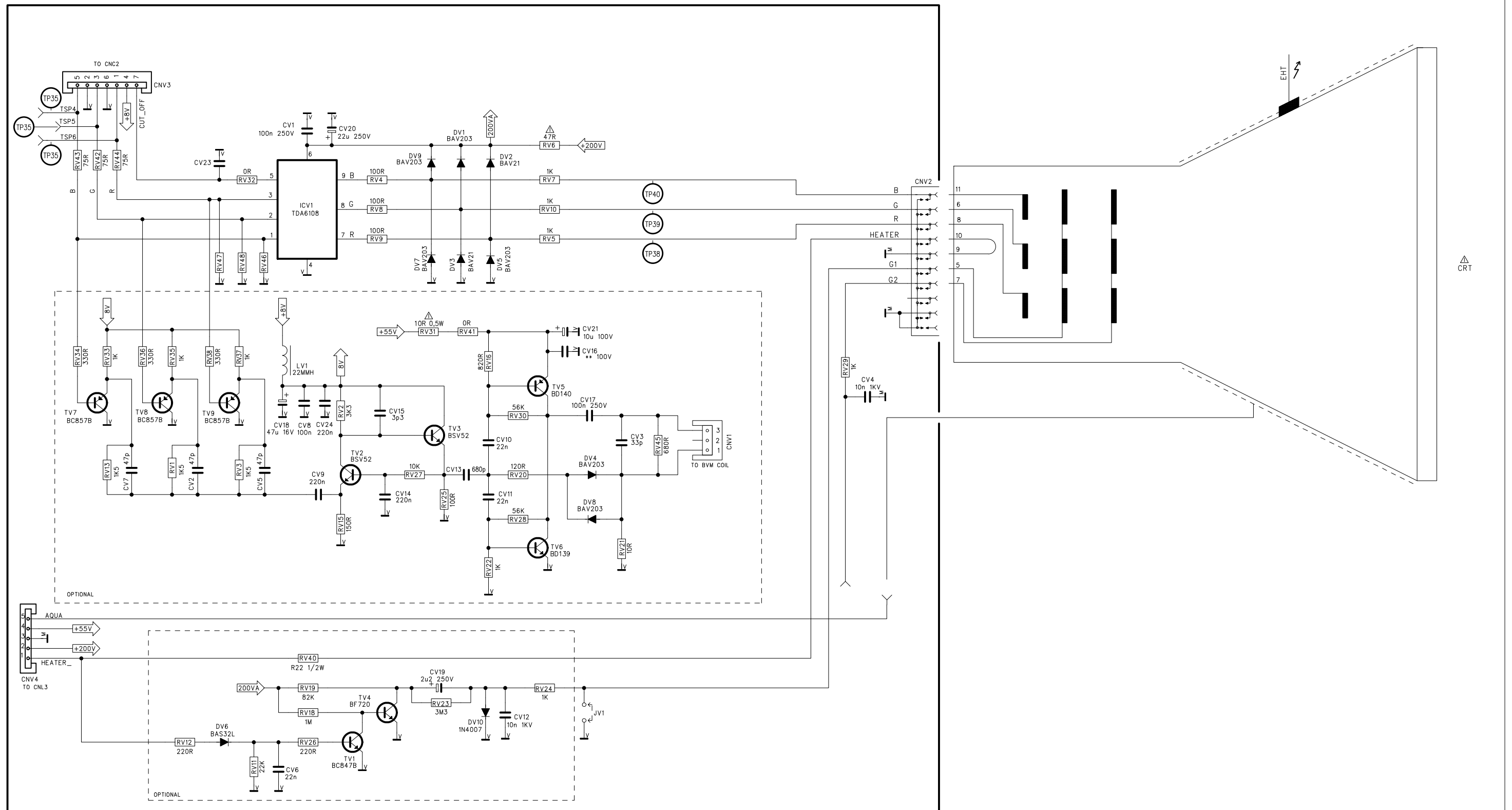
TEST POINT WAVEFORM LIST

RGB 8500

Rel. 1.3

TP35	500 mV/Div	10 us/Div
TP36	500 mV/Div	10 us/Div
TP37	500 mV/Div	10 us/Div
TP38	50 V/Div	10 us/Div
TP39	50 V/Div	10 us/Div
TP40	50 V/Div	10 us/Div

CNB3
TO CNP5
1
2
+15VA

CNB1
TO CNS2
3
2
5
4
R
L

RB9 22K
RB1 22K
CB14 470n
RB2 33K
CB1 47n
RB3 15K
CB2 10n
2
3
1
8
4
ICB1-A
1/2LM358N
47K RB4
RB6 15K
RB5 15K
CB3 47n
CB4 10n
6
5
7
ICB1-B
1/2LM35BN
CB8 470n

47K RB7
47K RB8
CB5 100n
CB6 100n
CB16 10u 16V
ZB1 ZPD12
820R 1W RB10
+15VA

CB13 220n
CB12 220n
6
7
MUTE
S1-by
12
10
11
5
ICB2
TDA7266M
15
14
4
In 1
Out 1-
2
Out 1+
1
Vcc
Vcc
Gnd
Gnd
3
13
8
9
CB9 *
CB10 470u 25V
+15VA

CNB2
1
2
TO WOOFER SPEAKER

EXT R

4
3
2
1
CNS3

TO ◁)

TO CNS1

4
3
2
1
CNS7

4
3
2
1
CNS5

CNS4
1
2
3
4

EXT L

Chassis Professional 8500
External speakers   Rev 1.0
Pg. 12/12

TECHNICAL SPECIFICATION   SPECIFICA TECNICA

1.0 Main features
Caratteristiche principali

1.01 Standard   BG   D/K   I   L/L'

1.02 Color System   PAL   SECAM   NTSC (Scart only)
     Sistema colore   (solo Scart)

1.03 Audio System   Stereo A2   AM   NICAM
     Sistema audio

1.04 Power Source   180/240V AC 50Hz
     Alimentazione

1.05 Audio Power   2 x 5Wrms (2 x 10W music)
     Potenza audio

1.06 Stand—By Power < 3W (if degauss control option present)
     Consumo Stand—By   (se opzione controllo degauss presente)
                       < 5W (without degauss control option)
                         (senza opzione controllo degauss)

1.07 Tuning—System   Frequency Syntesizer/99 programme positions
     Sintonia   Sintesi di frequenza/99 posizioni di programma

1.08 CRT type   All 110 size / Aspect ratio 4:3 and 16:9
     Tipi di cinescopio Tutti i formati 110 / Rapporto di forma 4:3 e 16:9

1.09 Connectors   2 x SCART   S—VHS (Scart2) 1 x Earphone
     Prese   1 x Cuffia

1.10 Regulations   EN55013 EN55020 EN61000—3—2 EN60065 (03—99)
     Normative

2.0 Additional features
Funzioni aggiuntive

2.01 Teletext   10 pages   TOP / FLOF
     Televideo

2.02 Multilingual graphic OSD   CZ/D/DK/E/F/FI/GB/I/N/NL/P/S
     OSD grafico multilingue

2.03 Hotel mode

2.04 Parental lock
     Sicurezza bambini

2.05 No signal auto switch—off
     Autospegnimento in assenza di segnale.

2.06 Sleep timer

2.07 100 Hz features
     —Scan conversion from 50/60 Hz to 100/120 Hz
     —Large area flicker reduction
     —Still picture
     —Digital color transient improvement (DCTI)
     —Luminance peaking
     —Panorama mode

2.08 Aspect ratio auto switch
     Commutazione automatica del formato

3.0 Options
Opzioni

3.01 Virtual Dolby

3.02 IN/OUT connectors —audio/video (RCA type) and S—VHS (Hosiden) inputs
                       —audio line outputs
                       —3 and 4 SCART (input)
                       —external speakers

3.03 VGA input   640x480 / 31,5 kHz/60 Hz RGB : 0,7 Vpp
     Ingresso VGA 640x400 / 31,5 kHz/70 Hz H/V : TTL level
                   640x350 / 31,5 kHz/70 Hz Audio: 150mVrms

3.04 Scan velocity
     modulation

Spare parts list
Lista parti di ricambio

Chassis Professional 8500

Rev.1.1

Ref./Pos.	Part.No. Codice	Description	Descrizione	Note
LC1	S067435100	Choke coil 10MMH LAL03	Bobina choke 10MMH LAL03	
LC11	S067450600	Choke coil 600 OHM BLM21A601	Bobina choke 600 OHM BLM21A601	
LF2	S067419100	Choke coil WBC2/RT-4A15	Bobina choke WBC2/RT-4A15	
LG1	S067081440	Linearity coil (Tipe A)	Bobina linearità (Tipo A)	
LG1	S030040050	Linearity coil (Tipe B)	Bobina linearità (Tipo B)	
LG2	S067070800	Choke coil E/W 5 MH	Bobina choke E/W 5 MH	
LL2	S030040130	Choke coil 100 MH 2,5A	Bobina choke 100 MH 2,5A	
LL6	S030040020	Bridge coil	Bobina ponte	
LP2	S030040110	PFC coil	Bobina PFC	
LV1	S067435220	Choke coil 22MMH LAL03 P.-52	Bobina choke 22MMH LAL03 P.-52	
ICC1	S020030240	I.C. VSP 9402	Circuito integrato VSP 9402	
ICC2	S020030210	I.C. LD1117ADT18TR	Circuito integrato LD1117ADT18TR	
ICC3	S020030230	I.C. TDA 9886TS/V3	Circuito integrato TDA 9886TS/V3	
ICC5	S020030000	I.C. TDA 9332H/N2/T3	Circuito integrato TDA 9332H/N2/T3	
ICF1	S020030270	I.C. TDA8358J/N2	Circuito integrato TDA8358J/N2	
ICP1	S020030050	I.C. TEA1504/N2	Circuito integrato TEA1504/N2	
ICP2	S020030130	I.C. LM317P	Circuito integrato LM317P	
ICP3	S020030140	I.C. TLP-3023	Circuito integrato TLP-3023	
ICP5	S020030150	I.C. TCD T1102G	Circuito integrato TCD T1102G	
ICP6	S063549310	I.C. L4931-CDT33	Circuito integrato L4931-CDT33	
ICP7	S020030180	I.C. STML78M08CDT	Circuito integrato STML78M08CDT	
ICR1	S006000010	C.I. SAA 5667HL	Circuito integrato SAA 5667HL	
ICR3	S020020010	I.C. M24C16-WBN6	Circuito integrato M24C16-WBN6	
ICS1	S063198700	I.C. TDA9870A (Stereo)	Circuito integrato TDA 9870A (Stereo)	
ICS1	S063198750	I.C. TDA 9875A (Nicam)	Circuito integrato TDA 9875A (Nicam)	
ICS2	S020030030	I.C. TDA7266	Circuito integrato TDA7266	
ICS5	S063570530	I.C. TDA 7053AT	Circuito integrato TDA 7053AT	
ICV1	S063161080	I.C. TDA 6108JF/N1	Circuito integrato TDA 6108JF/N1	
CG2	S040590100	Condensator 1 µF 250V	Condensatore 1 µF 250V	
CL21	S040600220	Condensator 22 µF 250V	Condensatore 22 µF 250V	
CL27	S040590220	Condensator 2,2 µF 250V	Condensatore 2,2 µF 250V	

CP1	S030244700	Condensator 470 nF 275 VAC	Condensatore 470 nF 275 VAC	
CP10	S010010130	Condensator 220 µF 400V	Condensatore 220 µF 400V	
CP31	S040600500	Condensator 47 µF 250V	Condensatore 470 µF 250V	
DC1	S061112050	Diode BAS 32 L	Diodo BAS 32 L	
DC3	S061517920	Diode BA792	Diodo BA792	
DF1	S061111320	Diode 1N 4007	Diodo 1N 4007	
DF2	S021020170	Diode BYD 37D	Diodo BYD 37D	
DF3	S061281050	Diode BAV 203	Diodo BAV 203	
DF4	S061002100	Diode BAV 21	Diodo BAV 21	
DH1	S021020200	Led diode red/green	Diodo led rosso/verde	
DL4	S021020240	Diode DMV1500H	Diodo DMV1500H	
DL6	S061301360	Diode BYW 36	Diodo BYW 36	
DL7	S061401370	Diode BYD 37K	Diodo BYD 37K	
DP2	S061401480	Diode BTA 08 700CW	Diodo BTA 08 700CW	
DP10	S021020160	Diode ER 506	Diodo ER 506	
DP11	S061503750	Diode BYD 37J	Diodo BYD 37J	
DP12	S021020080	Tyristor BT149G	Diodo tyristor BT149G	
DP14	S061303800	Diode BYV 98/200	Diodo BYV 98/200	
DP16	S021020060	Diode BYV 27/600	Diodo BYV 27/600	
DP19	S021020210	Bridge rectifiers GBL08	Diodo ponte a diodi GBL08	
DP19	S021020090	Diode TL431CZT	Diodo TL431CZT	
DP7	S021020100	Diode BYW 54	Diodo BYW 54	
ZC1	S061713300	Zener diode 33V	Diodo zener 33V	
ZC2	S021020220	Diode BAT85	Diodo BAT85	
ZC7	S061705100	Zener diode 5V1	Diodo zener 5V1	
ZF1	S021020230	Zener diode BZT03-C62	Diodo zener BZT03-C62	
ZF2	S021020120	Diode BZD27/C51	Diodo BZD27/C51	
ZP2	S021020140	Zener diode 15V	Diodo zener 15V	
ZS1	S061706800	Zener diode 6V8	Diodo zener 6V8	
ZS2	S061515500	Zener diode 3V6	Diodo zener 3V6	
FCC1	S067322500	Saw filter K9453M	Filtro SAW K9453M	
FCC2	S067322000	Saw filter K3953M	Filtro SAW K3953M	
TRP3	S030040080	Mains filter	Filtro rete	
FP1	S070503940	Mini fuse T4 A	Fusibile mini fuse T4 A	
FP2	S070506500	Fusible 3,15A H	Fusibile 3,15A H	
FP3	S070503900	Mini fuse T2,5 A	Fusibile mini fuse T2,5 A	
SWP1	S036020020	Mains switch	Interruttore di rete	
CNH5	S035040000	S-VHS connector	Presa S-VHS	
CNS6	S035040030	RCA jack	Presa RCA	
JKH1	S071015300	Earphone jack	Presa cuffia	

JKH2	S071020120	RCA connector yellow	Presa RCA gialla	
JKH3	S071020110	RCA connector red	Presa RCA rossa	
JKH4	S071020100	RCA connector white	Presa RCA bianca	
QC2	S066900200	Quarz 4 MHZ	Quarzo 4 MHZ	
QR1	S034010020	Quarz 12MHz	Quarzo 12MHz	
QS1	S066902450	Quarz 24,576MHz	Quarzo 24,576MHz	
QS2	S066902000	Quarz 20.25MHZ	Quarzo 20.25MHZ	
NTC1	S056590200	NTC resistor 4,7 Ohm	Resistenza NTC 4,7 Ohm	
RF12	S011010240	Resistor 2,2 Kohm 1%	Resistenza 2,2 Kohm 1%	
RF7	S048033000	Fusible resistor 33 Ohm	Resistenza sicurezza 33 Ohm	
RG4	S048002200	Fusible resistor 2,2 Ohm	Resistenza sicurezza 2,2 Ohm	
RL1	S044011500	Fusible resistor 15 Ohm	Resistenza sicurezza 15 Ohm	
RL14	S044010100	Fusible resistor 1 Ohm	Resistenza sicurezza 1 Ohm	
RP1	S053051000	Resistor 1 MOhm VR37	Resistenza 1 MOhm VR37	
RP21	S011010180	Resistor 240 Ohm 1%	Resistenza 240 Ohm 1%	
RP22	S047510000	Fusible resistor 10 Ohm	Resistenza sicurezza 10 Ohm	
RP38	S053054700	Resistor 4,7 MOhm VR37	Resistenza 4,7 MOhm VR37	
RP42	S011030020	Resistor 100 KOhm 3W	Resistenza 100 KOhm 3W	
RP8	S011010200	Resistor 33 KOhm 1%	Resistenza 33 KOhm 1%	
RS26	S047501000	Fusible resistor 1 Ohm SMD	Resistenza sicurezza 1 Ohm SMD	
RV6	S011010120	Fusible resistor 47 Ohm	Resistenza sicurezza 47 Ohm	
RW22	S047504700	Fusible resistor 4,7 Ohm	Resistenza sicurezza 4,7 Ohm	
IRH1	S020030100	IR receiver TSOP1836SS3VBS12	Ricevitore IR TSOP1836SS3VBS12	
PH1	S036020010	Switch push	Tasti push	
TC1	S021010080	TR. BSN20	Transistore BSN20	
TC14	S062608500	TR BC 847 B/T1	Transistore BC 847 B/T1	
TC18	S062608600	TR BC 857 B/T1	Transistore BC 857 B/T1	
TL1	S021010070	Transistor VN0610L	Transistore VN0610L	
TL2	S062764100	Transistor BUH 1015	Transistore BUH 1015	
TP1	S021010030	Transistor STW7NA80	Transistore STW7NA80	
TV2	S062620000	TR BSV52/T1	Transistore BSV52/T1	
TV4	S062607200	Transistor BF 720	Transistore BF 720	
TV5	S021010100	Transistor BD 140-16	Transistore BD 140-16	
TV6	S021010090	Transistor BD 139-16	Transistore BD 139-16	
TRL1	S066548000	Line drive transformer	Trasformatore pilota di riga	
TRL2	S031010050	Flyback transformer	Trasformatore EAT	
TRP1	S032020010	SMPS transformer	Trasformatore alimentazione	
	S040010010	Tuner	Tuner	

Da: **Data**:

A : Tutti i Centri Assistenza Tecnica Sinudyne

Oggetto: VARIANTI SUL PILOTAGGIO DEL FINALE DI RIGA PER TELAIO 8500

Gentili collaboratori,
Vi proponiamo di seguito due varianti tecniche al pilotaggio del finale di riga per i telai 8500.

Tali modifiche dovranno essere applicate ai soli telai che abbiano dimostrato una **mortalità precoce** del BUH1015 (poche settimane di funzionamento).

Di seguito troverete i dettagli circuitali delle modifiche e le immagini della realizzazione.

Verrete tempestivamente informati in merito alla data di introduzione di queste modifiche sulla nuova produzione.

Chassis 8500 Base circuit diagram
(All p.c.b.type : A/B/C)
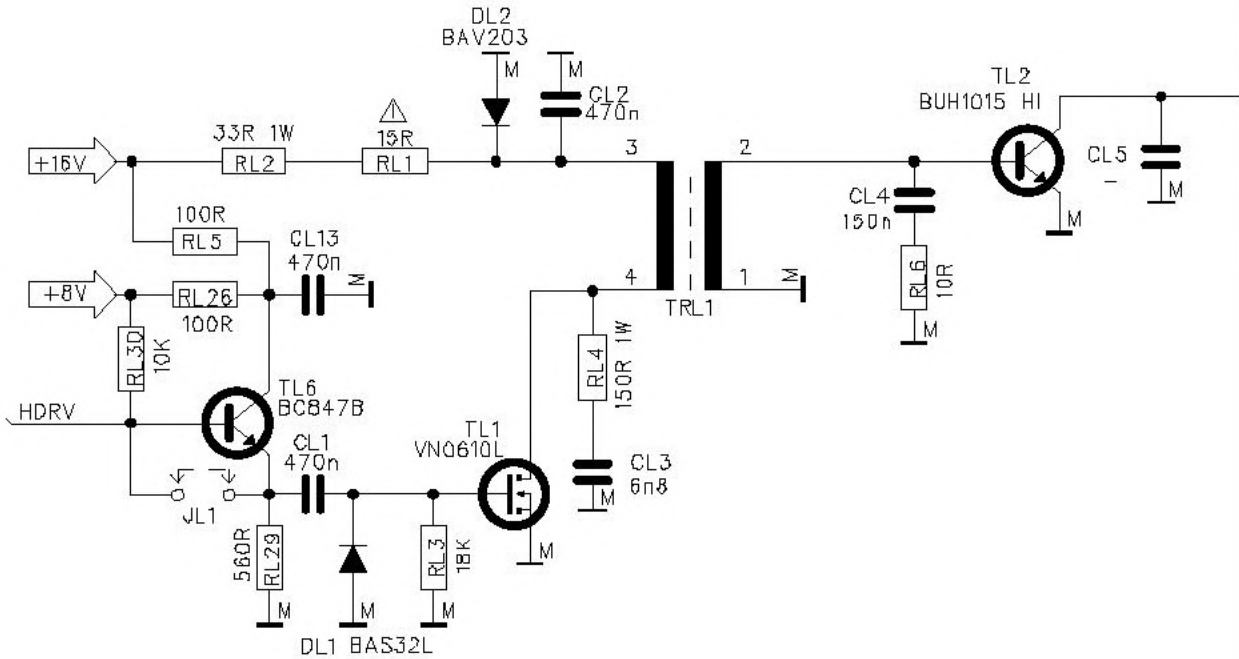
Chassis 8500 Modified circuit diagram "in case of BUH1015 failure"
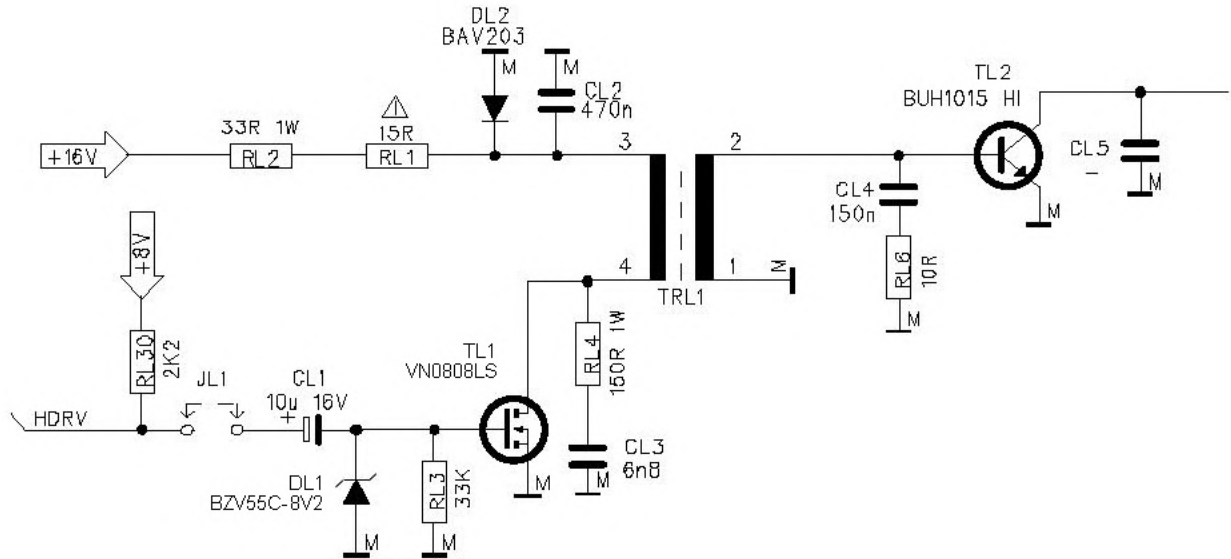
Reference	Descrizione	Circuito originale	Circuito modificato
RL5	Resistenza SMD	100Ω	Eliminato
CL13	Condens. SMD	470nF	Eliminato
RL30	Resistenza SMD	10KΩ	2,2KΩ
TL6 /JL1	Transistor SMD	BC847B	Sostituito con ponte tra base ed emitter TL6
RL29	Resistenza	1KΩ	Eliminato
CL1	Condens. Elettr.	470nF	10μF
RL3	Resistenza SMD	18KΩ	33KΩ
TL1	Transistor	VN0610L	VN0808LS (Codice SEI S021010140)
DL1	Diodo SMD	BAS32L	BZV55C-8V2 (Cod. SEI S061708200)

VERSIONE ORIGINALE
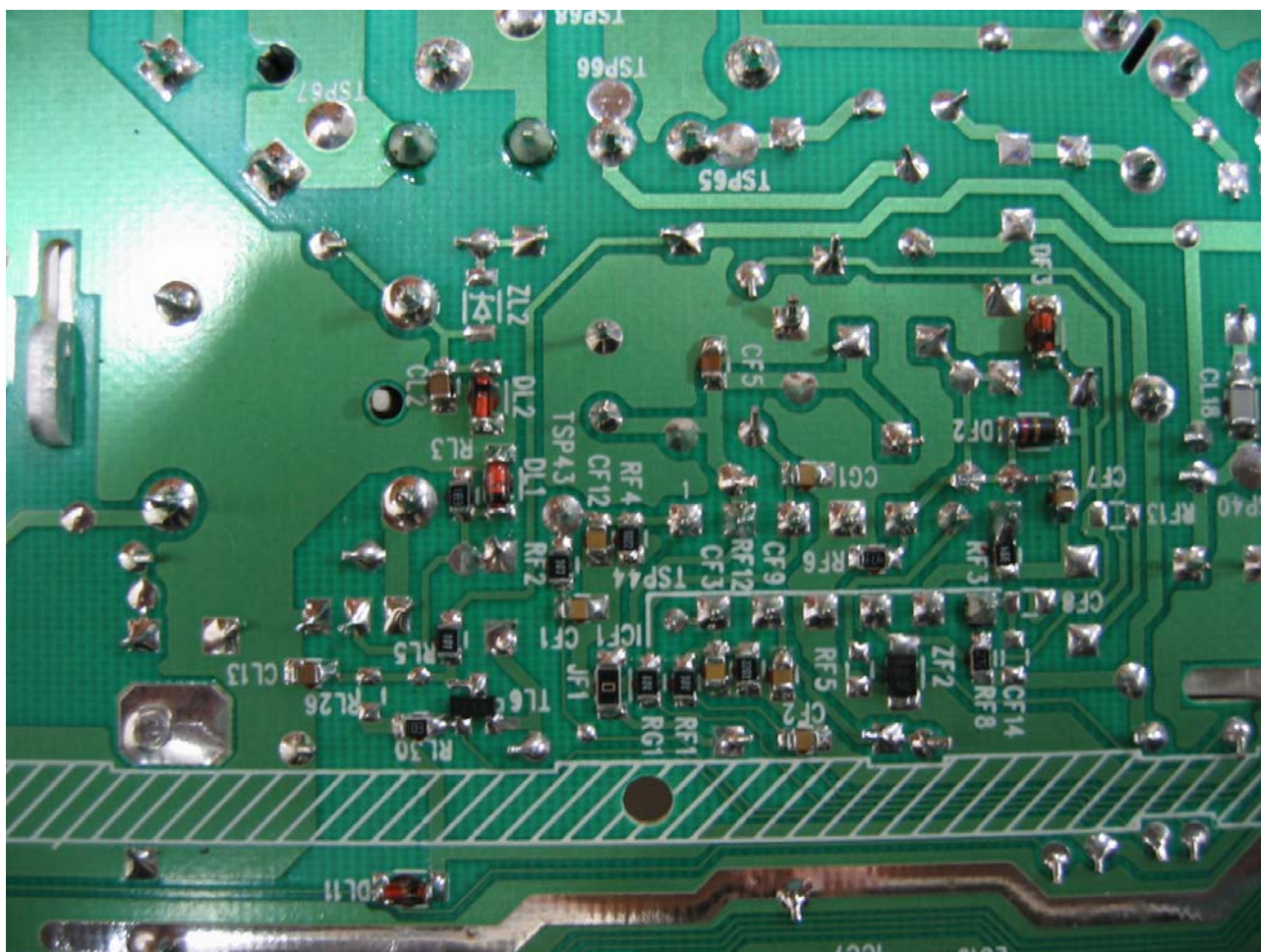
VERSIONE MODIFICATA
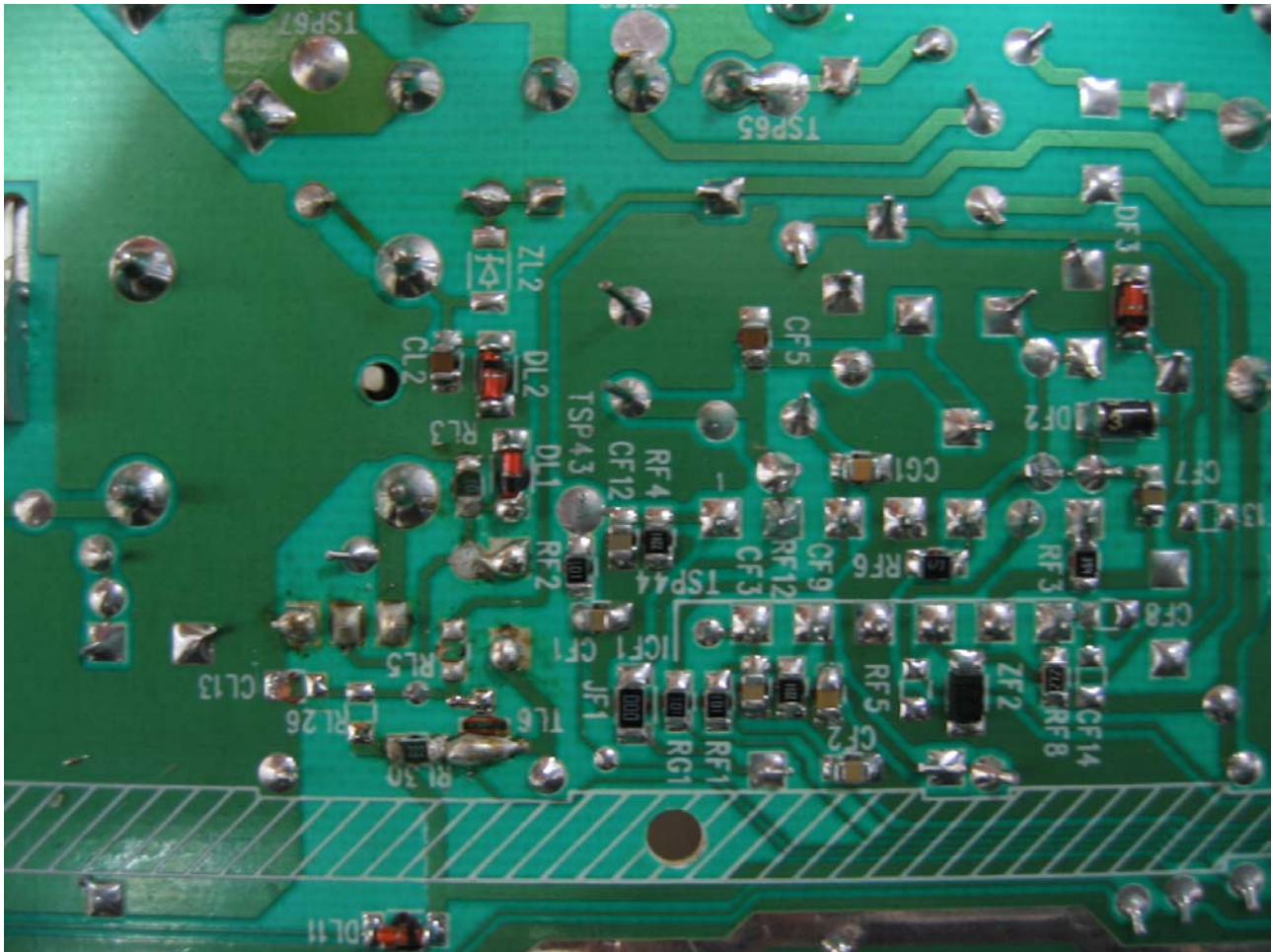
Description

IC TDA 8358J random malfunctioning

Product type	TV CRT
Model	Chassis 2550 – 8500
Involved serial nrs	
Brand	

Service Tip

In order to protect with efficiency the component IC TDA 8358J (e.g. against tube discharge) we suggest to act in the following way adding a bridge with a inner section > 1.0 mm2 ulti wire cable on tube PCB as from the photo here below.
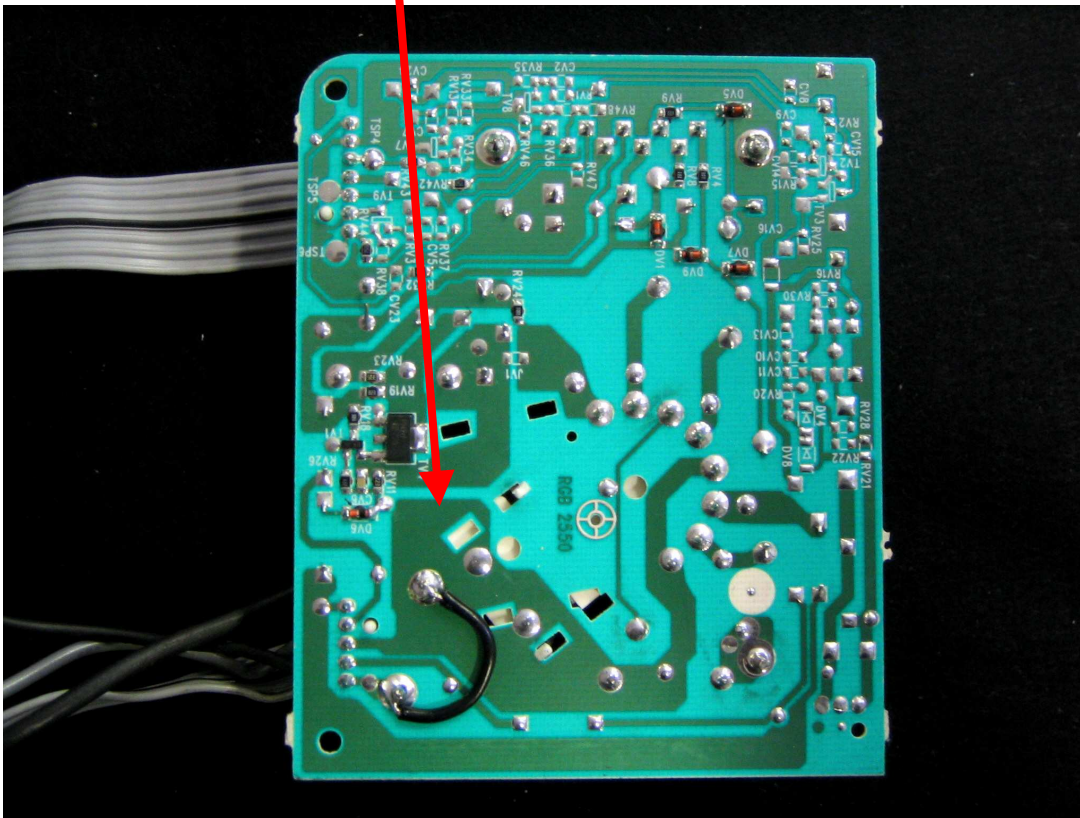
The indicated grounding path improvement is applied to production chassis (2550 and 8500) from June 2004 via a component side wire jumper.

File: TDA8358J.doc

Documento del Sistema Qualità della S.E.I. S.p.A. Uso interno.

Mod.: Proced/0

Subject : Chassis 2550 and 8500 Technical Improvements

The annex table resumes the technical improvements applied to the 2550 and 8500 chassis families production from March to Sept. 2004.
In the event of service job on products of earlier production date we suggest to implement the modifications listed in the table.
As additional info we highlight the fact that starting from April 2004 some soldering joints of the chassis is mechanically reinforced by the use of a specific rivet fitted on the PCB (LOPTX pins; Joke connector; EHT pins). In the event of service job we suggest to apply to chassis of earlier production date soldering reinforcement by new soldering joint making (renew tin alloy) on the previously listed areas.

| 2550 ISSUE	ACTION	APPLICATION / IMPROVEMENT		S.E.I. CODE
No power on from main switch operation (green led blinking)	Replace TL2 S2000 AFI and apply driving circuit modification Replace DP16 apply BYV27-600	In case of failure In case of failure		S021010110 S021020060
No power on from main switch operation (led blinking red to green)	Replace DP 8 apply BAS 32L Replace ICP5 TCDT1102G	In case of failure In case of failure		S061112050 S020030150
Difficult power on from standby status	Replace ZP2 apply BZV55-C15	In case of failure	Suggested	S021020140
Blanking screen on power on (horizontal coloured lines on dark screen)	Replace ICF1 TDA 8358 Replace RL15 1R 033 5% Replace RL14 1R 033 5% Replace DL8 from RGL34K to BYD37K Replace DL7 from RGL34K to BYD37K Apply wire jumper on CRT PCB (#2 Photo)	In case of failure In case of failure In case of failure 	 Suggested Suggested Suggested	S020030270 S044010100 S044010100 S021020280 S021020280

8500 ISSUE	ACTION	APPLICATION / IMPROVEMENT		S.E.I. CODE
No power on from main switch operation (green led blinking)	ReplaceTL2 BUH 1015 and apply driving circuit modification Replace DP16 apply BYV27-600	In case of failure In case of failure		S062764100 S021020060
No power on from main switch operation (led blinking red to green)	Replace DP 8 apply BAS 32L Replace ICP5 TCDT1102G DL6 / RL11 Discharge to ground elimination (#1 Photo)	In case of failure In case of failure	Suggested on 8500 PCB version A, B, C	S061112050 S020030150
Difficult power on from main switch operation	CR47 and CR48 from 47 pF to 33 pF CR3 from 1.0 uF to 2,2 uF		Suggested	S062764100 S010162200
Difficult power on from stand by status	Replace ZP2 apply BZV55-C15 Replace DP3 from RGL34J to BYD34J	In case of failure	Suggested	S021020140 S021020250
Blanking screen on power on (horizontal coloured lines on dark screen)	Replace ICF1 TDA 8358 Replace RL15 1R 033 5% Replace RL14 1R 033 5% Replace DL8 from RGL34K to BYD37K Replace DL7 from RGL34K to BYD37K Apply wire jumper on CRT PCB (#2 Photo)	In case of failure In case of failure In case of failure	Suggested Suggested Suggested	S020030270 S044010100 S044010100 S021020280 S021020280
Random switch off to st-by	Replace CL12 Gray type 220 pF 2KV - 500 Vac with Blue type 220 pF 2KV - 700 Vac Replace RC 103 from 4,7 K to 470 ohm		Suggested Suggested	S010030450 S044824700

NOTE : #1 Photo ; #2 Photo

#1 Photo 8500 Chassis type
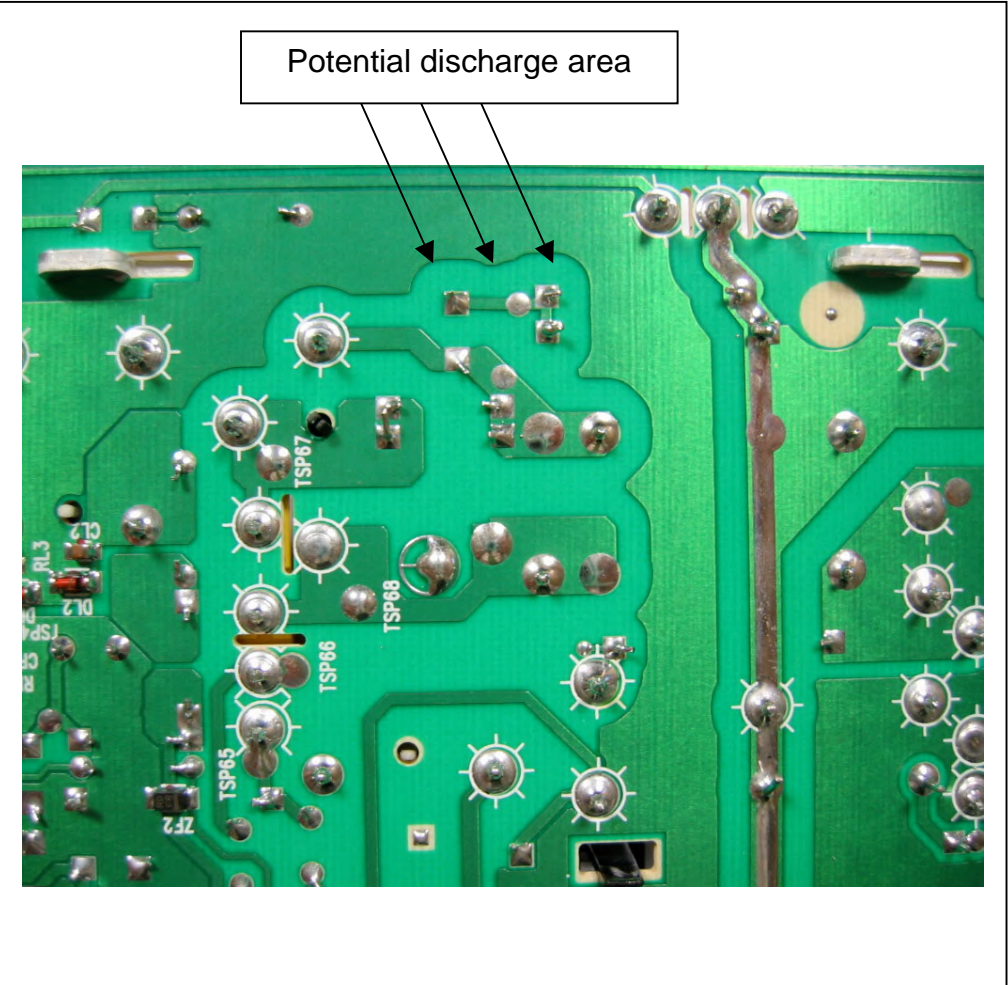
#2 Photo 2550 and 8500 Chassis type

Potential discharge area

Wired connection jumper
(multiwire type)
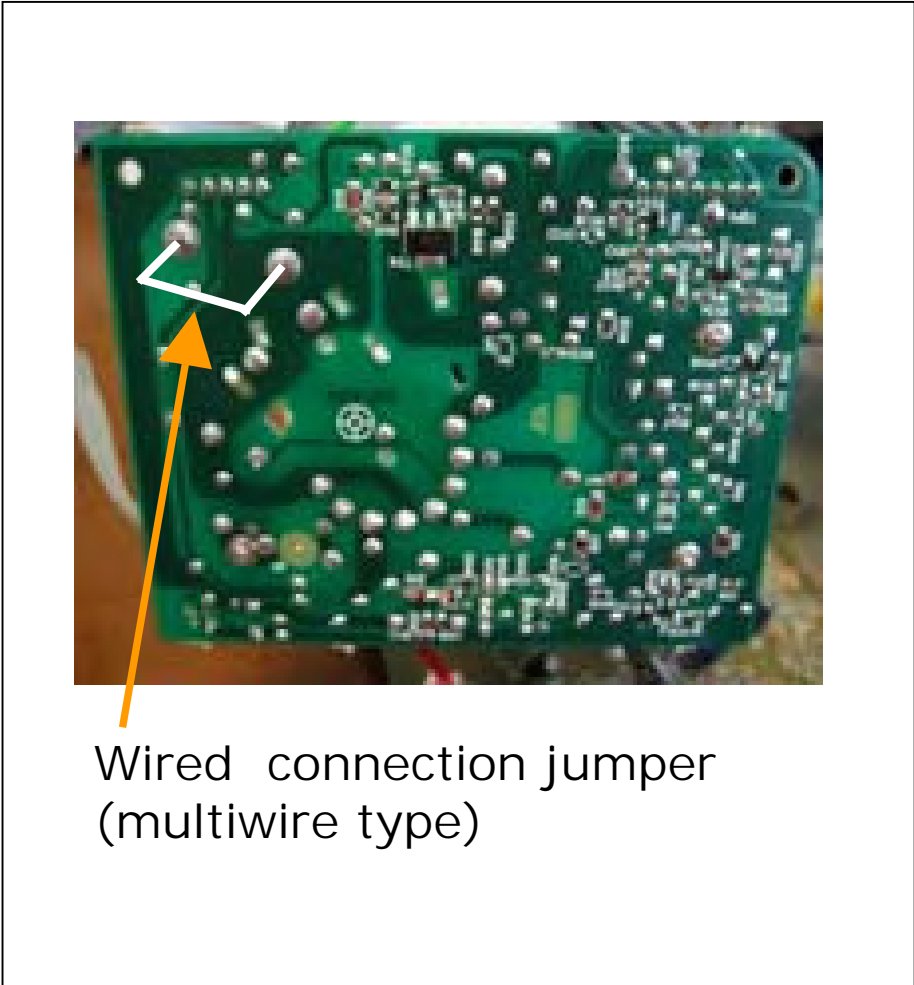
Chassis Professional 8500
Description of circuit

Power Supply

The chassis 8500 uses a **S**witch **M**ode **P**ower **S**upply (SMPS) operating at 50 kHz approx, rectified and stabilized on the secondary side and controlled by the TEA1504 (ICP1) integrated circuit.

The transformer TRP1 serves simultaneously to isolate the a.c. voltage and to generate the required supply voltages through the various secondary windings.

When the switch contacts are closed, the a.c. voltage, rectified to d.c., smoothed, and carried by the terminals of CP10, is connected to pin 1 of integrated circuit ICP1 which proceeds to charge capacitor CP14 by means of an internal current source. As soon as the charge voltage reaches a value of 11 V approx, the integrated circuit begins operating and generates pulses through pin 4 that are used to drive transistor TP1.

Current now begins to flow through the primary 6/2 of the transformer and pulses are generated at the terminals of winding 1/4 which, when rectified by DP9 and smoothed by CP16, will ensure that ICP1 is fully powered up.

At the same time, currents are induced in the secondary windings which when rectified and smoothed will provide the various supply voltages.

A voltage taken from the terminals of CP31 by way of a divider including RP31/RP32/RP35/PP2 and applied to the control electrode of DP19 will cause a current, proportional to the voltage, to flow through the photodiode of the optical coupler ICP5.

This current is transferred via the emitter of the photocoupler to the input (pin 9 of ICP1) of a comparator serving to regulate the duration of the pulses that will drive the transistor TP1.

The resulting circuitry ensures a notably precise regulation of the voltages presented at the secondaries of the transformer, controlling the duration for which current is allowed to flow through the primary winding and consequently determining the amount of energy put into the transformer.

The choke LP2 serves to limit current harmonics drawn from the a.c. supply, in accordance with pertinent regulations.

- **Stand-by mode**

During operation in stand-by, minimal power is consumed by the appliance as most of the circuits are inactive; the amount of energy to be put into the transformer is therefore very small, and this means that the conduction times for TP1 would be so short as to be incompatible with the characteristics of the transistor.

In this situation, accordingly, the SMPS uses a discontinuous type of operation in which the pulses driving transistor TP1 are generated by the integrated circuit ICP1 in bursts, rather than continuously. In this way, minimal energy is transferred, but employing conduction times that are acceptable for transistor TP1.

In stand-by mode, transistor TP3 conducts and TP2 is inhibited, so that thyristor DP12 conducts when the gate is in receipt of pulses, by way of RP24 and CP25, from the secondary winding 16/17-18 of the transformer. Accordingly, the +VB voltage winding is connected in parallel with that of the +3V3 stand-by voltage (pin15/14).

The voltage at the terminals of CP47 now rises swiftly and, on exceeding the threshold value of the Zener diode ZP2, establishes conduction through transistor TP4. The produces a current pulse in the photodiode of ICP5, which is transferred by way of DP8 and RP6 to pin 14 of ICP1, which ceases driving transistor TP1.

The voltage at pin 6 of ICP1 drops, ultimately reaching a value of 8 V approx, at which point the internal current generator is reactivated. The voltage at pin 6 now rises again to 11 V approx, returning transistor TP1 to a state of conduction, and the cycle described thus far is repeated.

To avoid unnecessary power consumption, moreover, only the circuits connected to the + 3.3V voltage are powered up, since circuits ICP2 (+ 3V3) and ICP4 (+5V) are in practice rendered inactive by the very low input voltage.

This ensures that power consumption in stand-by is only 2.5 W approx (Green Mode).

- **Normal Mode**

When an ON command is received, pin 98 of ICR1 is shifted to level L.

Transistor TP3 is inhibited and TP2 saturates, interrupting conduction of DP12 and restoring separation of the secondary windings. The +16V voltage at the terminals of CP21 is now able to power up the horizontal deflection stage contained in ICC5, by way of circuit ICP7 (the detailed description of the horizontal deflection start cycle is given under the relative heading). This means that the horizontal deflection stage can begin to operate, all secondary voltages are present, and the power supply is operating in normal mode.

If required power falls below 10% of peak power, the operating frequency drops to 20kHz approx to reduce switching losses.

- **Protections**

In the event of an a.c. supply overvoltage occurring, circuit ICP1 will stop generating pulses on pin 4 if the voltage at pin 6 exceeds 14V approx. Conversely, if the a.c. supply voltage is too low, pulses will cease to be generated if the voltage at pin 14 falls below 2.5V.

In addition, the current flowing through transistor TP1 is measured at the terminals of resistors RP14/RP19/RP45 and applied to pin 5 by way of RP15; if the value registers higher than the prescribed maximum, pulses will cease to be generated at pin 14.

These measures have the effect of protecting transistor TP1 and avoiding the risk of short circuits on the transformer secondaries.

- **PTC control**

The circuit (optional) made up of TP5, ICP3 and DP2 allows activation of the picture tube degaussing function at each power-up, not only when the power switch is operated but from the stand-by condition as well.

■Processor / Text

The functions indicated above are assigned to integrated circuit ICR1 (SAA5667HL).

- **■Processor**

This controls all functions of the appliance, communicating internally with the text section and externally with the various peripherals via two IIC buses and by way of L/H levels on certain pins.
The bus connected to pins 83 and 84 is dedicated to communication with memory NVM (ICR3), so as to ensure maximum protection of stored data.
The bus connected to pins 81 and 82 is used for communications with all other peripherals.
Receiver IR (IRH1) is connected to pin 76, pin 2 provides the input for commands entered manually by way of the keys, and pin 100 provides the output controlling the LED (DH1) by way of transistors TH1 and TH2.
Pin 72 receives the reset signal generated by integrated circuit ICR2 at power-up.
Pins 4 and 5 are inputs used for automatic selection of AV mode when the sources connected to the two SCART sockets supply the relative switching voltage. Pin 6 is used for selection of VGA mode.
Pin 28 provides "low power" control of the horizontal deflection stage (see relative heading) whilst pin 13 is an output used to reset the video processor (ICC1).
Pin 97 activates the MUTE function and pin 98 enables the SMPS to switch the appliance out of stand-by mode (L active).
Pins 95 and 96 control volume and balance through the earphones.
Pin 22 is an input used to check that the SMPS start cycle has been correctly completed. Pins 53 and 55 are inputs receiving the horizontal and vertical synchronizing pulses used to position the On-Screen Display.
Pin 31 is the input for the video signal used to extract text information, and pins 46, 47, 48 and 52 are the RGB signal outputs for OSD and text.

- **Text / OSD**

All hardware and software functions are contained in the integrated circuit, which also generates the relative RGB signals internally.

Processing of video / synchronizing signals

These functions are assigned to circuits TDA9886 (ICC3), VSP9402 (ICC1), TDA9332 (ICC5).

- **TDA9886**

This is a multistandard video demodulator for positive and negative modulation, which also includes the handling of AM audio.
No external control is required. The component is driven entirely by software through the IIC bus connected to pins 10/11. The pin 22 is used in conjunction with TC3 and TC4 to switch the SAW audio filter FCC1 when LL' standard is in use.
The demodulated video signal is carried by pin 17 and the intermediate audio frequency by pin 12.
Pin 8 carries the already demodulated AM audio signal when LL' standard is in use. Pin 14 is the tuner gain control output.

- **VSP9402**

This has the following functions:
- Video input selector
- A/D converters with 9 bit resolution
- Multistandard colour decoder (PAL/NTSC/SECAM)
- 50/60 Hz to 100/120 Hz converter
- Integrated video memories (Data format 4:2:2)
- Motion adaptive temporal noise reduction
- Digital colour transition improvement (DCTI)
- Luminance peaking
- Sync outputs
- A/D converters with 9 bit resolution for YUV outputs

All processes are controlled via IIC-bus (pins 6/13), and YUV output signals are carried on pins 2/79/76. Transistors TC1 and TC2 convert the level of the IIC bus from the 5V utilized by other peripherals to the 3.3V needed by circuit ICC1. Pins 17/23 carry the horizontal and vertical synchronizing signals.
Pin 63 carries the video text decode signal, and pin 61 the SCART2 video output signal. Pin 24 receives the reset signal (L active) controlled by microprocessor ICR1.

- **TDA9332H**

Video

The signals Y100, U100, V100 from ICC1 are connected to pins 26, 27 and 28.
The RGB signals are matrixed by the relative circuits, then verified for saturation, contrast and brightness. The output signals to the picture tube are carried by pins 40, 41 and 42 and directed at low impedance to the final video amplifiers by way of transistors TC9/TC14/TC15.
Pin 44 is the input for measurement pulses regulating the cutoff, which uses an automatic system for alignment at both low and high current, optimizing the performance of the picture tube. The regulation of voltage Vg2 is completely automated in service mode by a dedicated software procedure.
Pin 43 is the control input for automatic limitation of the tube current.
Pins 35, 36, 37 and 38 carry the RGB input signals for OSD and text, whilst pins 30, 31, 32 and 33 are the RGB inputs for the VGA source. Important: these inputs require sources with a horizontal frequency of 32 kHz approx.

Deflection

All management of deflection controls is referred to the 12 MHz oscillator FCC4 connected to pins 20/21.

At power-up, pin 22 is set at 5V by way of RC73 and ZC7, consequently activating the output of horizontal drive pulses at 50 kHz approx from pin 8. This allows the horizontal deflection stage to start up in low power mode (its consumption allowing stabilization of the power supply), thereby minimizing stress on the final line transistor.

When the supply voltage on pins 17/39 reaches 8V, the horizontal drive output passes progressively to the nominal frequency (32 kHz) and the definitive operating mode is established. At this point the software will remove the input voltage from pin 22, and pin 20 of ICR1 reverts to low level.

The horizontal and vertical synchronizing pulses HD and VD are applied respectively to the inputs at pins 24 and 23. If the VGA option is included, integrated circuit ICC7 is used to direct the signals of the selected source (TV or VGA) to the inputs.

Pin 13 is the horizontal flyback pulse input, and pin 4 is the input used for dimensional stabilization of the picture in response to variation in tube current.

Pin 9 is used as the input for a tube protection circuit that will blank the screen in the event of problems affecting the vertical deflection circuits.

Pins 1 and 2 are the symmetrical outputs driving vertical deflection and pin 3 is the output controlling E/W correction.

In service mode, all control functions are executed by a dedicated auxiliary software.

Processing of audio signal

The various audio functions are handled by circuits TDA9870/5A (ICS1), SAA7715H (ICS3), TDA7266 (ICS2) and TDA7053AT (ICS5).

- **TDA 9870A / TDA 9875A**

The basic functions of the two integrated circuits are the same, with version TDA9875A also incorporating a NICAM digital audio decoder.

The IF audio signal coming from pin 12 of circuit ICC3 is applied to input pin 12.

All audio functions (demodulation, FM/NICAM stereo decoding, input/output switching, volume/tone controls, effects) for BG/DK/I/LL' standards are contained in the integrated circuit, and all are selected and controlled entirely by software.

The audio inputs from the SCART 1 and SCART 2 sockets are connected respectively to pins 33/34 and 36/37; the audio input from the front sockets (optional) is connected to pins 31/32.

Pin 29 receives the AM audio signal from pin 8 of ICC3, when LL' standard is in use.

Pins 47/48 and 51/52 carry the audio outputs to SCART 1 and SCART 2 respectively.

Pins 62/63 are the constant level outputs for the LINE OUT sockets (optional), driven by way of transistors TW11 and TW13, and pins 60/61 are the outputs for the power amplifiers (ICS2) driving the speakers.

Pins 21/22/23/25/26/27 are the inputs/outputs of the I2S digital bus used for communications with circuit ICS3 (included only in appliances equipped with Virtual Dolby®).

- **SAA 7715H**

This is included only in appliances with Virtual Dolby® (optional).

The handling of the signal is entirely digital, with data transferred to and from ICS1 by way of bus I2S, which is connected to pins 1/2/3/22/30/31.
A dedicated software controls all the functions.

- **TDA 7266**

This is a dual audio power amplifier with bridge outputs coupled directly to the loudspeakers.
The input signals are connected to pins 4/12 and the outputs to pins 1/2 and 14/15.
Pin 6 (L active) mutes the amplifiers and is controlled by way of transistor TS1.
Transistors TS2 and TS3 activate the MUTE function during power transients.
Pin 7 (L active) minimizes power consumption in stand-by.

- **TDA 7053AT**

This is a dual amplifier used to drive the earphones socket.
The inputs are connected to pins 4/6 and the outputs to pins 9/16. The signal reproduced is the same as that of the speakers and can be controlled for volume and balance by way of pins 2/8, connected to the outputs (pins 95/96) of ICR1.

Deflections

- **Horizontal**

The final line transistor is driven using transformer TRL1, of which the primary winding is driven by transistor TL1, connected to the horizontal drive output of ICC5 (pin 8) by way of impedance transfer transistor TL6.

The horizontal deflection stage is implemented conventionally with the deflection transistor TL2, the diode EW modulation circuit (DL4), and internal pincushion correction (CL8/LL6). The EW correction signal is applied at the central point of the diodes by way of LG2.

The capacitive divider made up of CL11/CL12 handles the horizontal flyback pulse applied to pin 13 of ICC5, limiting its maximum value to 8V by way of diode DL11.

- **Vertical - EW**

The functions are assigned to integrated circuit TDA8358 (ICF1). This is a power amplifier that has a bridge output and therefore allows connection of the deflection coils directly to pins 4 and 10. Also connected in series is resistor RF10, which supplies the necessary feedback signal to pin 12.

The differential input circuit (pins 1/2) is driven by the voltage produced at the terminals of RF5/RF12 as a result of the symmetrical currents supplied by ICC5.

Pin 11 is an output that assumes value H at the moment of vertical flyback. This signal is connected to pin 9 of ICC5 and its function is to protect the picture tube in the event of problems in the vertical deflection circuits.

Two separate input voltages are used for the deflection part (pin 3) and for generating the flyback pulse (pin 9), thereby obtaining a high level of effectiveness.

The power stage for the EW correction, composed of a MOS transistor internally of the integrated circuit, is driven directly by ICC2 at pin 5 and its collector (pin 8) is connected by way of RG4 to the injection coil LG2.

Final video amplifiers

The RGB signals carried by pins 40/41/42 of circuit ICC5 (TDA9332) must be amplified and inverted to set them at the level necessary for driving the picture tube.
The signals are transferred via transistors TC9, TC14 and TC15, at low impedance, to the inputs of the final amplifiers.
Integrated circuit TDA6108 (ICV1) is used for this purpose.
The inputs are connected to pins 1/2/3 and the outputs (pins 7/8/9) are connected directly to the tube cathodes by way of the protection resistors RV5/RV7/RV10.
Pin 5 carries a copy of the currents flowing through the cathodes of the tube and this information is relayed to video processor TDA9332 for operation of the automatic cutoff control circuits.
Transistors TV1 and TV4 make up a circuit serving to eliminate the spot that remains on the screen when the appliance is switched off.
During operation, TV1 is maintained in saturation by the filament energizing pulses, rectified and filtered by DV6 and CV6, so that TV4 is inhibited.
Capacitor CV19 is able to charge at +200V through the agency of RV19 and DV10, whilst the aperture grilles 1 (G1) of the tube remain at ground potential since DV10 is in conduction.
As soon as the appliance is switched off, no further pulses will be supplied to the filament; TV1 is inhibited and TV4 is saturated by the voltage of +200V, still present and applied through RV18 to its base.
The collector of TV4 now refers the positive plate of CV19 to ground, and accordingly the grilles 1 of the tube are polarized with the -200V present on the negative plate, since DV10 is now reverse-polarized.
In this situation, the tube remains entirely inhibited for the duration of the period taken by CV19 to discharge, and no spot will appear on the blank screen.
Also included (optionally) is a deflection rate modulation circuit.
The RGB signals, decoupled by transistors TV7/TV8/TV9, are summated and transferred by the circuit made up of TV2 and TV3 to the power stage consisting in TV5 and TV6.
The coupling capacitor CV13 and the input impedance of the power stage combine to form a shunt circuit that generates pulses of suitable polarity to coincide with each signal transition.
Thanks to this expedient, a special deflection coil associated with the tube is able to modulate the deflection velocity (**B**eam **V**elocity **M**odulation), obtaining a significant improvement in definition of the picture.