1.1 RF AGC Alignment (Europe)

(a) Apply RF signal of 210.25MHz (BG CH 10) modulated with color bar at 3mVrms to Tuner NH001 RF input.

(b) Tune to CH10

(c) Go to service mode & set RF AGC -CHIP control = 00 (max).

(d) Monitor 38.9MHz IF frequency response at NH001 pin11 with spectrum analyser by using high impedance probe or equivalent.

e) Increase RF AGC -CHIP control until IF frequency response 8 + 1/ - 2 dB down from maximum **.**

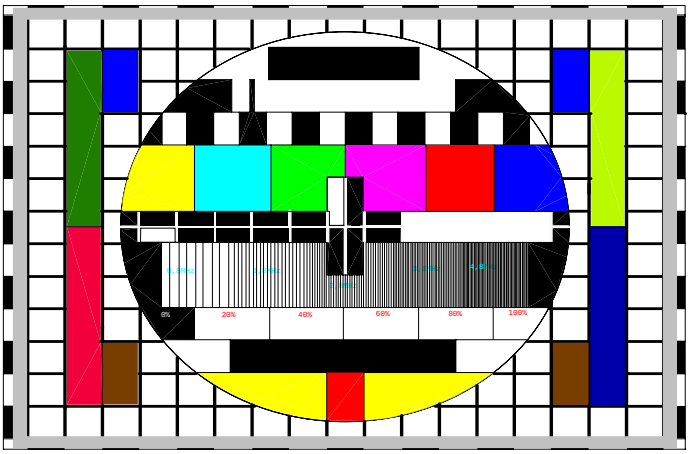
1.2 IF demodulator Off-set Alignment (Europe)

Go to service mode & set OIF -CHIP control = 32 .

Geometry

Special connector BR002 gives direct access to the I2C-bus and video-input in AV-mode for production purpose.

4:3 standard mode, overscan:
V=107% (line #32 to #301 visible = 270 lines)
H=107% (48.6µsec of 52 us visible)



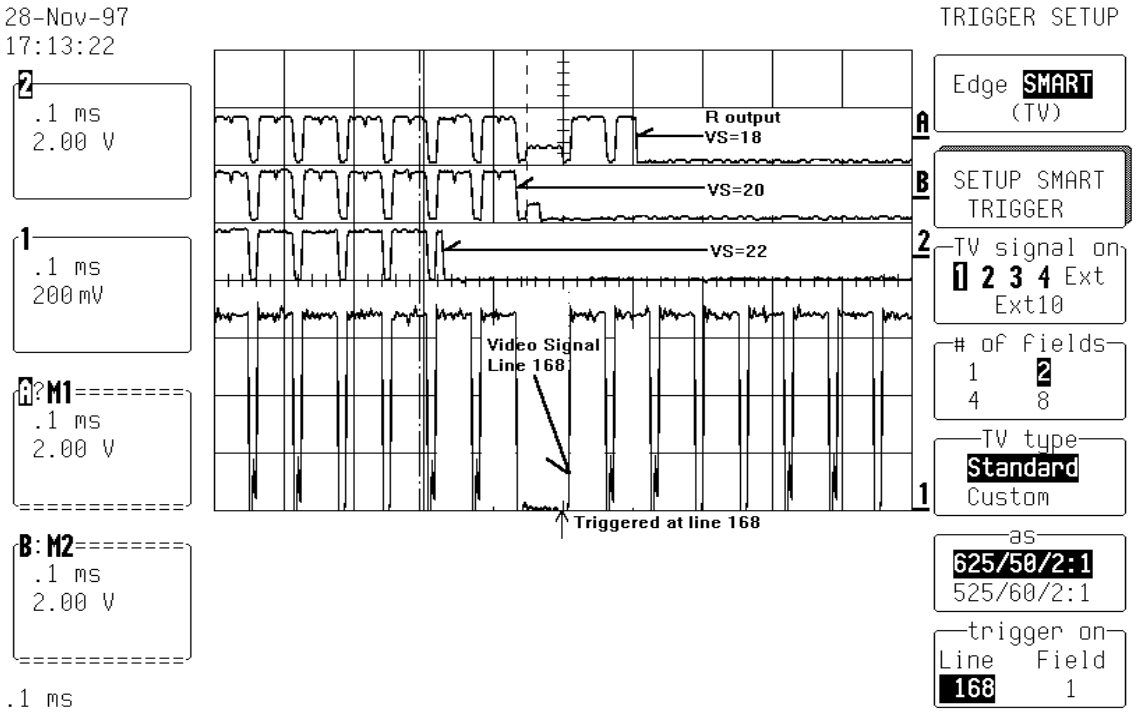
1.3 Alignment of vertical slope

- This alignment can be done on test jig without final tube
- Apply Full White pattern (625 lines/50Hz) at chassis test-jig, monitor R output and trigger the scope by TV line 168.
- Set AKB = 1 (enable Auto Black Current)
  Set SBL = 1 (to blank the bottom half video)
  Set VS = 0

Remark: For the 21"-XF-4/3, 25"/28"-MP-4/3 and 29"XF picture tubes the preferred alignment procedure for V-Slope alignment has to be used!

1.4 Preferred alignment procedure for V-Slope alignment:

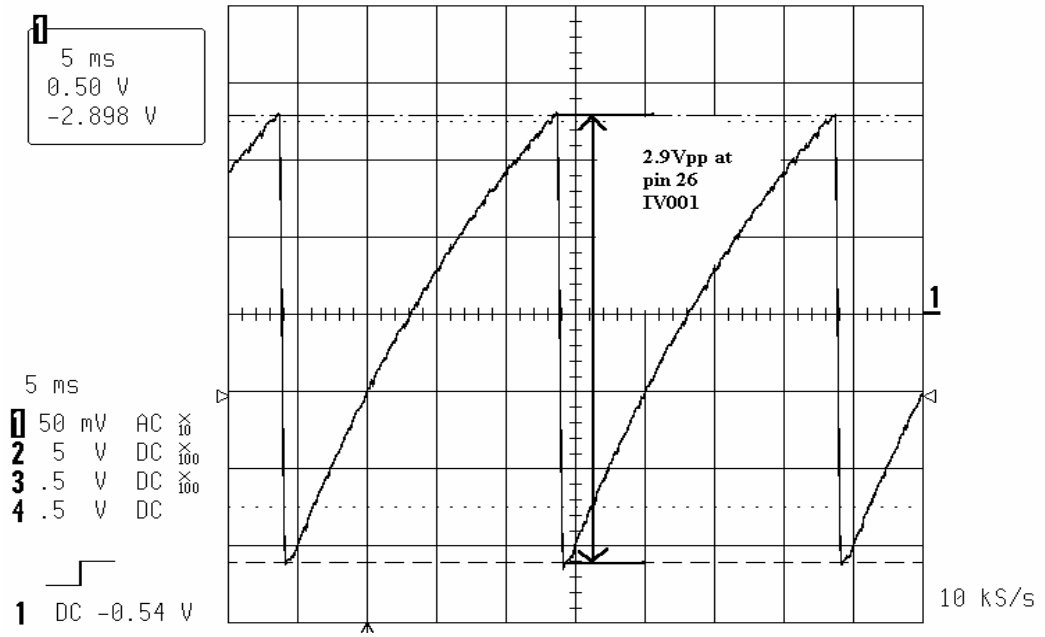
- Monitor R output (IV001 pin 51) at line 168. The level should be high.
- Increase VS until the blanking happens at line 168.
- Save VS and set SBL and AKB back to 0.



R output corresponding to VS=18, 20 and 22(decimal). Input is Full White with horizontal centre line shown that is triggered at line 168.

1.5 Optional alignment for V-Slope

At chassis test-jig, monitor the voltage at item pos IV001 pin 26.
Adjust VS value through the external computer until the voltage at pin 26 is at 2.9Vpp (a.c.) +/- 5% as shown in the figure below. The probe to be used is 10Mohm probe.
Save VS and set SBL and AKB back to 0.



a) This alignment must be done on chassis with final tube.

b) Make sure that UB1 voltage level according to page 5 table for respective tube.

c) Use a 50/60Hz test pattern with markings for correct horizontal and vertical overscan.

d) Adjust horizontal centring (HSH) via I^2C bus for optimum overscan symmetry

e) Adjust vertical centring (VSH) via I^2C bus for optimum overscan symmetry

f) Adjust picture height (VA) via I^2C bus for optimum overscan.

g) Adjust vertical linearity (SC) for minimum error via I^2C bus.

h) If necessary repeat VSH and VA alignment to 7% overscan and best overscan symmetry

Default values for s-correction

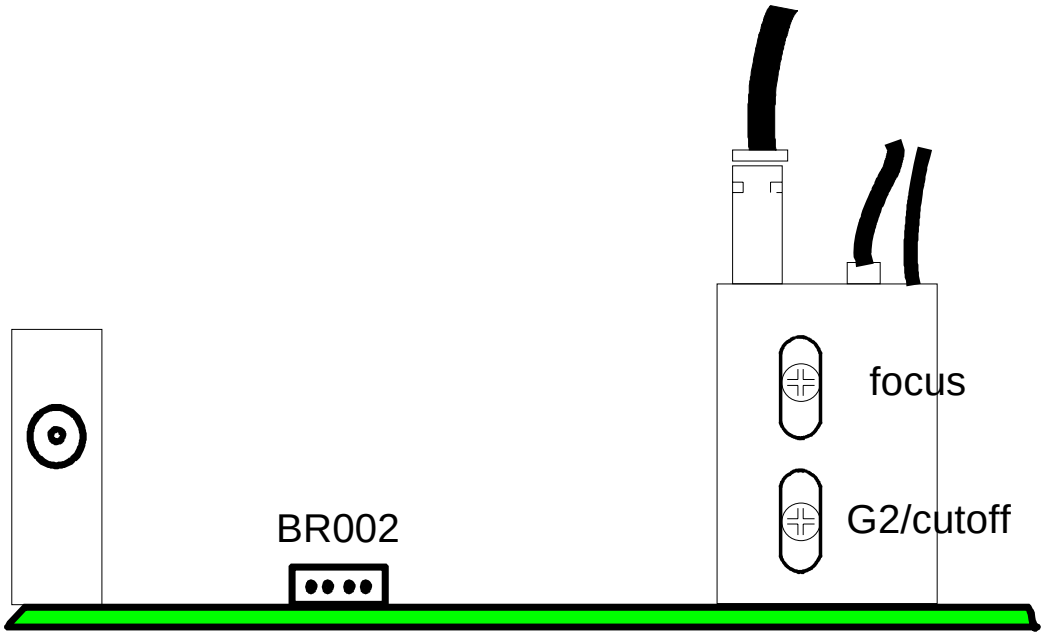
Picture tube	Default value S-correction dec
19V THAI CRT	25
19V CHUNGHWA	25
21" OT	17
20V TF-orion	24
20V TF/21" XF LGS	25
21"XF-Toshiba	24
21"XF-TTD GEN II	28
27V 1R	35
27V VHP	25
25" XF	25
28''MP TTD	24
27V TF /29"XFSamsung	28
27V TF /29" XF TTD GEN II	31
33" MP TTD	24
32V VHP	25
36V VHP	25
32V TF Toshiba	31
32V TF / 34" XF TTD	25
36V TF Toshiba	28
24" SF 16/9	22
28" SF 16/9	22
28" XF 16/9 GEN II	22
32'" XF 16/9 GEN II	22

Note
In case of misalignment/out of range of VS and VA causes the protection signal from E/W module activated and shut down the set, connector BF001 on main board or BL101 on E/W board can be temporary disconnected to start up and realign VS and VA to proper setting. Connector is reinserted to perform E/W alignment.

2. Part IV – Video (EU)

2.1 ALIGNMENTS OF ITC008 (EU)

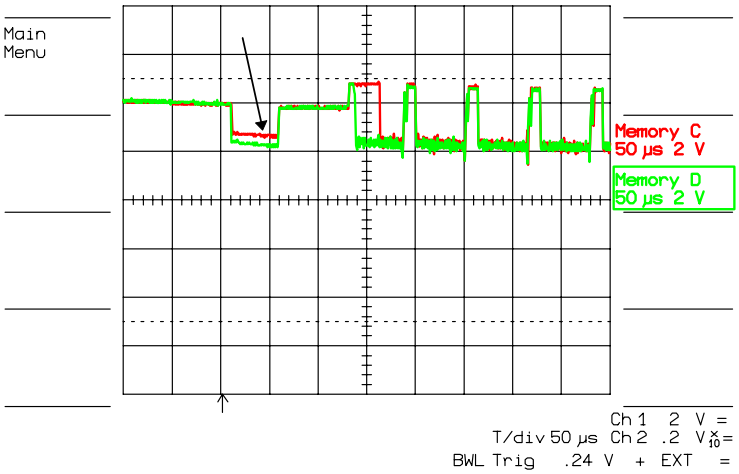
2.1.1 Alignments on tube (EU)



For cut-off - and focus - alignment the chassis must be matched to the finally used tube.

2.1.1.1 Alignment of G2 voltage:

With the existing continuous cathode calibration loop, one has to take care, that the right pulse is used for quasi-cut-off measurement. With this concept two different measurement pulses are inserted field alternating. For correct alignment the pulse, which corresponds to the low current insertion, has to be measured. At the cathodes this is the pulse with the higher level:



Procedure:

Insert a black level test pattern via RF or AV input.
Measure with a 100:1 probe at the R, G and B pins of the CRT socket.
The time base of the oscilloscope should be 2ms/div, set Y-scale to 20V/div DC-coupled and use frame triggering.
Adjust the cut off pulse of the highest cathode with the SCREEN potentiometer on the focus block to:

Tube size	Quasi cut off
19V THAI CRT	125V ± 3V
19V CHUNGHWA	
21" OT	
20V TF-orion	
20V TF/21" XF LGS	
21"XF-Toshiba	
21"XF-TTD GEN II	
27V 1R	
27V VHP	
25" XF	
28"MP TTD	
27V TF /29"XFSamsung	
27V TF /29" XF TTD GEN II	
33" MP TTD	140V ± 3V
32V VHP	
36V VHP	
32V TF Toshiba	
32V TF / 34" XF TTD	
36V TF	
24" SF 16/9	
28" SF 16/9	
28" XF 16/9	
32'" XF 16/9	

Note: Signal is triggered at start of vertical scan, the position of the cut off pulse is dependent on the stage selected.

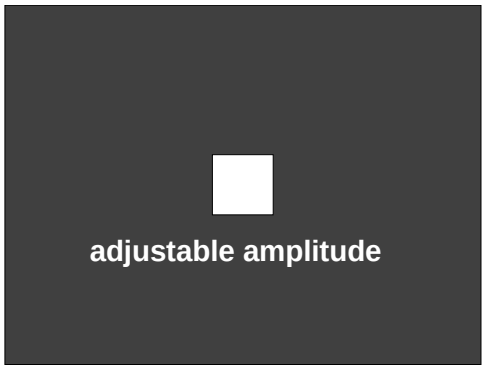
Alternative Method

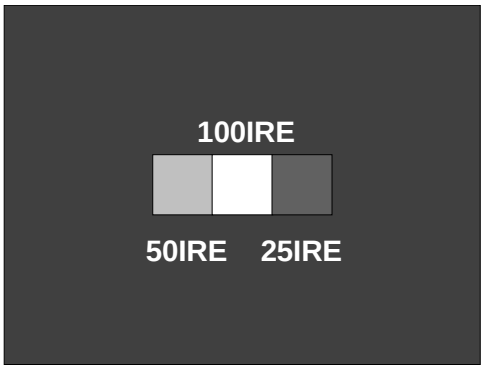
Insert a black level pattern via RF or AV input..
Select VG2 mode from service mode.
Align VG2 to get 03.

2.1.2 Video (EU)

2.1.2.1 Colour Temperature Alignment (EU)

It is necessary to calibrate the TV Colour Analyser periodically (light unit = cd/m^2)
Tune either to a spot test pattern with adjustable amplitude or to a test pattern with three spots in the middle of a black screen. The middle spot corresponds to 100IRE, one to 25IRE and one to 50IRE:





Apply external degaussing. Set Contrast 50%and Brightness at 50%; set Colour Saturation to 50%. Attached TV Colour Analyser sensor onto the centre (for spot with adjustable amplitude) or use a colour analyser with three probes and set them onto the three pads of the TV screen.

Align RF mode, RGB Mode and DVD mode (if available) separately.
For DVD mode, use the DVD alignment DISC or DVD building pattern No.5 .

First method with adjustable spot test pattern and one analyser probe:

First provide the test pattern in PAL B/G.
Start with the alignment of the 50IRE by adjusting WPR and WPG registers. Then adjust Input to 25IRE and align with BLOR and BLOG registers and realign the 50IRE level. When both probes show results within the tolerances to get

x = 0.288 ± 0.01 (0.278...0.298)
y = 0.301 ± 0.01 (0.291...0.311)

Do the iteration until the alignment is within the spec.

Repeat this procedure for SECAM L

Second method with three-spots-test-pattern and three analyser probes:

First provide the test pattern in PAL B/G.
Do an iterative measurement between the probe on the 50IRE-pad and the one on the 25IRE-pad. The third pad is necessary for Peak White Alignment in the following chapter. Start with the alignment of the 50IRE pad by adjusting WPR and WPG registers. Then align the 25IRE pad with BLOR and BLOG registers and realign the 50IRE pad. When both probes show results within the tolerances to get

x = 0.288 ± 0.01 (0.278...0.298)
y = 0.301 ± 0.01 (0.291...0.311)

Do the iteration until the alignment is within the spec.
Repeat this procedure for SECAM L

2.1.2.2 Brightness Preset

- Apply a ± 4% test pattern at RF input.
- RF-standard selection: Use standard BG for TVs without L'.
- Use standard L for TVs with L'
- Adjust with Sub Brightness (OS_B) to correct black level (+4% bar just visible).

2.1.2.3 Peak White alignment

It is necessary to calibrate the TV Colour Analyser periodically (light unit = cd/m^2).
Tune to a Peak White pattern. Separate alignment has to be done for PAL BG and SECAM L system for Europe Chassis.
Attach TV Colour Analyser sensor onto the centre of the Peak White pattern.
Set Brightness and Contrast at 50%, Colour Saturation to 50%
Increase or decrease the three WPA red, green and blue registers **in parallel** to achieve a peak white reading as listed in following table:

tube size and type	Light output according to TQC Application Form +/-10NITS
19V THAI CRT	450
19V CHUNGHWA	450
21" OT	420
20V TF-orion	420
20V TF/21" XF LGS	400
21"XF-Toshiba	420
21"XF-TTD GEN II	350
27V 1R	250
27V VHP	250
25" XF	300
28"MP TTD	300
27V TF /29"XFSamsung	250
27V TF /29" XF TTD GEN II	250
33" MP TTD	250
32V VHP	220
36V VHP	170
32V TF Toshiba	200
32V TF / 34" XF TTD	200
36V TF	170
24" SF 16/9	330
28" SF 16/9	300
28" XF 16/9	300
32'" XF 16/9	300

In Field Service Mode use PKWP (PAL) respectively PKWS (SECAM) for alignment.
If Peak-White cannot be attained by increasing/decreasing WPA-registers (or PWP/PWS in Field Service Mode), then increase/decrease CDL-register.

Align RF mode, Component mode (if available) and DVD mode (if available) separately.

Repeat this procedure for SECAM L..

For DVD mode, use the DVD alignment DISC

Or use build in Test Pattern from DVD by the following step.

a. From TV service mode select DVD factory mode by pressing DVD local key.
b. Press RCU Key Number 2(Peak white Pattern).
c. Then activate service menu and do alignment.

2.1.2.4 Peak White Limiting

When using there is an additional register under UOC-subaddress 04H, which is called “Peak White Limiting”. This function must not be aligned, but can be modified in the Field Service Mode (SOC). The actual default value is 2FH.

For 29”XF Samsung the default value is 2D hex.
For 21”XF TTD the default value is 2D hex.

3. Appendix B - Service Menu (EU).

To enter service mode:

1. Go to standby and switch off the set.
2. Press Magenta key on the Remote Control Unit
3. Press Power Switch To turn on the set..

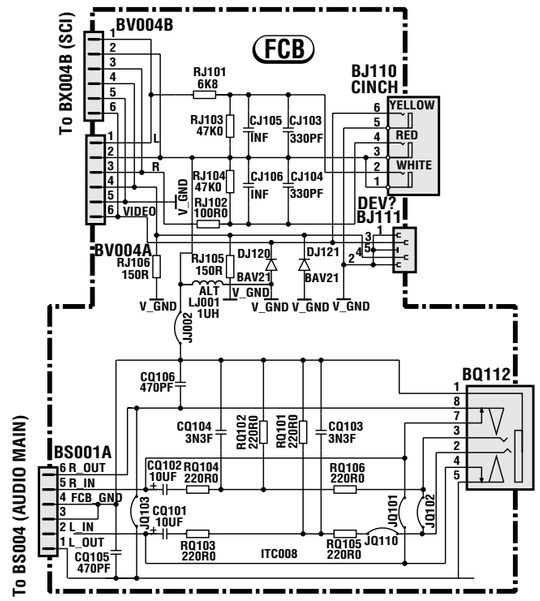
To exit from service mode, press EXIT.

Current parameter available in ITC008 EU software.

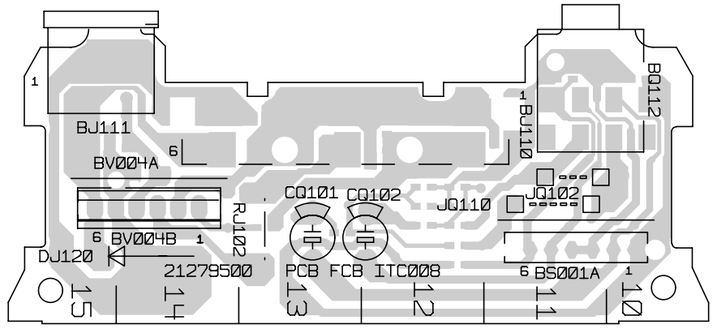
Description parameters in ITC008 EU service menu...

Format:display name	(range:decimal)	...description
Init		
SOC	0-63	PeakWhiteLimiting
OIF	0-63	Off-set IF Demodulator
HSH	0-63	Horizontal Shift Alignment
VS	0-63	Vertical Shift Alignment
VA	0-63	Vertical Amplitude Alignment
SC	0-63	S-Correction
VSH	0-63	Vertical Shift
CL	0-63	Cathode Drive Level
BLORP	0-63	Black Level offset Red PAL (for SECAM...BLORS)
BLOGP	0-63	Black Level offset Green PAL (for SECAM...BLOGS)
WPRP	0-63	White point offset Red PAL (for SECAM...WPRS)
WPGP	0-63	White point offset Green PAL (for SECAM...WPGS)
WPBP	0-63	White point offset Blue PAL (for SECAM...WPBS)
PKWP	0-63 stop when any one of the alignment reach limit)…	Peak White Alignment (for SECAM...PKWS)
OS_B	0-15	Sub-Brightness Alignment
BKS	0-1	Black Stretch On/Off
AGC	0-63	Automatic Gain Control Alignment
VG2	0-03	VG2 Screen Alignment
Limit	0 - 63	Limit for Volume control
Lock	On - Off	Lock for hotel mode
Key	On - Off	Lock Pr+ and Pr- on the front panel

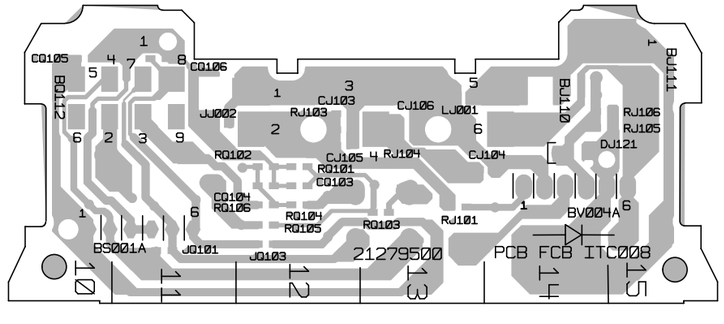
FRONT CONNECTOR BOARD - PRISES EN FACADE ET INTERCONNEXION DU CLAVIER -FRONT ANSCHLUSSPLATTE - PIASTRA CONNESSIONE FRONTALE - PLÁTINA MANDOS FRONTAL



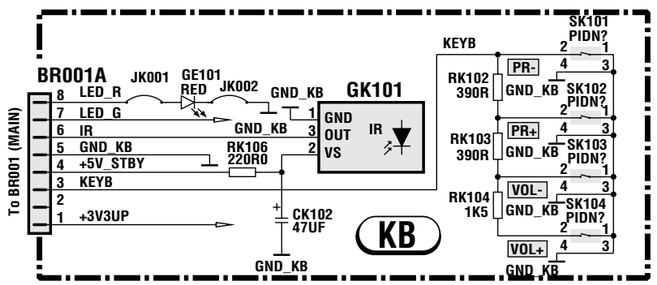
COMPONENT SIDE - CÖTE COMPOSANTS - BESTÜCKUNGSSEITE - LATO COMPONENTI - LADO COMPONENTES



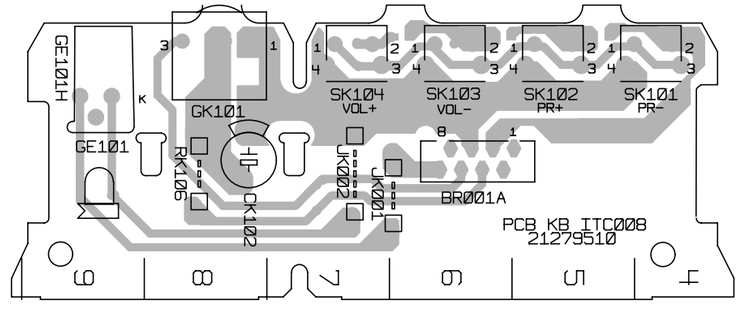
SOLDER SIDE - CÔTE SOUDURES - LÖTSEITE - LATO SALDATURE - LADO SOLDADURAS



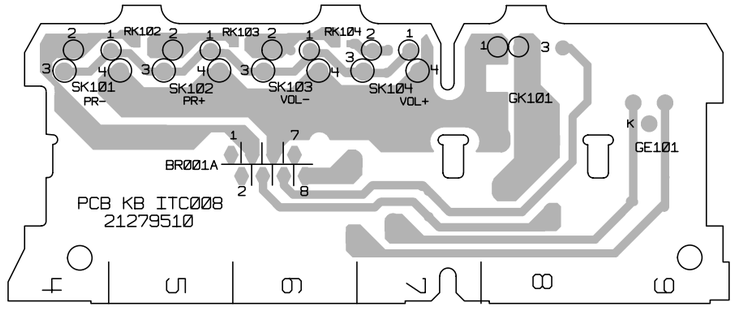
KEYBOARD - CIRCUITS DE COMMANDES - SCHALTBILD BEDIENTEIL - SCHEMA DEI CIRCUITI TASTIERA - ESQUEMA DE LOS CIRCUITOS MANDOS



COMPONENT SIDE - CÖTE COMPOSANTS - BESTÜCKUNGSSEITE - LATO COMPONENTI - LADO COMPONENTES

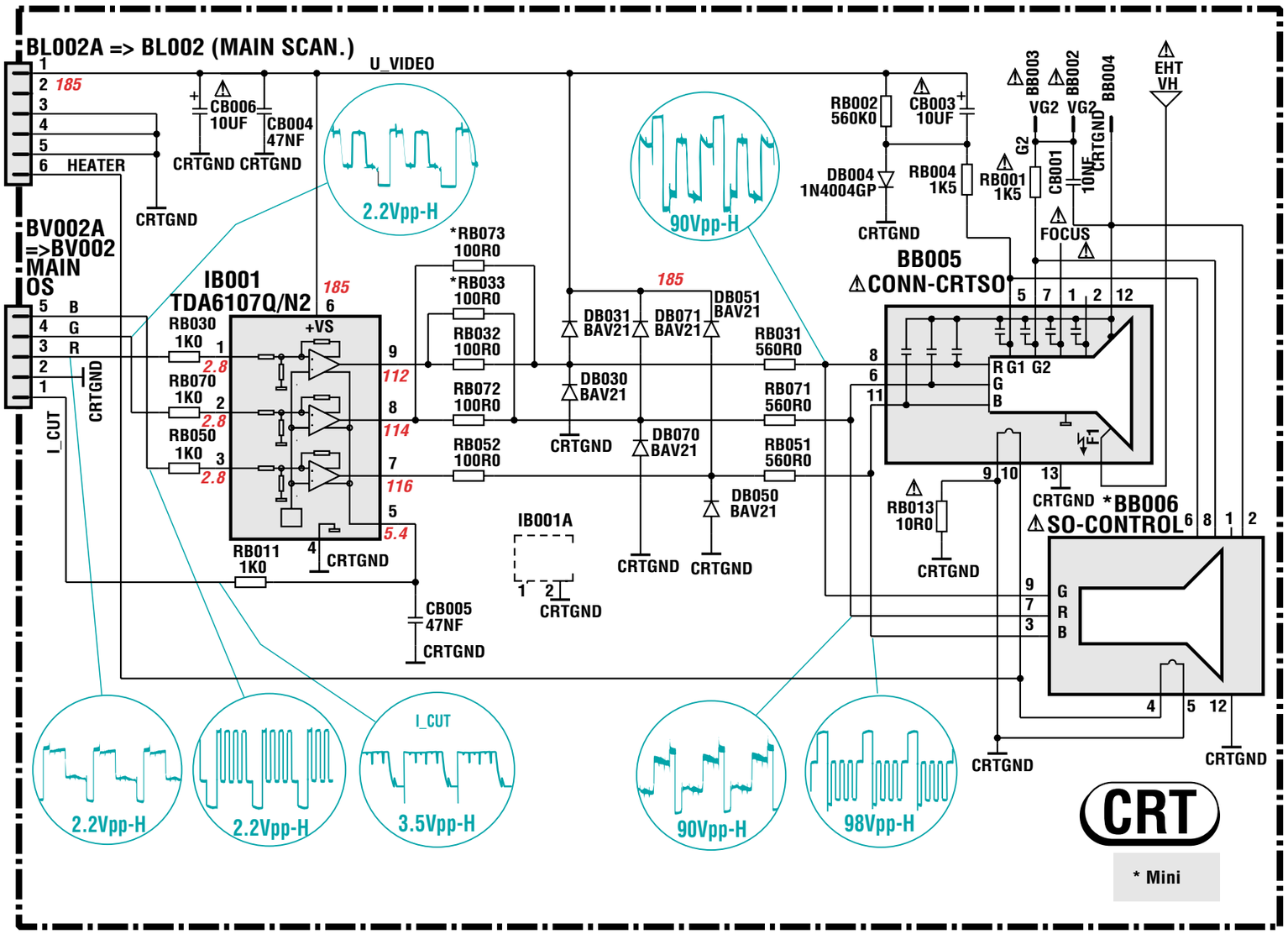


SOLDER SIDE - CÔTE SOUDURES - LÖTSEITE - LATO SALDATURE - LADO SOLDADURAS

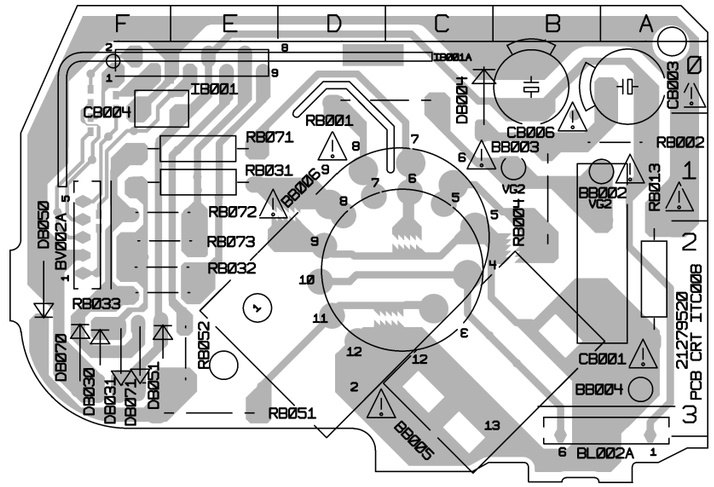


ITC008
First issue 04 / 03

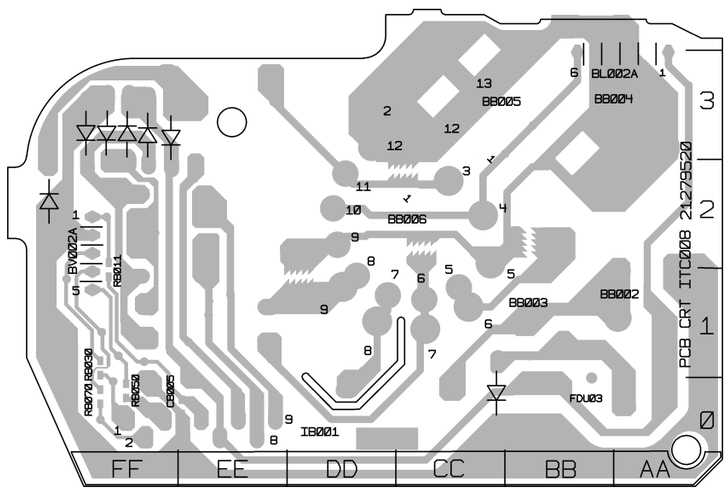
VIDEO AMPLIFIER BOARD - PLATINE AMPLIFICATEURS VIDEO - VIDEOVERSTÄRKERPLATTE - PIASTRA AMPLIFICATORE VIDEO - PLATINA AMPLIFICADOR VIDEO



COMPONENT SIDE - CÔTE COMPOSANTS - BESTÜCKUNGSSEITE - LATO COMPONENTI - LADO COMPONENTES

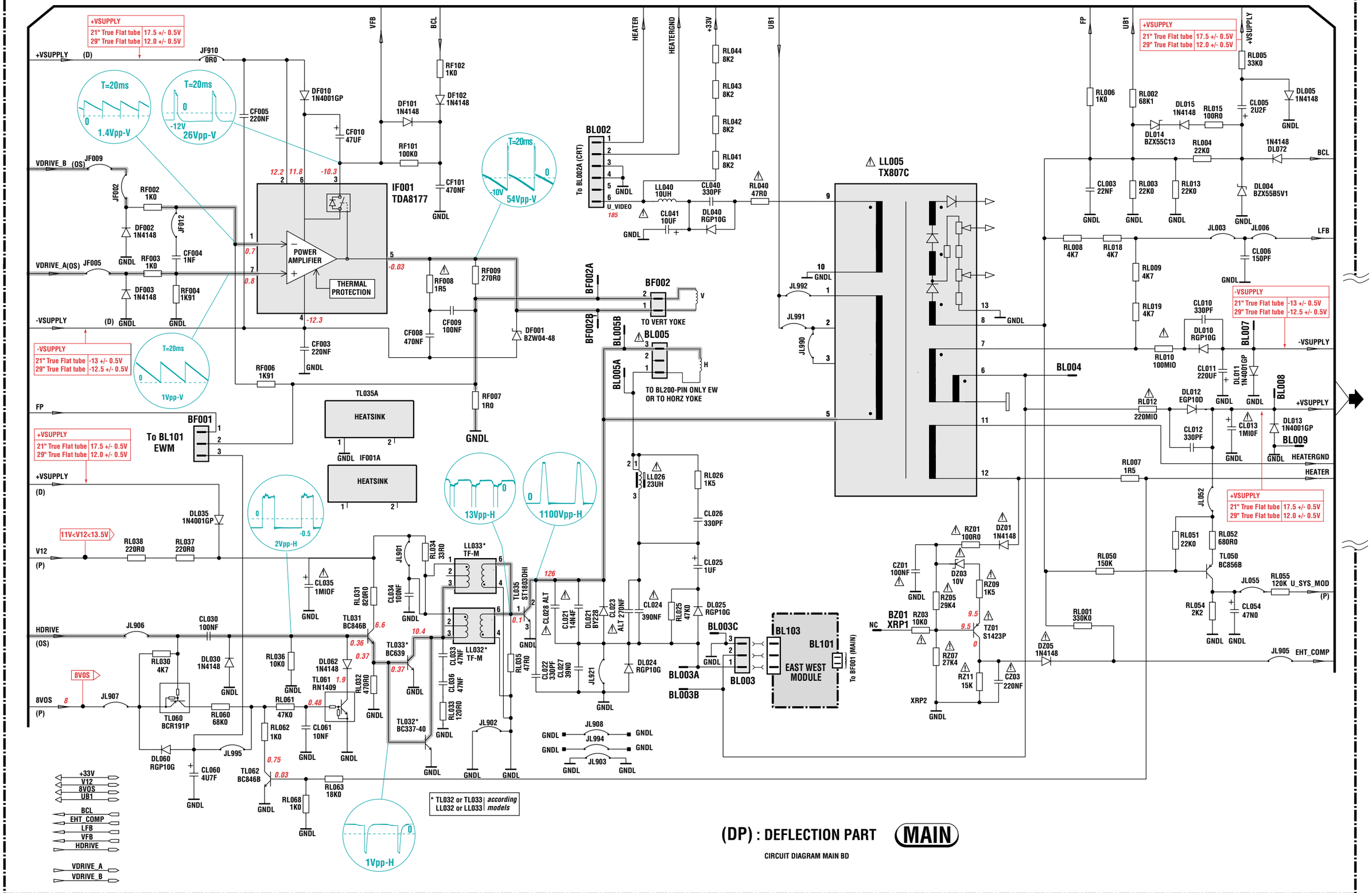


SOLDER SIDE - CÔTE SOUDURES - LÖTSEITE - LATO SALDATURE - LADO SOLDADURAS



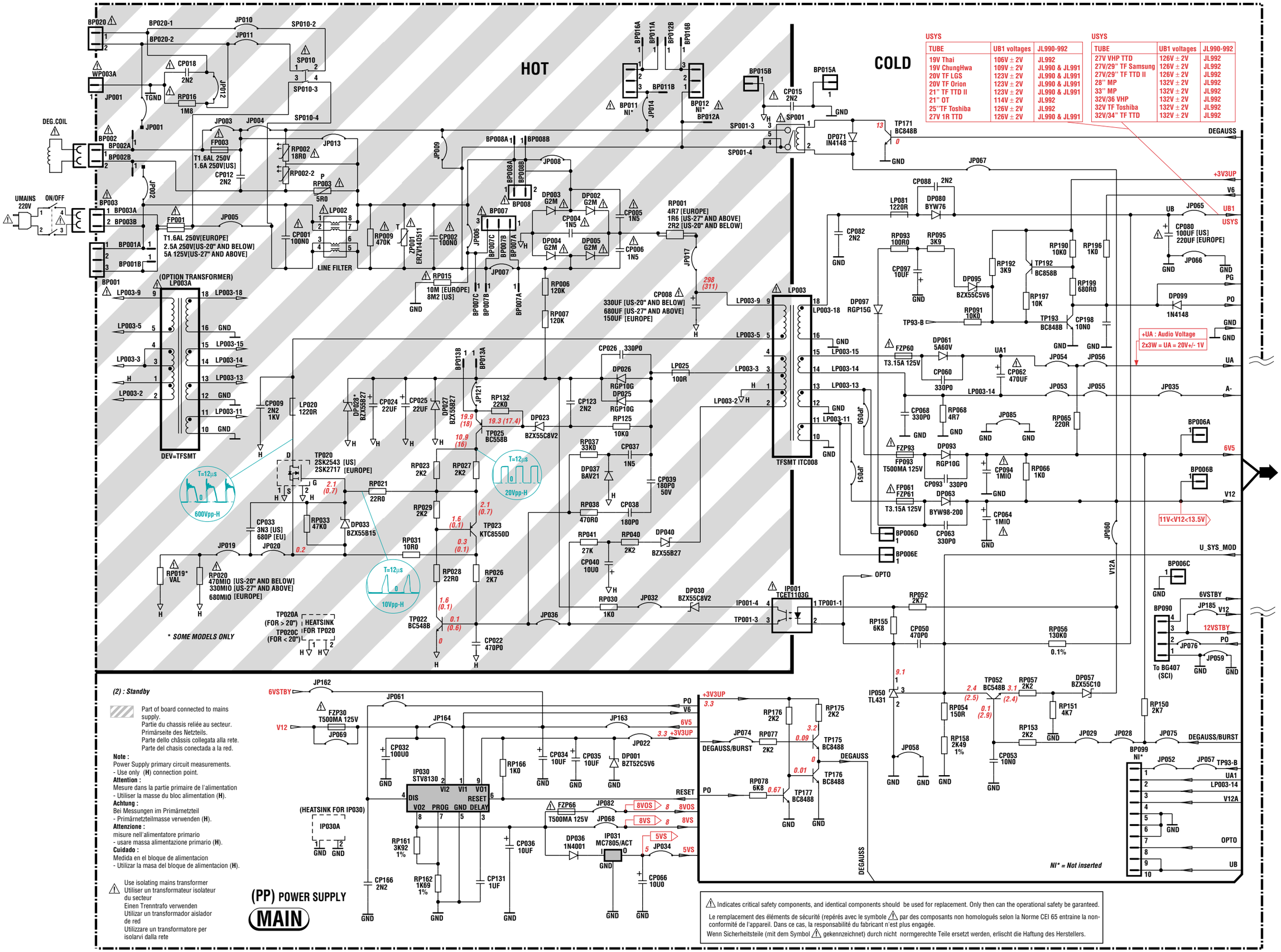
ITC008
First issue 04/ 03

COMPLETE PCB DIAGRAM - SCHEMA PLATINE PRINCIPALE EQUIPEE - SCHALTUNG LEITERPLATTE KPL - SCHEMA PIASTRA COMPLETA - ESQUEMA PLATINA EQUIPADA



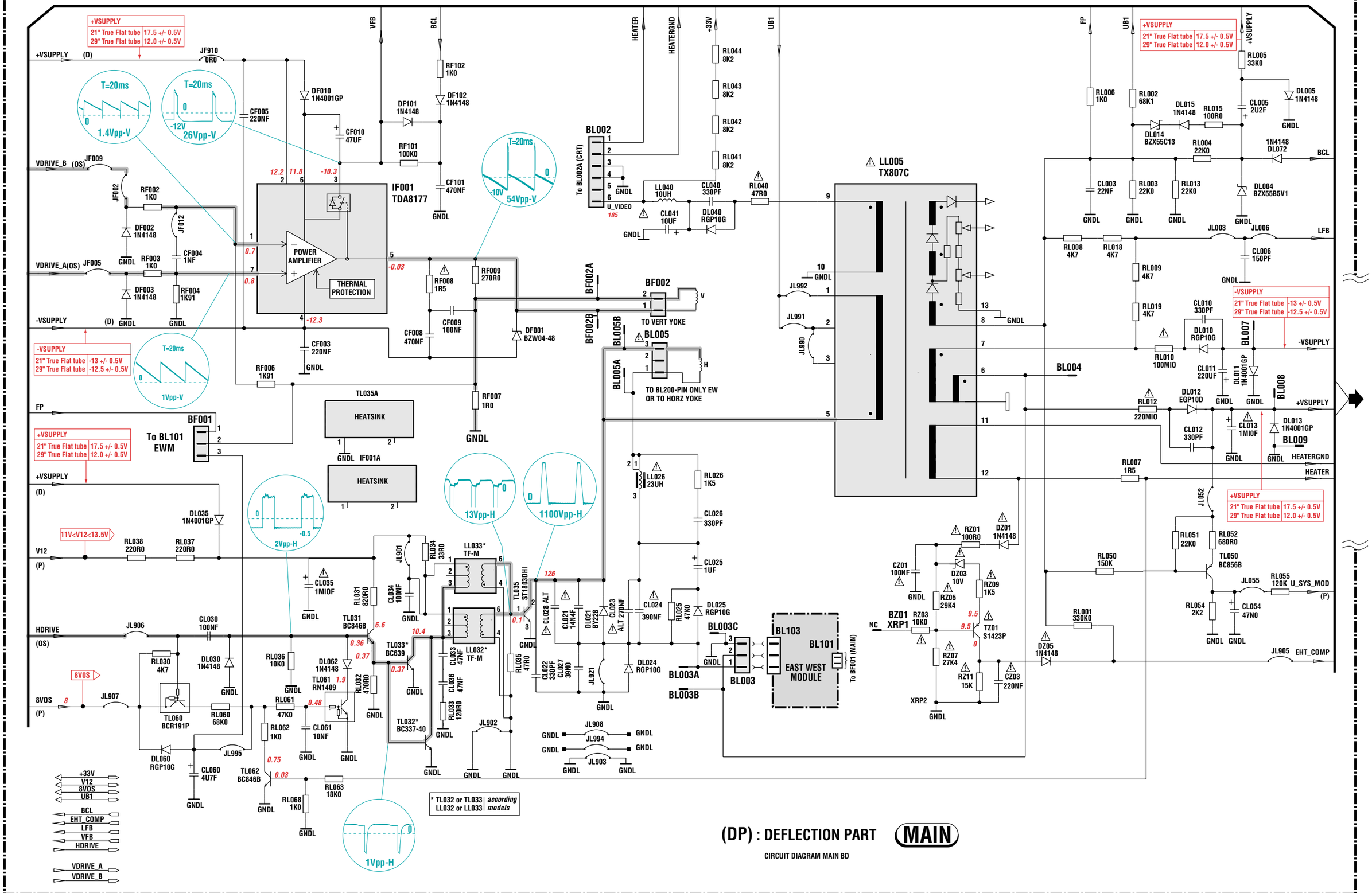
ITC008
First issue 04 / 03

COMPLETE PCB DIAGRAM - SCHEMA PLATINE PRINCIPALE EQUIPEE - SCHALTUNG LEITERPLATTE KPL - SCHEMA PIASTRA COMPLETA - ESQUEMA PLATINA EQUIPADA



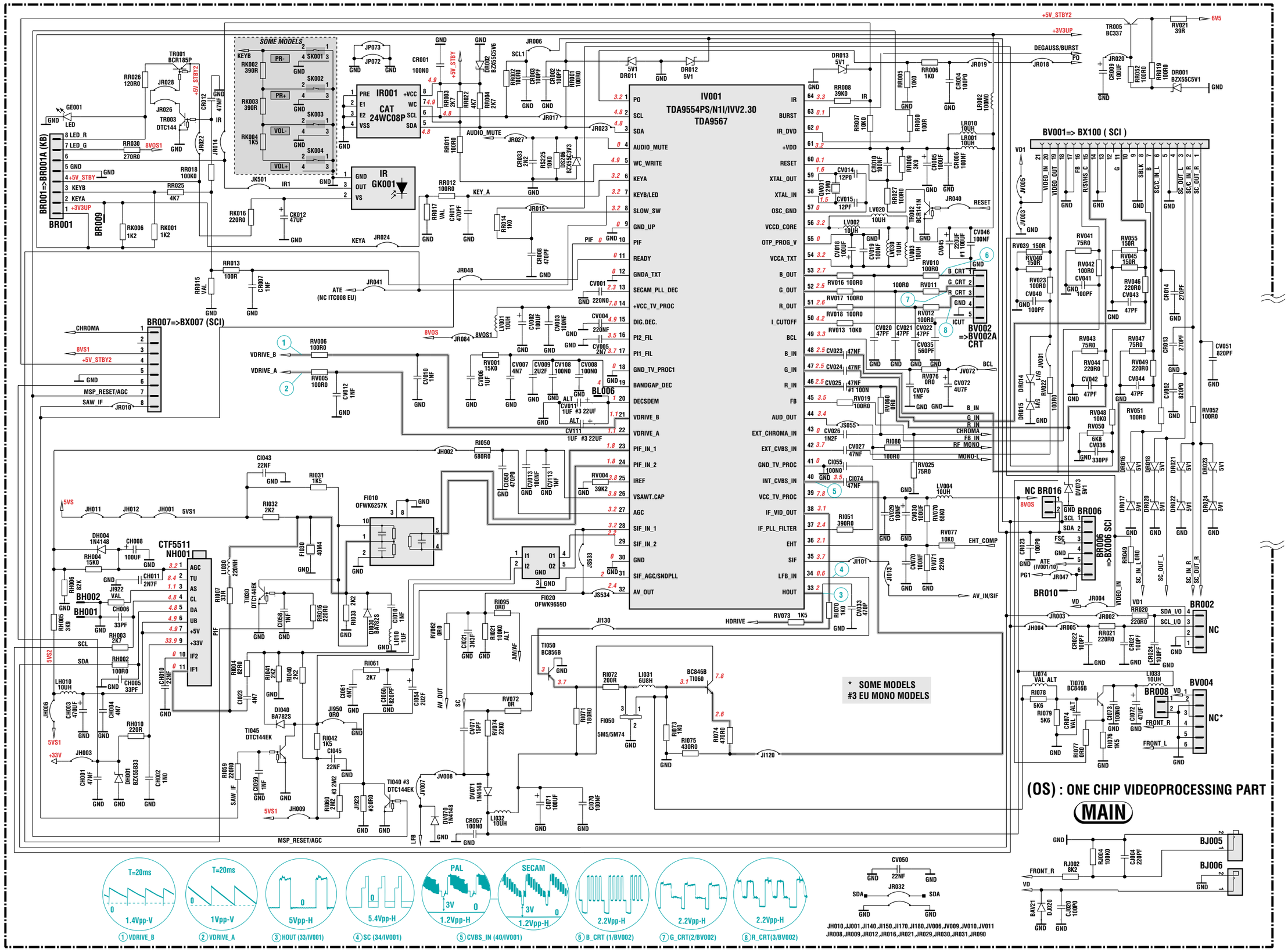
ITC 008
First issue 04 / 03

COMPLETE PCB DIAGRAM - SCHEMA PLATINE PRINCIPALE EQUIPEE - SCHALTUNG LEITERPLATTE KPL - SCHEMA PIASTRA COMPLETA - ESQUEMA PLATINA EQUIPADA

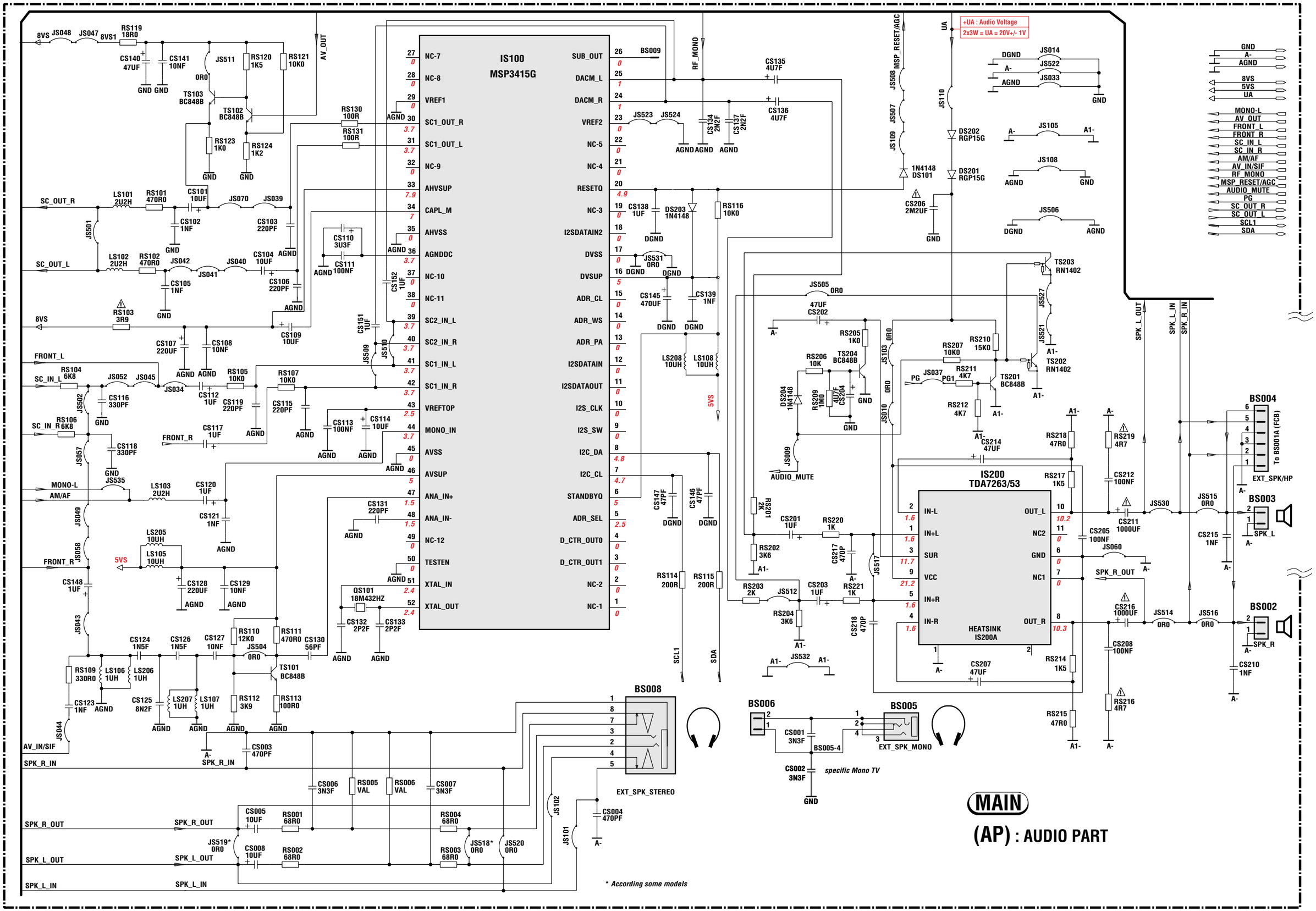


ITC008
First issue 04 / 03

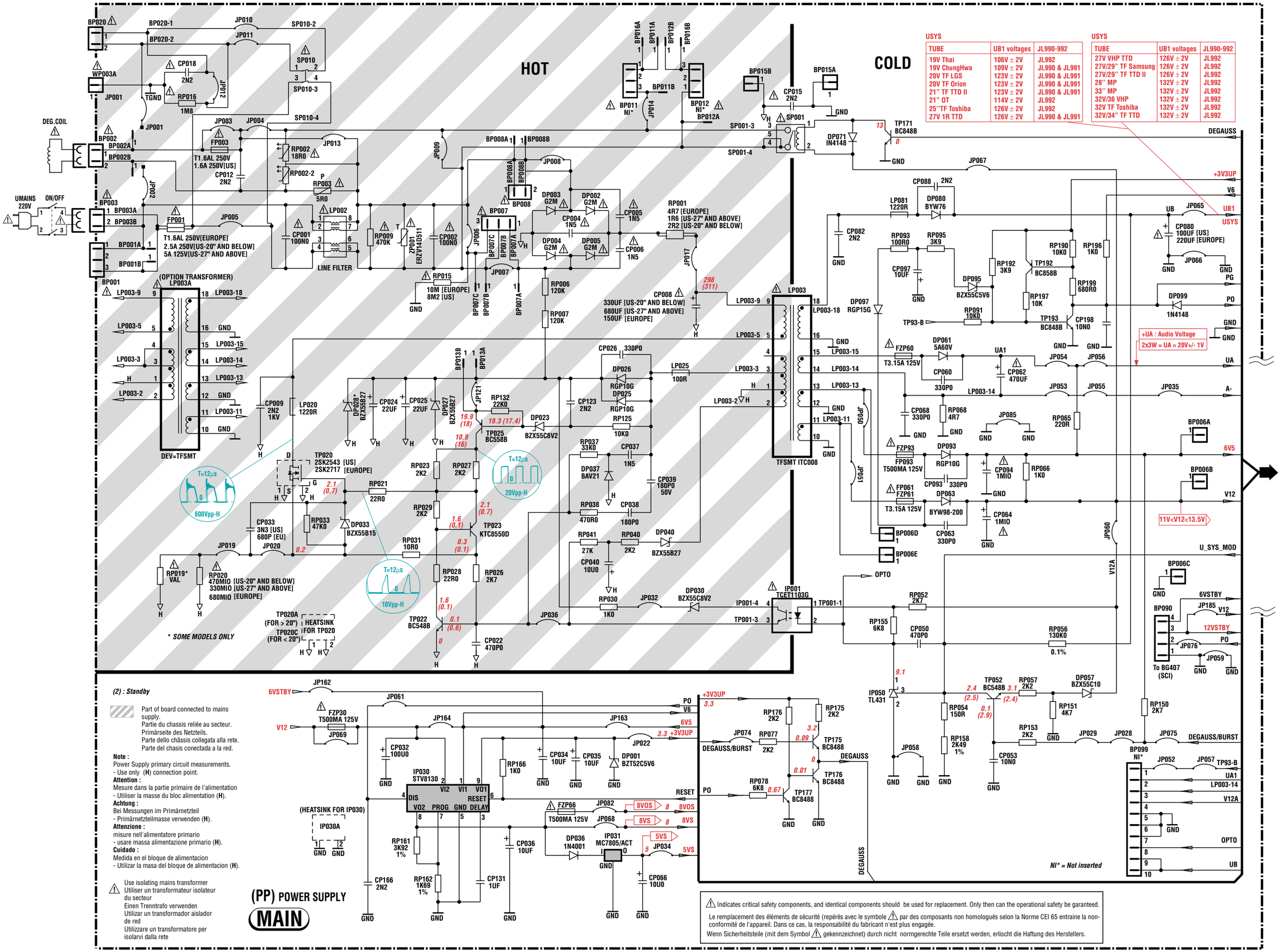
COMPLETE PCB DIAGRAM - SCHEMA PLATINE PRINCIPALE EQUIPEE - SCHALTUNG LEITERPLATTE KPL - SCHEMA PIASTRA COMPLETA - ESQUEMA PLATINA EQUIPADA



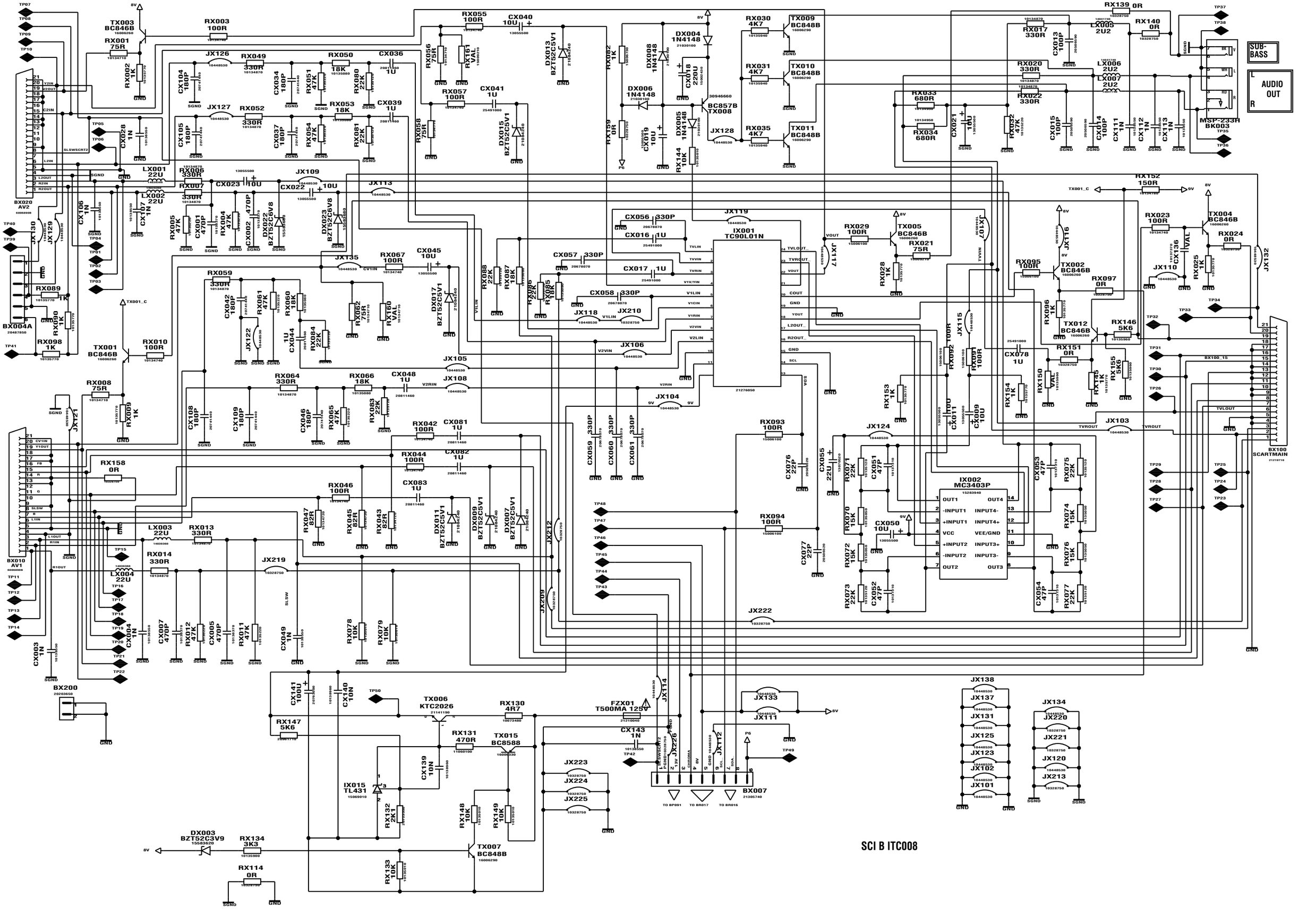
COMPLETE PCB DIAGRAM - SCHEMA PLATINE PRINCIPALE EQUIPEE - SCHALTUNG LEITERPLATTE KPL - SCHEMA PIASTRA COMPLETA - ESQUEMA PLATINA EQUIPADA



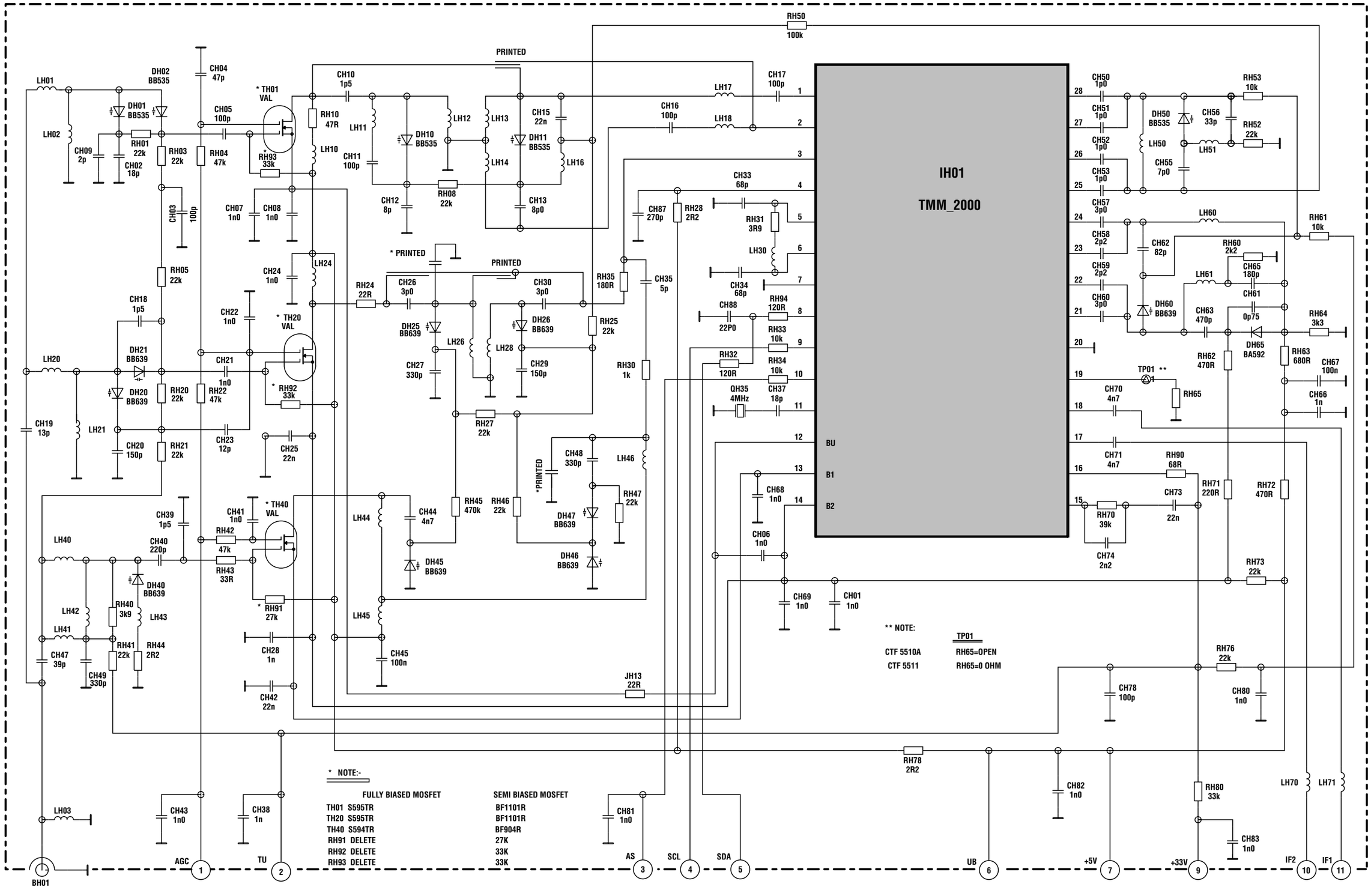
COMPLETE PCB DIAGRAM - SCHEMA PLATINE PRINCIPALE EQUIPEE - SCHALTUNG LEITERPLATTE KPL - SCHEMA PIASTRA COMPLETA - ESQUEMA PLATINA EQUIPADA



ITC 008
First issue 04 / 03


SUB-BASS
AUDIO OUT
L
R
MSP-233R
BK003
IX001
TC90L01N
212760S0
IX002
MC3403P
15283940
TX001
BC846B
TX002
BC846B
TX003
BC846B
TX004
BC846B
TX005
BC846B
TX006
KTC2026
TX007
BC848B
TX009
BC848B
TX010
BC848B
TX011
BC848B
TX012
BC846B
TX015
BC8588
IX015
TL431
FZX01
T500MA 125V
BX010
AV1
BX020
AV2
BX004A
BX200
BX100
SCARTMAIN
BX007
TO BP091
TO BR017
TO BR016
SCI B ITC008

VHF / UHF TUNER CTF 5510 - CTF 5511



ITC008
First issue 04/ 03