TV2KR – TXT

COLOUR TELEVISION RECEIVER

SERVICE MANUAL

SECIFICATION

• SYSTEM	PAL/SECAM BG/DK/I
• POWER INPUT	AC 170-245(50/60Hz)
• POWER CONSUMPTION	65W
• AERIAL IMPEDANCE	75 OHM UNBALANCED
• TUNER	FREQUENCY SYNTHESIZER TUNING
• RECEIVING CHANNELS	VHF-L E2-S6
	VHF-H S7-S41
	UHF E21- E69
• PROGRAMME	MAX. 100 PROGRAM MEMORIES
• PICTURE TUBE	14”, 15”, 20”, 21”; 90°
• SOUND OUTPUT	2.0W
• SPEAKER	3W 8OHM
• AV JACKS	FULL SCART X 1

CAUTION: Before servicing the chassis, read the “Safely Precaution”. “X -Ray radiation Precaution” and “Product Safety Notice” in this manual.

X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To Avoid such hazards the high voltage must be specified limit. The normal value of the high voltage of this receiver is 24.5KV +/-2KV under 230V AC power source. The high voltage must not exceed 27KV.
2. Each time a receiver requires servicing the high voltage should be checked following the HIGH VOLTAGE CHECK procedure in this manual. It is recommended the reading of the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.
3. The primary source of X -RAY RADIATION in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as used in this TV receiver.
4. Some parts in this receiver have special safety-related characteristics for X-RAY RADIATION protection. For continued safety, parts replacement should be undertaken only after referring the PRODUCT SAFETY NOTICE below.

SAFETY PRECAUTION

WARNING: Service should not be attempted by anyone unfamiliar with the necessary Precautions on this receiver.

The following are the necessary precautions to be observed before servicing this chassis.

1. Since the power supply circuit of this receiver is directly connected to the AC power line. An isolation transformer should be used during any dynamic service to avoid possible shock hazard.
2. Always discharge the picture tube anode to the CRT conductive coating before handling the picture tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled. Use shatterproof goggles and keep picture tube away from the unprotected body while handling.
3. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as: nonmetallic control; knobs, insulating covers, shields, isolation resistor-capacitor, network, etc.
4. When replacing parts or circuit boards, disconnect the power cord.
5. When replacing a high voltage resistor (metal oxide resistor) on circuit hoard, keep the resistor APP. 10mm(1/2 in.) away from circuit board.
6. Connection wires must be kept away from components with high voltage or high temperature.
7. If any fuse in this TV receiver is blown, replace it with the FUSE specified in the chassis parts list.
8. The receiver is designed to operate with 230V(50Hz) AC mains.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics are often passed unnoticed by a visual inspection and the X-RAY RADIATON protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, X-RAY RADIATION or other hazards.

GENERAL ADJUSTMENT

AUTOMATIC DEGAUSSING

An automatic degaussing coil is attached around the picture tube, degaussing the tube properly in about one second after the set is switched on. If the receiver is moved or faced on a different direction, the power must be switched off at least 15 minutes in order that the automatic degaussing circuit operated properly. External degaussing is necessary if the automatic degassing proves ineffective after the set is moved.

B+ ADJUSTMENT

CAUTION: To avoid X-ray hazards and result in a nominal display width, B+ voltage must be set in the scale of 110.0V+/-0.5V.

1. Make sure the AC power supply is 230V, 50Hz.
2. Switch on the TV receiver, tune in an active channel.
3. Measure the voltage between C318 on Main P.C. Board by DC voltmeter.
4. Set contrast, brightness, color to maximum.
5. Adjust RP301 on Main P. C. Board for B+110.0V+/-0.5V voltage reading.

HIGH VOLTAGE CHECK

CAUTION: There is no high voltage adjustment in this chassis, B+110V voltage directly relates to the high voltage. The high voltage does not exceed 27KV under any conditions.

1. Connect an accurate high voltage meter to the second anode cap of the picture tube.
2. Turn on the receiver, set brightness and contrast to minimum (Zero beam current).
3. Make sure the high voltage does not exceed 27KV.
4. NO matter whether the luminance, contrast and chrominance controls are set to maximum or minimum, the high voltage must be kept under 27KV.

FOCUSING

Receive a TV test pattern signal; adjust controls for optimum picture. Adjust Focus Control for a well-defined, sharpest display in the center area of the screen.

ADJUSTMENT AND SERVICING THE CHASSIS

SERVICE MODE

To enter the service mode, short service mode points on PCB (X202, pins 1&2) or press from ST-BY mode STATUS>MENU>MUTE>ST-BY on RC.
TV will display service menu as following table 1 line by line. To select the parameter by using the 'P+/P-' keys. To adjust the selected parameter by using the 'V+/V-' keys. To quit the service mode, press the 'TV' key on remote control when in the service mode.

Table 1

SERVICE MODE (enter: to short service mode points or press from ST-BY mode STATUS>MENU>MUTE>ST-BY)

Control bits	Function	Value	Notes
HS	Horizontal Shift	31	
VHS	Vertical Shift	30	
VA	Vertical Amplitude	30	
VAZ	Vertical expand (zoom)	1	VX
VS	Vertical Slope	33	
SC	S-Correction	22	
CL	Cathode drive Level	7	50 .. 95 Volt drive
Y	Y Delay	7	
IFO	IF PLL Offset adjusment	32	
Vg2	Screen Voltage Alignment mode	OK	Screen VR (on the FBT)
Vg2BR	Brightness control setting in sreen voltage alignment mode	32	

BLOR	Black level off-set R	32	
BLOG	Black level off-set G	32	
R	White point R	32	
G	White point G	32	
B	White point B	32	
AGC	AGC Take Over Point	35	TOP
BCF	Black Current loop Failure	0	
OSO	Overscan Switch-Off	1	
AGN	Sound pre-amplifier +6 db	1	Gain FM demodulator
IE2	RGB Insertion Enable	1	
ACL	Automatic Colour Limiting	1	
FSL	forced vertical slicing level	0	For special conditions (descramblers with unstable black level) the vertical slicing level can be forced to 70% under all conditions by setting FSL = 1.
BKS	BlacK Stretch	1	
IFO	IF frequency selection	0	(IF)
AGCs	AGC time constant	0	IF AGC speed
FFI	Fast filter IF-PLL	0	
AV2	AV2 inbut enabled	1	
SVID	SVID input enabled	0	
PF	Peaking centre frequency	1	
RPO	RATIO PRE-/OVERSHOOT	3	
TSM	Limit between VHF1/VHF3	157	
TSH	Limit between VHF3/UHF	443	
TBL	Code for band VHF-1	01	
TBM	Code for band VHF-3	02	
TBH	Code for band UHF	04	
DELAY	Delay time for tuner	32	
STEP	0-50 kHz, 1-62,5 kHz	0	
HOTEL	Hotel mode anabled	0	
LOCAL	6/3buttons keyboard swich	0	
BRT	Brightness control in service mode	32	
CONTR	Contrast control in service mode	32	
16:9	16:9 mode enabled	1	

IC DESCRIPTIONS AND INTERNAL BLOCK DIAGRAM

- TDA9351
- STV9302
- TDA7056A
- 24C08W6
- 74HC4053
- UC3842

TDA9351:

The various versions of the TDA935X/6X/8XPS/N2 series combine the functions of a TV signal processor together with a μ-Controller and US Closed Caption decoder. Most versions have a Teletext decoder on board. The Teletext decoder has an internal RAM memory for 1 or 10 page text. The ICs are intended to be used in economy television receivers with 90° and 110° picture tubes.

The ICs have supply voltages of 8 V and 3.3 V and they are mounted in S-DIP envelope with 64 pins.

Features:

TV-signal processor

- Multi-standard vision IF circuit with alignment-free PLL demodulator.
- Internal (switchable) time-constant for the IF-AGC circuit.
- A choice can be made between versions with mono intercarrier sound FM demodulator and versions with QSS IF amplifier.
- The mono intercarrier sound versions have a selective FM-PLL demodulator which can be switched to the different FM sound frequencies (4.5/5.5/6.0/6.5 MHz). The quality of this system is such that the external band-pass filters can be omitted.
- Source selection between 'internal 'CVBS and external CVBS or Y/C signals.
- Integrated chrominance trap circuit.
- Integrated luminance delay line with adjustable delay time.
- Picture improvement features with peaking (with variable centre frequency and positive/negative overshoot ratio) and black stretching.
- Integrated chroma band-pass filter with switchable centre frequency.
- Only one reference (12 MHz) crystal required for the μ-Controller, Teletext- and the colour decoder.
- PAL/NTSC or multi-standard colour decoder with automatic search system.
- Internal base-band delay line.
- RGB control circuit with 'Continuous Cathode Calibration', white point and black level offset adjustment so that the colour temperature of the dark and the light parts of the screen can be chosen independently.
- Linear RGB or YUV input with fast blanking for external RGB/YUV sources. The Text/OSD signals are internally supplied from the μ-Controller/Teletext decoder.
- Contrast reduction possibility during mixed-mode of OSD and Text signals.

- Horizontal synchronization with two control loops and alignment-free horizontal oscillator.
- Vertical count-down circuit.
- Vertical driver optimized for DC-coupled vertical output stages.
- Horizontal and vertical geometry processing.
- Horizontal and vertical zoom function for 16:9 applications.
- Horizontal parallelogram and bow correction for large screen picture tubes.
- Low-power start-up of the horizontal drive circuit.

μ-Controller

- 80C51-controller core standard instruction set and timing.
- 1μs machine cycle.
- 32 - 128Kx8-bit late programmed ROM.
- 3 - 12Kx8-bit Auxiliary RAM (shared with Display and Acquisition).
- Interrupt controller for individual enable/disable with two level priority.
- Two 16-bit Timer/Counter registers.
- One 16 bit Timer with 8-bit Pre-scaler.
- WatchDog timer.
- Auxiliary RAM page pointer.
- 16-bit Data pointer.
- Stand-by, Idle and Power Down (PD) mode.
- 14 bits PWM for Voltage Synthesis Tuning.
- 8-bit A/D converter.
- 4 pins which can be programmed as general I/O pin, ADC input or PWM (6-bit) output.

Data Capture

- Text memory for 0, 1 or 10 pages.
- In the 10 page versions inventory of transmitted Teletext pages stored in the Transmitted Page Table (TPT) and Subtitle Page Table (SPT).
- Data Capture for US Closed Caption.
- Data Capture for 525/625 line WST, VPS (PDC system A) and Wide Screen Signalling (WSS) bit decoding.
- Automatic selection between 525 WST/625 WST.
- Automatic selection between 625 WST/VPS on line 16 of VBI.
- Real-time capture and decoding for WST Teletext in Hardware, to enable optimized-processor throughput.
- Automatic detection of FASTEXT transmission.
- Real-time packet 26 engine in Hardware for processing accented, G2 and G3 characters.
- Signal quality detector for video and WST/VPS data types.
- Comprehensive teletext language coverage.
- Full Field and Vertical Blanking Interval (VBI) data capture of WST data.

Display

- Teletext and Enhanced OSD modes.
- Features of level 1.5 WST and US Close Caption.

- Serial and Parallel Display Attributes.
- Single/Double/Quadruple Width and Height for characters.
- Scrolling of display region.
- Variable flash rate controlled by software.
- Enhanced display features including overlining, underlining and italics.
- Soft colours using CLUT with 4096 colour palette.
- Globally selectable scanlines per row (9/10/13/16) and character matrix [12x10, 12x13, 12x16 (VxH)].
- Fringing (Shadow) selectable from N-S-E-W direction.
- Fringe colour selectable.
- Meshing of defined area.
- Contrast reduction of defined area.
- Cursor.
- Special Graphics Characters with two planes, allowing our colours per character.
- 32 software redefinable On-Screen display characters.
- 4 WST Character sets (G0/G2) in single device (e.g. Latin, Cyrillic, Greek, Arabic).
- G1 Mosaic graphics, Limited G3 Line drawing characters.
- WST Character sets and Closed Caption Character set in single device.

PINNING

SYMBOL	PIN	DESCRIPTION
P1.3/T1	1	port 1.3 or Counter/Timer 1 input
P1.6/SCL	2	port 1.6 or I2C-bus clock line
P1.7/SDA	3	port 1.7 or I2C-bus data line
P2.0/TPWM	4	port 2.0 or Tuning PWM output
P3.0/ADC0	5	port 3.0 or ADC0 input
P3.1/ADC1	6	port 3.1 or ADC1 input
P3.2/ADC2	7	port 3.2 or ADC2 input
P3.3/ADC3	8	port 3.3 or ADC3 input
VSSC/P	9	digital ground for μ-Controller core and periphery
P0.5	10	port 0.5 (8 mA current sinking capability for direct drive of LEDs)
P0.6	11	port 0.6 (8 mA current sinking capability for direct drive of LEDs)
VSSA	12	analog ground of Teletext decoder and digital ground of TV-processor
SECPLL	13	SECAM PLL decoupling
VP2	14	2nd supply voltage TV-processor (+8V)
DECDIG	15	decoupling digital supply of TV-processor
PH2LF	16	phase-2 filter
PH1LF	17	phase-1 filter
GND3	18	ground 3 for TV-processor
DECBG	19	bandgap decoupling
AVL/EWD	20	Automatic Volume Levelling /East-West drive output
VDRB	21	vertical drive B output
VDRA	22	vertical drive A output
IFIN1	23	IF input 1
IFIN2	24	IF input 2
IREF	25	reference current input
VSC	26	vertical sawtooth capacitor

TUNERAGC	27	tuner AGC output
AUDEEM/SIFIN1	28	audio deemphasis or SIF input 1
DECSDEM/SIFIN2	29	decoupling sound demodulator or SIF input 2
GND2	30	ground 2 for TV processor
SNDPLL/SIFAGC	31	narrow band PLL filter /AGC sound IF
AVL/SNDIF/REF0/ AMOUT	32	Automatic Volume Levelling/sound IF input/subcarrier reference output/AM output (non controlled)
HOUT	33	horizontal output
FBISO output	34	flyback input/sandcastle
AUDEXT/QSSO/AMOUT	35	external audio input/QSS intercarrier out/AM audio output (non controlled)
EHTO	36	EHT/overvoltage protection input
PLLIF	37	IF-PLL loop filter
IFVO/SVO	38	IF video output/selected CVBS output
VP1	39	main supply voltageTV-processor (+8V)
CVBSINT	40	internal CVBS input
GND1	41	ground 1 for TV-processor
CVBS/Y	42	external CVBS/Y input
CHROMA	43	chrominance input (SVHS)
AUDOUT/AMOUT	44	audio output/AM audio output (volume controlled)
INSSW2	45	2nd RGB/YUV insertion input
R2/VIN	46	2nd R input / V (R-Y) input
G2/YIN	47	2nd G input / Y input
B2/UIN	48	2nd B input / U (B-Y) input
BCLIN	49	beam current limiter input / (V-guard input)
BLKIN	50	black current input / (V-guard input)
RO	51	Red output
GO	52	Green output
BO	53	Blue output
VDDA	54	analog supply of Teletext decoder and digital supply of TV-processor (3.3 V)
VPE	55	OTP Programming Voltage
VDDC	56	digital supply to core (3.3 V)
OSCGND	57	oscillator ground supply
XTALIN	58	crystal oscillator input
XTALOUT	59	crystal oscillator output
RESET	60	reset
VDDP	61	digital supply to periphery (+3.3 V)
P1.0/INT1	62	port 1.0 or external interrupt 1 input
P1.1/T0	63	port 1.1 or Counter/Timer 0 input
P1.2/INT0	64	port 1.2 or external interrupt 0 input

STV9302A:

The STV9302A is a vertical deflection booster designed for TV and monitor applications. This device, supplied with up to 35V, provides up to 2App output current to drive the vertical deflection yoke. The internal flyback generator delivers flyback voltages up to 70V. In double-supply applications, a stand-by state will be reached by stopping the (+) supply alone.

Features:

- Power Amplifier
- Flyback Generator
- Output Current up to 2App

- Thermal Protection
- Stand-by Control

PINNING

1. Input (Inverting)
2. Supply Voltage
3. Flyback Generator
4. Ground Or Negative Supply
5. Output
6. Output Stage Supply
7. Input (Non Inverting)

TDA7056A:

The TDA7056A is a mono BTL output amplifier with DC volume control. It is designed for use in TV and monitors, but also suitable for battery-fed portable recorders and radios.

Features:

- DC volume control
- Few external components
- Mute mode
- Thermal Protection
- Short-circuit proof
- No switch-on and off clicks
- Good overall stability
- Low power consumption
- Low HF radiation
- ESD protected on all pins.

PINNING

1. Not connected, n.c.
2. Positive supply voltage, V_P
3. Voltage input, V_I
4. Signal ground, GND1
5. DC volume control, VC
6. Positive output, OUT+
7. Power ground, GND2
8. Negative output, OUT-
9. Not connected, n.c.

24C08W6:

The M24C08W6 is a series of 2-wire, low power 8Kbit EEPROM with a wide operating range. It is organized as 1K-word X 8-bit. It is capable of page write and sequential read.

Features:

- Two Wire I2C Serial Interface Supports 400kHz Protocol.
- Single Supply Voltage: 2.5V to 5.5V.
- Write Control Input.
- BYTE and PAGE WRITE (up to 16 Bytes).
- RANDOM and SEQUENTIAL READ Modes.
- Self-Timed Programming Cycle.
- Automatic Address Incrementing.
- Enhanced ESD/Latch-Up Behavior.
- More than 1 Million Erase/Write Cycles.
- More than 40 Year Data Retention.

PINNING

1. Connected to ground, A0
2. Connected to ground, A1
3. Connected to ground, A2
4. Connected to ground, A3
5. Serial data input/output, SDA
6. Serial clock input, SCL
7. Write protection Pin, WP
   - Connected to V_{CC} : Protection valid
   - Connected to Ground : Protection invalid
8. Power Supply, V_{CC}

74HC4053:

The 74HC/HCT4053 are high-speed Si-gate CMOS devices and are pin compatible with the “4053” of the “4000B” series. They are specified in compliance with JEDEC standard no. 7A.

The 74HC/HCT4053 are triple 2-channel analog multiplexers/demultiplexers with a common enable input $\bar{E}$). Each multiplexer/demultiplexer has two independent inputs/outputs (nY_0 and nY_1), a common input/output (nZ) and three digital select inputs (S_1 to S_3).

With $\bar{E}$ LOW, one of the two switches is selected (low impedance ON-state) by S_1 to S_3. With $\bar{E}$ HIGH, all switches are in the high impedance OFF-state, independent of S_1 to S_3.

V_{CC} and GND are the supply voltage pins for the digital control inputs (S_1, to S_3, and $\bar{E}$). The V_{CC} to GND ranges are 2.0 to 10.0 V for HC and 4.5 to 5.5 V for HCT. The analog inputs/outputs (nY_0 and nY_1, and nZ) can swing between V_{CC} as a positive limit and Vee as a negative limit. V_{CC} -V_{EE} may not exceed 10.0 V.

For operation as a digital multiplexer/demultiplexer, V_{EE} is connected to GND (typically ground).

Features:

- Low “ON” resistance:
  80Ω (typ.) at V_{CC}-V_{EE}=4.5 V,
  70Ω (typ.) at V_{CC}-V_{EE}=6.0 V,
  60Ω (typ.) at V_{CC}-V_{EE}=9.0 V.
- Logic level translation: to enable 5 V logic to communicate with 5V analog signals.
- Typical “break before make” built in.
- Output capability: non-standard.

PINNING

PIN	SYMBOL	NAME AND FUNCTION
2, 1	$2Y_0$ to, $2Y_1$	independent inputs/outputs
5, 3	$3Y_0$ to, $3Y_1$	independent inputs/outputs
6	$\bar{E}$	enable input (active LOW)
7	V_{EE}	negative supply voltage
8	GND	ground (0 V)
11, 10, 9	S_1 to S_3	select inputs
12, 13	$1Y_0$, $1Y_1$	independent inputs/outputs
14, 15, 4	1Z to 3Z	common inputs/outputs
16	V_{CC}	positive supply voltage

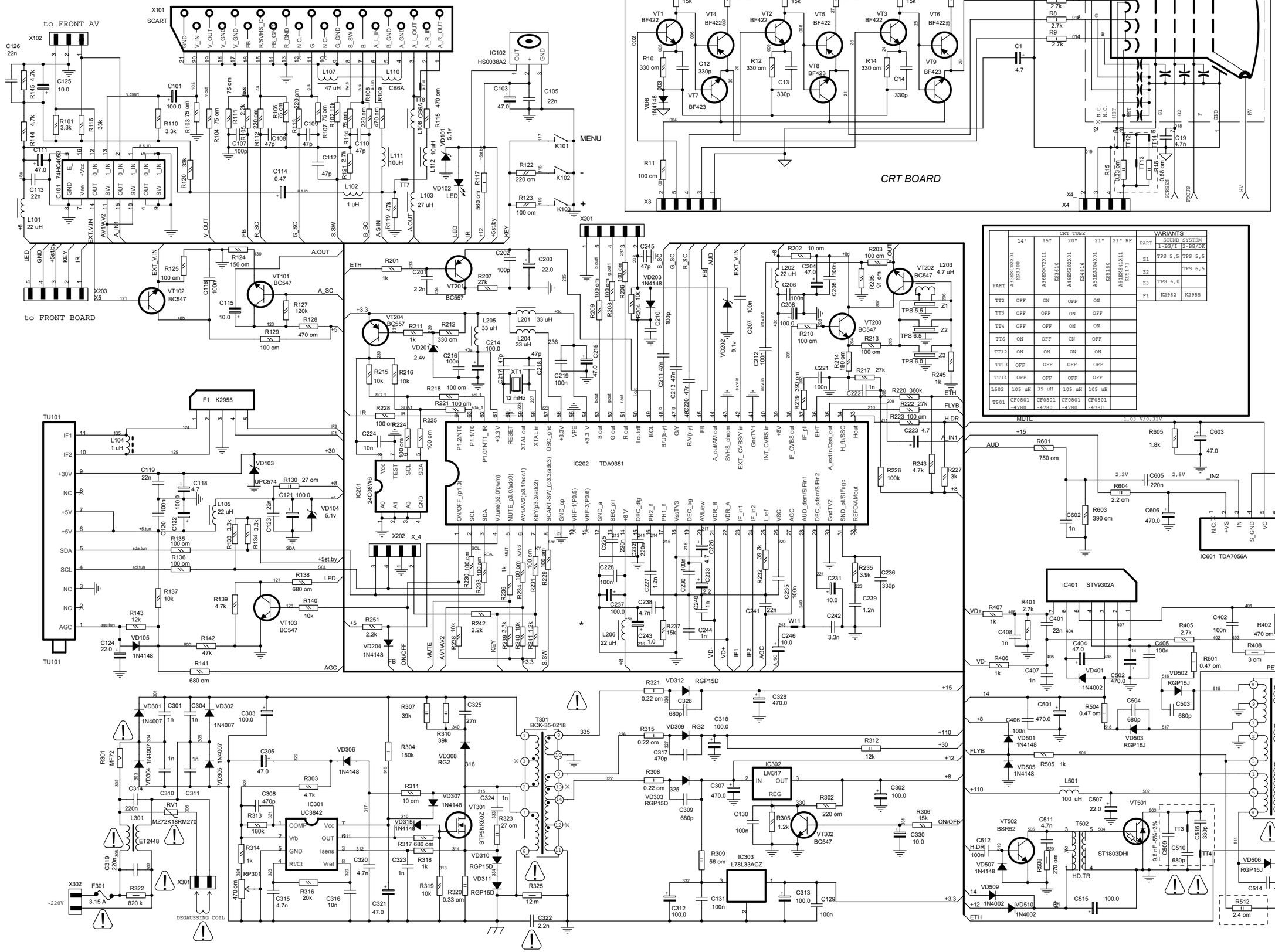
UC3842:

The UC3842 provides all the essential features necessary to the operation of the basic current mode controller.

PINNING

1. Error amplifier output.
2. Error amplifier inverting input.
3. Current sense comparator.
4. Timing network, R_T C_T.
5. Device ground.
6. Switching drive output.
7. Device supply voltage input.
8. Voltage reference, 5.0V.

TV2KR PAL/SECAM, BG/I/DK, MONO



PART	CRT TUBE 14" A31BKC02X01 K33300	15" A36EKM72X11 K5X610	20" A48EKB02X01 K5X616	21" A51BJJ04X01 K5X160	21" RF A51BKG41X11 K5X171
TT2	OFF	ON	OFF	ON	
TT3	OFF	OFF	ON	OFF	
TT4	OFF	OFF	ON	ON	
TT6	ON	OFF	ON	OFF	
TT12	ON	ON	ON	ON	
TT13	OFF	OFF	OFF	OFF	
TT14	OFF	OFF	OFF	OFF	
L502	105 uH	39 uH	105 uH	105 uH	
T501	CF0801 -4780	CF0801 -4780	CF0801 -4780	CF0801 -4780	

PART	VARIANTS SOUND SYSTEM 1-BG/I	2-BG/DK
Z1	TPS 5,5	TPS 5,5
Z2		TPS 6,5
Z3	TPS 6,0	
F1	K2962	K2955

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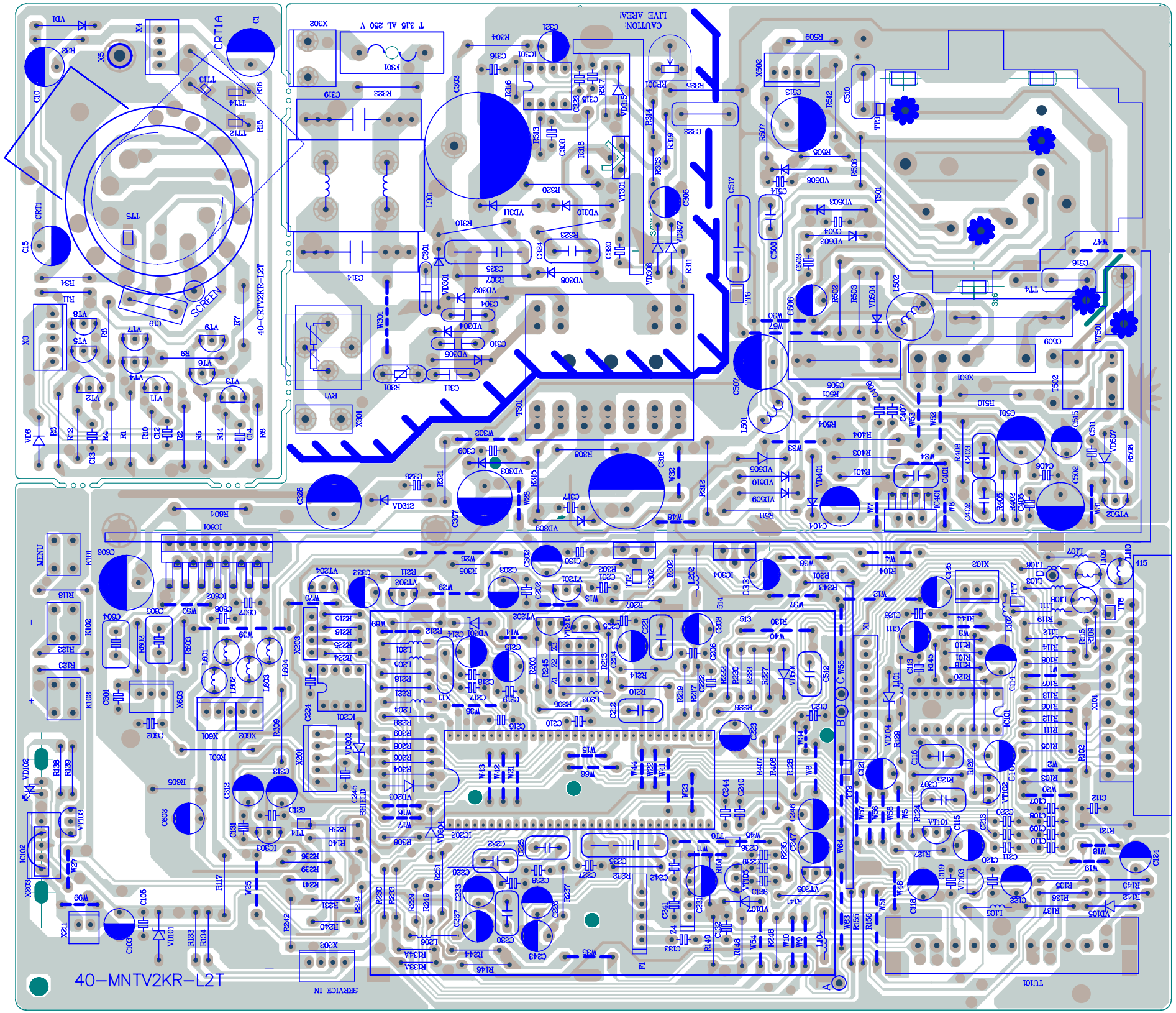
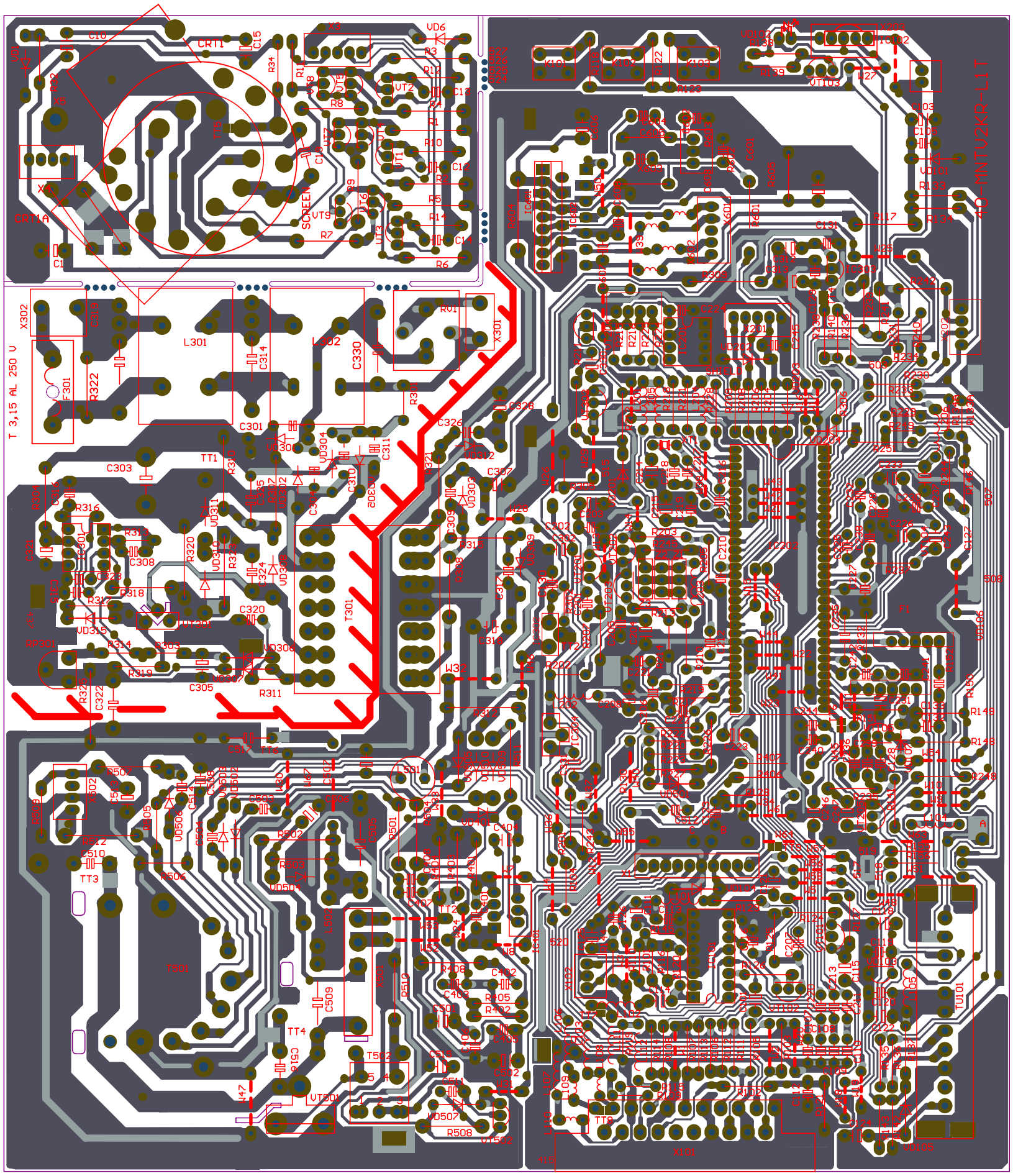

CAUTION:
LIVE AREA!
T 315 AL 250 V
CRT1A
SCREEN
40-CRTV2KR-L2T
SERVICE IN
40-MNTV2KR-L2T


4D-MNTV2KR-LIT
CRT1
SCREEN
CAT1A
T 3,15 AL 250 V
L301
L302
T301
T501
T502
X101
TU101