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Colour TV

Service Manual

Model: 14SWS1/CN
Chassis: Sanyo S01

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SAFETY INSTRUCTIONS

Warning: Before servicing this chassis, read the “X-Ray radiation precaution”, “Safety precaution” and “product safety notice” instructions below.

X-RTY Radiation precaution

1. The EHT must be checked every time the TV is serviced to ensure that the CRT does not emit X-ray radiation as result of excessive EHT voltage. The nominal EHT for this TV is 24.5KV (for 21” CRT only) at zero beam current (minimum brightness) operating at AC 220V. The maximum EHT voltage permissible in any operating circumstances must not exceed 30KV. When checking the EHT, use the High voltage check procedure in this manual using an accurate EHT voltmeter.
2. The only source of X-ray in this TV is the CRT. To prevent X-RAY radiation, the replacement CRT must be identical to the original fitted as specifies in the parts list.
3. Some components used in this TV have safety related characteristics preventing the CRT from emitting X-ray radiation. For continued safety, replacement component should be made after referring the PRODUCT SAFETY NOTICE below.

SAFETY PRECAUTION

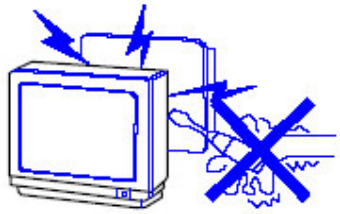
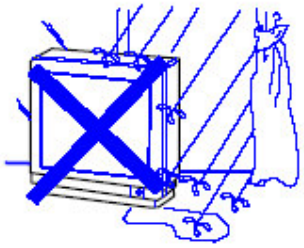
1. The TV has a nominal working EHT voltage of 24.5KV. Extreme caution should be exercised when working on the TV with the back removed.
    a. Do not attempt to service this TV if you are not conversant with the precautions and procedures for working on high voltage equipment.
    b. When handling or working on the CRT, always discharge the anode to the TV chassis before removing the anode cap in case of electric shock.
    c. The CRT, if broken, will violently expel glass fragments. Use shatterproof goggles and take and take extreme care while handling.
    d. Do not hold the CRT by the neck as this is a very dangerous practice.
2. It is essential that the maintain the safety of the customer all power cord forms be replaced exactly as supplied from factory.
3. Voltage exits between the hot and cold ground when the TV is in operation, Install a suitable transformer of beyond rated overall power when servicing or connecting any test equipment for the sake of safety.
4. Replace blown fuses within the TV with the fuse specified in the parts list.

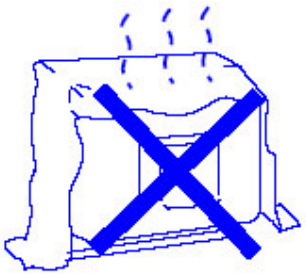
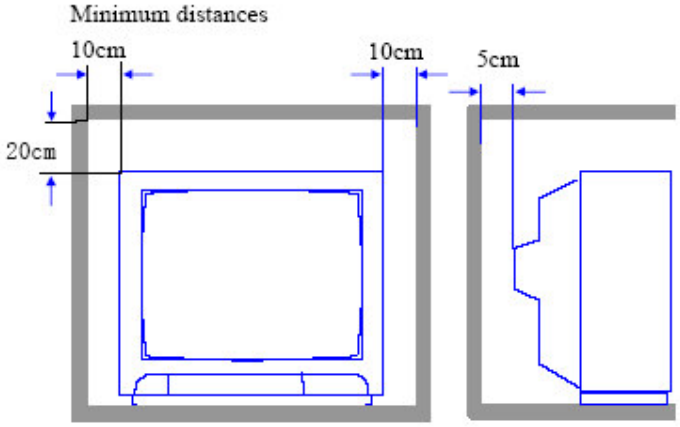
5. When replacing wires or components to terminals or tags, wind the leads around the terminal before soldering. When replacing safety components identified by the international hazard symbols in the circuit diagram and part list, it must be the company-approved type and must be mounted as the original.
6. Keep wires away from high temperature components.

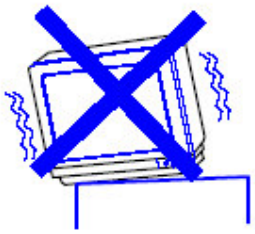
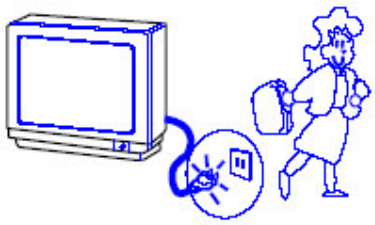
PRODUCT NOTICE

Many electrical and mechanical components in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-ray radiation protection afforded by them cannot necessary be obtained by using replacements rated at higher voltages or wattage, etc. Components which have these special safety characteristics in this manual and its supplements are identified by the international hazard symbols in the circuit diagram and part list. Before replacing any of these components read the parts list in this manual carefully. Substitute replacement components which do not have the same safety characteristics as specified in the parts list may create X-ray radiation.

PRECAUTIONS

	High voltages are used in the operation of this television receiver. Do not remote the Cabinet back from your set. Refer servicing To qualified service personnel.
	To prevent fire or electrical shock hazard. Do not expose the television receiver to rain or moisture.

	Avoid exposing the television receiver to direct, Sunlight and other source of the heat. Do not stand the television receiver directly on other produces, which give off heat E. g. video Cassette players. Audio amplifiers. Do not block the ventilation holes in the back cover. Ventilation is essential to prevent failure of electrical component. Do not squash power supply cord under the television receiver.
	If the television is to be built into a compartment or similarly enclosed The minimum distances must be maintained. Heat build-up can reduce the service life of your television, and can also be dangerous.
	Never stand on, lean on push suddenly the television or its stand. You should pay special attention to children to children.

	Do not place your television on an unstable cart stand, shelf or table. Serious injury to an individual, and damage to the television, may result if it should fall.
	When the television receiver is not used for an extended period of time, it is advisable to disconnect the AC power cord from the AC outlet.

MAINTENANCE

1. Use a piece of soft cloth when cleaning. (Neutral detergent is allowed.) Never use thinner or volatile, etc.
2. To ensure safety, unplug the TV set when cleaning.
3. Do not turn on the TV set in thundery days. At lightning intervals, pull off the power cord and the antenna cable.
4. Vacuum cleaner is recommended to clean the dust stick to the window net.
5. Do not put magnetic objects near the TV set to avoid color distortion.
6. Avoid hitting screen with hard objects. Attention when handling and transporting.

Warning!
There are no repairable components inside this set. Do not try to make any change to it. High voltage inside may cause danger.

SPECIFICATION

Model Number	**21S01**
RF system	Color system: PAL, NTSC3.58, NTSC4.43 Sound system: D/K, I, M, B/G
Video system	PAL, NTSC3.58, NTSC4.43 (50/60Hz)
Receiving channel	VHF: C1 ~ C12 UHF: C3 ~ C57
	CATV: Z1 ~ Z37
Programs preset	255
Antenna input	75Ω (unbalanced)
Audio output	5W (THD ≤7%)
Power source	150 – 250V AC, 50/60Hz
Weight (Approx)	25Kg
Rated power consumption (AC 220V 50Hz)	75W

Designs and specifications are subject to change without notice.

KEY ICS AND ASSEMBLIES

Serial No.	Position No.	Type	Function Description
1	N101	LA76818A	Small signal processor
2	N451	TDA9302 /LA78040	Vertical output circuit
3	N601, N602	LA4285 /LA4287	3W /5W sound power amplifier
4	N701	LC863328B-52G5	System control micro processor
5	N801	CD4053BE	Audio /video switch circuit
6	N551	L7809CV	Tri-pin regulator
7	N702	ST24C08	EEPROM

SIGNAL PROCESS

1. HIGH /INTERMEDIATE FREQUENCY SIGNAL PROCESSOR

Through the high /intermediate frequency signal processor, the RF TV signal received by the antenna is high-frequency amplified and converted to develop and output an IF signal, then are IF amplified and demodulated to develop a video signal and SIF signal as well as AFT control signal and AGC control signal. The high /intermediate frequency signal processor mainly consists of a A101 tuner, IF filtering circuit formed of V102 and Z101 and IF signal processor in LA76818A.

If signals output from the A101 tuner are coupled by C110 to V102 IF pre-amplifier for IF amplifying by about 20dB to compensate insertion loss of Z101 SAW filter. After coupled by C112, the IF signals output from V102 are sent to the Z101 SAW filter to develop IF signals, which meet requirements for the IF and amplitude frequency characteristics, to N101's Pin5 and Pin6. In N101, the generated IF signal are filtered out a video signal as a second SIF signal after through multi-polarity IF amplifying and PLL sync detecting, which then are output in two ways. After one set of signal is trapped (to eliminate the second SIF signal), cored and pre-video amplified, Pin 46 outputs video signals, which are sent to the video circuit for processing from N101's Pin44 after divided by R201 and R202 and coupled by C204, another set is output from N101's Pin52, which is later sent to the SIF circuit from N101's Pin54 after coupled by C126. The band control voltages of the A101 tuner are controlled respectively by levels output from Pin41 and Pin42 of N701 output low level to supply band switchover voltage to related pin of the tuner after out-phased by the related triode.

N701's Pin8 supplies VT voltage to the A101 tuner. The width pulse output from N701's Pin8 is converted into DC tuning voltage to be supplied to VT terminal of the tuner after level-converted and out-phased by V701 and integrating filtered by C707, R710, R712, R714, R715, R716, C709, C711, R718, N705 and C 708 are formed into a 33V stabilizing circuit.

The RF AGC voltage from LA76818's Pin4 is sent to AGC control terminal of the tuner through R104, R103 and R119 are voltage-dividing bias resistors of RF AGC and C104 is a filtering capacitor.

In the IF filtering circuit V101, VD101, R116, R117, R106, R112 and R115 are formed into an IF absorption selection circuit, which is controlled by the level from N701's Pin35 output high level, V101 saturates and conducts, and R106 is integrated into the paralleled resonator comprising R112 and VD101, by which the resonating frequency dot is moved to low frequency section and IF and amplitude frequency characteristics are stretched. In this case, IF characteristics are stretched. In this case, IF characteristics include B/G, I and D/K SIF characteristics. When Pin35 output low level, V101 cuts off and VD101 is not integrated into the paralleled resonator, by which the resonating frequency dot is moved to high frequency section and IF and amplitude frequency characteristics are narrowed. In this case, IF characteristic includes M SIF characteristic.

In the IF pre-amplifier, R108, R109 and R111 are bias resistors of V102, R107 and C111 are formed into a decoupling filter circuit, R110 is a damping resistor to stretch frequency band of the amplifier.

2. VIDEO SIGNAL PROCESSOR

The video signal processor in LA76818A mainly consist of an AV switch and filtering circuit, luminance signal processor, chroma signal processing/ color decoding /RGB selection circuit, which is mainly used to complete all video signal processes and demodulate out three primary color signals R, G, and B.

a) TV /AV switch circuit in LA76818A is used for switching over TV video signals, AV video signals, Y/C signals from the S-VHS terminal. The filtering circuit is used for strobe, delay, sharpness control, black level stretching for Y signal and strobe, amplification, color saturation control and color killing control for C signal.

The video signals from LA76818A's Pin46 are coupled by C204 to Pin44. External video signals from the AV terminals are coupled by C211 to Pin42. After clamped, DC video signals are restored and sent into the TV /AV switch circuit to select out one set of video signals from the internal video signals under the control of the I^2C bus. Then the set of video signals are output in three ways. One set is output from LA76818A's Pin40 and sent to the video output terminal after divided by R802 and E804, buffered by V801 and coupled by C805 to provide video signal source for the monitor. Another two sets of signals are sent to the filtering circuit for Y /C separation.

All the color trap in the luminance channel, band pass filtering circuit in the chroma channel and filter adjuster are controlled by the broadcast system identifying circuit and I2C bus to ensure correct and complete Y /C separation when different-system signals received. Meanwhile, when Y /C separation signals are input to LA76818A's Pin44 and Pin42, the inner I^2C bus makes the color trap in the luminance channel and band pass filtering circuit in the chroma channel enter the bypass mode, thus preventing attenuation to signal to the greatest extent and ensuring sharper and more vivid pictures.

b) Luminance signal processor

The luminance signal processor includes a luminance delay line, definition control circuit, coring circuit and contrast /luminance control circuit.

As the bandwidth of channel processing the luminance signal is wider than one processing the chroma signal, the transmission speed of the luminance signal is faster than of the chroma signal. It without delay processing, the time when the luminance signal reaches the CRT is not consistent with that when chroma signal reaches the CRT, resulting in display luminance and color not coinciding. A luminance delay line integrated in LA76818A can adjust delay time of the delay line by the I^2C bus so that the luminance and chroma signals reach the CRT synchronously. After delay processed, the luminance signal is sent into the definition control circuit, coring circuit, black level stretcher and contrast/ luminance control circuit for processing, and then sent into the luminance amplifier for amplifying and outputting a Y signal to the primary color matrix circuit.

LA76818A is equipped with an aperture compensating circuit to improve definition of pictures, coring circuit to reduce high frequency noise and black level stretcher to improve picture quality greatly.

c) Chroma signal processor

The chroma signal processor includes an ACC amplifier, killer identification control circuit, sub-carrier restorer, base band delay circuit, PAL /NTSC demodulator and color difference matrix /primary color matrix circuit.

The video signals selected out by the video switch are filtered out chroma signals with luminance element removed by the band pass filter, which are sent to the chroma signal selector. After selected, the chroma signals are amplified and chroma-controlled by the ACC circuit, and then output in two ways. One set is sent chroma demodulator and another set to sub-carrier restorer.

To correctly process chroma signals, firstly identify the input chroma signals. The I2C bus controls LA76818A to identify chroma signals. To identify chroma signals, identify signal systems and subcarrier frequency.

For NTSC signals, the subcarrier modulated by two color difference signals will not be progressively out-phased while the subcarrier modulated by R-Y color different signal PAL will be progressively out-phased. So whether the subcarrier phase modulated by R-Y signal or phase of color sync signal is out-phased or not decides that the signal is in NTSC or PAL system.

Both NTSC and PAL signal have a dual-frequency subcarrier, I.E. 4.43MHz and 3.58MHz. After detecting out two subcarrier frequencies at the same time of detecting subcarrier phase, the corresponding 4.43MHz or 3.58MHz can be identified (PAL4.43 and NTSC3.58 are standard systems while PAL3.58 and NTSC4.43 are nonstandard).

The subcarrier restorer in LA76818A uses a 4.43MHz crystal (G201) externally connected to N101's Pin38 as an oscillating source to generate a 3.58MHz or 4.43MHz dual-frequency subcarrier.

VC01 is a crystal oscillator with high Q value and narrow oscillating range. VC02 is an inner oscillator with wide oscillating range. Firstly, oscillating signals generated from VC02 and VC01 are discriminated in APC2, then the generated error signal is filtered by the filtered by the filtering circuit externally connected to LA76818A's Pin36 to get consistent oscillating frequencies of VC02 and VC01. Secondly, the oscillating signals are sent to APC1 by the tint adjuster to be discriminated together with the chroma signal from ACC. The error signal generated from the phase discriminator is filtered by the circuit externally connected to Pin39 to control oscillating frequency of VC02 so that it is consistent with chroma subcarrier frequency from ACC. Taking the calibrated subcarrier regeneration signal as reference, further calibrate oscillating frequency of VC02 in the APC2 circuit. Only after the APC2 circuit discriminates twice, can it correctly calibrate subcarrier regeneration signal of one frequency (firstly calibrate subcarrier regeneration signal on oscillating frequency of VC01; secondly recalibrate on subcarrier frequency of received chroma signal through VC01).

The calibrated sub-carrier regeneration signal is sent into the decoder through the PAL switch to demodulate out R-Y and B-Y color difference signals together with the modulated signal from ACC.

The demodulated color difference signals are sent into the color difference signal selector after clamped by the clamper. If with SECAM demodulation function, the circuit also sends color difference signals output from the SECAM demodulator to the color difference signal selector from Pin34 and Pin36. Under the control of the I2C bus, the color difference signals selected by the selector are sent to the base band delay line and adder respectively for further processing.

With PAL signal received, the circuit correct color phase distortion by means of progressively out-phasing R-Y color difference signals, causing tint distortion. Crosstalk may exit between the two color difference signals after simple PAL demodulation. Therefore, PAL signals should be color-difference-signal separated by the 1H base band delay circuit.

The color difference matrix /primary color matrix circuit includes a matrix circuit to generate a G-Y signal, contrast /luminance control circuit, primary color matrix circuit, character clamper, character contrast control circuit, primary color selector, white balance adjuster and beam current control circuit. The R-Y and B-Y color difference signals from the base band delay circuit are sent to the color difference matrix circuit for matrix processing to get a G-Y signal. The three color-difference signals are sent to the contrast /luminance control circuit together with the Y signal. Before sent to the primary matrix, the color difference signals/Y signal should be unitedly adjusted by the contrast /luminance control circuit to get proper three primary colors. In addition, LA76818A is equipped with setup circuit for sub-brightness, sub-contrast and sub-saturation so that users can adjust brightness, contrast and saturation, all of which are controlled by CPU through the I^2C bus.

The R-Y, B-Y and G-Y color difference signals can be processed into R, G and B three primary color signals after together with the Y signal in the primary color matrix circuit, which function as drive signals to display main pictures. Send the three primary color signals and the three character primary color signals from the CPU into the primary color selector for selection, then output.

The three character primary color signals from the CPU are input to Pin14, Pin15 and Pin16 of LA76818A respectively. Firstly, clamp them on a fired DC level to restore out the DC element lost during AC coupling transmission. Secondly, send the signals to the character contrast control circuit. Under normal condition, characters are slightly brightly than picture while the former changing range is narrower than the latter. The character blanking signal is input to Pin17 of LA76818A. When the signal is abnormal. No character display may appear.

d) White balance adjuster

Traditional white balance is adjusted through adjusting the bright and dark balance potentiometers of the CRT drive circuit. The white balance adjuster of the chassis is equipped in LA76818A, which is performed by the CPU through the I^2C bus.

e) Video amplifier

The video output circuit is amplify three primary colors and drive the CRT to display color pictures.

V902, V912 and V922 are three end video amplifying triodes. V931, V932, VD901, VD911, VD921, C901, C911 and C921 are formed into a spot killer.

When the TV operates, 9V supply voltage supplies enough voltage to C932 so that C905's negative has lower potential to saturate V931 and its positive has higher potential to cut off V932. as the positive potential of VD901, VD912, VD922 diodes lower than their negative potentials, the diodes cut off, not affecting the TV's operation. When turn-off, C931, C932 and C933 discharge to cut off V932 through VD902, VD903 and R933, as the electric charge of C934 is discharged quickly due to its too small capacitance, V932's emitter is conducted to conduct VD901, VD911 and VD921, ensuring V902, V912 and V922 end video amplifying triodes conducting for a period of time and high voltage of the CRT discharged quickly through the end amplifying triodes. Thus spot is killed when turn-off.

3. AUDIO SIGNAL PROCESSOR

The audio signal processor mainly consists of a SIF processor, audio switchover circuit and audio power amplifier. 21S01 uses LA4287 to complete audio power amplifying.

a) SIF processing and audio switchover circuit.

The detected video signal as well as second SIF signal is output from Pin52 of LA76818A to be coupled by R122, from which the high pass filter including C125, C126 and L121 filter out a SIF signal y to be sent to the band pass filter connected to Pin54. The band pass filter further filters interference elements except 4.5-6.5MHz SIF signals out of the two signals for sent to phase discriminator. In addition, SIF carrier signal from the SIF carrier signal from the SIF carrier PLL restorer (SPLL) is also sent to the phase discriminator. After the discriminator compares the two signals, the filter externally connected to Pin53 filters high frequency element out of the generated error signal and processes it into DC error voltage to control oscillating frequency in the SPLL circuit so that the frequency is always consistent with the received sound IF.

In the SPLL circuit, the frequency at which a SIF carrier signal is developed ranges from 4.5M to 6.5M which is used for demodulating M, B/G, I or D/K SIF signal is received, firstly perform discrimination adjustment mentioned above and calibrate the SIF carrier generated from SPLL. Then lock the SPLL oscillating circuit onto the calibrated frequency. The output SIF carrier signal is sent to the frequency discriminator for frequency discrimination. The output SIF carrier signal is sent to the frequency discriminator for frequency discrimination.

The SIF signal filtered by the double-level band pass filter is cut off a parasitic AM signal after amplified by the amplitude limiter, which is later sent into the FM frequency discriminator together with the SIF carrier signal to demodulate out an audio signal, then in two ways. One of set output from LA76818A's Pin1 to the AV terminals through V802 follower, another set is directly sent to the switchover switch to be switched over with the audio signal input to the AV terminals at N801's Pin1, Pin2, Pin3, Pin5 and then output from the Pin4, Pin 15 to the audio power amplifier after through DC volume control under the control of the N701 Pin5, Pin6.

b) Audio power amplifier.
The audio power amplifier comprises LA4287 (for 21S01). The following give descriptions of the circuit on basis of LA4287.

An audio signal from LA76818A's Pin 1 and Pin4, Pin15 is coupled by C611, C621, voltage divided by R611, R612, coupled to L601's Pin3 and L602's Pin3. After audio-power-amplified by LA4287, the signal is output from Pin 9 to drive the speakers to output sound V631, V632 and V633 are formed into a mute circuit.

4. HORIZONTAL /VERTICAL SCAN CIRCUIT

The horizontal /vertical scan circuit in this chassis comprises a sync separator, horizontal oscillator, horizontal /vertical frequency divider, 50Hz /60Hz identifying circuit, AFC1 /AFC2 and line pre-drive circuit in LA76818A; V431 line drive circuit, V432 horizontal output circuit and LA78040 /STV9302 vertical output circuit.

a) LA76818A horizontal /vertical scan small processor
LA76818A applies a digital dividing horizontal /vertical scan circuit. In the circuit a 4MHz oscillation signal generated from the crystal oscillator is processed into a horizontal frequency square wave signal by the frequency divider and AFC1 and AFC2 circuits, which later is divided to develop a vertical frequency pulse signal. The circuit improves sync performance greatly with low horizontal start voltage (5V) and without horizontal sync and vertical sync adjustments.

In addition, LA76818A can automatically control operating mode of the vertical output circuit by means of the I2C bus signal with 50/60Hz vertical frequency auto identifying circuit built-in, ensuring picture's vertical size unchanged with 50Hz or 60Hz vertical frequency.

b) Sync separator

The sync separator in LA76818A consists of a horizontal sync separator (including a sync separation triode T and comparison amplifier 1) and vertical sync separator. The bias of T1 is supplied with 7V fired bias voltage, with sync chip (downwards) in the video signal. Potential of T1' emitter drops and the emitter conducts. The conducted current charges the internal capacitor C through T1 with positive to the upper and negative to the lower. Without sync chip, potential of T1's emitter rises and the emitter cuts off, thus the collector outputting high level to get negative pulse with the same width as the sync chip's on the T1's collector and separate out a composite sync signal. At the same time, C discharges slowly through R1 to get ready for the next sync separation.

The negative sync pulse separated by the T1's collector is out-phased to positive pulse by the comparison amplifier 1, which is output in three ways. The first set is sent to the AFC1 PLL discriminator to function as a reference phase signal. The second set is separated out vertical frequency pulse by the vertical sync separator and shaped into vertical sync pulse with steep edges to be sent to the vertical divider. The third set is supplied to the horizontal consistency detector for checking horizontal scan for sync.

c) Horizontal oscillator

The horizontal oscillator in LA76818A is a integrated voltage-control oscillator whose free oscillating frequency is $256xf_H$=4MHz. Different from conventional integrated horizontal scan oscillator, the horizontal frequency oscillator in LA76818A only needs to be externally connected to a error resistor with smaller reference current source of the inner horizontal oscillator.

d) AFC1 PLL discriminator and horizontal frequency divider

AFC1 PLL discriminator in LA76818A includes A voltage-control crystal oscillator, horizontal frequency divider, phase discriminator 1 and AFC1 low-pass filter externally connected to Pin26. The discriminator is a frequency phase lock loop circuit, whose reference signal comes from horizontal sync pulse output from the comparison amplifier 1.4MHz oscillation signal generated from the horizontal oscillator in LA76818A is sent to the horizontal divider, which is sent to horizontal count frequency divider after fixedly divided with 256 times the size of horizontal frequency.

As the chassis can receive multi-system signals, horizontal scan frequency differs dependent on different-system TV signals. To make the horizontal oscillating signal in the horizontal counting frequency divider, which are controlled by the CPU through the I^2C bus. The CPU counting divider to count up or count down and counting amount according to size and direction of the phase. Discrimination error in the AFC1 circuit. After comparing the pulse from the counting divider to that of the received horizontal sync signal in AFC1, the error current is generated, which is processed into DC error voltage by the RC low pass filter externally connected to Pin26 to control horizontal oscillation and adjust oscillation frequency of VCO. If the two pulses are the same, counting adjustment stops to lock the loop so that frequencies of two-way input signals from AFC1 equal.

e) AFC2 discriminator and phase shifter

In LA76818A, the second group PLL formed of AFC2 circuit and horizontal output phase control circuit (phase shifter) is to correct phase of horizontal frequency pulse output from Pin27.

AFC2 has two sets of signals input: one set of signal is a horizontal frequency square wave pulse from the frequency divider functioning as a reference signal for the frequency and phase of the horizontal frequency pulse is locked in AFC1 by the horizontal sync pulse and remains unchanged. After delayed for about 4μs (to compensate delay resulted from horizontal output circuit for convenience of locking loop), the signal is sent to the AFC2 circuit.

Another is a horizontal flyback pulse output from T471 GBT. The pulse is sent into the IC from Pin28 of LA76818A to be pulse shaped into a pulse signal with steep locked edges, which is sent into the AFC2 circuit as a comparison signal. Through phase comparison, the two signals are processed into error current, which later is filtered out to DC error voltage by IC's low pass filter to control phase-shift angle and adjust horizontal frequency pulse phase output from Pin28, thus controlling start time of horizontal flyback and positive /negative peak of the horizontal scan current and correcting positive conducting time and current peak value of horizontal output triode.

In addition, LA76818A horizontal scan small signal processor can also output 4MHz horizontal oscillation signals and sandcastle pulse which function as clock signals and horizontal sequence control of the SECAM decoder. LA76818A's Pin30 functions as the 4MHz clock output terminal (AC grounding).

f) Vertical divider

The horizontal frequency oscillation pulse from the horizontal scan count divider is sent to the vertical count divider. Meanwhile the vertical sync signal from the vertical sync separator (frequency separator) is also sent to the vertical count divider. Controlled by the vertical sync pulse, the circuit counts horizontal frequency pulses and identifies and correct vertical frequency, all of which are controlled by the CPU through the I^2C bus. The vertical frequency is shifted to the Capture, Identification or Locking mode by the CPU.

Capture mode: The vertical sync count divider enters the wide-range count comparison mode, in which the CPU provides a wide-range count comparison value, i.e. when vertical frequency of the received signal changes within a wide range, the count circuit can always pause counting and enters another mode for counting and comparing.

Identification mode: Once the count circuit pauses counting in the Capture mode, the CPU provides a relatively narrow-range of count comparison value and the count divider recounts and re-compares until the comparison is finished to enter the Locking mode.

Locking mode: After identification, the CPU provides a narrower-range of count comparison value. Only when vertical frequency of the received signal changes within a very narrow range, can the operation mode be changed and enter the wide hold range, ensuring the generated vertical drive pulse strict with the vertical sync pulse.

g) Vertical sawtooth generator and vertical output circuit

The vertical frequency pulse output from the vertical count divider is sent to the sawtooth generator to develop a sawtooth with corresponding vertical frequency, which is output from LA76818A's Pin23 to the vertical output circuit. To get stable amplitude of the locked vertical frequency sawtooth signal, an auto level limiter (ALC) is also integrated in LA76818A to control amplitude of the output sawtooth. Externally connect the ALC's filtering component to Pin24 of LA76818A. The chassis' vertical output circuit consist of LA78040.

The vertical frequency sawtooth from LA76818A's Pin23 is DC coupled by R451 to LA78040's Pin1 to be amplified by the internal differential amplifier. Pin7 is an in-phase input terminal of the differential amplifier. Externally connected R453 and R454 are DC bias resistors, and C454 is a filtering capacitor. In the chassis, the in-phase input of the differentiate amplifier is fixed to reference potential of the DC

amplifier. The amplified vertical sawtooth voltage is output from Pin5 to the deflection yoke to generate deflection current. R452 and C459 filter out of horizontal frequency element inducted by the horizontal scan circuit. R460 and C458 eliminate parasitic oscillation generated when the deflection yoke and distributed capacitors resonate. The branch formed of C456, R458 and R459 fetches out an AC sawtooth from lower part of the deflection yoke to be fed back to the input terminal to correct vertical scan linearity. R455, R456, R457 and R459 are formed into a DC voltage divider to fetch out DC voltage to feed back the input terminal to regulate DC operating point of the output stage. C453 is a high frequency decoupling capacitor. VD450 and C452 are formed into a pump supply voltage raiser. The vertical flyback pulse output from Pin3 us used for positioning characters.

h) Line drive and horizontal output circuit

Similar to that of conventional TVs the line drive and horizontal output circuit comprises discrete components including a line drive triode V431, horizontal output triode V432, line drive transformer T431 and FBT T471.

LA76818A's Pin27 output line drive pulse with of 24μs, which is supplied to base of V431. After amplified and pulse shaped by V431 and coupled by T431, the horizontal frequency pulse is supplied to base of V432. R433 and C433 are formed into a damping resistor to restrict primary of T431 form generating large-amplitude inductive electric potential and avoid breakdown of the line drive triode. C433 is a high frequency filtering capacitor to remove high harmonic.

Line drive pulse from the secondary of T431 line drive transformer is supplied to base of V432 to control V432 operation and develop sawtooth scan current in the horizontal deflection yoke so that electron beams in CRT scan horizontally and over 1KV horizontal flyback pulse is formed on collector of the V432.

C435 and C436 are flyback capacitor. Adjusting their capacitances properly can change horizontal flyback time L431 and L432 are used to restrain horizontal radiation. DY-H is a horizontal deflection yoke. C441 are S correcting capacitors, L441 are linear correcting inductors and R441 are dampening resistors.

The flyback pulse from T471's Pin6 provides filament voltage for the CRT through R930. The horizontal flyback pulse from Pin4 is supplied to the CPU to position character level after out-phased by V705 or supplied to N101's Pin28 for AFC discrimination. In addition, T471 provides focus voltage, screen voltage and anode high voltage for the CRT.

SYSTEM BLOCK DIAGRAMS

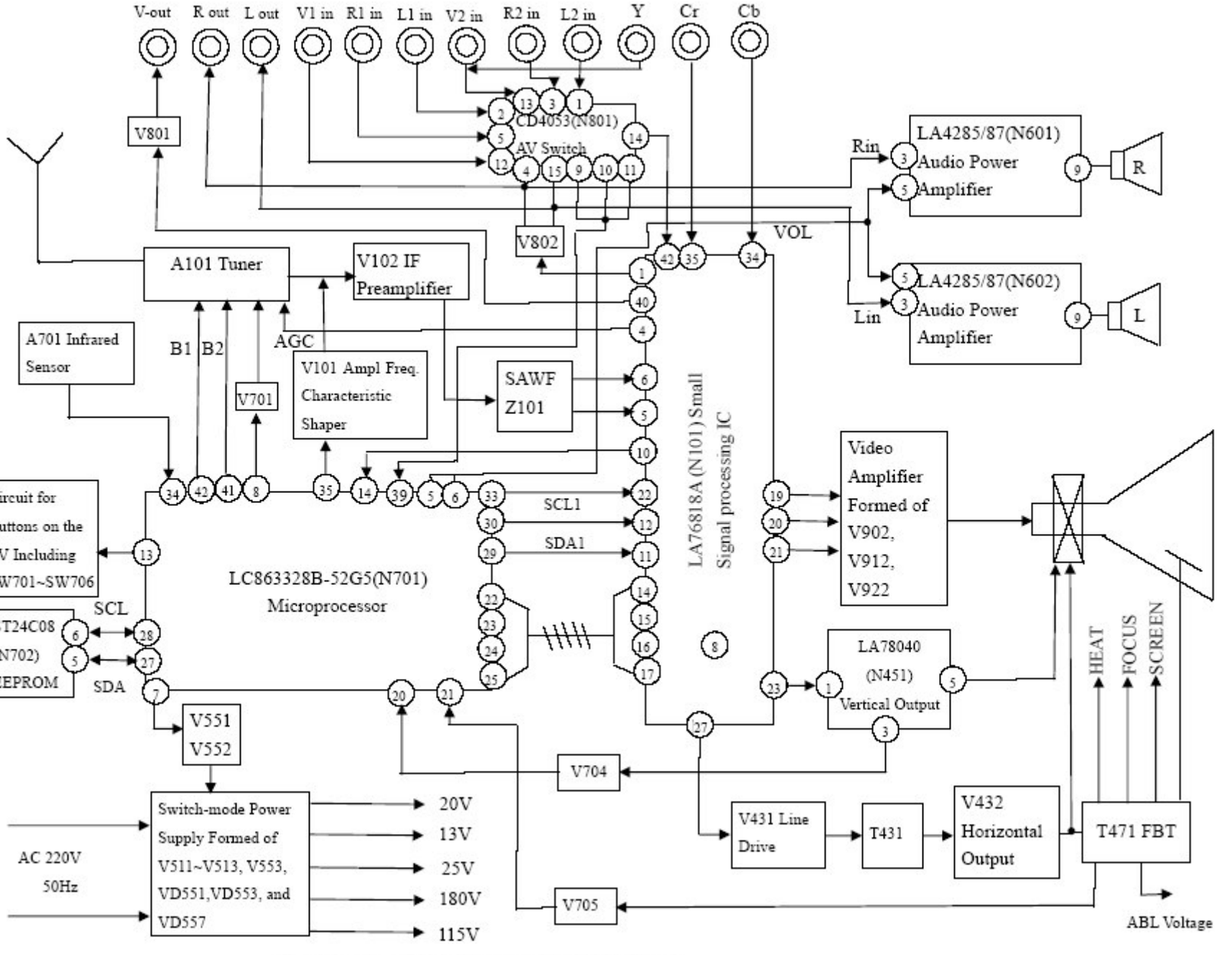


Fig. 1 Structure Block Diagram of 14/21S01 Chassis

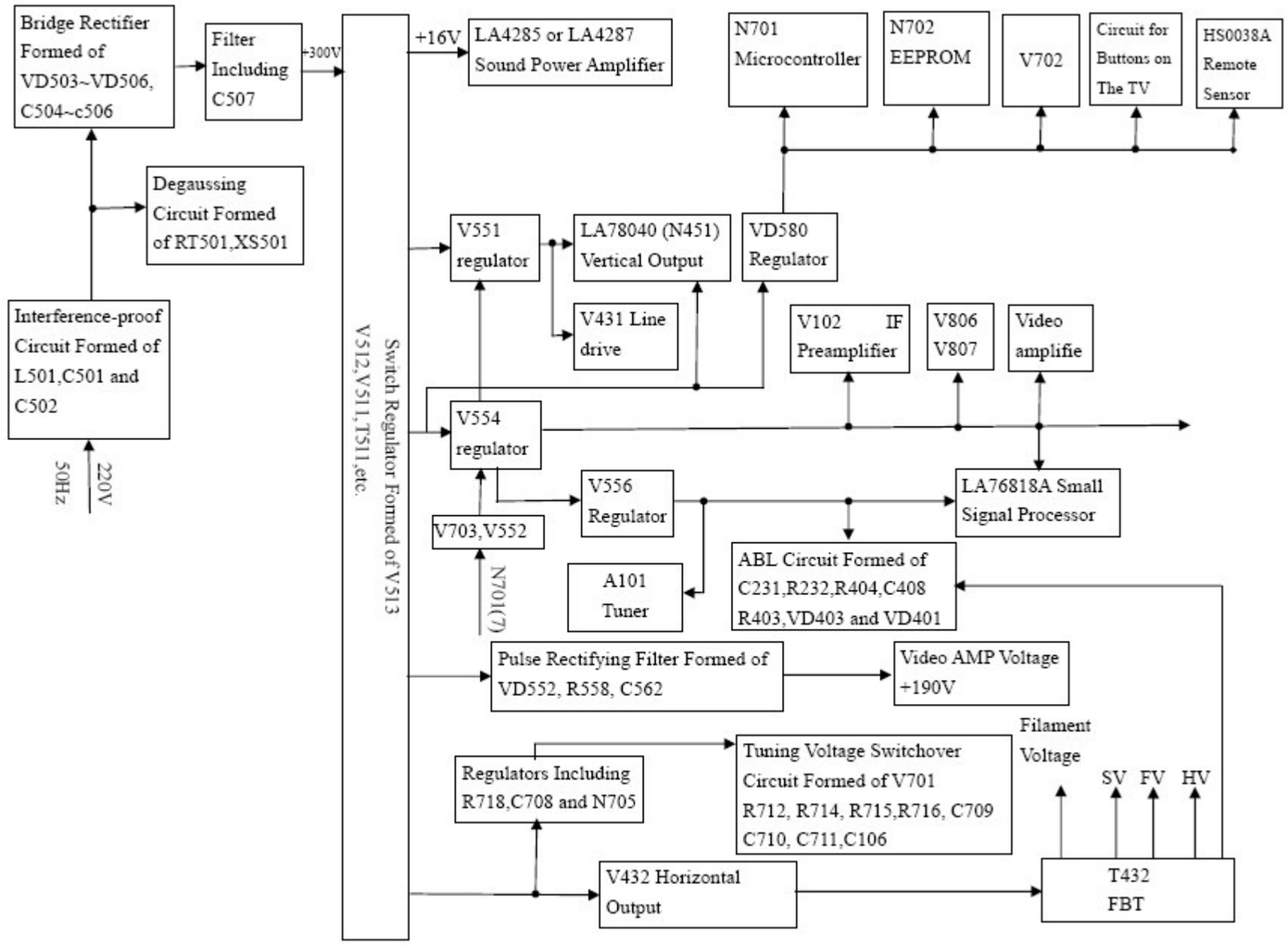


Fig. 2 Block Diagram for 14/21S01 Supply Voltage System

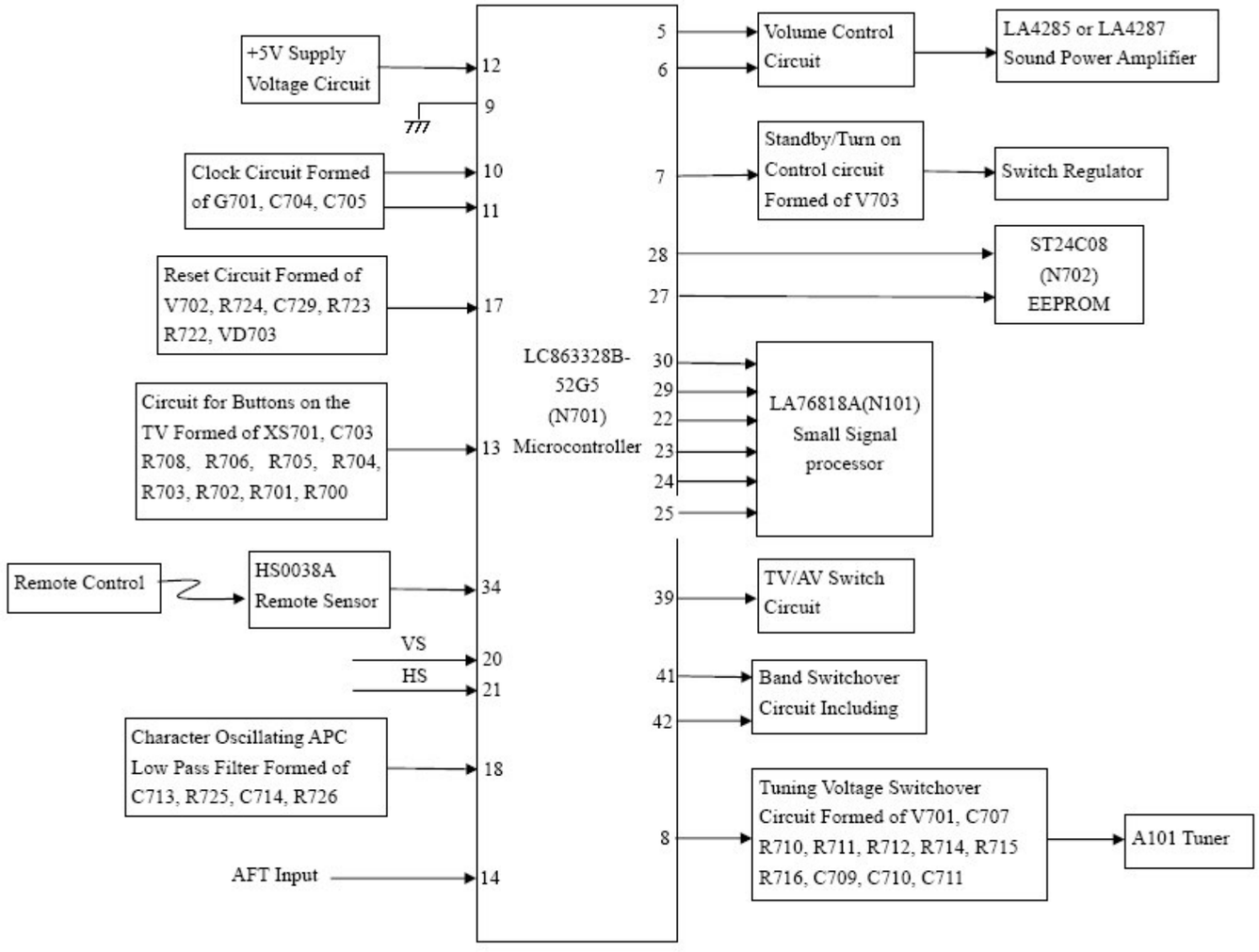


Fig. 3 Block Diagram for 14/21S01' s Remote Control Structure

IC DATA AND SERVICE DATA

LA76818A SMALL SIGNAL PROCESSING CIRCUIT

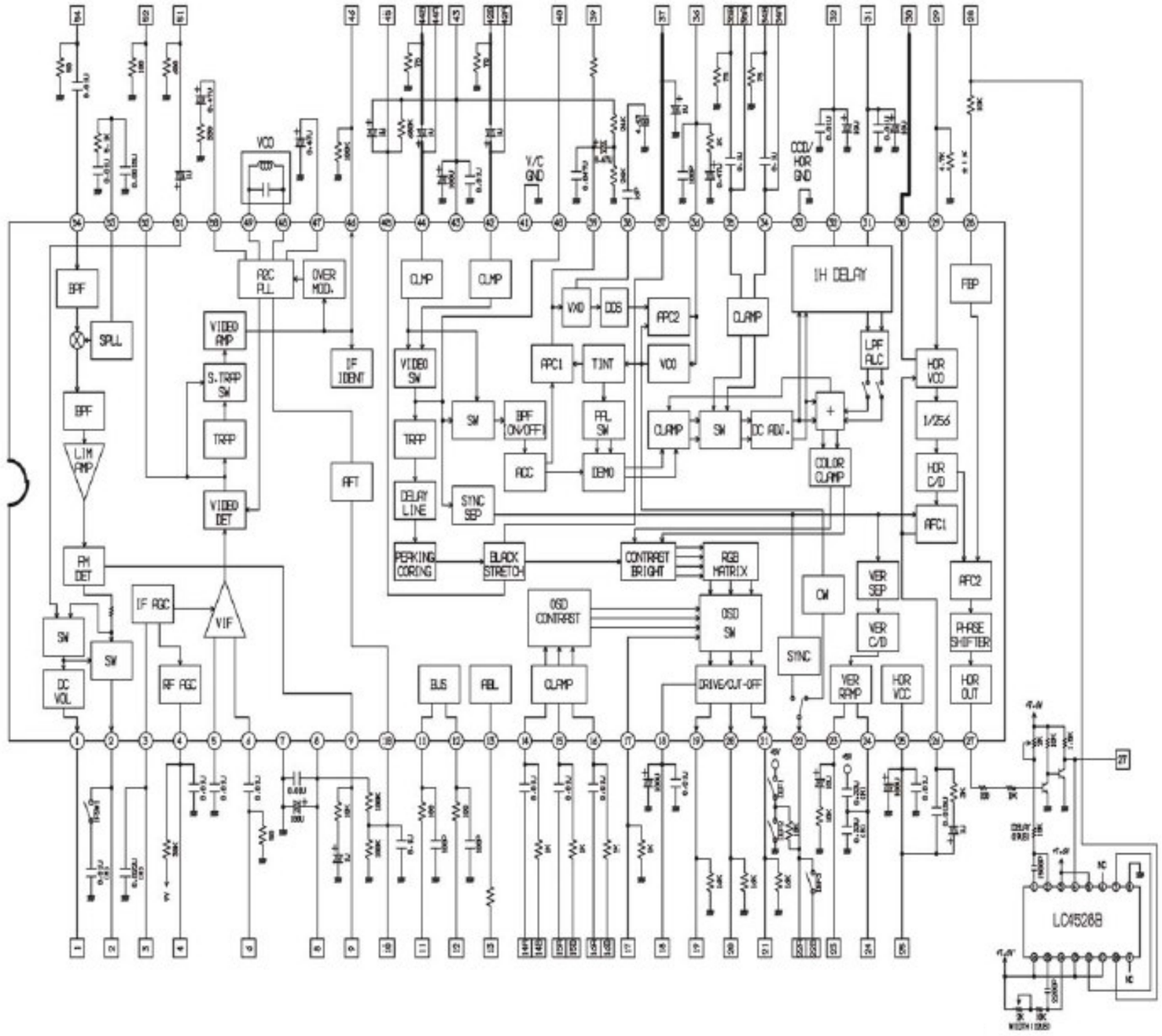
1. Features

   LA76818A is a multi system color TV specific monolithic IC developed by SANYO Co. in 2002, which is controlled by the I^2C bus. LA76818 comprises a tuning circuit and all small signal processing circuit including a PIF /SIF /luminance and chroma signal processing circuit, PAL /NTSC processing circuit, RGB signal processing and controlling circuit, horizontal /vertical small signal processing, SIF processing and demodulating circuit and volume controlling circuit. It has following features.

   - Multi system IF processing, high-gain IF amplifier and AGC without adjustment needed except IF phase-locked VCO coil. A buss eliminator is also built-in the IC.
   - Video PLL detector improves video detection characteristic and picture /sound quality greatly.
   - Video /audio switchover switch built-in.
   - Built-in luminance delay line, aperture correcting circuit, coring circuit and black level stretching circuit improve picture quality greatly.
   - Color signal trap and band pass filter, skin tone control circuit and white balance auto adjusting circuit built in.
   - Analog OSD and RGB switchover control circuit built-in with fast RGB blanking.
   - The horizontal /vertical scanning circuit uses dual auto frequency adjustment, 50/60Hz auto decision with constant vertical picture when no signal received.
   - SECAM signal decoding offers together with LA7642N

In addition, LA76818 features also sandcastle pulse generation, SECAM control clock output, PWM pulse width modulation and control.

2. Block diagram

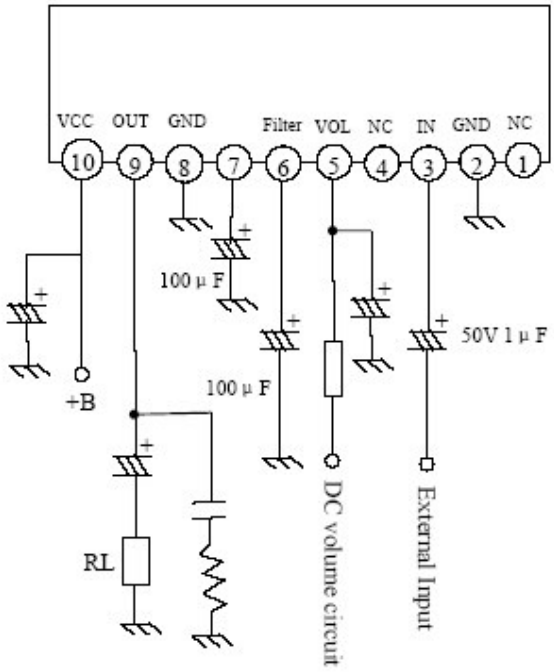


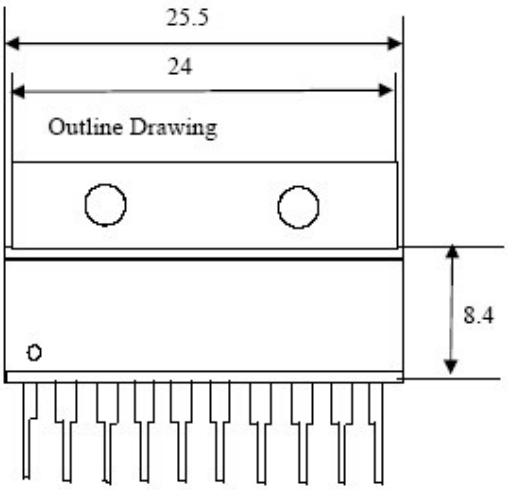
LA4285 3W POWER AMPLIFIER AND STEREO

1. Feature
   - TV sound output
   - Exchangeable with LA4285 (3W) /LA4287 (5W) pin
   - Package SIP-10HD (Pitch=2.54mm, straight type)
   - Heat protection loop and over voltage protection loop built in
   - Power output: 3W (Vcc=19V /RL=8Ω) LA4285
     5W (Vcc=22V /RL=8Ω) LA4287

2. Diagrams

Recommended Loop Diagram





3. Refer to table 5 about functions and data of the LA4285's Pins

LA78040 /STV9302 (N451) VERTICAL DEFLECTION OUTPUT CIRCUIT

1. Features
   - Low power dissipation due to built-in pump-up circuit
   - Vertical output circuit
   - Thermal protection circuit built in
   - Excellent crossover characteristics
   - DC coupling possible

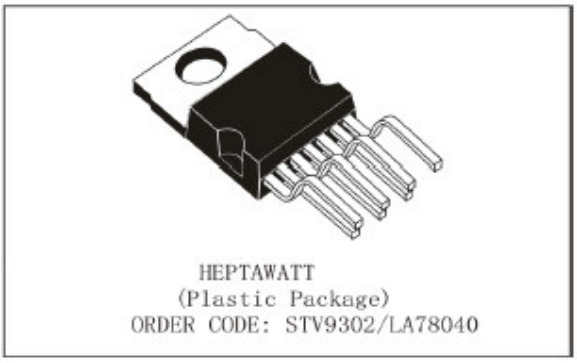
Feature

Power amplifier

Flyback generator

Output current up to 2 App

Thermal protection



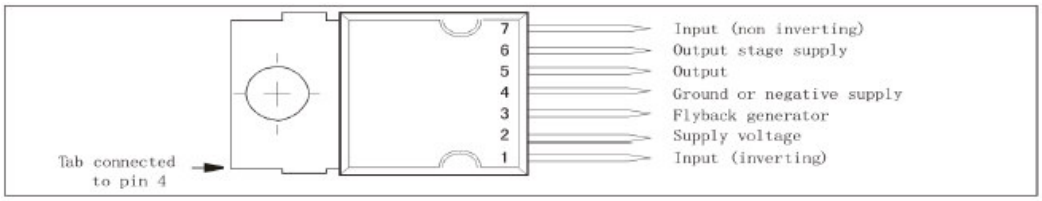
Description

The STV9302 is a vertical deflection booster designed for monitor and TV applications.

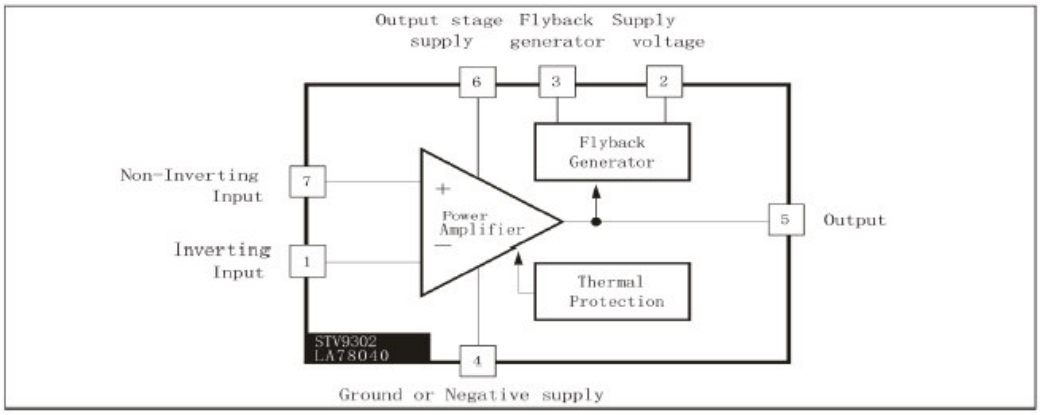
This device, supplied with up to 32V, provides up to 2App output current to drive the vertical deflection yoke.

The internal flyback generator delivers flyback voltage up to 60V.

PIN CONNECTION (Top view)



2. Block diagram



3. Refer to table 6 about functions and service data of LA78040's Pins

Table 2 functions and service data of LA76818A (N101)'s Pins

Pin No	Function Description	DT890D Multimeter		
		Voltage of Pin (V)	Ground Resistance (Ω)	
			Measure with Red Probe while grounding Black probe.	Measure with black Probe while grounding red probe
1	Audio signal output	2.44 /2.28	810	712
2	Audio frequency discrimination output	2.34	975	675
3	IF AGC filter	2.4	860	718
4	RF AGC voltage output	3.74	∞	680
5	IF signal input	2.87	780	693
6	IF signal input	2.87	778	712
7	IF circuit ground	0	0	0
8	Supply voltage for IF circuit	5.1	500	280
9	Filter for frequency discriminator	2	910	713
10	AFT voltage output	2.5	910	617
11	I^2C bus data line	4.55	1560	640
12	I^2C bus clock line	4.55	1542	667
13	Auto brightness control input	3.8	945	577
14	R character signal input	0.9/0	920	714
15	G character signal input	0.91/0	913	701
16	B character signal input	0.85/0	906	700
17	Character blacking signal input	0.28/0	780	683
18	Supply voltage for decoder	8	525	500
19	Red (R) signal output	2.35	780	671
20	Green (G) signal output	2.37	780	670
21	Bulue (B) signal output	2.31	780	670
22	White balance adjusting signal input	0.2	830	696
23	Vertical sawtooth output	2.1	710	672
24	Vertical sawtooth generation	2.78	782	702
25	Horizontal start supply voltage	5.1	350	350
26	Low pass filter for horizontal AFC	2.57	815	708
27	Line drive pulse output	0.73	700	653
28	Line flyback pulse input	1.1	785	707
29	Reference voltage generation terminal	1.64	746	700
30	4MHz clock signal output for SECAM demodulation	0.9	825	608

Pin No	Function Description	DT890D Multimeter		
		Voltage of Pin (V)	Ground Resistance (Ω)	
			Measure with Red Probe while grounding Black probe.	Measure with black Probe while grounding red probe
31	Power supply of 1H baseband delay circuit	4.45	330	330
32	Power filter of 1H baseband delay circuit	8.3	∞	567
33	1H baseband delay circuit ground	0	0	0
34	SECAM color difference signal input /DVD Cb input	2.39	775	712
35	SECAM color difference signal input /DVD Cr input	2.39	776	712
36	APC low pass filter	3.8	810	724
37	4.43MHz CW signal output or SECAM killing input	2.3	800	706
38	4.43MHz crystal oscillator connector	2.8	790	716
39	APC filter	2.5	760	697
40	Video signal output	2.3	730	662
41	Video /chroma /scan part ground	0	0	0
42	Video signals input from AV terminals or Y signal input from S-Video terminal	2.7	800	711
43	Supply voltage for video /chroma /scan part	5	285	280
44	Video signals input from AV terminals or C signal input from S-VIDEO terminal	2.53	805	707
45	Filter for black level stretch	3.1	762	700
46	Video detection output	2.12	397	397
47	If lock detection filter	3.6	840	712
48	External VCO resonating coil	4.2	526	526
49	External VCO resonating coil	4.2	530	530
50	IF PLL APC filter	2.41	820	698
51	Audio signal input	2.2	800	701
52	Sound IF output	1.96	809	697
53	APC filter for audio discrimination	2.23	808	691
54	Sound IF input	3.13	824	712

Table 3 Functions and service Data of LC863328B-52G5

Pin No	Function Description	DT890D Multimeter		
		Voltage of Pin (V)	Ground Resistance (KΩ)	
			Measure with Red Probe while grounding Black probe.	Measure with black probe while grounding red probe
1	Select UHF (BAND OPTION select PORT /H/ or PORT /L)	0.02V	22.1	22.23
2	Horizontal frequency 50/60 output	0.02V	22	22.06
3	Detect SCART signal input	5.1V	22	22.04
4	Detect SCART-RGB input	5.1V	10.4	10.41
5	Volume-L PWM output port	0~4.4V	4.6	4.5
6	Volume-R PWM output port	0~4.5V	4.62	4.49
7	POWER ON /OFF signal output control port	0.03V	10.3	10.34
8	Tuning-use 14bit PWM output port	0.2~5.1V	59.4	59.4
9	Ground	0V	0	0
10	CPU use crystal oscillation port	2.28	2.63	3.76
11	CPU use crystal oscillation port	2.7V	2.84	3.71
12	Power supply (+5V)	5.1V	0.55	0.549
13	Key in port	0~2.78V	9.87	9.87
14	AFT signal input port	2.38V	43.9	46.73
15	High voltage detection input	0.03V	10.36	10.37
16	Mains voltage detection input	5.1V	15.3	15.3
17	CPU reset port	5.1V	4.62	4.62
18	OSD filtering	3.65V	260	264
19	SECAM chroma detection	2.08V	2719	3714
20	Vertical pulse input	5V	10.4	10.4
21	Horizontal pulse input	4.47V	10.3	10.34
22	OSD red signal output	0.01V	2759	3793
23	OSD green signal output	0.01V	2785	3783
24	OSD blue signal output	0.01V	2800	3761
25	OSD blanking signal output	0.01V	6.51	6.52
26	Not used	0.01V	7.89	7.89
27	IIC data (EEPROM use)	5.1V	21.47	22.18
28	IIC clock (EEPROM use)	5.1V	22.13	22.2

Pin No	Function Description	DT890D Multimeter		
		Voltage of Pin (V)	Ground Resistance (KΩ)	
			Measure with Red Probe while grounding Black probe.	Measure with black probe while grounding red probe
29	IIC data (other IC use)	4.7V	22.1	22.14
30	IIC clock (other IC use)	4.7V	22.21	22.26
31	Automatic adjustment enabling port	5.1V	10.39	10.4
32	S-VIDEO detection	5.1V	22.1	22.17
33	SD input port	5.1V	22.12	22.14
34	Remote control signal input	5.1V	2732	3858
35	TXT-RESET	5.1V	22.15	22.17
36	Woofer on /off	5.1V	22.09	22.12
37	MUTE control	0.12V	2.71	2.71
38	AV option control port 2	0.02~5V	22.15	22.18
39	AV option control port 1	0.02~5V	22.15	22.2
40	Sensitive receiving switch control (LA76818 used, pin40 being the last way of video, can be used as YUV input control).	0.02V	22.24	22.27
41	Band option	0.02~5V	22.18	22.22
42	Band option	0.02~5V	21.94	21.98

Table 4 Functions and service data of ST24C08 (N702)'s Pins

Pin No	Function Description	DT890D Multimeter		
		Voltage of Pin (V)	Ground Resistance (Ω)	Ground Resistance (KΩ)
			Measure with Red Probe while grounding Black probe.	Measure with black probe while grounding red probe
1	Address input terminal	0.00	0.00	0.00
2	Address input terminal	0.00	0.00	0.00
3	Address input terminal	0.00	0.00	0.00
4	Common ground	0.00	0.00	0.00
5	Clock line	5.1	6.85	4.83
6	Data line	5.1	6.85	5.15
7	PW write protection terminal	5.1	9.58	5.31
8	Supply voltage	5.1	3.5	3.25

Table 5 Function and service data of LA4285 /LA4287 (N601 and N602)'s Pins

Pin No	Function Description	DT890D Multimeter		
		Voltage of Pin (V)	Ground Resistance (KΩ)	
			Measure with Red Probe while grounding Black probe.	Measure with black probe while grounding red probe
1	Internal input	0V	∞	∞
2	Small-signal ground	0V	∞	∞
3	External input	6.3V	54.37	51.37
4	INT /EXT switch	0V	∞	∞
5	DC volume control	0~4.5V	9.76	9.76
6	Filter	9.28V	14.04	4.94
7	Negative feedback	9.28V	33.5	28.79
8	Power ground	0V	∞	∞
9	Output	10.3V	38.9	38.3
10	Vcc	23.6V	0.49	∞

Table 6 functions and service data of LA78040 /STV9302 (N451)'s Pins

Pin No	Function Description	DT890D Multimeter		
		Voltage of Pin (V)	Ground Resistance (Ω)	
			Measure with Red Probe while grounding Black probe.	Measure with red probe while grounding black probe
1	Inverting input terminal	2.23	800	672
2	Supply voltage	24	770	465
3	Vertical flyback pulse output terminal	2.25	1167	638
4	Ground	0	0	0
5	Vertical output terminal	14.8	365	360
6	Pump supply voltage input	24.5	∞	584
7	Reference voltage	2.24	660	600

Table 7 Functions and service Data of L7809CV(N551)'s Pins

Pin No	Function Description	DT890D Multimeter		
		Voltage of Pin (V)	Ground Resistance (Ω)	
			Measure with Red Probe while grounding Black probe.	Measure with red probe while grounding black probe
1	Input terminal	13	865	477
2	Stable voltage output	8.9	1015	477
3	Ground	0	0	0

CIRCUIT ADJUSTMENT

Item	+B adjustment, TV signal receiving
Measuring equipment	TV SG (Signal generator) Digital multi-meter
Preparation before adj.	The set is turned on Connect the TV SG to RF input terminal of the set.

ADJUSTMENT PROCEDURE

1. Turn RP551 potentiometer to adjust B+ to specified voltage.
2. Check voltage for video out, vertical out, circuit work and audio power out as follow.

	Voltage (VOLT)	Tolerance
Video out	188	±5V
Vertical out	26	±1V
Circuit work	13	±1V
Audio power out	22	±1V

3. TV signal receiving
    a. Press MENU key, to select PRESET item.
    Press V+ or V- key, to select SEMI SEARCH or AUTO SEARCH item, press P+ key to start searching.
    b. Press P+ or P- to inspect the set if there is channel skipped, if so, searching again by FINE as above described.

Item	Picture /AFT IF coil T101 adjustment
Measuring equipment	38MHz signal pattern generator Multi-meter
Preparation before Adj.	Adjust probe

1. Input the 38MHz /38.9MHz /45.75MHz point frequency signal (input level 80db ±5db) from C110 terminal.
2. Connect the digital voltage meter to the cross-point of C137+ (capacitor positive pole).
3. Adjust T101 till the reading on the voltage meter is 3.6V ±0.02V.

Item	RF. AGC adjustment
Measuring equipment	SG and digital multi meter service remote control
Preparation before Adj.	Connect a digital multi meter to TP101 point on the chassis.

1. Receive Philips circular testing signal.
2. Adjust the signal input level to 62db ± 1db.
3. Connect the digital voltage meter to TP –A.
4. Press the PROD (factory) button on the maintenance use remote controller to start adjusting mode.
5. Press CH+ button to select RF. AGC option. Use Vol+ to adjust the value of RF. AGC till the reading on the voltage meter is 5.5V +0.1V.
6. Press PROD (factory) button till exit.

Item	Vertical height, linearity and Hor. Position adjustment
Measuring Equipment	Signal pattern generator service remote controllers
Preparation before Adj.	Brightness, contrast and color should be set in standard

1. Vertical size adjustment
    a. Receive Philips testing (PAL system) signal.
    b. Press PROD (factory) button to start adjusting mode.
    c. Press CH± button to select V.SIZE option, use VOL± to adjust the value of V.SIZE till the vertical over-scan is 8%.
    d. AV receive Philips testing (NTSC system) signal.
    e. Press CH ± button to select NT.V.SIZE function. Use VOL ± to adjust the value of NT. V. SIZE till the vertical over-scan is 8%.
    f. Press PROD (factory) till exit.

2. Vertical center adjustment
    a. Receive Philips circular testing signal (PAL system).
    b. Press PROD (factory) button on the maintenance use remote controller to start adjusting mode.
    c. Press CH ± button to select V.POSI option. Use VOL ± to adjust the value of V.POST till the picture is in the vertical center.
    d. AV receives Philips circular test signal (NTSC system).
    e. Press CH ± button to select NT. V. SIZE option. Use VOL ± to adjust the value of NT. V. SIZE till the picture appears in the vertical center.
    f. Press PROD (FACTORY) till exit.

3. Vertical linearity
    a. Receive Philips circular test signal (PAL system).
    b. Press PROD (FACTORY) button on the maintenance use remote controller to start adjusting mode.
    c. Press CH ± button to select V.LINE option. Use VOL ± button to adjust the value of V.LINE till the vertical linearity reaches the best.
    d. AV receives Philips circular test signal (NTSC system).
    e. Press CH ± button to select NT. LINE option. Use VOL ± button to adjust the value of NT. LINE till the vertical linearity reaches the best.
    f. Press PROD (FACTORY) button till exit.

Item	TV system adapting & AV in /output inspection
Measuring equipment	SG (with NTSC3.58). User remote controller Dual trace oscilloscope
Preparation before Adj.	Input TV and AV signal

Inspection procedure

1. Input the TV signal which system is designated in technical specification.
2. Switch TV system to the set by pressing SYS key on user remote controller according to the TV system in SG. The picture and sound must be normal.
3. Press TV /AV key, to select AV input. The picture and sound must be normal.
4. AV output inspection. Load a 75 Ω resistor to VIDEO output terminal, 1 Vp-p video output signal that is from TV signal should be observed on the oscilloscope. Load a 10K resistor to AUDIO output terminal, 0.7Vp-p audio signal that is from TV should be observed on the oscilloscope.

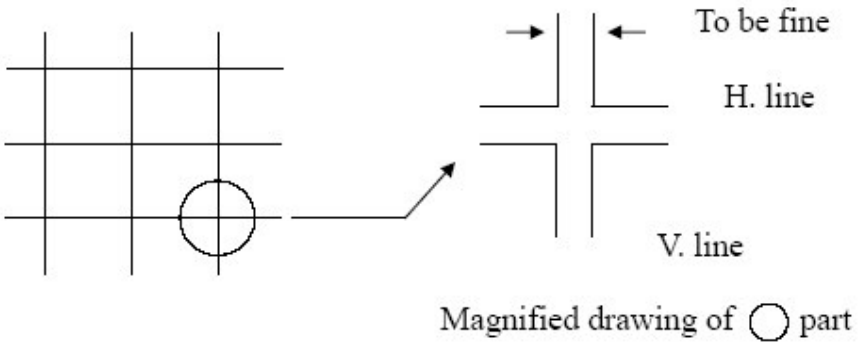
Item	General adjustment
Measuring Equipment	SG Service remote controller and user remote controller
Preparation before Adj.	Brightness, contrast and color should be set in standard Press PP key repeatedly to set the picture at Factory 2 (in standard)

1. Receive the monoscope pattern signal
2. Turn the focus adjusting VR to make the picture clear.
3. Press PRD key on service remote controller to set the set into manufactory adjustment mode.
4. Adjust the picture size roughly by service remote controller.
5. Grid 2 voltage adjustment.
    Press MUTE key on service remote controller, to set the screen into a horizontal line. Clockwise turn screen VR gradually until a horizontal line appears on the screen.
6. Press MUTE key again and changing back to normal screen.

Item	Focus adjustment
Measuring Equipment	SG
Preparation before Adj.	Brightness, contrast and color should be set in standard.

Adjustment procedure

1. Receive the cross-hatch pattern signal.
2. Turn the focus adjusting VR watching the screen and adjust the vertical line of mark to make the most thin. Then the focus adj. VR is set as close low voltage side as possible.
   Stop the focus adj. VR at the point that focus is a bit worse at once, turn back to the left and then turn back to the right a little again.



Item	White balance adjustment
Measuring Equipment	SG and white balance meter Service remote controller
Preparation before Adj.	Warm up the set for more than 30 min. Brightness, contrast and color should be set in standard

1. Operation method

   Adjustment procedure

   a) Press PROD button to enter into “B/W BALANCE” mode, and the first adjustable item “sub-brightness” will turn up then. The OSD display of the bright /dark balance adjustment covers one line on the top to reserve the central space for camera lighting.

   b) Press POS+ /POS- to turn pages to find adjust the selected item.

   c) Press VOL+ or VOL- button to adjust the selected item.

   d) Repeat step b) and c) till a satisfactory result is reached. Press PROD button to quit. In “B/W BALANCE” mode, use figure button “0” ~ “7” to select directly the option to be adjust.

2. Adjustable items table

OSD DISPLAY	CORRESPONDING LA76818 BUS ITEMS	NAME	RANGE VARIABLE
S-BRI	Sub Brightness	Sub Brightness	0~127
R-BIA	Red Bias	Red Bias	0~255
G-BIA	Green Bias	Green Bias	0~255
B-BIA	Blue Bias	Blue Bias	0~255
R-DRV	Red Drive	Red Drive	0~127
G-DRV	Green Drive	Green Drive	0~15
B-DRV	Blue Drive	Blue Drive	0~127
C.B/W	Cross B/W	Internal signal	0~3

3. During maintenance, one bright line can be used to roughly adjust dark balance.

   In “B /W” BALANCE” mode, press MUTE button to enter into one bright line mode; press MUTE button again will return to full screen mode. If the “LINE MODE” option is set to “ON”: in bright line mode the picture status will be set to “FACTORY1” mode, i.e., all the output values on the picture menu are “0”. When full screen returns, the picture status will be set to “FACTORY2” mode, i.e., the settings of brightness and contrast are “100” while the other settings on the picture menu are “0”. If “LINE MODE” is set to “OFF”, then picture modes will not switch.

   In “LINE MODE”, beside MUTE button, the following eight buttons will work, with their function changed as follow. Other buttons will not work.

BUTTON	1	3	5	7
FUNCTION	Sub brightness +	Red bias +	Green Bias +	Blue Bias +
BUTTON	0	2	4	6
FUNCTION	Sub brightness -	Red bias -	Green bias -	Blue bias -

Item	Screen character display adjustment
Measuring Equipment	Service remote controller
Preparation before Adj.	Brightness, contrast and color should be set in standard

1. Receive Philips circular test signal (PAL system).
2. Use PROD (FACTORY) button to enter into adjusting mode.
3. Press CH± button to select OSD. H. POSI option. Use VOL± button to adjust the value of OSD.H.POSI till the characters appear in the horizontal center position.
4. Press CH± button on the maintenance use remote controller to select OSD.V.POSI option. Use VOL± button to adjust the value of OSD.V.POSI to make the characters appear in the vertical center (i.e. make the caption of characters appear in the center of the caption frame of the Philips circular test signal).
5. Press CH± button to select OSD.CONT option. Use VOL± to adjust the value of OSD.CONT till the character display achieves proper brightness.
6. Press PROD (FACTORY) button till exit.

SERVICE MODE AND BUS DATA

1. User's remote control unit enabling "FACTORY" button function
   User's remote control unit has no "PROD (producer)" button. This may bring troubles to maintenance after TV sets exit the factory. So a substitution "PRO" function is specially designed in the software. Its operation is as follows:

   First press "REVIEW" button, then press and hold the "VOL-" button on the TV set and meanwhile press the "REVIEW" button again. The "PRO" button function is enabled then. Repeat the above steps can operate again.

2. Adjusting options and their setting.
   The adjusting options and setting options consist of 12 pages from "MENU 0" to "MENU 12". All the adjusting menus will be available. During practical manufacturing, most of the options are preset in a mother chip. Products of the same batch only need to copy the EEPROM without adjusting. Only a few need adjusting. The adjusting descriptions are as follows:

   Page 1 (MENU 0)

H.PHASE	10	Horizontal center (range: 0~31)
V.SIZE	63	Vertical size (range: 0~127)
V.LINE	14	Vertical linearity (range: 0~31)
V.POSITION	30	Vertical center (range: 0~63)
V.SC	11	Vertical SC correction (range: 0~31)
NT.H.PHASE	5	NTSC system horizontal center deviation (range: -7~+8)
NT.V.SIZE	1	NTSC vertical size deviation (range: -31~+32)
NT.V.LINE	-1	NTSC vertical linearity deviation (range: -7 ~ +8)
NT.V.POI.	30	NTSC vertical center deviation (range: -31~+32)
NT.V.SC	00	NTSC vertical SC correction deviation (range: -7~+8)

Page 2 (MENU 1)

RF.AGC	25	RF.AGC adjustment (range: 0~63)
VOLUME OUT	115	Internal volume output (range: 0~127): only when stereo function is selected can it work
R-Y /B-Y G.BL	8	Corresponding to R-Y /B-Y GAIN BALANCE option of decoding chip (range: 0~15), normally “8” is selected
R-Y /B-Y ANG	8	Corresponding to R-Y /B-Y ANGLE option of decoding chip (range: 0~15), normally “8” is selected
B-Y DC LEVEL	8	
R-Y DC LEVEL	8	
SECAM B-Y DC	8	Corresponding to the SECAM B-Y DC option of LA76818 (range: 0~15), normally “8” is selected.
SECAM R-Y DC	8	Corresponding to SECAM R-Y DC option of LA76818 (range: 0~15), normally “8” is selected.
YUV B-Y DC	8	“B-Y DC” setting for YUV (range: 0~15), available only if LA76818 is used
YUV R-Y DC	8	“R-Y DC” setting for YUV (range: 0~15), available only if LA76818 is used

Page 3 (MENU 2)

ZOOM1 V.SIZE	77	Vertical size during picture zoom (range: 0~127)
ZOOM2 V.SIZE	40	Vertical size during wide screen (range: 0~127)
H. BLK. LEFT	6	Left blanking adjustment (range: 0~7)
H. BLK. RIGHT	4	Right blanking adjustment (range: 0~7)
OSD H.POSI	20	OSD horizontal position (range: 0~127)
OSD V.POSI	20	OSD vertical position (range: 0~31)
OSD. CONT	60	OSD contrast (range: 0~127)
HOTEL MODE	0	
HOTEL VOLUME	60	
ON POSITION	255	

Page 4 (MENU 3)

POWER OPTION	1	POWER mode upon cold start-up (OFF /REMEMBER /ON)
POWER LOGO	0	Power logo option (ON /OFF)
SCREEN TYPE	1	
SCREEN OPT.	3	Screen option when turning on /off (OFF /P/ON /P.OFF /ALL)
SCREEN TIME	1	Black background time interval before drawing curtain: (0~7 seconds)
SCR. H. POSI	10	Auto search if no program storage checked after cold start-up (ON /OFF)
SEARCH CHECK	1	Search speed option (LOW /HIGH)
BAND OPTION	1	Band control option (LA7910 /TUNER /PORT L /PORT H)
AV OPTION	2	AV input option (0~3 ways)
SCART IN AV2	0	

Page 5 (MENU 4)

BACK COLOR	0
BLK PROCESS	1
LINE MODE	1
SENSITIVITY	0
V.MUTE P.OFF	0
CALENDER	1
GAME OPTION	3
ZOOM OPTION	1
MENU BACK	1
MENU ICON	1

Page 6 (MENU 5)

ENGLISH OSD	1
VIETNAMESE	1
INDONESIAN	1
THAI OSD	1
FRANCE OSD	1
THAI DUAL	0

Page 7 (MENU 6)

STEREO OPT	1
STEREO IC	0
WOOF OPTION	0
AV IF STATUS	0
AD POWER KEY	1
SUB. CONT.	31
SUB. COLOR	15
SUB. SHARP	10
SUB. TINT	32
B.B. BRIGHT	60

Page 8 (MENU 7)

PAL OPTION	1
N3.58 OPTION	1
N4.43 OPTION	1
SECAM OPTION	0
COLOR AUTO	1
4.5M OPTION	0
5.5M OPTION	1
6.0M OPTION	1
6.5M OPTION	1

Page 9 (MENU 8)

H.FREQUENCE	32
AFC GAIN	1
V. SEPUP	1
VIDEO. LEVEL	7
FM. LEVEL	16
CD. MODE	0
SOUND TRAP	4
H. TONE DEF.	0
HALF TONE	3
DIGITAL OSD	0

Page 10 (MENU 9)

VOL. FILTER	1
VIF. SYS. SW	1
BRT. ABL. DEF	0
MID. STP. DEF	0
BRT. ABL. TH	4
RGB TEMP SW.	0
YUV OPTION	1
FSC. /C-SYNC	0
VCO ADJ. SW.	0
C. VCO. ADJ	2

Page 11 (MENU 10)

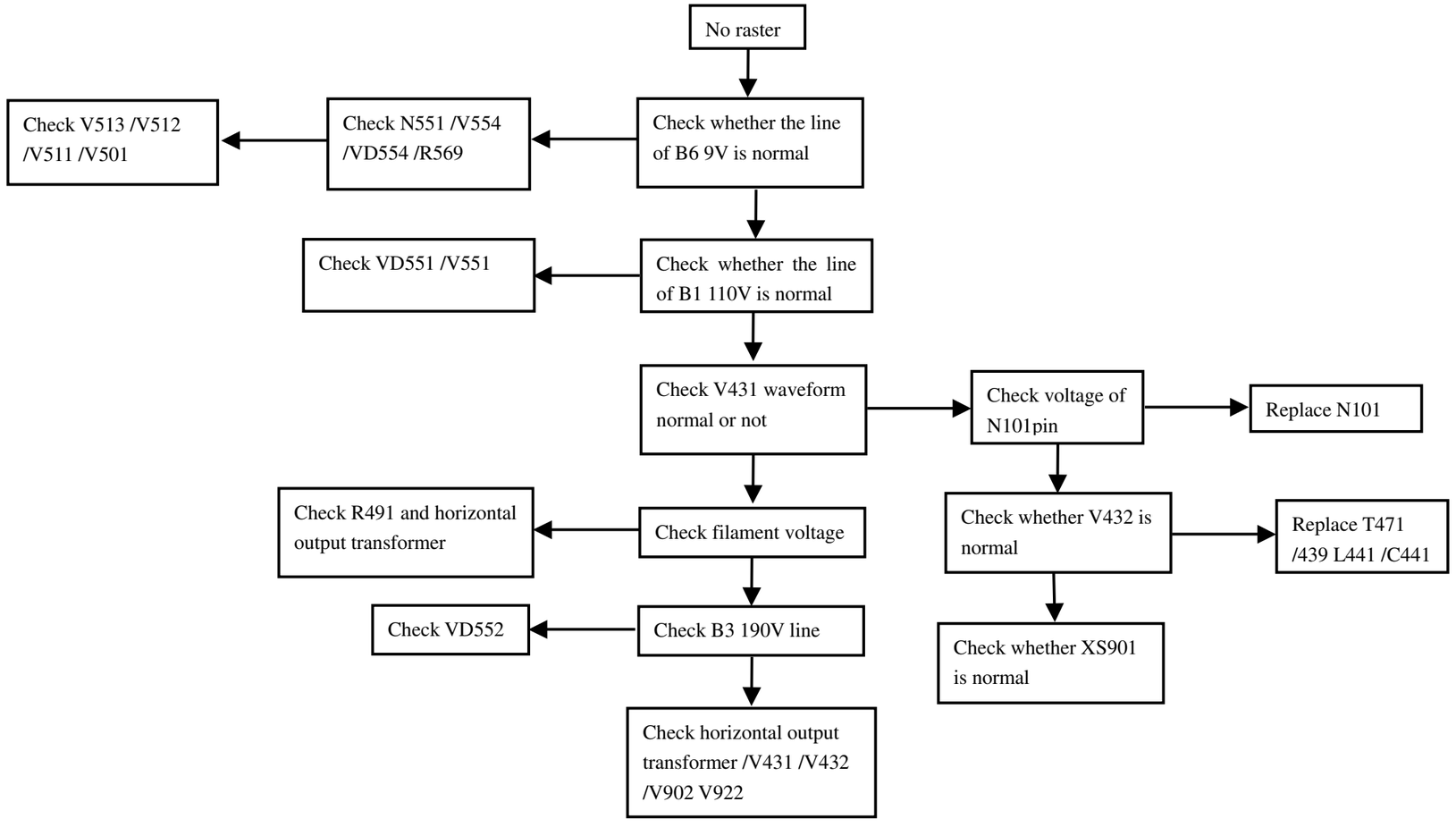
VREST TIMING	0
G-Y ANGLE	0
C. KILLER OPE	0
V. BLK.SW	0
FBPBLK. SW	0
WPL OPE	0
PRE /OVER ADJ	0
PRE /OVER SW.	0
CORING W/DEF	3

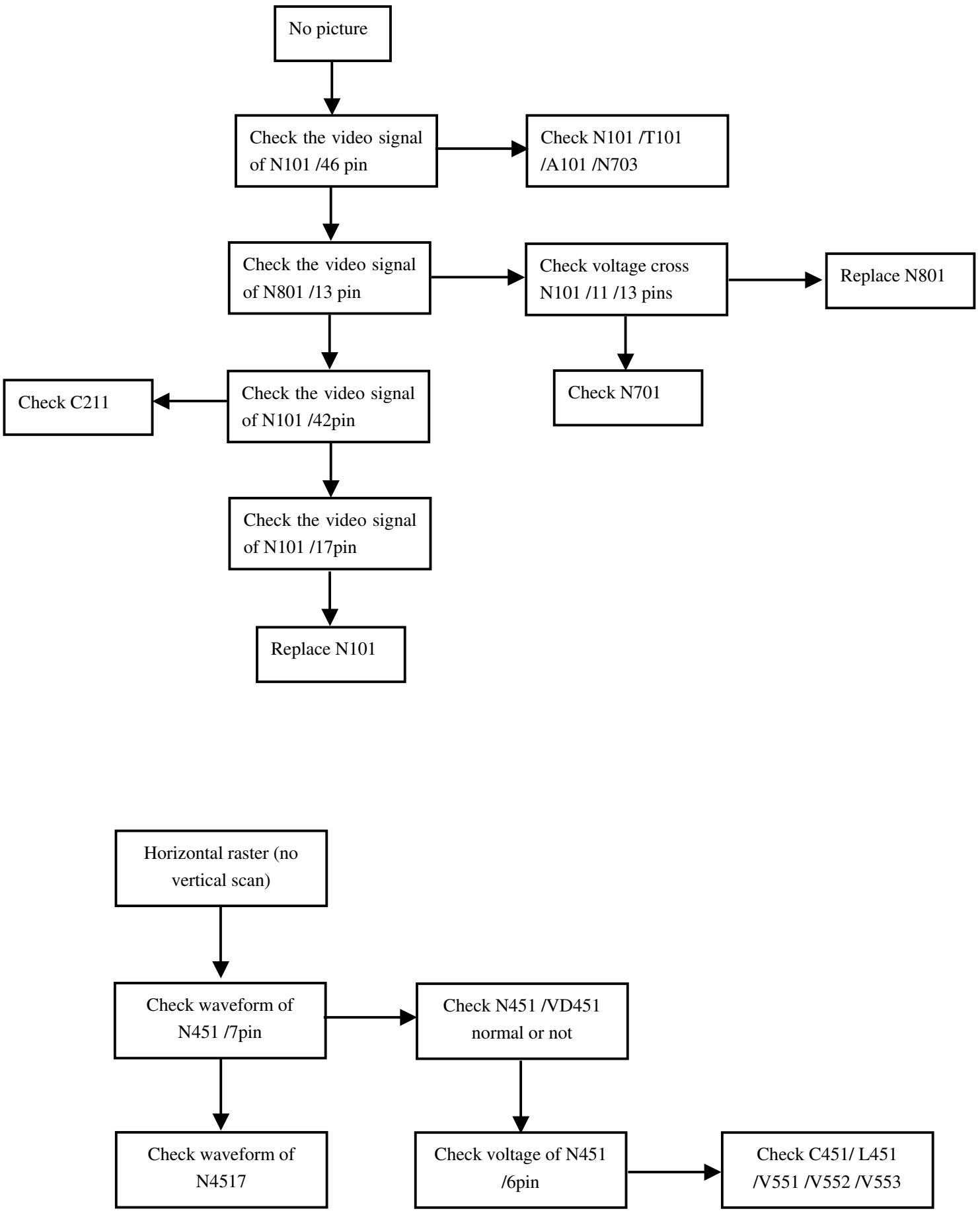
Page 12 (MENU 11)

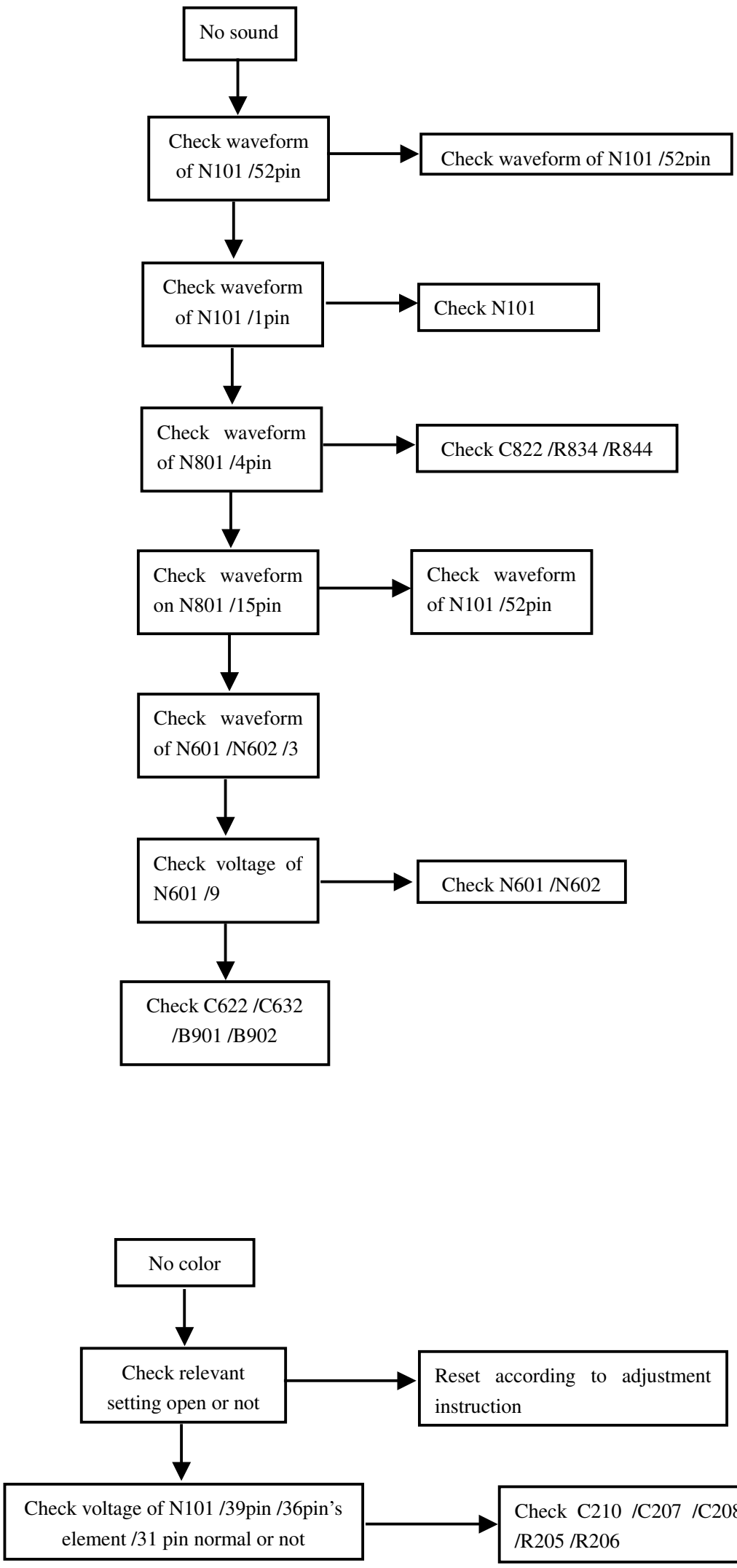
Y GAMMA STA.	0
DC. REST	3
BLK. STR. STA	0
BLK. STR. GAIN	2
A. MONI. SW	0
S. TRAP. SW	1
V. LEV. OFFSET	2
OVER. MOD. SW	0
OV. MOD. LEVEL	0

Note: Only when the over modulation switch is set to “ON” and the program to be compensated is fine adjusted (i.e., the auto digital AFT control is off), can this over modulation adjusting function work.

TROUBLE SHOOTING FLOW CHART




No picture
Check the video signal of N101 /46 pin
Check N101 /T101 /A101 /N703
Check the video signal of N801 /13 pin
Check voltage cross N101 /11 /13 pins
Replace N801
Check C211
Check the video signal of N101 /42pin
Check N701
Check the video signal of N101 /17pin
Replace N101
Horizontal raster (no vertical scan)
Check waveform of N451 /7pin
Check N451 /VD451 normal or not
Check waveform of N4517
Check voltage of N451 /6pin
Check C451/ L451 /V551 /V552 /V553


No sound
Check waveform of N101 /52pin
Check waveform of N101 /52pin
Check waveform of N101 /1pin
Check N101
Check waveform of N801 /4pin
Check C822 /R834 /R844
Check waveform on N801 /15pin
Check waveform of N101 /52pin
Check waveform of N601 /N602 /3
Check voltage of N601 /9
Check N601 /N602
Check C622 /C632 /B901 /B902
No color
Check relevant setting open or not
Reset according to adjustment instruction
Check voltage of N101 /39pin /36pin's element /31 pin normal or not
Check C210 /C207 /C208 /R205 /R206

PART LIST

Location No.	Part No.	Name	Type
R452	D10B4R7J-T	CARBON RES	RT13-1/6W-4.7 ±5%
R617	D10B4R7J-T	CARBON RES	RT13-1/6W-4.7 ±5%
R627	D10B4R7J-T	CARBON RES	RT13-1/6W-4.7 ±5%
R111	D10B330J-T	CARBON RES	RT13-1/6W-33 ±5%
R243	D10B330J-T	CARBON RES	RT13-1/6W-33 ±5%
R935	D10B330J-T	CARBON RES	RT13-1/6W-33 ±5%
R936	D10B330J-T	CARBON RES	RT13-1/6W-33 ±5%
W111	D10B330J-T	CARBON RES	RT13-1/6W-33 ±5%
R107	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R241	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R242	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R271	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R275	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R276	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R766	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R770	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R774	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R809	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R817	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R818	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R820	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R821	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R902	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R912	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R922	D10B101J-T	CARBON RES	RT13-1/6W-100 ±5%
R110	D10B221J-T	CARBON RES	RT13-1/6W-220 ±5%
R744	D10B221J-T	CARBON RES	RT13-1/6W-220 ±5%
R745	D10B221J-T	CARBON RES	RT13-1/6W-220 ±5%
R122	D10B331J-T	CARBON RES	RT13-1/6W-330 ±5%
R127	D10B331J-T	CARBON RES	RT13-1/6W-330 ±5%
R725	D10B331J-T	CARBON RES	RT13-1/6W-330 ±5%
R517	D10B471J-T	CARBON RES	RT13-1/6W-470 ±6%
R728	D10B471J-T	CARBON RES	RT13-1/6W-470 ±6%
R801	D10B471J-T	CARBON RES	RT13-1/6W-470 ±6%

Location No.	Part No.	Name	Type
R778	D10B561J-T	CARBON RES	RT13-1/6W-560 ±5%
R780	D10B561J-T	CARBON RES	RT13-1/6W-560 ±5%
R409	D10B681J-T	CARBON RES	RT13-1/6W-680 ±5%
R610	D10B681J-T	CARBON RES	RT13-1/6W-680 ±5%
R620	D10B681J-T	CARBON RES	RT13-1/6W-680 ±5%
R904	D10B681J-T	CARBON RES	RT13-1/6W-680 ±5%
R914	D10B681J-T	CARBON RES	RT13-1/6W-680 ±5%
R924	D10B681J-T	CARBON RES	RT13-1/6W-680 ±5%
R931	D10B681J-T	CARBON RES	RT13-1/6W-680 ±5%
R906	D10B751J-T	CARBON RES	RT13-1/6W-750 ±5%
R916	D10B751J-T	CARBON RES	RT13-1/6W-750 ±5%
R926	D10B751J-T	CARBON RES	RT13-1/6W-750 ±5%
R727	D10B821J-T	CARBON RES	RT13-1/6W-750 ±5%
R802	D10B821J-T	CARBON RES	RT13-1/6W-750 ±5%
R101	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R119	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R121	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R131	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R201	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R232	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R458	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R611	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R612	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R733	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R808	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R812	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R814	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R815	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R932	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R933	D10B102J-T	CARBON RES	RT13-1/6W-1K ±5%
R109	D10B122J-T	CARBON RES	RT13-1/6W-1.2K ±5%
R202	D10B122J-T	CARBON RES	RT13-1/6W-1.2K ±5%
R567	D10B122J-T	CARBON RES	RT13-1/6W-1.2K ±5%
R804	D10B122J-T	CARBON RES	RT13-1/6W-1.2K ±5%
R722	D10B152J-T	CARBON RES	RT13-1/6W-1.5K ±5%
R523	D10B182J-T	CARBON RES	RT13-1/6W-1.8K ±5%
R401	D10B222J-T	CARBON RES	RT13-1/6W-2.2K ±5%

Location No.	Part No.	Name	Type
R408	D10B222J-T	CARBON RES	RT13-1/6W-2.2K ±5%
R707	D10B222J-T	CARBON RES	RT13-1/6W-2.2K ±5%
R759	D10B222J-T	CARBON RES	RT13-1/6W-2.2K ±5%
R831	D10B222J-T	CARBON RES	RT13-1/6W-2.2K ±5%
R705	D10B272J-T	CARBON RES	RT13-1/6W-2.7K ±5%
R900	D10B272J-T	CARBON RES	RT13-1/6W-2.7K ±5%
R272	D10B332J-T	CARBON RES	RT13-1/6W-3.3K ±5%
R402	D10B332J-T	CARBON RES	RT13-1/6W-3.3K ±5%
R454	D10B332J-T	CARBON RES	RT13-1/6W-3.3K ±5%
R742	D10B332J-T	CARBON RES	RT13-1/6W-3.3K ±5%
R743	D10B332J-T	CARBON RES	RT13-1/6W-3.3K ±5%
R704	D10B392J-T	CARBON RES	RT13-1/6W-3.9K ±5%
R108	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R124	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R125	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R703	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R724	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R741	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R736	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R738	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R740	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R777	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R778	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R803	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R826	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R934	D10B472J-T	CARBON RES	RT13-1/6W-4.7K ±5%
R404	D10B512J-T	CARBON RES	RT13-1/6W-5.1K ±5%
R451	D10B562J-T	CARBON RES	RT13-1/6W-5.6K ±5%
R511	D10B562J-T	CARBON RES	RT13-1/6W-5.6K ±5%
R553	D10B562J-T	CARBON RES	RT13-1/6W-5.6K ±5%
R714	D10B562J-T	CARBON RES	RT13-1/6W-5.6K ±5%
R715	D10B562J-T	CARBON RES	RT13-1/6W-5.6K ±5%
R716	D10B562J-T	CARBON RES	RT13-1/6W-5.6K ±5%
R819	D10B562J-T	CARBON RES	RT13-1/6W-5.6K ±5%
R702	D10B822J-T	CARBON RES	RT13-1/6W-8.2K ±5%
R723	D10B822J-T	CARBON RES	RT13-1/6W-8.2K ±5%
R773	D10B822J-T	CARBON RES	RT13-1/6W-8.2K ±5%

Location No.	Part No.	Name	Type
R776	D10B822J-T	CARBON RES	RT13-1/6W-8.2K ±5%
R412	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R413	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R561	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R564	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R566	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R630	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R631	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R632	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R708	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R712	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R720	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R721	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R730	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R731	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R734	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R735	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R754	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R767	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R771	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R772	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R775	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R807	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R811	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R813	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R816	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R824	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R834	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R835	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R844	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R845	D10B103J-T	CARBON RES	RT13-1/6W-10K ±5%
R120	D10B123J-T	CARBON RES	RT13-1/6W-12K ±5%
R456	D10B153J-T	CARBON RES	RT13-1/6W-15K ±5%
R769	D10B153J-T	CARBON RES	RT13-1/6W-15K ±5%
R205	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R206	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R457	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%

Location No.	Part No.	Name	Type
R515	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R746	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R747	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R748	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R749	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R751	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R753	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R755	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R756	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R757	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R758	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R760	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R761	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R762	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R763	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R764	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R765	D10B223J-T	CARBON RES	RT13-1/6W-22K ±5%
R455	D10B273J-T	CARBON RES	RT13-1/6W-27K ±5%
R701	D10B273J-T	CARBON RES	RT13-1/6W-27K ±5%
R711	D10B273J-T	CARBON RES	RT13-1/6W-27K ±5%
R103	D10B333J-T	CARBON RES	RT13-1/6W-33K ±5%
R710	D10B333J-T	CARBON RES	RT13-1/6W-33K ±5%
R732	D10B823J-T	CARBON RES	RT13-1/6W-82K ±5%
R113	D10B104J-T	CARBON RES	RT13-1/6W-100K ±5%
R114	D10B104J-T	CARBON RES	RT13-1/6W-100K ±5%
VD401	D10B104J-T	CARBON RES	RT13-1/6W-100K ±5%
R104	D10B154J-T	CARBON RES	RT13-1/6W-150K ±5%
R700	D10B154J-T	CARBON RES	RT13-1/6W-150K ±5%
R729	D10B154J-T	CARBON RES	RT13-1/6W-150K ±5%
R726	D10B274J-T	CARBON RES	RT13-1/6W-270K ±5%
R403	D10B334J-T	CARBON RES	RT13-1/6W-330K ±5%
R204	D10B394J-T	CARBON RES	RT13-1/6W-390K ±5%
R709	D10B394J-T	CARBON RES	RT13-1/6W-390K ±5%
VD402	D10B564J-T	CARBON RES	RT13-1/6W-560K ±5%
R210	D10B624J-T	CARBON RES	RT13-1/6W-620K ±5%
R446	D10C2R7J-T	CARBON RES	RT14-1/4W-2.7 ±5%
R519	D10C220J-T	CARBON RES	RT14-1/4W-22 ±5%

Location No.	Part No.	Name	Type
R940	D10C330J-T	CARBON RES	RT14-1/4W-33 ±5%
R400	D10C151J-T	CARBON RES	RT14-1/4W-150 ±6%
R582	D10C471J-T	CARBON RES	RT14-1/4W-470 ±5%
R581	D10C561J-T	CARBON RES	RT14-1/4W-560 ±5%
R453	D10C182J-T	CARBON RES	RT14-1/4W-1.8K ±5%
R526	D10C222J-T	CARBON RES	RT14-1/4W-2.2K ±5%
R565	D10C392J-T	CARBON RES	RT14-1/4W-3.9K ±5%
R522	D10C153J-T	CARBON RES	RT14-1/4W-15K ±5%
R556	D10C223J-T	CARBON RES	RT14-1/4W-22K ±5%
R552	D10C513J-T	CARBON RES	RT14-1/4W-51K ±5%
R552A	D10C513J-T	CARBON RES	RT14-1/4W-51K ±5%
R554	D10C154J-T	CARBON RES	RT14-1/4W-150K ±5%
R459	D10D1R8J-T	CARBON RES	RT15-1/2W-1.8 ±5%
R461	D10D101J-T	CARBON RES	RT15-1/2W-100 ±5%
R460	D10D331J-T	CARBON RES	RT15-1/2W-330 ±5%
R433	D10D102J-T	CARBON RES	RT15-1/2W-1K ±5%
R908	D10D272J-T	CARBON RES	RT15-1/2W-2.7K ±5%
R918	D10D272J-T	CARBON RES	RT15-1/2W-2.7K ±5%
R928	D10D272J-T	CARBON RES	RT15-1/2W-2.7K ±5%
R560	D10D332J-T	CARBON RES	RT15-1/2W-3.3K ±6%
R555	D10D473J-T	CARBON RES	RT15-1/2W-47K ±5%
R520	D10D124J-T	CARBON RES	RT15-1/2W-120K ±5%
R521	D10D124J-T	CARBON RES	RT15-1/2W-120K ±5%
R558	D10D224J-T	CARBON RES	RT15-1/2W-220K ±5%
R105	S10E330J-C	OXIDE FILM RES	RY16-1W-33 ±5%
R441	S10E102J-S(A)	OXIDE FILM RES	RY16-1W-1K ±5%
R907	S10E104J-C	OXIDE FILM RES	RY16-1W-10K ±5%
R917	S10E104J-C	OXIDE FILM RES	RY16-1W-10K ±5%
R927	S10E104J-C	OXIDE FILM RES	RY16-1W-10K ±5%
R563	S10F270J-C	OXIDE FILM RES	RY17-2W-27 ±5%
R525	S10F680J-C	OXIDE FILM RES	RY17-2W-68 ±5%
R580	S10F151J-C	OXIDE FILM RES	RY17-2W-150 ±5%
R434	S10F271J-C	OXIDE FILM RES	RY17-2W-270 ±5%
R491	S10F103J-C	OXIDE FILM RES	RY17-2W-10K ±5%
R551	S10F123J-C	OXIDE FILM RES	RY17-2W-12K ±5%
R718	S10F123J-C	OXIDE FILM RES	RY17-2W-12K ±5%
R525	S10G560J-C	OXIDE FILM RES	RY18-3W-56 ±5%

Location No.	Part No.	Name	Type
R273	S10B472J-T	METALFILM RES	RJ24-1/4W-4K7-1%
R531	C10D246K-T	Glass-Glazed Fixed RES	RI40-1/2W-24M ±5%
R569	F10DR47J-C	FUSE RES	RF10-1/2W-0.47 ±5%
R550	F10D1R0J-C	FUSE RES	RF10-1/2W-1 ±5%
R562	F10D1R0J-C	FUSE RES	RF10-1/2W-1 ±5%
R930	F10F1R8J-C	FUSE RES	RF10-1/2W-1.8 ±5%
R471	W11H3R9K	WIRE RES	RXG6-5W-3.9 -J 立式
R502	W10J3R9K	WIRE RES	RXG6-6W-3.9 -J 式
RT501	P10X180J-C	Thermal RES	PTC-180HM
RP551	V11D202B	VARIABLE RES	WI06-2AA2K
C704	C2CF150J-T	CERAMIC CAPA.	CC1-06A-CH-50/63V-15pF-J
C125	C2CF180J-T	CERAMIC CAPA.	CC1-06A-CH-50/63V-18pF-J
C705	C2CF180J-T	CERAMIC CAPA.	CC1-06A-CH-50/63V-18pF-J
C126	C2CF390J-T	CERAMIC CAPA.	CC1-06A-CH-50/63V-39pF-J
C707	C2CF181J-T	CERAMIC CAPA.	CC1-06A-CH-50/63V-180pF-J
C706	C2SF221K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-220pF-J
C901	C2SF391K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-390pF-J
C911	C2SF391K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-390pF-J
C921	C2SF391K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-390pF-J
C121	C2SF471K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-470pF-J
C771	C2SF471K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-470pF-J
C772	C2SF471K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-470pF-J
C123	C2BF102K-T	CERAMIC CAPA.	CT1-06A-2B4-50/63V-1000pF-K
C102	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C110	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C111	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C112	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C116	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
R558	D10D224J-T	CARBON RES	RT15-1/2W-220K ±5%
R105	S10E330J-C	OXIDE FILM RES	RY16-1W-33 ±5%
R441	S10E102J-S(A)	OXIDE FILM RES	RY16-1W-1K ±5%
R907	S10E104J-C	OXIDE FILM RES	RY16-1W-10K ±5%
R917	S10E104J-C	OXIDE FILM RES	RY16-1W-10K ±5%
R927	S10E104J-C	OXIDE FILM RES	RY16-1W-10K ±5%
R563	S10F270J-C	OXIDE FILM RES	RY17-2W-27 ±5%
R525	S10F680J-C	OXIDE FILM RES	RY17-2W-68 ±5%
R580	S10F151J-C	OXIDE FILM RES	RY17-2W-150 ±5%

Location No.	Part No.	Name	Type
R434	S10F271J-C	OXIDE FILM RES	RY17-2W-270 ±5%
R491	S10F103J-C	OXIDE FILM RES	RY17-2W-10K ±5%
R551	S10F123J-C	OXIDE FILM RES	RY17-2W-12K ±5%
R718	S10F123J-C	OXIDE FILM RES	RY17-2W-12K ±5%
R525	S10G560J-C	OXIDE FILM RES	RY18-3W-56 ±5%
R273	S10B472J-T	METALFILM RES	RJ24-1/4W-4K7-1%
R531	C10D246K-T	Glass-Glazed Fixed RES	RI40-1/2W-24M ±5%
R569	F10DR47J-C	FUSE RES	RF10-1/2W-0.47 ±5%
R550	F10D1R0J-C	FUSE RES	RF10-1/2W-1 ±5%
R562	F10D1R0J-C	FUSE RES	RF10-1/2W-1 ±5%
R930	F10F1R8J-C	FUSE RES	RF10-1/2W-1.8 ±5%
R471	W11H3R9K	WIRE RES	RXG6-5W-3.9 -J 立式
R502	W10J3R9K	WIRE RES	RXG6-6W-3.9 -J 式
RT501	P10X180J-C	Thermal RES	PTC-180HM
RP551	V11D202B	VARIABLE RES	WI06-2AA2K
C704	C2CF150J-T	CERAMIC CAPA.	CC1-06A-CH-50/63V-15pF-J
C125	C2CF180J-T	CERAMIC CAPA.	CC1-06A-CH-50/63V-18pF-J
C705	C2CF180J-T	CERAMIC CAPA.	CC1-06A-CH-50/63V-18pF-J
C126	C2CF390J-T	CERAMIC CAPA.	CC1-06A-CH-50/63V-39pF-J
C707	C2CF181J-T	CERAMIC CAPA.	CC1-06A-CH-50/63V-180pF-J
C706	C2SF221K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-220pF-J
C901	C2SF391K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-390pF-J
C911	C2SF391K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-390pF-J
C921	C2SF391K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-390pF-J
C121	C2SF471K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-470pF-J
C771	C2SF471K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-470pF-J
C772	C2SF471K-T	CERAMIC CAPA.	CC1-06A-SL-50/63V-470pF-J
C123	C2BF102K-T	CERAMIC CAPA.	CT1-06A-2B4-50/63V-1000pF-K
C102	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C110	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C111	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C112	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C116	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C118	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C119	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C122	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z

Location No.	Part No.	Name	Type
C205	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C245	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C274	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C275	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C277	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C279	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C405	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C556	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C568	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C571	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C607	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C616	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C625	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C702	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C703	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C720	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C729	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C802	C2FF103Z-T	CERAMIC CAPA.	CT1-06A-2F4-50/63V-0.01uF-Z
C432	C2BP102K-T	CERAMIC CAPA.	CT1-08C-2B4-500V-1000pF-K
C433	C2BP392K-T	CERAMIC CAPA.	CT1-08C-2B4-500V-3900pF-K
C455	C2SP100D-T	CERAMIC CAPA.	CT1-07-B-500V-10PF-±10%
C503	C2BW102K-O	CERAMIC CAPA.	CT81-08C-2R-1KV-1000pF-K
C504	C2BW102K-O	CERAMIC CAPA.	CT81-08C-2R-1KV-1000pF-K
C505	C2BW102K-O	CERAMIC CAPA.	CT81-08C-2R-1KV-1000pF-K
C506	C2BW102K-O	CERAMIC CAPA.	CT81-08C-2R-1KV-1000pF-K
C552	C2BW471K-O	CERAMIC CAPA.	CT81-08C-2R-1KV-470pF-K
C551	C2RX221K-O	CERAMIC CAPA.	CT81-08C-2R-2KV-220pF-K
C438	C2RX471K-O	CERAMIC CAPA.	CT81-08C-2R-2KV-470pF-K
C516	C2RX681K-O	CERAMIC CAPA.	CT81-08C-2R-2KV-680pF-K
C940	C2EX222Z-O	CERAMIC CAPA.	CT81-08C-2R-2KV-2200pF-K
C533	C2EM102M-O	CERAMIC CAPA.	CK/CTJ1-400V/AC250V-1000PF-±20%
C615	E20C2R2M-T	Electrolytic Capa.	CD110-16V-2.2uF -M
C626	E20C2R2M-T	Electrolytic Capa.	CD110-16V-2.2uF -M
C714	E20C2R2M-T	Electrolytic Capa.	CD110-16V-2.2uF -M
C103	E20C4R7M-T	Electrolytic Capa.	CD110-16V-4.7uF -M

Location No.	Part No.	Name	Type
C105	E20C4R7M-T	Electrolytic Capa.	CD110-16V-4.7uF -M
C203	E20C4R7M-T	Electrolytic Capa.	CD110-16V-4.7uF -M
C104	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C276	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C104	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C276	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C611	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C621	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C773	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C774	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C807	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C808	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C809	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C810	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C813	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C814	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C822	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C931	E20C100M-T	Electrolytic Capa.	CD110-16V-10uF -M
C932	E20C220M-T	Electrolytic Capa.	CD110-16V-22uF -M
C101	E20C470M-T	Electrolytic Capa.	CD110-16V-47uF -M
C206	E20C470M-T	Electrolytic Capa.	CD110-16V-47uF –M
C244	E20C470M-T	Electrolytic Capa.	CD110-16V-47uF –M
C278	E20C470M-T	Electrolytic Capa.	CD110-16V-47uF –M
C404	E20C470M-T	Electrolytic Capa.	CD110-16V-47uF –M
C701	E20C470M-T	Electrolytic Capa.	CD110-16V-47uF –M
C719	E20C470M-T	Electrolytic Capa.	CD110-16V-47uF –M
C801	E20C470M-T	Electrolytic Capa.	CD110-16V-47uF -M
C115	E20C101M-T	Electrolytic Capa.	CD110-16V-100uF -M
C613	E20C101M-T	Electrolytic Capa.	CD110-16V-100uF –M
C614	E20C101M-T	Electrolytic Capa.	CD110-16V-100uF –M
C623	E20C101M-T	Electrolytic Capa.	CD110-16V-100uF –M
C624	E20C101M-T	Electrolytic Capa.	CD110-16V-100uF –M
C631	E20C101M-T	Electrolytic Capa.	CD110-16V-100uF –M
C805	E20C101M-T	Electrolytic Capa.	CD110-16V-100uF -M
C550	E20C471M-T	Electrolytic Capa.	CD110-16V-470uF -M
C570	E20C471M-T	Electrolytic Capa.	CD110-16V-470uF -M
C572	E20C471M-T	Electrolytic Capa.	CD110-16V-470uF -M

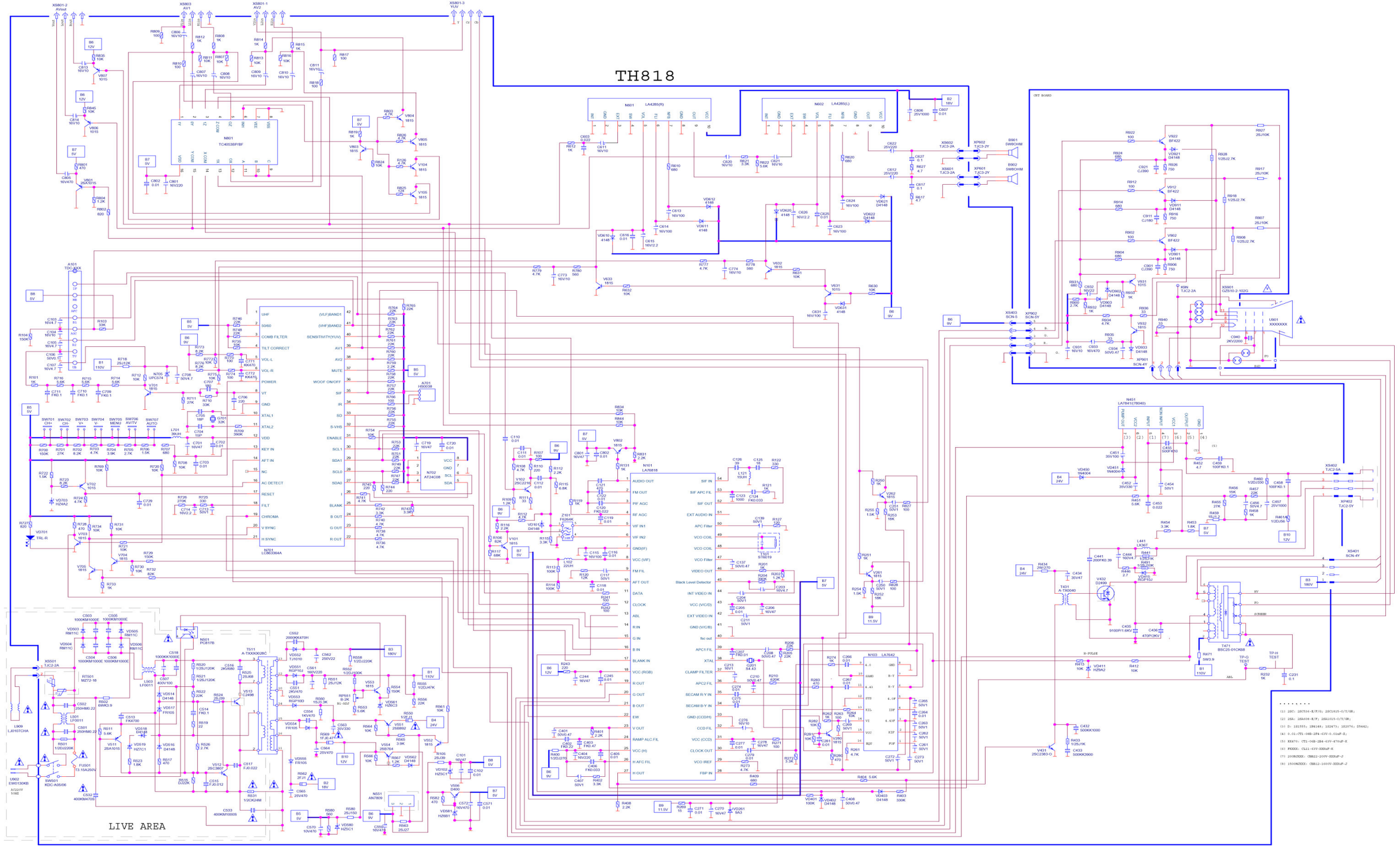
Location No.	Part No.	Name	Type
C933	E20C471M-T	Electrolytic Capa.	CD110-16V-470uF -M
C612	E20D221M-T	Electrolytic Capa.	CD110-25V-220uF -M
C622	E20D221M-T	Electrolytic Capa.	CD110-25V-220uF -M
C564	E20D471M-T	Electrolytic Capa.	CD110-25V-470uF -M
C565	E20D471M-T	Electrolytic Capa.	CD110-25V-470uF –M
C457	E20D102M	Electrolytic Capa.	CD110-25V-1000uF -M
C582	E20D102M	Electrolytic Capa.	CD110-25V-1000uF -M
C606	E20D102M	Electrolytic Capa.	CD110-25V-1000uF -M
C434	E20E470M-T	Electrolytic Capa.	CD110-35V-47uF -M
C451	E20E101M-T	Electrolytic Capa.	CD110-35V-100uF -M
C452	E20E331M-T	Electrolytic Capa.	CD110-35V-330uF -M
C563	E20E331M-T	Electrolytic Capa.	CD110-35V-330uF -M
C106	E20F0R1MR	Electrolytic Capa.	CD117-50V-0.1uF -M
C402	E20F0R22MR	Electrolytic Capa.	CD117-50V-0.22uF -M
C137	E20FR47M-T	Electrolytic Capa.	CD110-50V-0.47uF -M
C139	E20FR47M-T	Electrolytic Capa.	CD110-50V-0.47uF -M
C208	E20FR47M-T	Electrolytic Capa.	CD110-50V-0.47uF –M
C401	E20FR47M-T	Electrolytic Capa.	CD110-50V-0.47uF –M
C403	E20FR47M-T	Electrolytic Capa.	CD110-50V-0.47uF –M
C408	E20FR47M-T	Electrolytic Capa.	CD110-50V-0.47uF –M
C934	E20FR47M-T	Electrolytic Capa.	CD110-50V-0.47uF –M
C117	E20F1R0M-T	Electrolytic Capa.	CD110-50V-1uF -M
C204	E20F1R0M-T	Electrolytic Capa.	CD110-50V-1uF –M
C210	E20F1R0M-T	Electrolytic Capa.	CD110-50V-1uF –M
C211	E20F1R0M-T	Electrolytic Capa.	CD110-50V-1uF –M
C213	E20F1R0M-T	Electrolytic Capa.	CD110-50V-1uF –M
C407	E20F1R0M-T	Electrolytic Capa.	CD110-50V-1uF –M
C713	E20F1R0M-T	Electrolytic Capa.	CD110-50V-1uF –M
C806	E20F1R0M-T	Electrolytic Capa.	CD110-50V-1uF –M
C811	E20F1R0M-T	Electrolytic Capa.	CD110-50V-1uF –M
C456	E20F4R7M-T	Electrolytic Capa.	CD110-50V-4.7uF -M
C708	E20F4R7M-T	Electrolytic Capa.	CD110-50V-4.7uF -M
C444	E21H4R7M-T	Electrolytic Capa.	CD263-160V-4.7uF -M
C562	E20H100M-T	Electrolytic Capa.	CD110-160V-10uF -M
C561	E20H101M	Electrolytic Capa.	CD110-160V-100uF-M
C507	E20M101M	Electrolytic Capa.	CD293-400V-100uF-±10%
C453	F20F222J-T	FILM CAPA	CL11-50V/63V-2200PF-K

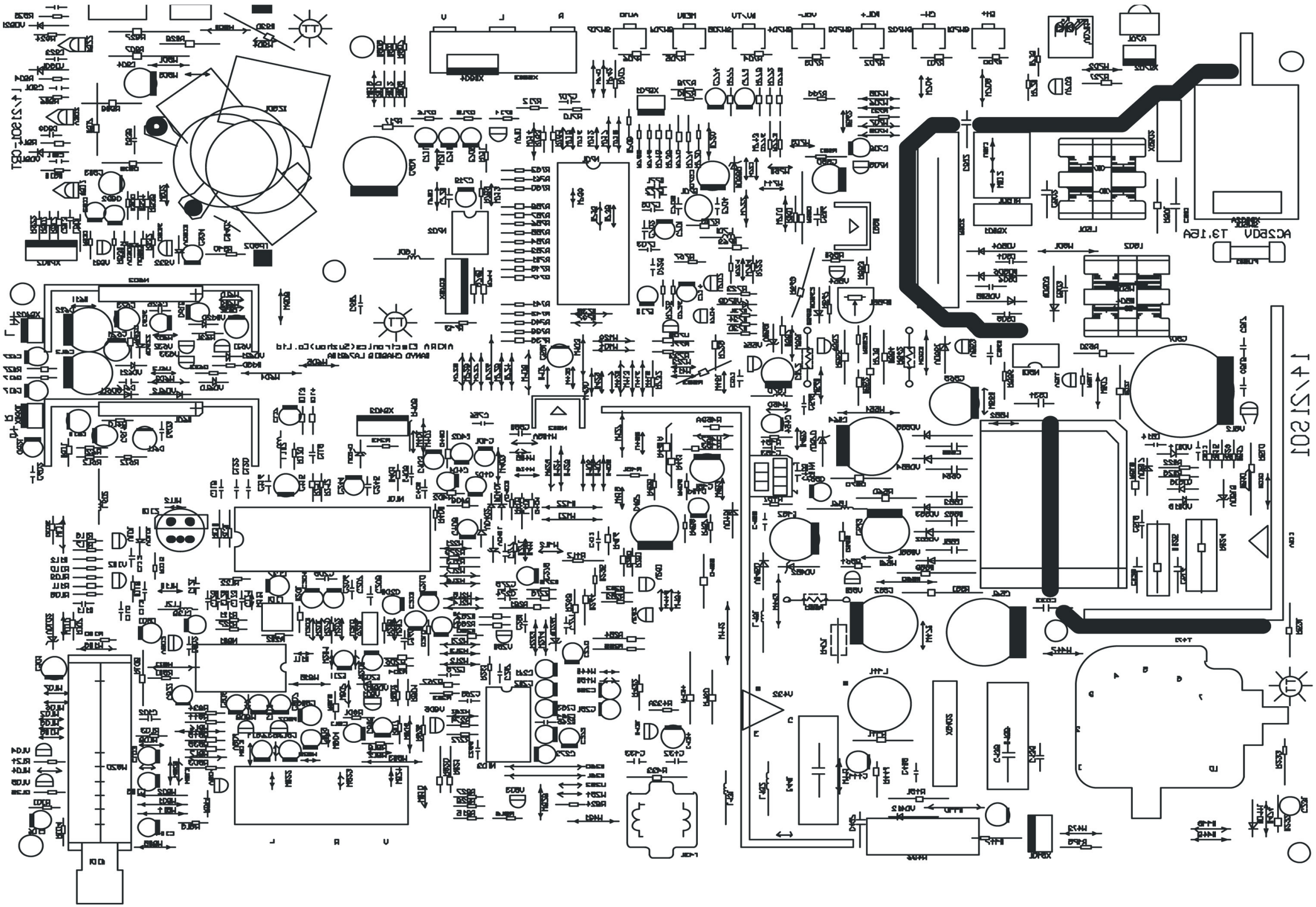
Location No.	Part No.	Name	Type
C602	F20F222J-T	FILM CAPA	CL11-50V/63V-2200PF-K
C603	F20F222J-T	FILM CAPA	CL11-50V/63V-2200PF-K
C515	F22F123J-T	FILM CAPA	CL21X-50V/63V-0.012uF-K
C406	F22F153J-T	FILM CAPA	CL21X-50V/63V-0.015uF-K
C120	F20F223K-T	FILM CAPA	CL11-50V/63V-0.022uF-K
C517	F20F223K-T	FILM CAPA	CL11-50V/63V-0.022uF-K
C124	F20F333K-T	FILM CAPA	CL11-50V/63V-0.033uF-K
C207	F20F473K-T	FILM CAPA	CL11-50V/63V-0.047uF-K
C513	F20F473K-T	FILM CAPA	CL11-50V/63V-0.047uF-K
C454	F20F563K-T	FILM CAPA	CL11-50V/63V-0.056uF-K
C514	F20F104K-T	FILM CAPA	CL11-63V-0.1uF-K
C617	F20F104K-T	FILM CAPA	CL11-63V-0.1uF-K
C627	F20F104K-T	FILM CAPA	CL11-63V-0.1uF-K
C709	F20F104K-T	FILM CAPA	CL11-63V-0.1uF-K
C710	F20F104K-T	FILM CAPA	CL11-63V-0.1uF-K
C711	F20F104K-T	FILM CAPA	CL11-63V-0.1uF-K
C231	F20G104K-T	FILM CAPA	CL11-100V-0.1uF-K
C458	F20G104K-T	FILM CAPA	CL11-100V-0.1uF-K
C459	F20G104K-T	FILM CAPA	CL11-100V-0.1uF-K
C501	F20R224M	FILM CAPA	CBB62-250VAC-0.22uF
C436	F20Z822J	FILM CAPA	CBB81-1.6KV-8200PF-J
C441	F20J394J	FILM CAPA	CBB21-200V-0.39uF±5%
L501	LMXX0002	Coil And Inductance	14″ DEGAUS COLL
T101	TLXX0021	Coil And Inductance	M-Frequency Transformer ST6019
L121	L3X15R2K-T	Coil And Inductance	LGA0307-15uH-K
L102	L3X22R2K-T	Coil And Inductance	LGA0307-22uH-K
L701	L3X1390K-T	Coil And Inductance	LGA0307-39uH-K
N501	RX0001XX	PHOTO COUPLE	PC817B/C
VD701	DL0008XX	DIODE	LED(RED 5mm)
VD403	DR0001XX-T	DIODE	IS1555/IN4148A
VD514	DR0001XX-T	DIODE	IS1555/IN4148A
VD516	DR0001XX-T	DIODE	IS1555/IN4148A
VD518	DR0001XX-T	DIODE	IS1555/IN4148A
VD562	DR0001XX-T	DIODE	IS1555/IN4148A
VD610	DR0001XX-T	DIODE	IS1555/IN4148A
VD611	DR0001XX-T	DIODE	IS1555/IN4148A
VD612	DR0001XX-T	DIODE	IS1555/IN4148A

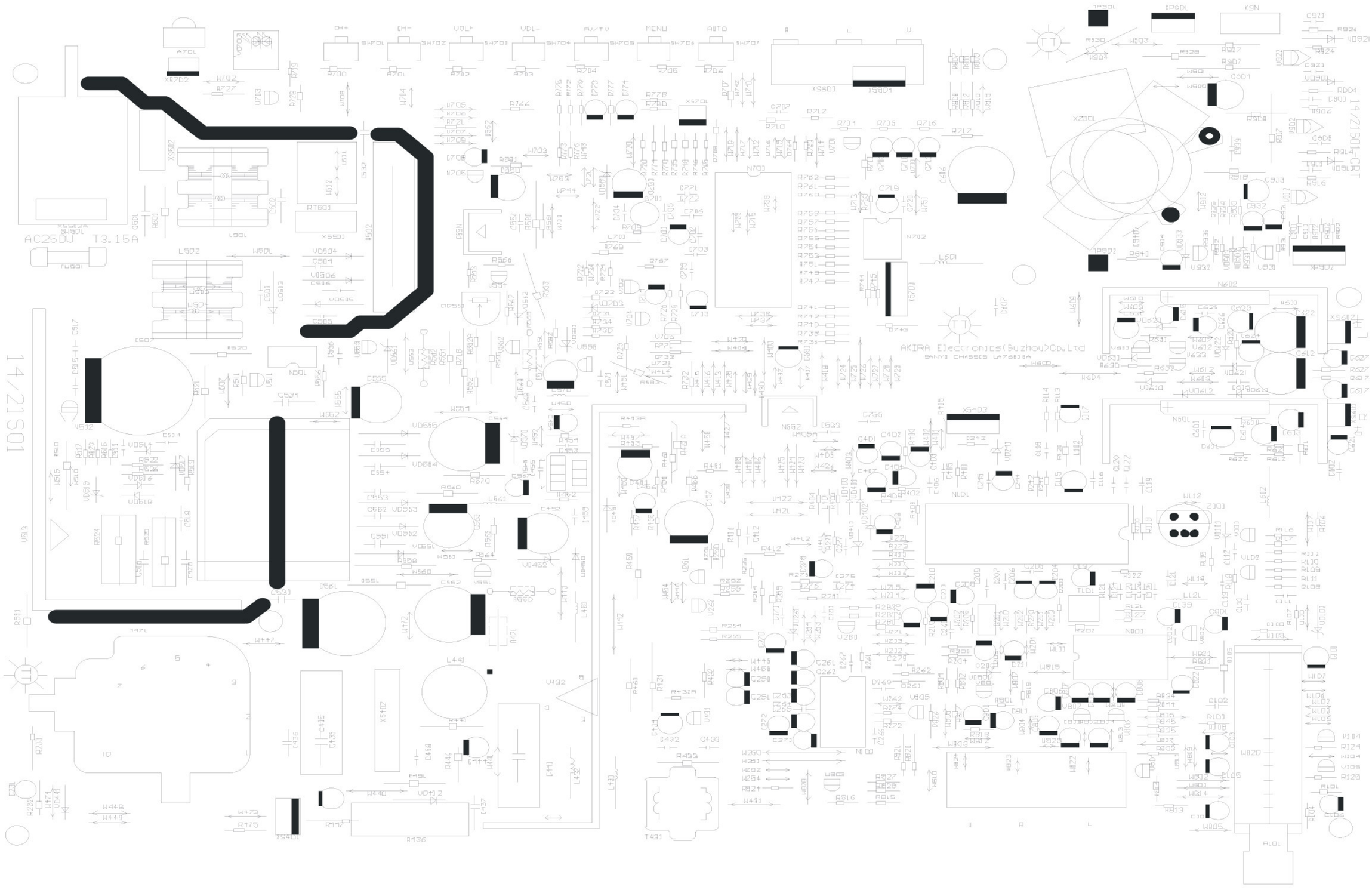
Location No.	Part No.	Name	Type
VD620	DR0001XX-T	DIODE	IS1555/IN4148A
VD621	DR0001XX-T	DIODE	IS1555/IN4148A
VD622	DR0001XX-T	DIODE	IS1555/IN4148A
VD631	DR0001XX-T	DIODE	IS1555/IN4148A
VD901	DR0001XX-T	DIODE	IS1555/IN4148A
VD902	DR0001XX-T	DIODE	IS1555/IN4148A
VD903	DR0001XX-T	DIODE	IS1555/IN4148A
VD911	DR0001XX-T	DIODE	IS1555/IN4148A
VD921	DR0001XX-T	DIODE	IS1555/IN4148A
VD933	DR0001XX-T	DIODE	IS1555/IN4148A
VD517	DR0003XX-T	DIODE	FR105
VD554	DR0003XX-T	DIODE	FR105
VD555	DR0003XX-T	DIODE	FR105
VD450	DR0009XX-T	DIODE	GP10D/FR104/IN4004
VD451	DR0009XX-T	DIODE	GP10D/FR104/IN4004
VD503	DR0015XX-T	DIODE	TVR4N/TRM11C
VD504	DR0015XX-T	DIODE	TVR4N/TRM11C
VD505	DR0015XX-T	DIODE	TVR4N/TRM11C
VD506	DR0015XX-T	DIODE	TVR4N/TRM11C
VD412	DR0017XX-T	DIODE	RGP10J
VD551	DR0017XX-T	DIODE	RGP10J
VD553	DR0018XX-T	DIODE	RGP10D
VD552	DR0031XX-T	DIODE	TJ1010
VD703	DZ0006XX-T	DIODE ZENER	HZ4A2
VD102	DZ0002XX-T	DIODE ZENER	HZ5C1
VD580	DZ0002XX-T	DIODE ZENER	HZ5C1
VD561	DZ0006XX-T	DIODE ZENER	HZ6C2
VD581	DZ0015XX-T	DIODE ZENER	RD5.6EB2/HZ6B1
VD519	DZ0016XX-T	DIODE ZENER	HZ7C1
VD411	DZ0012XX-T	DIODE ZENER	HZ9A2
N705	IXXX0080-T	IC	upc574J/CW574/KA33V
N601	IXXX0180	IC	LA4285 3W（LA4287 5W 21”)
N602	IXXX0180	IC	LA4285 3W（LA4287 5W 21”)
N551	IXXX0118	IC	TA78M09 9V
N801	IXXX0120	IC	LC4053B/CD4053B
N701	IXXX0121	IC	LC863328A-52G5
N101	IXXX0215	IC	LA76818A

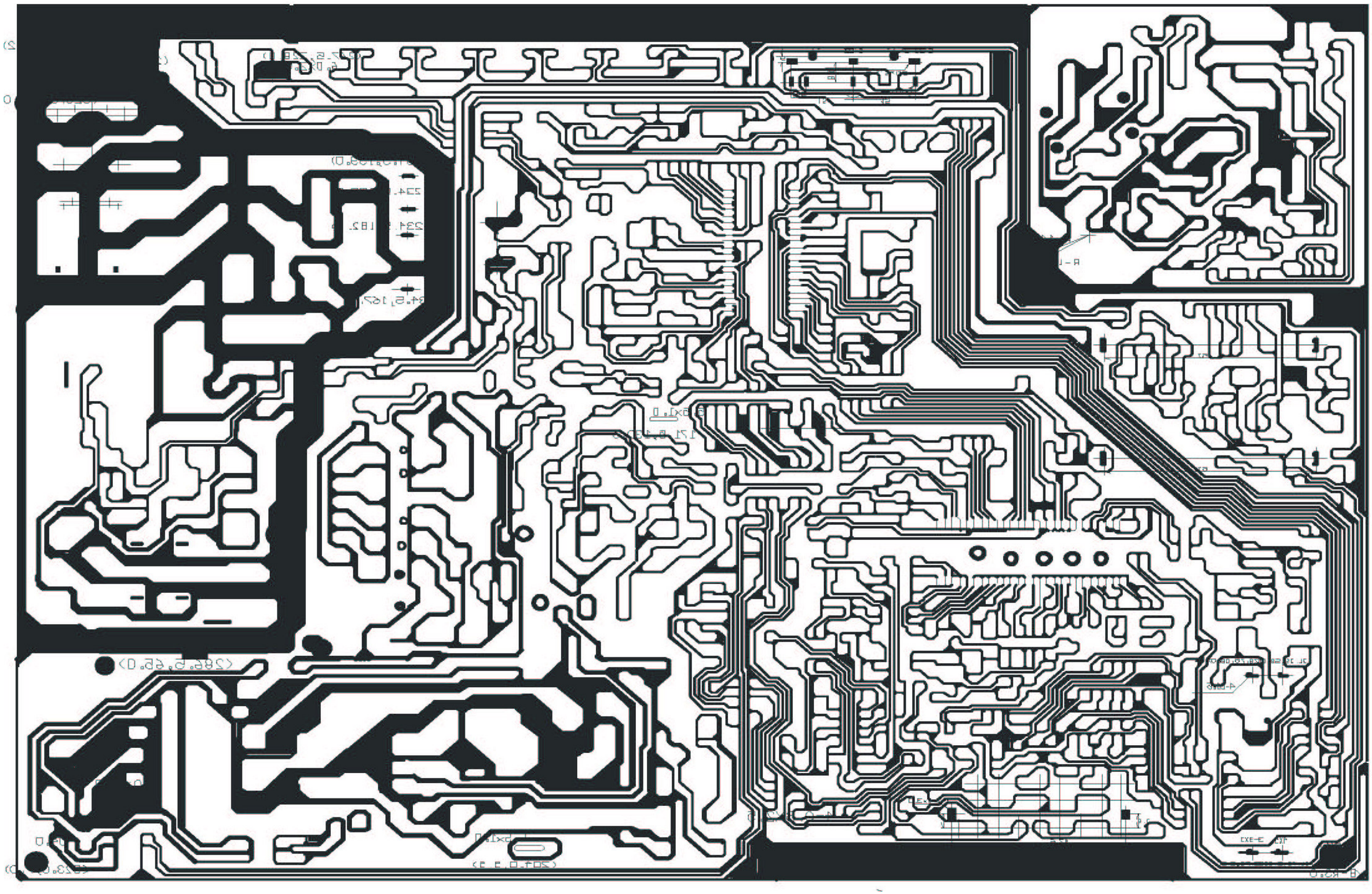
Location No.	Part No.	Name	Type
N451	IXXX0142	IC	LA78040/STV9302
N702	IXXX0173	IC	BR ST24C08-W
V511	RXA1015X-T	TRANSISTOR	2SA1015Y/2SA608/KTA1266-Y
V631	RXA1015X-T	TRANSISTOR	2SA1015Y/2SA608/KTA1266-Y
V702	RXA1015X-T	TRANSISTOR	2SA1015Y/2SA608/KTA1266-Y
V801	RXA1015X-T	TRANSISTOR	2SA1015Y/2SA608/KTA1266-Y
V806	RXA1015X-T	TRANSISTOR	2SA1015Y/2SA608/KTA1266-Y
V807	RXA1015X-T	TRANSISTOR	2SA1015Y/2SA608/KTA1266-Y
V931	RXA1015X-T	TRANSISTOR	2SA1015Y/2SA608/KTA1266-Y
V554	RXB764XX-T	TRANSISTOR	2SB764/KTA1281-Y
V551	RXB892XX-T	TRANSISTOR	2SB892/2SB985T/KTA1281-Y
V102	RXC2216X-T	TRANSISTOR	2SC2216
V902	RXC422X-TY	TRANSISTOR	HBF422/BF422
V912	RXC422X-TY	TRANSISTOR	HBF422/BF422
V922	RXC422X-TY	TRANSISTOR	HBF422/BF422
V431	RXC2383X-T	TRANSISTOR	2SC2383-O/KTC3228-O
V512	RXC3807X	TRANSISTOR	2SC3807/2SC5070
V513	RXC5287X	TRANSISTOR	2SD1710/2SC4584/C5586/2SD2498
V104	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V105	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V552	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V553	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V632	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V633	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V701	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V703	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V704	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V705	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V802	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V803	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V804	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V805	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V932	RXC945XX-T	TRANSISTOR	2SC945/2SC1815/2SC536E/KTC3198-Y
V432	RXD2499X	TRANSISTOR	2SD2499/2SD1651
V556	RXD400XX-T	TRANSISTOR	2SD400D/E, KTC3209-Y

Location No.	Part No.	Name	Type
Z101	FS0008XX	SAW FILTER38.9M	F2966M
F501	FXXX0020	FUSE	3.15A 250V
A701	RXXX0016	REMOTE RECEIVER	HS0038/AT138A
G201	XC0004XX-A	Crystal Oscillator	JA18C/JA18B 4.43MHz ∞
G701		Porcelain	32.768KHz
A101		TUNER	ET-5C1E-EV100K

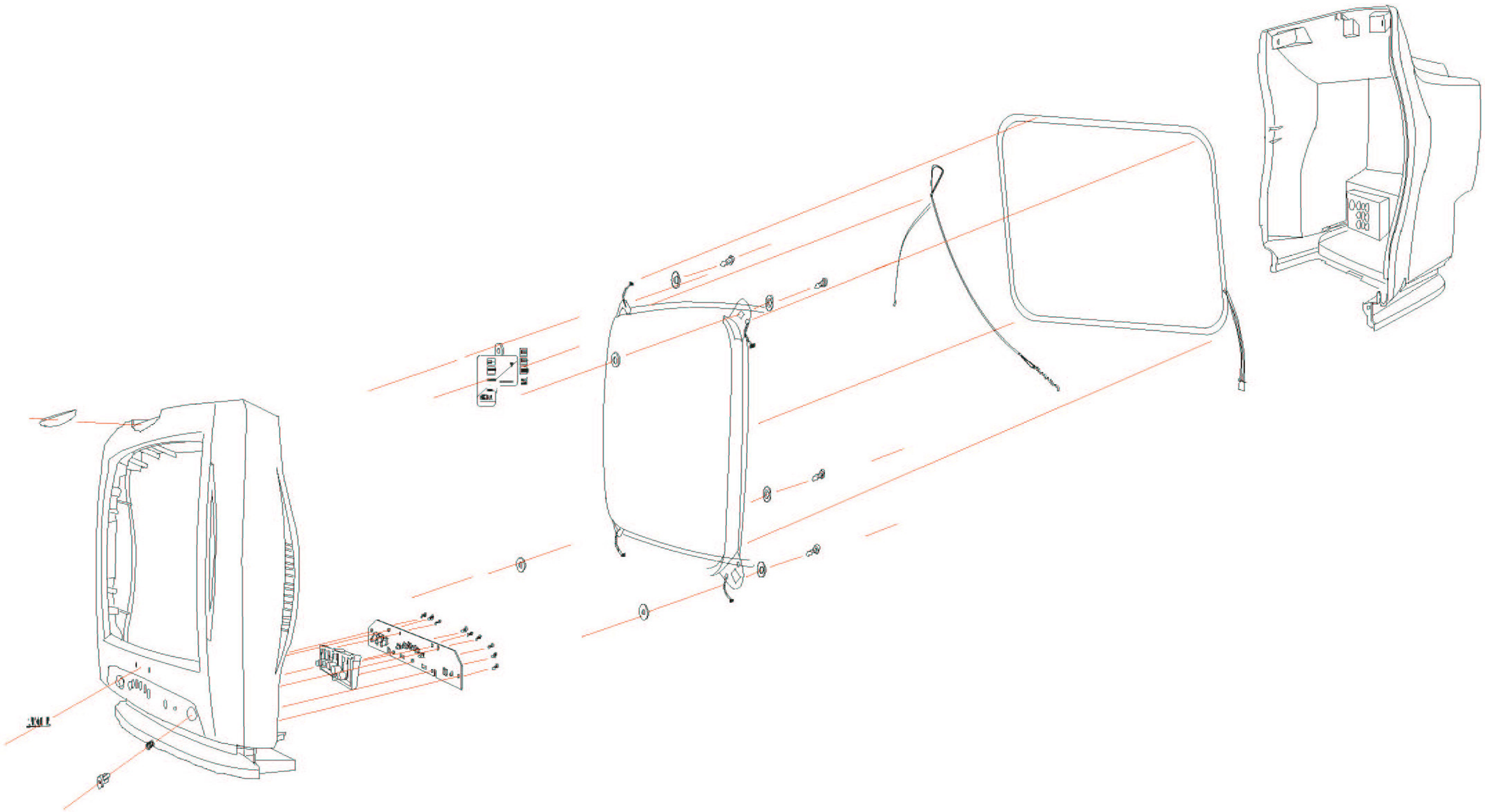

TH818
LIVE AREA
CRT BOARD



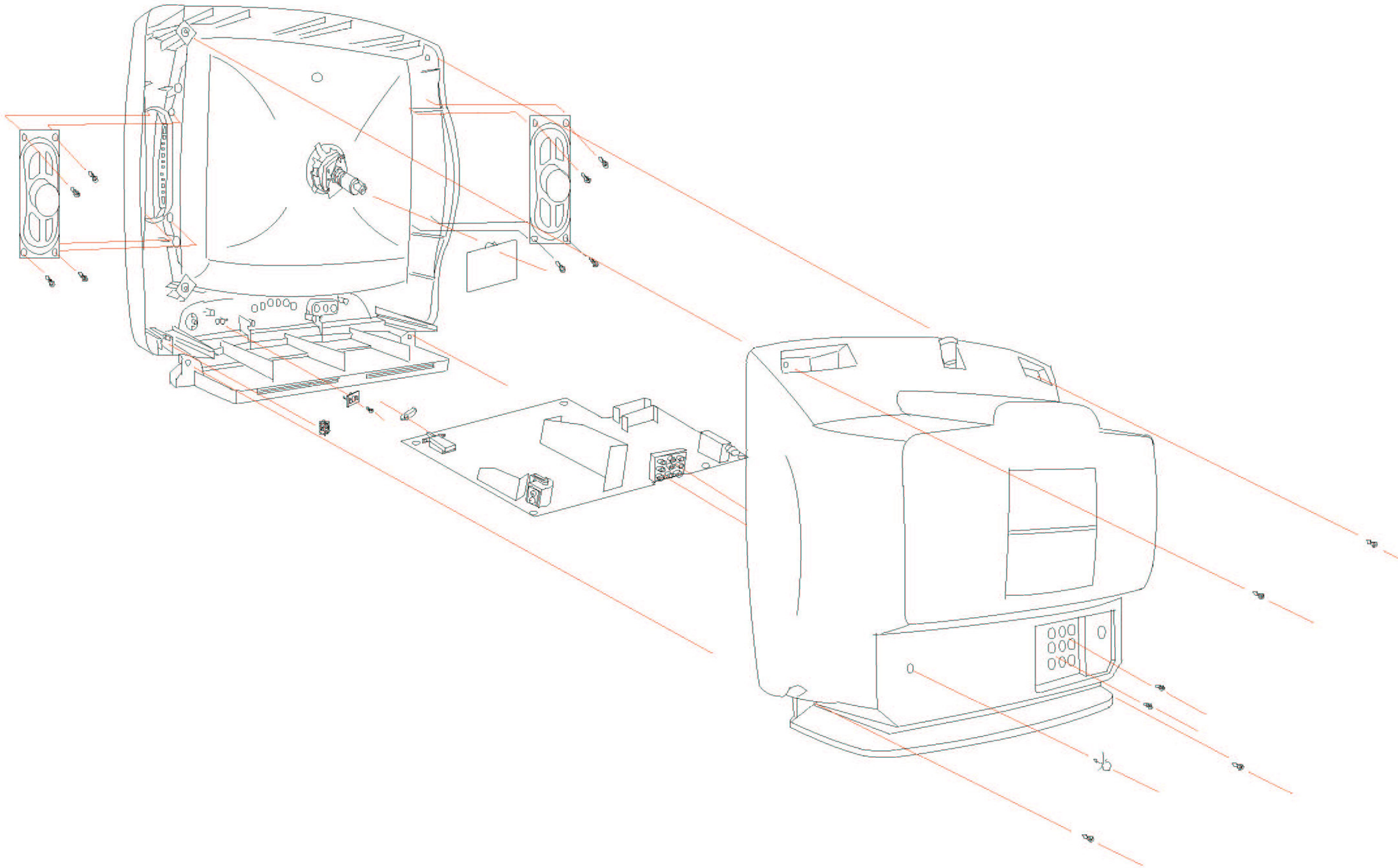

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