

**SAMSUNG**

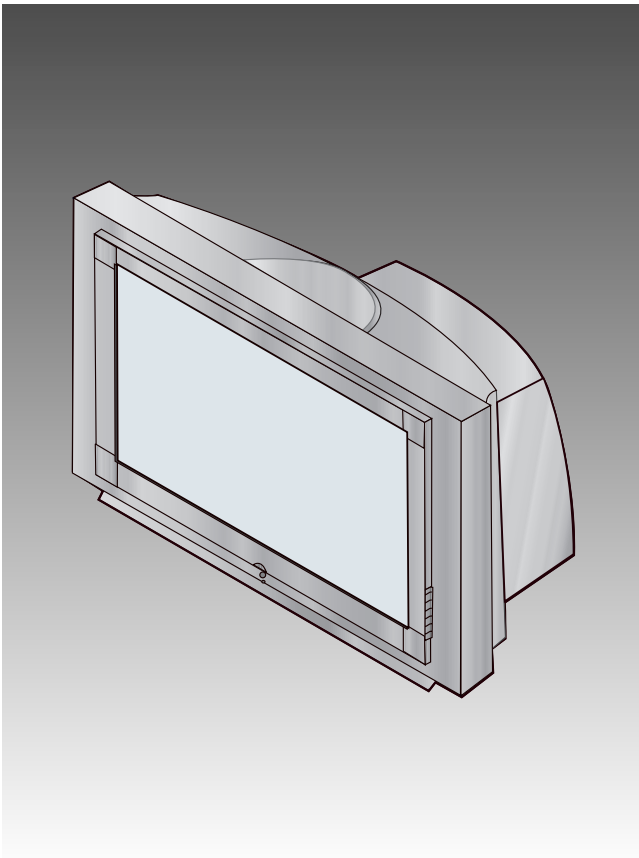
# COLOR TELEVISION RECEIVER

Chassis : K54A(REV.1)

Model : TSL3099WHFXXAA

# **SERVICE** *Manual*

## COLOR TELEVISION RECEIVER



## CONTENTS

1. Precautions
2. Reference Information
3. Specifications
4. Alignment and Adjustments
5. Troubleshooting
6. Exploded Views and Parts List
7. Electrical Parts List
8. Block Diagrams
9. Schematic Diagrams



**ELECTRONICS**

## 1. Precautions

Follow these safety, servicing and ESD precautions to prevent damage and protect against potential hazards such as electrical shock and X-rays.

### 1-1 Safety Precautions

1. Be sure that all of the built-in protective devices are replaced. Restore any missing protective shields.
2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including: nonmetallic control knobs and compartment covers.
3. Make sure that there are no cabinet openings through which people—particularly children—might insert fingers and contact dangerous voltages. Such openings include the spacing between the picture tube and the cabinet mask, excessively wide cabinet ventilation slots, and improperly fitted back covers.

If the measured resistance is less than 1.0 megohm or greater than 5.2 megohms, an abnormality exists that must be corrected before the unit is returned to the customer.

4. **Leakage Current Hot Check (Figure 1-1):**  
Warning: Do not use an isolation transformer during this test. Use a leakage-current tester or a metering system that complies with American National Standards Institute (ANIS C101.1, Leakage Current for Appliances), and Underwriters Laboratories (UL Publication UL1410, 59.7).
5. With the unit completely reassembled, plug the AC line cord directly into the power outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: antennas, handle brackets, metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

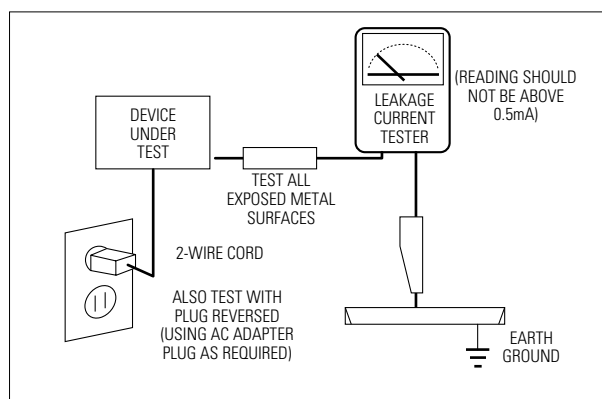




Fig. 1-1 AC Leakage Test

6. **Antenna Cold Check:**  
With the unit's AC plug disconnected from the AC source, connect an electrical jumper across the two AC prongs. Connect one lead of the ohmmeter to an AC prong. Connect the other lead to the coaxial connector.
7. **X-ray Limits:**  
The picture tube is especially designed to prohibit X-ray emissions. To ensure continued X-ray protection, replace the picture tube only with one that is the same type as the original. Carefully reinstall the picture tube shields and mounting hardware; these also provide X-ray protection.
8. **High Voltage Limits:**  
High voltage must be measured each time servicing is done on the B+, horizontal deflection or high voltage circuits. Correct operation of the X-ray protection circuits must be reconfirmed whenever they are serviced.  
(X-ray protection circuits also may be called "horizontal disable" or "hold-down".)

Heed the high voltage limits. These include the X-ray Protection Specifications Label, and the Product Safety and X-ray Warning Note on the service data schematic.

## 1-1 Safety Precautions (Continued)

---

9. High voltage is maintained within specified limits by close-tolerance, safety-related components and adjustments. If the high voltage exceeds the specified limits, check each of the special components.
10. Design Alteration Warning:  
Never alter or add to the mechanical or electrical design of this unit. Example: Do not add auxiliary audio or video connectors. Such alterations might create a safety hazard. Also, any design changes or additions will void the manufacturer's warranty.
11. Hot Chassis Warning:  
Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord. If an isolation transformer is not used, these units may be safely serviced only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC source.  
  
To confirm that the AC power plug is inserted correctly, do the following: Using an AC voltmeter, measure the voltage between the chassis and a known earth ground. If the reading is greater than 1.0V, remove the AC power plug, reverse its polarity and reinsert. Re-measure the voltage between the chassis and ground.
12. Some TV chassis are designed to operate with 85 volts AC between chassis and ground, regardless of the AC plug polarity. These units can be safely serviced only if an isolation transformer inserted between the receiver and the power source.
13. Some TV chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is not isolated from the AC power line. The two ground systems are electrically separated by insulating material that must not be defeated or altered.
14. Components, parts and wiring that appear to have overheated or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damage or overheating, and correct any potential hazards.
15. Observe the original lead dress, especially near the following areas: Antenna wiring, sharp edges, and especially the AC and high voltage power supplies. Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that leads and components do not touch thermally hot parts.
16. Picture Tube Implosion Warning:  
The picture tube in this receiver employs "integral implosion" protection. To ensure continued implosion protection, make sure that the replacement picture tube is the same as the original.
17. Do not remove, install or handle the picture tube without first putting on shatterproof goggles equipped with side shields. Never handle the picture tube by its neck. Some "in-line" picture tubes are equipped with a permanently attached deflection yoke; do not try to remove such "permanently attached" yokes from the picture tube.
18. Product Safety Notice:  
Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection. These safety features and the protection they give might be lost if the replacement component differs from the original—even if the replacement is rated for higher voltage, wattage, etc.  
  
Components that are critical for safety are indicated in the circuit diagram by shading, () or (). Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

## 1-2 Servicing Precautions

---

Warning1: First read the "Safety Precautions" section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precautions.

Warning2: An electrolytic capacitor installed with the wrong polarity might explode.

1. Servicing precautions are printed on the cabinet. Follow them.
2. Always unplug the unit's AC power cord from the AC power source before attempting to:  
(a) Remove or reinstall any component or assembly, (b) Disconnect an electrical plug or connector, (c) Connect a test component in parallel with an electrolytic capacitor.
3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.
5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
6. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of the AC plug.  
  
The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
7. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
8. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

## 1-3 Precautions for Electrostatically Sensitive Devices (ESDs)

---

1. Some semiconductor (“solid state”) devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs); examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damage caused by static electricity.
2. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power—this is an electric shock precaution.)
3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.
4. Do not use freon-propelled chemicals. These can generate electrical charges that damage ESDs.
5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.
6. Use only an anti-static solder removal device. Many solder removal devices are not rated as “anti-static”; these can accumulate sufficient electrical charge to damage ESDs.
7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
9. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting a foot from a carpeted floor can generate enough static electricity to damage an ESD.

## 2. Reference Information

### 2-1 Tables of Abbreviations and Acronyms

**Table 2-1 Abbreviations**

A	Ampere	MV	Megavolt
Ah	Ampere-hour	MW	Megawatt
Å	Angstrom	MΩ	Megohm
dB	Decibel	m	Meter
dBm	Decibel Referenced to One Milliwatt	μA	Microampere
°C	Degree Celsius	μF	Microfarad
°F	Degree Fahrenheit	μH	Microhenry
°K	degree Kelvin	μm	Micrometer
F	Farad	μs	Microsecond
G	Gauss	μW	Microwatt
GHz	Gigahertz	mA	Milliampere
g	Gram	mg	Milligram
H	Henry	mH	Millihenry
Hz	Hertz	ml	Milliliter
h	Hour	mm	Millimeter
ips	Inches Per Second	ms	Millisecond
kWh	Kilowatt-hour	mV	Millivolt
kg	Kilogram	nF	Nanofarad
kHz	Kilohertz	Ω	Ohm
kΩ	Kilohm	pF	Picofarad
km	Kilometer	lb	Pound
km/h	Kilometer Per Hour	rpm	Revolutions Per Minute
kV	Kilovolt	rps	Revolutions Per Second
kVA	Kilovolt-ampere	s	Second (Time)
kW	Kilowatt	V	Volt
l	Liter	VA	Volt-ampere
MHz	Megahertz	W	Watt
		Wh	Watt-hour

**Table 2-2 Table of Acronyms**

ABL	Automatic Brightness Limiter	I/O	Input/output
AC	Alternating Current	L	Left
ACC	Automatic Chroma Control	L	Low
AF	Audio Frequency	LED	Light Emitting Diode
AFC	Automatic Frequency Control	LF	Low Frequency
AFT	Automatic Fine Tuning	MOSFET	Metal-Oxide-Semiconductor-Field-Effect-Tr
AGC	Automatic Gain Control	MTS	Multi-channel Television Sound
AM	Amplitude Modulation	NAB	National Association of Broadcasters
ANSI	American National Standards Institute	NEC	National Electric Code
APC	Automatic Phase Control	NTSC	National Television Systems Committee
APC	Automatic Picture Control	OSD	On Screen Display
A/V	Audio-Video	PCB	Printed Circuit Board
AVC	Automatic Volume Control	PLL	Phase-Locked Loop
BAL	Balance	PWM	Pulse Width Modulation
BPF	Bandpass Filter	QIF	Quadrature Intermediate Frequency
B-Y	Blue-Y	R	Right
CATV	Community Antenna Television (Cable TV)	RC	Resistor & Capacitor
CB	Citizens Band	RF	Radio Frequency
CCD	Charge Coupled Device	R-Y	Red-Y
CCTV	Closed Circuit Television	SAP	Second Audio Program
Ch	Channel	SAW	Surface Acoustic Wave(Filter)
CRT	Cathode Ray Tube	SIF	Sound Intermediate Frequency
CW	Continuous Wave	SMPS	Switching Mode Power Supply
DC	Direct Current	S/N	Signal/Noise
DVM	Digital Volt Meter	SW	Switch
EIA	Electronics Industries Association	TP	Test Point
ESD	Electrostatic Discharge	TTL	Transistor Transistor Logic
ESD	Electrostatically Sensitive Device	TV	Television
FBP	Feedback Pulse	UHF	Ultra High Frequency
FBT	Flyback Transformer	UL	Underwriters Laboratories
FF	Flip-Flop	UV	Ultraviolet
FM	Frequency Modulation	VCD	Variable-Capacitance Diode
FS	Fail Safe	VCO	Voltage Controlled Oscillator
GND	Ground	VCXO	Voltage Controlled Crystal Oscillator
G-Y	Green-Y	VHF	Very High Frequency
H	High	VIF	Video Intermediate Frequency
HF	High-Frequency	VR	Variable Resistor
HI-FI	High Fidelity	VTR	Video Tape Recorder
IC	Inductance-Capacitance	VTVM	Vacuum Tube Voltmeter
IC	Integrated Circuit	TR	Transistor
IF	Intermediate Frequency		



## 2-2 Explanation of Landing Compensation Circuit

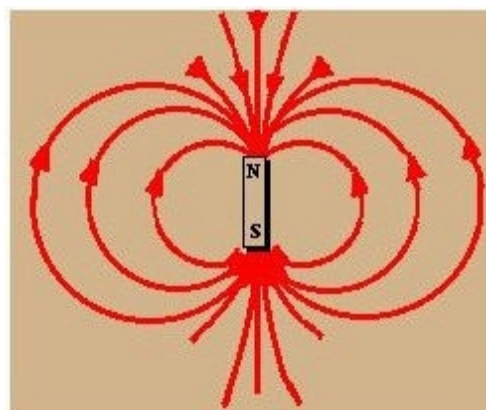
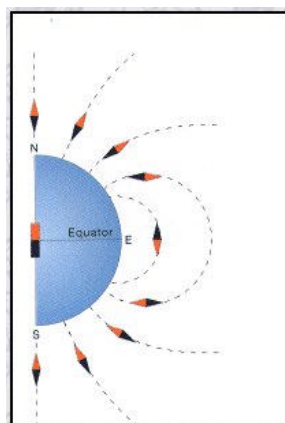
### 2-2-1 Definition

Landing in the display media using CRT means operation that beam occurred at the electronic gun passes through a constant hole and arrives to the light emitting object. The more accurate this is, the more even unified brightness of the whole of screen is uniform. However, landing becomes loose since there is deviation of manufacturing process in the CRT itself and various inside/outside factors.

#### - Effect of earth magnetic field

There is a magnetic line of force proceeding from South to North in the earth, called as earth magnetic field.

CRT emits light by electron from an electronic gun and direction of this electron becomes reverse direction of current. Force (F) applies to electron moved by current (I) of the earth magnetic field and the CRT. Electronic beam fails to arrive a proper position due to this force, which must constantly arrive at the fixed position of a shadow mask.



#### - Effect of ambient temperature

Beam flying to a constant position fails to arrive to the light emitting object by distortion of a mask since thermal expansion shrinkage of the shadow mask made of metal is different from the side where the light emitting object is attached depending on temperature.

#### - Effect of operation time and beam force

Immediately after TV turns on, temperature inside of the CRT rapidly increases by electronic beam and thereby thermal expansion proceeds in the shadow mask. This proceeds for about 2 hours and accordingly landing varies. Such a level of change differs depending on the strength of beam shone on the screen together with time. The stronger strength of the beam is, namely the brighter the screen is, the severer change of landing is.

The CRT used in the ZEUS is OMEGA CRT of a complete flat 32" HD-class with an injection degree of maximum 120' independently developed and produced by the SDI. It was manufactured in the most minimum width in the world in comparison with the same size to reduce depth of the set.

Such configuration gives a bad effect on the landing surface and thus landing at the 4 point within the CRT becomes distorted even by a small ambient effect and purity error (change of color purity: other color) occurs.

### 2-2-2 Principle of Operation

The following tables show direction of Landing distortion for factors effecting on Landing.

CRT Direction	EARTH	WEST	SOUTH	NORTH
Direction of distorted landing				

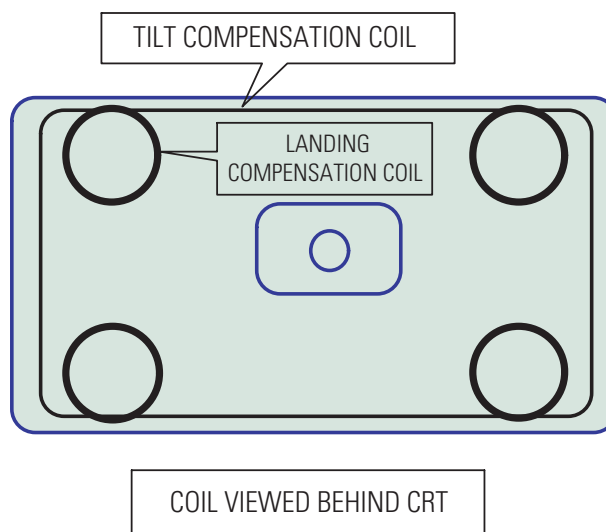
  

CRT Direction	Low Temperature	High Temperature
Direction of distorted landing		

\*\* The above tables show direction of actual effect and a reverse direction of it for Landing Data (direction of microscope). \*\*

The earth magnetic field sensor and the temperature sensor are attached for measuring direction and strength of the current earth magnetic field and temperature of set. Since effect on the above table must be compensated, force in the reverse direction must be made.

The following figure shows that coil for landing compensation and coil for TILT compensation are attached on the rear side of CRT to compensate for it. 4 round coils (coil for landing compensation) is used to compensate for error in the corner where landing error mostly occurs. The TILT coil adjusts degree of the whole of screen.



Compensation is currently not done for TIME and beam in the landing compensation circuit and circuit improved in the following version will operate

### 2-2-3 Operation of Circuit

#### - Explanation of Operation

Operation of the landing compensation circuit is controlled by a sub-micom within module. Operation of the sub-micom for the actual landing compensation is perceived and controlled. It receives values of the earth magnetic field sensor (SEN01) and temperature sensor (DM01) via the A/D port of the sub-micom and then perceives the current status and outputs compensation value in the PWM form. Direct driving of the landing compensation coil is done at the LA6510 power drive OP AMP. Standard operation voltage of the AMP is made by divided voltage of R028, R029 and applied to the (+) 1N of the OP AMP. The PWM type of control data that is output from the MICOM is smoothed by the RC integrated circuit and becomes analog voltage with a constant level. It is applied to the reverse amplitude circuit composed of a power drive OP AMP via a TR and resistance. In this case, amplitude level is determined by the whole output impedance and feedback resistance of circuits connected to the (-) 1N terminal of the OP AMP. The LA6510 VSENSE PORT is used for limiting current and can limit the max current value using resistance value between VOUT terminals. The output flows through the LC coil and creates magnetic field. Position of electronic beam is compensated by the magnetic field. DC R (voltage at both ends of the LC coil measured by DVM as direct current resistance component) of the LC coil is about 100 ohm.

Details of explanation are deleted since operation of the tilt coil operates even in general TV.

#### - Inspection of Operation

Operation inspection after set repair is as follows:

- 1) Is the output terminal (red, gray, blue, black) of coil at the aging mode within 9 +/- 300mV?
- 2) Does other color occur when removing the PCB Front Connector(CN905A) from the Main Chassis?
- 3) Does other color occur when touching magnetic object near the earth magnetic field Sensor Module?

Where all answers for the above questions are Yes, they show that the Landing compensation circuit properly operates for the set.

### 2-2-4. Related OSD Matters

Two matters are related each other in the factory mode.

Factory mode -> TL, BL, TR and BR value are value of the area that user (service man) can vary. It is better not use these values unless purity error occurs (where, TL, BL, TR, BR represents TOP LEFT, BOTTOM LEFT, TOP RIGHT and BOTTOM LIGHT, respectively).

Factory mode -> There are TL, BL, TR, BR and SENCE LRR types in the ITC. They must not be changed. There is information about CRT and the circuit part for compensating it. However, in replacing EEPROM or main chassis, change of it is needed but the value of sense REF must not be changed.

(The sense REF is used to compensate for sensor unique omission and is line adjustment value that reads center value of sensor in the 0-earth magnetic field and stores it at the EEPROM. Since the 0-earth magnetic field cannot be made in the field, this item shall not be changed. If changing it and thus purity error occurs, the EEPROM must be replaced according to the following cautions)

## 2-2-5 Cautions in troubleshooting

### ■ Check item prior to repair

- 1) Is the +- output terminal (Red, Gray, Blue, Black) of a coil in the Aging Mode within 0 +/- 300mV?
- 2) Does other color occur when removing the PCB front connector from the main chassis?
- 3) Does other color occur when touching approaching magnetic object around the earth magnetic field Sensor Module?

If all answers for above questions is Yes, it means landing compensation circuits properly operates for the set.

### 1) Cautions in replacement of parts and E2PROM in earth magnetic field

You should replace an E2PROM within the main chassis and the main chassis in the following orders if necessary:

#### ■ Where set operation is possible

- a) Memorize values of TL, BL, TR and BR from the Factory Mode -> TIC. Sense REF values should not be changed at any case (If pressing + - key, current values of the earth magnetic field becomes standard value and emergent operation is done by it).
- b) Replace parts.
- c) Change it into TL, BL, TR and BR memorized from the Factory Mode -> TIC. Sense REF values should not be changed at any case (In this case, initial value is 115, 125).
- d) Inspect operation status.
- e) If there is no abnormality in the operation inspection but other color occurs, change and adjust four value(TR, BL, TR, BR) from the Factory Mode ->User so that there is no purity error.

#### ■ Where set operation is not possible

- a) Replace parts.
- b) Change should not be done at any case in the Factory Mode -> TIC mode.  
(In this case, initial value is 115, 125).
- c) Inspect operation status.
- d) If there is no abnormality in the operation inspection but other color occurs depending on ambient conditions, change and adjust 4 values from the Factory Mode †User so that there is no purity error.

## 2) Cautions in De-Gaussing

### 1. ADG (Auto Degaussing)

- There is no problem since set itself operates in the Degaussing operation of set itself under the Purity Off Mode.  
However, the set normally operates when performing Power On after Off for 30 minutes after removing power.

### 2. HDG (Hand Degaussing)

- If desiring to operate the compulsory Degaussing mode, you should set "Aging Mode" for operation.

### 3. AGING MODE

- A strong magnetic field occurred in the HDE-GAUSSING affects on sensor in the earth magnetic field and as a result, a strong magnetic field occurs from the LC coil. It is not good for sense operation and DE-GAUSSING of the earth magnetic field. Be sure to perform sensing and DE-GAUSSING magnetic field in Aging Mode, especially when adjusting user values.

## 2-2 IC Line Up

Block	Des-Loc	Part-Number	IC Name	Description
<b>MAIN</b>	IC601	1204-001594	MSP3440G-B6	IC-SOUND PROCESSOR
	IC701	1001-001073	TEA6415C	IC-VIDEO SWITCH
	IC702	1001-001113	TEA6422	IC-AUDIO SWITCH
	IC703	1002-001193	PCF8591P	IC-A/D & D/A CONVERTER
	TU01	AA40-00020A	TCLN318PA09A(S)	TUNER-F/S
	TUP01	AA40-00032A	TCPN3081PC09A(S)	TUNER-F/S
	IC905	1103-001171	24L161	IC-EEPROM
	ICH01	1204-001454	TDA7449L	IC-VOLUME CONTROL
	IC602	1201-000407	TDA7050	IC-POWER AMP
	ICD603	1201-001385	TDA7269A	IC-POWER AMP
	IC603	1201-001385	TDA7269A	IC-POWER AMP
	IC804	1203-000203	SI3050	IC-POSI.ADJUST REG.
	IC805	1203-000203	SI3050	IC-POSI.ADJUST REG.
	IC802	1203-000293	KA7808	IC-POSI.FIXED REG.
	IC803	1203-000298	KA7809	IC-POSI.FIXED REG.
	IC801	1203-000165	78R12	IC-POSI.ADJUST REG.
	<b>POWER</b>	IC301	1204-000517	LA7845
D801S		0402-001399	GSDIB660	IC-HYBRID
IC801S		1203-002091	STR-F6658B	IC-HYBRID
IC803S		AA13-00024A	TNY253P	IC-HYBRID
Q403		0505-000156	IRF620	FET-SILICON
Q404		0505-001116	BUZ73A	FET-SILICON
QH407		0502-001187	2SC5612	TR-POWER
QH408		0502-001104	2SD921	TR-POWER
QH406		0502-001100	2SD4125	TR-POWER

Block	Des-Loc	Part-Number	IC Name	Description
<b>POWER</b>	QH405	0505-001202	IRF640	FET-HYBRID
	DH401	0402-001176	FMQG5GS	TR-DIODE
	DH400	0402-001176	FMQG5GS	TR-DIODE
	Q801	1004-000101	SE140N-DIP	IC-HYBRID
<b>F-BOX</b>	IC01	1204-001598	VPC3230D-A0	IC-VIDEO PROCESS
	IC02	AA13-00095A	SDP01	IC-ASIC
	IC05	1002-001045	SDA9280	IC-D/A CONVERTER
	IC06	1204-001372	SDA9361	IC-HOR./VER.PROCESS
	IC07	1204-001550	CXA2101AQ	IC-VIDEO PROCESS
	IC03	1105-001035	416S1120	IIC-DRAM
	IC04	1105-001035	416S1120	IC-DRAM
	PIC01	1204-001598	VPC3230D-A0	IC-VIDEO PROCESS
	PIC02	1109-001144	81V04160	IC-FIFO
	PIC04	1203-001419	4931	IC-VOLTAGE REGULATOR
	PIC05	1203-001419	4931	IC-VOLTAGE REGULATOR
	IC902	1203-001140	7039	IC-VOL.DETECTOR
	IC903	1203-001274	7545	IC-VOL.DETECTOR
	IC11	1203-001419	4931	IC-VOLTAGE REGULATOR
	IC12	1203-001140	7039	IC-VOL.DETECTOR
	IC13	1203-001359	1086	IC-POSI.FIXED REG.
	IC14	1202-000001	KA7533	IC-VOLTAGE COMP.
	IC04	1203-001419	4931	IC-VOLTAGE REGULATOR
	<b>CRT</b>	IC501	1201-001588	TDA6120Q
IC502		1201-001588	TDA6120Q	IC-VIDEO AMP
IC503		1201-001588	TDA6120Q	IC-VIDEO AMP
QF10		0502-000153	2SC2344-D	TR-POWER
QF09		0502-000131	2SA1011A-D	TR-POWER
IC504		1201-000010	2030	IC-OP AMP

## Reference Information

<b>Block</b>	<b>Des-Loc</b>	<b>Part-Number</b>	<b>IC Name</b>	<b>Description</b>
<b>MICOM</b>	IC901	AA13-00101A	Z9037116PSC-OTP	IC-MCU
<b>3D-COMB</b>	IC01	1204-001556	UPD64082GF	IC-SEPARATOR
<b>SUB MICOM</b>	IC005	1201-001199	IC-POWER AMP	6510, SIP
	IC006	1201-001199	IC-POWER AMP	6510, SIP
	IC001	1203-000515	IC-VOL. DETECTOR	7042, T0-92, 3P
	IC003	AA09-00070A	IC MCU	SPR2000, 42P
<b>CRT SENSOR</b>	SEN01	AA32-00010A	SENSOR MAG	TMC3000NF, 35MA
<b>TACK S/W</b>	DM03	1404-001039	THERMISTOR-NTC	Kohm, 1%, 3435K
<b>DOLBY</b>	IC601	1204-0001198	IC-DECODER	DPL3519A
	IC602	1201-000541	IC-OP AMP	062



### 3. Specifications

<b>Model</b>		TSL3099WHFX
<b>Dimensions (mm)</b>	<b>Set</b>	910 (W) x 455 (D) x 578 (H)
	<b>Transmitter</b>	54 (W) x 31.5 (D) x 220 (H)
<b>Weight</b>	<b>Set</b>	67 Kg
	<b>Transmitter</b>	153 g (including batteries)
<b>Picture Tube</b>		Hi Contrast Instant Reception Type
<b>Tuning Ranges</b>		VHF (CH 2 ~ 13)
		UHF (CH 14 ~ 69)
		CATV (CH 1, 14 ~ 125)
<b>Television System</b>		NTSC-M
<b>Antenna Input</b>		VHF, UHF: 75 ohm unbalanced type
<b>Intermediate Frequency</b>		Video: 45.75 MHz
		Sound: 41.25 MHz
		Chrominance Subcarrier: 42.17 MHz
<b>Automatic Gain Control</b>		Reverse Automatic Gain Control (Reverse AGC)
<b>Power Supply</b>	<b>Set</b>	AC 120 V, 60 Hz
	<b>Transmitter</b>	DC 1.5V (AAA Size) x 2
<b>Power Consumption</b>		180 W
<b>Rectification</b>		Insulation Switch
<b>Sound Output</b>		7.5 W x 2, WOOFER : 25W x 1
<b>Adjustment System</b>		Transmitter Adjustment: Infrared Rays Type
		UHF/VHF electronic tuner fine tuning: Electronic Type
		Electronic Function Adjustment

Specifications are subject to change.

# MEMO

## 4. Alignment and Adjustments

### 4-1 Adjustments

#### 4-1-1 General Alignment Instructions

Usually, a color TV needs only slight touch-up adjustment upon installation. Check the basic characteristics such as vertical size, horizontal size, and focus. Observe the picture and check for good black and white details. There must be no objectionable color shading. If color shading is present, demagnetize the receiver. If color shading persists, re-do purity and convergence adjustments.

**Note :**

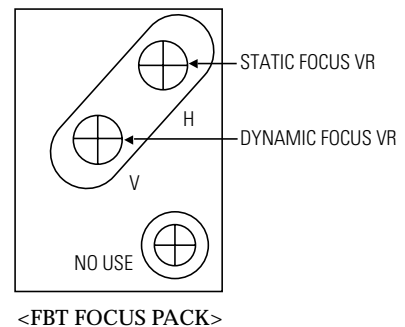
1. This '4. Alignment and Adjustments' applies to KS4A chassis applications.
2. AC Power Supply: 220 V only
3. This service manual has been written on the basis of domestic remote-control model adopting KS4A chassis. Depending on sales location and product specifications, some of specifications herein may be changed.

#### 4-1-2 Focus Adjustment

KS4A contains a dynamic focus circuit. When CRT PCB, FBT or CRT is replaced, be sure to adjust in the following sequence:

##### Dynamic Focus Adjustment

1. Input a crosshatch pattern.
2. Select "Standard" from the menu,
3. Turn the Static Focus VR clockwise to set it to its maximum.
4. Turn the Dynamic Focus VR counterclockwise to set it to its maximum.
5. Turn the Static Focus VR counterclockwise slowly for the clearest center vertical line.



6. Turn the Dynamic Focus VR clockwise slowly for the clearest third line.



7. Check for the FOCUS of entire screen. If necessary, re-do adjustments 3~6.

### 4-1-3 Screen Voltage Adjustment

1. Enter the Video/Component Mode. Just connect a jack and do not supply a video signal.
2. Use a DC multi-meter to identify RK, GK, BK. And then adjust FBT Screen VR so that the highest voltage becomes 175 Vp-p.

### 4-1-4 White Balance Adjustment

1. Select "Standard" from the menu.
2. Input an 100% White pattern.
3. In standby, press the remote-control keys in the following sequence: Mute → 1 → 8 → 2  
Power on the TV set.
4. Warm up the TV set at least for 30 minutes.
5. Input a 10-step stair signal.
6. Use the Volume +/- buttons on the remote-control to select RDR, GDR, BDR, CON.
7. Adjust High-Light while viewing the brighter side of screen.
8. Use the Volume +/- buttons on the remote-control to select RCT, GCT, BCT, SBT.
9. Adjust Low-Light while viewing the darker side of screen.
10. If not proper, re-adjust White Balance.
11. Press the Power button to exit.

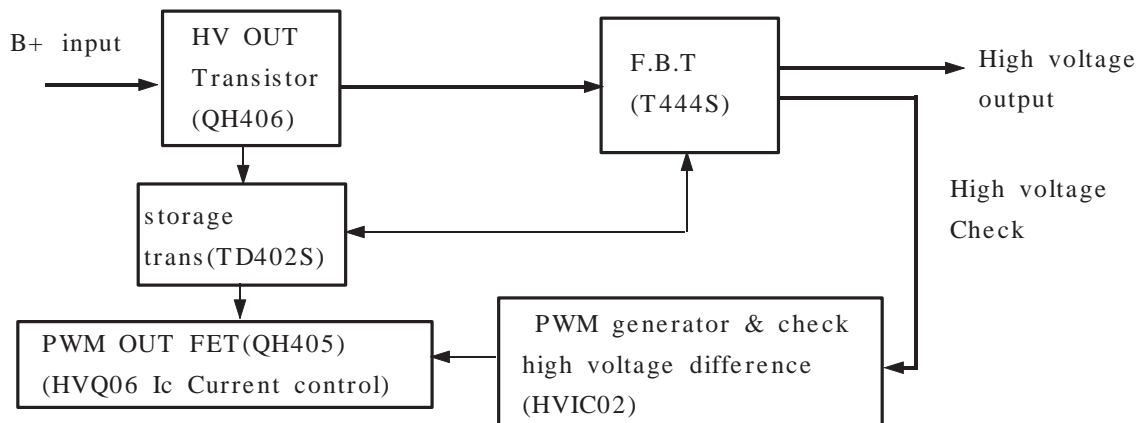
### 4-1-5 Sub-Brightness Adjustment

1. In standby, press the remote-control keys in the following sequence: Mute → 1 → 8 → 2  
Power on the TV set.
2. Use the Channel Up/Down buttons to receive the sub bright adjustment signal.
3. Use the Volume +/- buttons to select SBT.
4. Press the Menu or Mute button on the remote control to adjust so that the seventh step on the right of screen cannot be seen.
5. Press the Memory button to exit.

**Note1. HIGH VOLTAGE REGULATOR CIRCUIT (Digital TV) : 32", 36"**

This circuit uses in pulse width modulation method to check high voltage difference and then adjust energy of storage trans, in order to compensation and stabilize high voltage.

**1)Block Diagram**

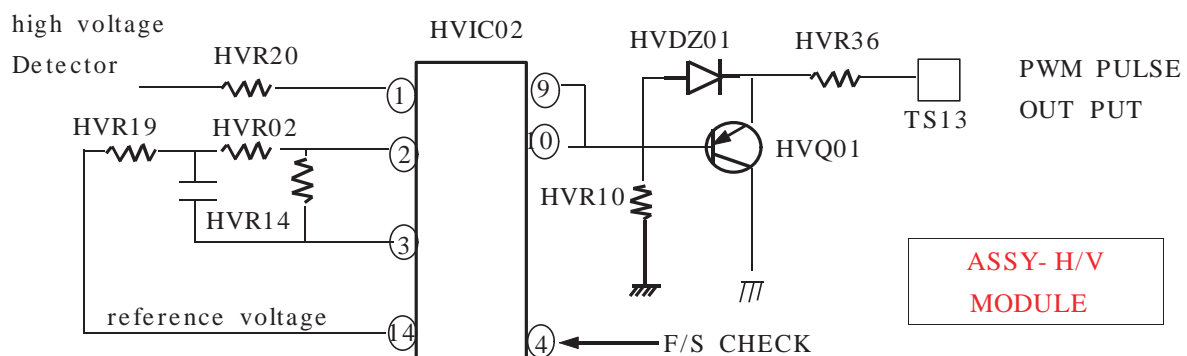


**2) Circuit description**

This circuit detect high voltage difference from FBT, will be compared with reference voltage of HVIC02. The varied voltage will be changed pulse width modulation by PWM Generator HV IC02 . This pulse will vary energy of storage trans(TD402S) according to high voltage difference the varied energy is added to basic high voltage pulse of FBT. As a result, this circuit will be stable high voltage.

**2-1) Working description in case of high voltage Up & Down**

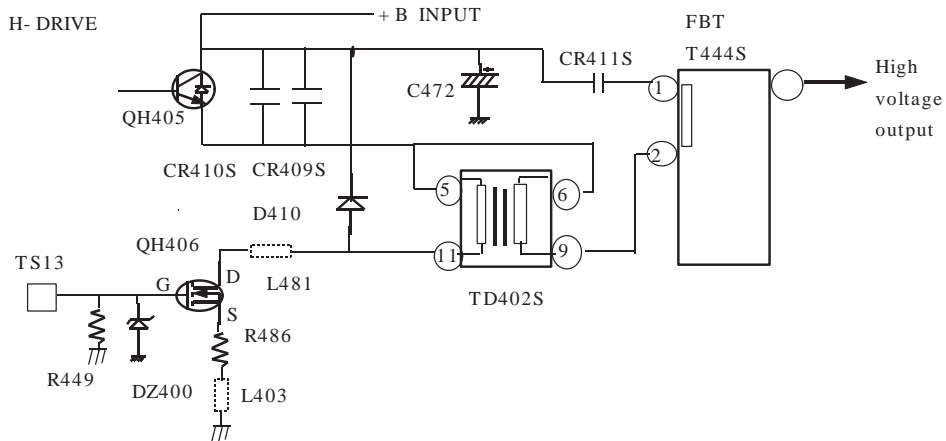
In case high voltage goes up(or down) due to change of beam current, the voltage of high voltage detection prove will be goes up(or down) according to Divider resistance value (which are inside of FBT(T444) and outside resistance), and this increased voltage will be supplied to PWM PULSE IC(HVIC02) pin #1.



This IC(HVIC02) provide a complete pulse width modulation system in a single monolithic intergrated circuit.

The voltage which is inputed to HVIC02 pin #1 will be compared with reference voltage (HVIC02 pin #14, 5V), and then its difference voltage will be amplified.

Its value will be convert PWM pulse in HVIC02, and then PWM pulse will be output from HVIC02 pin #9,#10. Transistor HVQ01 is used as Buffer for impedance matching.



The PWM duty which is outputed from HVQ01 is variable according to Beam current of high voltage. In case high voltage goes up (or down) due to change of Beam Current, PWM duty will be decreased (or increased).

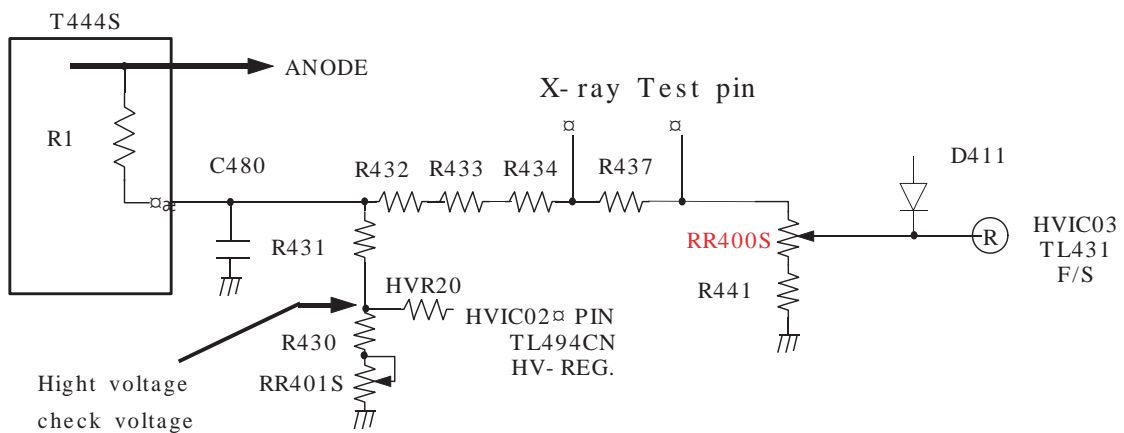
This pulse which is inputed to QH406 Gate(FBT) will be turn on between source and drain, and IC current of QH405 will be flow to primary of storage trans (TD402S) and then will be charge energy in primary of storage trans during trace period .

This energy is variable according to pluse duty, and will be induced to secondary of TD402S.

The induced energy will be added to basic high voltage generation pulse in FBT (T444S).

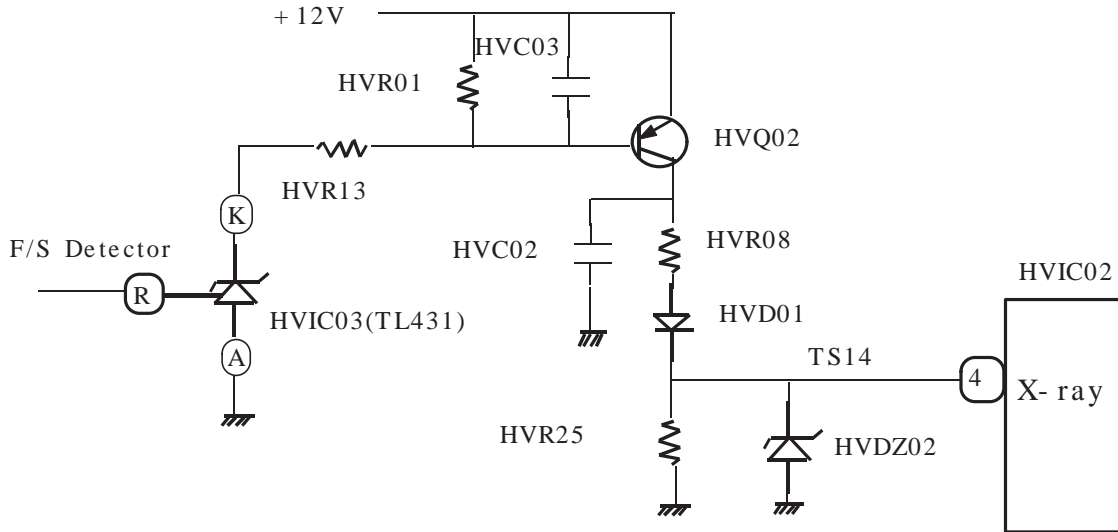
As a result, high voltage will be regulated by this method.

### 3) F/S circuit description



In case high voltage goes up, consequently detected voltage will be goes up and this voltage will be divided regularly through R432,R433,R434,RR400S R and R441.

This divided voltage will be inputted to HVIC03 pin #R, and then in this case voltage goes up more than 2.95V, Between pin #K and pin #A of HVIC03 will be turn on and will be decreased Base voltage of HVQ02, and then E-C of HVQ02 will be turn on and will be detected high level voltage by R482. Its value will be inputted HVIC02 pin #4(X-ray detect) , and high voltage oscillation will be OFF in order to protect X-ray.  
In this case, high voltage will be On if power is re-ON.



**Note2. HOLD-DOWN OR SAFETY CIRCUIT INFORMATION : 29", 34"**

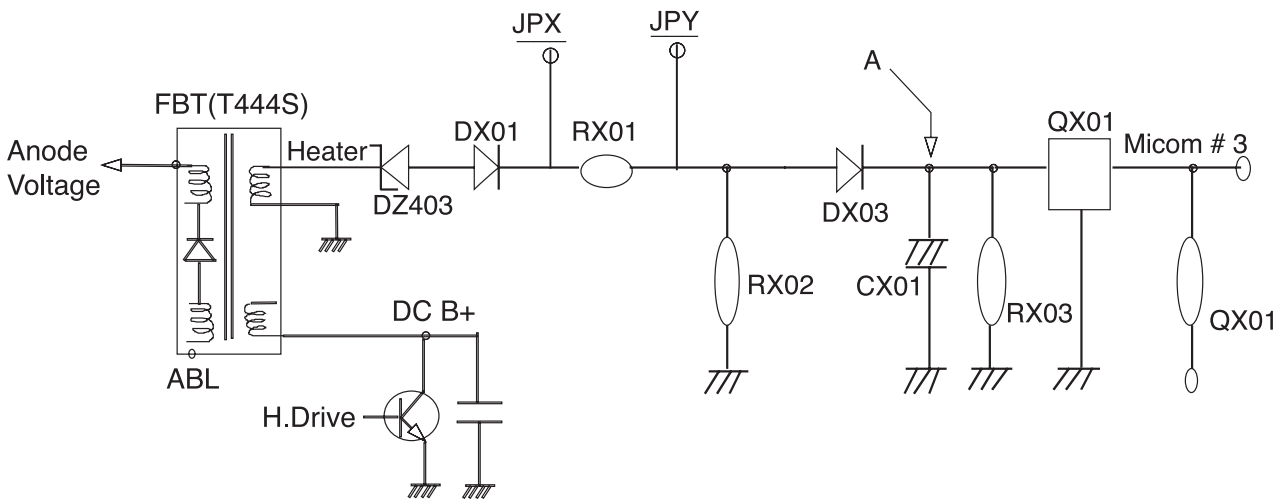
The high voltage hold-down circuit prevent TV from damage caused by abnormal high voltage.

The high voltage hold-down circuit is implemented by detecting the variation of Heater voltage because heater voltage varies with the variation of high voltage.

When the input voltage (A-Point) of QX01's RESET IC is higher than 4.5V, MICOM #3 port is turned to "HIGH" then power-off follows.

So to speak, if MICOM #3 port becomes "HIGH", MICOM #1 port is controlled (from "HIGH" to "LOW") and power-off is implemented.

**Fail Safe Test Point**





## 4-2 SZM 414AZ (ZILOG90371) Micom

### 4-2-1 Pin Layout

POWER	<b>1</b>	P16/SCLK	P15/B(1)	<b>52</b>	NC
IR-IN	<b>2</b>	IRIN	P14/B(0)	<b>51</b>	NC
X-RAY ID/VGA-ID	<b>3</b>	POC	P13/G(1)	<b>50</b>	NC
NC	<b>4</b>	POB	P18/G(0)	<b>49</b>	HOLD
NC	<b>5</b>	POA	P08/R(1)	<b>48</b>	NC
NC	<b>6</b>	P09	P10/R(0)	<b>47</b>	NC
1080i S/W	<b>7</b>	P0D	PWM6	<b>46</b>	LED2(TIMER)
NC	<b>8</b>	P07/CYNC	PWM5	<b>45</b>	LED1(STAND BY)
5VB-CHECK	<b>9</b>	P06/CNTR	PWM4	<b>44</b>	D-COIL
1H-SYNC	<b>10</b>	P03/1HSYNC	PWM3	<b>43</b>	MUTE(AMP)
SCL-2	<b>11</b>	P01/12CSC	PWM2	<b>42</b>	TILT
SDA-2	<b>12</b>	P02/12CSD	PWM1	<b>41</b>	S-RESET
CVBS	<b>13</b>	CV1/ADC0	GND	<b>40</b>	XTAL GND
LOOP FILTER	<b>14</b>	LPF	VCC	<b>39</b>	VCC
ANALOG GND	<b>15</b>	AGNDF	GND	<b>38</b>	GND
S-AFT	<b>16</b>	ADC5	XTAL2	<b>37</b>	XTAL2
KEY1	<b>17</b>	P04/ADC4	XTAL1	<b>36</b>	XTAL1
M-AFT	<b>18</b>	P04/ADC3	RESET	<b>35</b>	RESET
KEY2	<b>19</b>	P04/ADC2	12CMC1	<b>34</b>	NC
BUS STOP	<b>20</b>	P04/ADC1	12CMD1	<b>33</b>	NC
ANALOG GND	<b>21</b>	AGND	POE	<b>32</b>	WP
ANALOG VCC	<b>22</b>	AVCC	P11/12CMC2	<b>31</b>	SCL-1
HALF TONE	<b>23</b>	POF/SOVL	P12/12CMD2	<b>30</b>	SDA-1
OSD-B	<b>24</b>	V3(B)	V-SYNC	<b>29</b>	V-SYNC(2V)
OSD-G	<b>25</b>	V2(G)	H-SYNC	<b>28</b>	H-SYNC(2H)
OSD-R	<b>26</b>	V1(R)	OVL	<b>27</b>	BLANK(F/B)

**Z  
9  
0  
3  
7  
1  
1  
6  
P  
S  
C  
-  
O  
T  
P**

## 4-2-2 Port Assignment

PIN NO	PIN NAME	D4 PIN	DESCRIPTION
1	P16/SCLK	POWER	POWER CONTROL OUTPUT
2	IRIN	IR INPUT	REMOCON INPUT
3	POC	VGA ID	PC SIGNAL DETECTOR, X-RAY
4	POB	N.C	
5	POA	N.C	
6	PO9	N.C	
7	POD	1080i S/W	1080i B+ UP S/W
8	P07/CYNC	N.C	
9	P06/CNTR	5VB CHECK	5V-B+ CHECK
10	P03/1HSYNC	1HSYNC	H/V SYNC FOR CCD
11	P01/I2CSC	SCL2	E2PROM/PIP only, I2C BUS CLK2
12	P02/I2CSD	SDA2	E2PROM/PIP only, I2C BUS DATA 2
13	CVI/ADC0	CVBS IN	CCD COMPOSITE INPUT
14	LPF	LOOP FILTER	LOOP FILTER
15	AGNDF	GND	ANALOG GND
16	ADC5	S-AFT	PIP AFT INPUT
17	P04/ADC4	KEY1	VOL UP/DOWN, CH UP/DOWN, KEY SCAN INPUT PORT 1
18	P04/ADC3	MAIN AFT	MAIN AFT INPUT
19	P04/ADC2	KEY2	POWER, MENU, TV/VIDEO, KEY SCAN INPUT PORT 2
20	P04/ADC1	BUS STOP	I2C BUS STOP
21	AGND	GND	ANALOG GND
22	AVCC	VCC	ANALOG VCC
23	POF/SOVL	HALF TONE	HALF TONE
24	V3(B)	OSD B	BLUE SIGNAL OF OSD
25	V2(G)	OSD G	GREEN SIGNAL OF OSD
26	V1(R)	OSD R	RED SIGNAL OF OSD
27	OVL	BLANK	BLANKING SIGNAL OF OSD
28	HSYNC	HSYNC	HORIZONTAL SYNC INPUT FOR OSD
29	VSYNC	VSYNC	VERTICAL SYNC INPUT FOR OSD
30	P12/I2CMD2	SDA1	I2C BUS DATA 1
31	P11/I2CMC2	SCL1	I2C BUS CLK 1
32	POE	WP	E2PROM WRITE PROTECT

PIN NO	PIN NAME	D4 PIN	DESCRIPTION
33	I2CMD1	N.C	-
34	I2CMC1	N.C	-
35	RESET	RESET	RESET INPUT
36	XTAL1	XTAL1	-
37	XTAL2	XTAL2	-
38	GND	GND	GND
39	VCC	VCC	VCC
40	GND	GND	GND
41	PWM1	S-RESET	SOUND RESET
42	PWM2	TILT	TILT CONTROL
43	PWM3	MUTE	SOUND AMP MUTE
44	PWM4	D-COIL	DEGAUSSING COIL CONTROL OUTPUT
45	PWM5	LED1	STAND BY LED
46	PWM6	LED2	TIMER LED
47	P10/R(0)	N.C	-
48	P08/R(1)	N.C	-
49	P18/G(0)	HOLD	-
50	P13/G(1)	N.C	-
51	P14/B(0)	N.C	-
52	P15/B(1)	N.C	-

## 4-3 Service Mode Adjustments

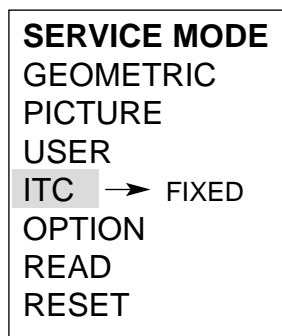
---

K54A chassis needs I<sup>2</sup>C for service mode adjustments. Since the outgone TV set has been adjusted optimum, I<sup>2</sup>C Adjustment doesn't need excluding when CRT, FBT, EEPROM, F-BOX (IC902) is replaced.

### 4-3-1 Entering the Service Mode

In standby, press the remote-control keys in the following sequence:

MUTE → 1 → 8 → 2 POWER When the Service Mode is entered, use the Channel UP/DOWN buttons on the remote control to move to the item to adjust.



### 4-3-2 Adjustments Adjust

Detailed Items: Use the Channel UP/DOWN buttons.

Data Adjustment: Use the Volume +/- buttons.

Channel Switching: Enter the Channel No.

### 4-3-3 Special Notes

1. When IC902 (EEPROM) is replaced, warm up the TV for 4~5 seconds after plugging in.
2. After IC902 (EEPROM) is replaced, enter the Service Mode and standard data for all items.
3. Make the following adjustments: Geometric, White Balance, Sub-contrast, Sub-brightness.

<Caution> You should not change SENSOR REF value using [+ , -] key.

### 4-3-4 Purity Compensation Method

- Type of calibration : 100% Green (calibration by copy)
- User item : “Perimeter Purity” compensation item depending on setting position conditions in respect of consumers

Adjustment method : Adjust 4 items such as TL/BL/TR/BR using Entry of service item -> User movement  
 -> VOL UP/DOWN key and compensate other color of corner purity.

TL	USER	20
BL	USER	20
TR	USER	20
BR	USER	20

- ITC item : In A/S, never compensate using the factory-adjusted mode.  
**Caution** You should not change SENSOR REF value using [+,-] key.

TL	ITC	30	
BL	ITC	30	
TR	ITC	30	
BR	ITC	30	
SENS	REF	117	127

### 4-4 Option Byte

		USA		CANADA		NT Latin America	
		NORMAL	WIDE	NORMAL	WIDE	NORMAL	WIDE
BYTE	FUNCTION						
B0	WIDE	X	○	X	○	X	○
B1	V-CHIP	○	○	X	X	X	X
B2	AFN	X	X	X	X	X	X
B3	RESERVED	—	—	—	—	—	—
B4	NO ACS	X	X	X	X	○	○
B5	NO X-RAY	X	○	X	○	○	○
OPTION BYTE		02	23	00	21	30	31

OPTION BYTE 0	0 (HEX)	3 2 1 0	0 : 4:3 (NORMAL) 1 : WIDE (16:9)
			0 (HEX)
OPTION BYTE 1	0 (HEX)	3 2 1 0	0 : AIR/STD/HRC/AFN 1 : AIR/STD/HRC/IRC
		3 2 1 0	DON'T CARE
		3 2 1 0	0 : ACS ON 1 : ACS OFF
		3 2 1 0	DON'T CARE
OPTION BYTE 1	0 (HEX)	3 2 1 0	DON'T CARE
		3 2 1 0	DON'T CARE
		3 2 1 0	DON'T CARE
		3 2 1 0	DON'T CARE
OPTION BYTE 1	0 (HEX)	3 2 1 0	DON'T CARE
		3 2 1 0	DON'T CARE
		3 2 1 0	DON'T CARE
		3 2 1 0	DON'T CARE

**NOTES**

- 32-Inch, 36-Inch : The X-ray feature functions at the H/V module on the power board.
- 29-Inch, 34-Inch : The X-ray feature functions by using the micom IC(Pin 3)

## 4-5 Geometric

DESCRIPTION		VS V-SHIFT	VA V-SIZE	VL V-LINE	VSC V-S CORR	VE V-V EHT	HA H-SIZE	PPH PIN PHS	PAM PIN AMP
32", 36" WIDE	RF Mode	166	112	105 (FIXED)	125 (FIXED)	0 (FIXED)	153	65	114
	480P Mode	184	111	105 (FIXED)	125 (FIXED)	0 (FIXED)	158	85	114
	1080i Mode	170	98	105 (FIXED)	125 (FIXED)	0 (FIXED)	200	82	120

DESCRIPTION		UPC UP-CORR	LOC LO-CORR	HEH H-EHT	HS H-SHIFT	VAN V-ANGLE	VBO V-BOW	HSP H-SYC-PH
32", 36" WIDE	RF Mode	207	144	0 (FIXED)	112	116	124	134 (FIXED)
	480P Mode	180	125	0 (FIXED)	43	107	124	134 (FIXED)
	1080i Mode	219	140	0 (FIXED)	53	118	125	142 (FIXED)

## 4-6 Picture

DESCRIPTION	RDR	GDR	BDR	RCT	GCT	BCT
	R-DRIVE	G-DRIVE	B-DRIVE	R-CUT OFF	G-CUT OFF	B-CUT OFF
32", 36" WIDE	32	32 (FIXED)	32	32	24 (FIXED)	32

DESCRIPTION	SBT	CON	COL	HUE	GAM
	SUB-BRT	UB-CON	UB-COL	SUB-HUE	GAMMA
32", 36" WIDE	25	6	3 (FIXED)	5 (FIXED)	12 (FIXED)

DESCRIPTION	VML		
	VM-LEVEL		
	RF	480P	1080i
32", 36" WIDE	203 (FIXED)	138 (FIXED)	138 (FIXED)

Adjustment Item		Variable Scope	Value Given	Explanation of Item
USER	TL	0 ~ 40	20	User Landing compensation value for top left
	BL	0 ~ 40	20	User landing compensation value for bottom left
	TR	0 ~ 40	20	User landing compensation value for top right
	BR	0 ~ 40	20	User landing compensation value for bottom right
ITC	TL	0 ~ 60	30	Factory landing compensation value for top left
	BL	0 ~ 60	30	Factory landing compensation value for bottom left
	TR	0 ~ 60	30	Factory landing compensation value for top right
	BR	0 ~ 60	30	Factory landing compensation value for top left
	SENCE REF	0 ~ 256 0 ~ 256	115, 125	EW Reference value of earth magnetic field sensor. NS Reference value of earth magnetic field sensor. (Never operate [-/+ ] key in this position)

### 4-7 White Balance

	COLOR COORDINATES	
	HIGH	LOW
X	275	265
Y	275	265
L	55	2.0

### 4-8 MAIN FACTORY DATA

MAIN FACTORY DATA

구분	TSL3099WHF		
	RF	480P	1080i
SUB-COLOR	3	5	5
VML	203	138	138
HUE	5	5	5



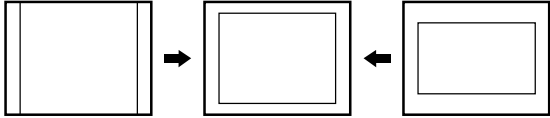
**MEMORY DESCRIPTION**

No.	Item	Description
0	V Shift	Vertical Shift
1	V Size	Adjusts the vertical image size
2	V Linearity	Adjusts the vertical linearity
3	V S Correction	Vertical S-Correction
4	V EHT	Adjusts the vertical variance (depending on the high pressure)
5	H Size	Adjusts the horizontal size
6	Pin Phase	Adjusts the left/right symmetry of pincushion
7	Pin AMP	Adjusts Pincushion
8	Upper Corner	Adjusts the upper corner
9	Lower Corner	Adjusts the lower corner
10	H EHT	Adjusts the horizontal variance (depending on the high pressure)
11	H Shift	Horizontal Shift
12	V Angle	Adjusts so that the vertical line becomes rectangular
13	V Bow	Adjusts so that the vertical lines are symmetrical
14	H Sync Phase	Adjusts the horizontal sync phase

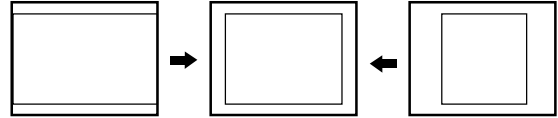
### 4-8 Screen Change (I2C Bus Geometric Adjustment)

---

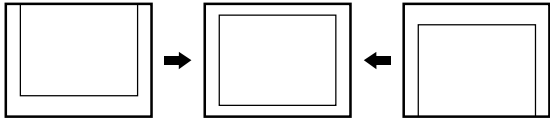
0 V - SIZE(VA)



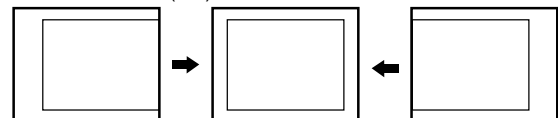
6 H - SIZE (HA)



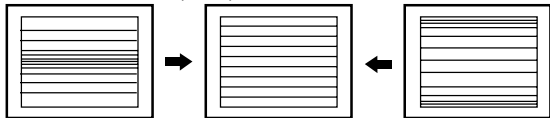
1 V - SHIFT(VS)



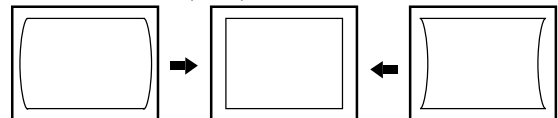
7 H - SHIFT(HS)



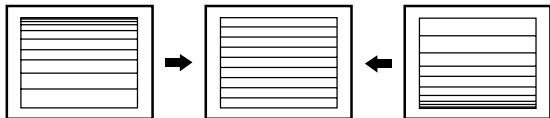
2 V-S-CORR (VSC)



8 PIN - AMP (PAM)



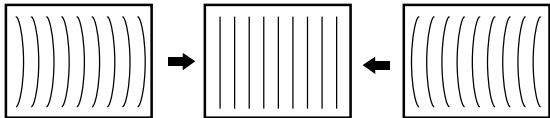
3 V - LINE (VL)



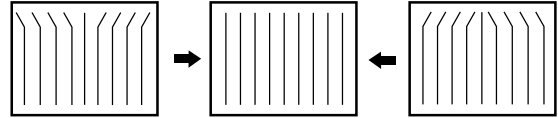
9 PIN-PHS (PPH)



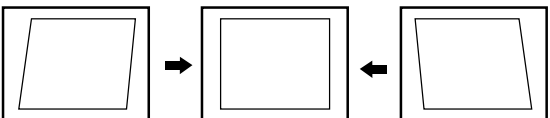
4 V - BOW (VBO)



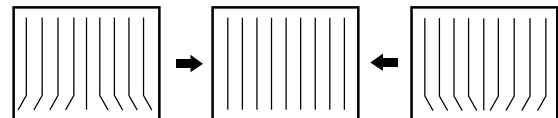
10 UP - CORR (UPC)



5 V - ANGLE (VAN)

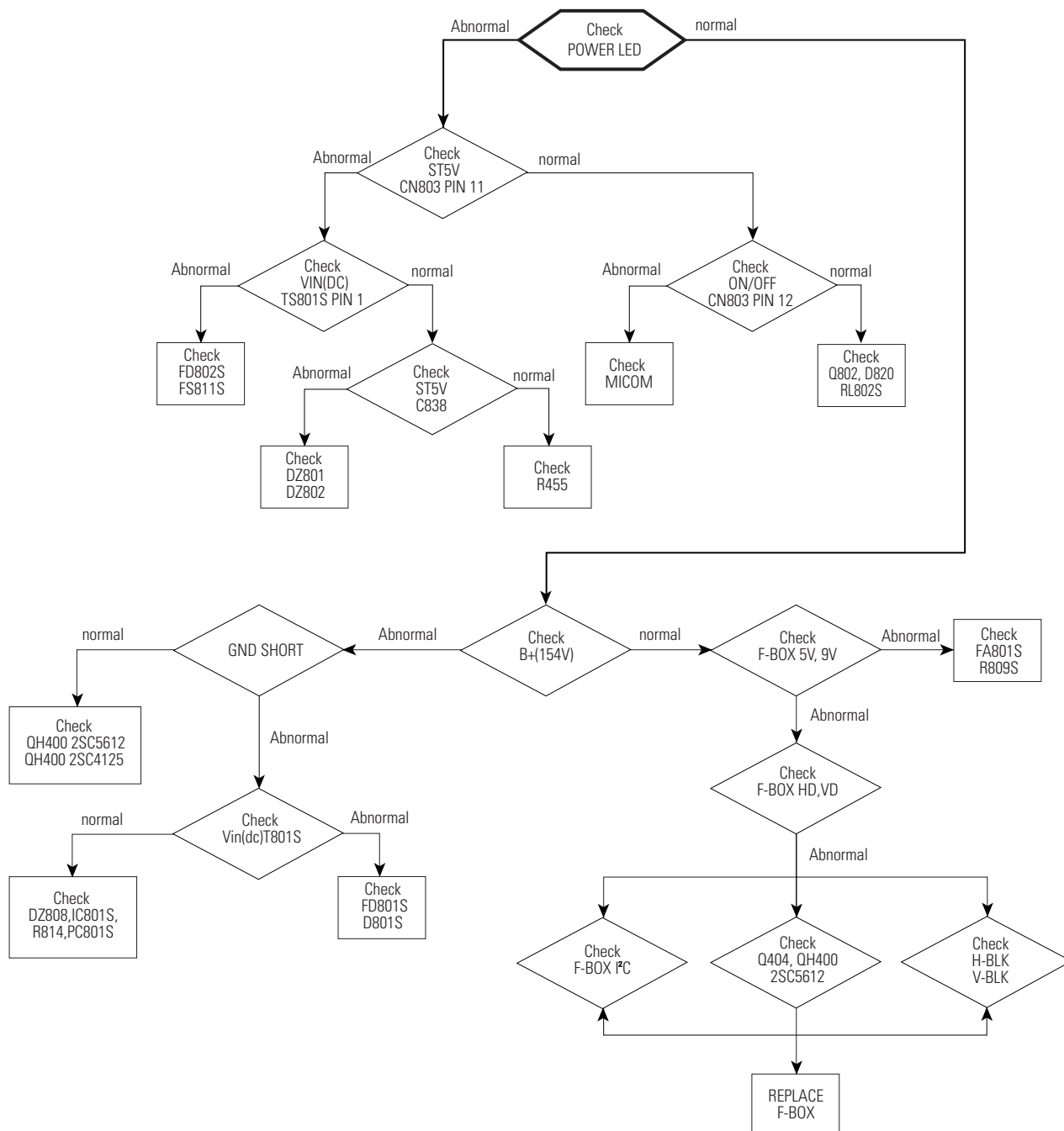


11 LO - CORR (LOC)

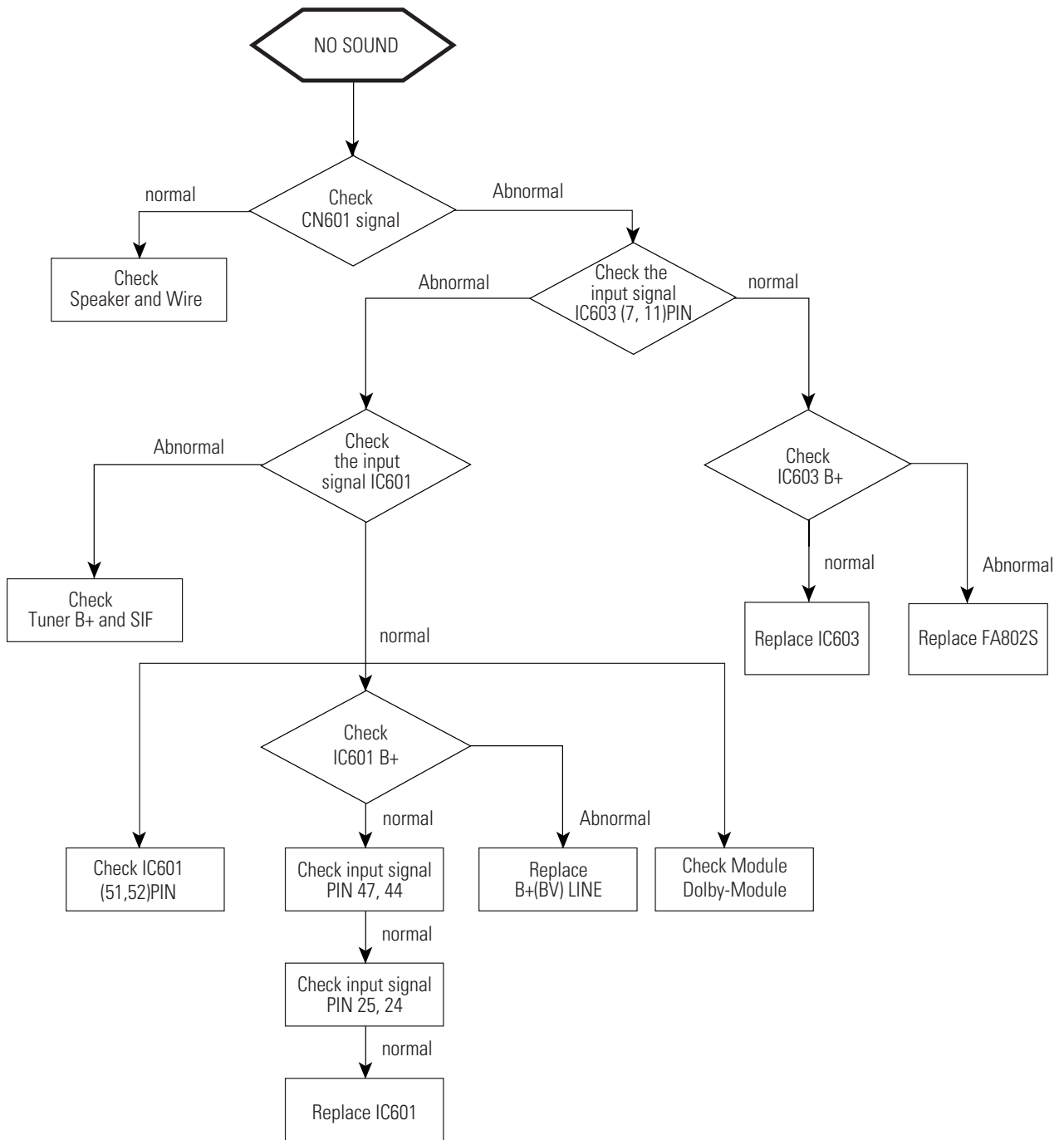


## 5. Troubleshooting

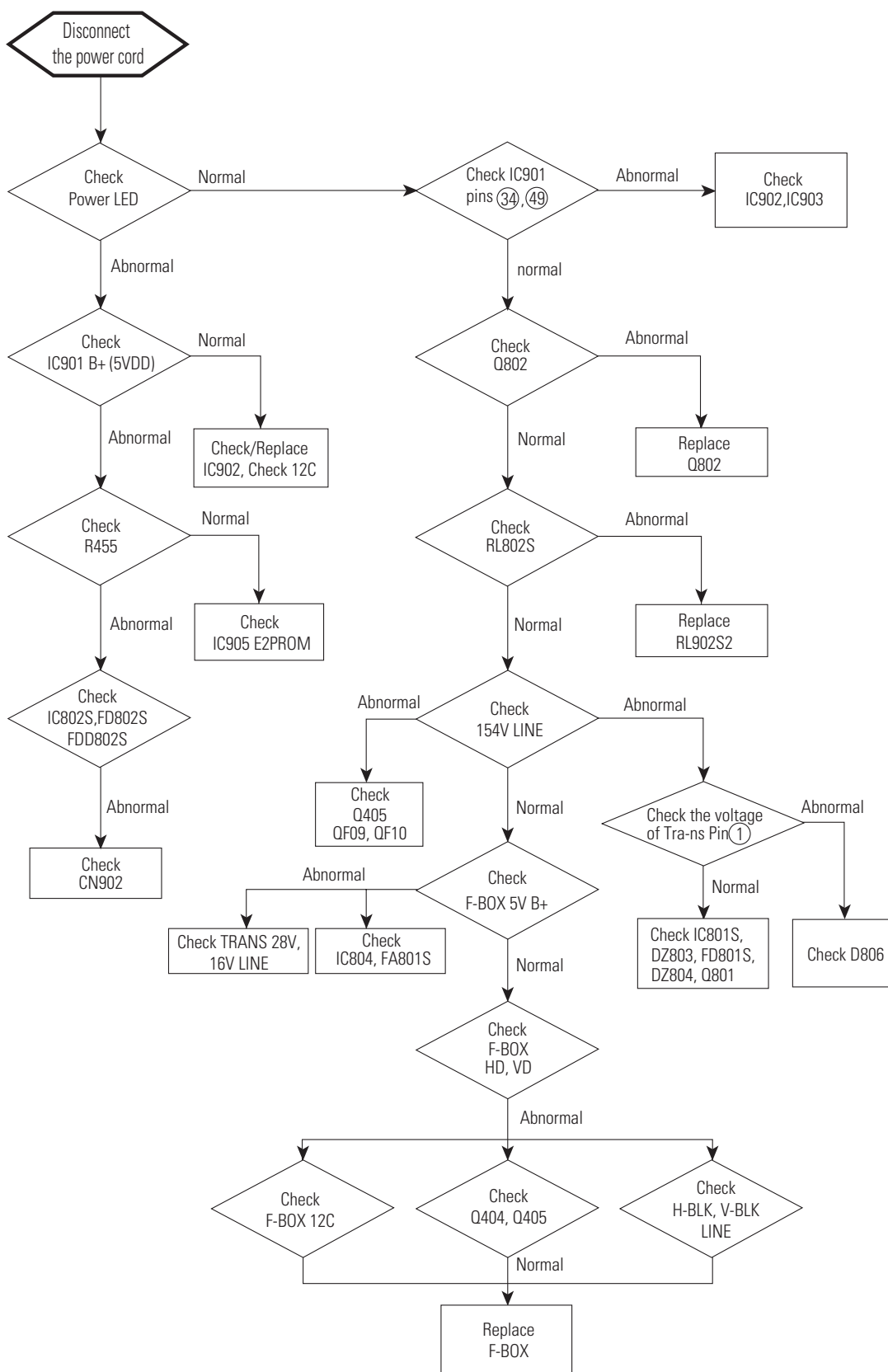
### 5-1 No Raster



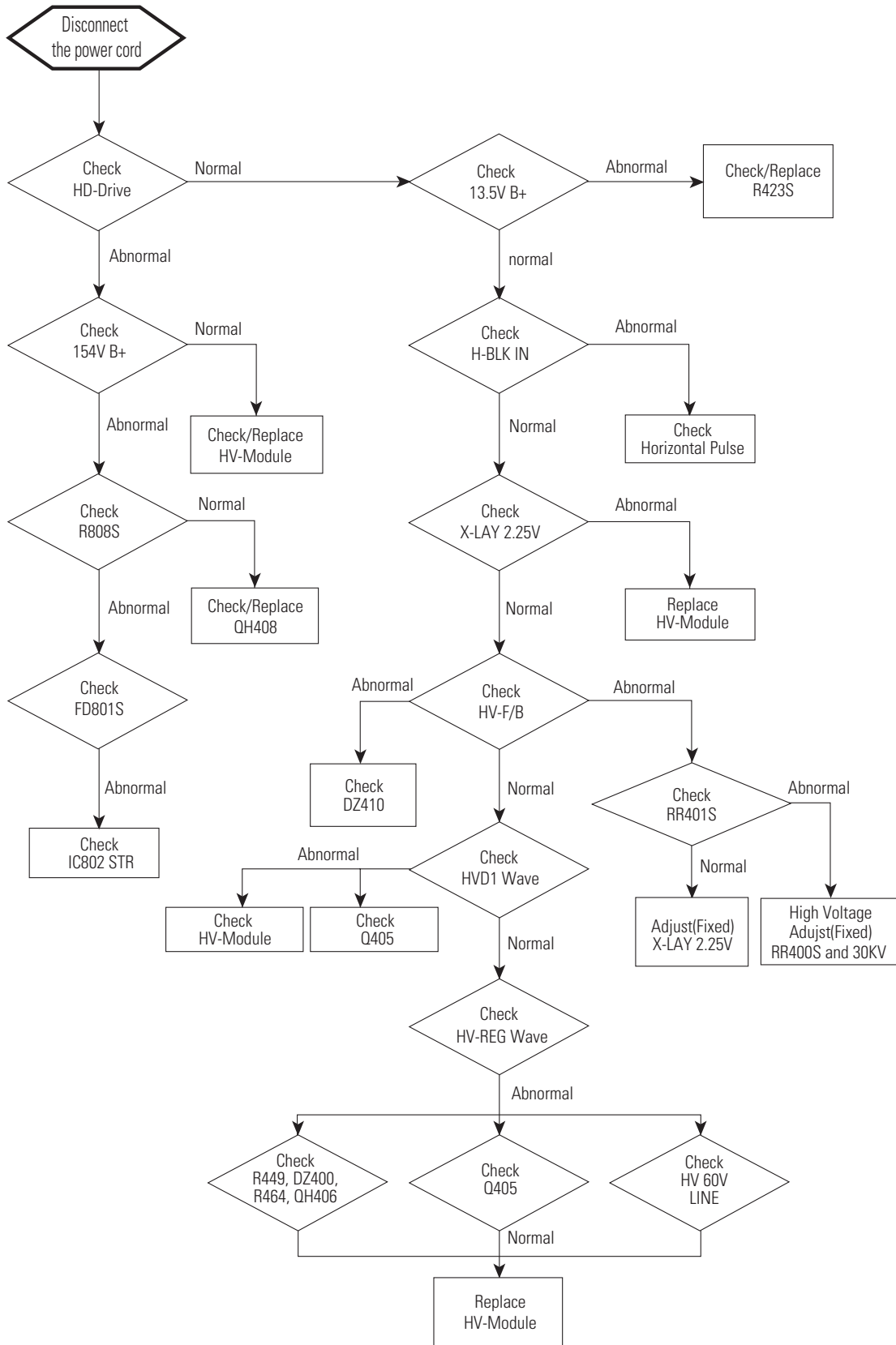
## 5-2 No Sound



## 5-3 No Power

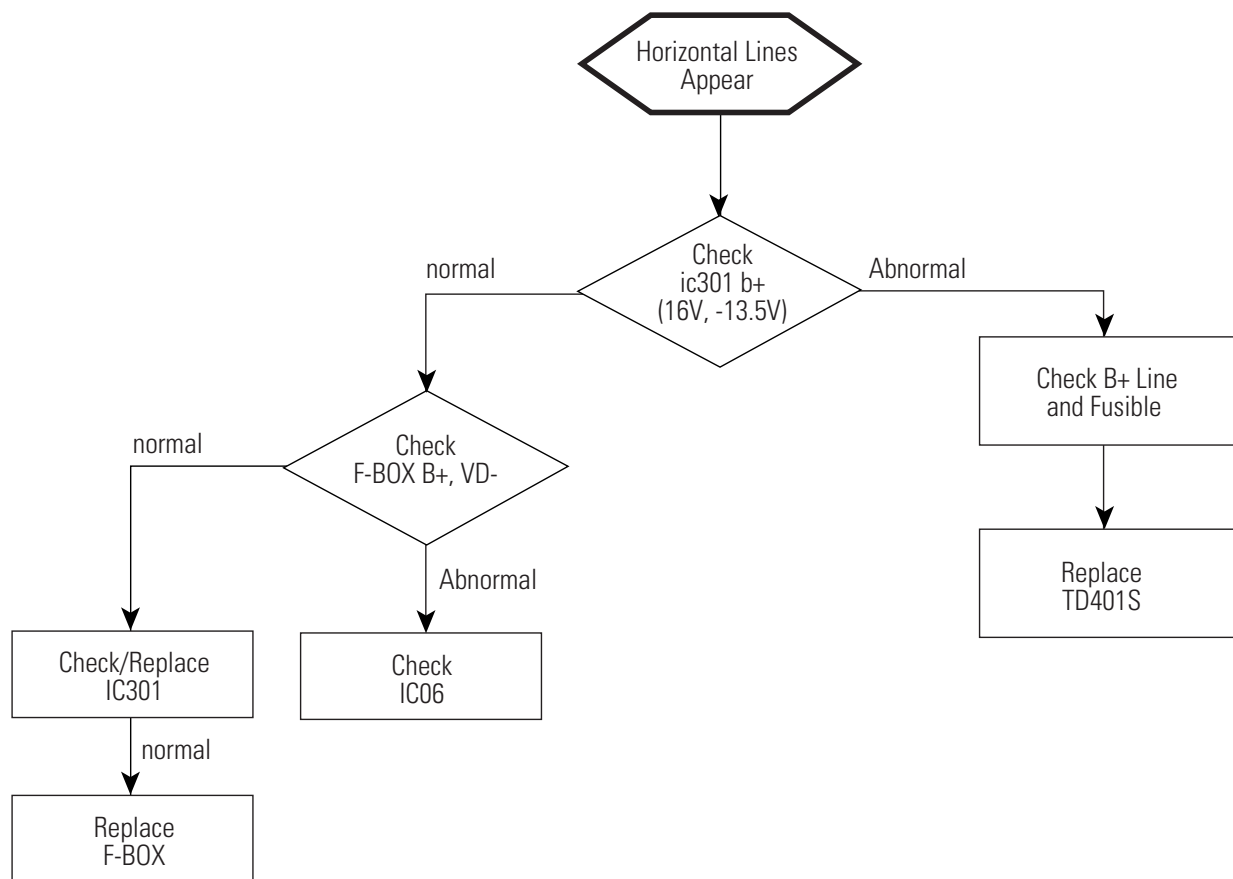


### 5-4 No Raster in High Voltage (Sound & Horizontal OK)

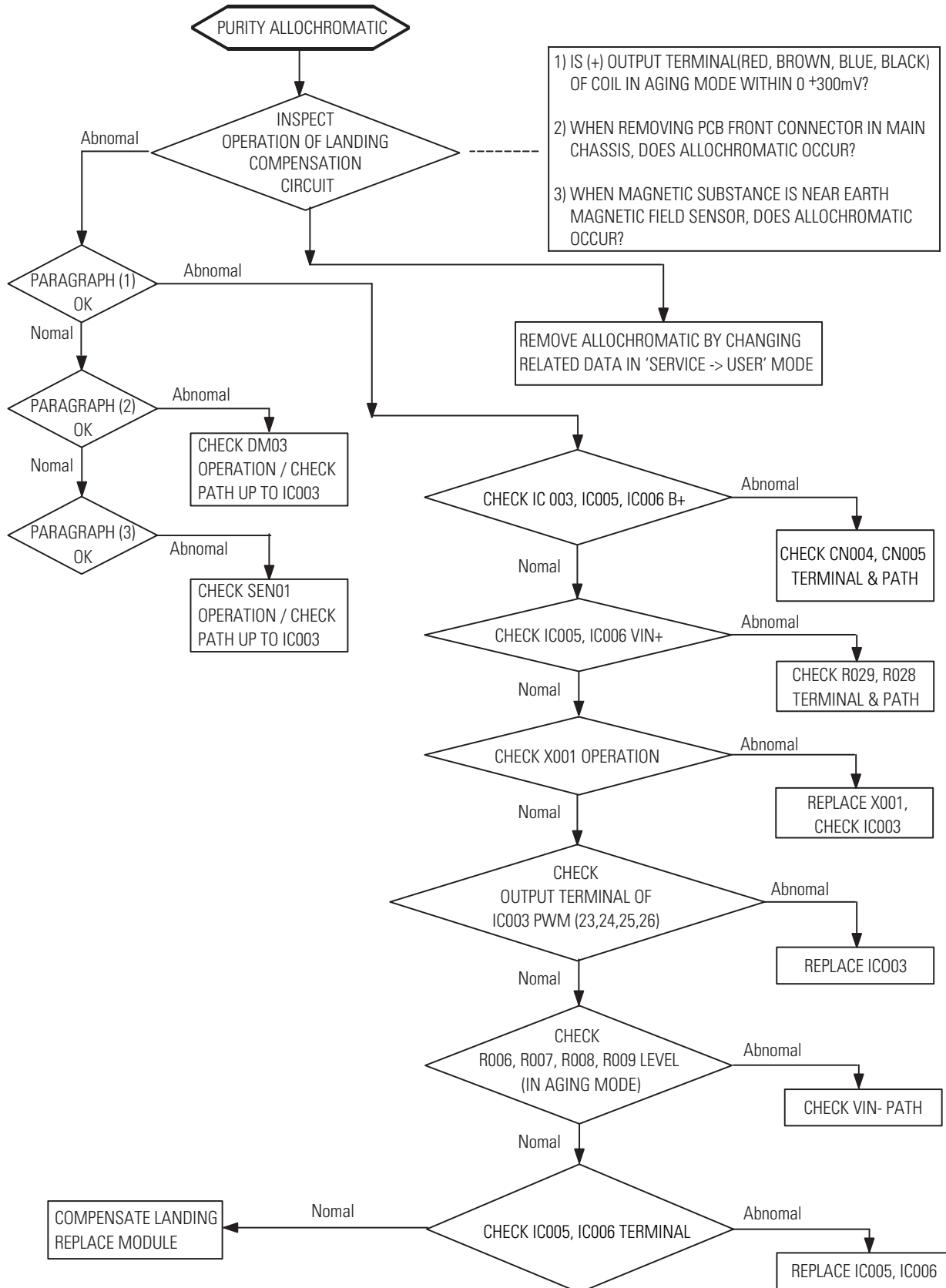


## 5-5 Horizontal Lines Appear on the screen

---



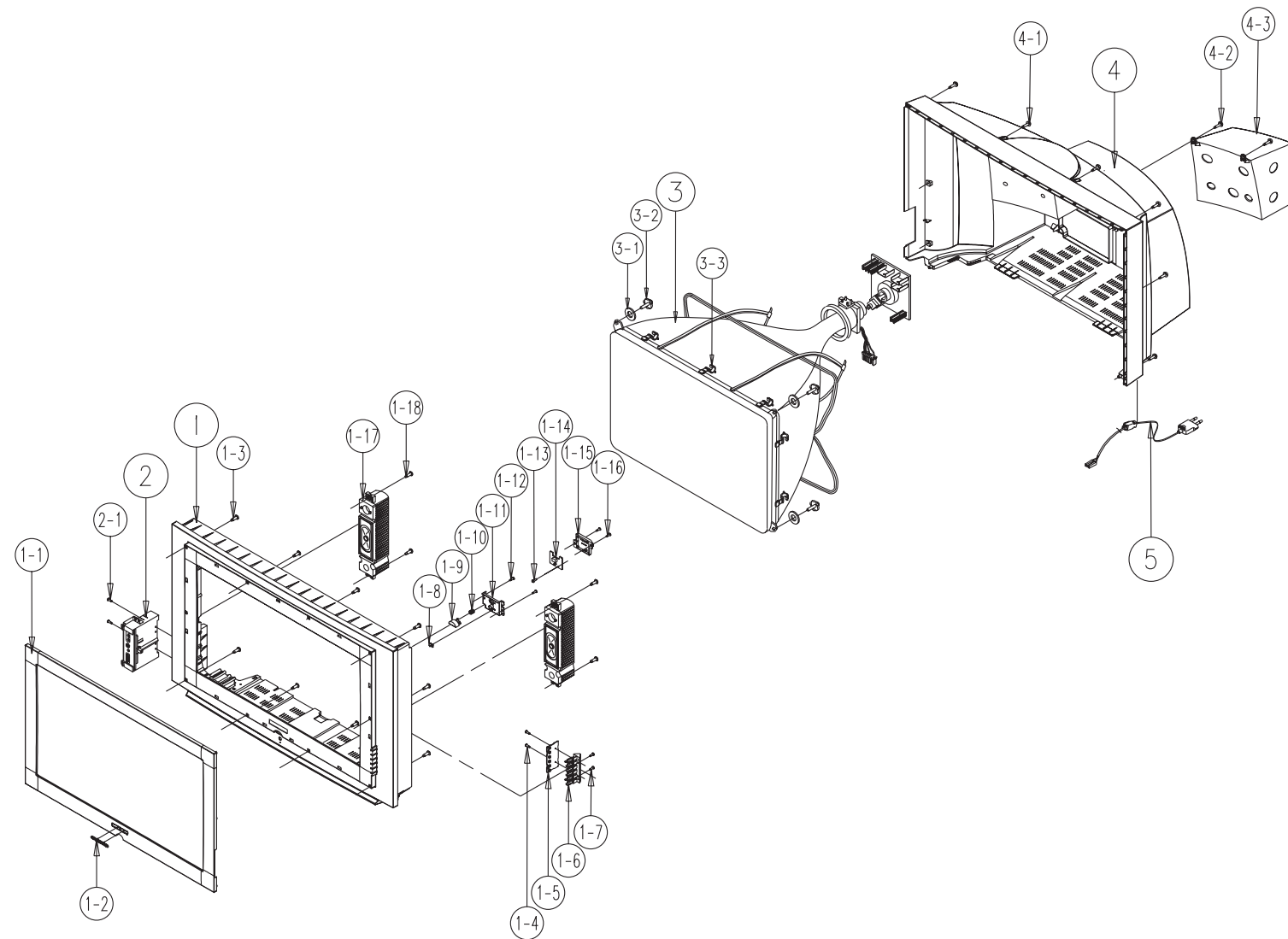
## 5-6 Purity Defect (Audio/ Video/ Sound : OK)





## 6. Exploded View & Parts List

### 6-1 TSL3099WHFXXAA



No	Code No	Description;Specification	Q'ty	Remark
1	AA91-00469H	ASSY CABINET FRONT;,TSL3099WHF,DG703+VT0	1	
1-1	AA64-01199F	CABINET-MASK;TSL3099,HIPS,VO,BLK,DG-703P	1	
1-2	AA64-01062B	BADGE BRAND;32Z5,AL FORGING,-,-,L65,-,SI	1	
1-3	6003-001019	SCREW-TAPTITE;RH,+,B,M4,L12,ZPC(BLK),SWR	10	MAS+CF
1-4	6003-000333	SCREW-TAPTITE;RH,+,2S,M3,L10,ZPC(YEL),SW	2	PCB+KC
1-5	AA95-01360A	ASSY PCB CONTROL;,K54A,TSL3099WHFXXAA	1	
1-6	AA64-01201F	KNOB CONTROL;32Z5,ABS,HB,BLK,DG-703P	1	
1-7	6003-001026	SCREW-TAPTITE;RH,+,B,M4,L15,ZPC(BLK),SWR	2	KC+CF
1-8	AA64-01203B	INDICATOR LED;32Z5,ACRYL,-,CLR,-,-,-	1	
1-9	AA64-01200F	KNOB POWER;32Z5,ABS,HB,BLK,DG-703P	1	
1-10	AA61-60003J	SPRING-CS;-;SUS304,-,-,OD6,N7,OD6,-,-,-	1	
1-11	AA64-01202B	WINDOW REMOCON;32Z5,PC,-,-,-,VO,VIOLET,-	1	
1-12	6003-001019	SCREW-TAPTITE;RH,+,B,M4,L12,ZPC(BLK),SWR	2	WIN+CF
1-13	6003-000333	SCREW-TAPTITE;RH,+,2S,M3,L10,ZPC(YEL),SW	1	PCB+HP
1-14	AA95-01217A	ASSY-TACK S/W;,32Z5,K54A,NTSC	1	
1-15	AA61-00450B	HOLDER-POWER;32Z5,ABS,-,-,-,GRAY,HB	1	
1-16	6003-001026	SCREW-TAPTITE;RH,+,B,M4,L15,ZPC(BLK),SWR	2	HP+CF
1-17	AA91-00486A	ASSY HOLDER SPK;-;PP,8ohm/10W,BLK,ZEUS S	1	
1-18	AA60-10050A	SCREW-ASSY;-;SWRCH18A,M4,L25,RH,+,WP,-,Z	4	DOME
2	AA61-00545A	HOLDER-AV,HOUSING ASSY;32Z5,ABS,-,-,-,GR	1	
2-1	6002-000522	SCREW-TAPPING;TH,+,2,M4,L15,ZPC(BLK),SWR	2	DR+CF
3	AA94-05150A	ASSY CRT;W76QDE991X002,+380MG,32	1	
3-1	AA63-60004L	SPACER-GUM,CRT;-;NTR RUBBER,-,-,-,BLK,T3	4	CRT
3-2	AA60-10050V	SCREW-ASSY;-;SWRCH18A,M6,L30,HH,+,WC,-,Z	4	CRT+CF
3-3	AA65-30017A	CLAMP-D,COIL;-;NYLON-66,VO,-,NTR,DADH300	11	
4	AA64-01198B	CABINET BACK;32Z5,HIPS,-,-,-,VO,G4309,-	1	
4-1	AA60-10050T	SCREW-TAPPING;-;SWRCH18A,M4,L20,RH,+,2S,	8	CB+CF
4-2	6006-001096	SCREW-ASS'Y TAPT;WP,BH,+,M4.0,L12,BLK,SW	4	WOOFER
4-3	AA91-00487A	ASSY HOLDER SPK;-;PP,8ohm/25W,-,ZEUS SUB	1	
5	AA96-20129H	ASSY POWER CORD;-;EP2/YES,H/S 150mm,KJ10	1	































Loc. No.	Code No.	Description ; Specification	Remark	Loc. No.	Code No.	Description ; Specification	Remark
...3	QM02	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,T	..2	CRT	AA63-60004L	SPACER-GUM,CRT;-NTR RUBBER,-,-,-,BLK,T3
...3	RM01	2001-000020	R-CARBON(S);220OHM,5%,1/2W,AA,TP,2.4X6.4M	..2	CRT+CF	AA60-10050V	SCREW-ASSY;-SWRCH18A,M6,L30,HH,+,WC,-,Z
...3	RM02	2001-000066	R-CARBON(S);10KOHM,5%,1/2W,AA,TP,2.4X6.4	..2	DR+CF	6002-000522	SCREW-TAPPING;TH,+,2,M4,L15,ZPC(BLK),SWR
...3	RM03	2001-001114	R-CARBON(S);2700HM,5%,1/2W,AA,TP,2.4X6.4	..2	HP+CF	6003-001026	SCREW-TAPTITE;RH,+,B,M4,L15,ZPC(BLK),SWR
...3	RM04	2001-001114	R-CARBON(S);2700HM,5%,1/2W,AA,TP,2.4X6.4	..2	KC+CF	6003-001026	SCREW-TAPTITE;RH,+,B,M4,L15,ZPC(BLK),SWR
...3	RM05	2001-000066	R-CARBON(S);10KOHM,5%,1/2W,AA,TP,2.4X6.4	..2	TB+RCA	AA60-10050T	SCREW-TAPPING;-SWRCH18A,M4,L20,RH,+,2S,
...3	RM06	2001-001108	R-CARBON(S);22KOHM,5%,1/2W,AA,TP,2.4X6.4	..2	WOOFER	6006-001096	SCREW-ASS'Y TAPT;WP,BH,+,M4,0,L12,BLK,SW
...3	RM07	2001-000066	R-CARBON(S);10KOHM,5%,1/2W,AA,TP,2.4X6.4	..2		AA64-01198B	CABINET BACK;32Z5,HIPS,-,-,-,VO,G4309,-
...3	RM08	2001-000085	R-CARBON(S);100KOHM,5%,1/2W,AA,TP,2.4X6.4	..2		AA73-00005B	RUBBER-CAP;FLAT,PRJ,SILICONE RUBBER,WHIT
..2		AA61-00450B	HOLDER-POWER;32Z5,ABS,-,-,-,GRAY,HB	..2		AA64-01291B	INLAY-COVER;D4,PVC-SHEET,TO,4.94 VO,-,-,-
..2		AA41-00310B	PCB-TACK SWITCH;WT-32Z5HR,FR-1,1L,B,1.6T	..2		AA64-60421C	INLAY-COVER;-PS,TO,3,-,-,BLK,SEA
..2		0202-000187	SOLDER-WIRE FLUX;-RS60S,D1,2.63Sn/37Pb	..2		AA65-30008A	CLAMP-CORD;-PE,HB,-,BLK,-

## ASSY PCB CONTROL

1	*	AA95-01360A	ASSY PCB CONTROL;K54A,TSL3099WHFXXAA	
..2	CNC01	AA39-00243A	LEAD CONNECTOR ASSY;,5P,YBNH250-05,35155	
..2	PCB+KC	6003-000333	SCREW-TAPTITE;RH,+,2S,M3,L10,ZPC(YEL),SW	
..2	SWC01	3404-000176	SWITCH-TACT;12V,50mA,120gf,6x6mm,SPST	
..2	SWC02	3404-000176	SWITCH-TACT;12V,50mA,120gf,6x6mm,SPST	
..2	SWC03	3404-000176	SWITCH-TACT;12V,50mA,120gf,6x6mm,SPST	
..2	SWC04	3404-000176	SWITCH-TACT;12V,50mA,120gf,6x6mm,SPST	
..2	SWC06	3404-000176	SWITCH-TACT;12V,50mA,120gf,6x6mm,SPST	
..2	SWC07	3404-000176	SWITCH-TACT;12V,50mA,120gf,6x6mm,SPST	
..2		AA64-01201F	KNOB CONTROL;32Z5,ABS,HB,BLK,DG-703P	
..2		AA99-20100K	ASSY-PCB SUB,AUTO; AA95-01360A ,J	S.N.A
...3	RC03	2001-000387	R-CARBON;16KOHM,5%,1/8W,AA,TP,1.8X3.2M	
...3	RC04	2001-000947	R-CARBON;7.5KOHM,5%,1/8W,AA,TP,1.8X3.2	
...3	RC05	2001-000591	R-CARBON;3.3KOHM,5%,1/8W,AA,TP,1.8X3.2	
...3	RC06	2001-000591	R-CARBON;3.3KOHM,5%,1/8W,AA,TP,1.8X3.2	
...3	RC07	2001-000947	R-CARBON;7.5KOHM,5%,1/8W,AA,TP,1.8X3.2	
..2		AA41-00294A	PCB-CONTROL;WT-32Z5DI,FR-1,1L,A,1.6T,245	S.N.A
..2		0202-000187	SOLDER-WIRE FLUX;-RS60S,D1,2.63Sn/37Pb	

## ASSY TERMINAL BOARD

1	*	AA91-00470D	ASSY TERMINAL BOARD;HIPS,VO,BLK,KS4A SE	
..2	DC06	2201-000532	C-CERAMIC,DISC;4.7nF,10%,50V,Y5P,TP,8x3.	
..2	DC07	2201-000532	C-CERAMIC,DISC;4.7nF,10%,50V,Y5P,TP,8x3.	
..2	DC09	2201-000144	C-CERAMIC,DISC;0.1nF,5%,50V,NP0,TP,8.5x3	
..2	DC10	2201-000144	C-CERAMIC,DISC;0.1nF,5%,50V,NP0,TP,8.5x3	
..2	DCN01	AA39-20070E	LEAD CONNECTOR-ASSY;,7P,YBNH025-07,67096	
..2	DCN02	AA39-20183A	LEAD CONNECTOR-ASSY;,8P,YBNH250-08,67096	
..2	DJK01	3722-001547	JACK-PIN;3P;3.5mm,AU,GRN/BLU/RED,-	
..2	DJK02	3722-001439	JACK-PIN;2P;3.5mm,NI,BLK,-	
..2	DJK03	3722-001546	JACK-PIN;3P;3.5mm,AU,WHT/RED/BLK,-	
..2	DL01	2701-000115	INDUCTOR-AXIAL;10uH,10%,3x7mm	
..2	DL02	2701-000115	INDUCTOR-AXIAL;10uH,10%,3x7mm	
..2	DL03	2701-000115	INDUCTOR-AXIAL;10uH,10%,3x7mm	
..2	DL04	2701-000115	INDUCTOR-AXIAL;10uH,10%,3x7mm	
..2	DLF01	3301-000287	CORE-FERRITE BEAD;AA,3.5x1.0x6.0mm,1500,	
..2	DLF02	3301-000287	CORE-FERRITE BEAD;AA,3.5x1.0x6.0mm,1500,	
..2	DVDPCB	6006-001095	SCREW-ASS'Y TAPT;WP,BH,+,M4,L12,ZPC(YEL)	S.N.A
..2	DZ04	0403-001325	DIODE-ZENER;MTZJ15C,14.35-15.09V,500mW,D	
..2	DZ05	0403-001325	DIODE-ZENER;MTZJ15C,14.35-15.09V,500mW,D	
..2	DZ06	0403-001325	DIODE-ZENER;MTZJ15C,14.35-15.09V,500mW,D	
..2	DZ07	0403-001325	DIODE-ZENER;MTZJ15C,14.35-15.09V,500mW,D	
..2		3301-001201	CORE-FERRITE;AE,21x11x32mm,1500,280G	
..2		AA41-00292B	PCB-DTV JACK;WT-32Z5HR,FR-1,1L,B,1.6T,33	S.N.A
..2		AA63-00312B	TERMINAL-BOARD;32Z5,HIPS,-,-,-,VO,BLK	
..2		AA64-01205G	INLAY-BACK;TSL3099,PS SHEET,TO,5,K54A SE	S.N.A

## ASSY CABINET

1	*	AA90-00377C	ASSY CABINET;32Z5,TSL3099WHFXXAA	S.N.A
..2	BC+CF	6002-000522	SCREW-TAPPING;TH,+,2,M4,L15,ZPC(BLK),SWR	
..2	CABBAC	AA60-00091J	SPACER-FELT;-FELT,330X10,-,-,BLK,TO,5,-	S.N.A
..2	CB+CF	AA60-10050T	SCREW-TAPPING;-SWRCH18A,M4,L20,RH,+,2S,	
..2	CB_TBA	AA60-10050T	SCREW-TAPPING;-SWRCH18A,M4,L20,RH,+,2S,	

## ASSY CABINET FRONT

1	*	AA91-00469H	ASSY CABINET FRONT;TSL3099WHF,DG703+VTO	
..2	DOME	AA60-10050A	SCREW-ASSY;-SWRCH18A,M4,L25,RH,+,WP,-,Z	S.N.A
..2	MAS+CF	6003-001019	SCREW-TAPTITE;RH,+,B,M4,L12,ZPC(BLK),SWR	
..2	WIN+CF	6003-001019	SCREW-TAPTITE;RH,+,B,M4,L12,ZPC(BLK),SWR	
..2		AA64-01199F	CABINET-MASK;TSL3099,HIPS,VO,BLK,DG-703P	S.N.A
..2		AA64-01200F	KNOB POWER;32Z5,ABS,HB,BLK,DG-703P	
..2		AA64-01202B	WINDOW REMOCOON;32Z5,PC,-,-,-,VO,VIOLET,-	
..2		AA64-01203B	INDICATOR LED;32Z5,ACRYL,-,CLR,-,-,-	
..2		AA91-00486A	ASSY HOLDER SPK;-PP,8ohm/10W,BLK,ZEUS S	
..2		AA61-60003J	SPRING-CS;-SUS304,-,-,OD6,N7,OD6,-,-,-	
..2		AA64-01062B	BADGE BRAND;32Z5,AL FORGING,-,-,L65,-,SI	S.N.A
..2		AA64-01197D	CABINET-FRONT;32Z5,HIPS,VO,BLK,DG703+VTO	S.N.A

## ASSY CHASSIS PART

1	*	AA90-00378A	ASSY CHASSIS PART;K54A,32Z5HR	S.N.A
..2	C-BLOC	6003-000333	SCREW-TAPTITE;RH,+,2S,M3,L10,ZPC(YEL),SW	
..2	MP+HC	6003-000333	SCREW-TAPTITE;RH,+,2S,M3,L10,ZPC(YEL),SW	
..2	PP+HC	6003-000333	SCREW-TAPTITE;RH,+,2S,M3,L10,ZPC(YEL),SW	
..2	SUBPCB	6003-000333	SCREW-TAPTITE;RH,+,2S,M3,L10,ZPC(YEL),SW	
..2	TBA+HC	6006-001095	SCREW-ASS'Y TAPT;WP,BH,+,M4,L12,ZPC(YEL)	S.N.A
..2		AA61-00449C	HOLDER-CHASSIS;32Z5,HIPS,-,-,-,G4309,VO	S.N.A

## ASSY TBC WIRE(P)

1	*	AA98-70011G	ASSY TBC WIRE(P);-.32inch,NTSC,2PWH,K54A	S.N.A
---	---	-------------	--	-------

## ASSY HOLDER SPK

1	*	AA91-00487A	ASSY HOLDER SPK;-PP,8ohm/25W,-,ZEUS SUB	
---	---	-------------	---	--

## ASSY CRT

△	1	*	AA94-05150A	ASSY CRT;W76QDE991X002,+380MG,32
..2			AA03-00313A	CRT COLOR;W76QDE991X002,+380MG,0.273MH,

## ASSY POWER CORD

△	1	*	AA96-20129H	ASSY POWER CORD;-EP2/YES,H/S 150mm,KJ10	S.N.A
---	---	---	-------------	---	-------

## ASSY ACCESSORY

1	*	AA94-03469C	ASSY ACCESSORY;TSL3099WHFXXAA,K54A	S.N.A
..2		AA68-01403A	MANUAL USERS;-ENG,W/P100(G),B5,68PAGE,K5	S.N.A



Electrical Parts List

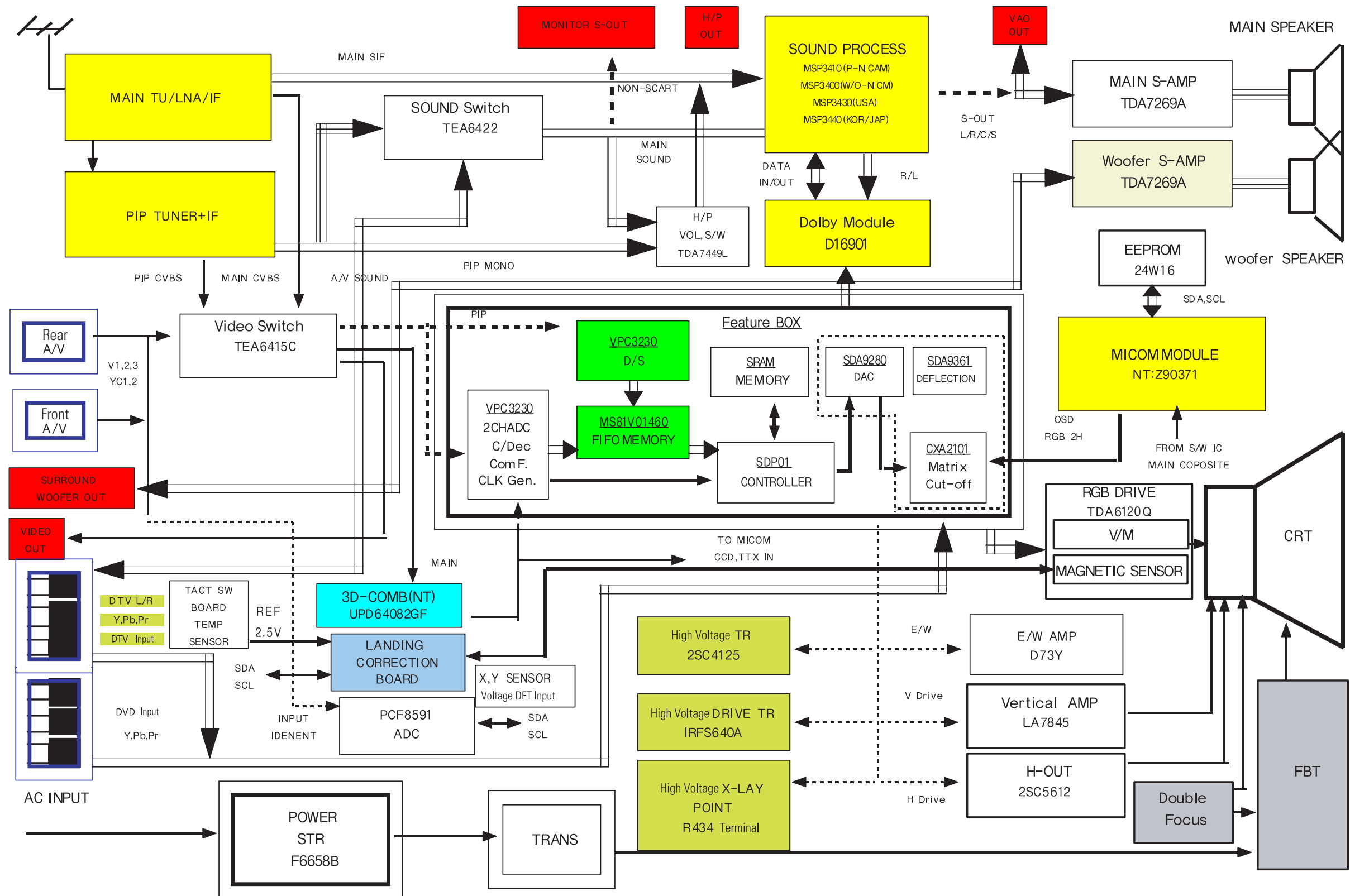
Loc. No.	Code No.	Description ; Specification	Remark	Loc. No.	Code No.	Description ; Specification	Remark
----------	----------	-----------------------------	--------	----------	----------	-----------------------------	--------

**REMOCON**

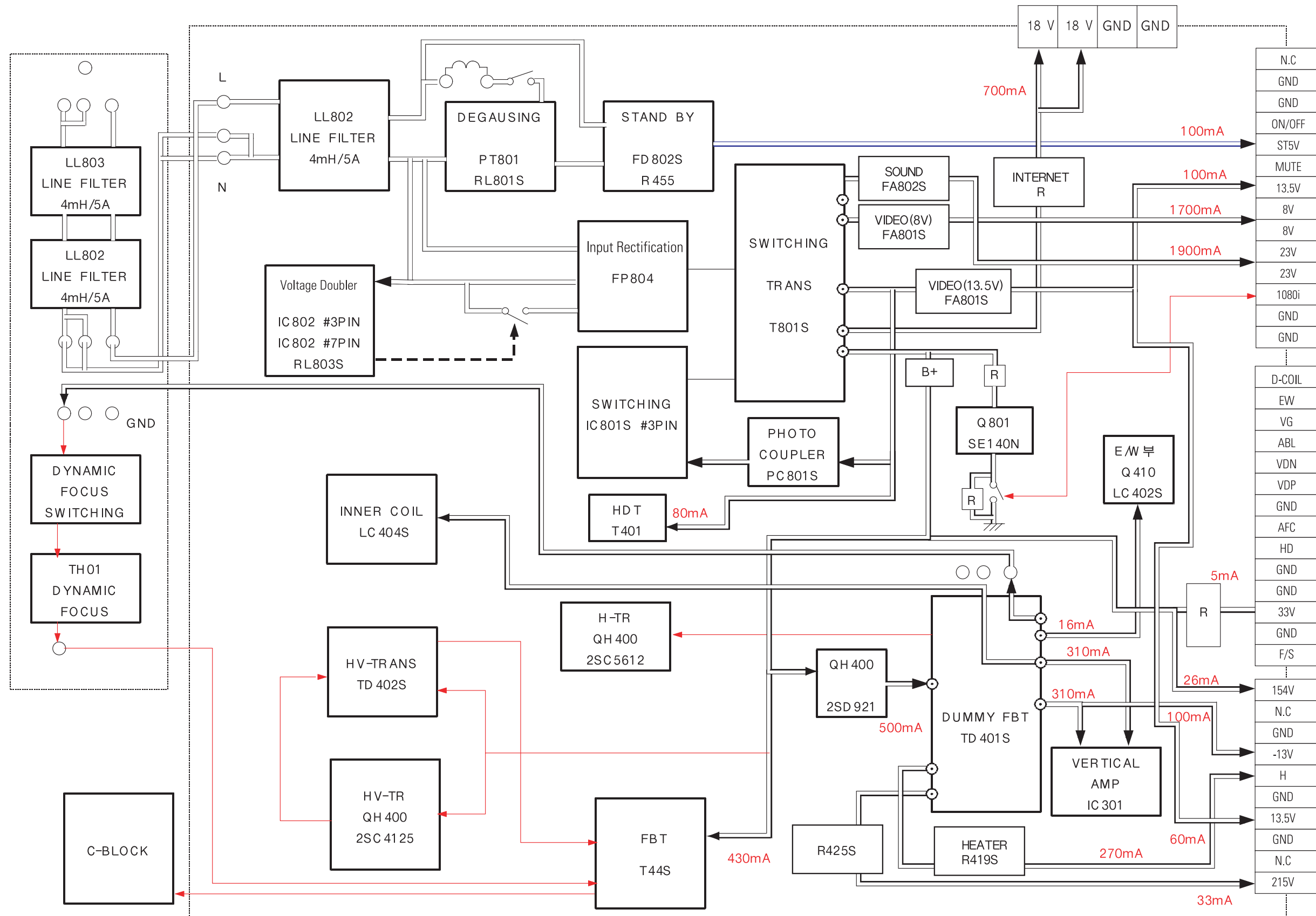
1	*	AA59-00175B	REMOCON;-;TM63,DREAM4,50,L/GRAY,S/S,E				
	.2	AA09-00051A	IC-MCU;Z86L8808SSC-R501M,SZTM-822,ST				
	.2	2802-000194	RESONATOR-CERAMIC;8MHz,1.0%,TP,8.5x4.5x5				

## 8. Block Diagrams

### 8-1 Power High Voltage Separation Applied

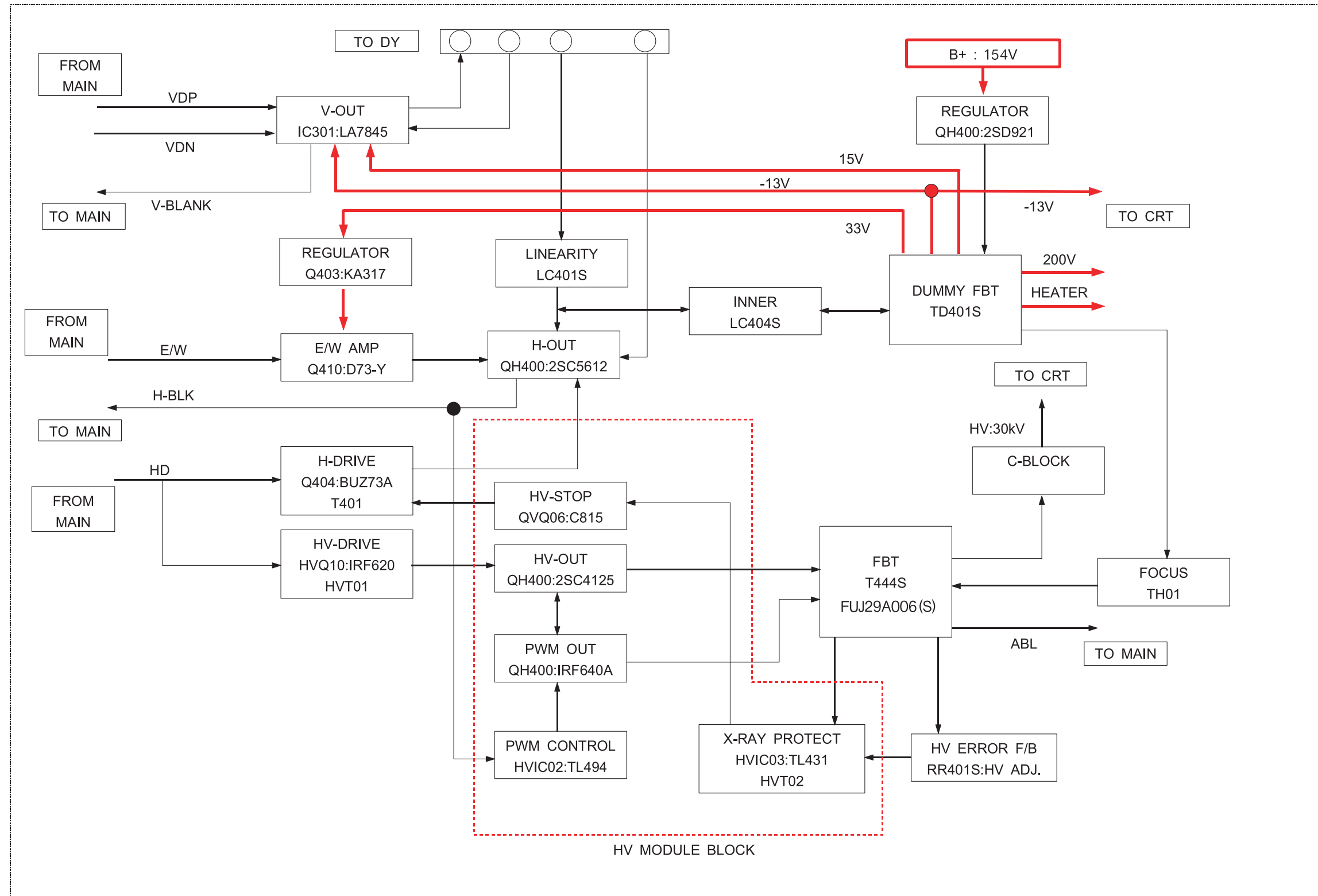


### 8-2 Power Supply Block Diagram



### 8-3 Deflection Block Diagram

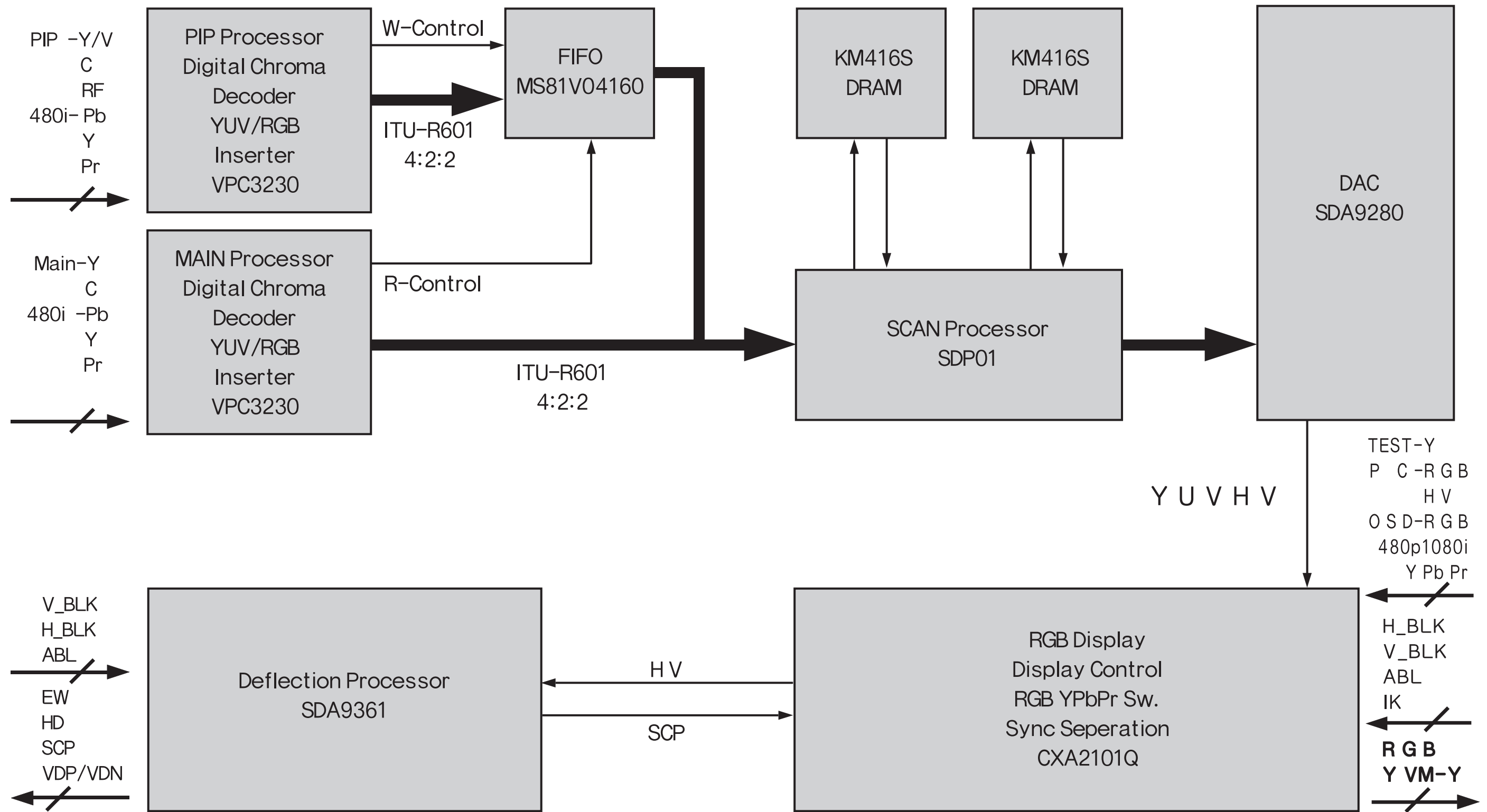
120° Wide Angle  
CET



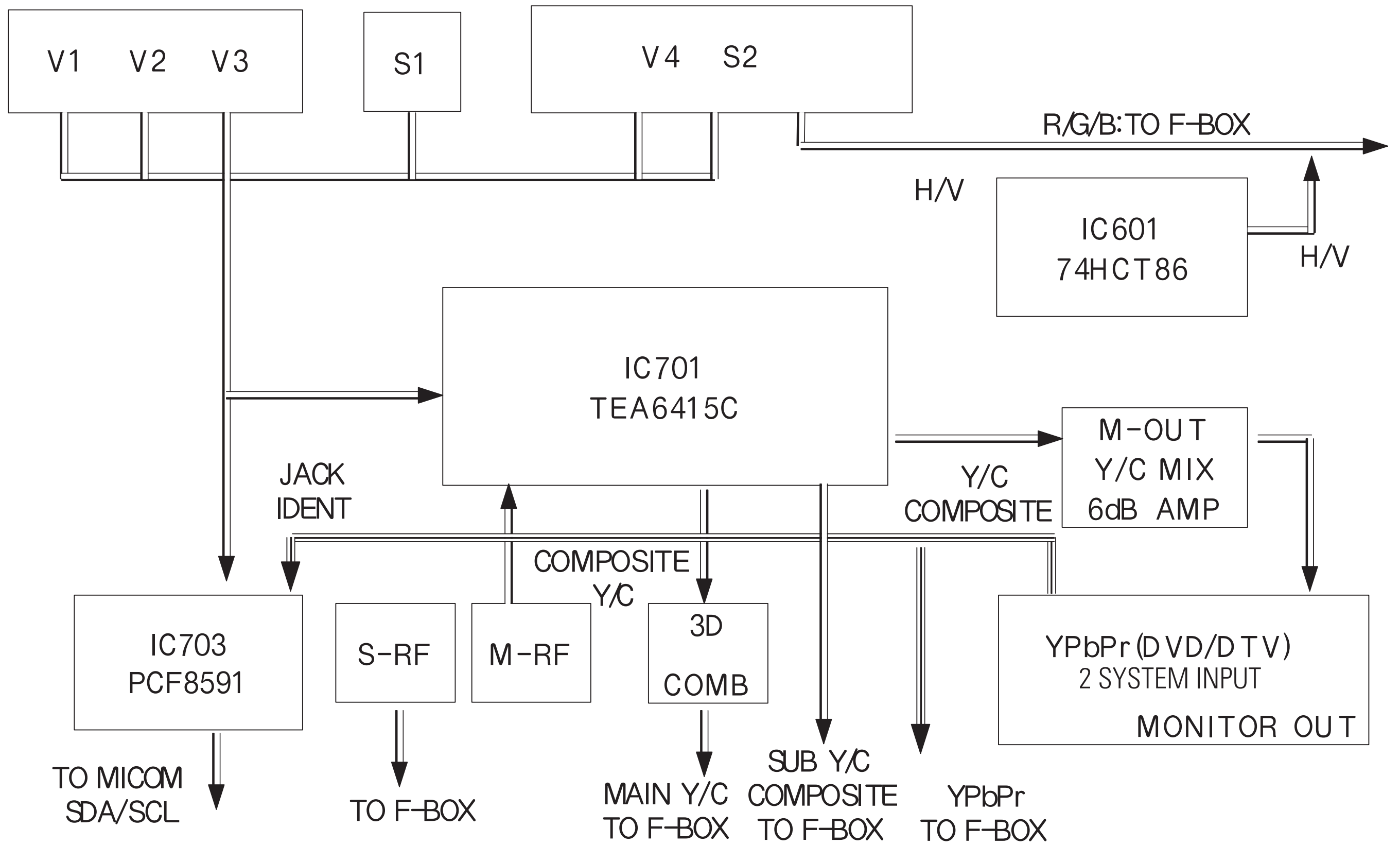
### 8-4 Magnetic Field Corrcion Circuit



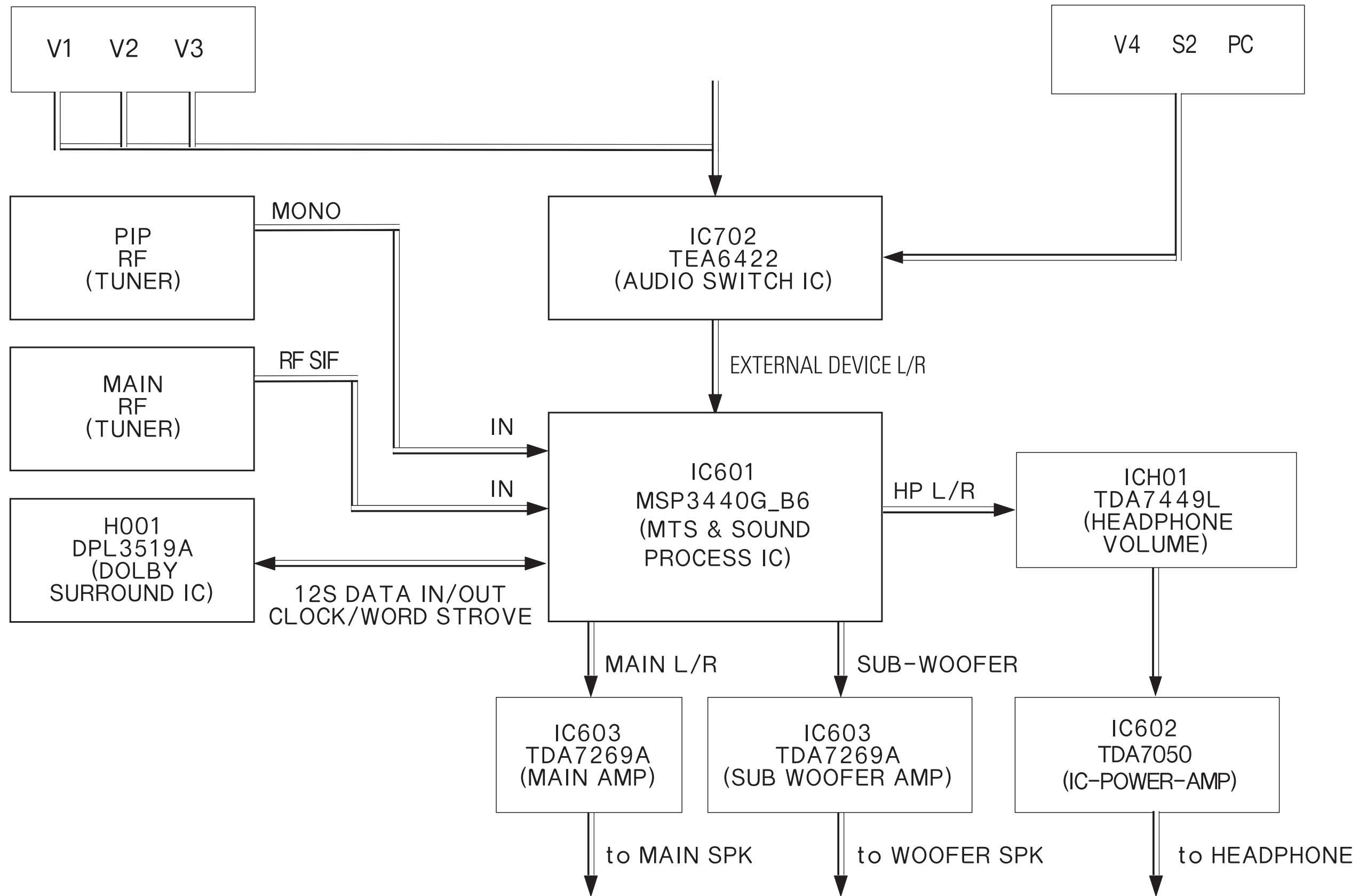
8-5 FEATURE-BOX Block Diagram



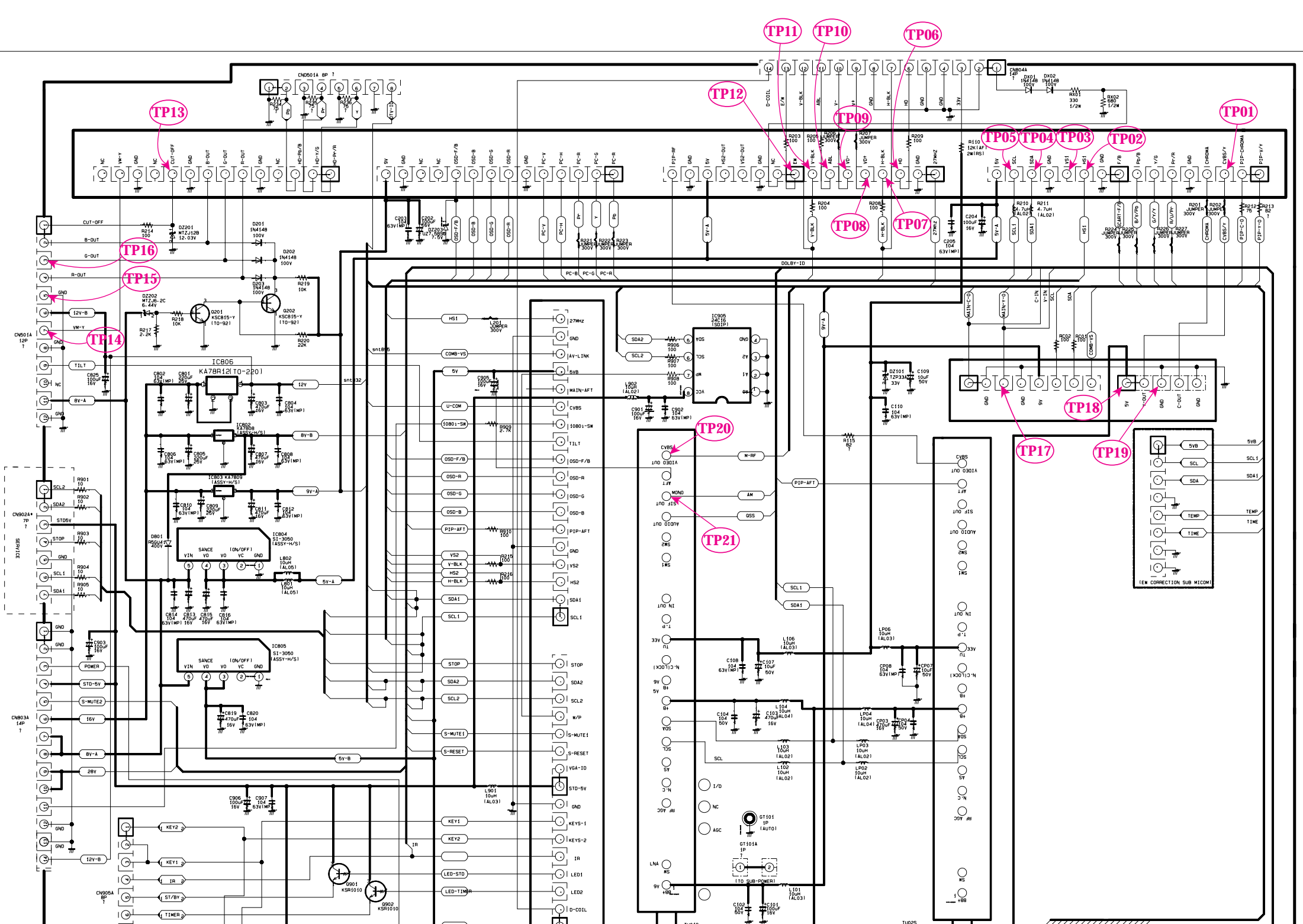
8-6 Video



8-7 Sound







TP13

TP11

TP10

TP06

TP01

TP05

TP04

TP03

TP02

TP12

TP09

TP08

TP07

TP16

TP15

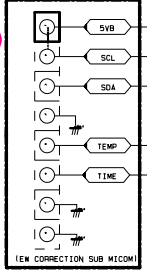
TP14

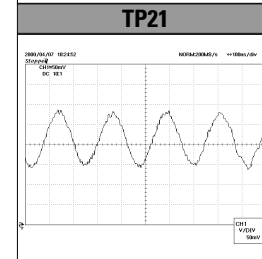
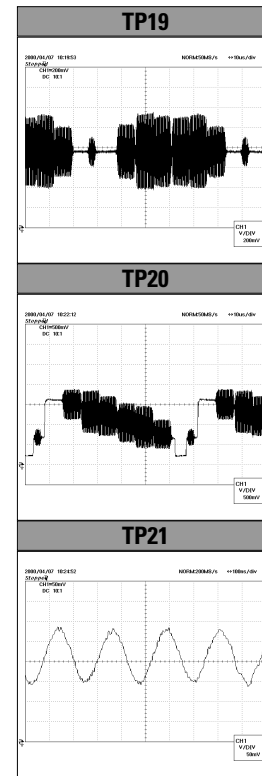
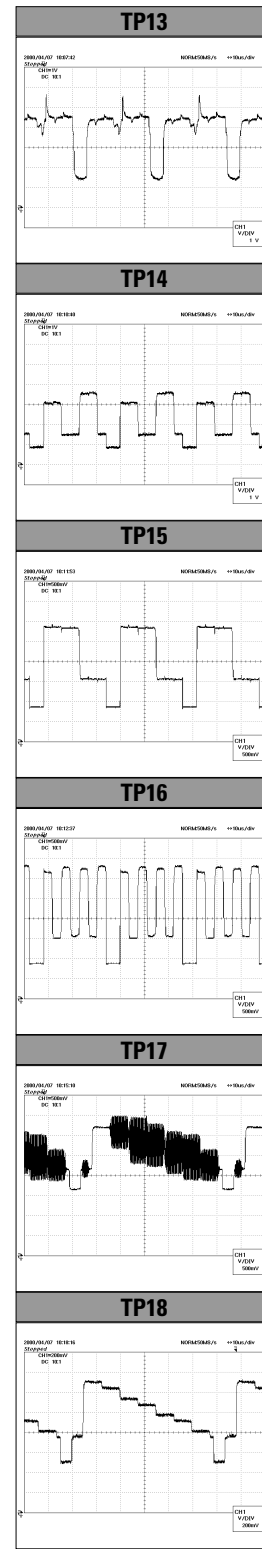
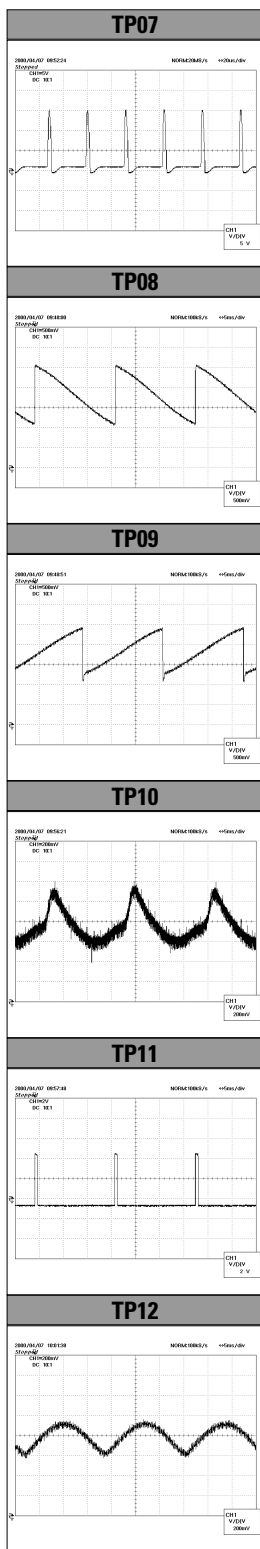
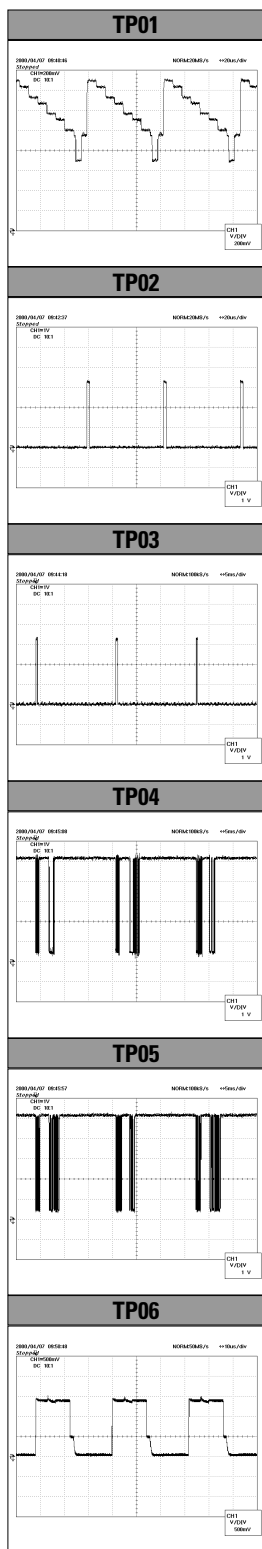
TP20

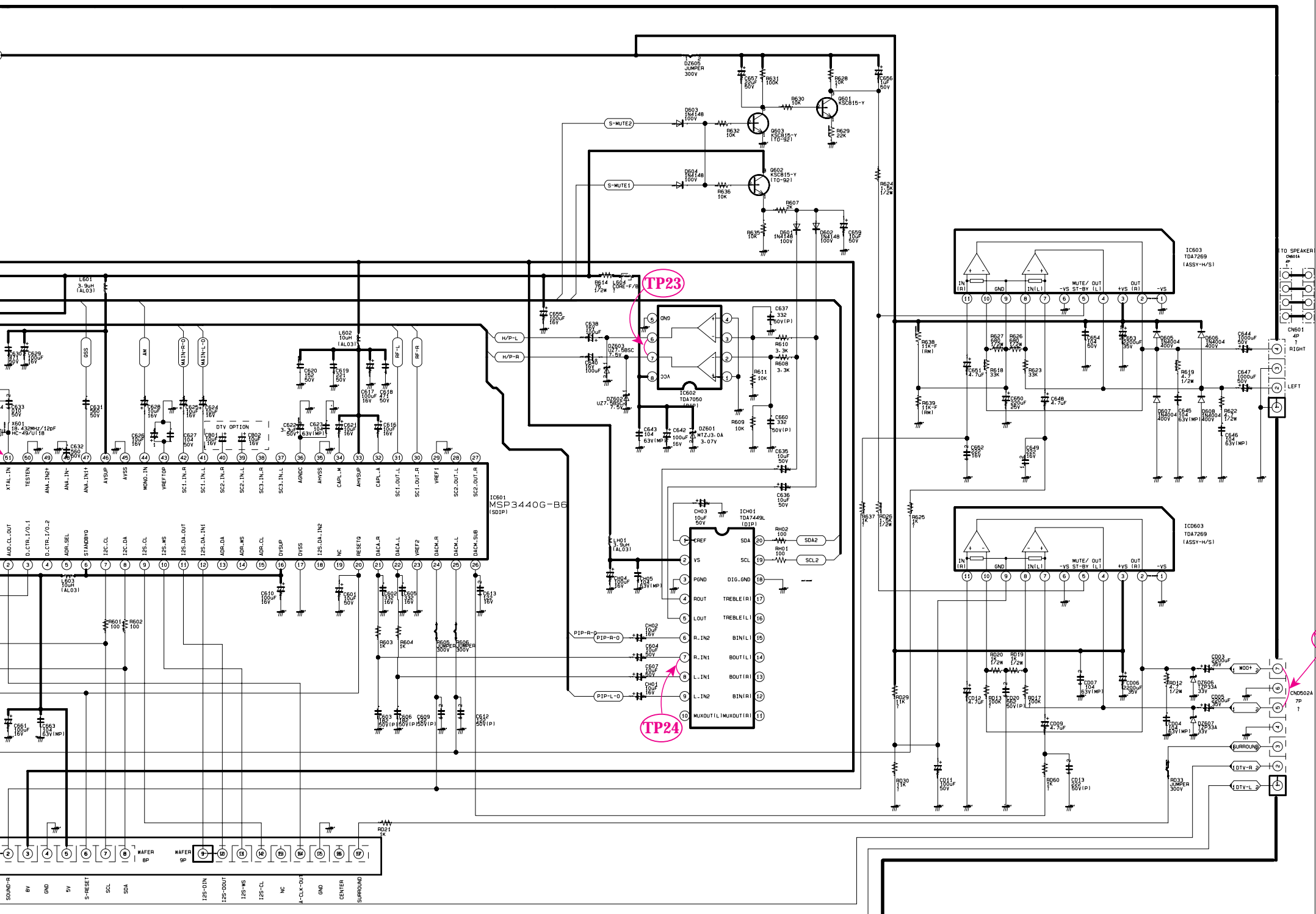
TP17

TP19

TP21



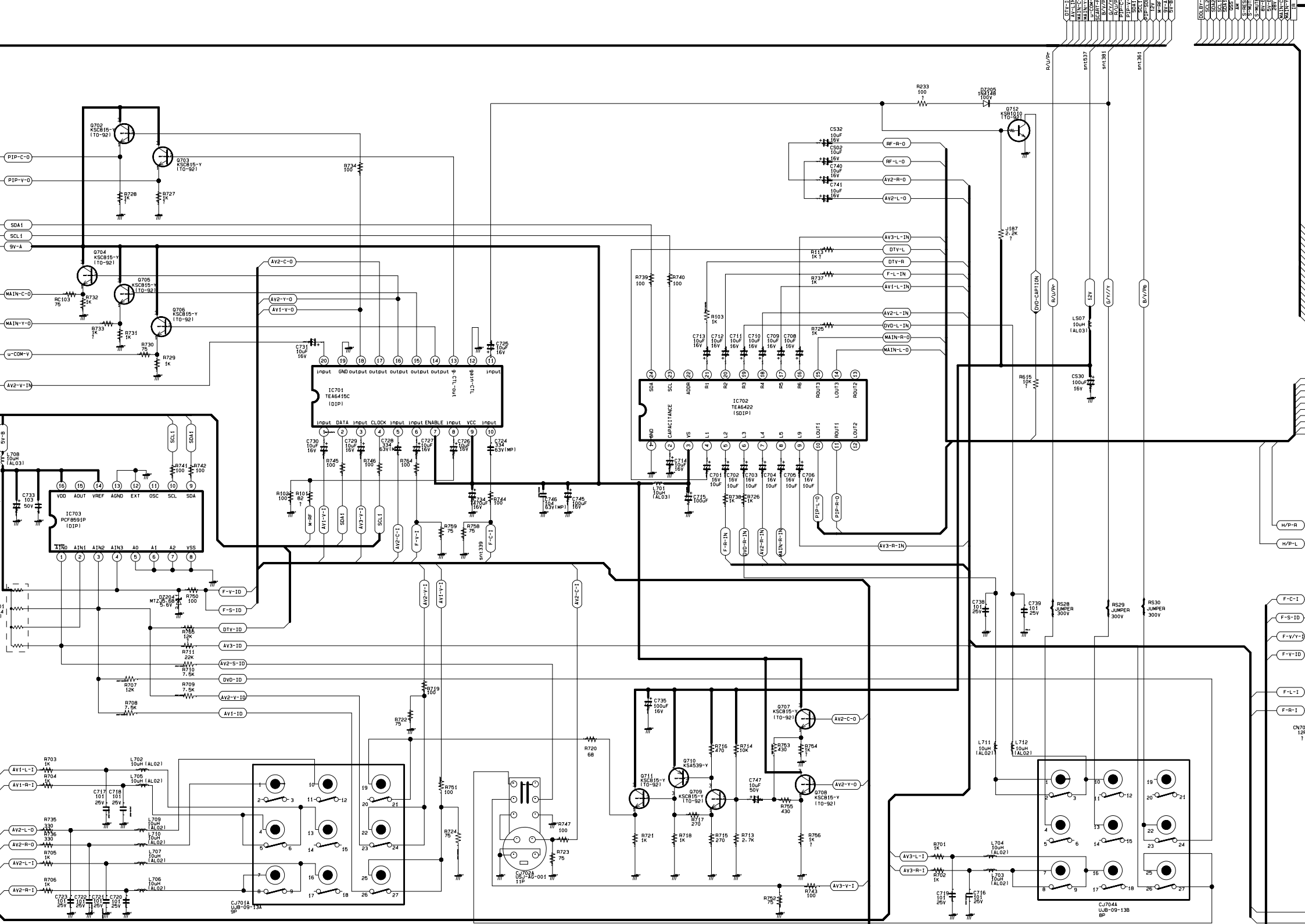


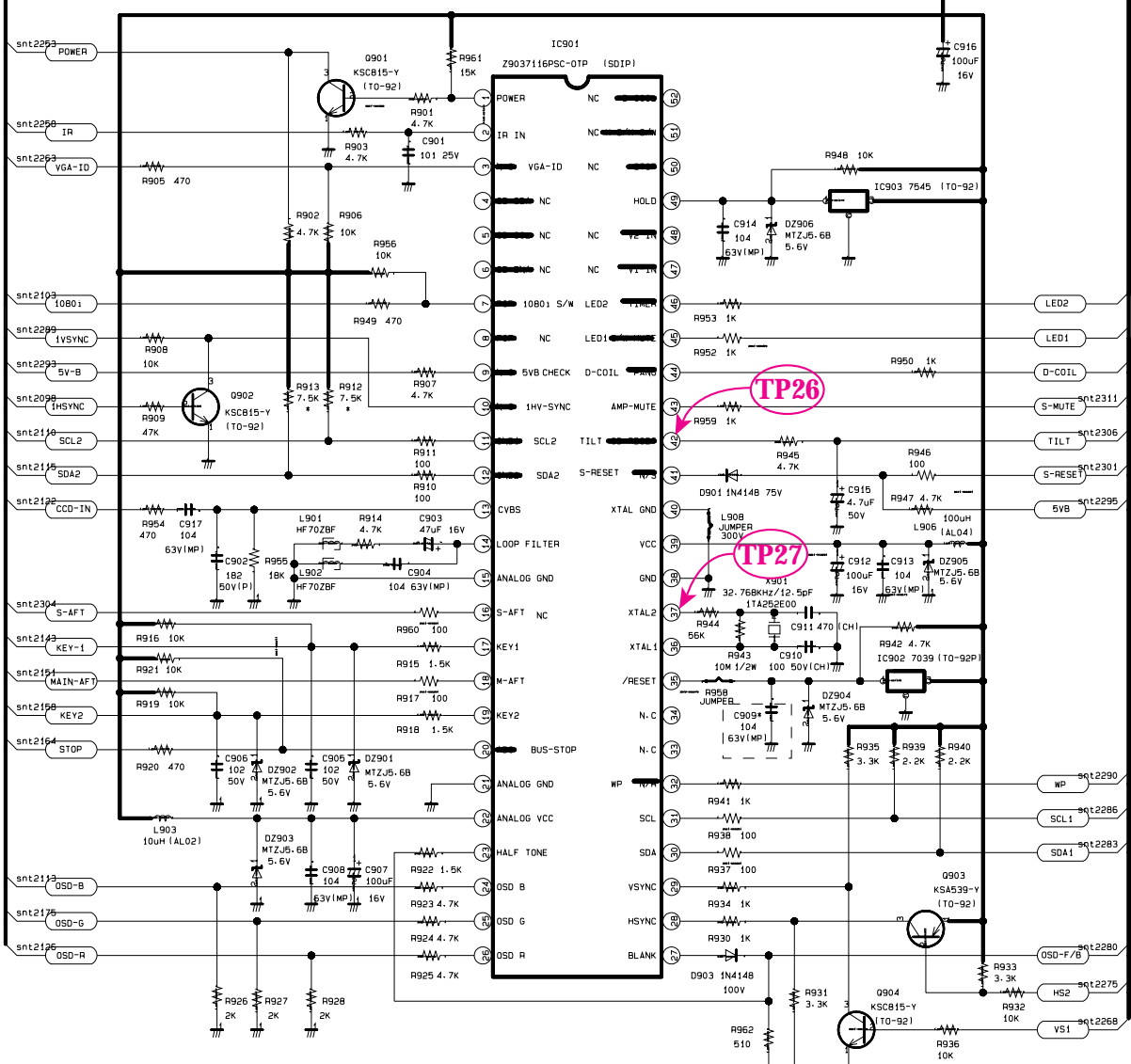
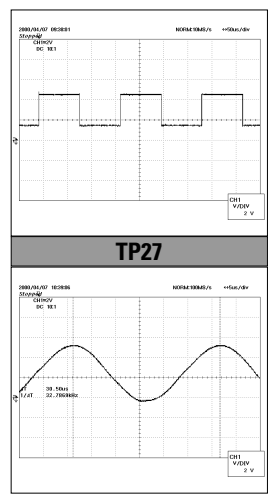
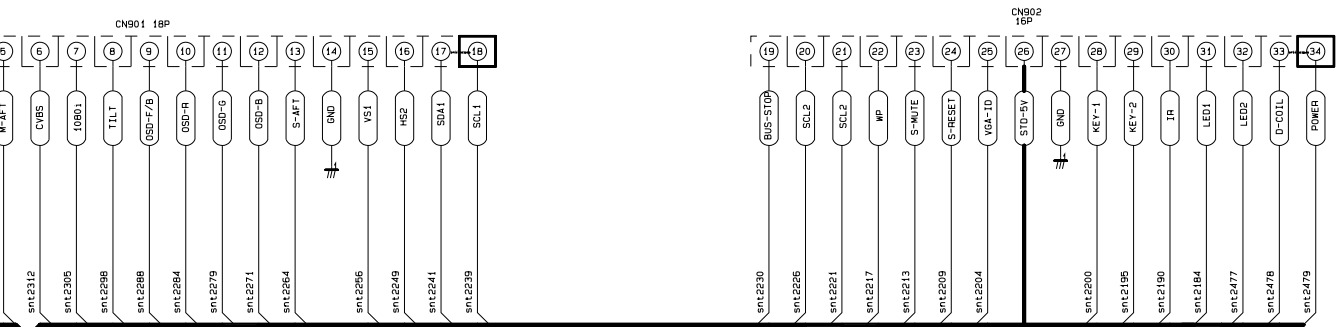


TP23

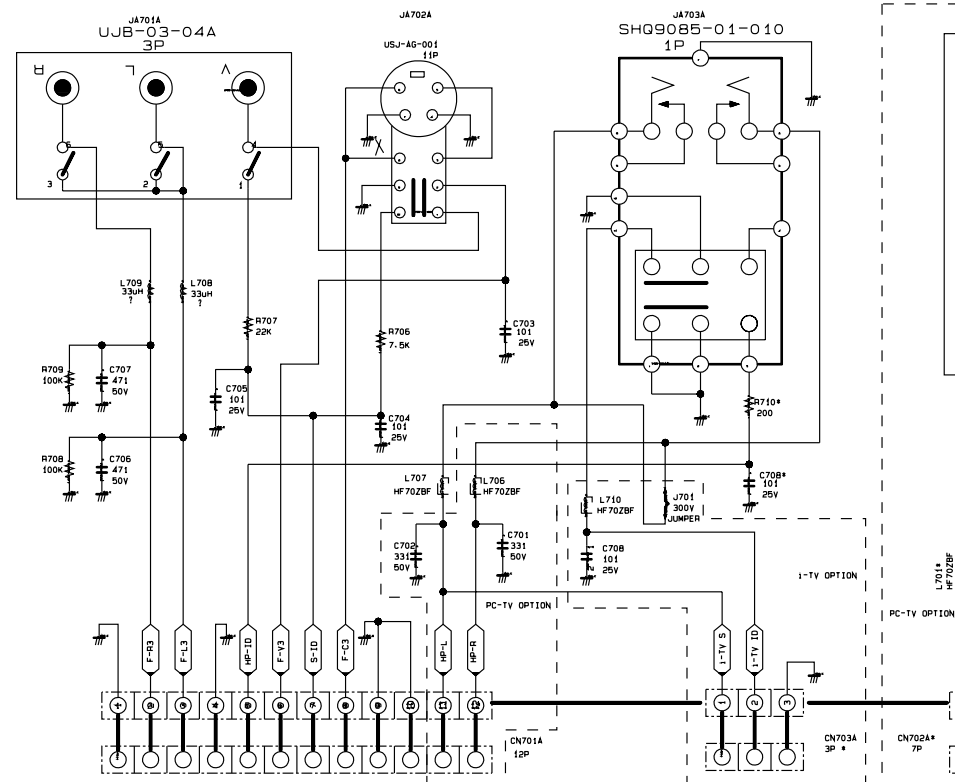
TP24

TP25

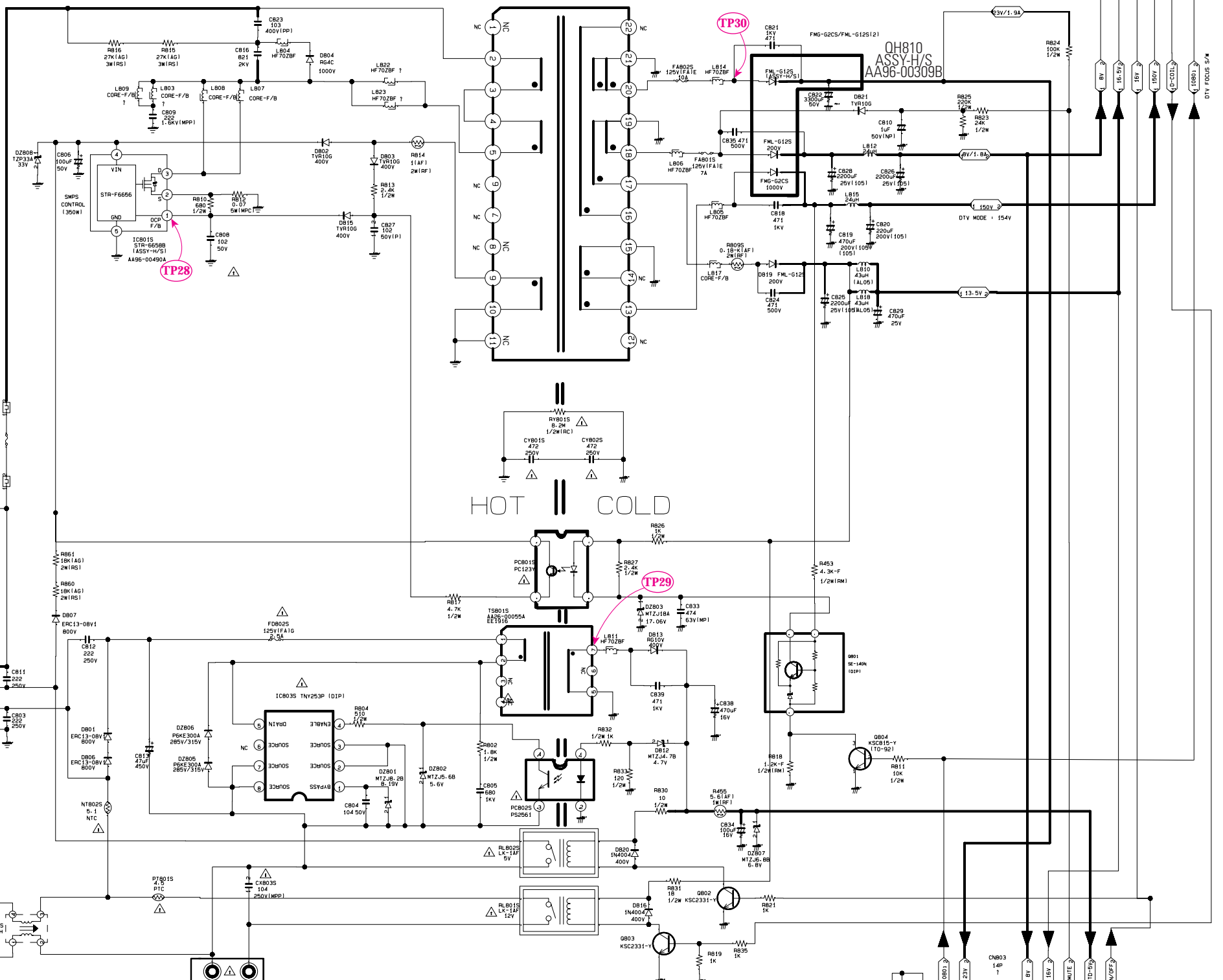




### SIDE AV



TB015  
EE55521  
AA26-00074A



TP28

TP30

TP29

HOT COLD

OH810  
ASSY-H/S  
AA96-00309B

DTV FOCUS S/M

DTV MODE 154V

13.5V

14P

BY

15V

NOTE

STD-5V

ON/OFF

25V

15V

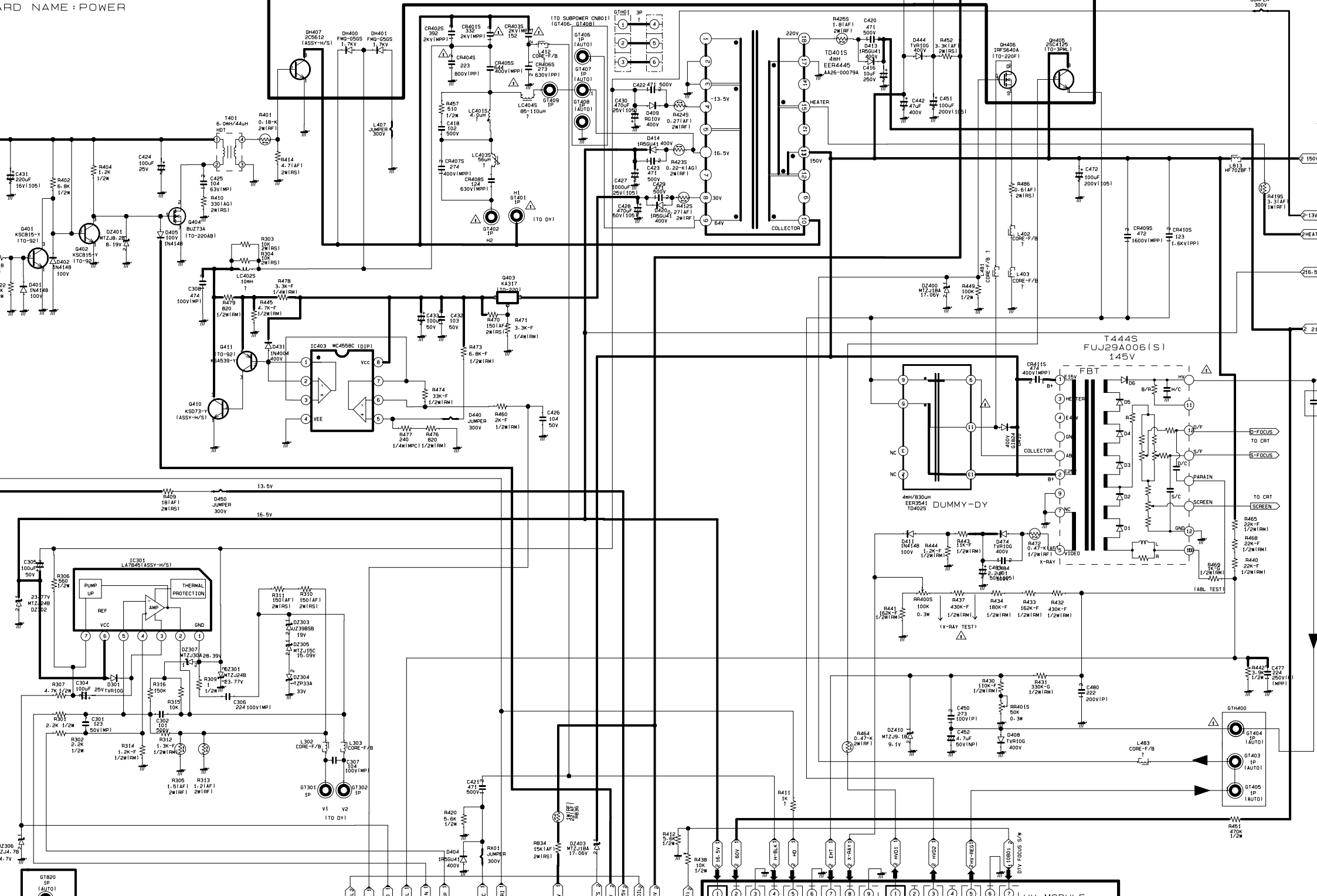
15V

15V

15V

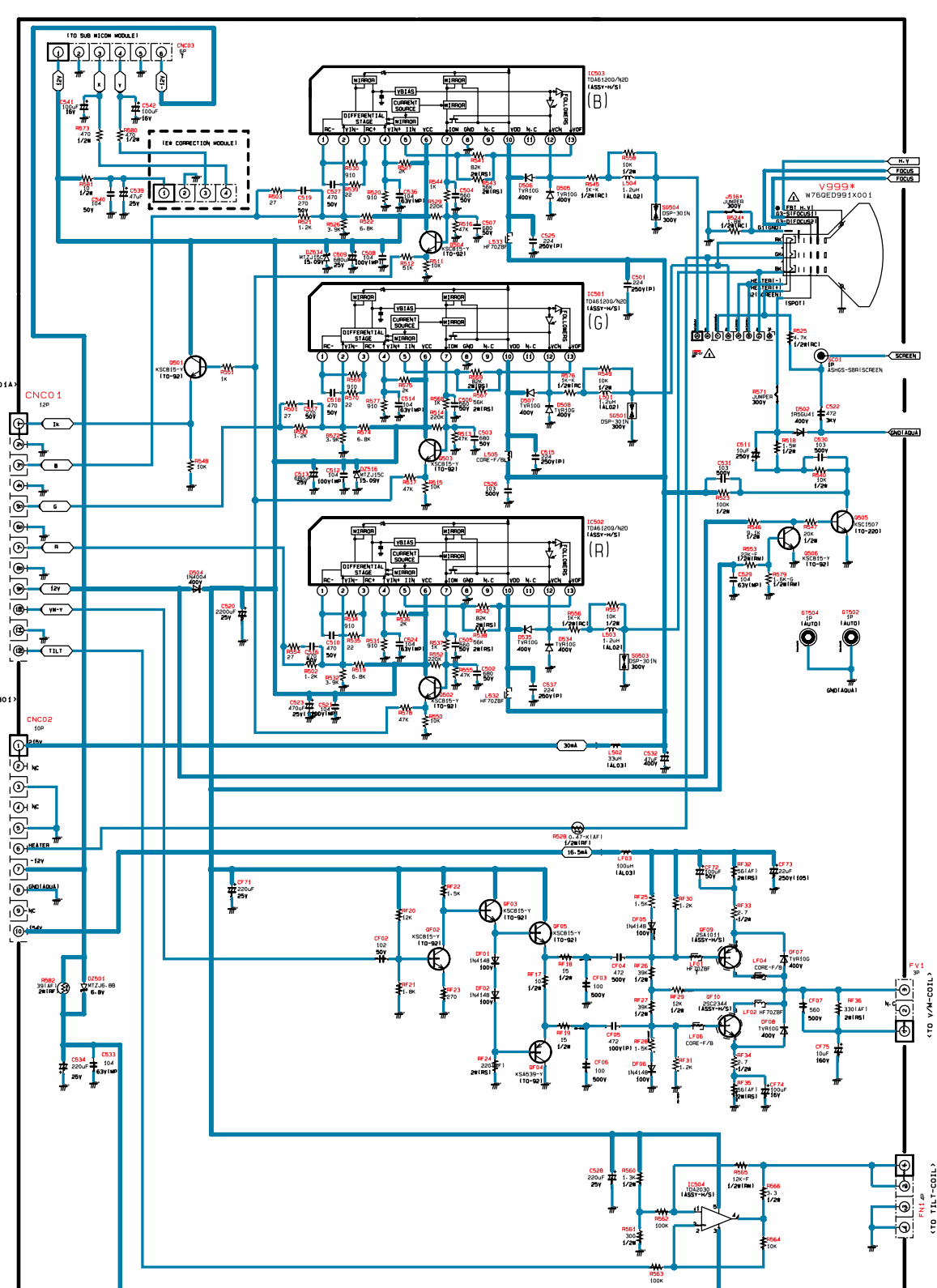
15V

SSIS : K54A/ZEUS  
DEL : WT-36Z4HD  
CARD NAME : POWER

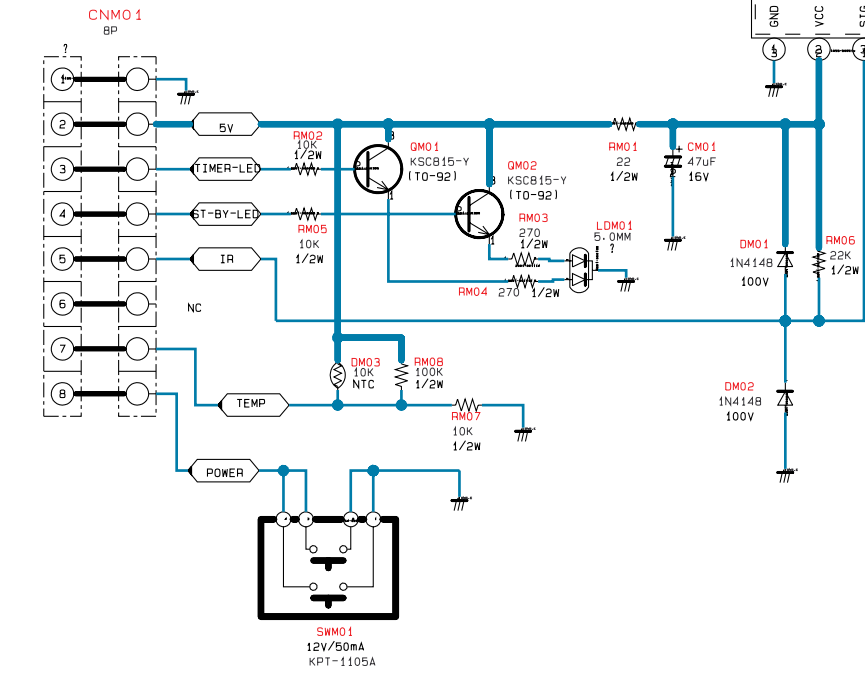








FROM MAIN CN905A

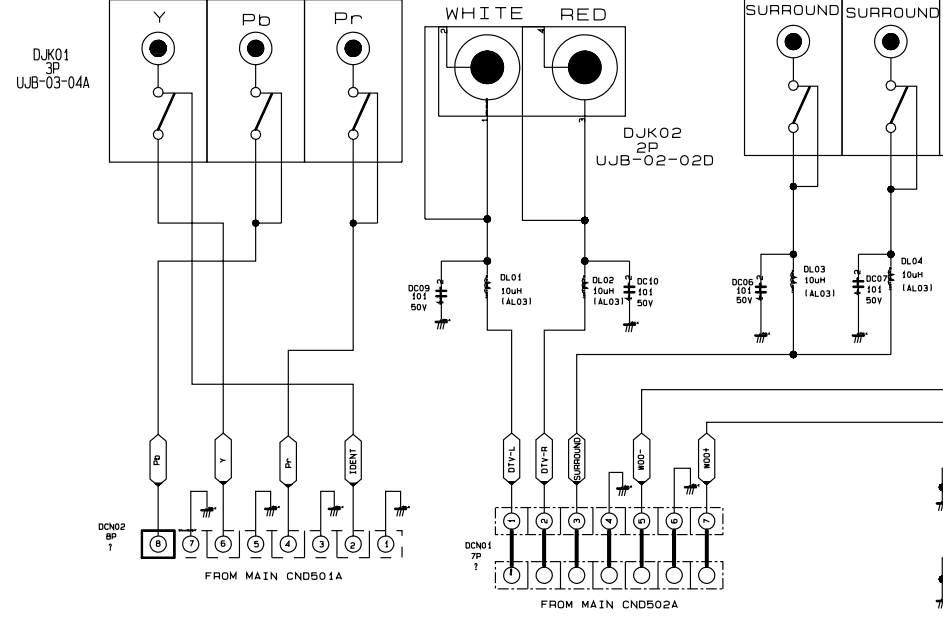


### DTV JACK

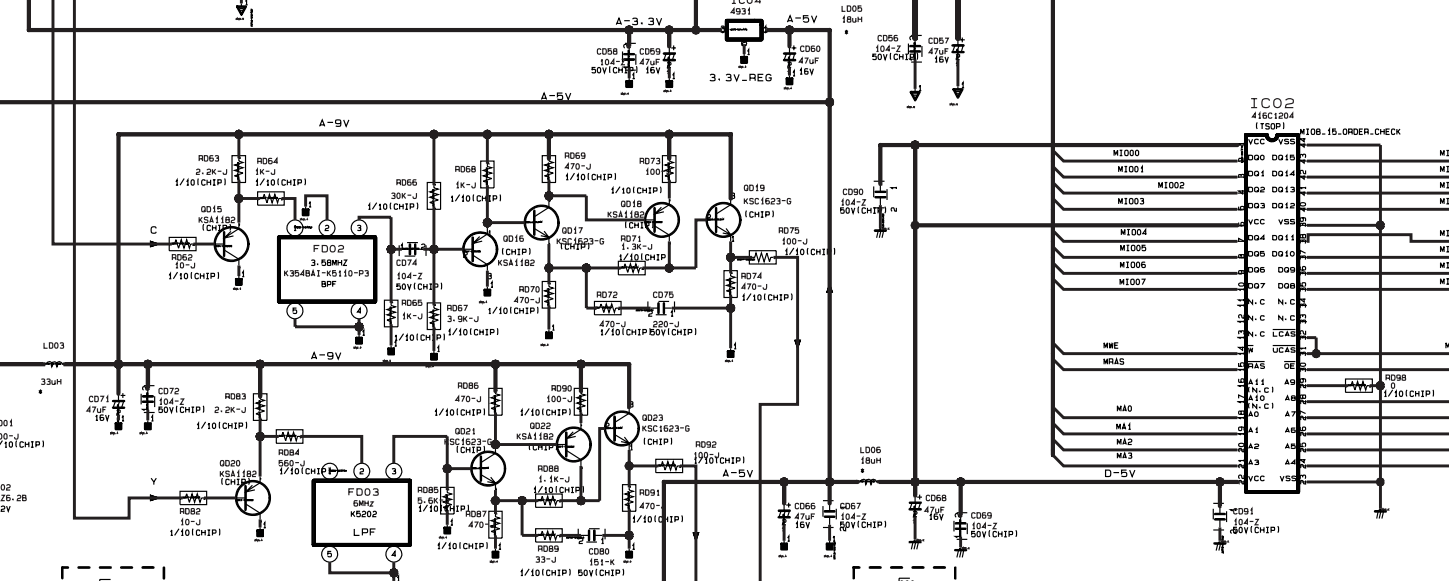
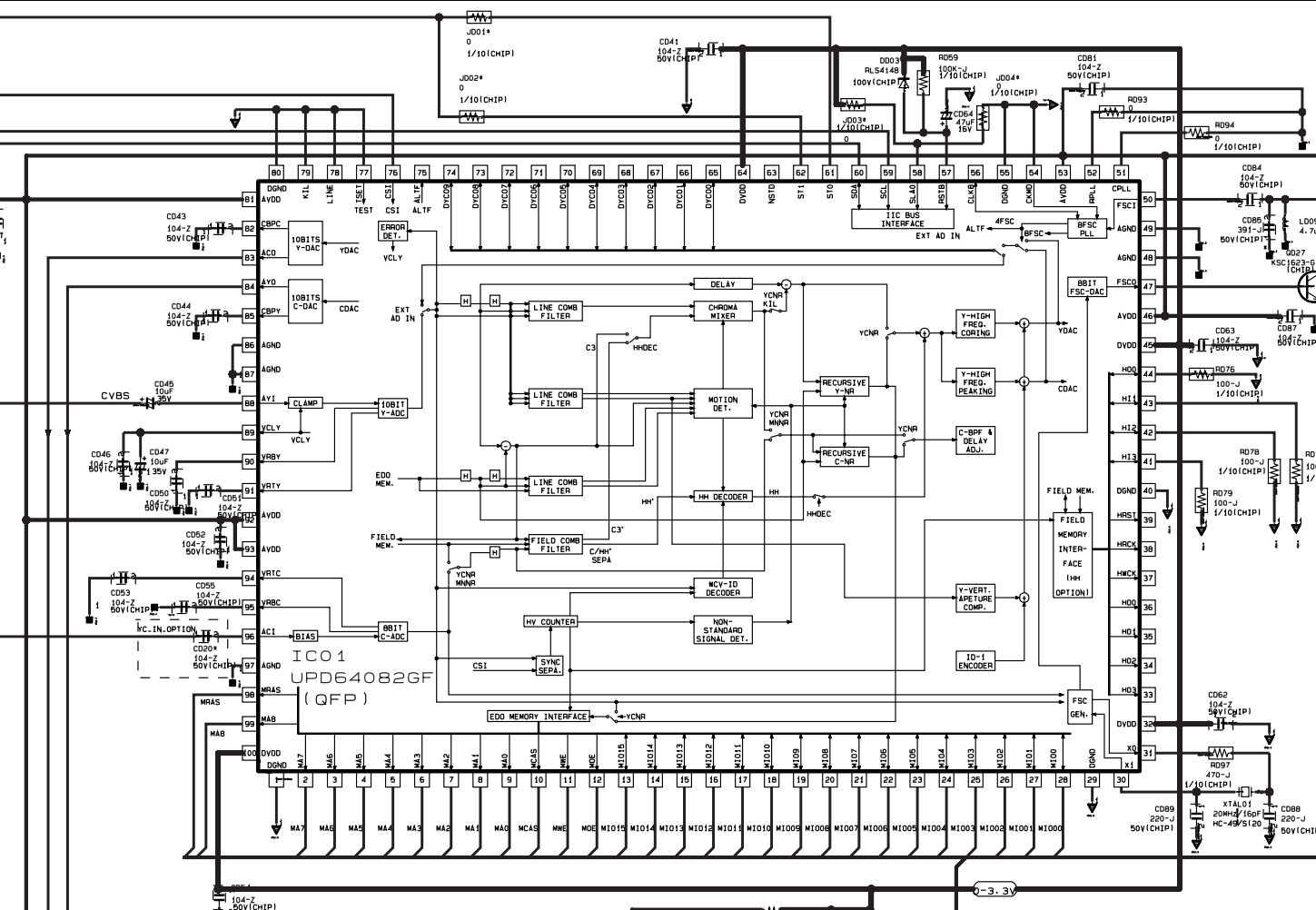
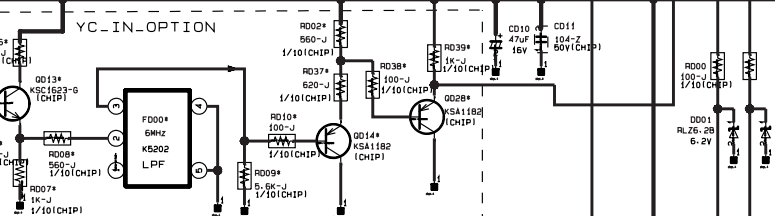
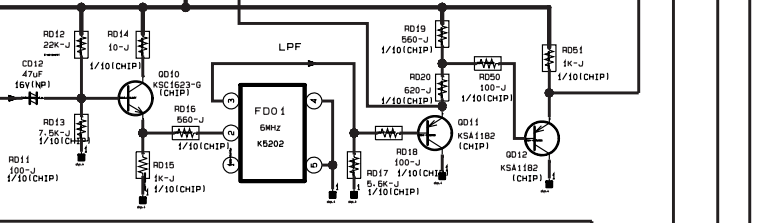
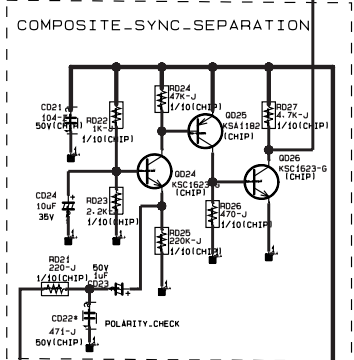
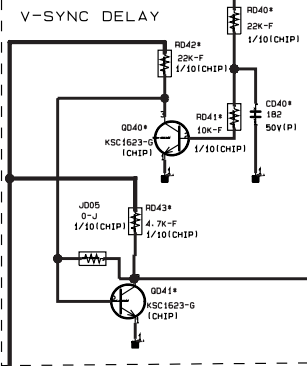
DTV-INPUT (Y/Pb/Pr)  
GREEN BLUE RED

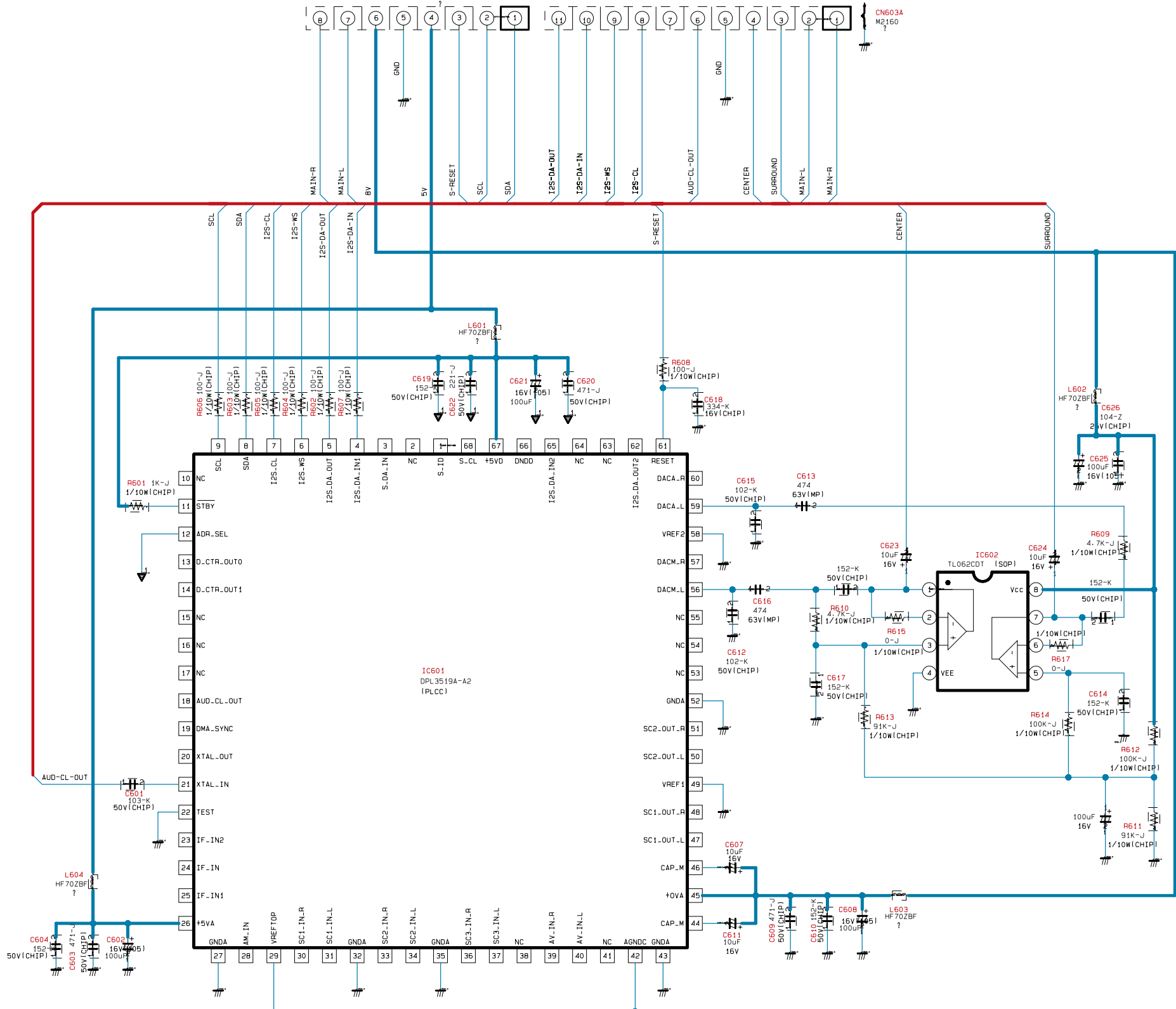
DTV-SOUND  
WHITE RED

SURROUND  
WHITE RED

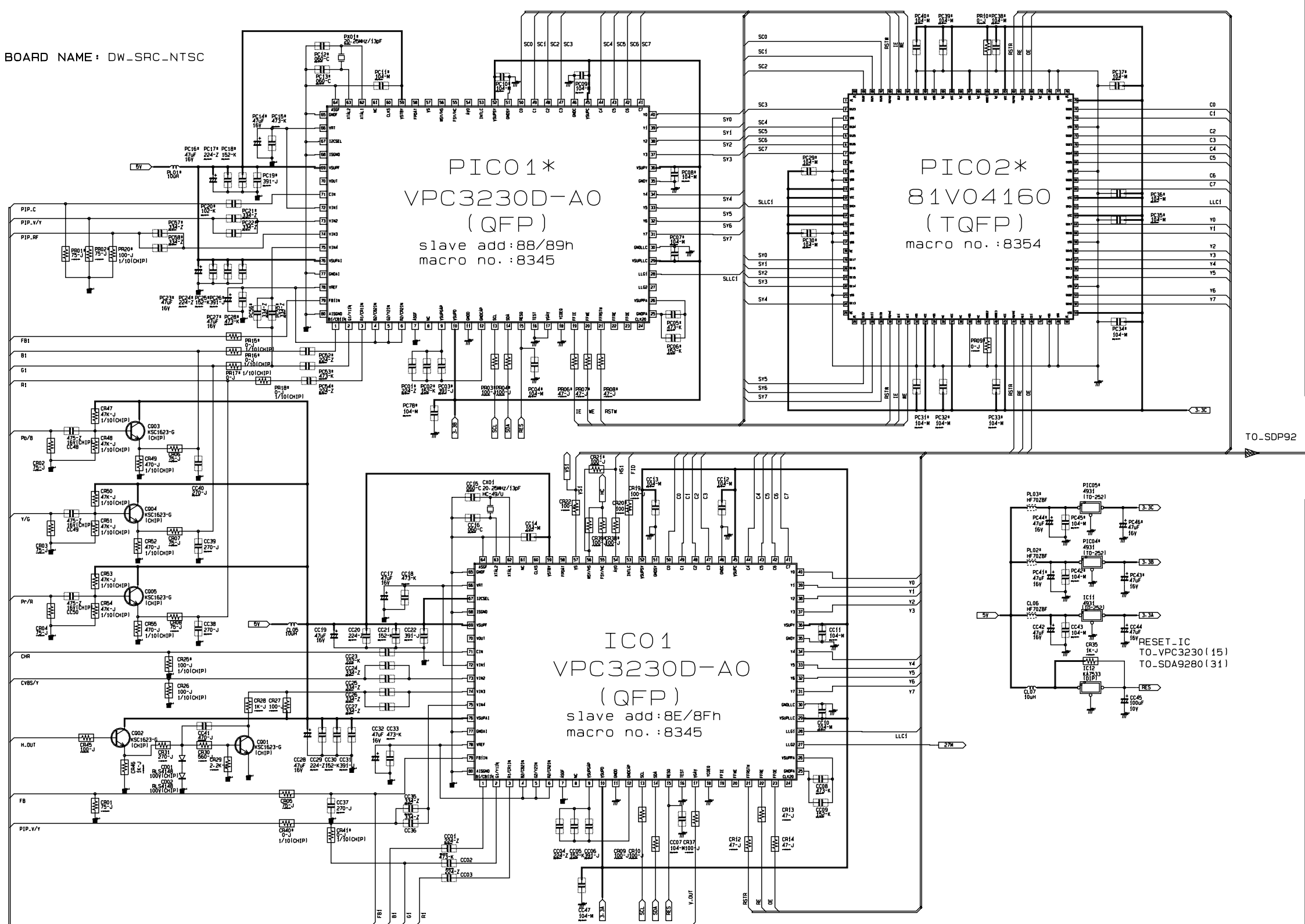


USED*	
V-SYNC	
H-SYNC	
MS ADDRESS HIGH	
MS ADDRESS LOW	
V-SYNC DELAY	B-LOT
V-SYNC DELAY	
V-SYNC DELAY	
V-SYNC DELAY	
V-SYNC DELAY	
V-SYNC DELAY	





BOARD NAME: DW\_SRC\_NTSC

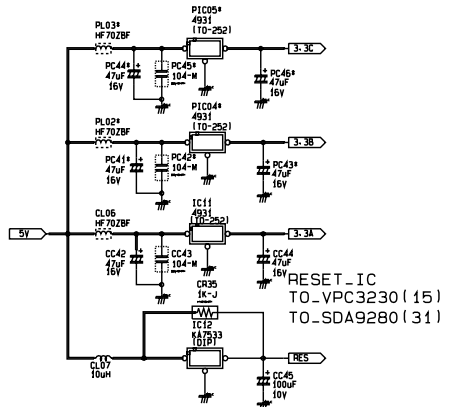


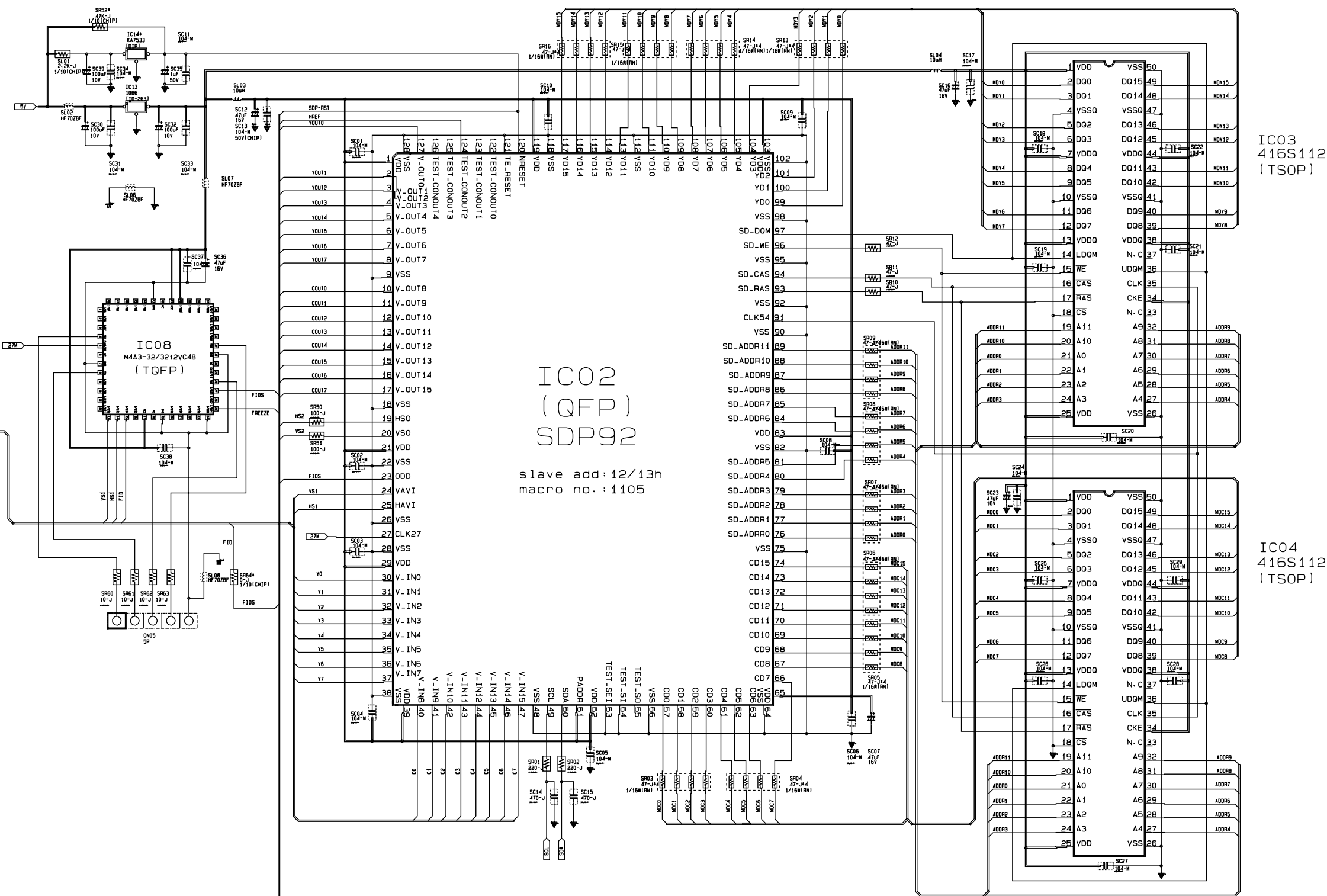
PIC01\*  
VPC3230D-A0  
(QFP)  
slave add: 88/89h  
macro no.: 8345

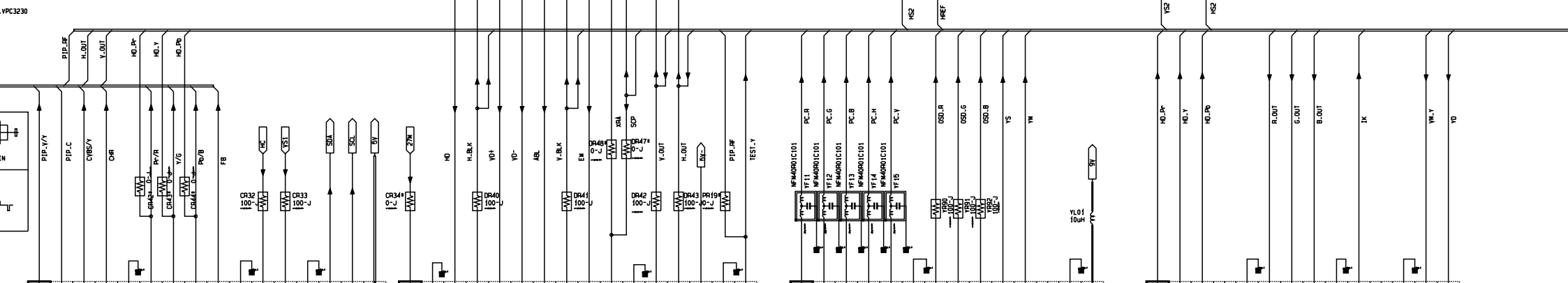
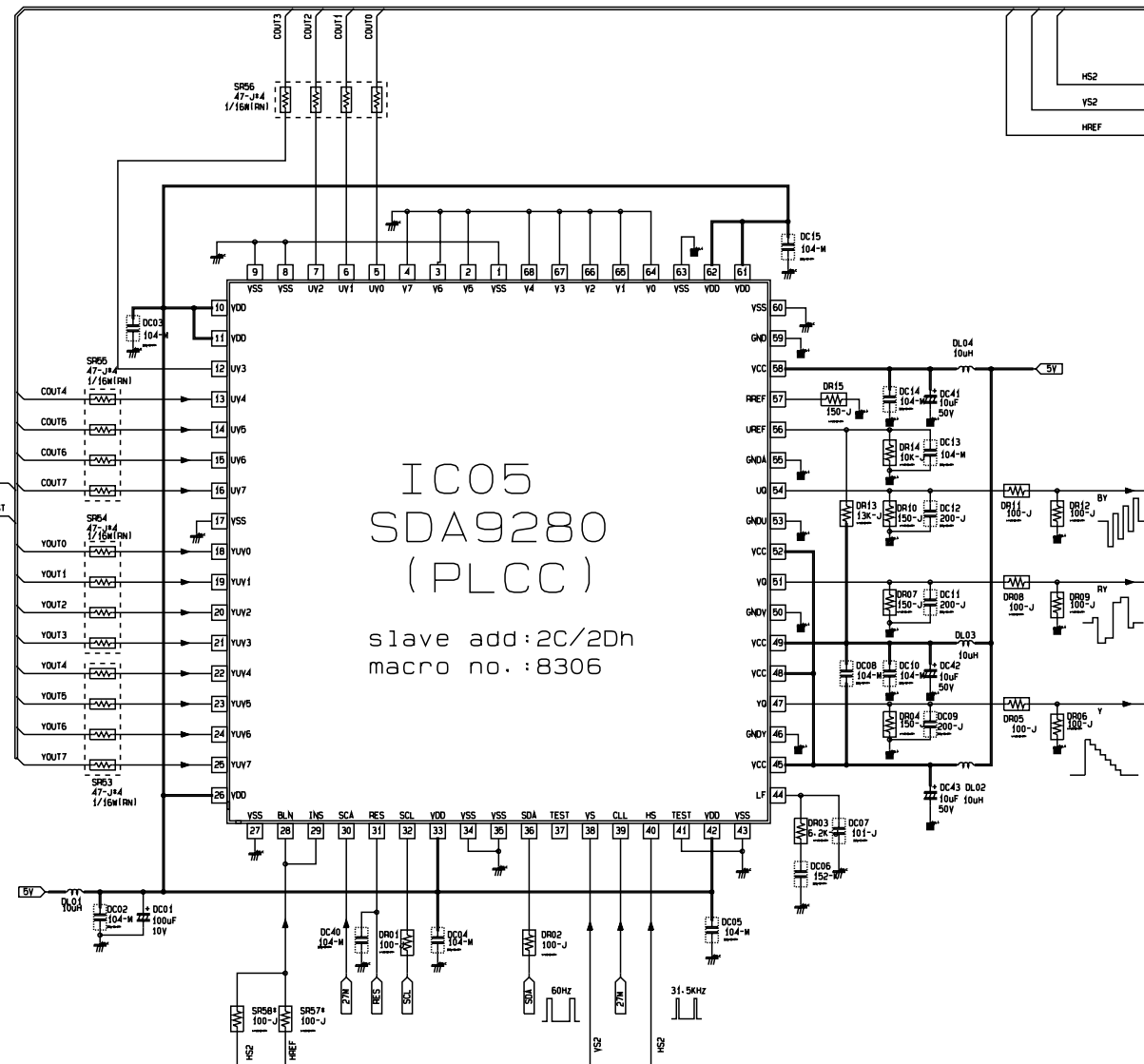
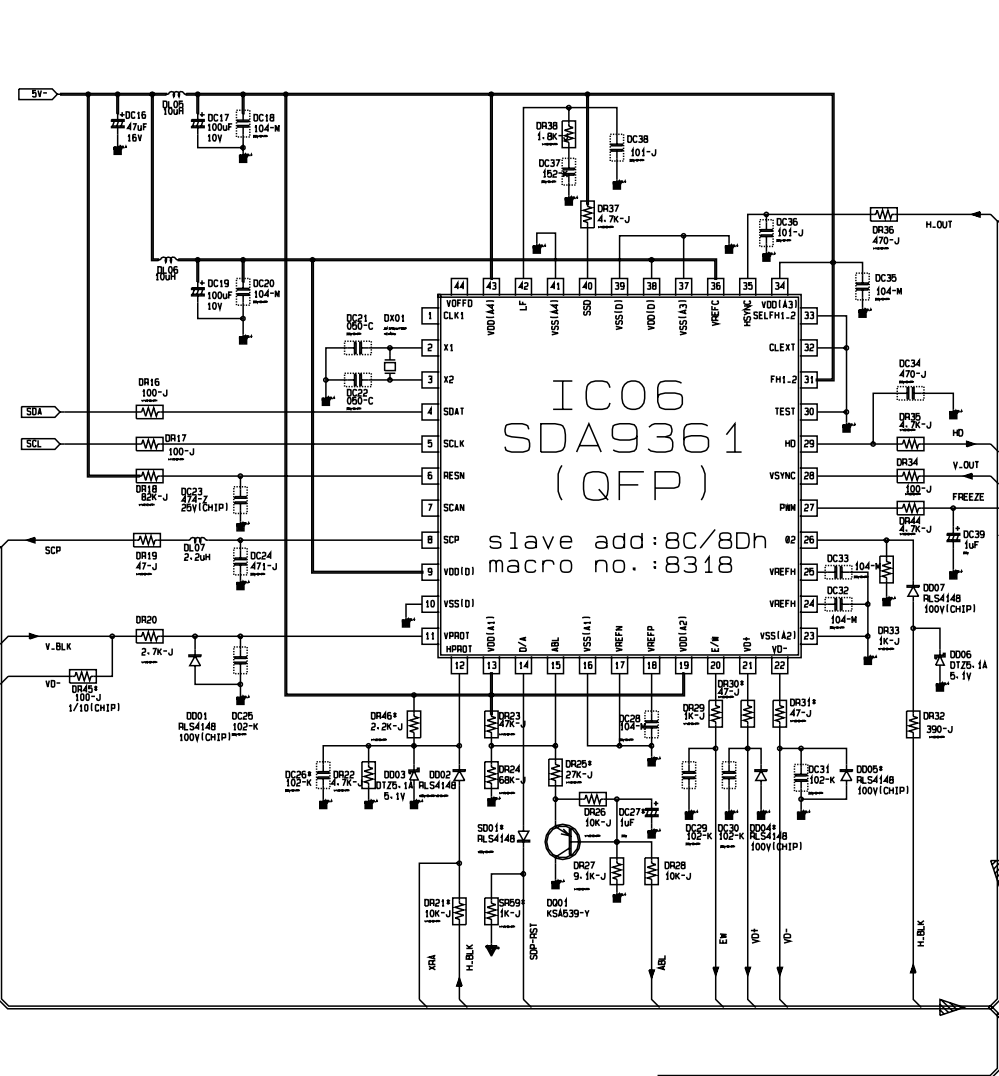
PIC02\*  
81V04160  
(TQFP)  
macro no.: 8354

IC01  
VPC3230D-A0  
(QFP)  
slave add: 8E/8Fh  
macro no.: 8345

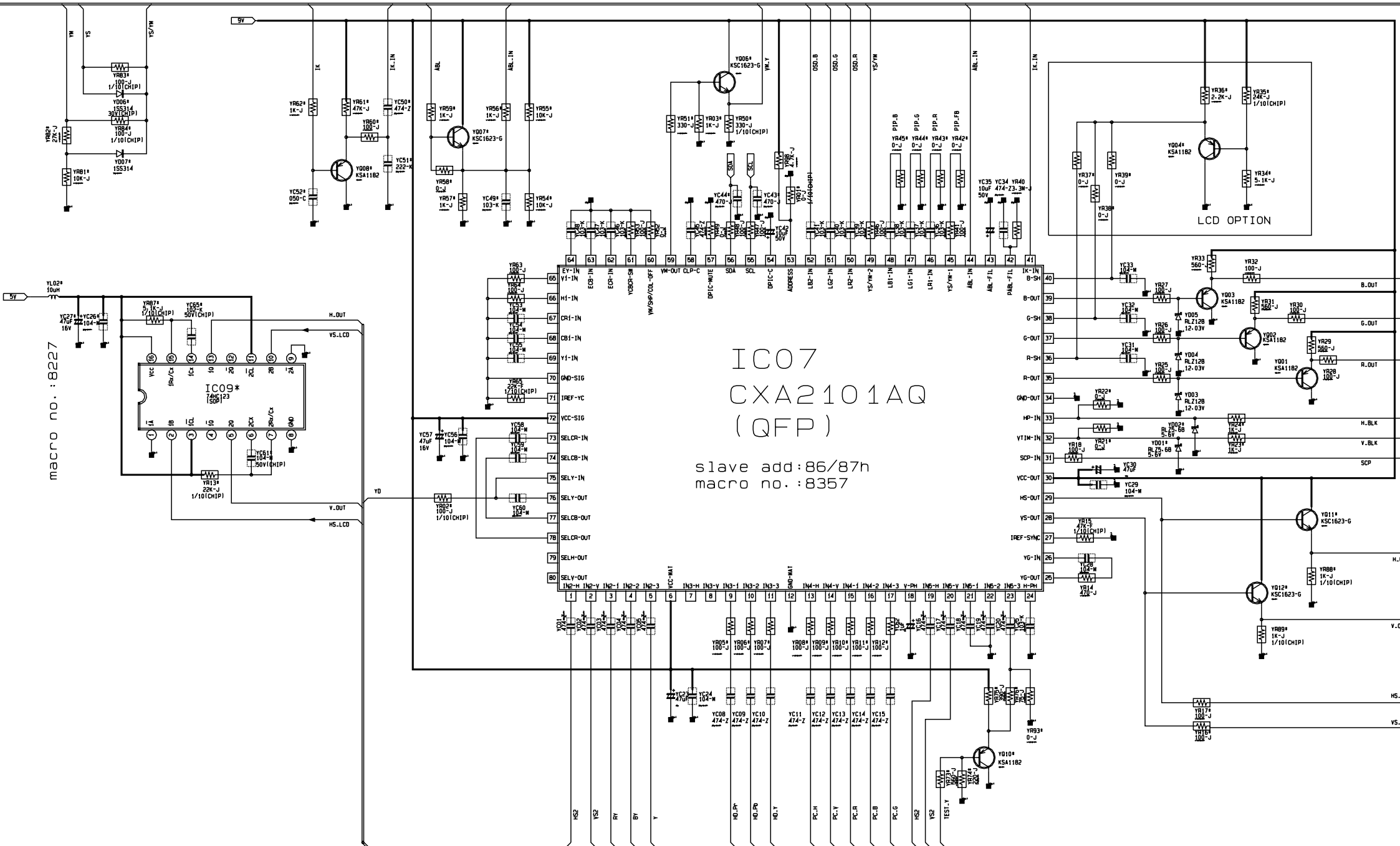
TO\_SDP92







macro no.:8227

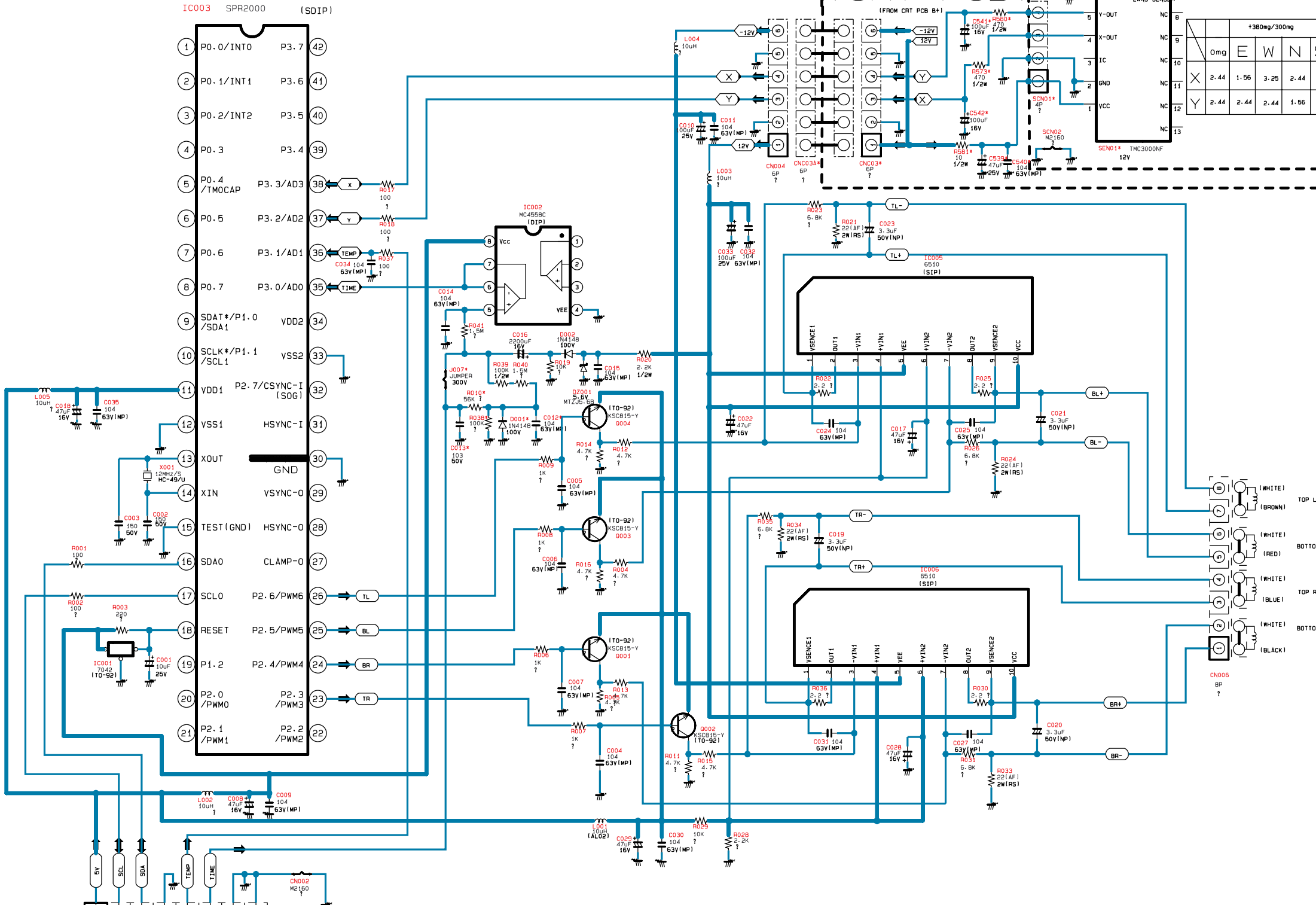


IC07  
CXA2101AQ  
(QFP)

slave add:86/87h  
macro no.:8357

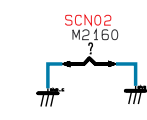
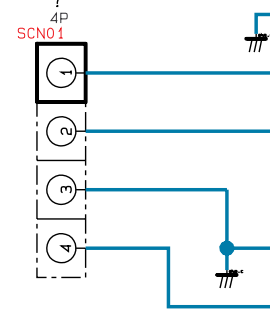
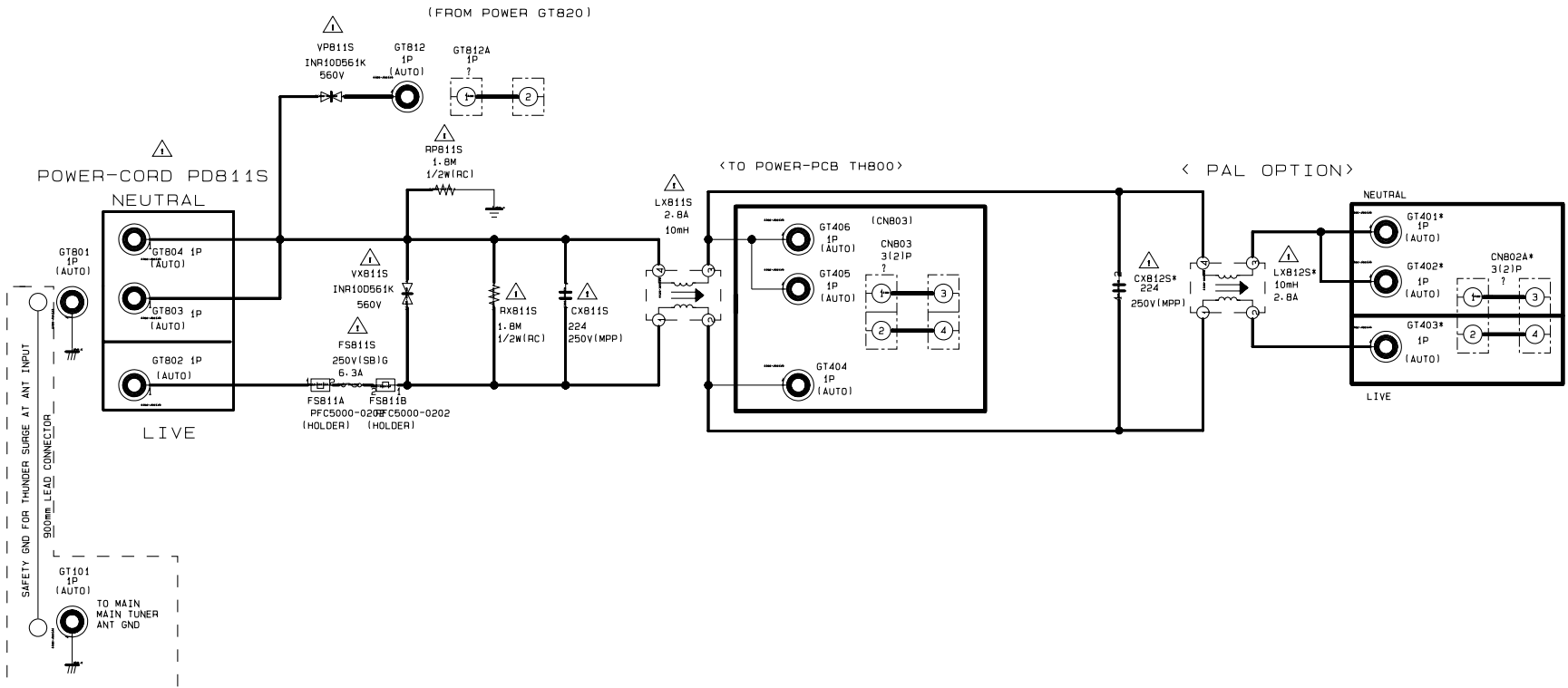
# EWNS CORRECTION MICOM

(CRT PCB)



		+380mg/300mg			
		Omg	E	W	S
X		2.44	1.56	3.25	2.44
Y		2.44	2.44	2.44	1.56

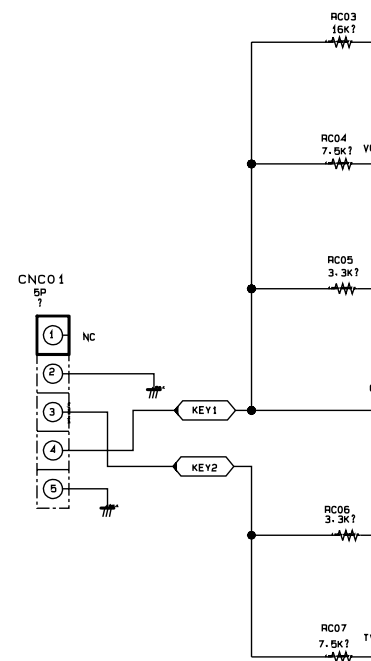
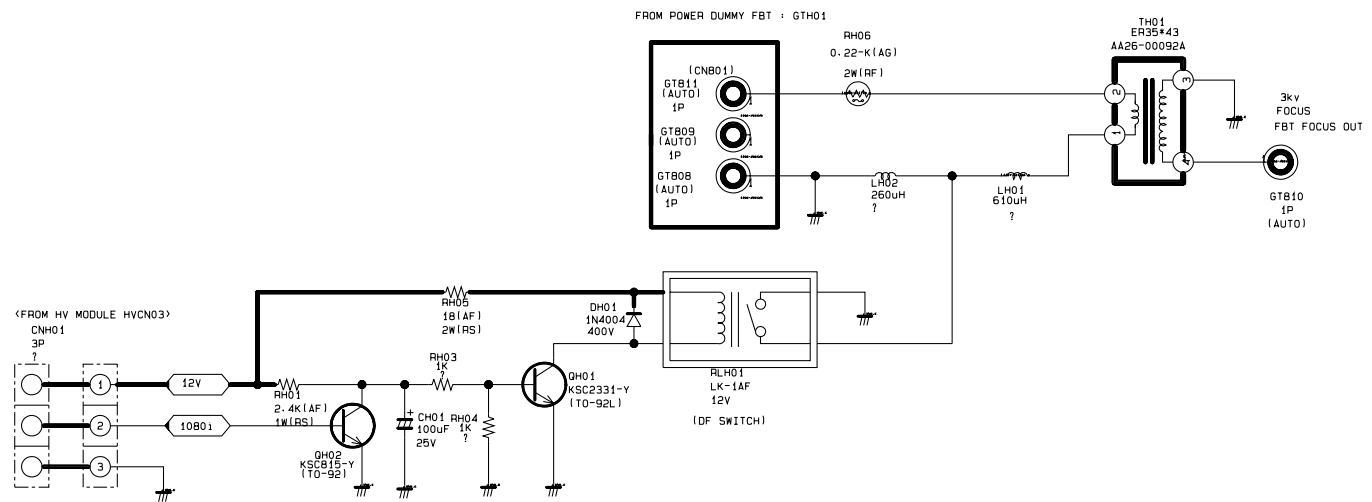


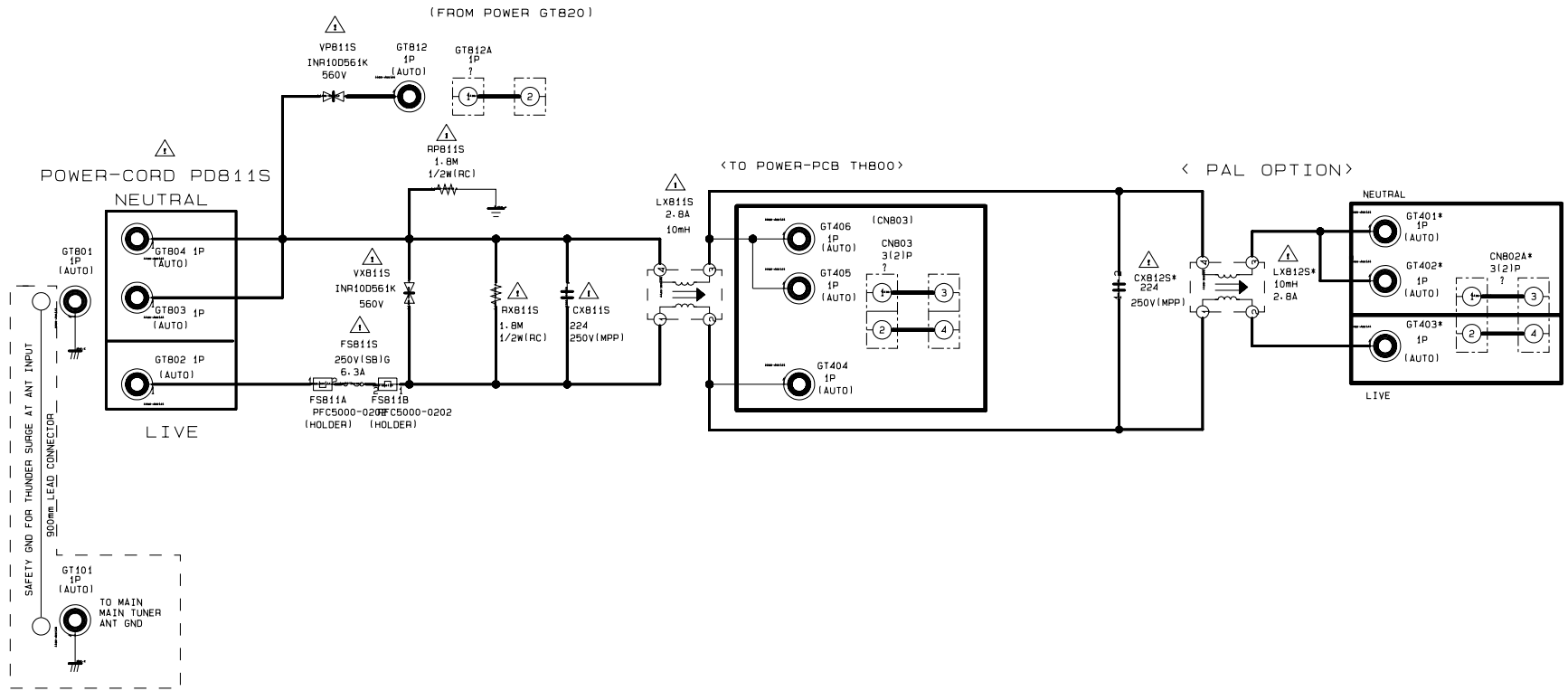


		0mg	
X	2.44	1	
Y	2.44	2	

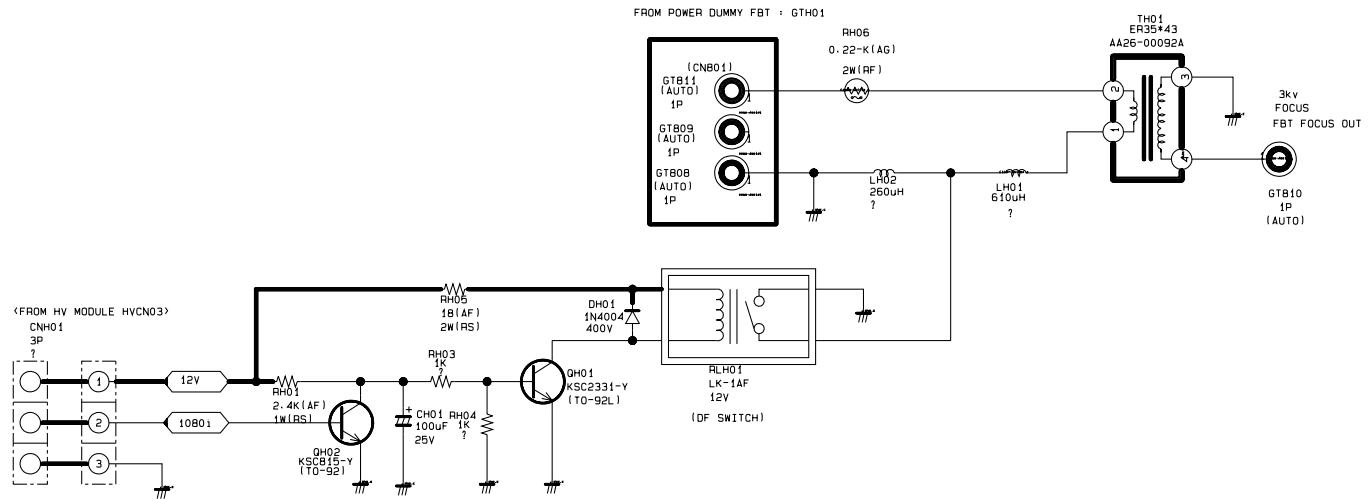
## CONTROL

## DYNAMIC FOCUS





### DYNAMIC FOCUS



# SCHEMATIC DIAGRAM

CHASSIS : K54A

MODEL : WT-32Z5HD

BOARD NAME : SUB-POWER DC-DC CONVERTER

