FILE NO. SM-CTV-O-056

COLOR TELEVISION

SERVICE MANUAL

MODEL NO. *PF2720/PF2730*

PF3220/PF3230

CHASSIS NO. CH-16CD

Please read this manual carefully before service.

TABLE OF CONTENTS

SAFETY INSTRUCTIONS AND MAINTENANCE

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" INSTRUCTIONS BELOW.

X-RAY 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 maximum EHT voltage permissible in any operating circumstances must not exceed the rated value. 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 radiation in this TV is the CRT. The TV minimizes X-RAY radiation, which ensures safety during normal operation. To prevent X-ray radiation, the replacement CRT must be identical to the original fitted as specified 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.
4. Service and adjustment of the TV may result in changes in the nominal EHT voltage of the CRT anode. So ensure that the maximum EHT voltage does not exceed the rated value after service and adjustment.

SAFETY PRECAUTION

WARNING: REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY.

1. The TV has a nominal working EHT voltage. Extreme caution should be exercised when working on the TV with the back removed.

1.1 Do not attempt to service this TV if you are not conversant with the precautions and procedures for working on high voltage equipment.

1.2 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.

1.3 The CRT, if broken, will violently expel glass fragments. Use shatterproof goggles and take extreme care while handling.

1.4 Do not hold the CRT by the neck as this is a very dangerous practice.

2. It is essential that to maintain the safety of the customer all power cord forms be replaced exactly as supplied from factory.
3. Voltage exists between the hot and cold ground when the TV is in operation. Install a suitable isolating transformer of beyond rated overall power when servicing or connecting any test equipment for the sake of safety.

4. When replacing ICs, use specific tools or a static-proof electric iron with small power (below 35W).
5. Do not use a magnetized screwdriver when tightening or loosing the deflection yoke assembly to avoid electronic gun magnetized and decrement in convergence of the CRT.
6. When remounting the TV chassis, ensure that all guard devices, such as nonmetal control buttons, switch, insulating sleeve, shielding cover, isolating resistors and capacitors, are installed on the original place.
7. Replace blown fuses within the TV with the fuse specified in the parts list.
8. 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 on the circuit diagram and parts list, it must be the company-approved type and must be mounted as the original.
9. Keep wires away from high temperature components.

PRODUCT SAFETY NOTICE

CAUTION: FOR YOUR PROTECTION, THE FOLLOWING PRODUCT SAFETY NOTICE SHOULD BE READ CAREFULLY BEFORE OPERATING AND SERVICING THIS TV SET.

1. Do not slap or beat the cabinet or CRT, since this may result in fire or explosion.
2. Never allow the TV sharing a plug or socket with other large-power equipment. Doing so may result in too large load, thus causing fire.
3. Do not allow anything to rest on or roll over the power cord. Protect the power cord from being walked on, modified, cut or pinched, particularly at plugs.
4. Do not place any objects, especially heavy objects and lightings, on top of the TV set. Do not install the TV near any heat sources such as radiators, heat registers, stove, or other apparatus that produce heat.
5. Service personnel should observe the SAFETY INSTRUCTIONS in this manual during use and servicing of this TV set. Otherwise, the resulted damage is not protected by the manufacturer.
6. 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 necessarily 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 on the circuit diagram and parts 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.

Safety Symbol Description

The lightning symbol in the triangle tells you that the voltage inside this product may be strong enough to cause an electric shock. Extreme caution should be exercised when working on the TV with the back removed.

This is an international hazard symbol, telling you that the components identified by the symbol have special safety-related characteristics.

FDA This symbol tells you that the critical components identified by the FDA marking have special safety-related characteristics.

UL This symbol tells you that the critical components identified by the UL marking have special safety-related characteristics.

MAINTENANCE

1. Install the TV set on a stable and level surface. Do not place the set near or over a radiator or heat register, or where it is exposed to direct sunlight.
2. Do not install the TV set in a place exposed to rain, water, excessive dust, mechanical vibrations or impacts.
3. Allow enough space (at least 10cm) between the TV and wall or enclosures for proper ventilation.
4. Slots and openings in the cabinet should never be blocked by clothes or other objects.
5. Please power off the TV set and disconnect it from the wall immediately if any abnormal condition are met, such as bad smell, belching smoke, sparkling, abnormal sound or no picture/sound/raster. Hold the plug firmly when disconnecting the power cord.
6. Unplug the TV set from the wall outlet before cleaning or polishing it. Use a dry soft cloth for cleaning the exterior of the TV set or CRT screen. Do not use liquid cleaners or aerosol cleaners.

SPECIFICATIONS

MODEL	PF2720	PF2730	PF3220	PF3230
Television System	NTSC-M			
Channel Coverage	VHF 2-13, UHF 14~69			
Cable TV Coverage	Mid Band (A-8~A-1, A~I)/Super Band (J~W) Hyper Band (AA~ZZ, AAA, BBB)/Ultra Band (65~94, 100~125)			
Channels Preset	181			
Antenna Input	75 ohm (unbalanced)			
Screen Dimensions	21.26x 15.94 in 540x405 mm		25.20x 18.82 in 640x478 mm	
Audio Output	5W+5W		5W+5W	
Power Source	~120Vac 60Hz			
Unit Weight	97.9lbs. (44.5kg)		156lbs. (71kg)	
Unit Dimensions	29.09x22.83x19.29 in. 739x580x490mm		33.70x26.34x22.05 in. 856x669x560mm	
Packaged Dimensions	33.07x26.38x23.43in. 840x670x595mm		40x30.55x27.76in. 1016x776x705mm	
Power Consumption	135W		170W	

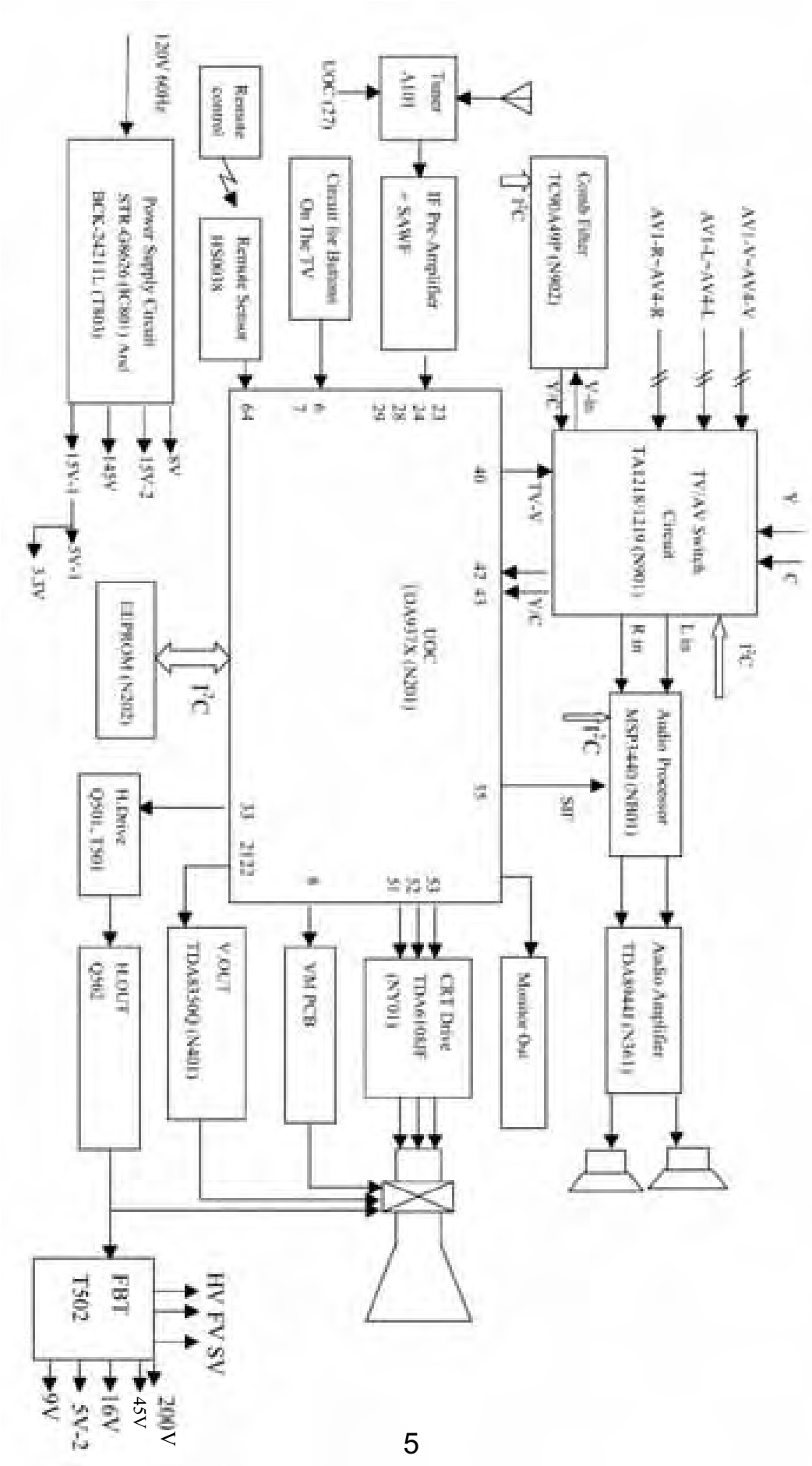
KEY ICS AND ASSEMBLIES

Table 1 Key ICs and Assemblies

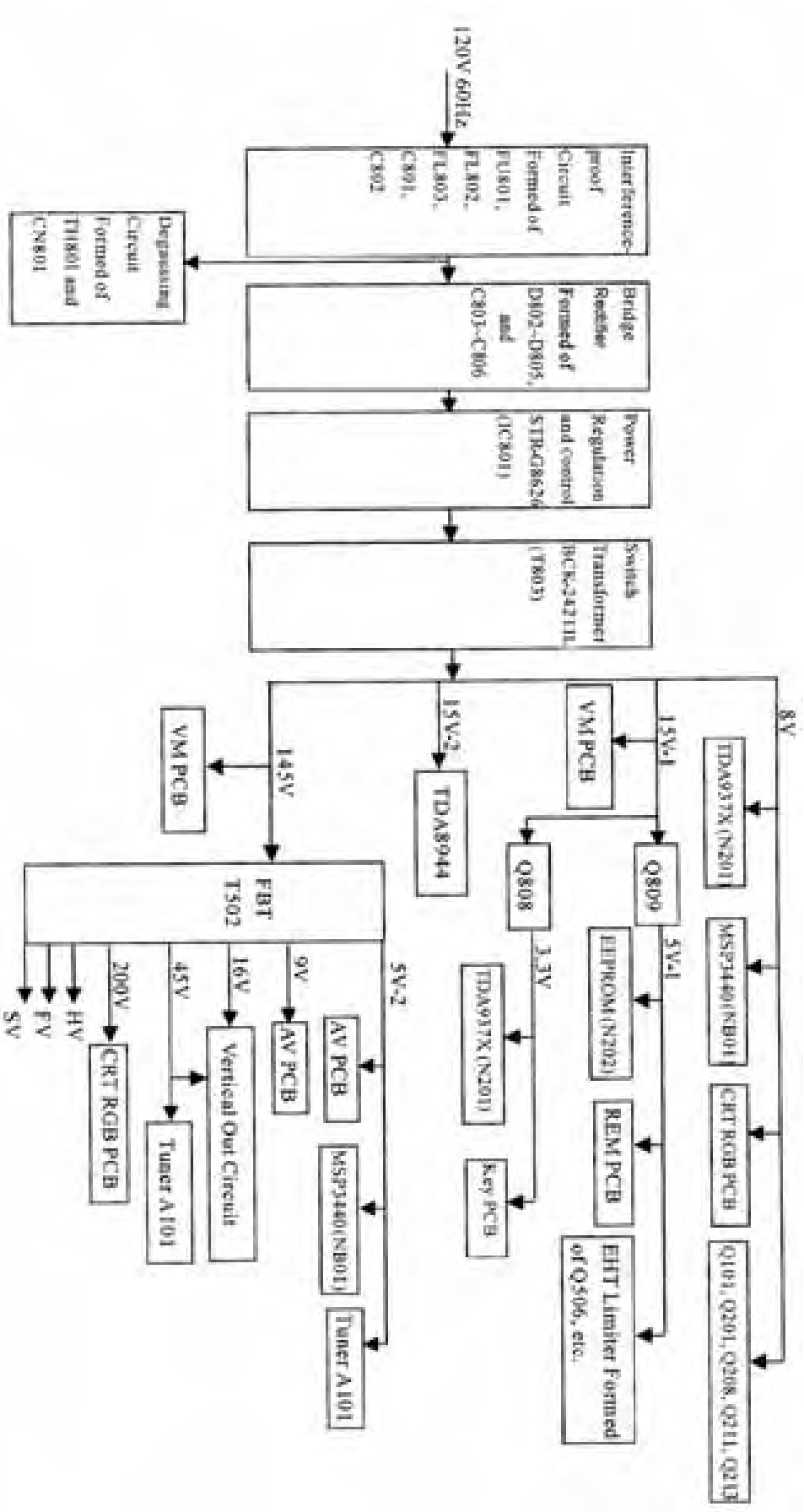
Serial No.	Position No.	Model No.	Function Description
1	N201	TDA937X	UOC
2	N202	AT24C16	EEPROM
3	NB01	MSP3440G-B8	BTSC
4	N401	TDA8350	Vertical output circuit
5	N361	TDA8944J	Sound power amplifier
6	N901	TA1219AN	TV/AV switch circuit
7	N902	TC90A49P	COMB filter
8	NY01	TDQ6108JF	Video amplifier
9	A101	TDQ-6F2-M	Tuner
10	IC801	STR-G8626	Power supply circuit

SYSTEM BLOCK DIAGRAMS

Structure Block Diagram



Block Diagram for Supply Voltage System



SERVICE DATA

Technical Data of Key ICs

TDA937X (N201)

UOC

1. General Description

The various versions of the TDA937X PS/N2 series combine the functions of a video processor together with a µ-Controller and US Closed Caption decoder. The ICs are intended to be used in economy television receivers with 90° and 110° picture tubes. The ICs have supply voltages of 8V and 3.3V and they are mounted in an S-DIP 64 envelope.

The features are given in the following feature list. The differences between the various ICs are given in the table on page 4.

2. Features

TV-signal processor

- Multi-standard vision IF circuit with alignment-free PLL demodulator
- Internal (switchable) time-constant for the IF-AGC circuit
- A choice can be made between versions with mono intercarrier sound FM demodulator and versions with QSS IF amplifier.
- The mono intercarrier sound versions have a selective FM-PLL demodulator which can be switched to the different FM sound frequencies (4.5/5.5/6.0/6.5 MHz).
  The quality of this system is such that the external band-pass filters can be omitted.
- Source selection between 'internal' CVBS and external CVBS or Y/C signals
- Integrated chrominance trap circuit
- Integrated luminance delay line with adjustable delay time
- Picture improvement features with peaking (with variable positive/negative overshoot ratio), black stretching and Dynamic Skin Tone Control
- Integrated chroma band-pass filter with switchable centre frequency
- Only one reference (12 MHz) crystal required for the µ-Controller, Teletext- and the colour decoder
- PAL/NTSC colour decoder with automatic search system
- Internal base-band delay line
- RGB control circuit with 'Continuous Cathode Calibration', white point and black level offset adjustment so that the colour temperature of the dark and the light parts of the screen can be chosen independently.
- Linear RGB or YUV input with fast blanking for external RGB/YUV sources. The Text/OSD signals are internally supplied from the µ-Controller/Teletext decoder
- Contrast reduction possibility during mixed-mode of OSD and Text signals
- Horizontal synchronization with two control loops and alignment-free horizontal oscillator
- Vertical count-down circuit
- Vertical driver optimized for DC-coupled vertical output stages
- Horizontal and vertical geometry processing
- Horizontal and vertical zoom function for 16 : 9 applications
- Horizontal parallelogram and bow correction for large screen picture tubes
- Low-power start-up of the horizontal drive circuit

3.Pin

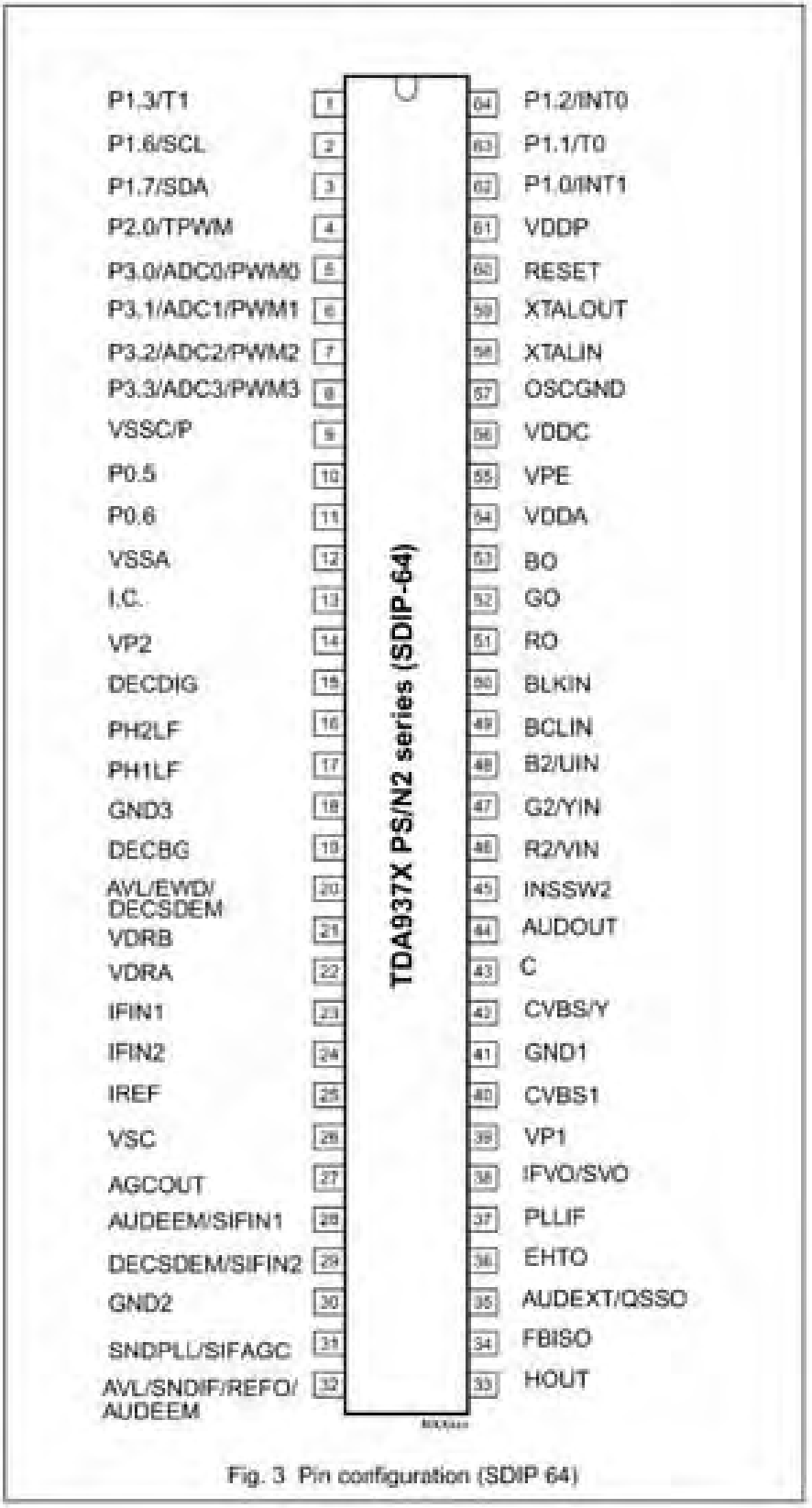
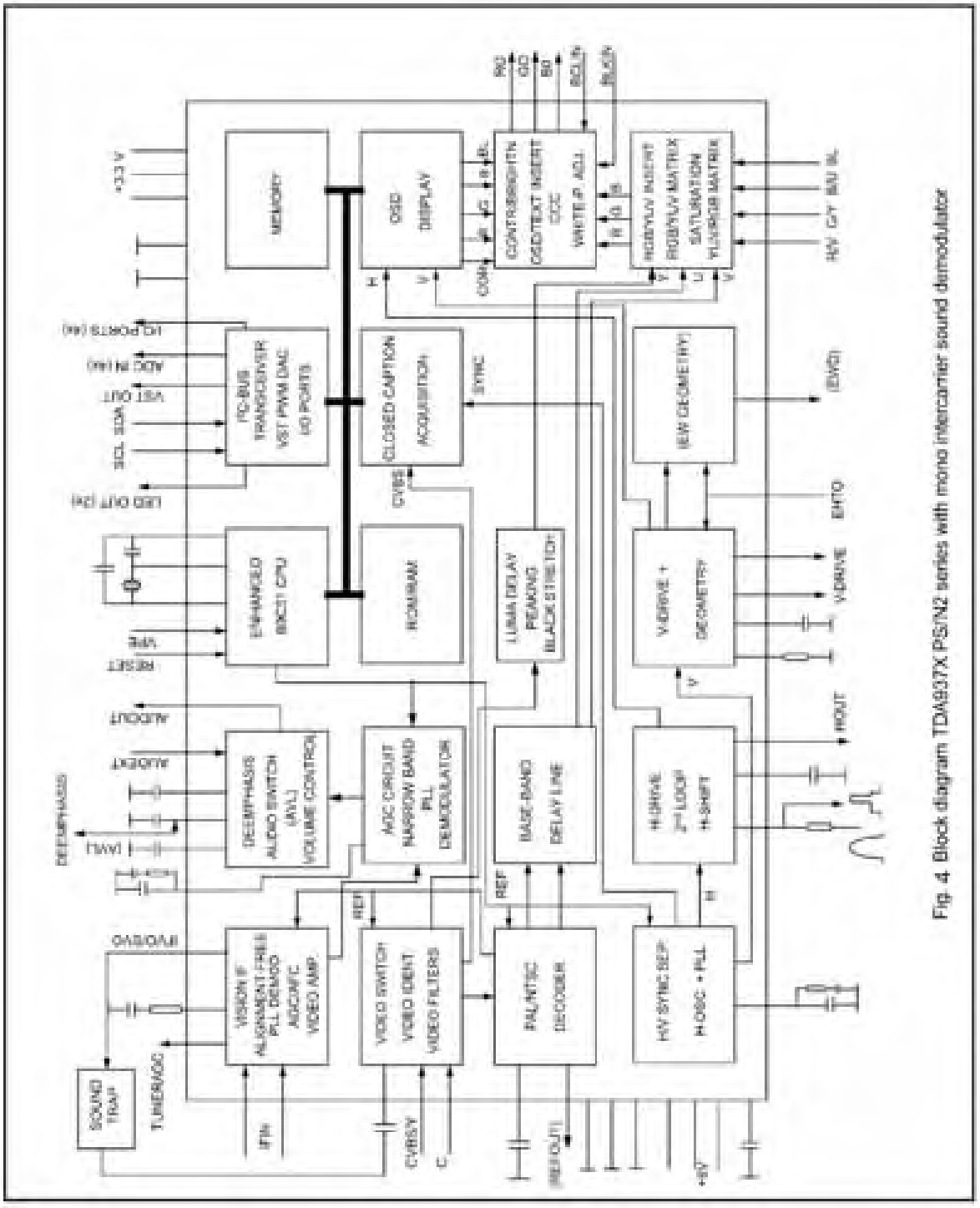


Fig. 3 Pin configuration (SDIP 64)

4.Block Diagram



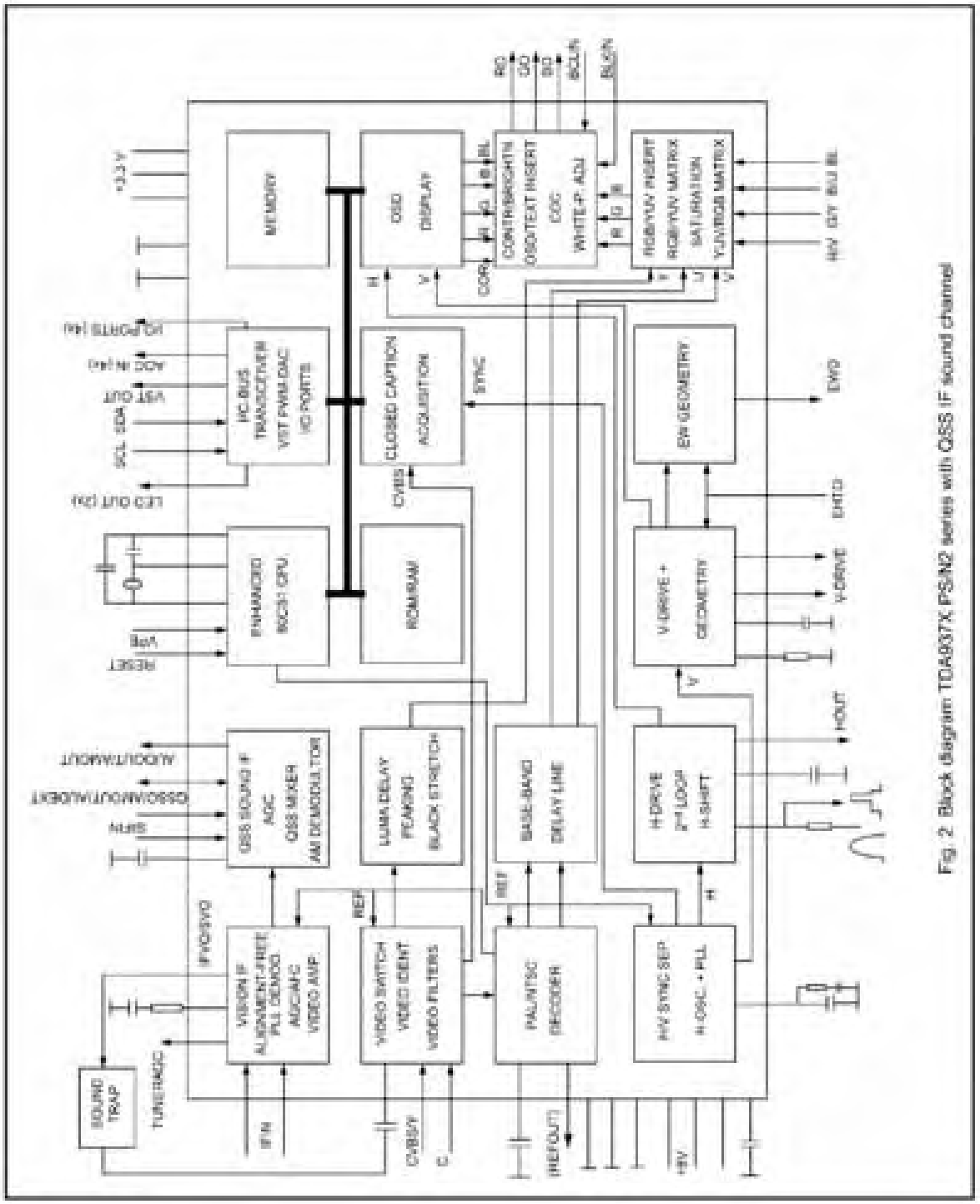


Fig. 2 Block diagram TDA837X PS/N2 series with QSS IF sound channel

5.Refer to Table 2 about Functions and Service Data of the IC's Each Pin.

AT24C16 (N202)

EEPROM

1. Features

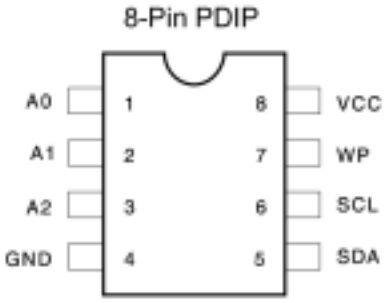
- Low Voltage and Standard Voltage Operation
  - 5.0 (V_{CC} = 4.5V to 5.5V)
  - 2.7 (V_{CC} = 2.7V to 5.5V)
  - 2.5 (V_{CC} = 2.5V to 5.5V)
  - 1.8 (V_{CC} = 1.8V to 5.5V)
- Internally Organized 128 x 8 (1K), 256 x 8 (2K), 512 x 8 (4K),1024 x 8 (8K) or 2048 x 8 (16K)
- 2-Wire Serial Interface
- Bidirectional Data Transfer Protocol
- 100 kHz (1.8V, 2.5V, 2.7V) and 400 kHz (5V) Compatibility
- Write Protect Pin for Hardware Data Protection
- 8-Byte Page (1K, 2K), 16-Byte Page (4K, 8K, 16K) Write Modes
- Partial Page Writes Are Allowed
- Self-Timed Write Cycle (10 ms max)
- High Reliability
  - Endurance: 1 Million Cycles
  - Data Retention: 100 Years
- Automotive Grade and Extended Temperature Devices Available
- 8-Pin and 14-Pin JEDEC SOIC and 8-Pin PDIP Packages

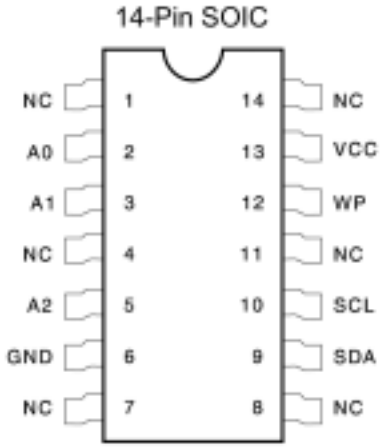
2.**Description**

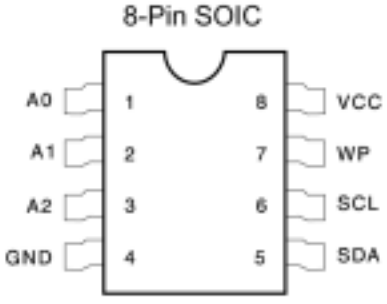
The AT24C01A/02/04/08/16 provides 1024/2048/4096/8192/16384 bits of serial electrically erasable and programmable read only memory (EEPROM) organized as 128/256/512/1024/2048 words of 8 bits each. The device is optimized for use in many industrial and commercial applications where low power and low voltage operation are essential. The AT24C01A/02/04/08/16 is available in space saving 8-pin PDIP, 8-pin and 14-pin SOIC packages and is accessed via a 2-wire serial interface. In addition, the entire family is available in 5.0V (4.5V to 5.5V), 2.7V (2.7V to 5.5V), 2.5V (2.5V to 5.5V) and 1.8V (1.8V to 5.5V) versions.

Pin Configurations

Pin Name	Function
A_0 to A_2	Address Inputs
SDA	Serial Data
SCL	Serial Clock Input
WP	Write Protect
NC	No Connect







3.Block Diagram

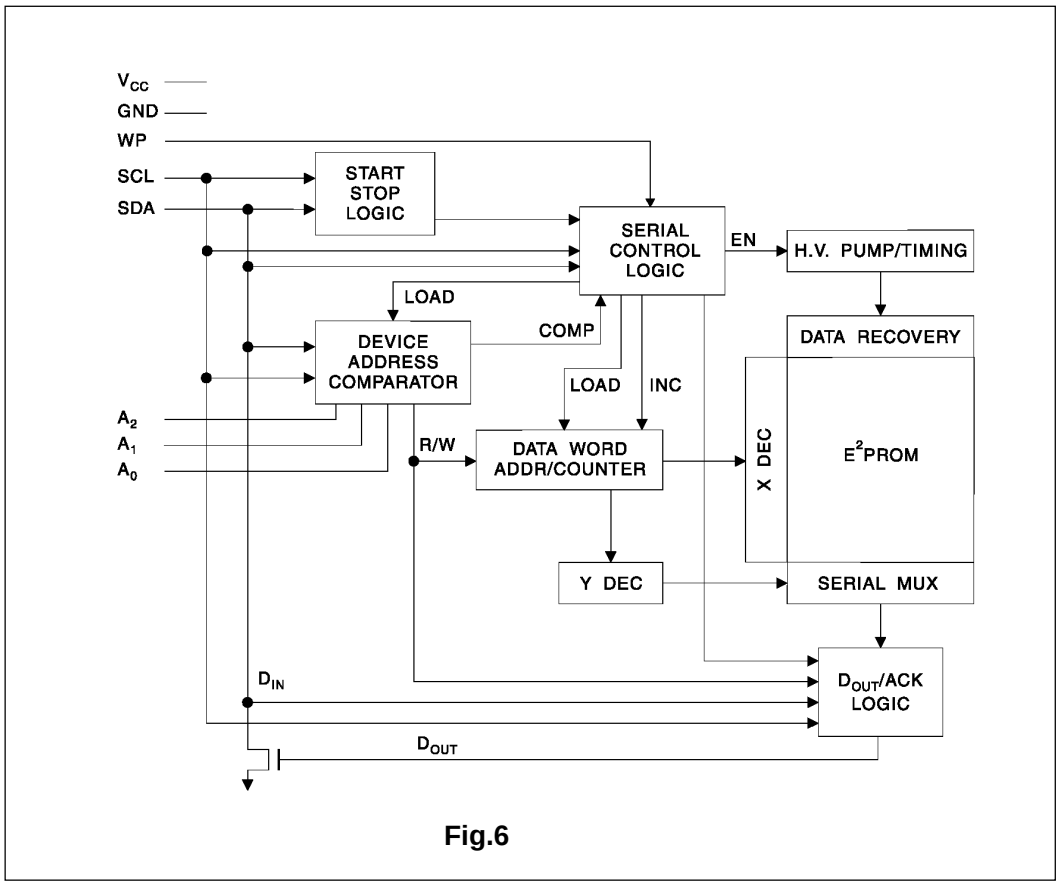


Fig.6

4.Refer to Table 3 about Functions and Data of the IC's Pins.

MSP3440G-B8 (NB01)

Multistandard Sound Processor Family

Release Note: Revision bars indicate significant changes to the previous edition. The hardware and software description in this document is valid for the MSP34X0G version B5 and following versions.

1. Introduction

The MSP34X0G family of single-chip Multistandard Sound Processors covers the sound processing of all analog TV-Standards worldwide, as well as the NICAM digital sound standards. The full TV sound processing, starting with analog sound IF signal-in, down to processed analog AF-out, is performed on a single chip. Figure 7 shows a simplified functional block diagram of the MSP34X0G.

This new generation of TV sound processing ICs now includes versions for processing the multichannel television sound (MTS) signal conforming to the standard recommended by the Broadcast Television Systems Committee (BTSC). The DBX noise reduction, or alternatively MICRONAS Noise Reduction (MNR) is performed alignment free

Other processed standards are the Japanese FM-FM multiplex standard (EIA-J) and the FM Stereo Radio standard.

Current ICs have to perform adjustment procedures in order to achieve good stereo separation for BTSC and EIA-J.

The MSP34X0G has optimum stereo performance without any adjustments.

All MSP34X0G versions are pin and software downward-compatible to the MSP34X0D. The MSP34X0G further simplifies controlling software. Standard selection requires a single I^2C transmission only.

The MSP34X0G has built-in automatic Functions: The IC is able to detect the actual sound standard automatically (Automatic Standard Detection). Furthermore, pilot levels and identification signals can be evaluated internally with subsequent switching between mono/stereo/bilingual; no I^2C interaction is necessary (Automatic Sound Selection).

The ICs are produced in submicron CMOS technology.

The MSP34X0G is available in the following packages: PLCC68, PSDIP64, PSDIP52, PQFP80 and PLQFP64.

2. Block Diagram

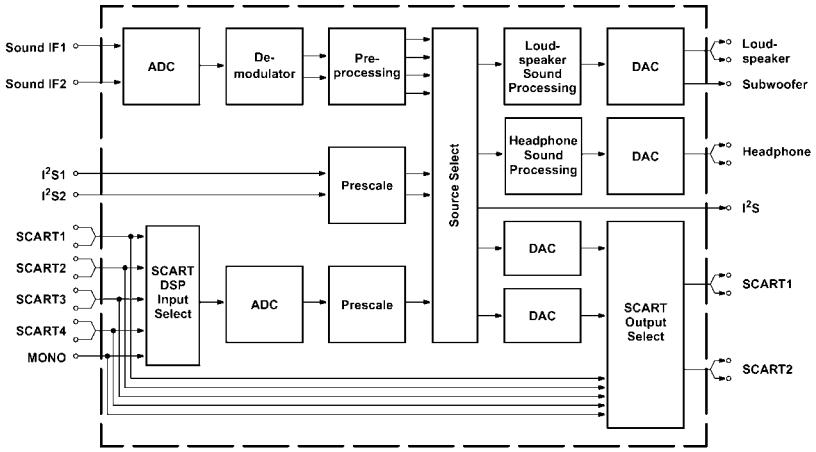


Fig. 7 Simplified Functional Block Diagram of the MSP34X0G

3. Refer to Table 4 about Functions and Service Data of MSP34X0G's Each Pins.

TDA8350 (N401)

DC-coupled Vertical Deflection and East-West Output Circuit

1. Features

- Few external components
- Highly efficient fully DC-coupled vertical output bridge circuit
- Vertical flyback switch
- Guard circuit
- Protection against：

-short-circuit of the output pins

-short-circuit of the output pins to Vp

- High EMC immunity due to common mode inputs
- Temperature (thermal) protection
- East-West output stage with one single conversion resistor.

2. General Description

The TDA8350Q is a power circuit for use in 90° and 110° colour deflection systems for field frequencies of 50 to 120 Hz. The circuit provides a DC driven vertical deflection output circuit, operating as a highly efficient class G system and an East-West driver for sinking the diode modulator current.

3. Block Diagram

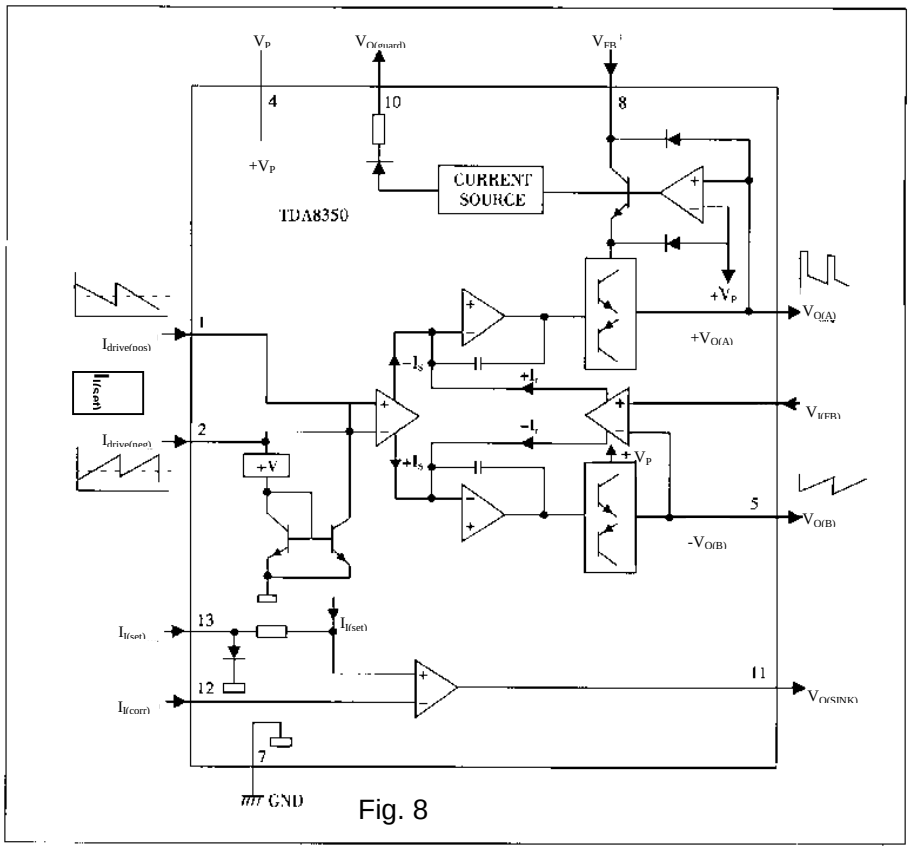


Fig. 8

4. Refer to Table 5 about Functions and Service Data of TDA8350Q's Pins.

TDA8944J (N361)

Audio Power Amplifier

1. General Description

The TDA8944J is a dual-channel audio power amplifier with an output power of

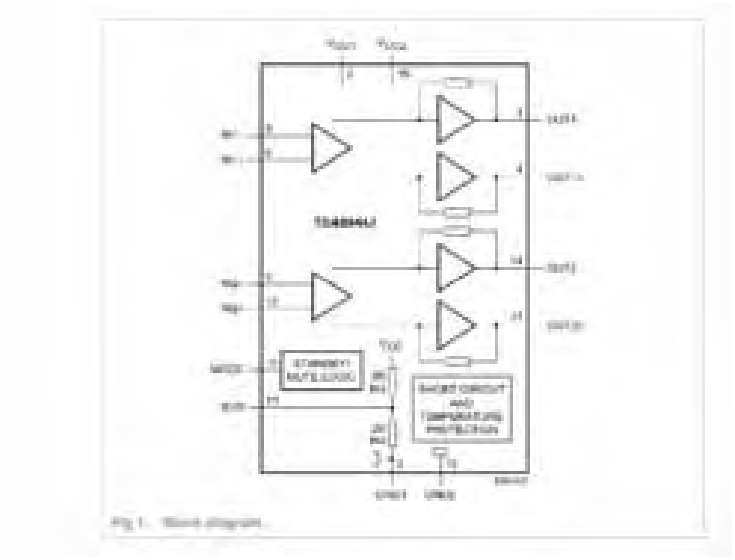
2 7 W at an 8 load and a 12 V supply. The circuit contains two Bridge Tied Load (BTL) amplifiers with an all-NPN output stage and standby/mute logic. The TDA8944J comes in a 17-pin DIL-bent-SIL (DBS) power package. The TDA8944J is printed-circuit board (PCB) compatible with all other types in the TDA894x family.

One PCB footprint accommodates both the mono and the stereo products.

2. Features

- Few external components
- Fixed gain
- Standby and mute mode
- No on/off switching plops
- Low standby current
- High supply voltage ripple rejection
- Outputs short-circuit protected to ground, supply and across the load
- Thermally protected
- Printed-circuit board compatible

3.Block Diagram



Pinning

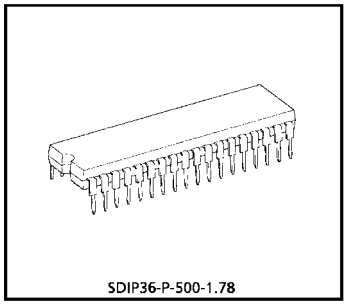
Fig.10 Pin configuration.

5. Refer to Table 6 about Functions and Service Data of TDA8944J's Pins.

TA1219AN (N901)

Audio/Video Switching IC for TVs

The TA1219AN is an audio/video switching IC for TV Sets. Conforming to I^2C bus standards, it allows you to perform various switching operations through the bus lines by using a microcomputer. Furthermore, since the presence of a signal on its sync signal output pin can be determined by a microcomputer , it is possible to check each input/output channel (self-diagnosis).
This IC has the same pin assignments as the TA1218AN (SDIP42), a 2-channel output version of the TA1219AN, so these chips are pin compatible on pins 3 to 20 and 23 to 40 in TA1218AN.



Weight : 2.98g (Typ.)

1. Features

- I^2C bus control
- Video: 5-channel inputs and 1-channel outputs (2 channels conforming to S system)
- Audio: 5-channel inputs and 2-channel outputs
- Self-diagnostic function
- ADC inputs based on European 21-pin standards
- ADC inputs based on S1/S2 terminal standards
- Switchable subaddress

2. Block Diagram

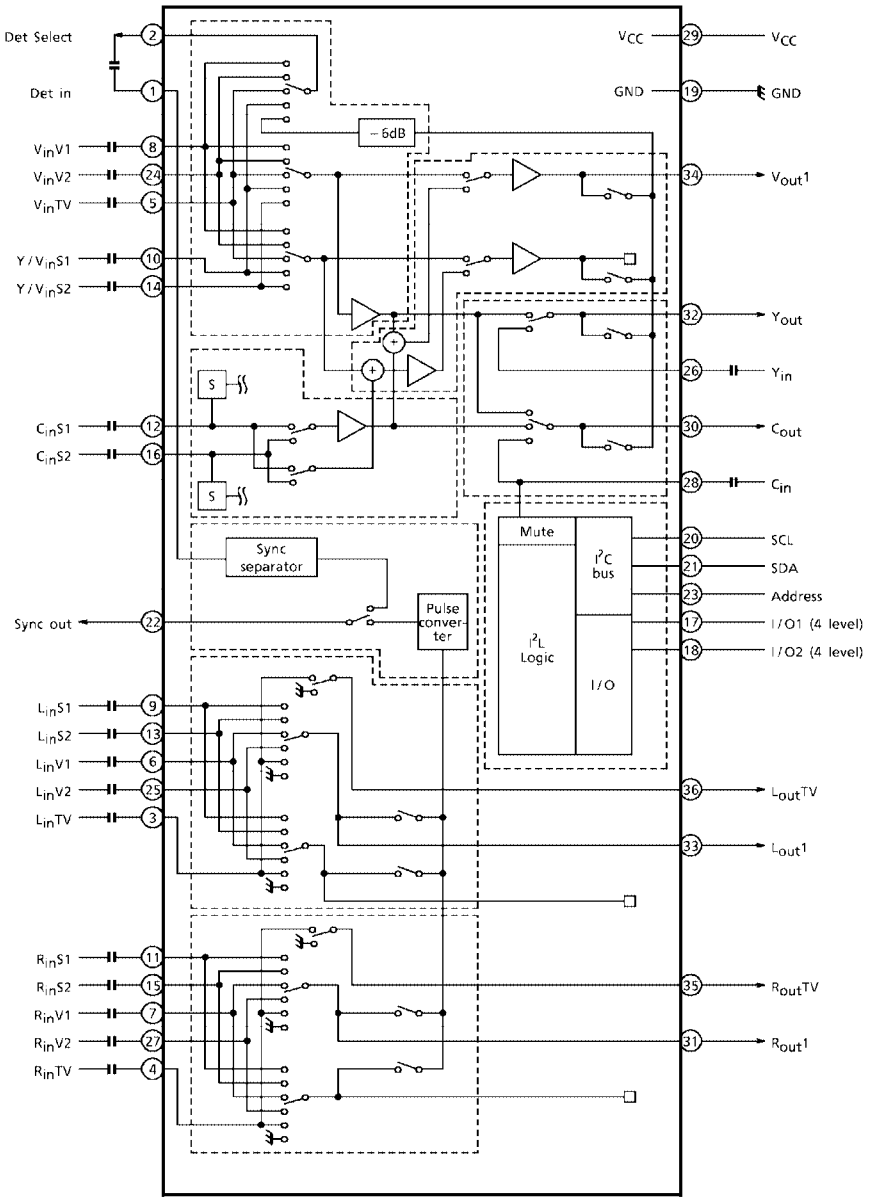
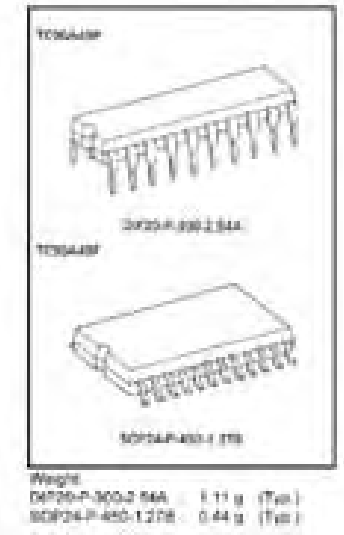


Fig.11

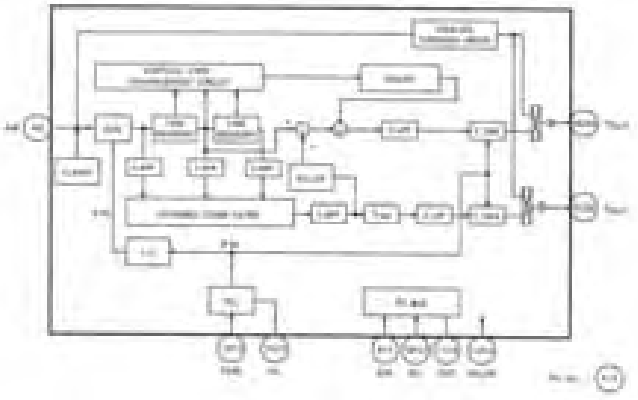
3. Refer to Table 7 about Functions and Service Data of TA1219AN's Pins.

TC90A49P (N902)
COMB Filter
1. Features

- TV format : NTSC (3.58), PAL, M-PAL, and N-PAL
- Dynamic comb filter
- Vertical edge enhancement circuit
- PLL 8 □ multiplier circuit
- Internal 8-bit 4 fsc AD converter
- Internal 8-bit precision 8 fsc DA converter (2 ch)
- Sync tip clamp circuit
- Internal 4H-line memory
- I^2C bus interface
- Package : DIP 20-pin and SOP 24-pin
- 5 V single power supply



2. Block Diagram



3. Pin Assignment

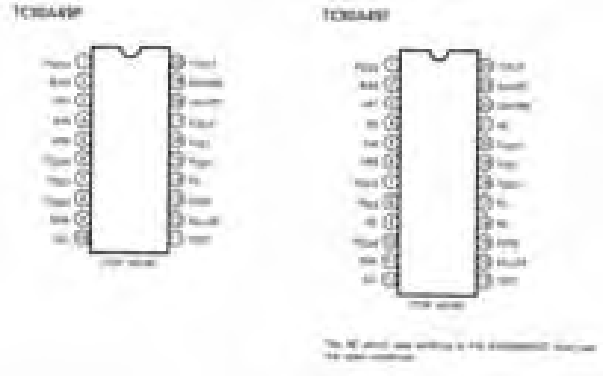


Fig.14

4. Refer to Table 8 about Functions and Service Data of TC90A49P□s Pins.

TDA6108JF (NY01)

Triple Video Output Amplifier

1. Features

- Typical bandwidth of 9.0 MHz for an output signal of 60 V (peak-to-peak value)
- High slew rate of 1850 V/μS
- No external components required
- Very simple application
- Single supply voltage of 200 V
- Internal reference voltage of 2.5 V
- Fixed gain of 51
- Black-Current Stabilization (BCS) circuit
- Thermal protection.

2. General Description

The TDA6108JF includes three video output amplifiers in one plastic DIL-bent-SIL 9-pin medium power (DBS9MPF)package (SOT 111-1), using high-voltage DMOS technology, and is intended to drive the three cathodes of a colour CRT directly. To obtain maximum performance, the amplifier should be used with black-current control.

3. Ordering Information

Type Number	Package		
	Name	Description	Version
TDA6108JF	DBS9MPF	Plastic DIL-bent-SIL medium power package with fin; 9 leads	SOT111-1

4. Block Diagram

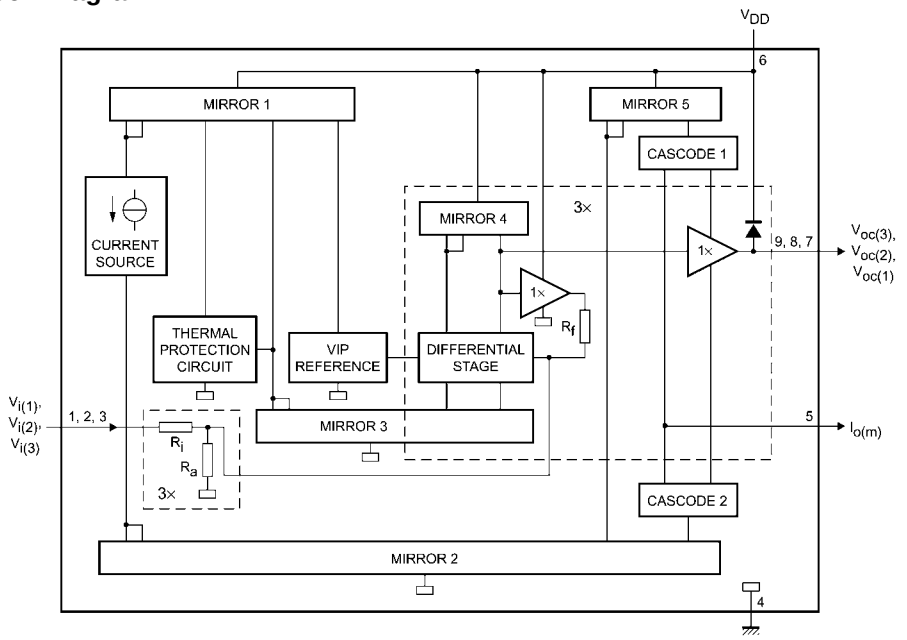


Fig.15

5. Refer to Table 8 about Functions and Service Data of TDA6108JF's Pins.

STR-G8626 (IC801)

The Series STR-G 86626/5653/F6654 is specifically designed to satisfy the requirements for increased integration and reliability in off-line quasi-resonant flyback converters. The series incorporates a high-precise error amplifying control and drive circuit with discrete avalanche-rated power MOSFET, featuring fewer external components, small-size and standard power supply.

Covering the power range from below 25 watts up to 300 watts for 100/115/230 VAC inputs, and up to 150 watts for 85 to 265 VAC universal input, these devices can be used in a range of applications, from battery chargers and set top boxes, to televisions, monitors, and industrial power supply units.

Cycle-by-cycle current limiting, under-voltage lockout with hysteresis, over-voltage protection, and thermal shutdown protects the power supply during the normal overload and fault conditions.

Low-current startup and a low-power standby mode selected from the secondary circuit completes a comprehensive suite of features. The series is provided in a five-pin overmolded SIP style package, affording dielectric isolation without compromising thermal characteristics.

1. Features

- Flyback Operation with Quasi-Resonant Soft Switching for Low Power Dissipation and EMI
- Rugged Avalanche-Rated MOSFET
  Soft drive circuit MOSFET
  Adjustable MOSFET switching speed
- Choice of MOSFET Voltage and Rds(on)
- Full Over-Current Protection (no blanking)
- Under-Voltage Lockout with Hysteresis
- Over-Voltage Protection
- Direct Voltage Feedback
- Low Start-up Current (100μA max)
- Low-Frequency, Low-Power Standby Operation
- Overmolded 5-Pin Package

2. Circuit Block Diagram

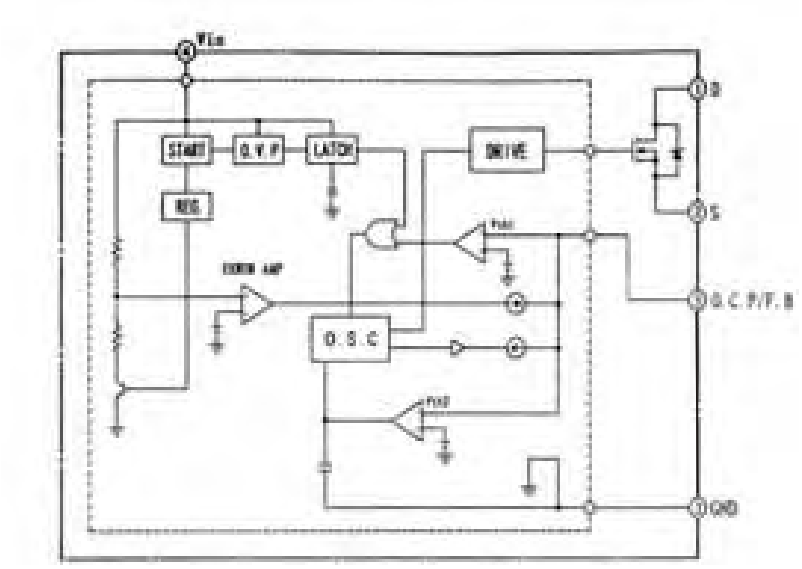


Fig. 16

3. Pin Configuration and Functions

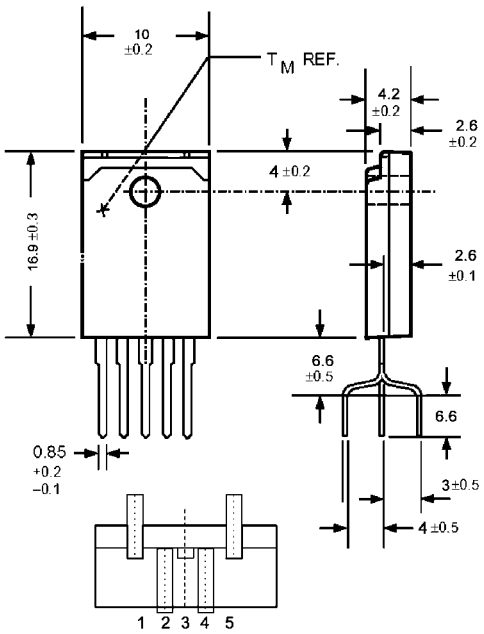


Fig.17

3.1) Pin function for STR-G5653/8626

Pin No.	Symbol	Function Description
1	D	MOSFET drain
2	S	MOSFET source
3	GND	Ground
4	V_{IN}	Supply voltage input for control circuit
5	OCP/FB	Over-current protection detection signal/ voltage-limiting signal input

3.2) Pin function for STR-F6654

Pin No.	Symbol	Function Description
1	OCP/FB	Over-current protection detection signal/ voltage-limiting signal input
2	S	MOSFET source
3	D	MOSFET drain
4	V_{IN}	Supply voltage input for control circuit
5	GND	Ground

4. Refer to Table 9 about Functions and Service Data of the IC's Pins.

SERVICE DATA OF KEY ICs

Table 2 Functions and Service Data of TDA9379 (N201)'s Pins

Pin No.	Functions Description	Digital Multimeter		
		Reference Voltage (V)	Positive Resistance (20KΩ)	Negative Resistance (20KΩ)
1	Port 1.3 or Counter/Timer 1 input	0.8	∞	∞
2	Port 1.6 or I^2C-bus clock line	4	6.5	6.0
3	Port 1.7 or I^2C-bus data line	4	6.5	6.0
4	Port 2.0 or Tuning PWM output	1.128	13.1	10.2
5	Port 3.0 or ADC0 input or PWM0 output	0.36	∞	∞
6	Port 3.1 or ADC1 input or PWM1 output	3.29	1.64	1.64
7	Port 3.2 or ADC2 input or PWM2 output	3.29	1.67	1.67
8	Port 3.3 or ADC3 input or PWM3 output	4.91	7.8	7.3
9	Digital ground for μ-Controller core and periphery	0	0	0
10	Port 0.5 (8 mA current sinking capability for direct drive of LEDs)	0	7.2	6.99
11	Port 0.6 (8 mA current sinking capability for direct drive of LEDs)	4.17	7.7	7.3
12	Analog ground of Teletext decoder and digital ground of TV-processor	0	0	0
13	Internally connected	2.285	∞	0
14	2nd supply voltage TV-processor (+8V)	8.1	1.2	1.4
15	Supply voltage of digital circuit of TV-processor	4.96	∞	∞
16	Phase-2 filter	3.49	∞	∞
17	Phase-1 filter	3.81	∞	∞
18	Ground 3 for TV-processor	0	0	0
19	Bandgap decoupling	3.96	∞	∞
20	Automatic Volume Levelling (90° versions) / E-W drive output (110° versions) /	0.78	∞	∞
21	Decoupling sound demodulator (QSS version in AM/FM mode)	2.3	∞	∞
22	Vertical drive B output	2.3	∞	∞
23	Vertical drive A output	1.85	∞	∞
24	IF input 1	1.85	∞	∞
25	IF input 2	3.82	∞	∞
26	Reference current input	3.75	∞	∞
27	Vertical sawtooth capacitor	1.36	4.75	4.73
28	Tuner AGC output	1.87	∞	∞
29	Audio deemphasis or SIF input 1	1.87	∞	∞

(Continued)

30	Decoupling sound demodulator or SIF input 2	0	0	0
31	Ground 2 for TV processor	2.32	∞	∞
32	Narrow band PLL filter or AGC sound IF	0	∞	∞
33	Automatic Volume Levelling / sound IF input / subcarrier reference output / audio	3.1	11.2	10.9
34	Deemphasis	0.75	∞	∞
35	Horizontal output	2.60	∞	∞
36	Flyback input/sandcastle output	1.47	9.8	9.75
37	External audio output / QSS intercarrier out	2.43	∞	∞
38	EHT/overvoltage protection input	2.75	∞	∞
39	IF-PLL loop filter	8.1	1.2	1.35
40	IF video output / selected CVBS output	4	∞	∞
41	Supply voltage TV processor	0	0	0
42	CVBS/Y input	3.9	∞	∞
43	C input	1.55	∞	∞
44	Audio output/AM audio output (volume controlled)	4.44	∞	∞
45	2nd RGB / YUV insertion input	1.67	∞	∞
46	2nd R input / V (R-Y) input / PR input	2.5	∞	∞
47	2nd G input / Y input	2.5	∞	∞
48	2nd B input / U (B-Y) input / PB input	2.5	∞	∞
49	Beam current limiter input	1.87	∞	∞
50	Black current input / V-guard input	5.8	∞	∞
51	Red output	2.63	3.1	3.0
52	Green output	2.47	3.1	3.0
53	Blue output	2.69	3.1	3.0
54	Analog supply of Teletext decoder and digital supply of TV-processor (3.3 V)	3.27	0.67	0.65
55	OTP programming voltage	0	0	0
56	Digital supply to core (3.3 V)	3.28	0.67	0.65
57	Oscillator ground supply	0	0	0
58	Crystal oscillator input	1.58	∞	∞
59	Crystal oscillator output	1.67	∞	∞
60	Reset	0	0	0
61	Digital supply to periphery (+3.3 V)	3.28	0.67	0.65
62	Port 1.0 or external interrupt 1 input	0	12.9	11.9
63	Port 1.1 or Counter/Timer 0 input	0	7.3	7.1
64	Port 1.2 or external interrupt 0 input	4.59	18.7	18.8

Table 3 Functions and Service Data of AT24C16 (N202)'s Pins

Pin No.	Functions Description	Digital Multimeter		
		Reference Voltage (V)	Positive Resistance (20KΩ)	Negative Resistance (20KΩ)
1	Address input	0	0	0
2	Address input	0	0	0
3	Address input	0	0	0
4	Common ground	0	0	0
5	Serial data	4	6.37	6.4
6	Serial clock input	4.2	6.37	6.44
7	Write protect	0	0	0
8	Supply voltage	4.9	3.03	3.02

Table 4 Functions and Service Data of MSP3440(N606M)'s Pins

Pin No.	Function Description	Digital Multimeter		
		Reference Voltage (V)	Positive Resistance (20KΩ)	Negative Resistance (20KΩ)
1	NC	0.00	15.32	5.3
2	NC	2.57	13.41	5.51
3	NC	0.00	15.32	5.57
4	NC	0.00	15.32	5.58
5	ADR-SEL	5.03	8.62	4.54
6	STANDBYQ	5.03	8.63	4.54
7	I^2C-DC	3.8	6.98	4.44
8	I^2C-DA	3.9	6.98	4.44
9	NC	2.5	15.32	6.24
10	NC	2.82	15.32	6.24
11	NC	2.5	15.32	6.24
12	NC	0.27	15.32	5.29
13	NC	0.2	15.32	5.59
14	NC	0.1	15.32	5.59
15	NC	0.1	15.32	5.59
16	DVSUP	5.04	8.6	4.54
17	DVSS	0.00	0.00	0.00
18	NC	0.00	15.32	5.31
19	NC	0.00	∞	∞
20	RESETQ	5	15.04	5.24
21	NC	0.00	3.54	3.54
22	NC	0.00	3.52	3.52
23	VREF2	0.00	0.00	0.00
24	DACM-R	2.03	3.52	3.52
25	DACM-L	2.04	3.54	3.54
26	NC	1.41	3.6	3.6

(Continued)

27	NC	3.81	13.8	5.92
28	NC	3.79	13.8	5.91
29	GND	0.00	0.00	0.00
30	SC1-OUT-R	3.8	12.8	5.91
31	SC1-OUT-L	3.79	12.8	5.92
32	CAPL-A	7.28	∞	6.04
33	AHVSUP	8.26	∞	4.59
34	CAPL-M	6.53	∞	6.04
35	AHVSS	0.00	0.00	0.00
36	ABNDC	3.74	∞	6.02
37	NC	3.77	∞	6.1
38	NC	3.77	∞	6.1
39	NC	3.77	∞	6.1
40	NC	3.77	∞	6.1
41	SC1-IN-L	3.77	∞	6.1
42	SC1-IN-R	3.77	∞	6.1
43	VREFTOP	2.61	1.63	1.63
44	NC	3.77	19.42	6.1
45	AVSS	0	0.00	0.00
46	AVSUP	5.13	8.62	4.53
47	ANA-IN1+	1.52	15.3	5.27
48	ANA-IN1-	1.52	15.3	5.26
49	ANA-IN2+	0.00	15.3	5.27
50	TESTEN	0.00	0.00	0.00
51	XTAL-IN	2.49	14.79	5.27
52	XTAL-OUT	2.49	14.63	5.3

Table 5 Functions and Service Data of TDA8350Q-N6 (N401)'s Pins

Pin No.	Function Description	Digital Multimeter		
		Reference Voltage (V)	Positive Resistance (20KΩ)	Negative Resistance (20KΩ)
1	Vertical drive input (positive)	2.33	8.82	5.8
2	Vertical drive input (negative)	2.28	8.83	5.83
3	Feedback input	8.52	5.74	4.71
4	Supply voltage	17.23	7.92	4.2
5	Output 1	8.5	5.83	4.71
6	Not connected	0.00	∞	∞
7	Ground	0.00	0.00	0.00
8	Pump supply voltage input	49.31	∞	∞
9	Output 2	0.00	5.87	4.7
10	Guard output	0.2	8.64	5.88
11	Pincushion output	0.07	9.79	5.24
12	Pincushion input (negative)	2.43	∞	6.97
13	Pincushion input (positive)	2.91	∞	6.88

Table 6 Functions and Service Data of TDA8944J (N361)'s Pins

Pin No.	Functions Description	Digital Multimeter		
		Reference Voltage (V)	Positive Resistance (20KΩ)	Negative Resistance (20KΩ)
1	Negative loudspeaker terminal 1	7.98	∞	∞
2	Ground channel 1	0	0	0
3	Supply voltage channel 1	14.9	5.8	7.7
4	Positive loudspeaker terminal 1	7.3	∞	∞
5	Not connected	0	∞	∞
6	Positive input 1	7.3	∞	∞
7	Not connected	0	∞	∞
8	Negative input 1	7.4	∞	∞
9	Negative input 2	7.3	∞	∞
10	Mode selection input (standby, mute, operating)	0	7.8	8.9
11	Half supply voltage decoupling (ripple rejection)	7.6	∞	∞
12	Positive input 2	7.3	∞	∞
13	Not connected	0	∞	∞
14	Negative loudspeaker terminal 2	7.3	∞	∞
15	Ground channel 2	0	0	0
16	Supply voltage channel 2	14.8	3.5	3.5
17	Positive loudspeaker terminal 2	7.3	∞	∞

Table 7 Functions and Service Data of TA1219AN (DS01)'s Pins

Pin No.	Function Description	Digital Multimeter		
		Reference Voltage(V)	Positive Resistance(20KΩ)	Negative Resistance(20 KΩ)
1	Get Select	6.54	7.88	5.77
2	Get Select	3.69	7.99	5.73
3	Lin TV	5.12	7.49	5.89
4	Rin TV	5.11	7.55	5.91
5	Vin TV	5.13	7.52	5.89
6	LinTV1	5.12	7.63	5.89
7	RinTV1	5.12	7.63	5.89
8	VinTV1	5.13	7.52	5.89
9	LinS1	5.12	7.64	5.89
10	Y/Vins1	5.09	7.5	5.89
11	RinS1	5.1	7.64	5.88
12	CinS1	0.00	0.00	0.00
13	LinS2	5.08	7.64	5.87
14	Y/VinS2	5.13	7.62	5.87

15	RinS2	5.11	7.62	5.86
16	CinS2	5.12	7.66	5.64
17	I/01	7.3	7.98	5.43
18	I/02	0.02	7.9	5.44
19	GND	0.00	0.006.98	0.00
20	Scl	3.5	6.98	4.47
21	SDA	3.77	6.98	4.46
22	Sync out	0.02	7.88	5.45
23	Address	0.00	0.00	0.00
24	VinV2	5.11	7.53	5.81
25	LinTV2	5.1	7.64	5.82
26	Yin	5.1	7.76	5.82
27	RinV2	5.1	7.64	5.82
28	Vin	5.09	7.76	5.6
29	Vcc	5.86	5.45	4.1
30	Cout	3.46	0.2	0.2
31	Rout1	3.95	7.43	5.46
32	Yout	3.48	0.2	0.2
33	Lout1	3.96	7.43	5.46
34	Vout1	4.06	0.2	0.2
35	RoutTV	3.95	7.39	5.48
36	LoutTV	3.95	7.46	5.48

Table 8 Functions and Service Data of TC90A49P (N902)'s Pins

Pin No.	Functions Description	Digital Multimeter		
		Reference Voltage (V)	Positive Resistance (20KΩ)	Negative Resistance (20KΩ)
1	ADC and DAC analog power supply.	4.98	0.55	0.54
2	ADC bias voltage. Stabilize by attaching a 0.01μF capacitor.	1.41	∞	∞
3	ADC input range D upper limit voltage. Stabilize by attaching a 0.01μF capacitor.	3.15	0.64	0.63
4	ADC input. Inputs 1.0 Vp-p video signal. Sync tip clamp is performed.	2.14	∞	∞
5	ADC input range D lower limit voltage. Stabilize by attaching a 0.01μF capacitor.	1.84	0.497	0.49
6	ADC and DAC logic power supply.	4.98	0.55	0.55
7	Logic and internal DRAM GND (digital).	0	0	0
8	Internal DRAM power supply	4.98	0.55	0.55
9	I^2C BUS SDA	4.12	6.39	6.44
10	I^2C BUS SCL	4.25	6.4	6.45
11	Shipment test mode switch or I2C bus setting reset pin.	0	0	0
12	Y signal comb function ON / OFF switch.	0	0	0

(Continued)

13	Clock input pin.	2.54	∞	∞
14	Connect the APC filter in the 8 fsc PLL circuit	0	∞	∞
15	PLL power supply	4.98	0.55	0.55
16	ADC, DAC, and PLL GND (analog).	0	0	0
17	Outputs chrominance signal.	2.25	∞	∞
18	DAC output range D upper limit voltage.	3.14	0.57	0.57
19	DAC output range D lower limit voltage	1.84	0.42	.043
20	Outputs luminance signal.	2.16	∞	∞

Table 9 Functions and Service Data of TDA6108JF (NY01)'s Pins

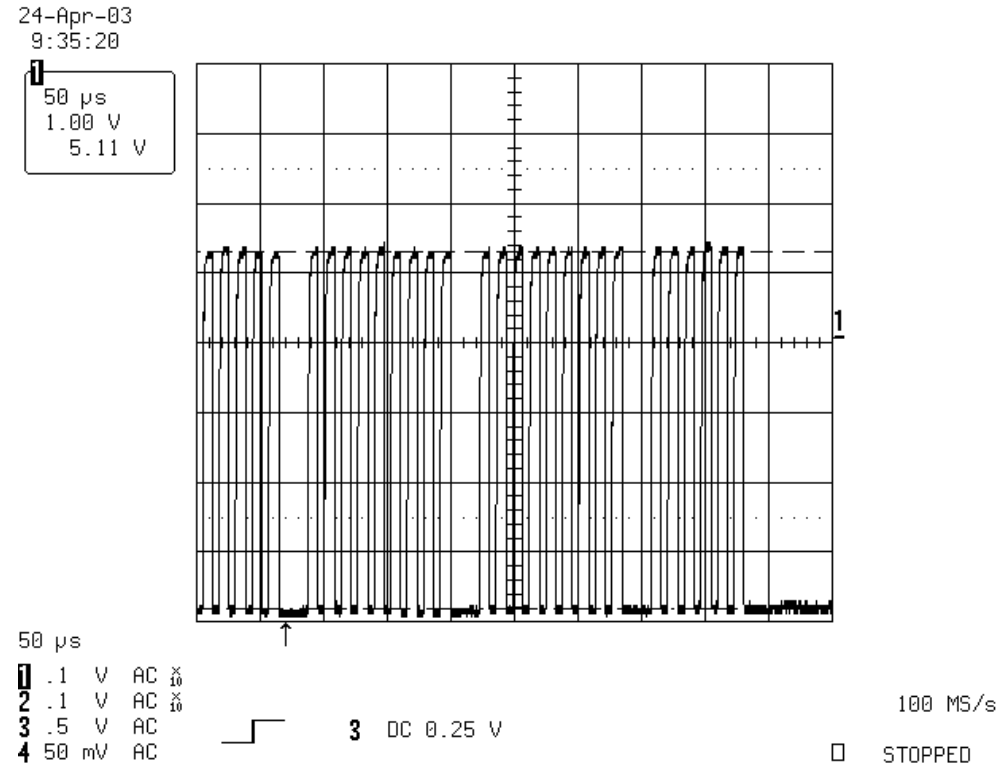
Pin No.	Functions Description	Digital Multimeter		
		Reference Voltage (V)	Positive Resistance (20KΩ)	Negative Resistance (20KΩ)
1	G inverting input	1.81	3.03	2.99
2	R inverting input	1.91	3.1	3.0
3	B inverting input	2.0	3.03	2.99
4	Ground	0	0	0
5	Black level current input	3.33	∞	∞
6	Supply voltage	196.7	∞	∞
7	B output	152.5	∞	∞
8	R output	157.5	∞	∞
9	G output	159.9	∞	∞

Table 10 Functions and Service Data of STR-G8626 (IC801)'s Pins

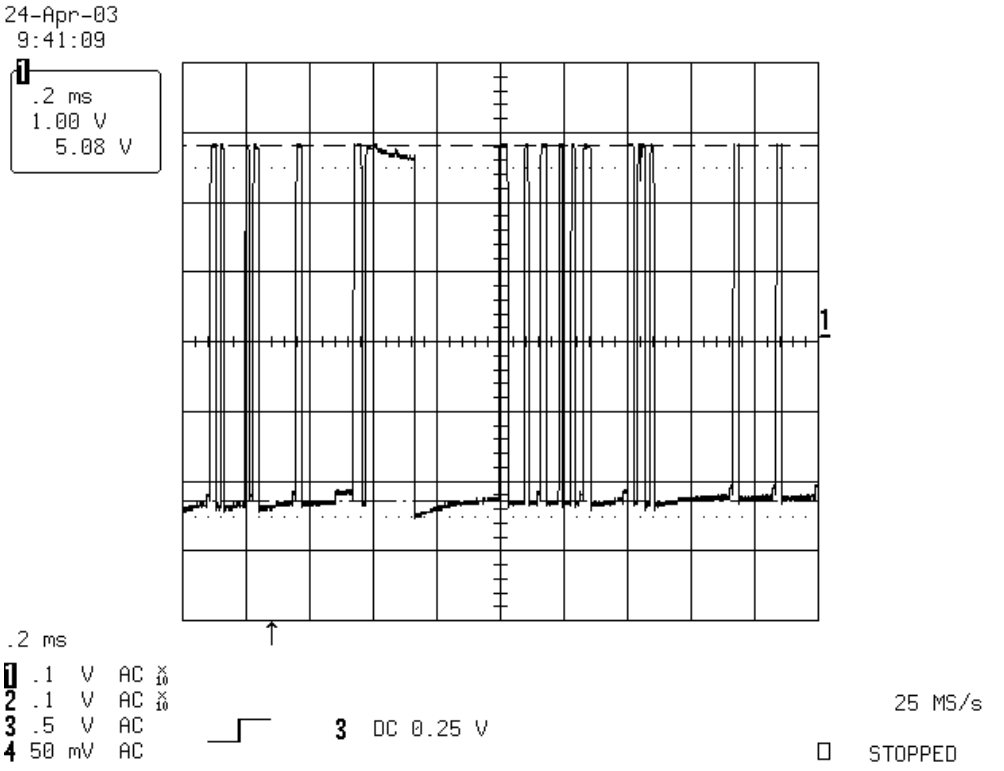
Pin No.	Functions Description	Digital Multimeter		
		Reference Voltage (V)	Positive Resistance (20KΩ)	Negative Resistance (20KΩ)
1	D	146.3	∞	∞
2	S	0	0	0
3	GND	0	0	0
4	Vin	31.96	∞	∞
5	DCP/FB	1.72	0.699	0.166

Waveforms of Key Points

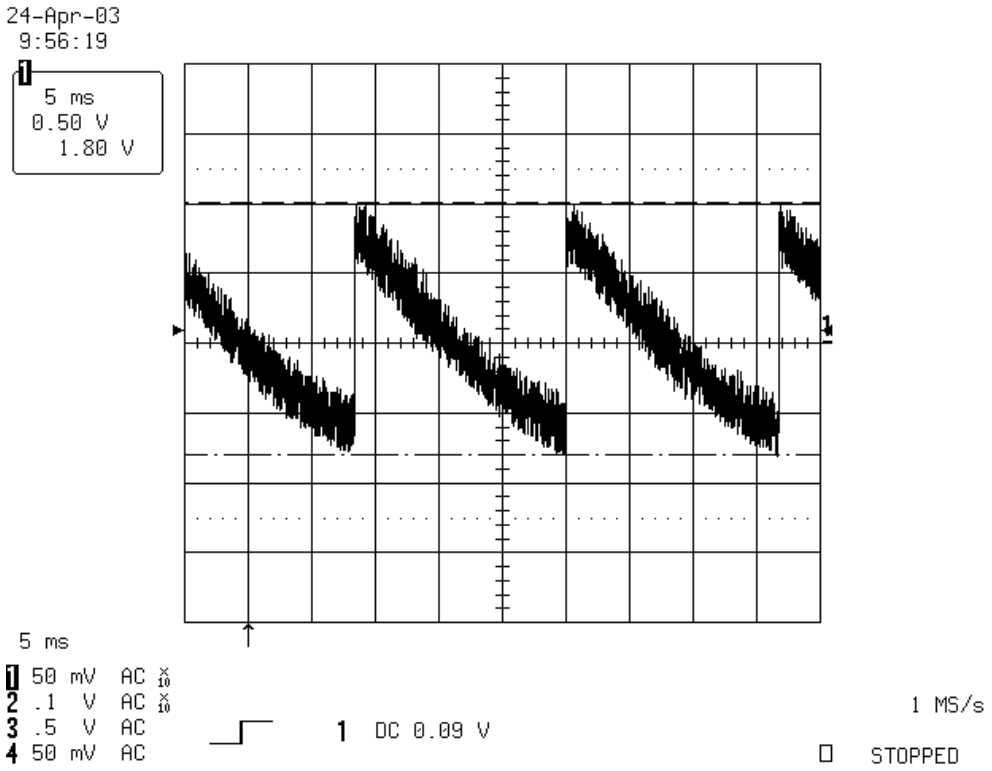
N201's Pin2



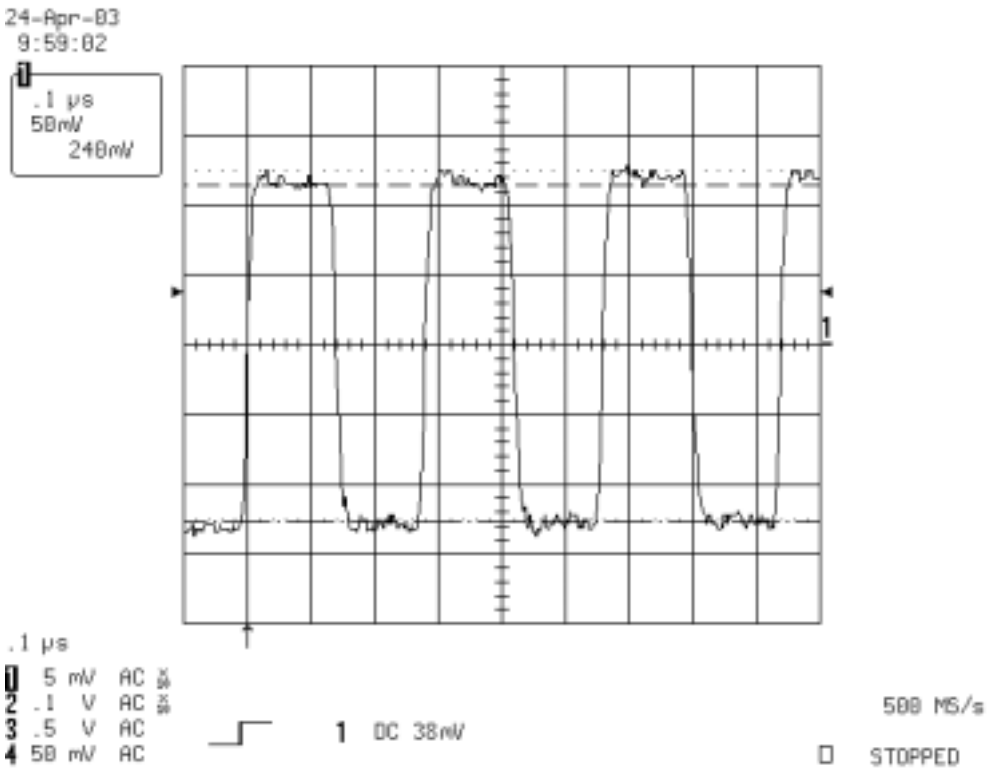
N201's Pin3



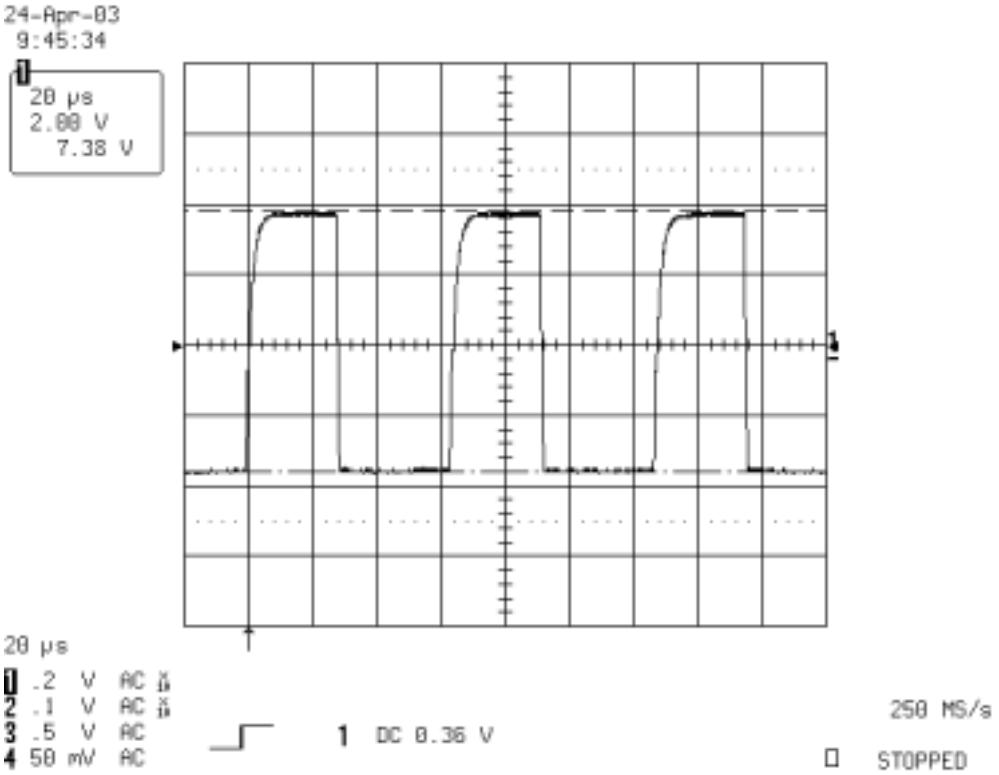
N201's Pin22



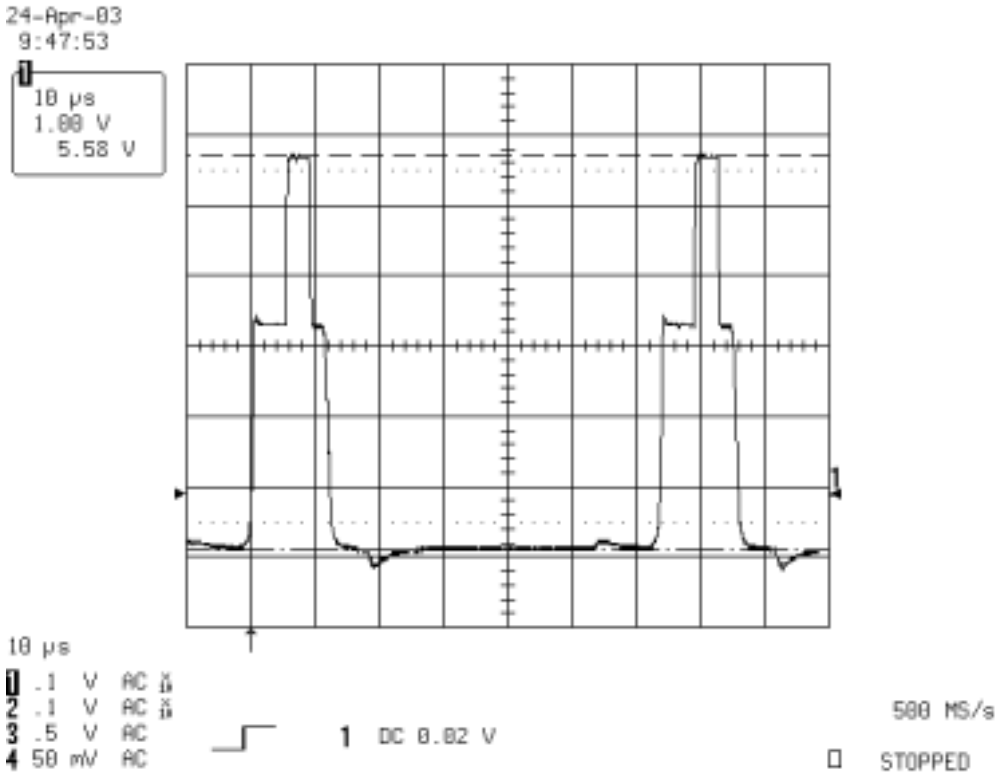
N201's Pin32



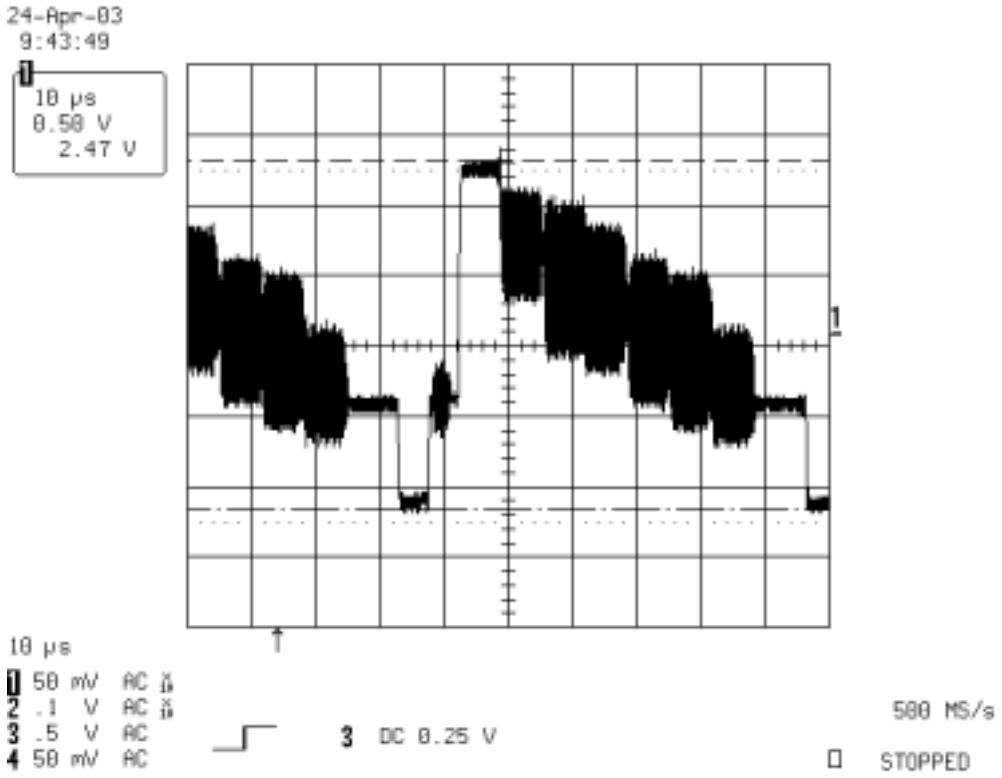
N201's Pin33



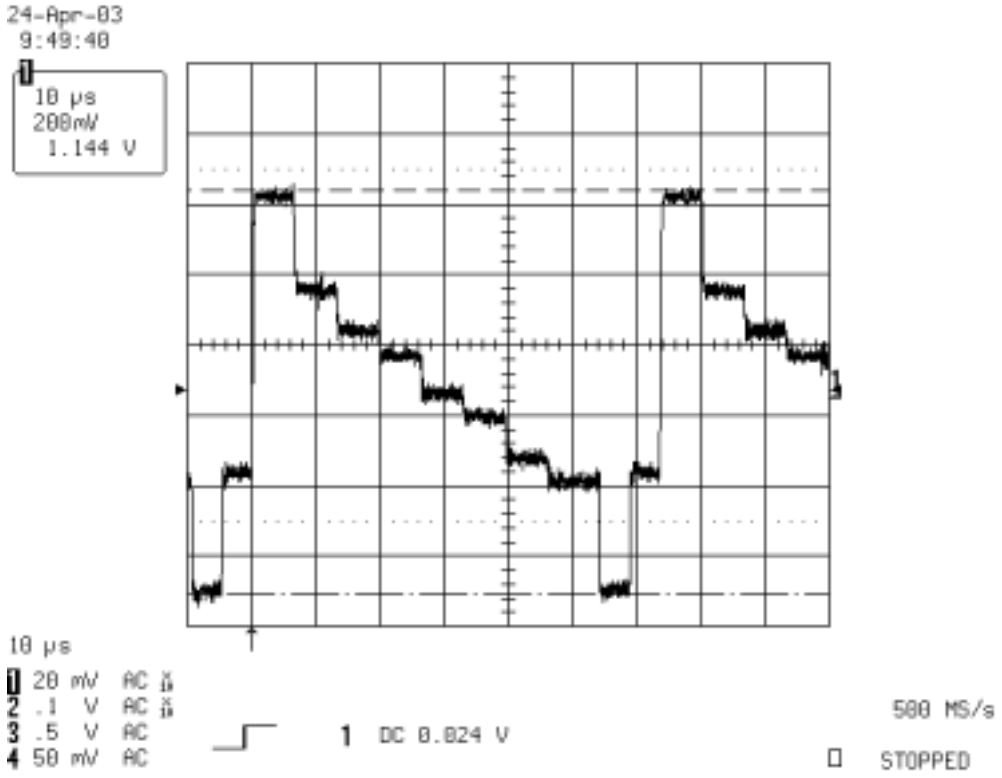
N201's Pin34



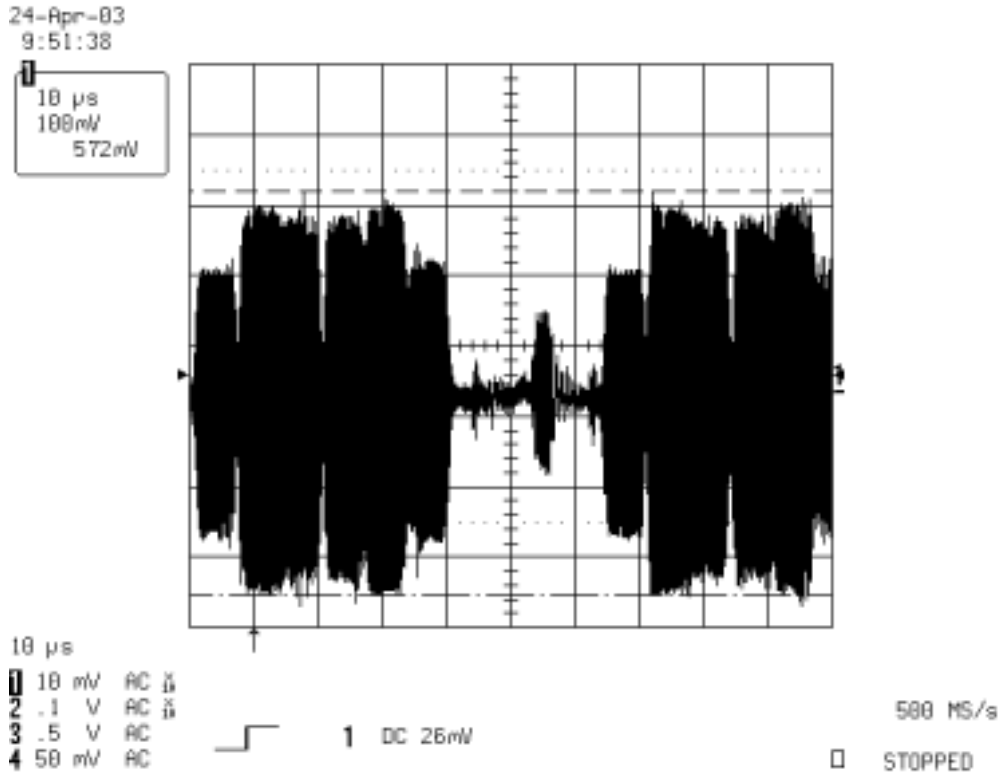
N201's Pin38



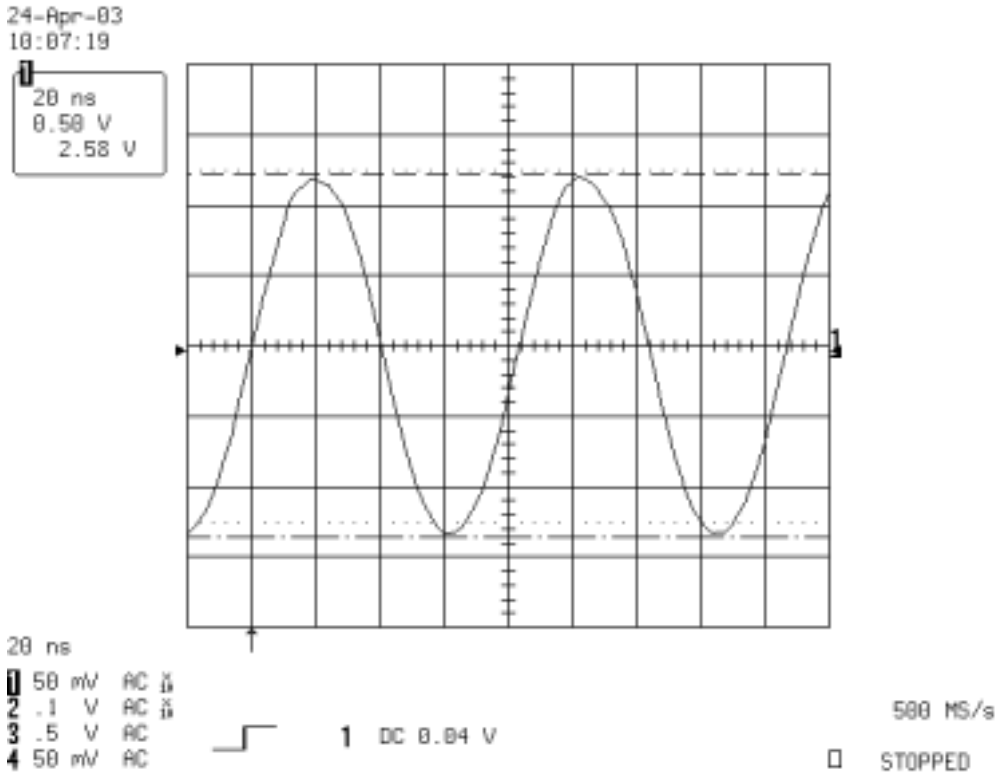
N201's Pin42



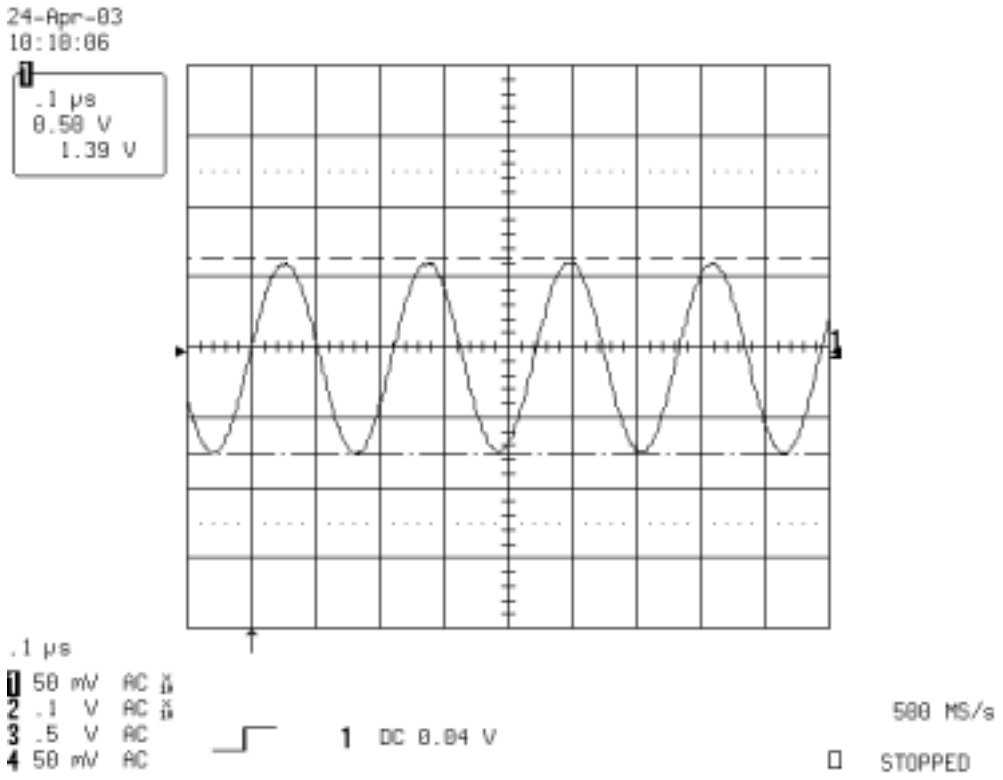
N201's Pin43



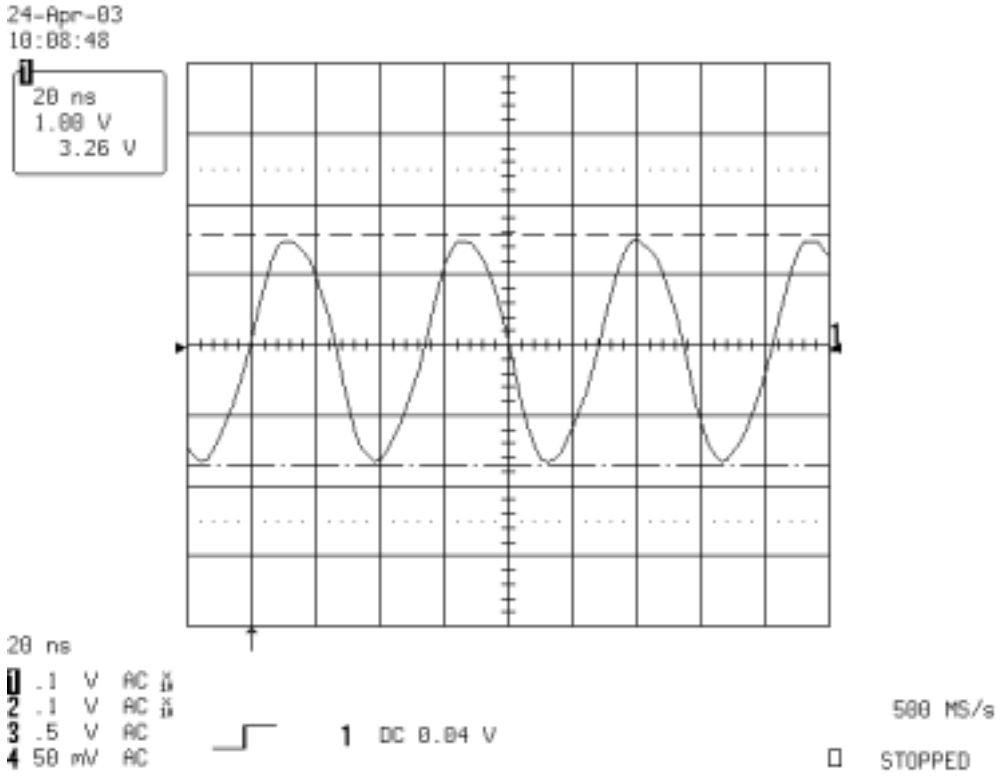
N201's Pin59



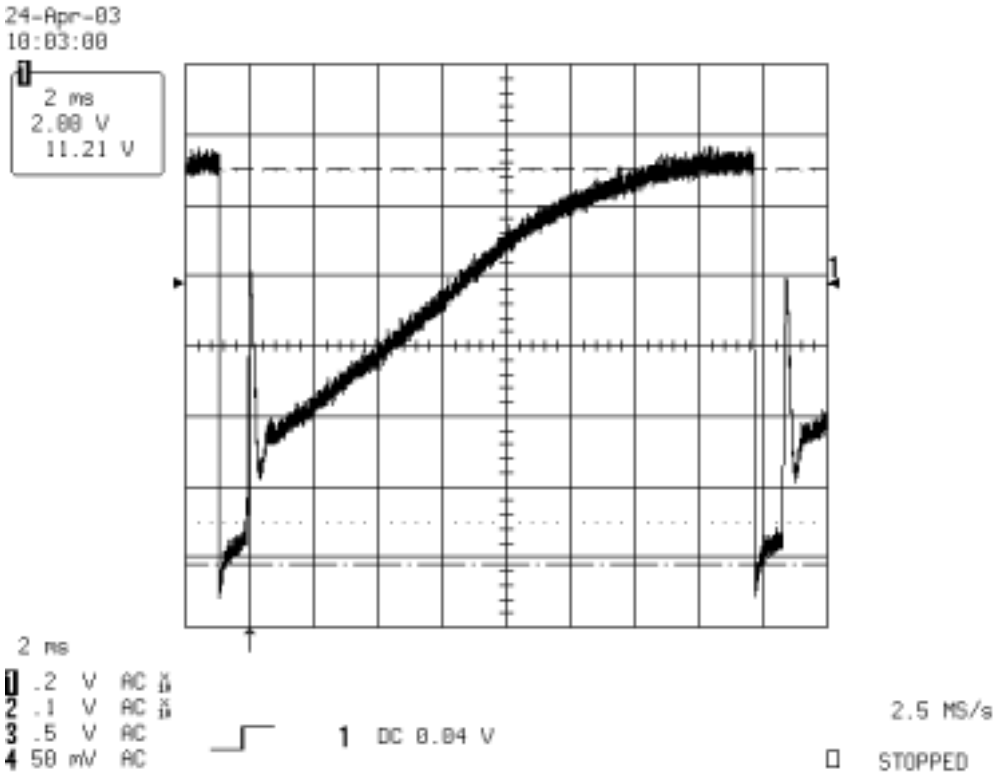
NB01's Pin47



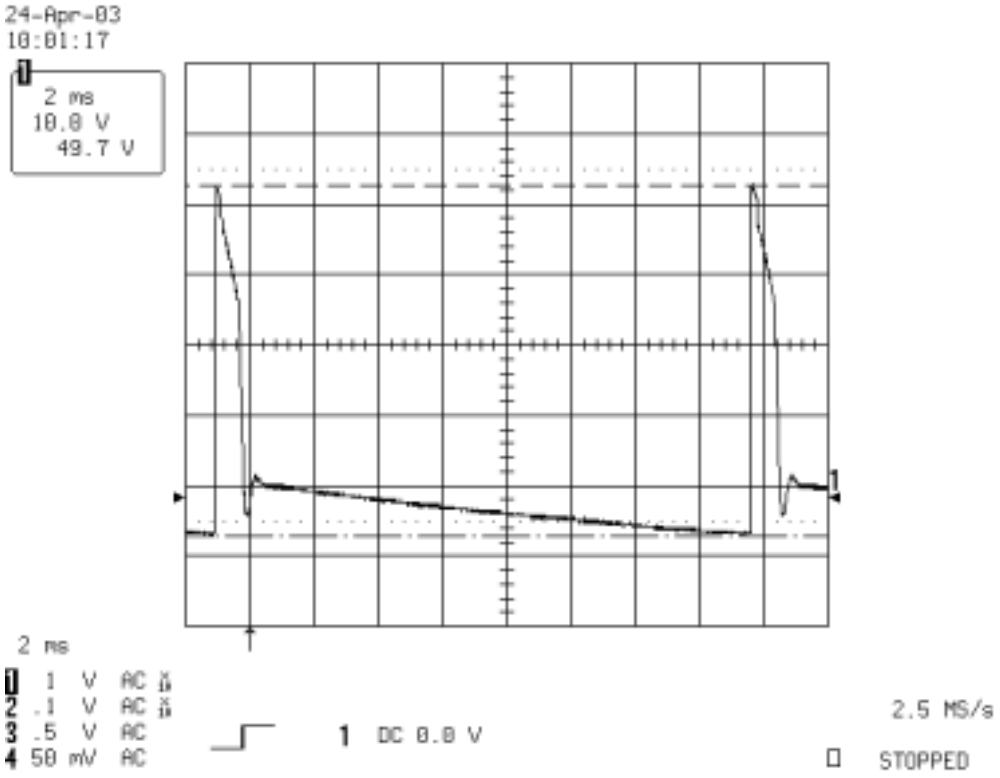
NB01's Pin52



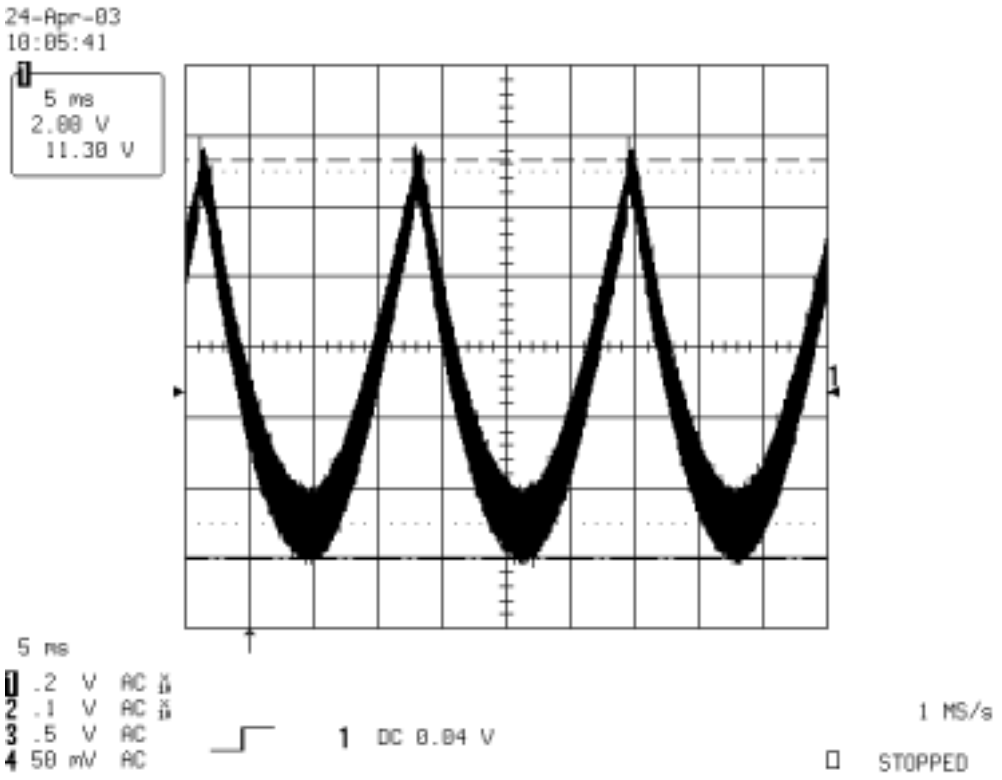
N401's Pin5



N401's Pin9



N401's Pin11


24-Apr-03
10:05:41
5 ms
2.00 V
11.30 V
5 ms
1 .2 V AC
2 .1 V AC
3 .5 V AC
4 50 mV AC
1 DC 0.04 V
1 MS/s
STOPPED

ADJUSTMENTS

Set-up Adjustments

●The following adjustments should be made when a complete realignment is required or a new CRT is installed. Perform the adjustments in order as follows.

1. Color purity
2. Convergence
3. White Balance

Note：

The purity/convergence magnet assembly and rubber wedges need mechanical positioning. Refer to Fig. 18.

1. Color Purity Adjustment

Note：

Before attempting any purity adjustment, the TV should be operated for at least 15 minutes.

1) Demagnetize the CRT and cabinet using a degaussing coil.
2) Set the brightness and contrast to maximum.
3) Receive the green raster test pattern.
4) Loosen the clamp screw holding the deflection yoke and slide it backward or forward to display vertical green belt (zone) on the screen.
5) Remove the rubber wedge.
6) Rotate and spread the tabs of the purity magnet around the neck of the CRT until the green belt is on the center of the screen.
7) Slowly move the deflection yoke forward or backward until a uniform green screen is obtained. Tighten the clamp screw of the yoke temporarily.
8) Check purity of the red and blue raster.

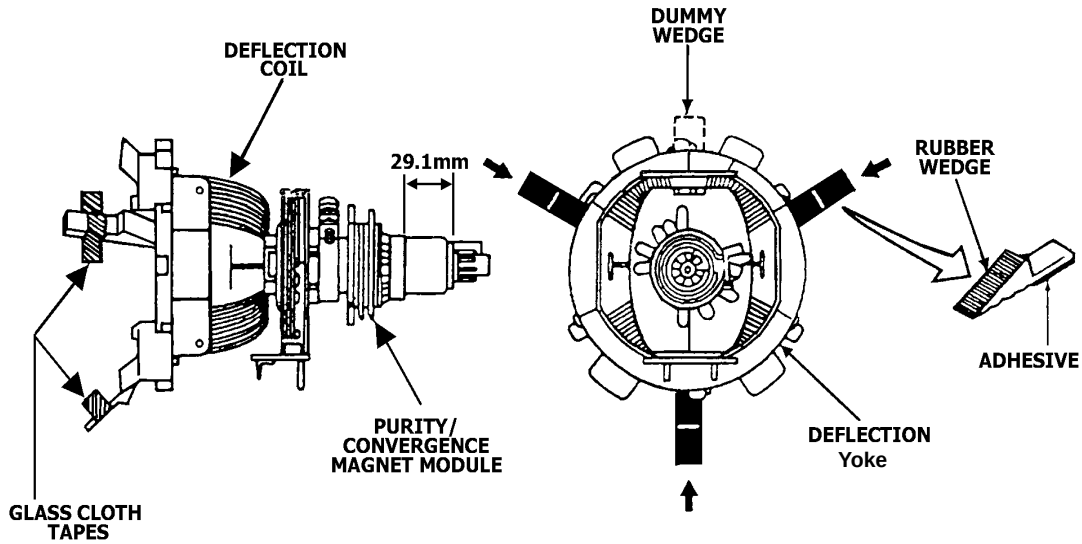


Fig. 18

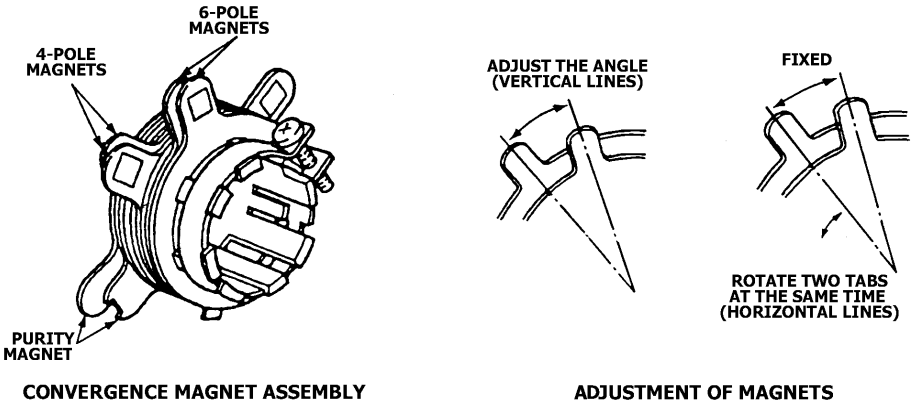


Fig. 19

2. Convergence Adjustment

Note:

Before attempting any convergence adjustment, the TV should be operated for at least 15 minutes.

●Center convergence adjustment

1) Receive the crosshatch test pattern.
2) Set the brightness and contrast properly.
3) Adjust two tabs of the 4-pole magnet to change the angle between them and red and blue vertical lines are superimposed on the center area of the screen.
4) Turn both tabs at the same time keeping the angle constant to superimpose red and blue horizontal lines on the center of the screen.
5) Adjust two tabs of 6-pole magnet to superimpose red/blue line and green line. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
6) Repeat steps 3)～5) keeping in mind red, green and blue movement. 4-pole magnet and 6-pole magnet interact each other, resulting in complicating and dot movement.

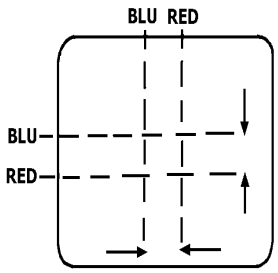
●Circumference convergence adjustment

1) Loosen the clamping screw of the defection yoke slightly to allow it to tilt.
2) Temporarily put a wedge as shown in Fig.18. (Do not remove cover paper on adhesive part of the wedge.)
3) Tilt front of the deflection yoke up or down to obtain better convergence in circumference.
Push the mounted wedge into the space between the CRT and yoke to fix the yoke temporarily.
4) Put other wedge into bottom space and remove the cover paper to stick.
5) Tilt front of the deflection yoke right or left to obtain better convergence in circumference.
6) Keep the deflection yoke position and put another wedge in either upper space. Remove cover paper and stick the wedge on the CRT to fix the yoke.
7) Detach the temporarily mounted wedge and put it in another upper space. Stick it on the CRT to fix the yoke.
8) After fixing three wedges, recheck overall convergence.

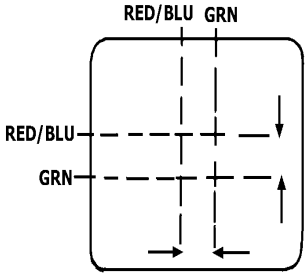
Tighten the screw firmly to fix the yoke and check if the yoke is fixed.

9) Stick three adhesive tapes on wedges as shown in Fig. 18.

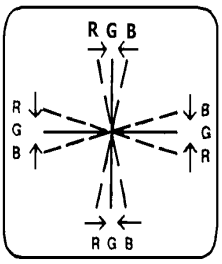
4-pole Magnet Movement



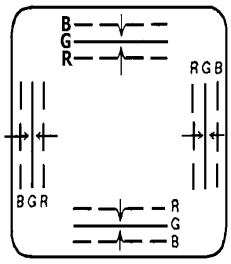
6-pole Magnet Movement



Center Convergence by Convergence Magnets



Incline the Yoke Up (or Down)



Incline the Yoke Right (or Left)

Circumference Convergence by DEF Yoke

Fig.20

Circuit Adjustments

1. General Description

All adjustments are thoroughly checked and corrected before the TV outgoing. Therefore the TV should operate normally and deliver proper color pictures upon installation. However, several minor adjustments may be required depending on the particular location where the TV is operated.

This TV is shipped completely in carton. Carefully take out the TV from the carton and remove all packing materials. Connect the power cord into a 120V AC, 60Hz two-pin power outlet. Turn on the TV. Check and adjust all the customer controls such as brightness, contrast and color to obtain natural color pictures.

2. Automatic Degaussing

A degaussing coil is mounted around the CRT so that external degaussing after moving the TV is generally unnecessary, providing it is properly degaussed upon installation. The degaussing coil operates in about 1 second after power on. If the set is moved or faced to a different direction, the power switch must be switched off for at least 30 minutes in order that the automatic degaussing circuit operates properly. Should the chassis or parts of the cabinet become magnetized to cause poor color purity, use an external-degaussing coil. Slowly move the degaussing coil around the screen, the sides and front of the TV and slowly withdraw the coil to a distance of about 2m before unplug it. If color shading still exists, perform the Color Purity Adjustment and Convergence Adjustment procedures.

3. Supply Voltage Adjustment

Caution: +B voltage has close relation to high voltage. To avoid X-ray radiation, +B voltage should be +145V.

1) AC power supply to 120±2V.
2) Connect a digital voltmeter to two pins of C820, and then turn on the TV.
3) Receive Philips test pattern.
4) The voltmeter should be read 145±1.5V.

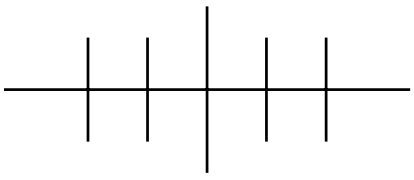
4. High Voltage Inspection

Caution: No high voltage adjustment should be done in the chassis.

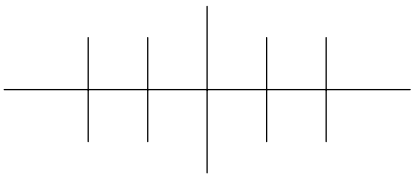
1) Connect a precise high voltmeter to the second anode of the CRT.
2) Turn on the TV and set the brightness and contrast to minimum (i.e. set beam current of the CRT to zero).
3) The high voltage tested should be 29±1KV (For 29" CRTs) or 31±1KV (for 34" CRTs).
4) Set the brightness to minimum or maximum, and ensure high voltage not beyond limitation of 32KV (for Samsung and LG 29" CRTs), 33 KV(for Daewoo and Toshiba 29" CRTs) or 35KV (for 34" CRTs).

5. Focus Adjustment

1) Use the remote control to set the contrast to maximum and the brightness，color to medium.
2) Set H. V. lines near center of Philips pattern to thinnest with the FCB on the FBT. After finishing adjustment，ensure that no poor focusing exists near the center or around of the frame.



Before Adjusting



After Adjusting

Service Mode and Bus Data

1. How to Enter the Service Mode with the Remote Control

1) Decrease volume to 0.

2) Press the MUTE button on the remote control and VIDEO button on the TV at the same time.

3) Adjust the TV with the MENU SELECT buttons on the remote control.

4) Press the ⏻ button on the remote control to quit the Service mode.

2. Bus Data

Symbol		Adjustment	Description
S0	OP1	190	Option bit 1（See “Option Set”）
	OP2	15	Option bit 2（See “Option Set”）
	OP3	1	Option bit 3（See “Option Set”）
	OP4	221	Option bit 4（See “Option Set”）
	OP5	140	Option bit 5（See “Option Set”）
	OP6	111	Option bit 6（See “Option Set”）
	OP7	191	Option bit 7（See “Option Set”）
	OP8	101	Option bit 8（See “Option Set”）
S1	PAR	Set to optimum	Parallelogram correction
	BOW	Set to optimum	Bow correction
	HSH	Set to optimum	Horizontal shift
	EWW	Set to optimum	East-west width adjustment
	EWP	Set to optimum	East-west pincushion correction
	UCR	Set to optimum	Upper corner correction
	LCR	Set to optimum	Lower corner correction
	EWT	Set to optimum	East-west Trapezoidal correction
S2	VSL	Set to optimum	Half vertical output
	VAM	Set to optimum	Vertical amplitude
	SCL	Set to optimum	Vertical linearity
	VSH	Set to optimum	Vertical shift
	VOF	Set to optimum	Vertical position of character
	CCV	Set to optimum	Vertical position of CCD
	HOF	Set to optimum	Horizontal position of character
	CCHF	Set to optimum	Horizontal position of CCD
S3	VX	25	
	RED	Set to optimum	Red gun cutoff voltage
	GRN	Set to optimum	Green gun cutoff voltage
	WPR	Set to optimum	Red gun drive voltage
	WPG	Set to optimum	Green gun drive voltage
	WPB	Set to optimum	Blue gun drive voltage

(Continued)

	YDFN	7	Luminance delay
	TOP	Set to optimum	Video automatic gain control
S4	VOL	31	UOC volume control
	IFFS	1	Picture intermediate frequency
	HDOL	13	Cathode drive voltage
	HD-B	3	Brightness of blue back
	AGC	2	Automatic gain control velocity
	VG2B	32	
	FEAT	57	See “Option Set”.
	FEAT1	56	See “Option Set”.
S5	TRE1	100	Treble Max.
	TRE2	50	Treble Mid.
	BAS1	60	Bass Max.
	BAS2	30	Bass Mid.
	1CON	80	Contrast in Normal mode
	1BRI	50	Brightness in Normal mode
	1COL	50	Color in Normal mode
	1SHP	50	Sharpness in Normal mode
S6	2CON	100	Contrast in Movie mode
	2BRI	40	Brightness in Movie mode
	2COL	60	Color in Movie mode
	2SHP	60	Sharpness in Movie mode
	3CON	100	Contrast in Sports mode
	3BRI	60	Brightness in Sports mode
	3COL	40	Color in Sports mode
	3SHP	40	Sharpness in Sports mode
S7	PP H	0	
	IFOF	Set to optimum	IF offset
	VENH	1	Vertical enhancement
	COR	3	Coring
S8	VOLA	70	Volume 25
	VOLB	80	Volume 50
	VOLC	90	Volume 75
	VOLD	100	Volume 100
	WFRA	70	Woofer 25
	WFRB	80	Woofer 50
	WFRC	90	Woofer 75
	WFRD	100	Woofer 100
S9	SAGC	0	Sound AGC
	LOUD	40	1KHz(or 2KHz) sound AGC
	SCOT	107	AV output volume

(Continued)

	SCIN	61	AV input volume
	FMIN	63	Sound frequency modulation
	WOCF	15	Woofer Mid.
SAV	CON1	100	Contrast Max.
	CON2	50	Contrast Min.
	BRI1	Set to optimum	Brightness Max.
	BRI2	Set to optimum	Brightness Min.
	COL1	100	Color Max.
	COL2	50	Color Min.
	SHP1	80	Sharpness Max.
	SHP2	40	Sharpness Min.

Notes:

① “ 5 ” or “ 6 ” will be displayed before the data depending on signal frequency (50Hz or 60Hz) during geometric data adjustment.

② The data sheet may differ dependent on different models.

③ The data sheet may differ dependent on different CRTs for the same model.

3. Option Set

	Bit	Item	Description	Default
OP1	0	TA1343N	Sound processor TA1343N: 1→Yes, 0→No	0
	1	MSP3440G	MSP3440G: 1→Yes, 0→No	1
	2	IDENT_TXT12	1→TXT12 IDENT detection, 0→SL IDENT detection	1
	3	COMB_FILTER	TC90A49P: 1→Yes, 0→No	1
	4	OP_X_RAY	X-Ray protection: 1→Yes, 0→No	1
	5	UOC_SVM	TDA9379-VM: 1→Yes, 0→No	1
	6	TDA9859	Sound processing chip TDA9859: 1→Yes, 0→No	0
	7	SOUND_CHIP	Sound processing chip: 1→Yes, 0→No (PWM control)	1
OP2	0	TV_29_21	Definition of UOC pin: 1→29”, 0→21”	1
	1	VCHIP	V-chip: 1→Yes, 0→No	1
	2	CCD	Closed Caption: 1→Yes, 0→No	1
	3	SOUND_EFFECT	Audio options: 1→Yes, 0→No	1
	4	OP-ZOOM-DELE-LINE	ZOOM detection：1→No, 0→Yes	0
	5			0
	6			0
	7	OP-LOGO	User LOGO display: 1→Yes under no signal condition, 0→No	0
OP3	0	BLUE_BACK	Blue back under no signal condition: 1→Yes, 0→No	1
	1	VM_OSD	1→Dependent on OSD MENU, 0→Independent on OSD	0
	2	TILT	Tilt: 1→Yes, 0→No	0
	3	WOOFER_ONOFF	Super woofer: 1→Yes, 0→No	0

(Continued)

	4	WOOFER_VOL	Super woofer volume control: 1→Yes, 0→No	0
	5			0
	6			0
	7	OP-TIMER	TIMER: 1→Yes, 0→No	0
OP4	0	ENGLISH	English: 1→Yes, 0→No	1
	1	PORTUGUESE	Portuguese: 1→Yes, 0→No	0
	2	FRENCH	French: 1→Yes, 0→No	1
	3	SPANISH	Spanish: 1→Yes, 0→No	1
	4	MSP3440G -AVC	Auto volume control: 1→Yes, 0→No	1
	5	MSP3440G-MDB	MDB: 1→Yes, 0→No	0
	6	MSP3440G-TONE	Five equalizer: 1→Yes, 0→No	1
	7	MSP3440G _GAIN	Frequency gain enhancement: 1→1KHz, 0→2KHz	1
OP5	0	PAL_M_N	PAL M /PAL N: 1→Yes, 0→No	0
	1	Power-on degaussing	1→4 seconds, 0→Every	0
	2	AV_STEREO	AV Stereo: 1→Yes, 0→No	1
	3	16：9	16 : 9: 1→Yes, 0→No	1
	4	LOCK_MENU	LOCK_MENU 1→Yes, 0→No	0
	5	BSCREEN	Black screen when changing channels: 1→Yes, 0→ No	0
	6	WOOFER_MAI N	Woofer available on main channel1(343): 1→Yes, 0→ No	0
	7	CHANNELLAB EL	Channel label: 1→Yes, 0→No	1
OP6	0	FMWS	FM-PLL window: 1→Large, 0→Small	1
	1	FSL	Vertical sync: 1→60%, 0→Noise detector	1
	2	OSO	Switch off: 1→Overscan, 0→Undefined	1
	3	YPRPB	YPbPr selection: 1→Yes, 0→No	1
	4	VG2_MODE	VG2 adjustment: 1→UOC H, 0→UOC I	0
	5	SYNC_Y	DVD sync separately: 1→Yes, 0→No	1
	6	QSS	1→QSS, 0→FM	1
	7			0
OP7	0	AV2	AV2: 1→Yes, 0→No	1
	1	AV3	AV3: 1→Yes, 0→No	1
	2	AV4	AV4: 1→Yes, 0→No	1
	3	SVHS1	SVHS1: 1→Yes, 0→No	1
	4	SVHS4	SVHS4: 1→Yes, 0→No	1
	5	DVD	DVD: 1→Yes, 0→No	1
	6	LAST_SOURC E	Turn-on mode after power-on: 1 → TV, 0 → Last program source	0

(Continued)

	7	STANDBY	Standby mode after power-on: 1→Standby, 0→The same as last power-off mode	1
OP8	0	VM	Velocity modulation: 1→Yes, 0→No	1
	1	LOCK	Lock used for identifying detection: 1→Yes, 0→No	0
	2	IDENT_MODE	Lock handle: 1→TXT12 | Lock; 0→TXT12 & Lock	0
	3	COLOR MATRIX	Matrix: 1→USA; 0 →Japan	0
	4	FORF	F/S 00→AUTO 60 01→60 FORCED 10→AUTO LAST 11→AUTO 50	0
	5	FORS		1
	6	CHILD_LOCK	Child lock: 1→Yes, 0→No	1
	7	SPEAKER	Speaker On/Off: 1→Yes, 0→No	0
FEAT	0	BKS	Black level stretch	1
	1	0		0
	2	0		0
	3	DSK	Skin tone correction	1
	4	COR0	Dynamic coring: 00→Off 11→Max.	1
	5	COR1		1
	6	SVM0	TDA9379 VM delay 00→50 01→70 10→90 11→Spare	0
	7	SVM1		0
FEAT1	0	0		0
	1	0		0
	2	VAM0	TDA9379 VM amplitude: 00→OFF 01→0.8V 10→1.2V 11→1.8V	**0**
	3	VAM1		**1**
	4	RPO0	Over pulse/preset pulse 00(1:1) 01(1:1.25) 10(1:1.5) 11(1:1.8)	**1**
	5	RPO1		**1**
	6	0		**0**
	7	0		**0**

Notes:

① The option data in the above table may differ depending on models, UOC chips and CRTs used.

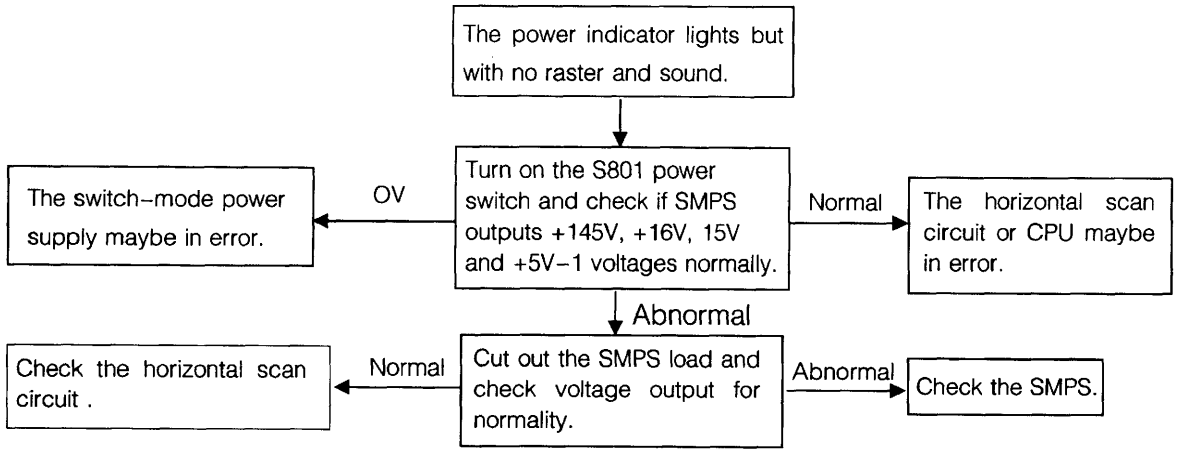
② It is required to check if the data comply with the function requirements of your TVs.
For example:

③ For PF2720 and PF3220 models, OP1 is set to 158, OP7 to 175 and OP8 to 100 when using TDA9375 or OP1 is set to 158, OP7 to 175 and OP8 to 100 when using TDA9379.
For PF2730 and PF3230 models, OP1 is set to 158, OP7 to 191 and OP8 to 101 when using TDA9375 or OP1 is set to 190, OP7 to 191 and OP8 to 101 when using TDA9379.

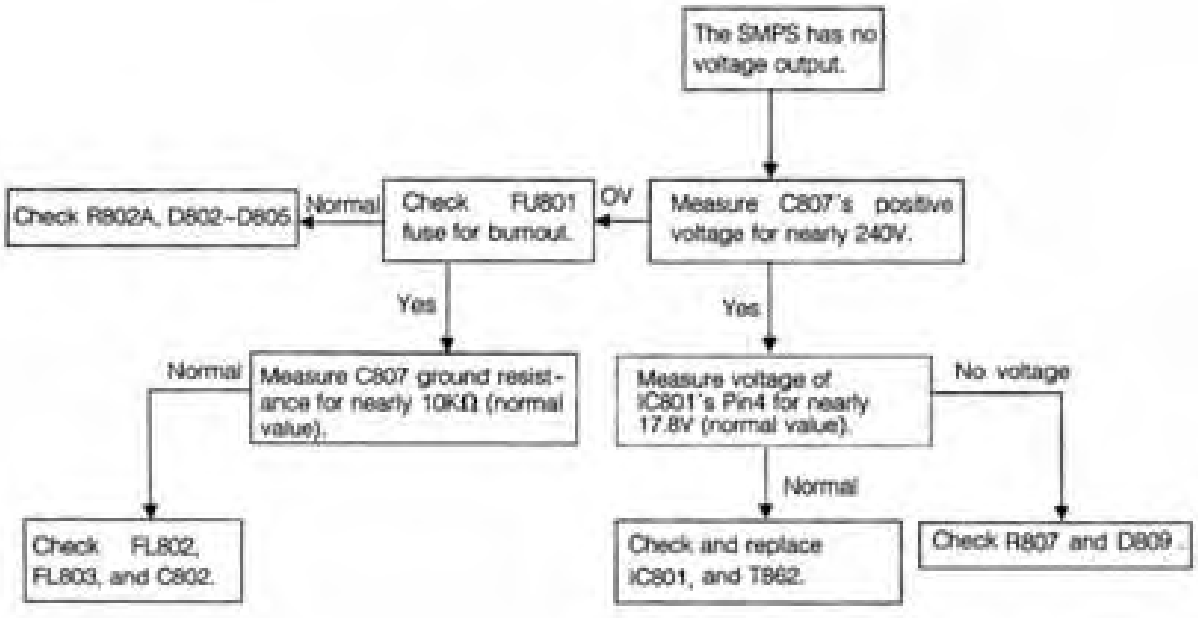
TROUBLESHOOTING FLOW CHARTS

1.Power On/Off

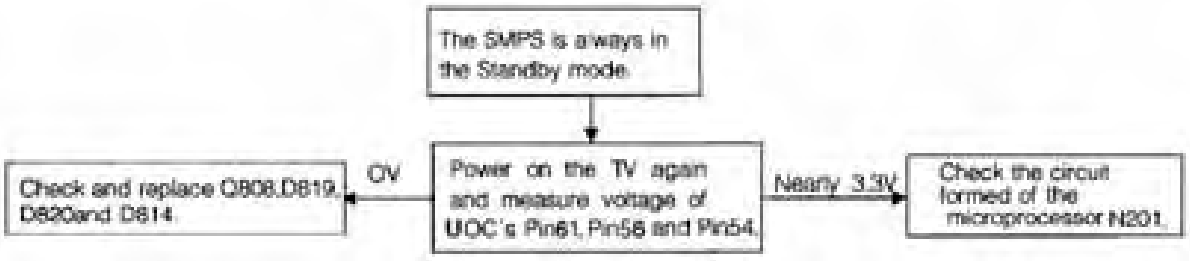
1.1 The power indicator lights but with no raster and sound



1.2 The SMPS has no voltage output.

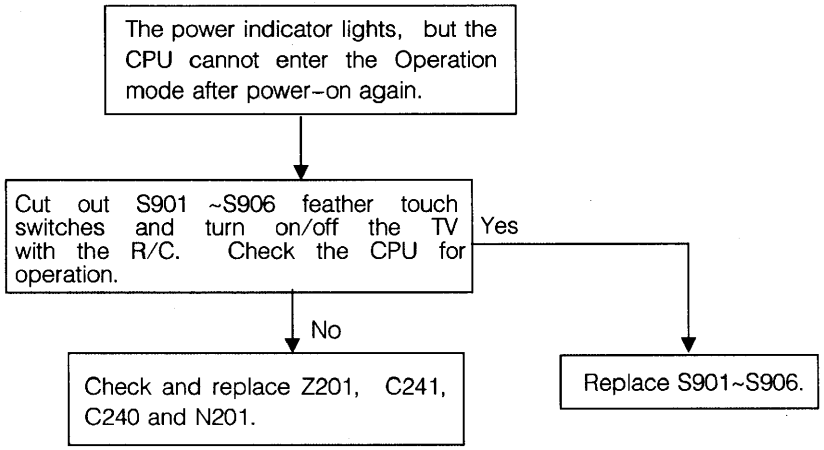


1.3 The SMPS is always in the Standby mode.

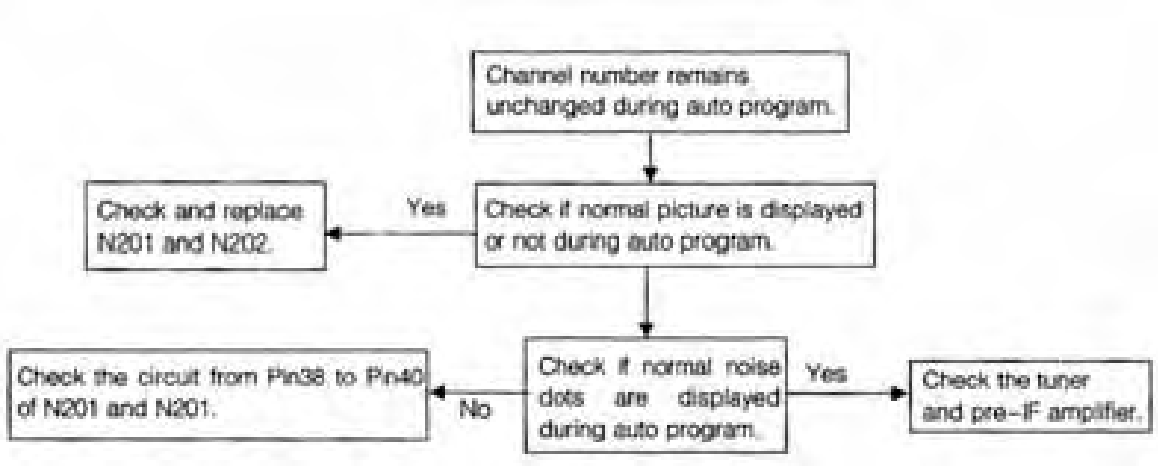


2. Control System

2.1 The power indicator lights, but the CPU cannot enter the Operation mode after power-on again.

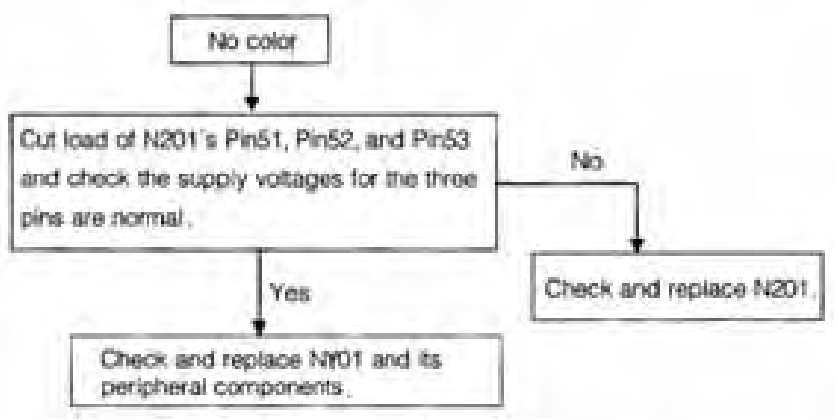


2.2 Channel number remains unchanged during auto program.

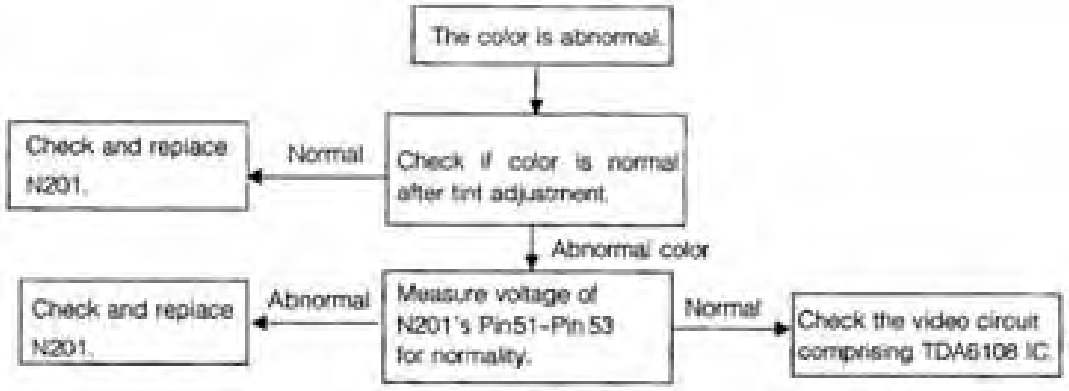


3. Video Signal Processor

3.1 No color

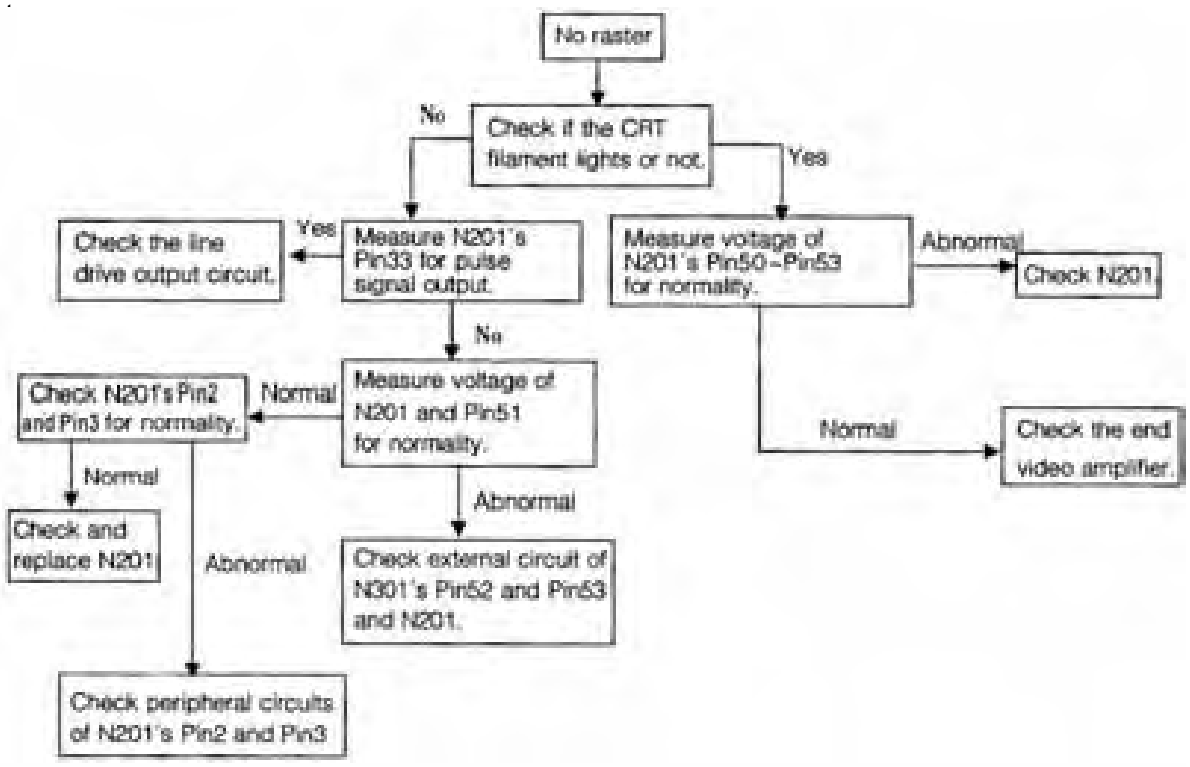


3.2 The color is abnormal.

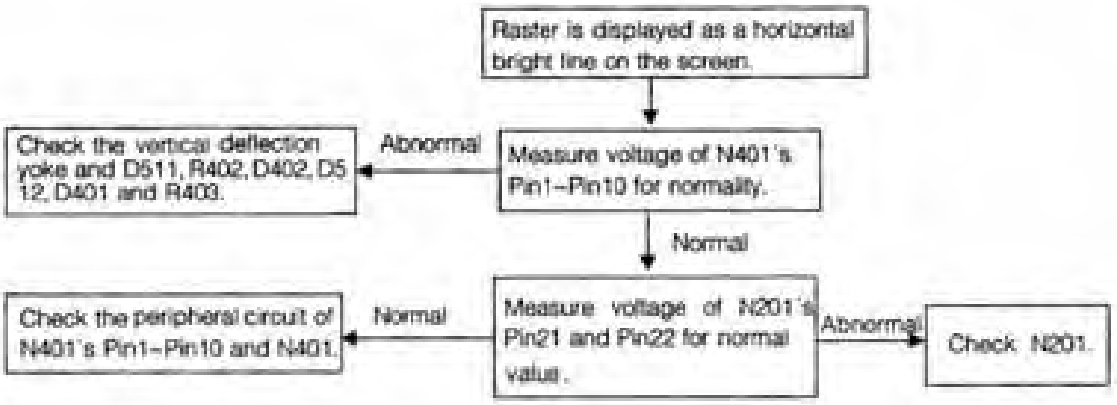


4. Horizontal/Vertical Scan Circuit

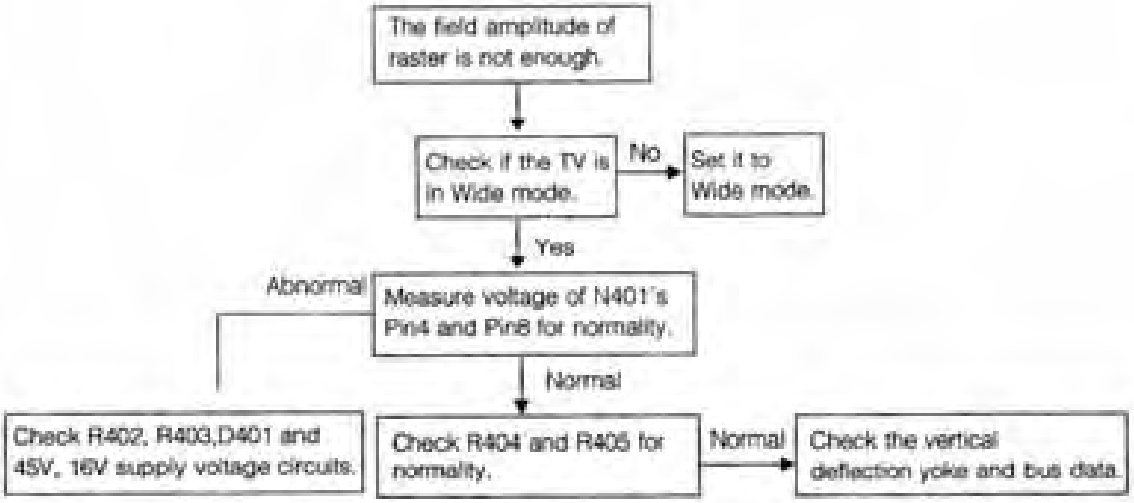
4.1 No ras



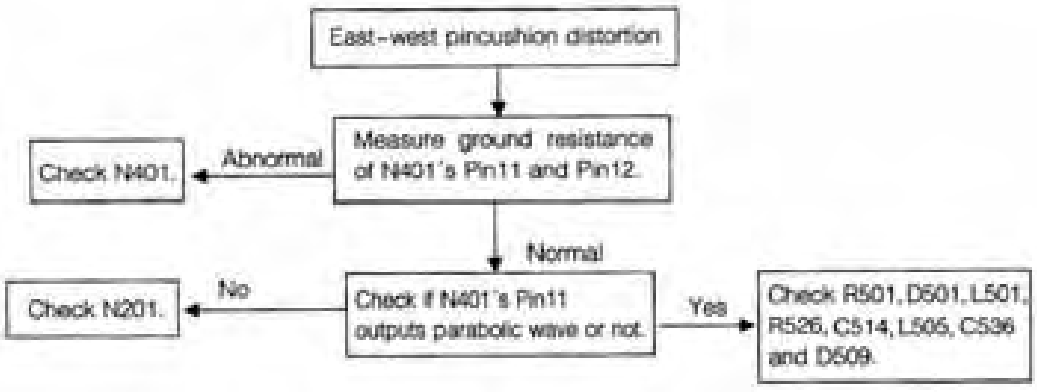
4.2 Raster is displayed as a horizontal bright line on the screen.



4.3 The field amplitude of raster is not enough.

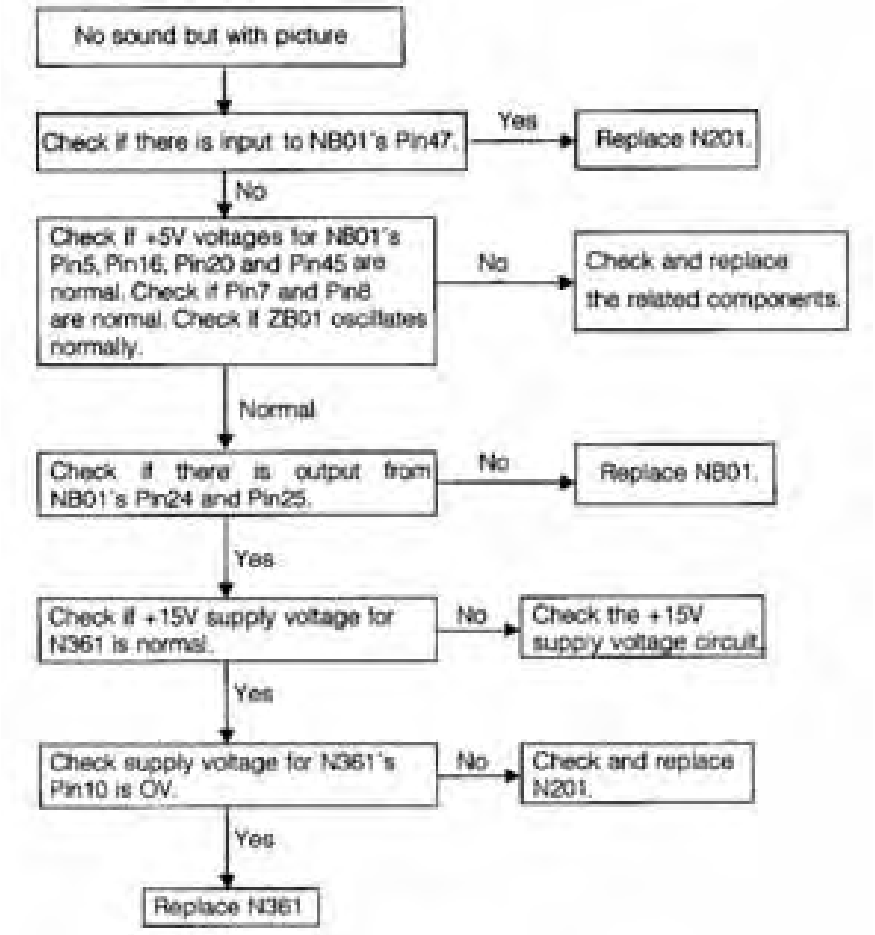


4.4 East-west pincushion distortion



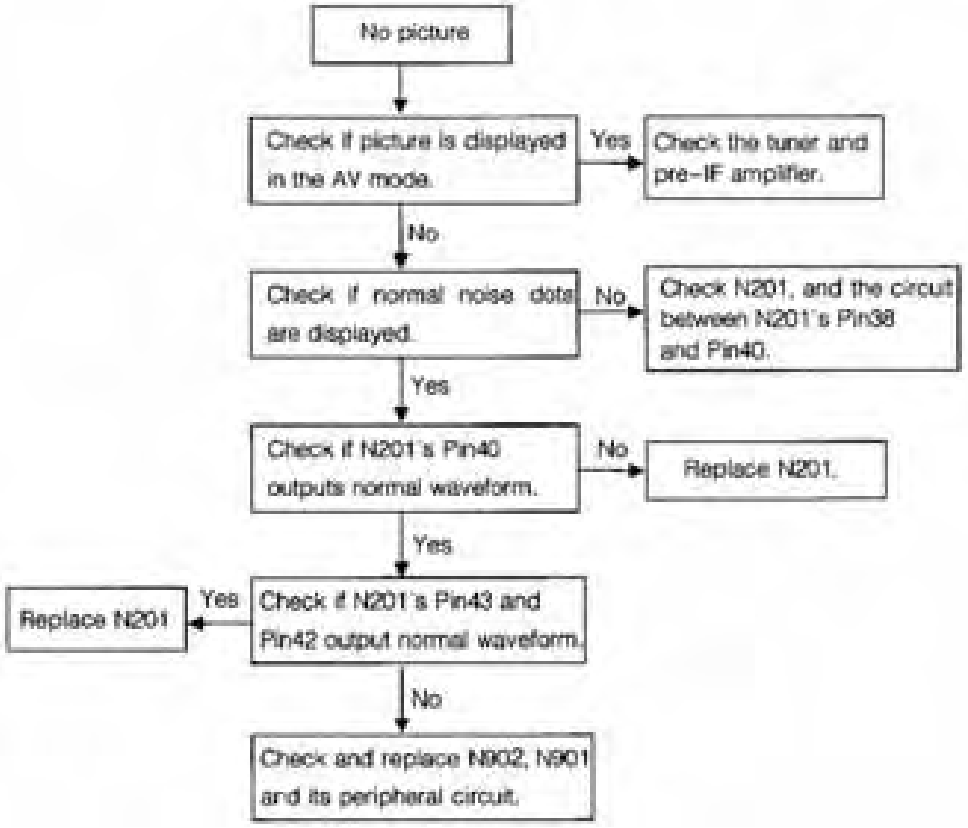
5. Audio System

5.1 No sound but with picture

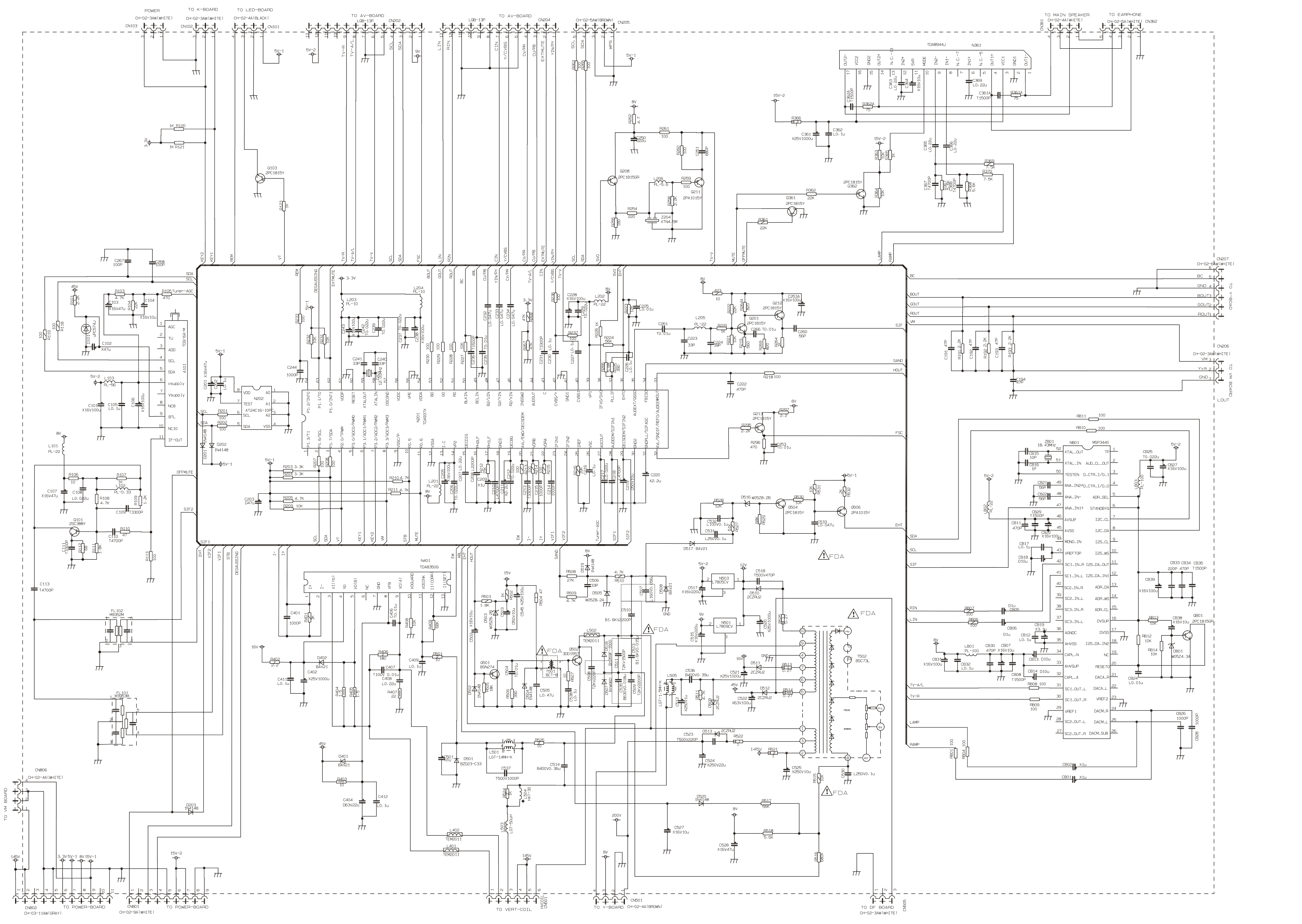


6. Video System

6.1 No picture



APPENDIX 1: Circuit Diagram for PF2720/PF2730 (1)



This circuit diagram is only for reference.
Specifications are subject to change without notice.

1. Any components identified by ⚠ have special safety-related characteristics.
   Use replacement components which have the same characteristics as the original parts.

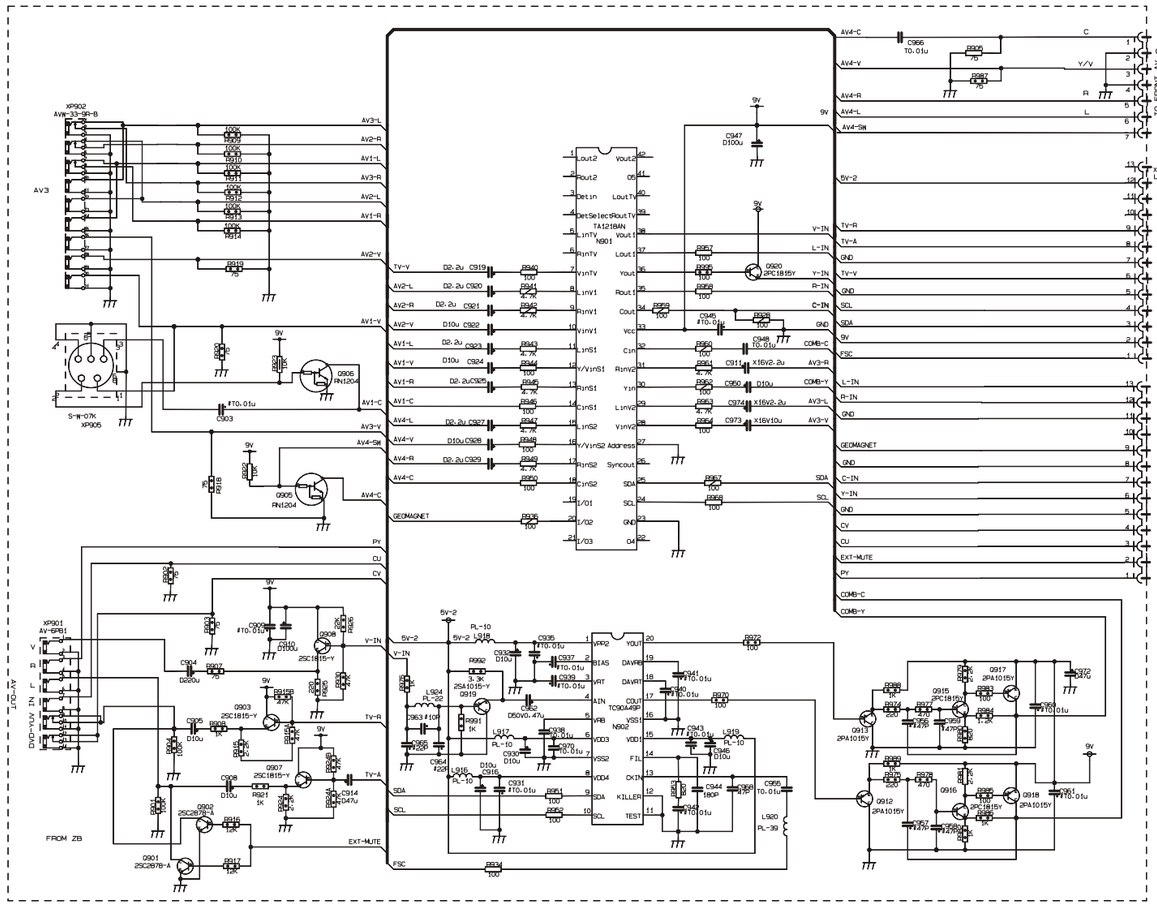
2. ⏚ Cold ground ⊥ Hot ground

3. ⚠ FDA This symbol tells you that replacement components related to high voltage,
   beam current and X_ray radiation should not be made at will.

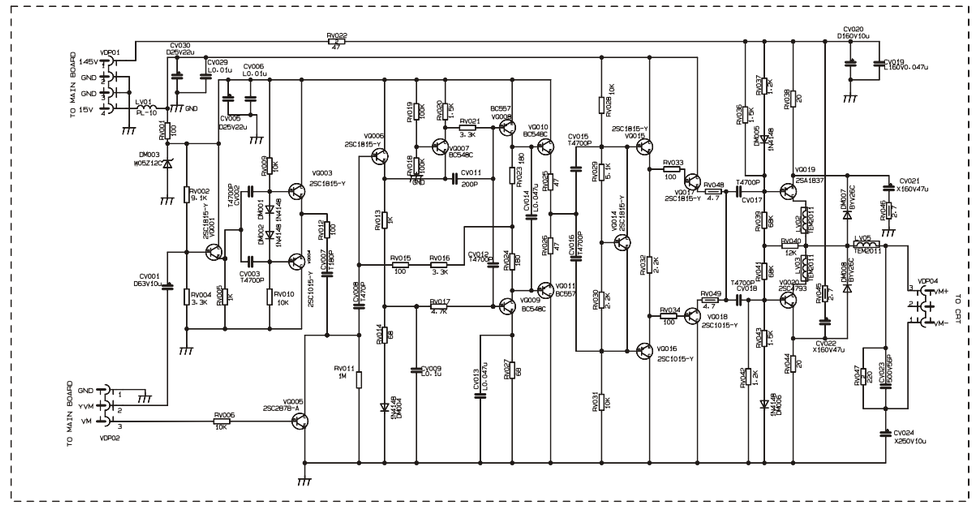
APPENDIX 2: Circuit Diagram for PF2720/PF2730 (2)

Note: VM board for PF2730 only

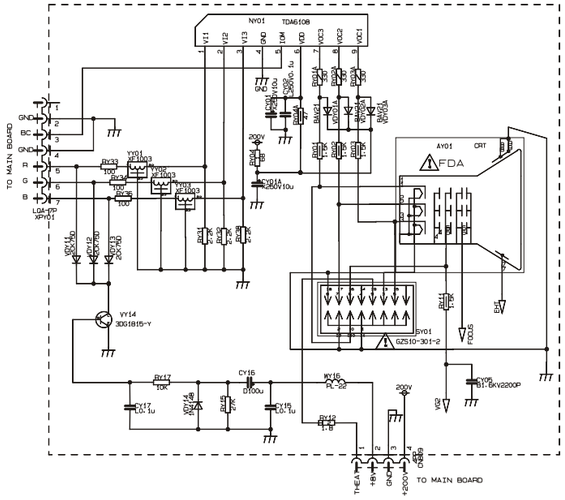
AV BOARD JUC7.820.577



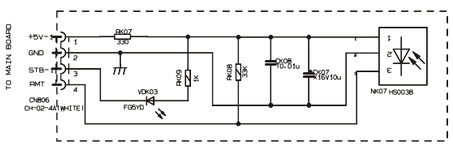
VM BOARD JUC7.820.472



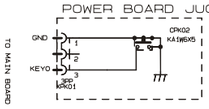
Y BOARD JUC7.820.588



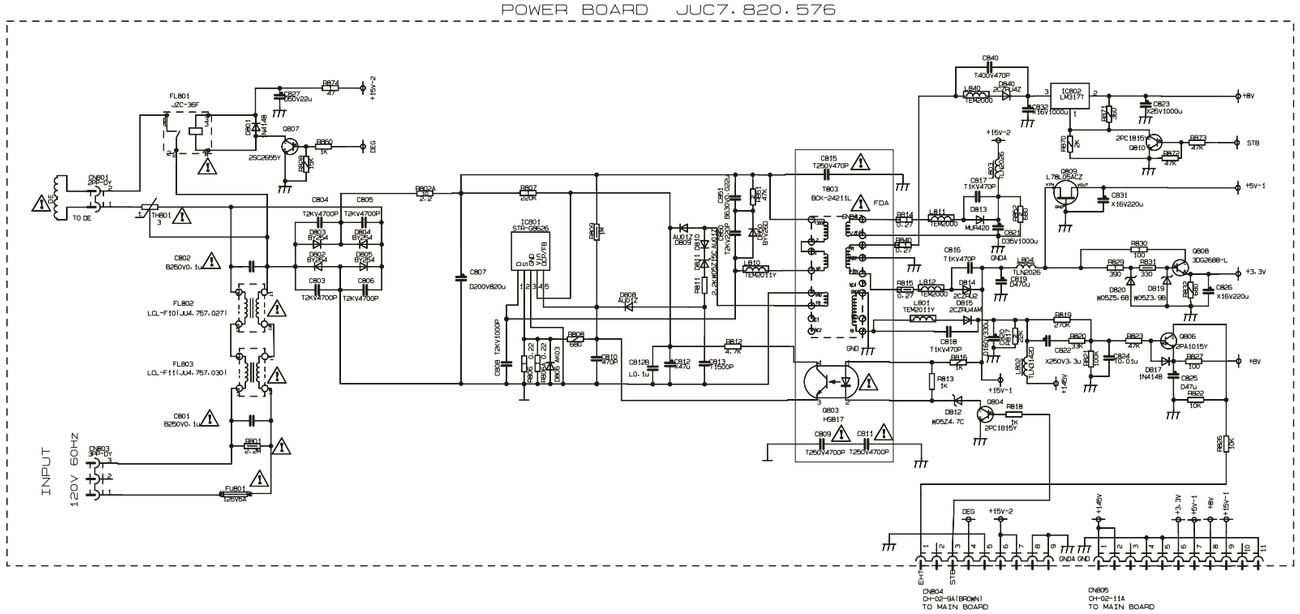
ROM BOARD
JUC7.820.798



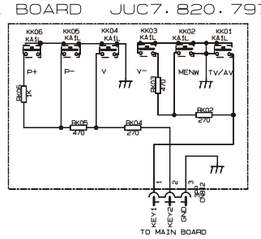
POWER BOARD JUC7.820.796



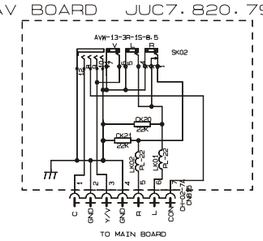
POWER BOARD JUC7.820.576



K BOARD JUC7.820.797



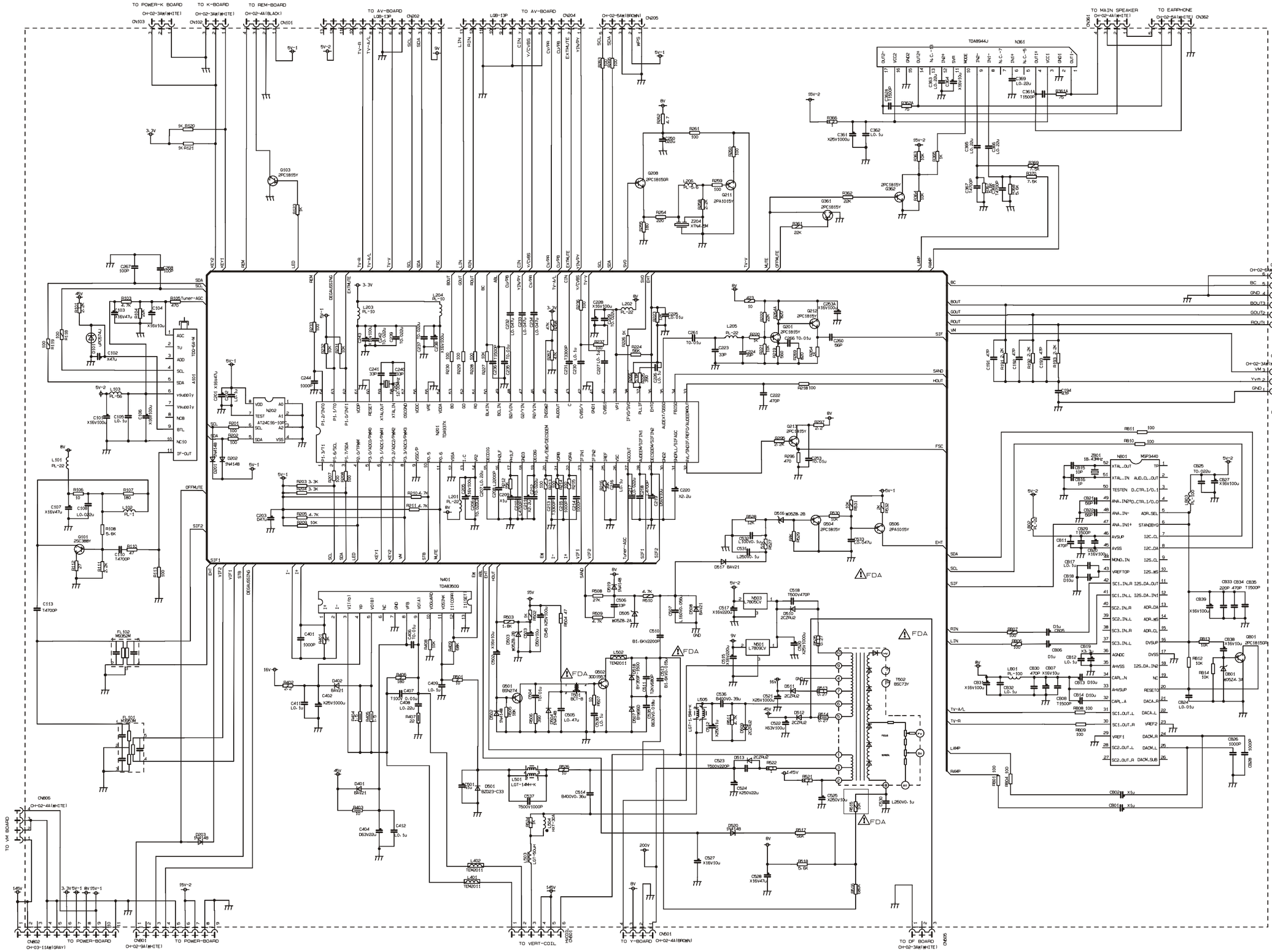
HAV BOARD JUC7.820.799



This circuit diagram is only for reference.
Specifications are subject to change without notice.

1. Any components identified by ⚠ have special safety-related characteristics. Use replacement components which have the same characteristics as the original parts.
2. ⏚ Cold ground ⊥ Hot ground
3. ⚠ FDA This symbol tells you that replacement components related to high voltage, beam current and X-ray radiation should not be made at will.

APPENDIX 3: Circuit Diagram for PF3220/PF3230 (1)



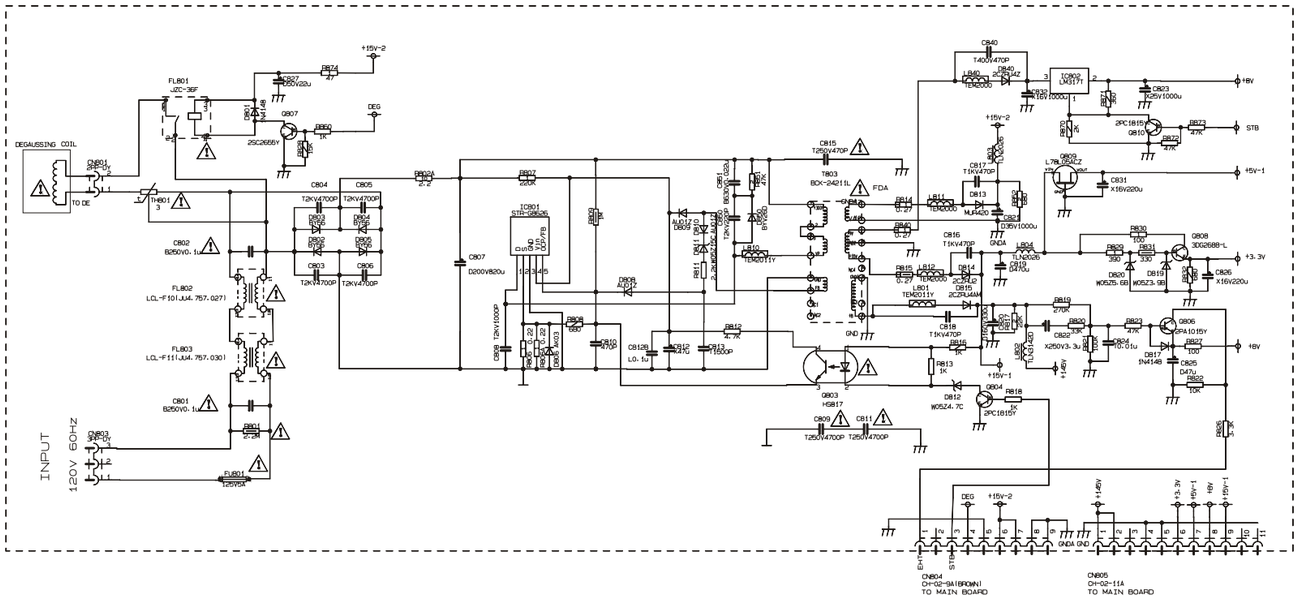
This circuit diagram is only for reference .
specification are subject to change without notice .

1. Any components identified by ⚠ have special safety-related characteristics.
   Use repalacement components whith have the same characteristics as the original parts.
2. ⊥ Hot ground ⏚ Cold ground

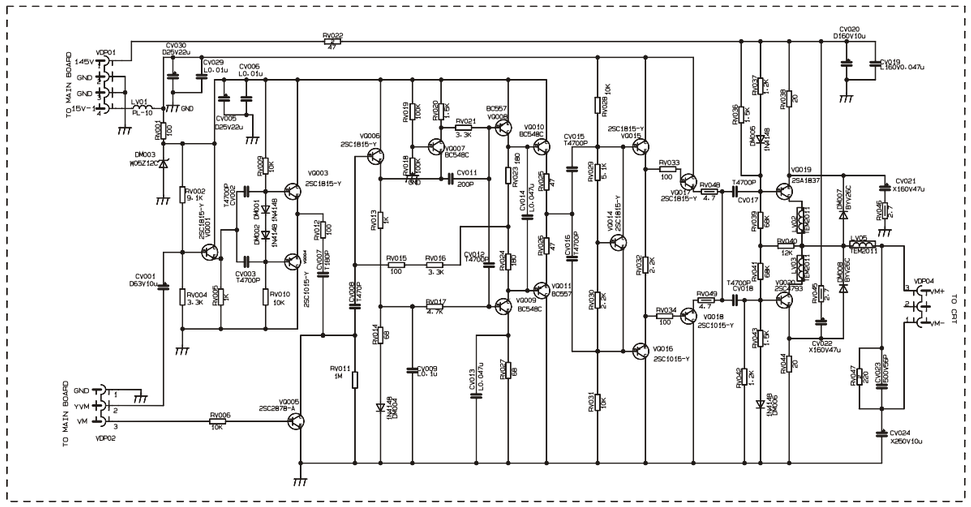
APPENDIX 4: Circuit Diagram for PF3220/PF3230 (2)

Note : VM Board for Pf3230 only

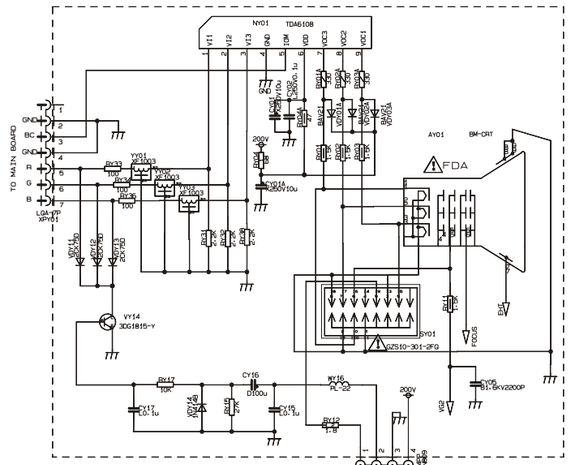
POWER BOARD JUC7.820.576



VM BOARD JUC7.820.472

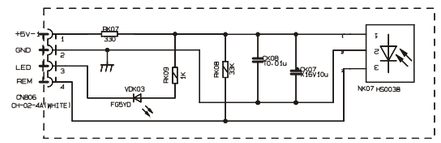


Y BOARD JUC7.820.588

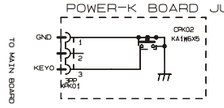


REM BOARD

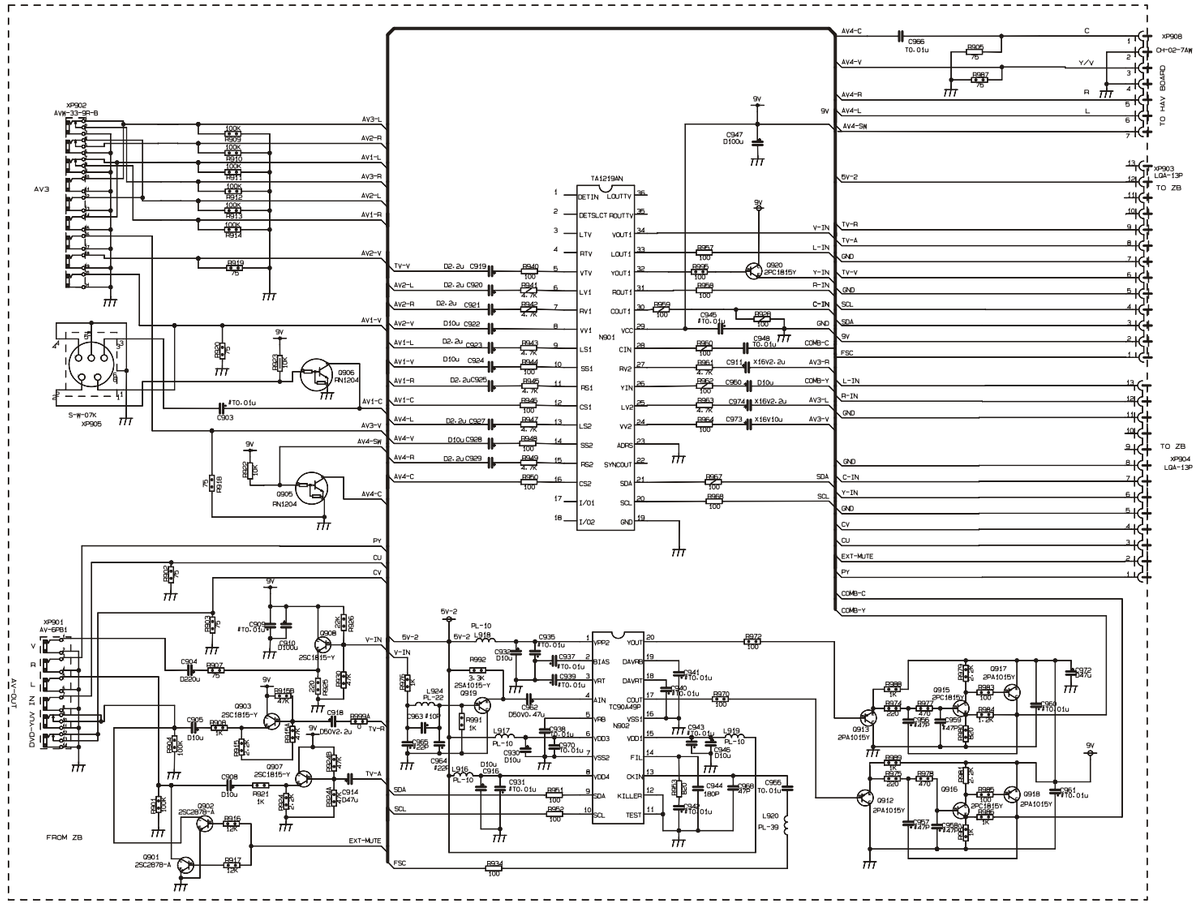
JUC7.820.798



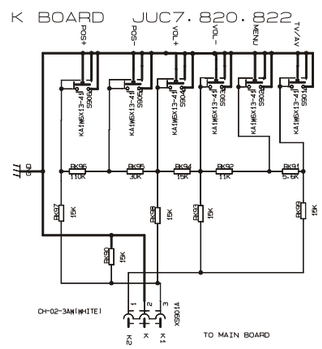
POWER-K BOARD JUC7.820.796



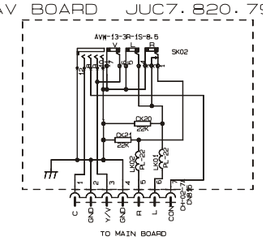
AV BOARD JUC7.820.577



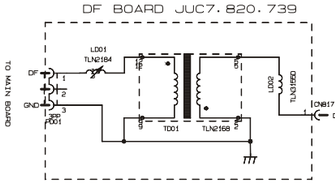
K BOARD JUC7.820.822



HAV BOARD JUC7.820.799



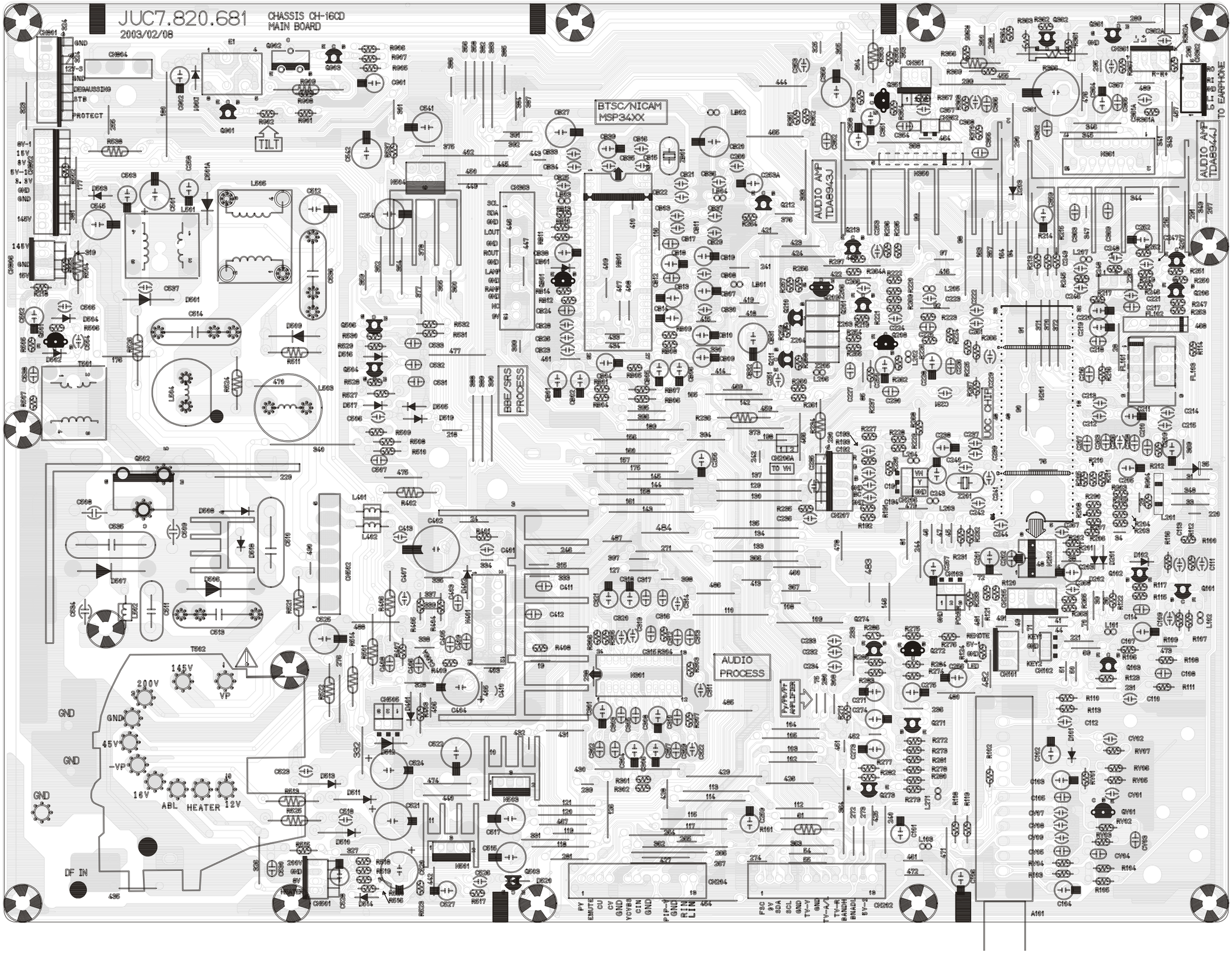
DF BOARD JUC7.820.739



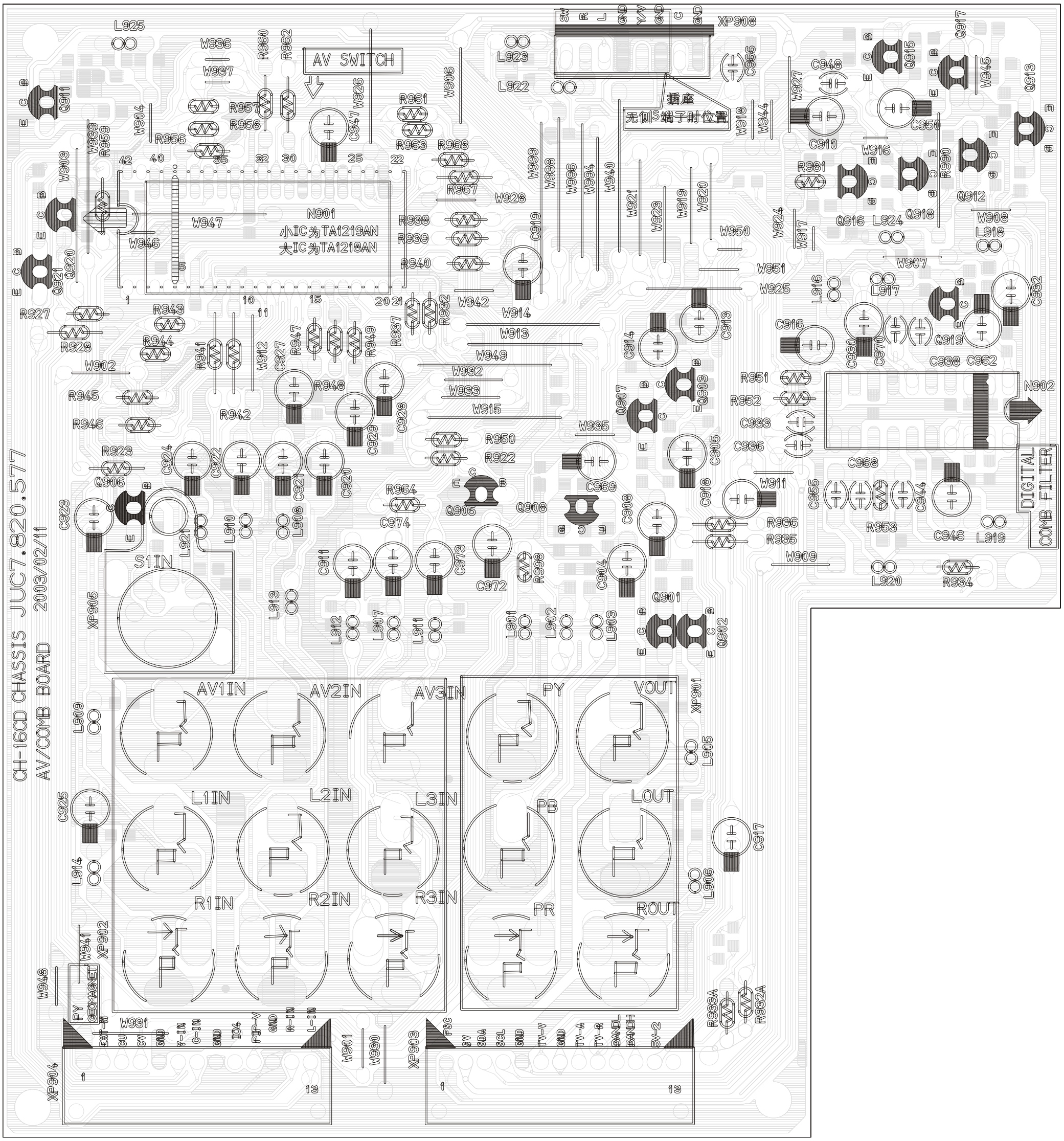
This circuit diagram is only for reference , specification are subject to change without notice .

1. Any components identified by ⚠ have special safety-related characteristics, Use repalacement components whith have the same characteristics as the original parts.
2. ⊥ Hot ground ⏚ Cold ground

APPENDIX 4: Main PCB Layout for PF2720/PF2730/PF3220/PF3230

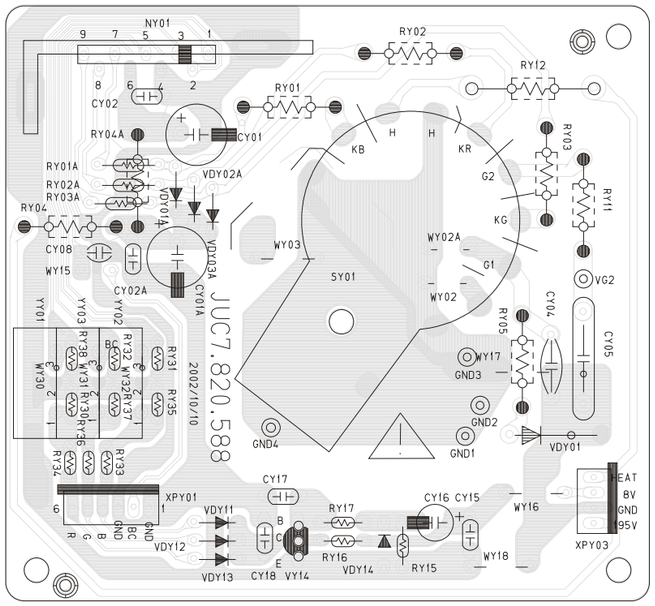


APPENDIX 6: AV PCB Layout for PF2720/PF2730/PF3220/PF3230

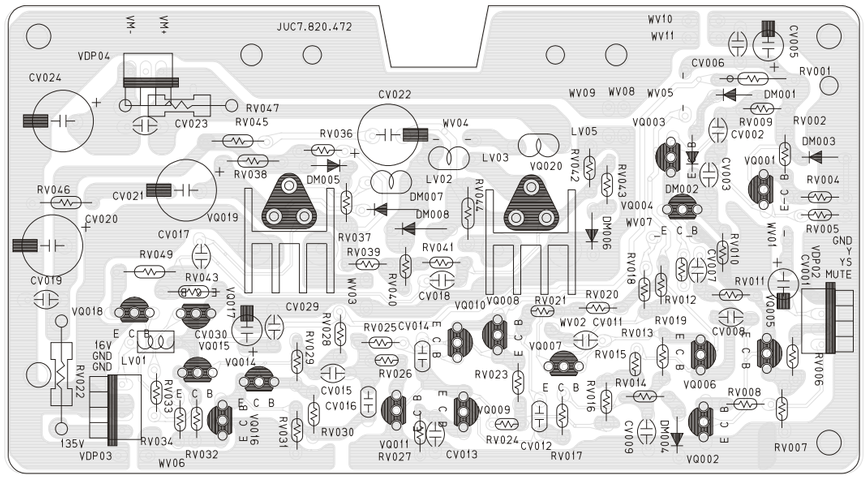


APPENDIX 7: Auxiliary PCBs Layout for PF2720/PF2730/PF3220/PF3230 (3)

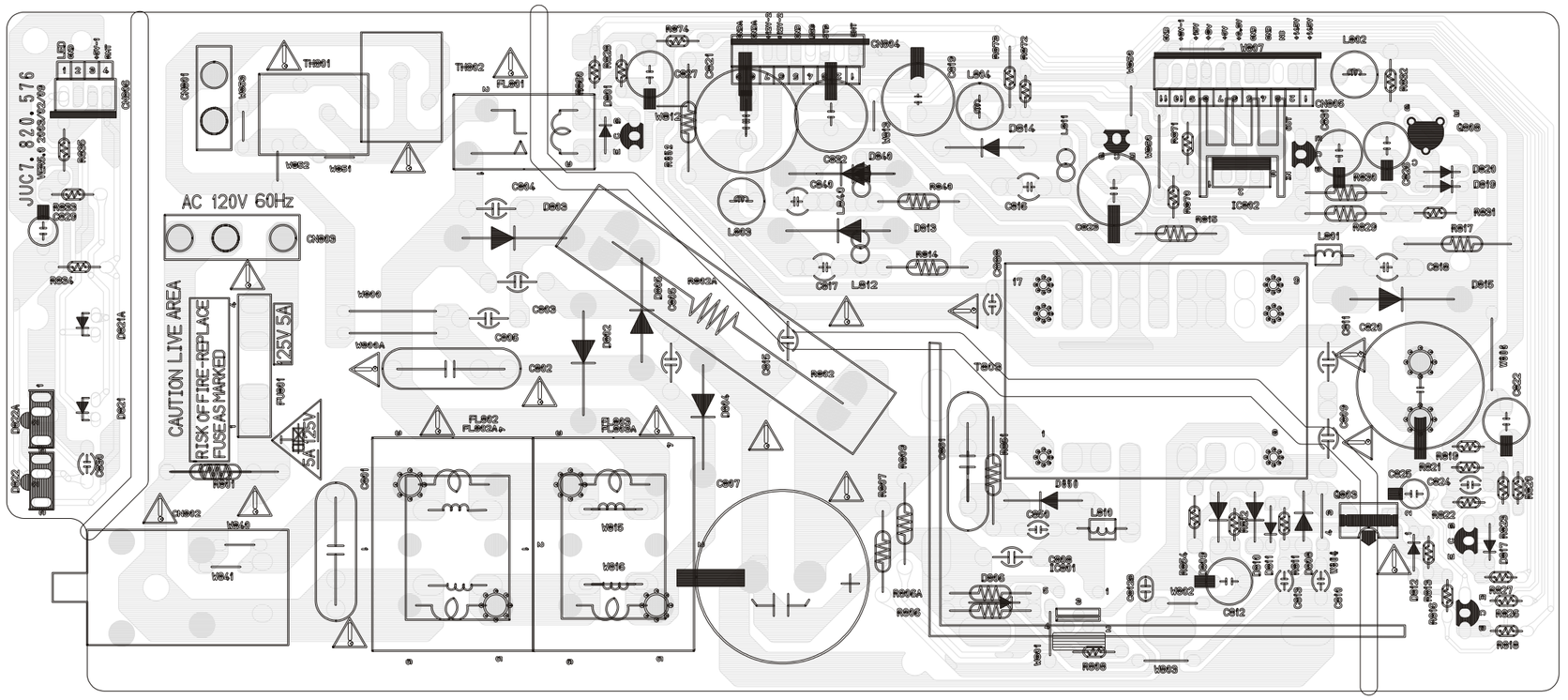
CRT RGB PCB



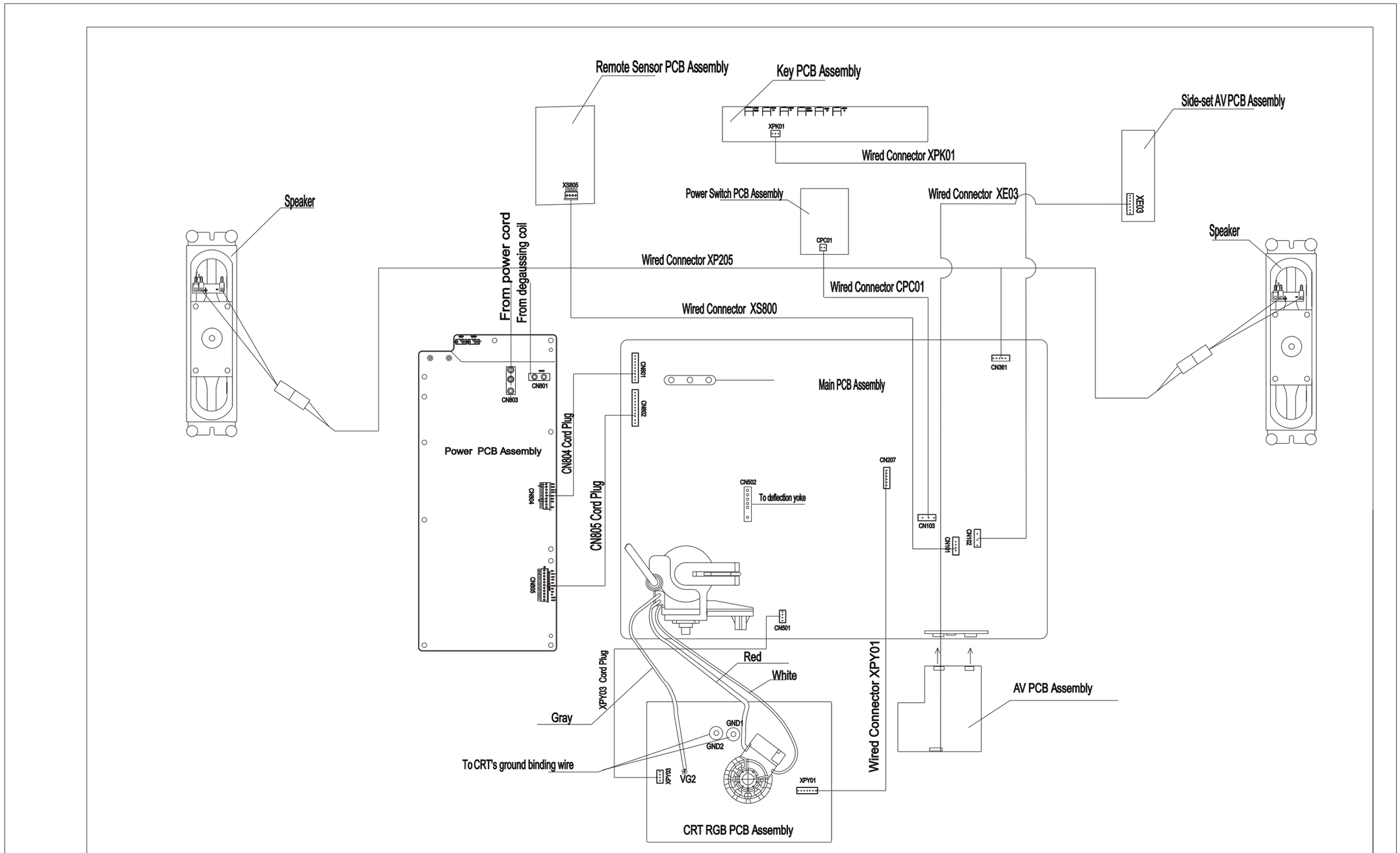
VM PCB



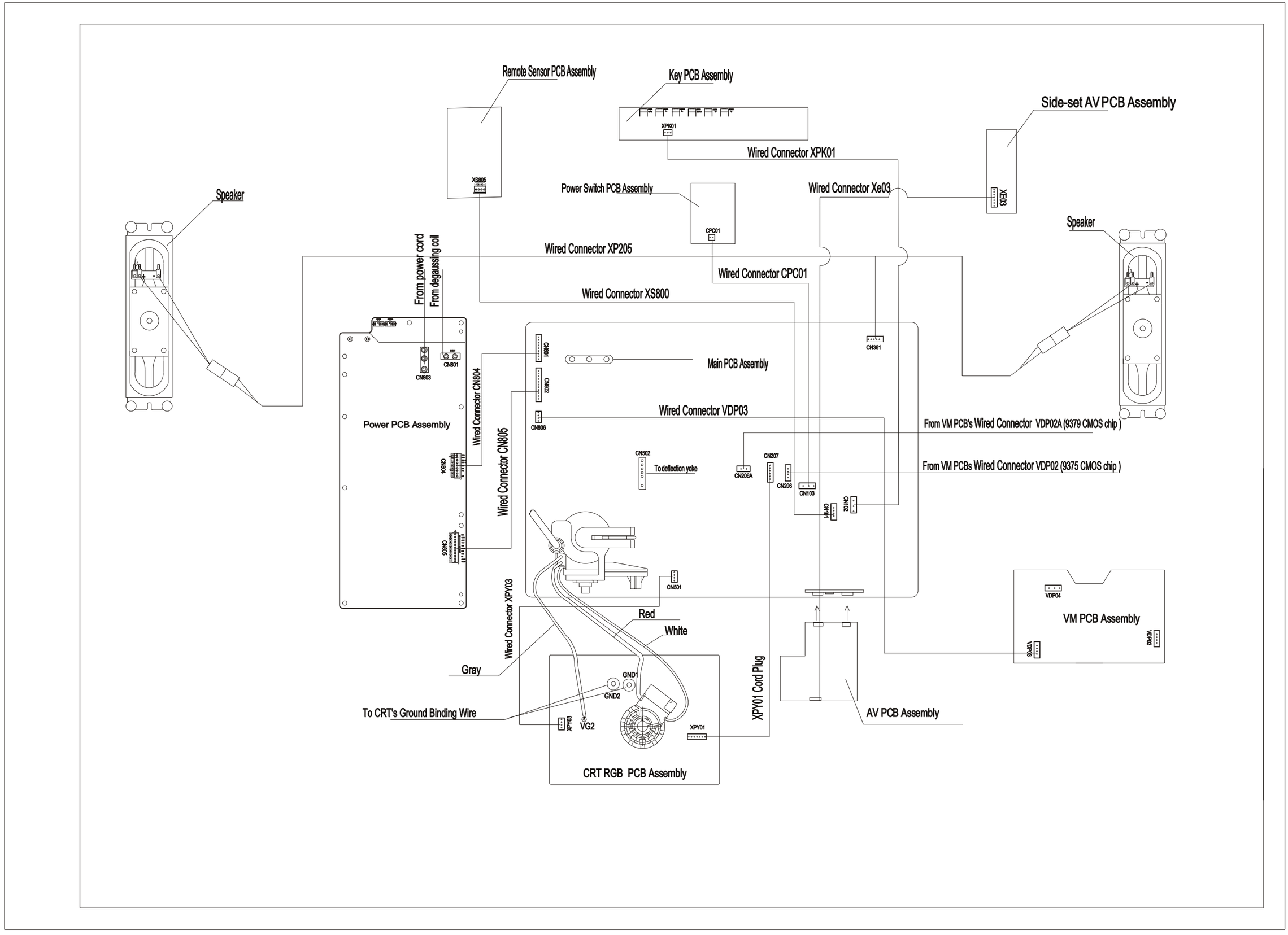
Power PCB



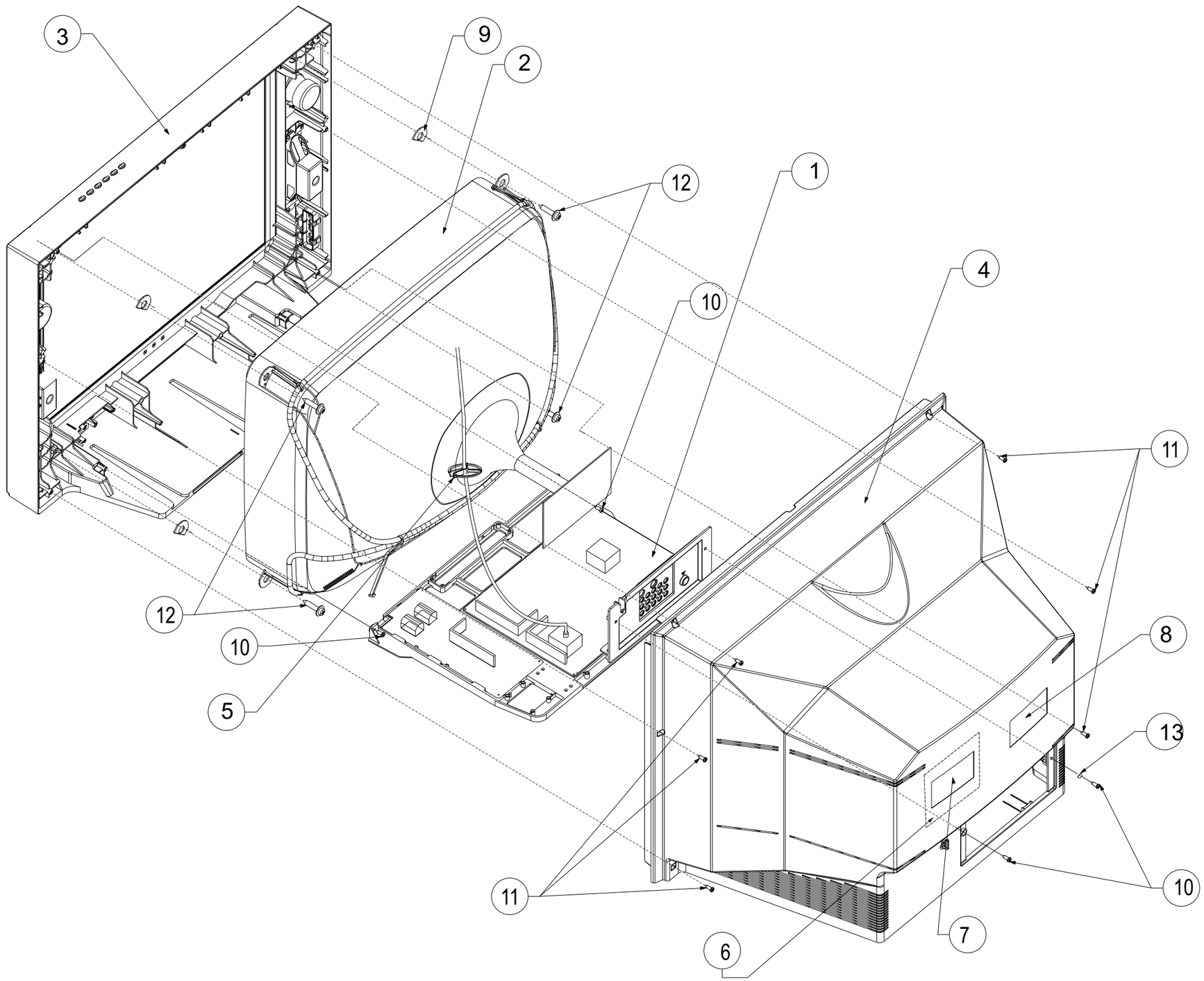
APPENDIX 8: Final Wiring Diagram for PF2720



APPENDIX 9: Final Wiring Diagram for Pf2730

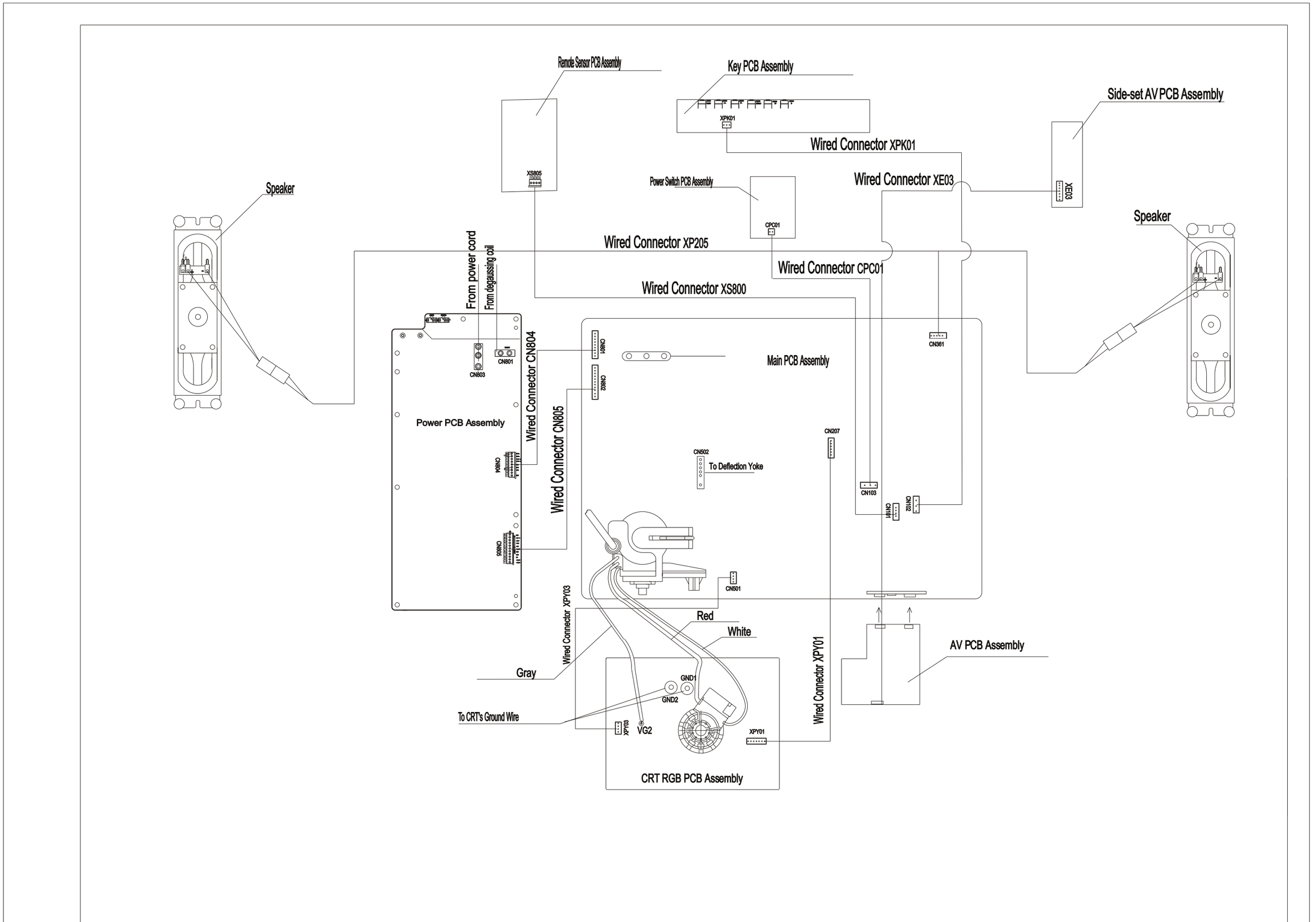


APPENDIX 10: Exploded View for PF2720/PF2730

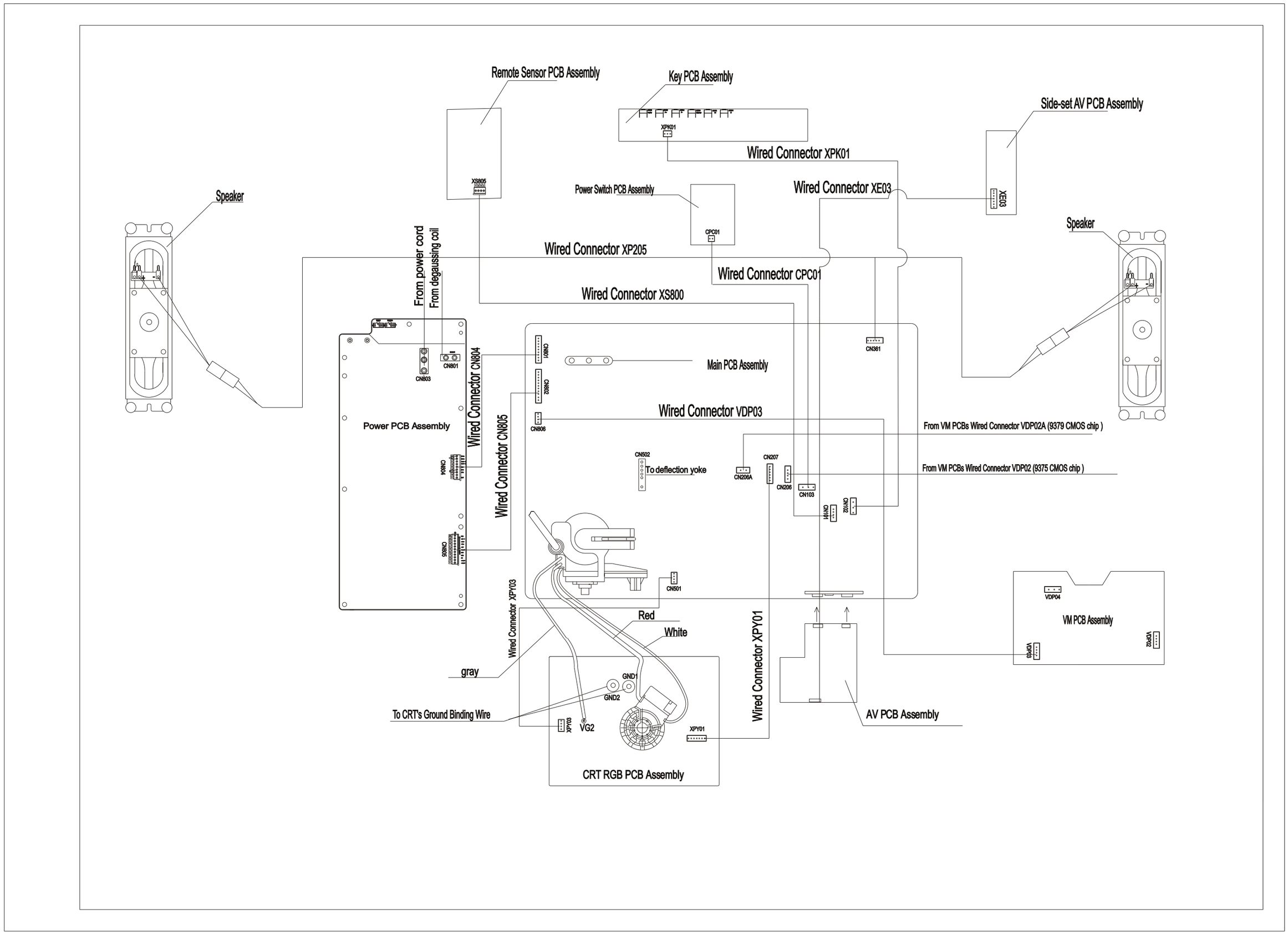


Serial No.	Parts	Quantity
20		
19		
18		
17		
16		
15		
14		
13	plasticene	
12	Tapping screw M6X35W	4
11	Tapping screw 4X20BAHCh	6
10	Tapping screw 4X16BTHCh	4
9	Washer	4
8	C-UL label	1
7	Real label	1
6	Admonition label	1
5	Distance clip	1
4	Back cover	1
3	Front cover assembly	1
2	CRT assembly	1
1	Chassis assembly	1

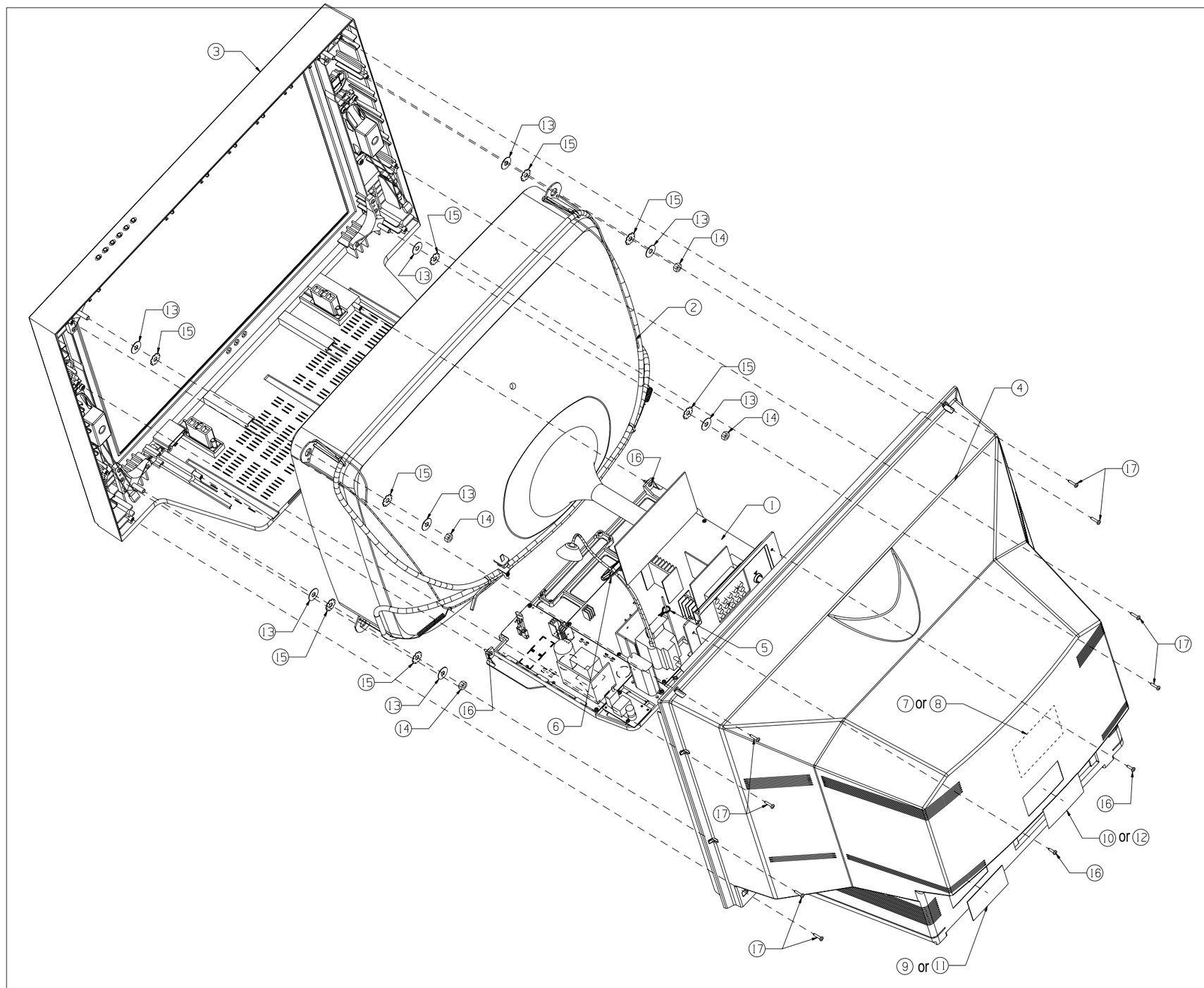
APPENDIX 11: Final Wiring Diagram for Pf3220



APPENDIX 12: Final Wiring Diagram for Pf3230



APPENDIX 13: Exploded View for PF3220/PF3230



Serial No.	Parts	Quantity
20	Soldering agent	
19	Tin solder	
18	Q04-3 white nitro magnetic paint	
17	Tapping screw 4X20BAHCh	8
16	Tapping screw 4X16BTHCh	4
15	C-1 notched washer	8
14	I hexagon nut A and B M8	4
13	Washer	8
12	C-UL label	1
11	Real label	1
10	C-UL label	1
9	Real label	1
8	Admonition label	1
7	Admonition label	1
6	Distance clip	1
5	Wire clip	2
4	Back cover	1
3	Front cover assembly	1
2	CRT assembly	1
1	Chassis assembly	1