

# COLOR TELEVISION

# SERVICE MANUAL

SERVICE MANUAL



## TS14"-20"

**AUTION:** THIS SERVICE MANUAL IS ONLY FOR PROFESSIONAL SERVICE PERSONNEL'S REFERENCE. BEFORE SERVICING THIS CHASSIS, PLEASE READ THE FOLLOWING NOTICE ITEMS.

## **1. SAFETY INSTRUCTION AND GENERAL INSTRUCTION**

Before servicing and aligning this equipment, please read the following “**X-RAY RADIATION PRECAUTION**”, “**SAFETY PRECAUTION**” and “**PRODUCT SAFETY NOTICE**”.

### **1.1 X-RAY RADIATION PRECAUTION**

- 1) Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not be above the specified limit. The normal value of the high voltage of this receiver is under 24.5kV(21”) and 22.5KV(14”) at zero beam current (minimum brightness), the high voltage must not, under any circumstances, exceed 30kV.
- 2) Each time a receiver requires servicing, the high voltage should be checked following the HIGH VOLTAGE CHECK procedure in this manual. It is recommended the reading of the high voltage be recorded as a part of service record. It is important to use an accurate and reliable high voltage meter.
- 3) The primary source of X-RAY RADIATION in this TV receiver is the picture tube. For continuous X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.
- 4) Some parts in this receiver have special safety-related characteristics for X-RAY RADIATION protection. For continuous safety, parts replacement should be undertaken only after referring to the PRODUCT SAFETY NOTICE below.

### **1.2 SAFETY PRECAUTION WARNING:**

Service should not be attempted by anyone unfamiliar with the necessary precaution on this receiver. The following are the necessary precautions to be observed before servicing this chassis.

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

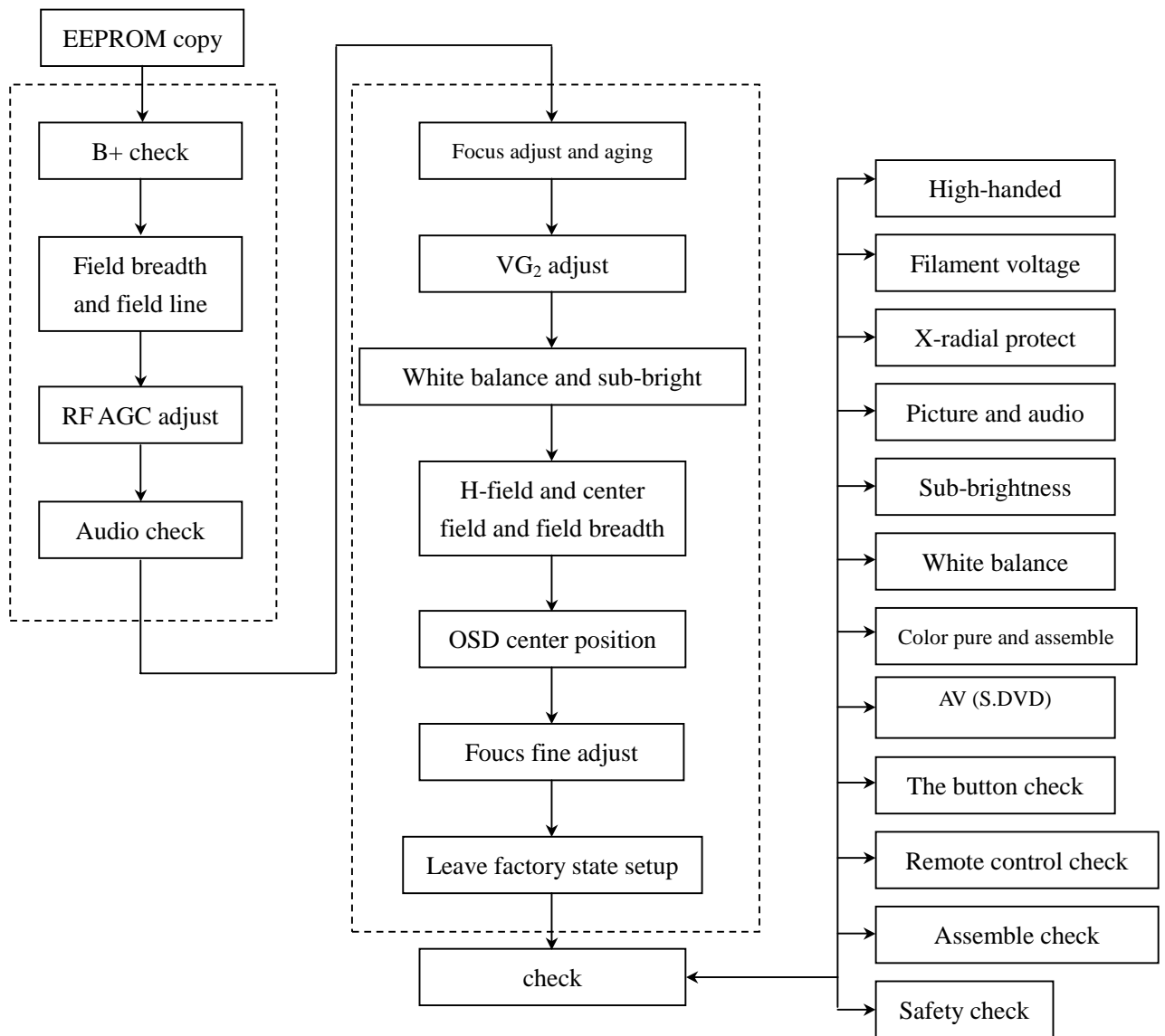
### 1.3 PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the 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 replacement components rated for higher wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplement electrical components having such features are shaded on the schematic diagram and the parts list.

Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same characteristics as specified in the parts list may create shock, fire, X-RAY RADIATION or other hazards.

### 2 Alignment items and procedure

The alignment flow chart (see below figure).



### 3 TEST EQUIPMENT

- 3.1 AUDIO VOLTAMETER
- 3.2 OSCILLOGRAPH
- 3.3 HIGH-VOLTAMETER
- 3.4 DIGITAL MULTIMETER
- 3.5 AC ATTACK PULL TEST EQUIPMENT
- 3.6 SCAN frequency signal generator BT-3

### 4 Debugging instruction

#### 4.1 enter into the factory debugging menu

use to the remote control(RC-A23),follow to the blow model enter into the factory:

→  →  →  → enter into the factory

press "sleep" button for pages upward, press "return" button for pages downward, press "CH+/-" to select alignment items and "VOL+/-" to adjust volume, press "MUTE" to exit.

If the remote sensor designed for alignment is unavailable, press the following buttons to enter by using user remote sensor

#### 4.2 B+ voltage adjustment

Check B+ voltage ( negative pole of VD509) by using DC voltmeter DC 200V

14"110 V±1 V CRT 21"PF 100 V CRT A15QDX992X002(H)

21"110 V±1 V CRT 54SX503Y22-CD01 A51LVV898X12

#### 4.3 AGC adjustment

Measure the voltage of RF AGC by connecting digital DC voltmeter with TP1, receive weak signal (40dBu) and the static AGC voltage of TP1 AGC should be  $V1=4V\pm0.2V$ ; the receive medium signal (60dBu), adjust the value of PAGE8 RF. AGC of factory menu and the start-control voltage of TP1 AGC should be  $V2=3.5V\pm0.2$ .if  $V2>3.5V$ , then the voltage is -1 or -2,if  $V2<3.5V$ , then the voltage is+1 or+2. after adjustment the picture should not appear no-sync , distortion and moire.

White balance and screen-grid voltage VG2 adjustment

After enter PAGE3 of factory menu, use remote sensor directly to adjust white balance by pressing the following digital buttons:

"1"=R.BIAS(+) "2"=G.BIAS(+) "3"=B.BIAS(+)

"4"=R.BIAS(-) "5"=G.BIAS(-) "6"=B.BIAS(-)

press "pp" button to select picture mode→T1→T2→bright→soft→nature→user→ the current picture mode will be display on the screen.

The T1 mode has the maximum value of brightness and contrast with all the other items min. Value of all the analog are minimum while in T2 mode.

Before adjustment you should set the following items :SUB-BRIGHT=50, R.B=100, G.B=100, B.B=100, R.D=100, G.D=15, B.D=100

Adjustment method: 1. press PP button to select T2 picture mode, press CH+/- to select V.K, press vol+ to let the field scanning fail to oscillate, adjust the screen-grid potentiometer on FBT clockwise to let horizontal bright line just appear on the screen; let the value of G.B unchanged, adjust R-BIAS and B-BIAS to let the horizontal bright line appear white. If the green horizontal line don't appear firstly, fine-turn the screen-grid voltage, the adjust R.B and B.B until red , green and blue just appear. After adjustment press VOL- to obtain normal field scanning mode.

4.4 Receive grey-scale signal (D8), enter PAGE4 of factory menu, press PP to select T2 picture mode,

adjustment SUB-BRIGHT to let picture on the screen microbright.

#### 4.5 receive white balance adjustment signal

enter PAGE3 of factory menu, press PP to select T1 picture mode, let the value of GD unchange, adjust RD and B.D to let the white part of the picture appear "white".

#### 4.6 Use white balancer to rectify the white balance under following conditions

colour temperature:12000K+8MPCD

$x = 0.270 \pm 0.008$   $Y = 0.283 \pm 0.008$  dark space : 4.5nit, bright space: 60nit

**Note:**1. Check the white balance of bright field and dark field by receiving monochrome signal or adjusting the degree of saturation to minimum under maintenance condition, adjust RGB BIAS in dark field and RGB DRIVE in bright area, adjust bright/dark balance repeatedly until the bright and dark field have no colour drift.

2. While the colour saturation changed from maximum to minimum, if the dark balance appears changeable, adjust RY.DC.LVL and BY.DC.LVL (page3) to let it coincide with white balance.

3. If the dark balance appears changeable while connected with DVD, adjust YUV.BY.DC and YUV.RY.DC (PAGE4) to let it coincide with white balance.

#### 4.7 High voltage and filament voltage check

Connect a high-voltage meter between anode cap of picture tube and the ground, measure the filament voltage using rms voltmeter, set the picture mode to "standard", the high-voltage: 24.5KV $\pm$ 1KV of 21", 22.5KV $\pm$ 1KV of 14", filament voltage: 6.3 $\pm$ 0.1Vrms.

#### 4.8 x-ray protection check

Receive local TV signal, set the picture mode to "standard", shorten the circuit and measure the value of TP1-TP2, restart the TV 30 seconds after turn off the power source and it should return to normal.

#### 4.9 AV function check

according to the owner's manual require, connect to the AV equipment and the AV interface:

VIDEO IN:	1 Vp-p 75OHM	AUDIO IN:	(-8 $\pm$ 3)dBm > 47 kOHM
S interface Y IN:	1 Vp-p 75OHM	C IN:	0.3 Vp-p 75OHM
DVD Y IN:	1 Vp-p 75OHM	Cr IN:	0.7 Vp-p 75OHM
		Cb IN:	0.7 Vp-p 75OHM

#### 4.10 AV parts check

incept to standard the TV signal:

- AV and crossfire and allophone and shake ;
- The user control function ana picture model
- The remote control function check;
- Color pure and converge check.

#### 4.11 leave factory state setup

Picture model (PP)	STENDARD
language	All the country language
Color system	AUTO
C.CAPTION	C1
CCD ON MUTE	OFF
RECEPTION	AIR
AFT	ON

MTS	AUTO
PASSWORD	CLEAR
volume	30

#### 4.12 the factory menu adjustment model pre-set

OSD	item	Pre-set	model
P1-60			
V SIZE	60HZ field amplitude	<b>50</b>	4.5.1
V SHIFT	60HZ field center	<b>0</b>	4.5.1
H-PHASE	60HZ H-center	<b>9</b>	4.5.1
V LINE	60HZ V-line	<b>15</b>	4.5.1
V SC	60HZ field S-correct	<b>10</b>	4.5.1
V COMP	field amplitude compensate	<b>7</b>	fixed
L.BLK	Left blanking	3	fixed
R.BLK	Right blanking	3	fixed
P3-50			
V SIZE	50HZ field amplitude	<b>50</b>	4.5.2
V SHIFT	50HZ field center	<b>0</b>	4.5.2
H-PHASE	50HZ H-center	<b>6</b>	4.5.2
V LINE	50HZ V-line	<b>13</b>	4.5.2
V SC	50HZ field S-correct	<b>10</b>	4.5.2
P5			
LINE	Level bright line	0	0=normal 1= Level bright line
RB	Red cut off	<b>100</b>	4.4
GB	Green cut off	<b>100</b>	4.4
BB	Blue cut off	<b>100</b>	4.4
RD	Red driver	<b>100</b>	4.4
GD	Green driver	<b>15</b>	4.4
BD	Blue driver	<b>100</b>	4.4
P6			
RF AGC	RF AGC	<b>30</b>	4.3
SUB-BRI	Sub-brightness	<b>127</b>	4.4
SUB-CNT	Sub-contrast	31	fixed
SUB-COL	Sub-colour	15	fixed
SUB-SHP	Sub-definition	15	fixed
SUB-TINT	Sub-tint	<b>28</b>	fixed
P7			
VOL.FIL	Volume control ADC filter	0	fixed
OSD.COT	OSD contrast	<b>2</b>	fixed
OSD.HPOS	OSD center	<b>6</b>	fixed
AFT	Line AFC loop gain and sync gate switch	1	fixed
VIF SW	IF3=45.75MHZ	3	fixed

SIF SW	Sound IF0=4.5MHZ	0	fixed
VIDEO LEVEL	VIDEO LEVEL	3	fixed
P8			
GY ANGLE	G-Y demodulation angle	0	fixed
V.R TM	Filed scan strting time	0	fixed
R/B ANG	R-Y/B-Y demodulation angle	8	Fixed
R/B BAL	R-Y/B-Ydemodulation balance	8	fixed
C TRAP	Color trap filter	6	fixed
H FREQ	H-frequency	16	fixed
C.BPF TEST	Color band filter center frequency	0	fixed
P9			
OVER.MOD.SW	Selection over-modulation function	0	Fixed,0=nothing 1=have
OVER.MOD.LVL	Adjustment over-modulation working point	0	fixed
BLK.STR	Dark level expand starting control point	0	Fixed,0=40IRE 2=60IRE 3-OFF
BLK.GAIN	Dark level expand gain	0	Fixed,0=MIN 2=MAX
Y.APF	Selection color trap filter	0	0=trap filter,1= direct pass(YcbCr&Y/C)
PRE.ADJ	Pre-shoot	3	fixed, 0=narrow 3=width
OVER ADJ	overshoot	3	Fixed,a 0=narrow 3=width
C.VCO.ADJ	Color VCO frequency adjustment	4	fixed,0 - 4 - 7=-120KHZ-0-90KHZ
P10			
BRT.ABL.DEF	Brightness ABL	0	fixed,0=ABL ON 1=ABL OFF
MID.STP.DEF	ABL start control point	0	fixed
BRT.ABL.THR	ABL threshold	7	fixed
WPL.OPE	White peak limit	2	fixed
V BLK.SW	Field blanking switch	0	fixed ,0=nomarl;1=width model
FBP BLK SW	Horizontal blanking switch	1	fixed,0=inside produce;1=FBP and inside logic "and"
DC REST	DC recover rate	1	fixed,0=100% 1=107%
CD.MODE	Field frequency division model	0	fixed,0=auto
P11			
CORE GAIN	Noise reduction	2	fixed,0=OFF 1=MIN 3=MAX
.GAMA	r-correct	0	fixed,0=OFF
RGB TEMP.SW	RGB DC output temperature speciality	1	fixed
A.MONI SW	Selection pin5 output	1	fixed , 1=SAO
SVO OR FSC	Selection pin5 output	0	fixed,0=VIDEO 1=FSC(color sub-carrier wave)
CROSS B/W	Selection test signal	0	fixed,0=TV

CRAY.MODE	Test signal	0	fixed,0=white(75%)1=grey(15%)
P12			
BY TV	Blue chromatism DC level	<b>8</b>	4.4 adjustment dark white balance(TV/AV model)
RY TV	Red chromatism DC level	<b>8</b>	4.4 adjustment dark white balance(TV/AV model)
BY YUV	DVD input Blue chromatism DC level	<b>8</b>	4.4 adjustment dark white balance (DVD input)
RY YUV	DVD input Red chromatism DC level	<b>8</b>	4.4 adjustment dark white balance(DVD input)
S.TRAP.TEST	Sound trap filter adjustment	6	fixed
LOW.BRI	Min-brightness	<b>28</b>	fixed
LOW.CONT	Min-contrast	<b>30</b>	fixed
P13			
COL.KILL	Achromatic level	5	fixed,0=-30dB 3=-40dB
VCO.FREQ	VCO frequency	32	fixed
P14			
Y GAIN		0	fixed
Y TH		0	fixed
B OFFSET		0	fixed
B WIDTH		0	fixed
C OFFSET		0	fixed
C WIDTH		0	fixed
CAN.V CHIP	V-CHIP	0/1	1=CAN.V-CHIP
OPTION			
AV	AV selection	<b>3</b>	AV input select(3=AV1/AV2/S/DVD)
MTS	MTS IC selection	<b>1/0</b>	0=nothing,1=72700 2=AN5832
V.OFF.MOTE	Turn off model	1	0=discharge,1=close
PWR.MEM	Turn on model	<b>0/2</b>	0=standby,1=auto turn on,2=memory
1115	select LV1115	0	fixed,0=nothing;1=have
BLCK GROND	No signal background selection	1	0=nothing 1/3=blue background;2=black background
N/PN	South America and North America selection	<b>1/0</b>	0=south america;1=north america
1115(the unit no use)			
VOL.OFFSET			
GAIN			
PWM LOGIC			
AVL MODE			
AVL DET LEVEL			
AVL SLOPE			
PWM SET			



VOL 1	1% volume control speciality	30	fixed
VOL 25	25%volume control speciality	32	fixed
VOL 50	50%volume control speciality	68	fixed
VOL 75	75%volume control speciality	82	fixed
72700			
ALC	ALC	1	fixed ,1=ALC ON
VOL	Baseband model ,input level adjustment	0	The unit no use
SAP LEVEL	SAP level	1	fixed
SIF.M/BB.M	SIF and baseband model	0	fixed,0=SIF MODE 1=BB MODE
5832			
AGC		1	fixed

Note:above “/” are the adjustment data for north america, below it are for south america.

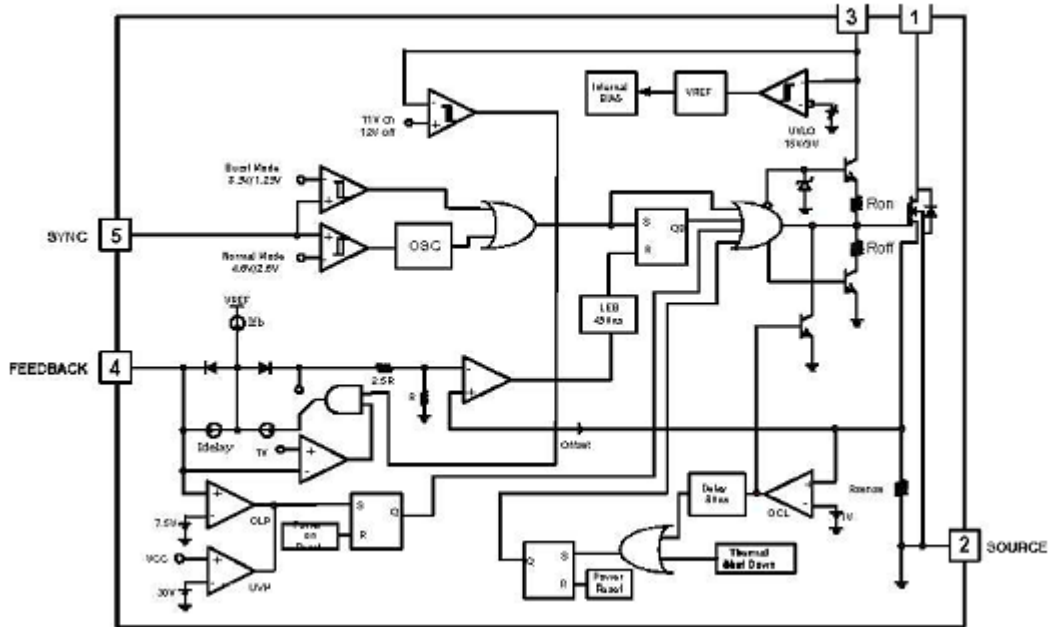


Function introduction to pin

pin	function	Reference voltage (V)	pin	function	Reference voltage (V)
1	SIF output	2.28	64	PIF input1	2.86
2	PIF AGC	2.61	63	PIF input 2	2.86
3	SIF input	3.11	62	IF GND	0
4	FM filter	2.64	61	RF AGC output	4.55
5	FM filter/sound output	2.25	60	Video output	2.30
6	Sound output	2.24	59	AFT filter	2.50
7	SIF APC filter	2.24	58	APC filter	2.60
8	IF VCC(5V)	4.92	57	Black level detection filter	2.50
9	Expanded sound input	2.25	56	Internal video input and S-C input	2.70
10	ABL	3.21	55	Video, colour and deflexion power VCC	4.90
11	RGB VCC(8V/18Ma)	8.00	54	Expanded video input and Y input	2.50
12	R ouput	2.65	53	Colour APC filter	3.40
13	G ouput	2.65	52	Selection video output and FSC output	2.40
14	B ouput	2.67	51	Cr input	2.50
15	AKB (undo)	2.31	50	4.43 MHZ crystal	2.73
16	Field sawtooth filter to capacitance	2.16	49	Cb input	2.50
17	Field output	2.34	48	Y(DVD) input	
18	VCO Reference voltage	1.65	47	DDS filter	1.89
19	H/BUS VCC(5V/27mA)	6.81	46	Y(Y/C) input	
20	H/APC filter	2.54	45	C(Y/C) input	
21	H-output	0.28	44	Retrace impulse input	1.20
22	Video, colour and deflexion ground	0	43	CCD VCC	4.50
23	<b>x-ray protection, low level availability</b>	5.00	42	CPU GND	0
24			41	PLL	3.50
25			40	reset	4.00
26	IR control input	4.90	39	Button input	0.32
27			38	TV/AV H=TV L=AV	0
28	POWER H=OFF L=ON	0	37	AV1/AV2	5.00
29	STAND-BY	5	36	MUTE high level	5.00

30	Mute, high Level availability	0	35	VDD	5.00
31	I2C DATA	5.00	34	x T2	4.50
32	I2C CLOCK	5.00	33	x T1	2.70

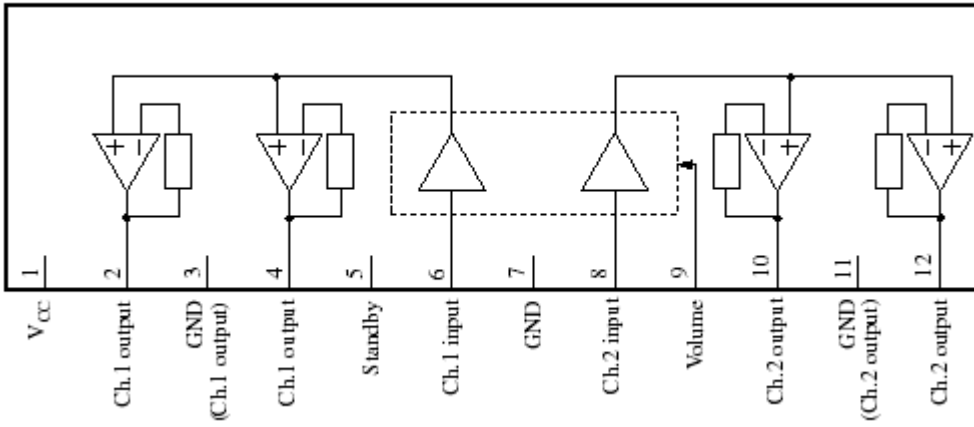
### KA5Q0565RT



### Function introduction to pin

pin	name	function	Reference Voltage(V)
1	Drain	drain output of MOSFET, current-limiting checking point of internal drain current.	283
2	GND	source of MOSFET, common ground and reference of circuit controlled by source.	0
3	Vcc	Control circuit power input, provide starting and stabilizing Operating current.	23
4	Vfb	Connect it with inverting input terminal of PWM comparator, the collector of optical coupler can be connected to it. To work stably, connect a capacitor between it and the ground. If the voltage upon it reaches to 7.5V, the overvoltage protection will work.	1.35
5	Sync	Connect it with sync detector for quasi-resonance conversion. Normal quasi-resonance work, threshold voltage upon sync comparator is 4.6V/2.6V. while expanding quasi-resonance operating mode, the threshold voltage will change to 3.0V/1.8V.	5.65

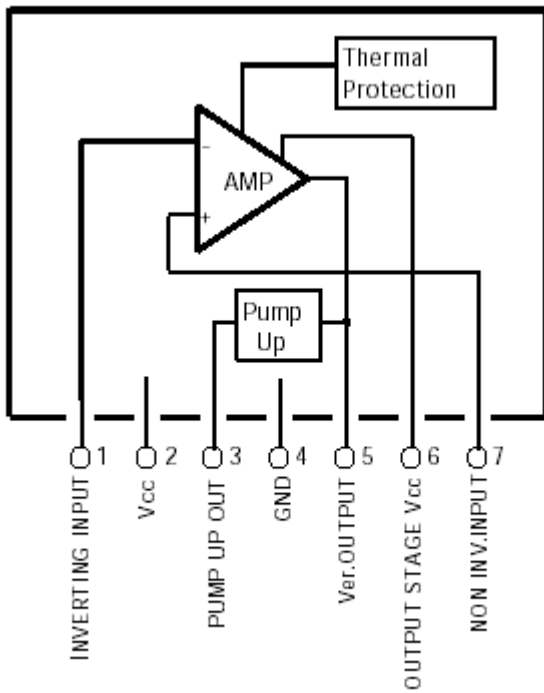
AN7522



Pins function

pin	function	pin	function
1	power	7	GND input
2	CH1+ output	8	CH2 input
3	GND	9	volume
4	CH1- output	10	CH1+ output
5	Stand-by	11	GND (CH2 output)
6	CH1 input	12	CH1+ output

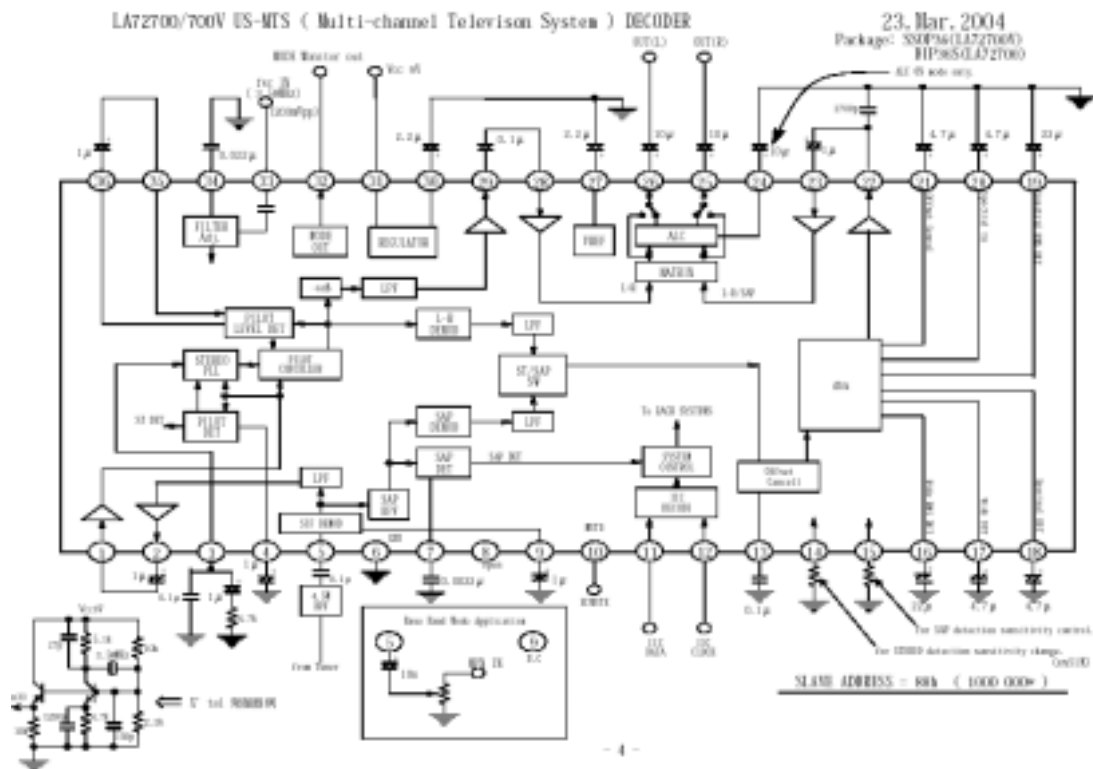
LA78040



Pins function

pin	function	pin	function
1	Inverting input	5	Ver. output
2	VCC	6	Output stage vcc
3	Pump up output	7	NON inverting input
4	GND		

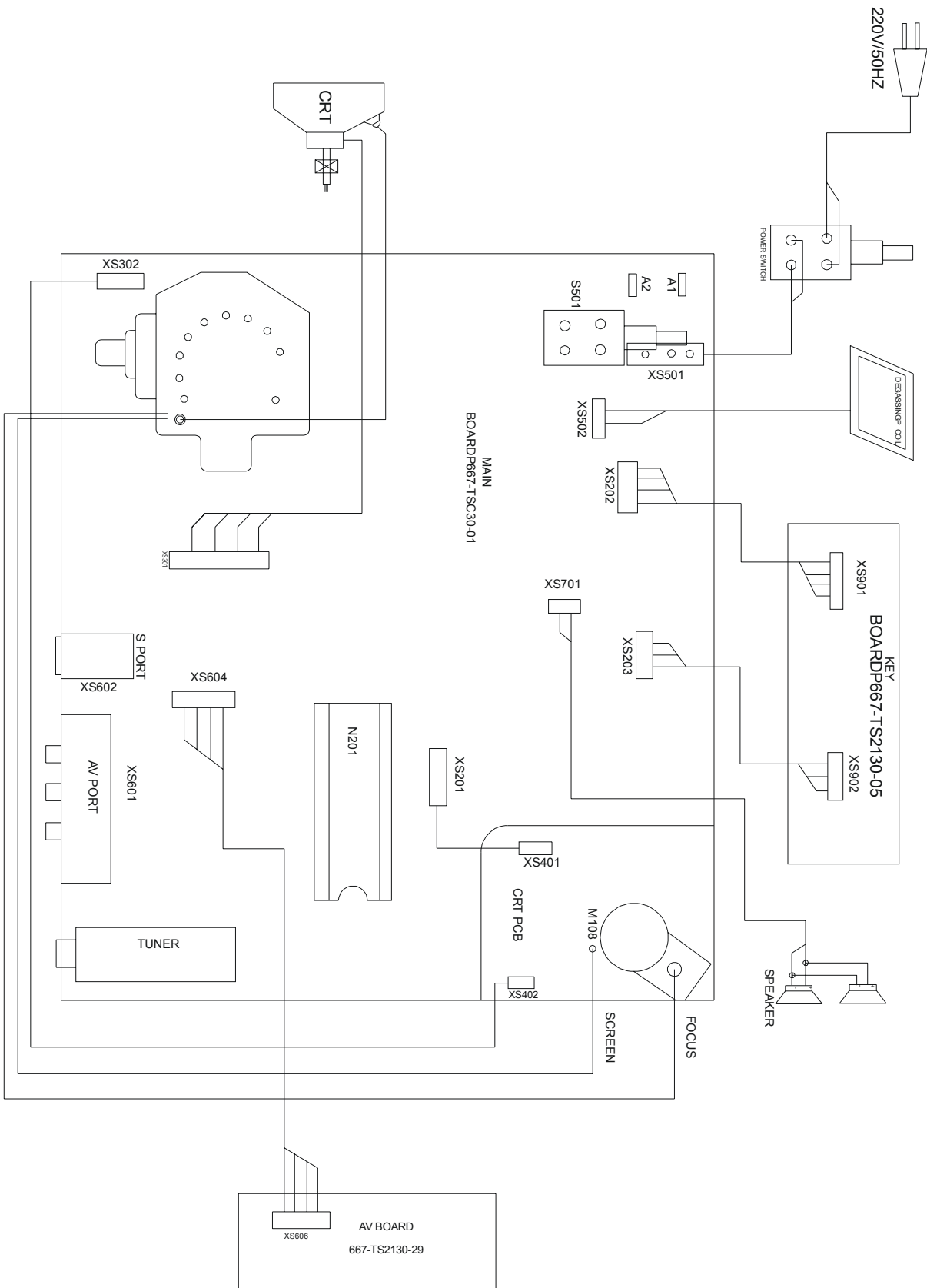
LA72700



pin	function	pin	function
1	AC coupling input	19	dbx RMS detection
2	AC coupling output	20	Dbx main signal V/I charge filter
3	Stereo VCO PLL filter	21	Decoupling filter
4	Pilot level check	22	AC coupling output
5	Signal input	23	AC coupling input
6	GND	24	ALC filter
7	SAP carrier level check	25	R output
8		26	L output
9	SIF decoupling filter	27	Reference voltage(DC3.8V)
10	mute(5V)	28	AC coupling input
11	Serial data input(SDA)	29	AC coupling output
12	Serial clock input (SCL)	30	Voltage regulation filter
13	Decoupling filter	31	VCC(9V)

14	Stereo detection sensitivity	32	Model output: MONO=0.9V SAP=2.0V STEREO=3.0V STEREO+SAP=3.8V
15	SAP detection sensitivity	33	Sub-carrier input(3.579545MHZ 200Mv)
16	dbx RMS detection	34	Filter adjustment check
17	Dbx broad band detection	35	Pilot dispel reference signal1
18	Dbx spectrum detection	36	Pilot dispel reference signal2

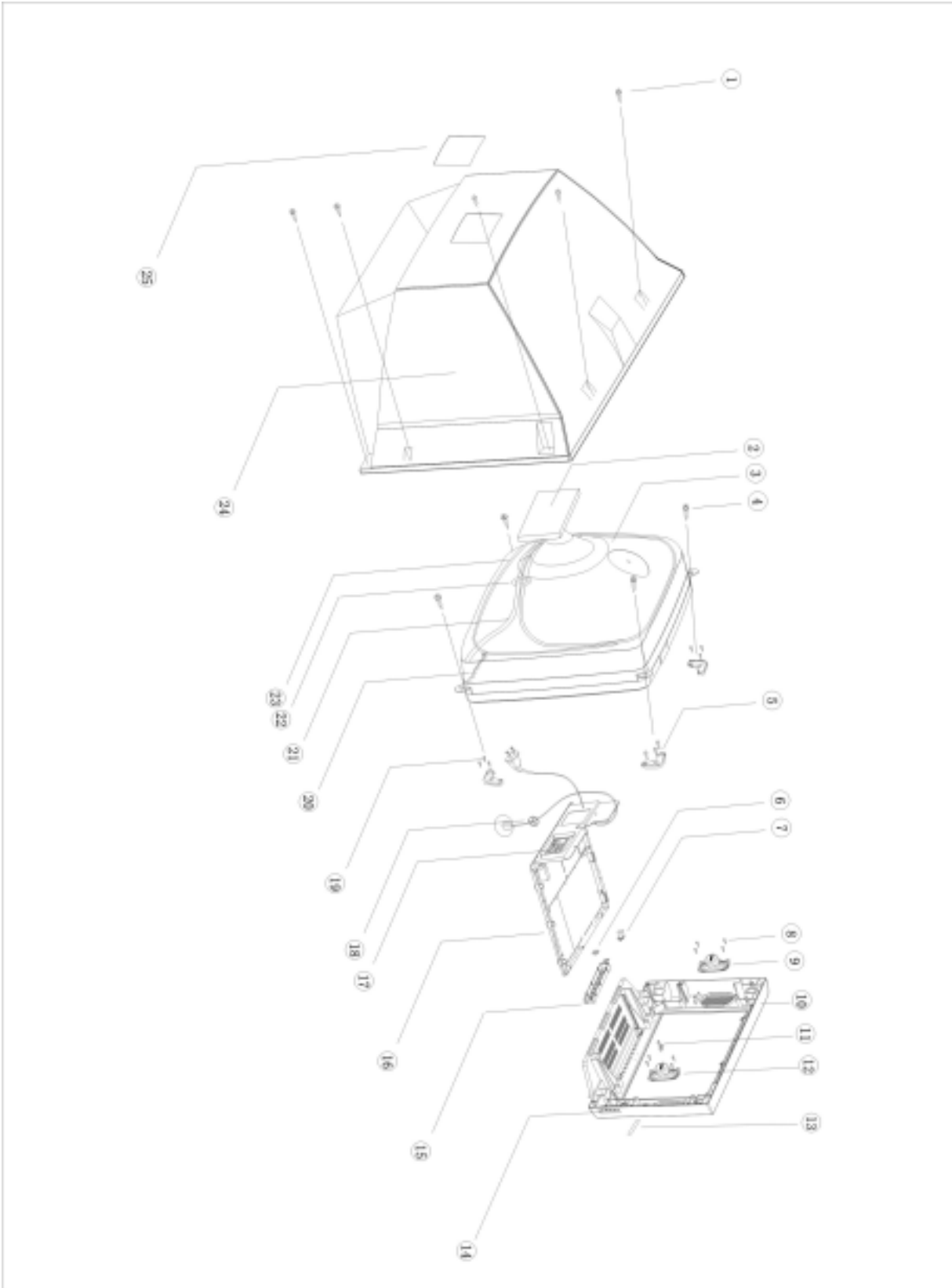
# WIRING DIAGRAM





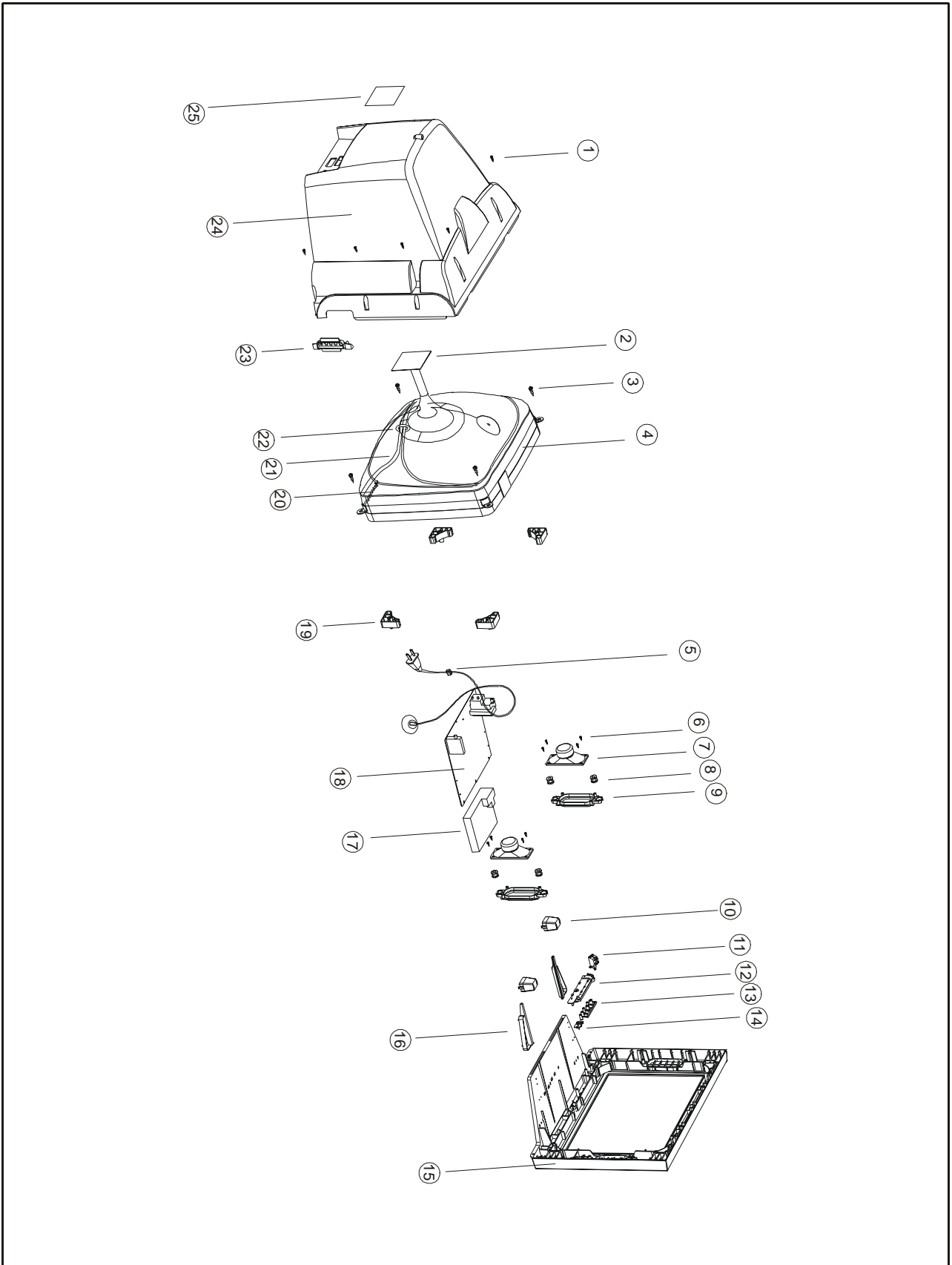
# Exploded views

TS1433



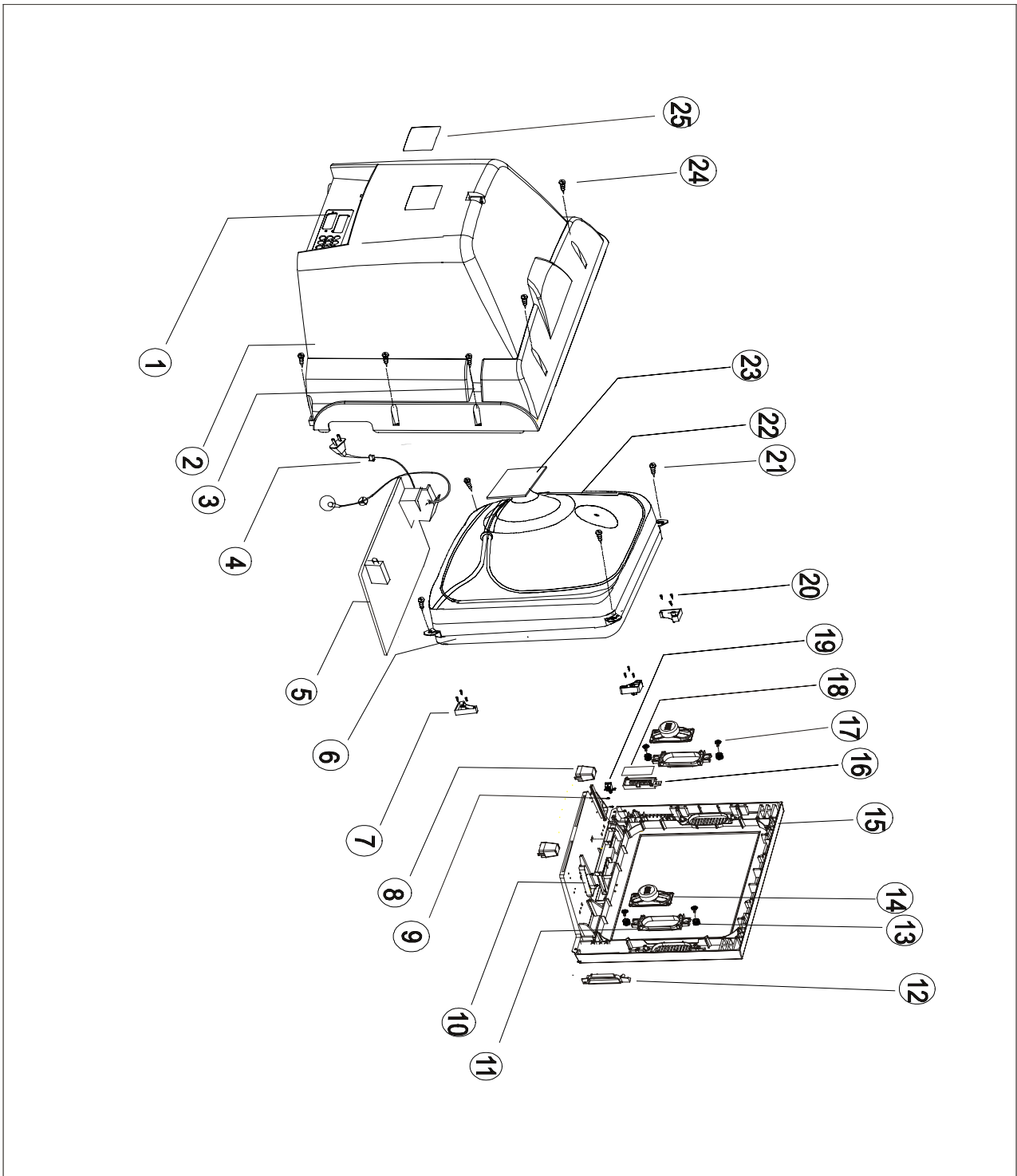
TS1433 exploded views list

<b>NO.</b>	<b>DESCRIPTION</b>	<b>NO.</b>	<b>DESCRIPTION</b>
1	SCREW	14	SIDE AV
2	CRT BOARD	15	BUTTON ASSY
3	CRT	16	MAIN BOARD ASSY
4	SCREW	17	REAR PANEL
5	CRT FIXER	18	THREDAD CLASP
6	LED COLUMN	19	SCREW
7	POWER SWITCH	20	BRAIDED PULLING SPRING
8	SCREW	21	DEGAUSSING COIL
9	SPEAKER	22	THREDAD CLASP
10	FRONT CABINET	23	BRAIDED PULLING
11	POWER KEY	24	HOLDER
12	SPEAKER	25	REAR CABINET
13	LOGO	26	LABEL



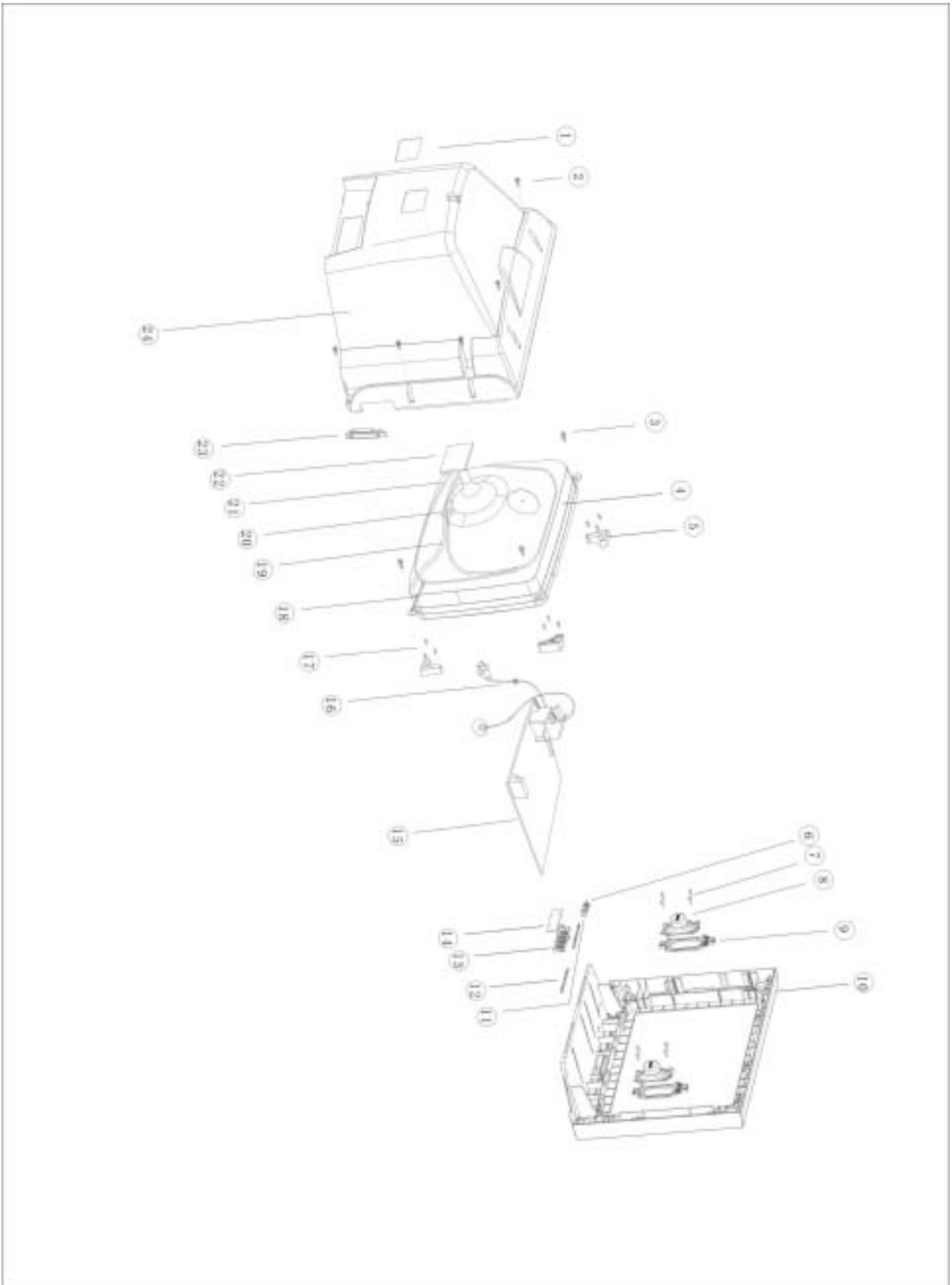
TS2026 exploded views list

<b>NO.</b>	<b>DESCRIPTION</b>	<b>NO.</b>	<b>DESCRIPTION</b>
1	SCREW	14	POWER KEY
2	CRT BOARD	15	FRONT CABINET
3	SCREW	16	SUPPORT
4	CRT	17	MAIN BOARD ASSY
5	THREDDAD CLASP	18	MAIN BOARD
6	SCREW	19	CRT FIXER
7	SPEAKER	20	BRAIDED PULLING SPRING
8	RUBBER WASHER	21	DEGAUSSING COIL
9	SPEAKER BRACKET	22	THREDDAD CLASP
10	SUPPORT	23	SIDE AV
11	LED COLUMN	24	HOLDER
12	SPEAKER	25	LABEL
13	BUTTON ASSY		



TS2050/TS2051 exploded views list

<b>NO.</b>	<b>DESCRIPTION</b>	<b>NO.</b>	<b>DESCRIPTION</b>
1	REAR PANEL	14	SPEAKER
2	BACK CABINET	15	FRONT CABINET
3	HOLDER	16	BUTTON
4	CLASP	17	SCREW
5	MAIN BOARD ASSEMBLY	18	BUTTON BOARD
6	CRT	19	POWER SWITCH
7	CRT FIXER	20	SCREW
8	CRT SUPPORT	21	SCREW
9	SCREW	22	DEGAUSSING COIL
10	MAIN BOARD LEADING TRACK	23	CRT BOARD
11	SPEAKER BRACKET	24	SCREW
12	AV BRACKET	25	LABEL
13	RUBBER WASHER		



TS2053/TS2055 exploded views list

<b>NO.</b>	<b>DESCRIPTION</b>	<b>NO.</b>	<b>DESCRIPTION</b>
1	LABEL	14	BUTTON BOARD
2	SCREW	15	MAIN BOARD
3	SCREW	16	POWER COIL
4	CRT	17	SCREW
5	CRT FIXER	18	BRAIDED PULLING SPRING
6	LIGHT-TOUCH SWITCH	19	BRAIDED PULLING
7	SCREW	20	THREDAD CLASP
8	SPEAKER	21	DEGAUSSING COIL
9	SPEAKER SUPPORT	22	CRT BOARD ASSY
10	FRONT CABINET	23	REAR CABINET
11	LED COLUMN	24	SIDE AV SUPPORT
12	DECORATION PIECE		
13	BUTTON		



WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION "SAFETY PRECAUTION" AND "COMPONENTS SAFETY NOTICE" ON PAGE 1 OF THIS MANUAL.

CAUTION: 1. The shaded areas makes in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with type identical to those in the original circuit or specified in the parts list. Before replacing any of these components, read carefully the COMPONENTS SAFETY NOTICE on page 1.  
2. Do not degrade the safety of the receiver through improper servicing.

### ELECTRICAL PARTS LIST FOR MAIN BOARD

	MAIN PCB	
782-TS2030-010A	MAIN PCB	
	FUSE	
569-13141-90	50TT3.15A/250VUL!	FU501
	POLYESTER CAPACITOR	
462-2B422-M0U	250VAC-0.22uF-M!	C501
462-83356-H0	CBB21-200V-0.056uF-J	C304
462-83433-H0	CBB21-200V-0.33uF-J	C339
462-88239-H0	CBB81-1600V-3900pF-J	C310
462-00315-H02	CL11-100V-0.015uF-J	C216
462-00322-H02	CL11-100V-0.022uF-J	C510
462-00333-H02	CL11-100V-0.033uF-J	C222
462-00347-K02	CL11-100V-0.047uF-K	C512
462-00410-K0	CL11-100V-0.1uF-K	C326
462-00410-K0	CL11-100V-0.1uF-K	C328
462-B0410-H02	CL21X-50V-0.1uF-J	C245
462-B0410-H02	CL21X-50V-0.1uF-J	C520
462-B0410-H0	CL21X-50V-0.1uF-J	C527
462-B0447-H02	CL21X-50V-0.47uF-J	C214
462-B0510-H02	CL21X-50V-1uF-J	C217
462-88256-H0	ECWH12H562JR	C311
462-2B410-M0U	MKP-300VAC-0.1UF-M!	C502
	CERAMIC CAPACITOR	
459-2110H-102	CC45-CH1H101JYR	C711
459-2110H-102	CC45-CH1H101JYR	C712
459-2110H-102	CC45-CH1H101JYR	C713
459-2110H-102	CC45-CH1H101JYR	C714
459-2015H-102	CC45-CH1H150JYR	C220
459-2015H-102	CC45-CH1H150JYR	C221
459-2022H-102	CC45-CH1H220JYR	C229
459-2127H-902	CC45-SL1H271JYR	C404
459-2127H-902	CC45-SL1H271JYR	C405
459-2127H-902	CC45-SL1H271JYR	C406

459-B147M-20U	CD11-B2GA471M-MYAS!	C524
459-B147M-20U	CD11-B2GA471M-MYAS!	C525
459-2210K-002	CK45-B1H102KYR	C333
459-5139K-002	CK45-B2H391KYR	C306
459-2310R-002	CK45-F1H103ZYZR	C103
459-2310R-002	CK45-F1H103ZYZR	C105
459-2310R-002	CK45-F1H103ZYZR	C106
459-2310R-002	CK45-F1H103ZYZR	C107
459-2310R-002	CK45-F1H103ZYZR	C108
459-2310R-002	CK45-F1H103ZYZR	C207
459-2310R-002	CK45-F1H103ZYZR	C210
459-2310R-002	CK45-F1H103ZYZR	C219
459-2310R-002	CK45-F1H103ZYZR	C224
459-2310R-002	CK45-F1H103ZYZR	C232
459-2310R-002	CK45-F1H103ZYZR	C237
459-2310R-002	CK45-F1H103ZYZR	C241
459-2310R-002	CK45-F1H103ZYZR	C244
459-2310R-002	CK45-F1H103ZYZR	C707
459-2310R-002	CK45-F1H103ZYZR	C709
459-2215K-002	CT1-06-2B4-63V-152K	C208
459-2233K-002	CT1-08-2B4-63V-332K	C511
459-2322R-002	CT1-10-2F4-63V-223Z	C202
459-2322R-002	CT1-10-2F4-63V-223Z	C205
459-2347R-002	CT1-14b-2E-63V-473Z	C231
459-5182K-002	DD06-999B812K500	C305
459-2410R-002	DD308-63F104Z50	C228
459-2410R-002	DD308-63F104Z50	C230
459-2410R-002	DD308-63F104Z50	C240
459-6147K-00	DE0705B471K1k	C514
459-8133K-00	DE0707B331K2K	C312
459-6215K-00	DE0905B152K1K	C508
459-8210K-00	DE0907B102K2K	C410
459-6247K-00	DE1205B472K1K	C503
459-6247K-00	DE1205B472K1K	C504
459-6247K-00	DE1205B472K1K	C505
459-6247K-00	DE1205B472K1K	C506
459-B222M-20	ECK-DNS222MEX!	C523
459-2120H-902	RBU06SL201J-H46CA	C252
459-5122K-002	RQC05B221K-6H46UA	C302
459-5168K-002	RQC06B681K-6H46UA	C315
459-5168K-002	RQC06B681K-6H46UA	C318
459-5168K-002	RQC06B681K-6H46UA	C323
459-5168K-002	RQC06B681K-6H46UA	C513
459-5168K-002	RQC06B681K-6H46UA	C515
459-2039H-102	CC45-CH1H390JYR	C201

459-2039H-102	CC45-CH1H390JYR	C203
459-2047H-102	CC45-CH1H470JYR	C226
	ELECTROLYTIC CAPACITOR	
464-04747-M0R	200USP470MA35	C507
464-6C710-M0	CD110-10V-100uF-M	C102
464-6C710-M02	CD110-10V-100uF-M	C209
464-6C710-M02	CD110-10V-100uF-M	C218
464-6C710-M0	CD110-10V-100uF-M	C225
464-6C722-M0	CD110-10V-220uF-M	C234
464-6C747-M02	CD110-10V-470uF-M	C250
464-6D810-M0	CD110-16V-1000uF-M	C519
464-6D810-M0	CD110-16V-1000uF-M	C703
464-6D710-M02	CD110-16V-100uF-M	C212
464-6D710-M02	CD110-16V-100uF-M	C322
464-6D710-M02	CD110-16V-100uF-M	C529
464-6D610-M02	CD110-16V-10uF-M	C325
464-6D610-M02	CD110-16V-10uF-M	C327
464-6D610-M02	CD110-16V-10uF-M	C407
464-6D610-M02	CD110-16V-10uF-M	C601
464-6D610-M02	CD110-16V-10uF-M	C602
464-6D610-M02	CD110-16V-10uF-M	C603
464-6D610-M02	CD110-16V-10uF-M	C604
464-6D610-M02	CD110-16V-10uF-M	C605
464-6D610-M02	CD110-16V-10uF-M	C607
464-6D610-M02	CD110-16V-10uF-M	C608
464-6D610-M02	CD110-16V-10uF-M	C609
464-6D610-M0	CD110-16V-10uF-M	C610
464-6D610-M02	CD110-16V-10uF-M	C611
464-6D610-M02	CD110-16V-10uF-M	C612
464-6D610-M02	CD110-16V-10uF-M	C613
464-6D610-M02	CD110-16V-10uF-M	C614
464-6D610-M02	CD110-16V-10uF-M	C705
464-6D610-M02	CD110-16V-10uF-M	C710
464-6D522-M02	CD110-16V-2.2uF-M	C704
464-6D722-M02	CD110-16V-220uF-M	C606
464-6D622-M02	CD110-16V-22uF-M	C211
464-6D733-M02	CD110-16V-330uF-M	C233
464-6D747-M02	CD110-16V-470uF-M	C319
464-6D647-M0	CD110-16V-47uF-M	C255
464-6E822-M0	CD110-25V-2200uF-M	C329
464-6F810-M0	CD110-35V-1000uF-M	C317
464-6F710-M02	CD110-35V-100uF-M	C332
464-6F747-M0	CD110-35V-470uF-M	C335
464-6F747-M0	CD110-35V-470uF-M	C521
464-60433-M02	CD110-50V-0.33uF-M	C227

464-60447-M02	CD110-50V-0.47uF-M	C236
464-60610-M0	CD110-50V-10uF-M	C104
464-60610-M02	CD110-50V-10uF-M	C324
464-60510-M02	CD110-50V-1uF-M	C204
464-60510-M02	CD110-50V-1uF-M	C239
464-60510-M02	CD110-50V-1uF-M	C242
464-60510-M02	CD110-50V-1uF-M	C243
464-60510-M02	CD110-50V-1uF-M	C247
464-60510-M02	CD110-50V-1uF-M	C248
464-60510-M02	CD110-50V-1uF-M	C249
464-60510-M02	CD110-50V-1uF-M	C706
464-60510-M0	CD110-50V-1uF-M	C708
464-60522-M02	CD110-50V-2.2uF-M	C223
464-60522-M02	CD110-50V-2.2uF-M	C238
464-60547-M02	CD110-50V-4.7uF-M	C101
464-60547-M02	CD110-50V-4.7uF-M	C330
464-60647-M02	CD110-50V-47uF-M	C509
464-30447-M02	CD11W-50V-0.47uF-M	C235
464-62710-M0	CD288-160V-100uF-M	C301
464-62710-M0	CD288-160V-100uF-M	C517
464-62547-M02	CD288-160V-4.7uF-M	C307
464-65633-M0	CD288-250V-33uF-M	C303
464-65547-M0	CD288-250V-4.7uF-M	C338
	POTENTIOMETER	
468-32107-00	EVND8A-A03-B13	RP501
	POWER FILTER	
477-20028-00U	LF21065	L501
	TUNER	
590-40707-00	115-B-8035AZ	T101
	DIODE	
340-00011-003	1N4002	VD308
340-00001-003	1N4148	VD401
340-00001-003	1N4148	VD402
340-00001-003	1N4148	VD403
340-00001-003	1N4148	VD502
340-00001-003	1N4148	VD506
340-00001-003	1N4148	VD510
340-00001-003	1N4148	VD512
340-00001-003	1N4148	VD601
340-00257-00	BYT56J	VD509
340-00079-00	FR103	VD304
340-00079-00	FR103	VD305
340-00079-00	FR103	VD306
340-00079-00	FR103	VD504
340-00079-00	FR103	VD505

340-00079-00	FR103	VD507
340-00010-00	S5295G	VD313
340-00005-003	S5295J	VD301
340-00291-00	TEU2YX	VD508
	FIXED COIL	
477-40031-00	LG750	L301
477-40031-00	LG750	L503
	IC	
352-78050-00	KA7805(M)	N503
352-04310-00	LM431A(M)	N504
352-24080-50	M24C08BN6	N202
352-40530-00	TC4053BP(M)	N601
352-06210-70	TLP621-GB(UL)(O)!	N502
352-05740-00	uPC574(D)	VD101
352-75220-00	AN7522N(M)	N701
352-07400-10	KA5Q0740RT	N501
352-76931-00	LA76931	N201
352-78040-70	LA78040N(D)	N301
	RELAY	
457-12019-90	JQX-14FF-012-1HS!	RL01
	METAL RESISTOR	
467-2E133-H0	1/2W-330Ω-JL	R317
467-2F210-H0	1W-1KΩ-JL	R315
467-2E001-H0	1/2W-1Ω-JL	R321
467-2D418-H03	1/4W-180K-J	R513
467-2D239-G0	1/4W-3.9K-G	R312
467-2D330-G0	1/4W-30K-G	R512
467-2D247-G03	1/4W-4.7K-G	R511
467-2D251-F03	1/4W-5.1K-F	R213
467-2D282-G0	1/4W-8.2K-G	R311
467-2G312-H0	2W-12kΩ-JL	R104
467-2G315-H0	2W-15kΩ-JL	R413
467-2G315-H0	2W-15kΩ-JL	R414
467-2G315-H0	2W-15kΩ-JL	R415
467-2G015-H0	2W-15Ω-JL	R520
467-2G291-H0	2W-9.1kΩ-JL	R301
467-2H239-H0D	3W-3.9kΩ-JL	R332
	CRYSTAL	
329-33204-00	32.768K	G201
329-54401-00	JA184.433619MHZ	G202
	TRANSISTOR	
343-10150-104	2SA1015YPr2.5	V202
343-10150-104	2SA1015YPr2.5	V501
343-18150-104	2SC1815-Y	V201
343-18150-104	2SC1815-Y	V303

343-18150-104	2SC1815-Y	V503
343-18150-104	2SC1815-Y	V504
343-18150-104	2SC1815-Y	V505
343-18150-104	2SC1815-Y	V507
343-26880-20	2SC2688L	V401
343-26880-20	2SC2688L	V402
343-26880-20	2SC2688L	V403
343-27170-004	2SC2717	V101
343-01800-00	KSE180TO-126	V502
343-23830-604	2SC2383-0	V301
343-21400-00	TT2140	V302
	SWITCHING TRANSFORMER	
470-00361-00U	SR4039C!	T501
	FUSIBLE RESISTOR	
467-4FB33-H0	1W-0.33Ω-JL	J046
467-4FB33-H0	1W-0.33Ω-JL	R308
467-4F010-H0	1W-10Ω-JL	R304
467-4FA24-H0	1W-2.4Ω-JL	R306
467-4F001-H0	1W-1Ω-JL	R307
467-4FA33-H0	1W-3.3Ω-JL	R419
	THERMISTOR	
469-40004-00	5D2-14LC	R502
469-10023-00	96708(9Ω)	RT501
	PEAKING COIL	
471-2068K-10	LGA0410-68uH-K	L102
471-2022K-003	SPT0305-220K-5	L201
471-2022K-003	SPT0305-220K-5	L202
471-2027K-003	SPT0305-270K-5	L203
471-2027K-003	SPT0305-270K-5	L204
471-2B56K-003	SPT0305-R56K-5	L101
	SAW FILTER	
458-07009-00	M1859M	Z201
	SOLID RESISTOR	
467-8E522-H0A	1/2W-2.2M-J!	R501
467-8E227-H0A	1/2W-2.7KΩ-J!	R416
467-8E227-H0A	1/2W-2.7KΩ-J!	R417
467-8E227-H0A	1/2W-2.7KΩ-J!	R418
467-8E422-H0	1/2W-220KΩ-JL!	R504
467-8E582-H0A	1/2W-8.2MΩ-J!	R509
	CARBON RESISTOR	
467-1C212-H03	1/6W-1.2K-J	R106
467-1C212-H03	1/6W-1.2K-J	R410
467-1C215-H03	1/6W-1.5K-J	R318
467-1C218-H03	1/6W-1.8K-J	R708
467-1C410-H03	1/6W-100K-J	R101

467-1C410-H03	1/6W-100K-J	R344
467-1C410-H03	1/6W-100K-J	R527
467-1C410-H03	1/6W-100K-J	R614
467-1C410-H03	1/6W-100K-J	R615
467-1C410-H03	1/6W-100K-J	R617
467-1C410-H03	1/6W-100K-J	R618
467-1C110-H03	1/6W-100Ω-J	R102
467-1C110-H03	1/6W-100Ω-J	R103
467-1C110-H03	1/6W-100Ω-J	R108
467-1C110-H03	1/6W-100Ω-J	R110
467-1C110-H03	1/6W-100Ω-J	R218
467-1C110-H03	1/6W-100Ω-J	R219
467-1C110-H03	1/6W-100Ω-J	R224
467-1C110-H03	1/6W-100Ω-J	R228
467-1C110-H03	1/6W-100Ω-J	R232
467-1C110-H03	1/6W-100Ω-J	R235
467-1C110-H03	1/6W-100Ω-J	R401
467-1C110-H03	1/6W-100Ω-J	R404
467-1C110-H03	1/6W-100Ω-J	R407
467-1C310-H03	1/6W-10K-J	R204
467-1C310-H03	1/6W-10K-J	R206
467-1C310-H03	1/6W-10K-J	R226
467-1C310-H03	1/6W-10K-J	R236
467-1C310-H03	1/6W-10K-J	R325
467-1C310-H03	1/6W-10K-J	R514
467-1C310-H03	1/6W-10K-J	R515
467-1C310-H03	1/6W-10K-J	R516
467-1C310-H03	1/6W-10K-J	R518
467-1C310-H03	1/6W-10K-J	R521
467-1C310-H03	1/6W-10K-J	R523
467-1C310-H03	1/6W-10K-J	R707
467-1C310-H03	1/6W-10K-J	R710
467-1C310-H03	1/6W-10K-J	R713
467-1C310-H03	1/6W-10K-J	R714
467-1C010-H03	1/6W-10Ω-J	R309
467-1C010-H03	1/6W-10Ω-J	R507
467-1C312-H03	1/6W-12K-J	R310
467-1C312-H03	1/6W-12K-J	R327
467-1C415-H03	1/6W-150K-J	R225
467-1C415-H03	1/6W-150K-J	R343
467-1C115-H03	1/6W-150Ω-J	R107
467-1C315-H03	1/6W-15K-J	R241
467-1C315-H03	1/6W-15K-J	R619
467-1C118-H03	1/6W-180Ω-J	R211
467-1C210-H03	1/6W-1K-J	R202

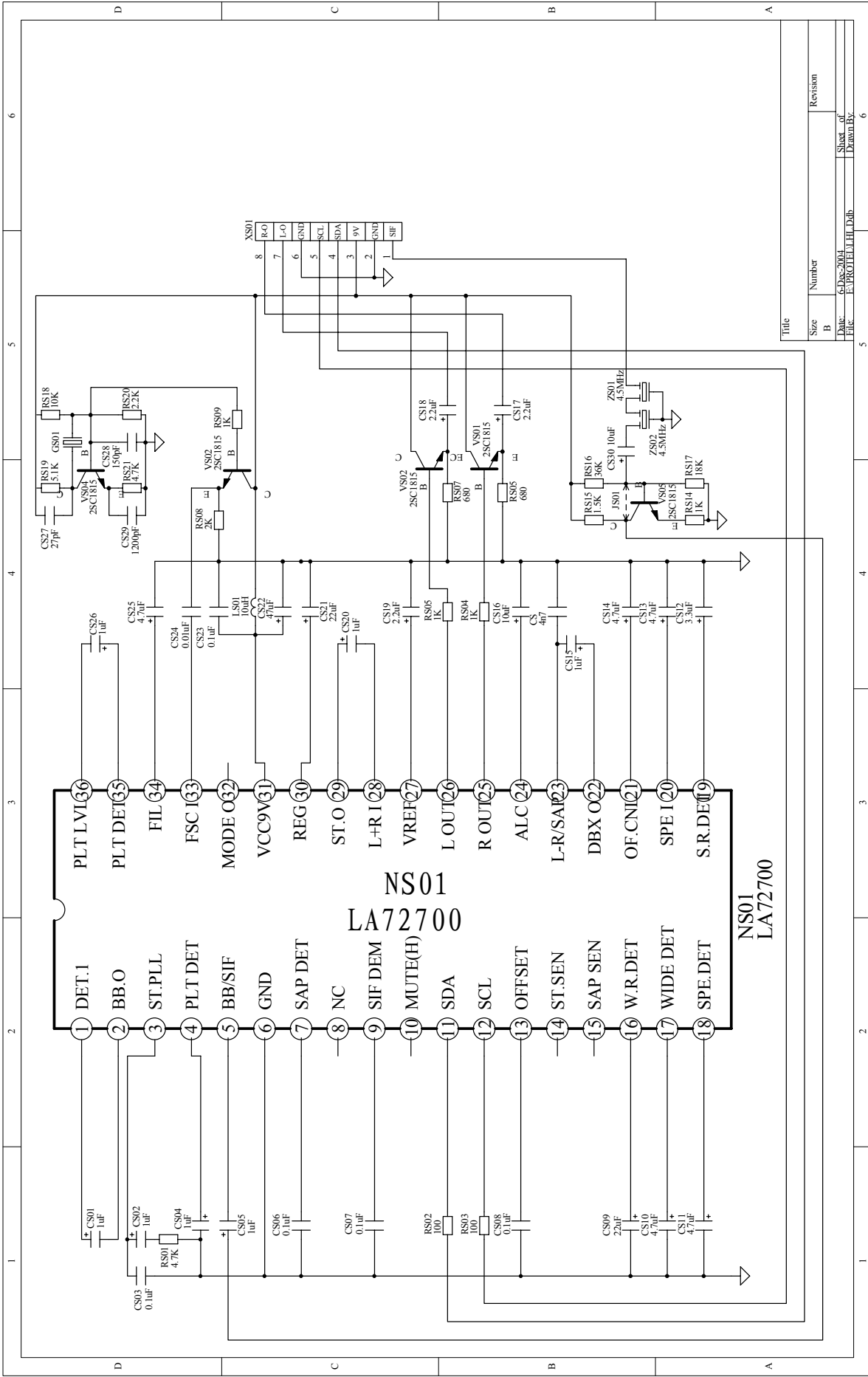
467-1C210-H03	1/6W-1K-J	R305
467-1C210-H03	1/6W-1K-J	R508
467-1C210-H03	1/6W-1K-J	R605
467-1C210-H03	1/6W-1K-J	R606
467-1C210-H03	1/6W-1K-J	R607
467-1C210-H03	1/6W-1K-J	R608
467-1C210-H03	1/6W-1K-J	R612
467-1C210-H03	1/6W-1K-J	R613
467-1C210-H03	1/6W-1K-J	R709
467-1C510-H03	1/6W-1M-J	R223
467-1C222-H03	1/6W-2.2K-J	R205
467-1C320-H03	1/6W-20K-J	R227
467-1C320-H03	1/6W-20K-J	R320
467-1C322-H03	1/6W-22K-J	R214
467-1C322-H03	1/6W-22K-J	R215
467-1C322-H03	1/6W-22K-J	R216
467-1C322-H03	1/6W-22K-J	R217
467-1C322-H03	1/6W-22K-J	R220
467-1C322-H03	1/6W-22K-J	R243
467-1C322-H03	1/6W-22K-J	R319
467-1C324-H03	1/6W-24K-J	R229
467-1C324-H03	1/6W-24K-J	R230
467-1C324-H03	1/6W-24K-J	R510
467-1C027-H03	1/6W-27Ω-J	R109
467-1C239-H03	1/6W-3.9K-J	R522
467-1C133-H03	1/6W-330Ω-J	R203
467-1C133-H03	1/6W-330Ω-J	R326
467-1C333-H03	1/6W-33K-J	R328
467-1C033-H03	1/6W-33Ω-J	R303
467-1C439-H03	1/6W-390K-J	R207
467-1C439-H03	1/6W-390K-J	R222
467-1C139-H03	1/6W-390Ω-J	R403
467-1C139-H03	1/6W-390Ω-J	R406
467-1C139-H03	1/6W-390Ω-J	R409
467-1C339-H03	1/6W-39K-J	R201
467-1C230-H03	1/6W-3K-J	R212
467-1C230-H03	1/6W-3K-J	R517
467-1C243-H03	1/6W-4.3K-J	R610
467-1C243-H03	1/6W-4.3K-J	R611
467-1C247-H03	1/6W-4.7K-J	R210
467-1C247-H03	1/6W-4.7K-J	R313
467-1C247-H03	1/6W-4.7K-J	R402
467-1C247-H03	1/6W-4.7K-J	R405
467-1C247-H03	1/6W-4.7K-J	R408
467-1C147-H03	1/6W-470Ω-J	R505



467-1C147-H03	1/6W-470Ω-J	R519
467-1C347-H03	1/6W-47K-J	R237
467-1C347-H03	1/6W-47K-J	R238
467-1C256-H03	1/6W-5.6K-J	R105
467-1C051-H03	1/6W-51Ω-J	R208
467-1C156-H03	1/6W-560Ω-J	R231
467-1C156-H03	1/6W-560Ω-J	R234
467-1C156-H03	1/6W-560Ω-J	R240
467-1C268-H03	1/6W-6.8K-J	R524
467-1C268-H03	1/6W-6.8K-J	R525
467-1C268-H03	1/6W-6.8K-J	R528
467-1C268-H03	1/6W-6.8K-J	R620
467-1C268-H03	1/6W-6.8K-J	R711
467-1C268-H03	1/6W-6.8K-J	R712
467-1C468-H03	1/6W-680K-J	R233
467-1C168-H03	1/6W-680Ω-J	R506
467-1C368-H03	1/6W-68K-J	R242
467-1C275-H03	1/6W-7.5K-J	R330
467-1C175-H03	1/6W-750Ω-J	R209
467-1C175-H03	1/6W-750Ω-J	R239
467-1C075-H03	1/6W-75Ω-J	R601
467-1C075-H03	1/6W-75Ω-J	R602
467-1C075-H03	1/6W-75Ω-J	R603
467-1C075-H03	1/6W-75Ω-J	R604
467-1C075-H03	1/6W-75Ω-J	R609
467-1C075-H03	1/6W-75Ω-J	R616
467-1C075-H03	1/6W-75Ω-J	R621
467-1C075-H03	1/6W-75Ω-J	R622
467-1C282-H03	1/6W-8.2K-J	R715
467-1C282-H03	1/6W-8.2K-J	R716
467-1D227-H03	RT14-1/4W-2.7K-J	R302
467-1D251-H0	RT14-1/4W-5.1K-J	R526
	ZENER DIODE	
340-50470-003	HZ5B1	VD503
340-50520-003	HZ5C3	VD201
340-50520-003	HZ5C3	VD309
340-50560-003	HZ6B1	VD202
340-50560-003	HZ6B1	VD203
340-50560-003	HZ6B1	VD204
340-50560-003	HZ6B1	VD513
340-50750-003	HZ7C2	VD307
340-51260-003	HZ12B1	VD515
340-50240-003	HZ2C2	VD514
	CRT SOCKET	
364-58210-00	GZS10-2-102G!	XS403

	WIRE ROUND RESISTOR	
467-6F001-H0	RX21-1-1Ω-J	R324
HORIZONTAL DRIVE TRANSFORMER		
472-10001-00	XR0961	T302
	FBT	
472-24209-00U	BSC24-3050!	T301
	LINERITY COIL	
477-00065-00	HL1830H-X13	L302
	RECTIFIER	
340-80022-00	T2SB60	VD501
	BUTTON PCB	
782-TS2153-0500	BUTTON PCB	
	TACT SWITCH	
360-10001-00	KFC-A06-4X4.5X5B	SW901
360-10001-00	KFC-A06-4X4.5X5B	SW902
360-10001-00	KFC-A06-4X4.5X5B	SW903
360-10001-00	KFC-A06-4X4.5X5B	SW904
360-10001-00	KFC-A06-4X4.5X5B	SW905
360-10001-00	KFC-A06-4X4.5X5B	SW906
	CARBON RESISTOR	
467-1C210-H0	1/6W-1K-J	R902
467-1C222-H0	1/6W-2.2K-J	R903
467-1C233-H0	1/6W-3.3K-J	R904
467-1C247-H0	1/6W-4.7K-J	R905
467-1C282-H0	1/6W-8.2K-J	R906
467-1C312-H0	1/6W-12K-J	R907
467-1C420-H0	1/6W-200K-J	R909
	IR RECEIVE PCB	
782-TS2153-0900	IR RECEIVE PCB	
	ELECTROLYTIC CAPACITOR	
464-6D647-M0	CD110-16V-47μF-M	C901
	DIODE	
340-00001-00	1N4148	VD902
	LED	
340-10039-20	HFR205(RED )	VD901
	IC	
352-38060-60	HRM138BB3006(M)	N901
	CARBON RESISTOR	
467-1C210-H0	1/6W-1K-J	R911
467-1C047-H0	1/6W-47Ω-J	R913
	POWER CARD	
491-702D0-02	UL!	

	CRT	
335-21234-00U	A51QDX993X001H!	



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