COLOR TELEVISION

SERVICE MANUAL

TK2426

Note: This service manual is only for professional service personnel's reference. Before servicing the unit, please read the following items carefully.

1 safety instruction

1.1 X-RAY radiation precaution

1.1.1 Excessive voltage will cause harmful X-ray. To avoid this radiation hazard, the high voltage should fall within the limitation. The appliance works at AC 120V, 60Hz. The high voltage of zero beam current should be within 29.0kV on condition that the main power (B+) voltage is AC135V. And it should not exceed 30kV in any condition.

* Keep the main power voltage at 135V when checking the high voltage.

1.1.2 The primary source of X-RAY RADIATION is the CRT. The CRT of this TV set have gotten the approval of safety authentication inspection. The replacement CRT should be exactly the same type and specification CRT which has gotten a similar safety approval, and check the high voltage according to the HIGH VOLTAGE CHECK procedure.

1.2 safety precaution

a. Since the power supply circuit of this receiver is directly connected to the AC power line, an isolation transformer is necessary during dynamic service to avoid possible shock hazard.

b. Always discharge the graphite layer conductor when moving the CRT.

c. Disconnect the power cord before replacing parts.

d. When replacing high-power resistor, keep the resistor 10 mm away from the circuit board.

1.3 Component safety precaution

Many electrical and mechanical parts in the chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection. Replacement parts which have these special safety characteristics are identified in this manual and its supplement electrical components having such features are shaded or marked by ⚠ 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 characteristic as specified in the parts list may create shock, fire, X-RAY RADIATION or other hazards.

2.General instruction

2.1 Copy the standard model data to let EEPROM of the chassis have those data before placing it on the unit, do "factory adjustment" if necessary. If use a blank EEPROM directly, you should preset IIC data and then do other common adjustment. Refer to TABLE1 to preset EEPROM.

2.2 the adjustment should be done under following circumstances without additional instruction

a) Alternating current 120V/60Hz

b) Preheat at least 30 min

2.3The unit has auto degaussing circuit, the auto degaussing process can be finished within 1s when the main power. only when turn on the unit at least 30min after last time turn off TV does the auto degaussing circuit work.

2.4 If the CRT with magnetism affects color purity and convergence, when the auto degaussing eraser. if the color purity and convergence are still not very good, then corresponding adjustment should be done. Refer to picture tube adjustment method for adjustment.

3 Alignment instruction

3.1 Debugging item

a)adjust mode instruction

b)B+ voltage adjustment

c)RFAGC voltage adjustment

d)focus adjustment

e)Screen-grid voltage white balance, sub brightness adjustment

f)filed scan center, line , amplitude adjustment

g)H-scan center adjustment

3.2 Alignment flow

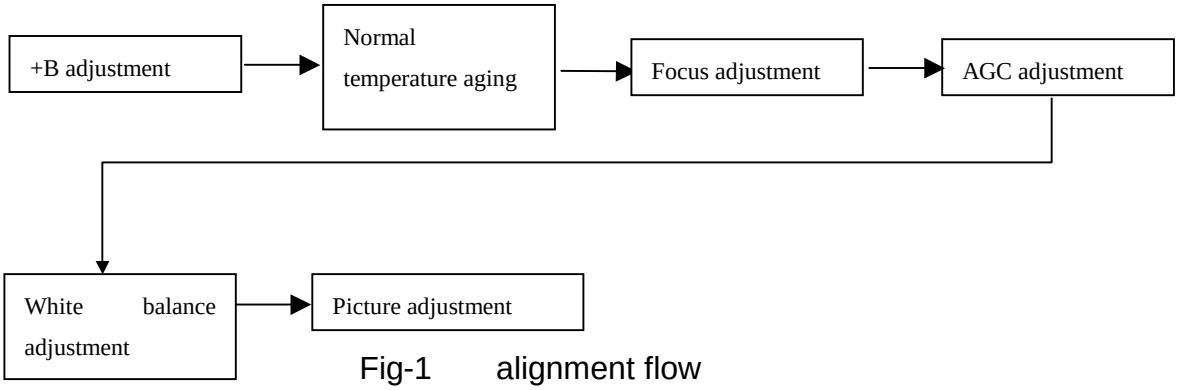


Fig-1 alignment flow

3.3 Enter/exit factory adjustment method

Use remote control, press “MENU” button, then press 6483,”M”will appear on screen to show that you have entered the factory adjustment method, press “STANDBY” to exit it.

3.4 Select adjustment item and adjust data

After entering factory adjustment mode, press 1-4 number buttons to select menu1- menu4; To enter into MENU0~MENU5, press “CHILD LOCK” button and then the number button (5~0) to enter into relative menus. Press “P+” and “P-” to select and “V+” and “V-”to adjust.

4 Alignment method

4.1 B+ voltage adjustment

a) connect B+ point with a digital voltmeter to measure the negative pole of VD524

b) receive PHILIPS test pattern signal and set the picture to standard.

c) Adjust VR501 to let the value of B+ voltage be 135 V ±0.5 V (yongxin super pure flat)

4.2 AGC adjustment

a) receive VHF-H band,60 dB RF signal.

b) Select factory menu2 of “AGC”.

c) Press “V+”,”V-”to let voltage value of tuner pin AGC be 3.8 V ± 0.1 V(DC).(if the selected tuner is changed, then the voltage of AGC should be measured again: receive VHF-H band and 60 dB RF signal, adjust AGC-TOP to let the picture just without noisy, then the voltage of tuner AGC is the required value for adjustment.)

d) exit factory menu

4.3 Normal temperature aging

a) do not receive signals.

b) under ”M” condition, set the accelerator to an appropriate point for aging.

4.4 Accelerator adjustment

a) do not receive signals;

b) select “SC” of factory menu3 to let the field scanning stop working.

c) adjust acceleration potentiometer to let bright lines just appears on screen.

d) exit SC menu.

4.5 High voltage check

Note: the main power voltage (B+=135 V)can affect the high voltage directly, so be sure to let the B+ power voltage accurate. Under any state, the high voltage should not exceed 30 kV.

a) connect an accurate high voltage meter between the second anode cap of picture tube and ground.

b) turn on TV and receive testing card signal.

c) set picture to standard, the high voltage should be 27 kV± 1 kV.

d) the high voltage should not exceed 30KV with minimum brightness and contrast.

4.6 Focus adjustment

a) receive PHILIPS signal

b) adjust focus electrode potentiometer on FBT to optimize B area focus of screen.

4.7 White balance adjustment (color temperature 12000°K± 8MPCD,X=0.270± 0.008,Y=0.283± 0.008)

a) receive full white signal

b) select factory menu3

c) on the basis of blue, adjustment RD,GD of M3, let to white balance coincide with standard.

4.8 Filed scanning adjustment (fig-2)

a) receive PAL of PHILIPS test pattern signal.

b) select factory menu1

c) adjust V-SLOPE menu to let the horizontal center line of test pattern above blanking.

d) select V-SHIFT menu and adjust to let the vertical center of picture coincide with vertical center of picture tube.

e) Select V-SIZE menu and adjust to let the vertical reproduction ratio of picture acceptable.

f) Adjust V.SC to optimise the vertical S correction of picture.

g) Receive NTSC PHILIPS test pattern and readjust the above items.

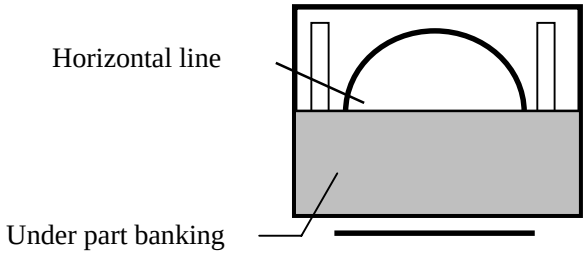


Fig-2 field scan adjustment

4.9 Horizontal scanning adjustment (Fig-3)

a) Receive PAL PHILIPS signal

b) Select factory menu1

c) Select H.SHIFT menu and adjust to let the scanning horizontal center coincide with mechanical center of picture tube

d) Exit M3 menu

e) Adjust VR433 to let horizontal reproduction ration of picture acceptable

f) Adjust VR432 to minimize left-right edge pincushion distortion of picture

g) Adjust VR431 to minimize trapezoidal distortion

h) Exit factory menu

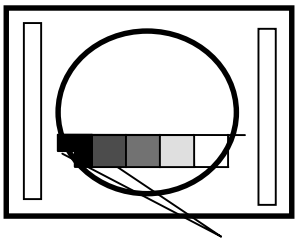


Fig-3 line scan adjustment

4.10 Sub-brightness adjustment

a) Receive PAL-D/K PHILIPS signal

b) Select “SB” of factory menu3

c) Adjust “SB” to let things between the sixth and seventh grey scale clear

4.11 OSD adjustment

a) Receive PAL-D/K PHILIPS signal

b) Select OSD H and OSD V of factory menu4. Adjust OSD H and OSD V to let OSD at a specified place.

c) Exit factory menu

4.12 Degaussing

a) The unit has and auto degaussing circuit, the degaussing circuit works several seconds after turning on TV

b) If you want to move TV or change the direction, turn off TV and ten minutes later the degaussing circuit will work

c) For better degaussing effect, you can use magnetic eraser

d) Move the magnetic eraser clockwise before your TV, when it is 2m away from your TV, turn off the magnetic eraser. If the effect is still not very good, you can adjust “color purity” and “convergence”

4.13 Color purity correction

a) Turn on your TV

b) At least 15 minutes later, use anti-magnetized coil for degaussing

c) Obtain maximum brightness and contrast

d) Select factory menu3 and adjust to let R and B be zero, then let only green raster appear on the screen at the moment

e) Loosen screws of deflection yoke frame to let vertical green belt appear on screen only

f) Move the rubber wedge

g) Rotate along neck of picture tube and slide color-purity magnets until the green belt at the middle of screen and is vertical at the same time

h) Slowly move the deflection yoke backward of forward until the whole green raster appears on screen, tighten the screws of the deflection yoke

i) Check the color purity of red raster and blue raster

j) Adjust white balance again to obtain white raster

4.14 Convergence correction

4.14.1 Central convergence correction

a) Turn on your TV

b) At least 15 minutes later, receive square test pattern signal
c) Adjust brightness and contrast to get the best picture
d) Adjust the angle of two tetrode magnetic rings to let the red vertical line coincide with the blue vertical line at middle of screen
e) Keep the angle unchanged, move the two tetrode magnetic rings at the same time to let the red and blue horizontal lines coincide at middle of screen
f) Adjust two hexode magnetic rings to let the green line coincide with the mixed line of red and blue. Adjust the angle between them will affect the vertical line, move them together will affect the horizontal line.
g) Repeat d), e), f) and observe the movement of red, green and blue.

4.14.2 Ambient convergence correction

a) Turn on your TV
b) At least 15 minutes later, loosen the screws of the deflection yoke
c) Fixate the rubber wedge temporarily under the deflection yoke
d) Move the deflection yoke upward or downward to get best convergence, push the rubber wedge into space between picture tube and deflection yoke to fixate the deflection yoke temporarily
e) Place the rubber wedge whose overlay paper has been removed at the bottom space
f) Move the deflection yoke left and right to get best convergence
g) Keep the condition unchanged, place another rubber wedge whose overlay paper has been removed also at the upper space at the same time
h) Remove the interim rubber wedge, adhere it to picture tube and deflection yoke
i) After placing three rubber wedges, check all the convergence again
j) Stick three transparent viscous belts to the rubber wedge

Chart 1 **I^2C TDA (NOM)8377-B-6NA** E^2PROM pre-set data

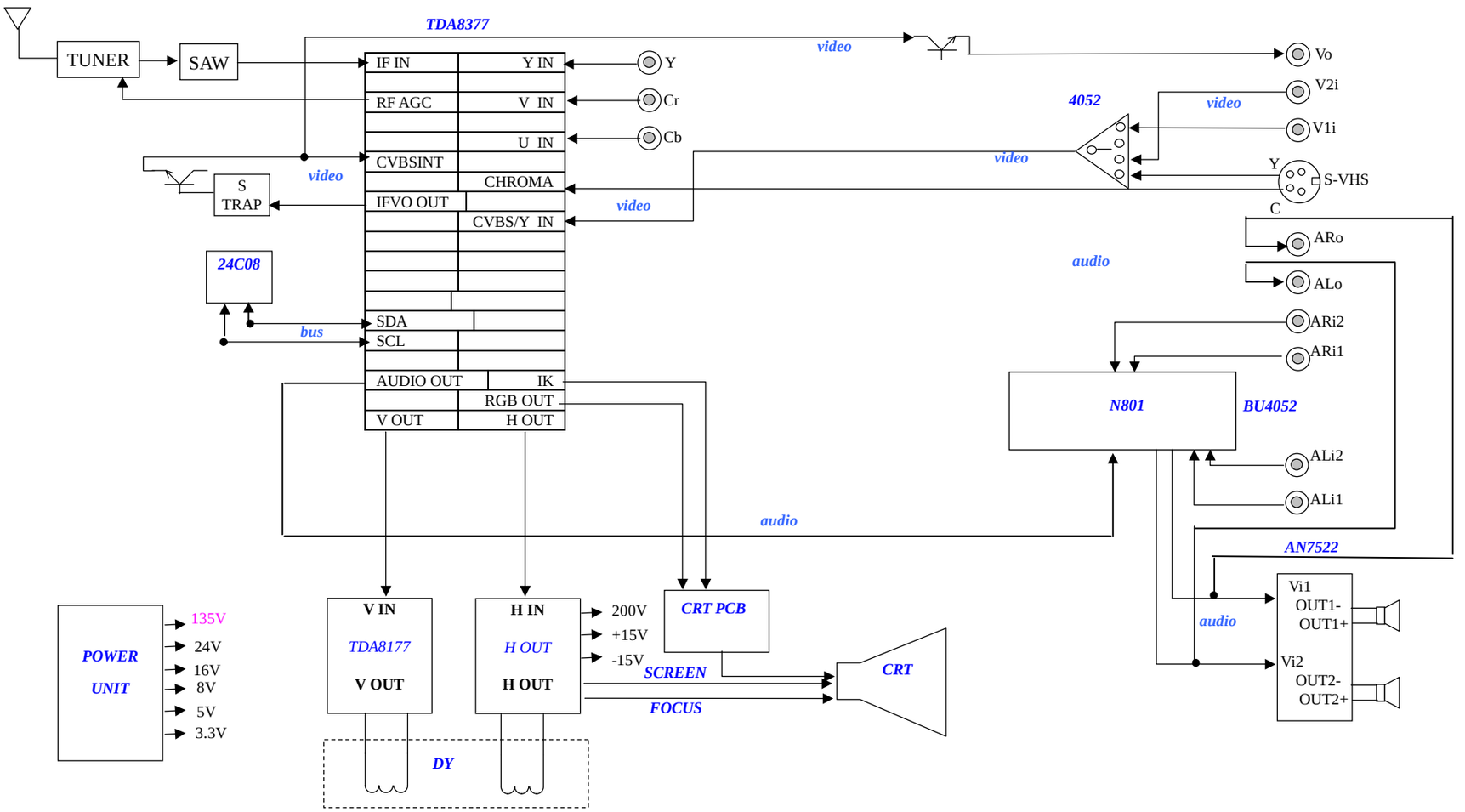
I^2C standard UOC for export bus control adjustment item default setting

MI	Items	Variable	Preset
M0	SUBCON		56(sub-contrast)
	SUBCOL		56(sub-chroma)
	SUBSHP		48(sub-acutance)
	SUBTINT		31(sub-hue)
M1	V.SLOPE		34(field center adjustment)
	V.SHIFT		27(field point adjustment)
	V.SIZE		36(field amplitude adjustment)
	V.SC		32(field line)
	HSHIFT		32(line point adjustment)
	PROGRAMA.NO		2(channel)
M2	AGCTAKEOVER		24(AGC adjustment)
	SHIPPING		0(leave factory set)
M3	BT		75(adjust white balance of brightness)

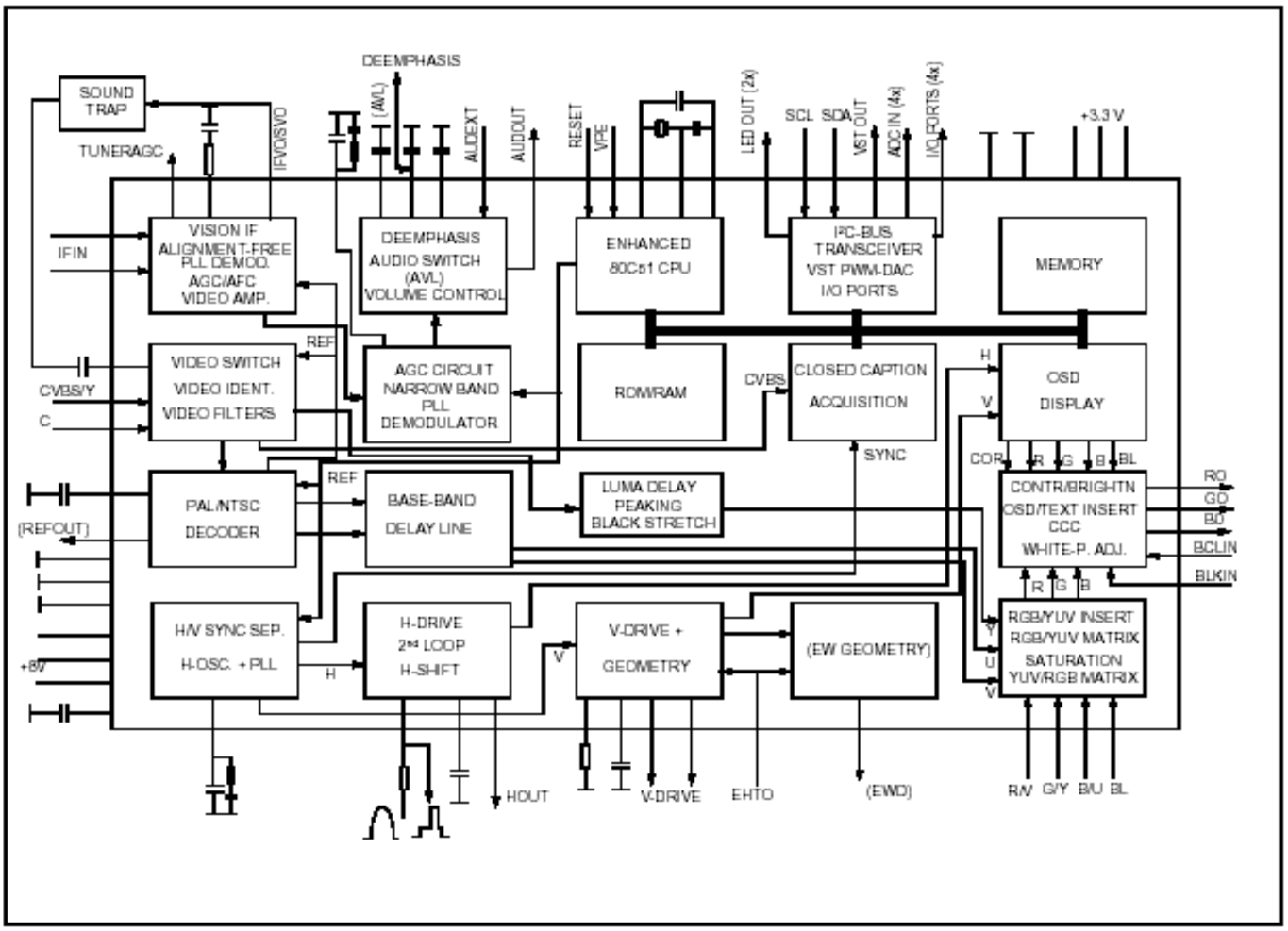
	CT		75(adjust white balance of brightness contrast)
	SC		OFF
	RB		32(red cut off level adjustment)
	GB		32(green cut off level adjustment)
	RD		32(red cut off level adjustment)
	GD		32(green cut off level adjustment)
	BD		32(blue cut off level adjustment)
	SB		40(sub brightness adjustment)
M4	OSD.V.POSITION		10(OSD position)
	OSD.H.POSITION		5(OSD H-position)
	BTSC-MODE		MONO(STEORO,SAP)
	BTSC-ST		13
	BTSC-SP		12
	BTSC-L1		1
	BTSC-A1		15
	BTSC-A2		0
	BTSC-TC		0
	BTSC-STS		0
	BTSC-ADJ		
MI	Items	Variable	Preset
M5	MODE		STANADARD(standard, soft, floweriness)
	BRIGHT		75
	CONTRAST		75
	COLOR		50
	SCBRIGHT		20
	YDELAYTV		12
	YDELAYAV		12
M6	OSO		1(field over-scan switch)
	AGCSPEED		1(AGC of speed)
	FFI		0(IF PLL SPEED)
	FMWS		1(frequency range of sound OFF=225KHZ,ON=450KHZ)
	RP0		0(pre-shock and over-shock scale)
	NTSCMATRIX		USA
	VOLPIN		0(1:push-pull output; 0: OC gate output.)
	SOFT CLIP		3(white level limit)
	PEAK WHITE		15(peak white limit)
	CORING		0(coring noise reduction)
M7	AV2		1
	SVHS		1
	YUV		1

	VOLADJPOING		1(volume value have:1,25,50,75)
	VOLVALUE		20(volume curve value:20,60,75,90)
M8	CATHOOELEVEL		7(cathode level)
	UOCVOLUME		0(0:PWM terminal control; 1:UOC sound amplitude control of inside)
	FMATT		45(UOC sound output of amplitude) BTSC : 38
	COMBFILTRE		0(N comb filter)
	HEADPHONE		0(earphone function selection)
	VM OPTION		0(VM function selection)
	FRANCE		1 French
	SPANISH		1 Spaish
	POTUGUES		1 Portuguese
M9	NOM8377-B-6NA		
	STARTON		2(turn on)
	STARTTIME		8(turn on time)
	IF OFFSET		32(IF compensate)
	TUNER OPTION		0(BXATB011F---X/ BXATB108F---K) 1 (BXATB017F---K) 2(XXX)

Block diagram



MAIN IC 8377:



ICs functional description

UOC TDA8377

SYMBOL	PIN	DESCRIPTION
STAND BY output.	1	In STAND BY mode, high level (Power OFF). For Power ON this pin will be reduced to low.
SCL	2	I^2C-bus clock line
SDA	3	I^2C-bus data line
TUNING	4	tuning Voltage (Vt) PWM output
P3.0/NTSC SW	5	Port 3.0 or NTSC output/SCART SW input, Forced NTSC selection, Low-level output, otherwise High output.
KEY	6	Control keys input *3

VOL	7	Sound Volume control PWM output
MUTE	8	Sound mute output
VSSC/P	9	Digit ground for µ-controller core and periphery
BAND1	10	Tuner Band selection output
BAND2	11	Tuner Band selection output
VSSA	12	Analog ground of teletext decoder and digital ground of TV-processor
SECPLL	13	SECAM PLL decoupling
VP2	14	2^{nd} supply voltage TV-processor(+8V)
DECDIG	15	decoupling digital supply of TV-processor
PH2LF	16	Phase-2 filter
PH1LF	17	Phase-1 filter
GND3	18	Ground 3 for TV-processor
DECBG	19	Band gap decoupling
AVL/EWD	20	Automatic volume leveling /EAST-WEST drive output
VDRB	21	Vertical drive B output
VDRA	22	Vertical drive A output
IFIN1	23	IF input 1
IFIN2	24	IF input 2
IREF	25	Reference current input
VSC	26	Vertical sawtooth capacitor
TUNER AGC	27	Tuner AGC output
AUDEEM/SIFIN1 *1	28	Audio deemphasis or SIF input
DECSDEM/SIFIN2	29	decoupling sound demodulator or SIF input 2
GND2	30	ground 2 for TV processor
SNDPLL/SIFAGC *1	31	narrow band PLL filter or AGC sound IF
AVL/SNDIF/REF0/ AMOUT *1	32	Automatic Volume Levelling / sound IF input / subcarrier reference output / audio deemphasis
HOUT	33	horizontal output
FBISO	34	flyback input/sandcastle output
AUDEXT/QSSO/ AMOUT *1	35	external audio output / QSS intercarrier out
EHTO	36	EHT/overvoltage protection input
PLL IF	37	IF-PLL loop filter
IFVO/SVO	38	IF video output / selected CVBS output
VP1	39	supply voltage TV processor
CVBS INT	40	internal CVBS input
GND1	41	ground for TV processor
CVBS/Y	42	CVBS/Y input
CHROMA	43	C input
AUDOUT/AMOUT *1	44	audio output /AM audio output (volume controlled)
INSSW2	45	2nd RGB / YUV insertion input

R2/VIN	46	2nd R input / V (R-Y) input / PR input
G2/YIN	47	2nd G input / Y input
B2/UIN	48	2nd B input / U (B-Y) input / PB input
BCLIN	49	beam current limiter input
BLKIN	50	black current input / V-guard input
RO	51	Red output
GO	52	Green output
BO	53	Blue output
VDDA	54	analog supply of Closed Caption decoder and digital supply of TV-processor (3.3 V)
VPE	55	OTP Programming Voltage
VDDC	56	digital supply to core (3.3 V)
OSCGND	57	oscillator ground supply
XTALIN	58	crystal oscillator input
XTALOUT	59	crystal oscillator output
RESET	60	reset
VDDP	61	digital supply to periphery (+3.3 V)
P1.0/INT1	62	TV/AV (AV1) / AV2 /S-VHS mode Output.
P1.1/T0	63	TV/AV (AV1) / AV2 /S-VHS mode Output.
P1.2/INT0	64	Remote control signal input.

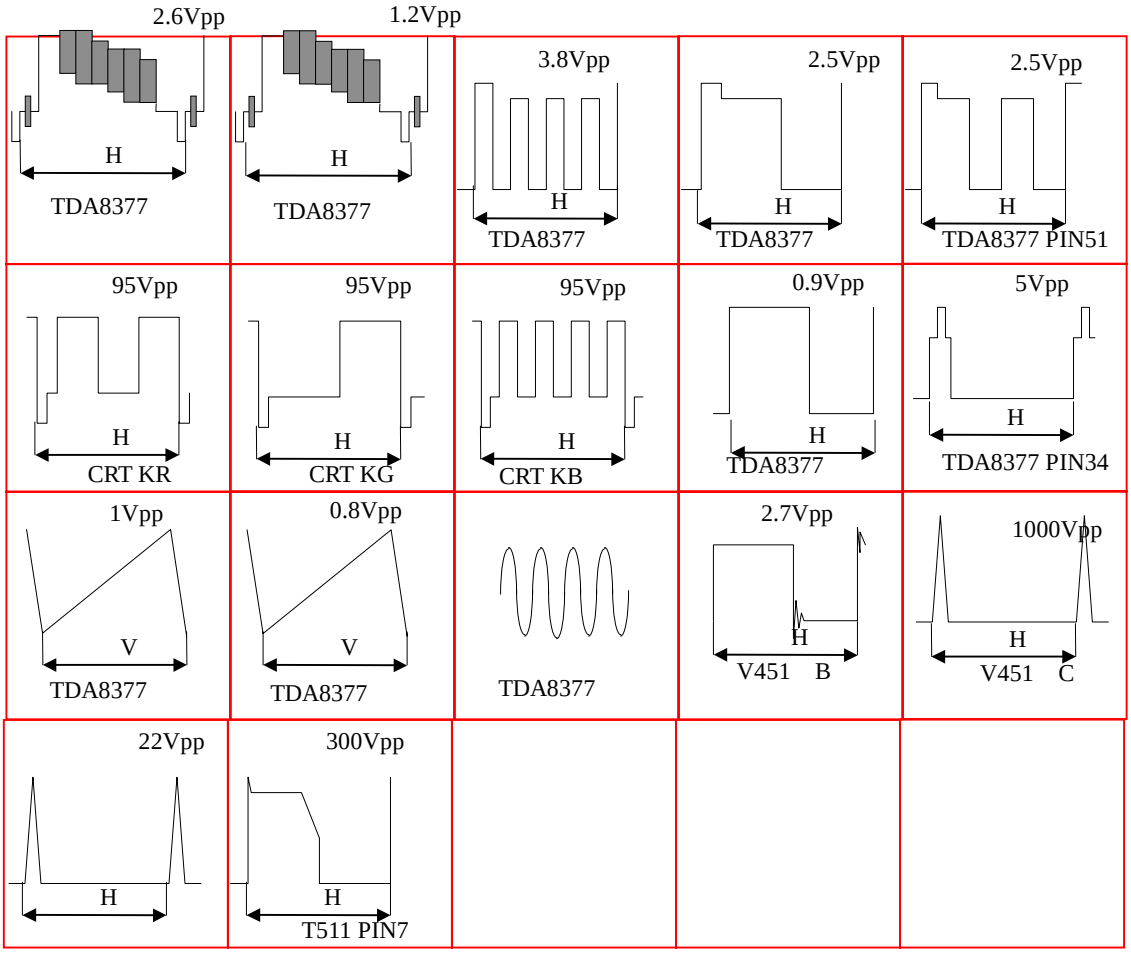
AN7522 Function : audio output

Symbol	PIN	Function	Symbol	PIN	Function
Vcc	1	Power supply	GND	7	ground
Out 1 (+)	2	Ch 1 output (+)	In 2	8	Ch 2 input
GND(out 1)	3	Ch 1Ground	VOL	9	Volume Control
Out 1 (-)	4	Ch 1 output (-)	Out 2 (-)	10	Ch 2 output (-)
Standby	5	Mute input	GND(out 2)	11	Ch 2 Ground
In 1	6	Ch 1 input	Out 2 (+)	12	Ch 2 output (+)

TDA8177 Function : vertical output

Symbol	PIN	Function	Symbol	PIN	Function
INV IN	1	Input	V OUT	5	Vertical output
VCC1	2	Power	VCC2	6	Output power supply
PUMP UP	3	Pump up power	NON INV IN	7	Negative feedback
GND	4	Ground			

Test point Waveforms



IC voltages

TDA8377

PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
V	2.8	3.8	3.6	3.3	3.5	3.5	0.1	0.1	0	5.4	0.1	0	2.3	8	5	3
PIN	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
V	4	0	4	0.9	0.7	0.8	1.9	1.9	3.9	3.8	1.6	3.2	3.4	0	2.4	0.1
PIN	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
V	0.6	0.5	3.7	1.7	2.4	3.1	8	3.8	0	3.4	1.5	3.6	2.3	2.6	2.6	2.6
PIN	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
V	2.3	7.2	2.7	2.7	2.7	3.5	0	3.5	0.1	1.7	1.8	0	3.5	0.1	0.1	5

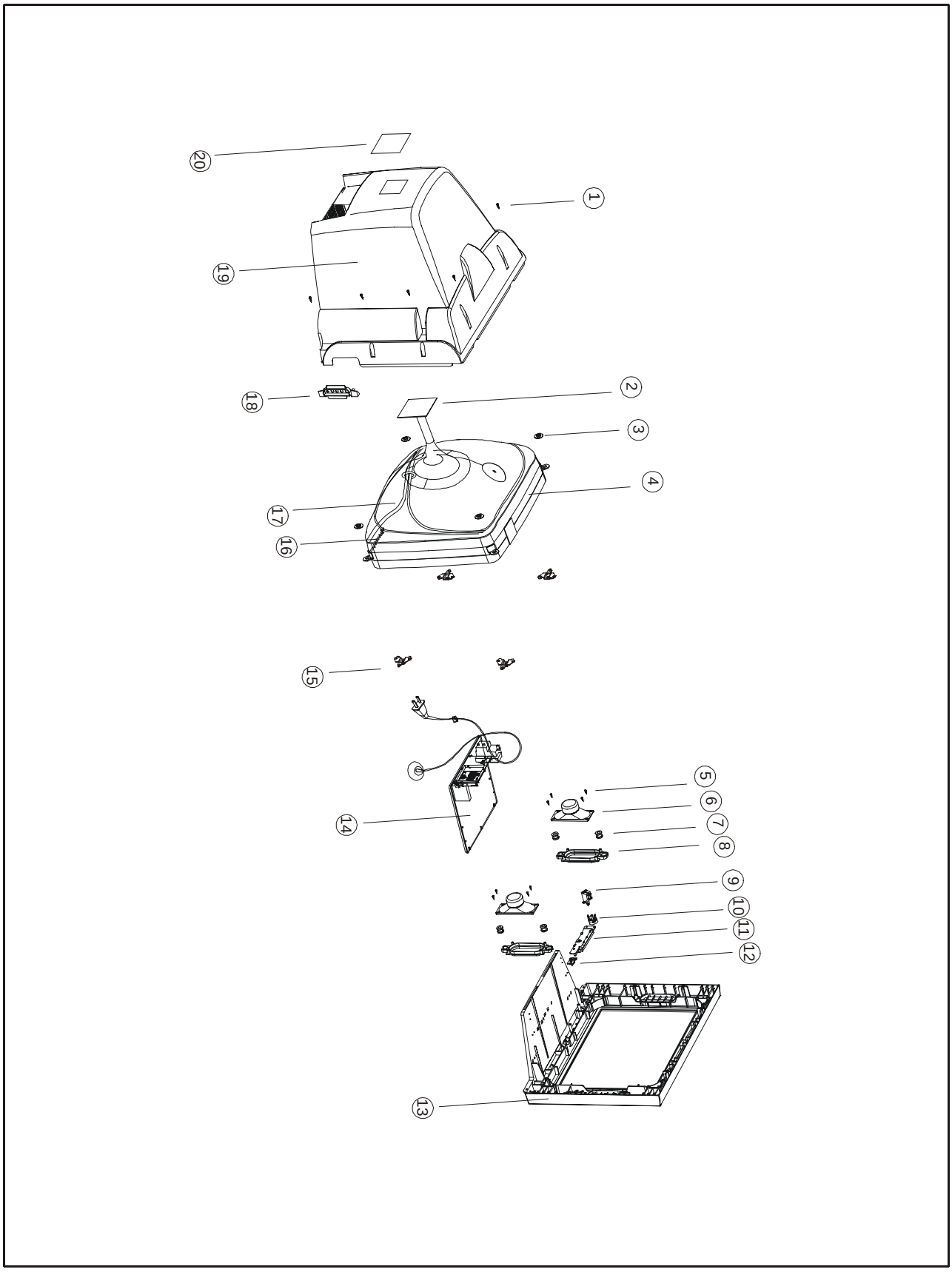
TDA8177

PIN	1	2	3	4	5	6	7
V	0.7	15	-12	-15	0.3	15.9	-0.07

AN 7522

PIN	1	2	3	4	5	6	7	8	9	10	11	12	
V	12	7	0	7	3.3	1.4	0	1.4	0	7	0	7	

Exploded view



Exploded view list

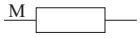
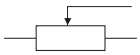
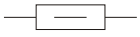
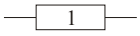
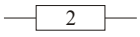
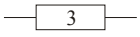
203-M25260-01-ZP

NO.	SERIAL NUMBER	NAME	QUANTITY
20	881-60685-093	Rear panel	1
19	780-10966-30	REAR CABINET	1
18	667-M2526-29	SET AV BOARD	1
17	123-30001-04	BRAIDED PULLING	1
16	838-10012-00	BRAIDED PULLING SPRING	1
15	615-10223-00	CRT FIXER PARTS	4
14	667-M2550-01	MAIN BOARD	1
13	611-D26X1-0H1	FRONT CABINET	1
12	700-60160-00	LED COLUMN	1
11	667-M2526-05	KEY BOARD	1
10	877-60555-00	POWER KEY	1
9	360-30028-00	POWER BUTTON	1
8	870-20700-00A	SPEAKER BRACKET	2
7	868-20217-00	WASHER	4
6	384-40908-B0	SPEAKER	2
5	851-53008-31	SCREW	8
4	335-2512B-00	CRT	1
3	648-30001-00	COMPONENT NUT	4
2	667-M2526-02	CRT BOARD	1
1	851-24020-14	SCREW	9

SCHEMATIC DIAGRAM

CAUTION:all the parts in the schematic diagram marked with shodows and the signs of ⚠ are extremely important for safety. In case of replacement of any part of components. Be sure to consult the service manual carefully.

1. the schematic diagram is characteristic. The various valus in the electric circuits are basic data, which are changeable according to the various basic circuits.
2. testing waves are abtained by inputing the standard color bar of the signed.
3. resistance unit is in Ohm, namely: K=1000; M=1000K; Capacitance unit is in μF; P=μμF($\mu=10^{-6}$)
4. Unless othervise noted inside, all resistors are 1/6W, the withstand voltage of all capacitor are 50V.
5. Inductance unit is in μH.
6. The mark ⊣⌐¬⊢ in the diagram means Ferrite ring
7. The symbols of various types of resistors and capacitors are listed as follows:

Carbon film resistor	
Metal film resistor	
Potentiometer resistor	
1/2w resistor	
1w resistor	
2w resistor	
3w resistor	
Ceramic capacitor	
AC Ceramic capacitor	
Terylene capacitor	
Polypropylene capacitor	
Metal Terylene capacitor	
Aluminium electrolyse capacitor	
Tantalum electrolyse capacitor