

UOC TDA9381 SERIES

SERVICE MANUAL

COLOUR TELEVISION




Model : KR14N7N - KR21N7N

Chassis : CM-OS-H1

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SAFETY PRECAUTIONS

1. The design of this product contains special hardware, many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by (!) on the parts list in Service manual.** The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual may cause shock, fire, or other hazards
4. **Don't short between the LIVE side ground and ISOLATED (NEUTRAL) side ground or EARTH side ground when repairing.** Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE: () side GND, ISOLATED (NEUTRAL): () side GND and EARTH: () side GND. Don't short between the LIVE side GND and ISOLATED (NEUTRAL) side GND or EARTH side GND and never measure with a measuring apparatus (oscilloscope etc.) the LIVE side GND and ISOLATED (NEUTRAL) side GND or EARTH side GND at the same time. If above note will not be kept, a fuse or any parts will be broken.
5. If any repair has been made to the chassis, it is recommended that the B1 setting should be checked or adjusted (See ADJUSTMENT OF B1 POWER SUPPLY).
6. The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.
7. Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10k Ω 2W resistor to the anode button.
8. When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the

9. manufacturer's replacement components.

10. Isolation Check

(Safety for Electrical Shock Hazard)

After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screwheads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

11. The surface of the TV screen is coated with a thin film which can easily be damaged. Be very careful with it when handle the TV. Should the TV screen become soiled, wipe it with a soft dry cloth. Never rub it forcefully. Never use any cleaner or detergent on it.

(1) Dielectric Strength Test

The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 3000V AC (r.m.s.) for a period of one second.

(...Withstand a voltage of 1100V AC (r.m.s.) to an appliance rated up to 120V, and 3000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.) This method of test requires a test equipment not generally found in the service trade.

(2) Leakage Current Check

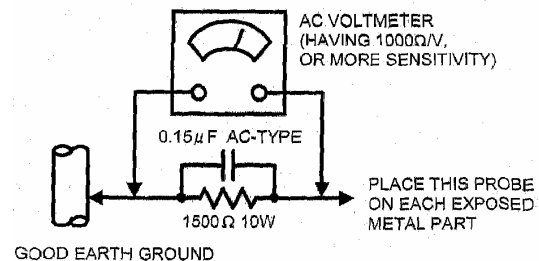
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.). However, in tropical area, this must not exceed 0.2mA AC (r.m.s.).

●Alternate Check Method

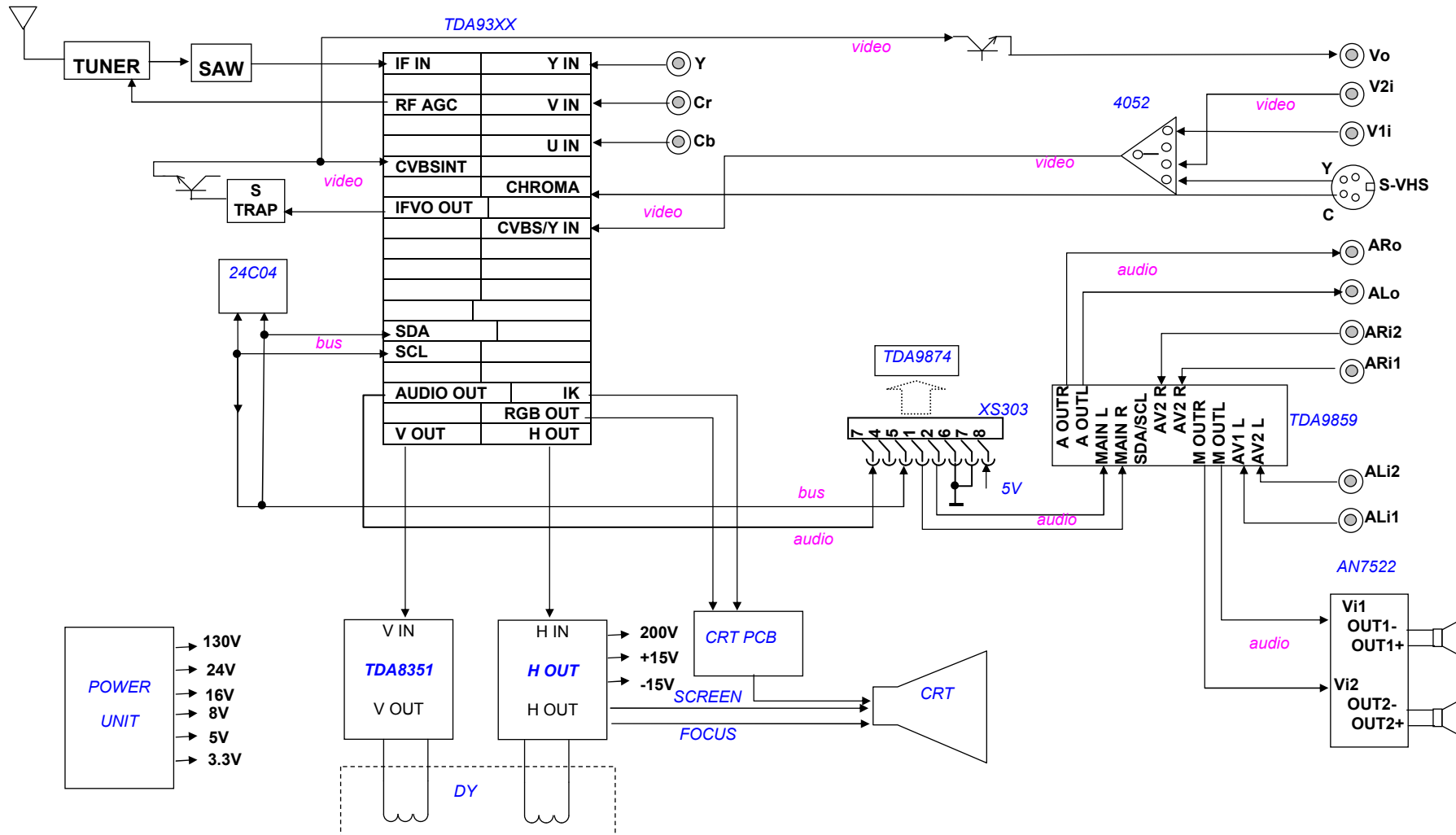
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1000 ohms per volt or more sensitivity in the following manner. Connect a 1500 Ω 10W resistor paralleled by a 0.15 μ F AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.). Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).

However, in tropical area, this must not exceed 0.3V AC (r.m.s.).

This corresponds to 0.2mA AC (r.m.s.)



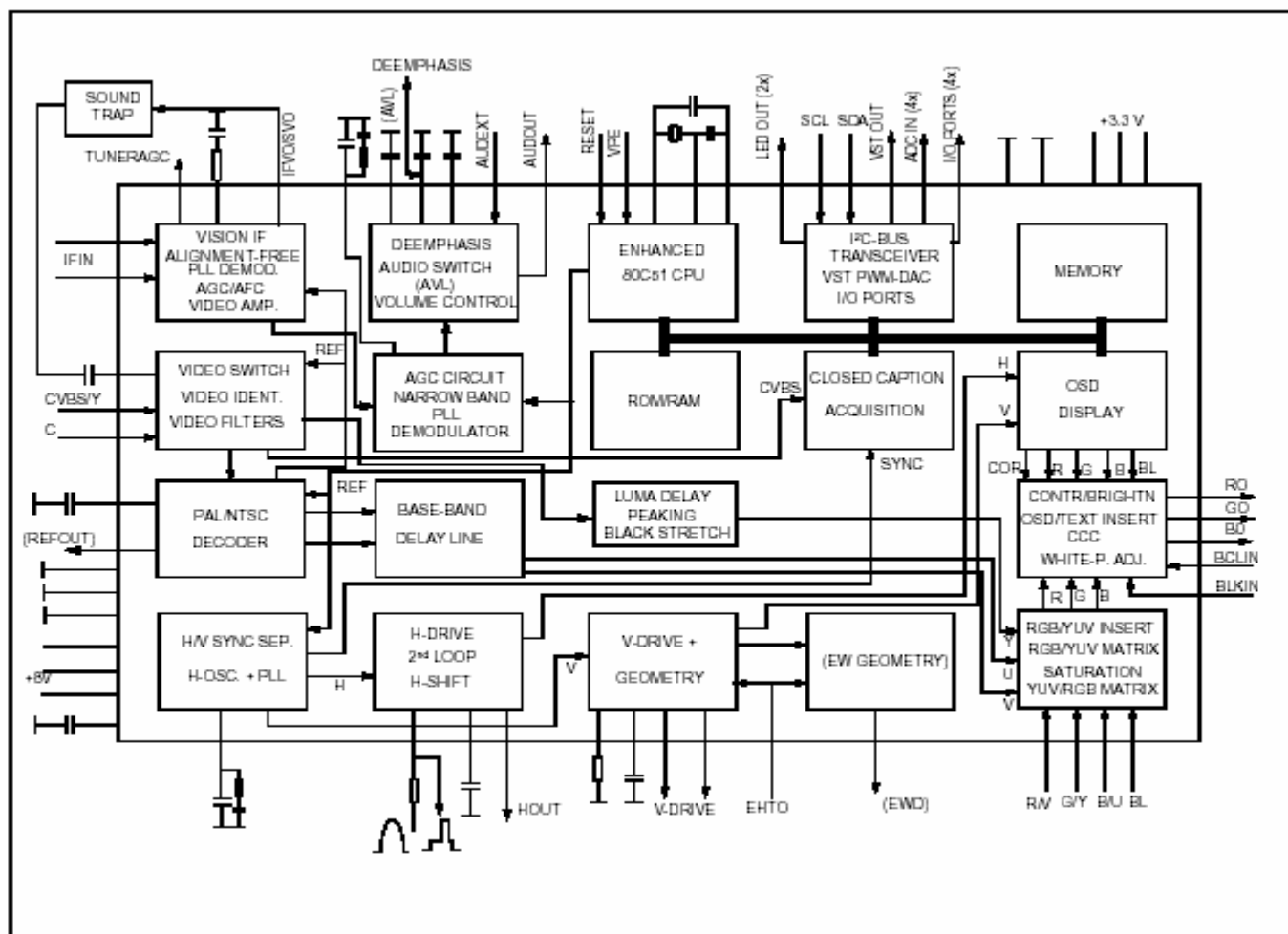
2 TV Block diagram



PHILIPS UOC FUNCTIONAL DIFFERENCE BETWEEN THE VARIOUS IC VERSIONS

IC VERSION	9350	9351	9352	9353	9360	9361	9362	9363	9364	9365	9366	9367	9380	9381	9382	9383	9384	9385	9386	9387	9388	9389	9370	9373	9375	9377	9378
TV rang	90	90	90	110	90	90	110	110	110	110	90	90	90	90	90	110	110	110	110	90	110	110	90	110	110	90	110
Mono inter-carrier multi-standard Sound demodulator (4.5-6.5MHz) With switch able centre frequency	√	√		√	√	√	√	√					√	√		√	√			√	√		√	√		√	√
Audio switch	√	√		√	√	√	√	√					√	√		√	√			√	√		√	√		√	√
Automatic volume leveling	√	√	√		√	√					√	√	√	√	√					√			√			√	
Automatic volume leveling or Subcarrier output (for comb filter applications)				√			√	√	√	√						√	√	√	√		√	√		√			√
QSS sound IF amplifier with Separate input and AGC circuit			√						√	√	√	√			√			√	√			√			√		
AM sound demodulator without Extra reference circuit										√								√									
PAL decoder	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√				√	√	√		
SECAM decoder		√	√	√		√		√		√		√		√	√		√		√								
NTSC decoder	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Horizontal geometry(E-W)				√			√	√	√	√						√	√	√	√		√	√		√	√		√
Horizontal and vertical zoom				√			√	√	√	√						√	√	√	√		√	√		√	√		√
ROM size	32- 64k	32- 64k	32- 64k	32- 64k	64- 128	64- 128	64- 128	64- 128	64- 128	64- 128	64- 128	64- 128	16- 64k	16- 64k	16- 64k	16- 64k	16- 64k	16- 64k	16- 64k	16- 64k	16- 64k	16- 64k	32- 55k	32- 55k	32- 55k	32- 55k	32- 55k
User RAM size	1k	1k	1k	1k	2k	2k	2k	2k	2k	2k	2k	2k	1k	1k	1k	1k	1k	1k	1k	1k	1k	1k	2.2 5	2.25	2.25	2.2 5	2.25
Teletext	1 p	1p	1p	1p	10p	10p	10p	10p	10p	10p	10p	10p															
Closed captioning	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Block diagram TDA93xX PS/N2 series with mono intercarrier sound demodulator



BLOCK DIAGRAM

3.REPLACEMENT OF MEMORY IC

1. MEMORY IC.

This TV uses memory IC. In the memory IC are memorized data for correctly operating the video and deflection circuits.

When replacing memory IC, be sure to use IC written with the initial value of data.

2. PROCEDURE FOR REPLACING MEMORY IC

(1) Power off

Switch the power off and unplug the power cord from AC outlet.

(2) Replace IC

Be sure to use memory IC written with the initial data values.

(3) Power On

Plug the power cord into the AC outlet and switch the power On.

(4) Check and set SYSTEM default value:

- 1) Press "QV" key holding about 4 second and then press "MENU1" key on the Remote control unit. Or Press "TEST" key on the Remote control unit for factory used.
- 2) The "TEST" will be displayed on the screen.
- 3) Press digital key, (Mkey) and corresponding on-screen display will be appeared.
Some time "PASSWORD" on-screen display will be appeared, you need to input 828.
- 4) Check the setting value of the SYSTEM default value of Table below. If the value is different, select items by [CH+]/[CH-] keys and set value by [VOL+]/[VOL-] keys.
- 5) Press "STANDBY" key again and return to the normal screen.

4.SERVICE ADJUSTMENT

B1 POWER SUPPLY

1. Receive normal colour bar signal.
2. Connect DC voltmeter to VD541- and isolated ground.
3. Adjust potentiometer in power unit to get the voltage as 110V \pm 1.0V for 21 inch hereinafter,
130 \pm 1.0V for 25 inch upwards.

FOCUS ADJUSTMENT

1. Receive a crosshatch signal.
2. While watching the screen, adjust the FOCUS VR to make the vertical and horizontal lines as fine and sharp as possible.

BUS CONTROL ADJUSTMENT

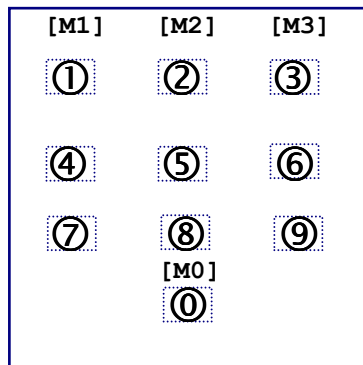
To enter BUS control mode, Press “TEST” key on the Remote control unit of factory.

Press “0” to “9” key, (Mkey) and corresponding on-screen display will be appeared.

On TV screen “TEST” will be indicated, this means entered bus control mode.

And press following key, each function will be available.

Remote Hand Unit keys



MENU8	
V SLOPE	31
V SHIFT	31
V AMP	31
V SCOR	31
H SHIFT	31

[M8] menu

MENU0 Geometrical adjustment

Receive PAL standard Complete pattern signal.

Adjustment steps:

- Adjust V. SLOPE, to the center horizontal line just appear from half bottom shadow.
- Adjust V. SIZE, to get 90% of vertical picture contents would be displayed on CRT.
- Adjust V. SHIFT, the center horizontal line correspond to CRT vertical center.
- Adjust H.SHIFT, to get the picture horizontal center correspond to CRT horizontal center.

Receive NTSC signal and repeat above [M0] and [M1] adjustment.

[M7] Menu

AGC Adjustment.

Receive 60dB μ (1mV) V_H colour bar pattern signal, adjust AGC value (voltage from high to low), to noise reduce gradually and just disappeared point.

[M9] Menu

CRT cut off and white balance adjustment.

Receive white signal.

- CRT cut off adjustment.
 - Select “SC”, then automatically vertical scan will be stopped.
 - Adjust SCREEN control on Flyback transformer to get the darkest single horizontal line (red, green, or blue, sometimes shows more yellow, more purple or more white).
- White balance adjustment.
 - Select RD/BD menu.
 - Adjust RD/BD to get colour temperature as x=281, y=311
- Sub-Brightness adjustment. (Use stair case signal)
 - Select SB menu.
 - Adjust SB to get the darkest step being cutoff.

ICs Default Settings – TDA9381

MI	Items	Variable	Preset	MI	Items	Variable	Preset	
M0	AVL	ON/OFF	ON	M4	SUBCON	0~63	63	
	FSL	ON/OFF	ON		SUBCOL	0~63	63	
	FMWS	ON/OFF	OFF		SUBSHP	0~63	63	
	FFI	ON/OFF	OFF		SUBTINT	0~15	15	
	OSO	ON/OFF	ON		YDLY PAL	0~15	12	
	FCO	ON/OFF	OFF		YDLY NTSC	0~15	12	
	WOOFER	ON/OFF	OFF		YDLY SEC	0~15	12	
	DUAL OUT	0~1	0		YDLY AV	0~15	12	
	Volume mode	0~1	1		UOC VOL	ON/OFF	Off	
					CATHODE	0~15	15	
M1	BAND	0~2	2		SC BRI	0~63	10	
	AV CFG*	0~8	3					
	NTSC MX		USA	M5	OSD VPOS	0~63	53	
	VIDEO OUT		CVBS		OSD HPOS	0~59	15	
	PIN5		NTSC		WIDE	0~63	15	
	PRO	0~3	0		ZOOM	0~63	59	
					NENU TITLE	0~6	3	
M2	VISION IF		38.9M		E2PROM ADRESS	0~33		
	DK	ON/OFF	OFF		E2PROM VALUE	0~95		
	BG	ON/OFF	ON		E2PROM WRITE			
	I	ON/OFF	OFF					
	M	ON/OFF	OFF	M8	FREQUENCY		50HZ	60HZ
	SIF PREFER		BG		VSLOPE	0~63	31	31
	AUTO SOUND	ON/OFF	ON		VSHIFT	0~63	31	31
					VAMP	0~63	31	31
M3	START ON	0~2	0		VSCOR	0~63	31	31
	ENGLISH	ON/OFF	ON		HSHIFT	0~63	31	31
	ARABIC	ON/OFF	OFF					
	PERSIAN	ON/OFF	OFF	M9	BT	0~63	48	
	TURKISH	ON/OFF	OFF		CT	0~63	48	
	FRANCE	ON/OFF	OFF		SC		OFF	
	RUSSIA	ON/OFF	OFF		RB	0~63	32	
					GB	0~63	32	
M6	SHIPMODE				RD	0~63	32	
	SEARCH SPEED	0~3	0		GD	0~63	32	
M7	AGC-TOP	0~63	25		BD	0~63	32	
	AGC-SPEED	0~3	2		SB	0~63	40	

5. ICs functional description

UOC TDA93XX

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 ² C-bus clock line
SDA	3	I ² C-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 / P _R input
G2/YIN	47	2nd G input / Y input
B2/UIIN	48	2nd B input / U (B-Y) input / P _B 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.

Note

1. The function of pin 20, 28, 29, 31, 32, 35 and 44 is dependent on the IC version (mono intercarrier FM demodulator /QSS IF amplifier and East-West output or not) and on some software control bits. The valid combinations are given in table 1.

2. the vertical guard function can be controlled via pin 49 or pin 50. the selection is made by means of the IVG bit in subaddress 2BH.

TABLE 1

IC version	FM-PLL version				QSS version					
East-West Y/N	N		Y		N			Y		
CMB1/CMB 0 bits	00	01/10/1 1	00	01/10/1 1	00	01/10/11		00	01/10/11	
AM bits	-	-	-	-	-	0	1	-	0	1
Pin 20	AVL		EWD		AVL			EWD		
Pin 28	AUDEEM				SIFIN1					
Pin 29	DECSDEM				SIFIN2					
Pin 31	SNDPLL				SIFAGC					
Pin 32	SNDIF(1)	REFO(2)	AVL/SNDIF(1)	REFO(2)	AMOUT	REFO(2)		AMOUT	REFO(2)	
Pin 35	AUDEXT				AUDEXT	QSS O	AMOU T	AUDEXT	QSS O	AMOU T
Pin 44	AUDOUT				Controlled AM or audio out					

Note

1. When additional (external) selectivity is required for FM-PLL system pin 32 can be used as sound IF input. This function is selected by means of SIF bit in subaddress 28H.

2. the reference output signal is only available for the CMB1/CMB0 setting of 0/1. for the other settings this pin is a switch output(see also 5 table 67).

Pin No. 6: Control keys input (Max. Limit voltage)

Function	POWER	MENU	TV/AV	V-	V+	P-	P+
Voltage	0	0.4125	0.825	1.2375	1.65	2.0625	2.475

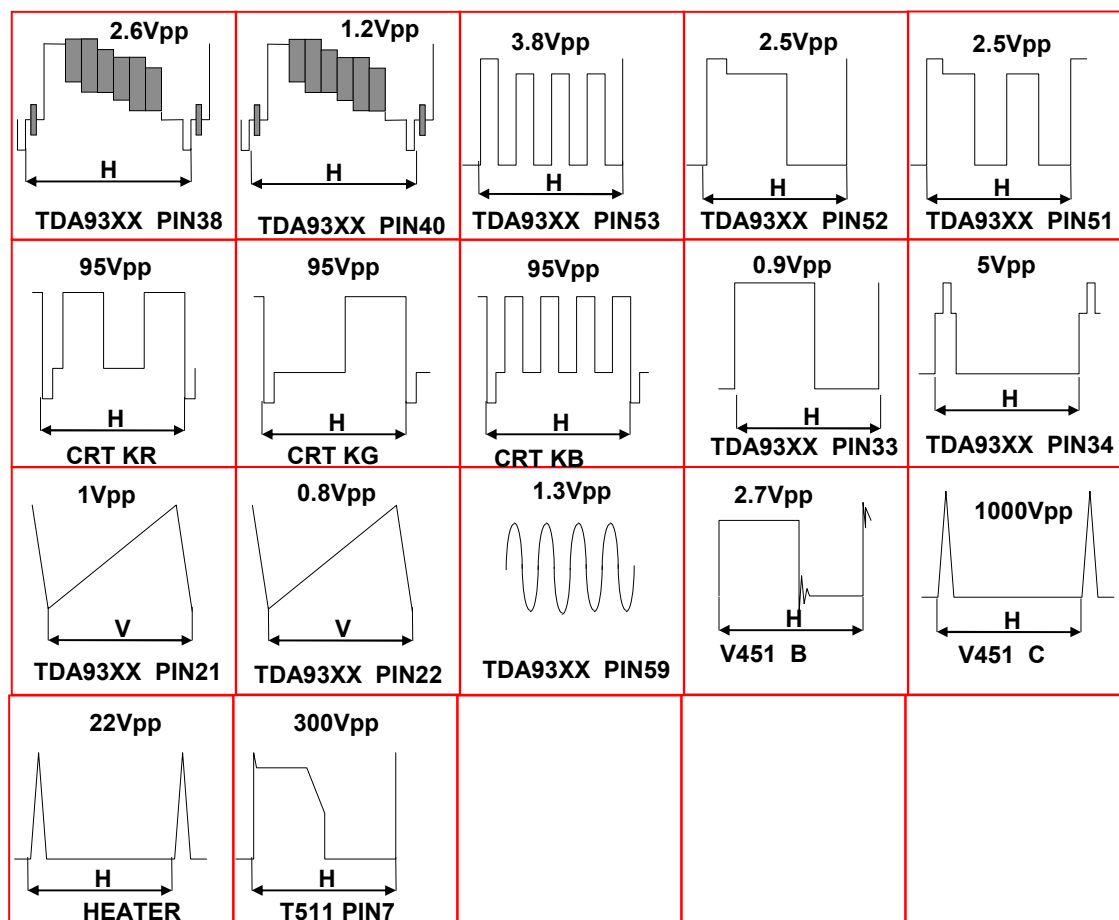
AN7522/AN17821A Function : **audio output**

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 (+)

LA78040 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			

6. Test point Waveforms



7. IC voltages

TDA93XX

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

LA76040

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	

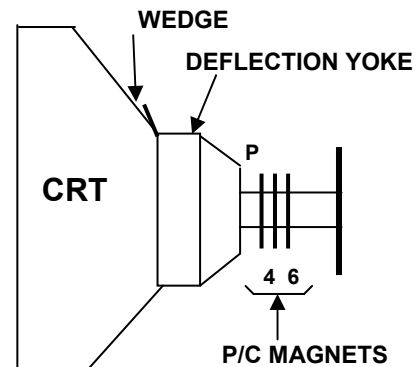
TDA9859

PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14
V	4.0	0	4.0	8.0	4.0	8.0	4.0	0	4.0	4.0	4.0	4.0	4.0	4.0
PIN	15	16	17	18	19	20	21	22	23	24	25	26	27	28
V	4.0	4.5	4.6	4.0	4.0	4.0	4.0	4.0	4.0	4.0	0	4.0	4.0	4.0
PIN	29	30	31	32										
V	4.0	4.0	0	4.0										

8. PURITY / CONVERGENCE ADJUSTMENT

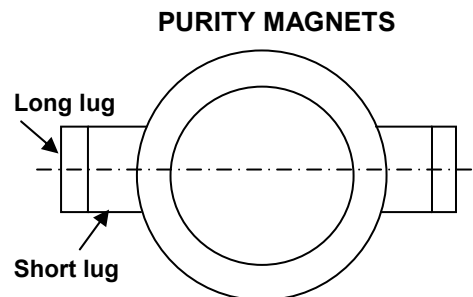
PURITY ADJUSTMENT

1. Demagnetize CRT with the demagnetizer.
2. Loosen the retainer screw of the deflection yoke.
3. Remove the wedges.
4. Input a green raster signal from the signal generator, and turn the screen to green raster.
5. Move the deflection yoke backward.
6. Bring the long lug of the purity magnets on the short lug and position them horizontally. (Fig2)
7. Adjust the gap between two lugs so that the GREEN RASTER will come into the center of the screen. (Fig. 3)
8. Move the deflection yoke forward, and fix the position of the deflection yoke so that the whole screen will become green.
9. Insert the wedge to the top side of the deflection yoke so that it will not move.
10. Input a crosshatch signal.
11. Verify that the screen is horizontal.
12. Input red and blue raster signals, and make sure that purity is properly adjusted.



P: PURITY MAGNET
 4: 4-POLES (convergence magnets)
 6: 6-POLES (convergence magnets)

Fig. 1



Bring the long lug over the short lug
 and position them horizontally.

Fig. 2

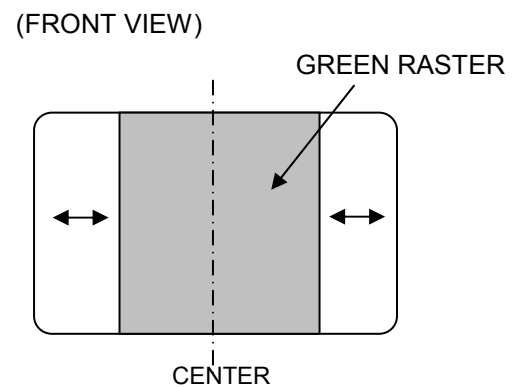


Fig. 3

STATIC CONVERGENCE ADJUSTMENT

1. Input a crosshatch signal.
2. Using 4-pole convergence magnets, overlap the red and blue lines in the center of the screen (Fig. 1) and turn them to magenta (red/blue).
3. Using 6-pole convergence magnets, overlap the magenta (red/blue) and green lines in the center of the screen and turn them to white.
4. Repeat 2 and 3 above, and make the best convergence.

DYNAMIC CONVERGENCE ADJUSTMENT

1. Move the deflection yoke up and down and overlap lines in the periphery. (Fig. 2)
2. Move the deflection yoke left to right and overlap the lines in the periphery. (Fig. 3)
3. Repeat 1 and 2 above, and make the best convergence.

After adjustment, fix the wedge at the original position.
Fasten the retainer screw of the deflection yoke.
Fix the 6 magnets with glue.

