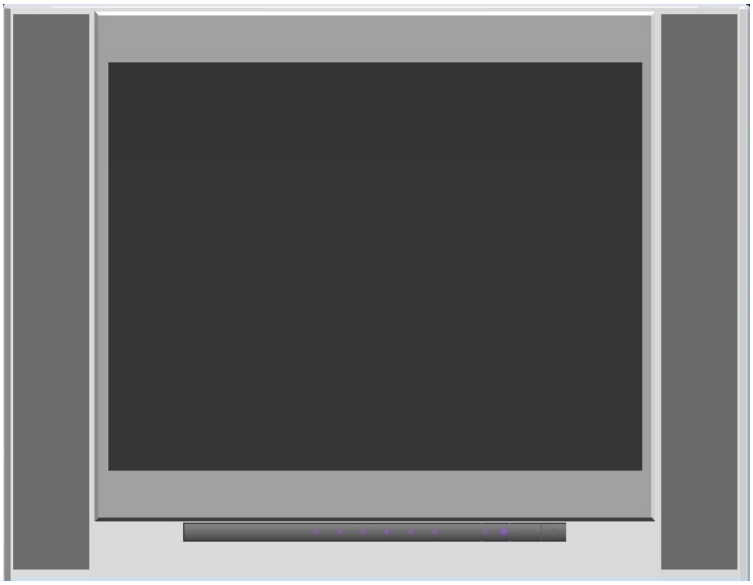
ST V02/06
COLOUR TELEVISION
SERVICE MANUAL



CONTENTS

1. 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 10kΩ 2W resitor 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 periode of one second.)

This method of test requires a test equipment not generally found in the service trade.

(2) Leakage Current Check

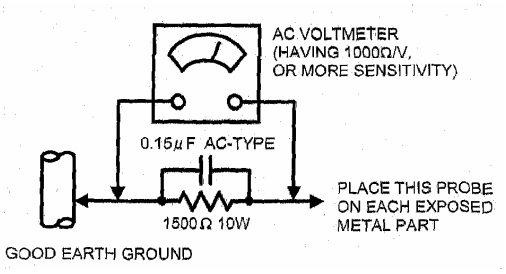
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known 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 1500Ω 10W resistor paralleled by a 0.15μF 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.)

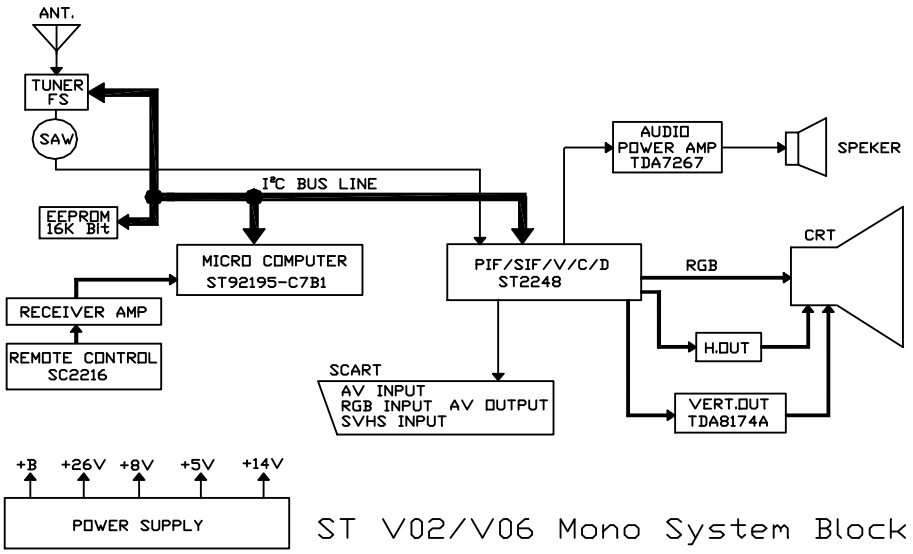


2.MCU and signal Processor for a PAL/NTSC/SECAM TV

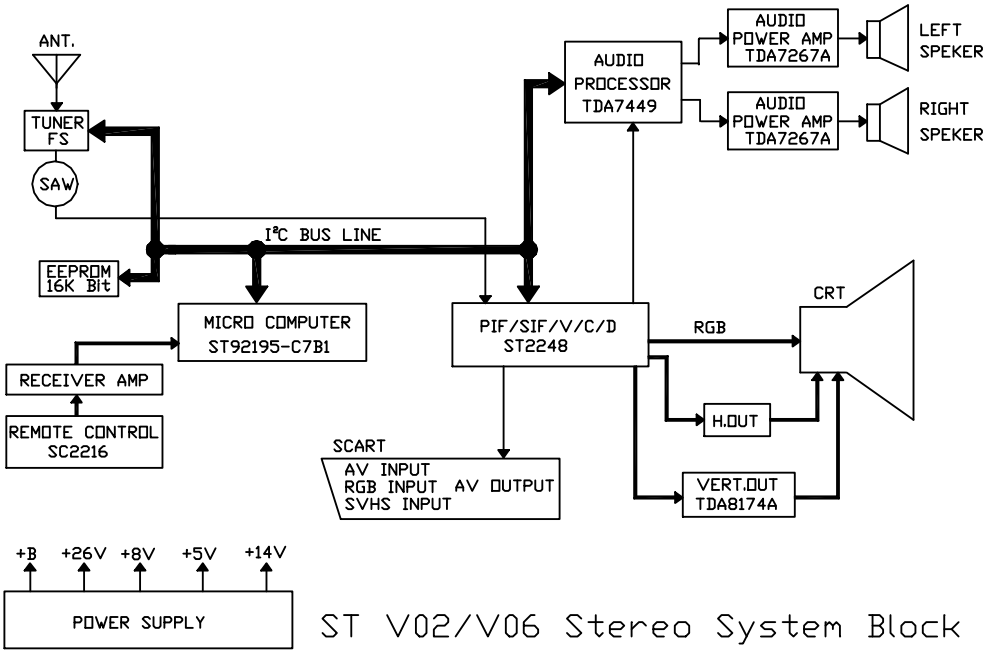
The ST92195-C7B1 is a MCU with on-screen display and Teletext data silcer. The STV2248 is an I^2C Bus-controller multistandard signal and chip TV pressor.

ST V02/V06 color TV block diagram

- ST92195 MCU+OSD+TXT controller with Software inside.
- 24C16 Non Volatile memory(EEPROM)
- STV2248 Bus Controlled Mulit-standard TV Processor.
- TDA7449 Bus Controlled Audio processor.
- TDA8174A Vertical deflection system output circuit.
- TDA7267 Audio Output
- SC6122 Remote Controlled Transmitter.



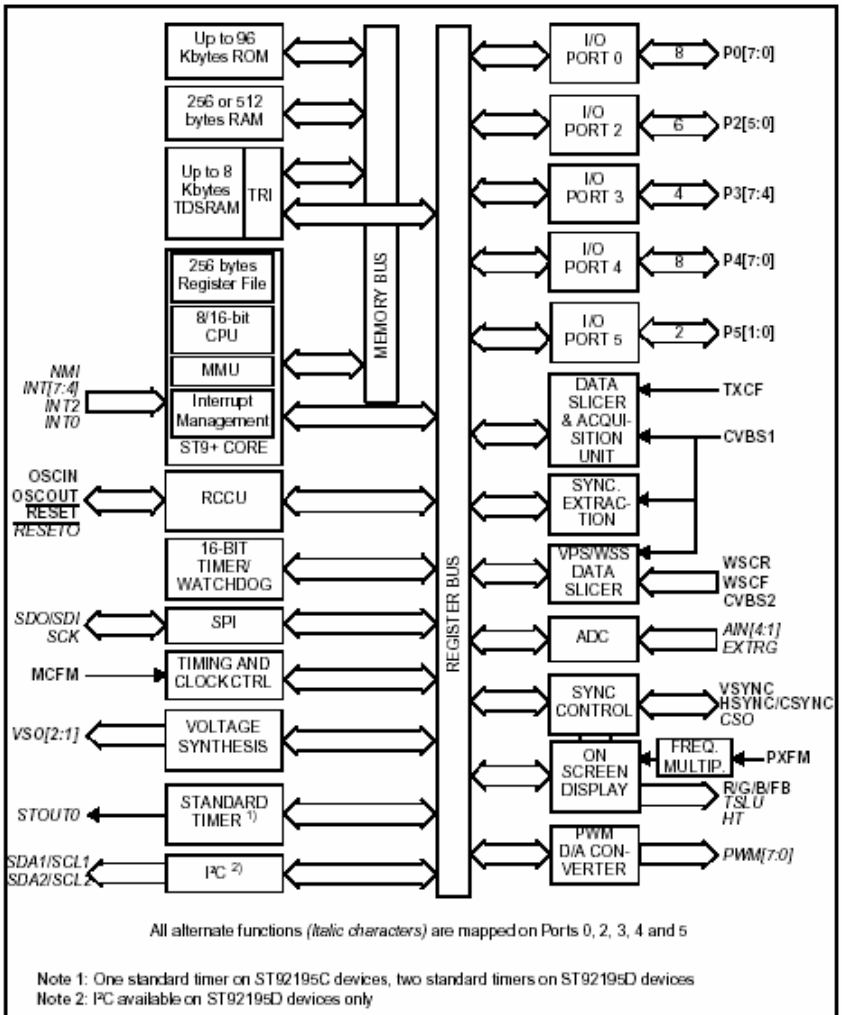
ST V02/V06 Mono System Block



ST V02/V06 Stereo System Block

3. Definition of ST92195 Pin

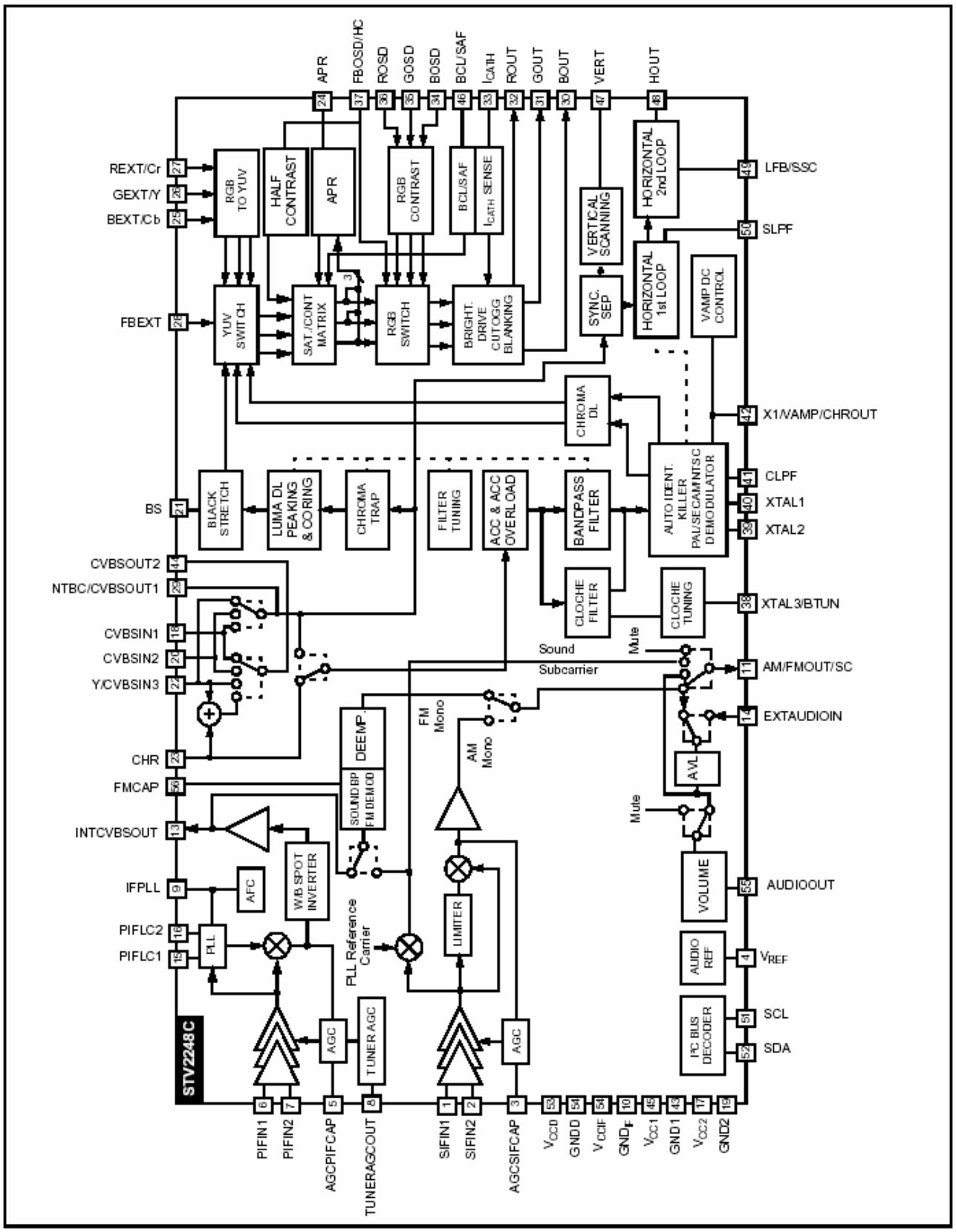
Pin Name	Port	I/O	Pin No.		Pin No.	I/O	Port	Pin Name
IR IN	P2.0	I	1		56	I	P2.1	KBINPUT(AIN1)
RESET	RESET	I	2		55	I	P2.2	XRAY2(AIN2)
Thermal resistance control	P0.7	O	3		54	O	P2.3	VT
Sound-MUTE	P0.6	O	4		53	O	P2.4	AV1/AV2/AV3
NC	P0.5	I/O	5		52	O	P2.5	AV1/AV2
POWER ON/OFF	P0.4	O	6		51		XTAL	XTAL
NC	P0.3	I	7	**S**	50		XTAL	XTAL
SCART-1	P0.2	I	8	**T**	49	O	P4.7	Volume PWM output
NC	P0.1	I	9	**9**	48	O	P4.6	
TV/AV switch	P0.0	O	10	**2**	47	I	P4.5	
NC	P3.7	I	11	**1**	46	O	P4.4	SAW-SW2
BUS OFF CON	P3.6	I	12	**9**	45	I	P4.3	
NC	P3.5	I	13	**5**	44	O	P4.2	SAW-SW1
SCART-2	P3.4	I	14		43	O	P4.1	BAND II
B	B	O	15		42	O	P4.0	BAND I
G	G	I	16		41		VSYNC	SYNC
R	R	O	17		40		HSYNC	HSYNC
BLANK	BLANK		18		39		AVDD1	AVDD1
SDA	P5.1	I/O	19		38		PXFM	PXFM
SCL	P5.0	O	20		37		JTRST0	JTRSTO
VDD	VDD		21		36		GND	GND
JTDO	JTDO		22		35		AGND	AGND
WSCF	WSCF		23		34	I	CVBS1	CVBS1
WSCR	WSCR		24		33	I	CVBS2	CVBS2
AVD3	AVDD3		25		32		JTMS	JTMS
TEST0	TEST0		26		31		AVDD2	AVDD2
MCFM	MCFM		27		30		CVBS0	CVBS0
JTCK	JTCK		28		29		TXCF	TXCF



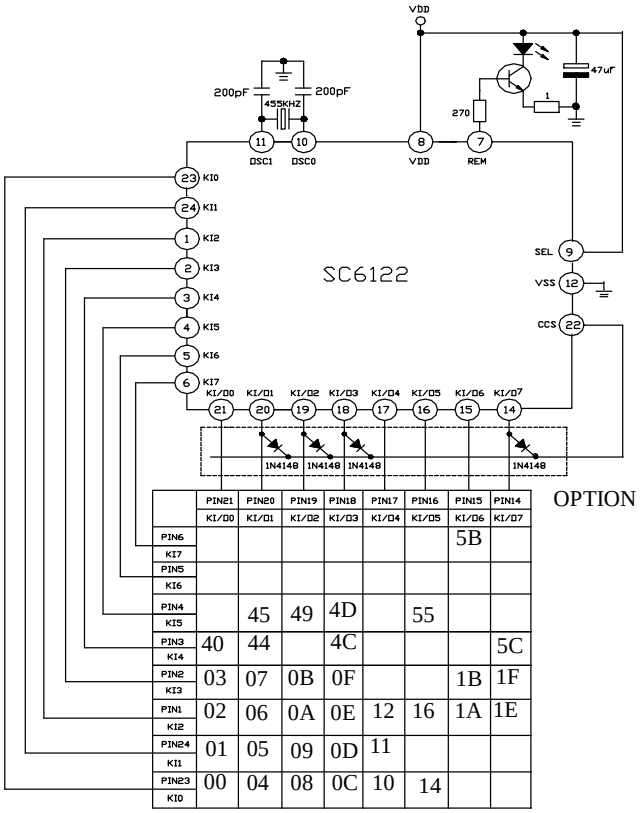
All alternate functions *(italic characters)* are mapped on Ports 0, 2, 3, 4 and 5

Note 1: One standard timer on ST92195C devices, two standard timers on ST92195D devices
Note 2: I²C available on ST92195D devices only

4. Definition of STV2248 Pin

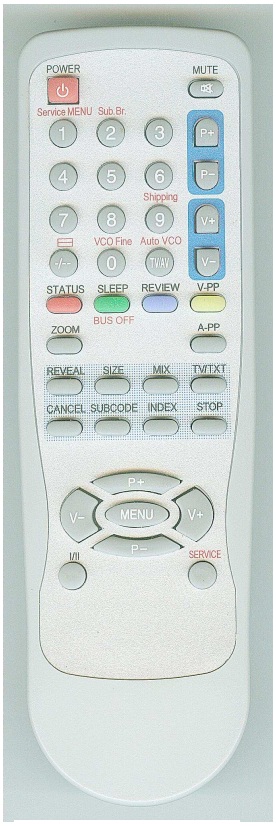


5. Remote Control Circuit Diagram and Function



OPTION

	PIN21 KI/D0	PIN20 KI/D1	PIN19 KI/D2	PIN18 KI/D3	PIN17 KI/D4	PIN16 KI/D5	PIN15 KI/D6	PIN14 KI/D7
PIN6 KI7							5B	
PIN5 KI6								
PIN4 KI5		45	49	4D		55		
PIN3 KI4	40	44		4C				5C
PIN2 KI3	03	07	0B	0F			1B	1F
PIN1 KI2	02	06	0A	0E	12	16	1A	1E
PIN24 KI1	01	05	09	0D	11			
PIN23 KI0	00	04	08	0C	10	14		



Service Remote

	User Remote		Service Remote
Remote	Roadstar	Keymat	TTXXX409-S
CUSL	002	028	---
CUSH	253	227	---
Diode	Pin20	Pin17,18,19	Pin14,18,19,20

NO.	Code	Name	TV Mode	Menu Mode	Service Mode	TXT Mode
01	00	0	0	0	VCO Fine	0
02	01	1	1	1	Service MENU	1
03	02	2	2	2	Sub brightness	2
04	03	3	3	3		3
05	04	4	4	4		4
06	05	5	5	5		5
07	06	6	6	6		6
08	07	7	7	7		7
09	08	8	8	8		8
10	09	9	9	9	Shipping	9
11	0A	SUBCODE				Subcode
12	0B	-/--	Tens		Line gain adjust( )	
13	0C	MENU	Menu switch			Run_time_mode_choice
14	0D	I/II	NICAM			
15	0E	REVIEW	Channel review			CYAN key
16	0F	V-PP	Video PP	Channel move		YELLOW key
17	10	MUTE	Mute/unmute	Mute/unmute		
18	11	TV/TXT	Enter txt			Exit txt
19	12	POWER	Power on/off	Power on/off	Power on/off	Power on/off
20	14	TV/AV	-Source changed	Channel delete	Auto adjust VCO	
21	16	STATUS	Status Recall			RED key
22	1A	V+	Volume +	Increase value	Value +	
23	1B	P+	Channel +	Menu item up	Item up	Page plus
24	1E	V-	Volume -	Decrease value	Value -	
25	1F	P-	Channel -	Menu item down	Item down	Page minus
26	40	Service	Service in		Service exit	
27	44	INDEX				Index
28	45	SLEEP	Sleep		BUS OFF	GREEN key
29	49	MIX				Mix
30	4C	SIZE / ZOOM	Screen zoom/wide			Size
31	4D	STOP				Stop

32	55	CANCEL				Cancel
33	5B	REVEAL				Reveal
34	5C	A-PP	Audio PP			

6.Service Controlled Function

The Service mode is entered by firstly pressing the “INDEX” key then secondly pressing the “SERVICE” key when the TV is in ON condition,”M” is displayed on the screen. Once in service mode, “MENU SW.”(Digit 1) key displays successively the white balance ment and 3service menus. Press the “Service In” key again to exit Service mode.

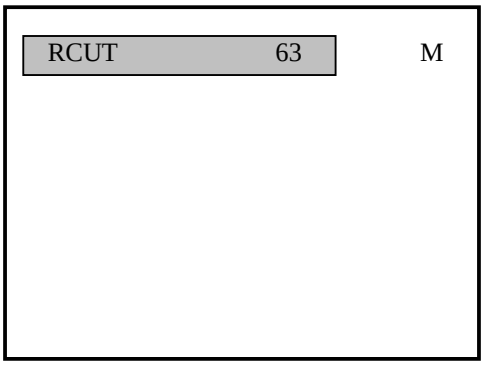
Note:How to use user remote enter Service mode?

Press “MENU”→ “6 ” → “4 ” → “8 ” → “3 ” key

(1)Service RGB adjustment

The items within the White Balance mode can be accessed using “Item up” (P+)/ “Item down” (P-) keys and the selected item value is modified using “Value+” (V+)/ “Value-” (V-) keys. The parameters controlled in the White Balance menu are:

a)RCUT: Red cut-off
b)GCUT: Green cut-off
c)BCUT: Blue cut-off
d)RDRV: Red drive
e)GDRV: Green drive
f)BDRV: Blue drive
g)SUBR: Sub Red
h)SUBG: Sub Green
i)BMAX: Brightness maximum.
j)BMIN: Brightness minimum
k)ATHD(APR_threshold 00┅ 15)
l)LOGO(the first shoe the length of logo, and the followed is the logo)

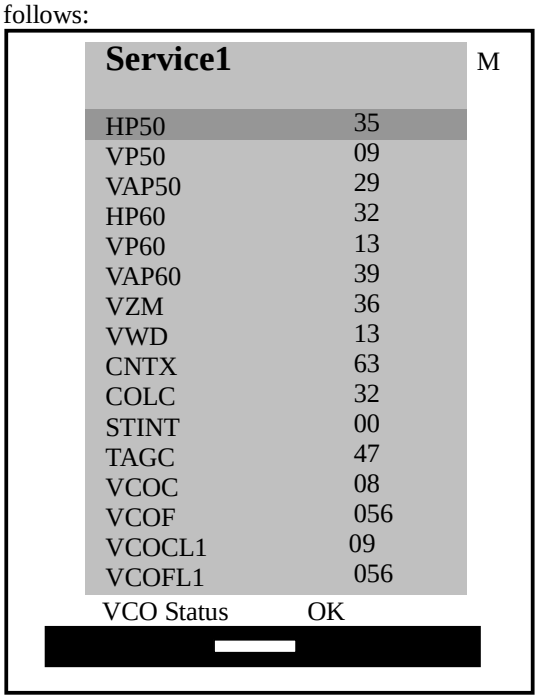


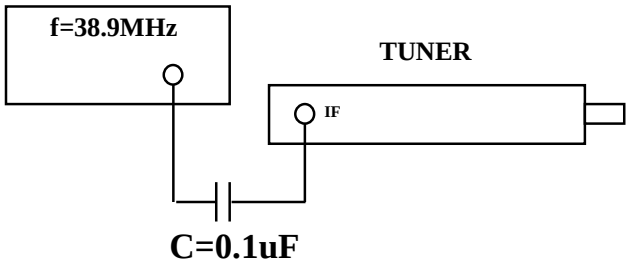
①Press the ▭ (-/--) key to set the screen into a horizontal line.

②Press the ▭ (-/--) key again to return to the normal picture.

(2)Service1 adjustment

When in White Balance menu, If the “**MENU SW.”**(Digit 1) key is pressed, Service–1 menu appears and the display is as follows:





For the VCO adjustment

Feed a 38.9MHz carrier as IF input.

Press the “**Item up”** (P+)/ “**Item down”** (P-) keys to move the cursor to the VCOC item and press the “**Auto adjust VCO”** (TV/AV) key will automatically adjust VCO Coarse and VCO Fine to get VCO OK Status.

The VCO status bar at the bottom of the screen appears only if either VCO Coarse item or VCO Fine item is selected. The VCO status is read from the Read register of STV 2248 and guides whether to Increase/Decrease the VCO registers to attain VCO OK Status.

** SECAM L/L' VCO Adjustment*

Firstly adjustment "VCOC" to "OK". Secondly input f =33.9MHz SECAM LL' signal from tuner IF pin and set the TV set system to SECAM-LL' and move the cursor to "VCOCL1" then press "TV/AV" key to "OK".

Note:VCOCL1 and VCOFL1 is SECAM LL' （France System ） use. Some model without SECAM LL' System.

Picture and AGC Adjustment

Using "Item up" (P+)/ "Item down" (P-) keys and the selected item value is modified using "Value+" (V+)/ "Value-" (V-) keys. The parameters controlled in the picture menu are:

a)HP50: Horizontal position for 50 Hz signal.
b)VP50: Vertical position for 50 Hz signal.
c)VAP50: Vertical amplitude for 50 Hz signal.
d)HP60: Horizontal position for 60 Hz signal.
e)VP60: Vertical position for 60 Hz signal.
f)VAP60: Vertical amplitude for 60 Hz signal.
g)VZM: Vertical amplitude for zoom.
h)VWD: Vertical amplitude for wide.
j)CNTX: Contrast maximum.
k)COLC: Colour center.
l) STINT: Bub tint.
m)TAGC:Tuner AGC.

(3)Service2 adjustment

When in Service-1 menu, if the "**MENU SW.**" (Digit 1) key is pressed, Service–2 menu appears and the display is as follows:

VS50,VS60,VSH,VSC,VCC,EWVC,EWAP,EWSP and EWTP no use.

a)BGC
Bit7:No use
Bit6-4:these three bits are used to set the color of title string of menu
Bit3-0: these four bits are used to set the background color of menu

b)FGC
Bit7:No use
Bit6-4:these three bits are used to set the color of title string of menu
Bit3-0: these four bits are used to set the background color of menu

c)BAC
Bit7:No use
B6~4:these three bits are used to set the character color of adjusting bar
B3~0:these four bits are used to set the background color of adjusting bar

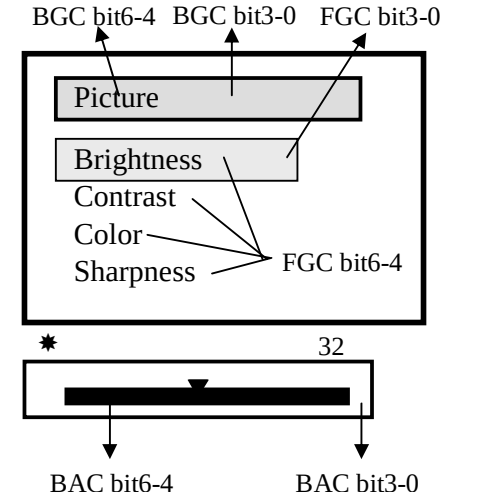
d)CUSL
Custom code low bit set

e)CUSH
Custom code high bit set

g)MOD
Bit7: SERVICE_CUSTOM_CODE (0: the custom code of 8E/71 is always accepted 1: the custom code of 8E/71e is not always accepted)
Bit6: KEY_MUTE_OPT (0: the output of pin41 is high while mute status, 1: the output of pin41 is low while mute status)
Bit5: POS_SPEAKER_MUTE (0: the output of pin41 is high while changing pos or TV/AV, 1: the output of pin41 is low while changing pos or TV/AV)
Bit4: VOL_SLOW_DOWN_MUTE(0:directly set the mute register of ST2248 to mute status and mute pin of ST92195 to be high, 1:firstly reduce the volume to zero , then set the mute register of ST2248 to mute status and mute pin of ST92195 to be high)
Bitit3:NO_SIGNAL_OPTION (0: the software will check the status of both bit2 and bit3 of the only read register 0x00 of st2248 whether there is valid signal or not, 1: the software will only check the status of bit3 of the only read register 0x00 of st2248 whether there is valid signal or not)
Bit2: ONLY_UHF_OPTION (0= three band,1= only UHF band)
Bit1: FAC_VID_OPTION (0:disable factory automation of VID mode, 1: enable factory automation of VID mode)
Bit0: POS_VID_OPTION (0: P+/P- can not enter AV, 1: P+/P- CAN enter AV)

h)BVLP
B7:TDA7449_AVMUTE_OPT(0: no use ,1: Audio output of AV is mute while no video signal)
B6：VRGB_MUTE_OPT (0:no Y mute while adjusting vertical one line, 1: Y

Service 2	M
VS50	00
VS60	36
VSH	24
VSC	05
VCC	07
EWVC	31
EWAP	00
EWSP	29
EWTP	22
BGC	111
FGC	113
BAC	111
CUSL	002
CUSH	253
MOD	050
BVLP	192

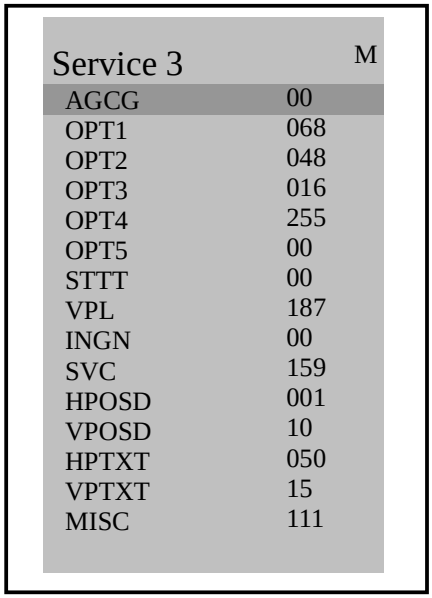


Colour option:
0:black 1:red 2:green 3:yellow 4:blue 5: magenta 6:cyan 7:white
8:HBLACK(highlight black) 9:HRED 10:HGREEN 11:HYELLOW 12:HBLUE 13:HMAGENTA 14:HCYAN 15:GRAY

mute while adjusting vertical one line)
B5~4: These two bits are used to set the sound system while shipping(00: BG, 01: DK, 10: I, 11: LL')
B3~0：These four bits are used to set the brightness of st2248 while adjusting vertical one line and bit6 of BVLP is zero.

(4)Service3 adjustment

When in Service-2 menu, if the "**MENU SW.**" (Digit 1) key is pressed, Service–3 menu appears and the display is as follows:



a)AGC
AGC gain(00-03)
b)OPT1
Bit7~6:Thermal resistance delay time control 00:4s 01:6s 10:8s 11:10s
Bit5:P/N/S crystals application (0=2 crystals,P/S/N application 1=1 crystal,P/N/S 4.43MHz application)
Bit4:Cutoff loop(0=OFF,1=ON)(be used to set the bit6 of register 0x0c 0f stv2248)
Bit3:Safty_Reset(0=active,1=non)
Bit2:Power on keep standby (0 = Last power memory function, 1= Standby state after power on)
Bit1:PIF overmodulation(0=OFF,1=ON)
Bit0:LOGO display(0=OFF,1=ON)
c)OPT2
Bit7:Market_france---SECAM LL(0=OFF,1=ON)
Bit6:Manual/Auto cutoff(0= Manual ,1= Auto)
Bit5:ENG_LOG_RUS_FARSI (0= the characters of LOGO and LABEL will changed automatically while Russian language is selected, 1= the English characters of LOGO and LABEL will not changed automatically while Russian language is selected)
Bit4: COLOR 6dB(0=OFF,1=ON)
Bit3: APR Feature (0=ON,1=OFF)
Bit2: Black Stretch (0=ON,1=OFF)
Bit1: Auto Flesh(0=ON,1=OFF)
Bit0: RGB OSD CONTRAST(0=contrast control disable,1=contrast control enable)
d)OPT3
Bit7:Sound demodulation (0 = intercarrier, 1 = QSS)
Bit6:Smart volume control(0= no use,1= use)
Bit5:Woofer (0= no use,1= use)
Bit4: AVL (0=OFF,1=ON)
Bit3: Nicam Module of STV8216 (0= no use, 1= use)
Bit2:Pin49 Volume PWM (0 = no use, 1= use)
Bit1:STV8216 (0= no use, 1= use)
Bit0:TDA7449 (0= no use, 1= use)
e)OPT4
Bit7:AV_VID_OPTION(0=AV1/AV2/RGB(DVD)/AV3(S-AV3),each AV channel is optional 1=AV1/SCART AV/SCART RGB/SCART SVHS, this option is for VIDEOCON)
B6it: TVAV_AUDIO_OUT(0 = the output of pin11 is always AM/FM demodulator output, 1 = the output of pin11 is Main audio switch output)
Bit5:TVAV_VIDEO_OUT(0 =CVBSOUT2 is always CVBSIN1, 1 = According to AV1/AV2/RGB/AV3, CVBSOUT2 is CVBS1,CVBS2,Y/CVBS3 or Y+ C)
Bit4:SVHS_SET(0 = only AV3, 1 = SVHS auto detect)
Bit3:AV3(SVHS)(SCART SVHS for VID) (0 =OFF,1=ON)
Bit2:RGB(DVD)(SCART RGB FOR VID) (0 =OFF,1=ON)
Bit1:AV2(SCART AV FOR VID) (0 =OFF,1=ON)
Bit0:AV1 (0 =OFF,1=ON)
f)OPT5
Bit0=enable the remote controller to change Run_Time_Mode Choice
Bit1, Bit2= "Run_Time_Mode Choice"
The Run_Time_Mode Choice selects the user table for teletext languages. For more details please refer to the teletext software (Sttext) user guide and the "Font management" documentation.
Our standard OSD font is designed for European market. Other language are also available(Russian, Ukranian, Arabic, Persian, Greek, Hebrew…)

ST West-europe MCU(sixteen kinds of language : ENGLISH / FRENCH/ SWEDISH/ TURKISH/ GERMAN/ PORTUGUESE/SPANISH/ ITALIAN/ FARSI/ POLISH/ RUSSIAN/ RUMANIAN/ SERBIAN/ CZECH/ ESTONIA/

NEDERLAND)
0:ENGLISH / FRENCH/ SWEDISH/ TURKISH/ GERMAN/ PORTUGUESE(SPANISH)/ ITALIAN/ FARSI
1:ENGLISH / FRENCH/ SWEDISH/ CZECH / GERMAN(NEDERLAND)/ SERBIAN / ITALIAN/ FARSI
2:POLISH / FRENCH/ SWEDISH/ CZECH / GERMAN(NEDERLAND)/ SERBIAN / ITALIAN/ RUMANIAN
3:POLISH/RUSSIAN/ESTONIAN/TURKISH/GERMAN(NEDERLAND)/PORTUGUESE(SPANISH)/ITALIAN/ FARSI

g) STTT …only for ST engineer

Bit0= enable Stto change the process for adjusting Autogain.
Bit1, Bit2, Bit3=select the correct process
ROM_M6_P_valid │OSDEPROM_M6_R_ valid │ROM_M6_P_valid │EPROM_M6_R_ valid
EPROM_M6_R_ valid│ROMLESS_H5_P_valid │ROM_H5_P_valid │EPROM_M6_A_ valid
/*note:ROMLESS_M6_R_valid=ROM_M6_R_valid*/

h) VPL

Voltage protect level for XRAY (0~255)

i) INGN

Input gain for TDA7449

j) SVC

Smart volume control for STV8216

k) HPOSD

Horizontal position for OSD.

l) VPOSD

Vertical position for OSD.

m) HPTXT

Horizontal position for teletext .

n) VPTXT

Vertical position for teletext .

o) MICS

Bit7: FORCED_MONO_OPTION (0: for forced mono status, st8216 will demodulate the input signal, 1: for forced mono status, st2248 will demodulate the input signal)
Bit6:Coring(0 = no use, 1 =use)
Bit5: XRAY_SET(0 = no use, 1 = use)
Bit4:FS_TUNER_SET2(0:unuse 1:use(L:49.75~144.25M:152.25~424.25H:432.25~863.25 (PIF:38.0Mhz)))
Bit3:FS_TUNER_SET1(0:unuse 1:use(L:48.25~140.25M:147.25~423.25H:431.75~863.25 (PIF:38.9Mhz))) if FS_TUNER_SET2 and FS_TUNER_SET1are both zero, then
L:48.25~147.25M:154.25~423.25H:431.75~855.25(PIF:38.9Mhz)
Bit2:FS tuner UHF port set(0= p2,1= p3)
Bit1:FS_380_389(0= PIF38.0 ,1= PIF38.9)
Bit0:VS/FS (0= VS,1= FS)

7. Service and Design Data

SERVICE white balance

SR. NO.	PARAMETERS	Description	VALUE	NOTE
1	RCUT	Red cut-off	49	
2	GCUT	Green cut-off	68	
3	BCUT	Blue cut-off	60	
4	RDRV	Red drive	32	
5	GDRV	Green drive	32	
6	BDRV	Blue drive	32	
7	SUBR	Sub Red	32	
8	SUBG	Sub Green	32	
9	BMAX	Brightness maximum.	57	
10	BMIN	Brightness minimum	10	
11	ATHD	APR_threshold	15	
12	LOGO	LOGO set	00	

SERVICE 1

SR. NO.	PARAMETERS	Description	VALUE	NOTE
1	HP50	Hpos 50Hz	37	
2	VP50	Vpos 50Hz	08	
3	VAP50	V size 50Hz	26	
4	HP60	Hpos 60Hz	31	
5	VA60	Vpos 60Hz	15	
6	VAP60	V size 60Hz	35	
7	VZM	V zoom size	35	
8	VWD	V wide size	12	
9	CNTX	Contrast maximum.	63	
10	COLC	Colour center.	32	
11	STINT	Bub tint.	32	
12	TAGC	Tuner AGC	42	SECAM LL' use : TAGC=28
13	VCOC	VCO coarse	06	
14	VCOF	VCO fine	58	
15	VCOCL1	VCO coarse L1	09	
16	VCOFL1	VCO fine L1	56	

SERVICE 2

SR. NO.	PARAMETERS	Description	VALUE	NOTE
1	VS50	V saw50	00	No Use
2	VS60	V saw60	00	No Use
3	VSH	V sh(50 and 60)	24	No Use
4	VSC	V sc	05	No Use
5	VCC	V cc	07	No Use
6	EWVC	EW vdc	31	No Use
7	EWAP	EW amp	00	No Use
8	EWSP	EW shape	29	No Use
9	EWTP	EW trap	22	No Use
10	BGC	Background color	111	
11	FGC	Foreground color	113	
12	BAC	Bar color	111	
13	CUSL	Custom code low byte	002/028	Roadstar:002 / Keymat: 028
14	CUSH	Custom code high byte	253/227	Roadstar:253 / Keymat: 227
15	MOD	Option of the software	058	TACT SWITCH 6:058/TACT SWITCH 5:059
16	BVLP	Option of the software	192	

SERVICE 3

SR. NO.	PARAMETERS	Description	VALUE	
1	AGCG	AGC gain	00	
2	OPT1	Option 1	64	
3	OPT2	Option 2	48	SECAM LL' no use:48 / SECAM LL' use:176
4	OPT3	Option 3	144/145	MONO:144 / STEREO:145
5	OPT4	Option 4	255	AV1 USE:255 / AV1 NO USE:254
6	OPT5	Option 5	00	
7	STTT	ST Ttext	00	
8	VPL	Voltage protect level for XRAY	187	
9	INGN	Input gain for tda7449	00	
10	SVC	Smart volume control for stv8216	159	
11	HPOSD	HPOS OSD	001	
12	VPOSD	VPOS OSD	10	
13	HPTXT	HPOS TXT	50	
14	VPTXT	VPOS TXT	15	
15	MISC	Option for functions	111	

8. ICs Functional Description

TDA8174A Function : Vertical Output

PIN	PIN CONNECTIONS		PIN	PIN CONNECTIONS
1	Power Out		7	Ramp Generator
2	Output Stage Vs		8	Buffer Output
3	Trigger Input		9	Inverting Input
4	Height Adjustment		10	Supply Voltage
5	Voltage Ref Decoupling		11	Flyback Generator
6	Gnd			

TDA7267 Function : Audio Output

PIN	PIN CONNECTIONS		PIN	PIN CONNECTIONS
1	Vs		5	GND
2	OUT		6	GND
3	SVR		7	GND
4	IN		8	GND

TDA7267A Function : Audio Output

PIN	PIN CONNECTIONS		PIN	PIN CONNECTIONS
1	Vs		5	P-GND
2	OUT		6	P-GND
3	SVR		7	P-GND
4	IN		8	P-GND
5	N.C.		5	P-GND
6	S-GND		6	P-GND
7	N.C.		7	P-GND
8	N.C.		8	P-GND

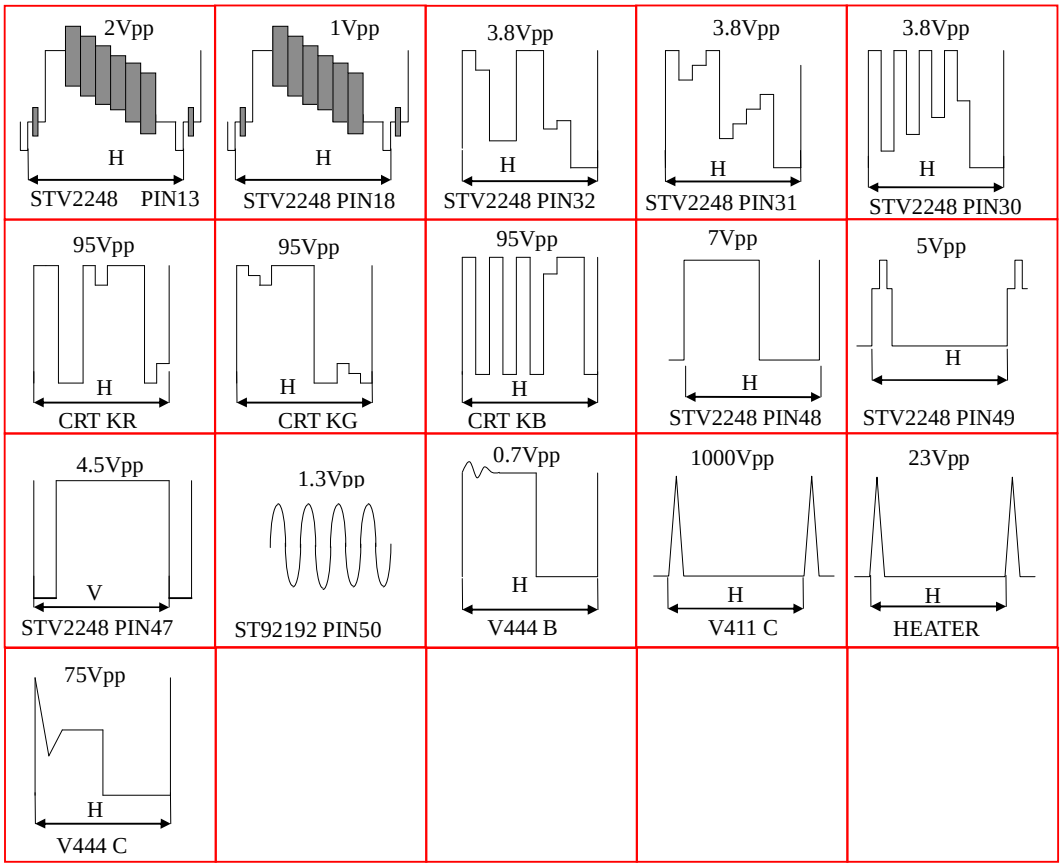
TDA7449(ONLY IN STEREO MODEL) Function : Digitally Controlled Audio Processor

PIN	PIN CONNECTIONS		PIN	PIN CONNECTIONS
1	CREF		11	MUXOUT(R)
2	Vs		12	BIN(R)
3	PGND		13	BOUT(R)
4	ROUT		14	BOUT(L)

5	LOUT
6	R_IN2
7	R_IN1
8	L_IN1
9	L_IN2
10	MUXOUT(L)

15	BIN(L)
16	TREBLE(L)
17	TREBLE(R)
18	DIG_GND
19	SCL
20	SDA

9. Test Point Waveforms



10. IC Voltages

ST92195

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Voltage	5.0	5.0	0.1	5.0	0.2	4.9	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.5	0.1	3.2
Pin	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
Voltage	3.6	5.0	0.1	0.1	0.0	5.0	5.0	1.7	5.0	2.1	0.4	5.0	4.9	0.1	1.3	0.0	0.0	0.0	2.0
Pin	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	
Voltage	5.0	0.8	0.8	5.0	5.0	0.1	0.1	0.1	5.0	0.1	5.0	2.4	2.3	0.1	0.1	0.1	3.1	5.1	

STV2248

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Voltage	2.5	2.5	2.6	3.2	2.7	2.5	2.5	1.8	2.0	0.0	3.9	5.0	2.9	2.4	4.0	3.9	7.9	3.2	0.0
Pin	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
Voltage	2.8	2.6	2.8	1.7	1.7	2.5	1.7	2.5	0.0	4.0	1.7	1.7	1.7	3.7	4.4	4.4	4.3	0.0	0.1
Pin	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	
Voltage	1.0	1.7	2.4	2.8	0.0	3.2	7.1	5.6	4.1	3.2	0.6	4.1	3.6	3.2	5.0	0.0	3.8	1.2	

TDA8174A

Pin	1	2	3	4	5	6	7	8	9	10	11

Voltage	13.3	26.9	3.9	6.7	4.5	0.0	7.5	8.3	4.5	26.8	1.5

TDA7267

Pin	1	2	3	4	5	6	7	8
Voltage	14.9	7.6	8.1	0.9	0.0	0.0	0.0	0.0

STV7267A

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Voltage	14.9	7.6	8.1	0.9	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TDA7449

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Voltage	4.0	7.9	0.0	3.3	3.3	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	0.0	3.6	3.2

AC supply : 176~260V 50/60Hz

11. Other

1) binary digit change to algorism

binary digit algorism
Bit0 1
Bit1 2
Bit2 4
Bit3 8
Bit4 16
Bit5 32
Bit6 64
Bit7 128

OPTION2	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
binary digit	0	0	1	1	0	0	0	0
algorism	128	64	32	16	8	4	2	1

Note:
0= N o use
1=Use

binary digit 00110000= **algorism** 32+16=48

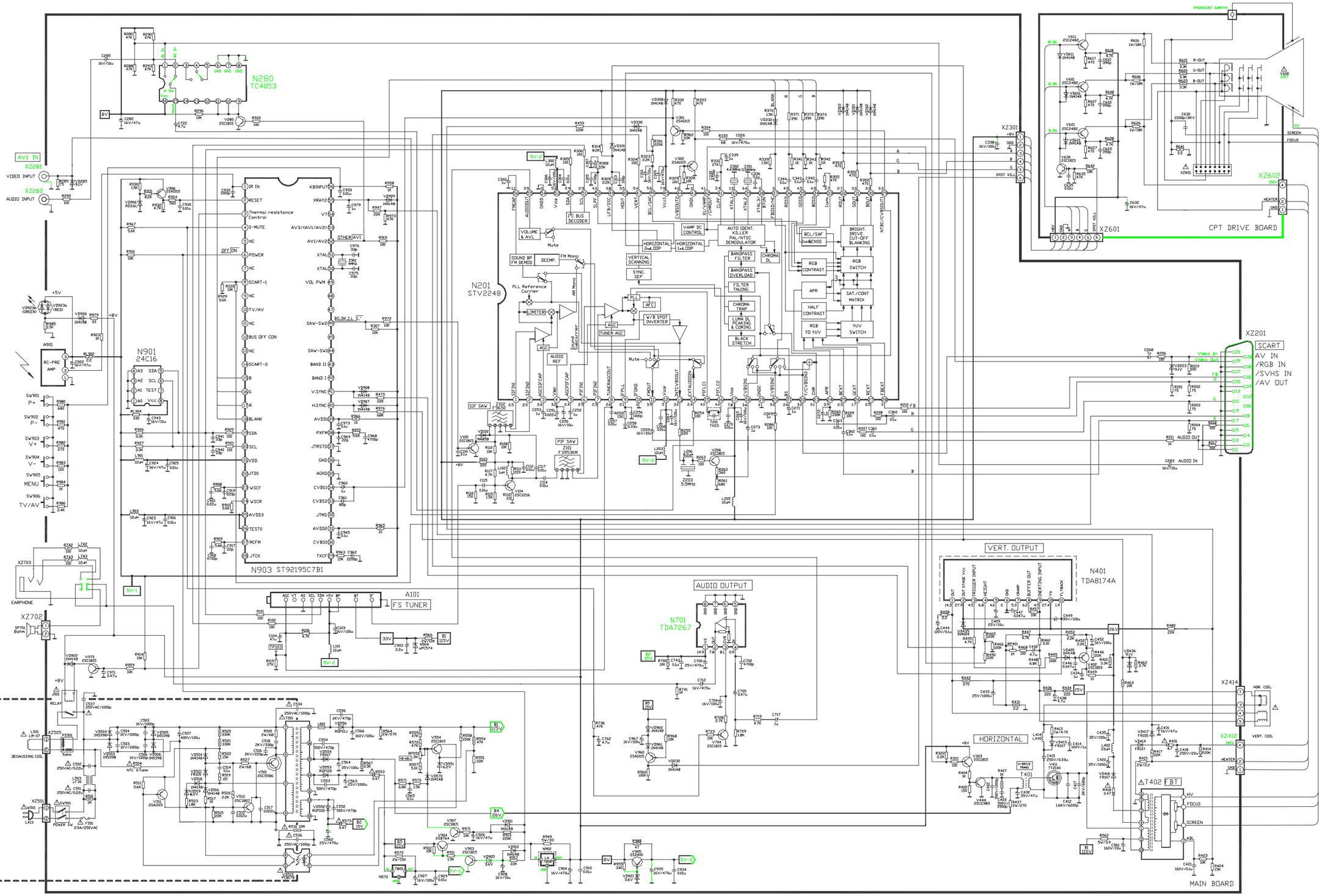
2) Some skills of factory adjustment:

a)How to enter service mode? Firstly pressing the “INDEX” key then secondly pressing the “SERVICE” key, . Press “SERVICE” key again to exit service mode.
b)How to use user remote enter Service mode? Press “MENU”→ “6” → “4” → “8” → “3” key(within 6s).
c)How to unlock TV set if you forgot password? Press “-/--” → “QV” → “1” → “7” key(within 6s).
d)How to bus off ? Press “SLEEP” key after entering service mode.
e)How to adjustment VCO ? Press “TV/AV” key while the VCO item is selected at service mod.
f)How to realize VCO fine auto adjust: Press DIGITAL “0” key while the VCO fine item is selected at service mode
g) How to set vertical scan disable: Press “-/--” key at white balance mode.
Note: the custom code of service remote controller is:CUSL= 8E / CUSH= 71

3)Keyboard input:

Key In	Key Pressed
0.3～0.7V	Volume-
0.8～1.2V	Volume+
1.3～1.7V	Program-
1.8～2.2V	Program+
2.3～2.7V	Menu
2.8～3.2V	No use
3.3～3.7V	AV

3.8～4.2V	POWER



NOTICE
SINCE THIS IS A BASIC CIRCUIT DIAGRAM THE VALUE OF COMPONENTS ARE SUBJECT TO BE CHANGED FOR IMPROVEMENT.
CAUTION
THE COMPONENTS WITH '⚠' IN THE SCHEMATIC DIAGRAM WHICH HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY SHOUD BE REPLACED ONLY WITH TYPE IDENTICAL TO THOSE IN THE ORIGIGIAL CIRCUIT.

ST V02 MONO