

Service Manual

59 / 66 Cm STEREO Colour Television

CHASSIS : CP-776

MODEL : DTL- 25G6F

DTL- 25G7F

DTL- 28G2F

DTL- 28G6F

DTL- 28G7F

DTL- 28G8F



DAEWOO ELECTRONICS CO., LTD.

<http://svc.dwe.co.kr>

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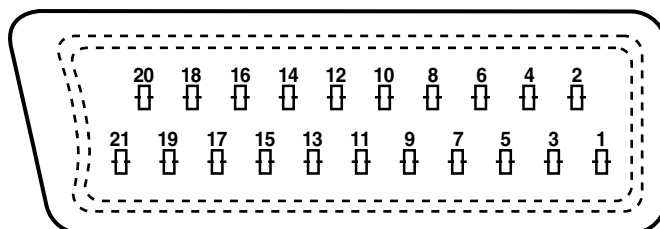
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■ Specifications

CRT	25" : A59EAK071X11 (PHILIPS) 28" : A66EAK071X11 (PHILIPS)
System	PAL/SECAM-B/G, D/K, PAL-I, SECAM-L/L', NTSC-3.58/4.43(Play back)
Main Voltage	230V AC, 50Hz
Power Consumption	Stand-by mode : 2.5 Watts Normal operating mode : 25" = 75 Watts 28" = 75 Watts
Sound output	7 + 7 Watts, 10 % THD at RF 60 % mod. (1kHz)
Speaker	12W 8 ohm x 2 EA
Antenna Impedance	75 ohm unbalanced input
Tuning system	Frequency Synthesizer(FS) Tuning System
Tuner	DT5-BF14D, EL2782-105-B
Number of program	100 programs
Aux. Terminal	21 pin EURO-SCART jack (AV input, TV output, RGB input) 21 pin EURO-SCART jack (AV input, S-VHS input) RCA type AV input jack Headphone jack (3.5 mm ϕ)
Remote controller	R-28B07 with 2 "AA" type batteries
Teletext	8 pages memory TOP & FLOF - West option :English, German/Dutch/Flemish, French, Italian, Spanish/Portuguese, Swedish/Finnish/Danish, Czech/Slovak - East option : Polish, Czech/Slovak, Rumanian, Hungarian, Servo-croat, German/Dutch/Flemish, French, Italian - Turkish option : Turkish, English, German/Dutch/Flemish, French, Italian, Spanish/Portuguese, Swedish/Finnish/Danish
OSD language	- West : English, German, French, Italian, Spanish, Netherlands, Portuguese, Danish, Swedish, Finnish, Norwegian - East : Polish, Rumanian, Czech, Hungarian

■ 21 PIN EURO-SCART

PIN	Signal Designation	Matching Value
1	Audio Out(linked with 3)	0.5Vrms,Imp<1k Ω (RF 60% MOD)
2	Audio In(linked with 6)	0.5Vrms,Imp>10k Ω
3	Audio Out(linked with 1)	0.5Vrms,Imp<1k Ω (RF 60% MOD)
4	Audio Earth	
5	Blue Earth	
6	Audio in (linked with 2)	0.5Vrms,Imp>10k Ω
7	Blue in	0.7Vpp $\pm$ 3dB,Imp75 Ω
8	Slow(Function) Switching	TV:0-2V,PERI:9.5-12V,Imp>10k Ω
9	Green Earth	
10	NC	
11	Green In	0.7Vpp $\pm$ 3dB,Imp75k Ω
12	NC	
13	Red Earth	
14	NC	
15	Red In, C In	0.7Vpp $\pm$ 3dB,Imp75k Ω
16	Rapid(Blanking) switching	Logic 0:0-0.4V,Logic 1:1-3V,Imp 75 Ω
17	Video Earth	
18	Rapid Blanking Earth	
19	Video Out	1Vpp $\pm$ 3dB,Imp75 Ω
20	Video In, Y In	1Vpp $\pm$ 3dB,Imp75 Ω
21	Common Earth	



■ Safety Instruction

WARNING: Only competent service personnel may carry out work involving the testing or repair of this equipment.

■ X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not exceed the specified limit. The nominal value of the high voltage of this receiver is 26kV at max beam current. The high voltage must not, under any circumstances, exceed 29.5kV (25"), 30kV (28"). Each time a receiver requires servicing, the high voltage should be checked. It is important to use an accurate and reliable high voltage meter.
2. The only source of X-RAY Radiation in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.

■ SAFETY PRECAUTION

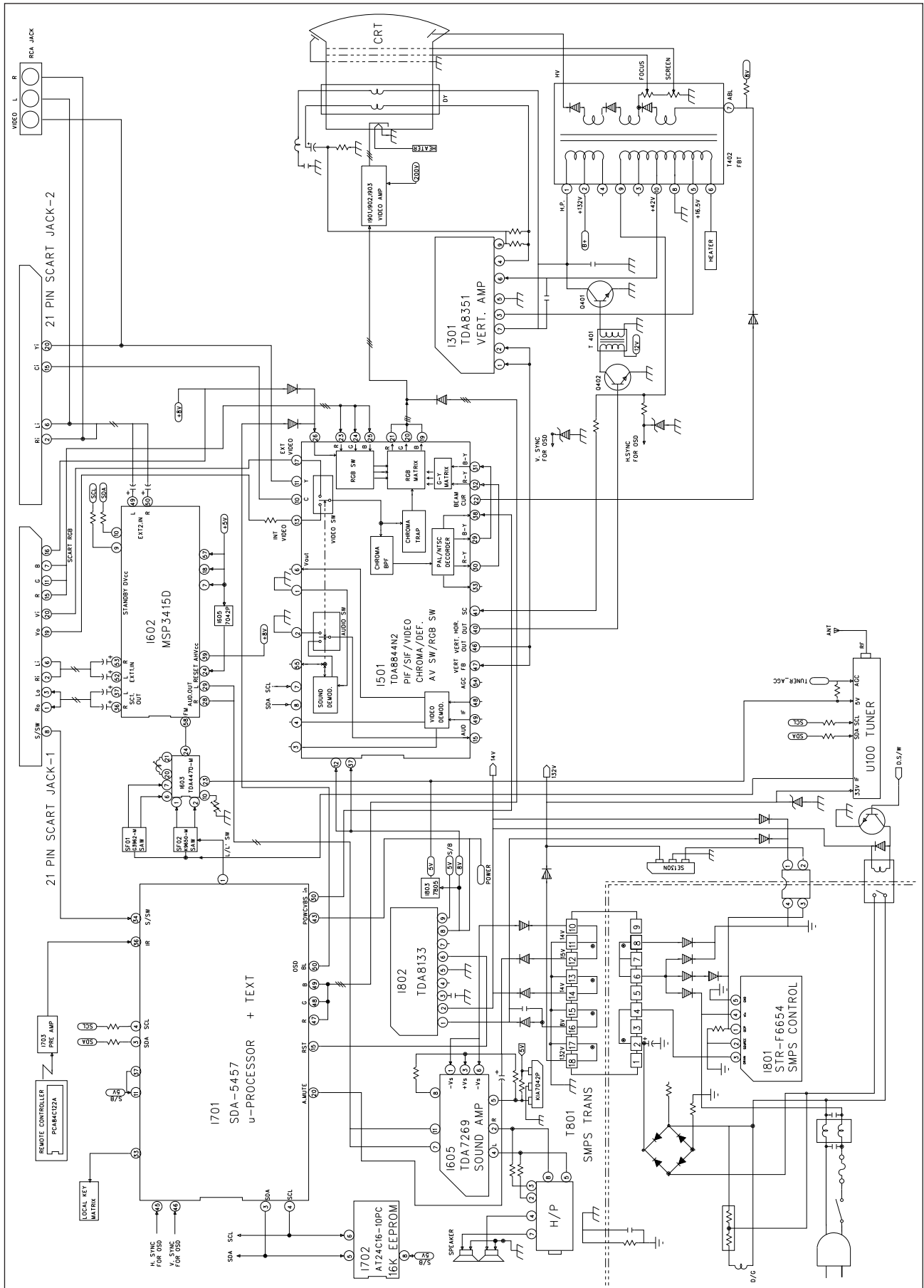
1. Potentials of high voltage are present when this receiver is operating. Operation of the receiver outside the cabinet or with the back board removed involves a shock hazard from the receiver.
 - 1) Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high-voltage equipment.
 - 2) Discharge the high potential of the picture tube before handling the tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled.
2. If any Fuse in this TV receiver is blown, replace it with the FUSE specified in the Replacement Parts List.
3. When replacing a high wattage resistor (oxide metal film resistor) in circuit board, keep the resistor 10mm away from circuit board.
4. Keep wires away from high voltage or high temperature components.
5. This receiver must operate under AC230 volts, 50Hz. NEVER connect to DC supply or any other power or frequency.

■ PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this 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 voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements, electrical components having such features are

identified by designated symbol on 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 safety characteristics as specified in the parts list may create X-RAY Radiation.

Circuit Block Diagram



■ Alignment Instructions

1. AFT

1.1 Standard B/G,D/K,I and L

- 1) Set a Signal Generator with
 - RF FREQUENCY = 38.9 MHz,
 - RF OUTPUT LEVEL = $80 \pm 5\text{dBuV}$
 - System = PAL-B/G
- 2) Connect the Signal Generator RF Output to TP2 (Tuner IF Output).
There must be no signal input to the tuner.
- 3) Set the L109 to TP1(I603, #22) with DC Voltage to $2.5\text{V} \pm 0.3\text{V}$

2. AGC

- 1) Set a Pattern Generator with RF LEVEL $63 \pm 3\text{dBuV}$, RF Frequency 210.25MHz(10CH).
- 2) Connect a OSCILLOSCOPE PROBE to P101 (TUNER AGC INPUT).
- 3) Set the RBOI to P101(Tuner AGC Input) with DC Voltage to $2.5\text{V} \pm 0.3\text{V}$

3. SCREEN

- 1) Set the TV to AVI mode(no signal)
- 2) Set the TV to NORMAL I mode.
- 3) Press the SVC key on SVC Remocon.
- 4) Connect a OSCILLOSCOPE PROBE to P904 (CRT CATHOD R, G, B).
- 5) Adjust the SCREEN VOLUME on FBT
such that the highest black level voltage $145 \pm 5\text{Vdc}$.

4. WHITE BALANCE

- 1) Set the TV to NOR I mode.
- 2) Set the R,G,B LEVEL to CENTER with R,G,B UP/DOWN KEY .
- 3) Adjust the R,G,B UP/DOWN KEY of the other color which did not appear on the screen to obtain WHITE.

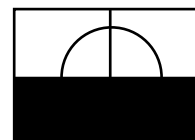
5. FOCUS

- 1) Apply a RETMA PATTERN signal.
- 2) Adjust the FOCUS VOLUME on FBT to obtain optimal resolution.

6. GEOMETRY

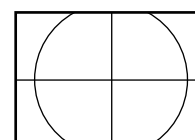
6.1 VERTICAL SLOPE

- 1) Apply a RETMA PATTERN Signal.
- 2) Set the TV to NORMAL I mode.
- 3) Pressing the V-SLOPE DOWN/UP KEY,
the lower half of the screen is blanked .
- 4) Adjust the border line of blanked picture
coincident with the retma center using
the V-SLOPE DOWN/UP keys.



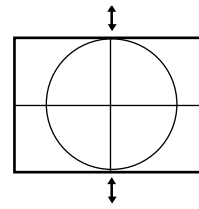
6.2 VERTICAL CENTER

- 1) Apply a RETMA PATTERN Signal.
- 2) Set the TV to NORMAL I mode.
- 3) Adjust the center of the picture
with the V-CENTER DOWN/UP keys.



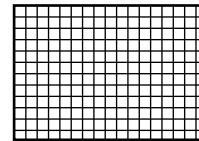
6.3 VERTICAL SIZE

- ★ The VERTICAL CENTER adjustment has to be done in advance.
 - 1) Apply a RETMA PATTERN Signal.
 - 2) Set the TV to NORMAL I mode.
 - 3) Adjust the upper part of the picture with the V-SIZE DOWN/UP keys.



6.4 VERTICAL S-CORRECTION

- 1) Apply a CROSSHATCH PATTERN signal.
- 2) Adjust the S-COR UP/DOWN KEY to obtain the same distance between horizontal lines.



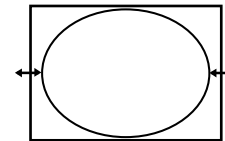
6.5 HORIZONTAL CENTER

- 1) Apply a RETMA PATTERN signal.
- 2) Adjust picture centering with CENTER LEFT/RIGHT keys.

7. EW

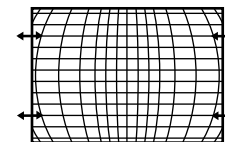
7.1 WIDTH

- 1) Apply a RETMA PATTERN signal.
- 2) Pressing the EW KEY, the WIDTH OSD appear in the screen.
- 3) Adjust the over to make a perfect circle with VOL-UP/DOWN KEY.



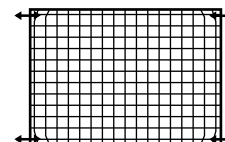
7.2 PARA

- 1) Apply a CROSSHATCH PATTERN signal.
- 2) Pressing the EW KEY, the PARA OSD appear in the screen.
- 3) Adjust the vertical line to straight with VOL-UP/DOWN KEY.



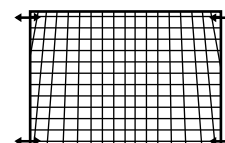
7.3 CORNER

- 1) Apply a CROSSHATCH PATTERN signal.
- 2) Pressing the EW KEY, the CORNER OSD appear in the screen.
- 3) Adjust the vertical line to straight with VOL-UP/DOWN KEY.



7.4 TRAPI

- 1) Apply a CROSSHATCH PATTERN signal.
- 2) Pressing the EW KEY, the TRAPI OSD appear in the screen.
- 3) Adjust the vertical line to straight with VOL-UP/DOWN KEY.

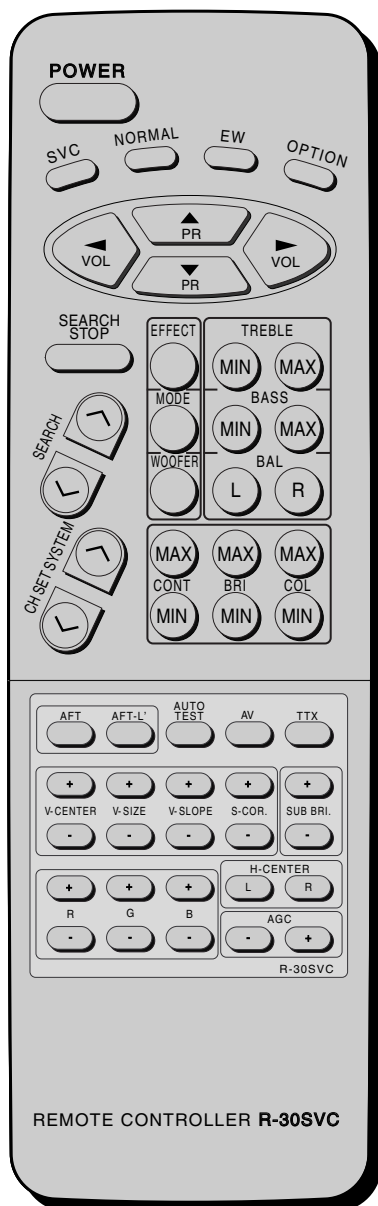


If EEPROM (I702) has been changed ;

- Option data has to be changed and
- all alignment function has to be readjusted .

★ Service Remocon (Part Code : 48B1530SVC)

- If you need this service remocon, then please order to our subsidiaries.



■ IC Description

DW5457 - AE1

(1) General Description

The DW5457-AE1 is a single chip teletext decoder for decoding World System Teletext data as well as Video Programming System(VPS), Program Delivery Control(PDC), and Wide Screen Signalling(WSS) data used for PALplus transmissions(line 23).

Furthermore, the device provides an integrated C500 based general-purpose, fully 8051-compatible microcontroller with television specific hardware features. The on-chip display unit for displaying 'Level 1.5' teletext data can also be used for customer defined on-screen displays. Up to 10 display pages are available internally.

The DW 5457-AE1 contains a slicer for VPS, WSS, PDC, and TTX, an accelerating acquisition hardware modul, a display generator for " Level 1.5 " TTX data, and an 8bit microcontroller running at 250 ns cycle time(min.). The controller with dedicated hardware guarantees flexibility, does most of the internal processing of TTX acquisition, transfers data to/from the external memory interface and receives/transmits data via I²C-firmware user-interface. The slicer combined with dedicated hardware stores TTX data in a VBI buffer of 764Byte. The microcontroller firmware performs all the acquisition tasks(hamming-and parity-checks, page search and evaluation of header control bits) once per field. Additionally, the firmware can provide high-end Teletext-features like Packet-26-handling, FLOF, TOP(in 8/10-sheet for details).

(2) Feature

▣ Acquisition

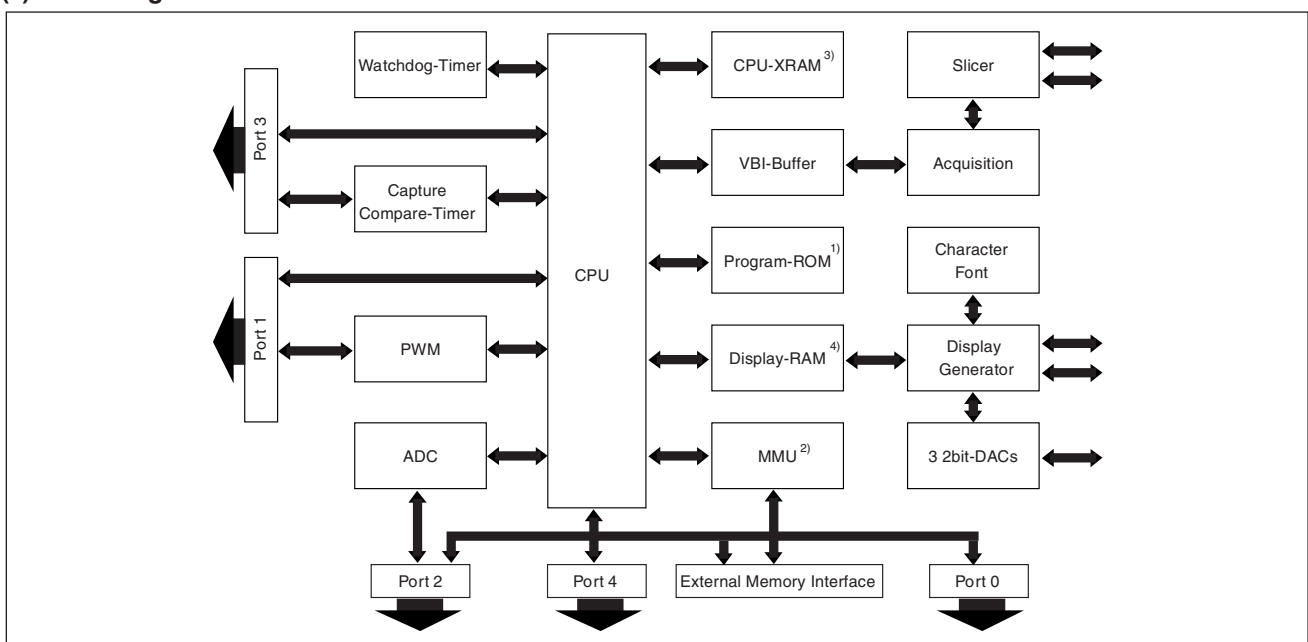
- Feature selection via special function register
- Simultaneous reception of TTX, VPS, PDC, and WSS(line 23)
- Fixed framing code for VPS and TTX.
- Acquisition during VBI
- Direct access to VBI RAM buffer.
- Acquisition of packets x/0 to x/24, x/27, 8/30(firmware)
- Assistance of all relevant checks(firmware)
- 1-bit framing code error tolerance(switchable)
- Complete TTX-acquisition firmware with simple user interface

▣ Display

- Features selectable via special function register.
- 50/60/100/120-Hz display.
- Level 1.5 serial attribute display pages.
- Blanking and contrast reduction output.
- 8 direct addressable display pages.
- 12 x 10-character matrix.
- 96 character ROM(standard G0 character set).
- 156 national option characters for 12 languages(European version).
- 288 characters for X/26 display.
- 64 block mosaic graphic characters.
- 32 characters for OSD in expanded character ROM +32 characters inside OSD box.
- Saturation of basic colors adjustable in 4 steps.
- 8 foreground +8 background colours out of 64 colours.
- Conceal/reveal.
- Transparent foreground/background-inside/outside of a box.
- Contrast reduction inside/outside of a box.
- Cursor(colour changes from foreground to background colour).
- Flash(flash rate 1 s, independent of frame rate).
- Programmable horizontal and vertical sync delay.
- Full screen background colour in outer screen.
- Double size/double width/double height characters.
- Character shadowing.

- Box shadowing.
- Up to 64 Characters in a display row.
- Software selectable pixel frequency(12, 13.7, 16, 19.2 and 24MHz).
- **Synchronization**
 - Display synchronization to Sandcastle Pulse
- **Microcontroller**
 - 8bit C500-CPU(8051 compatible)
 - 24-MHz internal clock(max.)
 - 0.25 μ s(min.) instruction cycle.
 - Non-multiplexed 8-bit data and 16 ... 19-bit address bus(ROMless Version)
 - Eight 16-bit data pointer registers(DPTR)
 - Two 16-bit timers
 - Watchdog timer
 - Capture compare timer for infrared remote control decoding.
 - 256-bytes on-chip RAM.
 - Display RAM and TXT/VPS/PDC/WSS-Acquisition-Buffer directly accessible via MOVX.
 - 10 Kbyte on-chip display-RAM(access via MOVX) for SDA 5457.
 - 8 Kbyte on-chip display-RAM(access via MOVX) SDA 5454 to SDA 5457.
 - 1 Kbyte on-ship ACQ-buffer-RAM(XRAM, access via MOVX)for SDA 5450 and SDA 5454 to SDA 5457.
 - 6 channel 8-bit pulse width modulation unit.
 - 2 channel 14-bit pulse width modulation unit.
 - ADC with 8-bit resolution(4 multiplexed input channels)
- **Ports**
 - One 8-bit I/O-port with open drain output and optional I²C Bus emulation(Port0).
 - Two 8-bit multifuncional I/O-ports(Port1, Port3).
 - One 4-bit port working as digital or analog inputs for the ADC(Port2).
 - One 1-bit Input-port with secondary functions(P4.7/VS/EVEN_ODD).
 - One 2-bit I/O-port with optional RAM/ROM address expansion up to 512 Kbyte(P4.0 and P4.1).
- **Additional Features**
 - Single external 6MHz crystal, all necessary clocks are generated internally
 - CPU clock speed selectable via special funtion registers(7 possible selections between 3 and 24MHz)

(3) Block Diagram



(4) Pin Description

Pin	Name	Symbol	Description
1	P3.1	SYS	SECAM-L' OUT for switching SAW filter K9650-M - SECAM-L' : H - SECAM- L : L
2	P0.7/Open Drain	BUSSTOP	I2C BUS STOP IN for Computer controlled alignment in Factory (Active Low)
3	P0.6/Open Drain	SDA	Serial data IN/OUT for I2C
4	P0.5/Open Drain	SCL	Serial clock IN/OUT for I2C
5	P0.4/Open Drain		Not Used
6	P0.3/Open Drain		
7	P0.2/Open Drain		
8	P0.1/Open Drain		Not Used
9	P0.0/Open Drain	LED	
10	VSS	VSS	ground
11	VCC	VCC	Power Supply
12	XTAL1	OSCIN	Input to inverting osc. Amplifier
13	XTAL2	OSCOUT	Output of inverting osc. Amplifier
14	P4.0/ALE		Not Used
15	RESET	RST	RESET IN (ACTIVE LOW)
16	P1.7/14BIT PWM		Not Used
17	P1.6/14BIT PWM		Not Used
18	P1.5/14BIT PWM		Not Used
19	P1.4/14BIT PWM	Degaussing/SW	H : ON L : OFF
20	P1.3/14BIT PWM	MUTE	AUDIO MUTE OUT
21	P1.2/14BIT PWM	GND	GND
22	P1.1/8BIT PWM		Not Used
23	P1.0/8BIT PWM		Not Used
24	VSSA	VSSA	Analog GND for Slicer
25	FIL3	FIL3	PLL Loop Filter I/O for Phase Shifting
26	FIL2		Not Used
27	FIL1		Not Used
28	VCCA	VCCA	Analog Supply for SlicerNot Used
29	IREF	IREF	Reference Current for Slicer PLLs
30	CVBS	CVBS	CVBS IN
31	P2.3/8 bit ADC	AFT	AFT
32	P2.2/8 bit ADC	AGC	IF AGC INPUT for Auto Tuning System

Pin	Name	Symbol	Description
33	P2.1/8 bit ADC	KS	Local KEY SCAN IN
34	P2.0/8 bit ADC	S/SW	S/SW IDENT IN for Automatic switching between TV/AV mode - H : AV / RGB mode - L : TV mode
35	VSS VSS-OSD	VSS	Ground
36	P3.3/INT1	IR	REMOTE IR IN
37	VDD VCC-OSD	VDD	Power Supply
38	LCIN OSCIN-OSD		Not Used
39	LCOUT		Not Used
40	P3.7/TXT I/O		Not Used
41	P3.6/RXD		Not Used
42	P3.5/T1	SYS	Standard switch Meg. modulated video-IF Signal : H Pos. modulated video-IF Signal : L
43	P3.4/T0	POWER	POWER CONTROL OUT
44	P3.2/INT0		Not Used
45	HS/SC	Sandcastle IN	Sandcastle IN
46	P4.7/VS		Not Used
47	R	R	RED OUT
48	G	G	GREEN OUT
49	B	B	BLUE OUT
50	BLANK	BL	BLANK OUT
51	COR	COR	Not Used (CONTRAST REDUCTION OUT)
52	P3.0 T1C2/PWM1	EVEN/ODD	EVEN/ODD OUT for non-interlacing in TTX mode

AT24C16-10PC (E² PROM)

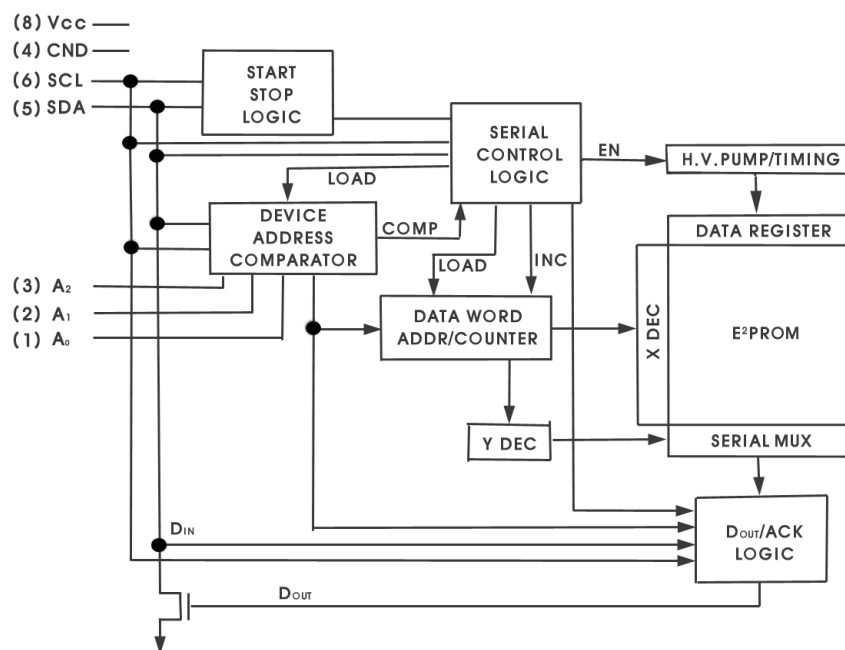
(1) Typical Features

- IC Bus compatible
- Low power CMOS Technology
- Eight-byte page(1k, 2k), 16-byte page(4k, 8k, 16k) write buffer
- Self-Timed Write cycle with Auto-Clear
- 100,000 program/Erase cycles
- 100 Year Data Retention
- Optional High Endurance Device Available

(2) Description

The AT24C16-10PC is a 16K bit serial CMOS E² PROM internally organized as 2048x8bits.
The AT24C16-10PC features a 16 byte page write buffer.

(3) Block Diagram



(4) Pin Description

PIN	SYMBOL	DESCRIPTION
1-3	A0, A1, A2	Device Address Inputs
4	Vss	Ground
5	SDA	Serial Data/Address
6	SCL	Serial Clock
7	TEST	Connect to Vss
8	Vcc	+5V Power supply

TDA8844N2 (I²C-bus controlled PAL/NTSC/SECAM TV Processors)

(1) General Description

The TDA8844N2 is I²C-bus controlled single chip TV processors which are intended to be applied in PAL/NTSC television receiver.

The IC is mounted in a S-DIP 56 envelope.

(2) Feature

- **Video**

- Integrated luminance delay line
- Integrated chroma trap and bandpass filters (auto calibrated)
- Asymmetrical peaking circuit in the luminance channel
- Black stretching of non standard CVBS or luminance signals

- **RGB**

- RGB control circuit with "Continuous Cathode Calibration" and white point adjustment.

- **Input / Output**

- Flexible source selection with CVBS switch and Y(CUBS)/C input so that a comb filter can be applied.
- The output signal of the video source select is externally available (also as CVBS when Y/C input is used).
- External audio input.
- Linear RGB input with fast blanking.

- **Synchronization and Deflection**

- Horizontal synchronization with two control loops and alignment free horizontal oscillator.

- Slow start and slow stop of the horizontal drive output to enable low stress start-up and switch-off from the line circuit at nominal line supply voltage.

- Vertical count-down circuit for stable behavior with provisions for non-standard signals.
- Vertical geometry control.
- Vertical drive optimized for DC coupled vertical output stages.

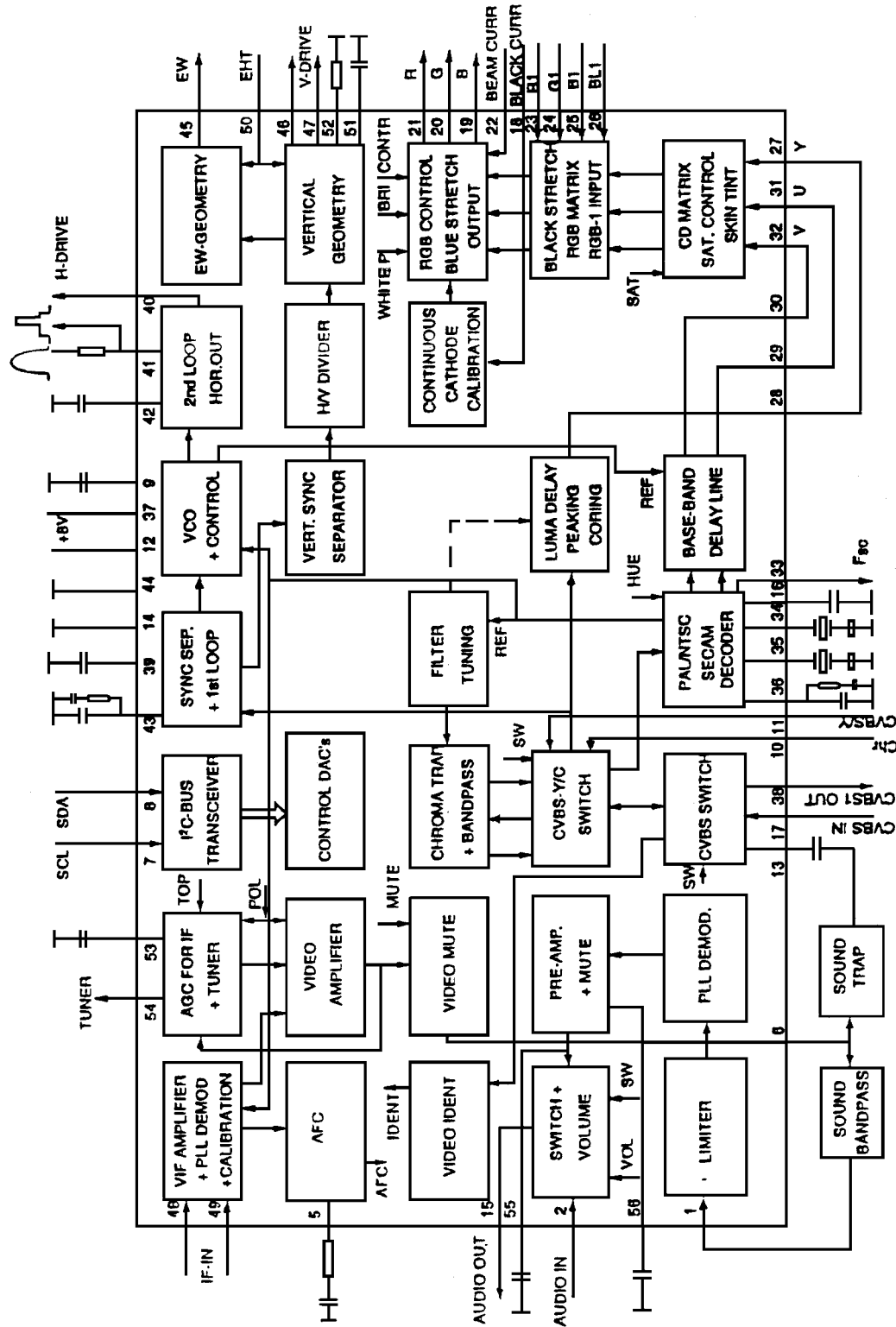
- **Control**

- Full I²C bus control, as well for customer controls as for factory alignment.
- All automatic controls have an option for forced mode.

- **Packaging**

- SDIP-56(Soldering Dual in-line Packages)

(3) Block Diagram



(4) PIN Description

SYMBOL	PIN	DESCRIPTION
ANDIF	1	Sound IF input
AUDIOEXT	2	External audio input
NC	3	not connected
NC	4	not connected
PLLLF	5	IF-PLL loop filter
IFVO	6	IF video output
SCL	7	serial clock input
SDA	8	serial data input/output
DECBG	9	bandgap decoupling
CHROMA	10	chrominance input(S-VHS)
CVBS/Y	11	external CVBS/Y input
VP1	12	main supply voltage 1 (+8V)
CVBSINT	13	external CVBS input
GND1	14	ground1
AUDIOOUT	15	audio output
SECPLL	16	SECAM PLL decoupling
CVBSEXT	17	external CVBS input
BLKIN	18	black-current input
BO	19	blue output
GO	20	green output
RO	21	red output
BCLIN	22	beam current limiter input/V-guard input
RI	23	red input for insertion
GI	24	green input for insertion
BI	25	blue input for insertion
RGBIN	26	RGB insertion input
LUMIN	27	Luminance input
LUMOUT	28	Luminance output
BYO	29	(B-Y) signal output
RYO	30	(R-Y) signal output
BYI	31	(B-Y) signal input
RYI	32	(R-Y) signal input
REFO	33	subcamer reference output
XTAL1	34	3.58 MHz crystal connection
XTAL2	35	4.43/3.58 MHz crystal connection
DET	36	loop filter phase detector
VP2	37	2nd supply voltage 1(+8V)
CABS10	38	CVBS-1 output
DECDIG	39	Decoupling digital supply
HOUT	40	horizontal output
FBISO	41	flyback input/sandcastle output
PH2LF	42	phase-2 filter
PH1LF	43	phase-1 filter
GND2	44	ground2
EWD	45	east-west drive output
VDRB	46	vertical drive B output
VDRA	47	vertical drive A output
IFIN1	48	IF input 1
IFIN2	49	IF input 2
EHTO	50	EHT/overvoltage protection input
VSC	51	vertical sawtooth capacitor
Irel	52	reference current input
DECAGC	53	AGC decoupling capacitor
AGCOUT	54	tuner AGC output
AUDEEM	55	Audio deemphasis
DECSDEM	56	Decoupling sound demodulator

TDA4470-M(Multistandard Video-if and Quasi Parallel Sound Processing)

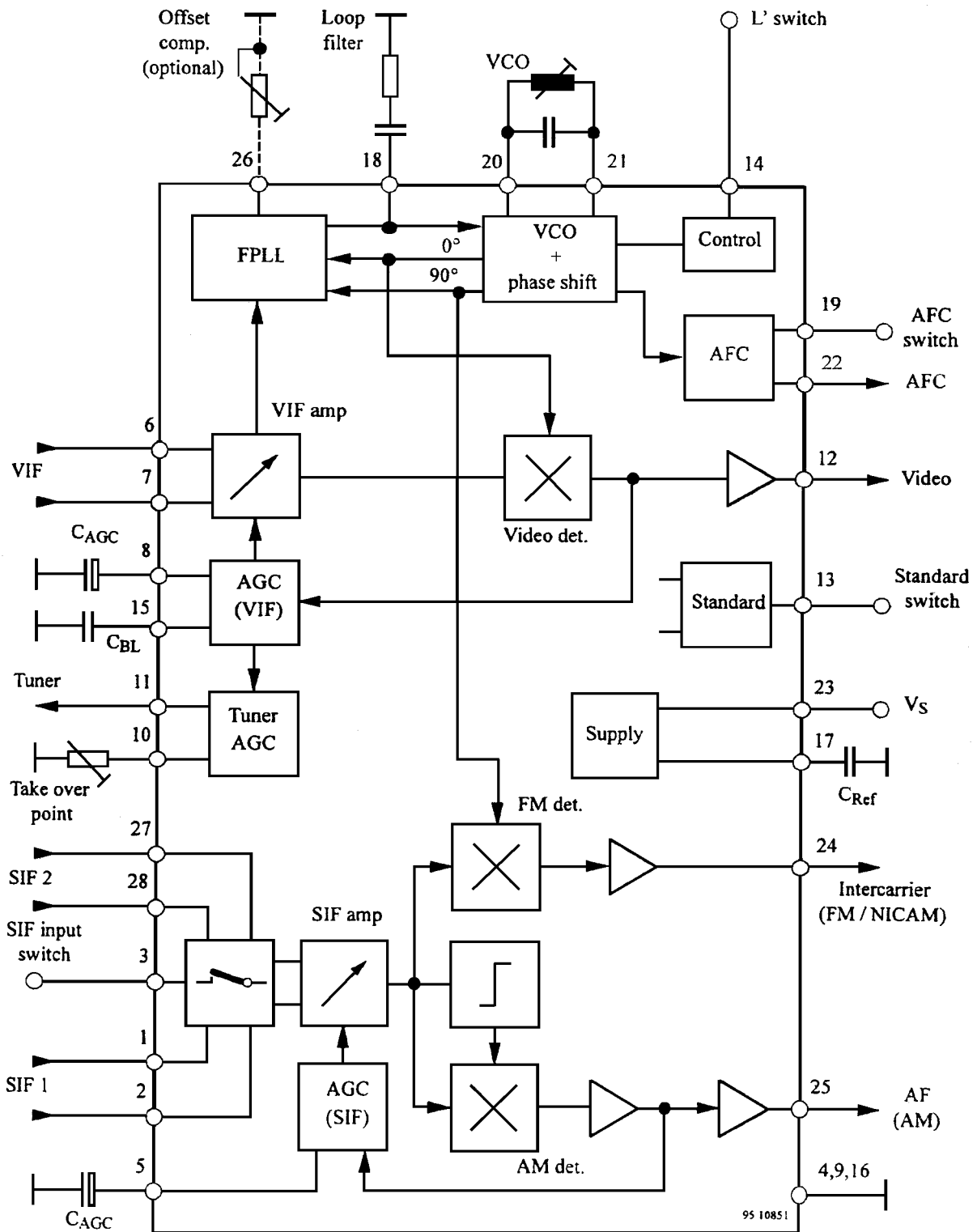
(1) Feature

- 5V supply voltage; low power consumption
- Active carrier generation by FPLL principle (frequency-phase-locked-loop) for true synchronous demodulation.
- Very linear video demodulation, good pulse response and excellent intermodulation figures.
- VCO circuit operates at picture carrier frequency, the VCO frequency is switchable for L'-mode.
- Alignment-free AFC without external reference circuit, polarity of the AFC curve is switchable.
- VIF-AGC for negative modulated signals(peak sync detection) and for positive modulation (peak white/black level detector)
- Tuner AGC with adjustable take over point
- Alignment-free quasi parallel sound(QPS) mixer for FM/NICAM sound IF signals.
- Inter-carrier output signal is gain controlled(necessary for digital sound processing)
- Complete Alignment-free AM demodulator with gain control AF output.
- Separate SIF-AGC with average detection
- Two independent SIF inputs
- Parallel operation for the AM demodulator and QPS mixer (for NICAM-L stereo sound)

(2) Description

The TDA4470 is an integrated bipolar circuit for multistandard video/sound IF(VIF/SIF) signal processing in TV/VCR and multimedia applications. The circuit processes all TV video IF signals with negative modulation (e.g., B/G standard), positive modulation(e.g., L standard) and the AM, FM/NICAM sound IF signals.

(3) Block Diagram



(4) Pin Description

Pin	Symbol	Function
1,2	V_i , SIF 1	SIF 1 input(symmetrical)
3	V_{SW}	Input selector switch
4, 9, 16	GND	Ground
5	C_{AGC}	SIF-AGC(time constant)
6, 7	V_i , VIF	VIF input(symmetrical)
8	C_{AGC}	VIF-AGC(time constant)
10	R_{top}	Take over point, tuner AGC
11	I_{tun}	Tuner AGC output current
12	V_o , vid	Video output
13	V_{SW}	Standard switch
14	V_{SW}	L'switch
15	C_{b1}	Black level capacitor
17	C_{ref}	Internal reference voltage
18	LF	Loop filter
19	V_{SW}	AFC swich
20, 21	V_{VCO}	VCO circuit
22	V_{AFC}	AFC output
23	V_s	Supply voltage
24	V_o , FM	Intercarrier output
25	V_o , AM	AF output-AM sound
26	R_{comp}	Offset compensation
27, 28	V_i , SIF2	SIF 2 input(symmetrical)

TDA6106Q (Video Output Amplifier)

(1) General Description

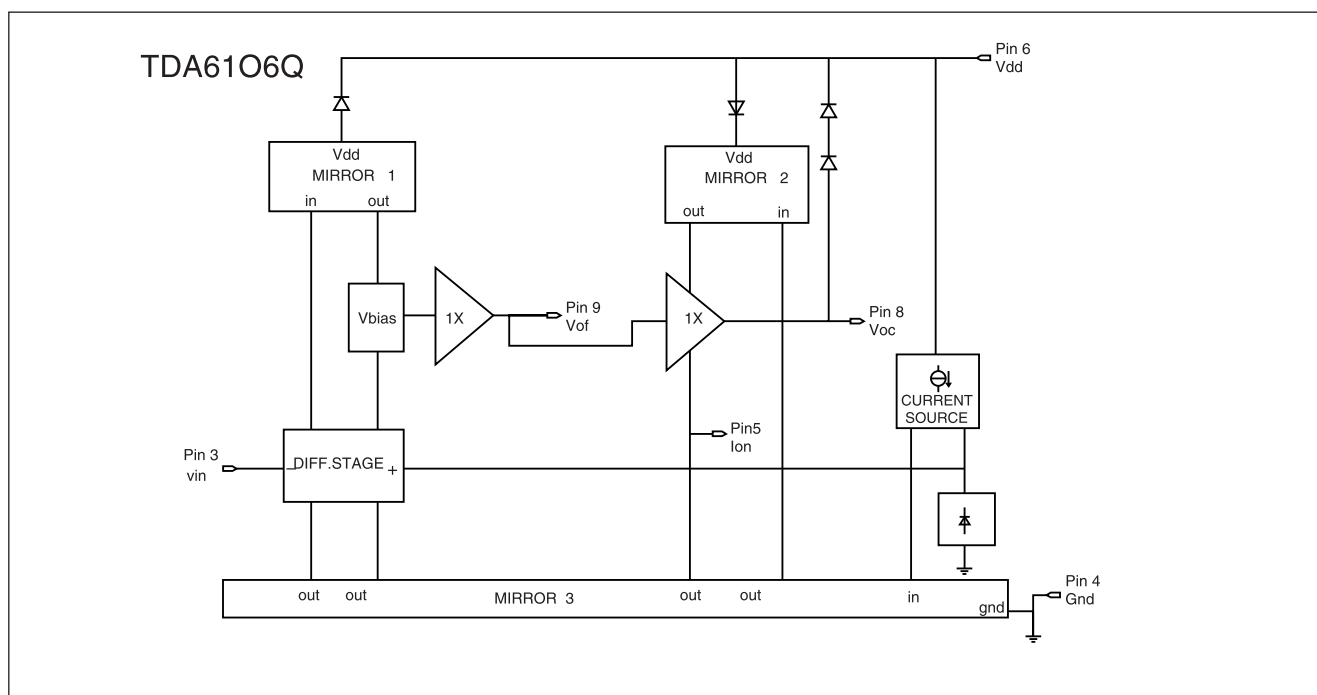
The TDA6106Q is a monolithic video output amplifier (5MHz bandwidth) in a SIL 9 MPpackage, using high-voltage DMOS technology, and is intended to drive the cathode of CRT directly .

To obtain maximum performance, the amplifier should be used with black-current control.

(2) Feature

- Black - current measurement output for automatic black current stabilization (ABS)
- Single supply voltage of 200V
- Internal protection against positive appearing CRT flash-over discharge
- Protection against ESD
- Internal 2.5V reference circuit
- Controllable switch-off behavior

(3) Block Diagram



(4) Pin Description

PIN	SYMBOL	DESCRIPTION
1		N.C
2		N.C
3	V in	inverting input
4	GND	ground, substrate
5	I om	Black-current measurement output
6	V dd	supply voltage high
7		N.C
8	V oc	cathode output
9	V of	feedback/transient output

TDA8351 (DC-coupled vertical deflection circuit)

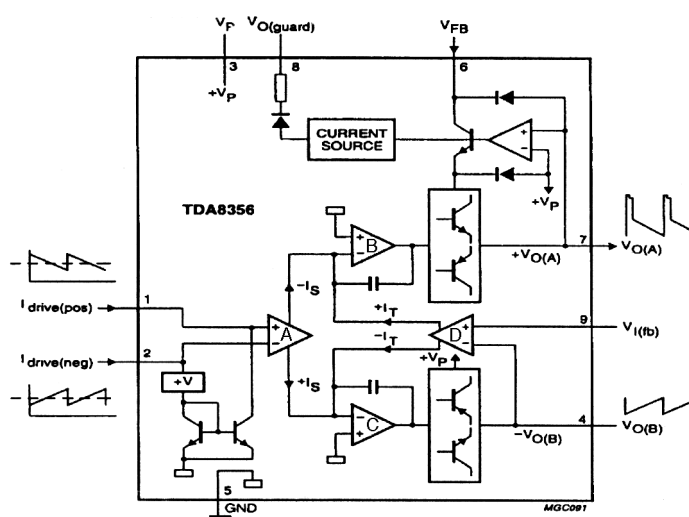
(1) General Description

The TDA8351 is power circuit for use in 90° and 110° color deflection systems for field frequencies of 50 to 120 Hz. The circuit provides a DC driven vertical deflection output circuit, operating as a high efficient class G system.

(2) Feature

- High efficient fully DC-coupled vertical output bridge circuit
- Vertical fly-back switch
- Guard circuit
- Protection against : - short circuit of the output pins (7 and 4)
- short circuit of the output pins to V_p
- Temperature (thermal) protection
- High EMC immunity because of common mode inputs
- A guard signal in zoom mode.

(3) Block Diagram



(4) Pin Description

PIN	SYMBOL	DESCRIPTION
1	I drive (pos)	input power stage (positive); include li(sb) signal bias
2	I drive (neg)	input power stage (negative); include li(sb) signal bias
3	V p	operating supply voltage
4	V o(b)	output voltage B
5	GND	ground
6	V fb	input fly-back supply voltage
7	V o(a)	output voltage A
8	V o(guard)	guard output voltage (Not used)
9	V l(fb)	input feedback voltage

STR-F6654 (Hybrid IC for a Switching Regulator)

(1) General Description

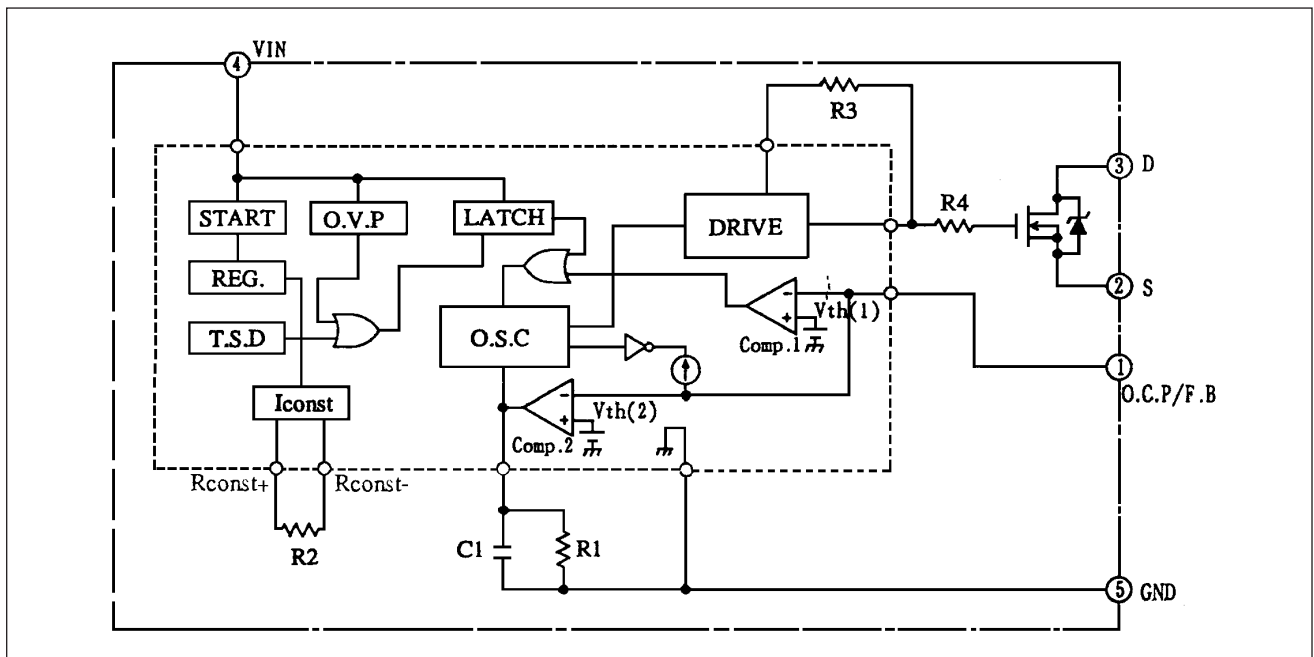
The STR-F6654 is a Hybrid IC with a built in power transistor and a separate excitation control IC, designed for converter type switching mode power supply applications.

The IC is capable of quasi-resonant mode and requires small number of external component.

(2) Feature

- Small SIP isolated package : Resin sealed type (transfer mold)
- Lower power dissipation at a lighter load
- Many protection function : - Pulse-by-pulse over current protection
 - Over-voltage protection with a latch
 - Thermal protection with a latch
- These protection functions are incorporated and can be latched with an external signal.

(3) Block Diagram



(4) Pin Description

Pin	Symbols	Description	Functions
1	O.C.P/F.B	Overcurrent/Feedback terminal	Input of overcurrent detection signal and constant voltage control signal
2	S	Source terminal	MOS FET source
3	D	Drain terminal	MOS FET drain
4	VIN	Power supply terminal	Input of power supply for control circuit
5	GND	Ground terminal	Ground

(5) Electrical Characteristics of Control Part (Ta=25°C)

Parameter	Terminal	Symbol	Rating			Unit
			MIN	TYP	MAX	
Operation start voltage	4-5	V _{IN(ON)}	14.4	16	17.6	V
Operation stop voltage	4-5	V _{IN(OFF)}	9	100	11	V
Circuit current in operation	4-5	I _{IN(ON)}	-	-	30	mA
Circuit current in non-operation	4-5	I _{IN(OFF)}	-	-	100	μA
Maximum OFF time	-	T _{OFF(MAX)}	45	-	55	μsec
Minimum time for input of quasi resonant signals	1-5	T _{th(2)}	-	-	1.0	μsec
Minimum OFF time	-	T _{OFF(MIN)}	-	-	1.5	μsec
O.C.P/F.B terminal threshold voltage 1	1-5	V _{th(1)}	0.68	0.73	0.78	V
	1-5	V _{th(2)}	1.3	1.45	1.6	V
O.C.P/F.B terminal extraction current	1-2	I _{O.C.P/F.B}	1.2	1.35	1.5	mA
O.V.P operation voltage	4-5	V _{IN(OVP)}	20.5	22.5	24.5	V
Latch circuit sustaining voltage	4-5	I _{IN(H)}	-	-	400	μA
Latch circuit release voltage	4-5	V _{IN(La.OFF)}	6.6	-	8.4	V
Thermal shutdown operating temperature	-	T _{J(TSD)}	140	-	-	°C

(6) Electrical Characteristics of Power Transistor Part(Trl) (Ta=25 °C)

Parameter	Terminal	Symbol	Rating			Unit
			MIN	TYP	MAX	
Drain-to-Source breakdown voltage	3-2	V _{DSS}	650	-	-	V
Drain leakage current	3-2	I _{DSS}	-	-	300	μA
On-resistance	3-2	R _{DS(ON)}	-	-	1.15	Ω
Switching time	3-2	t _f	-	-	250	nsec
Thermal resistance	-	θ _{ch-F}	-	-	0.95	°C/W

TDA8133 (5.1V+8V regulator with Disable and Reset)

(1) General Description

The TDA8133 is a monolithic dual positive voltage regulator designed to provide fixed precision output voltages of 5.1V and 8V at currents up to 0.75A.

An internal reset circuit generates a reset pulse when the output 1 decrease below the regulated voltage value.

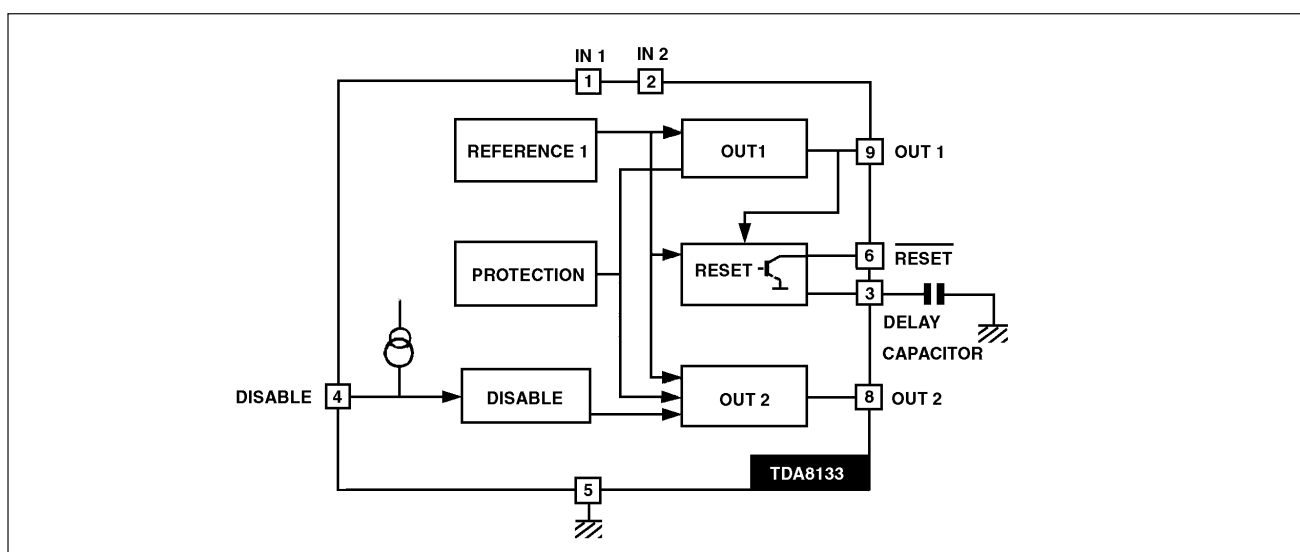
Output 2 can be disabled by TTL input.

Short circuit and thermal protections are included in all the versions.

(2) Feature

- output currents up to 0.75A
- Fixed precision Output 1 voltage $5.1V \pm 2\%$
- fixed precision Output 2 voltage $8V \pm 2\%$
- output 1 with Reset facility
- output 2 with Disable by TTL input
- short circuit protection at both outputs
- thermal protection
- low drop output voltage

(3) Block Diagram



(4) Pin Description

PIN	SYMBOL	DESCRIPTION
1	V in 1	input 1
2	V in 2	input 2
3	C e	Delay capacitor
4	V dis	disable
5	GND	ground
6	RST	reset
7		n.c
8	V out 2	output 2 (12V)
9	V out 1	output 1 (5.1V)

TDA 7269(10W+10W Stereo Amplifier with Mute & ST-BY)

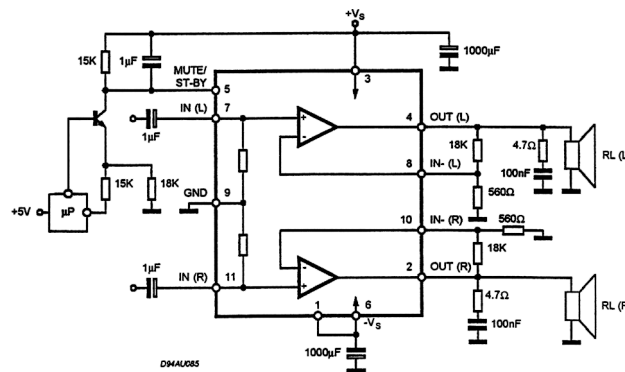
(1) Features

- Wide supply voltage range up to $\pm 20V$.
- Split supply
- High output power 10+10W @ THD=10%, $R_L=8\Omega$, $V_s= \pm 14V$
- No pop at turn-ON/OFF
- Mute(POP FREE)
- Stand-by feature(LOWIq)
- Thermal overload protection
- Short circuit protection to gnd

(2) Description

The TDA7269 is class AB dual Audio power amplifier assembled in the Multiwatt package, specially designed for high quality sound application as Hi-Fi music centers and stereo TV sets.

(3) Block Diagram



(4) Pin Description

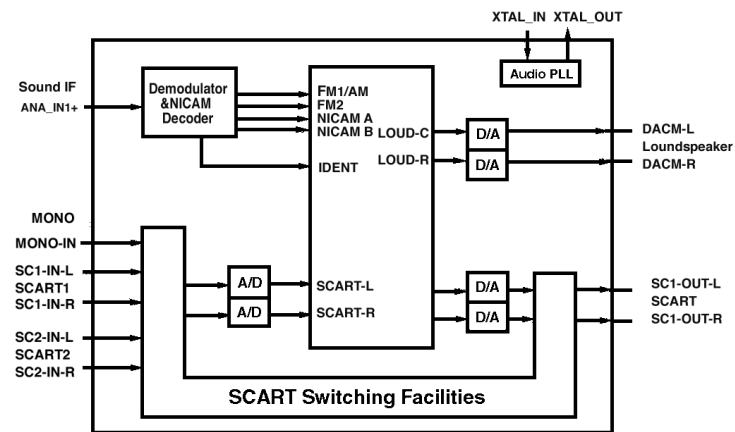
Pin	Symbol
1	-Vs
2	output(1)
3	+Vs
4	output(2)
5	Mute
6	-Vs
7	IN+(2)
8	IN-(2)
9	GND
10	IN-(1)
11	IN+(1)

MSP3415D (Multistandard Sound processor for NICAM & 2-Carrier)

(1) Features

- A single-chip Multistandard Sound Processor for applications in analog and digital TV sets
- TWO selectable analog inputs
- Automatic Gain control for analog input
- All demodulation and filtering is performed on chip and is individually programmable
- Adjustment of volume, balance, loudness, treble, bass, base width enlargement, pseudo stereo
- Independent input selection for speaker-out and scart-out

(2) Block Diagram



(3) Description

- Analog Sound IF - Input Section

The input pins ANA_IN1+, ANA_IN2+ and ANN_IN-offer the possibility to connect two different sound IF sources to the MSP 3415D. By means of bit [8] of AD_CV either terrestrial or satellite sound IF signals can be selected.

The analog-to-digital conversion of the preselected sound IF signal is done by a flash-converter, whose output can be used to control an analog automatic gain circuit (AGC), providing optimum level for a wide range of input levels. It is possible to switch between automatic gain control and a fixed (setable) input gain. In the optimum case, the input range of the AD converter is completely covered by the sound if source. Some combinations of SAW filters and sound IF mixer IC's however show large picture components on their outputs. In this case filtering is recommended.

It was found, that the high pass filters formed by the coupling capacitors at pins ANA_IN1+ and ANA_IN2+ are sufficient in most cases.

- Quadrature Mixers

The digital input coming from the integrated A/D converter may contain audio information at a frequency range of theoretically 0 to 9 MHz corresponding to the selected standards. By means of two programmable quadrature mixers two different audio sources, for example NICAM and FM-mono, may be shifted into baseband position. In the following the two main channels are provided to process either:

- NICAM (channel 1) and FM mono (channel 2) simultaneously or alternatively
- FM2 (channel 1) and FM1 (channel2).

Two independent digital oscillators are provided to generate two pairs of sin/cos-functions. Two programmable increments, to be divided up into Low- and High part, determine frequency of the oscillator, which corresponds to the frequency of the desired audio carrier.

- Lowpass Filtering Block for Mixed Sound IF Signals

By means of decimation filters the sampling rate is reduced. Then, data shaping and/or FM bandwidth limitation is performed by a linear phase Finite Impulse Response (FIR-filter). Just like the oscillators' increments the filter

NICAM versions can easily be implemented. Two not necessarily different sets of coefficients are required, one for channel 1 (NICAM or FM2) and one for channel 2 (FM1=FM-mono).

Since both MSP channels are designed to process the German FM Stereo System with the same FIR coefficient set (despite 7 dB power level difference of the two sound carriers), the MSP channel 1 has an internal overall gain of 6 dB. To process two carriers of identical power level these 6 dBs have to be taken into account by decreasing the values of the channel 1 coefficient set.

- CORDIC Block

The filtered sound IF signals are demodulated by transforming the incoming signals from Cartesian into polar format by means of a CORDIC processor block. On the output, the phase and amplitude is available for further processing. AM signals are derived from the amplitude information whereas the phase information serves for FM and NICAM (DQPSK) demodulation.

- Differentiators

FM demodulation is completed by differentiation the phase information output of the CORDIC block.

- Lowpass Filer Block for Demodulated Signals

The demodulated FM and AM signals are further lowpass filtered and decimated to a final sampling frequency of 32 kHz. The usable bandwidth of the final baseband signals is about 15 kHz.

- DQPSK-Decoder

In case of NICAM-mode the phase samples are decoded according the DQPSK-Coding scheme. The output of this block contains the original NICAM-bitstream, which is available at the N-Bus interface.

- NICAM-Decoder

Before any NICAM decoding can start, the MSP must lock to the NICAM frame structure by searching and synchronizing to the so-called Frame Alignment Words (FAW).

To reconstruct the original digital sound samples the NICAM-bitstream has to be descrambled, deinterleaved and rescaled. Also bit error detection and correction (concealment) is performed in this NICAM specific block.

To facilitate the Central Control Unit CCU to switch the TV-set to the actual sound mode, control information on the NICAM mode and bit error rate are supplied by the the NICAM-Decoder, It can be read out via the I²C-Bus.

- Analog Section and SCART Switches

The analog input and output sections offer a wide range of switching facilities, which are shown in Fig.

The switches are controlled by the ACB bits defined in the audio processing interface (see chapter “programming the audio processing part”).

If the MSP 3415D is switched off by first pulling STANDBYQ low and then disconnecting the 5V but keeping the 8V power supply (**‘Standby’-mode**), the switches S1, S2 and S3 maintain their position and function. This facilitates the copy from selected SCART-inputs to SCART-outputs in the TV-sets standby mode.

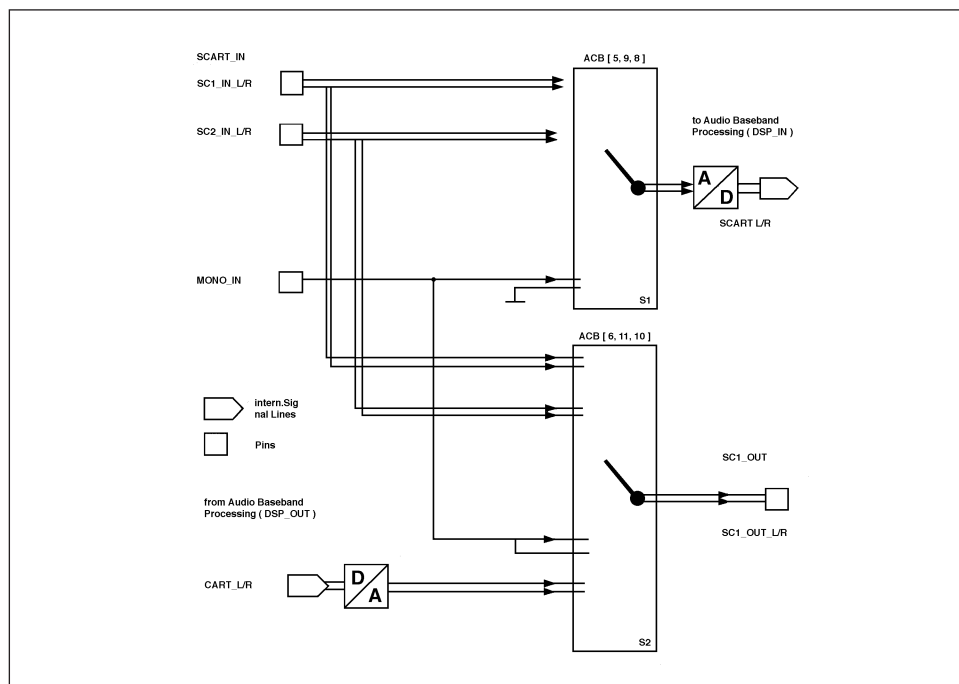


Fig. SCART-Switching Facilities Bold lines determine the default configuration

In case of power-on start or starting from standby, the IC switches automatically to the default configuration, shown in the figure above. This action takes place after the first I²C transmission into the DFP part. By transmitting the ACB register first, the default setting mode can be changed.

- MSP 3415D Audio Baseband Processing

By means of the DFP processor all audio baseband functions are performed by digital signal processing (DSP). The DSP functions are grouped into three processing parts: Input preprocessing, channel selection and channel postprocessing.

The input preprocessing is intended to prepare the various signals of all input sources in order to form a standardized signal at the input to the channel selector. The signals can be adjusted in volume, are processed with the appropriate deemphasis and are dematrixed if necessary.

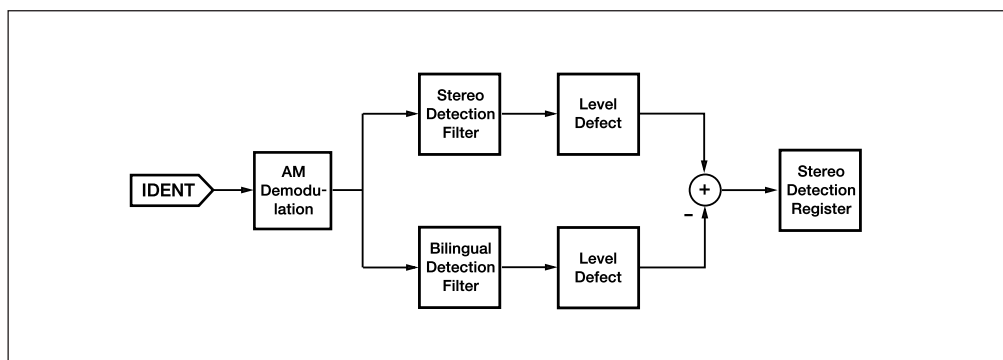
Having prepared the signals that way, the channel selector makes it possible to distribute all possible source signals to the desired output channels.

Of special importance is the ability to route in an external coprocessor for special effects like graphic equalizer, surround processing and sound field processing. Routing can be done with each input source and output channel via the I²S inputs and outputs.

All input and output signals can be processed simultaneously with the exception that FM2 cannot be processed at the same time as NICAM. While processing the adaptive deemphasis, no dual carrier stereo (German or Korean) or NICAM processing is possible. Identification values are not valid either.

- Dual Carrier FM Stereo/Bilingual Detection

In the German and Korean TV standard, audio information can be transmitted in three modes: Mono, stereo or bilingual. To obtain information about the current audio operation mode, the MSP 3415D detects the so-called identification signal. Information is supplied via the Stereo Detection Register to an external CCU.



(4) Pin Description

PIN	PIN NAME	DESCRIPTION
1	AUD_CL_OUT	Audio clock output
2	CW_CL	Pay-TV control clock
3	CW_DA	Pay-TV control data
4	D_CTR_OUT1	Digital control output 1
5	D_CTR_OUT0	Digital control output 0
6	ADR_SEL	Control bus address select
7	STANDBYQ	Standby (low-active)
8	D_CTR_IN 0	For future use
9	I ² C_CL	I ² C clock
10	I ² C_DA	I ² C clock
11	I ² S_CL	I ² S clock
12	I ² S_WS	I ² S wordstrobe
13	I ² S_DA_OUT	I ² S data output
14	I ² S_DA_IN	I ² S data input
15	S_DA_IN	SBUS data input
16	S_ID	SBUS ident
17	S_CL	SBUS clock
18	DVSUP	Digital power supply +5V
19	DVSS	Digital ground
20	S_DA_OUT	SBUS data output (FM/NICAM-test)
21	FRAME	NBUS frame
22	N_CL	NBUS clock
23	N_DA	NBUS data
24	RESETQ	Power-on-reset
25	DACA_R	Analog output AUX, right
26	DACA_L	Analog output AUX, left
27	VREF2	Reference ground2 high voltage part
28	DACM_R	Analog output MAIN, right
29	DACM_L	Analog output MAIN, left
30	TESTIO2	Test pin 2
31	C_DACS_R	SCART output capacitor to ground
32	C_DACS_L	SCART output capacitor to ground
33	SC2_OUT_R	SCART output2, right
34	SC2_OUT_L	SCART output2, left
35	VREF1	Reference ground1 high voltage part
36	SC1_OUT_R	SCART output, right
37	SC1_OUT_L	SCART output, left
38	CAPL_A	Volume capacitor AUX
39	AHVSUP	Analog power supply 8V
40	CAPL_M	Volume capacitor MAIN

PIN	PIN NAME	DESCRIPTION
41	AHVSS	Analog ground
42	AGNDC	Analog reference voltage high voltage part
43	PDMC1	Capacitor to BAGNDI
44	PDMC2	Capacitor to BAGNDI
45	BAGNDI	Buffered AGNDC
46	SC3_IN_L	Scart input3 in, left
47	SC2_IN_R	Scart input3 in, right
48	ASG2	Analog Shield Ground2
49	SC2_IN_L	Scart input2 in, left
50	SC2_IN_R	Scart input2 in, right
51	ASG1	Analog Shield Ground1
52	SC1_IN_L	Scart input1 in, left
53	SC1_IN_R	Scart input1 in, right
54	VREFTOP	Reference voltage IF A/D converter
55	MONO_IN	Mono input
56	AVSS	Analog ground
57	AVSUP	Analog power supply +5V
58	ANA_IN1+	IF input1
59	ANA_IN1-	IF common
60	ANA_IN2+	IF input (if ANA_IN1+is used only, connect to AVSS with 50pF Capacitor
61	TESTIO1	Test pin1
62	XTAL_IN	Crystal oscillator
63	XTAL_OUT	Crystal oscillator
64	DMA_SYNC	DMAC-sync: signal

GMS30112-R098 (4-bit Single Chip Microcomputer for Remote control)

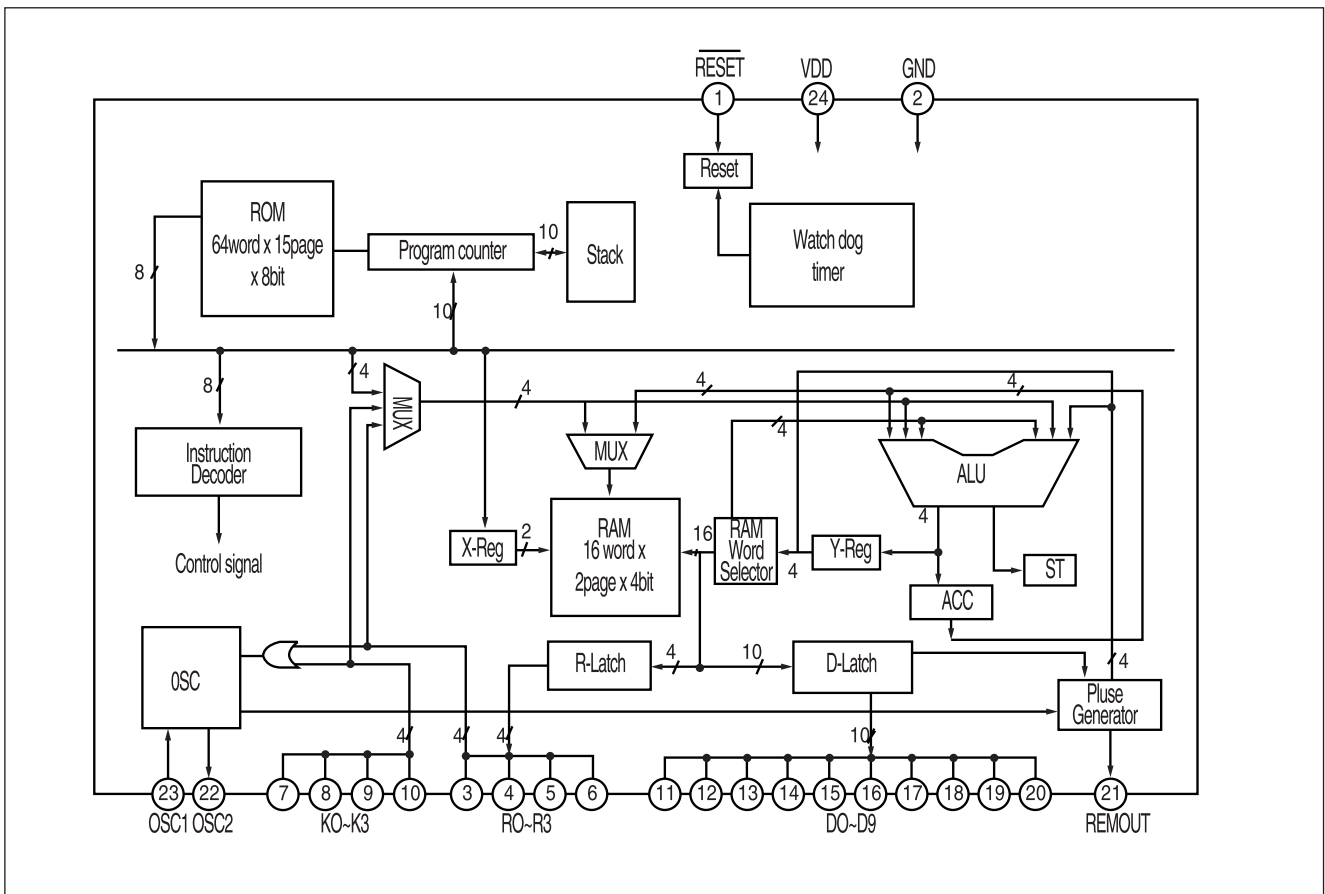
(1) General Description

The GMS30112-R098 is 4-bit single chip CMOS microcomputer.

(2) Feature

- program memory : 1024 bytes
- data memory : 32 x 4 bits
- 43 types of instruction set
- 3 levels of subroutine nesting
- 1 bit output port for a large current (REMOUT signal)
- operating frequency : 300kHz - 1 MHz
- instruction cycle : 12.5 usec @ 480kHz
- CMOS process (single 3.0 V power supply)
- stop mode (through internal instruction)
- released stop mode by key input (masked option)
- built in capacitor for ceramic oscillation circuit (masked option)
- built in a watch dog timer(WDT)
- low operating voltage (2.0 V to 4.0 V)

(3) Block Diagram



(4) Pin Description

PIN	SYMBOL	DESCRIPTION
1,2,3,4	K0,K1,K2,K3	4 bit input port with built in pull up resistor
5,6,7,8,9,10	D0,D1,D2,D3,D4,D5	10 bit output port which can be set or reset pin by pin independently. The output structure is N-channel open drain.
11	REMOUT	remote control signal output port which has high current driving capability
12	OSC 2	oscillator output
13	OSC 1	oscillator input
14	Vdd	2-4V power supply
15	RESET	reset signal input which is a low active
16	GND	ground
17,18,19,20	R0,R1,R2,R3	4 bit programmable I/O port

■ IC DC Voltage charts

★ **Input signal** PAL/CH5-Video : 8 step colour bar (87% AM)

Audio : 1 KHz sinewave (60% FM)

★ **User's control condition** Contrast, Brightness, Colour, Volume Controls-max.

★ **Line voltage** AC 230V, 50Hz

★ **All the voltage in each point are measured with Multimeter.**

1. TDA 8351 (I301)

Pin No.	1	2	3	4	5	6	7	8	9
V(DC)	2.3	2.3	16.0	8.3	0	4.6	8.3	0.6	7.1

2. MSP 3415D (I602)

Pin No.	1	2	3	4	5	6	7	8	9	10
V(DC)	0	0	0	0	0	0	5.0	0	1.8	1.8

Pin No.	11	12	13	14	15	16	17	18	19	20
V(DC)	2.5	2.5	2.5	1.3	1.3	1.3	1.3	5.0	0	3.5

Pin No.	21	22	23	24	25	26	27	28	29	30
V(DC)	0	0	0	5.0	0	0	0	1.5	1.5	0

Pin No.	31	32	33	34	35	36	37	38	39	40
V(DC)	0.1	0	0	0	0	3.8	3.8	3.8	8.0	7.0

Pin No.	41	42	43	44	45	46	47	48	49	50
V(DC)	0	3.7	0	0	0	0	0	0	3.7	3.7

Pin No.	51	52	53	54	55	56	57	58	59	60
V(DC)	0	3.7	3.7	2.6	3.7	0	5.0	1.5	1.5	0

Pin No.	61	62	63	64
V(DC)	0	2.5	2.5	3.7

3. TDA 4470-M(I603)

Pin No.	1	2	3	4	5	6	7	8	9	10
V(DC)	3.2	3.2	3.4	0	1.0	2.3	2.3	2.0	0	10

Pin No.	11	12	13	14	15	16	17	18	19	20
V(DC)	1.8	2.0	4.5	3.8	2.5	0	4.2	2.2	3.4	3.3

Pin No.	21	22	23	24	25	26	27	28
V(DC)	3.3	3.2	4.9	2.1	2.1	0.6	0.1	0.1

4. TDA 7269 (I605)

Pin No.	1	2	3	4	5	6	7	8	9	10	11
V(DC)	-14.0	0	13.5	0	6.5	-14	0	0	0	0	0

5. SDAL 5457 (I701)

Pin No.	1	2	3	4	5	6	7	8	9	10
V(DC)	0	5.1	2.2	1.7	0.3	0.3	0.3	0.3	0.4	0

Pin No.	11	12	13	14	15	16	17	18	19	20
V(DC)	5.1	2.5	2.7	5.1	5.1	3.8	5.1	5.1	0.1	0.1

Pin No.	21	22	23	24	25	26	27	28	29	30
V(DC)	0	5.1	5.1	0	2.3	4.8	5.1	4.8	1.4	2.4

Pin No.	31	32	33	34	35	36	37	38	39	40
V(DC)	2.5	1.6	5.1	0	0	4.8	5.0	4.5	4.5	5.0

Pin No.	41	42	43	44	45	46	47	48	49	50
V(DC)	0	5.0	2.1	5.0	0.7	5.0	0	0	0	0

Pin No.	51	52
V(DC)	2.5	0

6. AT24C16-10PC (I702)

Pin No.	21	22	23	24	25	26	27	28
V(DC)	0	0	0	0	2.3	1.8	0	5.1

7. STR-F6654 (I801)

Pin No.	1	2	3	4	5
V(DC)	2.6	0.1	286.9	17.4	0

8. TDA 8133 (I801)

Pin No.	21	22	23	24	25	26	27	28
V(DC)	9.4	11.2	3.1	1.9	0	5.1	8.0	5.1

Circuit Description

Vision IF Amplifier

The video IF signal(VIF) is fed through a SAW filter to the differential input(pin 6-7) of the VIF amplifier. This amplifier consists of three AC-coupled amplifier stages. Each differential amplifier is gain controlled by the automatic gain control(VIF-AGC). The output signal of the VIF amplifier is applied to the FPLL carrier generation and the video demodulator.

Tuner-and VIF-AGC

At Pin 8, the VIF-AGC charges/discharges the AGC capacitor to generate a control voltage for setting the gain of the VIF amplifier and tuner in order to keep the video output signal at a constant level. Therefore, in the case of all negative modulated signals(e.g., B/G standard) the sync. level of the demodulated video signal is the criterion for a fast charge/discharge of the AGC capacitor.

For positive modulation(e.g., L standard) the peak white level of video signal controls the charge current. In order to reduce reaction time for positive modulation, where a large time constant is needed, an additional black level detector controls the discharge current in the event of decreasing VIF input signal. The control voltage(AGC voltage at Pin 8) is transferred to an internal control signal, and is fed to the tuner AGC to generate the tuner AGC can be adjusted at Pin 10 by a potentiometer or an external dc voltage(form interface circuit of microprocessor).

FPLL, VCO and AFC

The FPLL circuit(frequency phase locked loop) consists of a frequency and phase detector to generate the control voltage for the VCO tuning. In the locked mode, the VCO is controlled by the phase detector and in unlocked mode, the frequency detector is superimposed. The VCO operates with an external resonance circuit(L and Cparallel) and is controlled by internal varicaps. The VCO control voltage is also converted to a current and represents the AFC output signal at Pin 22. At the AFC are possible: AFCcurve "rising" or "falling" and AFC "off".

A practicable VCO alignment of the external coil is the adjustment to zero AFC output current at Pin 22. At center frequency the AFC output current is equal to zero. Furthermore, at Pin 14, the VCO center frequency can be switched for setting to the required L' value(L' standard).

The optional potentiometer at Pin 26 allows an offset compensation of the VCO phase for improved sound quality(fine adjustment). Without a potentiometer(open circuit at Pin 26), this offset compensation is not active.

The oscillator signal passes a phase shifter and supplies the in-phase signal(0°) and the quadrature signal(90°) of the generated picture carrier.

Video Demodulation and Amplifier

The video IF signal, which is applied from the gain controlled IF amplifier, is multiplied with the inphase component of the VCO signal. The video demodulator is designed for low distortion and large bandwidth. The demodulator output signal passes an integrated low pass filter for attenuation of the residual vision carrier and is fed to the video amplifier. The video amplifier is realized by an operational amplifier with internal feedback and 8MHz bandwidth(-3dB). A standard dependent dc level shift in this stage delivers the same sync. level for positive and negative modulation. An additional noise clipping is provided. The video signal is fed to VIF-AGC and to the video output buffer. This amplifier with a 6dB gain offers easy adaption of the sound trap. For nominal video IF modulation the video output signal at Pin 12 is 2V_{pp}.

Sound IF Amplifier and SIF-AGC

The SIF amplifier is nearly identical with the 3-stage VIF amplifier. Only the first amplifier stage exists twice and is switchable by a control voltage at Pin 3. Therefore with a minimal external expense it is possible to switch between two different SAW filters. Both SIF inputs features excellent cross-talk attenuation and an input impedance which is independent from the switching condition.

signal to the AM demodulator and QPS mixer.

AM Demodulator

The alignment-free AM demodulator is realized by a synchronous detector. The modulated SIF signal from the SIF amplifier output is multiplied in phase with the limited SIF signal(AM is removed). The AF signal of the demodulator output is fed to the output amplifier and to the SIF-AGC. For all TV standards with negative video modulation(e.g., B/G standard), the AF output signal (Pin 24) is switched off by the standard switch.

Quasi-Parallel-Sound(QPS) Mixer

The QPS mixer is realized by a multiplier. The SIF signal(FM or NICAM carrier) is converted to the intercarrier frequency by the regenerated picture carrier(quadrature signal) which is provided from the VCO. The intercarrier signal is fed via an output amplifier to Pin 24.

Standard Switch

To have equal polarity of the video output signal the polarity can be switched in the demodulation stage in accordance with the TV standard. Additionally a standard dependent dc level shift in the video amplifier delivers the same sync. level. In parallel to this, the correct VIF-AGC is selected for positive or negative modulated VIF signals.

In the case of negative modulation(e.g., B/G standard) the AM output signal is switched off. For positive modulation(L standard) the AM demodulator and QPS mixer is active. This condition allows a parallel operation of the AM sound signal and the NICAM-L stereo sound.

L' Switch

With a control voltage at Pin 14 the VCO frequency can be switched for setting to the required L' value(L' standard). Also a fine adjustment of the L'-VCO center frequency is possible via a potentiometer. The L' switch is only active for positive modulated video IF-signals(standard switch in L mode).

AFC Switch

The AFC output signal at Pin 22 can be controlled by a switching voltage at Pin 19. It is possible to select an AFC output signal with a rising-or falling AFC curve and to switch off the AFC.

Source select switch

TDA8844 input switch can select one of the following sources ;

- pin 13 front-end : CVBS I int
- pin 17 : CVBS 2 ext
- pin 11, pin 10 : Y (S-VHS), C (S-VHS)

Selected signal is available at the CVBS output pin 38, in case of Y/C input Y+C are added.
It drives teletext.

For S-VHS applications, the Y,C input can be selected, independent of the CVBS source switch.
Y,C inputs are selected, while the source switch outputs CVBS I int or CVBS 2 ext on CVBS out.

Horizontal synchronization and protection

The synchronization separator adapts its slicing level in the middle between top-sync and black level of the CVBS signal.

The separated synchronization pulses are fed to the first phase detector and to the coincidence detector.

The Φ_1 loop gain is determined by the components at pin 43 (C+RC).

The coincidence detector detects whether the horizontal line oscillator is synchronized to the incoming video.

The line oscillator is a VCO-type, running at twice the line frequency.

It is calibrated with the X-tal oscillator frequency of the colour decoder and has a maximum deviation of 2% of the nominal frequency, so no alignment is needed.

The second phase detector Φ_2 locks the phase of the horizontal driver pulses at output pin 40 to the horizontal flyback pulse at input pin 41 .

This compensates for the storage time of the horizontal deflection transistor.

The Φ_2 loop filter (C) is externally connected to pin 42.

The horizontal phase can be given a static offset via I2C-bus (HSH "horizontal shift")

A dynamic correction is possible by current feedback into the Φ_2 loop filter capacitor.

To protect the horizontal deflection transistor, the horizontal drive is switched off immediately when a power failure (" Power-On Reset " bit POR) is detected.

The power failure may have corrupted the contents of the internal data registers, so the TDA8844 should be started up again.

The TDA8844 has a separate supply input (pin 37) that only used as a clean supply voltage for the horizontal oscillator circuits.

Vertical synchronization

The vertical sawtooth generator drives the vertical output.

It uses an external capacitor at pin 51 and a current reference resistor at pin 52.

The TDA8844 vertical drive has differential current outputs for DC-coupled vertical output stage, like the TDA8351 .

At TDA8351 input pins 1 and 2 this current is converted into a drive voltage via a resistor.

Geometry processing

With the TDA8844 it is possible to implement automatic geometry alignment, because all parameters are adjusted via the I2C bus.

The deflection processor of the TDA8844 offers the following five controls;

- Horizontal shift
- Vertical slope.
- Vertical amplitude
- Vertical S-correction
- vertical shift

PAL/NTSC demodulation

The 0° and 90° reference signals from the VCXO are supplied to the HUE phase rotator; its outputs (H0, H90) are supplied to the (B-Y) and (R-Y) burst demodulators respectively.

The demodulated burst from the (B-Y) demodulator supplies NTSC ident information to the ASM(IDN signal).

The demodulated burst from (R-Y) demodulator supplies PAL ident information to the ASM(IDP signal).

For correct demodulation of (R-Y) PAL burst and chroma signals, then the H90 signal requires 180° phase shift on alternate lines. This is realised with the H/2 switch before the (R-Y) demodulator. It is not active during demodulation of NTSC signals.

The (B-Y)/(R-Y) baseband signals are obtained from the chroma signal by the (B-Y)/(R-Y) demodulators, filtered and supplied via the PAL/SECAM switch(PS) to the internal baseband delay line.

The demodulator gain ratio (B-Y)/(R-Y) is typically 1.78 in order to compensate for scaling in the transmitter.

For NTSC applications it is possible to bypass the delay line via I2C bus command BPS; the gain is also corrected then by a factor two.

The V_{INT} and U_{INT} signals from delay line outputs are fed to the YUV selection circuit(see YUV/RGB processing part).

SECAM demodulation

SECAM demodulation is realised with a PLL type demodulator.

When the VCXO is connected to pin 35 (controlled by XTS) and if a 4.43 MHz Xtal is present on that pin then SECAM demodulation is possible. The auto tuning loop, consisting of PLL demodulator and oscillator, ensures that the PLL oscillator is locked to the 4.43MHz Xtal frequency during calibration time in the vertical retrace period. The SECAM reference voltage, generated at pin 16, is regulated in order that the PLL demodulator output is set to a reference voltage derived from a stable bandgap voltage.

Outside calibration the oscillator remains tracking the SECAM chrominance resulting in the corresponding demodulated voltage. This is delivered to the LF de-emphasis stage and to the line ident stage of the Automatic System Manager(IDS

switch(PS) to the baseband delay line. The bypass mode of the delay line is not possible for SECAM.

The V_{INT} and U_{INT} signals from delay line outputs are fed to the YUV selection circuit(see YUV/RGB processing part).

RGB output and black current stabilization

The colour difference signals (R-Y, B-Y) are matrixed with the luminance signal (Y) to obtain the RGBout output signals (pins 19, 20, 21).

In the TDA8844 the matrix type automatically adapts to the decoded standard (NTSC, PAL) .

Linear amplifiers are used to interface external RGB in signals (pins 23,24,25) from the SCART connector.

These signals overrule the internal RGB signals when the data insertion pin 26 (FBI) is switched to a level between 1.0V and 3.0V.

The contrast and brightness control and the peak white limiter operate on both internal and external RGB signals R,G and B each have their own, independent gain control to compensate for the difference in phosphor efficiencies of the picture tube: so called "white point" adjustment.

The nominal amplitude is about 2V black to white, at nominal input signals and control settings.

TDA8844 has a black current stabilization loop, that automatically adjust the black level to the cut-off voltage of the picture tubes three gun cathodes.

Since no current is flowing when the voltage the cathode is equal to the cut-off voltage of the tube, the loop stabilizes at a very small gun current.

This "black current" of the three guns is measured internally and compared with a reference current, to adjust the black level of RGBout.

The black level loop is active during 4 lines at the end of the vertical blanking.

In the first line the leakage current is measured (max. acceptable $100\mu\text{A}$).

In the next three lines the black levels of the three guns are adjusted.

The nominal value of the 'black current' is $10\mu\text{A}$

The ratio of the 'black currents' for the 3 guns tracks automatically with the white point adjustment, so the back-ground colour is the same as the adjusted white point.

At switch-on of the TV receiver the black current stabilization circuit is not yet active and RGBout are blanked.

Before the first measurement pulses appear, 0.5 sec delay ensures that the vertical deflection is active, so the pulses will not be visible on the screen.

During the measuring lines RGBout will supply 4V pulses to the video output stages.

The TDA8844 waits until the black current feedback input (pin 18) exceeds $200\mu\text{A}$, which indicates that the picture tube is warm-up.

Then the black current stabilization circuit is active.

After a waiting time of about 1.0 sec, the blanking of RGBout is released.

TDA8351 vertical deflection.

The TDA8351 is a vertical deflection circuit.

It can be used in 90 deflection systems with frame frequencies from 50 up to 120 Hz

With its bridge configuration the deflection output can be DC coupled with few external components.

Only a supply voltage for the scan and a second supply for the flyback are needed.

The TDA8351 can drive max.2A.

The vertical drive currents of TDA8375A pins 47 and 46 are connected to input pins 1 and 2 of the TDA8351.

The currents are converted into a voltage by a resistor between pins 1 and 2.

Pin2 is on a fixed DC level (internal bias voltage) and on pin 1 the drive voltage can be measured (typical 1.8 Vpp).

The drive voltage is amplified by 'A' and fed to two amplifiers 'B' and 'C', one is inverting and the other is a non inverting amplifier.

The outputs (pins 4 and 7) are connected to the series connection of the vertical deflection coil and feedback resistor .

The voltage across feed back resistor is fed via pin 9 to correction amplifier 'D', to obtain a deflection current which is proportional to the drive voltage.

The supply voltage for the TDA8351 is 16V at pin 3.

The flyback generator has a separate supply voltage of 45V on pin 6.

Horizontal deflection

The circuit contains horizontal drive, line output transformer.

The horizontal driver pulses from the TDA8844 are amplified in the horizontal drive circuit, to get sufficient base-drive current for the high voltage switching transistor Q401.

During the horizontal scan period($\approx 52\mu\text{s}$) Q401 will conduct, and a sawtooth current flows from +132V through the primary winding of the FBT to ground.

After this time Q401 is switched off and the energy stored in the FBT during the scan period will be transformed to the flyback capacitor CT.

This energy transfer will take place in a cosine shape because the primary of the FBT and CT form a resonant circuit.

The time the energy is transferred from FBT to CT. and back to the FBT, is called the flyback time and will take place in about $12\mu\text{s}$.

The flyback peak voltage is about 9 times the scan voltage.

In series with the horizontal deflection coil there is a (damped) linearity corrector coil.

During the scan there is some loss in the resistance of the deflection coil.

In the first part of a line the linearity corrector stores some energy in a permanent magnet until it is saturated.

This improves the linearity of the horizontal scan speed.

The required S correction for the picture tube can be adjusted with the value of C408.

The beam current limiting information (BeamCurr) is derived from the foot of the H.V winding of the FBT.

This is connected via resistor to +8V.

As the beam current increases, the voltage on line BeamCurr*decreases.

Beam current is damped by a integration filter before it is fed back to TDA8844 pin 22.

The TDA8844 will decrease the contrast (and eventually the brightness) to limit the average beam current.

EW drive

The DC voltage on pin 45 is determined by the East-West driver stage input and may range from 1 to 8 volts.

To prevent distortion, the voltage must always be $>1\text{ volt}$.

Because the DC voltage on pin 45 is equal to the minimal output voltage of the East-West driver stage (reached for $i = 0$), it is recommended to choose this level close to 1 volt for maximum range.

Video amplifiers

Three TDA6106Q integrated video amplifiers drive cathode of the picture tube directly.

They are protected against CRT flashover discharges and ESD (electro static discharge).

The three video amplifiers, have a beam current output I black, used by the TDA8844 black current loop to control the black level on the cathodes.

The outputs can be connected together because the black current 100p sequentially controls the black level for each cathode.

The amplification of the TDA6106Q is set by the resistors between pin 3 and 9 and between pin 3 (negative-input) and the TDA8844 output.

There are no alignment any more on the CPT panel, because of the automatic black current stabilization and because the white point adjustment can be done in the TDA8844 via I2C bus.

Service Parts List

Caution "®" Parts recommended for stock
 "△" Safety critical component, Replace only with genuine Daewoo safety part.

LOC	PART CODE	PART NAME	DESCRIPTION	LOC	PART CODE	PART NAME	DESCRIPTION
®	48B3228B07	TRANSMITTER REMOCON	R-28B07	C302	CEYD1H689W	C ELECTRO	50V RHD 6.8MF (16X35.5)
	PTACPWD165	ACCESSORY AS	DTL-28G2F	C303	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)
10	4850Q00810	BATTERY	R6P/LN	C304	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)
10000	48586054K1	MANUAL INSTRUCTION	DTM-2082CW	C305	CEXF1E471V	C ELECTRO	25V RSS 470MF (10X16) TP
	PTBCSHD165	COVER BACK AS	DTL-28G2F	C310	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)
	PTPKCPD165	PACKING AS	DTL-28G2F	C311	CMXM2A103J	C MYLAR	100V 0.01MF J (TP)
M801	4858037300	BOX CARTON	DW-3 2895	C312	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)
M811	4858184600	PAD	EPS 28G2	C401	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP
	48519A5510	CRT GROUND NET	2801H-1015-2P	C402	CMYH3C722J	C MYLAR	1.6KV BUP 7200PF J
△	58G0000103	COIL DEGAUSSING	DC-2701	C403	CEXF1E471V	C ELECTRO	25V RSS 470MF (10X16) TP
	48519B6110	CRT GROUND NET	DS-DW450T/A	C404	CMYH3C472J	C MYLAR	1.6KV BUP 4700PF J
	PTCACAD165	CABINET AS	DTL-28G2F	C405	CMXE2G273J	C MYLAR	400V PU 0.027MF J (TP)
M211A	7122401612	SCREW TAPPING	T2S TRS 4X16 MFZN BK	C407	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)
M251	4852534301	GRILL SPKR R/L	PS BK T0.5 28G2 L/R	C408	CMYE2G274J	C MYLAR	400V PU 0.27MF J
M281	4852821001	DOOR	PC SMOG	C409	CEXF2E470V	C ELECTRO	250V RSS 47MF (16X25) TP
M352	97P4602700	CLAMP CORD	NYLON 66 BLK 5280N	C410	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP
M481	4854852701	BUTTON POWER	ABS BK	C411	CEXF2C229V	C ELECTRO	160V RSS 2.2MF (8X11.5)TP
M481A	4856716000	SPRING	SWPA PIE0.5	C413	CEXF2C220V	C ELECTRO	160V RSS 22MF (10X20) TP
M491	4854934001	BUTTON	ABS BK	C414	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)
M501	4855058201	DECO CTRL	PVC T0.3	C415	CEXF2E100V	C ELECTRO	250V RSS 10MF (10X20) TP
M561	4855617401	MARK BRAND	AL (SILVER)	C416	CCYR3D681K	C CERA	2KV R 680PF K 125 DE1007
M681	4856812001	TIE CABLE	NYLON66 DA100	C417	CMXB2G472J	C MYLAR	400V EU 4700PF J (TP)
M683	4856816300	CLAMP WIRE	NYLON 6 (V0)	C501	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)
M783	4857817610	CLOTH BLACK	FELT 300X20X0.7	C502	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP
M791	4857923300	DOOR LOCK	LA701(KIFCO)	C504	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP
P405	4850706S21	CONNECTOR	35135-0620+YLT502+ULW=500	C505	CEXF1H220V	C ELECTRO	50V RSS 22MF (5X11) TP
SP01A	7122401212	SCREW TAPPING	T2S TRS 4X12 MFZN BLACK	C506	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP
SP02A	7122401212	SCREW TAPPING	T2S TRS 4X12 MFZN BLACK	C507	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP
® V901	4859622160	CRT	A66EAK071X11	C508	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP
V901A	4856215402	WASHER RUBBER	CR T2.0	C509	CMXL2E104K	C MYLAR	250V MEU 0.1MF K
V901B	4856015800	SCREW CRT FIX	L=27	C510	CCZF1H473Z	C CERA	50V F 0.047MF Z (AXIAL)
®	PTFMSJD165	MASK FRONT AS	DTL-28G2F	C515	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP
	PTSPPWD165	SPEAKER AS	DTL-28G2F	C520	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z
P601A	4850704S30	CONNECTOR	YH025-04+35098+ULW=700	C521	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z
® SP01	4858311110	SPEAKER	12W 8 OHM SP-58126F	C522	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z
SP02	4858311110	SPEAKER	12W 8 OHM SP-58126F	C526	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP
®	PTMPMSD165	PCB MAIN MANUAL AS	DTL-28G2F	C527	CMXM2A103J	C MYLAR	100V 0.01MF J (TP)
1	1K1A7805P1	IC REGULATOR	KIA7805PI	C601	CXRH1H150J	C CERA	RH 50V 15PF J (TAPPING)
C101	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	C602	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP
C102	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	C605	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP
C103	CZCH1H220J	C CERA	50V CH 22PF J (AXIAL)	C606	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5X11) TP
C106	CEXF1H330V	C ELECTRO	50V RSS 33MF (6.3X11) TP	C607	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5X11) TP
C301	CMXM2A223J	C MYLAR	100V 0.022MF J TP	C608	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP

LOC	PART CODE	PART NAME	DESCRIPTION	LOC	PART CODE	PART NAME	DESCRIPTION
C609	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	C820	CCXB3A471K	C CERA	1KV B 470PF K (T)
C610	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	C821	CCXB2H101K	C CERA	500V B 100PF K (TAPPING)
C611	CEXF1H339V	C ELECTRO	50V RSS 3.3MF (5X11) TP	C822	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP
C612	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	C824	CCXB3A471K	C CERA	1KV B 470PF K (T)
C613	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	C827	CEXF1H470V	C ELECTRO	50V RSS 47MF (6.3X11) TP
C614	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	C830	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z
C615	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	C831	CCXB3A471K	C CERA	1KV B 470PF K (T)
C616	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	C832	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP
C618	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	C833	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP
C619	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	C834	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP
C621	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	C850	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP
C623	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	C851	CEXF1E471V	C ELECTRO	25V RSS 470MF (10X16) TP
C631	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	C860	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP
C636	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	C861	CEXF1E471V	C ELECTRO	25V RSS 470MF (10X16) TP
C650	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	C902	CEXF2E100V	C ELECTRO	250V RSS 10MF (10X20) TP
C660	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	C905	CEXF2E100V	C ELECTRO	250V RSS 10MF (10X20) TP
C661	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	C965	CCXB3D102K	C CERA	2KV B 1000PF K (TAPPING)
C662	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	C968	CMXL2E104K	C MYLAR	250V MEU 0.1MF K
C663	CEXF1H478V	C ELECTRO	50V RSS 0.47MF (5X11) TP	C969	CMXL2E104K	C MYLAR	250V MEU 0.1MF K
C701	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	C970	CMXL2E104K	C MYLAR	250V MEU 0.1MF K
C702	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	CA10	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)
C703	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	CA11	CCXF1H473Z	C CERA	50V F 0.047MF Z (TAPPING)
C706	CMXM2A333J	C MYLAR	100V 0.033MF J (TP)	CA12	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP
C707	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	CC101	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012
C708	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	CC102	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012
C709	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	CC103	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012
△ C801	CL1JB3474K	C LINE ACROSS	AC250V 0.47MF U/C/SNDF/SV	CC105	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012
△ C802	CL1JB3474K	C LINE ACROSS	AC250V 0.47MF U/C/SNDF/SV	CC106	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012
C803	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	CC301	HCBK152KCA	C CHIP CERA	50V X7R 1500PF K 2012
C804	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	CC402	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012
C805	CEYN2G181P	C ELECTRO	400V LHS 180MF (25X35)	CC403	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012
® C806	CEXF1H220V	C ELECTRO	50V RSS 22MF (5X11) TP	CC404	HCBK472KCA	C CHIP CERA	50V X7R 4700PF K 2012
C807	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	CC501	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012
C808	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	CC502	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012
C809	CCZB1H561K	C CERA	50V B 560PF K	CC510	HCBK472KCA	C CHIP CERA	50V X7R 4700PF K 2012
C810	CBYB3D152K	C CERA SEMI	2KV BL(N) 1500PF K	CC511	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012
C811	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5X11) TP	CC512	HCBK223KCA	C CHIP CERA	50V X7R 0.022MF K 2012
△ C812	CH1BFE472M	C CERA AC	AC400V 4700PF M U/C/V	CC517	HCQK221JCA	C CHIP CERA	50V CH 220PF J 2012
C813	CEXF2C101V	C ELECTRO	160V RSS 100MF (16X25) TP	CC518	HCQK180JCA	C CHIP CERA	50V CH 18PF J 2012
C814	CEXF2C101V	C ELECTRO	160V RSS 100MF (16X25) TP	CC520	HCBK472KCA	C CHIP CERA	50V X7R 4700PF K 2012
C815	CEYF1E332V	C ELECTRO	25V RSS 3300MF (16X31.5)	CC521	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012
C817	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	CC522	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012
C819	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	CC523	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012

LOC	PART CODE	PART NAME	DESCRIPTION	LOC	PART CODE	PART NAME	DESCRIPTION
CC524	HCFK224ZCA	C CHIP CERA	Y5V 50V 0.22MF Z 2012	CC802	HCBK152KCA	C CHIP CERA	50V X7R 1500PF K 2012
CC528	HCQK181JCA	C CHIP CERA	50V CH 180PF J 2012	CC803	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012
CC530	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	CC901	HCBK561KCA	C CHIP CERA	50V X7R 560PF K 2012
CC555	HCBK223KCA	C CHIP CERA	50V X7R 0.022MF K 2012	CC902	HCBK561KCA	C CHIP CERA	50V X7R 560PF K 2012
CC603	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	CC903	HCBK561KCA	C CHIP CERA	50V X7R 560PF K 2012
CC604	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	CCA25	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012
CC607	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	D101	D1N4148---	DIODE	1N4148 (TAPPING)
CC608	HCBK223KCA	C CHIP CERA	50V X7R 0.022MF K 2012	D401	D1N4003---	DIODE	1N4003 (TAPPING)
CC609	HCQK509DCA	C CHIP CERA	50V CH 5PF D 2012	D402	D1N4003---	DIODE	1N4003 (TAPPING)
CC610	HCQK509DCA	C CHIP CERA	50V CH 5PF D 2012	D403	DBY228----	DIODE	BY228 (TAPPING)
CC611	HCBK472KCA	C CHIP CERA	50V X7R 4700PF K 2012	D404	DRGP30J---	DIODE	RGP30J
CC612	HCBK472KCA	C CHIP CERA	50V X7R 4700PF K 2012	D405	D1N4936GP-	DIODE	1N4936GP (TAPPING)
CC613	HCBK103KCA	C CHIP CERA	50V X7R 0.01MF K 2012	D406	DRGP30J---	DIODE	RGP30J
CC614	HCBK103KCA	C CHIP CERA	50V X7R 0.01MF K 2012	D407	DRGP15J---	DIODE	RGP15J
CC616	HCBK103KCA	C CHIP CERA	50V X7R 0.01MF K 2012	D408	DRGP15J---	DIODE	RGP15J
CC618	HCQK220JCA	C CHIP CERA	50V CH 22PF J 2012	D410	DRGP15J---	DIODE	RGP15J
CC619	HCQK470JCA	C CHIP CERA	50V CH 47PF J 2012	D501	D1N4148---	DIODE	1N4148 (TAPPING)
CC620	HCBK103KCA	C CHIP CERA	50V X7R 0.01MF K 2012	D503	D1N4148---	DIODE	1N4148 (TAPPING)
CC621	HCBK223KCA	C CHIP CERA	50V X7R 0.022MF K 2012	D504	D1N4148---	DIODE	1N4148 (TAPPING)
CC622	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	D505	D1N4148---	DIODE	1N4148 (TAPPING)
CC642	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	D506	DUZ9R1BM--	DIODE ZENER	UZ-9.1BM 9.1V
CC650	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	D507	DUZ9R1BM--	DIODE ZENER	UZ-9.1BM 9.1V
CC651	HCBK472KCA	C CHIP CERA	50V X7R 4700PF K 2012	D508	DUZ9R1BM--	DIODE ZENER	UZ-9.1BM 9.1V
CC652	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	D509	DUZ9R1BM--	DIODE ZENER	UZ-9.1BM 9.1V
CC660	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	D601	D1SS85TA--	DIODE	1SS85TA
CC661	HCBK472KCA	C CHIP CERA	50V X7R 4700PF K 2012	D602	D1N4148---	DIODE	1N4148 (TAPPING)
CC662	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	D701	D1N4148---	DIODE	1N4148 (TAPPING)
CC671	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	D702	D1N4148---	DIODE	1N4148 (TAPPING)
CC672	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	D703	D1N4148---	DIODE	1N4148 (TAPPING)
CC675	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	D704	D1N4148---	DIODE	1N4148 (TAPPING)
CC676	HCBK103KCA	C CHIP CERA	50V X7R 0.01MF K 2012	D705	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)
CC677	HCBK103KCA	C CHIP CERA	50V X7R 0.01MF K 2012	D706	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)
CC701	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	D707	DSR54MVW3-	LED	SPR54 MVW RED/GREEN
CC702	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	D707A	4853533600	HOLDER LED	P.P BK
CC703	HCBK103KCA	C CHIP CERA	50V X7R 0.01MF K 2012	D708	DMTZ6R2B--	DIODE ZENER	MTZ 6.2-B (TAPPING)
CC706	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	D709	D1N4148---	DIODE	1N4148 (TAPPING)
CC707	HCBK103KCA	C CHIP CERA	50V X7R 0.01MF K 2012	® D801	D1S1888---	DIODE	1S1888 (TAPPING)
CC708	HCBK102KCA	C CHIP CERA	50V X7R 1000PF K 2012	D802	D1S1888---	DIODE	1S1888 (TAPPING)
CC709	HCBK103KCA	C CHIP CERA	50V X7R 0.01MF K 2012	D803	D1S1888---	DIODE	1S1888 (TAPPING)
CC711	HCQK180JCA	C CHIP CERA	50V CH 18PF J 2012	D804	D1S1888---	DIODE	1S1888 (TAPPING)
CC712	HCQK180JCA	C CHIP CERA	50V CH 18PF J 2012	D805	DRGP15J---	DIODE	RGP15J
CC715	HCBK103KCA	C CHIP CERA	50V X7R 0.01MF K 2012	D806	DRGP15J---	DIODE	RGP15J
CC801	HCFK104ZCA	C CHIP CERA	50V Y5V 0.1MF Z 2012	D807	DRGP15J---	DIODE	RGP15J

LOC	PART CODE	PART NAME	DESCRIPTION	LOC	PART CODE	PART NAME	DESCRIPTION
D808	DRGP15J---	DIODE	RGP15J	® HP01	4859102130	JACK EARPHONE	YSC-1537
D809	DRGP15J---	DIODE	RGP15J	I301	PTA2SW4403	HEAT SINK ASS'Y	1TDA8351-- + 7174301011
D810	D1N4937G--	DIODE	1N4937G	® I301	1TDA8351--	IC VERTICAL	TDA8351
D811	DUZ7R5BM--	DIODE ZENER	UZ-7.5BM 7.5V	I301A	4857024403	HEAT SINK	AL EX
D812	D1N4148---	DIODE	1N4148 (TAPPING)	I301B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN
D813	DRGP30J---	DIODE	RGP30J	® I501	1TDA8844N2	IC VIDEO	TDA8844/N2
D814	DRGP30J---	DIODE	RGP30J	® I602	1MSP3415D-	IC AUDIO	MSP3415D
D820	DRGP30J---	DIODE	RGP30J	I603	1TDA4470M-	IC IF	TDA4470-M
D821	DRGP15J---	DIODE	RGP15J	I604	1K1A7042AP	IC REGULATOR	KIA7042AP
D824	DRGP15J---	DIODE	RGP15J	I605	PTB2SW4403	HEAT SINK ASS'Y	1TDA7269-- + 7174301011
D825	DRGP15J---	DIODE	RGP15J	® I605	1TDA7269--	IC AUDIO	TDA7269
D829	DRGP15J---	DIODE	RGP15J	I605A	4857024403	HEAT SINK	AL EX
D831	DRGP15J---	DIODE	RGP15J	I605B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN
D832	D1N4148---	DIODE	1N4148 (TAPPING)	I606	1K1A7042AP	IC REGULATOR	KIA7042AP
D903	D1S1888---	DIODE	1S1888 (TAPPING)	® I701	1SD545X0TP	IC MICOM	SDA-545X0TP
D904	DMTZ12C---	DIODE ZENER	MTZ-12C	I702	1AT24C16PC	IC	AT24C16-10PC
DA01	D1N4148---	DIODE	1N4148 (TAPPING)	I703	1TS0P1238W	IC PREAMP	TS0P1238WI1
DA02	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	I801	PTH2SW4600	HEAT SINK ASS'Y	1STRF6654- + 7174301011
DA03	DMTZ12C---	DIODE ZENER	MTZ-12C	® I801	1STRF6654-	IC SMPS	STR-F6654
DA04	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	I801A	4857024600	HEAT SINK	AL EX B/K
DA06	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	I801B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN
DA08	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	I802	PTC2SW5401	HEAT SINK ASS'Y	1TDA8133-- + 7174300811
DA09	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	I802	1TDA8133--	IC REGULATOR	TDA8133
DA10	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	I802A	4857025401	HEAT SINK	A1050P-H24 T2
DA11	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	I802B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN
DA13	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	I803	PTX2SW6900	HEAT SINK ASS'Y	1K1A7805P1 + 7174301011
DA14	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	△ ® I804	1LTV817C--	IC PHOTO COUPLER	LTV-817C
DA15	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	I805	1UPC574J--	IC	UPC574J
DA16	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	I806	1SE130N---	IC	SE130N
DA20	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	I810	TX0202DA--	THYRISTOR	X0202DA1BA2
DA21	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	® I901	1TDA6106Q-	IC AMP	TDA6106Q
DA22	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	I902	1TDA6106Q-	IC AMP	TDA6106Q
DA23	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	I903	1TDA6106Q-	IC AMP	TDA6106Q
DA24	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	JC01-JC59	HRFT000-CA	R CHIP	1/10 0 OHM 2012
DA27	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	JPA01	4859200401	SOCKET RGB	YRS21-R1
DA28	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	JPA02	4859200401	SOCKET RGB	YRS21-R1
DA29	DMTZ5R6B--	DIODE ZENER	MTZ 5.6-B (TAPPING)	JPA03	4859108450	JACK PIN BOARD	YSC03P-4120-14A
△ F801	5FSCB4022R	FUSE CERA	SEMKO F4AH 4A 250V MF51	L101	5CPX109K--	COIL PEAKING	PL 1 UH K (TAPPING)
F801A	4857415001	CLIP FUSE	PFC5000-0702	L109	5.80E+42	COIL AFT	TRF-A005
F801B	4857415001	CLIP FUSE	PFC5000-0702	L301	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)
G971	4SG0D00103	SPARK GAP	S-23 900V-1.5KV	L302	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)
G972	4SG0D00103	SPARK GAP	S-23 900V-1.5KV	L401	58H0000025	COIL H-LINEARITY	TRL-330
G973	4SG0D00103	SPARK GAP	S-23 900V-1.5KV	L402	58C7070085	COIL CHOKE	TLN-3062A

LOC	PART CODE	PART NAME	DESCRIPTION	LOC	PART CODE	PART NAME	DESCRIPTION
L501	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	Q502	TKTC3198Y-	TR	KTC3198Y
L601	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	Q601	TKTC3198Y-	TR	KTC3198Y
L602	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	Q603	TKTC3198Y-	TR	KTC3198Y
L603	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	Q604	TKTC3197--	TR	KTC3197 (TP)
L604	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	Q605	TKTC3198Y-	TR	KTC3198Y
L801	5MC0000100	COIL BEAD	HC-3550	Q606	TKTA1266Y-	TR	KTA1266Y (TP)
L802	58C9430599	COIL CHOKE	AZ-9004Y(94MH)	Q607	TKTC3198Y-	TR	KTC3198Y
L850	58C9430599	COIL CHOKE	AZ-9004Y(94MH)	Q701	TKTC3198Y-	TR	KTC3198Y
L851	58C9430599	COIL CHOKE	AZ-9004Y(94MH)	Q708	TKTC3198Y-	TR	KTC3198Y
LF801	5PLF24A1--	FILTER LINE	LF-24A1	Q709	TKTC3198Y-	TR	KTC3198Y
M681	4856812001	TIE CABLE	NYLON66 DA100	Q710	TKTA1266Y-	TR	KTA1266Y (TP)
M721	4857235402	SHIELD CASE	SPTH-C T0.25	Q805	TKTC3207--	TR	KTC3207 (TP)
P101	485923162S	CONN WAFER	YW025-03 (STICK)	Q807	TKTC3198Y-	TR	KTC3198Y
P103	485923162S	CONN WAFER	YW025-03 (STICK)	Q808	TKTC3207--	TR	KTC3207 (TP)
P401	485923182S	CONN WAFER	YW025-05 (STICK)	Q809	TKTC3207--	TR	KTC3207 (TP)
P401A	4850705S04	CONNECTOR	YH025-05+YST025+ULW=400	Q810	TKTC3207--	TR	KTC3207 (TP)
P402	4859240120	CONN WAFER	YFW500-06	Q811	TKTC3207--	TR	KTC3207 (TP)
P501	485923192S	CONN WAFER	YW025-06 (STICK)	Q812	TKSA1013Y-	TR	KSA1013Y (TP)
P501A	4850706S02	CONNECTOR	YH025-06+YST025+ULW=400	Q813	TKTC3198Y-	TR	KTC3198Y
P601	485923172S	CONN WAFER	YW025-04 (STICK)	QA01	TKTA1266Y-	TR	KTA1266Y (TP)
P702	485923182S	CONN WAFER	YW025-05 (STICK)	QA02	TKTC3198Y-	TR	KTC3198Y
P801	4859242220	CONN WAFER	YFW800-02	R101	RD-AZ109J-	R CARBON FILM	1/6 1 OHM J
P802	4859242220	CONN WAFER	YFW800-02	R102	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J
P903	4859238620	CONN WAFER	YPW500-02	R103	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J
P904	4859289920	CONN WAFER	YFW254-05S	R302	RD-2Z129J-	R CARBON FILM	1/2 1.2 OHM J
P905	4859262120	CONN WAFER	YFW800-01	R303	RD-2Z129J-	R CARBON FILM	1/2 1.2 OHM J
PW000	4859906111	CORD POWER	M5206+H03VVH2-F=2250	R304	RD-2Z220J-	R CARBON FILM	1/2 22 OHM J
PW001	4857417700	TERM CLAMP	PT-01-T3	R305	RD-2Z101J-	R CARBON FILM	1/2 100 OHM J
△®PW801	PTWBWS7410	CORD POWER ASS'Y	906111+HOUSING+TUBE+17700	R306	RD-2Z101J-	R CARBON FILM	1/2 100 OHM J
Q301	TKTC3198Y-	TR	KTC3198Y	R307	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J
Q401	PTG2SW4500	HEAT SINK ASS'Y	T2SD1880-- + 7174300811	R308	RD-4Z472J-	R CARBON FILM	1/4 4.7K OHM J
®Q401	T2SD1880--	TR	2SD1880	R309	RD-AZ752J-	R CARBON FILM	1/6 7.5K OHM J
Q401A	4857024500	HEAT SINK	AL EX B/K	R333	RN-4Z3001F	R METAL FILM	1/4 3.0K OHM F
Q401B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	R401	RD-4Z272J-	R CARBON FILM	1/4 2.7K OHM J
®Q402	T2SD1207T-	TR	2SD1207-T (TAPPING)	R403	RD-4Z220J-	R CARBON FILM	1/4 22 OHM J
Q403	PTC2SW4902	HEAT SINK ASS'Y	T2SB54K--- + 7174300811	R404	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J
Q403	T2SB546K--	TR	2SB546-K	R405	RF-2Y309J-	R FUSIBLE	1/2W 3 OHM J
Q403A	4857024902	HEAT SINK	AL EX	R406	RF-2Y479J-	R FUSIBLE	1/2 4.7 OHM J
Q403B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	R407	RS02Z561JS	R M-OXIDE FILM	2W 560 OHM J SMALL
Q404	TKTC3198Y-	TR	KTC3198Y	R409	RD-4Z472J-	R CARBON FILM	1/4 4.7K OHM J
Q405	TKTC3198Y-	TR	KTC3198Y	R410	RS02Z223JS	R M-OXIDE FILM	2W 22K OHM J SMALL
Q406	TKTA1266Y-	TR	KTA1266Y (TP)	R415	RS02Z102JS	R M-OXIDE FILM	2W 1K OHM J SMALL
Q501	TKTC3198Y-	TR	KTC3198Y	R421	RF-4Y228K-	R FUSIBLE	1/4 0.22 OHM K

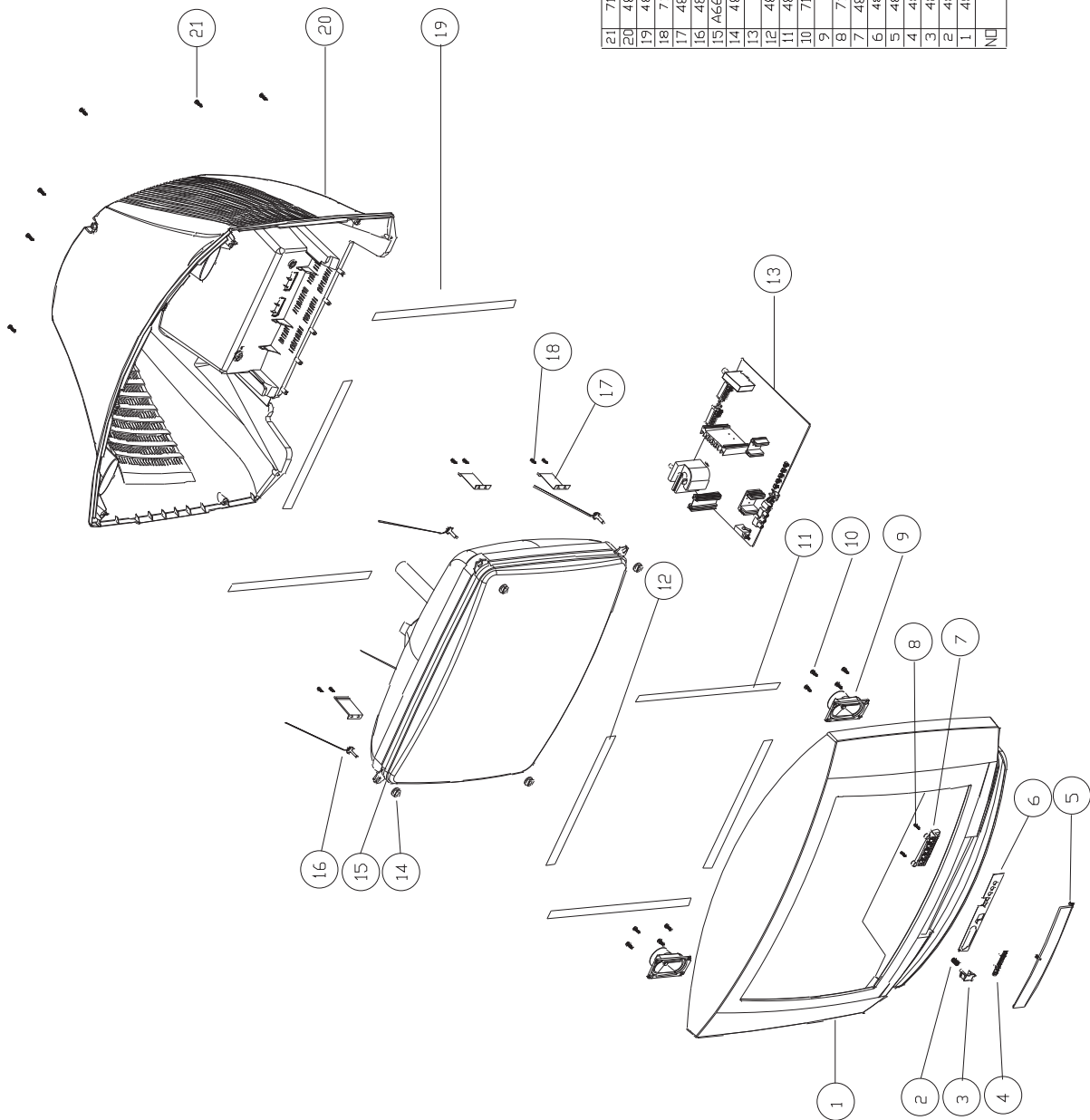
LOC	PART CODE	PART NAME	DESCRIPTION	LOC	PART CODE	PART NAME	DESCRIPTION
R422	RF-2Y169J-	R FUSIBLE	1/2 1.6 OHM J	R830	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J
R423	RF-4Y228K-	R FUSIBLE	1/4 0.22 OHM K	R831	RD-4Z300J-	R CARBON FILM	1/4 30 OHM J
R501	RD-AZ109J-	R CARBON FILM	1/6 1 OHM J	R833	RS02Z100JS	R M-OXIDE FILM	2W 10 OHM J SMALL
R502	RD-AZ392J-	R CARBON FILM	1/6 3.9K OHM J	R834	RF02Z338KA	R FUSIBLE	2W 0.33 OHM K A CURVE
R503	RN-AZ3902F	R METAL FILM	1/6 39K OHM F	R835	RF02Z338KA	R FUSIBLE	2W 0.33 OHM K A CURVE
R515	RD-AZ684J-	R CARBON FILM	1/6 680K OHM J	R910	RN-4Z1003F	R METAL FILM	1/4 100K OHM F
R601	RN-AZ3600F	R METAL FILM	1/6 360.0 OHM F	R911	RN-4Z1003F	R METAL FILM	1/4 100K OHM F
R602	RN-AZ1502F	R METAL FILM	1/6 15K OHM F	R912	RN-4Z1003F	R METAL FILM	1/4 100K OHM F
R605	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	R913	RC-2Z332K-	R CARBON COMP	1/2 3.3K OHM K
R606	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	R914	RC-2Z332K-	R CARBON COMP	1/2 3.3K OHM K
R608	RD-2Z151J-	R CARBON FILM	1/2 150 OHM J	R915	RC-2Z332K-	R CARBON COMP	1/2 3.3K OHM K
R609	RD-2Z151J-	R CARBON FILM	1/2 150 OHM J	R916	RS02Z101JS	R M-OXIDE FILM	2W 100 OHM J SMALL
R610	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	R917	RD-4Z105J-	R CARBON FILM	1/4 1M OHM J
R650	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	R918	RD-2Z102J-	R CARBON FILM	1/2 1K OHM J
R654	RD-2Z479J-	R CARBON FILM	1/2 4.7 OHM J	R919	RF01Z309J-	R FUSIBLE	1W 3 OHM J (TAPPING)
R660	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	R920	RF01Z129JA	R FUSIBLE	1W 1.2 OHM J A CURVE
R662	RD-AZ153J-	R CARBON FILM	1/6 15K OHM J	RA01	RD-AZ470J-	R CARBON FILM	1/6 47 OHM J
R664	RD-2Z479J-	R CARBON FILM	1/2 4.7 OHM J	RA02	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J
R700	RS02Z912JS	R M-OXIDE FILM	2W 9.1K OHM J SMALL	RA03	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J
R701	RS02Z912JS	R M-OXIDE FILM	2W 9.1K OHM J SMALL	RA04	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J
R702	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	RA05	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J
R715	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	RB01	RV5426103P	R SEMI FIXED	ENV-DJAA03B14 10K OHM B
R801	DEC140M290	POSISTOR	ECPC140M290	RC101	HRFT183JCA	R CHIP	1/10 18K OHM J 2012
R802	RS02Z623JS	R M-OXIDE FILM	2W 62K OHM J SMALL	RC102	HRFT333JCA	R CHIP	1/10 33K OHM J 2012
R803	RS02Z473JS	R M-OXIDE FILM	2W 47K OHM J SMALL	RC103	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012
R804	RF02Z228K-	R FUSIBLE	2W 0.22 OHM K (TAPPING)	RC305	HRFT823JCA	R CHIP	1/10 82K OHM J 2012
R805	RD-2Z100J-	R CARBON FILM	1/2 10 OHM J	RC306	HRFT471JCA	R CHIP	1/10 470 OHM J 2012
R807	RD-2Z222J-	R CARBON FILM	1/2 2.2K OHM J	RC401	HRFT272JCA	R CHIP	1/10 2.7K OHM J 2012
R808	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	RC402	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012
R809	RF02Z688K-	R FUSIBLE	2W 0.68 OHM K (TAPPING)	RC501	HRFT622JCA	R CHIP	1/10 6.2K OHM J 2012
R810	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	RC502	HRFT103JCA	R CHIP	1/10 10K OHM J 2012
® R811	RC-2Z565J-	R CARBON COMP	1/2 5.6M OHM J	RC503	HRFT273JCA	R CHIP	1/10 27K OHM J 2012
R812	RS02Z689JS	R M-OXIDE FILM	2W 6.8 OHM J SMALL	RC504	HRFT102JCA	R CHIP	1/10 1K OHM J 2012
R813	RS02Z569JS	R M-OXIDE FILM	2W 5.6 OHM J SMALL	RC505	HRFT104JCA	R CHIP	1/10 100K OHM J 2012
R814	RD-AZ153J-	R CARBON FILM	1/6 15K OHM J	RC506	HRFT103JCA	R CHIP	1/10 10K OHM J 2012
R815	RD-AZ223J-	R CARBON FILM	1/6 22K OHM J	RC507	HRFT102JCA	R CHIP	1/10 1K OHM J 2012
R816	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	RC508	HRFT103JCA	R CHIP	1/10 10K OHM J 2012
R818	RD-AZ682J-	R CARBON FILM	1/6 6.8K OHM J	RC511	HRFT470JCA	R CHIP	1/10 47 OHM J 2012
R819	RX10B339JN	R CEMENT	10W 3.3 OHM J BENCH 4P	RC512	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012
R820	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	RC514	HRFT102JCA	R CHIP	1/10 1K OHM J 2012
R821	RS02Z472JS	R M-OXIDE FILM	2W 4.7K OHM J SMALL	RC515	HRFT104JCA	R CHIP	1/10 100K OHM J 2012
R823	RS02Z102JS	R M-OXIDE FILM	2W 1K OHM J SMALL	RC516	HRFT102JCA	R CHIP	1/10 1K OHM J 2012
R824	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	RC518	HRFT332JCA	R CHIP	1/10 3.3K OHM J 2012

LOC	PART CODE	PART NAME	DESCRIPTION	LOC	PART CODE	PART NAME	DESCRIPTION
RC520	HRFT153JCA	R CHIP	1/10 15K OHM J 2012	RC713	HRFT102JCA	R CHIP	1/10 1K OHM J 2012
RC524	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	RC715	HRFT272JCA	R CHIP	1/10 2.7K OHM J 2012
RC525	HRFT470JCA	R CHIP	1/10 47 OHM J 2012	RC717	HRFT153JCA	R CHIP	1/10 15K OHM J 2012
RC526	HRFT273JCA	R CHIP	1/10 27K OHM J 2012	RC718	HRFT392JCA	R CHIP	1/10 3.9K OHM J 2012
RC530	HRFT222JCA	R CHIP	1/10 2.2K OHM J 2012	RC719	HRFT182JCA	R CHIP	1/10 1.8K OHM J 2012
RC531	HRFT222JCA	R CHIP	1/10 2.2K OHM J 2012	RC720	HRFT132JCA	R CHIP	1/10 1.3K OHM J 2012
RC532	HRFT222JCA	R CHIP	1/10 2.2K OHM J 2012	RC721	HRFT101JCA	R CHIP	1/10 100 OHM J 2012
RC533	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	RC722	HRFT101JCA	R CHIP	1/10 100 OHM J 2012
RC534	HRFT334JCA	R CHIP	1/10 330K OHM J 2012	RC723	HRFT101JCA	R CHIP	1/10 100 OHM J 2012
RC601	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	RC725	HRFT102JCA	R CHIP	1/10 1K OHM J 2012
RC602	HRFT222JCA	R CHIP	1/10 2.2K OHM J 2012	RC727	HRFT222JCA	R CHIP	1/10 2.2K OHM J 2012
RC603	HRFT153JCA	R CHIP	1/10 15K OHM J 2012	RC731	HRFT100JCA	R CHIP	1/10 10 OHM J 2012
RC604	HRFT751JCA	R CHIP	1/10 750 OHM J 2012	RC732	HRFT273JCA	R CHIP	1/10 27K OHM J 2012
RC607	HRFT682JCA	R CHIP	1/10 6.8K OHM J 2012	RC733	HRFT105JCA	R CHIP	1/10 1M OHM J 2012
RC608	HRFT222JCA	R CHIP	1/10 2.2K OHM J 2012	RC734	HRFT473JCA	R CHIP	1/10 47K OHM J 2012
RC609	HRFT222JCA	R CHIP	1/10 2.2K OHM J 2012	RC735	HRFT332JCA	R CHIP	1/10 3.3K OHM J 2012
RC610	HRFT562JCA	R CHIP	1/10 5.6K OHM J 2012	RC738	HRFT102JCA	R CHIP	1/10 1K OHM J 2012
RC611	HRFT562JCA	R CHIP	1/10 5.6K OHM J 2012	RC742	HRFT101JCA	R CHIP	1/10 100 OHM J 2012
RC612	HRFT102JCA	R CHIP	1/10 1K OHM J 2012	RC743	HRFT101JCA	R CHIP	1/10 100 OHM J 2012
RC613	HRFT243JCA	R CHIP	1/10 24K OHM J 2012	RC744	HRFT103JCA	R CHIP	1/10 10K OHM J 2012
RC614	HRFT151JCA	R CHIP	1/10 150 OHM J 2012	RC748	HRFT271JCA	R CHIP	1/10 270 OHM J 2012
RC615	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	RC749	HRFT271JCA	R CHIP	1/10 270 OHM J 2012
RC616	HRFT202JCA	R CHIP	1/10 2K OHM J 2012	RC750	HRFT331JCA	R CHIP	1/10 330 OHM J 2012
RC623	HRFT153JCA	R CHIP	1/10 15K OHM J 2012	RC751	HRFT161JCA	R CHIP	1/10 160 OHM J 2012
RC624	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	RC752	HRFT102JCA	R CHIP	1/10 1K OHM J 2012
RC625	HRFT103JCA	R CHIP	1/10 10K OHM J 2012	RC801	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012
RC626	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	RC802	HRFT152JCA	R CHIP	1/10 1.5K OHM J 2012
RC627	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	RC803	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012
RC630	HRFT473JCA	R CHIP	1/10 47K OHM J 2012	RC804	HRFT332JCA	R CHIP	1/10 3.3K OHM J 2012
RC631	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	RC805	HRFT103JCA	R CHIP	1/10 10K OHM J 2012
RC632	HRFT472JCA	R CHIP	1/10 4.7K OHM J 2012	RC806	HRFT562JCA	R CHIP	1/10 5.6K OHM J 2012
RC652	HRFT153JCA	R CHIP	1/10 15K OHM J 2012	RC809	HRFT751JCA	R CHIP	1/10 750 OHM J 2012
RC653	HRFT561JCA	R CHIP	1/10 560 OHM J 2012	RC811	HRFT102JCA	R CHIP	1/10 1K OHM J 2012
RC663	HRFT561JCA	R CHIP	1/10 560 OHM J 2012	RC901	HRFT471JCA	R CHIP	1/10 470 OHM J 2012
RC701	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	RC902	HRFT471JCA	R CHIP	1/10 470 OHM J 2012
RC702	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	RC903	HRFT471JCA	R CHIP	1/10 470 OHM J 2012
RC703	HRFT332JCA	R CHIP	1/10 3.3K OHM J 2012	RC904	HRFT162JCA	R CHIP	1/10 1.6K OHM J 2012
RC704	HRFT332JCA	R CHIP	1/10 3.3K OHM J 2012	RC905	HRFT162JCA	R CHIP	1/10 1.6K OHM J 2012
RC705	HRFT332JCA	R CHIP	1/10 3.3K OHM J 2012	RC906	HRFT162JCA	R CHIP	1/10 1.6K OHM J 2012
RC706	HRFT101JCA	R CHIP	1/10 100 OHM J 2012	RCA10	HRFT750JCA	R CHIP	1/10 75 OHM J 2012
RC707	HRFT223JCA	R CHIP	1/10 22K OHM J 2012	RCA11	HRFT750JCA	R CHIP	1/10 75 OHM J 2012
RC709	HRFT100JCA	R CHIP	1/10 10 OHM J 2012	RCA14	HRFT750JCA	R CHIP	1/10 75 OHM J 2012
RC710	HRFT271JCA	R CHIP	1/10 270 OHM J 2012	RCA16	HRFT750JCA	R CHIP	1/10 75 OHM J 2012

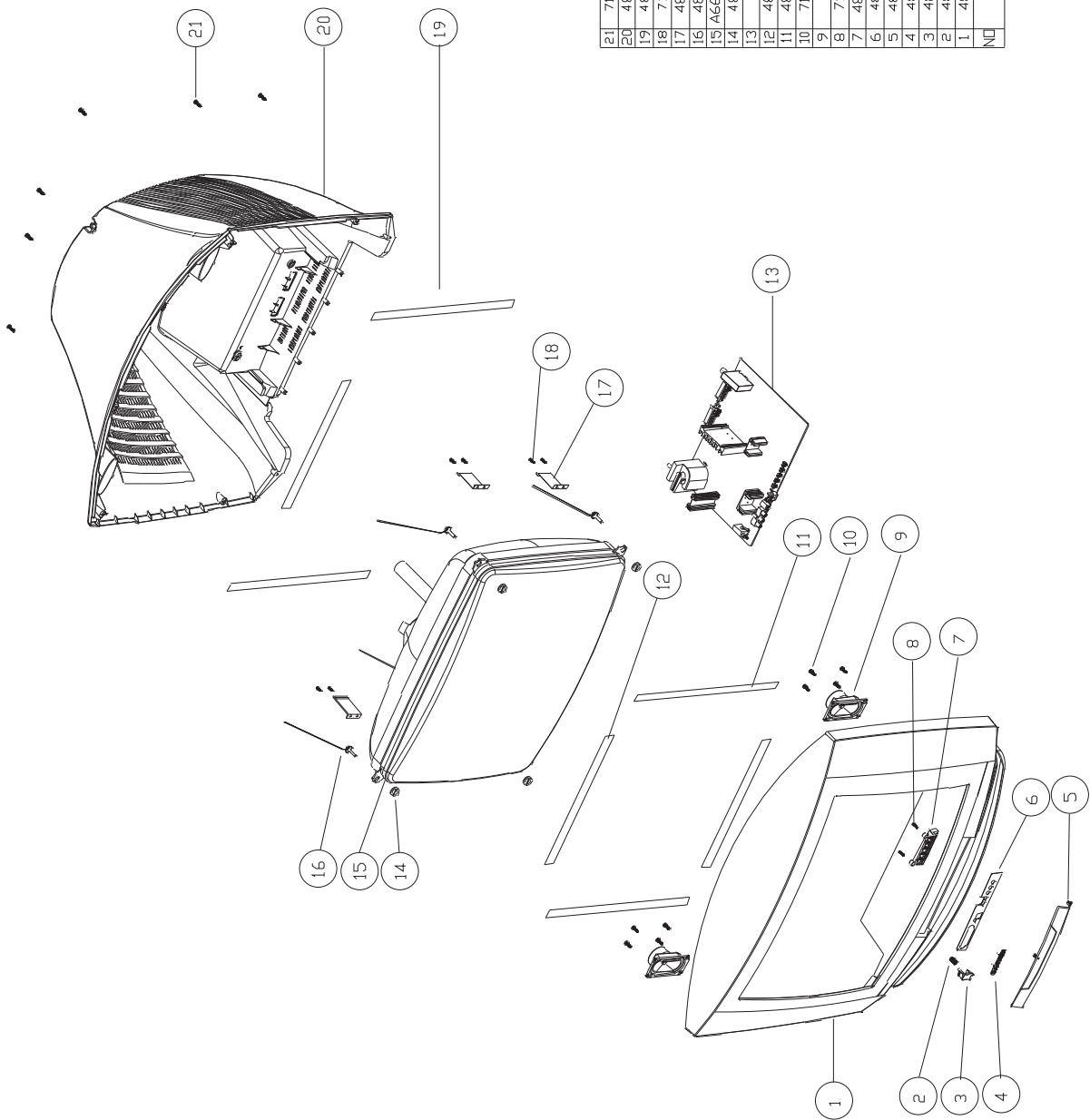
LOC	PART CODE	PART NAME	DESCRIPTION
RCA17	HRFT750JCA	R CHIP	1/10 75 OHM J 2012
RCA18	HRFT750JCA	R CHIP	1/10 75 OHM J 2012
RCA19	HRFT750JCA	R CHIP	1/10 75 OHM J 2012
RCA20	HRFT102JCA	R CHIP	1/10 1K OHM J 2012
RCA30	HRFT470JCA	R CHIP	1/10 47 OHM J 2012
® SCT1	4859302930	SOCKET CRT	ISHS-09S
SF01	5PG3962M--	FILTER SAW	G 3962-M
SF02	5PK9650M--	FILTER SAW	K9650M
SW700	5S50101090	SW TACT	SKHV17910A
SW701	5S50101090	SW TACT	SKHV17910A
SW702	5S50101090	SW TACT	SKHV17910A
SW703	5S50101090	SW TACT	SKHV17910A
SW704	5S50101090	SW TACT	SKHV17910A
△® SW801	5S40101143	SW POWER PUSH	PS3-22SP (P.C.B)
® T401	50D19A1---	TRANS DRIVE	TD-19A1
△® T402	50H0000181	FBT	1352.5008E
△® T801	50M4950A7-	TRANS SMPS	TSM-4950A7
® U100	4859719430	TUNER VARACTOR	EL2782/105-B
W101	4851900130	GROUND TUNER AS	DS-W1015-S
X501	5XE4R4336E	CRYSTAL QUARTZ	HC-49/U 4.433619MHZ 30PPM
X502	5XE3R5795E	CRYSTAL QUARTZ	HC-49/U 3.579545MHZ 30PPM
X601	5XE18R432E	CRYSTAL QUARTZ	HC-49/U 18.43200MHZ 30PPM
X701	5XE6R0000C	CRYSTAL QUARTZ	HC-49/U 6.0000 MHZ 20PPM
△® Y801	5SC0101003	SW RELAY	DG12D1-0(M)-II 1C-1P
Z601	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF
Z602	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF
Z603	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF
Z604	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF
Z605	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF
Z606	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF
Z607	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF
Z608	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF
Z609	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF
Z610	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF

Mechanical Exploded View

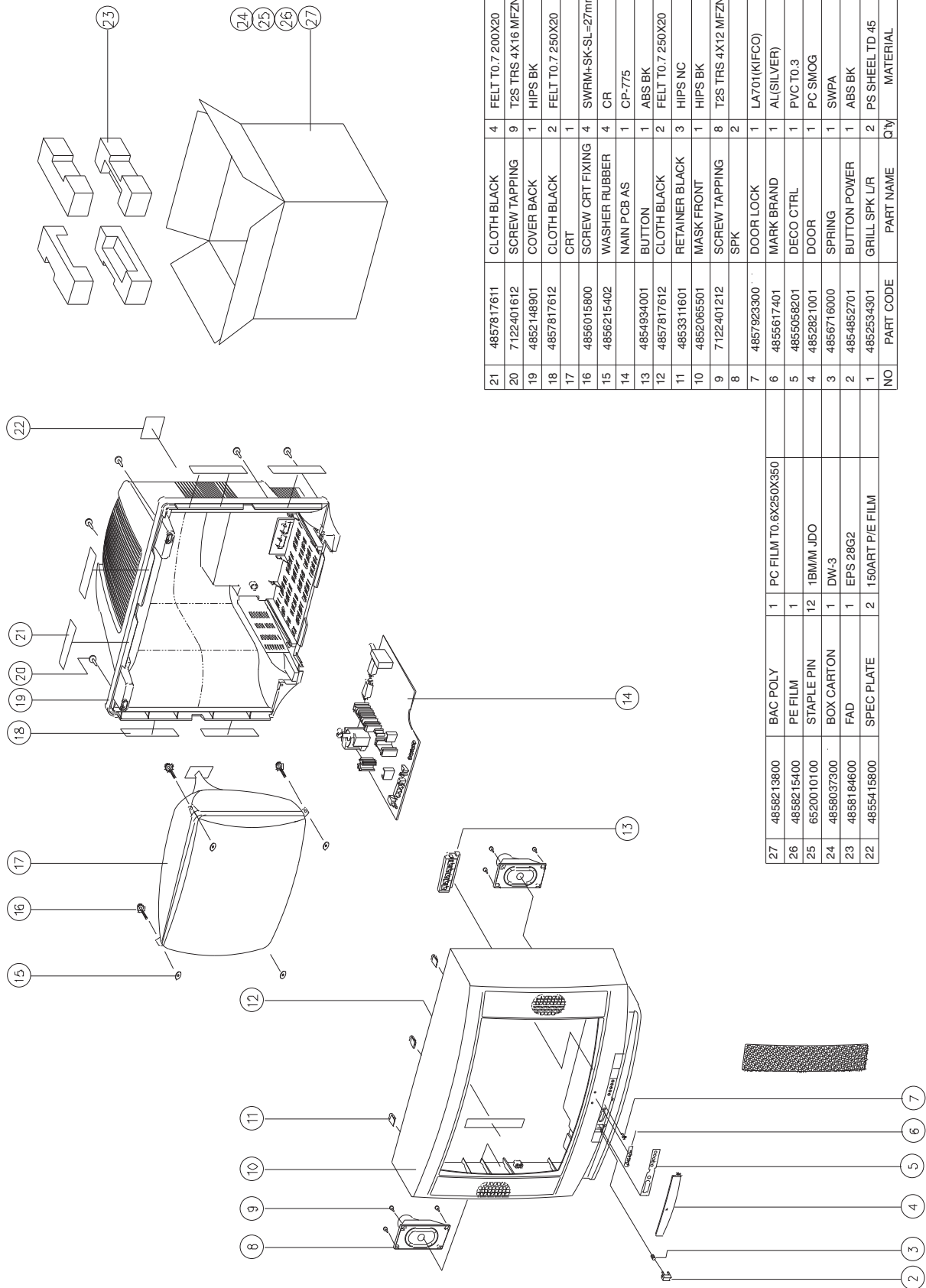
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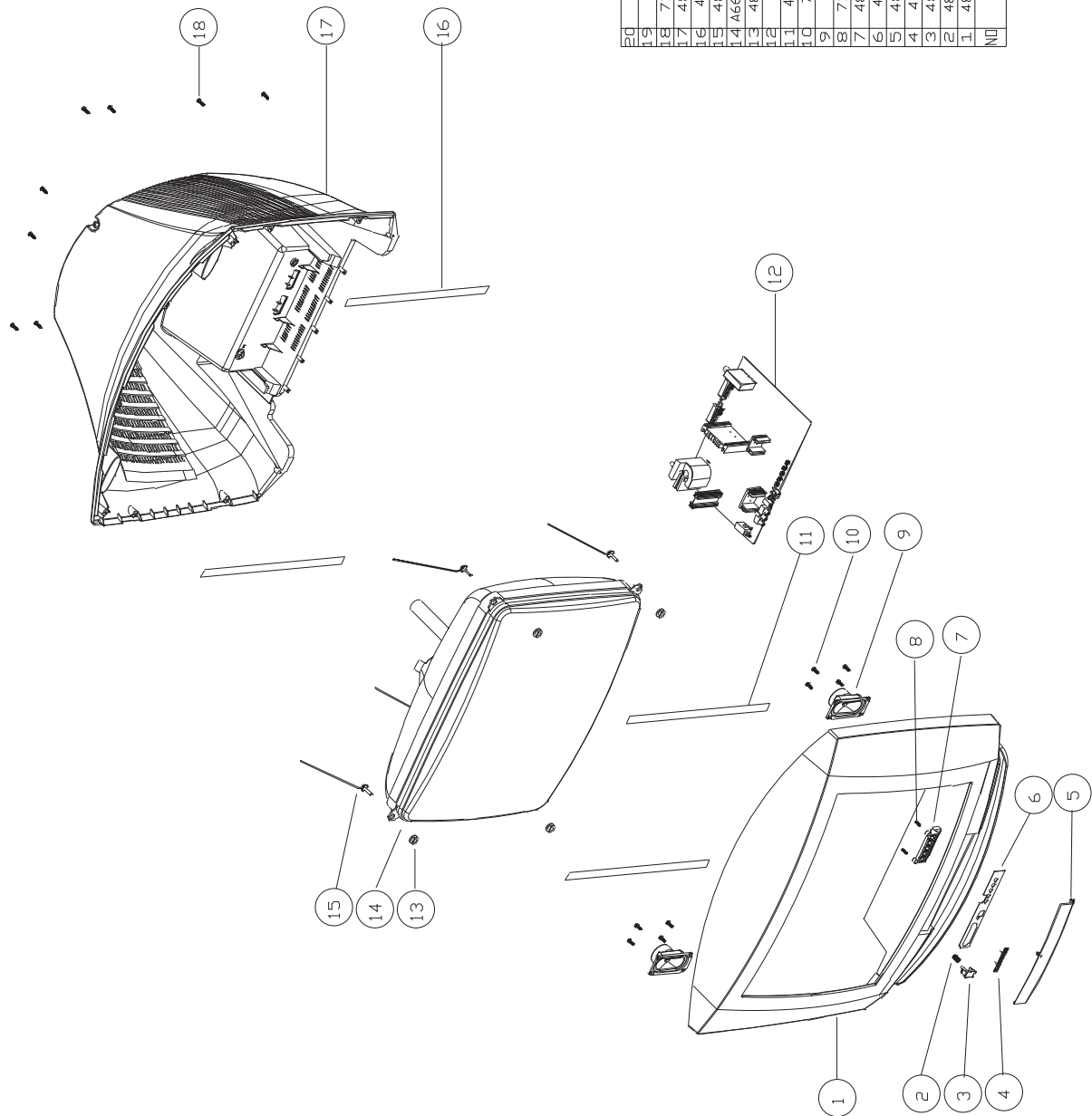


21	7122401612	SCREW TAPPING	8	T2S TRS 4X16 MFZN BK	
20	4852153211	COVER BACK	1	HIPS BK	
19	4857817610	CLOTH BLACK	3	FELT 300X20X0.7	
18	7122401612	SCREW TAPPING	8	T2S TRS 4X16 MFZN BK	
17	4853951200	BKRT	4	EGI T10+CLOTH BLACK	
16	4856015800	SCREW CRT FIX	4	L=27mm	
15	A66ECY13X-26V	CRT A'ssy	1	GLASS	
14	4856215404	WASHER RUBBER	4	CR T4.0	
13		PCB A'ssy	1	CP-776	
12	4857818701	CLOTH BLACK	2	FELT 10.7 L=350 W=15	
11	4857818702	CLOTH BLACK	2	FELT 10.7 L=250 W=15	
10	7122401412	SCREW TAPPING	8	T2S TRS 4X14 MFZN BK	
9		SPEAKER	2		
8	7121301212	SCREW TAPPING	2	T2S WAS 3X12 MFZN BK	
7	4854939901	BUTTON CTRL	1	ABS BK	
6	4855059001	DECO CTRL	1	PVC T0.25	
5	4852821601	DOOR	1	PC SMUG	
4	48556161SD	MARK BRAND	1	SILVER DIA-CUTTING	
3	4854854801	BUTTON POWER	1	HIPS BK	
2	4856716000	SPRING	1	SWPA PIE0.5	
1	4852070411	MASK FRONT	1	HIPS BK	
NO	PART CODE	PART NAME	QTY	MATERIAL	REMARKS

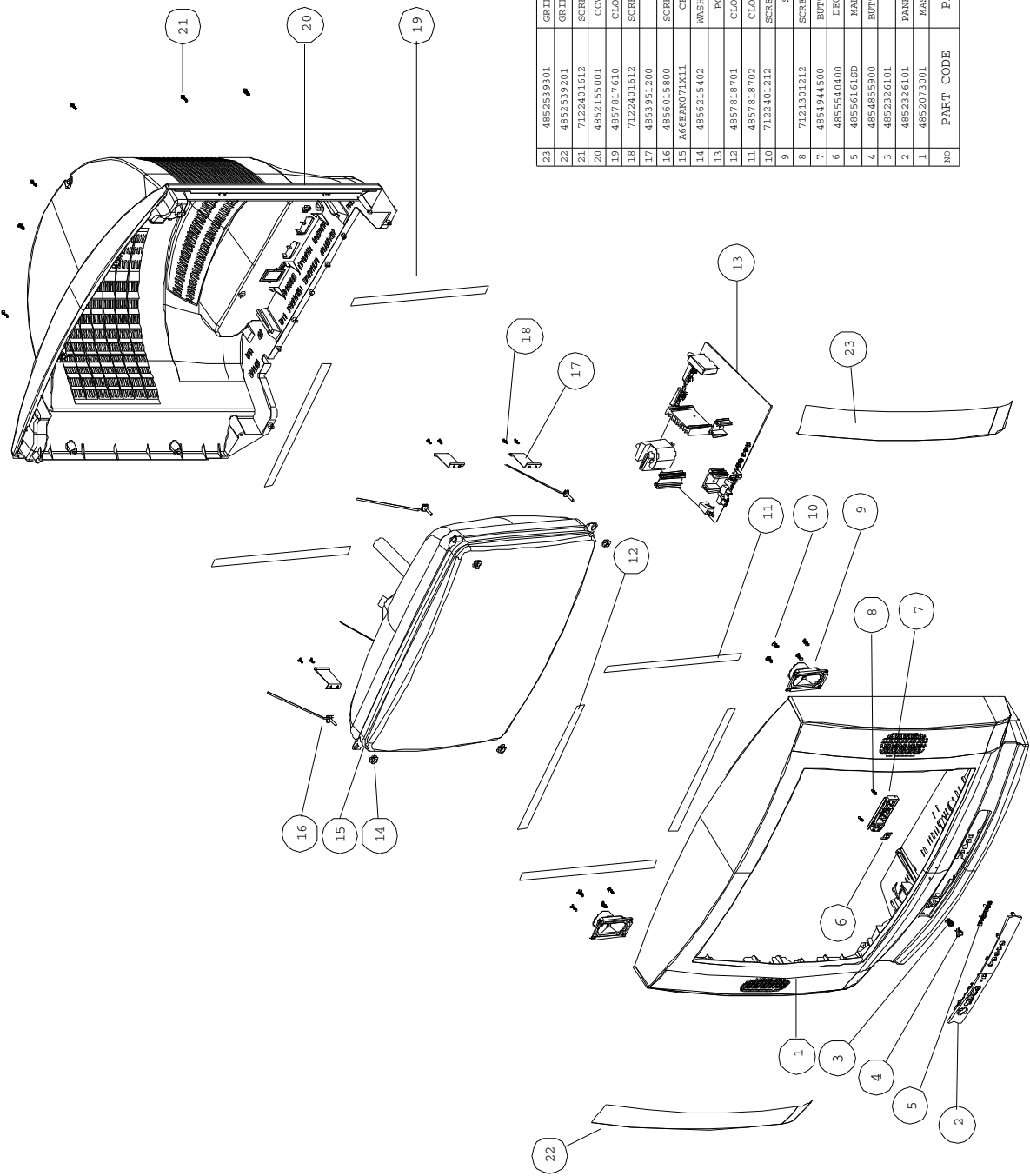


21	7122401612	SCREW TAPPING	8	T2S TRS 4X16 MFZN BK	
20	4852153211	COVER BACK	1	HIPS BK	
19	4857817610	CLOTH BLACK	3	FELT 300X20X0.7	
18	7122401612	SCREW TAPPING	8	T2S TRS 4X16 MFZN BK	
17	4853951200	BKRT	4	EGI T1.0+CLOTH BLACK	
16	4856015800	SCREW CRT FIX	4	L=27mm	
15	A65ECY13X.26V	CRT A'ssy	1	GLASS	
14	4856215404	WASHER RUBBER	4	CR T4.0	
13		PCB A'ssy	1	CP-776	
12	4857818701	CLOTH BLACK	2	FELT 10.7 L=350 W=15	
11	4857818702	CLOTH BLACK	2	FELT 10.7 L=250 W=15	
10	7122401412	SCREW TAPPING	8	T2S TRS 4X14 MFZN BK	
9		SPEAKER	2		
8	7121301212	SCREW TAPPING	2	T2S WAS 3X12 MFZN BK	
7	4854939901	BUTTON CTRL	1	ABS BK	
6	4855059001	DECO CRTL	1	PVC T0.25	
5	4852821801	DOOR	1	PC SMIG	
4	48556161SD	MARK BRAND	1	SILVER DIA-CUTTING	
3	4854854901	BUTTON POWER	1	HIPS BK	
2	4856716000	SPRING	1	SWPA PIE0.5	
1	4852070511	MASK FRONT	1	HIPS BK	
NO	PART CODE	PART NAME	QTY	MATERIAL	REMARKS





NO	PART CODE	PART NAME	QTY	MATERIAL	REMARKS
1	7122401612	SCREW TAPPING	10	SWRM BK	
2	4852151900	COVER BACK	1	HIPS BK	
3	4857817611	CLOTH BLACK	2	FELT T0.7 L=200	
4	4856015800	SCREW CRT FIX	4	SWRM+SK-5 BK	
5	466EC113X 26V	CRT A'ssy	1	GLASS	
6	4856215402	WASHER RUBBER	4	CR	
7	4857818702	PCB A'ssy	1	cp-775	
8	7122401412	SCREW TAPPING	8	FELT T0.7 L=250 W=15	
9	7121301212	SPEAKER	2	SWRM BK	
10	4854939901	SCREW TAPPING	2	SWRM BK	
11	4855059901	BUTTON CTRL	1	ABS BK	
12	4852821701	DECO.CRTL	1	PS	
13	4855617400	DOOR	1	PC	
14	4854854101	MARK BRAND	1	A1050P-H24	
15	4856716001	BUTTON POWER	1	ABS	
16	4852068001	SPRING	1	SWPA	
17	4852068001	MASK FRONT	1	HIPS BK	
18					

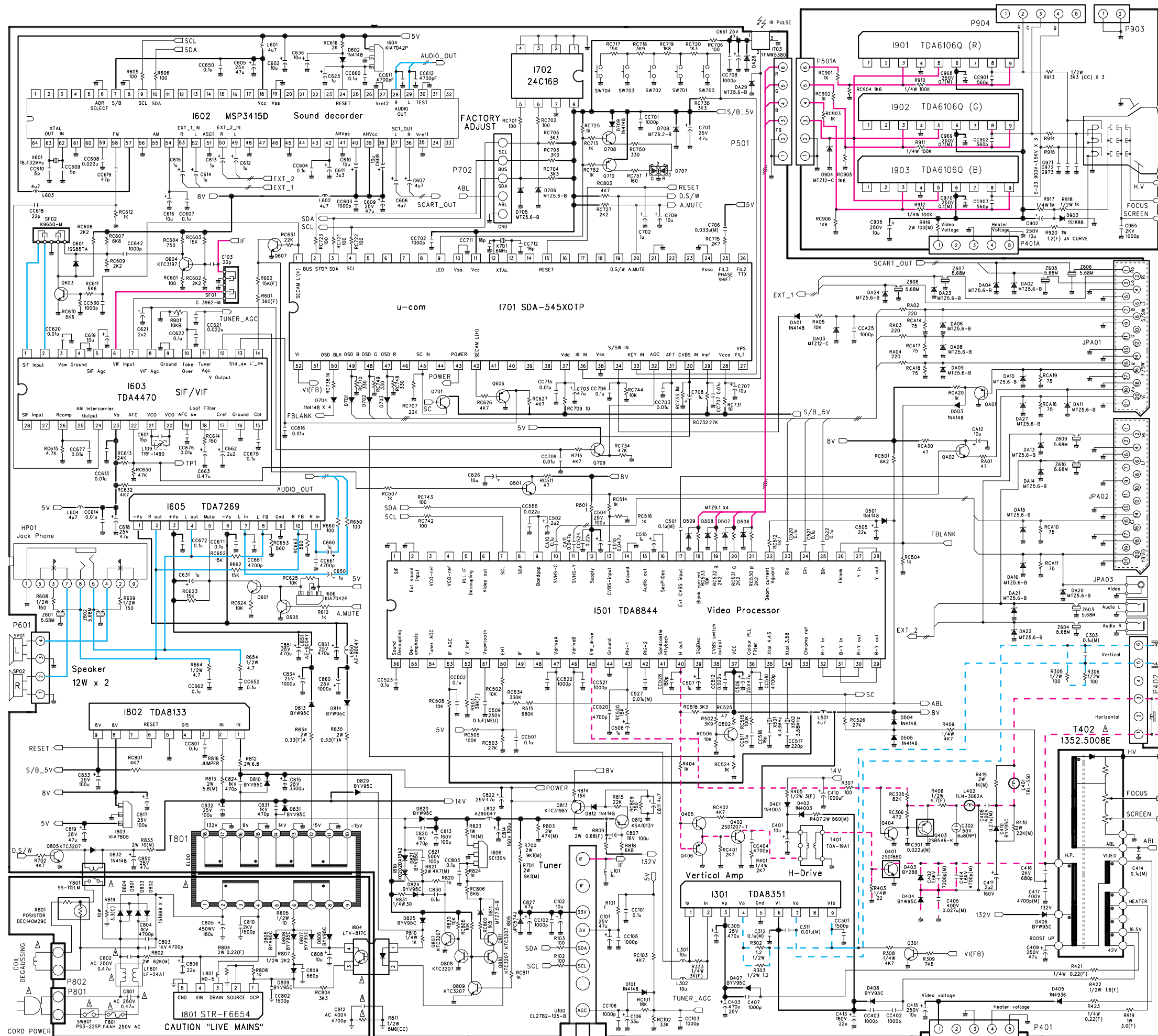


23	4852539301	GRILL SPKR R	1	PS SHEET	
22	4852539201	GRILL SPKR L	1	PS SHEET	
21	7122401612	SCREW TAPPING	8	T2S TRS 4X1.6 MFZN BK	
20	4852155001	COVER BACK	1	HIPS BK	
19	4857817610	CLOTH BLACK	3	FELT 30020X0.7	
18	7122401612	SCREW TAPPING	8	T2S TRS 4X1.6 MFZN BK	
17	4853951200	BRRT	4	EGI T1.0+CLOTH BLACK	
16	4856015800	SCREW CRT FIX	4	L=27mm	
15	A66BA071X11	CRT A'8BY	1	GLASS	
14	4856215402	WASHER RUBBER	4	CR T2.0	
13		PCB A'8BY	1	CP-776	
12	4857818701	CLOTH BLACK	2	FELT T0.7 L=350 W=15	
11	4857818702	CLOTH BLACK	2	FELT T0.7 L=250 W=15	
10	7122401212	SCREW TAPPING	8	T2S TRS 4X1.2 MFZN BK	
9		SPEAKER	2		
8	7121301212	SCREW TAPPING	2	T2S WAS 3X1.2 MFZN BK	
7	4854944500	BUTTON CTRL	1	ABS BK	
6	4855404000	DECO SENSOR	1	PWVA CL	
5	485561615D	MARK BRAND	1	SILVER DIA-CUTTING	
4	4854855900	BUTTON POWER	1	HIPS BK	
3	4852326101	SPRING	1	SWPA PIECE.5	
2	4852326101	PANEL CONTROL	1	HIPS BK	
1	4852073001	MASK FRONT	1	HIPS BK	
NO	PART CODE	PART NAME	QTY	MATERIAL	REMARKS

■ Printed Circuit Board

■ Main PCB

CP-776 Chassis Schematic Diagram



NOTE:

1. RESISTANCE IS SHOWN IN OHM. K=1000, M=1000000
2. UNLESS OTHERWISE NOTED IN SCHEMATIC ALL CAPACITOR VALUES ARE EXPRESSED IN uF
3. VOLTAGES READ WITH "VTVM" FROM POINT INDICATED TO CHASSIS GROUND USING A COLOR BAR SIGNAL WITH ALL CONTROLS AT NORMAL LINE 230V AC VOLTAGE READINGS SHOWN ARE NORMAL VALUES AND MAY VARY +20% EXCEPT H.V
4. THIS CIRCUIT DIAGRAM IS A STANDARD ONE CIRCUIT PRINTED MAY BE SUBJECT TO CHANGE FOR PRODUCT IMPROVEMENT WITHOUT PRIOR NOTICE

WARNING:

BEFORE SERVICING THE CHASSIS, READ "X-RAY RADIATION", "SAFETY PRECAUTION", AND "PRODUCT SAFETY NOTICE" IN SERVICE MANUAL

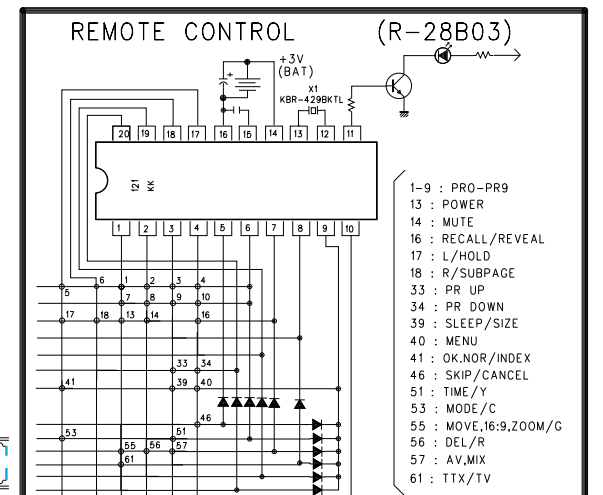
CAUTION TO SERVICE TECHNICIANS:

BEFORE RETURNING THE RECEIVER TO CUSTOMER, LEAKAGE CURRENT QR RESISTANCE MEASUREMENTS SHOULD BE PERFORMED TO DETERMINE THAT EXPOSED PARTS ARE PROPERLY INSULATED FROM THE SUPPLY CIRCUIT.

RESISTOR	CAPACITOR	COIL
CARBON FILM	ELECTRO	PEAKING
R M-OXIDE	CERAMIC	CHOKE
CARBON COMP	CERAMIC CH	BEAD
FUSIBLE	ELECTRO NONPOLAR	
CEMENT	MYLAR	

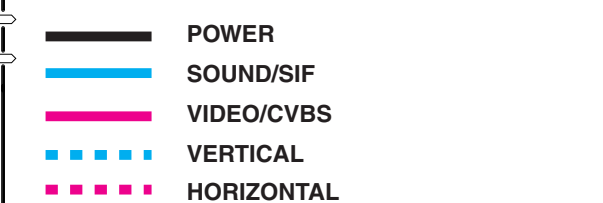
THE DIFFERENT PARTS FOR CRT

LOC.	28 INCH V/COLOR	28 INCH PHILIPS	25 INCH PHILIPS	25 INCH ORION	29 INCH ORION
C402	1.6KV 7200pF(M)	←	←	←	1.6KV 8200pF(M)
C404	1.6KV 4700pF(M)	←	←	←	1.6KV 8200pF(M)
C408	400V 0.27uF(M)	←	←	←	400V 0.33uF(M)
C409	250V 47uF(C)	←	←	←	←
D406	BY95C	←	←	←	←
J802	x	x	x	x	JUMPER
L401	TRL-330	←	←	←	TRL-2000
P501A	CONN AS(500mm)	←	←	←	CONN AS(500mm)
R333	1/4W 2K OHM	←	←	←	←
R319	1W 0.68 (F)	←	←	←	←
ZC010	280H-1015-2P	←	←	←	280H-1015-2P
ZC010	DC-2701	←	←	←	DC-2901



PRODUCT SAFETY NOTE :

THE COMPONENTS MARKED WITH ⚠ ARE IMPORTANT FOR MAINTAINING THE SAFETY OF THE SET AND SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL OR SPECIFIED ONE IN THE PART LIST. DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.



DAEWOO

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