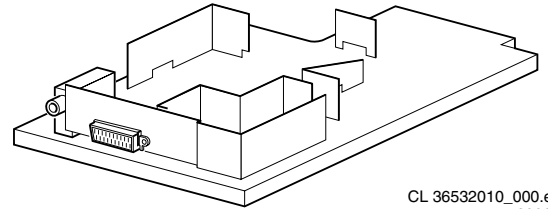


Service
Service
Service



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Service Manual

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1. Technical Specifications, Connection Facilities and Chassis Overview

1.1 Technical Specifications

1.1.1 Reception

Tuning system	: PLL
Colour systems	: PAL
	: SECAM
Sound system	: Mono
A/V Connections	: Scart
	: Headphone front
Channel selection	: Air
	: Cable
IF Frequency	: B/G, D/K, L: 38.9 MHz
	: L': 33.4 MHz
	: I: 39.5 MHz
Aerial input	: 75 Ohm

1.1.2 Miscellaneous

Audio Output (RMS)	: 1 x 1 W
Mains Voltage	: 150/240 V (± 10 %)
Mains Frequency	: 50 Hz (± 5 %)
Power Consumption	: 45 W
Standby Power Consumption	: 4 W

1.2 Connection/Control Facilities

1.2.1 TV Front Control

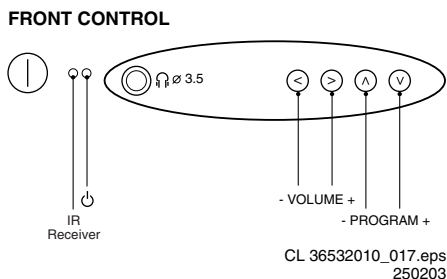


Figure 1-1 Front control

1.2.2 TV Rear Connections

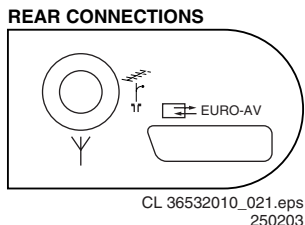


Figure 1-2 Rear connections

Euro AV

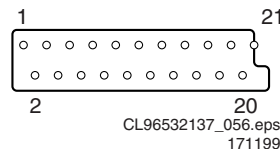


Figure 1-3 SCART connector

1 - Audio - R	0.5 Vrms / 1 kOhm	⊖→
2 - Audio - R	0.5 Vrms / 10 kOhm	⊖→
3 - Audio - L	0.5 Vrms / 1 kOhm	⊖→
4 - Audio	Ground	⊖
5 - Blue	Ground	⊖
6 - Audio - L	0.5 Vrms / 10 kOhm	⊖→
7 - Blue	0.7 Vpp / 75 Ohm	⊖→
8 - CVBS-status	0 - 1.3 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	
9 - Green	Ground	⊖
10 -		
11 - Green	0.7 Vpp / 75 Ohm	⊖→
12 -		
13 - Red	Ground	⊖
14 - CVBS status	Ground	⊖
15 - Red	0.7 Vpp / 75 Ohm	⊖→
16 - RGB status	0 - 0.4 V: INT 1 - 3 V: EXT / 75 Ohm	
17 - CVBS	Ground	⊖
18 - RGB status	Ground	⊖
19 - CVBS-out	1 Vpp / 75 Ohm	⊖→
20 - CVBS-in	1 Vpp / 75 Ohm	⊖→
21 - Shielding	Ground	⊖

1.3 Chassis Overview

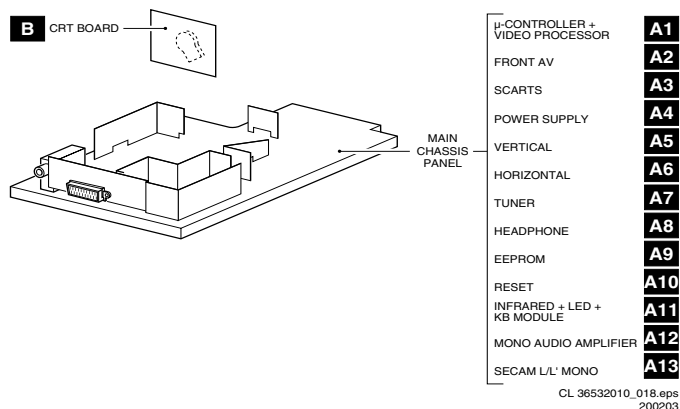


Figure 1-4 PWB location

2. Safety & Maintenance Instructions, Warnings, and Notes

Index of this chapter:

1. Safety Instructions for Repairs
2. Maintenance Instructions
3. Warnings
4. Notes

2.1 Safety Instructions for Repairs

Safety regulations require that during a repair:

- Due to the 'hot' parts of this chassis, the set must be connected to the AC power via an isolation transformer.
- Safety components, indicated by the symbol **▲**, should be replaced by components identical to the original ones.
- When replacing the CRT, safety goggles must be worn.

Safety regulations require that after a repair, the set must be returned in its original condition. Pay particular attention to the following points:

- General repair instruction: as a strict precaution, we advise you to resolder the solder connections through which the horizontal deflection current is flowing, in particular:
 - all pins of the line output transformer (LOT)
 - fly-back capacitor(s)
 - S-correction capacitor(s)
 - line output transistor
 - pins of the connector with wires to the deflection coil
 - other components through which the deflection current flows.

Note: This resoldering is advised to prevent bad connections due to metal fatigue in solder connections and is therefore only necessary for television sets more than two years old.

- Route the wire trees and EHT cable correctly and secure them with the mounted cable clamps.
- Check the insulation of the AC power cord for external damage.
- Check the strain relief of the AC power cord for proper function, to prevent the cord from touching the CRT, hot components, or heat sinks.
- Check the electrical DC resistance between the AC plug and the secondary side (only for sets that have an isolated power supply). Do this as follows:
 1. Unplug the AC power cord and connect a wire between the two pins of the AC plug.
 2. Turn on the main power switch (keep the AC power cord unplugged!).
 3. Measure the resistance value between the pins of the AC plug and the metal shielding of the tuner or the aerial connection of the set. The reading should be between 4.5 MOhm and 12 MOhm.
 4. Switch the TV 'off' and remove the wire between the two pins of the AC plug.
- Check the cabinet for defects, to prevent the possibility of the customer touching any internal parts.

2.2 Maintenance Instructions

It is recommended to have a maintenance inspection carried out by qualified service personnel. The interval depends on the usage conditions:

- When the set is used under normal circumstances, for example in a living room, the recommended interval is three to five years.
- When the set is used in an environment with higher dust, grease or moisture levels, for example in a kitchen, the recommended interval is one year.
- The maintenance inspection includes the following actions:
 1. Perform the 'general repair instruction' noted above.
 2. Clean the power supply and deflection circuitry on the chassis.

3. Clean the picture tube panel and the neck of the picture tube.

2.3 Warnings

- In order to prevent damage to ICs and transistors, avoid all high voltage flashovers. In order to prevent damage to the picture tube, use the method shown in Fig. 2-1, to discharge the picture tube. Use a high voltage probe and a multi-meter (position Vdc). Discharge until the meter reading is 0 V (after approx. 30 s).

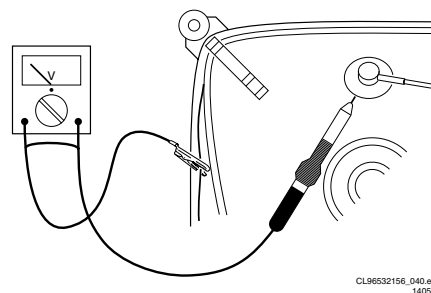


Figure 2-1 Discharge picture tube

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD **▲**). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this potential.
- Available ESD protection equipment:
 - Complete kit ESD3 (small tablemat, wristband, connection box, extension cable, and ground cable) 4822 310 10671.
 - Wristband tester 4822 344 13999.
- Together with the deflection unit and any multi-pole unit, flat square picture tubes form an integrated unit. The deflection and the multi-pole units are set optimally at the factory. Adjustment of this unit during repair is therefore not recommended.
- Be careful during measurements in the high voltage section and on the picture tube.
- Never replace modules or other components while the unit is switched 'on'.
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

2.4 Notes

2.4.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (\perp), or hot ground (\downarrow), depending on the area of circuitry being tested.
- The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode (see "Service Modes, Error Codes, and Faultfinding" section) with a color bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 61.25 MHz (NTSC, channel 3).
- Where necessary, measure the waveforms and voltages with (Γ) and without (⌘) aerial signal. Measure the voltages in the power supply section both in normal operation (Ⓢ) and in standby (Ⓢ). These values are indicated by means of the appropriate symbols.

- The picture tube panel has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aquadag coating.
- The semiconductors indicated in the circuit diagram and in the parts lists are completely interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

2.4.2 Schematic Notes





- All Resistor values are in ohms and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kOhm).
- Resistor values with no multiplier may be indicated with either an 'E' or an 'R' (e.g. 220E or 220R indicates 220 Ohm).
- All Capacitor values are expressed in Micro-Farads ($\mu = \times 10^{-6}$), Nano-Farads ($n = \times 10^{-9}$), or Pico-Farads ($p = \times 10^{-12}$).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An 'asterisk' (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed in the Electrical Replacement Parts List. Therefore, always check this list when there is any doubt.

2.4.3 Practical Service Precautions

- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages.** While some may not be dangerous in themselves, they can cause unexpected reactions - reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage insulation. It is easy to do, and is a good service precaution.
- **Before powering up the TV set with the back cover off** (or on a test fixture), attach a clip lead to the CRT DAG ground and to a screwdriver blade that has a well insulated handle. After the TV is powered on and high voltage has developed, probe the anode lead with the blade, starting at the case of the High Voltage Transformer (flyback - IFT). Move the blade to within two inches of the connector of the CRT. **If there is an arc, you found it the easy way, without getting a shock!** If there is an arc to the screwdriver blade, replace the part which is causing the problem; the High Voltage Transformer or the lead (if it is removable).

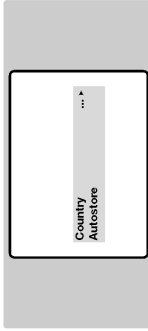
3. Directions for Use

Installing your television set

-  Insert the aerial plug into the **T** socket at the rear of the set.
-  Insert the mains plug into a wall socket (220-240 V / 50 Hz).
-  Insert the two R6-type batteries (supplied) making sure that they are the right way round.
-  To switch on the set, press the on/off key. If the television remains in standby mode, press **P** on the remote control.

Quick installation

When you turn on the TV set for the first time, a menu is displayed on screen. This menu prompts you to select the country.



*If the menu is not displayed, press and hold down the **▲** and **▶** keys on the TV set for 5 seconds to display the menu.*

- Use the **◀** **▶** keys on the remote control to select your country and validate with **↵**.

If your country does not appear in the list, select choice "...".

- The search starts automatically. All the available TV programmes will be stored. This operation takes a few minutes. The display shows the progress of the search and the number of programs found. At the end of the search, the menu disappears.

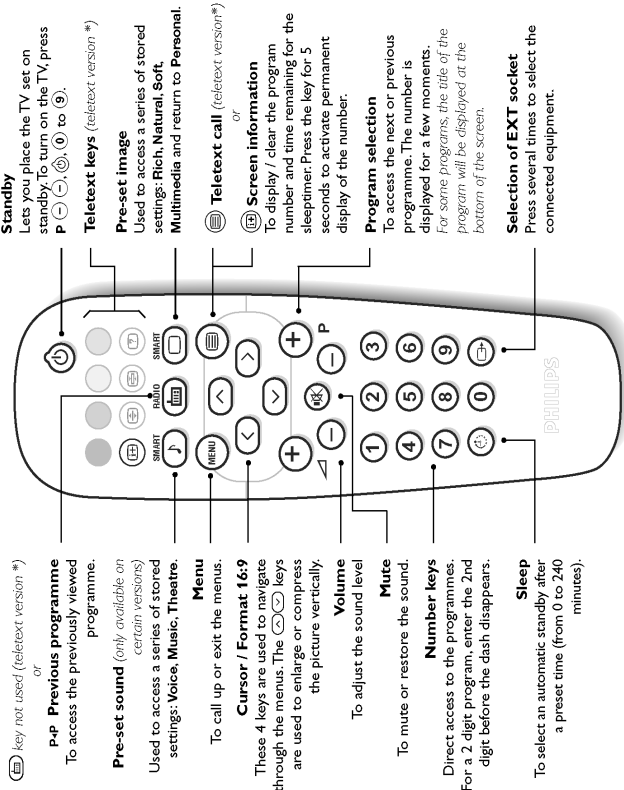
*To exit or interrupt the search, press **⏏**. If no programme is found, see [tips chapter](#) at the end of the instruction for use.*

- The programmes found are arranged by number 99, 98, 97, ... etc. You may now remember these programmes as you wish. See Program sort below.

Plug & Play

Remote control keys

* Depending on the model, there are 2 different versions of the remote control.



Standby
Lets you place the TV set on standby. To turn on the TV, press **P** **◀** **▶** **⏏** to **⏏**.

Teletext keys (teletext version *)
Pre-set image
Used to access a series of stored settings: Rich, Natural, Soft, Multimedia and return to Personal.

Teletext call (teletext version*)
or
Screen information
To display / clear the program number and time remaining for the sleeper: Press the key for 5 seconds to activate permanent display of the number.

Program selection
To access the next or previous programme. The number is displayed for a few moments. For some programs, the title of the program will be displayed at the bottom of the screen.

Selection of EXT socket
Press several times to select the connected equipment.

key not used (teletext version *)

P-P Previous programme
To access the previously viewed programme.

Pre-set sound (only available on certain versions)
Used to access a series of stored settings: Voice, Music, Theatre.

Menu
To call up or exit the menu.

Cursor / Format 16:9
These 4 keys are used to navigate through the menu. The **◀** **▶** keys are used to enlarge or compress the picture vertically.

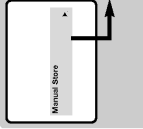
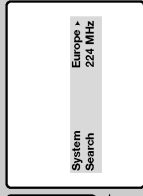
Volume
To adjust the sound level

Mute
To mute or restore the sound.

Number keys
Direct access to the programmes. For a 2 digit program, enter the 2nd digit before the dash disappears.

Sleep
To select an automatic standby after a preset time (from 0 to 240 minutes).

Program sort

- Press key **⏏**. The Main menu is displayed on the screen.
-  With the **◀** key, select **Manual Store** and press **↵**.
-  With the **◀** key, select **System Search** and press **↵**.
- Repeat steps **2** to **5** for each program you wish to remember.
- To quit the menu, press **⏏**.
- Use the **◀** **▶** or **◀** **▶** keys to select the program you wish to remember.
- Then use the **◀** key to select **Program No** and enter the new number with the **◀** **▶** keys.
- With the **◀** key, select **Store** and press **↵**.
- Repeat steps **2** to **5** for each program you wish to remember.
- To quit the menu, press **⏏**.

Teletext

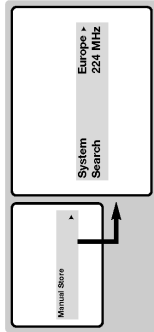
(only available on certain versions)

- Teletext call**
Press the **⏏** key to call teletext, change to transparent mode and then exit. The summary appears with a list of items that can be accessed.
If the channel selected does not broadcast teletext, the screen remain black.
- Enlarge a page**
Press **⏏** several times to enlarge the page.
- Stop sub-page acquisition**
Certain pages contain sub-pages which follow on automatically. Press **⏏** to stop / resume the sequence.
- Hidden information** (games solutions)
Press **⏏** to display or hide the concealed information.
- Direct access to the items**
Coloured areas are displayed at the bottom of the screen. The 4 coloured keys are used to access the items or corresponding pages.
- Contents**
Press **⏏** to return to the contents page (usually page 100).

Manual store

This menu is used to store the programmes one at a time.

- 1 Press the **Menu** key.
- 2 With the **Left** key, select **Manual Store** and press **Enter**. Use the **Up** and **Down** keys to select a setting and the **Left** and **Right** keys to adjust. :



- 3 **System:** select Europe (automatic detection^{*)} or West Europe (BG standard), East Europe (DK standard), UK (I standard) or France (LL^{*)}

standard).

^{*} Except for France (LL^{*)} standard, you must select choice **France**.

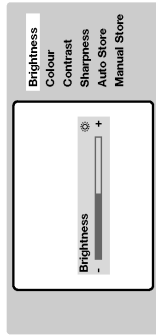
- 4 **Search:** press **Enter**. The search starts. Once a programme is found, the scanning stops. Go to the next step. If you know the frequency of the required programme, this can be entered directly using the **0** to **9** keys.

If no programme is found, see **Tips** chapter at the end of the instruction for use.

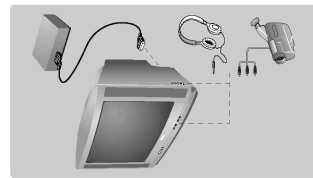
- 5 **Program No.:** enter the required number with the **Left** or **0** to **9** keys.
- 6 **Store:** press **Enter**. The program is stored.
- 7 Repeat steps 4 to 6 for each programme to store.
- 8 To quit the menu, press **Menu**.

Other settings in the menu

- 1 Press the **Menu** key.
- 2 Use the **Left** and **Right** keys to select a setting and the **Up** and **Down** keys to adjust. :



Other functions



Connecting peripheral equipment

Use the euroconnector socket located at the back of the set or the front-**AV** connections (when available).

To select connected equipment, press several times the **Source** key. Most equipment (decoder, VCR) carries out the switching itself.

Headphones socket (only available on certain versions)

When headphones are connected, the sound on the TV set will be cut.

The **Volume** and **Power** keys are used to adjust the volume level.

The headphones impedance must be between 32 and 600 Ohms.

The keys on the TV set

The TV set has 4 keys: **VOLUME +** (**+**) and **PROGRAM -** (**-**) and **P +**.

To access or exit the menus, press simultaneously the **Left** and **Right** keys. Then use the **P +** and **-** keys to select and adjust.

Tips : see at the end of the booklet (p. 57).

Tips

Positioning the television set

Place your TV on a solid, stable surface, leaving a space of at least 5 cm around the appliance. To avoid accidents, do not put anything on the set such as a cloth or cover, a container full of liquid (vase) or a heat source (lamp). The set must not be exposed to water.

Poor reception

The proximity of mountains or high buildings may be responsible for ghost pictures, echoing or shadows. In this case, modify the orientation of the aerial.

No picture or no sound

Have you connected the aerial socket properly?

Have you chosen the right system? (p. 5).

Teletext

Are certain characters not displayed correctly? Press and hold down the **Left** and **Right** keys on the TV set for 5 seconds to display the **Country** menu. Then use the

GB

Standby
The **Standby** keys to select your country and validate with **Enter**.

If the set receives no signal for 15 mins, it automatically goes into standby mode. To save power, your set is fitted with components that give it a very low power consumption when in standby mode (less than 3 W).

Still no results?

If your TV set breaks down, never attempt to repair it yourself; contact your dealer's after-sales service.

Recycling directive

The batteries supplied with this appliance do not contain mercury or nickel cadmium. The materials used in your set are either reusable or can be recycled. To minimise environmental waste, specialist companies collect used appliances and dismantle them after retrieving any materials that can be used again (ask your dealer for further details).

4. Mechanical Instructions

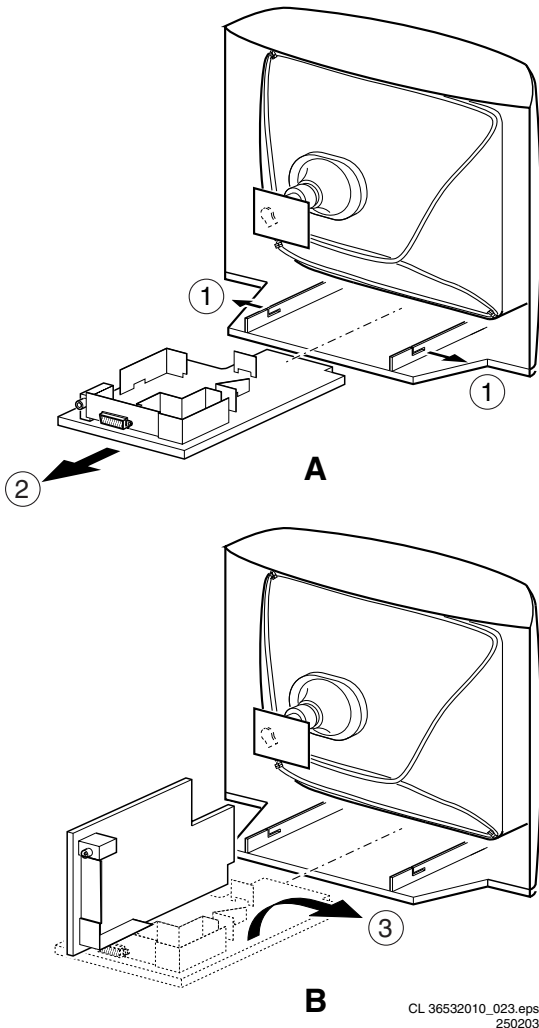
Note: Figures below can deviate slightly from the actual situation, due to the different set executions.

4.1 Rear Cover Removal

1. Remove all (ten) fixation screws of the rear cover: two at the top, two at each side, three at the bottom and one in the middle of the rear cover. The 14" set has only four fixation screws: two at the top and two at the bottom.
2. Now pull the rear cover backward to remove it.

4.2 Service Position Main Panel

1. Disconnect the strain relief of the Mains cord.
2. Remove the main panel, by pushing the two centre clips outward [1]. At the same time pull the panel away from the CRT [2].
3. Disconnect the degaussing coil by removing the cable from connector KP02.
4. Move the panel somewhat to the left and flip it 90 degrees [3], with the components towards the CRT.



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Figure 4-1 Service Position

4.3 Rear Cover Mounting

Before you mount the rear cover:

1. Place the mains cord correctly in its guiding brackets (strain relief).
2. Place all cables in their original position.

5. Service Modes, Error Codes and Fault Finding

Index of this chapter

1. Service Modes
2. Dealer Mode
3. Fault Finding

5.1 Service Modes

The Service Mode offers features, which the service technician can use to repair a set.

Any feature change, made via the Service Menu, will respond at the same time (for example; if Hotel Mode is enabled, the volume cannot be increased above max. volume displayed at the Service Menu).

All displayed text strings in the Service Modes are in English.

5.1.1 TV Service Mode

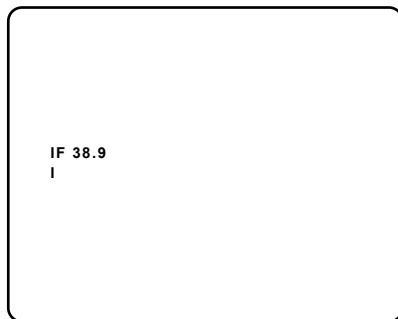
Purpose

- To perform alignments (e.g. colour adjustment and geometry alignments)
- To change option settings
- Hotel Mode operations

How to enter the Service Mode

Screen menu's must be 'off', when you enter the Service Mode. Use a standard customer RC-transmitter and key in the code **062596** directly followed by the **OSD** button.

The following screen is visible when you enter the Service Mode:



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Figure 5-1 TV Service Mode menu

How to navigate

- Select menu items with the CURSOR UP/DOWN keys.
- With the CURSOR LEFT/RIGHT keys, it is possible to change the value of the menu items

How to exit

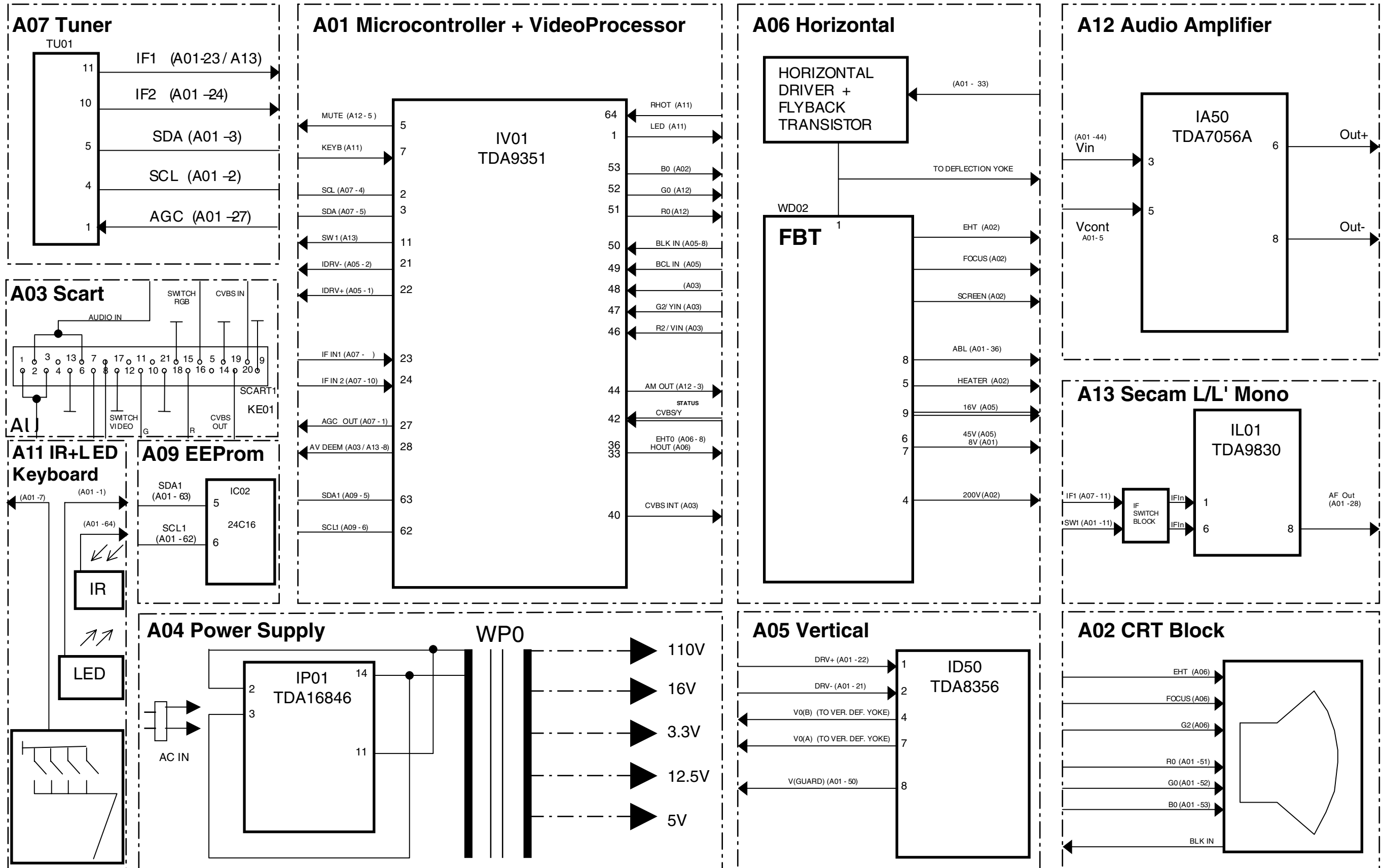
- With the STANDBY command, the set switches to Standby.
- With the MENU key.

Switching the set 'off' and 'on' with the mains switch, brings the set into normal operation again.

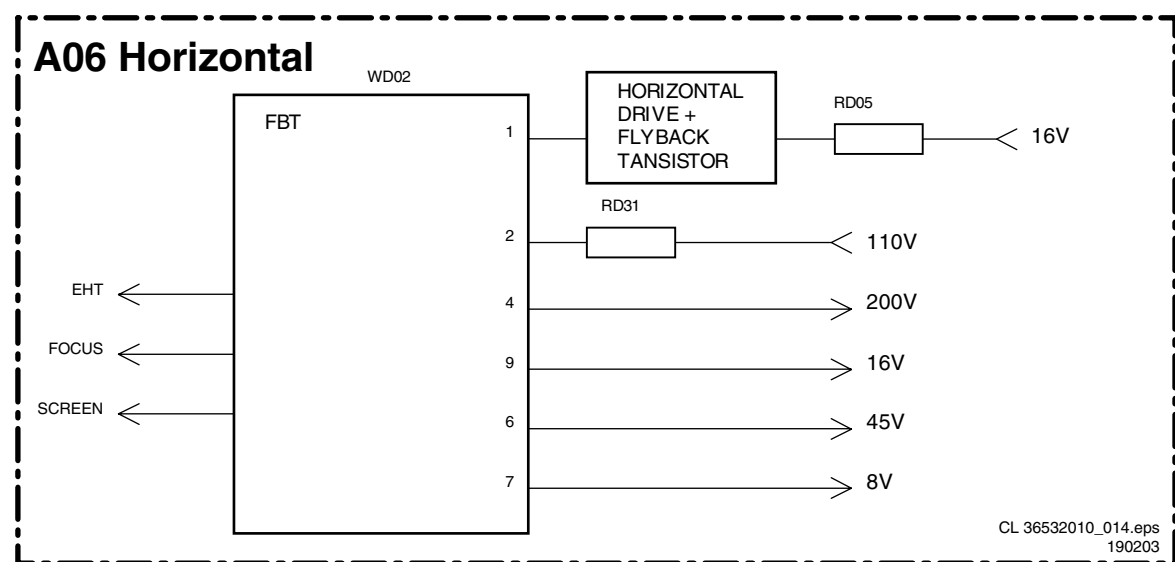
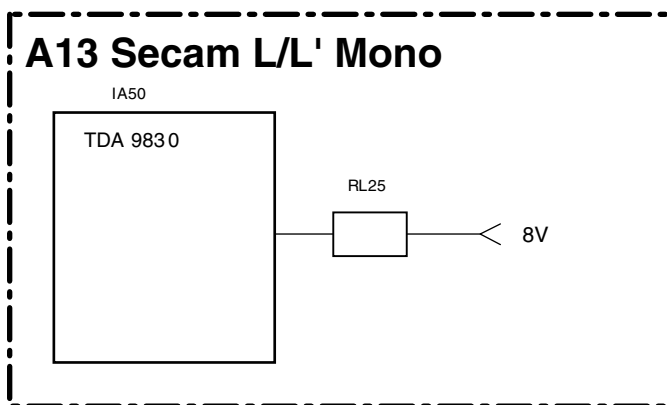
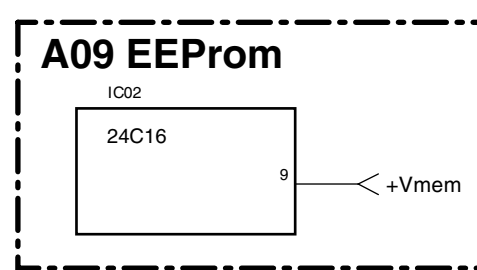
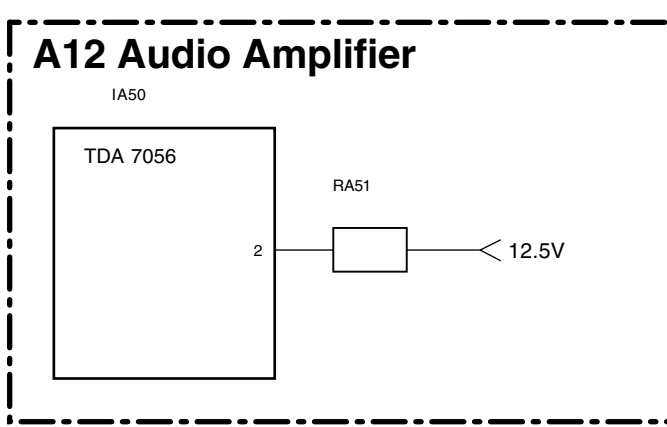
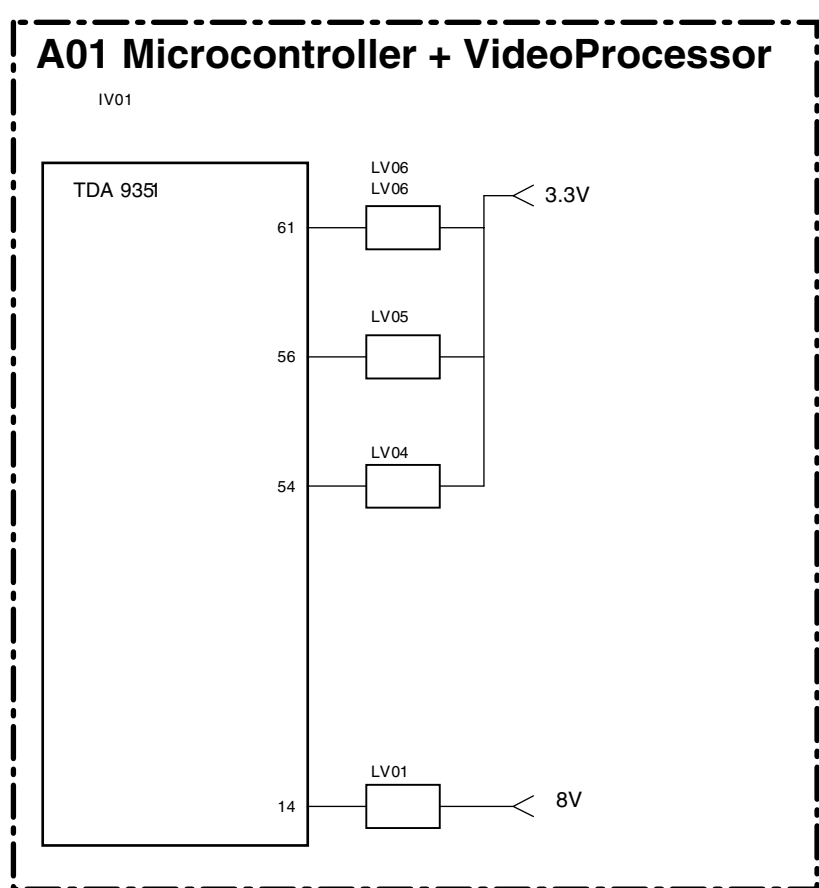
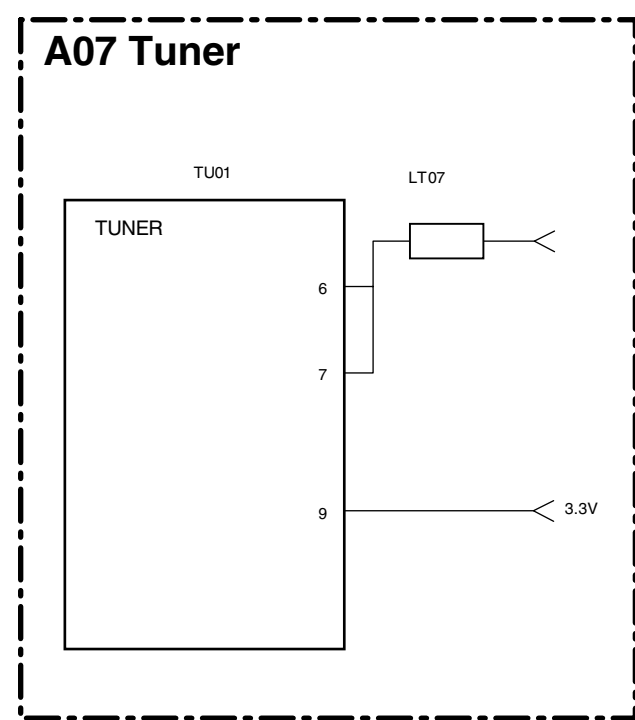
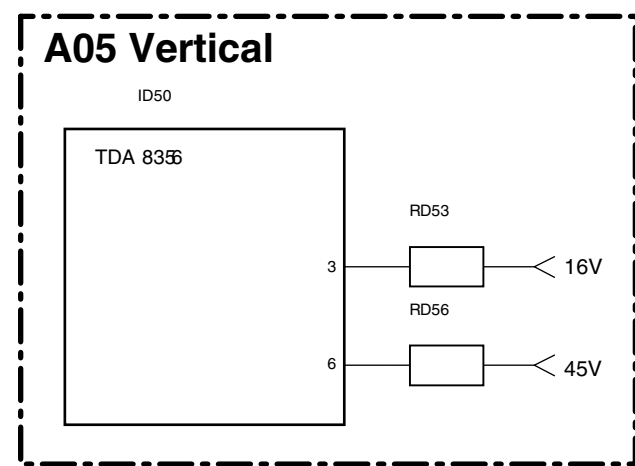
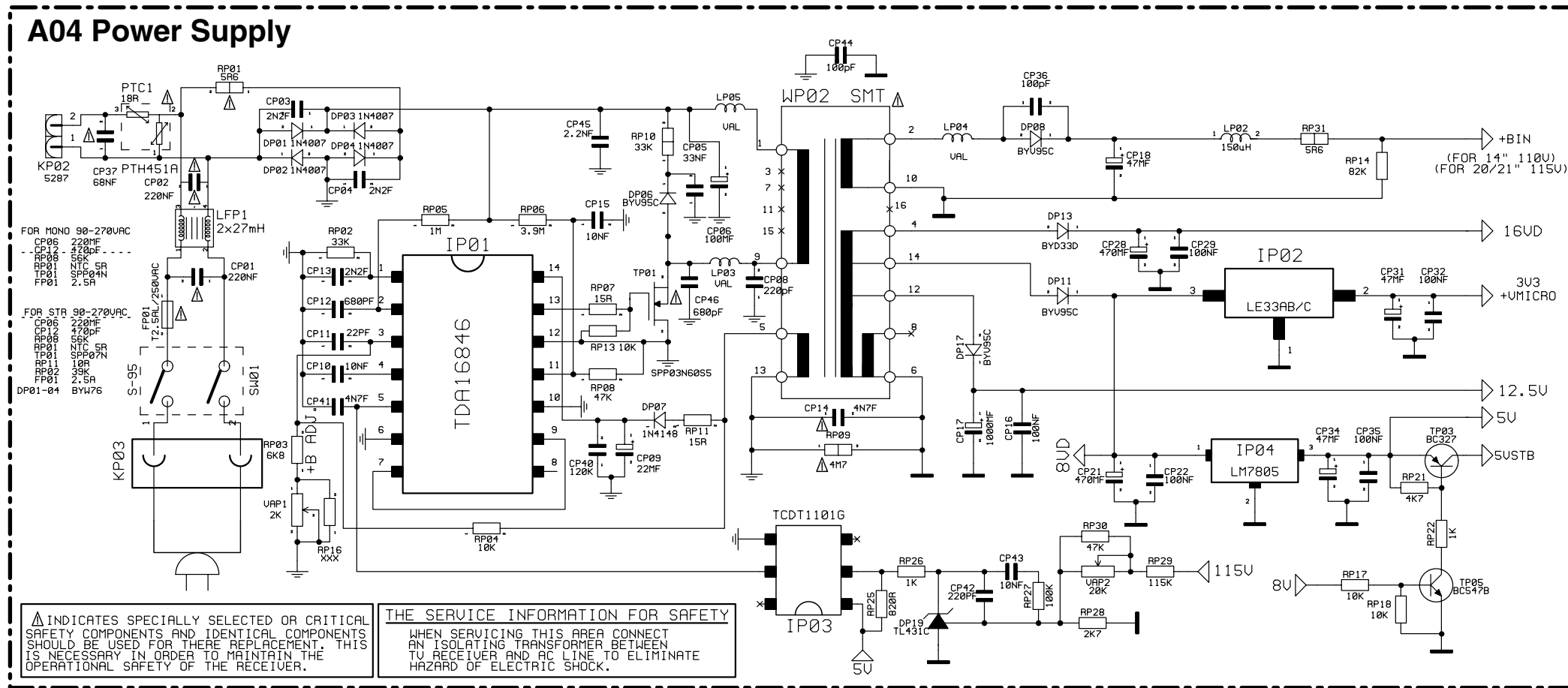
All changes in the Service Mode are stored immediately.

6. Wiring Diagram, Block Diagrams and Overviews

Block Diagram

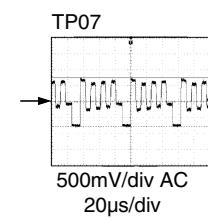
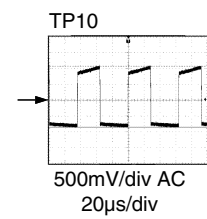
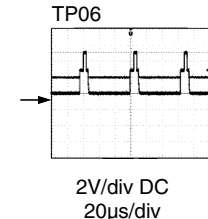
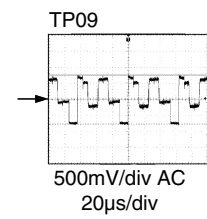
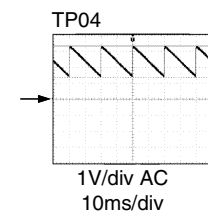
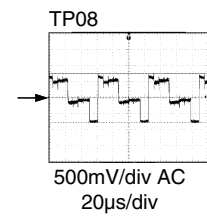
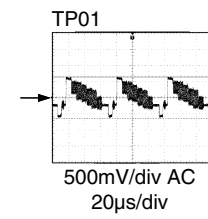
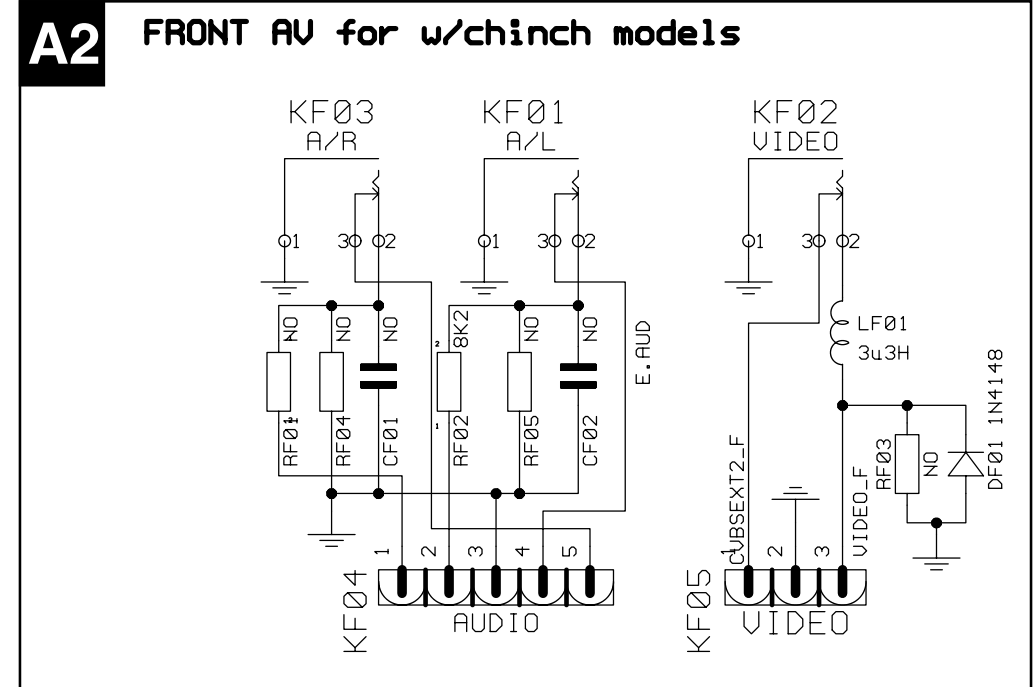
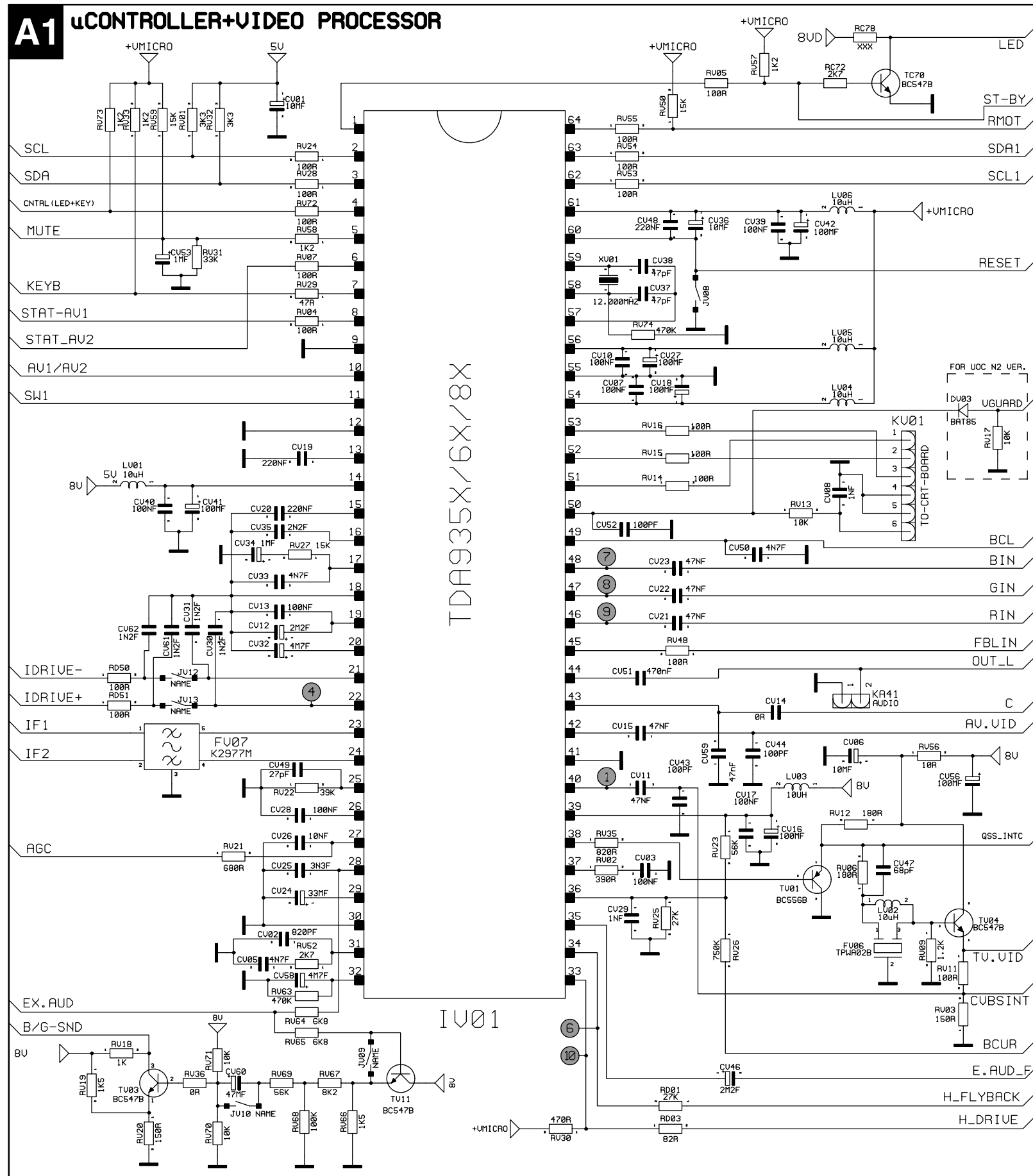


Supply Voltage Diagram



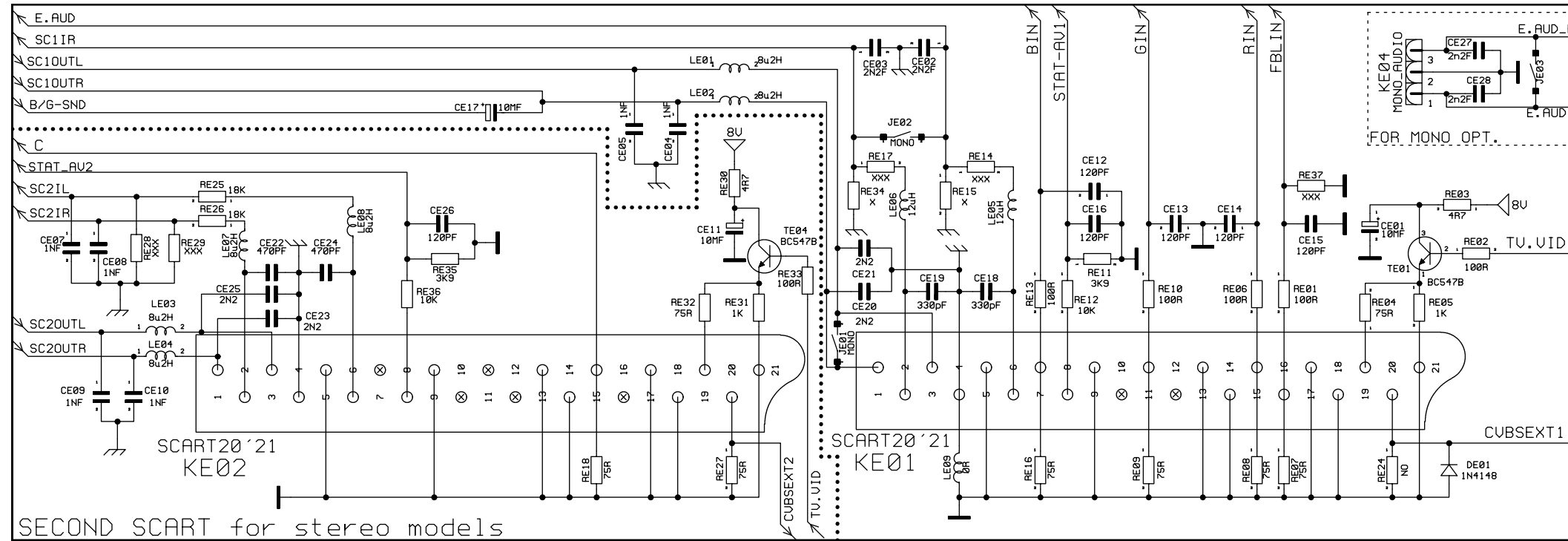
7. Circuit Diagrams and PWB Layouts

Main Panel: uController + Video Processor and Front AV

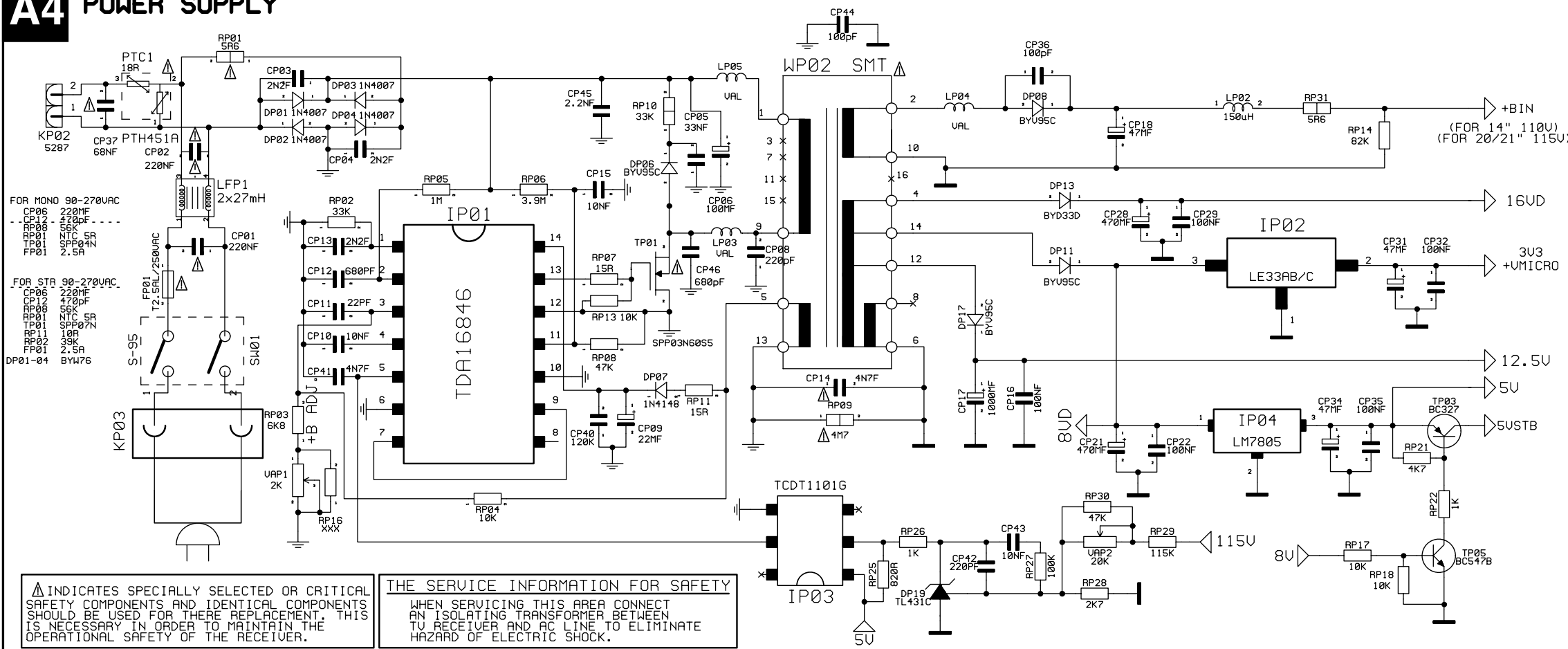


Main Panel: SCARTS and Power Supply

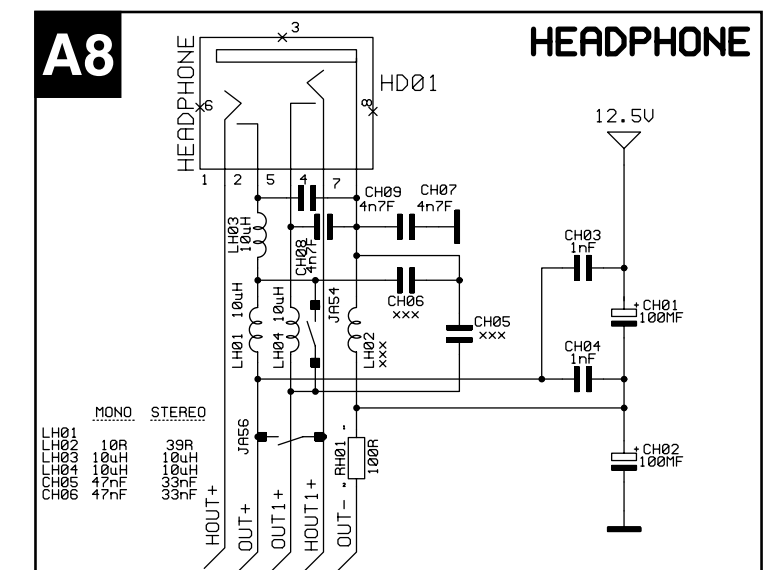
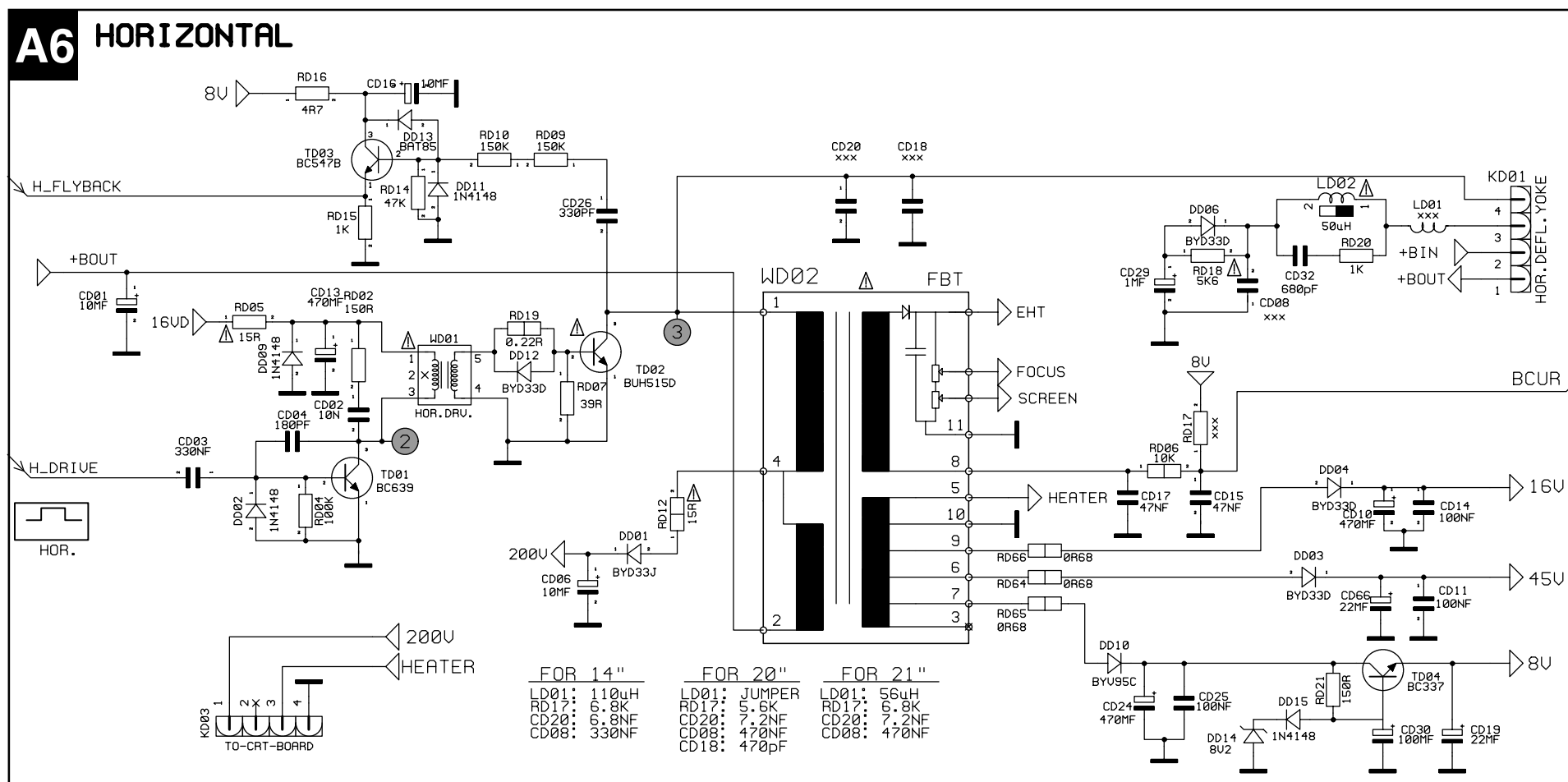
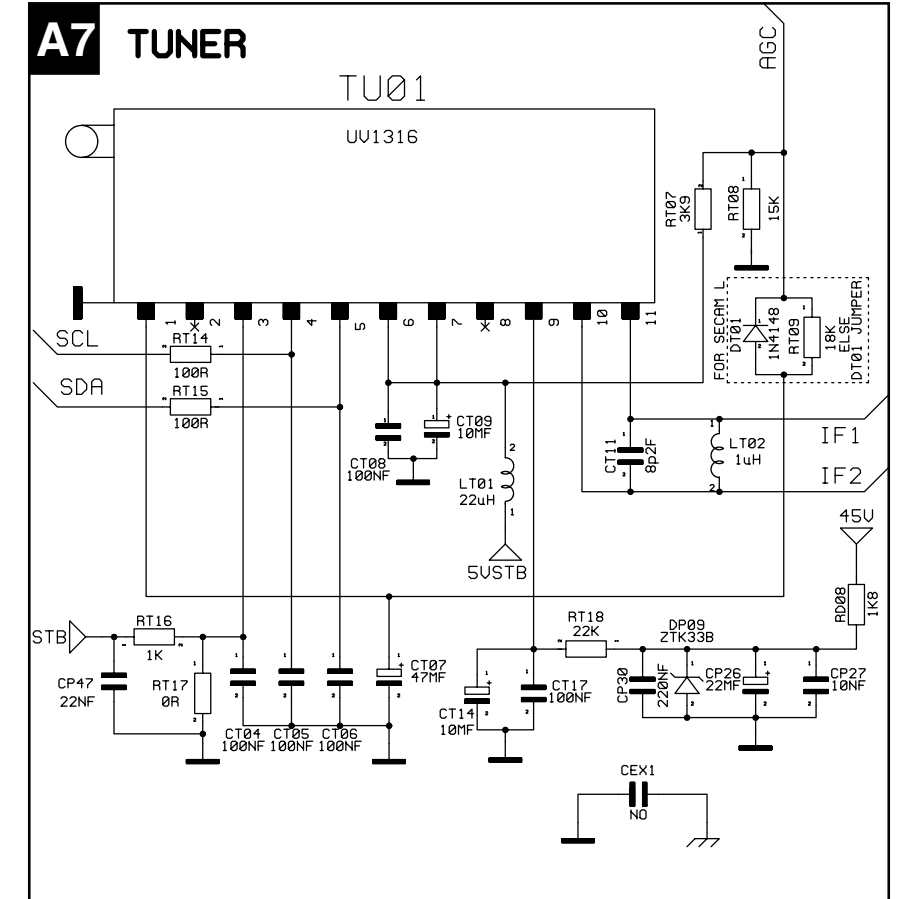
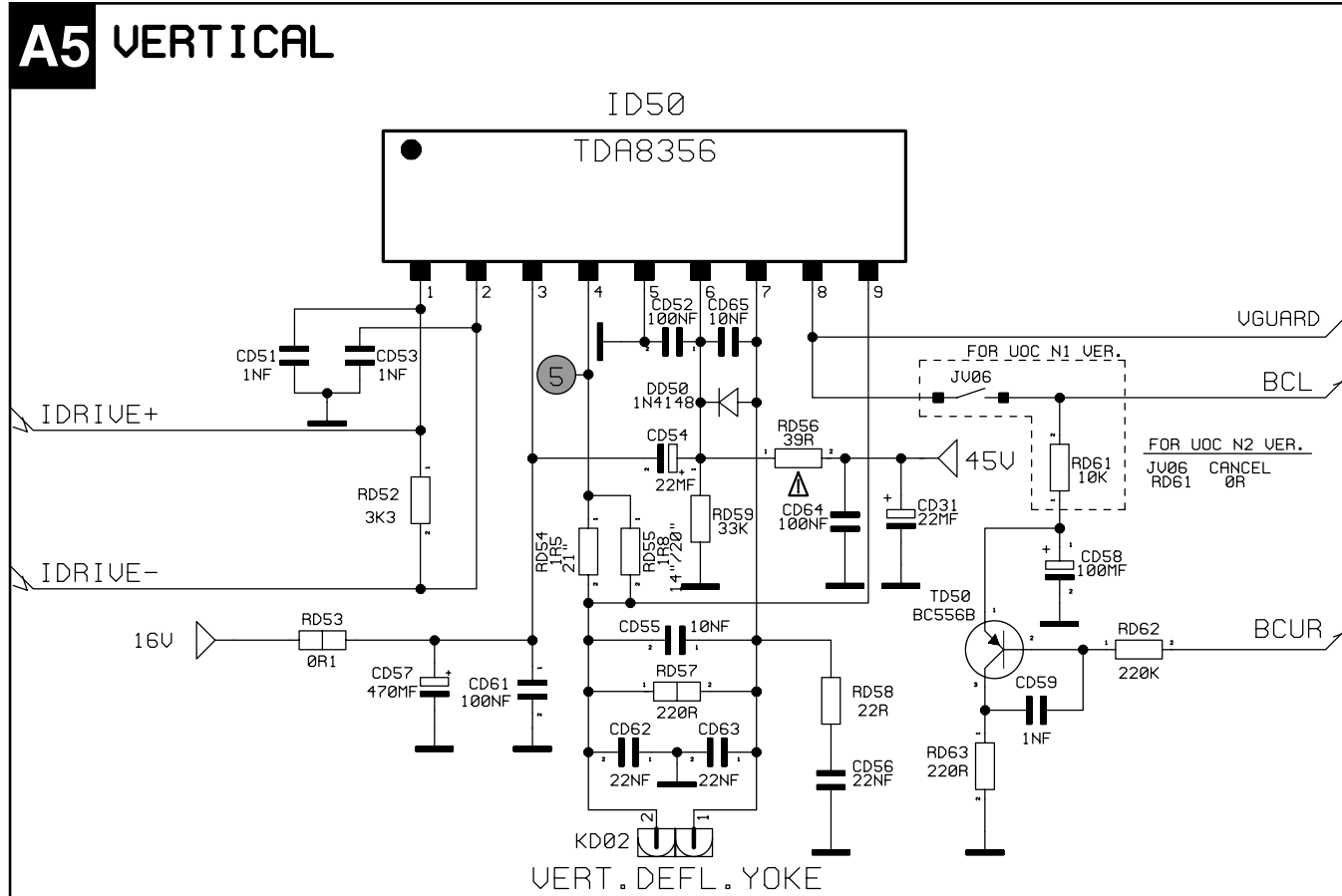
A3 SCARTS



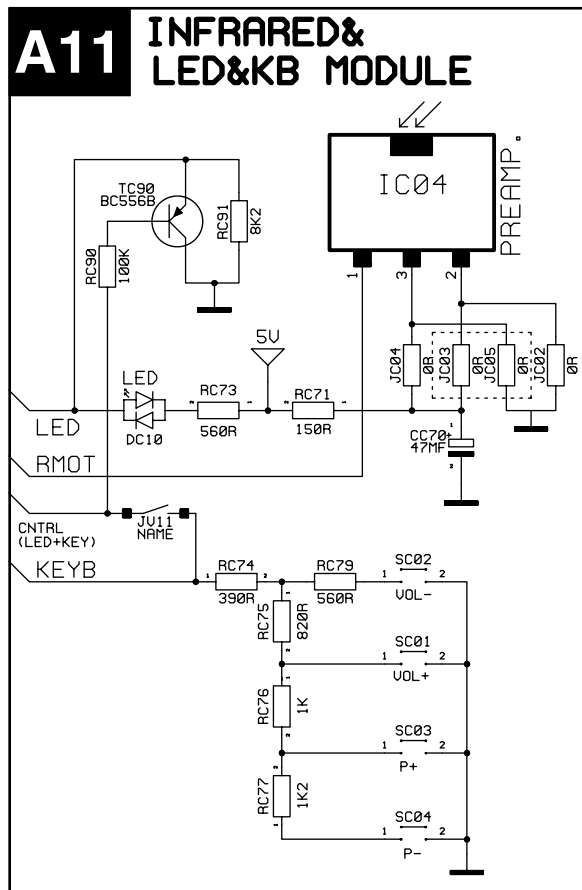
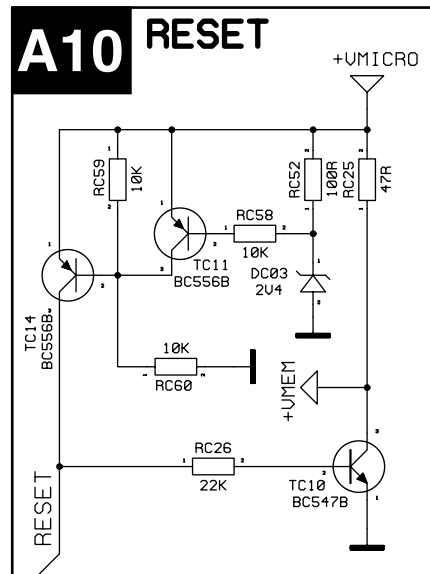
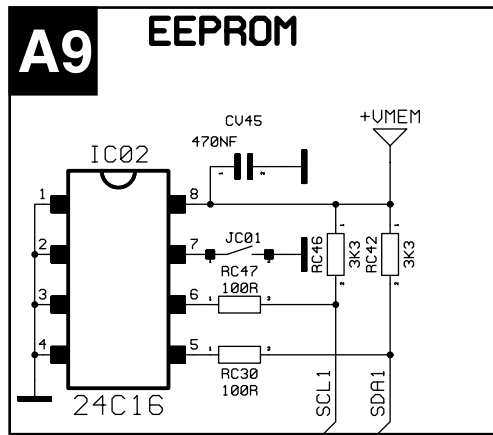
A4 POWER SUPPLY



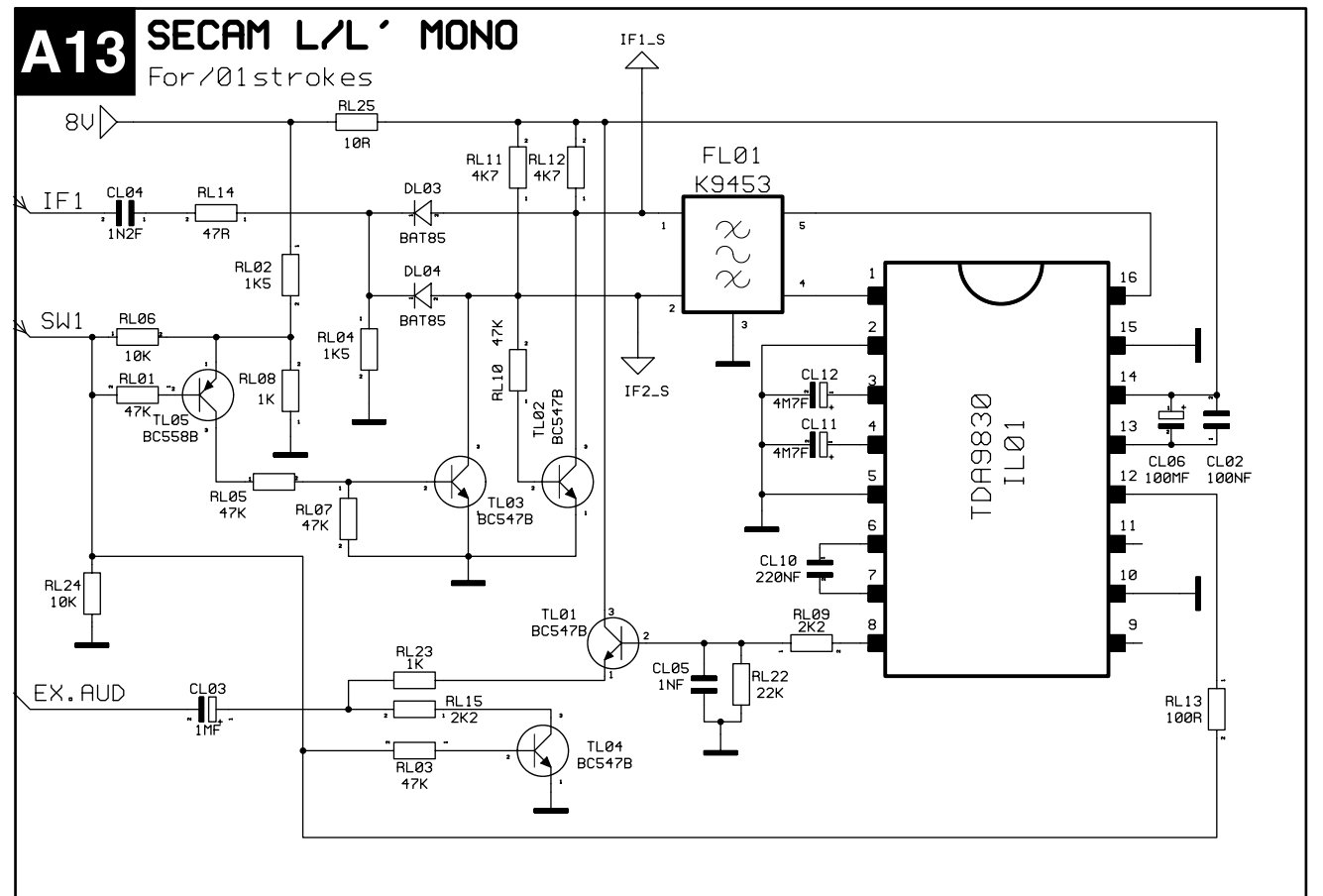
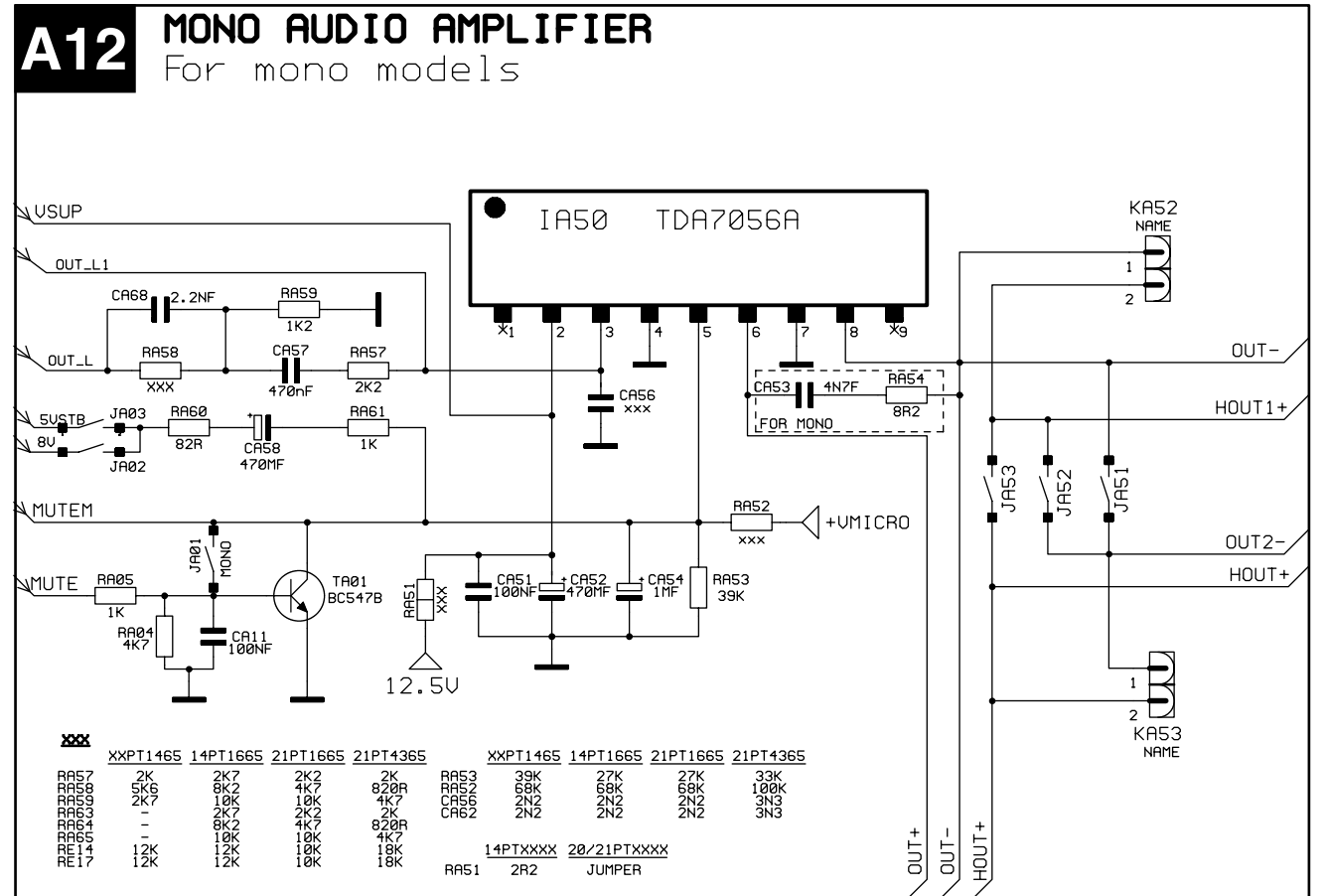
Main Panel: Vertical, Horizontal, Tuner and Headphone



Main Panel: Eeprom, Reset and Infrared & LED & KB



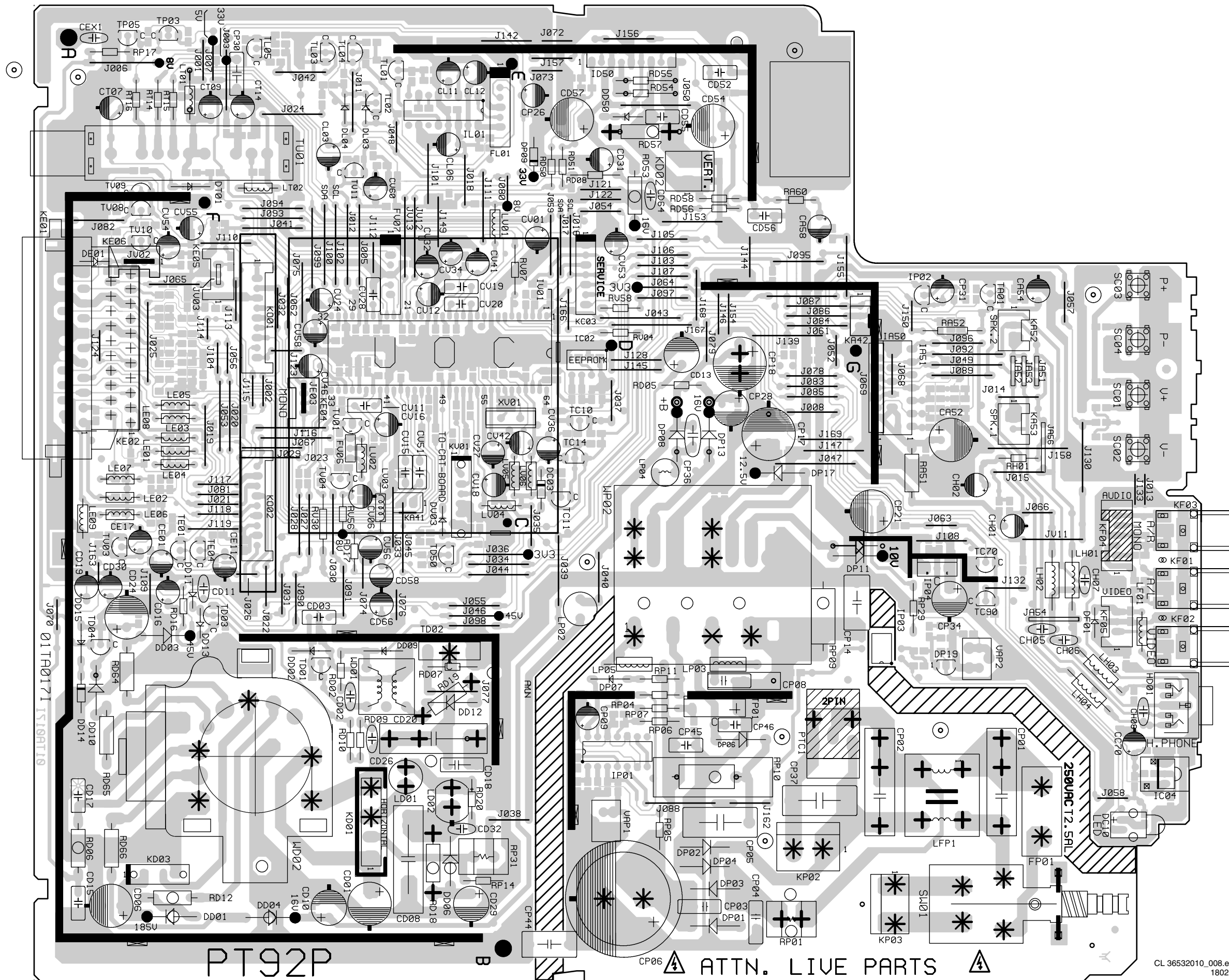
Main Panel: Mono Audio Amplifier and SECAM L/L' Mono



CL 36532010_004.eps 250203

CL 36532010_022.eps 250203

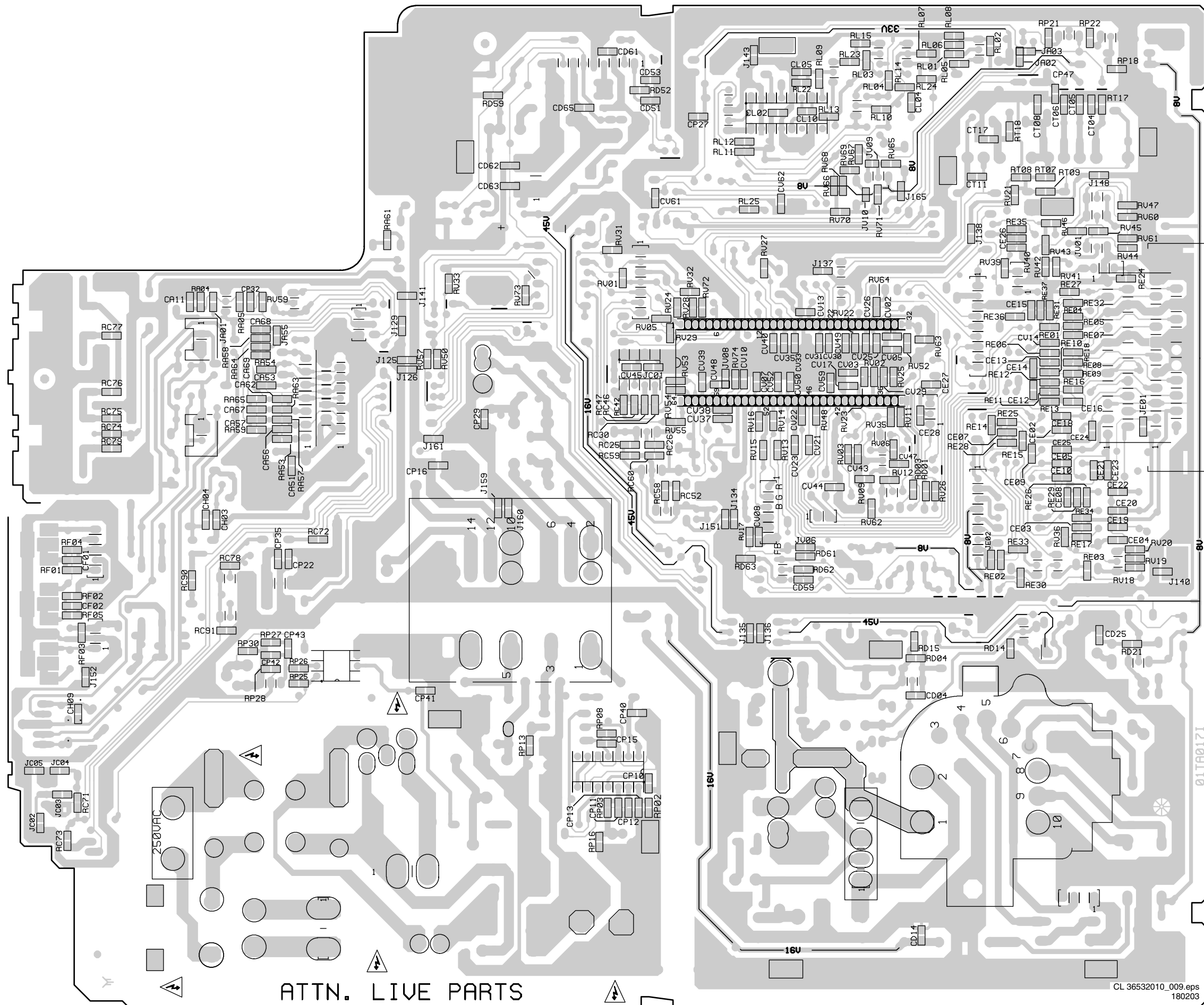
Layout Main Panel (Top Side)



PT92P

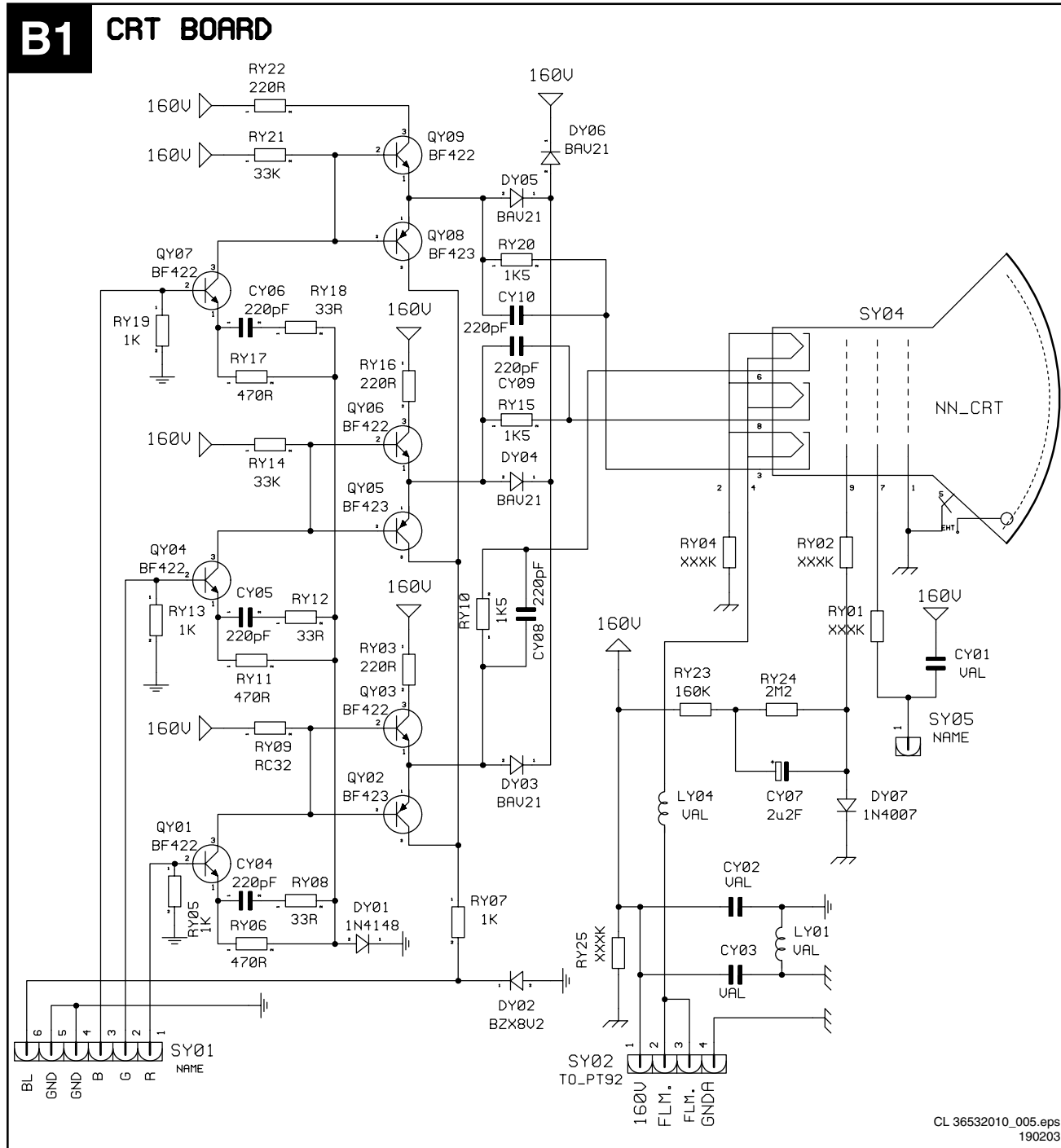
ATTN. LIVE PARTS

Layout Main Panel (Bottom Side)

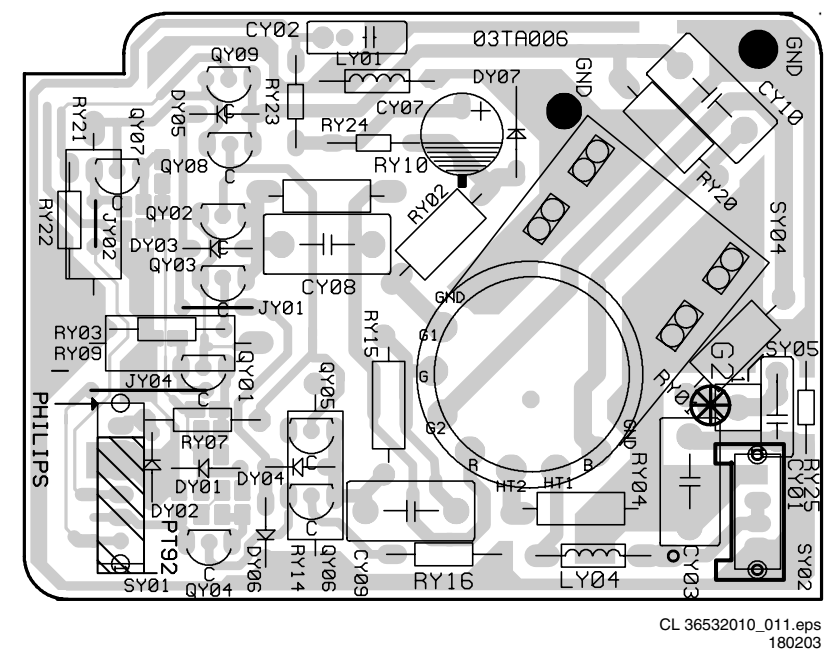


ATTN. LIVE PARTS

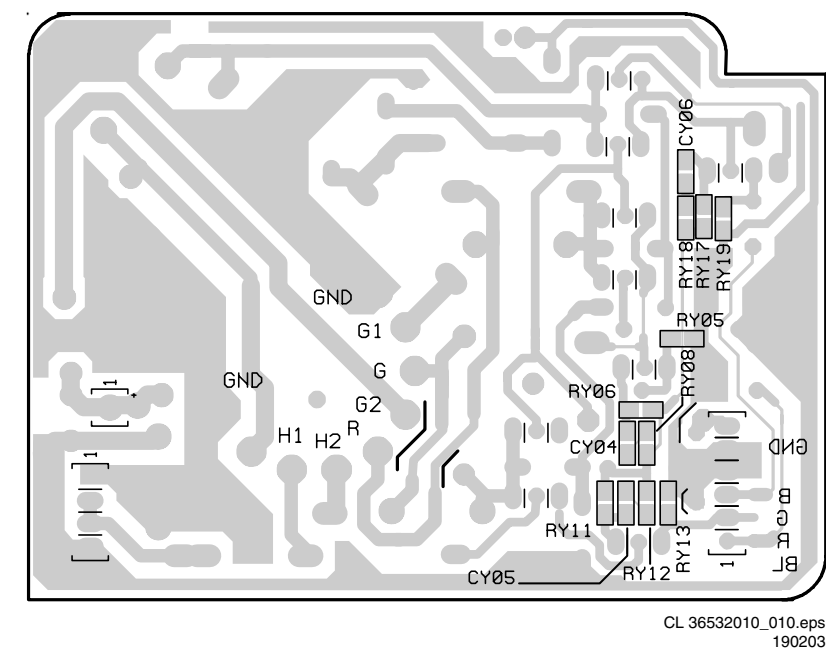
CRT Board



Layout CRT Board (Top Side)



Layout CRT Panel (Bottom Side)



8. Alignments

Index of this chapter

1. Hardware Alignments
2. Software Alignments/Settings

8.1 Hardware Alignments

8.1.1 System Voltage Adjustment

- Switch the TV in AV mode by pressing the AV button on the remote control unit (minimum beam current condition).
- Adjust the VAP1 potentiometer until you measure 110Vdc for 14" or 115 Vdc for 20" on the cathode of diode DP08.

8.2 Software Alignments/Settings

Enter the Service Mode (see chapter 5). The Service Mode menu will now appear on the screen. The first screen that is displayed is of the IF adjustment. With the CURSUR DOWN key the next menu item will be displayed. The value can be changed with the LEFT/RIGHT CURSOR keys.

8.2.1 Adjustments

IF:

You can select the following IF frequencies: 38.9, 38.0, 58.8 and 45.8 MHz
Default value is 38.9 for PAL BG, DK and L and 33.4 for PAL L'.

IFL1:

You can select the following IF frequencies: 33.4 and 33.9 MHz
Default value is 33.9

Connect a PLL pattern generator to the TV and select a crosshatch pattern. Enter the service menu as described in chapter 5 and perform the geometry adjustments HP, HB, HS, VA, VS and VSH.

Press the MENU or OSD key to leave the service menu.

HP:

Horizontal Parallelogram. Default value is 31.

HB:

Horizontal Bow. Default value is 31.

HS:

Horizontal Shift. Default value is 33.

VS:

Vertical Slope. Default value is 29.

VA:

Vertical Amplitude. Default value is 51.

SC:

S-Correction. Default value is 15.

VSD:

Vertical Scan Disable. Default value is off.

With this bit the G2 can be adjusted. When this item is selected information about the G2 is displayed (INCR, OK, DECR). Turn the G2 potentiometer on the LOT until the screen displays "OK". "INCR" means the G2 must be increased and "DECR" means the G2 must be decreased.

VSH:

Vertical Shift. Default value is 41.

Connect a pattern generator to the TV and select a colour bar. Set the contrast to 70%, brightness in the middle and the colour saturation in the middle. Enter the service menu as described in chapter 5 and perform the video adjustments BLR, BLG, WPR, WPG, WPB, Ys, Yn, Yp and Yo.

Press the MENU or OSD key to leave the service menu.

BLR:

Black Level Red. Default value is 32.

BLG:

Black Level Green. Default value is 31.

WPR:

White Point Red. Default value is 40.

WPG:

White Point Green. Default value is 32.

WPB:

White Point Blue. Default value is 32.

Ys:

Y-delay for SECAM. Default value is 5.

Yn:

Y-delay for NTSC. Default value is 5.

Yp:

Y-delay for PAL. Default value is 5.

Yo:

Y-delay for external. Default value is 5.

AGC:

Automatic gain control. Default value is 30.

CL:

Cathode Drive level. Default value is 6.

Bits0 00:

ACL, FCO, SVO, HP2, FSL, OSO:

These bits are control bits of the video processor. The default value is 0.

It is advised to keep these bits on the default value.

Bits1 18:

FFI, BTSC, FMWS, BKS, IFS:

These bits are control bits of the video processor.

The default values are:

FFI = 0

BTSC = 0

FMWS = 0

BKS = 1

IFS = 1

It is advised to keep these bits on the default value.

TXT-CL:

Teletext Cathode Drive level. Default value is 5

8.2.2 Options

Options are used to control the presence/absence of certain features and hardware.

An Option byte represents a number of different options. All options are controlled via six option bytes.

How to change an Option byte

Use a LEFT/RIGHT CURSOR keys to change the option byte. The byte values will change from 00 to FF.

Op1	87
PAL-BG	1
PAL-DK	1
PAL-I	1
PAL-M	0
PAL-N	0
NTSC-M	0
NTSC-443	0
SECAM-BG	1

CL 36532010_020.eps
200203

Figure 8-1 Option Code Screen

Option byte 1 (Op1)**PAL-BG**

1: PAL BG available
 0: PAL BG not available
 Default setting = 1

PAL-DK

1: PAL DK available
 0: PAL DK not available
 Default setting = 1

PAL-I

1: PAL I available
 0: PAL I not available
 Default setting = 1

PAL-M

1: PAL M available
 0: PAL M not available
 Default setting = 0

PAL-N

1: PAL N available
 0: PAL N not available
 Default setting = 0

NTSC-M

1: NTSC M available
 0: NTSC M not available
 Default setting = 1

NTSC-443

1: NTSC 4.43 available
 0: NTSC 4.43 not available
 Default setting = 1

SECAM_BG

1: SECAM BG available
 0: SECAM BG not available
 Default setting = 1

Option byte 2 (Op2)**SECAM DK**

1: SECAM DK available
 0: SECAM DK not available
 Default setting = 1

FRANCE

1: FRANCE available
 0: FRANCE not
 Default setting = 1

SYS-FR

1: System France available
 0: System France not available
 Default setting = 1

SYS-UK

1: System UK available
 0: System UK not available
 Default setting = 1

AV2

1: AV2 available
 0: AV2 not available
 Default setting = 0

AV-S

1: AV-S available
 0: AV-S not available
 Default setting = 0

AV3

1: AV3 available
 0: AV3 not available
 Default setting = 0

AV3S

1: AV3S available
 0: AV3S not available
 Default setting = 0

Option byte 3 (Op3)**JR**

1: Stereo volume control via PWM-DACs enabled
 0: Stereo volume control via PWM-DACs disabled
 Default setting = 0

HP

1: reserved*
 0: reserved*
 Default setting = 0

Vbar

1: Volume bar OSD enabled
 0: Volume bar OSD disabled
 Default setting = 1

SubWoof

1: reserved*
 0: reserved*
 Default setting = 0

Presets

1: Predefined settings are available
 0: Predefined settings are not available
 Default setting = 1

Lock

1: reserved*
 0: reserved*
 Default setting = 1

Hotel

1: Hotel mode enabled
 0: Hotel mode disabled
 Default setting = 0

Option byte 4 (Op4)**16:9**

1: 16:9 enabled
 0: 16:9 disabled
 Default setting = 0

110

1: 110 Deg. Picture tube
 0: 90 Deg. Picture tube
 Default setting = 0

Hpol

1: Polarity of the Horizontal sync for OSD is negative
 0: Polarity of the Horizontal sync for OSD is positive
 Default setting = 0

Vpol

1: Polarity of the Vertical sync for OSD is negative
 0: Polarity of the Vertical sync for OSD is positive
 Default setting = 0

Field

When set, the vertical sync for OSD is in the second half line at the start of an even field. When not set in the first half line at the start of an even field.

1: enabled

0: disabled

Default setting = 1

FEOut

1: CVBS signal always present on AV1

0: CVBS signal not always present on AV1

Default setting = 1

Swon

1: Last status enabled

0: Last status disabled

Default setting = 1

VGCheck

When service mode is activated vertical guard is switched off.

1: VG Check enabled

0: VG Check disabled

Default setting = 1

Option byte 5 (Op5)**Clock**

1: Clock menu enabled
 0: Clock menu disabled
 Default setting = 1

AM/PM

1: AM/PM enabled
 0: AM/PM disabled
 Default setting = 0

AVL

1: Automatic Volume Level enabled
 0: Automatic Volume Level disabled
 Default setting = 1

1norma

1: reserved*
 0: reserved*
 Default setting = 0

FLOF-TXT

1: FLOF TXT on
 0: FOLF TXT off
 Default setting = 1

TR

1: Sound is not muted in weak signals
 0: Sound is muted in weak signals
 Default setting = 0

P-AND-P

1: Plug and Play enabled
 0: Plug and Play disabled
 Default setting = 1

Option byte 6 (Op6)**UOC-J**

1: reserved*
 0: reserved*
 Default setting = 0

IgnrSUP

1: Ignore the status of SUP at power on
 0: Not ignore the status of SUP at power on
 Default setting = 0

Ignr NDF

1: Ignore the status of NDF at power on
 0: Not ignore the status of NDF at power on
 Default setting = 1

TXT on

1: Teletext available
 0: Teletext not available
 Default setting = 0

SYS-DK

1: System DK available
 0: System DK not available
 Default setting = 1

WSS

1: Wide Screen Signalling bit enabled
 0: Wide Screen Signalling bit disabled
 Default setting = 0

Note:

- Reserved bits (*) must be set to 0.
- The 7th bit of Option byte 03 enables the 'no video ident' timer.

8.2.3 Tune IF**TSL:**

Start frequency of the low-band in MHz.

TEL:

End frequency of the low-band in MHz.

TSM:

Start frequency of the mid-band in MHz.

TEM:

Start frequency of the mid-band in MHz.

TSH:

Start frequency of the high-band in MHz.

TEH:

Start frequency of the high-band in MHz.

TBL:

Hex value needed for switching to the low-band.

TBM:

Hex value needed for switching to the mid-band.

TBH:

Hex value needed for switching to the high-band.

Tuner Type	Philips	Orega	Temic	Samsung	Alps
TSL	45	45	45	45	45
TEL	160	118	150	150	180
TSM	160	118	150	150	180
TEM	440	400	440	425	465
TSH	440	400	440	425	465
TMH	863	865	865	865	900
TBL	A1	3	1	1	1
TBM	92	6	2	2	2
TBH	34	85	4	8	0C

8.2.4 Hotel Mode

Installation and Child Lock Menus are omitted in Hotel Mode. You cannot search any channel when the Hotel Mode is activated.

8.2.5 Volume

In Hotel Mode the volume level cannot be increased higher than the level adjusted in the Service Mode.

9. Circuit Descriptions and Abbreviation List

9.1 Circuit Descriptions

Not applicable.

9.2 Abbreviation List

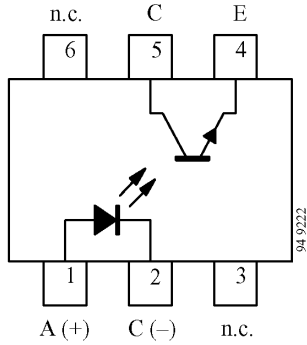
Doc	Depends on Chassis	GIN	Green in
CH-	Channel minus	RIN	Red in
CH+	Channel plus	FBLIN	Fast blanking in
Vol+	Volume +	5VSTB	Stand-by voltage
Vol-	Volume -	C	Chromo
IF1	Intermediate Frequency 1	AV.VID	Video signal for AV
IF2	Intermediate Frequency 2	BCUR	Beam Current
SCL	I2C Clock	E.AUD_F	External Audio
AGC	Auto Gain Control	H_FLYBACK	Horizontal Flyback
SDA	I2C Data	H_DRIVE	Horizontal Drive
FBEXT	Fast Blanking External	VMEM	Voltage supplied for Eepro
R	Red		
G	Green		
B	Blue		
CVBSEXT1	External Composite Video Signal		
SC_OUT	Scart out		
SC_IN	Scart in		
CVBS	Composite Video Signal		
KEYB	Front panel keyboard		
5VD	5 V digital		
5VA	5 V analog		
ST_BY	Standby		
HOUT	Horizontal Output pulse		
110VOUT	110 V Horizontal power supply		
FBT	Flayback Transformer		
V_OSD	Vertical OSD		
V_AMP	Vertical Amplitude DAC output		
24V_VERT	24 V Vertical power supply		
VERT	Vertical Output pulse		
AV1/AV2	AV1 / AV2 information		
B_OSD	OSD Blue input		
G_OSD	OSD Green input		
R_OSD	OSD Red input		
FB_OSD	OSD Fast blanking Input		
CVBSOUT	Second Video Switch Output		
CVBSEXT	External CVBS input		
GNDA	Analog Ground		
AUDOUT	Main Audio Output		
VOL	Volume		
IR	Infrared led		
RMOT	Remote Control		
L/L'	Secam L/L' sound standard		
TXTSW	Teletext switch		
BCL	Beam Current Limiter		
FLM.	Flaman		
LOUT	Left out		
VGND	Video ground		
ON/STBY	On/Standby		
MDO	Mode control data output		
PRST	Preset		
VGUARD	Vertical guard voltage		
IDRIVE+	Vertical drive +		
IDRIVE-	Vertical drive -		
VMICRO	Power supply for micro controller		
SW1	Switch 1		
EX.AUD	External audio		
E.AUD	ExternalAudio		
SC1IA	Scartin Audio		
SC1OUTL	Scartout Left		
SC1OUTA	Scartout Audio		
B/G-SND	BG Sound		
TV.VID	Video signal for TV		
BIN	Blue in		
STAT-AV	AV Status		

9.3 IC Data Sheets

In this paragraph, the internal block diagrams and pinning are given of ICs that are drawn as a "black box" in the electrical diagrams (with the exception of "memory" and "logic" ICs).

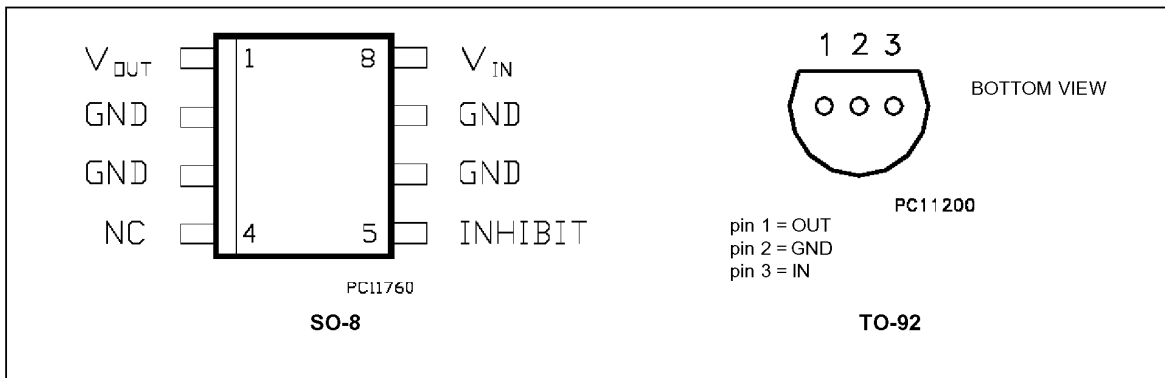
9.3.1 TCDT110(G) Series

Pin Connection

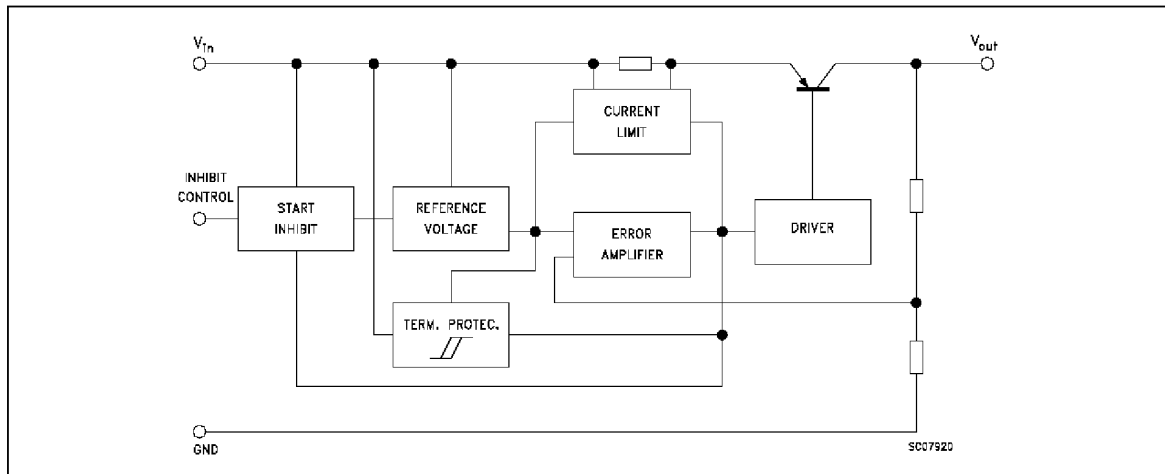


LE00AB/C

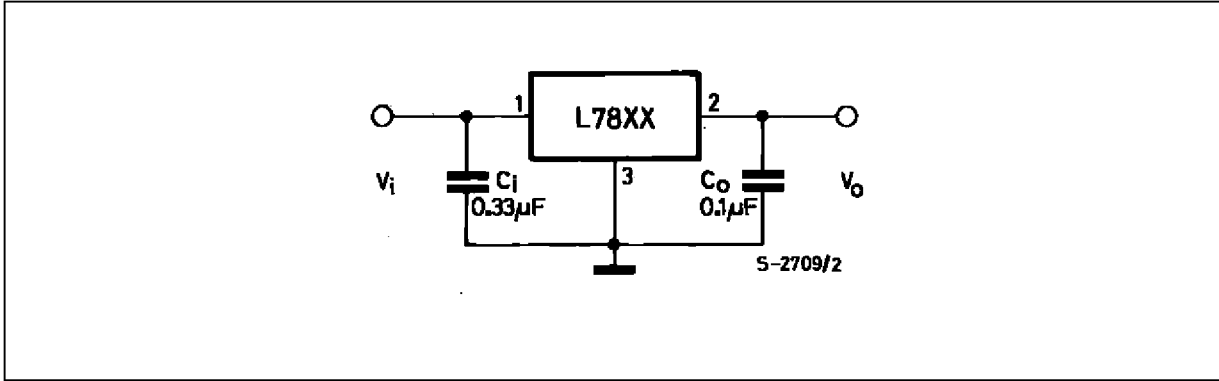
CONNECTION DIAGRAM AND ORDERING NUMBERS (top view)



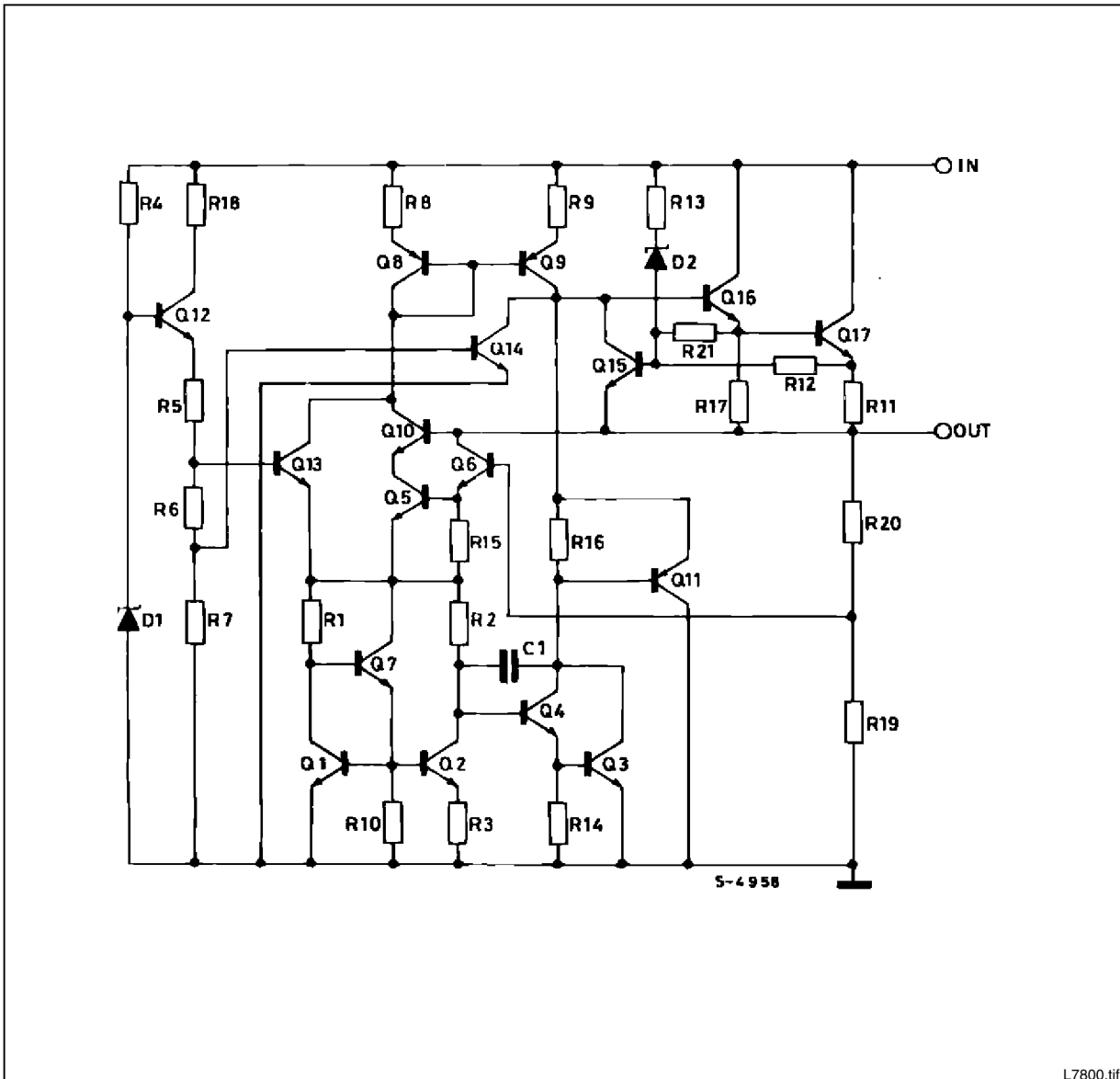
SCHEMATIC DIAGRAM



APPLICATION CIRCUIT

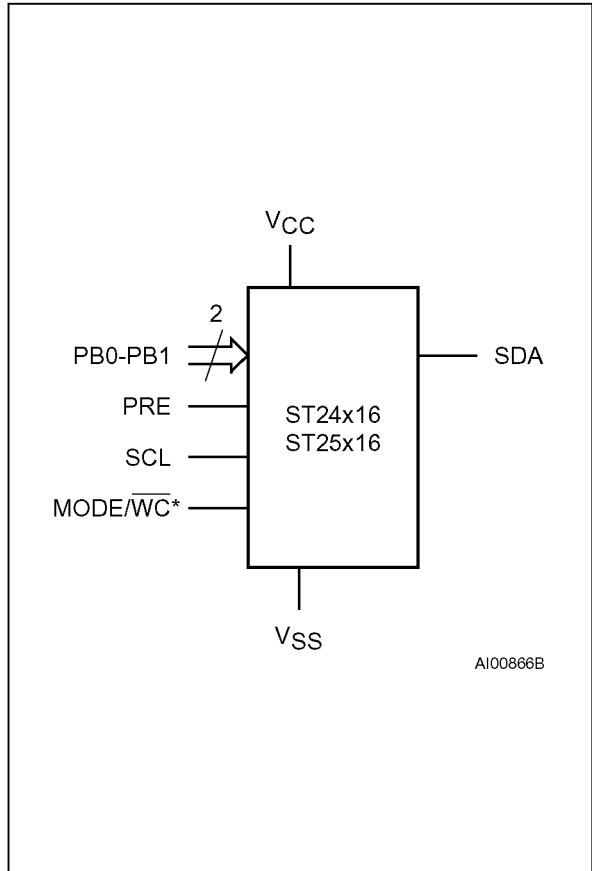
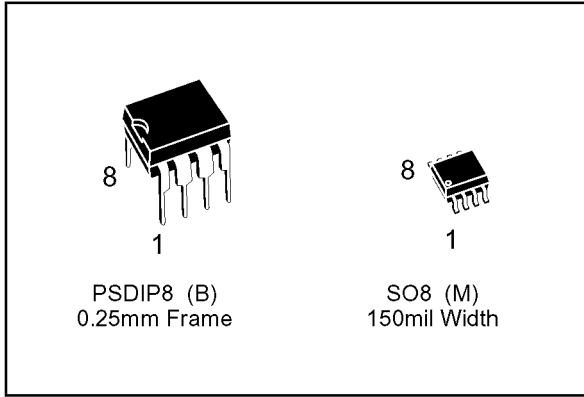


SCHEMATIC DIAGRAM



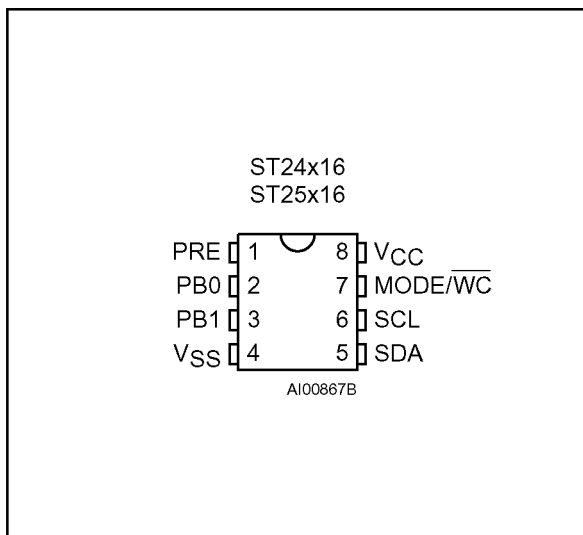
ST24C16, ST25C16 ST24W16, ST25W16

SERIAL 16K (2K x 8) EEPROM

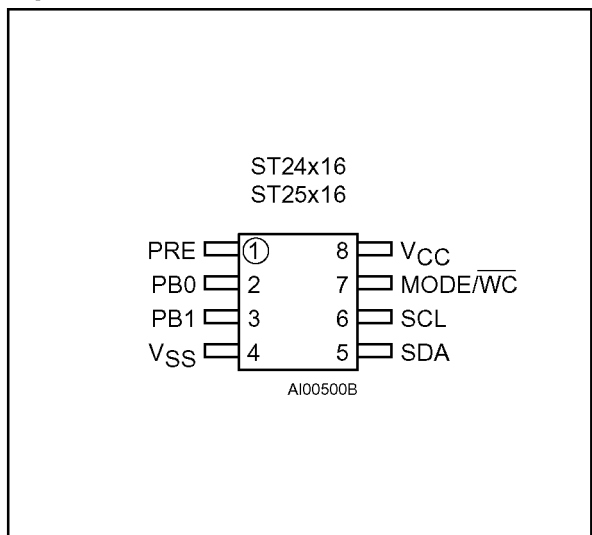


Note: \overline{WC} signal is only available for ST24/25W16 products.

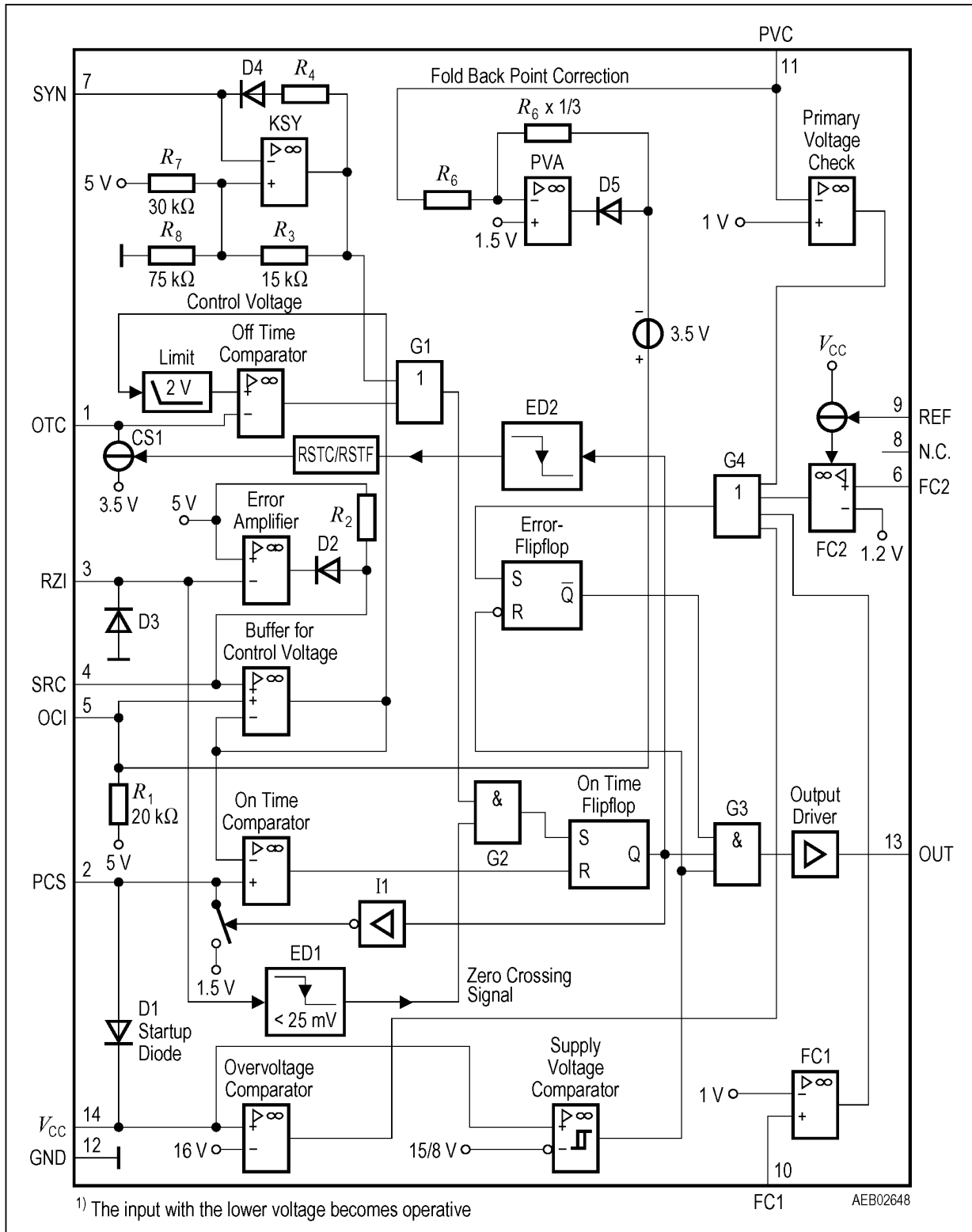
DIP Pin Connections



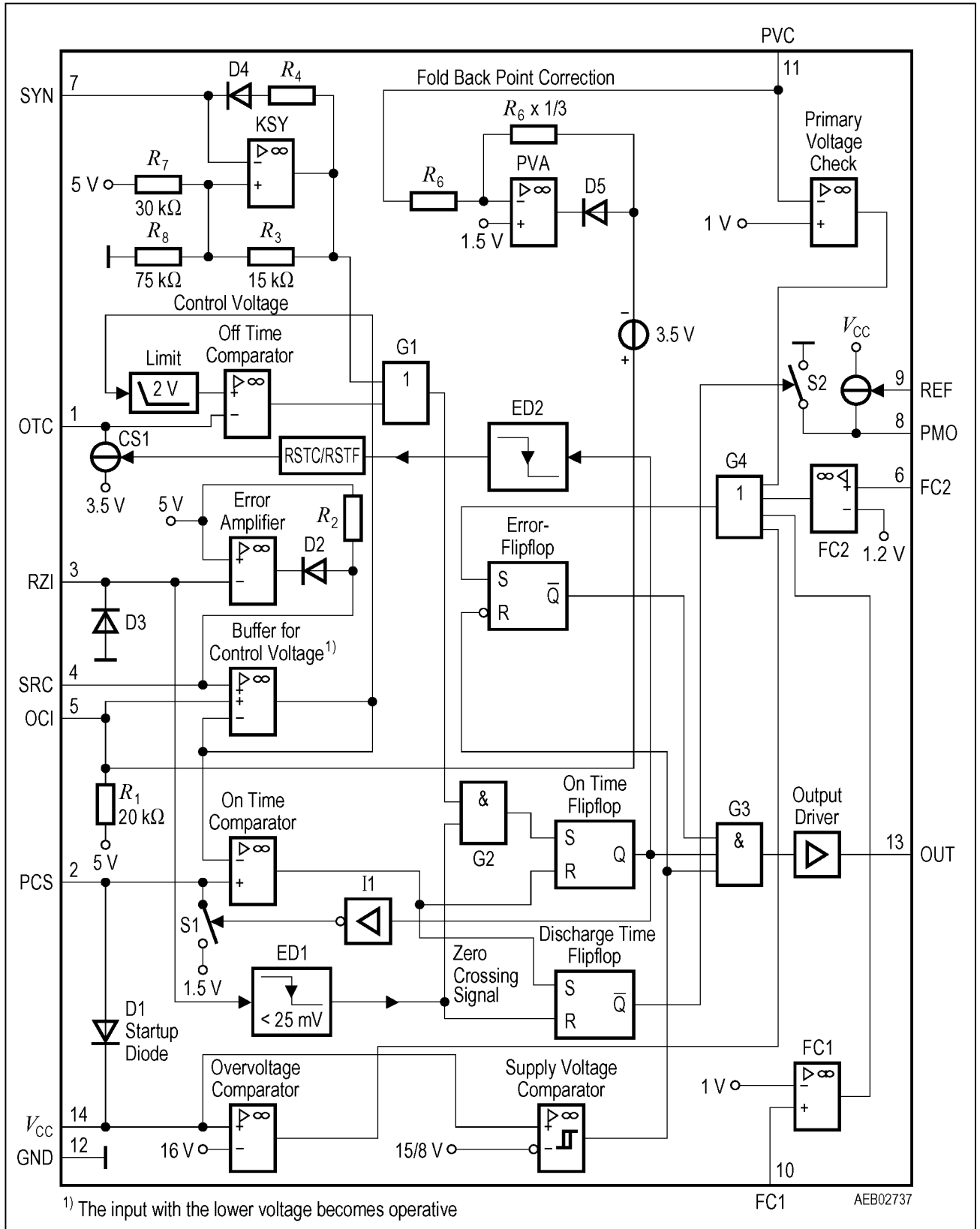
SO8 Pin Connections



1.5 Block Diagrams



TDA 16846
TDA 16847



TDA 16846**TDA 16847**

The TDA 16846 is suited for TV-, VCR- sets and SAT receivers. It also can be good used in PC monitors.

The TDA 16847 is identical with TDA 16846 but has an additional power measurement output (pin 8) which can be used for a Temporary High Power Circuit.

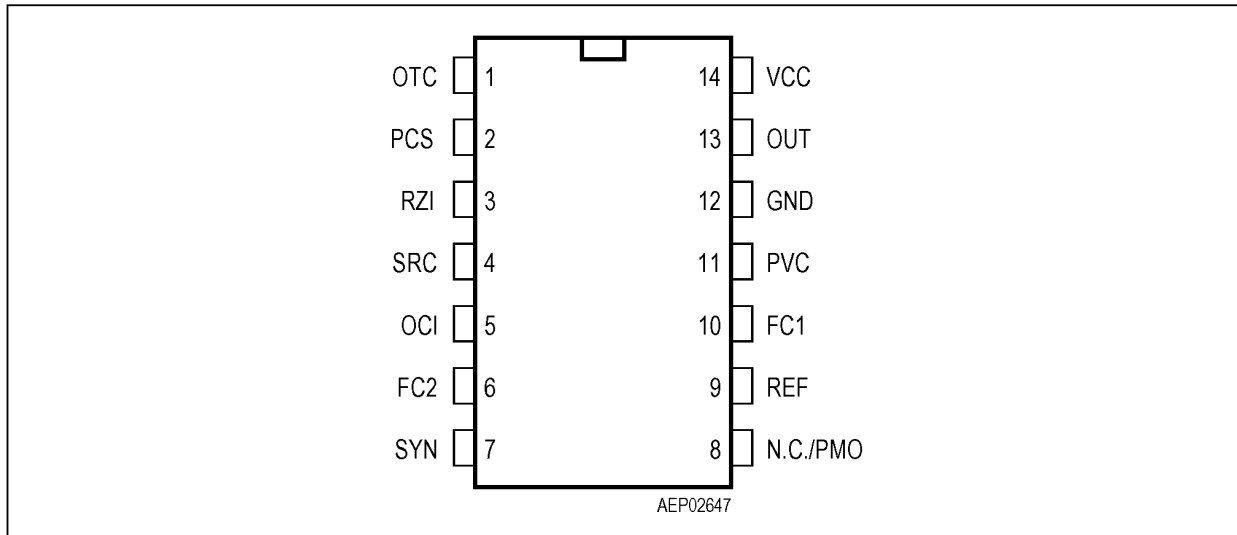


Figure 1 Pin Configuration (top view)

1.3 Pin Definitions and Functions

Pin	Symbol	Function
1	OTC	Off Time Circuit
2	PCS	Primary Current Simulation
3	RZI	Regulation and Zero Crossing Input
4	SRC	Soft-Start and Regulation Capacitor
5	OCI	Opto Coupler Input
6	FC2	Fault Comparator 2
7	SYN	Synchronization Input
8	N.C./PMO	Not Connected (TDA 16846)/PMO (TDA 16847)
9	REF	Reference Voltage and Current
10	FC1	Fault Comparator 1
11	PVC	Primary Voltage Check
12	GND	Ground
13	OUT	Output
14	VCC	Supply Voltage

Triple video output amplifier

TDA6107Q

FEATURES

- Typical bandwidth of 5.0 MHz for an output signal of 60 V (peak-to-peak value)
- High slew rate of 900 V/ μ s
- No external components required
- Very simple application
- Single supply voltage of 200 V
- Internal reference voltage of 2.5 V
- Fixed gain of 52

- Black-Current Stabilization (BCS) circuit
- Thermal protection.

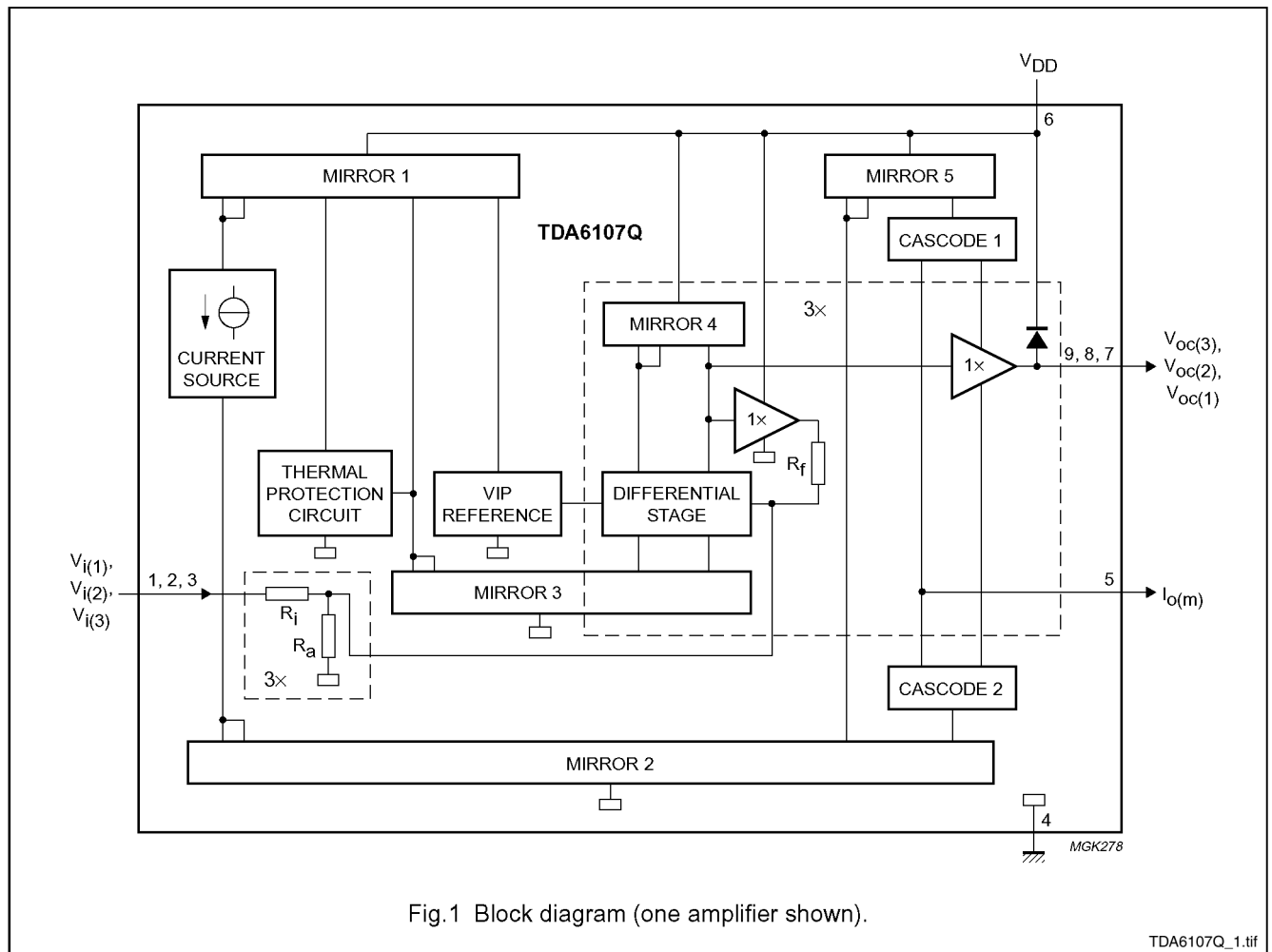
GENERAL DESCRIPTION

The TDA6107Q includes three video output amplifiers in one plastic DIL-bent-SIL 9-pin medium power (DBS9MPF) package (SOT111-1), using high-voltage DMOS technology, and is intended to drive the three cathodes of a colour CRT directly. To obtain maximum performance, the amplifier should be used with black-current control.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
TDA6107Q	DBS9MPF	plastic DIL-bent-SIL medium power package with fin; 9 leads	SOT111-1

BLOCK DIAGRAM



Triple video output amplifier

TDA6107Q

PINNING

SYMBOL	PIN	DESCRIPTION
$V_{i(1)}$	1	inverting input 1
$V_{i(2)}$	2	inverting input 2
$V_{i(3)}$	3	inverting input 3
GND	4	ground (fin)
I_{om}	5	black current measurement output
V_{DD}	6	supply voltage
$V_{oc(3)}$	7	cathode output 3
$V_{oc(2)}$	8	cathode output 2
$V_{oc(1)}$	9	cathode output 1

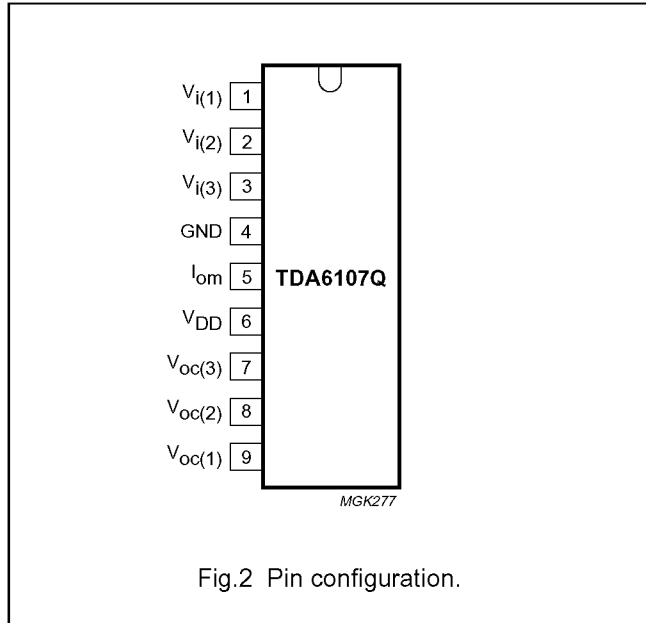
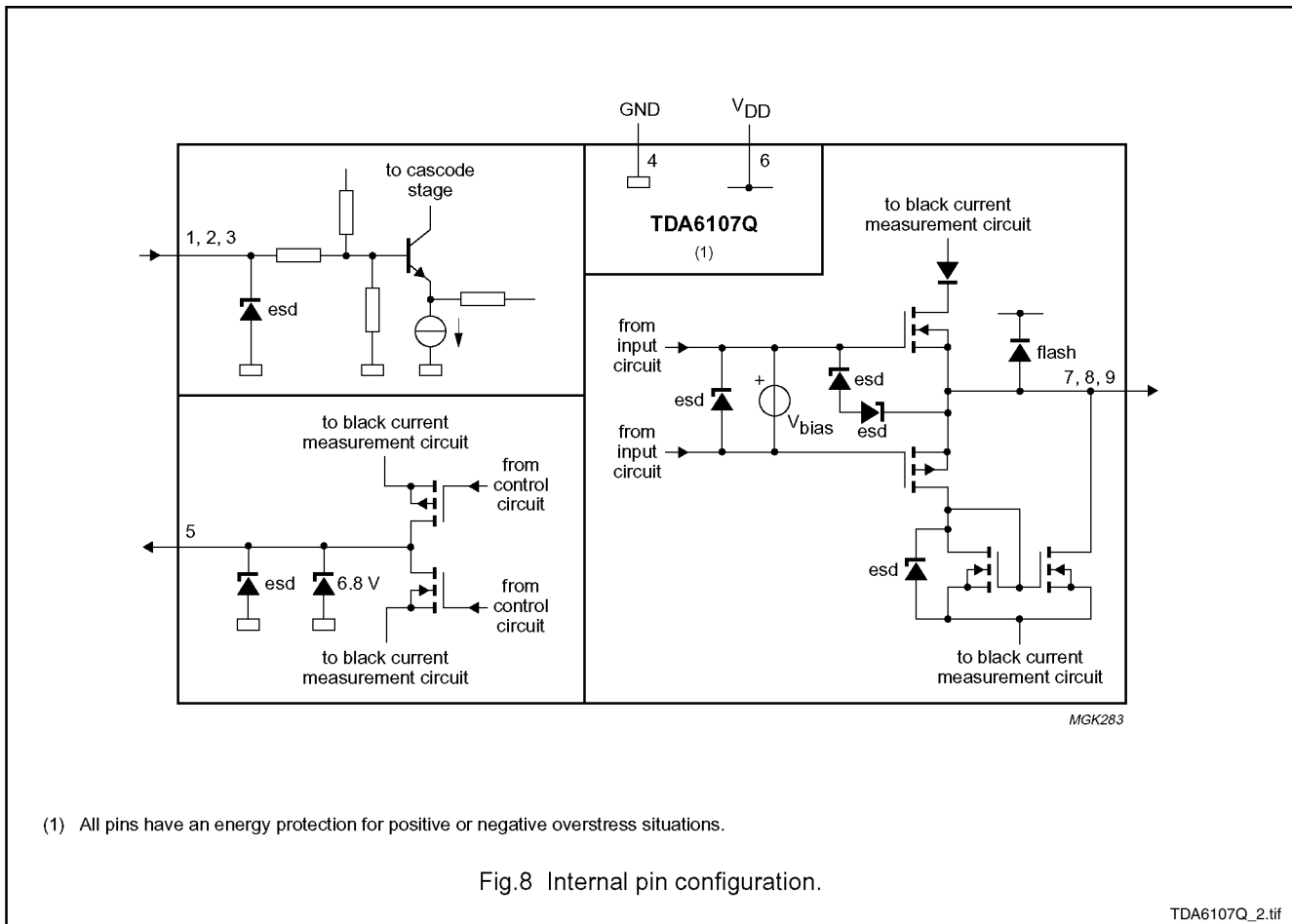


Fig.2 Pin configuration.

INTERNAL CIRCUITRY



(1) All pins have an energy protection for positive or negative overstress situations.

Fig.8 Internal pin configuration.

3 W mono BTL audio output amplifier

TDA7056

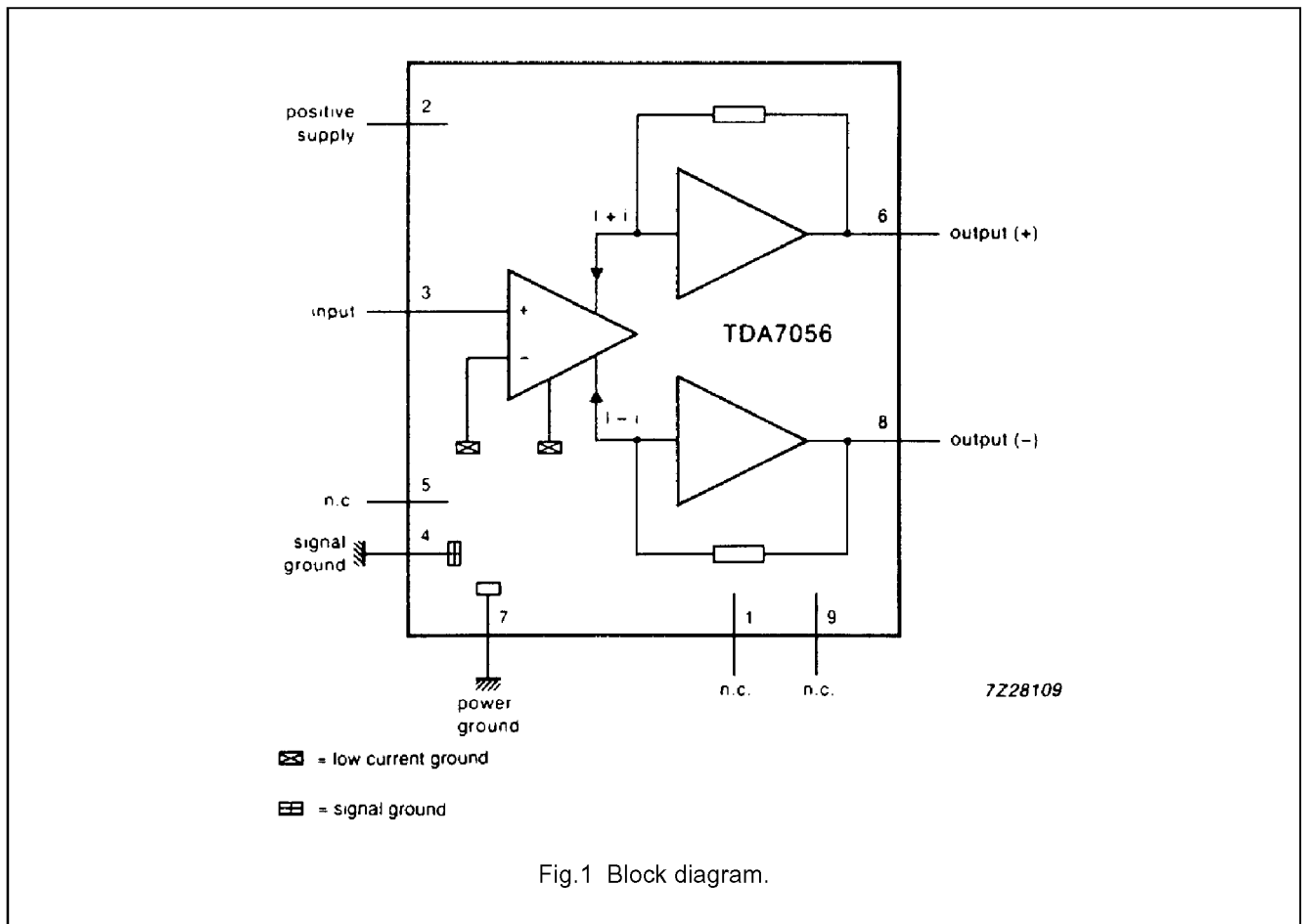


Fig.1 Block diagram.

PINNING

PIN	DESCRIPTION
1	n.c.
2	V_P
3	input (+)
4	signal ground
5	n.c.
6	output (+)
7	power ground
8	output (-)
9	n.c.

FUNCTIONAL DESCRIPTION

The TDA7056 is a mono output amplifier, designed for battery-fed portable radios and mains-fed equipment such as television. For space reasons there is a trend to decrease the number of external components. For portable applications there is also a trend to decrease the number of battery cells, but still a reasonable output power is required.

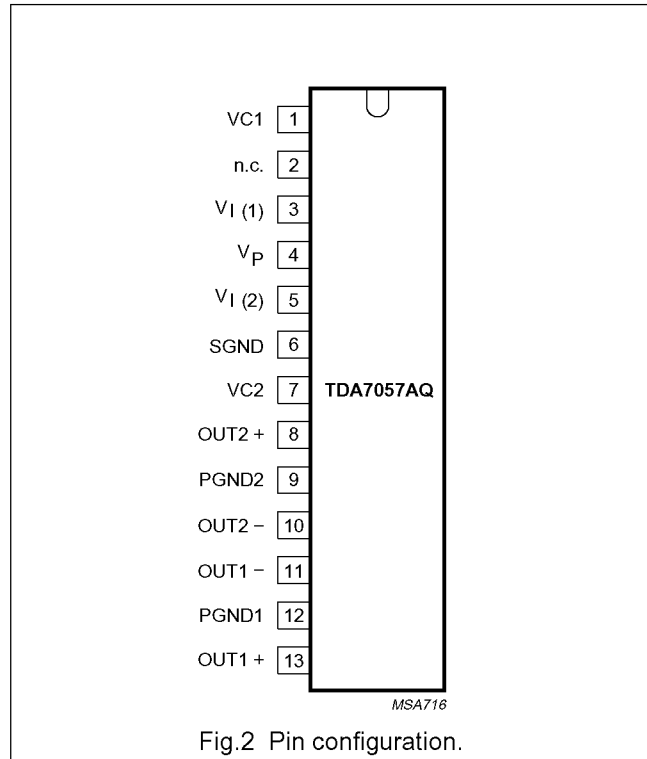
The TDA7056 fulfills both of these requirements. It needs no peripheral components, because it makes use of the Bridge-Tied-Load (BTL) principle. Consequently it has, at the same supply voltage, a higher output power compared to a conventional Single Ended output stage. It delivers an output power of 1 W into a loudspeaker load of 8 Ω with 6 V supply or 3 W into 16 Ω loudspeaker at 11 V without need of an external heatsink. The gain is internally fixed at 40 dB. Special attention is given to switch-on/off click suppression, and it has a good overall stability. The load can be short circuited at all input conditions.

2 x 5 W stereo BTL audio output amplifier with DC volume control

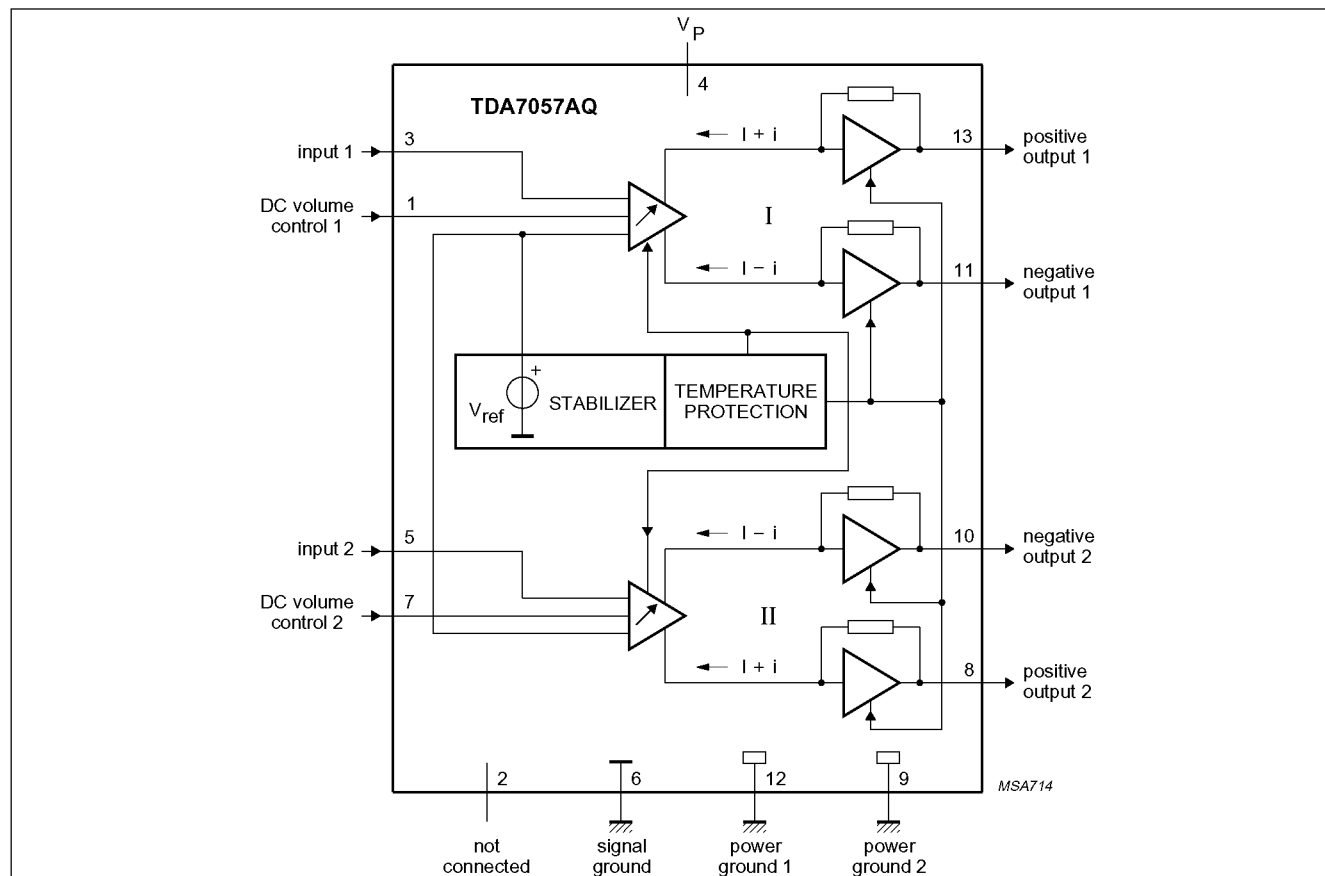
TDA7057AQ

PINNING

SYMBOL	PIN	DESCRIPTION
VC1	1	DC volume control 1
n.c.	2	not connected
$V_{I(1)}$	3	voltage input 1
V_P	4	positive supply voltage
$V_{I(2)}$	5	voltage input 2
SGND	6	signal ground
VC2	7	DC volume control 2
OUT2+	8	positive output 2
PGND2	9	power ground 2
OUT2-	10	negative output 2
OUT1-	11	negative output 1
PGND1	12	power ground 1
OUT1+	13	positive output 1



BLOCK DIAGRAM



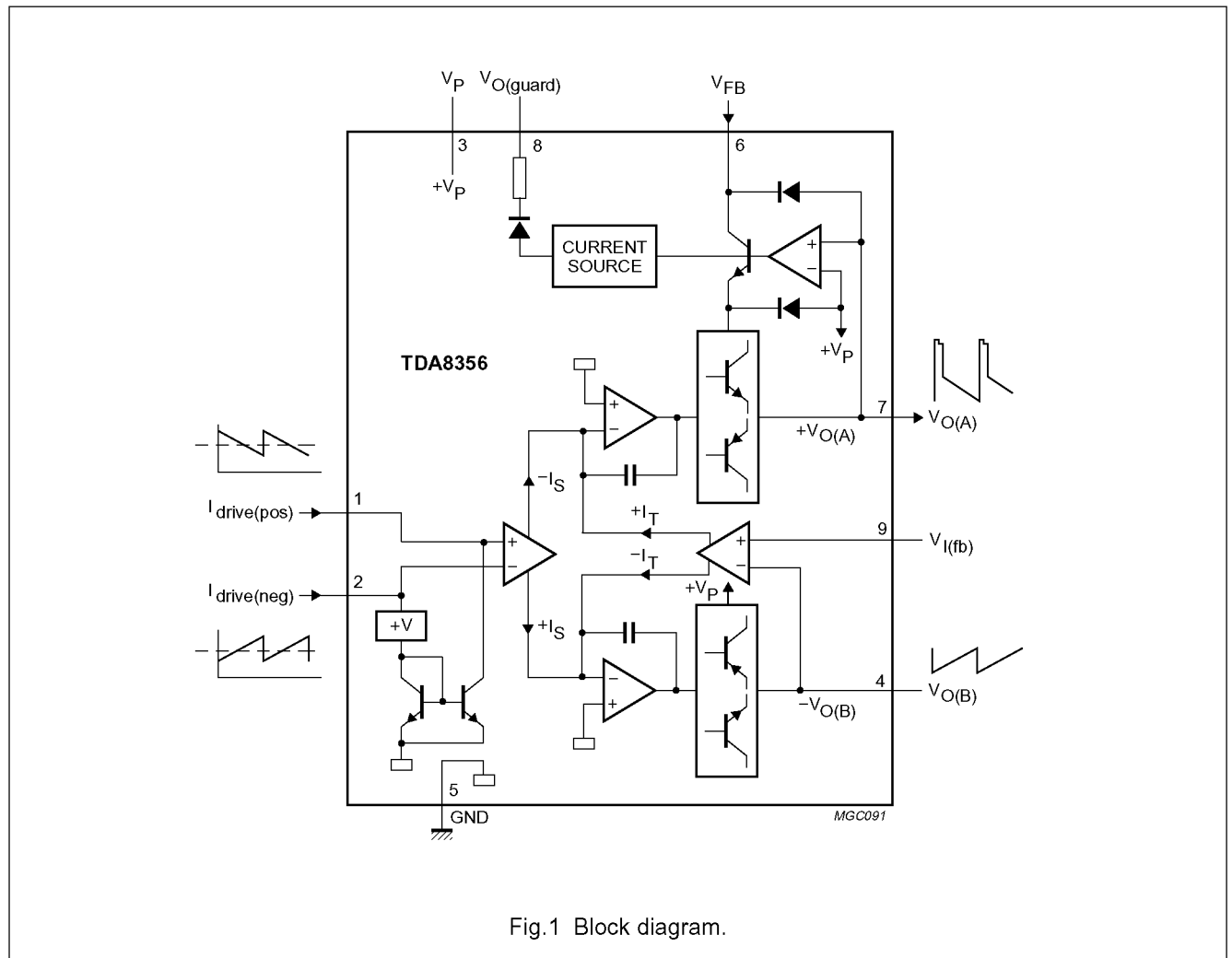
DC-coupled vertical deflection circuit

TDA8356

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
TDA8356	SIL9P	plastic single-in-line power package; 9 leads	SOT131-2

BLOCK DIAGRAM

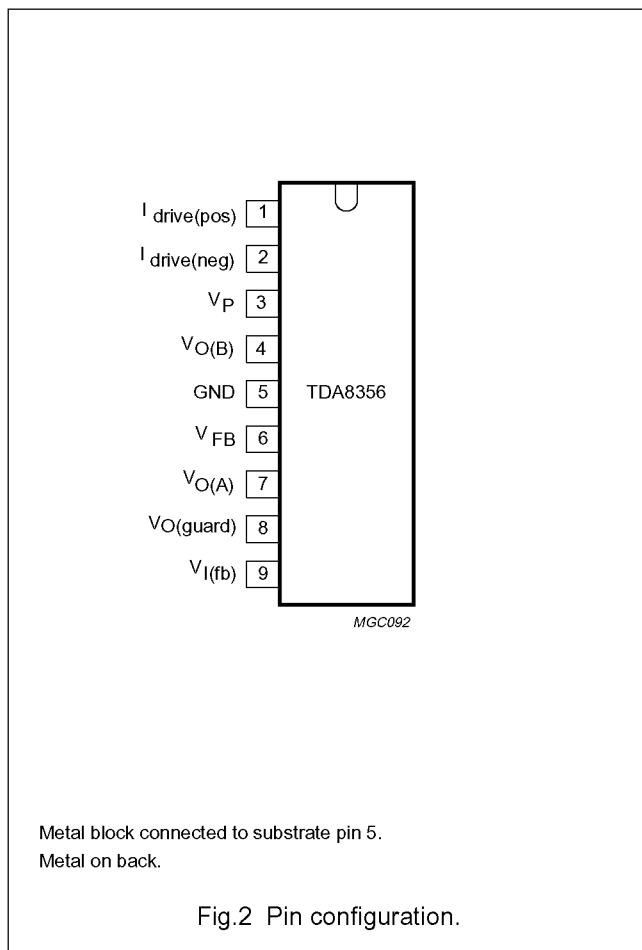


DC-coupled vertical deflection circuit

TDA8356

PINNING

SYMBOL	PIN	DESCRIPTION
$I_{drive(pos)}$	1	input power-stage (positive); includes $I_{I(sb)}$ signal bias
$I_{drive(neg)}$	2	input power-stage (negative); includes $I_{I(sb)}$ signal bias
V_P	3	operating supply voltage
$V_{O(B)}$	4	output voltage B
GND	5	ground
V_{FB}	6	input flyback supply voltage
$V_{O(A)}$	7	output voltage A
$V_{O(guard)}$	8	guard output voltage
$V_{I(fb)}$	9	input feedback voltage



FUNCTIONAL DESCRIPTION

The vertical driver circuit is a bridge configuration. The deflection coil is connected between the output amplifiers, which are driven in phase opposition. An external resistor (R_M) connected in series with the deflection coil provides internal feedback information. The differential input circuit is voltage driven. The input circuit has been adapted to enable it to be used with the TDA9150, TDA9151B, TDA9160A, TDA9162, TDA8366 and TDA8376 which deliver symmetrical current signals. An external resistor (R_{CON}) connected between the differential input determines the output current through the deflection coil. The relationship between the differential input current and the output current is defined by: $I_{diff} \times R_{CON} = I_{coil} \times R_M$. The output current is adjustable from 0.5 A (p-p) to 2 A (p-p) by varying R_M . The maximum input differential voltage is 1.8 V. In the application it is recommended that $V_{diff} = 1.5$ V (typ). This is recommended because of the spread of input current and the spread in the value of R_{CON} .

The flyback voltage is determined by an additional supply voltage V_{FB} . The principle of operating with two supply voltages (class G) makes it possible to fix the supply voltage V_P optimum for the scan voltage and the second supply voltage V_{FB} optimum for the flyback voltage. Using this method, very high efficiency is achieved.

The supply voltage V_{FB} is almost totally available as flyback voltage across the coil, this being possible due to the absence of a decoupling capacitor (not necessary, due to the bridge configuration). The output circuit is fully protected against the following:

- thermal protection
- short-circuit protection of the output pins (pins 4 and 7)
- short-circuit of the output pins to V_P .

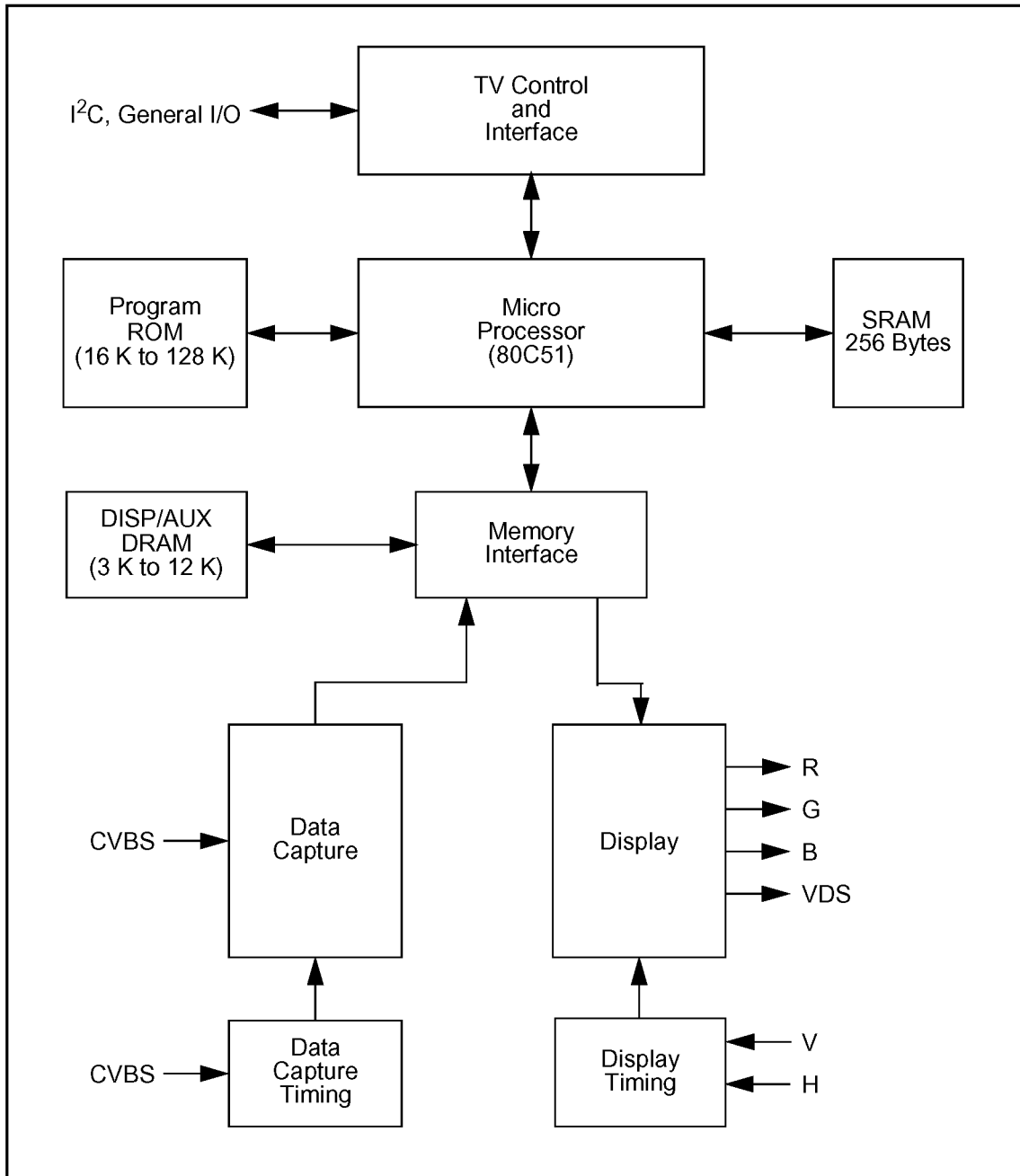
A guard circuit $V_{O(guard)}$ is provided. The guard circuit is activated at the following conditions:

- during flyback
- during short-circuit of the coil and during short-circuit of the output pins (pins 4 and 7) to V_P or ground
- during open loop
- when the thermal protection is activated.

This signal can be used for blanking the picture tube screen.

TV Signal Processor-Teletext Decoder
with Embedded μ -Controller

TDA 935X/6X/8X PS/N1 series

1 **FUNCTIONAL DESCRIPTION OF THE MICRO-CONTROLLER/TEXT DECODER**2 **Block Diagram**

TV signal processor-Teletext decoder with
embedded μ -Controller

TDA935X/6X/8X PS/N1 series

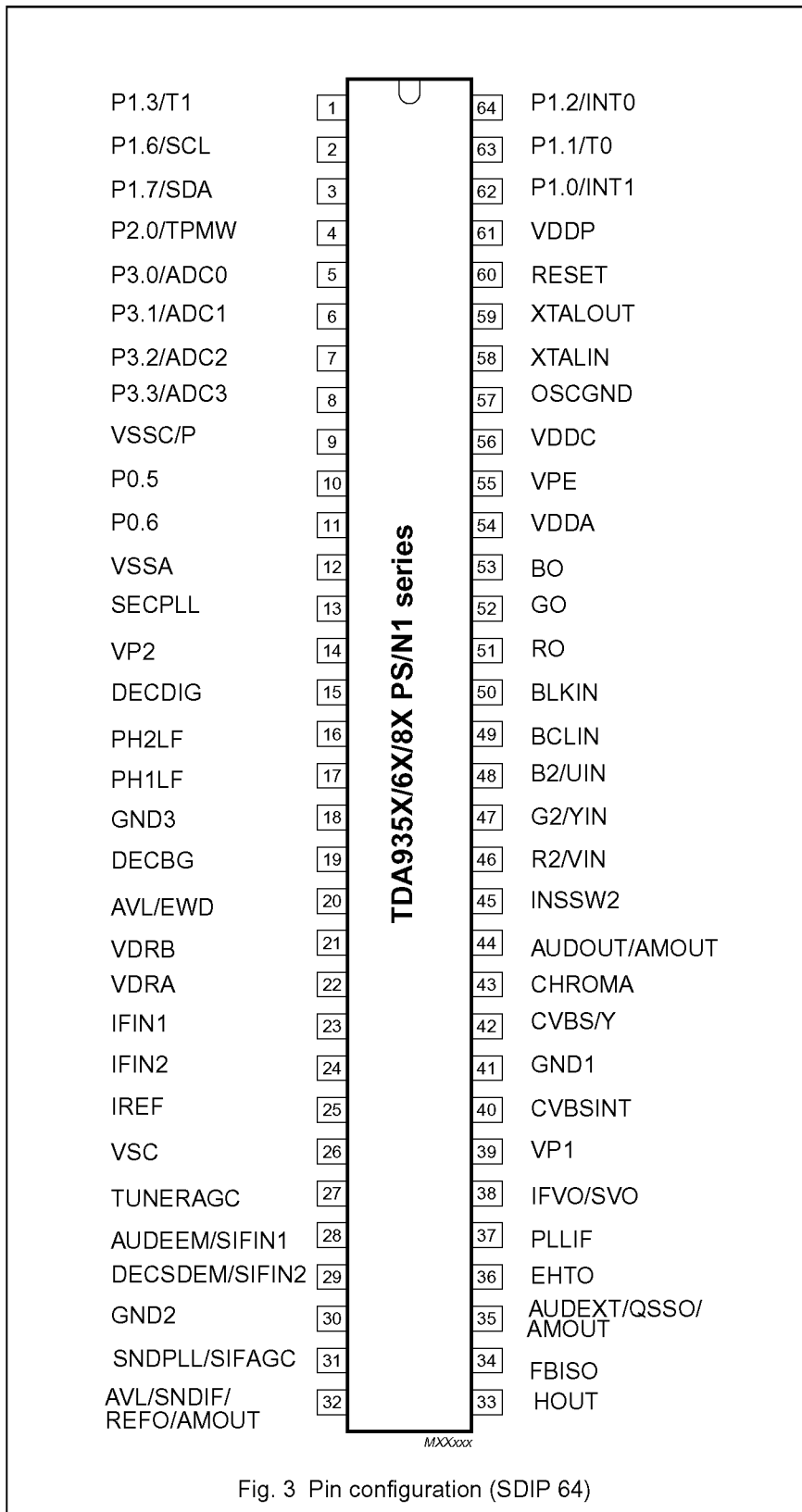


Fig. 3 Pin configuration (SDIP 64)

TV signal processor-Teletext decoder with embedded μ -Controller

TDA935X/6X/8X PS/N1 series

BLOCK DIAGRAM

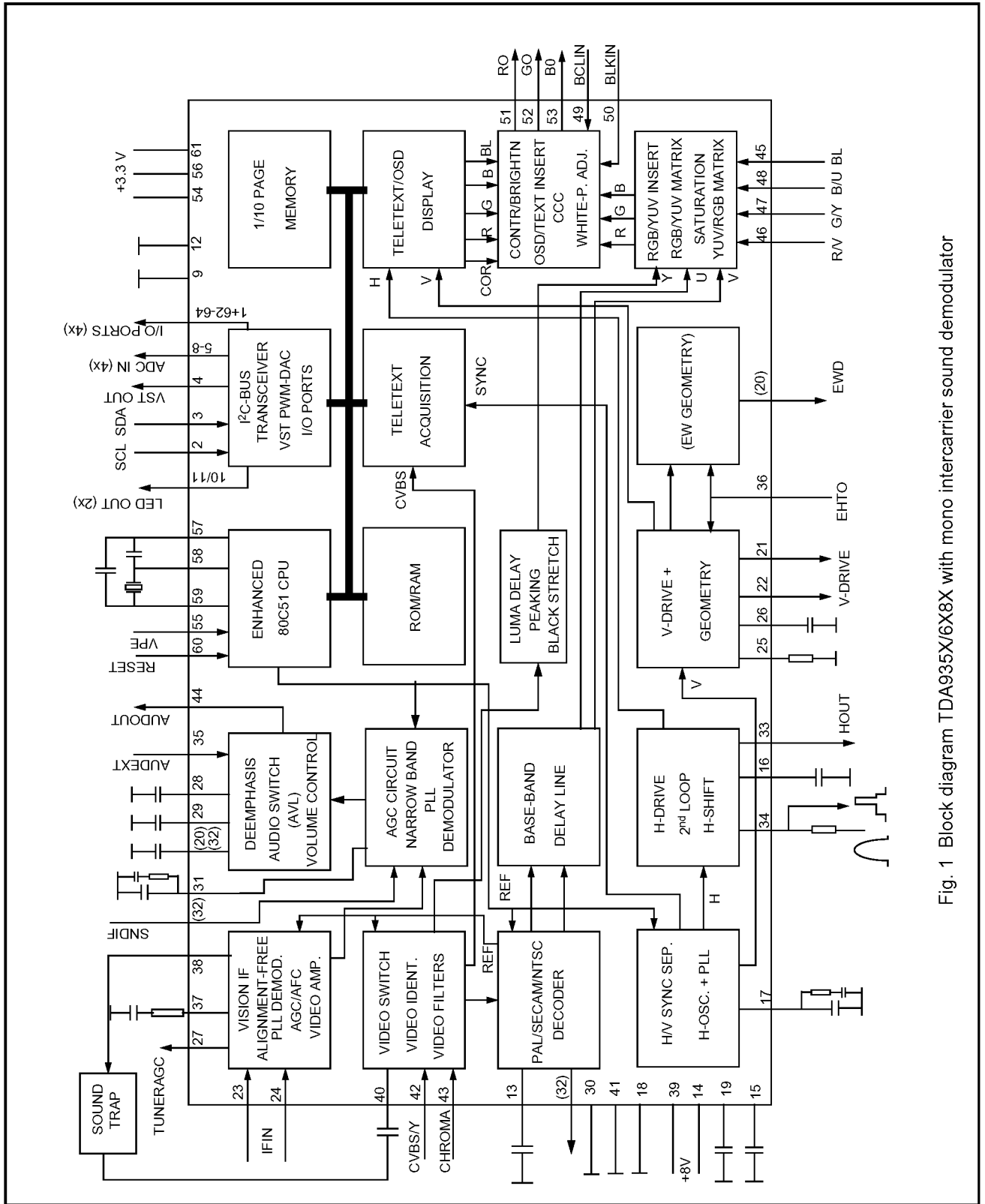


Fig. 1 Block diagram TDA935X/6X8X with mono intercarrier sound demodulator

TV signal processor-Teletext decoder with embedded μ -Controller

TDA935X/6X/8X PS/N1 series

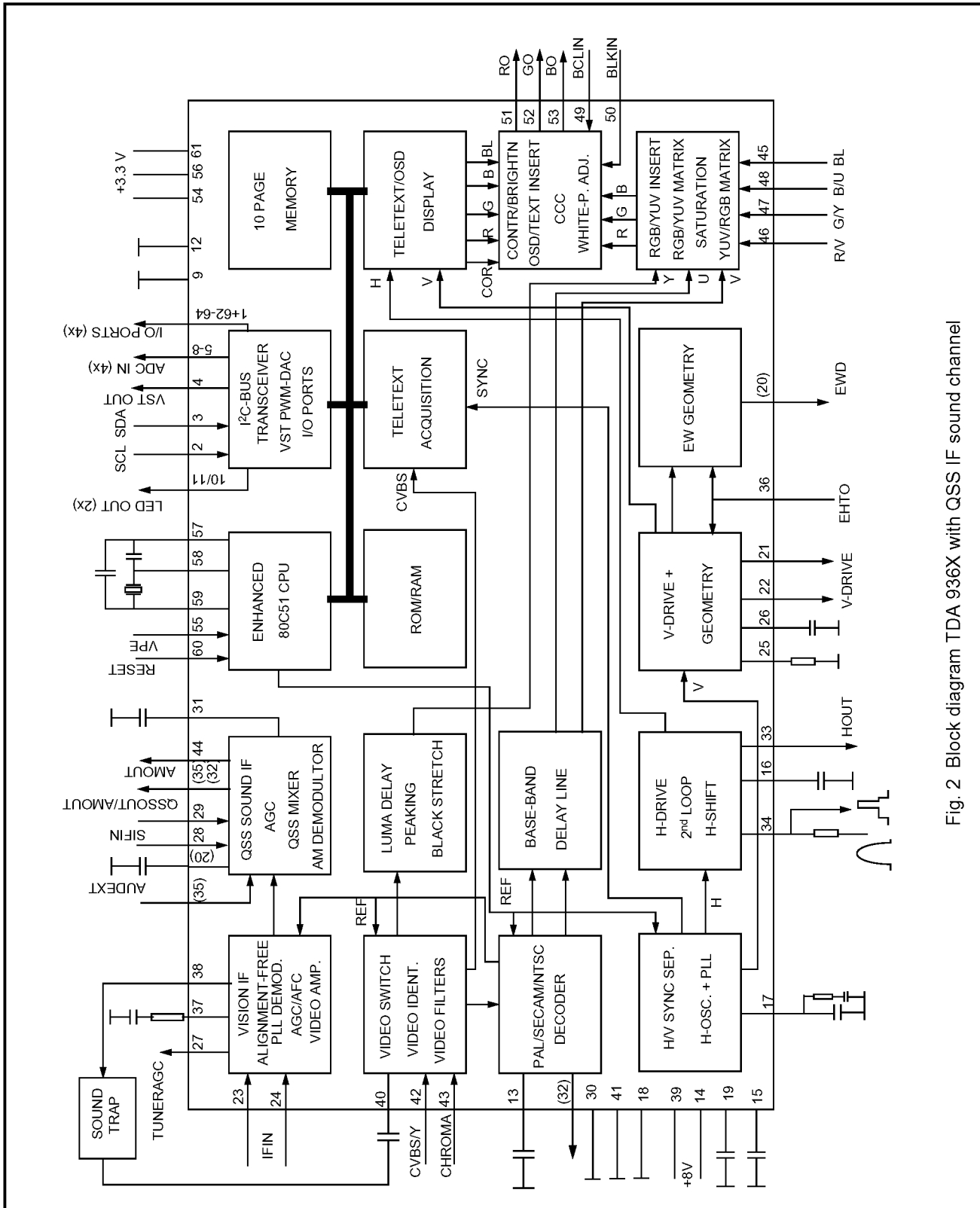


Fig. 2 Block diagram TDA 936X with QSS IF sound channel

TV signal processor-Teletext decoder with embedded μ -Controller

TDA935X/6X/8X PS/N2 series

BLOCK DIAGRAM

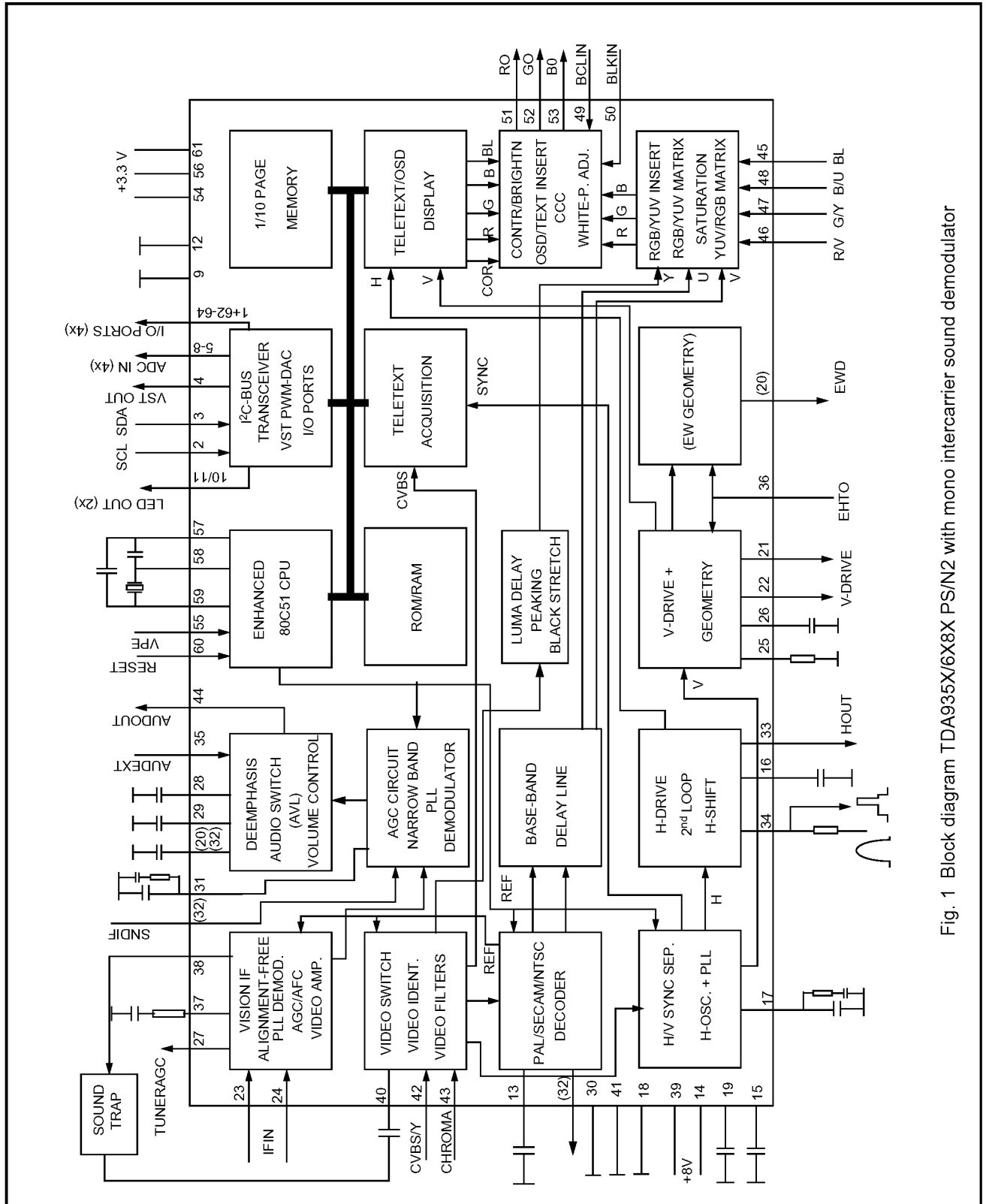


Fig. 1 Block diagram TDA935X/6X8X PS/N2 with mono intercarrier sound demodulator

TV signal processor-Teletext decoder with embedded μ -Controller

TDA935X/6X/8X PS/N2 series

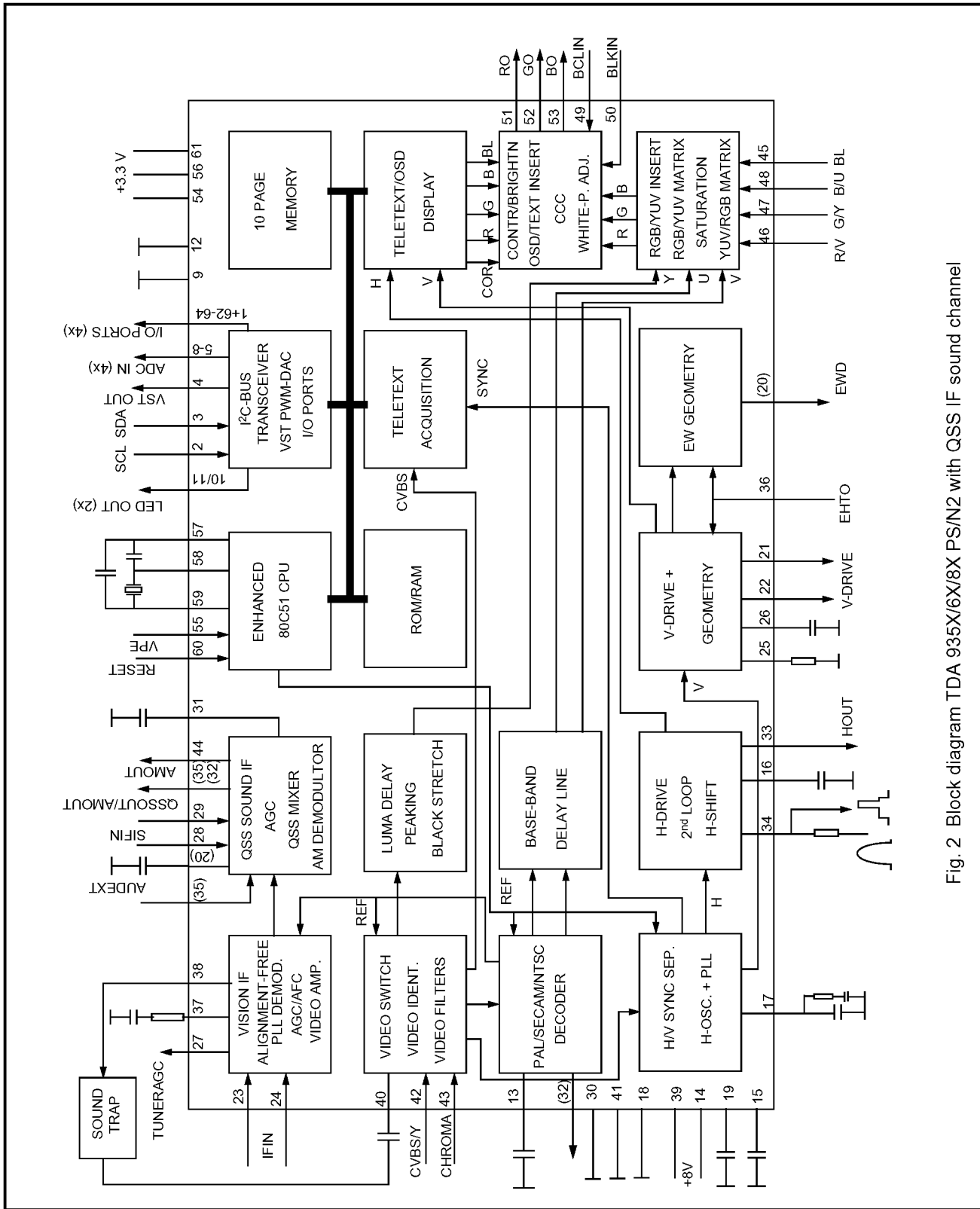


Fig. 2 Block diagram TDA 935X/6X/8X PS/N2 with QSS IF sound channel

TV signal processor-Teletext decoder with
embedded μ -Controller

TDA935X/6X/8X PS/N2 series

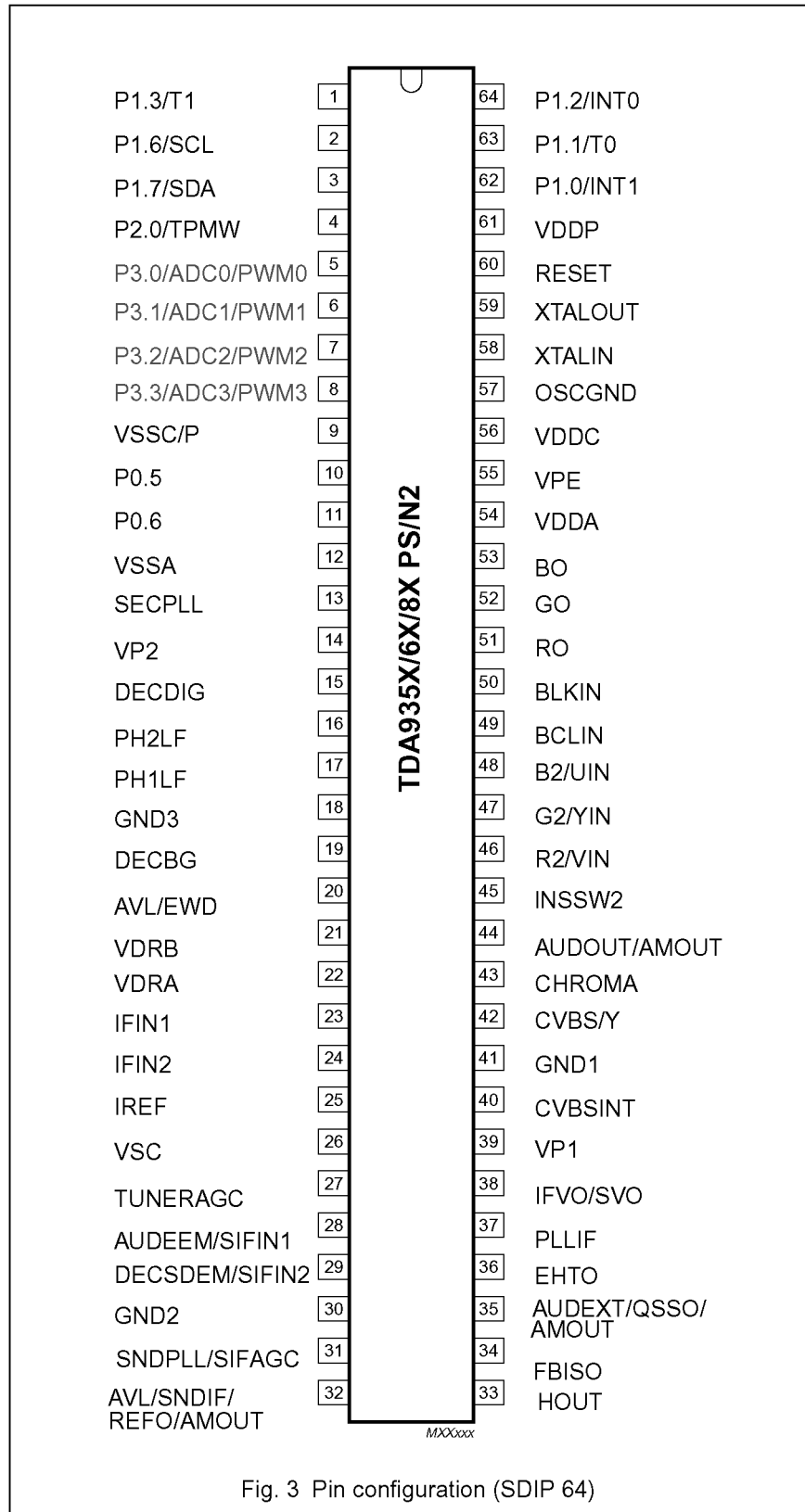
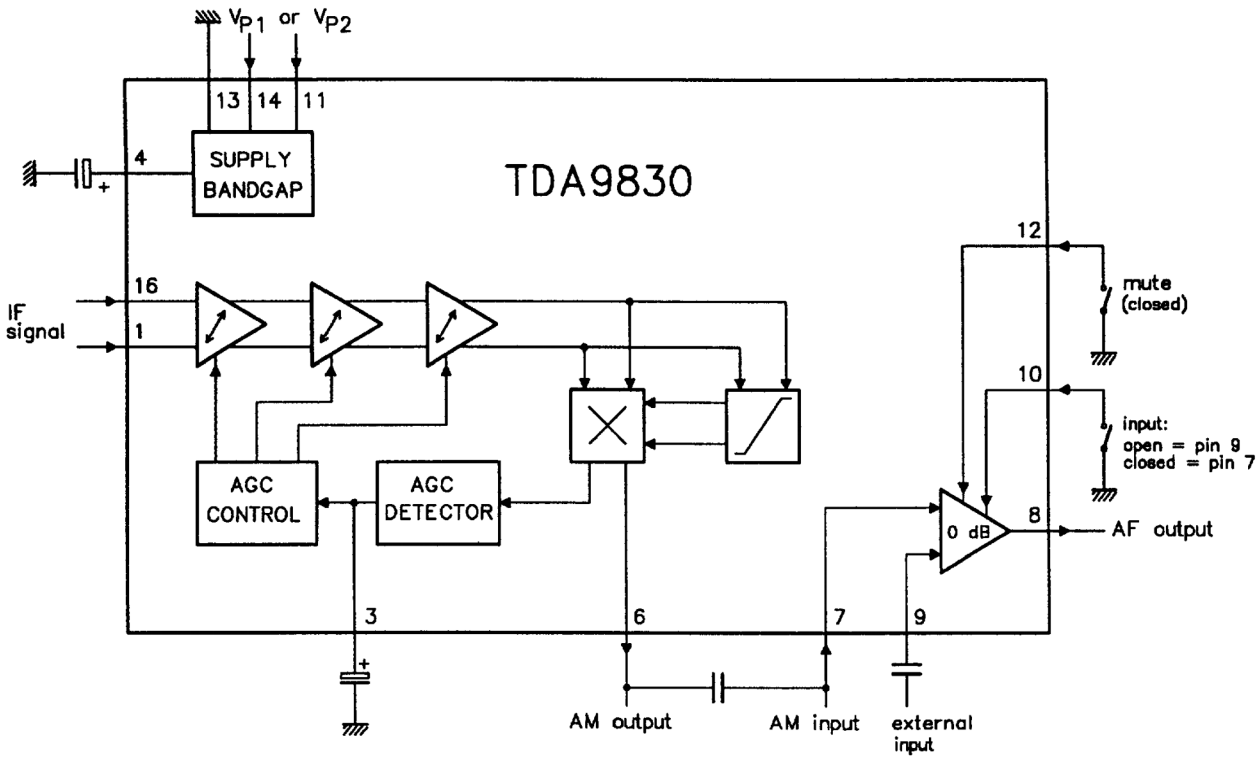


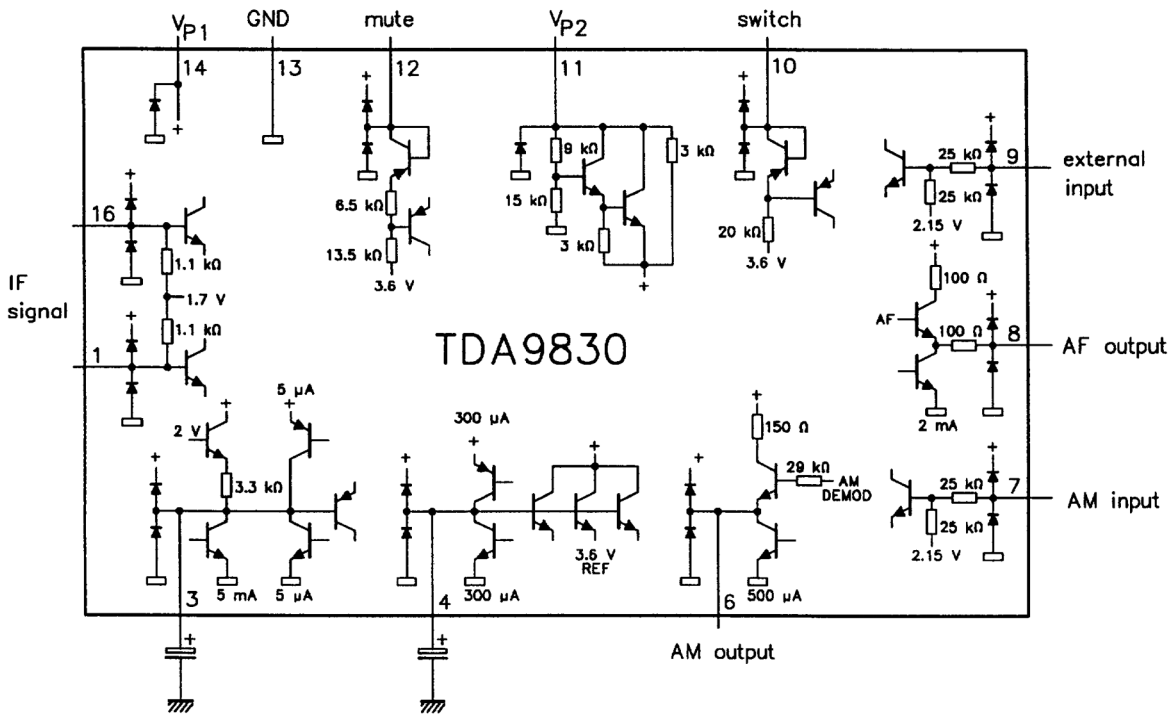
Fig. 3 Pin configuration (SDIP 64)

TV sound AM-demodulator and audio source switch

TDA9830



Block diagram.



Internal circuits.

TV sound AM-demodulator and audio source switch

TDA9830

PINNING

SYMBOL	PIN	DESCRIPTION
IFIN	1	sound IF differential input signal
n.c.	2	not connected
C _{AGC}	3	AGC capacitor
C _{REF}	4	REF voltage filtering capacitor
n.c.	5	not connected
AMOUT	6	AM demodulator output
AMIN	7	input signal (from AM) to audio switch
AFOUT	8	output signal from audio switch
EXTIN	9	input signal (from external) to audio switch
V _{p2}	11	supply voltage +12 V (alternative)
MUTE	12	mute control
GND	13	ground (0 V)
V _{p1}	14	supply voltage +5 to +8 V
n.c.	15	not connected
IFIN	16	sound IF differential input signal

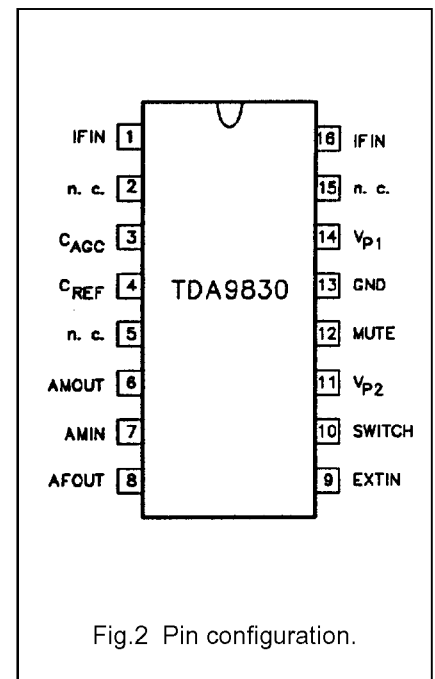


Fig.2 Pin configuration.

FUNCTIONAL DESCRIPTION

Sound IF input

The sound IF amplifier consists of three AC-coupled differential amplifier stages each with approximately 20 dB gain. At the output of each stage is a multiplier for gain controlling (\rightarrow current distribution gain control). The overall control range is approximately -6 to $+60$ dB and the frequency response (-3 dB) of the IF amplifier is approximately 6 to 70 MHz. The steepness of gain control is approximately 10 mV/dB.

IF AGC

The automatic gain control voltage to maintain the AM demodulator output signal at a constant level is generated by a mean level detector. This AGC-detector charges and discharges the capacitor at pin 3 controlled by the output signal of the AM-demodulator compared to an internal reference voltage. The

maximum charge/discharge current is approximately $5 \mu\text{A}$. This value in combination with the value of the AGC capacitor and the AGC steepness determines the lower cut-off audio frequency and the THD-figure at low modulation frequency of the whole AM-demodulator. Therefore a large time constant has to be chosen which leads to slow AGC reaction at IF level change. To speed up the AGC in case of IF signal jump from low to high level, there is an additional comparator built in, which can provide additional discharge current from the AGC capacitor up to 5 mA in a case of overloading the AM demodulator by the internal IF signal.

AM-demodulator

The IF amplifier output signal is fed to a limiting amplifier (two stages) and to a multiplier circuit. However the limiter output signal (which is not any more AM modulated) is also fed to the multiplier, which provides AM

demodulation (in phase demodulation). After lowpass filtering ($f_g \approx 400$ kHz) for carrier rejection and buffering, the demodulator output signal is present at pin 6. The AM demodulator operates over a wide frequency range, so that in combination with the frequency response of the IF amplifier applications in a frequency range from approximately 6 MHz up to 70 MHz are possible.

Audio switch

This circuit is an operational amplifier with three input stages and internal feedback network determining gain (0 dB) and frequency response ($f_g \approx 700$ kHz). Two of the input stages are connected to pin 7 and pin 9, the third input stage to an internal reference voltage. Controlled by the switching pins 10 and 12, one of the three input stages can be activated and a choice made between two different AF signals or mute state. The selected signal is present at

DY04	4822 130 30842	BAV21
DY05	4822 130 30842	BAV21
DY06	4822 130 30842	BAV21
DY07	0483 214 23201	1N4007



I001	9352 713 37112	TDA6107JF/N3
IA50	0450 000 00971	TDA7056A/N2
IC02	0450 000 02401	M24C16-WBN6
IC04	6093 300 01231	PREAMPLIFIER TUTUCULU PHLP2236
ID50	0451 900 00051	TDA8356/N6
ID50	0451 900 00151	TDA8357J
IL01	0450 000 00861	TDA9830/V1
IP01	0451 900 00021	TDA16846
IP02	4822 209 15576	LE33CZ
IP04	0452 381 03081	LM7805
IV01	0450 000 01801	TDA9353 PS/N2/3I
IV01	0450 000 05891	TDA9351-PM1 P/S/NTSC 90DEG1P
IV01	0450 000 09791	TDA9351-PI1 P/S/NTSC 90DEG1P
QY01	4822 130 41782	BF422
QY02	4822 130 41646	BF423
QY03	4822 130 41782	BF422
QY04	4822 130 41782	BF422
QY05	4822 130 41646	BF423
QY06	4822 130 41782	BF422
QY07	4822 130 41782	BF422
QY08	4822 130 41646	BF423
QY09	4822 130 41782	BF422
TA01	4822 130 40959	BC547B
TC10	4822 130 40959	BC547B
TC11	4822 130 41691	BC556B
TC14	4822 130 41691	BC556B
TC70	4822 130 40959	BC547B
TC90	4822 130 41691	BC556B
TD01	4822 130 41053	BC639
TD02	0460 000 00141	BU2508DF
TD03	4822 130 40959	BC547B
TD04	4822 130 40855	BC337
TD50	4822 130 41691	BC556B
TE01	4822 130 40959	BC547B
TL01	4822 130 40959	BC547B
TL02	4822 130 40959	BC547B
TL03	4822 130 40959	BC547B
TL04	4822 130 40959	BC547B
TL05	4822 130 41691	BC556B
TP01	0467 110 00031	SPA04N60C2
TP03	0469 862 94161	2SA720 / BC327
TP05	4822 130 40959	BC547B
TV01	4822 130 41691	BC556B
TV03	4822 130 40959	BC547B
TV04	4822 130 40959	BC547B
TV11	4822 130 40959	BC547B