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1.INTRODUCTION

11AK45 is a 50Hz colour television capable of driving 24" + CRT sizes(beginning from 24" 16:9 up to 33").

The chassis is capable of operation in PAL, SECAM, NTSC (playback) colour standards and multiple transmission standards as B/G, D/K, I/I', and L/L'.

Sound system output is supplying 2x10W (10%THD) for left and right outputs of 8ohm speakers.

TV supports FASTTEXT. It is possible to decode transmissions including high graphical data.

The chassis is equipped with three full EuroScarts, only one of them supports RGB input, one headphone output, one FAV input, one SVHS input (via SCART)

2.TUNER

The hardware and software of the TV is suitable for tuners, supplied by different companies, which are selected from the Service Menu. These tuners can be combined VHF, UHF tuners suitable for CCIR systems B/G, H, L, L', I and I'. The tuning is available through the digitally controlled I²C bus (PLL). Below you will find info on one of the Tuners in use.

General description of UV1316:

The UV1316 tuner belongs to the UV 1300 family of tuners, which are designed to meet a wide range of applications. It is a combined VHF, UHF tuner suitable for CCIR systems B/G, H, L, L', I and I'. The low IF output impedance has been designed for direct drive of a wide variety of SAW filters with sufficient suppression of triple transient.

Features of UV1316:

1. Member of the UV1300 family small sized UHF/VHF tuners
2. Systems CCIR: B/G, H, L, L', I and I'; OIRT: D/K
3. Digitally controlled (PLL) tuning via I²C-bus
4. Off-air channels, S-cable channels and Hyperband
5. World standardized mechanical dimensions and world standard pinning
6. Compact size
7. Complies to "CENELEC EN55020" and "EN55013"

Pinning:

1. Gain control voltage (AGC) : 4.0V, Max: 4.5V
2. Tuning voltage
3. I²C-bus address select : Max: 5.5V
4. I²C-bus serial clock : Min:-0.3V, Max: 5.5V
5. I²C-bus serial data : Min:-0.3V, Max: 5.5V
6. Not connected
7. PLL supply voltage : 5.0V, Min: 4.75V, Max: 5.5V
8. ADC input
9. Tuner supply voltage : 33V, Min: 30V, Max: 35V
10. Symmetrical IF output 1
11. Symmetrical IF output 2

3.IF PART (TDA9885/86)

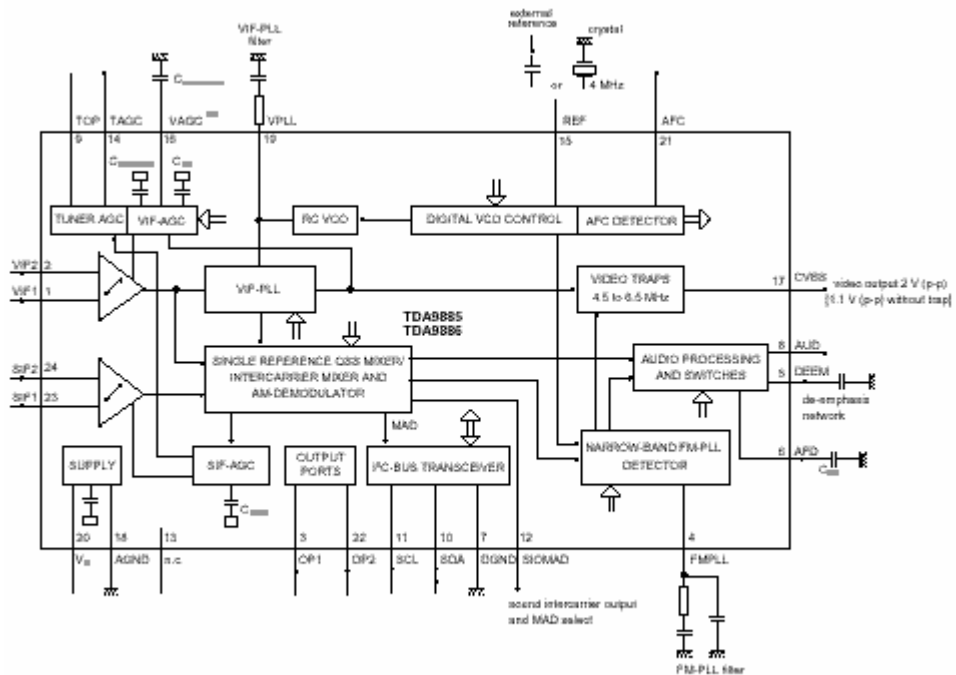
The TDA9885 is an alignment-free single standard (without positive modulation) vision and sound IF signal PLL.

The TDA9886 is an alignment-free multistandard (PAL, SECAM and NTSC) vision and sound IF signal PLL Both devices can be used for TV, VTR, PC and set-top box applications.

The following figure shows the simplified block diagram of the integrated circuit.

The integrated circuit comprises the following functional blocks:

VIF amplifier, Tuner and VIF-AGC, VIF-AGC detector, Frequency Phase-Locked Loop (FPLL) detector, VCO and divider, Digital acquisition help and AFC, Video demodulator and amplifier, Sound carrier trap, SIF amplifier, SIF-AGC detector, Single reference QSS mixer, AM demodulator, FM demodulator and acquisition help, Audio amplifier and mute time constant, I²C-bus transceivers and MAD (module address), Internal voltage stabilizer.



(7) Not connected for TDA8855.

4.VIDEO SWITCH TEA6415

In case of three or more external sources are used, the video switch IC TEA6415 is used. The main function of this device is to switch 8 video-input sources on the 6 outputs. Each output can be switched on only one of each input. On each input an alignment of the lowest level of the signal is made (bottom of sync. top for CVBS or black level for RGB signals). Each nominal gain between any input and output is 6.5dB. For D2MAC or Chroma signal the alignment is switched off by forcing, with an external resistor bridge, 5VDC on the input. Each input can be used as a normal input or as a MAC or Chroma input (with external Resistor Bridge). All the switching possibilities are changed through the BUS. Driving 75ohm load needs an external resistor. It is possible to have the same input connected to several outputs.

5.MULTI STANDARD SOUND PROCESSOR

The MSP 34x10G family of single-chip Multi-standard Sound Processors covers the sound processing of all analog TV-Standards worldwide, as well as the NICAM digital sound standards. The full TV sound processing, starting with analog sound IF signal-in, down to processed analog AF-out, is performed on a single chip. The DBX noise reduction, or alternatively, MICRONAS Noise Reduction (MNR) is performed alignment free. Other processed standards are the Japanese FM-FM multiplex standard (EIA-J) and the FM Stereo Radio standard.

6.SOUND OUTPUT STAGE WITH TDA7269A

The TDA7269A is class AB dual Audio power amplifier assembled in the Multi-watt package, specially designed for high quality sound application as Hi-Fi music centers and stereo TV sets.

7.BERTICAL OUTPUT STAGE WITH STV9379FA

The IC STV9379FA is the vertical deflection booster circuit. Two supply voltages, +14V and -14V are needed to scan the inputs VERT+ and VERT-, respectively. And a third supply voltage, +60V for the flyback limiting are needed. The vertical deflection coil is connected in series between the output and feedback to the input.

8.VIDEO OUTPUT AMPLIFIER TDA6108

The TDA6108Q includes three video output amplifiers is intended to drive the three cathodes of a colour picture tube.

9. POWER SUPPLY (SMPS)

The DC voltages required at various parts of the chassis are provided by an SMPS transformer controlled by the IC MC44608, which is designed for driving, controlling and protecting switching transistor of SMPS. The transformer generates 145V for FBT input, +/-14V for audio amplifier, 5V and 3.3V stand by voltage and 8V, 12V and 5V supplies for other different parts of the chassis.

An optocoupler is used to control the regulation of line voltage and stand-by power consumption. There is a regulation circuit in secondary side. This circuit produces a control voltage according to the changes in 145V DC voltage, via an optocoupler (TCET1102G) to pin3 of the IC.

During the switch on period of the transistor, energy is stored in the transformer. During the switch off period energy is fed to the load via secondary winding. By varying switch-on time of the power transistor, it controls each portion of energy transferred to the second side such that the output voltage remains nearly independent of load variations.

10. MICROCONTROLLER SDA55XX

10.1. General Features

- Feature selection via special function register
- Simultaneous reception of TTX, VPS, PDC, and WSS (line 23)
- Supply Voltage 2.5 and 3.3 V
- ROM version package PSDIP52-2, PMQFP64-1
- Romless version package PMQFP100-2, PLCC84-2

10.2. External Crystal and Programmable Clock Speed

- Single external 6MHz crystal, all necessary clocks are generated internally
- CPU clock speed selectable via special function registers.
- Normal Mode 33.33 MHz CPU clock, Power Save mode 8.33 MHz

10.3. Microcontroller Features

- 8bit 8051 instruction set compatible CPU.
- 33.33-MHz internal clock (max.)
- 0.360 ms (min.) instruction cycle
- Two 16-bit timers
- Watchdog timer
- Capture compare timer for infrared remote control decoding
- Pulse width modulation unit (2 channels 14 bit, 6 channels 8 bit)
- ADC (4 channels, 8 bit)
- UART (rx, tx)

10.4. Memory

- Non-multiplexed 8-bit data and 16 ... 20-bit address bus (ROMless Version)
- Memory banking up to 1Mbyte (Romless version)
- Up to 128 Kilobyte on Chip Program ROM
- Eight 16-bit data pointer registers (DPTR)
- 256-bytes on-chip Processor Internal RAM (IRAM)
- 128bytes extended stack memory.
- Display RAM and TXT/VPS/PDC/WSS-Acquisition-Buffer directly accessible via MOVX
- UP to 16KByte on Chip Extended RAM (XRAM) consisting of;
 - 1 Kilobyte on-chip ACQ-buffer-RAM (access via MOVX)
 - 1 Kilobyte on-chip extended-RAM (XRAM, access via MOVX) for user software
 - 3 Kilobyte Display Memory

10.5. Display Features

- ROM Character Set Supports all East and West European Languages in single device
- Mosaic Graphic Character Set
- Parallel Display Attributes
- Single/Double Width/Height of Characters
- Variable Flash Rate
- Programmable Screen Size (25 Rows x 33...64 Columns)
- Flexible Character Matrixes (HxV) 12 x 9...16
- Up to 256 Dynamical Redefinable Characters in standard mode; 1024 Dynamical Redefinable Characters in Enhanced Mode
- CLUT with up to 4096 colour combinations

- Up to 16 Colours per DRCS Character
- One out of Eight Colours for Foreground and Background Colours for 1-bit DRCS and ROM Characters
- Shadowing
- Contrast Reduction
- Pixel by Pixel Shiftable Cursor With up to 4 Different Colours
- Support of Progressive Scan and 100 Hz.
- 3 X 4Bits RGB-DACs On-Chip
- Free Programmable Pixel Clock from 10 MHz to 32MHz
- Pixel Clock Independent from CPU Clock
- Multinorm H/V-Display Synchronization in Master or Slave Mode

10.6.Acquisition Features

- Multi-standard Digital Data Slicer
- Parallel Multi-norm Slicing (TTX, VPS, WSS, CC, G+)
- Four Different Framing Codes Available
- Data Caption only limited by available Memory
- Programmable VBI-buffer
- Full Channel Data Slicing Supported
- Fully Digital Signal Processing
- Noise Measurement and Controlled Noise Compensation
- Attenuation Measurement and Compensation
- Group Delay Measurement and Compensation
- Exact Decoding of Echo Disturbed Signals

10.7.Ports

- One 8-bit I/O-port with open drain output and optional I²C Bus emulation support (Port0)
- Two 8-bit multifunction I/O-ports (Port1, Port3)
- One 4-bit port working as digital or analogue inputs for the ADC (Port2)
- One 2-bit I/O port with secondary function (P4.2, 4.3, 4.7)
- One 4-bit I/O-port with secondary function (P4.0, 4.1, 4.4) (Not available in P-SDIP 52)

11.CLASS AB STEREO HEADPHONE DRIVER TDA1308

The TDA1308 is an integrated class AB stereo headphone driver contained in a DIP8 plastic package. The device is fabricated in a 1 mm CMOS process and has been primarily developed for portable digital audio applications.

12.SAW FILTERS

K3953M:

Standard

B/G, D/K, I, L/L'

Features

TV IF filter with Nyquist slopes at 33,90 MHz and 38,90 MHz

Constant group delay

Suitable for CENELEC EN 55020

Terminals

Tinned CuFe alloy

Pin configuration

1 Input

2 Input - ground

3 Chip carrier - ground

4 Output

5 Output

K3958M:

Standard

B/G, D/K, I, L/L'

Features

TV IF filter with Nyquist slopes at 33.90 MHz and 38.90 MHz

Constant group delay

Terminal and Pin configuration are the same with K3953M

K9356M:

Standard

B/G, D/K, I, L

Features

TV IF audio filter with pass band for sound carriers at 32,40 MHz (D/K, L), 32,90 MHz (I) and 33,40 MHz (B/G)

Terminal and Pin configuration are the same with K3953M

K9656M:

Standard

B/G, D/K, I, L/L'

Features

TV IF audio filter with two channels

Channel 1 (L') with one pass band for sound carriers at 40,40 MHz (L') and 39,75 MHz (L' - NICAM)

Channel 2 (B/G, D/K, L, I) with one pass band for sound carriers between 32,35 MHz and 33,40 MHz

Terminal and Pin configuration are the same with K3953M

13.IC DESCRIPTIONS

LM317T

MSP3410G

TEA6415

TDA7269A

24C08

MC44608

TDA9885T

TDA1308T

VDP3130Y

STV9379FA

LM7805/LM7808

SDA55XX

TCET1102G

13.1.LM317T

13.1.1.Description

The LM317T is an adjustable 3 terminal positive voltage regulator capable of supplying in excess of 1.5 amps over an output range of 1.25 to 37 volts. This voltage regulator is exceptionally easy to use and requires only two external resistors to set the output voltage. Further, it employs internal current limiting, thermal shutdown and safe area compensation, making it essentially blow-out proof. The LM317 serves a wide variety of applications including local, on card regulation. This device can also be used to make a programmable output regulator, or by connecting a fixed resistor between the adjustment and output, the LM317 can be used as a precision current regulator.

13.1.2.Features

- Output Current in Excess of 1.5 A
- Output Adjustable between 1.2 V and 37 V
- Internal Thermal Overload Protection
- Internal Short Circuit Current Limiting Constant with Temperature
- Output Transistor Safe-Area Compensation
- Floating Operation for High Voltage Applications
- Available in Surface Mount D²PAK, and Standard 3-Lead Transistor Package
- Eliminates Stocking many Fixed Voltages

13.2.TDA1308T

13.2.1.General Description

The TDA1308 is an integrated class AB stereo headphone driver contained in an SO8 or a DIP8 plastic package. The device is fabricated in a 1 mm CMOS process and has been primarily developed for portable digital audio applications. It gets its input from two analog audio outputs (DACA_L and DACA_R) of MSP 34x0G. The gain of the output is adjustable by the feedback resistor between the inputs and outputs.

13.2.2.Features

- Wide temperature range
- No switch ON/OFF clicks
- Excellent power supply ripple rejection

- Low power consumption
- Short-circuit resistant
- High performance
- high signal-to-noise ratio
- High slew rate
- Low distortion
- Large output voltage swing.

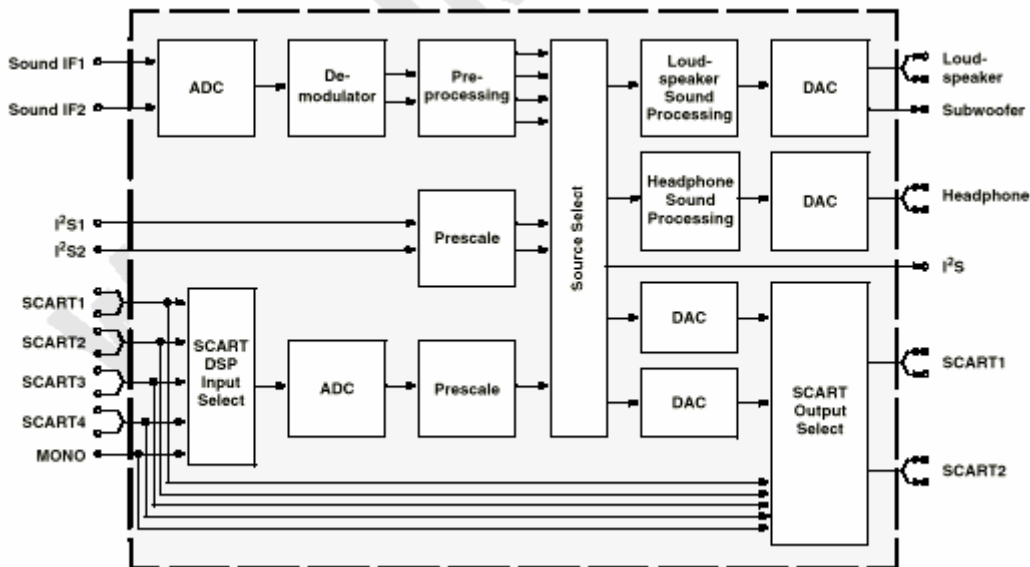
13.2.3.Pinning

| SYMBOL | PIN | DESCRIPTION |
|-----------------|-----|-----------------------|
| OUTA | 1 | Output A |
| INA(neg) | 2 | Inverting input A |
| INA(pos) | 3 | Non-inverting input A |
| V _{SS} | 4 | Negative supply |
| INB(pos) | 5 | Non-inverting input B |
| INB(neg) | 6 | Inverting input B |
| OUTB | 7 | Output B |
| V _{DD} | 8 | Positive supply |

13.3.MSP34X0G (MSP3410G)

13.3.1.Description

The MSP 34x0G family of single-chip Multi standard Sound Processors covers the sound processing of all analog TV-Standards worldwide, as well as the NICAM digital sound standards. The full TV sound processing, starting with analog sound IF signal-in, down to processed analog AF-out, is performed on a single chip. Figure shows a simplified functional block diagram of the MSP 34x0G.



This new generation of TV sound processing ICs now includes versions for processing the multi channel television sound (MTS) signal conforming to the standard recommended by the Broadcast Television Systems Committee (BTSC). The DBX noise reduction, or alternatively, MICRONAS Noise Reduction (MNR) is performed alignment free. Other processed standards are the Japanese FM-FM multiplex standard (EIA-J) and the FM Stereo Radio standard. Current ICs have to perform adjustment procedures in order to achieve good stereo separation for BTSC and EIA-J. The MSP 34x0G has optimum stereo performance without any adjustments.

All MSP 34x0G versions are pin and software downward compatible to the MSP34x0D. The MSP34x0G further simplifies controlling software. Standard selection requires a single I²C transmission only.

The MSP 34x0G has built-in automatic functions: The IC is able to detect the actual sound standard automatically (Automatic Standard Detection). Furthermore, pilot levels and identification signals can be evaluated internally with subsequent switching between mono/stereo/bilingual; no I²C interaction is necessary (Automatic Sound Selection).

13.3.2.Features

Standard Selection with single I²C transmission
 Automatic Standard Detection of terrestrial TV standards
 Automatic Sound Selection (mono/stereo/bilingual), new registers MODUS, STATUS
 Two selectable sound IF (SIF) inputs
 Automatic Carrier Mute function
 Interrupt output programmable (indicating status change)
 Loudspeaker / Headphone channel with volume, balance, bass, treble, loudness
 AVC: Automatic Volume Correction
 Subwoofer output with programmable low-pass and complementary high-pass filter
 5-band graphic equalizer for loudspeaker channel
 Spatial effect for loudspeaker channel
 Four Stereo SCART (line) inputs, one Mono input; two Stereo SCART outputs
 Complete SCART in/out switching matrix
 Two I²S inputs; one I²S output
 Dolby Pro Logic with DPL 351xA coprocessor
 All analog FM-Stereo A2 and satellite standards; AM-SECAM L standard
 Simultaneous demodulation of (very) high-deviation FM-Mono and NICAM
 Adaptive deemphasis for satellite (Wegener-Panda, acc. to ASTRA specification)
 ASTRA Digital Radio (ADR) together with DRP 3510A
 All NICAM standards
 Korean FM-Stereo A2 standard

13.3.3.Pin connections

NC = not connected; leave vacant
 LV = if not used, leave vacant
 X = obligatory; connect as described in circuit diagram
 DVSS: if not used, connect to DVSS
 AHVSS: connect to AHVSS

| PLCC 68-pin | Pin No. | | | | Pin Name | Type | Connection (if not used) | Short Description |
|----------------|-----------------|-----------------|----------------|-----------------|-------------|--------|-----------------------------|--|
| | PSDIP 64-pin | PSDIP 52-pin | PQFP 80-pin | PLQFP 64-pin | | | | |
| 1 | 16 | 14 | 9 | 8 | ADR_WS | OUT | LV | ADR word strobe |
| 2 | - | - | - | - | NC | | LV | Not connected |
| 3 | 15 | 13 | 8 | 7 | ADR_DA | OUT | LV | ADR Data Output |
| 4 | 14 | 12 | 7 | 6 | I2S_DA_IN1 | IN | LV | I ² S1 data input |
| 5 | 13 | 11 | 6 | 5 | I2S_DA_OUT | OUT | LV | I ² S data output |
| 6 | 12 | 10 | 5 | 4 | I2S_WS | IN/OUT | LV | I ² S word strobe |
| 7 | 11 | 9 | 4 | 3 | I2S_CL | IN/OUT | LV | I ² S clock |
| 8 | 10 | 8 | 3 | 2 | I2C_DA | IN/OUT | X | I ² C data |
| 9 | 9 | 7 | 2 | 1 | I2C_CL | IN/OUT | X | I ² C data |
| 10 | 8 | - | 1 | 64 | NC | | LV | Not connected |
| 11 | 7 | 6 | 80 | 63 | STANDBYQ | IN | X | Stand-by (low-active) |
| 12 | 6 | 5 | 79 | 62 | ADR_SEL | IN | X | I ² C bus address select |
| 13 | 5 | 4 | 78 | 61 | D_CTR_I/O_0 | IN/OUT | LV | D_CTR_I/O_0 |
| 14 | 4 | 3 | 77 | 60 | D_CTR_I/O_1 | IN/OUT | LV | D_CTR_I/O_1 |
| 15 | 3 | - | 76 | 59 | NC | | LV | Not connected |
| 16 | 2 | - | 75 | 58 | NC | | LV | Not connected |
| 17 | - | - | - | - | NC | | LV | Not connected |
| 18 | 1 | 2 | 74 | 57 | AUD_CL_OUT | OUT | LV | Audio clock output (18.432 MHz) |
| 19 | 64 | 1 | 73 | 56 | TP | | LV | Test pin |
| 20 | 63 | 52 | 72 | 55 | XTAL_OUT | OUT | X | Crystal oscillator |
| 21 | 62 | 51 | 71 | 54 | XTAL_IN | IN | X | Crystal oscillator |
| 22 | 61 | 50 | 70 | 53 | TESTEN | IN | X | Test pin |
| 23 | 60 | 49 | 69 | 52 | ANA_IN2+ | IN | AVSS via 56 pF/LV | IF Input 2 (can be left vacant, only if IF input 1 is also not in use) |
| 24 | 59 | 48 | 68 | 51 | ANA_IN- | IN | AVSS via 56 pF/LV | IF common (can be left vacant, only if IF input 1 is also not in use) |
| 25 | 58 | 47 | 67 | 50 | ANA_IN1+ | IN | LV | IF input 2 |
| 26 | 57 | 46 | 66 | 49 | AVSUP | | X | Analog power supply 5v |
| - | - | - | 65 | - | AVSUP | | X | Analog power supply 5v |

| | | | | | | | | |
|----|----|----|----|----|------------|-----|-------------|------------------------------------|
| - | - | - | 64 | - | NC | | LV | Not connected |
| - | - | - | 63 | - | NC | | LV | Not connected |
| 27 | 56 | 45 | 62 | 48 | AVSS | | X | Analog ground |
| - | - | - | 61 | - | AVSS | | X | Analog ground |
| 28 | 55 | 44 | 60 | 47 | MONO_IN | IN | LV | Mono input |
| - | - | - | 59 | - | NC | | LV | Not connected |
| 29 | 54 | 43 | 58 | 46 | VREFTOP | | X | Reference voltage IF A/D converter |
| 30 | 53 | 42 | 57 | 45 | SC1_IN_R | IN | LV | SCART 1 input, right |
| 31 | 52 | 41 | 56 | 44 | SC1_IN_L | IN | LV | SCART 1 input, left |
| 32 | 51 | - | 55 | 43 | ASG1 | | AHVSS | Analog Shield Ground 1 |
| 33 | 50 | 40 | 54 | 42 | SC2_IN_R | IN | LV | SCART 2 input, right |
| 34 | 49 | 39 | 53 | 41 | SC2_IN_L | IN | LV | SCART 2 input, left |
| 35 | 48 | - | 52 | 40 | ASG2 | | AHVSS | Analog Shield Ground 2 |
| 36 | 47 | 38 | 51 | 39 | SC3_IN_R | IN | LV | SCART 3 input, right |
| 37 | 46 | 37 | 50 | 38 | SC3_IN_L | IN | LV | SCART 3 input, left |
| 38 | 45 | - | 49 | 37 | ASG4 | | AHVSS | Analog Shield Ground 4 |
| 39 | 44 | - | 48 | 36 | SC4_IN_R | IN | LV | SCART 4 input, right |
| 40 | 43 | - | 47 | 35 | SC4_IN_L | IN | LV | SCART 4 input, left |
| 41 | - | - | 46 | - | NC | | LV or AHVSS | Not connected |
| 42 | 42 | 36 | 45 | 34 | AGND | | X | Analog reference voltage |
| 43 | 41 | 35 | 44 | 33 | AHVSS | | X | Analog ground |
| - | - | - | 43 | - | AHVSS | | X | Analog ground |
| - | - | - | 42 | - | NC | | LV | Not connected |
| - | - | - | 41 | - | NC | | LV | Not connected |
| 44 | 40 | 34 | 40 | 32 | CAPL_M | | X | Volume capacitor MAIN |
| 45 | 39 | 33 | 39 | 31 | AHVSUP | | X | Analog power supply 8V |
| 46 | 38 | 32 | 38 | 30 | CAPL_A | | X | Volume capacitor AUX |
| 47 | 37 | 31 | 37 | 29 | SC1_OUT_L | OUT | LV | SCART output 1, left |
| 48 | 36 | 30 | 36 | 28 | SC1_OUT_R | OUT | LV | SCART output 1, right |
| 49 | 35 | 29 | 35 | 27 | VREF1 | | X | Reference ground 1 |
| 50 | 34 | 28 | 34 | 26 | SC2_OUT_L | OUT | LV | SCART output 2, left |
| 51 | 33 | 27 | 33 | 25 | SC2_OUT_R | OUT | LV | SCART output 2, right |
| 52 | - | - | 32 | - | NC | | LV | Not connected |
| 53 | 32 | - | 31 | 24 | NC | | LV | Not connected |
| 54 | 31 | 26 | 30 | 23 | DACM_SUB | OUT | LV | Subwoofer output |
| 55 | 30 | - | 29 | 22 | NC | | LV | Not connected |
| 56 | 29 | 25 | 28 | 21 | DACM_L | OUT | LV | Loudspeaker out, left |
| 57 | 28 | 24 | 27 | 20 | DACM_R | OUT | LV | Loudspeaker out, right |
| 58 | 27 | 23 | 26 | 19 | VREF2 | | X | Reference ground 2 |
| 59 | 26 | 22 | 25 | 18 | DACA_L | OUT | LV | Headphone out, left |
| 60 | 25 | 21 | 24 | 17 | DACA_R | OUT | LV | Headphone out, right |
| - | - | - | 23 | - | NC | | LV | Not connected |
| - | - | - | 22 | - | NC | | LV | Not connected |
| 61 | 24 | 20 | 21 | 16 | RESETQ | IN | X | Power-on-reset |
| 62 | 23 | - | 20 | 15 | NC | | LV | Not connected |
| 63 | 22 | - | 19 | 14 | NC | | LV | Not connected |
| 64 | 21 | 19 | 18 | 13 | NC | | LV | Not connected |
| 65 | 20 | 18 | 17 | 12 | I2S_DA_IN2 | IN | LV | I ² S-data input |
| 66 | 19 | 17 | 16 | 11 | DVSS | | X | Digital ground |
| - | - | - | 15 | - | DVSS | | X | Digital ground |
| - | - | - | 14 | - | DVSS | | X | Digital ground |
| 67 | 18 | 16 | 13 | 10 | DVSUP | | X | Digital power supply 5V |
| - | - | - | 12 | - | DVSUP | | X | Digital power supply 5V |
| - | - | - | 11 | - | DVSUP | | X | Digital power supply 5V |
| 68 | 17 | 15 | 10 | 9 | ADR_CL | OUT | LV | ADR clock |

13.4.VDP313xY

13.4.1.Introduction

The VDP 313xY is a video IC family of high-quality single-chip video processors. Modular design and a sub-micron technology allow the economic integration of features in all classes of TV sets. The VDP 313xY family is based on the VDP 31xxB including YCRCb inputs for DVD component signals.

The VDP 313xY includes complete video, display and deflection processing. All processing is done digitally, the video frontend and video backend are interfacing to the analog world. Most functions of the VDP can be controlled by software via I²C-Bus interface

13.4.2.Features

Video Decoding and Processing

- four CVBS, one S-VHS input, one YC R C B component input
- integrated high-quality A/D converters and associated clamp and AGC circuits
- adaptive 2H comb filter Y/C separator
- multistandard colour decoder PAL/NTSC/SECAM including all substandards
- multistandard sync decoder
- automatic standard recognition
- black-line detector
- linear horizontal scaling (0.25...4), as well as nonlinear horizontal scaling “Panoramavision”
- black-level expander
- dynamic peaking
- soft limiter (gamma correction)
- colour transient improvement

RGB Processing and Deflection

- programmable RGB matrix
- two analog RGB / Fastblank inputs
- half-contrast switch
- picture frame generator
- scan velocity modulation output
- high-performance H/V deflection
- separate ADC for tube measurements
- EHT compensation
- angle and bow correction
- one 20.25 MHz crystal, few external components
- I²C-Bus Interface
- 64-pin PSDIP package

13.4.3.Pin Connections and short descriptions

NC = not connected

X = obligatory; connect as described in circuit diagram

OUT = Output

LV = if not used, leave vacant

IN = Input

SUPPLY = Supply Pin

| Pin no PSDIP 64-pin | Pin name | Type | Connection (if not used) | Short description |
|------------------------|----------|--------|-----------------------------|--|
| 1 | TEST | IN | GNDD | Test Input |
| 2 | RESQ | IN | X | Reset Input |
| 3 | SCL | IN/OUT | X | I ² C Bus Clock |
| 4 | SDA | IN/OUT | X | I ² C Bus Data |
| 5 | GNDD | SUPPLY | X | Digital Ground |
| 6 | HCS | IN | LV | Half Contrast Switch Input |
| 7 | FSY | OUT | LV | Front Sync Output |
| 8 | CSY | OUT | LV | Composite Sync Output |
| 9 | VS | OUT | LV | Vertical Sync Output (=VS Bit of MSY for TPU) |
| 10 | INTLC | OUT | LV | Intefrace Control Output |
| 11 | VPROT | IN | GNDAB | Vertical Protection Input |
| 12 | SAFETY | IN | GNDAB | Safety Input |
| 13 | HFLB | IN | HOUT | Horizontal Flyback Input |
| 14 | GNDD | SUPPLY | X | Digital Ground |
| 15 | VSUPD | SUPPLY | X | Digital Supply Voltage (3.3V) |
| 16 | GNDD | SUPPLY | X | Digital Ground |
| 17 | VSUPD | SUPPLY | LV | Digital Supply Voltage (3.3V) |
| 18 | P0 | IN/OUT | LV | Port 1, Bit 0 |
| 19 | P1 | IN/OUT | LV | Port 1, Bit 1 |
| 20 | P2 | IN/OUT | GNDD | Port 1, Bit 2 |
| 21 | P3 | IN/OUT | GNDD | Port 1, Bit 3 |
| 22 | P4 | IN/OUT | GNDD | Port 1, Bit 4 |
| 23 | P5 | IN/OUT | GNDD | Port 1, Bit 5 |
| 24 | P6 | IN/OUT | GNDD | Port 1, Bit 6 |

| | | | | |
|----|------------|--------|--------|--|
| 25 | GNDD | SUPPLY | X | Digital Ground |
| 26 | RSW2 | OUT | GNDAB | Range Switch 2 for Measurement ADC |
| 27 | RSW1 | OUT | GNDAB | Range Switch 1 for Measurement ADC |
| 28 | SENSE | IN | GNDAB | Sense ADC Input |
| 29 | GNDM | SUPPLY | X | Ground, MADC input |
| 30 | VERTQ | OUT | LV | Inverted Vertical Sawtooth Output |
| 31 | VERTQ | OUT | LV | Vertical Sawtooth Output |
| 32 | E/w | OUT | LV | Vertical Parabola Output |
| 33 | XREF | IN | X | Reference Input for RGB DACs |
| 34 | SVMOUT | OUT | VSUPAB | Analog Scan Velocity Modulation Output |
| 35 | GNDAB | SUPPLY | X | Analog Ground Backend |
| 36 | VSUPAB | SUPPLY | X | Analog Supply Voltage (5.0V) Backend |
| 37 | ROUT | OUT | VSUPAB | Analog Red Output |
| 38 | GOUT | OUT | VSUPAB | Analog Green Output |
| 39 | BOUT | OUT | VSUPAB | Analog Blue Output |
| 40 | VRD | IN | X | DAC Reference |
| 41 | RIN | IN | GNDAB | Analog Red Input |
| 42 | GIN | IN | GNDAB | Analog Green Input |
| 43 | BIN | IN | GNDAB | Analog Blue Input |
| 44 | FBLIN | IN | GNDAB | Fast Blank Input |
| 45 | RIN2 | IN | GNDAB | Analog Red Input2 |
| 46 | GIN2 | IN | GNDAB | Analog Green Input2 |
| 47 | BIN2 | IN | GNDAB | Analog Blue Input2 |
| 48 | FBLIN2 | IN | GNDAB | Fast Blank Input2 |
| 49 | CLK20 | OUT | LV | 20.25 MHz System Clock Output |
| 50 | HOUT | OUT | X | Horizontal Drive Output |
| 51 | XTAL 1 | IN | X | Analog Crystal Input |
| 52 | XTAL 2 | OUT | X | Analog Crystal Output |
| 53 | CIN 2/CRIN | | LV | Analog Chroma 2/Component C _R Input |
| 54 | CBIN | IN | LV | Component C _B Input |
| 55 | GNDAF | SUPPLY | X | Analog Ground Frontend |
| 56 | SGND | IN | GNDAF | Signal Ground for Analog Input |
| 57 | VRT | IN | X | Reference Voltage Top, Video ADC |
| 58 | VSUPAF | SUPPLY | X | Analog Supply Voltage (5.0V) Frontend |
| 59 | VOUT | OUT | LV | Analog Video Output |
| 60 | CIN1 | IN | VRT | Analog Chroma 1 Input |
| 61 | VIN1 | IN | VRT | Analog Video 1 Input |
| 62 | VIN2 | IN | VRT | Analog Video 2 Input |
| 63 | VIN3 | IN | VRT | Analog Video 3 Input |
| 64 | VIN4 | IN | VRT | Analog Video 4 Input |

13.5.TEA6415C

13.5.1.General Description

The main function of the IC is to switch 8 video input sources on 6 outputs. Each output can be switched on only one of each input. On each input an alignment of the lowest level of the signal is made (bottom of synch. top for CVBS or black level for RGB signals). Each nominal gain between any input and output is 6.5dB. For D2MAC or Chroma signal the alignment is switched off by forcing, with an external resistor bridge, 5 V_{dc} on the input. Each input can be used as a normal input or as a MAC or Chroma input (with external resistor bridge). All the switching possibilities are changed through the BUS. Driving 75Ω load needs an external transistor. It is possible to have the same input connected to several outputs. The starting configuration upon power on (power supply: 0 to 10V) is undetermined. In this case, 6 words of 16 bits are necessary to determine one configuration. In other case, 1 word of 16 bits is necessary to determine one configuration.

13.5.2.Features

- 20MHz Bandwidth
- Cascadable with another TEA6415C (Internal address can be changed by pin 7 voltage)
- 8 Inputs (CVBS, RGB, MAC, CHROMA,...)
- 6 Outputs
- Possibility of MAC or chroma signal for each input by switching-off the clamp with an external resistor bridge
- Bus controlled

- 6.5dB gain between any input and output
- 55dB crosstalk at 5mHz
- Fully ESD protected

13.5.3.Pinning

1. Input : Max : 2Vpp, Input Current: 1mA, Max : 3mA
2. Data : Low level: -0.3V Max: 1.5V,
High level : 3.0V Max : Vcc+0.5V
3. Input : Max : 2Vpp, Input Current: 1mA, Max : 3mA
4. Clock : Low level: -0.3V Max: 1.5V,
High level : 3.0V Max : Vcc+0.5V
5. Input : Max : 2Vpp, Input Current: 1mA, Max : 3mA
6. Input : Max : 2Vpp, Input Current: 1mA, Max : 3mA
7. Prog
8. Input : Max : 2Vpp, Input Current: 1mA, Max: 3mA
9. Vcc : 12V
10. Input : Max : 2Vpp, Input Current: 1mA, Max : 3mA
11. Input : Max : 2Vpp, Input Current: 1mA, Max : 3mA
12. Ground
13. Output : 5.5Vpp, Min : 4.5Vpp
14. Output : 5.5Vpp, Min : 4.5Vpp
15. Output : 5.5Vpp, Min : 4.5Vpp
16. Output : 5.5Vpp, Min : 4.5Vpp
17. Output : 5.5Vpp, Min : 4.5Vpp
18. Output : 5.5Vpp, Min : 4.5Vpp
19. Ground
20. Input : Max : 2Vpp, Input Current : 1mA, Max : 3mA

13.6.STV9379FA

13.6.1.Description

Designed for monitors and high performance TVs, the STV9379FA vertical deflection booster can handle flyback voltage up to 90V. Further to this, it is possible to have a flyback voltage, which is more than the double of the supply (Pin 2). This allows to decrease the power consumption, or to decrease the flyback time for a given supply voltage. The STV9379FA operates with supplies up to 42V and provides up to 2.6APP output current to drive the yoke. The STV9379FA is offered in HEPTAWATT package.

13.6.2.Features

Power Amplifier
 Thermal Protection
 Output Current Up To 2.6APP
 Flyback Voltage Up To 90V (on Pin 5)
 Suitable For DC Coupling Application
 External Flyback Supply

13.6.3.Pinning

Pin1 : Output Stage Supply
 Pin2 : Output
 Pin3 : GND or Negative Supply
 Pin4 : Flyback Supply
 Pin5 : Supply Voltage
 Pin6 : Inverting Input
 Pin7 : Non-inverting Input

13.7.TDA7269A

13.7.1.Description

The TDA7269A 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.

13.7.2.Features

Wide Supply Voltage Range Up To $\pm 20V$
Split Supply
High Output Power
14 + 14W @THD =10%, $R_L = 8\Omega, V_S = +16V$
No Pop at Turn-On/Off
Mute (Pop Free)
Stand-By Feature (Low I_q)
Short Circuit Protection To Gnd
Thermal Overload Protection

13.8.LM7800 (LM7805/LM7808)

13.8.1.Description

The L7800 series of three-terminal positive regulators is available in TO-220 TO-220FP TO-3 and D 2 PAK packages and several fixed output voltages, making it useful in a wide range of applications. These regulators can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. Each type employs internal current limiting, thermal shutdown and safe area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

13.8.2.Features

Output Current Up To 1.5 A
Output Voltages of 5; 5.2; 6; 8; 8.5; 9; 12; 15; 18; 24V
Thermal Over load protection
Short Circuit Protection
Output Transition SOA Protection

13.9.AT24C08

13.9.1.Description

The AT24C01A/02/04/08/16 provides 1024/2048/4096/8192/16384 bits of serial electrically erasable and programmable read-only memory (EEPROM) organized as 128/256/512/1024/2048 words of 8 bits each. The device is optimized for use in many industrial and commercial applications where low-power and low-voltage operation are essential. The AT24C01A/02/04/08/16 is available in space-saving 8-pin PDIP, (AT24C01A/02/04/08/16), 8-lead TSSOP (AT24C01A/02/04/08/16) and 8-lead JEDEC SOIC (AT24C01A/02/04/08/16) packages and is accessed via a 2-wire serial interface. In addition, the entire family is available in 5.0V (4.5V to 5.5V), 2.7V (2.7V to 5.5V), 2.5V (2.5V to 5.5V) and 1.8V (1.8V to 5.5V) versions.

13.9.2.Features

- Low-voltage and Standard-voltage Operation
 - 5.0 (V CC = 4.5V to 5.5V)
 - 2.7 (V CC = 2.7V to 5.5V)
 - 2.5 (V CC = 2.5V to 5.5V)
 - 1.8 (V CC = 1.8V to 5.5V)
- Internally Organized 128 x 8 (1K), 256 x 8 (2K), 512 x 8 (4K), 1024 x 8 (8K) or 2048 x 8 (16K)
- 2-wire Serial Interface
- Schmitt Trigger, Filtered Inputs for Noise Suppression
- Bi-directional Data Transfer Protocol
- 100 kHz (1.8V, 2.5V, 2.7V) and 400 kHz (5V) Compatibility
- Write Protect Pin for Hardware Data Protection

- 8-byte Page (1K, 2K), 16-byte Page (4K, 8K, 16K) Write Modes
- Partial Page Writes are Allowed
- Self-timed Write Cycle (10 ms max)
- High-reliability
 - Endurance: 1 Million Write Cycles
 - Data Retention: 100 Years
- Automotive Grade and Extended Temperature Devices Available
- 8-lead JEDEC SOIC, 8-pin PDIP and 8-lead TSSOP Packages

13.9.3.Pin Configurations

| Pin name | Function |
|----------|--------------------|
| A0-A2 | Address Inputs |
| SDA | Serial Data |
| SCL | Serial Clock Input |
| WP | Write Protect |
| NC | No Connect |

13.10.SDA5555

13.10.1.General definition

The SDA55XX 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 PAL plus transmissions (Line 23). The device also supports Closed caption acquisition and decoding. The device provides an integrated general-purpose, fully 8051-compatible Microcontroller with television specific hardware features. Microcontroller has been enhanced to provide powerful features such as memory banking, data pointers, and additional interrupts etc. The on-chip display unit for displaying Level 1.5 teletext data can also be used for customer defined on screen displays. Internal XRAM consists of up to 16 Kbytes. Device has an internal ROM of up to 128 KBytes. ROMless versions can access up to 1 MByte of external RAM and ROM. The SDA 55XX supports a wide range of standards including PAL, NTSC and contains a digital slicer for VPS, WSS, PDC, TTX and Closed Caption, an accelerating acquisition hardware module, a display generator for Level 1.5 TTX data and powerful On screen Display capabilities based on parallel attributes, and Pixel oriented characters (DRCS).

13.10.2.Features

General

- Feature selection via special function register
- Simultaneous reception of TTX, VPS, PDC, and WSS (line 23)
- Supply Voltage 2.5 and 3.3 V
- ROM version package PSDIP52-2, PMQFP64-1
- Romless version package PMQFP100-2, PLCC84-2

External Crystal and Programmable Clock Speed

- Single external 6MHz crystal, all necessary clocks are generated internally
- CPU clock speed selectable via special function registers.
- Normal Mode 33.33 MHz CPU clock, Power Save mode 8.33 MHz

Microcontroller Features

- 8bit 8051 instruction set compatible CPU.
- 33.33-MHz internal clock (max.)
- 0.360ms (min.) instruction cycle
- Two 16-bit timers
- Watchdog timer
- Capture compare timer for infrared remote control decoding
- Pulse width modulation unit (2 channels 14 bit, 6 channels 8 bit)
- ADC (4 channels, 8 bit)
- UART

Memory

- Non-multiplexed 8-bit data and 16 ... 20-bit address bus (ROMless Version)
- Memory banking up to 1Mbyte (Romless version)
- Up to 128 Kilobyte on Chip Program ROM
- Eight 16-bit data pointer registers (DPTR)
- 256-bytes on-chip Processor Internal RAM (IRAM)
- 128bytes extended stack memory.
- Display RAM and TXT/VPS/PDC/WSS-Acquisition-Buffer directly accessible via MOVX
- UP to 16KByte on Chip Extended RAM (XRAM) consisting of;
 - 1 Kilobyte on-chip ACQ-buffer-RAM (access via MOVX)
 - 1 Kilobyte on-chip extended-RAM (XRAM, access via MOVX) for user software
 - 3 Kilobyte Display Memory

Display Features

- ROM Character Set Supports all East and West European Languages in single device
- Mosaic Graphic Character Set
- Parallel Display Attributes
- Single/Double Width/Height of Characters
- Variable Flash Rate
- Programmable Screen Size (25 Rows x 33...64 Columns)
- Flexible Character Matrixes (HxV) 12 x 9...16
- Up to 256 Dynamical Redefinable Characters in standard mode; 1024 Dynamical Redefinable Characters in Enhanced Mode
- CLUT with up to 4096 colour combinations
- Up to 16 Colours per DRCS Character
- One out of Eight Colours for Foreground and Background Colours for 1-bit DRCS and ROM Characters
- Shadowing
- Contrast Reduction
- Pixel by Pixel Shiftable Cursor With up to 4 Different Colours
- Support of Progressive Scan and 100 Hz.
- 3 X 4Bits RGB-DACs On-Chip
- Free Programmable Pixel Clock from 10 MHz to 32MHz
- Pixel Clock Independent from CPU Clock
- Multinorm H/V-Display Synchronization in Master or Slave Mode

Acquisition Features

- Multistandard Digital Data Slicer
- Parallel Multi-norm Slicing (TTX, VPS, WSS, CC, G+)
- Four Different Framing Codes Available
- Data Caption only Limited by available Memory
- Programmable VBI-buffer
- Full Channel Data Slicing Supported
- Fully Digital Signal Processing
- Noise Measurement and Controlled Noise Compensation
- Attenuation Measurement and Compensation
- Group Delay Measurement and Compensation
- Exact Decoding of Echo Disturbed Signals

Ports

- One 8-bit I/O-port with open drain output and optional I²C Bus emulation support (Port 0)
- Two 8-bit multifunction I/O-ports (Port 1, Port 3)
- One 4-bit port working as digital or analog inputs for the ADC (Port 2)
- One 2-bit I/O port with secondary functions (P4.2, 4.3, 4.7)
- One 4-bit I/O-port with secondary function (P4.0, 4.1, 4.4) (Not available in P-SDIP 52)

13.11.MC44608

13.11.1.Description

The MC44608 is a high performance voltage mode controller designed for off-line converters. This high voltage circuit that integrates the start-up current source and the oscillator capacitor, requires few

external components while offering a high flexibility and reliability. The device also features a very high efficiency stand-by management consisting of an effective Pulsed Mode operation. This technique enables the reduction of the stand-by power consumption to approximately 1W while delivering 300mW in a 150W SMPS.

- Integrated Start-Up Current Source
- Lossless Off-Line Start-Up
- Direct Off-Line Operation
- Fast Start-Up

13.11.2.General Features

- Flexibility
- Duty Cycle Control
- Under voltage Lockout with Hysteresis
- On Chip Oscillator Switching Frequency 40, or 75kHz
- Secondary Control with Few External Components

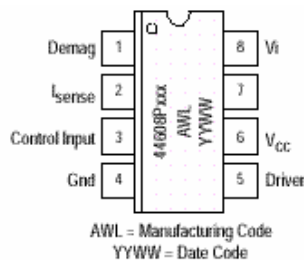
Protections

- Maximum Duty Cycle Limitation
- Cycle by Cycle Current Limitation
- Demagnetization (Zero Current Detection) Protection
- “Over Vcc Protection” Against Open Loop
- Programmable Low Inertia Over Voltage Protection Against Open Loop
- Internal Thermal Protection

GreenLine™ Controller

- Pulsed Mode Techniques for a Very High Efficiency Low Power Mode
- Lossless Startup
- Low dV/dT for Low EMI Radiations

13.11.3.Pin Connections



13.11.4.Pin Function description

| Pin | Name | Description |
|-----|---------------|---|
| 1 | Demag | The Demag pin offers 3 different functions: Zero voltage crossing detection (50mV), 24mA current detection and 120mA current detection. The 24mA level is used to detect the secondary reconfiguration status and the 120mA level to detect an Over Voltage status called Quick OVP. |
| 2 | ISENSE | The Current Sense pin senses the voltage developed on the series resistor inserted in the source of the power MOSFET. When I sense reaches 1V, the Driver output (pin 5) is disabled. This is known as the Over Current Protection function. A 200mA current source is flowing out of the pin 3 during the start-up phase and during the switching phase in case of the Pulsed Mode of operation. A resistor can be inserted between the sense resistor and the pin 3; thus a programmable peak current detection can be performed during the SMPS stand-by mode. |
| 3 | Control Input | A feedback current from the secondary side of the SMPS via the opto-coupler is injected into this pin. A resistor can be connected between this pin and GND to allow the programming of the Burst duty cycle during the Stand-by mode. |
| 4 | Ground | This pin is the ground of the primary side of the SMPS. |
| 5 | Driver | The current and slew rate capability of this pin are suited to drive Power MOSFETs. |
| 6 | VCC | This pin is the positive supply of the IC. The driver output gets disabled when the voltage becomes higher than 15V and the operating range is between 6.6V and 13V. An intermediate voltage level of 10V creates a disabling condition called Latched Off phase. |
| 7 | | This pin is to provide isolation between the Vi pin 8 and the VCC pin 6. |
| 8 | Vi | This pin can be directly connected to a 500V voltage source for start-up function of the IC. During the Start-up phase a 9 mA current source is internally delivered to the VCC pin 6 allowing a rapid charge of the VCC capacitor. As soon as the IC starts-up, this current source is disabled. |

13.12.TCET1102G

13.12.1.Description

The TCET110/ TCET2100/ TCET4100 consists of a phototransistor optically coupled to a gallium arsenide infrared-emitting diode in a 4-lead up to 16-lead plastic dual inline package. The elements are mounted on one lead frame using a **coplanar technique**, providing a fixed distance between input and output for highest safety requirements.

13.12.2.Applications

Circuits for safe protective separation against electrical shock according to safety class II (reinforced isolation):

For appl. class I – IV at mains voltage ≤ 300 V

For appl. class I – III at mains voltage ≤ 600 V

According to VDE 0884, table 2, suitable for: **Switch-mode power supplies, line receiver, computer peripheral interface, microprocessor system interface.**

13.12.3.Features

VDE 0884 related features:

Rated impulse voltage (transient overvoltage) $V_{IOTM} = 8$ kV peak

Isolation test voltage (partial discharge test voltage) $V_{pd} = 1.6$ kV

Rated isolation voltage (RMS includes DC) $V_{IOWM} = 600$ V RMS (848 V peak)

Rated recurring peak voltage (repetitive) $V_{IORM} = 600$ V RMS

General features:

CTR offered in 9 groups

Isolation materials according to UL94-VO

Pollution degree 2 (DIN/VDE 0110 / resp. IEC 664)

Climatic classification 55/100/21 (IEC 68 part 1)

Special construction: Therefore, extra low coupling capacity of typical 0.2pF, high **Common Mode Rejection**

Low temperature coefficient of CTR

G = Leadform 10.16 mm; provides creepage distance > 8 mm, for TCET2100/ TCET4100 optional; suffix letter 'G' is not marked on the optocoupler

Coupling System U

13.13.TDA9885T

13.13.1.General Description

The TDA9885 is an alignment-free single standard (without positive modulation) vision and sound IF signal PLL.

13.13.2.Features

- 5 V supply voltage
- Gain controlled wide-band Vision Intermediate Frequency (VIF) amplifier (AC-coupled)
- Multistandard true synchronous demodulation with active carrier regeneration (very linear demodulation, good intermodulation figures, reduced harmonics, excellent pulse response)
- Gated phase detector for L/L accent standard
- Fully integrated VIF Voltage Controlled Oscillator (VCO), alignment-free; frequencies switchable for all negative and positive modulated standards via I²C-bus
- Digital acquisition help, VIF frequencies of 33.4, 33.9, 38.0, 38.9, 45.75 and 58.75 MHz
- 4 MHz reference frequency input [signal from Phase-Locked Loop (PLL) tuning system] or operating as crystal oscillator
- VIF Automatic Gain Control (AGC) detector for gain control, operating as peak sync detector for negative modulated signals and as a peak white detector for positive modulated signals
- Precise fully digital Automatic Frequency Control (AFC) detector with 4-bit digital-to-analog converter; AFC bits via I²C -bus readable
- TakeOver Point (TOP) adjustable via I²C-bus or alternatively with potentiometer
- Fully integrated sound carrier trap for 4.5, 5.5, 6.0 and 6.5 MHz, controlled by FM-PLL oscillator
- Sound IF (SIF) input for single reference Quasi Split Sound (QSS) mode (PLL controlled)

- SIF AGC for gain controlled SIF amplifier; single reference QSS mixer able to operate in high performance single reference QSS mode and in intercarrier mode, switchable via I²C-bus
- AM demodulator without extra reference circuit
- Alignment-free selective FM-PLL demodulator with high linearity and low noise
- I²C-bus control for all functions
- I²C-bus transceiver with pin programmable Module Address (MAD).

13.13.3.Pinning

| SYMBOL | PIN | DESCRIPTION |
|----------------|-----|--|
| VIF1 | 1 | VIF differential input 1 |
| VIF2 | 2 | VIF differential input 2 |
| OP1 | 3 | output 1 (open-collector) |
| FMPLL | 4 | FM-PLL for loop filter |
| DEEM | 5 | de-emphasis output for capacitor |
| AFD | 6 | AF decoupling input for capacitor |
| DGND | 7 | digital ground |
| AUD | 8 | audio output |
| TOP | 9 | tuner AGC TakeOver Point (TOP) |
| SDA | 10 | I ² C-bus data input/output |
| SCL | 11 | I ² C-bus clock input |
| SIOMA | 12 | sound intercarrier output and MAD select |
| n.c. | 13 | not connected |
| TAGC | 14 | tuner AGC output |
| REF | 15 | 4 MHz crystal or reference input |
| VAGC | 16 | VIF-AGC for capacitor; note 1 |
| CVBS | 17 | video output |
| AGND | 18 | analog ground |
| VPLL | 19 | VIF-PLL for loop filter |
| V _p | 20 | supply voltage (+5 V) |
| AFC | 21 | AFC output |
| OP2 | 22 | output 2 (open-collector) |
| SIF1 | 23 | SIF differential input 1 |
| SIF2 | 24 | SIF differential input 2 |

13.14.PI5V330

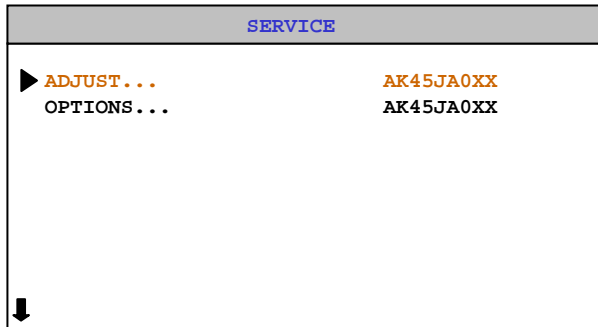
13.14.1.General Description

The PI5V330 is well suited for video applications when switching composite or RGB analog. A picture-in-picture application will be described in this brief. The pixel-rate creates video overlays so two or more pictures can be viewed at the same time. An inexpensive NTSC titler can be implemented by superimposing the output of a character generator on a standard composite video background.

14.AK45 CHASSIS PRODUCTION SERVICE MODE ADJUSTMENTS

14.1.SERVICE MENU

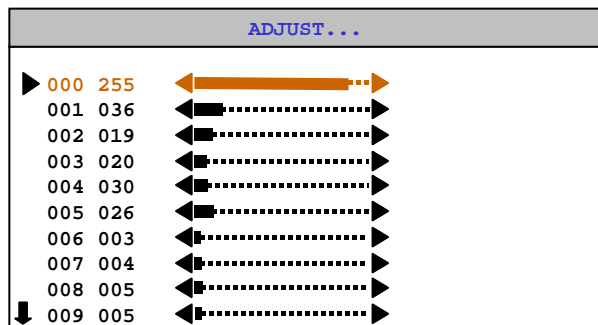
All system, geometry and white balance alignments are performed in production service mode. Before starting the production mode alignments, make sure that all manual adjustments are done correctly. To start production mode alignments enter the MAIN MENU and then press the digits 4, 7, 2 and 5 respectively or press **MUTE** and **INFO** buttons at the same time. The following first menu appears on the screen.



You can select Adjust or Options items by pressing Up/Down buttons. Selected parameter will be highlighted. In order to enter the selected parameter, press Left or Right button. To exit the service menu press MENU button. Entire service menu parameters of AK45 CHASSIS are listed below.

14.2.ADJUST MENU

Select the parameter by pressing up/down buttons. Adjust the parameter by pressing Left/Right buttons. In ADJUST menu, changed values are stored automatically.



White Point Red, White Point Green, White Point Blue:

Not used.

AGC

Apply PAL BG signal, VHF-3 Channel-12 and 60dBμV signal level. Adjust AGC (Automatic Gain Control) item by pressing Left/Right buttons till the voltage at AGC point (pin1 of the tuner) becomes 3.0 volts.

If PLL negative

Not used.

If PLL positive

Not used.

Y-Delay

Enter a PAL B/G colour and black-white bar test pattern via RF. Adjust Y-Delay for PAL till the colour transients on the colour bar of the pattern become as sharper and colours between transients do not mix with each other as possible.

Y-Delay SECAM

Enter a SECAM B/G colour and black-white bar test pattern via RF. Adjust Y-Delay SECAM till the colour transients on the colour bar of the pattern become as sharper and colours between transients do not mix with each other as possible.

Y-Delay NTSC

Enter an NTSC colour and black-white bar test pattern via RF. Adjust Y-Delay NTSC till the colour transients on the colour bar of the pattern become as sharper and colours between transients do not mix with each other as possible.

Y-Delay other

Not used.

Vertical Position Offset

This value is fixed (127)

Vertical Position Offset

This value is fixed (127)

Horizontal Position Offset

This value is fixed (127)

Horizontal Position Offset

This value is fixed (127)

Vertical Blank Start

This register will be used only at 4:3 tube for 16:9 mode adjustment. It adjusts the vertical blank start position.

Vertical Blank Stop

This register will be used only at 4:3 tube for 16:9 mode adjustment. It adjusts the vertical blank stop position.

Angle

Change Angle by pressing Left/Right buttons till the vertical lines of the crosshatch pattern become completely perpendicular to horizontal lines without any angle of vertical deviation. Check and readjust ANGLE item if the adjustment becomes improper after some other geometric adjustments are done.

Bow

Change Bow by pressing Left/Right buttons till the vertical lines especially ones close to the left and right sides will of equal and symmetrical bending, i.e. they together will neither be towards left side nor right side. Check and readjust BOW item if the adjustment becomes improper after some other geometric adjustments are done.

4:3 Horizontal Blank Start

This register will be used only at 16:9 tube for 4:3 mode adjustment. It adjusts the horizontal blank start position.

4:3 Horizontal Blank Stop

This register will be used only at 16:9 tube for 4:3 mode adjustment. It adjusts the horizontal blank stop position.

EHTV Compensation

It's used to adjust the EHT compensation vertical gain coefficient.

EHTTM Compensation

It's used to adjust the EHT compensation time constant.

EHTEW Compensation

It's used to adjust the EHT compensation east/west gain coefficient.

WDR

The amplitude of R of RGB output can be adjusted with the drive parameter WDR.

WDG

The amplitude of G of RGB output can be adjusted with the drive parameter WDG.

WDB

The amplitude of B of RGB output can be adjusted with the drive parameter WDB.

CR

The DC offset values of R of RGB output can be adjusted with the cutoff parameter CR.

CG

The DC offset values of G of RGB output can be adjusted with the cutoff parameter CG.

CB

The DC offset values of B of RGB output can be adjusted with the cutoff parameter CB.

COR coring level

The amplitude of the correction signal is adjustable. Small noise amplitudes in the correction signal are suppressed by an adjustable coring circuit.

REGULAR VERT_POS (Regular mode Vertical Position)

Enter a PAL B/G circle test pattern via RF. Change Vertical Position till the test pattern is vertically centered. Horizontal line at the center pattern is in equal distance both to upper and lower side of the picture tube. Check and readjust Vertical Position item if the adjustment becomes improper after some other geometric adjustments are done.

It's used to adjust the vertical position of regular mode.

REGULAR VERT_AMPL (Regular mode Vertical Amplitude)

It's used to adjust the vertical amplitude of regular mode.

REGULAR VERT_SCOR (Regular mode Vertical S-Correction)

It's used to adjust the vertical s-correction of regular mode.

REGULAR VERT_SSYM(Regular mode Vertical S Symmetry)

It's used to adjust the vertical s-symetry of regular mode.

REGULAR TRAPEZE (Regular mode Trapeze)

Change Trapezium by pressing Left/Right buttons till vertical lines, especially lines at the sides of the picture frame became parallel to the both sides of picture tube as close as possible. Check and readjust TRPEZ item if the adjustment becomes improper after some other geometric adjustments are done.

It's used to adjust the trapeze of regular mode.

REGULAR CUSHION (Regular mode Cushion)

It's used to adjust the cushion of regular mode.

REGULAR HOR_COR_SYM (Regular mode Horizontal Corner Symmetry)

It's used to adjust the horizontal corners symmetry of regular mode.

REGULAR HOR_CORNER (Regular mode Horizontal Corner)

It's used to adjust the horizontal corners of regular mode.

REGULAR HORZ_POS (Regular mode Horizontal Position)

Enter a PAL B/G circle test pattern via RF. Change Horizontal Position until the picture is horizontally centered. Check and readjust Horizontal Position item if the adjustment becomes improper after some other geometric adjustments are done.

It's used to adjust the horizontal position of regular mode.

REGULAR HORZ_AMPL (Regular mode Horizontal Amplitude)

It's used to adjust the horizontal amplitude of regular mode.

PANORAMIC VERT_POS (Panoramic mode Vertical Position)

It's used to adjust the vertical position of panoramic mode.

PANORAMIC VERT_AMPL (Panoramic mode Vertical Amplitude)

It's used to adjust the vertical amplitude of panoramic mode.

PANORAMIC VERT_SCOR (Panoramic mode Vertical S-Correction)

It's used to adjust the vertical s-correction of panoramic mode.

PANORAMIC VERT_SSYM (Panoramic mode Vertical S-Symmetry)

It's used to adjust the vertical s-symmetry of panoramic mode.

PANORAMIC TRAPEZE (Panoramic mode Trapeze)

It's used to adjust the trapeze of panoramic mode.

PANORAMIC CUSHION (Panoramic mode Cushion)

It's used to adjust the cushion of panoramic mode.

PANORAMIC HOR_COR_SYM (Panoramic mode Horizontal corner symmetry)

It's used to adjust the horizontal corners symmetry of panoramic mode.

PANORAMIC HOR_CORNER (Panoramic mode Horizontal corner)

It's used to adjust the horizontal corners of panoramic mode.

PANORAMIC HORZ_POS (Panoramic mode Horizontal position)

It's used to adjust the horizontal position of panoramic mode.

PANORAMIC HORZ_AMPL (Panoramic mode Horizontal amplitude)

It's used to adjust the horizontal amplitude of panoramic mode.

14:9 ZOOM VERT_POS (14:9 Zoom mode Vertical Position)

It's used to adjust the vertical position of 14:9 zoom mode.

14:9 ZOOM VERT_AMPL (14:9 Zoom mode Vertical Amplitude)

It's used to adjust the vertical amplitude of 14:9 zoom mode.

14:9 ZOOM VERT_SCOR (14:9 Zoom mode Vertical S-Correction)

It's used to adjust the vertical s-correction of 14:9 zoom mode.

14:9 ZOOM VERT_SSYM (14:9 Zoom mode Vertical Symmetry)

It's used to adjust the vertical s-symmetry of 14:9 zoom mode.

14:9 ZOOM TRAPEZE (14:9 Zoom mode Trapeze)

It's used to adjust the trapeze of 14:9 zoom mode.

14:9 ZOOM CUSHION (14:9 Zoom mode Cushion)

It's used to adjust the cushion of 14:9 zoom mode.

14:9 ZOOM HOR_COR_SYM (14:9 Zoom mode Corner Symmetry)

It's used to adjust the horizontal corners symmetry of 14:9 zoom mode.

14:9 ZOOM HOR_CORNER (14:9 Zoom mode Horizontal Corner)

It's used to adjust the horizontal corners of 14:9 zoom mode.

14:9 ZOOM HORZ_POS (14:9 Zoom mode Horizontal Position)

It's used to adjust the horizontal position of 14:9 zoom mode.

14:9 ZOOM HORZ_AMPL (14:9 Zoom mode Horizontal Amplitude)

It's used to adjust the horizontal amplitude of 14:9 zoom mode.

16:9 ZOOM VERT_POS (16:9 Zoom mode Vertical Position)

It's used to adjust the vertical position of 16:9 zoom mode.

16:9 ZOOM VERT_AMPL (16:9 Zoom mode Vertical Amplitude)

It's used to adjust the vertical amplitude of 16:9 zoom mode.

16:9 ZOOM VERT_SCOR (16:9 Zoom mode Vertical S-Correction)

It's used to adjust the vertical s-correction of 16:9 zoom mode.

16:9 ZOOM VERT_SSYM (16:9 Zoom mode Vertical S-Symmetry)

It's used to adjust the vertical s-symmetry of 16:9 zoom mode.

16:9 ZOOM TRAPEZE (16:9 Zoom mode Trapeze)

It's used to adjust the trapeze of 16:9 zoom mode.

16:9 ZOOM CUSHION (16:9 Zoom mode Cushion)

It's used to adjust the cushion of 16:9 zoom mode.

16:9 ZOOM HOR_COR_SYM (16:9 Zoom mode Horizontal corner symmetry)

It's used to adjust the horizontal corners symmetry of 16:9 zoom mode.

16:9 ZOOM HOR_CORNER (16:9 Zoom mode Horizontal corner)

It's used to adjust the horizontal corners of 16:9 zoom mode.

16:9 ZOOM HORZ_POS (16:9 Zoom mode Horizontal position)

It's used to adjust the horizontal position of 16:9 zoom mode.

16:9 ZOOM HORZ_AMPL (16:9 Zoom mode Horizontal amplitude)

It's used to adjust the horizontal amplitude of 16:9 zoom mode.

16:9 ZOOM SUBTITLE VERT_POS (16:9 Zoom Subtitle mode Vertical position)

It's used to adjust the vertical position of 16:9 zoom subtitle mode.

16:9 ZOOM SUBTITLE VERT_AMPL (16:9 Zoom Subtitle mode Vertical amplitude)

It's used to adjust the vertical amplitude of 16:9 zoom subtitle mode.

16:9 ZOOM SUBTITLE VERT_SCOR (16:9 Zoom Subtitle mode Vertical S-Correction)

It's used to adjust the vertical s-correction of 16:9 zoom subtitle mode.

16:9 ZOOM SUBTITLE VERT_SSYM (16:9 Zoom Subtitle mode Vertical Symmetry)

It's used to adjust the vertical s-symmetry of 16:9 zoom subtitle mode.

16:9 ZOOM SUBTITLE TRAPEZE (16:9 Zoom Subtitle mode Trapeze)

It's used to adjust the trapeze of 16:9 zoom subtitle mode.

16:9 ZOOM SUBTITLE CUSHION (16:9 Zoom Subtitle mode Cushion)

It's used to adjust the cushion of 16:9 zoom subtitle mode.

16:9 ZOOM SUBTITLE HOR_COR_SYM (16:9 Zoom Subtitle mode Horizontal Corner Symmetry)

It's used to adjust the horizontal corners symmetry of 16:9 zoom subtitle mode.

16:9 ZOOM SUBTITLE HOR_CORNER (16:9 Zoom Subtitle mode Horizontal corner)

It's used to adjust the horizontal corners of 16:9 zoom subtitle mode.

16:9 ZOOM SUBTITLE HORZ_POS (16:9 Zoom Subtitle mode Horizontal position)

It's used to adjust the horizontal position of 16:9 zoom subtitle mode.

16:9 ZOOM SUBTITLE HORZ_AMPL (16:9 Zoom Subtitle mode Horizontal amplitude)

It's used to adjust the horizontal amplitude of 16:9 zoom subtitle mode.

OSD Position

It's used to adjust the horizontal position of the OSD.

BCLTHR

Beam current threshold

BCLG

Beam current loop gain

ROTATION (TILT)

This adjustment only works when the TV has rotation option. Change TILT by pressing Left/Right buttons to rotate the complete raster clock-wise and counter clock-wise depending on the CRT. Check and readjust TRPEZ item if the adjustment becomes improper after some other geometric adjustments are done.

LSLSA, LSLSB, LSL2, LSLTA, LSLTB (Luma soft limiter)

LSLSA: Luma soft limiter slope A (fixed)

LSLSB: Luma soft limiter slope B (fixed)

LSL2: Luma soft limiter absolute limit (fixed)

LSLTA: Luma soft limiter segment A tilt point (fixed)

LSLTB: Luma soft limiter segment A tilt point (fixed)

REFERENCE WDR RED (NORMAL)

The amplitude of R of RGB output can be adjusted with the drive parameter WDR for the colour temperature of normal mode.

REFERENCE WDR GREEN (NORMAL)

The amplitude of G of RGB output can be adjusted with the drive parameter WDR for the colour temperature of normal mode.

REFERENCE WDR BLUE (NORMAL)

The amplitude of B of RGB output can be adjusted with the drive parameter WDR for the colour temperature of normal mode.

REFERENCE CUTOFF RED

It's fixed.

REFERENCE CUTOFF GREEN

It's fixed.

REFERENCE CUTOFF BLUE

It's fixed.

IBRM

Internal Brightness, the brightness for measurement can be set to measure at higher cutoff current. The measurement brightness is independent of the drive values. It's used to adjust the maximum brightness level.

WDRV

White drive measurement control. It is used to adjust the maximum contrast level.

ACC_SAT (COLOUR OFFSET)

It's used to adjust the max. colour level.

G2 CUTOFF REFERENCE

It's fixed.

G2 WDR REFERENCE

It's fixed.

POFS2 (RGB HORIZONTAL SHIFT)

It's used to adjust the horizontal position of RGB signal.

REFERENCE WDR RED COOL

The amplitude of R of RGB output can be adjusted with the drive parameter WDR for the colour temp of cool mode.

REFERENCE WDR GREEN COOL

The amplitude of G of RGB output can be adjusted with the drive parameter WDR for the colour temp of cool mode.

REFERENCE WDR BLUE COOL

The amplitude of B of RGB output can be adjusted with the drive parameter WDR for the colour temp of cool mode.

REFERENCE WDR RED WARM

The amplitude of R of RGB output can be adjusted with the drive parameter WDR for the colour temp of warm mode.

REFERENCE WDR GREEN WARM

The amplitude of G of RGB output can be adjusted with the drive parameter WDR for the colour temp of cool mode.

REFERENCE WDR BLUE WARM

The amplitude of B of RGB output can be adjusted with the drive parameter WDR for the colour temp of cool mode.

STANDARD MODE BRIGHTNESS

It's used to adjust the brightness value of standard mode.

STANDARD MODE COLOUR

It's used to adjust the colour value of standard mode.

STANDARD MODE CONTRAST

It's used to adjust the contrast value of standard mode.

FULL VERT_POS (16:9 MODE)

It's used to adjust the vertical position of 16:9 mode (full mode).

FULL VERT_AMPL

It's used to adjust the vertical amplitude of 16:9 mode (full mode).

FULL VERT_SCOR

It's used to adjust the vertical s-correction of 16:9 mode (full mode).

FULL VERT_SSYM

It's used to adjust the vertical s-symmetry of 16:9 mode (full mode).

FULL TRAPEZE

It's used to adjust the trapeze of 16:9 mode (full mode).

FULL CUSHION

It's used to adjust the cushion of 16:9 mode (full mode).

FULL HOR_COR_SYM

It's used to adjust the horizontal corners symmetry of 16:9 mode (full mode).

FULL HOR_CORNER

It's used to adjust the horizontal corners of 16:9 mode (full mode).

FULL HORZ_POS

It's used to adjust the horizontal position of 16:9 mode (full mode).

FULL HORZ_AMPL

It's used to adjust the horizontal amplitude of 16:9 mode (full mode).

BRIGHT MODE BRIGHTNESS

It's used to adjust the brightness value of bright mode.

BRIGHT MODE COLOUR

It's used to adjust the colour value of bright mode.

BRIGHT MODE CONTRAST

It's used to adjust the contrast value of bright mode.

SOFT MODE BRIGHTNESS

It's used to adjust the brightness value of soft mode.

SOFT MODE COLOUR

It's used to adjust the colour value of soft mode.

SOFT MODE CONTRAST

It's used to adjust the contrast value of soft mode.

PERSONAL MODE FACTORY SETTING BRIGHTNESS

It's fixed.

PERSONAL MODE FACTORY SETTING COLOUR

It's fixed.

PERSONAL MODE FACTORY SETTING CONTRAST

It's fixed.

SCINC FOR PANAROMIC MODE

scaler1 coefficient, this scaler is compressing the signal.

SCINC1 FOR PANAROMIC MODE

scaler2 coefficient, this scaler is expanding the signal.

VOLUME AFTER APS

It's used to adjust the volume level after APS.

VERTICAL SCROLL

It's used to adjust the step width for scroll function.

14:9 HORIZONTAL START

It's used to adjust the horizontal blank start position for 14:9 mode.

14:9 HORIZONTAL STOP

It's used to adjust the horizontal blank stop position for 14:9 mode.

4:3 RGB HORIZONTAL AMPLITUDE

It's used to adjust the horizontal amplitude in 4:3 mode for RGB signals.

4:3 RGB CUSHION

It's used to adjust the cushion in 4:3 mode for RGB signals.

14:9 RGB HORIZONTAL AMPLITUDE

It's used to adjust the horizontal amplitude in 14:9 mode for RGB signals.

14:9 RGB CUSHION

It's used to adjust the cushion in 14:9 mode for RGB signals.

PANAROMIC RGB HORIZONTAL AMPLITUDE

It's used to adjust the horizontal amplitude in panoramic mode for RGB signals.

16:9 RGB HORIZONTAL AMPLITUDE

It's used to adjust the horizontal amplitude in 16:9 mode for RGB signals.

16:9 SUBTITLE RGB HORIZONTAL AMPLITUDE

It's used to adjust the horizontal amplitude in 16:9 subtitle mode for RGB signals.

FULL RGB HORIZONTAL AMPLITUDE

It's used to adjust the horizontal amplitude in full mode for RGB signals.

TELETEXT HORZ_POS

It's used to adjust the horizontal position of teletext signal.

| ADJUST | EXPLANATION | 2835 | 2835W |
|--------|---|--|---------------|
| | | MULTI | MULTI - PAL I |
| 000 | White Point RED | 255 | 255 |
| 001 | White Point GREEN | 126 | 036 |
| 002 | Whit Point BLUE | 127 | 019 |
| 003 | AGC (Automatic Gain Control) | 20 It will be adjusted to below 1V of Max. AGC for each TV. | |
| 004 | IF-PLL Negative | 030 | 030 |
| 005 | IF-PLL Positive | 026 | 026 |
| 006 | Y-Delay | 003 | 002 |
| 007 | Y-Delay SECAM | 004 | 003 |
| 008 | Y-Delay NTSC | 005 | 005 |
| 009 | Y-Delay OTHER | 005 | 005 |
| 010 | Vertical Position Offset | 127 | 127 |
| 011 | Vertical Amplitude Offset | 127 | 127 |
| 012 | Horizontal Position Offset | 127 | 127 |
| 013 | Horizontal Amplitude Offset | 127 | 127 |
| 014 | Vertical Blank Start (It will be used only at 4:3 tube for 16:9 mode adjustment) | 149 | 119 |
| 015 | Vertical Blank Stop (It will be used only at 4:3 tube for 16:9 mode adjustment) | 013 | 034 |
| 016 | Angle | 132 | 132 |
| 017 | Bow | 126 | 131 |
| 018 | 4:3 Horz. Blank Start (It will be used only at 16:9 tube for 4:3 mode adjustment) | 021 | 042 |
| 019 | 4:3 Horz. Blank Stop (It will be used only at 16:9 tube for 4:3 mode adjustment) | 140 | 175 |
| 020 | EHTV compensation | 054 | 066 |
| 021 | EHTTM compensation | 004 | 001 |
| 022 | EHTEW compensation | 219 | 160 |
| 023 | WDR | VIDEO PROCESSOR ADJUSTS ITSELF. | |
| 024 | WDG | | |
| 025 | WDB | | |
| 026 | CR | | |
| 027 | CG | | |
| 028 | CB | | |
| 029 | COR coring level | 015 | 031 |
| 030 | REGULAR VERT_POS (Vertical Position) | 128 | 129 |
| 031 | REGULAR VERT_AMPL (Vertical Amplitude) | 081 | 055 |
| 032 | REGULAR VERT_SCOR (Vertical S Correction) | 131 | 129 |
| 033 | REGULAR VERT_SSYM (Vertical S Symmetry) | 139 | 136 |
| 034 | REGULAR TRAPEZE | 125 | 127 |
| 035 | REGULAR CUSHION | 162 | 153 |
| 036 | REGULAR HOR_COR_SYM(Horizontal Corner Symmetry) | 137 | 132 |
| 037 | REGULAR HOR_CORNER (Horizontal Corner) | 094 | 113 |
| 038 | REGULAR HORZ_POS (Horizontal Position) | 055 | 052 |
| 039 | REGULAR HORZ_AMPL (Horizontal Amplitude) | 057 | 030 |
| 040 | PANORAMIC VERT_POS | - | 129 |
| 041 | PANORAMIC VERT_AMPL | - | 050 |
| 042 | PANORAMIC VERT_SCOR | - | 129 |
| 043 | PANORAMIC VERT_SSYM | - | 139 |
| 044 | PANORAMIC TRAPEZE | - | 125 |
| 045 | PANORAMIC CUSHION | - | 156 |
| 046 | PANORAMIC HOR_COR_SYM | - | 141 |
| 047 | PANORAMIC HOR_CORNER | - | 108 |
| 048 | PANORAMIC HORZ_POS | - | 030 |

| | | | |
|-----|--------------------------------|-----|-----|
| 049 | PANORAMIC HORZ_AMPL | - | 013 |
| 050 | 14:9 ZOOM VERT_POS | - | 129 |
| 051 | 14:9 ZOOM VERT_AMPL | - | 043 |
| 052 | 14:9 ZOOM VERT_SCOR | - | 129 |
| 053 | 14:9 ZOOM VERT_SSYM | - | 140 |
| 054 | 14:9 ZOOM TRAPEZE | - | 125 |
| 055 | 14:9 ZOOM CUSHION | - | 159 |
| 056 | 14:9 ZOOM HOR_COR_SYM | - | 141 |
| 057 | 14:9 ZOOM HOR_CORNER | - | 110 |
| 058 | 14:9 ZOOM HORZ_POS | - | 053 |
| 059 | 14:9 ZOOM HORZ_AMPL | - | 032 |
| 060 | 16:9 ZOOM VERT_POS | - | 129 |
| 061 | 16:9 ZOOM VERT_AMPL | - | 035 |
| 062 | 16:9 ZOOM VERT_SCOR | - | 129 |
| 063 | 16:9 ZOOM VERT_SSYM | - | 148 |
| 064 | 16:9 ZOOM TRAPEZE | - | 125 |
| 065 | 16:9 ZOOM CUSHION | - | 164 |
| 066 | 16:9 ZOOM HOR_COR_SYM | - | 138 |
| 067 | 16:9 ZOOM HOR_CORNER | - | 104 |
| 068 | 16:9 ZOOM HORZ_POS | - | 036 |
| 069 | 16:9 ZOOM HORZ_AMPL | - | 020 |
| 070 | 16:9 ZOOM SUBTITLE VERT_POS | - | 137 |
| 071 | 16:9 ZOOM SUBTITLE VERT_AMPL | - | 039 |
| 072 | 16:9 ZOOM SUBTITLE VERT_SCOR | - | 124 |
| 073 | 16:9 ZOOM SUBTITLE VERT_SSYM | - | 146 |
| 074 | 16:9 ZOOM SUBTITLE TRAPEZE | - | 119 |
| 075 | 16:9 ZOOM SUBTITLE CUSHION | - | 164 |
| 076 | 16:9 ZOOM SUBTITLE HOR_COR_SYM | - | 162 |
| 077 | 16:9 ZOOM SUBTITLE HOR_CORNER | - | 081 |
| 078 | 16:9 ZOOM SUBTITLE HORZ_POS | - | 035 |
| 079 | 16:9 ZOOM SUBTITLE HORZ_AMPL | - | 021 |
| 080 | OSD Position | 217 | 205 |
| 081 | BCLTHR Beam current threshold | 050 | 060 |
| 082 | BCLG Beam current loop gain | 008 | 007 |
| 083 | ROTATION (TILT) | 000 | 000 |
| 084 | LLSA Luma soft limiter | 000 | 003 |
| 085 | LLSB Luma soft limiter | 000 | 000 |
| 086 | LSL2 Luma soft limiter | 255 | 255 |
| 087 | LSLTA Luma soft limiter | 000 | 000 |
| 088 | LSLTB Luma soft limiter | 000 | 001 |
| 089 | REFERENCE WDR RED (NORMAL) | 088 | 092 |
| 090 | REFERENCE WDR GREEN (NORMAL) | 074 | 083 |
| 091 | REFERENCE WDR BLUE (NORMAL) | 075 | 082 |
| 092 | REFERENCE CUTOFF RED | 065 | 055 |
| 093 | REFERENCE CUTOFF GREEN | 068 | 069 |
| 094 | REFERENCE CUTOFF BLUE | 077 | 069 |
| 095 | IBRM | 200 | 215 |
| 096 | WDRV | 075 | 060 |
| 097 | ACC_SAT (COLOUR OFFSET) | 154 | 130 |
| 098 | G2_CUTOFF_REFERENCE | 200 | 220 |
| 099 | G2_WDR_REFERENCE | 090 | 090 |
| 100 | POFS2 (RGB HORIZONTAL SHIFT) | 053 | 034 |
| 101 | REFERENCE WDR RED COOL | 090 | 089 |
| 102 | REFERENCE WDR GREEN COOL | 078 | 082 |
| 103 | REFERENCE WDR BLUE COOL | 093 | 090 |
| 104 | REFERENCE WDR RED WARM | 096 | 104 |
| 105 | REFERENCE WDR GREEN WARM | 070 | 085 |
| 106 | REFERENCE WDR BLUE WARM | 073 | 080 |
| 107 | STANDARD MODE BRIGHTNESS | 027 | 043 |

| | | | |
|-----|--|-----|-----|
| 108 | STANDARD MODE COLOUR | 050 | 047 |
| 109 | STANDARD MODE CONTRAST | 022 | 029 |
| 110 | FULL VERT_POS (16:9 MODE) | 128 | 129 |
| 111 | FULL VERT_AMPL | 093 | 055 |
| 112 | FULL VERT_SCOR | 131 | 129 |
| 113 | FULL VERT_SSYM | 133 | 136 |
| 114 | FULL TRAPEZE | 127 | 126 |
| 115 | FULL CUSHION | 148 | 153 |
| 116 | FULL HOR_COR_SYM | 137 | 136 |
| 117 | FULL HOR_CORNER | 109 | 109 |
| 118 | FULL HORZ_POS | 055 | 035 |
| 119 | FULL HORZ_AMPL | 057 | 020 |
| 120 | BRIGHT MODE BRIGHTNESS | 027 | 043 |
| 121 | BRIGHT MODE COLOUR | 050 | 050 |
| 122 | BRIGHT MODE CONTRAST | 030 | 032 |
| 123 | SOFT MODE BRIGHTNESS | 027 | 043 |
| 124 | SOFT MODE COLOUR | 050 | 058 |
| 125 | SOFT MODE CONTRAST | 017 | 020 |
| 126 | PERSONAL MODE FACTORY SETTING BRIGHTNESS | 027 | 043 |
| 127 | PERSONAL MODE FACTORY SETTING COLOUR | 050 | 050 |
| 128 | PERSONAL MODE FACTORY SETTING CONTRAST | 030 | 032 |
| 129 | SCINC FOR PANORAMIC MODE | 032 | 056 |
| 130 | SCINC1 FOR PANORAMIC MODE | 032 | 125 |
| 131 | VOLUME AFTER APS | | 005 |
| 132 | VERTICAL SCROLL | 005 | 008 |
| 133 | 14:9 HORIZONTAL START (It will be used only at 16:9 tube for 14:9 mode adjustment) | - | 031 |
| 134 | 14:9 HORIZONTAL STOP (It will be used only at 16:9 tube for 14:9 mode adjustment) | - | 185 |
| 135 | 4:3 RGB HORIZONTAL AMPLITUDE | 055 | 074 |
| 136 | 4:3 RGB CUSHION | 163 | 150 |
| 137 | 14:9 RGB HORIZONTAL AMPLITUDE | - | 055 |
| 138 | 14:9 RGB CUSHION | - | 158 |
| 139 | PANAROMIC RGB HORIZONTAL AMPLITUDE | - | 031 |
| 140 | 16:9 RGB HORIZONTAL AMPLITUDE | - | 027 |
| 141 | 16:9 SUBTITLE RGB HORIZONTAL AMPLITUDE | - | 027 |
| 142 | FULL RGB HORIZONTAL AMPLITUDE | 054 | 027 |
| 143 | TELETEXT HORIZONTAL POSITION | 101 | 095 |

14.3.OPTIONS MENU

Select the parameter by pressing up/down buttons. Adjust the parameter by pressing Left/Right buttons. . In OPTIONS menu, some of the changed parameters are not stored automatically. To store the adjusted parameters, you should turn off and on TV.

| OPTIONS... | | |
|------------|--------|----------|
| ▶ | 000 02 | 00000010 |
| | 001 00 | 00000000 |
| | 002 22 | 00100010 |
| | 003 08 | 00001000 |
| | 004 00 | 00000000 |
| | 005 10 | 00010000 |
| | 006 00 | 00000000 |
| | 007 56 | 01010110 |
| | 008 39 | 00111001 |
| ↓ | 009 0F | 00001111 |

Option 0. Video Processor Crystal Indication

B7: x = x
B6: x = x
B5: x = x
B4: x = x
B3: x = x
B2: x = x
B1: Xa = note1 (Crystal indication)
B0: Xb = note1 (Crystal indication)

note 1:

Xa,Xb

0,1 : Pal M, Pal N, NTSC M

Pin 34 : 3.58 (1, 2 or 3 crystals)

Pin 35 : No crystal

1,0 : Pal BG, Pal DK, Pal I/I+, Secam BG, Secam DK, Secam L/L', Secam K1

Pin 34 : No crystal

Pin 35 : 4.43 (1 crystal)

1,1 : Pal BG, Pal DK, Pal I/I+, Secam BG, Secam DK, Secam L/L', Secam K1, Pal M, Pal N, Ntsc M

Pin 34 : 3.58 (1, 2 or 3 crystals)

Pin 35 : 4.43 (1 crystal)

Option 1. (0x01) Video Processor Decoder Mode Register

B7: x = x
B6: x = x
B5: x = x
B4: x = x
B3: x = x
B2: x = x
B1: x = x
B0: x = x

Option 2. (0x18) Video Processor Blanking Control

B7: SWF = 1 (Subwoofer item at menu)
B6: Vsd = 0 (Vertical scan disable)
B5: x = x

B4: x = x
 B3: x = x
 B2: x = x
 B1: LUMA = 1 Luma Soft Limiter Enabled
 B0: BB = 1 Blue Background Option

Option 3. (0x19) Video Processor Cathode Drive Level

B7: x = x
 B6: x = x
 B5: x = x
 B4: x = x
 B3: x = x
 B2: x = x
 B1: x = x
 B0: country = note 0

Note 0: choice for others country option

1 : BG
 0 : DK

Option 4.

B7: x = x
 B6: x = x
 B5: x = x
 B4: x = x
 B3: x = x
 B2: x = x
 B1: x = x
 B0: x = x

Option 5. CTI Available, Mono AVL

B7: x = x
 B6: x = x
 B5: x = x
 B4: x = x
 B3: x = x
 B2: x = x
 B1: x = x
 B0: x = x

Option 6.

B7: = TEXT LANGUAGE 3
 B6: = TEXT LANGUAGE 2
 B5: = TEXT LANGUAGE 1
 B4: x = x
 B3: x = x
 B2: x = x
 B1: x = x
 B0: x = x

Option 7. OPTIONHOTELACTIVE, PLL_VST, PIP Zoom Mode, PIP Position

B7: x = x
 B6: x = x
 B5: F = note 1
 B4: x = x
 B3: x = x
 B2: PZM= x
 B1: AV2 = 1 AV2 Output enabled
 B0: x = x

note 1:

F :Frequency Mode
 1: = Frequency Menu Item available
 0: = Frequency Menu Item not available

Option 8. IF Frequency

B7: x = x
 B6: x = x
 B5: Ifl = 0 note 3
 B4: IfD = 0 note 4
 B3: IfM = note 5
 B2: Aps = note 6
 B1: Hp = note 7
 B0: Hue = note 8

note 3:

Ifl
 1 = IF I 39.5 MHz Great Britain I , Only UHF Tuner
 0 = IF I 38.9 MHz Ireland I+, Standard Tuner

note 4:

IfD
 1 = IF DK 38.0 MHz
 0 = IF DK 38.9 MHz

note 5:

IfM
 1 = IF M,N 45.75 MHz S&N American Models , Tuner UV1336 (Only Pal M/N, Ntsc M)
 0 = IF M,N 38.9 MHz Euro M,N Models , Standard Tuner

Note 6:

Aps (Only for PLL)
 0 = A.P.S. done
 1 = A.P.S. set

note 7:

Hp : Headphone available
 0 = No headphone
 1 = Headphone available

note 8:

Hue : Hue Available
 0 = No Hue
 1 = Hue available

Option 9. Standard Available

B7: NM = note 1
 B6: PN = note 1
 B5: PM = note 1
 B4: K1 = note 1
 B3: L = note 1
 B2: I = note 1
 B1: DK = note 1
 B0: BG = note 1

note 1:

0 = Standard not supported
 1 = Standard available

Option 10. Scart, Combfilter, Teletext, Language

B7: x = x
B6: RGB = note 2
B5: FAV =
B4: AV2S =
B3: FSVHS = note 3
B2: BAV = note 4
B1: Sc2 = note 5
B0: BSVHS = note 6

note 2 :

RGB = RGB Menu Item active/inactive

0 = RGB Menu Item inactive
1 = RGB Menu Item active

note 3:

0 = Front S-VHS not supported
1 = Front S-VHS available

note 4:

0 = Back AV (AV-3) not supported
1 = Back AV (AV-3) available

note 5:

0 = Scart 2 not supported
1 = Scart 2 available

note 6:

0 = Back SVHS not supported
1 = Back SVHS available

Option 11. PLL Tuner Control 1 Byte

PLL tuner control 1 byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---------|----------------|----|----|----|----|----|----|----|----|
| Philips | UV1316T MK3 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Philips | UV1316MK2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Alps | TELE9X062A | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Samsung | TEXX2949PG28A | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Siel | PT060 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Temic | 5001PH5-3X0003 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Thomson | CTT5020 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |

Option 12. PLL Tuner Control 2 Low Byte

PLL tuner control 2 low byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---------|----------------|----|----|----|----|----|----|----|----|
| Philips | UV1316T MK3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Philips | UV1316MK2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Samsung | TEXX2949PG28A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Siel | PT060 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Thomson | CTT5020 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |

Option 13. PLL Tuner Control 2 Mid Byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---------|----------------|----|----|----|----|----|----|----|----|
| Philips | UV1316T MK3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Philips | UV1316MK2 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Samsung | TEXX2949PG28A | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Siel | PT060 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Thomson | CTT5020 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |

Option 14. PLL Tuner Control 2 High Byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---------|----------------|----|----|----|----|----|----|----|----|
| Philips | UV1316T MK3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Philips | UV1316MK2 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Samsung | TEXX2949PG28A | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Siel | PT060 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Thomson | CTT5020 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

Option 15. PLL Tuner VHF LOW – VHF HIGH Crossover Low Byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---------|----------------|----|----|----|----|----|----|----|----|
| Philips | UV1316T MK3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Philips | UV1316MK2 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Samsung | TEXX2949PG28A | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Siel | PT060 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thomson | CTT5020 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |

(0A hex)

(AA hex)

Option 16. PLL Tuner VHF LOW – VHF HIGH Crossover High Byte

PLL tuner VHF LOW - VHF HIGH crossover high byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---------|----------------|----|----|----|----|----|----|----|----|
| Philips | UV1316T MK3 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Philips | UV1316MK2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Samsung | TEXX2949PG28A | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| Siel | PT060 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thomson | CTT5020 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |

(0C hex)

(09 hex)

Option 17. PLL Tuner VHF HIGH – UHF Crossover Low Byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---------|----------------|----|----|----|----|----|----|----|----|
| Philips | UV1316T MK3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Philips | UV1316MK2 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Samsung | TEXX2949PG28A | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| Siel | PT060 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thomson | CTT5020 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |

(E2 hex)

(A2 hex)

Option 18. PLL Tuner VHF HIGH – UHF Crossover High Byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---------|----------------|----|----|----|----|----|----|----|----|
| Philips | UV1316T MK3 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| Philips | UV1316MK2 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Samsung | TEXX2949PG28A | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| Siel | PT060 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

(1D hex)

Thomson CTT5020 0 0 0 1 1 0 1 1 (1B hex)

Option 19. PIP PLL Tuner Control 1 Byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---------|----------------|----|----|----|----|----|----|----|----|
| Philips | UV1316MK2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Alps | TELE9X062A | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Samsung | TEXX2949PG28A | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Siel | PT060 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Temic | 5001PH5-3X0003 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Thomson | CTT5020 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |

Option 20. PIP PLL Tuner Control 2 Low Byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---------|----------------|----|----|----|----|----|----|----|----|
| Philips | UV1316MK2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Samsung | TEXX2949PG28A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Siel | PT060 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Thomson | CTT5020 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |

Option 21. PIP PLL Tuner Control 2 Mid Byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---------|----------------|----|----|----|----|----|----|----|----|
| Philips | UV1316MK2 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Samsung | TEXX2949PG28A | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Siel | PT060 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Thomson | CTT5020 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |

Option 22. PIP PLL Tuner Control 2 High Byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---------|----------------|----|----|----|----|----|----|----|----|
| Philips | UV1316MK2 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Samsung | TEXX2949PG28A | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Siel | PT060 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Thomson | CTT5020 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

Option 23. PIP PLL Tuner VHF LOW – VHF HIGH Crossover Low Byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 | |
|---------|----------------|----|----|----|----|----|----|----|----|----------|
| Philips | UV1316MK2 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | (0A hex) |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Samsung | TEXX2949PG28A | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | |
| Siel | PT060 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Thomson | CTT5020 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | (AA hex) |

Option 24. PIP PLL Tuner VHF LOW – VHF HIGH Crossover High Byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 | |
|---------|----------------|----|----|----|----|----|----|----|----|----------|
| Philips | UV1316MK2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | (0C hex) |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Samsung | TEXX2949PG28A | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | |
| Siel | PT060 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Thomson | CTT5020 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | (09 hex) |

Option 25. PIP PLL Tuner VHF HIGH – UHF Crossover Low Byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 | |
|---------|----------------|----|----|----|----|----|----|----|----|----------|
| Philips | UV1316MK2 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | (E2 hex) |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Samsung | TEXX2949PG28A | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | |
| Siel | PT060 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Thomson | CTT5020 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | (A2 hex) |

Option 26. PIP PLL Tuner VHF HIGH – UHF Crossover High Byte

| | | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 | |
|---------|----------------|----|----|----|----|----|----|----|----|----------|
| Philips | UV1316MK2 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | (1D hex) |
| Alps | TELE9X062A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Samsung | TEXX2949PG28A | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | |
| Siel | PT060 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | |
| Temic | 5001PH5-3X0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Thomson | CTT5020 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | (1B hex) |

Option 27. Language Available 1

B7: L7 = DANISH
 B6: L6 = SWEDISH
 B5: L5 = ITALIAN
 B4: L4 = PORTUGUESE
 B3: L3 = SPANISH
 B2: L2 = FRENCH
 B1: L1 = GERMAN
 B0: L0 = ENGLISH

1: Language available
 0: Language not available

Option 28. Language Available 2

B7: L15 = CROATIC
 B6: L14 = POLISH
 B5: L13 = SLOVAK
 B4: L12 = CZECH
 B3: L11 = HUNGARY
 B2: L10 = GREEK
 B1: L9 = TURKEY
 B0: L8 = NORWEGIAN

1: Language available
 0: Language not available

Option 29. Language Available 3 and Zoom Mode Available

B7: ZSP = 16:9 ZOOM SUBTITLE MODE
 B6: ZSB = 16:9 ZOOM MODE
 B5: ZCN = 14:9 ZOOM MODE
 B4: PNM = 1 (Panaromic zoom mode)
 B3: Tub = note 2
 B2: Z.Def = note 3
 B1: PMK = note 1
 B0:

1: Available
 0: Not available

note 1 :

PMK : Picture mode key
 0 : Not available picture mode key from RC
 1 : available picture mode key from RC

note 2:

Tub : Tube size

- 0 = 16:9 Tube size
- 1 = 4:3 Tube size

note 3:

Z.Def : Zoom Default Mode

- 0 = 16:9 mode default
- 1 = 4:3 mode default

Option 30. Country

- B7: C4 = note 1
- B6: C3 = note 1
- B5: C2 = note 1
- B4: C1 = note 1
- B3: C0 = note 1
- B2: x = x
- B1: x = x
- B0: x = x

note 1:

C5,C4,C3,C2,C1,C0 = Country

- 0, 0, 0,0,0 = OTHER, Not allowed
- 0, 0, 0,0,1 = D, Germany
- 0, 0, 0,1,0 = A,
- 0, 0, 0,1,1 = CH,
- 0, 0, 1,0,0 = I,
- 0, 0, 1,0,1 = F,
- 0, 0, 1,1,0 = RSM,
- 0, 0, 1,1,1 = B,
- 0, 1, 0,0,0 = DK,
- 0, 1, 0,0,1 = S,
- 0, 1, 0,1,0 = N,
- 0, 1,0,1,1 = FIN,
- 0, 1,1,0,0 = GB,
- 0, 1,1,0,1 = IRL,
- 0, 1,1,1,0 = IS,
- 0, 1,1,1,1 = NL,
- 1, 0,0,0,0 = E,
- 1, 0,0,0,1 = P,
- 1, 0,0,1,0 = PL,
- 1, 0,0,1,1 = CZ,
- 1, 0,1,0,0 = H,
- 1, 0,1,0,1 = HR,
- 1, 0,1,1,0 = GR,
- 1, 0,1,1,1 = TR

Option 31. Prescaler MSP FM (AVL=OFF)

prescaler MSP FM (AVL = OFF) b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 1 0 0 0

prescaler MSP FM (AVL = OFF) b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 1 0 0 0 (if virtual dolby option is available)

Option 32. Prescaler MSP NICAM (AVL=OFF)

prescaler MSP NICAM (AVL = OFF) b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 1 1 1 1 1

prescaler MSP NICAM (AVL = OFF) b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 1 1 1 1 1 (if virtual dolby option is available)

Option 33. Prescaler MSP SCART (AVL=OFF)

prescaler MSP SCART (AVL = OFF) b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 1 1 0 0

prescaler MSP SCART (AVL = OFF) b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 1 1 0 0 1 (if virtual dolby option is available)

Option 34. Prescaler MSP I2S (AVL=OFF)

prescaler MSP I2S (AVL = OFF) b7 b6 b5 b4 b3 b2 b1 b0
(if virtual dolby option is available) not defined yet

Option 35. Not used

- B7: x = note 7
- B6: x = note 6
- B5: x = note 5
- B4: x = note 4
- B3: AV2S = Scart2 SVHS
- B2: Macro = Macrovision
- B1: DP = Dolby Prologic
- B0: VD = Virtual Dolby

Option 36. Not used

- B7: x = note 7
- B6: TAT = 1 Tilt and trapez enabled
- B5: SWF = 1 Subwoofer enabled
- B4: VLO = 1 Variable line out
- B3: VBUS = 1 Vestelbus enabled
- B2: x = x
- B1: DVD = 1 DVD enabled
- B0: DVB = 1 DVB enabled

Option 37. Reserved for USA

Option 38. TV Teletext Mode Selection, Child Lock, Equalizer Country

- B7: VCR = note 7
- B6: C = note 6
- B5: LM = note 5
- B4: EQ = note 4
- B3: x = x
- B2: CL = note 2
- B1: T1 = note 1
- B0: T0 = note 1

note 1:

Teletext selection
T1, T0:
0,0 = No TV Text
0,1 = Simple TV Text (One page)
1,1 = Fasttext/Toptext TV Text (Eight pages)

note 2 :

CL = Child Lock
0 = Off
1 = On (Active)

note 3 :

RGB = RGB Menu Item active/inactive
 0 = RGB Menu Item inactive
 1 = RGB Menu Item active

note 4 :

EQ = Equalizer available
 0 = Equalizer not available
 1 = Equalizer available

note 5 :

LM = List Mode available
 0 = List Mode not available
 1 = List Mode available

note 6 :

C = Country Line available / Aps available or not
 0 = Country Line not available / Aps not available
 1 = Country Line available / Aps available

note 7 :

VCR = VCR Menu Item available / not available
 0 = VCR Menu Item not available
 1 = VCR Menu Item available

Option 39. Personal Preference Equalizer Band 1

EQUALIZER BAND 1 b7 b6 b5 b4 b3 b2 b1 b0
 0 0 0 0 0 1 1 0

Option 40. Personal Preference Equalizer Band 2

EQUALIZER BAND 2 b7 b6 b5 b4 b3 b2 b1 b0
 0 0 0 0 0 1 1 0

Option 41. Personal Preference Equalizer Band 3

EQUALIZER BAND 3 b7 b6 b5 b4 b3 b2 b1 b0
 0 0 0 0 0 1 1 0

Option 42. Personal Preference Equalizer Band 4

EQUALIZER BAND 4 b7 b6 b5 b4 b3 b2 b1 b0
 0 0 0 0 0 1 1 0

Option 43. Personal Preference Equalizer Band 5

EQUALIZER BAND 5 b7 b6 b5 b4 b3 b2 b1 b0
 0 0 0 0 0 1 1 0

Option 44. Sound Effect (Standard; Music; Speech; Jazz; Pp)

SOUND EFFECT b7 b6 b5 b4 b3 b2 b1 b0
 0 0 0 0 0 1 1 0

Option 45. Volume Offset Left

VOLUME OFFSET LEFT b7 b6 b5 b4 b3 b2 b1 b0
 0 0 0 0 0 1 1 0

Option 46. Volume Offset Right

VOLUME OFFSET RIGHT b7 b6 b5 b4 b3 b2 b1 b0
 0 0 0 0 0 1 1 0

Option 47. Volume Offset Center

VOLUME OFFSET CENTER b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 0 1 1 0

Option 48. Volume Offset Rear

VOLUME OFFSET REAR b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 0 1 1 0

Option 49. Surround Delay

SURROUND DELAY b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 0 0 0 1

Option 50. FM Prescale

FM PRESCALE for Stereo b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 1 1 0 0

FM PRESCALE for Dolby b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 1 0 0 1

Note: if virtual dolby is available, this option is not used.

Option 51. NICAM Prescale

NICAM Prescale for Stereo b7 b6 b5 b4 b3 b2 b1 b0
0 0 1 0 1 1 0 1

3D Panorama b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 1 0 1 1

NICAM Prescale for Dolby b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 1 1 1 0

Note: if virtual dolby is available, this option is not used.

Option 52. Scart Input Prescale

Scart Input Prescale for Stereo b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 1 0 0 0

Scart Input Prescale for Dolby b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 1 1 1 1

prescaler MSP Scart (AVL = OFF) b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 1 1 0 0 1 (if virtual dolby option is available)

Note: if virtual dolby is available, this option is not used.

Option 53. I2S Prescale

I2S Prescale for Stereo b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 0 1 1 0

I2S Prescale for Dolby b7 b6 b5 b4 b3 b2 b1 b0
0 0 0 0 0 1 1 0

Note: if virtual dolby is available, this option is not used.

Option 54. Scart Output Prescale

Scart Output Prescale b7 b6 b5 b4 b3 b2 b1 b0
0 1 1 1 1 1 1 1

Option 55. Speaker Setup

| | | | | | | | | |
|--|----|----|----|----|----|----|----|----|
| | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
| Speaker Setup (L/R, L/C/R, L/R/S, L/C/R/S) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Option 56. Audio Options Available Or Not

Attention: All bits on the Option 56 must be the "0" for MONO TV SETS

| | | |
|-----------|---|--------|
| B7: nicam | = | note 7 |
| B6: ASD | = | note 6 |
| B5: VRS | = | note 5 |
| B4: CRM | = | note 4 |
| B3: ... | = | x |
| B2: LBE | = | note 2 |
| B1: Spa | = | note 1 |
| B0: Avl | = | note 0 |

note 7 :

| | | |
|-------|---|---------------------|
| nicam | = | nicam available |
| 0 | = | nicam not available |
| 1 | = | nicam available |

note 6 :

| | | |
|-----|---|--|
| ASD | = | Auto Sound Detection available/not available |
| 0 | = | Auto Sound Detection not available |
| 1 | = | Auto Sound Detection available |

note 5 :

| | | |
|-----|---|-------------------|
| VRS | = | Virtual Surround |
| 0 | = | VRS not available |
| 1 | = | VRS available |

note 4 :

| | | |
|-----|---|--|
| CRM | = | CARRIER MUTE OFF/ON |
| 0 | = | Sound carrier mute is ON in the Stereo Sound IC |
| 1 | = | Sound carrier mute is OFF in the Stereo Sound IC (i.e. option available) |

note 2 :

| | | |
|-----|---|--------------------|
| LBE | = | LBE (Dynamic Bass) |
| 0 | = | LBE not available |
| 1 | = | LBE available |

note 1 :

| | | |
|-----|---|------------------------------|
| Spa | = | Spatial Effect available |
| 0 | = | Spatial Effect not available |
| 1 | = | Spatial Effect available |

note 0 :

| | | |
|-----|---|--|
| Avl | = | Automatic volume level available on the Menu |
| 0 | = | Automatic volume level not available |
| 1 | = | Automatic volume level available |

Option 57. Stereo Threshold

| | | | |
|--------|---|--------|---|
| B7: b7 | = | note 1 | Remark : |
| B6: b6 | = | note 1 | |
| B5: b5 | = | note 1 | -Threshold for all FM A2 signals to switch from MONO to STEREO. |
| B4: b4 | = | note 1 | -For first check after programme change half value is changed (0Ch) 19h/2 |
| B3: b3 | = | note 1 | -For switching from STEREO back to MONO: 19h/4 *3 |
| B2: b2 | = | note 1 | |
| B1: b1 | = | note 1 | |
| B0: b0 | = | note 1 | |

note 1 :

MSP Stereo/Mono Threshold b7 b6 b5 b4 b3 b2 b1 b0
 0 0 0 1 1 0 0 1

Option 58. MSP Audio Flags

B7: b7 = x
 B6: b6 = x
 B5: b5 = x
 B4: Trs = note 1
 B3: Trb = note 1
 B2: Bbe = note 1
 B1: Spa = note 1
 B0: Avl = note 1

note 1 :

Defines whether the feature is toggled ON or OFF in the menu and stored.

0 : OFF
 1 : ON

Option 59. NICAM Threshold

MSP NICAM Threshold b7 b6 b5 b4 b3 b2 b1 b0
 0 1 1 0 0 1 0 0

Option 60. Power Delay Time

B7: NZ = x
 B6: HM = x
 B5: L5 = note 3
 B4: L4 = note 3
 B3: L3 = note 3
 B2: L2 = note 3
 B1: L1 = note 3
 B0: L0 = note 3

note 3:

 L7 L6 L5 L4 L3 L2 L1 L0
 Default Value : x x 1 1 0 0 0 0
 1000 MSEC = 1SN

| Number | L7L6L5L4L3L2L1L0 | Delay | Number | L7L6L5L4L3L2L1L0 | Delay |
|--------|------------------|------------|--------|------------------|-------------|
| 0 | 00000000 | = 4 sec | 32 | 00100000 | = 12 sec |
| 1 | 00000001 | = 4,25 sec | 33 | 00100001 | = 12,25 sec |
| 2 | 00000010 | = 4,5 sec | 34 | 00100010 | = 12,5 sec |
| 3 | 00000011 | = 4,75 sec | 35 | 00100011 | = 12,75 sec |
| 4 | 00000100 | = 5 Sec | 36 | 00100100 | = 13 sec |
| 5 | 00000101 | = 5,25 Sec | 37 | 00100101 | = 13,25 sec |
| 6 | 00000110 | = 5,5 Sec | 38 | 00100110 | = 13,5 sec |
| 7 | 00000111 | = 5,75 Sec | 39 | 00100111 | = 13,75 sec |
| 8 | 00001000 | = 6 sec | 40 | 00101000 | = 14 sec |
| 9 | 00001001 | = 6,25 sec | 41 | 00101001 | = 14,25 sec |
| 10 | 00001010 | = 6,5 sec | 42 | 00101010 | = 14,5 sec |
| 11 | 00001011 | = 6,75 sec | 43 | 00101011 | = 14,75 sec |
| 12 | 00001100 | = 7 sec | 44 | 00101100 | = 15 sec |
| 13 | 00001101 | = 7,25 sec | 45 | 00101101 | = 15,25 sec |
| 14 | 00001110 | = 7,5 sec | 46 | 00101110 | = 15,5 sec |
| 15 | 00001111 | = 7,75 sec | 47 | 00101111 | = 15,75 sec |
| 16 | 00010000 | = 8 sec | 48 | 00110000 | = 16 sec |
| 17 | 00010001 | = 8,25 sec | 49 | 00110001 | = 16,25 sec |
| 18 | 00010010 | = 8,5 sec | 50 | 00110010 | = 16,5 sec |
| 19 | 00010011 | = 8,75 sec | 51 | 00110011 | = 16,75 sec |

| | | | | |
|----|----------|---|-------|-----|
| 20 | 00010100 | = | 9 | sec |
| 21 | 00010101 | = | 9,25 | sec |
| 22 | 00010110 | = | 9,5 | sec |
| 23 | 00010111 | = | 9,75 | sec |
| 24 | 00011000 | = | 10 | sec |
| 25 | 00011001 | = | 10,25 | sec |
| 26 | 00011010 | = | 10,5 | sec |
| 27 | 00011011 | = | 10,75 | sec |
| 28 | 00011100 | = | 12 | sec |
| 29 | 00011101 | = | 12,25 | sec |
| 30 | 00011110 | = | 12,5 | sec |
| 31 | 00011111 | = | 12,75 | sec |

| | | | | |
|----|----------|---|-------|-----|
| 52 | 00110100 | = | 17 | sec |
| 53 | 00110101 | = | 17,25 | sec |
| 54 | 00110110 | = | 17,5 | sec |
| 55 | 00110111 | = | 17,75 | sec |
| 56 | 00111000 | = | 18 | sec |
| 57 | 00111001 | = | 18,25 | sec |
| 58 | 00111010 | = | 18,5 | sec |
| 59 | 00111011 | = | 18,75 | sec |
| 60 | 00111100 | = | 19 | sec |
| 61 | 00111101 | = | 19,25 | sec |
| 62 | 00111110 | = | 19,5 | sec |
| 63 | 00111111 | = | 19,75 | sec |

| | 76543210 |
|----|----------|
| 0 | 00000000 |
| 1 | 00000001 |
| 2 | 00000010 |
| 3 | 00000011 |
| 4 | 00000100 |
| 5 | 00000101 |
| 6 | 00000110 |
| 7 | 00000111 |
| 8 | 00001000 |
| 9 | 00001001 |
| 10 | 00001010 |
| 11 | 00001011 |
| 12 | 00001100 |
| 13 | 00001101 |
| 14 | 00001110 |
| 15 | 00001111 |
| 16 | 00010000 |
| 17 | 00010001 |
| 18 | 00010010 |
| 19 | 00010011 |
| 20 | 00010100 |
| 21 | 00010101 |
| 22 | 00010110 |
| 23 | 00010111 |
| 24 | 00011000 |
| 25 | 00011001 |
| 26 | 00011010 |
| 27 | 00011011 |
| 28 | 00011100 |
| 29 | 00011101 |
| 30 | 00011110 |
| 31 | 00011111 |

| Bit Positions | | 76543210 |
|---------------|-------------|----------|
| 32 | | 00100000 |
| 33 | | 00100001 |
| 34 | | 00100010 |
| 35 | | 00100011 |
| 36 | | 00100100 |
| 37 | | 00100101 |
| 38 | | 00100110 |
| 39 | | 00100111 |
| 40 | | 00101000 |
| 41 | | 00101001 |
| 42 | | 00101010 |
| 43 | | 00101011 |
| 44 | | 00101100 |
| 45 | | 00101101 |
| 46 | | 00101110 |
| 47 | | 00101111 |
| 48 | Colour Code | 00110000 |
| 49 | | 00110001 |
| 50 | | 00110010 |
| 51 | | 00110011 |
| 52 | | 00110100 |
| 53 | | 00110101 |
| 54 | | 00110110 |
| 55 | | 00110111 |
| 56 | | 00111000 |
| 57 | | 00111001 |
| 58 | | 00111010 |
| 59 | | 00111011 |
| 60 | | 00111100 |
| 61 | | 00111101 |
| 62 | | 00111110 |
| 63 | | 00111111 |

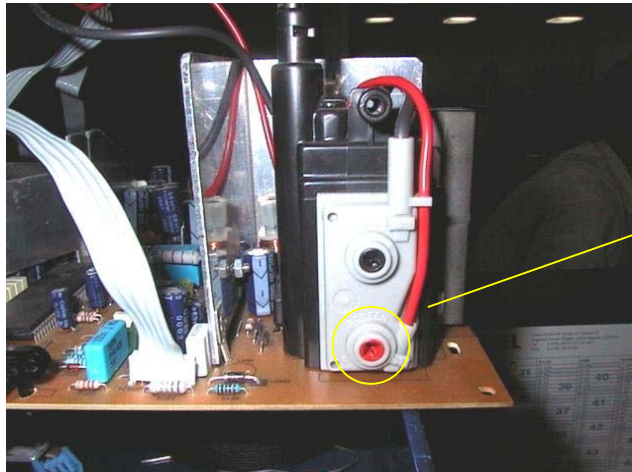
14.4.OPTION TABLE RECOMMENDED VALUES

X listed in the option can be 0 or 1

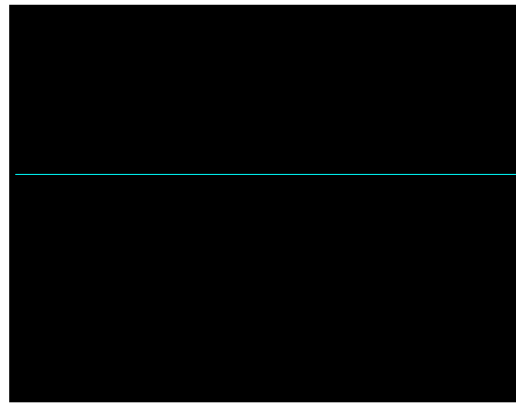
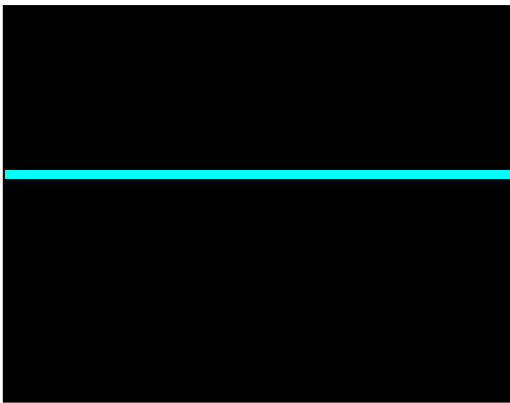
| OPTION | 2835 MULTI | 2835W MULTI | 2835W PAL I |
|--------|--------------|--------------|--------------|
| 000 | X2 XXXXXX10 | X2 XXXXXX10 | X2 XXXXXX10 |
| 001 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 002 | 23 001XXX11 | 23 001XXX11 | 23 001XXX11 |
| 003 | XX XXXXXXXX0 | XX XXXXXXXX0 | XX XXXXXXXX0 |
| 004 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 005 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 006 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 007 | XX XX0XXX1X | XX XX0XXX1X | XX XX0XXX1X |
| 008 | A1 11000001 | 01 00000001 | 01 00000001 |
| 009 | 0B 00001111 | 0B 00001111 | 04 00001111 |
| 010 | X2 XXXXX011 | X7 XXXXX111 | X7 XXXXX111 |
| 011 | 8E 10001110 | 8E 10001110 | 8E 10001110 |
| 012 | 03 00000011 | 03 00000011 | 03 00000011 |
| 013 | 06 00000110 | 06 00000110 | 06 00000110 |
| 014 | 15 10000101 | 15 10000101 | 15 10000101 |
| 015 | AA 10101010 | AA 10101010 | AA 10101010 |
| 016 | 09 00001001 | 09 00001001 | 09 00001001 |
| 017 | A2 10100010 | A2 10100010 | A2 10100010 |
| 018 | 1B 00011011 | 1B 00011011 | 1B 00011011 |
| 019 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 020 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 021 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 022 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 023 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 024 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 025 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 026 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 027 | FF 11111111 | FF 11111111 | FF 11111111 |
| 028 | FF 11111111 | FF 11111111 | FF 11111111 |
| 029 | FF 11111111 | EF 11101111 | EF 11101111 |
| 030 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 031 | 0F 00001111 | 0F 00001111 | 0F 00001111 |
| 032 | 23 00100011 | 23 00100011 | 23 00100011 |
| 033 | 0E 00001110 | 0E 00001110 | 0E 00001110 |
| 034 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 035 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 036 | X4 XXXXX1XX | X4 XXXXX1XX | X4 XXXXX1XX |
| 037 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 038 | AF 11001111 | AF 11001111 | AF 11001111 |
| 039 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 040 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 041 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 042 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 043 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 044 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 045 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 046 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 047 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 048 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 049 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 050 | XX XXXXXXXX | XX XXXXXXXX | XX XXXXXXXX |
| 051 | 41 01000001 | 41 01000001 | 41 01000001 |
| 052 | 1B 00011011 | 1B 00011011 | 1B 00011011 |
| 053 | 06 00000110 | 06 00000110 | 06 00000110 |

| | | | |
|-----|-------------|-------------|-------------|
| 054 | 75 01110101 | 75 01110101 | 75 01110101 |
| 055 | 00 00000000 | 00 00000000 | 00 00000000 |
| 056 | DE 11011110 | DE 11011110 | DE 11011110 |
| 057 | 19 00011001 | 19 00011001 | 19 00011001 |
| 058 | 00 00000000 | 00 00000000 | 00 00000000 |
| 059 | 64 01100100 | 64 01100100 | 64 01100100 |
| 060 | 10 00010000 | 10 00010000 | 10 00010000 |

14.5.SCREEN ADJUSTMENT (FBT SCREEN)



SCREEN
ADJUST
POT



From the option list change option 2 bit 6 from 0 to 1 for disabling vertical scan. Adjust horizontal line via screen adjust pot. as thin as possible. Then press 0 to leave service menu.

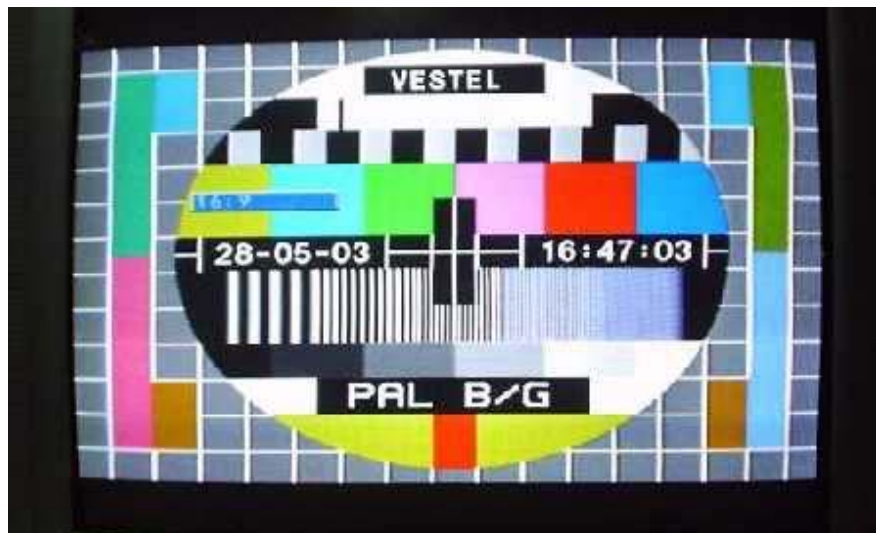
14.6.GEOMETRY ADJUSTMENT

4:3 FORMATS

4:3 MODE

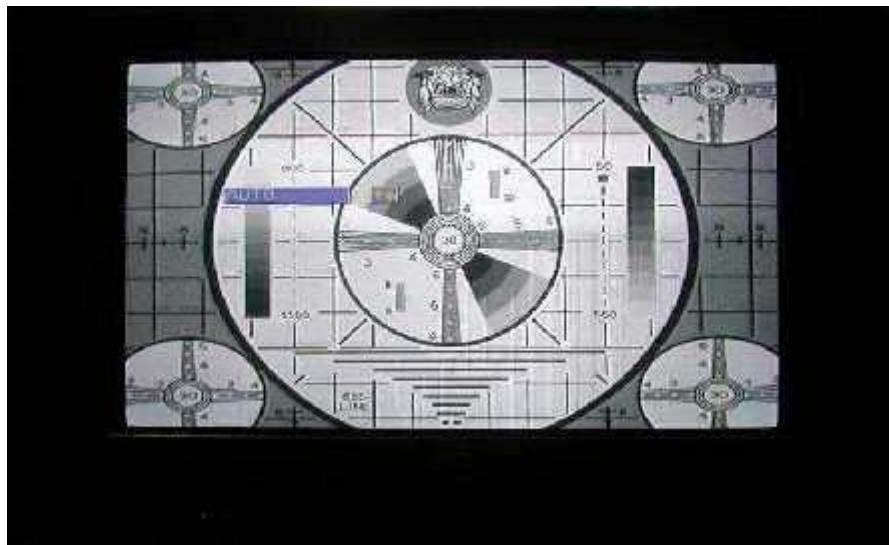


16:9 MODE

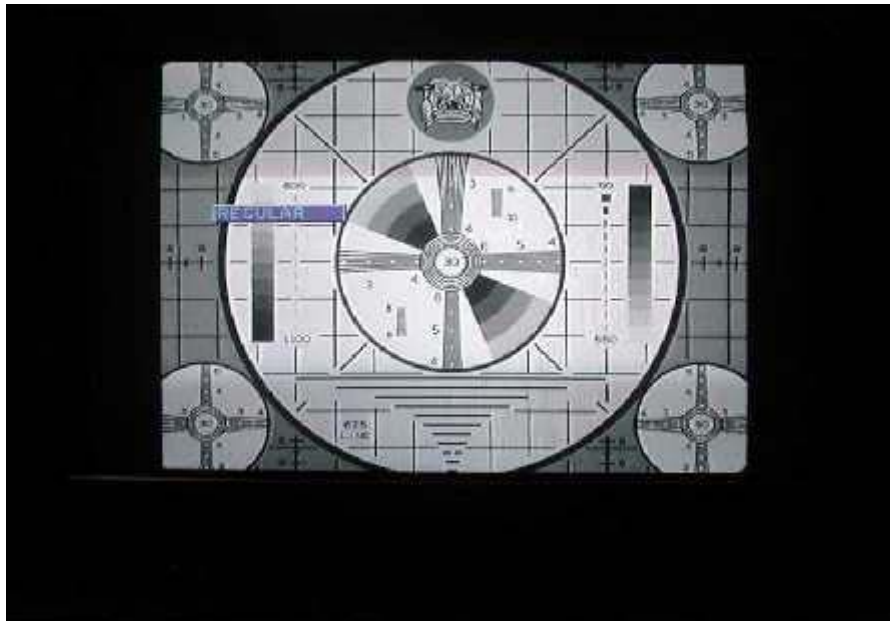
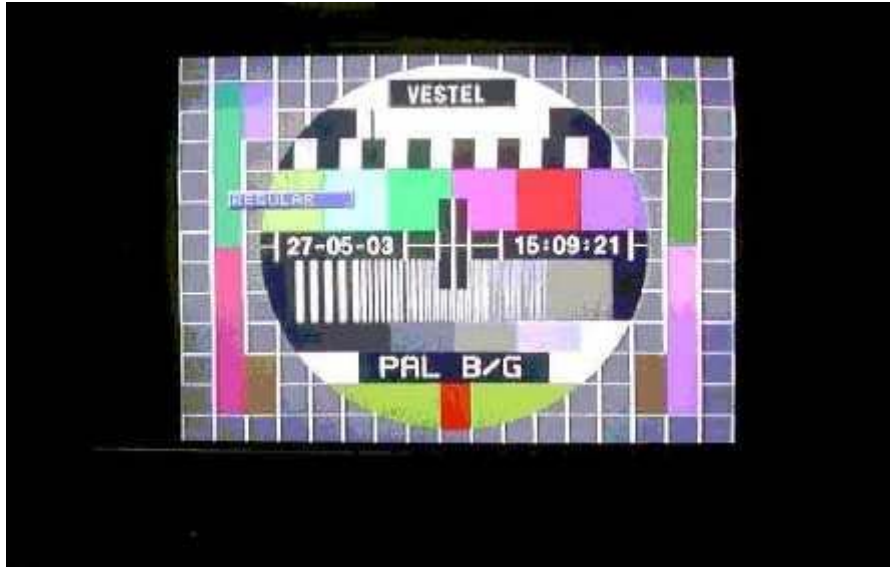


16:9 FORMATS

AUTO MODE



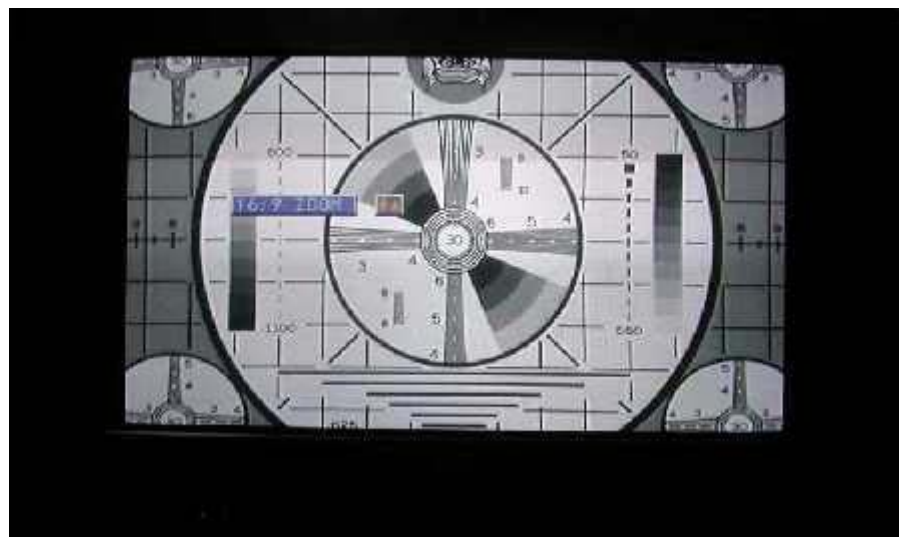
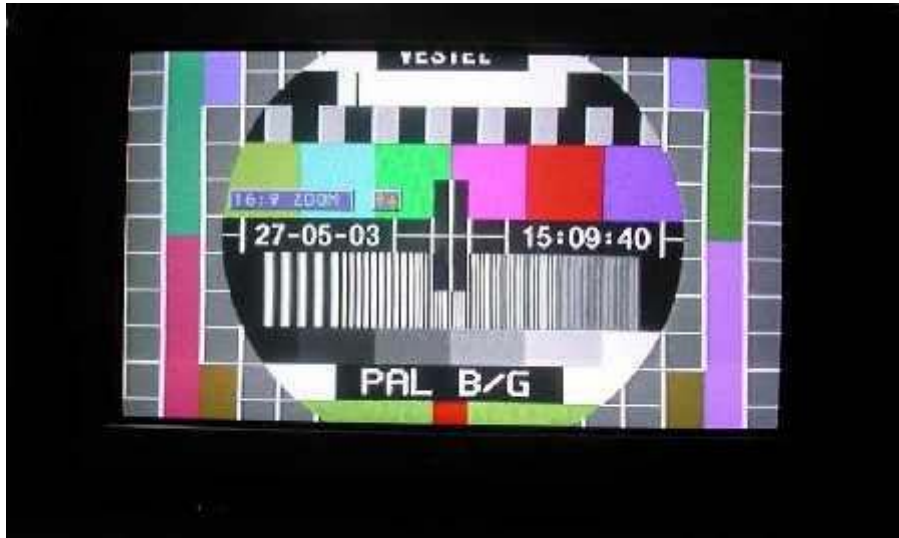
REGULAR MODE



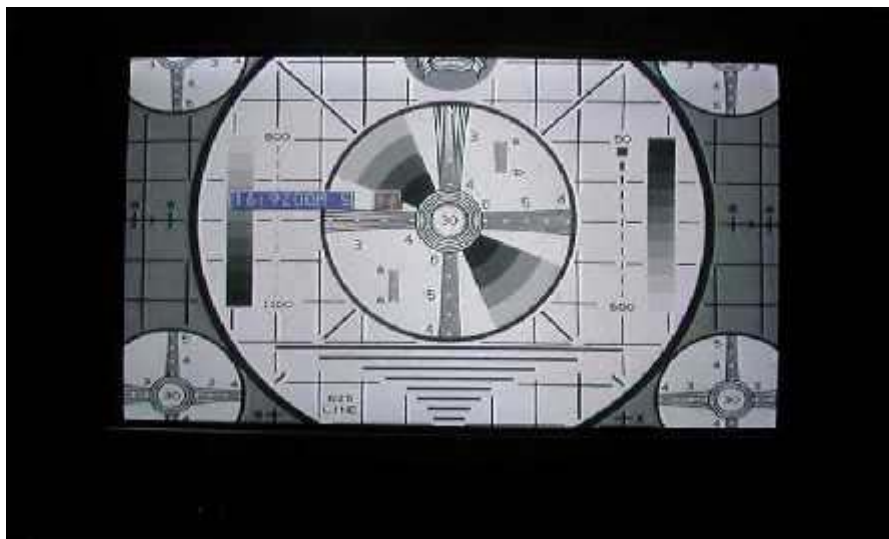
ZOOM 14:9 MODE



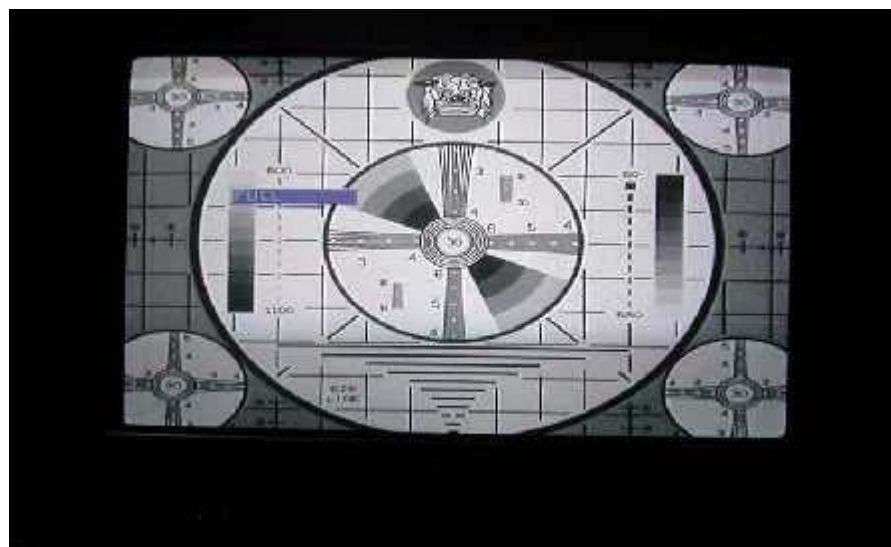
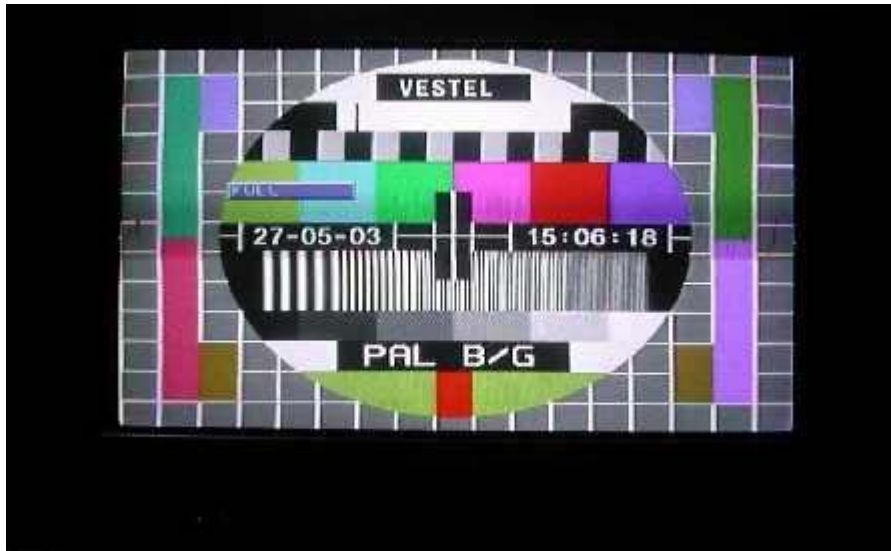
ZOOM 16:9 MODE



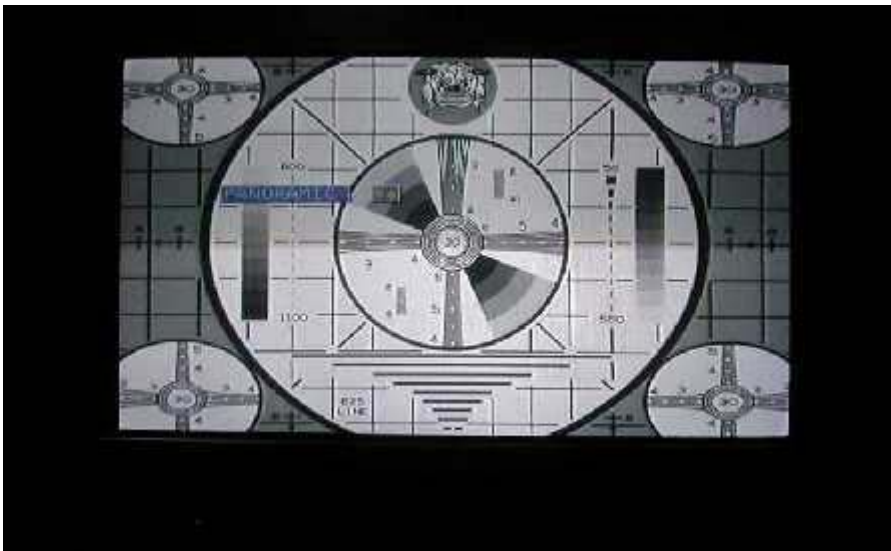
SUBTITLE ZOOM MODE



FULL MODE

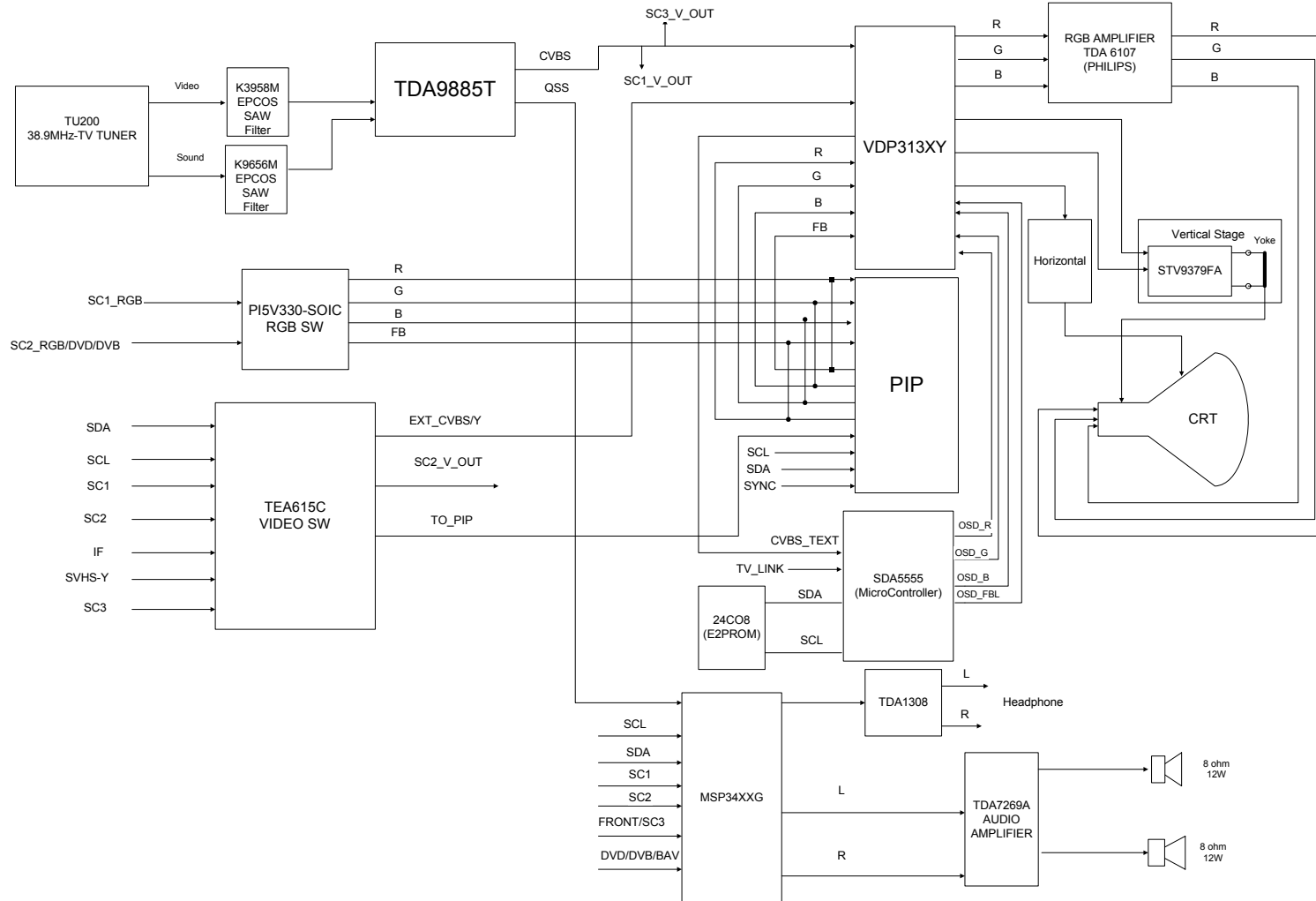


PANOROMIC MODE

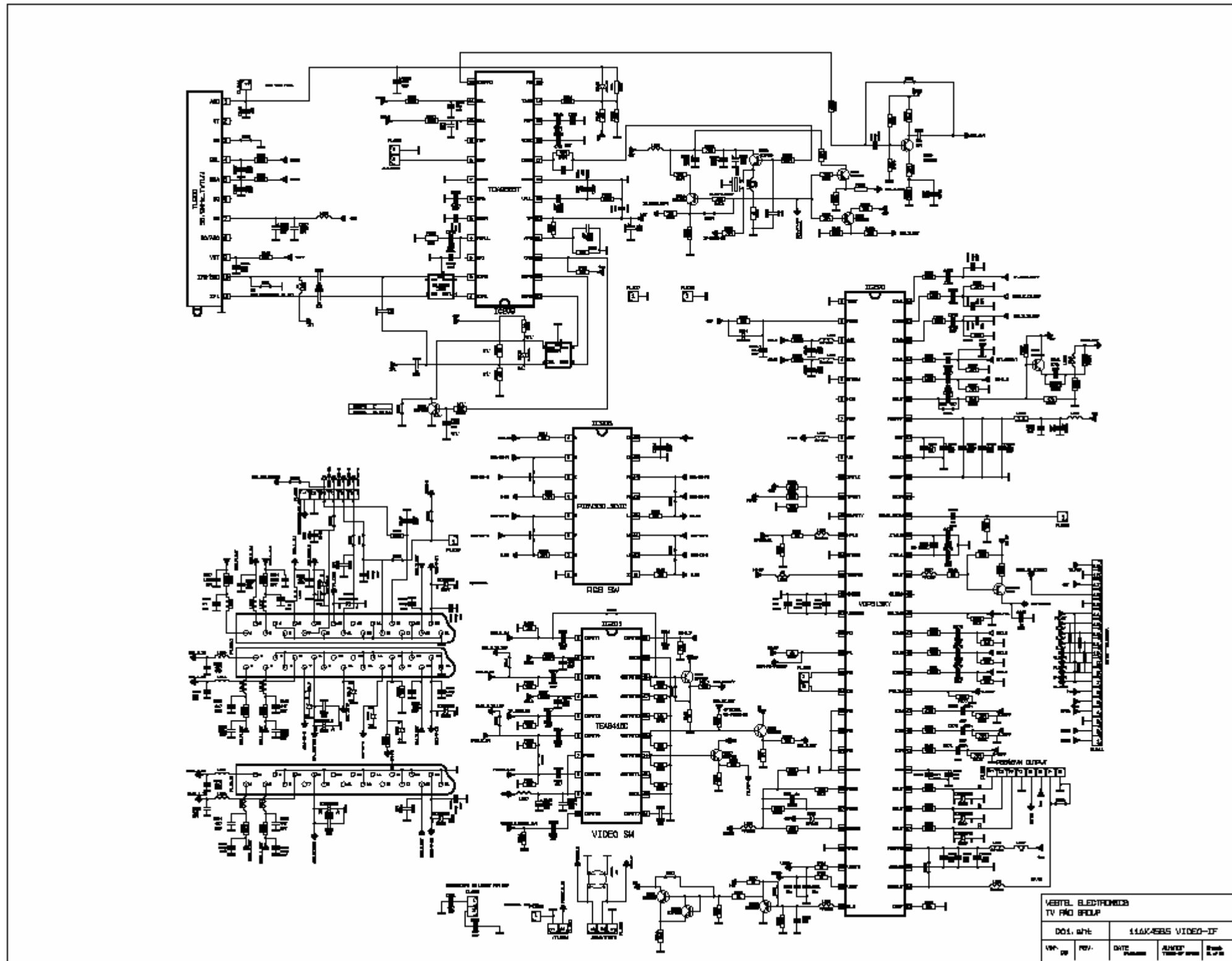


16. BLOCK DIAGRAM

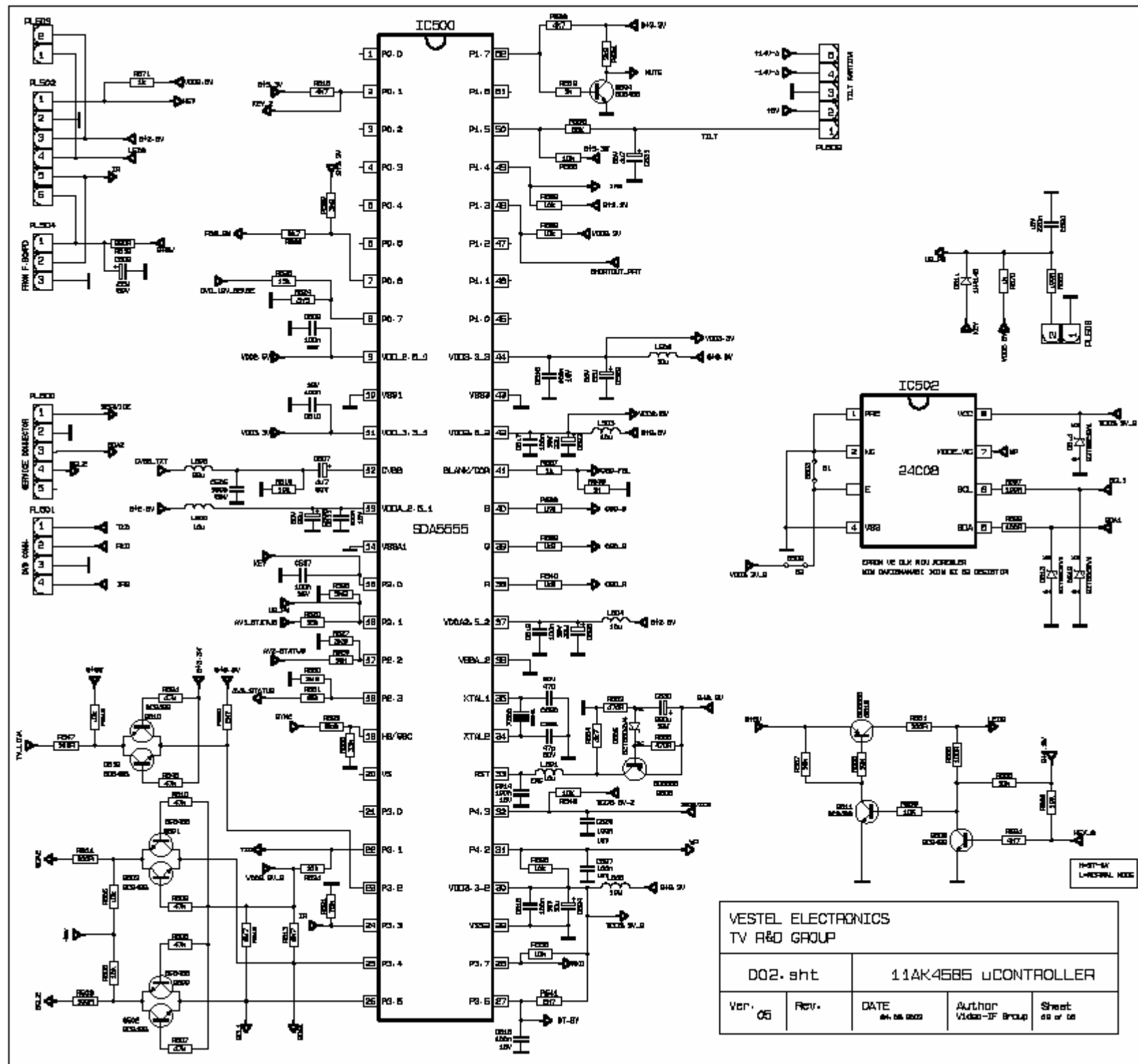
GENERAL BLOCK DIAGRAM OF CHASSIS 11 AK 45



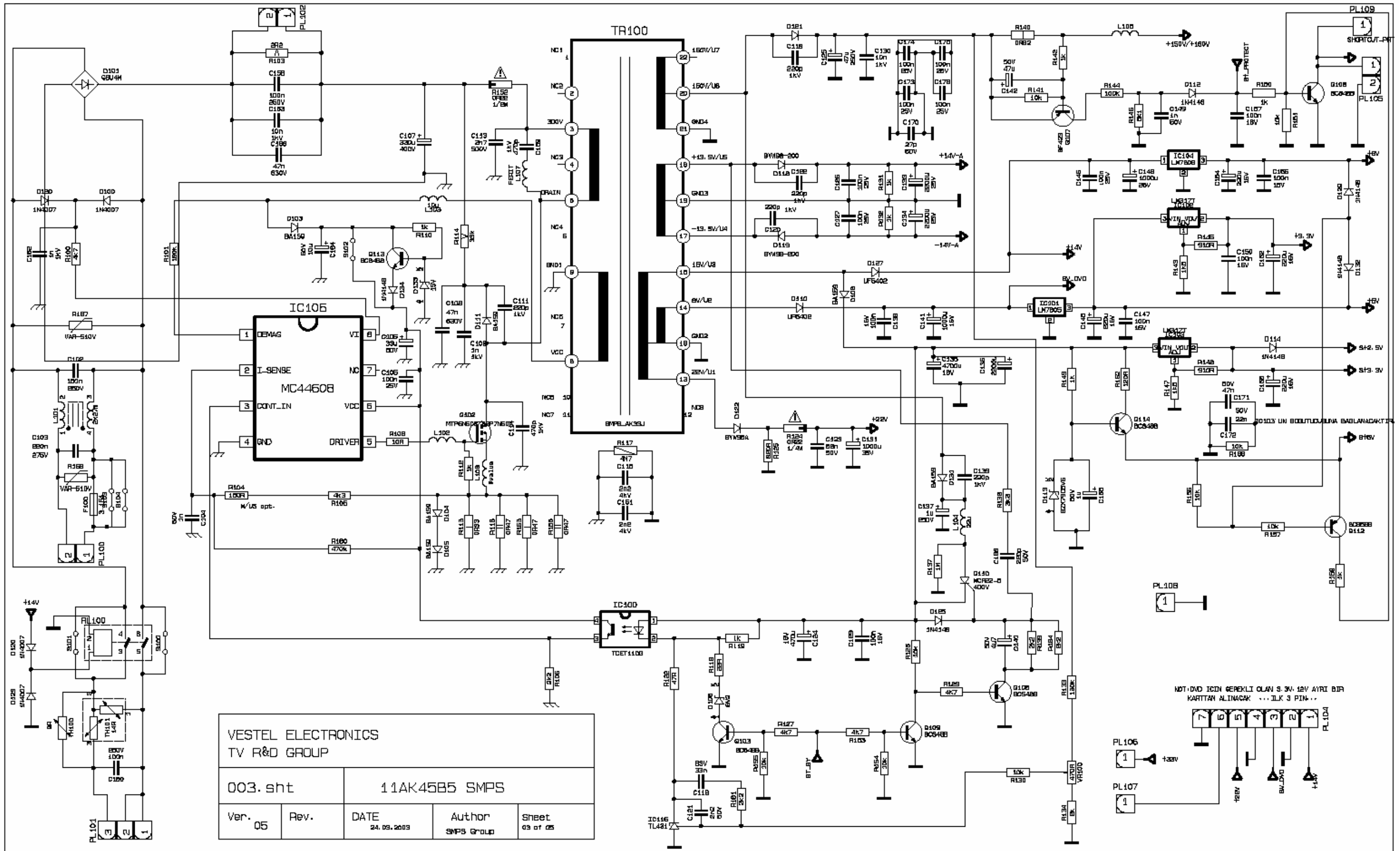
17.CIRCUIT DIAGRAMS



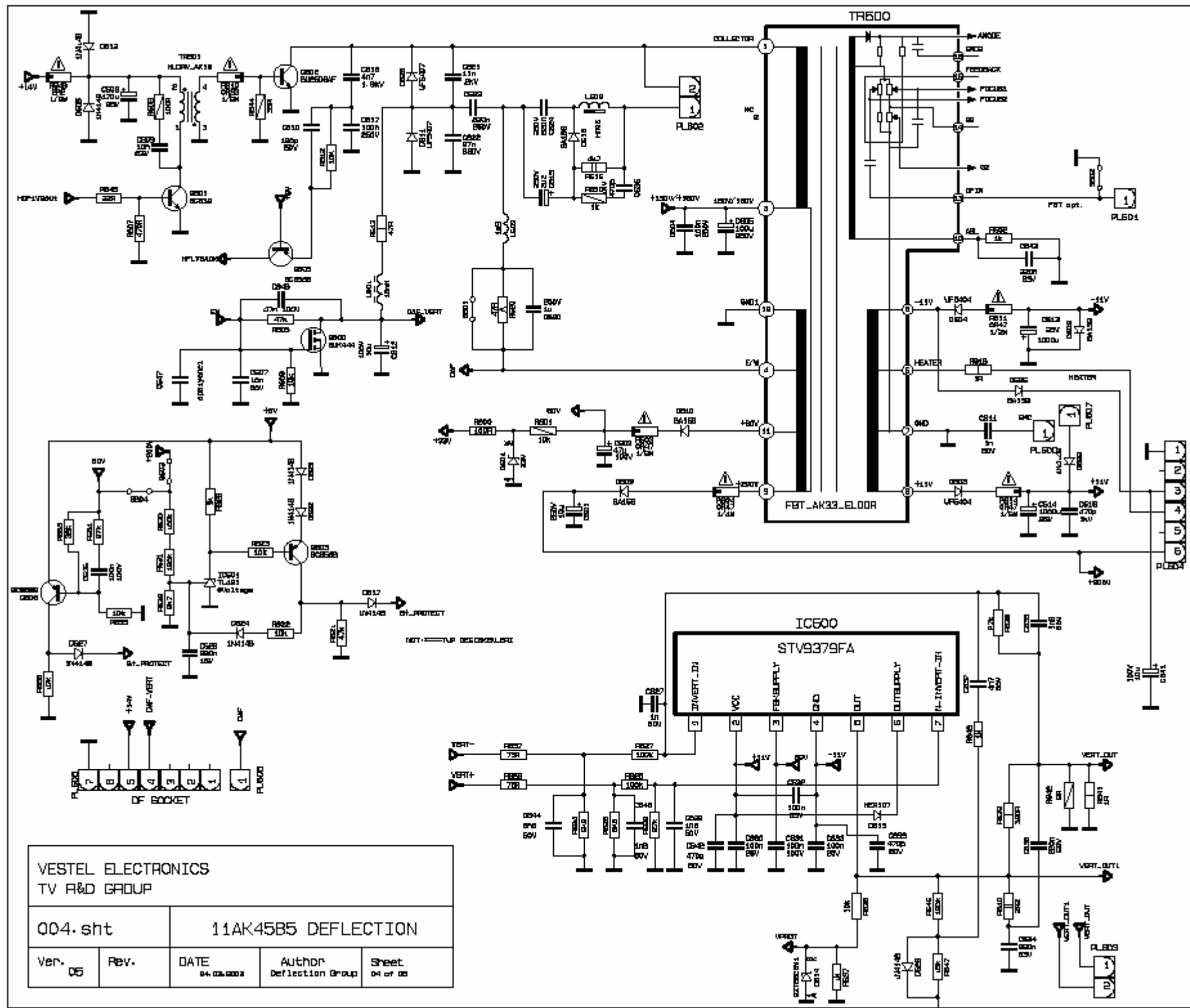
11AK45B5-1



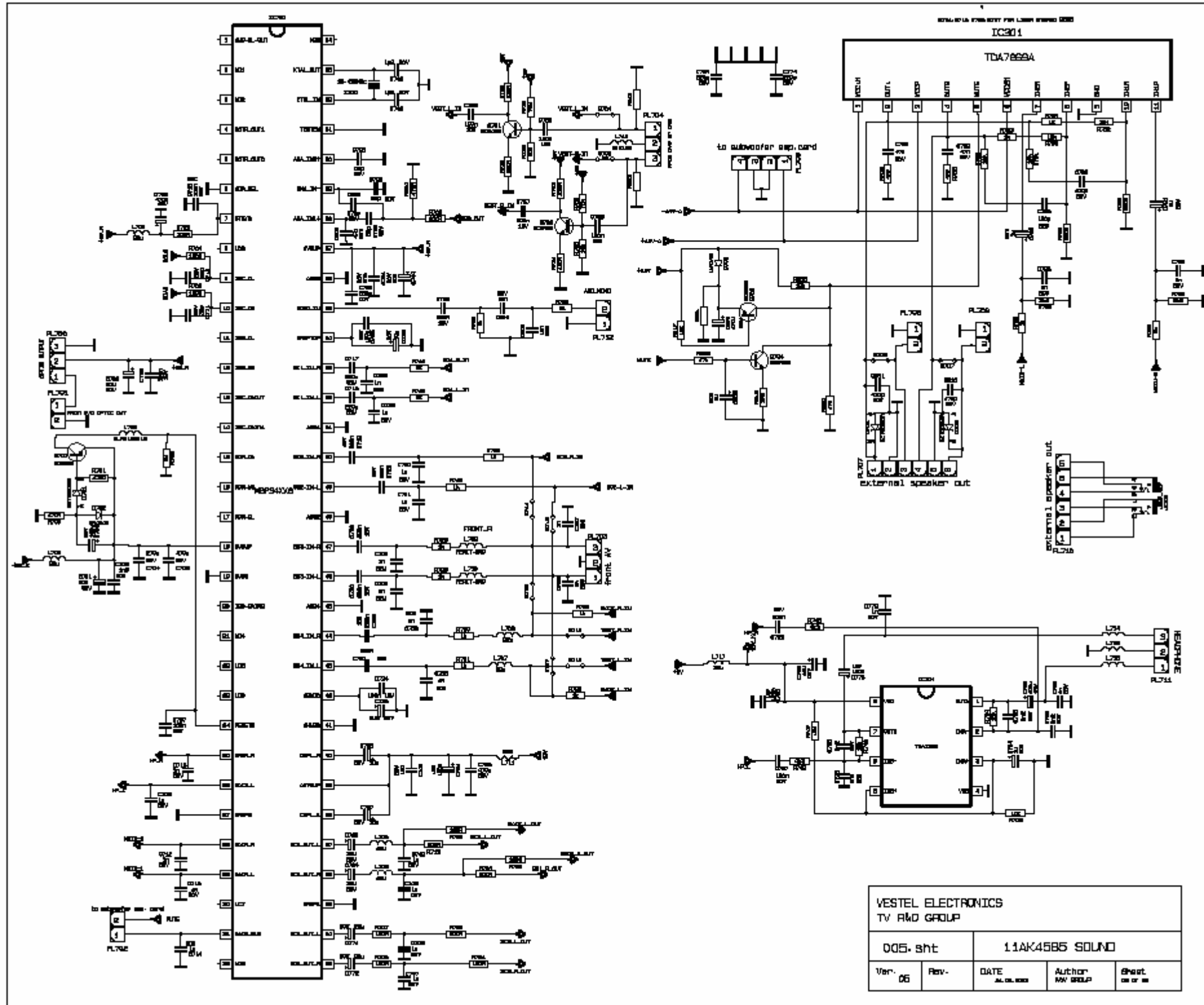
11AK45B5-2



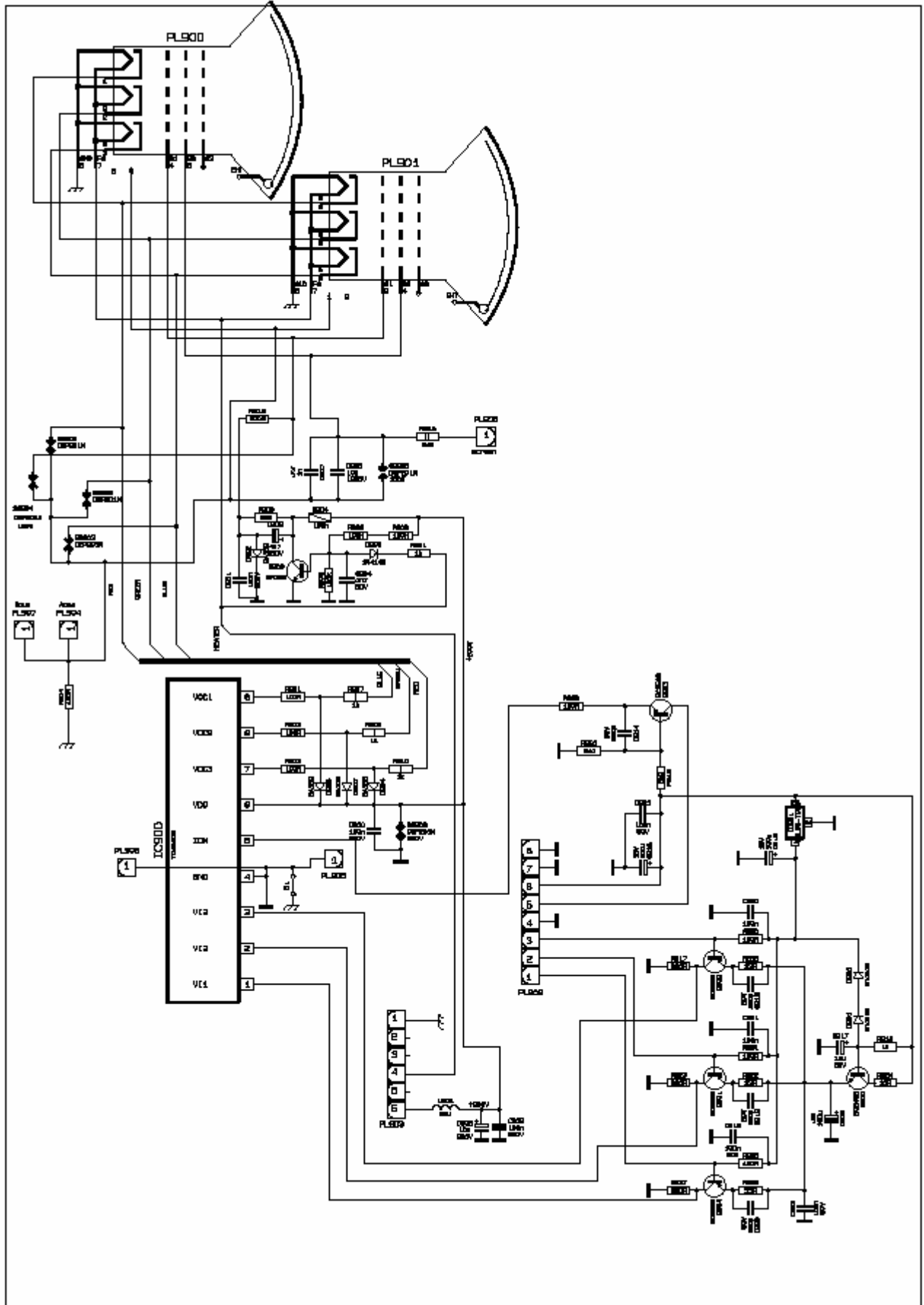
11AK45B5-3



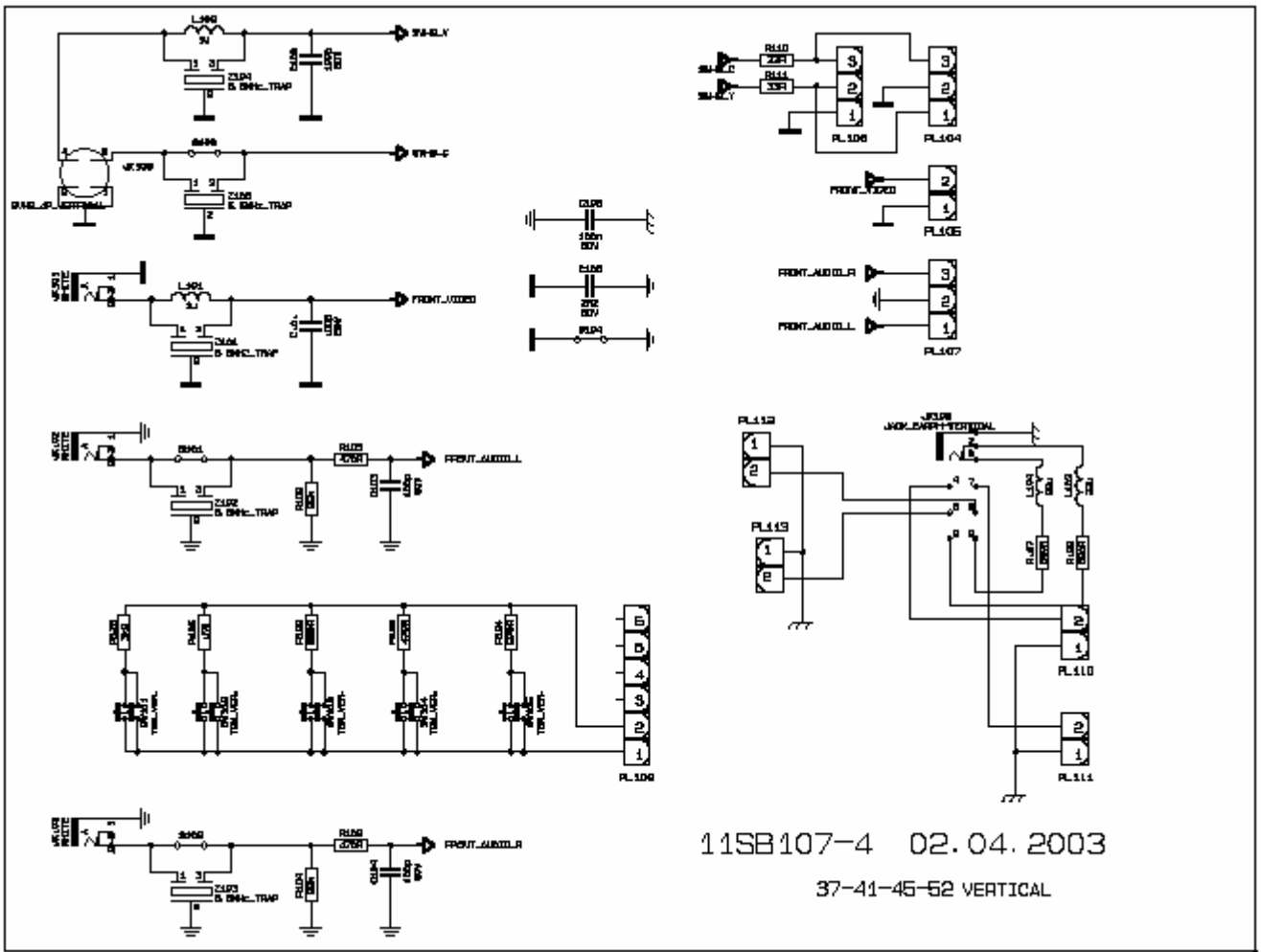
11AK45B5-4



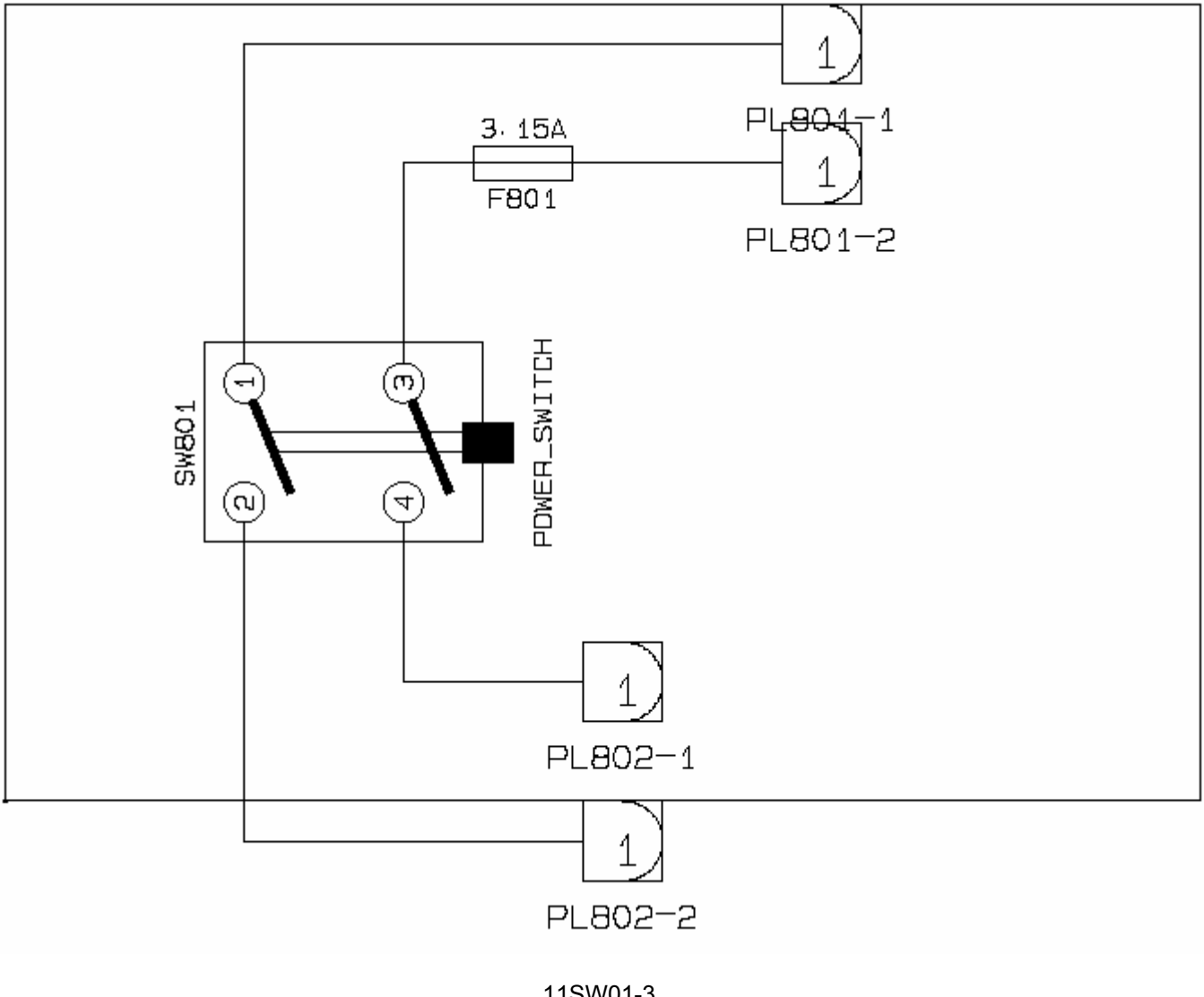
11AK45B5-5



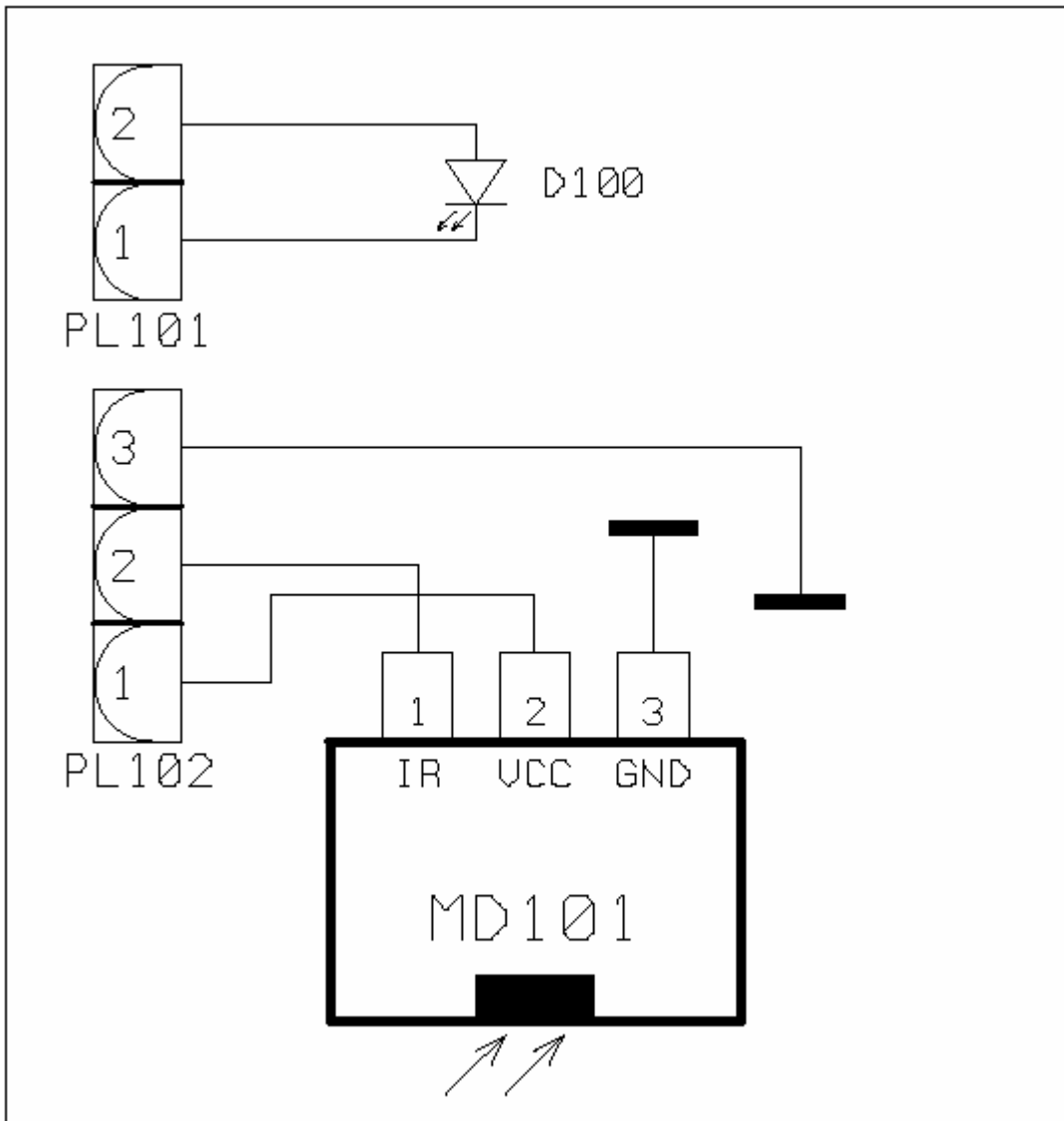
11TP45B-1



11SB107-4



11SW01-3



11LD13