

TEAC®

SERVICE MANUAL

CTW2850S1

16:19 CTV

11AK33 CHASSIS

11 AK-33

Service Manual

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1. INTRODUCTION

11AK33 is a 110ø chassis capable of driving 28-29",32",33" tubes at appropriate currents The chassis is a Frequency Controlled Tuning (PLL) and control system for multi-standard TV receivers with on-screen-display (OSD) for all relevant control functions. The system is based on the 'one-chip' IC bus controlled video processing / deflection IC TDA8885 which also controls sound.

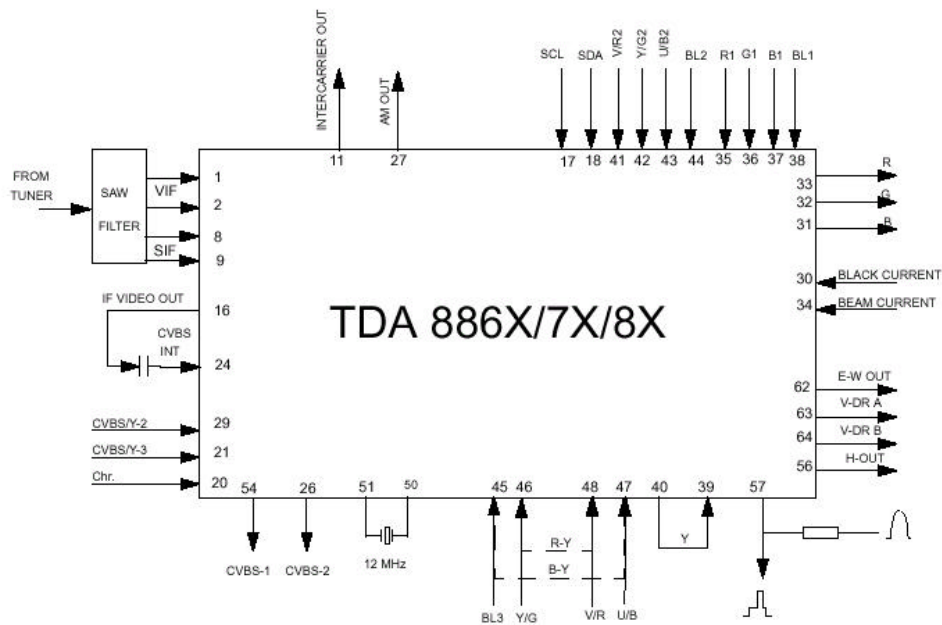
German stereo and Nicam is detected and processed by the MSP 3410 G. Dolby sound is processed by MSP 3452 G, virtual dolby by MSP 3411G, BTSC Stereo by MSP 3430G IC's by option. All sound processors also control the sound volume, balance, tone and spatial stereo effect.

The user-interface is menu based control system with cursor keys. Only for some functions the colour keys are needed: This means that some of the functions can also be operated from the local keyboard (i.e. Vol -, Vol +, P -, P+ and M).

Teletext is done by the microcontroller on-chip teletext module.

2. SMALL SIGNAL PART WITH TDA8885

The TDA8885 combine all small signal functions required for a colour TV receiver.



2.1. Vision IF amplifier

The IF-amplifier contains 3 ac-coupled control stages with a total gain control range, which is higher than 66 dB. The sensitivity of the circuit is comparable. The video signal is demodulated by means of an alignment-free PLL carrier regenerator with an internal VCO. This VCO is calibrated by means of a digital control circuit, which uses the clock frequency of the m-Controller/Teletext decoder as a reference. The frequency setting for the various standards (33.4, 33.9, 38, 38.9, 45.75 and 58.75 MHz) is realised via the I 2 C-bus. To get a good performance for phase modulated carrier signals the control speed of the PLL can be increased by means of the FFI bit. The AFC output is generated by the digital control circuit of the IF-PLL demodulator and can be read via the I 2 C bus. For fast search tuning systems the window of the AFC can be increased with a factor 3. The setting is realised with the AFW bit. The AGC-detector operates on top sync and top white-level. The demodulation polarity is switched via the I 2 C-bus. The AGC detector capacitor is integrated. The time-constant can be chosen via the I 2 C-bus. The time-constant of the AGC system during positive modulation is rather long to avoid visible variations of the signal amplitude. To improve the speed of the AGC system a circuit has been included which detects whether the AGC detector is activated every frame period. When during 3 field periods no action is detected the speed of the system is increased. For signals without peak white information

the system switches automatically to a gated black level AGC. Because a black level clamp pulse is required for this way of operation the circuit will only switch to black level AGC in the internal mode. The circuit contains a video identification circuit, which is independent of the synchronisation circuit. Therefore search tuning is possible when the display section of the receiver is used as a monitor. However, this Ident circuit cannot be made as sensitive as the slower sync Ident circuit (SL) and we use both Ident outputs to obtain a reliable search system. The Ident output is supplied to the tuning system via the I 2 C-bus. The input of the identification circuit is connected to pin 24, the internal CVBS input. This has the advantage that the Ident circuit can also be made operative when a scrambled signal is received (descrambler connected between the IF video output (pin 16) and pin 24). A second advantage is that the Ident circuit can be used when the IF amplifier is not used. The video Ident circuit can also be used to identify the selected CBVS or Y/C signal. The switching between the 2 modes can be realised with the VIM bit. The IC contains a group delay correction circuit, which can be switched between the BG and a flat group delay response characteristic. This has the advantage that in multi-standard receivers no compromise has to be made for the choice of the SAW filter. Also the sound trap is integrated within the IC. The centre frequency of the trap can be switched via the I 2 C-bus. For mono-FM versions it is possible to obtain a demodulated IF video signal which has not passed the sound trap so that an external stereo decoder can be driven. This function is selected by means of the ICO bit (sub-address 28H). The signal is available on pin 27 (audio output pin when ICO = 0). The S/N ratio of the selected video signal can be read via the bits SN1/SN0 in sub-address 03H.

2.2. Video Switches

The circuit has an input for the internal CVBS signal and 2 inputs for external CVBS or Y signals. The circuit has only 1 chroma input so that it is not possible to apply 2 separate Y/C inputs. The switch configuration is given in Fig. A. The selection of the various sources is made via the I 2 C-bus. The QFP-64 version has 2 independently switchable outputs. The CVBS1O output is identical to the selected signal that is supplied to the internal video processing circuit and can therefore be used as source signal for a teletext decoder. Both CVBS outputs have an amplitude of 2.0 VP-P. The CVBS2O output can for instance be used as drive signal for a PIP decoder. If the Y/C-3 signal is selected for one of the outputs the luminance and chrominance signals are added so that a CVBS signal is obtained again.

2.3. Sound Circuit

The sound IF amplifier is similar to the vision IF amplifier and has a gain control range of about 66 dB. The AGC circuit is related to the SIF carrier levels (average level of AM or FM carriers) and ensures a constant signal amplitude of the AM demodulator and the QSS mixer. A multiplier realises the single reference QSS mixer. In this multiplier the SIF signal is converted to the intercarrier frequency by mixing it with the regenerated picture carrier from the VCO. The mixer output signal is supplied to the output via a high-pass filter for attenuation of the residual video signals. With this system a high performance hi-fi stereo sound processing can be achieved. To optimise the performance of the demodulator the offset can be compensated by means of an I 2 C-bus setting. The AM sound demodulator is realised by a multiplier. The modulated sound IF signal is multiplied in phase with the limited SIF signal. The demodulator output signal is supplied to the output via a low-pass filter for attenuation of the carrier harmonics. The AM signal is supplied to the output (pin 27) via the volume control. It is possible to get the AM output signal (not controlled on amplitude) on the QSS intercarrier output. The selection is made by means of the AM bit in sub-address 29H. Another possibility is that pin 11 can be used as external audio input pin and pin 49 can be used as (non-controlled) AM output pin. This can be realised by means of the setting the control bits CMB0 and CMB1 in sub-address 22H.

2.4. Synchronisation circuit

The sync separator is preceded by a controlled amplifier, which adjusts the sync pulse amplitude to a fixed level. These pulses are fed to the slicing stage, which is operating at 50% of the amplitude. The separated sync pulses are fed to the first phase detector and to the coincidence detector. This coincidence detector is used to detect whether the line oscillator is synchronised with the incoming signal and can also be used for transmitter identification. This circuit can be made less sensitive by means of the STM bit. This mode can be used during search tuning to avoid that the tuning system will stop at very weak input signals. The first PLL has a very high statically steepness so that the phase of the picture is independent of the line frequency. The horizontal drive signal is generated by an internal VCO, which is running at a frequency of 25 MHz. This oscillator is stabilised to that frequency by using the 12 MHz frequency of the crystal oscillator as a reference. The time-constant of the first loop

can be forced by the I 2 C-bus (fast or slow). If required the IC can select the time-constant depending on the noise content of the incoming video signal. The horizontal output signal is generated by means of a second loop, which compares the phase of the internal oscillator signal with the phase of the incoming flyback pulse. The time-constant of this loop is connected externally and can be used as input for a dynamic horizontal phase correction. To obtain a smooth switch-on and switch-off behaviour of the horizontal output stage the horizontal drive signal is switched-on and off via the soft-start/soft-stop procedure. This function is realised by means of a variation of the TON of the horizontal drive pulse. When the soft-start procedure is completed the horizontal output is gated with the flyback pulse so that the horizontal output transistor cannot be switched-on during the flyback time. An additional function of the IC is the 'low-power start-up' feature. For this function a supply voltage with a value between 3 and 5 V must be available at the start-up pin (required current 5 mA typical). When all sub-address bytes have been sent and the POR and XPR flags have been cleared, the horizontal output can be switched-on via the STB-bit (sub-address 24H). In this condition the horizontal drive signal has the nominal TOFF and the TON grows gradually from zero to the nominal value as indicated in the soft-start behaviour. As soon as the 8 V supply is present the switch-on procedure (e.g. closing of the second loop) is continued. The presence of the 8 V supply voltage is indicated by the SUP bit in the I 2 C-bus output byte 02. The circuit generates a vertical sync pulse. This pulse can be selected on pin 49 via the bits CMB1 and CMB0. In the 100 Hz input processor versions the vertical sync pulse is available on pin 63 and the horizontal pulse on pin 56. Via the I C-bus adjustments can be made of the horizontal and vertical geometry. The vertical sawtooth generator drives the vertical output drive circuit, which has a differential output current. For the E-W drive a single ended current output is available. A special feature is the zoom function for both the horizontal and vertical deflection and the vertical scroll function. When the horizontal scan is reduced to display 4 : 3 pictures on a 16 : 9 picture tube an accurate video blanking can be switched on to obtain well-defined edges on the screen. Overvoltage conditions (X-ray protection) can be detected via the EHT tracking pin. When an overvoltage condition is detected the horizontal output drive signal will be switched-off via the slow stop procedure but it is also possible that the drive is not switched-off and that just a protection indication is given in the I 2 C-bus output bytes. The choice is made via the input bit PRD. When PRD = 1 and an overvoltage is detected the drive is switched-off and the STB bit is set to 0. Switching on of the drive is only possible when the XPR flag is cleared. The IC has a second protection input on the j2 filter capacitor pin. When this input is activated the drive signal is switched-off immediately and switched-on again via the slow start procedure. For this reason this protection input can be used as 'flash protection'. The drive pulses for the vertical sawtooth generator is obtained from a vertical countdown circuit. This countdown circuit has various windows depending on the incoming signal (50 Hz or 60 Hz and standard or non-standard). The countdown circuit can be forced in various modes by means of the I 2 C-bus. During the insertion of RGB signals the maximum vertical frequency is increased to 72 Hz so that the circuit can also synchronise on signals with a higher vertical frequency like VGA. To obtain short switching times of the countdown circuit during a channel change the divider can be forced in the search window by means of the NCIN bit. The vertical deflection can be set in the de-interlace mode via the I 2 C bus.

2.5. Chroma and Luminance processing

The circuit contains a chroma bandpass and trap circuit. The filters are realised by means of gyrator circuits and they are automatically calibrated by comparing the tuning frequency with the reference frequency of the decoder. The luminance delay line and the delay for the peaking circuit are also realised by means of gyrator circuits. The centre frequency of the chroma bandpass filter is switchable via the I 2 C-bus so that the performance can be optimised for 'front-end' signals and external CVBS signals. During SECAM reception the centre frequency of the chroma trap is reduced to get a better suppression of the SECAM carrier frequencies.

2.6. Colour Decoder

The colour decoder can decode PAL, NTSC and SECAM signals. The internal clock signals for the various colour standards are generated by means of an internal VCO, which uses the 12 MHz crystal frequency as a reference. Under bad-signal conditions (e.g. VCR-playback in feature mode), it may occur that the colour killer is activated although the colour PLL is still in lock. When this killing action is not wanted it is possible to overrule the colour killer by forcing the colour decoder to the required standard and to activate the FCO-bit (Forced Colour On) in subaddress 21H. The IC contains an

Automatic Colour Limiting (ACL) circuit which is switchable via the I²C-bus and which prevents that oversaturation occurs when signals with a high chroma-to-burst ratio are received. The ACL circuit is designed such that it only reduces the chroma signal and not the burst signal. This has the advantage that the colour sensitivity is not affected by this function. The SECAM decoder contains an auto-calibrating PLL demodulator which has two references, viz: the divided 12 MHz reference frequency of the crystal oscillator which is used to tune the PLL to the desired free-running frequency and the bandgap reference to obtain the correct absolute value of the output signal. The VCO of the PLL is calibrated during each vertical blanking period, when the IC is in search or SECAM mode. The reference frequency of the colour decoder is fed to the Fsc output (pin 49) and can be used to tune an external comb filter. The base-band delay line is integrated. The demodulated colour difference signals are internally supplied to the delay line. The colour difference matrix switches automatically between PAL/SECAM and NTSC, however, it is also possible to fix the matrix in the PAL standard.

2.7. PICTURE IMPROVEMENT FEATURES

In the TDA 8885 series various picture improvement features have been integrated. These features are:

- Video dependent coring in the peaking circuit. The coring can be activated only in the low-light parts of the screen. This effectively reduces noise while having maximum peaking in the bright parts of the picture.
- Colour Transient Improvement (CTI). This circuit improves the rise and fall times of the colour difference signals. The function is realised by using delay cells with a length of 300 ns.
- Black-stretch. This circuit corrects the black level for incoming video signals, which have a deviation between the black level and the blanking level (back porch). The time constant for the black stretcher is realised internally
- Blue-stretch. This circuit is intended to shift colour near 'white' with sufficient contrast values towards more blue to obtain a brighter impression of the picture
- White-stretch. This function adapts the transfer characteristic of the luminance amplifier in a non-linear way dependent on the picture content. The system operates such that maximum stretching is obtained when signals with a low video level are received. For bright pictures the stretching is not active.
- Dynamic skin tone (flesh) control. This function is realised in the YUV domain by detecting the colours near to the skin tone. The correction angle can be controlled via the I²C-bus.

2.8. RGB output circuit and black-current stabilisation

The ICs have a very flexible control circuit for RGB and YUV input signals, which has the following features:

- Input which can be used for YUV or RGB input signals and as YUV interface. The selection of the various modes can be realised via the I²C-bus. For the YUV input 2 different input signal conditions can be chosen. It is also possible to connect the synchronisation circuit to the incoming Y input signal. This input signal can be controlled on saturation, contrast and brightness.
 - The RGB-1 input which is intended for OSD/text signals and which can be controlled on contrast and brightness. By means of the IE1 bit the insertion blanking can be switched on or off. Via the IN1 bit it can be read whether the insertion pin has a high level or not. It is also possible to convert the incoming RGB-1 signal to a YUV signal. The resulting signal is supplied to the YUV outputs.
 - The TDA 888X versions have an additional YUV or RGB input which can be controlled on contrast, saturation and brightness. The various input signal conditions are given. The insertion blanking of this input can be switched-off by means of the IE2 bit. Via the IN2 bit it can be read whether the insertion pin has a high level or not. The control circuit has a half tone input, which can be used to reduce the contrast setting during mixed mode operation for teletext and OSD signals. The output signal has amplitude of about 2 V black-to-white at nominal input signals and nominal settings of the controls. To increase the flexibility of the IC it is possible to insert OSD and/or teletext signals directly at the RGB outputs. This insertion mode is controlled via the insertion input (pin 38). This blanking action at the RGB outputs has some delay, which must be compensated externally.
- To obtain an accurate biasing of the picture tube the 'Continuous Cathode Calibration' system has been included in this IC. Via the I²C-bus a black level offset can be made with respect to the level which is generated by the black current stabilisation system. In this way different colour temperatures can be obtained for the bright and the dark part of the picture.

The black current stabilisation system checks the output level of the 3 channels and indicates whether the black level of the highest output is in a certain window (WBC-bit) or below or above this window (HBC-bit). This indication can be read from the I² C-bus and can be used for automatic adjustment of the Vg2 voltage during the production of the TV receiver.

The control circuit contains a beam current limiting circuit and a peak white limiting circuit. The peak white level is adjustable via the I² C-bus. To prevent that the peak white limiting circuit reacts on the high frequency content of the video signal a low-pass filter is inserted in front of the peak detector. The circuit also contains a soft-clipper, which prevents that the high frequency peaks in the output signal become too high. The difference between the peak white limiting level and the soft clipping level is adjustable via the I² C-bus in a few steps.

During switch-off of the TV receiver, the black current control circuit generates a fixed beam current. This current ensures that the picture tube capacitance is discharged. During the switch-off period the vertical deflection can be placed in an overseen position so that the discharge is not visible on the screen.

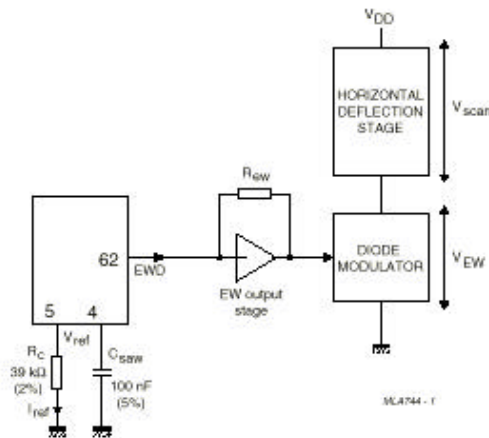
2.9. EAST – WEST OUTPUT STAGE

In order to obtain correct tracking of the vertical and horizontal EHT-correction, the EW output stage should be dimensioned as illustrated in Figure. Resistor REW determines the gain of the EW output stage. Resistor Rc determines the reference current for both the vertical sawtooth generator and the geometry processor. The preferred value of Rc is 39 kW which results in a reference current of 100 mA (Vref = 3.9 V).

The value of REW must be:

$$R_{EW} = R_C * (V_{scan} / (18 * V_{ref}))$$

Example: With Vref = 3.9 V; Rc =39 kohm and Vscan = 120 V then REW =68 kohm



3. TUNER

PLL tuner is used as a tuner.

UV1316 (VHF/UHF) is used as a PLL tuner. For only PALM/N, NTSC M applications UV 1336 are used as the PLL tuner.

Channel coverage of UV1316:

BAND	OFF-AIR CHANNELS		CABLE CHANNELS
	CHANNELS	FREQUENCY	CHANNELS
FREQUENCY			
RANGE (MHz)	RANGE (MHz)		
Low Band	E2 to C	48.25 to 82.25 (1)	S01 to S08
69.25 to 154.25			

Mid Band 161.25 to 439.25	E5 to E12	175.25 to 224.25	S09 to S38
High Band 447.25 to 463.25	E21 to E69	471.25 to 855.25 (2)	S39 to S41

(1). Enough margin is available to tune down to 45.25 MHz.

(2). Enough margin is available to tune up to 863.25 MHz.

Noise	Typical	Max.	Gain	Min.	Typical
Low band	: 5dB 52dB	9dB	All channels	: 38dB	44dB
Mid band	: 5dB 8dB	9dB	Gain Taper (of-air channels)	: -	-
High band	: 6dB	9dB			

Channel Coverage UV1336:

BAND	CHANNELS	FREQUENCY RANGE (MHz)
Low Band	2 to D	55.25 to 139.25
Mid Band	E to PP	145.25 to 391.25
High Band	QQ to 69	397.25 to 801.25

Noise is typically 6dB for all channels. **Gain** is minimum 38dB and maximum 50dB for all channels.

4. VIDEO SWITCH TEA6415C

In case of three or more external sources are used, the video switch IC TEA6415C 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 34x0D is designed to perform demodulation of FM or AM-Mono TV sound. Alternatively, two-carrier FM systems according to the German or Korean terrestrial specs or the satellite specs can be processed with the MSP 34x0D. Digital demodulation and decoding of NICAM-coded TV stereo sound, is done only by the MSP 3410. The MSP 34x0D offers a powerful feature to calculate the carrier field strength which can be used for automatic standard detection (terrestrial) and search algorithms (satellite).

6. SOUND OUTPUT STAGE WITH TDA 7265

TDA7265 is a class AB dual Audio power amplifier assembled in the multiwatt package.

Mute stand-by function of the audio amplifier can be described as the following; the pin 5

(MUTE/STAND-BY) controls the amplifier status by two different thresholds, referred to +Vs. When Vpin (5) higher than (+Vs - 2.5V) the amplifier is in Stand-by mode and the final stage generators are off. When Vpin (5) is between (+Vs - 2.5V) and (+Vs - 6V) the final stage current generators are switched on and the amplifier is in mute mode. When the Vpin (5) is lower than +Vs - 6V the amplifier is play mode.

7. VERTICAL OUTPUT STAGE WITH STV 9379

The IC TDA9379FA is the vertical deflection booster circuit. Two supply voltages, +12V and –12V are needed to scan the inputs VERT+ and VERT-, respectively. And a third supply voltage, +45V 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 TDA6107/08Q includes three video output amplifiers in a SIL 9 MP (Single in Line 9 pins Medium Power) package SOT111BE, using high-voltage DMOS technology, and is intended to drive the three cathodes of a colour picture tube.

In contrast to previous types of DMOS video amplifiers, all external resistors (Rf, Ri and Ra) are integrated, so the gain is fixed.

To obtain maximum performance, the amplifier should be used with black-current control and mounted on the CRT panel.

9. COMBFILTER TDA 9181

The TDA 9181 is an adaptive PAL/NTSC comb filter with two internal delay lines, filters, clock control, and input clamps. Video standards PAL B, G, H, I, M and N NTSC M are supported.

Two CVBS input signals can be selected by means of input switch.

In addition to the comb filter the circuit contains an output switch so that a selection can be made between the combed CVBS signal and an external Y/C signal.

The supply voltage is 5V.

10. 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 produces 150V for FBT input, ? 14V for audio output IC, S+3.3, S+5V and 8V for TDA8885.

11. POWER FACTOR CORRECTION

The MC33260 is a controller for Power Factor Correction pre-converters meeting international standard requirements in electronic ballast and off-line power conversion applications. Designed to drive a free frequency discontinuous mode, it can also be synchronised and in any case, it features very effective protections that ensure a safe and reliable operation.

12. MICROCONTROLLER SDA555X

12.1. 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 P-SDIP 52
- ROMless version package P-LCC84

12.2. 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

12.3. 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

12.4. 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

12.5. 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

12.6. 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 Synchronisation in Master or Slave Mode

12.7. 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

12.8. 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 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. SERIAL ACCESS CMOS 8K (1024*8) EEPROM ST24C08

The ST24C08 is a 8Kbit electrically erasable programmable memory (EEPROM), organised as 4 blocks of 256*8 bits.

The memory is compatible with the I²C standard, two wire serial interface, which uses a bi-directional data bus and serial clock.

The memory carries a built-in 4 bit, unique device identification code (1010) corresponding to the I²C bus definition.

This is used together with 1 chip enable input (E) so that up to 2*8K devices may be attached to the I²C bus and selected individually.

14. 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.

15. SAW FILTERS

Saw filter type : Model:

K9356M : PAL-SECAM B/G/D/K/I STEREO (AUDIO IF)

K9656M : PAL-SECAM B/G/D/K/I/L/L' STEREO (AUDIO IF)

K3958M : PAL-SECAM B/G/D/K/I/L/L' STEREO (VIDEO IF)

16. IC DESCRIPTIONS AND INTERNAL BLOCK DIAGRAM

? TDA8885

? TUNER (UV1315, UV1316)

? TEA6415C

? TDA 7265

? TDA6108Q

? 74HCT32

? MC44608

? SDA5555

? TDA9181

? TCD1102

? ST24C08

? TDA1308

? PCF8583

? MC33260

? STV9379

? MSP34XXG

? LM358N

16.1. TDA8885:

16.1.1. GENERAL DESCRIPTION

The TDA 8885 is I²C-bus controlled singlechip TV processors, which are intended to be applied in PAL/NTSC and multi-standard television receivers. These ICs are largely compatible with the TDA 884X/5X series. Also in this IC family we have versions with a mono intercarrier FM sound channel and versions with a QSS IF amplifier.

The main difference between the TDA 884X/5X series and the TDA 886X/7X/8X series is that the latter contains integrated sound band-pass (in mono FM versions) and trap circuits, a switchable group delay correction circuit and a multi-standard colour decoder which needs only one inexpensive (12 MHz) reference crystal for all standards.

Furthermore various picture improvement features have been included.

16.1.2. FEATURES

- Multi-standard vision IF circuit with an alignment-free PLL demodulator without external components
- Internal (switchable) time-constant for the IF-AGC circuit
- Switchable sound trap and group delay correction circuit for the demodulated CVBS signal
- Flexible source selection with CVBS switch and a Y (CVBS)/C input so that a comb filter can be applied
- Integrated chrominance trap circuit
- Integrated luminance delay line with adjustable delay time
- Integrated chroma band-pass filter with switchable centre frequency

- Colour decoder which needs only one 12 MHz reference crystal (or external clock signal) for all standards
- Blanking of the ‘helper signals’ for PAL PLUS and EDTV-2
- Several picture improvement features.
- Internal base-band delay line
- YUV interface
- Linear RGB input and fast blanking
- RGB control circuit with ‘Continuous Cathode Calibration’, white point and black level offset adjustment so that the colour temperature of the dark and the light parts of the screen can be chosen independently.
- Adjustable peak white limiting circuit
- Half-tone (contrast reduction) possibility during mixed-mode of OSD and text signals
- Possibility to insert a ‘blue back’ option when no video signal is available
- Horizontal synchronisation with two control loops and alignment-free horizontal oscillator
- Vertical count-down circuit
- Vertical driver optimised for DC-coupled vertical output stages for improved geometry
- Vertical geometry processing.
- Low-power start-up for the horizontal drive circuit
- I²C-bus control of various functions
- QSS sound IF amplifier
 - AM sound demodulator
 - PAL decoder
 - SECAM decoder
 - NTSC decoder
 - Additional RGB/ YUV input
 - Black stretch and Blue stretch
 - Dynamic skin tone control and coring on complete video signal
 - Video dependent coring and Colour Transient Improvement
 - White stretch and green enhancement
 - Horizontal geometry (EW)
 - Horizontal and vertical zoom
 - Horizontal parallelogram and angle correction
 - 2nd CVBS output
 - Additional YUV/ RGB input with saturation control
 - 2 (I²C- bus controlled) switch outputs, which can be used to switch external circuits

16.1.3. Pin Description

1	IF input 1
2	IF input 2
3	EHT/overvoltage protection input
4	vertical sawtooth capacitor
5	reference current input
6	ground (vision/QSS IF amplifier and sound)
7	tuner AGC output
8	de-emphasise (front-end sound out) or selected sound out or AM sound in (1) SIF input 1
9	decoupling sound demodulator SIF input 2
10	narrow-band PLL filter AGC sound IF
11	external audio input QSS intercarrier out or AM output or external audio input (2)
12	internally connected
13	half tone (contrast reduction)
14	low-power start-up
15	IF-PLL loop filter
16	IF video output
17	serial clock input
18	serial data input/output
19	white stretch capacitor
20	chrominance input (S-VHS)
21	external CVBS/Y 3 input
22	output switch 1 (I ² C)
23	main supply voltage (+8V) (vision/QSS amplifier, filters, CTI and sound)

24	internal CVBS input
25	ground 1 (colour decoder and synchronisation)
26	CVBS-2 output
27	audio out (volume controlled) / IF video out (3) AM audio output (volume controlled)
28	SECAM PLL decoupling
29	CVBS/Y 2 input
30	black-current input
31	blue output
32	green output
33	red output
34	beam current limiter input/V-guard input
35	red input for insertion
36	green input for insertion
37	blue input for insertion
38	RGB insertion input
39	luminance input
40	luminance output
41	2nd V/R input
42	2nd Y/G input
43	2nd U/B input
44	2nd RGB insertion input
45	U signal output or YUV-RGB insertion input (4)
46	V signal output or Y input or G input (4)
47	U or B signal input (4)
48	V or R signal input (4)
49	Ref. signal out or AVL or V-sync out (5) Ref. signal out or AM out or V-sync out (5)
50	decoupling digital supply
51	12 MHz crystal connection
52	12 MHz crystal connection
53	2nd supply voltage (+8 V) (colour decoder, control, synchronisation and geometry)
54	CVBS-1 output
55	bandgap decoupling
56	horizontal output
57	flyback input / sandcastle output
58	phase-2 filter
59	phase-1 filter
60	output switch 2 (I 2 C)
61	ground 2 (filters, CTI, control and geometry)
62	east-west drive output / Automatic Volume Levelling
63	vertical drive B output
64	vertical drive A output

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
Supply					
V _P	supply voltage		8.0		V
I _P	supply current		tbf		mA
Input voltages					
V _i (VIF)(rms)	video IF amplifier sensitivity (RMS value)		35		V
V _i (SIF)(rms)	sound IF amplifier sensitivity (RMS value)		60		V
V _i (CVBS/Y)(p-p)	external CVBS/Y input (peak-to-peak value)		1.0		V
V _i (CHROMA)(p-p)	external chroma input voltage (burst amplitude)(peak-to-peak value)		0.3		V
V _i (RGB)(p-p)	RGB inputs (peak-to-peak value)		0.7		V
V _i (YI)(p-p)	luminance input signal (peak-to-peak value)		1.4/1.0		V
V _i (UI)(p-p)	U input signal (peak-to-peak value)		1.33/+0.7		V
V _i (VI)(p-p)	V input signal (peak-to-peak value)		1.05/+0.7		V
Output signals					
V _o (IFVO)(p-p)	demodulated CVBS output (peak-to-peak value)		2.5		V
I _o (AGCOUT)	tuner AGC output current range	0		5	mA
V _o (QSSO)(rms)	sound IF intercarrier output (RMS value)		100		mV
V _o (AMOUT)(rms)	demodulated AM sound output (RMS value)		500		mV
V _o (CVBSO)(p-p)	CVBS output voltage video switch (peak-to-peak value)		2.0		V
V _o (VO/I)(p-p)	? V output/input voltage (peak-to-peak value)		1.05		V

V _{o(UO/I)} (p-p)	? U output/input voltage (peak-to-peak value)	1.33	V
V _{o(YO/I)} (p-p)	Y output/input voltage (peak-to-peak value)	1.4	V
V _{o(RGB)} (p-p)	RGB output signal amplitudes (peak-to-peak value)	2.0	V
I _{o(HOUT)}	horizontal output current	10	mA
I _{o(VERT)}	vertical output current (peak-to-peak value)	1	mA
I _{o(EWD)}	EW drive output current	1.2	mA

16.2. UV1315, UV1316

16.2.1. General description of UV1315:

The UV1315 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.

16.2.2. Features of UV1315:

- Member of the UV1300 family small sized UHF/VHF tuners
- Systems CCIR: B/G, H, L, L', I and I'; OIRT: D/K
- Voltage synthesised tuning (VST)
- Off-air channels, S-cable channels and Hyperband
- Standardised mechanical dimensions and pinning
- Compact size

PINNING

PIN VALUE

1. Gain control voltage (AGC)	:	4.0V, Max:4.5V
2. Tuning voltage		
3. High band switch	:	5V, Min:4.75V, Max:5.5V
4. Mid band switch	:	5V, Min:4.75V, Max:5.5V
5. Low band switch	:	5V, Min:4.75V, Max:5.5V
6. Supply voltage	:	5V, Min:4.75V, Max:5.5V
7. Not connected		
8. Not connected		
9. Not connected		
10. Symmetrical IF output 1		
11. Symmetrical IF output 2		

Bandswitching table:

	Pin 3	Pin 4	Pin 5
Low band	0V	0V	+5V
Mid band	0V	+5V	0V
High band	+5V	0V	0V

16.2.3. 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.

16.2.4. Features of UV1316:

- Member of the UV1300 family small sized UHF/VHF tuners
- Systems CCIR: B/G, H, L, L', I and I'; OIRT: D/K
- Digitally controlled (PLL) tuning via I2C-bus
- Off-air channels, S-cable channels and Hyperband
- World standardised mechanical dimensions and world standard pinning

- Compact size
- Complies to “CENELEC EN55020” and “EN55013”

PINNING	PIN VALUE
1. Gain control voltage (AGC)	: 4.0V, Max:4.5V
2. Tuning voltage	
3. I ² C-bus address select	: Max:5.5V
4. I ² C-bus serial clock	: Min:-0.3V, Max:5.5V
5. I ² C-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	

16.3. TEA6415C:

16.3.1. General Description:

The main function of the TEA6415C is to switch 8 video input sources on the 6 outputs. Each output can be switched to only one of the inputs whereas but any same input may be connected to several outputs.

All switching possibilities are controlled through the I²C-bus.

16.3.2. Features:

- 20 MHz 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

PINNING	PIN VALUE
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

16.4. TDA7265:

The TDA7265 is a 25W+25W stereo sound amplifier with mute/stand-by facility. STPA control signal coming from microcontroller (when it is at high level) activates the mute function. IC is muted when mute port is at low level. Two stereo audio signals coming from audio module is injected to the inputs of the IC and a power of 12Wrms (10%) is obtained. An external pop-noise circuitry pulls AF inputs of the IC in order to eliminate pop noise when TV is turned on or off via mains supply connection. It is possible to adjust the gain of the amplifiers by feedback external resistors.

16.4.1. Features:

- Wide supply voltage range (up to 50V ABS Max.)
- Split supply
- High output power: 25+25 W @ TDA = 10%, RL = 8ohm, Vs = ±20V
- No pop at turn-on / off
- Mute (pop free)
- Stand-By feature (low I_Q)
- Few external components
- Thermal overload protection
- Adjustable gain via an external resistor

16.4.2. Pinning:

1. Output (1)
2. +Vs
3. Output (2)
4. Mute / St-By
5. -Vs
6. Input (2)
7. Ground
8. Input (1)

16.5. TDA6108Q:

The TDA6108Q consists of three monolithic video output amplifiers. The amplifier can be seen as an operational amplifier with negative feedback. The advantage of negative feedback is that the amplifier characteristics do not play an important role up to certain frequencies. The internal flash diodes protect the amplifiers against flash over in the picture tube. The only protections required at the cathode outputs are a flash resistor and a spark gap. Furthermore, the device needs only one power supply voltage (V_{dd}). The TDA6108Q is provided with a black current data pin.

16.5.1. Features:

- No external components, only the well known supply decoupling
- Very simple application with a variety of colour decoders
- Black-current measurement output for automatic black current stabilisation
- Only one supply voltage needed
- Internal protection against positive appearing CRT flash-over discharges
- Protection against ESD
- Internal reference voltage
- Thermal protection
- Controllable switch-off behaviour
- Very small PCB dimensions
- Very high replacement value

PINNING

1. Inverting input 1
2. Inverting input 2
3. Inverting input 3
4. Ground
5. BSC-output

PIN VALUE

- :2V_{pp}
:2V_{pp}
:2V_{pp}
:Max:7V

6. Supply voltage	:200VDC
7. Cathode output 3	:20mA, 100Vpp
8. Cathode output 2	:20mA, 100Vpp
9. Cathode output 1	:20mA, 100Vpp

16.6. 74 HCT 32

The 74HC/HCT32 are high-speed Si-gate CMOS devices and are pin compatible with low power Schottky TTL (LSTTL). They are specified in compliance with JEDEC. The 74HC/HCT32 provide the 2-input OR function.

16.6.1. PINNING

1, 4, 9, 12	: 1A to 4A data inputs
2, 5, 10, 13	: 1B to 4B data inputs
3, 6, 8, 11	: 1Y to 4Y data outputs
7	: GND ground (0 V)
14	: VCC positive supply voltage

For HC the condition is $V_I = \text{GND to } V_{CC}$

For HCT the condition is $V_I = \text{GND to } V_{CC} ? ? 1.5 \text{ V}$

16.7. MC44608

16.7.1. General 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

16.7.2. General Features

- Flexibility
- Duty cycle control
- On chip oscillator switching frequency 40, or 75kHz
- Secondary control with few external components

Protections

- Maximum duty cycle limitation
- Cycle by cycle current limitation
- Demagnetisation (Zero current detection) protection
- "Over V_{CC} 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 start-up
- Low dV/dT for low EMI radiation's

PINNING

1. Demagnetisation
2. I Sense

PIN VALUE

- Zero cross detection voltage: 50 mV typ.
Over current protection voltage 1V typ.

3. Control Input	Min: 7.5V Max.: 18V
4. Ground	Iout 2A _{p-p} during scan 1.2A _{p-p} during flyback
5. Driver	Output resistor 8.5 Ohm sink 15 Ohm source typ.
6. Supply voltage	Max:16V (Operating range 6.6V-13V)
7. No connection	
8. Line Voltage	Min:50V Max:500V

16.8. SDA5555:

16.8.1. General description:

- Feature selection via special function register
- Simultaneous reception of TTX, VPS, PDC, and WSS (line 23)
- Supply Voltage 2.5 and 3.3 V

PINNING

1	Comb Filter Standard Selection 1	Low Level : 0V	High Level : 3.3 V
2	Key 2	Low Level : 0V	High Level : 3.3 V
3	Key 1	Low Level : 0V	High Level : 3.3 V
4	Loc.key.switch input	Low Level : 0V	High Level : 3.3 V
5	Loc.key.switch input	Low Level : 0V	High Level : 3.3 V
6	Loc.key.switch input	Low Level : 0V	High Level : 3.3 V
7	Loc.key.switch input	Low Level : 0V	High Level : 3.3 V
8	Mute output	Low Level : 0V	High Level : 3.3 V
9	Digital supply voltage	2.5 V	
10	Ground		
11	Digital supply voltage	3.3 V	
12	CVBS input	1 Vpp	
13	Analogue supply voltage	2.5 V	
14	Analogue ground		
15	Wake Interrupt	Low Level : 0V	High Level : 3.3 V
16	AV-1 status input	Low Level : 0V	High Level : 3.3 V
17	AV-2 status input	Low Level : 0V	High Level : 3.3 V
18	Shortcut protection	Low Level : 0V	High Level : 3.3 V
19	SAND input	Low Level : 0V	High Level : 3.3 V
20	ODD/EVEN output	Low Level : 0V	High Level : 3.3 V
21	DVD 12 V Sense	Low Level : 0V	High Level : 3.3 V
22	Not used		
23	Idle Off	Low Level : 0V	High Level : 3.3 V
24	IR-input	Low Level : 0V	High Level : 3.3 V
25	Data output	Low Level : 0V	High Level : 3.3 V
26	Clock signal output	Low Level : 0V	High Level : 3.3 V
27	Stand-By Mode selection	Low Level : 0V	High Level : 3.3 V
28	Not used		
29	Ground		
30	Digital supply voltage	3.3 V	
31	Write Protect output	Low Level : 0V	High Level : 3.3 V
32	Service output	Low Level : 0V	High Level : 3.3 V
33	Reset output	Low Level : 0V	High Level : 3.3 V
34	6 MHz cristal connection 2	Low Level : 0V	High Level : 3.3 V
35	6 MHz cristal connection 1	Low Level : 0V	High Level : 3.3 V
36	Analogue ground		
37	Analogue supply voltage	2.5 V	
38	OSD-Red output	0.7 Vpp to 1.2 Vpp	

39	OSD-Green output	0.7 Vpp to 1.2 Vpp	
40	OSD-Blue output	0.7 Vpp to 1.2 Vpp	
41	OSD-Blanking output	Low Level : 0V	High Level : 3.3 V
42	Digital supply voltage	2.5 V	
43	Ground		
44	Digital supply voltage	3.3 V	
45	PAL / SECAM	Low Level : 0V	High Level : 3.3 V
46	Degauss	Low Level : 0V	High Level : 3.3 V
47	Horizontal Trapezoid	Low Level : 0V	High Level : 3.3 V
48	Tilt	Low Level : 0V	High Level : 3.3 V
49	Not used		
50	Micro s. select	Low Level : 0V	High Level : 3.3 V
51	Comb Filter Standard Selection 2	Low Level : 0V	High Level : 3.3 V
52	SVHS Sense	Low Level : 0V	High Level : 3.3 V

16.9. TDA9181:

Pin#:

Pin-1 = C_{yn}=Chrominance input signal
Pin-2 = INPSEL=input switch select input
Pin-3 = Y/CVBS2=luminance or CVBS input signal 2
Pin-4 = Digital GND
Pin-5= VDD=digital supply voltage
Pin-6=VCC=analog supply voltage
Pin-7 =SC=sandcastle input signal
Pin-8 =FSCSEL=color subcarrier select input
Pin-9 = FSC=color subcarrier input signal
Pin-10 =SYS2=standart select 2 input
Pin-11 = SYS1=standart select 1 input
Pin-12 =Y/CVBS1=luminance or CVBS input signal
Pin-13 = analogue GND
Pin-14 = Y/CVBSout=luminance or CVBS output signal
Pin-15 =OUTSEL=output switch select input
Pin-16 =Cout=chrominance output signal

16.9.1. General Features:

- One chip multistandart adaptive comb filter
- Cross luminance reduction
- Cross colour reduction
- No chroma trap, so sharper vertical luminance
- Analogue discrete-time signal processing, so no quantization noise
- Anti aliasing and reconstruction filters are included
- Input switch selects between two Y/CVBS inputs
- Output switch selects between combed CVBS and an external Y/C source
- Fsc as well as 2*fsc colour subcarrier signal may be applied
- Alignment free
- Few external components
- Low power

16.9.2. Limits:

- Analogue supply voltage Vcc=5.5V(max)
- Analogue supply current Icc=25mA(typ)
- Digital supply voltage Vdd=5.5(V)(max)
- Digital supply current Idd=10Ma(typ)
- Luminance or CVBS input signal (p-p) Y/CVBS1, 2 1.4V(max)

-Chrominance input signal (p-p) $C_{in}=1.0V(\max)$

16.10. TCD1102:

16.10.1. Description

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

16.10.2. 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 interfaces.

VDE 0884 related features:

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

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

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

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

16.10.3. 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 0.2 pF, 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

16.11. ST24C08:

16.11.1. General description:

The ST24C08 is an 8Kbit electrically erasable programmable memory (EEPROM), organised as 4 blocks of 256 * 8 bits.

The memory operates with a power supply value as low as 2.5V. Both Plastics Dual-in-Line and Plastic Small Outline packages are available.

16.11.2. Features:

- Minimum 1 million ERASE/WRITE cycles with over 10 years data retention
- Single supply voltage:4.5 to 5.5V
- Two wire serial interface, fully I2C-bus compatible
- Byte and Multibyte write (up to 8 bytes)

- Page write (up to 16 bytes)
- Byte, random and sequential read modes
- Self timed programming cycle

PINNING

1. Write protect enable (Ground)
2. Not connected (Ground)
3. Chip enable input (Ground)
4. Ground
5. Serial data address input/output
6. Serial clock
7. Multibyte/Page write mode
8. Supply voltage

PIN VALUE

- : 0V
- : 0V
- : 0V
- : 0V
- : Input LOW voltage : Min : -0.3V, Max : 0.3*Vcc
Input HIGH voltage: Min : 0.7*Vcc, Max : Vcc+1
- : Input LOW voltage : Min : -0.3V, Max : 0.3*Vcc
Input HIGH voltage: Min : 0.7*Vcc, Max : Vcc+1
- : Input LOW voltage : Min : -0.3V, Max : 0.5V
Input HIGH voltage: Min : Vcc-0.5, Max : Vcc+1
- : Min : 2.5V, Max : 5.5V

16.12. TDA1308:

16.12.1. 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

PINNING

1. Output A (Voltage swing)
2. Inverting input A
3. Non-inverting input A
4. Ground
5. Non-inverting input B
6. Inverting input B
7. Output B (Voltage swing)
8. Positive supply

PIN VALUE

- : Min : 0.75V, Max : 4.25V
- : Vo(clip) : Min : 1400mVrms
- : 2.5V
- : 0V
- : 2.5V
- : Vo(clip) : Min : 1400mVrms
- : Min : 0.75V, Max : 4.25V
- : 5V, Min : 3.0V, Max : 7.0V

16.13. PCF8583:

16.13.1. FEATURES

- I²C-bus interface operating supply voltage: 2.5 V to 6 V
- Clock operating supply voltage (0 to +70 ° C): 1.0 V to 6.0 V
- 240 8-bit low-voltage RAM
- Data retention voltage: 1.0 V to 6 V
- Operating current (at fsCL = 0 Hz): max. 50 μA
- Clock function with four year calendar
- Universal timer with alarm and overflow indication
- 24 or 12 hour format
- 32.768 kHz or 50 Hz time base
- Serial input/output bus (I²C)
- Automatic word address incrementing
- Programmable alarm, timer and interrupt function
- Slave address:
 - READ: A1 or A3
 - WRITE: A0 or A2.

16.13.2. GENERAL DESCRIPTION

The PCF8583 is a clock/calendar circuit based on a 2048-bit static CMOS RAM organised as 256 words by 8 bits. Addresses and data are transferred serially via the two-line bi-directional I²C-bus. The built-in word address register is incremented automatically after each written or read data byte. Address pin A0 is used for programming the hardware address, allowing the connection of two devices to the bus without additional hardware. The built-in 32.768 kHz oscillator circuit and the first 8 bytes of the RAM are used for the clock/calendar and counter functions. The next 8 bytes may be programmed as alarm registers or used as free RAM space. The remaining 240 bytes are free RAM locations.

SYMBOL PIN DESCRIPTION

OSCI	1	oscillator input, 50 Hz or event-pulse input
OSCO	2	oscillator output
A0	3	address input
Vss	4	negative supply
SDA	5	serial data line
SCL	6	serial clock line
INT	7	open drain interrupt output (active LOW)
VDD	8	positive supply

16.14. MC33260:

16.14.1. General Features:

- Standard Constant Output Voltage or “Follower Boost” Mode
- Switch Mode Operation: Voltage Mode
- Latching PWM for Cycle-by-Cycle On-Time Control
- Constant On-Time Operation That Saves the Use of an Extra Multiplier
- Totem Pole Output Gate Drive
- Undervoltage Lockout with Hysteresis
- Low Start-Up and Operating Current
- Improved Regulation Block Dynamic Behaviour
- Synchronisation Capability
- Internally Trimmed Reference Current Source

16.14.2. Safety Features:

- Overvoltage Protection: Output Overvoltage Detection
- Undervoltage Protection: Protection Against Open Loop
- Effective Zero Current Detection
- Accurate and Adjustable Maximum On-Time Limitation
- Overcurrent Protection
- ESD Protection on Each Pin

16.14.3. LIMITS:

- V_{cc} MAX voltage 16V
- Gate drive current source=-500mA, sink=500mA
- Input voltage -0.3V to +1.0V
- Operating junction Temperature +150 C

16.14.4. PINNING

- Pin1=Feedback input
- Pin2=V_{control}
- Pin3=Oscillator capacitor(C_t)

Pin4=Current Sense Input
Pin5=Synchronization Input
Pin6=GND
Pin7=Gate Drive
Pin8=Vcc

16.15. STV9379:

16.15.1. 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.

16.15.2. 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

16.16. MSP34XX :

MSP3410D

The MSP3410D is an I2C controlled single-chip multistandard sound processor for applications in analog and digital TV sets. The full TV sound processing, starting with analog sound IF signal-in, down to processed analog AF-out is performed in a single-chip covering all European TV-standards. It is designed to simultaneously perform digital demodulation and decoding of NICAM-coded TV stereo sound, as well as demodulation of FM-mono TV sound and two FM systems according to the German or Korean terrestrial specs. It is also possible to do AM-demodulation according to the SECAM system. There is AGC for analog inputs: 0.14 - 3Vpp. All demodulation and filtering is performed on chip and is individually programmable. All digital NICAM standards (B/G, L, and I) are realised. Only one crystal clock (18.432Mhz) is necessary. External capacitors at each crystal pin to ground are required. They are necessary for tuning the open-loop frequency of the internal PLL and for stabilising the frequency in closed-loop operation. The higher the capacitors, the lower the clock frequency result. The nominal free running frequency should match the centre of the tolerance range between 18.433 and 18.431Mhz as closely as possible. By means of standardised I2S interface, additional feature processors (DPL35xx, Dolby Prologic processor for this chassis) can be connected to the IC.

I2S bus interface consists of five pins:

I2S_DA_IN1...2	for input four channels (two channels per line) per sampling cycle (32Khz).
I2DA_OUT,	for output, two channels per sampling cycle (32KHz).
I2S_CL,	for timing of the transmission of I2S serial data, 1.024Mhz.
I2S_WS,	for the word strobe line defining the left and right sample.

Features:

- 5-band graphic equalizer (as in MSP3400C)
- Enhanced spatial affect (pseudo stereo / base-width enlargement as in MSP3400C)
- Headphone channel with balance, bass treble, loudness
- Balance for loudspeaker and headphone channels in dB units (optional)

- Additional pair of D/A converters for SCART2 out
- Improved over-sampling filters (as in MSP 3400C)
- Additional SCART input
- Full SCART in/out matrix without restrictions
- SCART volume in dB units (optional)
- Additional I²S input (as in MSP 3400C)
- New FM-identification (as in MSP 3400C)
- Demodulator short programming
- Auto-detection for terrestrial TV-sound standards
- Precise bit-error rate indication
- Automatic switch from NICAM to FM/AM or vice versa
- Improved NICAM synchronisation algorithm
- Improved carrier mute algorithm
- Improved AM-demodulation
- ADR together with DRP 3510A
- Dolby Pro Logic together with DPL 35xx A
- Reduction of necessary controlling
- Less external components
- Significant reduction of radiation

Pinning:

1. ADR wordstrobe	35.	Analog Shield Ground 1
2. Not connected	36.	Scart input 3 in right
3. ADR data output	37.	Scart input 3 in left
4. I ² S 1 data input	38.	Analog Shield Ground 4
5. I ² S data output	39.	Scart input 4 in, right
6. I ² S wordstrobe	40.	Scart input 4 in, left
7. I ² S clock	41.	Not connected
8. I ² S data	42.	Analog reference voltage high voltage part
9. I ² S clock	43.	Analog ground
10. Not connected	44.	Volume capacitor MAIN
11. Standby (low-active)	45.	Analog power supply 8.0V
12. I ² C Bus address select	46.	Volume capacitor AUX
13. Digital control output 0	47.	Scart output 1, left
14. Digital control output 1	48.	Scart output 1, right
15. Not connected	49.	Reference ground 1 high voltage part
16. Not connected	50.	Scart output 2, left
17. Not connected	51.	Scart output 2, right
18. Audio clock output	52.	Analog Shield Ground 3
19. Not connected	53.	Not connected
20. Crystal oscillator	54.	Not connected
21. Crystal oscillator	55.	Not connected
22. Test Pin	56.	Analog output MAIN, left
23. IF input 2 (if ANA_IN1+is used only, connect 50 pF capacitor)	57.	Analog output MAIN, right to AVSS with Reference ground 2 high voltage part
24. IF common	59.	Analog output AUX, left
25. IF input 1	60.	Analog output AUX, right
26. Analog power supply +5V	61.	Power-on-reset
27. Analog ground	62.	Not connected
28. Mono input	63.	Not connected
29. Reference voltage IF A/D converter	64.	Not connected
30. Scart input 1 in, right	65.	I ² S2-data input
31. Scart input 1 in, left	66.	Digital ground
32. Analog Shield Ground 2	67.	Digital power supply +5V
33. Scart input 2 in, right	68.	ADR clock
34. Scart input 2 in, left		

16.17. LM358N:

16.17.1. General Description

The LM158 series consists of two independent, high gain, internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage. Application areas include transducer amplifiers, dc gain blocks and all the conventional op amp circuits, which now can be more easily implemented in single power supply systems. For example, the LM158 series can be directly operated off of the standard +5V power supply voltage, which is used in digital systems and will easily provide the required interface electronics without requiring the additional $\pm 15V$ power supplies.

16.17.2. Unique Characteristics

In the linear mode the input common-mode voltage range includes ground and the output voltage can also swing to ground, even though operated from only a single power supply voltage.

The unity gain cross frequency is temperature compensated.

The input bias current is also temperature compensated.

16.17.3. Advantages

Two internally compensated op amps

Eliminates need for dual supplies

Allows direct sensing near GND and V_{OUT} also goes to GND

Compatible with all forms of logic

Power drain suitable for battery operation

Pin-out same as LM1558/LM1458 dual op amp

16.17.4. Features

Available in 8-Bump micro SMD chip sized package, Internally frequency compensated for unity gain n Large dc voltage gain: 100 dB

Wide bandwidth (unity gain): 1 MHz (temperature compensated)

Wide power supply range:

— Single supply: 3V to 32V

— or dual supplies: $\pm 1.5V$ to $\pm 16V$

Very low supply current drain (500 μA) —essentially independent of supply voltage

Low input offset voltage: 2 mV

Input common-mode voltage range includes ground

Differential input voltage range equal to the power supply voltage

Large output voltage swing: 0V to $V + 1.5V$

17. AK33 CHASSIS MANUAL ADJUSTMENTS PROCEDURE

In order to enter the service menu, first enter the installation menu and then press the digits 4, 7, 2 and 5 respectively.

For ADJUST settings:

Select **Adjust** using or button and press or button to enter it. To select different adjust parameters, use or button.

To change the selected parameter, use or button.

WHITE BALANCE ADJUSTMENT:

The following three parameters are used to make white balance adjustment. To do this, use a Colour Analyser.

Using white point RED, white point GREEN and white point BLUE parameters, insert the + sign in the square which is in the middle of the screen.

ADJUST 00 = White Point RED

ADJUST 01 = White Point GREEN

ADJUST 02 = White Point BLUE

AGC ADJUSTMENT:

In order to do AGC adjustment, enter a 60dBmV RF signal level from channel C-12.

Connect a digital voltmeter to pin 1 of the tuner. Change the AGC parameter until you see 3.70VDC on voltmeter display. Check that picture is normal at 90dBmV signal level.

ADJUST 03 = AGC

IF-PLL NEGATIVE ADJUSTMENT (Only with PLL tuner):

Connect 38.9 MHz test pattern for PAL B/G, PAL-SECAM B/G, 39.5 MHz test pattern for PAL I or 45.75 MHz test pattern for PAL M/N, NTSC M model to Z401 SAW filter input terminals. Change the IF-PLL Negative parameter until you see IN, DOWN below. If you cannot catch IN, DOWN position this way, using a screwdriver rotate the VIF-COIL LT401 left or right until you see IN, DOWN.

ADJUST 04 = IF-PLL Negative

IF-PLL POSITIVE ADJUSTMENT (Only with PLL tuner):

Connect 33.9 MHz test pattern for SECAM L' model to Z401 SAW filter input terminals. Change the IF-PLL Positive parameter until you see IN, DOWN below. If you cannot catch IN, DOWN position this way, using a screwdriver rotate the VIF-COIL LT401 left or right until you see IN, DOWN.

ADJUST 05 = IF-PLL Positive

LUMINANCE DELAY ADJUSTMENT (with only TDA 8844 video processor):

ADJUST 06 = Y-Delay PAL

Enter a PAL B/G colour and black-white bar test pattern via RF. Adjust Y-Delay 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.

Note: If the SAW filter is one of the G1965M, J1951M, J3950M, K2958M, K2962M, G3957M, K6256K, K6259K or M1963M, there is constant group delay distortion, so for an equal delay of the luminance and chrominance signal the delay must be set at a

value of 160nS. This means the adjustment must be set to the maximum value.

ADJUST 07 = 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.

Note: If the SAW filter is one of the G1965M, K2958M, K2962M, G3957M, K6256K or K6259K, there is constant group delay distortion, so for an equal delay of the luminance and chrominance signal the delay must be set at a value of 160nS.

This means the adjustment must be set to the maximum value.

ADJUST 08 = 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.

Note: If the SAW filter is M1963M, there is constant group delay distortion, so for an equal delay of the luminance and chrominance signal the delay must be set at a value of 160nS. This means the adjustment must be set to the maximum value.

ADJUST 09 = Y-Delay Other

In case of other colour systems, enter this system with colour and black-white bar test pattern via RF. Adjust Y-Delay Other 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. Normally for an equal delay of the luminance and chrominance signal the delay must be set at a value of 160nS.

This means the adjustment must be set to the maximum value.

VERTICAL ZOOM ADJUSTMENT (only for 110ø picture tubes):

ADJUST 10 = Vertical Zoom

Enter a PAL B/G circle test pattern via RF. Change vertical zoom till you see the upper and lower limit of the circle as close to the upper and lower limit of the picture tube as possible.

VERTICAL SCROLL ADJUSTMENT (only for 110ø picture tubes):

ADJUST 11 = Vertical Scroll

Enter a PAL B/G circle test pattern via RF. Change vertical scroll till you see the circle exactly in the middle of the screen.

4:3 HORIZONTAL SHIFT ADJUSTMENT:

ADJUST 12 = 4 : 3 Horizontal Shift

Enter a RED PURITY test pattern via RF. Change horizontal shift till the picture is horizontally centred. Check whether this adjustment is correct after completing Service Mode Adjustment.

4:3 VERTICAL SLOPE ADJUSTMENT:

ADJUST 13 = 4 : 3 Vertical Slope

Enter a CROSS-HATCH B/G test pattern via RF. Change vertical slope till the size of squares on both the upper and lower part of test pattern become equal to the squares laying on the vertical centre of the test pattern. Check and readjust VERTICAL

SLOPE item if the adjustment becomes improper after some other geometric adjustments are done.

4:3 VERTICAL AMPLITUDE ADJUSTMENT:

ADJUST 14 = 4 : 3 Vertical Amplitude

Enter a PAL B/G test pattern via RF. Change vertical slope till horizontal black lines on both the upper and lower part of the test pattern become very close to the upper and lower horizontal sides of picture tube and nearly about to disappear. Check and readjust VERTICAL AMPLITUDE item if the adjustment becomes improper after some other geometric adjustments are done.

4:3 S-CORRECTION ADJUSTMENT:

ADJUST 15 = 4 : 3 S-Correction

Enter a PAL B/G circle test pattern via RF. Change S-correction till the middle part of the circle is as round as possible.

4:3 VERTICAL SHIFT ADJUSTMENT:

ADJUST 16 = 4 : 3 Vertical Shift

Enter a PAL B/G test pattern via RF. Change Vertical Shift till the test pattern is vertically centred, i.e. horizontal line at the centre pattern is in equal distance both to upper and lower side of the picture tube. Check and readjust Vertical Shift item if the adjustment becomes improper after some other geometric adjustments are done.

4:3 EW WIDTH ADJUSTMENT (only for 110ø picture tubes):

ADJUST 17 = 4 : 3 EW Width

Enter a PAL B/G test pattern via RF. Change EW Width till the vertical black and white bars on both left and right side of the pattern exactly disappear.

4:3 EW PARABOLA WIDTH ADJUSTMENT (only for 110ø picture tubes):

ADJUST 18 = 4 : 3 EW Parabola Width

Enter a PAL B/G test pattern via RF. Change EW Parabola Width till vertical lines close to the both sides of the picture frame become parallel to vertical sides of picture tube. Check and readjust EW Parabola Width item if the adjustment becomes improper after some other geometric adjustments are done.

4:3 EW UPPER CORNER PARABOLA ADJUSTMENT (only for 110ø picture tubes):

ADJUST 19 = 4 : 3 EW Corner Parabola

Enter a PAL B/G test pattern via RF. Change EW Upper Corner Parabola till vertical lines at the corners of both sides of picture frame become vertical and parallel to vertical corner sides of picture tube. Check and readjust EW Upper Corner Parabola item if the adjustment becomes improper after some other geometric adjustments are done.

4:3 EW TRAPEZIUM ADJUSTMENT :

ADJUST 20 = 4 : 3 EW Trapezium

Enter a PAL B/G test pattern via RF. Change EW Trapezium 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 EW Trapezium item if the adjustment becomes improper after some other geometric adjustments are done.

HORIZONTAL PARALLELOGRAM:

ADJUST 21 = Horizontal Parallelogram

Enter a PAL B/G test pattern via RF. Change Horizontal Parallelogram to set vertical lines orthogonal to the horizontal lines Check and readjust Horizontal Parallelogram item if the adjustment becomes improper after some other geometric adjustments are done.

BOW :

ADJUST 22 = Bow

Enter a PAL B/G test pattern via RF. Change Bow to straighten the vertical lines. Check and readjust Bow item if the adjustment becomes improper after some other geometric adjustments are done.

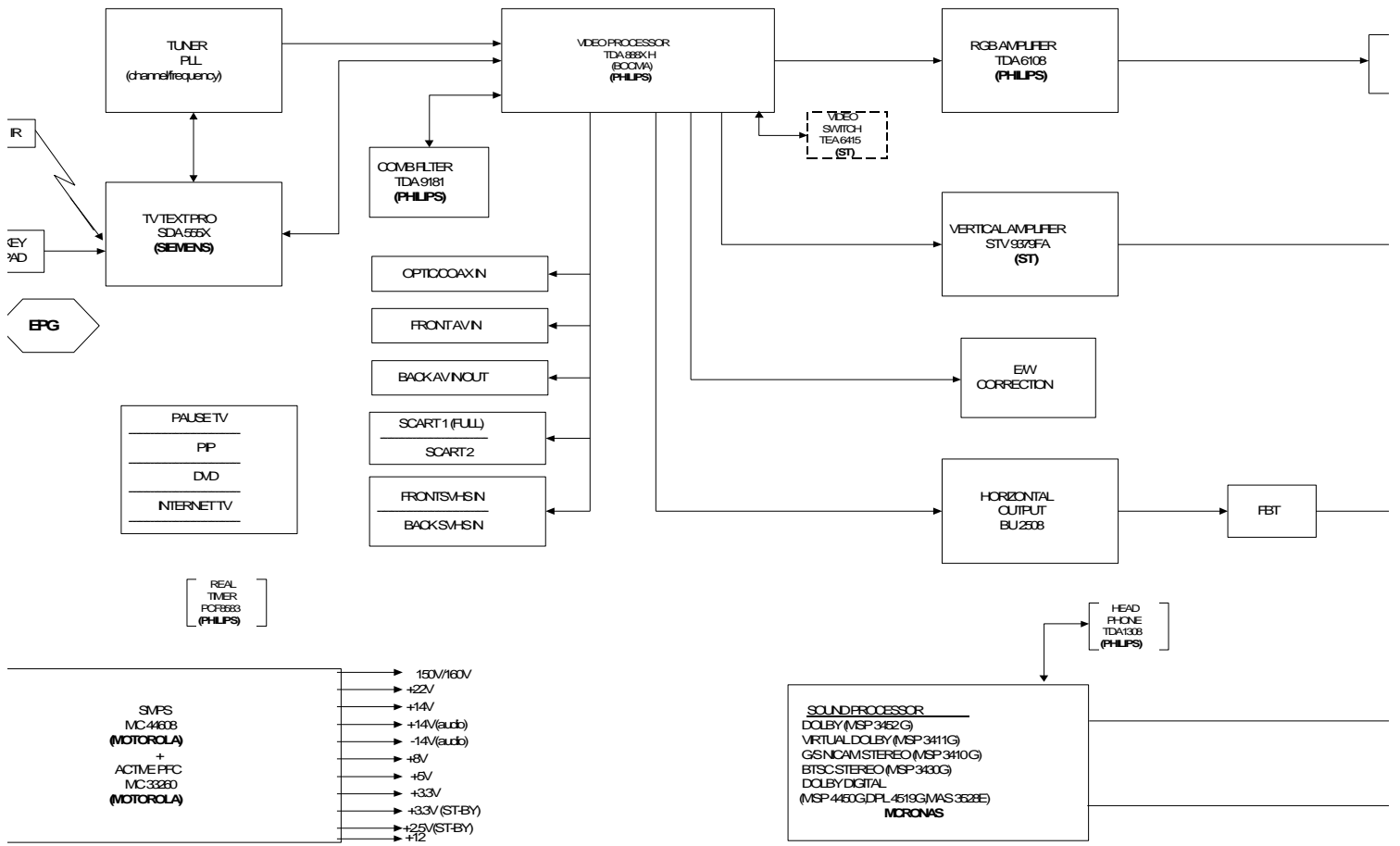
4:3 EW LOWER CORNER PARABOLA ADJUSTMENT (only for 110ø picture tubes):

ADJUST 23 = 4 : 3 EW Lower Corner Parabola

Enter a PAL B/G test pattern via RF. Change EW Lower Corner Parabola till vertical lines at the corners of both sides of picture frame become vertical and parallel to vertical corner sides of picture tube. Check and readjust EW Lower Corner Parabola item if the adjustment becomes improper after some other geometric adjustments are done.

**remark that some adjustments are fixed to default values in order to get correct geometry in all picture modes(4:3,16:9,Cinema,Subtitle,Super zoom)

GENERAL BLOCK DIAGRAM OF CHASSIS 11 AK33



SPARE PARTS LIST										
10015332	2850W*TEAC TEAC CTW2850S(AK33)SILVER									
BOM Date : 11/09/2002										
COMPONENT CODE	MATERIAL	POSITION NUMBER					PRICE	CUR	CHK	
ELECTRONICS										
20000849	FUSE ASSY.TK79-A (3.15A)	.	.	.	.	.	0,0434	USD	<input type="checkbox"/>
20011486	MD.ASY.SB16-AV&SVHS&HP (AK18)	.	.	.	.	.	2,1288	USD	<input type="checkbox"/>
20036465	ON/OFF AS.110°(32-33")(2.2/AU)(W/MAKARON	.	.	.	.	.	1,2056	USD	<input type="checkbox"/>
20060968	MD.ASY.TB285X-W 2850/51W 5SW 19PRO	.	.	.	.	.	1,1781	USD	<input type="checkbox"/>
20072781	CRT B.ASSY.TP33 (AK33) REAL FLAT (SAM)	.	.	.	.	.	3,4863	USD	<input type="checkbox"/>
20088026	PR.IC.33-AK33F003	.	.	.	.	.	0,00	*	<input type="checkbox"/>
20094976	MD.ASY.37-T KARTI	PL208	.	.	.	.	0,2521	USD	<input type="checkbox"/>
20103273	IC 24C16 R100YD1410101K1101	.	.	.	.	.	0,00	*	<input type="checkbox"/>
20103274	CHS.ASSY.33J-11C1K12213316122B2	.	.	.	.	.	0,00	*	<input type="checkbox"/>
20108337	PR.IC.33-AK33F006	.	.	.	.	.	0,00	*	<input type="checkbox"/>
30000071	CAP MKT 10NF 63V J	C606	.	.	.	.	0,0200	USD	<input type="checkbox"/>
.	.	C122	.	.	.	.
30000074	CAP MKT 100NF 63V J	C502	.	.	.	.	0,0400	USD	<input type="checkbox"/>
.	.	C772	.	.	.	.
.	.	C260	C764	C768	C643	C644				
30000075	CAP MKT 100NF 250V K (DC)	C601	C604	.	.	.	0,0900	USD	<input type="checkbox"/>	
.	.	C900	C907	.	.	.				
30000076	CAP MKT 100NF 275V M AC	C180	.	.	.	.	0,1400	USD	<input type="checkbox"/>
30000092	CAP MKT 220NF 63V J	C112	.	.	.	.	0,0700	USD	<input type="checkbox"/>
.	.	C280	C285	C626	.	.				
30000094	CAP MKT 220NF 275V M AC	C100	.	.	.	.	0,0300	USD	<input type="checkbox"/>
30000100	CAP MKT 330NF 63V J	C771	C773	.	.	.	0,0800	USD	<input type="checkbox"/>	
30000104	CAP MKT 4.7NF 100V J	NOT	.	.	.	.	0,0300	USD	<input type="checkbox"/>
30000106	CAP MKT 47NF 100V J	C355	.	.	.	.	0,0300	USD	<input type="checkbox"/>
30000115	CAP MKT 6.8NF 100V J	C101	C102	.	.	.	0,0200	USD	<input type="checkbox"/>	
30000136	CAP MKP 12NF 2000V %3.5	C615	.	.	.	.	0,2600	USD	<input type="checkbox"/>

30000144	CAP MKP 22NF 630V J	C616	.	.	.	.	.	0,1100	USD	<input type="checkbox"/>
30000151	CAP MKP 3.3NF 2KV %3.5	C611	.	.	.	.	.	0,1600	USD	<input type="checkbox"/>
30000153	CAP MKP 330NF 400V J	C105	.	.	.	.	.	0,1400	USD	<input type="checkbox"/>
30000160	CAP MKP 47NF 250V J	C612	.	.	.	.	.	0,0900	USD	<input type="checkbox"/>
30000161	CAP MKP 47NF 630V J	C114	.	.	.	.	.	0,1400	USD	<input type="checkbox"/>
30000162	CAP MKP 470NF 250V J	C617	.	.	.	.	.	0,4400	USD	<input type="checkbox"/>
30000172	CAP MKP 680NF 250V J (P=15)	C614	C618	.	.	.	.	0,3000	USD	<input type="checkbox"/>
30000190	CAP CER 100PF 50V J CH	CAB90	DX906	.	.	.	.	0,0120	USD	<input type="checkbox"/>
.	.	CAB90	DX906	.	.	.	.
30000191	CAP CER 100PF 50V J SL	C107	.	.	.	.	.	0,0114	USD	<input type="checkbox"/>
.	.	C106	.	.	.	.	.
30000198	CAP CER 120PF 500V J SL	C640	.	.	.	.	.	0,0300	USD	<input type="checkbox"/>
30000213	CAP CER 180PF 50V J CH	C103	C104	.	.	.	.	0,0200	USD	<input type="checkbox"/>
30000234	CAP CER 270PF 50V J SL	C905	.	.	.	.	.	0,0129	USD	<input type="checkbox"/>
30000266	CAP CER 560PF 50V J SL	C111	.	.	.	.	.	0,0200	USD	<input type="checkbox"/>
30000283	CAP CER 1NF 50V K B	C865	C265	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000287	CAP CER 10NF 50V K B	C638	.	.	.	.	.	0,0100	USD	<input type="checkbox"/>
30000290	CAP CER 10NF 50V Z F	C524	C526	C525	C527	.	.	0,0120	USD	<input type="checkbox"/>
30000295	CAP CER 100NF 50V Z F	C908	C904	.	.	.	.	0,0300	USD	<input type="checkbox"/>
.	.	C130	C142	C152	C153	.	.			
30000296	CAP CER 100NF 100V Z F	C623	.	.	.	.	.	0,0207	USD	<input type="checkbox"/>
30000316	CAP CER 220NF 25V Z F	C642	.	.	.	.	.	0,0400	USD	<input type="checkbox"/>
30000323	CAP CER 33NF 50V K B	C257	.	.	.	.	.	0,0300	USD	<input type="checkbox"/>
30000330	CAP CER 4.7NF 50V K B	C368	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000345	CAP EL 10UF 50V M	C219	C516	C741	C742	C744	.	0,0200	USD	<input type="checkbox"/>
.	.	C749	C701	.	.	.	.
.	.	C281	.	.	.	.	.
.	.	C230	.	.	.	.	.
.	.	C235	C352	.	.	.	.
.	.	C325	.	.	.	.	.
.	.	C304	.	.	.	.	.
30000350	CAP EL 10UF 250V M	C635	.	.	.	.	.	0,0800	USD	<input type="checkbox"/>

.	.	C906	.	.	.	.	.	.	.	.
30000351	CAP EL 10UF 350V M	C603	.	.	.	.	.	0,0541	USD	<input type="checkbox"/>
30000352	CAP EL 100UF 16V M	C779	C786	.	.	.	.	0,0300	USD	<input type="checkbox"/>
.	.	C306	C700	C363	C364	C365	.	.	.	.
.	.	C759	C274	C520	.	.	.	.	.	.
30000353	CAP EL 100UF 25V M	C107	.	.	.	.	.	0,0300	USD	<input type="checkbox"/>
30000354	CAP EL 100UF 35V M	C110	.	.	.	.	.	0,0400	USD	<input type="checkbox"/>
30000355	CAP EL 100UF 50V M	C217	.	.	.	.	.	0,0183	USD	<input type="checkbox"/>
30000359	CAP EL 1000UF 16V M	C143	.	.	.	.	.	0,0500	USD	<input type="checkbox"/>
30000360	CAP EL 1000UF 25V M	C144	C600	C621	.	.	.	0,1100	USD	<input type="checkbox"/>
30000362	CAP EL 1UF 50V M	C789	.	.	.	.	.	0,0200	USD	<input type="checkbox"/>
.	.	C275	C762	C763	.	.	.	.	.	.
30000365	CAP EL 1UF 160V M	C639	.	.	.	.	.	0,0300	USD	<input type="checkbox"/>
30000367	CAP EL 1UF 250V M	C173	.	.	.	.	.	0,0198	USD	<input type="checkbox"/>
30000371	CAP EL 22UF 50V M	C501	C503	C514	C515	C517	.	0,0200	USD	<input type="checkbox"/>
.	.	C728	C732	C347	.	.	.	.	.	.
.	.	C776	C780	.	.	.	.	.	.	.
.	.	C778	C781	.	.	.	.	.	.	.
30000375	CAP EL 220UF 16V M	C001	.	.	.	.	.	0,0300	USD	<input type="checkbox"/>
.	.	C149	C150	C147	.	.	.	.	.	.
30000383	CAP EL 2200UF 25V M	C137	C138	.	.	.	.	0,0500	USD	<input type="checkbox"/>
30000384	CAP EL 2.2UF 50V M	C262	C283	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000385	CAP EL 2.2UF 250V M	C909	.	.	.	.	.	0,4100	USD	<input type="checkbox"/>
30000393	CAP EL 3.3UF 50V M	C740	C760	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000395	CAP EL 47UF 6.3V M (4*7MM)	C100	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000400	CAP EL 47UF 50V M	C148	.	.	.	.	.	0,0300	USD	<input type="checkbox"/>
30000402	CAP EL 47UF 100V M	C607	.	.	.	.	.	0,0300	USD	<input type="checkbox"/>
30000406	CAP EL 47UF 250V M (HR) 105°	C127	C608	.	.	.	.	0,4200	USD	<input type="checkbox"/>
30000407	CAP EL 470UF 16V M	C356	C711	.	.	.	.	0,0600	USD	<input type="checkbox"/>
.	.	C775	.	.	.	.	.	.	.	.
.	.	C866	.	.	.	.	.	.	.	.
30000409	CAP EL 470UF 25V M	C605	C767	C770	.	.	.	0,1000	USD	<input type="checkbox"/>

30000411	CAP EL 4700UF 16V M	C164	.	.	.	.	.	0,3000	USD	<input type="checkbox"/>
30000413	CAP EL 4.7UF 50V M	C539	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000415	CAP EL 4.7UF 250V M	C902	.	.	.	.	.	0,0600	USD	<input type="checkbox"/>
30000426	CAP EL 6.8UF 50V M (BPL)	.	.	.	.	.	.	0,1200	USD	<input type="checkbox"/>
.			
30000428	SPARK GAP 300V	SG900	SG901	SG902	SG903	SG904	.	0,1634	USD	<input type="checkbox"/>
30000433	CAP CER 1NF 1KV M B	C901	.	.	.	.	.	0,0300	USD	<input type="checkbox"/>
30000436	CAP CER 10NF 1KV ZE	C170	.	.	.	.	.	0,0282	USD	<input type="checkbox"/>
30000438	CAP CER 2.2NF 2KV	C903	.	.	.	.	.	0,0700	USD	<input type="checkbox"/>
.	.	C166	.	.	.	.	.
30000440	CAP CER 2.2NF 4KV M	C119	.	.	.	.	.	0,0500	USD	<input type="checkbox"/>
30000444	CAP CER 470PF 1KV KB	C636	C637	.	.	.	.	0,0083	USD	<input type="checkbox"/>
30000452	RES CF 1/4W 10R J	R110	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
.	.	R405	R411	.	.	.	.
30000459	RES CF 1/4W 100R J	R711	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
.	.	R902	R904	R903	.	.	.			
.	.	R309	R331	R335	R560	R600	.			
.	.	R705	R122	R561	R206	R207	.			
30000460	RES CF 1/4W 100R G	R329	.	.	.	.	.	0,0127	USD	<input type="checkbox"/>
30000466	RES CF 1/4W 1K J	R287	R536	R608	R650	R148	.	0,0120	USD	<input type="checkbox"/>
.	.	R001	.	.	.	.	.
.	.	R709	R712	R713	R714	.	.			
30000471	RES CF 1/4W 10K J	R101	R102	.	.	.	.	0,0120	USD	<input type="checkbox"/>
.	.	R501	R513	R611	R130	R629	.			
.	.	R279	R506	R113	R298	R626	.			
.	.	R505	.	.	.	.	.
.	.	R366	.	.	.	.	.
.	.	R918	.	.	.	.	.
.	.	R159	.	.	.	.	.
30000477	RES CF 1/4W 100K J	R145	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
.	.	R907	R912	R908	.	.	.			
30000500	RES CF 1/4W 12K J	R500	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
.	.	R365	.	.	.	.	.

30000513	RES CF 1/4W 130K J	R128	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000525	RES CF 1/2W 1.5K J	R909	R913	R910	.	.	.	0,0120	USD	<input type="checkbox"/>
30000531	RES CF 1/4W 15K J	R369	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
.	.	R516	.	.	.	.	.
30000535	RES CF 1/2W 150K J	R906	.	.	.	.	.	0,0114	USD	<input type="checkbox"/>
30000536	RES CF 1/4W 150K J	R142	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000541	RES CF 1/4W 1.5M J	R432	.	.	.	.	.	0,0100	USD	<input type="checkbox"/>
.	.	R112	.	.	.	.	.
30000554	RES CF 1/4W 180R J	R294	R607	.	.	.	.	0,0129	USD	<input type="checkbox"/>
30000560	RES CF 1/4W 1.8K J	R537	R538	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000580	RES CF 1/4W 22R J	R915	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000583	RES CF 1/4W 220R J	R300	R302	.	.	.	.	0,0115	USD	<input type="checkbox"/>
30000590	RES CF 1/4W 2.2K J	R922	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000594	RES CF 1/4W 22K J	R107	R109	.	.	.	.	0,0115	USD	<input type="checkbox"/>
30000599	RES CF 1/4W 220K J	R921	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000628	RES CF 1/4W 2.7K J	R605	.	.	.	.	.	0,0114	USD	<input type="checkbox"/>
30000633	RES CF 1/4W 27K J	R278	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000650	RES CF 1/4W 33R J	R111	R112	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000655	RES CF 1/4W 330R J	R303	R304	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000670	RES CF 1/4W 330K J	R748	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000682	RES CF 1/4W 39R J	R103	R104	R105	R106	.	.	0,0128	USD	<input type="checkbox"/>
30000706	RES CF 1/4W 47R J	R323	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000712	RES CF 1/4W 470R J	R108	R110	.	.	.	.	0,0120	USD	<input type="checkbox"/>
.	.	R157	.	.	.	.	.
30000718	RES CF 1/4W 4.7K J	R530	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
.	.	R111	.	.	.	.	.
30000729	RES CF 1/4W 470K J	R114	.	.	.	.	.	0,0114	USD	<input type="checkbox"/>
30000734	RES CF 1/4W 4.7R J	R719	R720	.	.	.	.	0,0114	USD	<input type="checkbox"/>
30000752	RES CF 1/4W 56K J	R649	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000767	RES CF 1/4W 68R J	R106	.	.	.	.	.	0,0100	USD	<input type="checkbox"/>
30000770	RES CF 1/4W 680R J	R131	R132	.	.	.	.	0,0120	USD	<input type="checkbox"/>

30000788	RES CF 1/4W 6.8M J	R900	.	.	.	.	.	0,0114	USD	<input type="checkbox"/>
30000792	RES CF 1/4W 75R J	R236	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
.	.	R229	.	.	.	.	.
30000848	RES MF 1/4W 1K F	R615	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30000865	RES MF 1/4W 1.2K J	R659	.	.	.	.	.	0,0000	USD	<input type="checkbox"/>
30000913	RES MF 1/4W 2K J	R109	.	.	.	.	.	0,0100	USD	<input type="checkbox"/>
30000982	RES MF 1/4W 4.7K J	R108	.	.	.	.	.	0,0100	USD	<input type="checkbox"/>
30000994	RES MF 1/4W 51K F	R657	.	.	.	.	.	0,0129	USD	<input type="checkbox"/>
30001082	RES MO 1/2W 1K J	R613	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30001084	RES MO 1W 1K J	R914	.	.	.	.	.	0,0100	USD	<input type="checkbox"/>
.	.	R101	.	.	.	.	.
30001088	RES MO 1W 1R J	R627	.	.	.	.	.	0,0100	USD	<input type="checkbox"/>
30001125	RES MO 2W 2.2K J	R911	.	.	.	.	.	0,0900	USD	<input type="checkbox"/>
30001132	RES MO 2W 0.22R J	R102	R152	.	.	.	.	0,0117	USD	<input type="checkbox"/>
30001134	RES MO 2W 2.2R J	R623	.	.	.	.	.	0,0095	USD	<input type="checkbox"/>
30001138	RES MO 1W 2.7K J	R601	R603	.	.	.	.	0,0100	USD	<input type="checkbox"/>
30001159	RES MO 1W 0.33R J	R116	.	.	.	.	.	0,0200	USD	<input type="checkbox"/>
30001162	RES MO 1W 390R J	R625	.	.	.	.	.	0,0114	USD	<input type="checkbox"/>
30001170	RES MO 1W 4.7K J	R916	.	.	.	.	.	0,0115	USD	<input type="checkbox"/>
30001174	RES MO 2W 0.47R J	R153	.	.	.	.	.	0,0119	USD	<input type="checkbox"/>
30001178	RES MO 5W 5.1K J	R614	.	.	.	.	.	0,0614	USD	<input type="checkbox"/>
30001208	RES FUSE 1W 10R J	R917	.	.	.	.	.	0,1100	USD	<input type="checkbox"/>
30001222	RES FUSE 1W 1.8R J	R617	.	.	.	.	.	0,0114	USD	<input type="checkbox"/>
30001232	RES FUSE 1/4W 2.7R J	R612	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30001244	RES FUSE 1/2W 0.47R J	R604	R606	J118	.	.	.	0,0079	USD	<input type="checkbox"/>
30001245	RES FUSE 1/4W 0.47R J	R652	.	.	.	.	.	0,0400	USD	<input type="checkbox"/>
30001257	RES MG 1/2W 4.7M J	R118	.	.	.	.	.	0,0700	USD	<input type="checkbox"/>
30001259	RES WW 5W 1R J	R100	.	.	.	.	.	0,0400	USD	<input type="checkbox"/>
30001270	PTC 9 OHM	TH100	.	.	.	.	.	0,4000	USD	<input type="checkbox"/>
30001279	LED RED/GREEN LTL293SJ	LD101	.	.	.	.	.	0,2800	USD	<input type="checkbox"/>
30001284	DIODE 1N4148 0.15A/100V 0.5A	D105	D128	D607	D608	D609	.	0,0120	USD	<input type="checkbox"/>

.	.	D131	D209	.	.	.	.	.	.	.
.	.	D905	D906	D907	D908	.	.	.	.	.
.	.	D001	D002	D003	D004	.	.	.	.	.
.	.	D106	D139	.	.	.	.	.	.	.
30001291	DIODE HER107 1A/800V 30A	D613	D111	.	.	.	.	0,0312	USD	<input type="checkbox"/>
30001299	DIODE UF5404 3A/400V 150A	D603	D604	.	.	.	.	0,0672	USD	<input type="checkbox"/>
30001315	DIODE BYD33D 1A/200V 20A	D117	.	.	.	.	.	0,1100	USD	<input type="checkbox"/>
.	.	D127	D133	.	.	.	.	.	.	.
30001318	DIODE BA159 1A/800V 20A	D902	.	.	.	.	.	0,0300	USD	<input type="checkbox"/>
.	.	NOT2	.	.	.	.	.	.	.	.
.	.	D129	D610	D600	D622	D140	.	.	.	.
.	.	D141	.	.	.	.	.	.	.	.
.	.	D601	.	.	.	.	.	.	.	.
30001329	DIODE 1N4007 1A/1000V 30A	D104	D135	D109	D703	.	.	0,0120	USD	<input type="checkbox"/>
.	.	D901	D903	D904	.	.	.	.	.	.
30001344	DIODE ZENER 6.2V 1/2W	D909	.	.	.	.	.	0,0200	USD	<input type="checkbox"/>
30001368	DIODE ZENER 3V	D136	.	.	.	.	.	0,0220	USD	<input type="checkbox"/>
30001372	DIODE ZENER 9.1V ZPD	D123	.	.	.	.	.	0,0129	USD	<input type="checkbox"/>
30001377	DIODE ZENER 33V UZT 33B	D615	.	.	.	.	.	0,1700	USD	<input type="checkbox"/>
30001384	TR MCR22-6	Q107	.	.	.	.	.	0,2300	USD	<input type="checkbox"/>
30001386	TR MTP6N60E (PLASTIC)	Q100	.	.	.	.	.	0,5396	USD	<input type="checkbox"/>
30001427	TR BF422	Q900	.	.	.	.	.	0,1300	USD	<input type="checkbox"/>
30001428	TR BF423	Q106	.	.	.	.	.	0,0312	USD	<input type="checkbox"/>
30001429	TR BUK444-200A	Q604	.	.	.	.	.	0,4250	USD	<input type="checkbox"/>
30001435	TR BC639	Q600	.	.	.	.	.	0,0300	USD	<input type="checkbox"/>
30001441	TR BU2508AF	Q602	.	.	.	.	.	0,5401	USD	<input type="checkbox"/>
30001452	TR BC327	Q102	.	.	.	.	.	0,0400	USD	<input type="checkbox"/>
30001454	TR BC548B	Q901	.	.	.	.	.	0,0500	USD	<input type="checkbox"/>
.	.	Q103	Q105	Q101	.	.	.	.	.	.
30001455	TR BC558B	Q605	.	.	.	.	.	0,0500	USD	<input type="checkbox"/>
.	.	Q001	.	.	.	.	.	.	.	.
30001500	IC LM7808	IC103	.	.	.	.	.	0,2800	USD	<input type="checkbox"/>
30001506	IC TL431	IC116	IC601	.	.	.	.	0,3300	USD	<input type="checkbox"/>

30001518	IC TDA1308	IC704	.	.	.	.	.	0,7200	USD	<input type="checkbox"/>
30001619	IC TEA6415C	IC201	.	.	.	.	.	2,3500	USD	<input type="checkbox"/>
30001622	IC 7805 (1A)	IC102	.	.	.	.	.	0,1900	USD	<input type="checkbox"/>
30001668	IC LM317T	IC101	.	.	.	.	.	0,2500	USD	<input type="checkbox"/>
30001670	PREAMPLIFIER TFMS5360	MD101	.	.	.	.	.	0,5000	USD	<input type="checkbox"/>
30001732	FUSE 3.15A 250V 5*20	.	.	.	.	.	.	0,0500	USD	<input type="checkbox"/>
30001737	XTAL 12MHZ	X200	.	.	.	.	.	1,1500	USD	<input type="checkbox"/>
30001756	XTAL 18.432MHZ	X700	.	.	.	.	.	0,7300	USD	<input type="checkbox"/>
30001762	CONN.MALE 2P (2052) GRAY	PL702	.	.	.	.	.	0,0400	USD	<input type="checkbox"/>
30001764	CONN.MALE (2052) BLACK	PL701	.	.	.	.	.	0,0500	USD	<input type="checkbox"/>
30001770	CONN.MALE 3P (2003) GRAY	PL503	.	.	.	.	.	0,0500	USD	<input type="checkbox"/>
30001783	CONN.MALE 5P (2005)	PL502	.	.	.	.	.	0,0500	USD	<input type="checkbox"/>
30001785	CONN.MALE 7P (2007)	PL509	.	.	.	.	.	0,0700	USD	<input type="checkbox"/>
30001792	CONN.MALE 2P MOLEX	PL602	PL101	.	.	.	.	0,0500	USD	<input type="checkbox"/>
30001795	CONN.MALE 3P (DEG)	PL100	.	.	.	.	.	0,0600	USD	<input type="checkbox"/>
30001829	CONN MALE 2P TOP WHITE	PL601	.	.	.	.	.	0,0115	USD	<input type="checkbox"/>
30001830	CONN MALE 2P TOP BLUE	PL200	.	.	.	.	.	0,0300	USD	<input type="checkbox"/>
.	.	PL103	.	.	.	.	.
30001835	CONN MALE 3P TOP WHITE	PL705	.	.	.	.	.	0,0300	USD	<input type="checkbox"/>
30001838	CONN MALE 3P TOP YELLOW	PL105	.	.	.	.	.	0,0500	USD	<input type="checkbox"/>
.	.	PL211	.	.	.	.	.
30001839	CONN MALE 3P TOP GREEN	PL104	.	.	.	.	.	0,0500	USD	<input type="checkbox"/>
.	.	PL700	.	.	.	.	.
30001850	CONN MALE 6P TOP WHITE	PL903	.	.	.	.	.	0,0500	USD	<input type="checkbox"/>
.	.	PL600	.	.	.	.	.
30001855	SOCKET CRT NARROWNECK W/GND	PL900	.	.	.	.	.	0,5100	USD	<input type="checkbox"/>
30001882	RCA JACK 1P WHITE	JK1	.	.	.	.	.	0,0810	USD	<input type="checkbox"/>
.	.	JK3	.	.	.	.	.
30001883	RCA JACK 1P RED	JK4	.	.	.	.	.	0,1148	USD	<input type="checkbox"/>
.	.	JK6	.	.	.	.	.
30001884	RCA JACK 1P YELLOW	JK11	.	.	.	.	.	0,1800	USD	<input type="checkbox"/>

30001891	RCA JACK 1P WHITE 28 FAV	CON10	.	.	.	.	.	0,2300	USD	<input type="checkbox"/>
30001892	RCA JACK 1P RED 28 FAV	CON10	.	.	.	.	.	0,2500	USD	<input type="checkbox"/>
30001893	RCA JACK 1P YELLOW 28 FAV	CON10	.	.	.	.	.	0,2300	USD	<input type="checkbox"/>
30001895	JACK 4P DIN TYPE FOR SVHS	CON10	.	.	.	.	.	0,4000	USD	<input type="checkbox"/>
30001902	JACK HEADPHONE STEREO WO/SW	CON10	.	.	.	.	.	0,3200	USD	<input type="checkbox"/>
30001912	PIN F 5P/2.5MM (11.5MM)	PL002	.	.	.	.	.	0,1000	USD	<input type="checkbox"/>
30001946	SPEAKER 8R 15W 57*160	.	.	.	.	.	.	3,9400	USD	<input type="checkbox"/>
.			
30001947	TWEETER 8R 15W CLOSED	.	.	.	.	.	.	0,7000	USD	<input type="checkbox"/>
.			
30001964	FERRITE BAR 5*8	.	.	.	.	.	.	0,0700	USD	<input type="checkbox"/>
30001979	FIXED COIL 1UH Q45 M-A	L102	.	.	.	.	.	0,0300	USD	<input type="checkbox"/>
.	.	L200	.	.	.	.	.
.	.	L101	.	.	.	.	.
30001987	FIXED COIL 4.7UH Q70 K-A	L507	.	.	.	.	.	0,0200	USD	<input type="checkbox"/>
30001992	FIXED COIL 10UH Q65 K-A	L500	L501	L502	L503	L504	.	0,0300	USD	<input type="checkbox"/>
.	.	L210	L105	L209	.	.	.			
30001996	FIXED COIL 22UH Q40 K	L700	L701	L708	L702	L704	.	0,0300	USD	<input type="checkbox"/>
.	.	L715	.	.	.	.	.
.	.	L720	L721	.	.	.	.
30002031	FIXED COIL INJECTION 15MH	L600	.	.	.	.	.	0,4100	USD	<input type="checkbox"/>
30002090	LINE DRIVER NEW TYPE	TR600	.	.	.	.	.	0,5300	USD	<input type="checkbox"/>
30002104	LINE FILTER 2X22MH (AK16)	L107	L108	.	.	.	.	0,7400	USD	<input type="checkbox"/>
30002140	28 DEG COIL&EARTH CB.16:9 FTZ	.	.	.	.	.	.	2,3846	USD	<input type="checkbox"/>
30002174	SWITCH ON/OFF 4A/64A	.	.	.	.	.	.	0,3968	USD	<input type="checkbox"/>
30002181	SWITCH TACT	S101	S102	S103	S104	S105	.	0,0600	USD	<input type="checkbox"/>
30002183	RELAY MON15 KI-S-212M	RL100	.	.	.	.	.	1,0900	USD	<input type="checkbox"/>
30002238	CABLE 2/20 R2.6 WO/SOCKET AK16	.	.	.	.	.	.	0,0400	USD	<input type="checkbox"/>
.			
30002287	CONN.ASSY.7/42 (FL) KEYBOARD	CON10	.	.	.	.	.	0,1683	USD	<input type="checkbox"/>

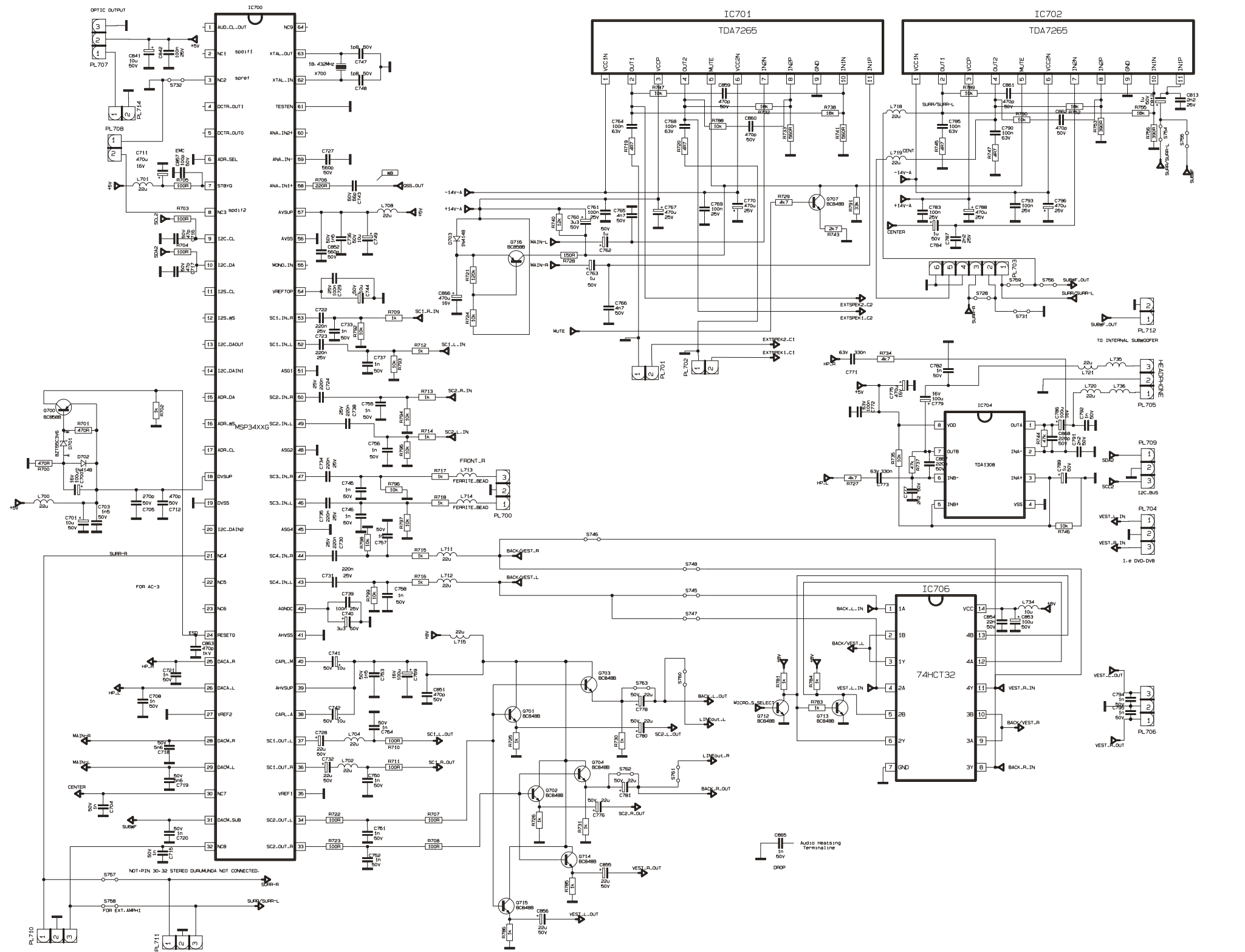
30002335	CONN.ASSY.3/60 FC (PRE-AMP)	CON10	.	.	.	.	.	0,0931	USD	<input type="checkbox"/>
30002347	CONN.ASSY.2/76 R2.6 W/GRAY CONN.	.	.	.	.	.	.	0,1138	USD	<input type="checkbox"/>
30002368	CABLE AC 2P 65CM W/MLX CONN.	.	.	.	.	.	.	0,1447	USD	<input type="checkbox"/>
30002733	LED INFRARED IR333	D100	.	.	.	.	.	0,1331	USD	<input type="checkbox"/>
30002734	TR BC548C	Q101	.	.	.	.	.	0,0800	USD	<input type="checkbox"/>
30002735	IC SAA3010T	IC101	.	.	.	.	.	0,3008	USD	<input type="checkbox"/>
30006662	XTAL 6MHZ	X500	.	.	.	.	.	0,3100	USD	<input type="checkbox"/>
30006709	CONN MALE 5P TOP WHITE	PL902	.	.	.	.	.	0,0100	USD	<input type="checkbox"/>
.	.	PL001	.	.	.	.	.
30006712	FERRITE BEAD 3.5X4.7X0.8	L219	L220	.	.	.	.	0,0120	USD	<input type="checkbox"/>
.	.	L201	L202	J203	.	.	.			
.	.	J136	J308	.	.	.	.
30006755	RES MO 2W 4.7R J	R161	.	.	.	.	.	0,0116	USD	<input type="checkbox"/>
30006758	RES MO 1W 0.82R J	R144	.	.	.	.	.	0,0100	USD	<input type="checkbox"/>
30006940	CAP CER 2.7NF 1KV K B	C117	.	.	.	.	.	0,0210	USD	<input type="checkbox"/>
30007202	RES MF 1/4W 56K F	R658	.	.	.	.	.	0,0100	USD	<input type="checkbox"/>
30007308	CAP CER 220PF 1KV K (PULSE)	C115	C123	C124	C126	C155	.	0,0334	USD	<input type="checkbox"/>
.	.	C118	.	.	.	.	.
30007499	CONN ASSY.2/90 R2/6 SPK. W/BL CONN.	.	.	.	.	.	.	0,0958	USD	<input type="checkbox"/>
30007678	DIODE GUC DTV32F1500A 6A/1500V 100A	D612	.	.	.	.	.	0,5697	USD	<input type="checkbox"/>
30007681	DIODE UF5407 3A/800V 150A	D611	.	.	.	.	.	0,1800	USD	<input type="checkbox"/>
.			
.	.	D137	D108	.	.	.	.
30007708	CAP CER 1NF 1KV K (PULSE)	C167	.	.	.	.	.	0,0800	USD	<input type="checkbox"/>
.	.	C540	C182	.	.	.	.
30007758	DIODE BRIDGE GBU4M 4A/1000V 150A	D132	.	.	.	.	.	0,2863	USD	<input type="checkbox"/>
30007771	FIXED COIL 100UH	L603	.	.	.	.	.	0,1020	USD	<input type="checkbox"/>
30007793	IC STV9379FA	IC600	.	.	.	.	.	1,2655	USD	<input type="checkbox"/>
30007794	IC TDA7265	IC701	.	.	.	.	.	1,6154	USD	<input type="checkbox"/>
30007858	CAP MKT 470NF 275V M AC (P=22.5MM)	C101	.	.	.	.	.	0,1547	USD	<input type="checkbox"/>

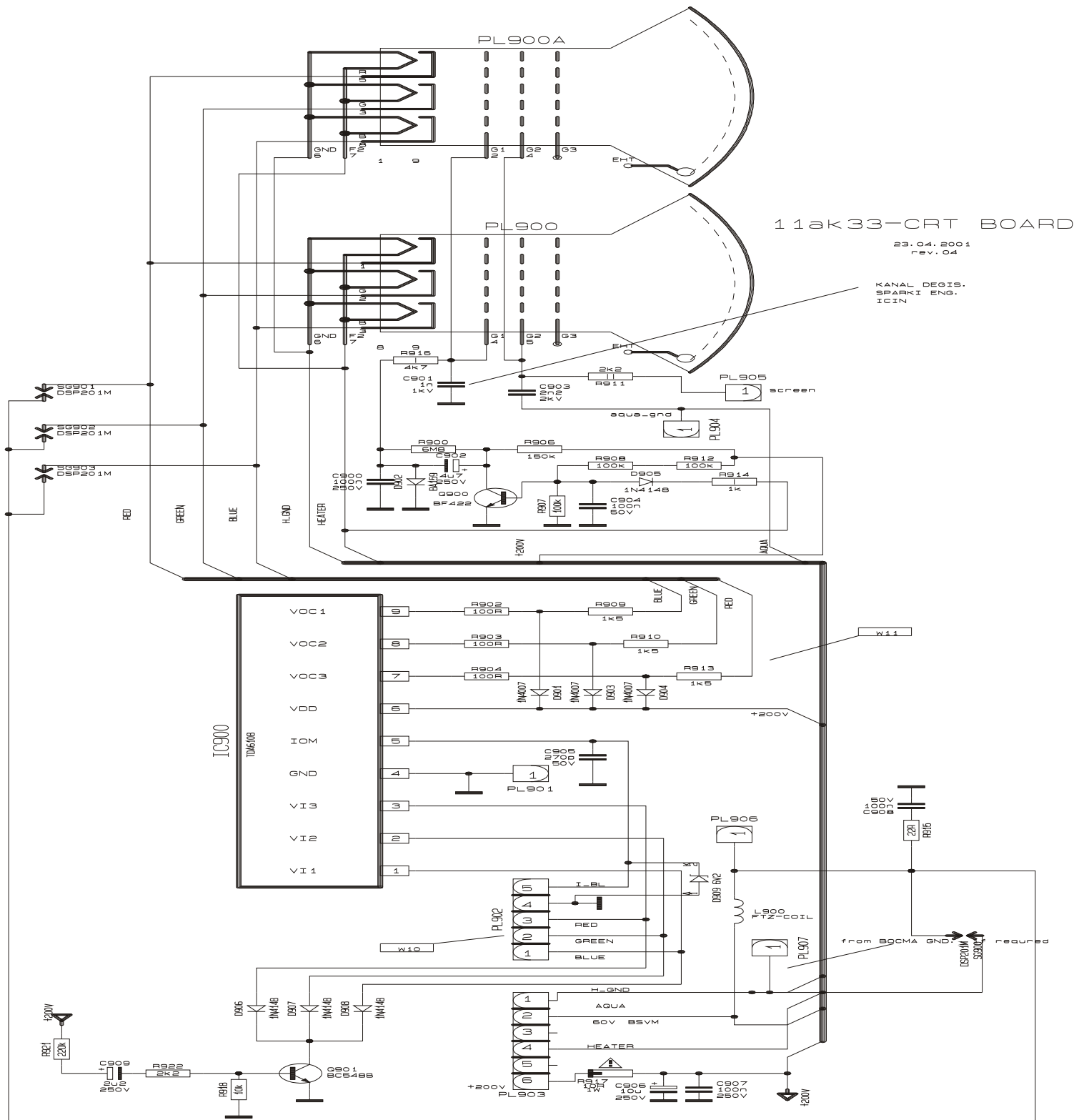
30008721	IC TDA6108	.	.	.	.	.	.	0,9251	USD	<input type="checkbox"/>
30008915	28" CPT TUBE 16:9 SF IRON	.	.	.	.	.	.	154,0500	USD	<input type="checkbox"/>
30009085	CABLE 1P R2.6 35 W/CLIPS	CAB1	.	.	.	.	.	0,0343	USD	<input type="checkbox"/>
30009208	CAP CER 470PF 1KV K (PULSE)	C863	.	.	.	.	.	0,0327	USD	<input type="checkbox"/>
.	.	C645	.	.	.	.	.
30009366	DIODE UF5402 3A/200V 150A	D118	.	.	.	.	.	0,1500	USD	<input type="checkbox"/>
.	.	D119	.	.	.	.	.
30009637	TUNER WSP (PLL) 38.9 MK2 - BATCH	TU200	.	.	.	.	.	3,7054	USD	<input type="checkbox"/>
30009828	CABLE 1P R2.6 (25CM)	CAB+1	.	.	.	.	.	0,0137	USD	<input type="checkbox"/>
30009846	CABLE 0.6MM BLUE (4CM)	F-F	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
30009847	CABLE 0.6MM BLUE (8CM)	NOT3	.	.	.	.	.	0,0127	USD	<input type="checkbox"/>
30010571	CAP EL 10UF 16V M	C323	.	.	.	.	.	0,0100	USD	<input type="checkbox"/>
.	.	C255	.	.	.	.	.
30010921	DOUBLE-DECK SCART SOCKET	PL207	.	.	.	.	.	0,3993	USD	<input type="checkbox"/>
30010964	FERRITE BEAD(805) BLM21A601RPT	L103	.	.	.	.	.	0,0279	USD	<input type="checkbox"/>
.	.	L713	L714	.	.	.	.
30011443	XTAL REZ 429KHZ (0.9MM)	X100	.	.	.	.	.	0,0273	USD	<input type="checkbox"/>
30011968	IC MC44608	IC106	.	.	.	.	.	0,6566	USD	<input type="checkbox"/>
30011970	IC MC33260 PFC	IC107	.	.	.	.	.	0,4891	USD	<input type="checkbox"/>
30012251	CABLE 1P R2.6 (55CM)	CAB2	.	.	.	.	.	0,0152	USD	<input type="checkbox"/>
30013163	FILTER SAW K9356	Z200	.	.	.	.	.	1,1616	USD	<input type="checkbox"/>
30013231	CONN.ASSY.3/90 W/WHITE(NELTRON)	PL102	.	.	.	.	.	0,0946	USD	<input type="checkbox"/>
30013413	FERRITE BEAD ACB2012H-300	L224	L229	L230	L231	L233	.	0,0321	USD	<input type="checkbox"/>
.	.	L225	L226	L227	L228	.	.			
.	.	L735	L736	.	.	.	.
.	.	L223	.	.	.	.	.
.	.	L217	L218	.	.	.	.
.	.	L213	L214	L215	L216	.	.			
30013690	CAP EL 220UF 450V M 105°	C116	.	.	.	.	.	1,5155	USD	<input type="checkbox"/>
30014059	POWER CORD 2.2MT W/FILTER AUST.TYPE	.	.	.	.	.	.	1,8483	USD	<input type="checkbox"/>
30014060	CONN ASSY FRONT	.	.	.	.	.	.	0,0000	USD	<input type="checkbox"/>

	AV+SVHS W/FERRITE									
30014175	TRF FBT 110° AK33 16:9 SLOT	TR601	.	.	.	.	.	6,0223	USD	<input type="checkbox"/>
30014261	FILTER SAW K3958M	Z201	.	.	.	.	.	0,7080	USD	<input type="checkbox"/>
30014359	IC MSP3400G SDIP64	IC700	.	.	.	.	.	3,7922	USD	<input type="checkbox"/>
30014610	PIN F 24P/2.5MM	PL1	.	.	.	.	.	0,0986	USD	<input type="checkbox"/>
30014717	IC 24C16 3.3V	.	.	.	.	.	.	0,2284	USD	<input type="checkbox"/>
30015050	CONN ASSY 5/50 AWG24 NELTRON	PL902	.	.	.	.	.	0,4937	USD	<input type="checkbox"/>
30015087	IC TCET1102G	IC100	.	.	.	.	.	0,0975	USD	<input type="checkbox"/>
30015122	CONN ASSY 5+1/50 AWG24 NELTRON AK33	PL903	.	.	.	.	.	0,1659	USD	<input type="checkbox"/>
30015617	TRF PFC AK33 200UH	L102	.	.	.	.	.	0,7139	USD	<input type="checkbox"/>
30016083	FIXED COIL 1MH AK33 HIGH CURRENT	L601	.	.	.	.	.	0,3652	USD	<input type="checkbox"/>
30016154	TRF SMPS AK33 (170-270V) 170W JVC	TR101	.	.	.	.	.	1,4202	USD	<input type="checkbox"/>
30016421	CONN.ASSY.2/60 VRT	PL601	.	.	.	.	.	0,0434	USD	<input type="checkbox"/>
30016483	CONN.ASSY.2/60 HRZ	PL602	.	.	.	.	.	0,0776	USD	<input type="checkbox"/>
30016755	TR STP8NC70ZFP (PLASTIC)	Q102	.	.	.	.	.	0,8196	USD	<input type="checkbox"/>
30017085	LINEARITY COIL 20UH	L602	.	.	.	.	.	0,3688	USD	<input type="checkbox"/>
30017270	IC TDA8885H2 QFP64	.	.	.	.	.	.	0,00	*	<input type="checkbox"/>
COSMETICS										
20004519	CABLE HOLDER CRT (I)	.	.	.	.	.	.	0,0120	USD	<input type="checkbox"/>
20030438	SNOW BOX TOP-2850/51-W	.	.	.	.	.	.	0,00	*	<input type="checkbox"/>
20030439	SNOW BOX BOTTOM- 2850/51-W	.	.	.	.	.	.	0,00	*	<input type="checkbox"/>
20030465	LENS 2850W (I)	.	.	.	.	.	.	0,3424	USD	<input type="checkbox"/>
20032745	SNOW BOX ASSY.2850/51-W	.	.	.	.	.	.	1,5270	USD	<input type="checkbox"/>
20061967	BUTTON ASSY.2850W-M (SILVER)	.	.	.	.	.	.	0,00	*	<input type="checkbox"/>
20061970	BUTTON FUNCTION 2850-W 5T (SILVER/P)	.	.	.	.	.	.	0,0296	USD	<input type="checkbox"/>
20061972	BUTTON FUNCTION 2850-W 5T EKO.GRAY(I)	.	.	.	.	.	.	0,00	*	<input type="checkbox"/>
20061974	BUTTON ON/OFF 2850- W(SILVER/P)(PW-SM BAS	.	.	.	.	.	.	0,0116	USD	<input type="checkbox"/>
20061975	BUTT.ON/OFF 2850W EKO.GRAY(I)(PW-SM BASK	.	.	.	.	.	.	0,00	*	<input type="checkbox"/>
20066805	FRONT 2850-W W/H (UL)SILVER (P)	.	.	.	.	.	.	0,00	*	<input type="checkbox"/>

20067973	BACK DOOR AK33 W/JACK BOARD HOLE (I)	.	.	.	.	.	0,2640	USD	<input type="checkbox"/>
20067975	JACK BOARD 11AK33 (I)	.	.	.	.	.	0,2128	USD	<input type="checkbox"/>
20069012	CHASSIS FRAME AK33(FR-HIPS.V0)(I)AK33/28	.	.	.	.	.	0,5069	USD	<input type="checkbox"/>
20071444	SIDE DOOR BRACK.7289/99 (UL) SILVER(P)	.	.	.	.	.	0,00	*	<input type="checkbox"/>
.			
20071445	SIDE DOOR BRACK.7289/99 (UL) EKO.GRAY(I)	.	.	.	.	.	0,00	*	<input type="checkbox"/>
.			
20095741	BACK C.7289/99-2850/51W(UL)SILVER(P)AK18	.	.	.	.	.	0,00	*	<input type="checkbox"/>
20095802	BACK C.7289/99-2850/1W(UL)EK.GRAY(I)AK18	.	.	.	.	.	0,00	*	<input type="checkbox"/>
20102898	BASE 7289/99 (I)(UL) AK18 WO/FRAME	.	.	.	.	.	0,00	*	<input type="checkbox"/>
40000011	RUBBER PAD TRP18 (RC2040/45)	.	.	.	.	.	0,2896	USD	<input type="checkbox"/>
40000020	TR HOLDER TR-06A	.	.	.	.	.	0,0600	USD	<input type="checkbox"/>
.			
40000026	EJECTOR CLIP-CLAP	.	.	.	.	.	0,2900	USD	<input type="checkbox"/>
40000127	SWITCH INSULATION DOOR LK101	.	.	.	.	.	0,0400	USD	<input type="checkbox"/>
40001898	MACARON (12cm.Isý ile daralan)	.	.	.	.	.	0,0100	USD	<input type="checkbox"/>
40005299	BATTERY COVER RC2040 SILVER(P)	.	.	.	.	.	0,0169	USD	<input type="checkbox"/>
40005300	BOTTOM COVER RC2040 SILVER (P)	.	.	.	.	.	0,1100	USD	<input type="checkbox"/>
40005301	TOP COVER RC2040 NB SILVER (S)	.	.	.	.	.	0,1100	USD	<input type="checkbox"/>
40005467	LENS RC2040(I)	.	.	.	.	.	0,0309	USD	<input type="checkbox"/>
40006432	MOUNTING BUTTON (MB-10)	.	.	.	.	.	0,0213	USD	<input type="checkbox"/>
40007581	HOLDER LED3-1B (PINGOOD)	.	.	.	.	.	0,0112	USD	<input type="checkbox"/>
40007645	BRACKET RUBBER FOOT L121003	.	.	.	.	.	0,0355	USD	<input type="checkbox"/>
40007992	SPACER SUPPORT (PINGOOD SCC 19-A)	.	.	.	.	.	0,0319	USD	<input type="checkbox"/>
40010895	ADJUSTABLE BOSS 63-72/XX (NON-EC)	.	.	.	.	.	0,00	*	<input type="checkbox"/>
ARTWORK									
20013018	LBL.BCK.CVR.ASSY (TV) (WO/UL)	.	.	.	.	.	0,0130	USD	<input type="checkbox"/>

20079973	R/C 2040 NOBRAND (SILVER/P) (F)	.	.	.	.	.	1,8678	USD	<input type="checkbox"/>
20105821	LBL.BCK.CVR.TEAC CTW2850S/1 (AK33)	.	.	.	.	.	0,00	*	<input type="checkbox"/>
20106956	R/C 2040 TEAC RC-827(S) (SILVER/P)	.	.	.	.	.	0,00	*	<input type="checkbox"/>
40001939	LOGO TEAC (BIG)(GRAY W/P)	.	.	.	.	.	0,3200	USD	<input type="checkbox"/>
50006060	CARTON BOX 7289/99 16:9 CR&W/TV EMPTY	.	.	.	.	.	0,00	*	<input type="checkbox"/>
50011720	LABEL HIGH END	.	.	.	.	.	0,1621	USD	<input type="checkbox"/>
.			
50018915	LBL.SCREEN TEAC CTW2850S	.	.	.	.	.	0,00	*	<input type="checkbox"/>
50025239	WARRANTY CARD TEAC (ENG) (3)	.	.	.	.	.	0,00	*	<input type="checkbox"/>
50025305	LBL.SERVICE TEAC (4) (AUST)	.	.	.	.	.	0,00	*	<input type="checkbox"/>
50029818	I/B TEAC CTW2850S PLL/5533/2040/ENG (33)	.	.	.	.	.	0,00	*	<input type="checkbox"/>
50030351	CARTON BOX TEAC CTW2850S (SILVER)(33)	0,00	*	<input type="checkbox"/>





11aK33-CRT BOARD

23.04.2001
REV. 04

KANAL DEGIS.
SPARKI ENG.
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W11

W10

1 0 0 3 BOCMA GND

DSF201M 552004

H-GND

AQUA

HEATER

60V B5VM

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PL901

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PL903

PL904

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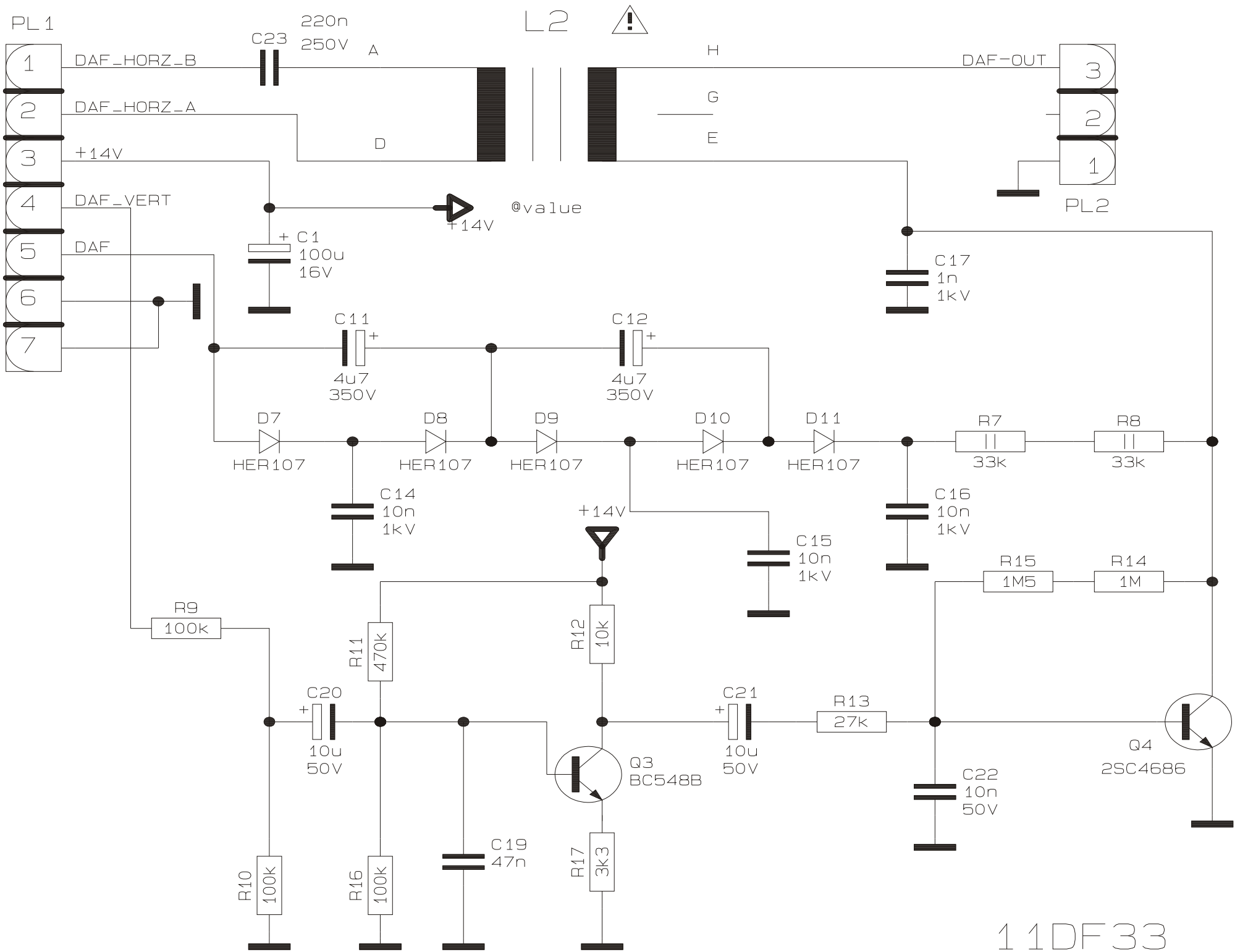
PL996

PL997

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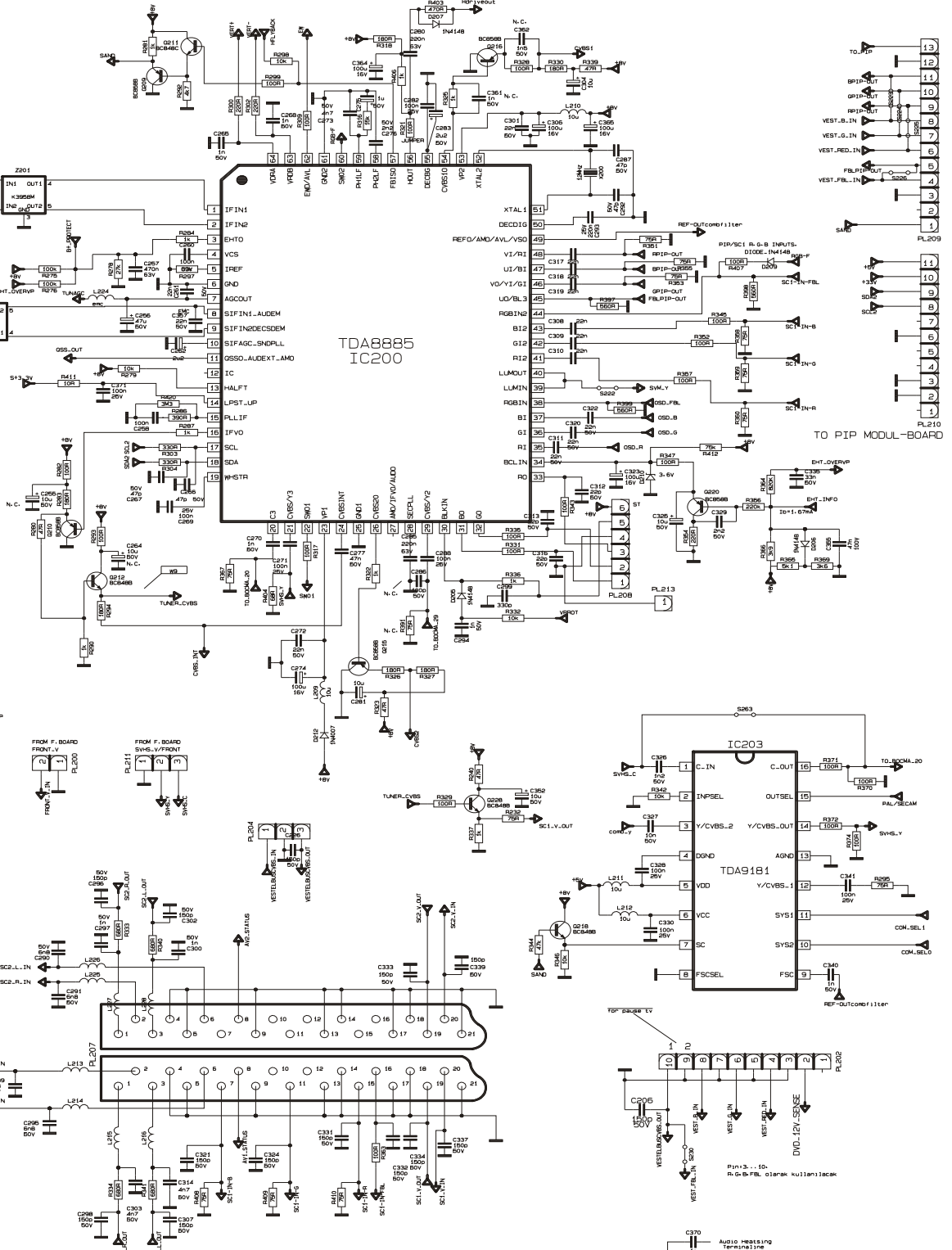
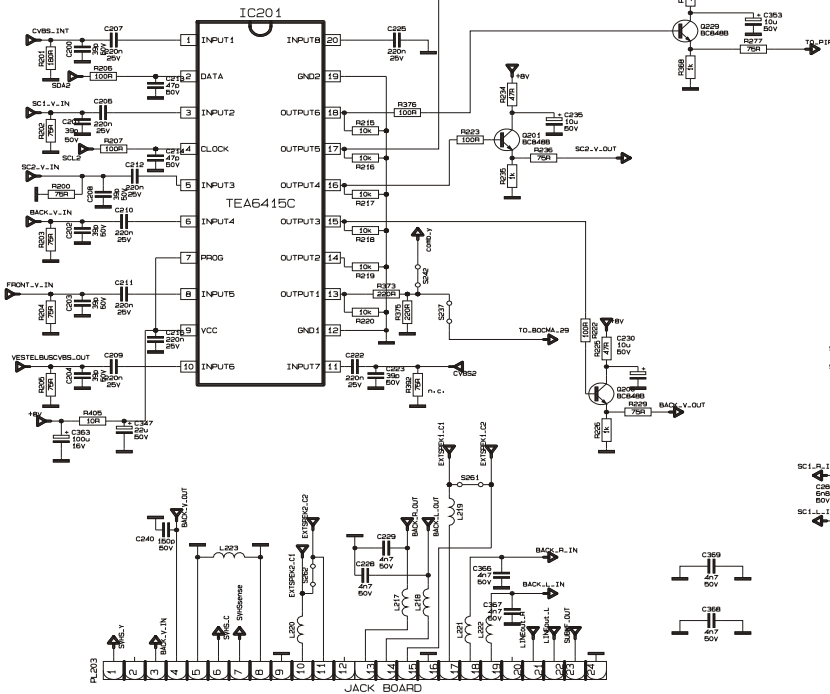
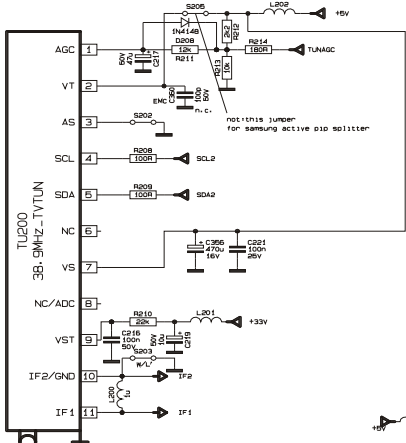
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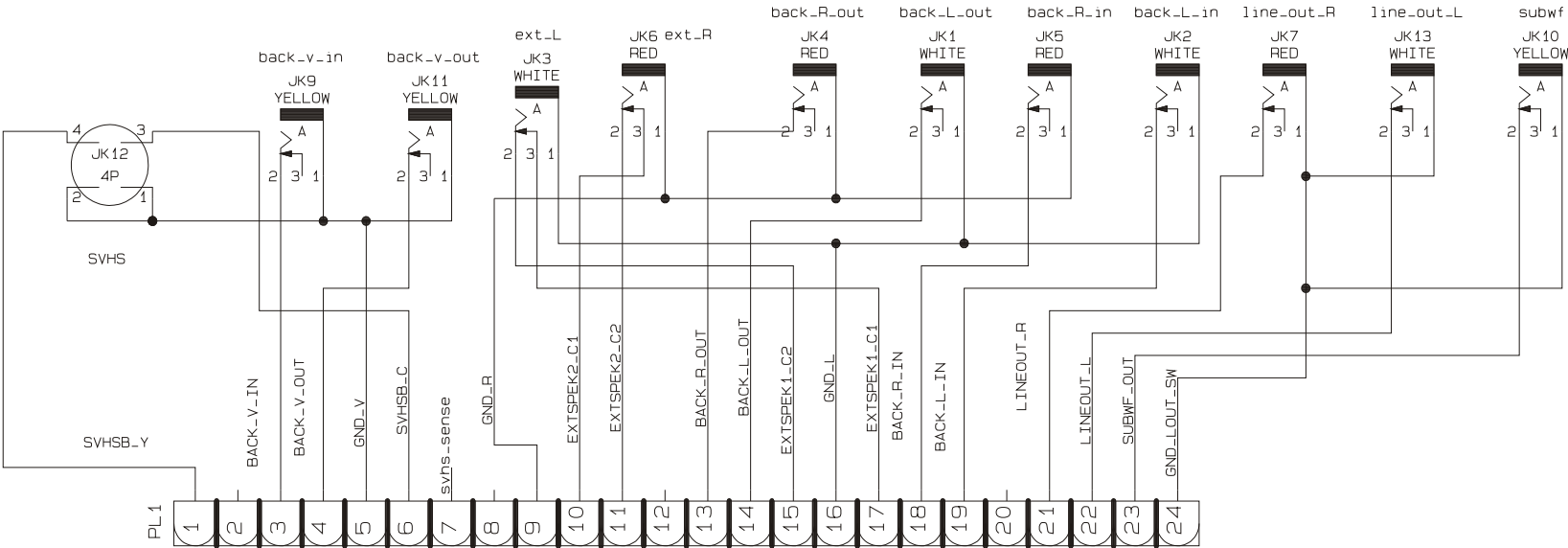
PL1000



11DF33

REMARK THAT, FOR PIP SPLITTER THERE SHOULD BE ADEQUATE PLACE IN LAY-OUT





11AK33 JACK BOARD	
author	KOKSAL KIRAZ
date	14.11.2000
revision	V.1

