

TEAC®

SERVICE MANUAL

CTW3270

32" WIDE CTV

CONTENTS

Safety Precautions	2
TV Set switched off	2
Measurements	2
PERI-TV SOCKET	2
SCART 1, SCART 2	2
INTRODUCTION	2
POWER SUPPLY (SMPS)	3
IF PART	3-4
TUNER	4-5
SAW FILTERS	5
DIGITAL TV SOUND PROCESSING	5-6
DOLBY PRO LOGIC PROCESSOR	6-7
HEADPHONE OUTPUT	7
VIDEO OUTPUT	7-8
VIDEO INPUT AND OUTPUT SOURCE SWITCHING	8
VIDEO OUTPUT AMPLIFIER STAGE	8-9
VERTICAL OUTPUT STAGE	9
MICROTEXT CONTROLLER	9-10
SERIAL ACCESS 32K EEPROM	10-11
DRAM	11
EPROM	11
100Hz FEATURE BOX	12
VPC32X5 (VIDEO PROCESSOR)	12-13
CIP3250	13-14
SDA9400	14-15
DDP3310	15-16
AK28 CHASSIS MANUAL ADJUSTMENTS PROCEDURE	17
PRELIMINARY	17
SYSTEM VOLTAGE AJUSTMENT	17
AFC ADJUSTMENT	17
FOCUS ADJUSTMENT	17
SCREEN ADJUSTMENT	17
IF ADJUSTMENT FOR L'MODE	17
AK28 CHASSIS PRODUCTION MODE ADJUSTMENTS PROCEDURE	18
PRELIMINARY	18
HORIZONTAL AND VERTICAL GEOMETRY ALIGNMENTS	18
V-SHIFT	18
V-SIZE	18
H-SHIFT	18
H-SIZE	18
S-COR	18
LINRT	18
ANGLE	18
BOW	18
TRPEZ	18
PARAB	18
U.COR	19
L.COR	19
VIDEO ALIGNMENTS	19
RGn, GGn, BGn; WHITE BALANCE ADJUSTMENT	19
RRf, GRf, BRf	19
YDF	19
AGC	19
TLAN	19
APS	19
T_T	19
T_P	19
EXT3	19
CLT	19
SERVICE ALIGNMENTS	20
IMPORTANT	20
ADJUSTMENTS GROUOP	20
OPTIONS GROUP	20
SYSTEM GROUP	20
GENERAL BLOCK DIAGRAM OF CHASSIS AK28	21

DO NOT CHANGE ANY MODULE UNLESS THE SET IS SWITCH OFF

The mains supply side of the switch mode power supply transformer is live.

Use an isolating transformer.

The receivers fulfill completely the safety requirements.

Safety precautions:

Servicing of this TV should only be carried out by a qualified person.

- Components marked with the warning symbol on the circuit diagram are critical for safety and must only be replaced with an identical component.

- Power resistor and fusible resistors must be mounted in an identical manner to the original component.

- When servicing this TV, check that the EHT does not exceed 26kV.

TV Set switched off:

Make short-circuit between HV-CRT clip and CRT ground layer.

Short C804 (150mF) before changing IC802 or other components in primary side of SMPS.

Measurements:

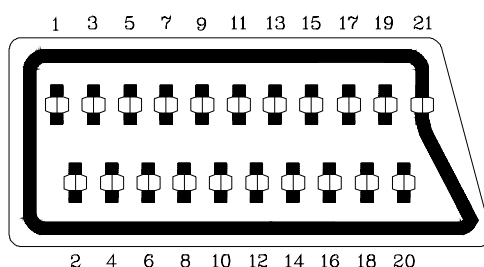
Voltage readings and oscilloscope traces are measured under following conditions.

Antenna signal 60dB from colourbar generator. (100% white, 75% colour saturation)

Brightness, contrast, colour set for a normal picture.

Mains supply, 220VAC, 50Hz.

PERI-TV SOCKET



SCART 1 (SC050)

1	Audio right output	0.5Vrms / 1K
2	Audio right input	0.5Vrms / 10K
3	Audio left output	0.5Vrms / 1K
4	Ground AF	
5	Ground Blue	
6	Audio left input	0.5Vrms / 10K
7	Blue input	0.7Vpp / 75ohm
8	AV switching input	0-12VDC / 10K
9	Ground Green	
10	-	
11	Green input	0.7Vpp / 75ohm
12	-	
13	Ground Red	
14	Ground Blanking	
15	Red input	0.7Vpp / 75ohm
16	Blanking input	0-0.4VDC, 1-3VDC / 75ohm
17	Ground CVS output	
18	Ground CVS input	
19	CVS output	1Vpp / 75ohm
20	CVS input	1Vpp / 75ohm
21	Ground	

SCART 2 (SC051)

1	Audio right output	0.5Vrms / 1K
2	Audio right input	0.5Vrms / 10K
3	Audio left output	0.5Vrms / 1K
4	Ground AF	
5	Ground Blue	
6	Audio left input	0.5Vrms / 10K
7	Blue input	0.7Vpp / 75ohm
8	AV switching input	0-12VDC / 10K
9	Ground Green	
10	-	
11	-	
12	-	
13	Ground Red	
14	Ground Blanking	
15	-	
16	-	
17	Ground CVS output	
18	Ground CVS input	
19	CVS output	1Vpp / 75ohm
20	CVS input	1Vpp / 75ohm
21	Ground	

INTRODUCTION

11Ak28 is a 100Hz flicker free colour television capable of driving 28"4:3/16:9, 33"4:3 and 29"4:3 real flat picture tubes.

The chassis is capable of operation in PAL, SECAM, NTSC (playback) colour standards and multiple transmission standards as B/G, D/K, I/I', and L/L'. Sound system output is supplying 12W (10%THD) for left, right and center outputs of 8ohm speakers, and 2 x 7W for surround outputs of 2 x 4ohm speakers, connected in series.

TV supports the hightext (level 2.5) teletext standard. It is possible to decode transmissions including high graphical data. The chassis is equipped with one full EuroScart, two other SCARTs for AV input/output, one front-AV input, one back-AV output, one headphone output, one SVHS input (via SCART and SVHS connector), one VGA input, two external speaker outputs (left and right), one centre speaker output, and one surround speaker output for two speakers in series.

POWER SUPPLY (SMPS)

TDA16846

A SMPS transformer controlled by the IC TDA16846, which is designed for driving, controlling, and protecting switching transistor, provides the DC voltages required at various parts of the chassis. SMPS generates the necessary 5V supply for the micro-controller, 130V supply for the FBT, +/-16V supply for the audio amplifier, which are active in stand-by and others 8V, 12V and 5V for other different parts of the chassis.

When the TV is switched on, a reference voltage is provided to TDA16846 and the start-up operation occurs, then TV enters into the stand-by position.

Two optocouplers are used to control the regulation of line voltage and stand-by power consumption. There are two regulation circuits, one in primary side and one in secondary side. The primary regulation circuit provides a control voltage to pin3 of the IC. Secondary regulation circuit produces a control voltage according to the changes in 130V DC voltage, via an optocoupler (SFH617A) to pin4 of the IC.

During the switch on period of the transistor, energy is stored in the transformer. During the switch off period energy is fed to the load via secondary winding. By varying switch-on time of the power transistor, it controls each portion of energy transferred to the second side such that the output voltage remains nearly independent of load variations. At the same time, the supply voltages 12V, 8V, 5V are stabilised by the series regulators.

Features:

- Line Current Consumption with PFC
- Continuous Frequency Reduction with Decreasing Load
- Stable and Adjustable Stand-by Frequency
- Very Low Start-up Current
- Soft-Start for Quiet Start-up
- Adjustable and Voltage Dependent Ringing Suppression Time
- Synchronization and Fixed Frequency Facility
- Over- and Under-voltage Lockout
- Switch Off at Mains Under-voltage
- Mains Voltage Dependent Fold Back Point Correction
- Low Power Consumption
- Free usable Fault Comparators

Pinning:

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

IF PART

TDA4470 / TDA4472

The TDA44XX is an integrated bipolar circuit for multistandard video/sound IF (VIF/SIF) signal processing in TV/VCR and multimedia applications. The circuit processes all TV video IF signals with negative modulation (e.g., B/G standard), positive modulation (e.g., L standard) and the AM, FM/NICAM sound IF signals. Active carrier generation by FPLL (frequency phase-locked loop) is the principle for true synchronous demodulation. VCO circuit is operating on picture carrier frequency, the VCO frequency is switchable for L'-mode. AFC without external reference circuit is alignment-free and polarity of the AFC curve is switchable. VIF-AGC for negative modulated signals operates on peak sync detection principle and for positive modulation on peak white / black level detection principle. Tuner AGC is adjustable with determining take over point. It has alignment-free quasi-parallel sound (QPS) mixer for FM/NICAM sound IF signals. Intercarrier output sound is gain controlled (necessary for digital sound processing). AM-demodulator is completely alignment-free with gain controlled AF output. Operation of the AM demodulator and QPS mixer (for NICAM-L stereo sound is parallel. TDA4472 is used for negative modulation and TDA4470 is used for both negative and positive modulation.

Features:

- 5V supply voltage; low power consumption
- Active carrier generation by FPLL principle (frequency-phase-locked-loop) for true synchronous demodulation
- Very linear video demodulation, good pulse response and excellent intermodulation figures
- VCO circuit is operating on picture carrier frequency, the VCO frequency is switchable for the L' mode
- Alignment-free AFC without external reference circuit, polarity of the AFC curve is switchable
- VIF-AGC for negative modulated signals (peak sync detection) and for positive modulation (peak white/black level detector).
- Tuner AGC with adjustable take over point
- Alignment-free quasi parallel sound (QPS) mixer for FM/NICAM sound IF signals
- Intercarrier output signal is gain controlled (necessary for digital sound processing)
- Complete alignment-free AM demodulator with gain controlled AF output
- Separate SIF-AGC with average detection
- Two independent SIF inputs
- Parallel operation of the AM demodulator and QPS mixer (for NICAM-L stereo sound)
- Package and relevant pinning is compatible with the single standard version TDA 4472; simplifies the design of an universal IF module

Pinning:

1. Input sensitivity, RMS value : 80mVrms
2. Input sensitivity, RMS value : 80mVrms
3. SIF Input selector switch : 2.0 V
4. Ground
5. IF gain control range : 65dB
6. Input sensitivity, RMS value : 80mVrms
7. Input sensitivity, RMS value : 80mVrms
8. IF gain control range : 65dB
9. Ground
10. Available tuner-AGC current : 2mA
11. Available tuner-AGC current : Min : 0.3V Max : 13.5V
12. Video output : Min : 1.8V Max : 2.2V
13. Standard switch : Min : 0V Max : 0.8V
14. L' switch : Min : 0V Max : 3.0V
15. IF gain control range : 65dB
16. Ground
17. Internal reference voltage
18. FPLL and VCO : Min : 1mA Max : 4mA
19. AFC switch : Min : 0V Max : 0.8V
20. FPLL and VCO : Min : 1mA Max : 4mA
21. FPLL and VCO : Min : 1mA Max : 4mA
22. AFC output : 0.7 mA/kHz
23. DC supply : Min : 4.5V Max : 9.0V
24. DC output voltage : 2V
25. AF output-AM : 2.2V
26. FPLL and VCO : Min : 1mA Max : 4mA
27. Input sensitivity, RMS value : 80mVrms
28. Input sensitivity, RMS value : 80mVrms

TUNER

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

General description of UV1316:

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

Features of UV1316:

- 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:

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

SAW FILTERS

K9453: Two channels switchable sound IF saw filter of BG, DK, I, L systems for input channel 2 and of L' system for input channel 1.

K3953: Two channel switchable video IF saw filter of BG, DK, I, L systems for input channel 2 and of L' system for input channel 1.

J3950: Video IF saw filter for I system

DIGITAL TV SOUND PROCESSING

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 | 57. Analog output MAIN, right to AVSS with 50 pF capacitor) 58. |
| 24. IF common | 58. Reference ground 2 high voltage part |
| 25. IF input 1 | 59. Analog output AUX, left |
| 26. Analog power supply +5V | 60. Analog output AUX, right |
| 27. Analog ground | 61. Power-on-reset |
| 28. Mono input | 62. Not connected |
| 29. Reference voltage IF A/D converter | 63. Not connected |
| 30. Scart input 1 in, right | 64. Not connected |
| 31. Scart input 1 in, left | 65. I ² S2-data input |
| 32. Analog Shield Ground 2 | 66. Digital ground |
| 33. Scart input 2 in, right | 67. Digital power supply +5V |
| 34. Scart input 2 in, left | 68. ADR clock |

DOLBY PRO LOGIC PROCESSOR IC**DPL3519A**

The IC DPL3519A processor family is designed to decode Dolby encoded surround sound. The IC integrate the complete Dolby Surround Pro Logic decoding on chip without any necessary external circuitry. It designed as a coprocessor of the MSP34xx family.

It gets digitised sound from the audio processor IC MSP3410D for both C (centre) and S (surround) channels, and for both L (left) and R (right) channels. The analog L and R outputs are supplied by MSP3410D, while the analog S and C outputs are supplied by the DPL33519A.

Two I²S busses obtain synchronisation between the MSP and DPL :

I²S_CL; for timing of the transmission of I²S serial data 1.024Mhz and I²S_WS; The word strobe line defining the left and right sample at 32Khz. The IC is also I²C bus controlled to select the sound feature (Stereo, 3D-Phonic and Dolby Pro Logic).

Pinning:

- | | |
|-----------------------------------------|------------------------------|
| 1. Not connected | 16. Not connected |
| 2. Not connected | 17. Not connected |
| 3. Not connected | 18. Audio clock output |
| 4. I ² S1 data input | 19. Digital control input |
| 5. I ² S1 data output | 20. Crystal oscillator |
| 6. I ² S wordstrobe | 21. Crystal oscillator |
| 7. I ² S clock | 22. Test pin |
| 8. I ² C data | 23. Not connected |
| 9. I ² C clock | 24. Not connected |
| 10. Not connected | 25. Not connected |
| 11. Standby (low-active) | 26. Analog power supply +5 V |
| 12. I ² C-Bus address select | 27. Analog ground |
| 13. Digital control IO 0 | 28. Mono input |
| 14. Digital control IO 1 | 29. Reference voltage |
| 15. Not connected | 30. Scart input 1 in, right |

- | | |
|------------------------------------------------|------------------------------------------|
| 31. Scart input 1 in, left | 50. Scart output 2, left |
| 32. Analog Shield Ground 1 | 51. Scart output 2, right |
| 33. Scart input 2 in, right | 52. Analog Shield Ground 3 |
| 34. Scart input 2 in, left | 53. Not connected |
| 35. Analog Shield Ground 2 | 54. Not connected |
| 36. Scart input 3 in, right | 55. Not connected |
| 37. Scart input 3 in, left | 56. Analog output Channel 1, left |
| 38. Analog Shield Ground 4 | 57. Analog output Channel 1, right |
| 39. Not connected | 58. Reference ground 2 high voltage part |
| 40. Not connected | 59. Analog output Channel 2, left |
| 41. Not connected | 60. Analog output Channel 2, right |
| 42. Analog reference voltage high voltage part | 61. Power-on-reset |
| 43. Analog ground | 62. Not connected |
| 44. Volume capacitor Channel1 | 63. Not connected |
| 45. Analog power supply 8.0 V | 64. I2S2-data output |
| 46. Volume capacitor Channel 2 | 65. I2S2-data input |
| 47. Scart output 1, left | 66. Digital ground |
| 48. Scart output 1, right | 67. Digital power supply +5 V |
| 49. Reference ground 1 high voltage part | 68. Not connected |

HEADPHONE OUTPUT

TDA1308

The TDA1308 is an integrated class AB stereo headphone driver. It gets its input from two analog audio outputs (DACA_L and DACA_R) of MSP3410D. The gain of the output is adjustable by the feedback resistor between the inputs and outputs.

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) | : Min : 0.75V, Max : 4.25V |
| 2. Inverting input A | : Vo(clip) : Min : 1400mVrms |
| 3. Non-inverting input A | : 2.5V |
| 4. Ground | |
| 5. Non-inverting input B | : 2.5V |
| 6. Inverting input B | : Vo(clip) : Min : 1400mVrms |
| 7. Output B (Voltage swing) | : Min : 0.75V, Max : 4.25V |
| 8. Positive supply | : 5V, Min : 3.0V, Max : 7.0V |

AUDIO OUTPUT

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 12W_{rms} (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.

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 IQ)
- Few external components
- Thermal overload protection
- Adjustable gain via an external resistor

Pinning:

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

VIDEO INPUT AND OUTPUT SOURCE SWITCHING**TEA6415C**

Video switching is performed by the I2C controlled IC TEA6415C with a gain of 0dB. Inputs to the video switch are IF_CVBS, three SCART video signals, front-AV video signal, SVHS luma signal, and one of SC1_R or SVHS_C. Outputs of the video switch are three SCART video signals (SC1_OUT_V and SC3_OUT_V are the same), one video output for the PIP module, Chroma signal (C), and luma (Y) or CVBS signal.

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:

- | | | | | |
|------------|-------------|-----------------------|------------|------------|
| 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 |

VIDEO OUTPUT AMPLIFIER STAGE**TDA6111Q**

The TDA6111Q is a video output amplifier with 16Mhz bandwidth. It has a high slew rate. Automatic black-current stabilisation is possible by black-current measurement output. It has two cathode outputs: one for DC currents and one for transient currents. A feedback output is separated from the cathode outputs. An internal protection exists against positive appearing cathode-ray-tube flashover discharges with ESD protection.

Features:

- High bandwidth and slew rate
- Black-current measurement output for Automatic Black-current Stabilisation (ABS)
- Two cathode outputs; one for DC currents, and one for transient currents
- A feedback output separated from the cathode outputs
- Internal protection against positive appearing cathode-ray Tube (CRT) flashover discharges
- ESD protection
- Simple application with a variety of colour decoders
- Differential input with a designed maximum common mode input capacitance of 3pF, a maximum differential mode input capacitance of 0.5 pF and a differential input voltage temperature drift of 50 uV/K
- Defined switch-off behaviour.

Pinning:

1. Non-inverting voltage input
2. Supply voltage LOW
3. Inverting voltage input
4. Ground, substrate
5. Black current measurement output
6. Supply voltage HIGH
7. Cathode transient voltage output
8. Cathode CD voltage output
9. Feedback voltage output

VERTICAL OUTPUT STAGE**TDA9379FA**

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.

Features:

- Power Amplifier
- Thermal Protection
- Output Current up to 2.6App
- Flyback Voltage up to 90V
- External Flyback Supply

Pinning:

1. Inverting Input
2. Supply Voltage
3. Flyback Supply
4. GND or Negative Supply
5. Output
6. Output Stage Supply
7. Non-inverting Input

MICROTEXT CONTROLLER**SDA30C264**

The SDA30C264 is the microcontroller used with the Megatext IC. Its architecture and instruction set are based upon that of the 8051 microcomputer. Like the 8051 it has many features which increase programming ease; extended internal data memory-space, variable manipulation in internal data memory, free stack location in data RAM, 4 register banks, special function registers, memory mapped I/O, individually addressable bits, and a Boolean processor which gives the programmer the ability to improve the power of the software development. The IC produces the following input or output control signals; AGC_CON, MODE_SW, L/L', PIP_MODS, PIP_SEL, ON/OFF (stand-by), SC1..3_IN_AV (pin 8 information from 3 SCARTs), AFC, MUTE (to mute audio output IC), I2CEN.

The SDA30C26x family, a derivative of the SAB C501, is a member of family of single-chip computers, in which the emphasis is no longer placed on purely numeric computational performance, but on application-specific controller functions.

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The SDA 30C36x family members contain a 1024 + 256-byte or a 2048 + 256-byte data memory (XRAM + RAM), two independent 16-bit timers /-counters and a seven-source, four-priority-level, nested interrupt structure, on-chip oscillator and clock circuits. The 30 digital I/O-lines include four 8-bit ports (P1 and P3 contain I/O-lines with multifunction options) and one 2-bit port. One or two serial interfaces are included, one behaves like the 8051 UART, the other is a I²C Bus interface (SDA 30C264 only)

The second multifunction port consists of port P1, which alternatively can be used as up to eight independent pulse width modulated output channels (PWM). Controlled via special function registers, the PWM-circuitry provides flexibility in time resolution and system configuration.

Specially the realisation of D/A-outputs using pulse width modulation will be a cost saving advantage in analog applications.

The internal ADC is an 8-bit, four-channel converter. The input channels are P20 to P23, the analog supply are pins VDDA and VSSA. A flexible overvoltage / undervoltage detector is included (SDA 30C264 only).

Port 4 can be used as a standard port or as memory extension address bits.

Increased system reliability can be achieved by activating the integrated watchdog timer.

Efficient use of program memory results from an instruction set consisting of 49 single-byte, 46 two-byte and 16 three-byte instructions. Using an internal clock frequency of 12 MHz, 64 instructions execute in 0.5 us and 45b instructions execute in 1.0us. The remaining instructions (multiple and divide) require only 2us. The number of bytes in each instruction and the number of oscillator periods required for execution are listed in the instruction

Based on the SDA 30C163 and similar to the SDA 30C164, the SDA 30C26x comprise double stack size for the extension memory (32 byte) and seven additional data pointer registers.

The SDA 30C263 is a reduced version of the SDA 30C264. The SDA 30C264 is functionally compatible to the SDA 30C164, but uses a different package and a different Reset input stage (P-MQFP-80-1 instead of P-LCC-84).

If using the P-MQFP-64-1 Package, some I/O-features are not available.

Features:

■ SAB 8051 Architecture

- On-chip oscillator and clock circuits
- Binary or decimal arithmetic
- Signal-overflow detection and parity computation
- Integrated Boolean processor for control applications
- Full depth stacks for subroutines return linkage and data storage
- Four priority level, nested interrupt structure
- 0.5us instruction cycle at 12 MHz internal clock rate
- 8 data pointer registers

■ Serial interface

- Full duplex UART-interface
- I²C compatible interface (SDA 30C264 only)

■ On-Chip RAM

- Direct byte and bit addressability
- Four register banks
- 256 bytes of data memory, including 128 user-defined software flags
- 2048 bytes of data memory accessible with MOVX-instructions (SDA 30C263; 1024 bytes)

■ External Program Memory Interface

- 512 Kbytes of program memory may be addressed by a 8-bit data bus and a 16 + 3-bit address bus
- Extension stacks depth 32 byte

■ 30 Bi-directional I/O-Lines

- Two 8-bit ports, one comprising up to eight programmable D/A-outputs
- One 4-bit input port, also used for analog input
- One 8-bit port with open drain output
- One 2-bit port with optional memory extension function

■ Pulse Width Modulation Unit

- Up to eight programmable PWM-output channels for low cost digital-to-analog conversion

■ Timers

- Two 16-bit general purpose timer/event counters
- Watchdog timer

■ Analog-to-Digital Converter

- Four multiplexed input channels with 8-bit resolution
- Overvoltage/Undervoltage Detector with interrupts capability

SERIAL ACCESS 32K EEPROM

24LC32A

It is the 32Kbit electrically erasable programmable memory. The memory is compatible with the I2C standard, two wire serial interface, which uses a bi-directional data bus and serial clock.

Features:

- Single supply with operation down to 2.5V
 - Maximum writes current 3mA at 6.0V
 - Standby current 1mA max at 2.5V
- 2-wire serial interface bus, I²C compatible
- 100 kHz (2.5V) and 400 kHz (5V) compatibility
- Self-timed ERASE and WRITE cycles
- Power on/off data protection circuitry
- Hardware write protect
- 1,000,000 Erase/Write cycles guaranteed
- 32-byte page or byte writes modes available
- Schmitt trigger filtered inputs for noise suppression

- Output slope control to eliminate ground bounce
- 2 ms typical write cycle time, byte or page
- Up to eight devices may be connected to the same bus for up to 256K bits total memory
- Electrostatic discharge protection > 4000V
- Data retention > 200 years
- 8-pin PDIP and SOIC packages
- Temperature ranges
 - Commercial (C): 0°C to +75°C
 - Industrial (I): -40°C to +85°C

Pinning:

1. A0 User Configurable Chip Select
2. A1 User Configurable Chip Select
3. A2 User Configurable Chip Select
4. Vss Ground
5. SDA Serial Address/Data I/O
6. SCL Serial Clock
7. WP Write Protect Input
8. Vcc +2.5V to 6.0V Power Supply

DRAM

HYB514400BJ

The HYB514400BJ is the new generation dynamic RAM organised as 1M by 4-bit. It utilises CMOS silicon gate process as well as advances circuit techniques to provide wide operation margins both internally and for the system user. This DRAM is used with Megatext IC to store teletext pages.

Features:

- 1 048 576 words by 4-bit organisation
- 0 to 70 °C operating temperature
- Fast Page Mode Operation
- Single +5V (± 10 %) supply with a built-in VBB generator
- Low power dissipation
 - max. 660mW active (-50 version)
 - max. 605mW active (-60 version)
 - max. 550mW active (-70 version)
- Standby power dissipation
 - 11mW max. Standby (TTL)
 - 5.5mW max. Standby (CMOS)
 - 1.1mW max. Standby (CMOS) for low Power Version
- Output unlatched at cycle and allows two-dimensional chip selection
- Read, writes, read-modify write, CAS-before-RAS refreshes, RAS-only refresh hidden refresh and test mode capability
- All inputs and outputs TTL-compatible
- 1024 refresh cycles / 16 ms
- 1024 refresh cycles / 128 ms Low Power Version only
- Plastic Packages: P-SOJ-26/20-5 with 300mil width

EPROM

ST27C2001

The ST27C2001 is 2097 152-bit, ultra-violet erasable, electrically programmable read-only memory. This device is fabricated using power-saving CMOS technology for high speed and simple interface with MOS and bipolar circuits. All inputs (including program data inputs) can be driven by series 74TTL circuits without the use of external pull-up resistors. Each output can drive one series 74 TTL circuit without external resistors. Software for user interface and control of hardware circuitry are stored in this IC.

Features:

- Organisation ...256K x 8
- Single 5-Vpover supply
- Operationally Compatible with Existing Megabit EPROMs
- Industry Standard 32-pinDual-in-line Package
- All inputs/Outputs Fully TTL Compatible
- Max Access/Min Cycle Time
- 8-Bit Output for Use in Microprocessor-Based Systems
- Power Saving CMOS Technology
- 3-State Output Buffers
- 400 mV Minimum DC Noise Immunity with Standard TTL Loads
- Latchup Immunity of 250mA on all input and output pins
- No pull-up resistors required
- Low power dissipation (Vcc = 5.5V)
 - Active 165mW Worst case
 - Standby 0.55mW Worst case (CMOS-Input levels)

100Hz FEATURE BOX

VPC3215, CIP3250, SDA9400, DDP3310

The feature box consists of four I2C controlled ICs:

Video Processor	VPC3215
Component Interface Processor	CIP3250
Digital Image Processor	SDA9400
Digital Deflection Processor	DDP3310

The input supplies to the feature box are +12V, +5V. The ICs do also need a supply of 3.3V, which is regulated by IC4 LM314.

Besides the composite video in normal operation and luma/chroma inputs in the SVHS applications, there are also R-G-B-FB inputs from the PIP module.

OSD R-G-B-FB inputs from the Megatext IC or from the controller in the case of TV-text option. While the 50Hz sync signals for PIP are supplied by the VPC3215, the 100Hz sync signals for OSD are supplied by the DDP3310.

Control signals for HV stage such as VertQ, Vert, HDrive, EW (East-West) and SVM (Scan Velocity Modulation) are produced by this module. VProt and HProt input signals are used for protection. There are also a flyback sample signal from HV stage and the sense signal from the CRT board.

The feature box also supports the VGA mode.

VPC32X5 (Video Processor)

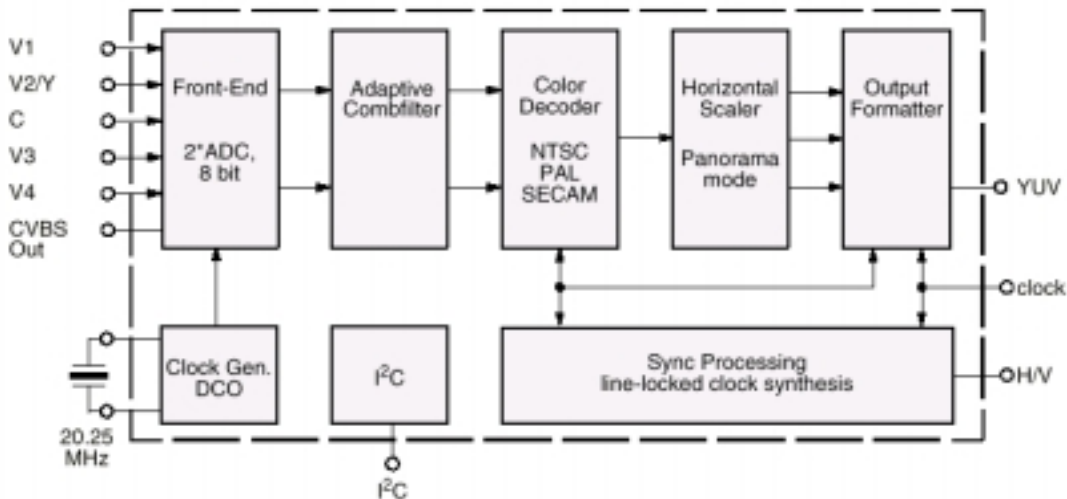


Figure 1

As seen in figure 1 all the processings in VPC are digital. This IC has four composite, one SVHS input, and one composite output which is used for teletext. In AK28 the main video input is Vin2, which is also used for luma input in SVHS applications. After switching the inputs the signals are converted to digital via two 8 bit ADCs. And these digital data are processed to produce the 4:2:2 formatted digital YUV signals. The main features are, multi-standard color decoding including all substandards, multi-standard sync processing, adaptive 4H comb filter, linear horizontal scaling, as well as nonlinear horizontal scaling (panorama vision.) It provides 50Hz vertical and 15625Hz horizontal sync signals for the PIP module.

Features:

- all-digital video processing
- high-performance adaptive 4H comb filter Y/C separator with adjustable vertical peaking
- multi-standard color decoder PAL/NTSC/SECAM including all substandards
- 4 composite, 1 S-VHS input, 1 composite output
- integrated high-quality A/D converters and associated clamp and AGC circuits
- multi-standard sync processing
- linear horizontal scaling (0.25 ... 4), as well as non-linear horizontal scaling 'panorama vision'
- PAL+ preprocessing (VPC 3215)
- line-locked clock, data and sync output (VPC 3215)
- display/deflection control (VPC 3205)
- submicron CMOS technology
- I2C-Bus Interface
- one 20.25 MHz crystal, few external components
- 68-pin PLCC package

Pinning:

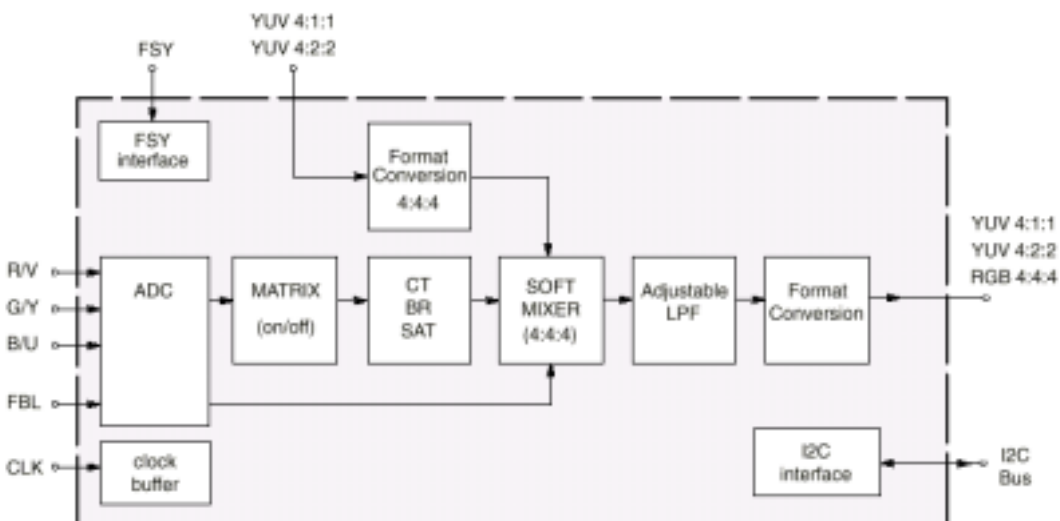
1	Ground	35.	Ground
2	Ground	36.	Supply Voltage
3	5 MHz Clock Out	38...47.	Picture Bus Chroma
4	Standby Supply Volt	48...50.	Picture Bus Priority
5	Analog Crystal Out	51.	Ground
6	Analog Crystal In	52.	VGA Input
7	Ground	53.	Front-End/ Back-End Data
9	Ground	54.	Reset Input, Active Low
10	Interlace Out	55.	I2C Bus Data
12	Vertical Sync Pulse	56.	I2C Bus Clock
13	Front Sync Pulse	57.	Test Pin, connect to GND
14	Main Sync/Horiz Sync Pulse	58.	Video 4 Analog Input
15	Helper Line Output	59.	Ground
16.	Horz Clamp Pulse	60.	Video 3 Analog Input
17.	Active Video Out	61.	Video 2 Analog Input
18.	Double Output Clock	62.	Video 1 Analog Input
19.	Output Clock	63.	Chroma/ Video 4 Analog Input
20...29.	Picture Bus Luma	64.	Analog Video Output
26.	Ground	65.	Analog Shield GND F
27.	Not Connected	66.	Supply Voltage, Analog Front-End
30.	Main Clock Output 20.25 MHz	67.	Signal Ground for Analog Input
31.	Supply Volt	68.	Reference Voltage Top, Analog
34.	Ground		

CIP3250:

The IC is used to interface the analog input, which is output from the PIP module (SCART RGB or PIP RGB). As can be seen from the block diagram, there is a CT-BR-SAT block, which is used for luma contrast, brightness, hue, and color saturation correction. The soft mixer is controlled by the fast blank signal.

Features:

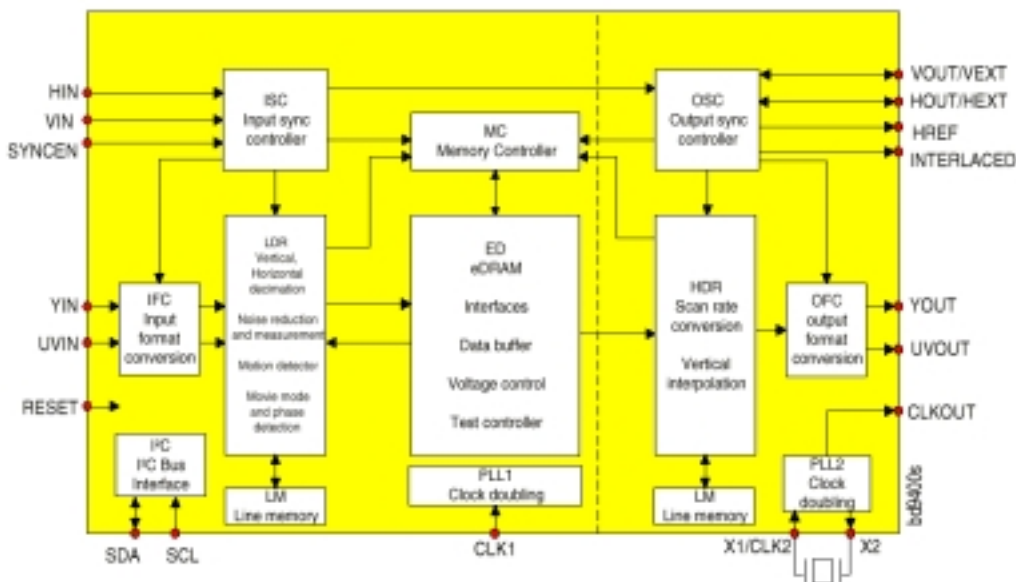
- analog input for RGB or YUV and Fast Blank
- triple 8 bit analog to digital converters for RGB/YUV with internal programmable clamping
- single 6 bit analog to digital converter for Fast Blank signal
- digital matrix RGB % YUV (Y, B-Y, R-Y)
- luma contrast and brightness correction for signals from analog input
- color saturation and hue correction for signals from analog input
- digital input for DIGIT 2000 or DIGIT 3000 formats
- digital interpolation to 4:4:4 format
- high quality soft mixer controlled by Fast Blank signal
- programmable delays to match digital YUVin and ana-log RGB/YUV
- variable low pass filters for YUV output
- digital output in DIGIT 2000 and DIGIT 3000 formats, as well as RGB 4:4:4
- I2C bus interface
- clock frequency 13.5... 20.25 MHz



Pinning:

- | | |
|------------------------------------|------------------------------------|
| 1. Standby connect to ground | 54. Main Clock Input |
| 2...9. Blue Output | 55. Reset Input |
| 10...17. Green/Luma Output | 56. In Test Mode connect to ground |
| 18. Pad Ground | 57. Analog Supply Voltage +5 V |
| 19. Pad Supply Voltage +5 V/+3.3 V | 58. Analog Ground |
| 20...27. Red/Chroma Output | 59. Reference External Capacitor |
| 28. Active Video Output | 60. Substrate connect to ground |
| 29. Active Video Input | 61. Fast Blank Input |
| 30. Front Sync Input | 62. Ground Fast Blank |
| 31. I2C Clock Input/Output | 63. Blue/U Input |
| 32. I2C Data Input/Output | 64. Ground Blue/U |
| 33...35. Picture Bus Priority | 65. Green/Luma Input |
| 36...43. Chroma Input | 66. Ground Green/Luma |
| 44...51. Luma Input | 67. Red/V Input |
| 52. Digital Ground | 68. Ground Red/V |
| 53. Digital Supply Voltage +5 V | |

SDA9400:



SDA9400 converts the scan rate from 50/60 Hz to 100/120 Hz

Features:

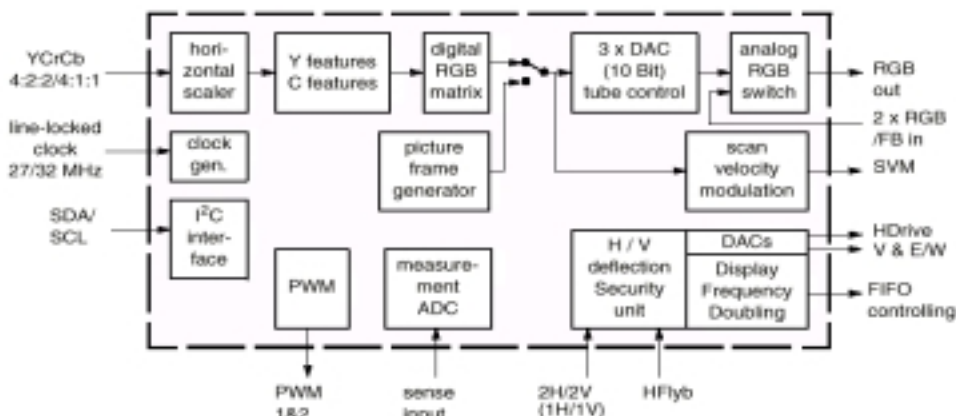
- **Two input data formats**
 - 4:2:2 luminance and chrominance parallel (2 x 8 wires)
 - ITU-R 656 data format (8 wires)
- **Two different representations of input chrominance data**
 - 2's complement code
 - Positive dual code
- **Flexible input sync controller**
- **Flexible compression of the input signal**
 - Digital vertical compression of the input signal (1.0, 1.25, 1.5, 1.75, 2.0, 3.0, 4.0)
 - Digital horizontal compression of the input signal (1.0, 2.0, 4.0)
- **Noise reduction**
 - Motion adaptive spatial and temporal noise reduction (3D-NR)
 - Temporal noise reduction for luminance frame based or field based
 - Temporal noise reduction for chrominance field based
 - Separate motion detectors for luminance and chrominance
 - Flexible programming of the temporal noise reduction parameters
 - Automatic measurement of the noise level (5 bit value, readable by I²C bus)

- **3-D motion detection**
 - High performance motion detector for scan rate conversion
 - Global motion detection flag (readable by I²C bus)
 - Movie mode and phase detector (readable by I²C bus)
- **TV mode detection by counting line numbers (PAL, NTSC, readable by I²C bus)**
- **Embedded memory**
 - 5 Mbit embedded DRAM core for field memories
 - 192 kbit embedded DRAM core for line memories
- **Flexible clock and synchronization concept**
 - Decoupling of the input and output clock system possible
- **Scan rate conversion**
 - Motion adaptive 100/120 Hz interlaced scan conversion
 - Motion adaptive 50/60 Hz progressive scan conversion
 - Simple static interlaced and progressive conversion modes for 100/120 Hz interlaced or 50/60 Hz progressive scan conversion : e.g. ABAB, AABB, AA*B*B, AAAA, BBBB, AB, AA*
 - Simple progressive scan conversion with joint lines:
50 Hz -> 60, 70, 75 Hz progressive
60 Hz -> 70, 75 Hz progressive
 - Large area and line flicker reduction
- **Flexible digital vertical expansion of the output signal (1.0, ... [1/32] ... , 2.0)**
- **Flexible output sync controller**
 - Flexible positioning of the output signal
 - Flexible programming of the output sync raster
 - External synchronization by backend IC possible
(e.g. split screen for one TV channel with joint lines and one PC VGA channel)
- **Signal manipulations**
 - Insertion of coloured background
 - Vertical and/or horizontal windowing with four different speed factors
 - Flash generation (for supervising applications, motion flag readable by I²C bus)
 - Still frame or field
 - Support of split screen applications
 - Multiple picture display - Tuner scan (4 and 16 times for 4:3, 12 times for 16:9 tubes)
 - Support of multi picture display with PIP or front-end processor with integrated scaler
(e.g. 9 times display of PIP pictures, picture tracking, random pictures, still-in-moving picture, moving-in-still picture)
- **I²C-bus control (400 kHz)**
- **3.3 V ± 5% supply voltage**

Pinning:

2,8,24,42,55	Supply volt (VSS=0V)	54.	System clock 1
9,25,41,56	Supply volt (VDD=3.3V)	17,...,10	Data output UV
36,52,58	Supply volt (VSS=0V)	7,...,3;1;64;63	Data output Y
35,51,53,57,59	Supply volt (VDD=3.3V)	62	Horz active video out
43,...,50	Data input Y	61	V-Sync out / Ext V-Sync
31,...,34;37,...,40	Data input UV	60	H-Sync out / Ext H-Sync
30	System reset.	18	Interlace signal vert deflection
23	H-Sync input	28	Crystal conn / System clock 2
22	V-Sync input	27	Crystal connection
29	Sync enable input	26	Clock output
21	I2C-Bus data line	19	Test input
20	I2C-Bus clock line		

DDP3310:



It is the display and deflection processor. All the horizontal and vertical stages are driven by this IC. The last controls such as contrast, brightness and saturation of the actual video signal, OSD and VGA are accomplished by the blocks in DDP. Tube measurement and SVM controls are also managed by this IC.

Features:

Video processing

- linear horizontal scaling (0.25 ... 4)
- non-linear horizontal scaling "panoramavision"
- dynamic peaking
- soft limiter (gamma correction)
- color transient improvement
- programmable RGB matrix
- picture frame generator
- two analog RGB/Fast-Blank inputs

Deflection processing

- scan velocity modulation output
- high-performance H/V deflection
- EHT compensation for vertical / East/West
- soft start/stop of H-Drive
- vertical angle and bow
- differential vertical output
- vertical zoom via deflection
- horizontal and vertical protection circuit
- adjustable horizontal frequency for VGA/SVGA display

Miscellaneous

- selectable 4:1:1/ 4:2:2 YC r C b input
- selectable 27/ 32-MHz line-locked clock input
- crystal oscillator for horizontal protection
- automatic picture tube adjustment (cutoff, white-drive)
- single 5-V power supply
- hardware for simple 50/60-Hz to 100/ 120-Hz conversion (display frequency doubling)
- two I2C-controlled PWM outputs
- beam current limiter

Pinning:

- | | |
|------------------------------------|-----------------------------------------------|
| 1. Supply Voltage | 28. Sup Volt, Analog Back-end |
| 2. Gnd, Output Pin Driver | 29. VRD/BCS DAC Ref, Beam Current Safety |
| 3. Additional VSYNC input | 30. Fast-Blank1 Input |
| 4. Read counter Reset | 31. Analog Red1 Input |
| 5. FIFO Read Enable | 32. Analog Green1 Input |
| 6. FIFO Write Enable | 33. Analog Blue1 Input |
| 7. FIFO Write counter Reset | 34. Fast-Blank2 Input |
| 8. Horz. Drive Output | 35. Analog Red2 Input |
| 9. Horz. Flyback Input | 36. Analog Green2 Input |
| 10. Safety Input | 37. Analog Blue2 Input |
| 11. Vertical Protection Input | 38. Test Pin |
| 12. Select of H-Drv Freq. Range | 39. Reset Input, active low |
| 13. Clock Sel 40.5 or 27/32MHz | 40. PWM out |
| 14. Clock select 27/32 MHz | 41. PWM out |
| 15. Range Switch2, Measure ADC | 42. Half-Contrast |
| 16. Range Switch1, Measure ADC | 43...50. Picture Bus Chroma |
| 17. Sense ADC Input | 51. Supply Volt, Digital Circuitry |
| 18. Ground, MADC Input | 52. Ground, Digital Circuitry |
| 19. Differential Vert Sawtooth Out | 53. Sys. Clock Input(27/32/40.5MHz) |
| 20. Differential Vert Sawtooth Out | 54...61. Y0 Picture Bus Luma |
| 21. E/W Output | 62. Single LLC Input(13.5/16MHz) |
| 22. Reference Input for RGB DACs | 63. Horizontal Sync Input |
| 23. Scan Velocity Modulation | 64. Vertical Sync Input |
| 24. Analog Output Red | 65. Analog Crystal Out (5-MHz Security Clock) |
| 25. Analog Output Green | 66. Analog Crystal In (5-MHz Security Clock) |
| 26. Analog Output Blue | 67. I2C-Bus Data |
| 27. Ground, Analog Back-end | 68. I2C-Bus Clock |

AK28 CHASSIS MANUAL ADJUSTMENTS PROCEDURE

A) PRELIMINARY

Before starting with the alignment procedure, make sure that all the potentiometers on the chassis and also screen and focus pots are in the medium position.

B) SYSTEM VOLTAGE ADJUSTMENT

- Inputs* - AC power (220V 50 Hz).
- PAL B/G test pattern via RF
(PAL I test pattern for PAL I TV's, SECAM D/K pattern, SECAM L/L 'K' TV's).
- Outputs* - Digital voltmeter to anode of D110.
- Display* - System voltage
- Action* - Apply power. Check that The stand-by led lights.
- Select TV mode and tune to the applied test pattern via local test keyboard.
Chassis should start normally.
- Adjust all analogue controls (volume, bass, treble, brightness, contrast, colour) to minimum settings.
- Adjust VR127 according to the following different types of CRT's

SYSTEM VOLTAGE

135V±0.5V

135V±0.5V

135V±0.5V

135V±0.5V

TYPE OF CRT

PHILIPS A66EAK552X54

PHILIPS A66EAK071X54

VIDEOCOLOR A66ECY13X12

PHILIPS W66ESF002X44

C) AFC ADJUSTMENT

- Inputs* - AC power.
- 38.9 MHz test pattern for PAL B/G, PAL-SECAM B/G or 39.5 MHz test pattern for PAL I model
(90dBmV) to Z403 SAW filter input terminals 1 and 2.
- Outputs* - Digital Voltmeter to AFC point (pin22 of IC401)
- Display* - AFC Voltage.
- Action* - Adjust VL401 for 2.5±0.1 Volts. TV should automatically tune to a station when search tuning is activated.

D) FOCUS ADJUSTMENT

- Inputs* - AC power
- PAL B/G test pattern via RF input.
- Outputs* - Picture tube drive.
- Display* - Picture
- Action* - Select TV mode and tune to the signal.
- Adjust focus potentiometer (the upper pot on the rear side of the FBT transformer) for optimum focusing.drive.

E) SCREEN ADJUSTMENT

- Inputs* - AC power
- PAL B/G Colour Bar test pattern via RF
- Outputs* - 1/100 Oscilloscope probe to RGB cathodes on CRT baseboard.
NOTE:Ground pin of probe will be connected to 1st pin (GND) of the CRT socket.
- Display* - RGB ratio
- Action* - Select PAL B/G Colour Bar pattern using the local test keyboard and the user remote control unit.
- Adjust all control functions (brightness, colour and contrast) to minimum settings.
- Measure the most sensitive cathode
- Adjust the screen potentiometer (lower pot on the rear side of FBT transformer) until cathode voltage becomes 150V.

F) IF ADJUSTMENT FOR L' MODE

- Inputs* - AC power.
- 38.9 MHz test pattern for PAL B/G, PAL-SECAM B/G or 39.5 MHz test pattern for PAL I model.
(90dBmV) to Z403 SAW filter input terminals 1 and 2.
- Outputs* - Digital Voltmeter to AFC point. (pin22 of IC401)
- Digital Voltmeter to AFC_L point. (pin14 of IC401)
- Display* - AFC Voltage.
- Action* - Firstly adjust VL401 for 2.5 ± 0.1 Volts. TV should automatically tune to a station.
when search tuning is activated.
- Adjust VR401 for 2.5±0.1 Volts at the AFC_L point.

AK28 CHASSIS PRODUCTION MODE ADJUSTMENTS PROCEDURE

A) PRELIMINARY

All system, geometry and white balance alignments are performed in production service mode. Before starting the production mode alignments, make sure that all manual alignments are done correctly. To start production mode alignments enter the MAIN MENU and enter the code **1675** by pressing digit keys. Production mode items will appear on the screen. Production mode groups will be displayed with different colours of headlines, so in order to access a production alignment group press the colour key of the related group on the remote control transmitter. After selecting one of the production service mode groups, you can access its items by pressing the cursor-up and/or cursor-down keys. You can change the value of an item by pressing cursor-left and/or cursor-right keys on the remote control transmitter.

In order to switch between other group of items press the colour key of this groups headline.

To store the settings press OK key. In order to leave this menu press MENU key.

B) HORIZONTAL AND VERTICAL GEOMETRY ALIGNMENTS

- Switch the program to crosshatch test pattern.
- Press RED key to access this group of item.
- Select the items by pressing cursor-up and/or cursor-down keys.
- Adjust the item by pressing cursor-left and/or cursor-right after selecting that item.
- Store the settings by pressing OK key.
- Switch to another item group by pressing the colour keys of the related coloured headline of that group.
- Exit production mode by pressing the MENU key on the remote transmitter..

1) V-SHIFT

- Press cursor-left and/or cursor-right buttons till the test pattern is vertically centred, i.e. horizontal line at the centre of the test pattern is in equal distance both to upper and lower side of the picture tube. Check and readjust V-SHIFT item if the adjustment becomes improper after some other geometric adjustments are done

2) V-SIZE

- Press cursor-left and/or cursor-right buttons 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 V-SIZE item if the adjustment becomes improper after some other geometric adjustments are done.

3) H-SHIFT

- Adjust H-SHIFT item by pressing cursor-left and/or cursor-right buttons till test pattern is horizontally in equal distance both to right and left sides of the picture tube. Check and readjust H-SHIFT item if the adjustment becomes improper after some other geometric adjustments are done.

4) H-SIZE

- Adjust H-WIDTH item by pressing cursor-left and/or cursor-right buttons till no under-scan condition will happen, i.e. no white bars on the left and right side of the test pattern will be visible nor the picture will be so wide. Check and readjust H-WIDTH item if the adjustment becomes improper after some other geometric adjustments are done.

5) S-COR

- Press cursor-left and/or cursor-right buttons 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 S-COR item if the adjustment becomes improper after some other geometric adjustments are done.

6) LINRT

- Press cursor-left and/or cursor-right buttons till all the size of squares of the test pattern become in equal size from the top of the screen to its bottom of the whole screen. Check and readjust LINRT item if the adjustment becomes improper after some other geometric adjustments (especially after than S-COR adjustment are done).

7) ANGLE

- Press cursor-left and/or cursor-right buttons till the vertical lines of the crosshatch pattern become completely perpendicular to horizontal lines without any angle of vertical deviation. Check and readjust ANGLE item if the adjustment becomes improper after some other geometric adjustments are done.

8) BOW

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

9) TRPEZ

- Press cursor-left and/or cursor-right buttons till vertical lines, especially lines at the sides of the picture frame became parallel to the both sides of picture tube as close as possible. Check and readjust TRPEZ item if the adjustment becomes improper after some other geometric adjustments are done.

10) PARAB

- Press cursor-left and/or cursor-right buttons till vertical lines close to the both sides of the picture frame become parallel to vertical sides of picture tube without any bending to left or to right side of the screen.. Check and readjust PARAB item if the adjustment becomes improper after some other geometric adjustments are done.

11) U. COR

- Press cursor-left and/or cursor-right buttons till vertical lines at the upper corners of the picture frame become vertical and parallel to vertical corner sides of picture tube. Check and readjust U. COR item if the adjustment becomes improper after some other geometric adjustments are done.

12) L. COR

- Press cursor-left and/or cursor-right buttons till vertical lines at the lower corners of the picture frame become vertical and parallel to vertical corner sides of picture tube. Check and readjust L. COR item if the adjustment becomes improper after some other geometric adjustments are done.

C) VIDEO ALIGNMENTS

- Switch the program to crosshatch test pattern for geometric adjustments.
- Switch the program to colour bar test pattern for video adjustments.
- Press GREEN key to access this group of item.
- Select the items by pressing cursor-up and/or cursor-down keys.
- Adjust the item by pressing cursor-left and/or cursor-right after selecting that item.
- Store the settings by pressing OK key.
- Switch to another item group by pressing the colour keys of the related coloured headline of that group.
- Exit production mode by pressing the MENU key on the remote transmitter..

1) RGn, GGn, BGn: WHITE BALANCE ADJUSTMENT

- Apply WHITE test pattern via RF.

Adjust all analogue functions to medium level and set GGn, RGn, BGn at value 80, if needed.

Use Colour analyser and monitor the colour temperature (X, Y) on colour analyser.

Select RGn and BGn by cursor-up and/or cursor-down buttons and change the values by cursor-left and/or cursor-right buttons till the following values are read:

X=285±10

Y=293±10 on the colour analyser.

2) RRf, GRf, BRf

Set the values of these items as 62 (constant).

3) YDF

Apply COLOUR BAR test pattern.

Select YDF item cursor-up and/or cursor-down buttons.

Adjust YDF by pressing cursor-left and/or cursor-right buttons till the colour transients on the colour bar pattern becomes as sharper and possible as colours between transients do not mix with each other. Check and readjust YDF item if the adjustment becomes improper after YDV adjustment is done.

4) AGC

Apply PAL BG signal, VHF-3 Channel-12 and 60dBmV RF signal level.

Adjust AGC item till voltage at the AGC point (pin1 of the tuner) becomes 3.0 volts.

5) TLAN

This item and its settings will be defined later.

6) APS

This value of this item toggles between ON and OFF while pressing the cursor-left and cursor-right after this item is selected by cursor-up and/or cursor-down buttons.

In order to activate APS installation procedure whenever TV is turned select ON for the very first time.

In order to start TV without APS installation procedure select OFF.

7) T_T

This item is used for the Tuner Selection.

SAM, THO, SIE, ALP, MK2 and MK3 are for Samsung, Thomson, Siemens, Alps and Philips MP2/MP3, respectively.

8) T_P

This item is used for the Tuner Selection.

SAM, THO, TEM, and MK2 are for Samsung, Thomson, Temic, and Philips, respectively.

9) EXT3

This item is toggles between ON and OFF and is used to enable and disable EXT3, respectively.

10) CLT

This item is used to set the Menu colors. 5 choices are possible.

D) SERVICE ALIGNMENTS

IMPORTANT: There will no adjustments in this service mode during production mode alignments.

- Press BLUE key on the remote transmitter when Production mode is active.
- Press the colour key of the related item group's headline colour
- Press cursor-up and/or cursor-down to select the item of the group
- Press cursor-left and/or cursor-right to alter the value of the item.
- Press OK to store the values of items and MENU to exit the service alignments mode.

1) ADJUSTMENTS GROUP

Press RED key on the remote transmitter in order to access this group of items.

- PIP CNTRST , level of the PIP picture
- PIP YDelay , luma delay of the PIP picture
- PIP Frame , color selection of the PIP frame. (edges of the PIP)
- EHTHP , EHT compensation coefficient for horizontal phase
- EHTH TC , EHT time constant for horizontal phase compensation
- EHTH , EHT compensation coefficient for horizontal amplitude
- EHTV , EHT compensation coefficient for vertical amplitude
- EHTV TC , time constant for control of vertical and horizontal amplitude EHT compensation. (0 means off.)
- OSD LEVEL , contrast level of the OSD
- INIT NVM , to initiate the NVM

2) OPTIONS GROUP

- Press BLUE key on the remote transmitter in order to access this group of items.

- 0. HPHONE , on / off
- 1. CRT , 4:3 / 16:9
- 2. S-VHS , on / off
- 3. f(IF) , always set to 38.9
- 4. Türk. , turkish menu on/off
- 5. VGA , on / off
- 6. FRONT , Front AV on/off

3) SYSTEM GROUP

- Press YELLOW key on the remote transmitter in order to access this group of items.

- 0. PAL B/G , on / off
- 1. PAL D/K , on / off
- 2. PAL I , on / off
- 3. SECAM B/G , on / off
- 4. SECAM D/K , on / off
- 5. SECAM L/L' , on / off
- 6. AUST. , on / off

SPARE PART LIST							
10009785				EAC AUSTR TEAC CTW 3270S(AK2			
COMPONENT CODE	MATERIAL	QTY	POSITION NUMBER				
20000849	FUSE ASSY.TK79-A (3.15A)	1000	F101	.	.	.	.
20004005	CHASSIS FRAME AK19 (110°)	1,000	.	.	.	.	.
20004519	CABLE HOLDER CRT (I)	1,000	.	.	.	.	.
20013018	LBL.BCK.CVR.ASSY (TV) (WO/UL)	1,000	.	.	.	.	.
20013966	SNOW BOX ASSY.8270/71-3250/51	1,000	.	.	.	.	.
20013967	SNOW BOX-TOP 8270/71	1,000	.	.	.	.	.
20013968	SNOW BOX-BOTTOM 8270/71	1,000	.	.	.	.	.
20016405	ON/OFF AS.110°(28-29°)(2.2/AU)(W/MAKARON	1,000	.	.	.	.	.
20021028	MD.ASY.TB8270/71-3 / 3250/51 5SW AK18	1,000	.	.	.	.	.
20040575	CHASSIS FRAME AK28 (I)	1,000	.	.	.	.	.
20040684	BACK DOOR AK28 (I)	1,000	.	.	.	.	.
20050372	LENS 3250 (I)	1,000	.	.	.	.	.
20050376	LENS LED 3250/51 (I)	1,000	.	.	.	.	.
20051793	MD.ASY.BSVM28-BEAM SCAN VM	1,000	.	.	.	.	.
20053145	MD.ASY.DS28-FAV+HP+BAV+SVHS+VD	1,000	.	.	.	.	.
20055386	MD.ASY.FB28-FEATURE BOX 28 (FB28-1)	1,000	.	.	.	.	.
20063054	CN.ASY.28-DIODE BYM26D+FERIT+HEATSINK	1,000	D110	.	.	.	.

20063097	CABLE ASSY.19-4/60 R2.6(HRZ&VER)IMPROVED	1,000	.	.	.	.	.
20070899	BUTTON ASSY 3250 (KROM METAL KAPLI)	1,000	.	.	.	.	.
20070900	BUTTON FUNCTION 3250 (KROM MET.KAPLAMA)	1,000	.	.	.	.	.
20070901	BUTTON ON/OFF 3250 (KROM MET.KAPLAMA)	1,000	.	.	.	.	.
20072002	BACK C.8270/71- 3250/51(UL)(SILVER/P)AK18	1,000	.	.	.	.	.
20072004	BASE 8270/1-3250/51(UL)(I)W/CHS.FRM AK18	1,000	.	.	.	.	.
20072006	CHS.ASSY.28-13612121321147	1,000	.	.	.	.	.
20072007	IC 24LC32 0591221622121	1,000	.	.	.	.	.
20072606	R/C 2100 TEAC RC-847 (S) (SILVER/P)	1,000	.	.	.	.	.
20072607	LBL.BCK.CVR.TEAC AU.TEAC CTW 3270S(AK28)	1,000	.	.	.	.	.
20075205	FRONT 3250FAV W/H (UL)SILVER(P)(VIR.DO/S	1,000	.	.	.	.	.
20075897	MD.ASY.SB28T-HP&SVHS AK28	1,000	.	.	.	.	.
20075922	MD.AS.FAV19-STR 7216/71 AK28(SVHS OLDUĐU	1,000	.	.	.	.	.
20078330	BUTTON FUNCTION 3250 PLATABLE(I)	1,000	.	.	.	.	.
20078331	BUTTON ON/OFF 3250 PLATABLE(I)(SM BASKI)	1,000	.	.	.	.	.
20087557	R/C 2100 NOBRAND (SILVER/P) (F)	1,000	.	.	.	.	.
20088683	CRT B.ASSY.TP28-28"-33" W/BSVM (TP28-7)	1,000	.	.	.	.	.
30000072	CAP MKT 10NF 1250V J	1,000	C914	.	.	.	.

30000074	CAP MKT 100NF 63V J	1,000	C571	.	.	.	.
.	.	6,000	C808	C809	C221	C301	C302
.	.	.	C103	.	.	.	.
.	.	6,000	C560	C566	C567	C568	C569
.	.	.	C576	.	.	.	.
.	.	1,000	C202	.	.	.	.
30000075	CAP MKT 100NF 250V K (DC)	5,000	C903	C907	C911	C922	C936
30000092	CAP MKT 220NF 63V J	6,000	C582	C585	C586	C587	C592
.	.	.	C620	.	.	.	.
.	.	2,000	C256	C203	.	.	.
30000094	CAP MKT 220NF 275V M AC	1,000	C112	.	.	.	.
30000098	CAP MKT 3.3NF 63V J	1,000	C100	.	.	.	.
30000100	CAP MKT 330NF 63V J	2,000	C555	C559	.	.	.
30000109	CAP MKT 470NF 63V J	1,000	C411	.	.	.	.
.	.	8,000	C518	C519	C522	C523	C524
.	.	.	C525	C527	C528	.	.
.	.	4,000	C035	C078	C079	C25	.
30000131	CAP MKP 100NF 250V J	1,000	C111	.	.	.	.
30000134	CAP MKP 11NF 2000V %3.5	1,000	C211	.	.	.	.
30000137	CAP MKP 15NF 630V J	1,000	C212	.	.	.	.
30000140	CAP MKP 1.8NF 2KV %3.5	1,000	C210	.	.	.	.

30000147	CAP MKP 2.2UF 400V	1,000	C213	.	.	.	.
30000159	CAP MKP 4.7NF 1.6KV J	1,000	C109	.	.	.	.
30000166	CAP MKP 560NF 250V J	1,000	C215	.	.	.	.
30000191	CAP CER 100PF 50V J SL	1,000	C107	.	.	.	.
30000275	CAP CER 8PF 50V D CH	1,000	C901	.	.	.	.
30000283	CAP CER 1NF 50V K B	1,000	C380	.	.	.	.
30000296	CAP CER 100NF 100V Z F	1,000	C955	.	.	.	.
30000330	CAP CER 4.7NF 50V K B	1,000	C916	.	.	.	.
30000345	CAP EL 10UF 50V M	1,000	C952	.	.	.	.
.	.	7,000	C204	C316	C330	C402	C455
.	.	.	C450	C506	.	.	.
.	.	3,000	C531	C532	C533	.	.
.	.	19,000	C102	C021	C022	C024	C026
.	.	.	C027	C028	C036	C037	C074
.	.	.	C075	C076	C077	C080	C081
.	.	.	C082	C098	C099	C108	.
30000348	CAP EL 10UF 160V M	1,000	C954	.	.	.	.
30000350	CAP EL 10UF 250V M	1,000	C223	.	.	.	.
30000352	CAP EL 100UF 16V M	2,000	C504	C556	.	.	.
.	.	2,000	C574	C578	.	.	.

.	.	1,000	C919	.	.	.	.
.	.	7,000	C141	C144	C150	C321	C322
.	.	.	C500	C456	.	.	.
30000353	CAP EL 100UF 25V M	1,000	C114	.	.	.	.
30000355	CAP EL 100UF 50V M	1,000	C453	.	.	.	.
30000356	CAP EL 100UF 63V M	1,000	C226	.	.	.	.
30000359	CAP EL 1000UF 16V M	4,000	C146	C225	C251	C147	.
.	.	1,000	C921	.	.	.	.
30000360	CAP EL 1000UF 25V M	4,000	C140	C228	C201	C254	.
30000362	CAP EL 1UF 50V M	5,000	C207	C801	C802	C499	C803
.	.	1,000	C579	.	.	.	.
.	.	1,000	C638	.	.	.	.
30000371	CAP EL 22UF 50V M	1,000	C391	.	.	.	.
.	.	2,000	C101	C408	.	.	.
.	.	10,000	C516	C521	C621	C622	C623
.	.	.	C624	C626	C627	C628	C629
.	.	2,000	C039	C041	.	.	.
30000375	CAP EL 220UF 16V M	1,000	C323	.	.	.	.
30000384	CAP EL 2.2UF 50V M	4,000	C328	C332	C412	C403	.

30000385	CAP EL 2.2UF 250V M	1,000	C214	.	.	.	.
30000392	CAP EL 0.33UF 50V M	4,000	C101	C040	C042	C043	.
30000393	CAP EL 3.3UF 50V M	1,000	C100	.	.	.	.
.	.	1,000	C530	.	.	.	.
30000395	CAP EL 47UF 6.3V M (4*7MM)	1,000	C100	.	.	.	.
30000400	CAP EL 47UF 50V M	2,000	C320	C440	.	.	.
.	.	2,000	C386	C383	.	.	.
30000406	CAP EL 47UF 250V M (HR)	1,000	C923	.	.	.	.
30000407	CAP EL 470UF 16V M	4,000	C501	C505	C551	C552	.
.	.	1,000	C570	.	.	.	.
30000409	CAP EL 470UF 25V M	3,000	C133	C804	C806	.	.
30000413	CAP EL 4.7UF 50V M	2,000	C220	C307	.	.	.
.	.	1,000	C393	.	.	.	.
30000415	CAP EL 4.7UF 250V M	1,000	C216	.	.	.	.
.	.	1,000	C208	.	.	.	.
.	.	1,000	C915	.	.	.	.
30000426	CAP EL 6.8UF 50V M (BPL)	1,000	.	.	.	.	.
.	.	1,000	.	.	.	.	.

30000428	SPARK GAP 300V	6,000	SP901	SP903	SP904	SP905	SP906
.	.	.	SP907	.	.	.	.
30000431	CAP CER 100PF 1KV M	1,000	C222	.	.	.	.
30000433	CAP CER 1NF 1KV M B	1,000	C938	.	.	.	.
30000447	CAP CER 4.7NF 4KV M E	1,000	C122	.	.	.	.
30000452	RES CF 1/4W 10R J	1,000	R105	.	.	.	.
30000459	RES CF 1/4W 100R J	2,000	R140	R323	.	.	.
.	.	2,000	R391	R392	.	.	.
30000466	RES CF 1/4W 1K J	1,000	R929	.	.	.	.
.	.	3,000	R490	R245	R230	.	.
30000471	RES CF 1/4W 10K J	2,000	R101	R102	.	.	.
.	.	1,000	R141	.	.	.	.
.	.	1,000	R932	.	.	.	.
30000477	RES CF 1/4W 100K J	3,000	R922	R923	R924	.	.
.	.	2,000	R250	R251	.	.	.
30000531	RES CF 1/4W 15K J	1,000	R806	.	.	.	.
30000535	RES CF 1/2W 150K J	1,000	R920	.	.	.	.
30000536	RES CF 1/4W 150K J	1,000	R128	.	.	.	.
30000564	RES CF 1/4W 18K J	1,000	R810	.	.	.	.

30000583	RES CF 1/4W 220R J	1,000	R210	.	.	.	.
30000590	RES CF 1/4W 2.2K J	1,000	R220	.	.	.	.
30000594	RES CF 1/4W 22K J	1,000	R322	.	.	.	.
30000628	RES CF 1/4W 2.7K J	2,000	R341	R803	.	.	.
30000650	RES CF 1/4W 33R J	2,000	R111	R112	.	.	.
30000665	RES CF 1/4W 33K J	1,000	R330	.	.	.	.
30000689	RES CF 1/4W 3.9K J	1,000	R227	.	.	.	.
30000718	RES CF 1/4W 4.7K J	1,000	R802	.	.	.	.
.	.	8,000	R310	R325	R326	R329	R358
.	.	.	R236	R801	R480	.	.
30000723	RES CF 1/4W 47K J	4,000	R307	R305	R306	R334	.
30000729	RES CF 1/4W 470K J	1,000	R238	.	.	.	.
30000734	RES CF 1/4W 4.7R J	4,000	R812	R808	R819	R820	.
30000784	RES CF 1/4W 680K J	1,000	R242	.	.	.	.
30000788	RES CF 1/4W 6.8M J	1,000	R918	.	.	.	.
30000808	RES CF 1/4W 82R J	2,000	R103	R105	.	.	.
30000855	RES MF 1/4W 1M F	1,000	R103	.	.	.	.
30000885	RES MF 1/4W 1.5K J	2,000	R960	R963	.	.	.
30000927	RES MF 1/4W 220K J	1,000	R125	.	.	.	.

30000969	RES MF 1/4W 390R J	1,000	R964	.	.	.	.
30001004	RES MF 1/2W 0.56R J	1,000	R205	.	.	.	.
30001013	RES MF 1/4W 68K F	2,000	R961	R962	.	.	.
30001041	RES ADJ 0.15W 1K M VER	1,000	VR127	.	.	.	.
30001077	RES MO 2W 10R J	1,000	R264	.	.	.	.
30001079	RES MO 1W 100R J	1,000	R206	.	.	.	.
30001125	RES MO 2W 2.2K J	1,000	R916	.	.	.	.
30001134	RES MO 2W 2.2R J	1,000	R255	.	.	.	.
30001162	RES MO 1W 390R J	1,000	R226	.	.	.	.
.	.	1,000	R256	.	.	.	.
30001170	RES MO 1W 4.7K J	1,000	R917	.	.	.	.
30001171	RES MO 2W 4.7K J	1,000	R225	.	.	.	.
.	.	1,000	R116	.	.	.	.
30001192	RES MO 1W 680R J	3,000	R905	R910	R915	.	.
30001207	RES FUSE 1/4W 10R J	1,000	R535	.	.	.	.
30001211	RES FUSE 1W 1K J	1,000	R944	.	.	.	.
30001213	RES FUSE 1/4W 1R J	1,000	R262	.	.	.	.
30001220	RES FUSE 1W 1.5R J	1,000	R239	.	.	.	.

30001229	RES FUSE 1W 2.2R J	1,000	R231	.	.	.	.
30001231	RES FUSE 1/4W 27R J	1,000	R613	.	.	.	.
30001244	RES FUSE 1/2W 0.47R J	2,000	R237	R233	.	.	.
30001247	RES FUSE 1/2W 4.7R J	1,000	R927	.	.	.	.
30001257	RES MG 1/2W 4.7M J	1,000	R117	.	.	.	.
30001270	PTC 9 OHM	1,000	R109	.	.	.	.
30001279	LED RED/GREEN LTL293SJ	1,000	LD101	.	.	.	.
30001284	DIODE 1N4148	3,000	D001	D002	D003	.	.
.	.	1,000	D907	.	.	.	.
.	.	1,000	D502	.	.	.	.
.	.	2,000	D951	D952	.	.	.
.	.	3,000	D101	D119	D220	.	.
30001291	DIODE HER107	8,000	D120	D201	D208	D209	D212
.	.	.	D213	D218	D219	.	.
30001299	DIODE UF5404	3,000	D111	D210	D211	.	.
30001301	DIODE BYM26D	1,000	.	.	.	.	.
30001302	DIODE BYW29-200	3,000	D112	D113	D114	.	.
30001318	DIODE BA159	1,000	D902	.	.	.	.
.	.	2,000	D121	D122	.	.	.

30001349	DIODE ZENER 11V	1,000	D503	.	.	.	.
30001369	DIODE ZENER 3.6V ZPD	1,000	D501	.	.	.	.
30001427	TR BF422	1,000	Q901	.	.	.	.
30001452	TR BC327	1,000	Q102	.	.	.	.
30001454	TR BC548B	11,000	Q001	Q002	Q004	Q005	Q007
.	.	.	Q008	Q010	Q011	Q013	Q014
.	.	.	Q015	.	.	.	.
30001455	TR BC558B	1,000	Q902	.	.	.	.
.	.	4,000	Q003	Q006	Q009	Q012	.
30001468	IC 24LC32	1,000	.	.	.	.	.
30001472	IC HYB514400	1,000	IC382	.	.	.	.
30001495	IC TDA4472	1,000	IC401	.	.	.	.
30001500	IC LM7808	1,000	IC105	.	.	.	.
30001506	IC TL431	1,000	IC103	.	.	.	.
30001518	IC TDA1308	1,000	IC503	.	.	.	.
30001551	IC TDA6111Q	1,000	.	.	.	.	.
30001613	IC SDA30C264	1,000	IC301	.	.	.	.
30001619	IC TEA6415C	1,000	IC502	.	.	.	.
30001670	PREAMPLIFIER TFMS5360	1,000	MD101	.	.	.	.

30001692	FILTER SAW OFWK3953M	1,000	Z403	.	.	.	.
30001706	FILTER SAW OFWK9453	1,000	Z401	.	.	.	.
30001724	FILTER SER TRAP TPS 5.5MHZ	1,000	T401	.	.	.	.
30001732	FUSE 3.15A 250V 5*20	1,000	.	.	.	.	.
30001737	XTAL 12MHZ	1,000	X301	.	.	.	.
30001756	XTAL 18.432MHZ	1,000	X501	.	.	.	.
30001757	XTAL REZ 20.48MHZ	1,000	X381	.	.	.	.
30001762	CONN.MALE 2P (2052) GRAY	1,000	PL802	.	.	.	.
30001764	CONN.MALE (2052) BLACK	1,000	PL804	.	.	.	.
30001770	CONN.MALE 3P (2003) GRAY	1,000	PL301	.	.	.	.
30001783	CONN.MALE 5P (2005)	1,000	PL304	.	.	.	.
30001785	CONN.MALE 7P (2007)	1,000	PL302	.	.	.	.
30001792	CONN.MALE 2P MOLEX	1,000	PL101	.	.	.	.
30001795	CONN.MALE 3P (DEG)	1,000	PL102	.	.	.	.
30001800	CONN FEMALE 8P MOLEX (UF)	1,000	PL951	.	.	.	.
30001801	CONN.MALE 8P MOLEX (UF)	1,000	PL903	.	.	.	.
30001810	CONN.MALE 14P MOLEX	1,000	PL414	.	.	.	.
30001811	CONN.FEMALE 14P MOLEX	1,000	PL504	.	.	.	.

30001812	CONN MALE BB 15P MOLEX	4,000	PL330	PL331	PL332	PL41 5	.
30001813	CONN FEMALE BB 15P MOLEX	1,000	PL503	.	.	.	.
.	.	3,000	PL001	PL002	PL003	.	.
30001827	HRZ VRT CONN.(4P)	1,000	PL201	.	.	.	.
30001828	CONN.MALE 5P EKINLER	1,000	PL202	.	.	.	.
30001833	CONN MALE 2P SIDE BLUE	1,000	PL120	.	.	.	.
.	.	1,000	PL507	.	.	.	.
30001838	CONN MALE 3P TOP YELLOW	1,000	PL105	.	.	.	.
30001842	CONN MALE 3P SIDE BLUE	1,000	PL952	.	.	.	.
.	.	1,000	PL508	.	.	.	.
30001843	CONN MALE 3P SIDE YELLOW	1,000	PL505	.	.	.	.
30001844	CONN MALE 3P SIDE GREEN	1,000	PL120	.	.	.	.
.	.	1,000	PL502	.	.	.	.
30001853	SOCKET IC 32P	1,000	IC304	.	.	.	.
30001855	SOCKET CRT NARROWNECK W/GND	1,000	PL904	.	.	.	.
30001866	SOCKET SCART (R) VER BLACK	1,000	PL501	.	.	.	.
30001867	SOCKET SCART (R) VER BLUE	1,000	PL506	.	.	.	.
30001880	JACK RCA 3P (BACK AV) 180°	1,000	JK501	.	.	.	.

30001882	RCA JACK 1P WHITE	1,000	PL120	.	.	.	.
30001883	RCA JACK 1P RED	1,000	PL120	.	.	.	.
30001884	RCA JACK 1P YELLOW	1,000	PL120	.	.	.	.
30001895	JACK 4P DIN TYPE FOR SVHS	1,000	CON10	.	.	.	.
30001899	JACK EXT.SPK.HSP-102V-02	1,000	PL803	.	.	.	.
30001902	JACK HEADPHONE STEREO WO/SW	1,000	CON10	.	.	.	.
30001946	SPEAKER 8R 15W 57*160	1,000	.	.	.	.	.
.	.	1,000	.	.	.	.	.
30001947	TWEETER 8R 15W CLOSED	1,000	.	.	.	.	.
.	.	1,000	.	.	.	.	.
30001960	FERIT BAR 6*20MM AK16	4,000	L107	L108	L109	L106	.
30001962	FERRITE AK18 VIDEO	9,000	Z1	Z10	Z14	Z18	Z24
.	.	.	Z25	Z26	Z37	Z38	.
30001964	FERRITE BAR 5*8	1,000	.	.	.	.	.
30001968	FERRITE BEAD (0805) BLM21B201S	1,000	L111	.	.	.	.
30001971	FERRITE BEAT (805) BLM21A601S	1,000	L425	.	.	.	.
.	.	4,000	L526	L527	L528	L529	.
30001979	FIXED COIL 1UH Q45 M-A	2,000	L403	L405	.	.	.
.	.	1,000	L102	.	.	.	.

30001986	FIXED COIL 3.3UH Q65 K	3,000	L004	L005	L007	.	.
.	.	3,000	L008	L009	L010	.	.
.	.	1,000	L401	.	.	.	.
30001992	FIXED COIL 10UH Q65 K-A	1,000	L950	.	.	.	.
.	.	3,000	L001	L002	L003	.	.
.	.	2,000	L381	L382	.	.	.
.	.	3,000	L304	L302	L421	.	.
30001996	FIXED COIL 22UH Q40 K	1,000	L006	.	.	.	.
.	.	2,000	L518	L519	.	.	.
.	.	17,000	L501	L502	L503	L504	L505
.	.	.	L506	L507	L508	L509	L510
.	.	.	L511	L512	L513	L514	L515
.	.	.	L516	L517	.	.	.
.	.	3,000	L301	L303	L420	.	.
30001997	FIXED COIL 33UH Q60 J	1,000	L904	.	.	.	.
30002037	ADJ COIL VIF 38.9 Q80	1,000	VL401	.	.	.	.
30002174	SWITCH ON/OFF 4A/64A	1,000	.	.	.	.	.
30002181	SWITCH TACT	5,000	S101	S102	S103	S104	S105
30002183	RELAY MON15 KI-S-212M	1,000	RL2	.	.	.	.
30002238	CABLE 2/20 R2.6 WO/SOCKET AK16	1,000	.	.	.	.	.

.	.	1,000	.	.	.	.	.
30002287	CONN.ASSY.7/42 (FL) KEYBOARD	1,000	.	.	.	.	.
30002309	CONN.ASSY 5P 50CM FLAM.AK18	1,000	PL902	.	.	.	.
30002335	CONN.ASSY.3/60 FC (PRE-AMP)	1,000	.	.	.	.	.
30002349	CONN ASSY.2/90 R2/6 SPK. W/GRAY CONN.	1,000	.	.	.	.	.
30002368	CABLE AC 2P 65CM W/MLX CONN.	1,000	.	.	.	.	.
30002733	LED INFRARED IR333	1,000	D100	.	.	.	.
30002734	TR BC548C	1,000	Q101	.	.	.	.
30002735	IC SAA3010T	1,000	.	.	.	.	.
30002828	RES FUSE 1W 0.75R J	1,000	R257	.	.	.	.
30003768	TR BD139	1,000	Q955	.	.	.	.
30006712	FERRITE BEAD 3.5X4.7X0.8	2,000	L101	L206	.	.	.
30006744	LINE FILTER 16MH 15AK17-17"	1,000	L104	.	.	.	.
.	.	1,000	L103	.	.	.	.
30006909	CAP EL 100UF M 250V	1,000	C131	.	.	.	.
30007081	CAP EL 4.7UF 50V M (NPL)	1,000	C160	.	.	.	.
30007204	RES MF 1/2W 1.5M F	1,000	R149	.	.	.	.
30007248	CONN.FEMALE 4P MLX 4CONTACT	1,000	.	.	.	.	.

30007299	CONN.ASSY.4/60 R2.6 HRZ&VRT 33 IMPROVED	1,000	.	.	.	.	.
30007308	CAP CER 220PF 1KV K (PULSE)	1,000	CXX6	.	.	.	.
.	.	2,000	C161	C162	.	.	.
30007442	IC TDA16846 (4646)	1,000	IC101	.	.	.	.
30007443	IC SFH617	1,000	IC102	.	.	.	.
30007444	IC L4931CV50	1,000	IC104	.	.	.	.
30007668	IC SDA9400	1,000	IC003	.	.	.	.
30007678	DIODE GUC DTV32F1500A	1,000	D206	.	.	.	.
30007708	CAP CER 1NF 1KV K (PULSE)	1,000	C130	.	.	.	.
30007739	IC LM317T D2PAK	1,000	IC004	.	.	.	.
30007745	CONN MALE 10P SIDE WHITE	1,000	PL004	.	.	.	.
30007748	CAP EL 1000UF 35V M	2,000	C135	C136	.	.	.
30007750	CAP EL 470UF 35V (H/R 1150MA)	2,000	C132	C134	.	.	.
30007753	CAP MKP 1NF 1KV	1,000	C120	.	.	.	.
30007754	CAP MKP 1UF 400V	1,000	C119	.	.	.	.
30007755	CAP MKT 680NF 275V M AC X2	1,000	C118	.	.	.	.
30007756	COIL BRIDGE 150UH 32KHZ AK28	1,000	L205	.	.	.	.
30007757	COIL INJECTION EW 6MH AK28	1,000	L202	.	.	.	.

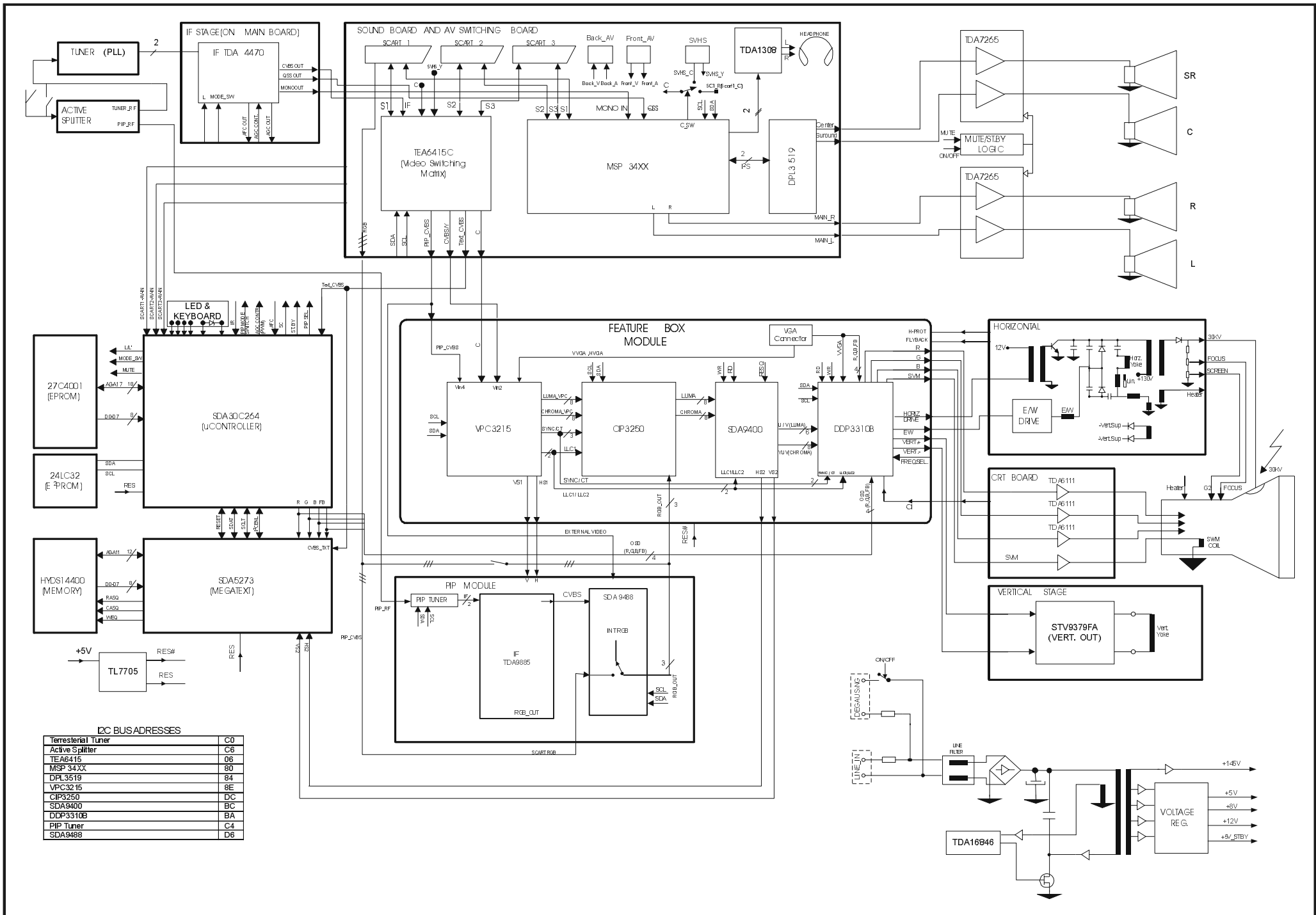
30007758	DIODE BRIDGE GBU4M	1,000	D106	.	.	.	.
30007768	DIODE STTA506F	1,000	D207	.	.	.	.
.	.	3,000	D103	D104	D105	.	.
30007770	FILTER COIL 1MH AK28	1,000	L203	.	.	.	.
30007771	FIXED COIL 100UH	1,000	L201	.	.	.	.
30007774	NTC 5 OHM	1,000	R110	.	.	.	.
30007775	COIL PFC 1MH 1KHZ 2A	1,000	L102	.	.	.	.
30007782	RES MF 1/4W 3.9M F	1,000	R102	.	.	.	.
30007783	RES FUSE 1/4W 2.2R J	1,000	R150	.	.	.	.
30007793	IC STV9379FA	1,000	IC201	.	.	.	.
30007794	IC TDA7265	1,000	IC802	.	.	.	.
30007795	IC TL7705	1,000	IC303	.	.	.	.
30007797	TR 2SC5331	1,000	Q202	.	.	.	.
30007799	TR BDX53BFI	1,000	Q205	.	.	.	.
30007800	TR BF799	1,000	Q408	.	.	.	.
30007801	TR SPP20N60S5	1,000	Q101	.	.	.	.
30007802	TR STP20N06LFP	1,000	Q201	.	.	.	.
.	.	2,000	Q103	Q106	.	.	.

30007803	TRF FBT AK28 ELDOR	1,000	TR202	.	.	.	.
30007804	TRF. HORIZONTAL DRIVER AK28	1,000	TR201	.	.	.	.
30007805	TRF SMPS AK28 W/PFC	1,000	TR101	.	.	.	.
30007858	CAP MKT 470NF 275V M AC (P=22.5MM)	1,000	C115	.	.	.	.
30008778	XTAL 20.25MHZ	1,000	X001	.	.	.	.
30008782	XTAL 5MHZ	1,000	X002	.	.	.	.
30009036	RES FUSE 1/2W 0.1R J	1,000	R118	.	.	.	.
.	.	1,000	R234	.	.	.	.
.	.	1,000	R119	.	.	.	.
30009037	FUSE 6.3A 250V 5mm	2,000	F102	F103	.	.	.
30009208	CAP CER 470PF 1KV K (PULSE)	2,000	C110	C163	.	.	.
30009353	IC SDA5275-3	1,000	IC380	.	.	.	.
30009354	IC MSP3411 SDIP64	1,000	IC501	.	.	.	.
30009698	IC 27C4001	1,000	IC304	.	.	.	.
30009832	CABLE 0.6MM BLUE (13CM)	1,000	CAB00	.	.	.	.
30010348	IC CIP325OA	1,000	IC002	.	.	.	.
30010349	IC DDP3310	1,000	IC005	.	.	.	.
30010350	IC VPC3211	1,000	IC001	.	.	.	.

30011443	XTAL REZ 429KHZ (0.9MM)	1,000	X100	.	.	.	.
30011835	TUNER WSP (PLL) 38.9 THOMSON	1,000	TU401	.	.	.	.
30012271	LINEARTY COIL 4.3UH VOGT	1,000	L204	.	.	.	.
30012323	CAP MKT 1NF 100V J WIMA FK12	1,000	C104	.	.	.	.
30012619	CONN ASSY 10/50 SHL.D.C. WHT	1,000	PL004	.	.	.	.
30012894	CONN MALE 10P TOP WHITE	1,000	PL901	.	.	.	.
30013413	FERRITE BEAD ACB2012H-300	2,000	L524	L525	.	.	.
30013531	TR BD140	1,000	.	.	.	.	.
30013611	FERRITE BEAD (0805) MMZ2012R102A	1,000	L530	.	.	.	.
30013690	CAP EL 220UF 450V M 105°C	1,000	C121	.	.	.	.
30014023	RES FUSE 1/2W 0.1R J VISHAY	2,000	R148	R151	.	.	.
30014059	POWER CORD 2.2MT W/FILTER AUST.TYPE	1,000	.	.	.	.	.
30014060	CONN ASSY FRONT AV+SVHS W/FERRITE	1,000	.	.	.	.	.
30014528	CONN ASSY.2/100 R2/6 SPK. W/BL CONN.	1,000	.	.	.	.	.
30014568	TERMINAL SSC 2000T	4,000	.	.	.	.	.
30014862	32" 16:9 DEG COIL&EARTH CB. WO/UL SFLAT	1,000	.	.	.	.	.
30015851	32"SF CPT TEAC 100HZ.TÜP WW	1,000	.	.	.	.	.
30016862	CONN ASSY 3P/70CM FLAT	1,000	.	.	.	.	.

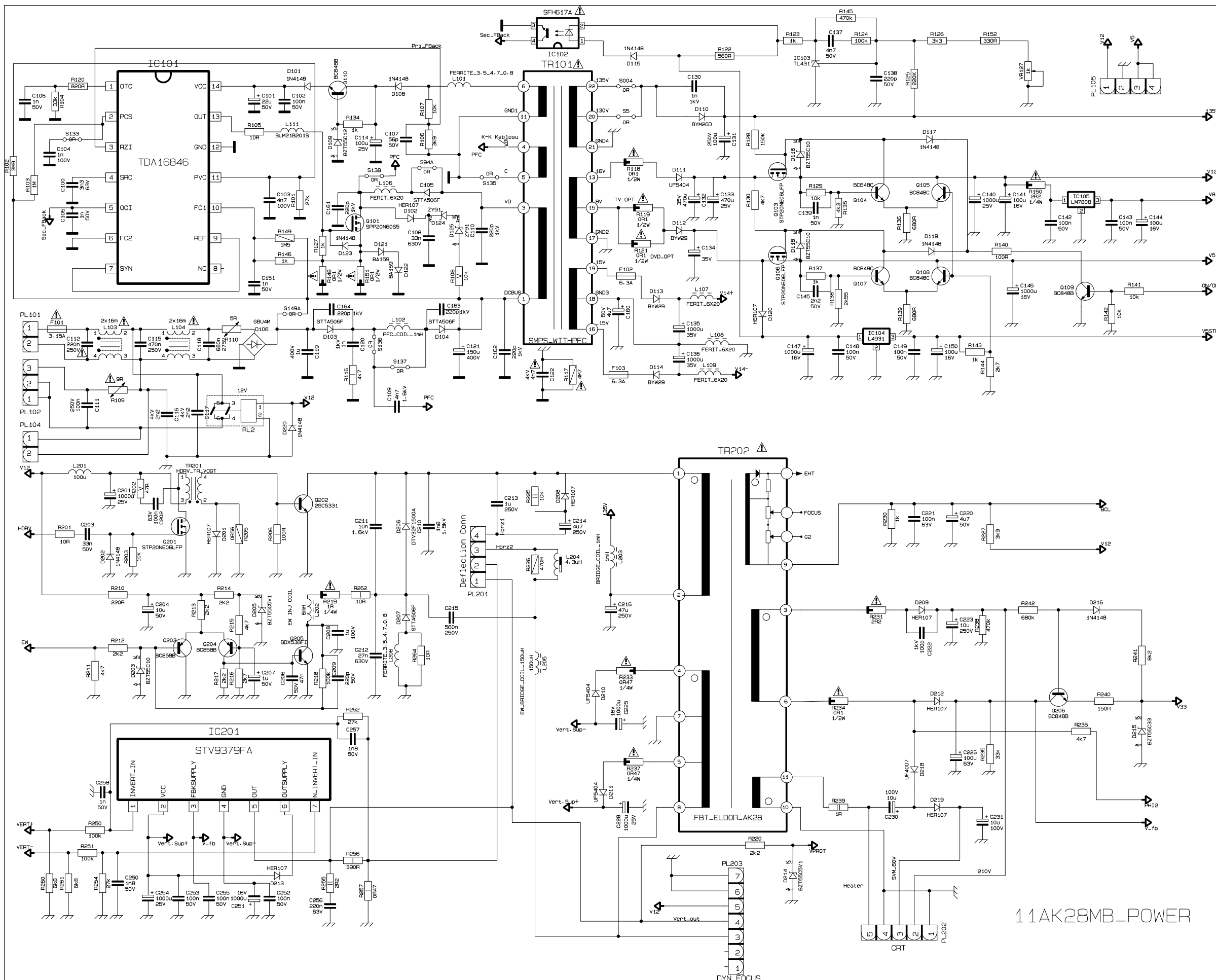
30016866	CONN ASSY 3/15 FLAT D.C.	1,000	.	.	.	.	.
30017132	RES MF 1W 51K F	3,000	.	.	.	.	.
40000020	TR HOLDER TR-06A	1,000	.	.	.	.	.
.	.	1,000	.	.	.	.	.
40000082	FOOT RUBBER 8410/11	4,000	.	.	.	.	.
40000107	ADJUSTABLE BOOS 84XX	4,000	.	.	.	.	.
40000127	SWITCH INSULATION DOOR LK101	1,000	.	.	.	.	.
40000270	RUBBER PAD TRP24 (RC2100)	1,000	.	.	.	.	.
40001898	MACARON (12cm.Isý ile daralan)	1,000	.	.	.	.	.
40001900	INSULATOR SILICON PAD (30x40)	1,000	.	.	.	.	.
40001939	LOGO TEAC (BIG)(GRAY W/P)	1,000	.	.	.	.	.
40005299	BATTERY COVER RC2040 SILVER(P)	1,000	.	.	.	.	.
40005300	BOTTOM COVER RC2040 SILVER (P)	1,000	.	.	.	.	.
40005467	LENS RC2040(I)	1,000	.	.	.	.	.
40006147	TOP COVER RC2100 NB (S) (SILVER/P)	1,000	.	.	.	.	.
40006431	SPACER SUPPORT (SCC-10A)	1,000	.	.	.	.	.
.	.	1,000	.	.	.	.	.
40006432	MOUNTING BUTTON (MB-10)	1,000	.	.	.	.	.

.	.	2,000	.	.	.	.	.
40006901	SPACER SUPPORT (TCBS-29)	1,000	.	.	.	.	.
40006903	HOLD PLUG COVER (BH-10)	1,000	.	.	.	.	.
40007645	BRACKET RUBBER FOOT L121003	1,000	.	.	.	.	.
40008183	SPACER SUPPORT (SCC-10C)	1,000	.	.	.	.	.
50006325	CARTON SEPERATOR 665x980x6.5 (8270/71)	2,000	.	.	.	.	.
50006805	CARTON BOX 16:9 8270/71 CR&W/TV HAM EMPT	1,000	.	.	.	.	.
50011720	LABEL HIGH END	1,000	.	.	.	.	.
.	.	1,000	.	.	.	.	.
50016128	LBL.SERVICE TEAC (3) (AUST)	1,000	.	.	.	.	.
50016146	WARRANTY CARD TEAC (ENG) (2)	1,000	.	.	.	.	.
50020574	I/B TEAC CTW3270S P/5275/2100/ENG	1,000	.	.	.	.	.
50020575	CARTON BOX TEAC CTW 3270S (AK28)	1,000	.	.	.	.	.
50020576	LBL.SCREEN TEAC CTW 3270S	1,000	.	.	.	.	.
50021011	LBL SCR.100HZ-VIRTUAL DOL.SURR. (TEAC)	1,000	.	.	.	.	.
60000927	CRYSTAL PS (NATURAL)	1,000	.	.	.	.	.



I2C BUS ADDRESSES

Terrestrial Tuner	C0
Active Splitter	C6
TEA6415	08
MSP 34XX	80
DPL3519	84
VPC3215	8E
CIP3250	DC
SDA9400	BC
DDP3310B	BA
PIP Tuner	C4
SDA9488	D6

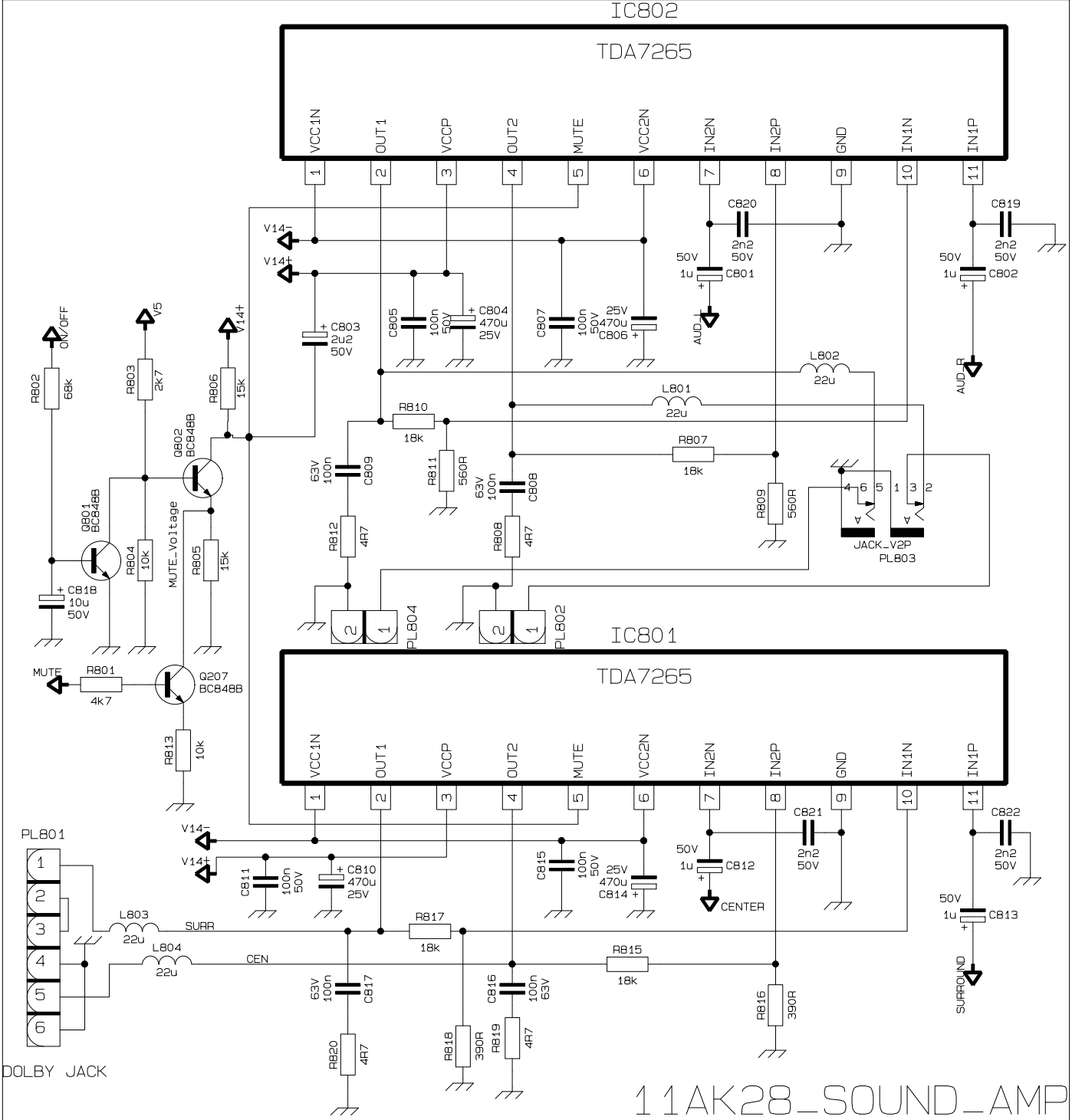


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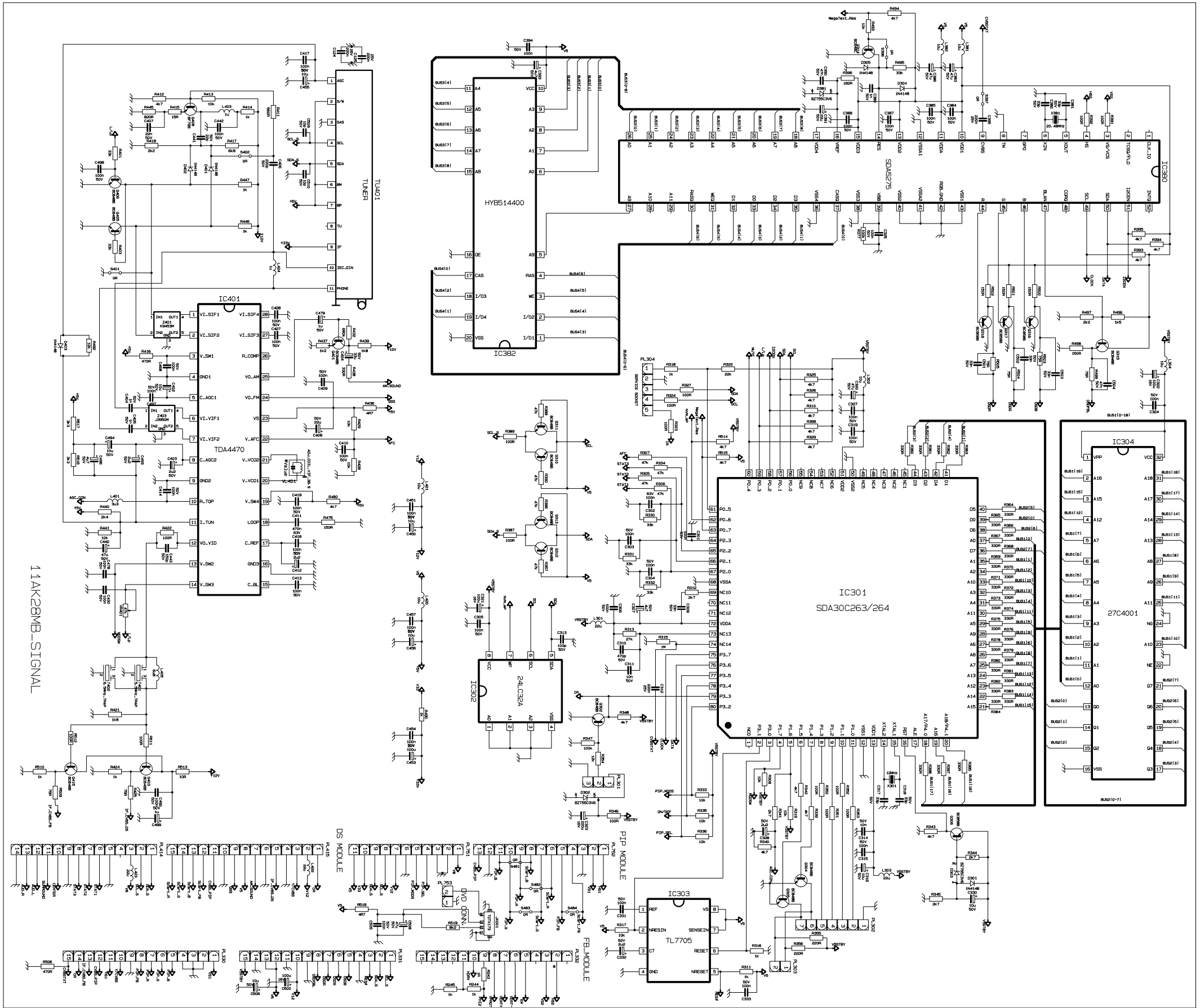
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11AK28_SOUND_AMP



11AK28MB-SIGNAL