

SERVICE MANUAL FOR M35&36 CHASSIS

PART I. Servicing Precautions

When working, the unit is with ultra high voltage about 25KV inside. So, to avoid the risk of electric shock, be careful to adjust the chassis!

1. Only qualified personnel should perform service procedures.
2. All specification must be met over line voltage ranger of 160V AC to 240V AC 50Hz/60Hz.
3. Do not operate in WET/DAMP conditions.
4. Portions of the power supply board are hot ground. The remaining boards are cold ground.
5. Discharge of CRT anode should be done only to CRT ground strap.
6. When fuse blow, ensure to replace a fuse with the same type and specification.
7. Keep the wires away from the components with high temperature or high voltage.
8. When replacing the resister with high power, keep it over the PCB about 10mm.
9. The CRT anode high voltage has been adjusted and set in the factory. When repairing the chassis, do not make the high voltage exceed 27.5KV (The beam current is 0uA). Generally, the high voltage is set on $25.5KV \pm 1.5KV$ (The beam current is 700uA).
* The values of parameters above are for information only.
10. Before return the fixed unit, do check all the covering of wires to ensure that not fold or not short with any metal components. Check the entire protection units, such as control knobs, rear cabinet & front panel, insulation resister & capacitor, mechanical insulators and so on.
11. There are some mechanical and electrical parts associating with safety (EMC) features (Generally related to high voltage or high temperature or electric shock), these features cannot be found out from the outside. When replace these components, perhaps the voltage and power suit the requirements, but efficient X-ray protection may not be provided. All these components are marked with Δ in the schematic diagram. When replace these, you'd better look up the components listed in this manual. If the component you replaced not has the same safety (EMC) performance, harmful X-ray may be produced.

Part II -Product Specification

1. Ambient conditions:

1.1 Ambient temperatures:

a. Operating: $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$

b. Storage: $-15^{\circ}\text{C} \sim +45^{\circ}\text{C}$

1.2 Humidity

a. Operation: $< 80\%$

b. Storage: $< 90\%$

1.3 Air pressure: 86kpa $\sim$ 106kpa

2. Chassis Specification

2.1 MCU/Video/Teletext IC: VCT 3831A Super one chip IC

2.2 System

[M35:PAL-DK.1 M36:PAL-DK/BG]

SECAM DK/BG

Receiving channels CATV 470MHz

Scanning lines and frequencies 525/625 lines 15.625kHz/15.75kHz 50/60Hz

Color sub-carrier 4.433MHz/3.579MHz

2.3 IF:picture 38.9MHz sound 5.5MHz/6.0MHz/6.5MHz

2.4 Power Consumption:120W (M36) 70W (M35)

2.5 Power Supply: AC 220V 45-55Hz

2.6 Audio Output Power(7%THD): 29" $>6\text{W}+6\text{W}$ (M36) 21" $\geq 3\text{W}+3\text{W}$ (M35)

2.7 Aerial Input Impedance:75 Ω Unbalanced Din Jack Ant.Input

2.8 Product Safety Requirement: CE

2.9 Product EMC/EMI Requirement: CE

3. Basic Feature of Controller

3.1 Channel Tuning Method: Voltage Synthesizer

3.2 Presettable Program:100 Programs

3.3 Tuning for VHF and UHF Bands: Auto/Manual/Fine Tuning

3.4 Picture and Sound Adjustment

Bright, Contrast, Color and Volume Control;

Tint Control(NTSC);

[Treble, Bass, Balance Control (M36 have these, but M35 haven't)]
Sharpness Control

3.5 OSD

General Features(Volume, Brightness, Contrast, Color, Program, Band, Auto Search, Manual, Tune, Muting, AV And Sleep Timer)
Stereo Dual Language
Four Sound Effect Indicator

3.6 Sleep Timer:15MIN

3.7 Remote Effective Distance:8m

3.8 Construction of Front Panel

Main Power Switch
Remote Sensor
Menu Select
TV/AV Select
Standby Indicator
Program Volume UP/DOWN
RCA Socket (Side)

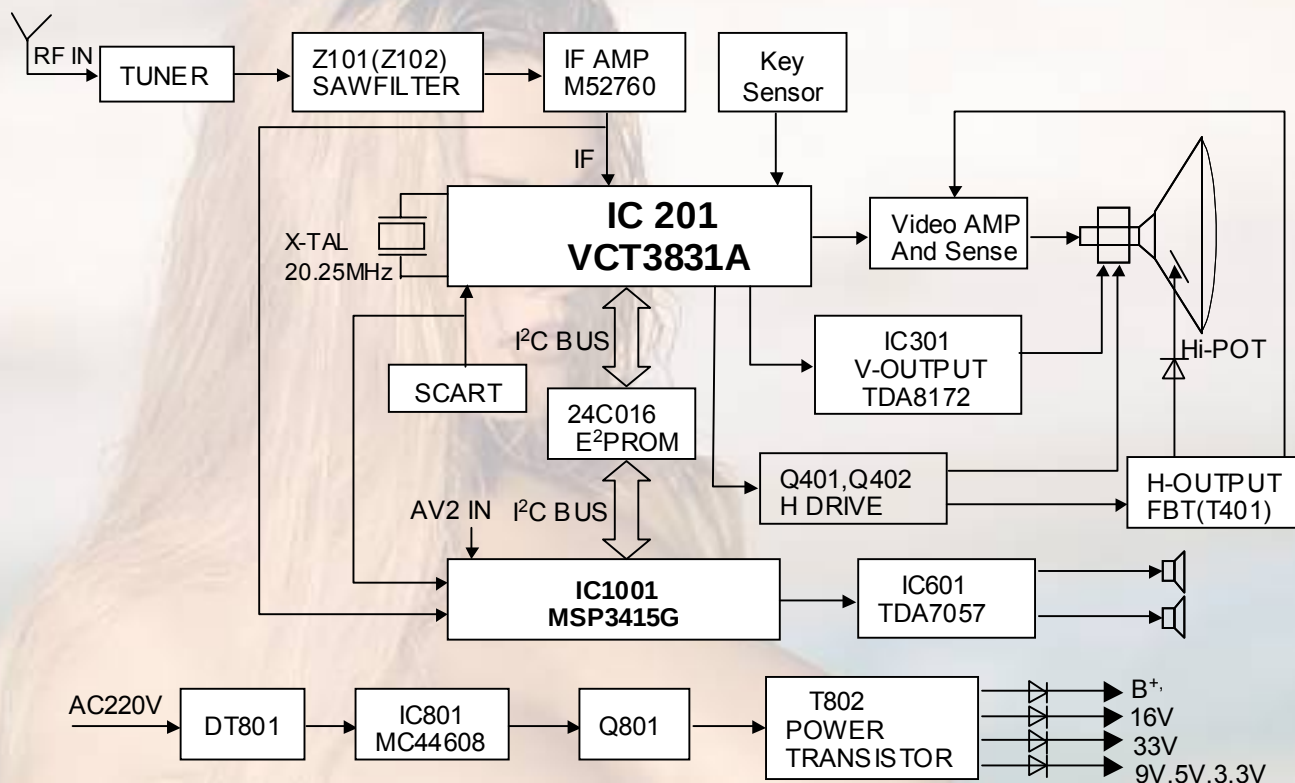
3.9 Construction of Rear Panel

75 Ω Aerial Terminal
RCA Socket (AV Input Only)
Scart Socket
S.VHS Input

Specification	Scart	RCA
Video input 75 Ω	1V _{p-p}	1V _{p-p}
Audio input 10k Ω (R+L)	0.5V _{rms}	0.5V _{rms}
Video output 75 Ω	1V _{p-p}	1V _{p-p}
Audio output 1k Ω (R+L)	0.5V _{rms}	0.5V _{rms}
RGB input 75 Ω	0.7V _{p-p}	
Audio line output 1k Ω	1V _{p-p}	

- Design and specifications are subject to change without prior notice for the purpose of performance improvement.
- This specification is only for your reference.

Part III-Brief Introduction On Chassis



M35 and M36 use a high-quality singlechip IC VCT3831A as TV processors . It is a combo IC with TV process unit and CPU inside. The follows are the operation theory with example of **M35**.

1. Tuning section

This section mainly consists of tuner and its accessory circuits. VCT3831A will control the band switching via Pin7 and Pin 10. (See table 1)

PIN 7	PIN 10	BAND
High level	Low level	VHF-L
Low level	High level	VHF-H
High level	High level	UHF

VCT3831A sends out a 5Vp-p VT signal with pulse-width modulation from Pin6. This signal is amplified with phase inversion by Q210, and changed to a 33Vp-p pulse signal with pulse-width modulation. R255, C242, R256, C101, R101 and

C102 compose a triple integral circuit, which is in charge of changing the 33Vp-p PWM signal to a DC tuning voltage which is variable from 0V to 33V. The tuner will select the corresponding channel according to the tuning voltage. If the sync signal and AFT signal cannot be inputted to the control section of VCT3831A, the auto tuning function will be invalidated. During the auto tuning process, the CVBS out from IC101, which is in charge of IF amplifying and demodulation, enter VCT3831A from Pin19. This CVBS will be treated by sync separation circuit inside VCT3831A and sends out a H-sync signal to the control unit of VCT3831A. If the H sync is detected by the control unit of VCT3831A, CPU will consider that a channel will be locked soon. So the tuning speed will slower automatically. On the other hand, an AFT signal out from Pin2 of IC101 enter VCT3831A from Pin9 of it. The control unit of VCT3831A will detect the accuracy of tuning according to the voltage of AFT signal.

By this way, tuning with high accuracy can be achieved. And the corresponding tuning data will be stored in memory IC. Then the auto tuning process will go on and auto stop at the end (VHF-L → VHF-H → UHF) .

2. VIF section

The tuner sends out IF signal from Pin IF. This signal is amplified about 20db by Q101. Having passed the

SAWZ101 and Z101A, the IF signal is inputted into IC101 from Pin4-5 (VIF input) and Pin7 (SIF input). The VIF signal pass the video amplifier and video detector and is changed to CVBS. And IC101 sends out CVBS from Pin18 of itself. Having passed Q104 and Q105 and the trapper network consisted by L102, Z104 and Z105, CVBS is divide into two way. One enter IC201 from Pin19. And another pass Q903 and arrive the video output terminal of TV.

IC101 sends out QIF signal from Pin13 of itself. QIF signal enters the sound process circuit which is mainly consisted by IC1001. A 38.9MHz VCO coil is connected with Pin 15 and 16 of IC101. By adjusting the magnetic core of T101, the AFT curve can match the standard. IF AGC delay signal comes out from Pin1 of IC101, and goes to tuner for high frequency signal amplifying with auto-gain control.

3. Sound process section

M35/36 chassis adopts MSP3415G made by Micronas also as sound process IC. This IC can process the stereo signal and NICAM signal.

The QIF signal pass a high pass filter network consisted by C1024, C1024A and L1102, and enter IC1001 from Pin47. This QIF signal is changed to sound signal via amplitude-limit amplifier and frequency discrimination circuit and sound deemphasis circuit inside the sound process IC. On the other hand, the two way audio signals from audio input terminal enter IC1001 from Pin42/44 and Pin39/40, they and the TV sound signal will be switched by IC1001. IC1001 selects one way sound signal from these three ways and divide it into two ways: One way is from Pin 24/25 to the audio amplifier circuit which is mainly consisted by TDA7057AQ and to drive the speakers. Another way is from Pin30/31 to audio out terminal of TV. VCT3831A sends out the volume control signal via Pin64 to control the speakers volume.

4. Video signal process section

The video signal from sound IF filter circuit enter IC201 via Pin19, and pass a video amplifier inside of IC. Then the video signal is splitted into two ways, one way to the sync-separation circuit, another one to the clamp circuit, black strength circuit, luminance delay line, sharpness improvement circuit. Then this signal is done with matrix operation with the C signal, which is from the chroma process unit, in the matrix circuit. The finally result is IC201 output R/G/B signal to CRT board from Pin42/43/44 and to drive the CRT. Another video signal which come from video input terminal of TV, is switched by electrical switch inside IC201 and out from pin11 of IC201 as the video output signal to video output terminal.

5. Chroma process section

The chroma signal is separated from the video signal, which is from pin19 or pin20 or 21 (video input or TV video signal), after having passed a band/ high pass filter. Then the chroma signal is amplified by ACC circuit and splitted into two ways. One way goes to the demodulation unit and another way goes to the APC circuit to make the chroma subcarrier oscillator to generate reference subcarrier signal which is needed for sync demodulation, and to sent it to the demodulation unit. The R-Y and B-Y signal demodulated from chroma signal are sent to color system recognition circuit. Having passed the system recognition switch circuit, it goes to 1H delay line and other control circuit. Finally it goes to matrix circuit. The Y signal from luminance process unit will be done with matrix operation with R-Y and B-Y signal via matrix circuit. If the color system is NTSC, the TINT circuit is enabled. This TINT circuit is a phase shift circuit. It can change the phase of the reference subcarrier which is sent to APC circuit and to shift the APC output voltage, therefore , to change the oscillator frequency (phase) of chroma VCO. So the chroma will be changeable.

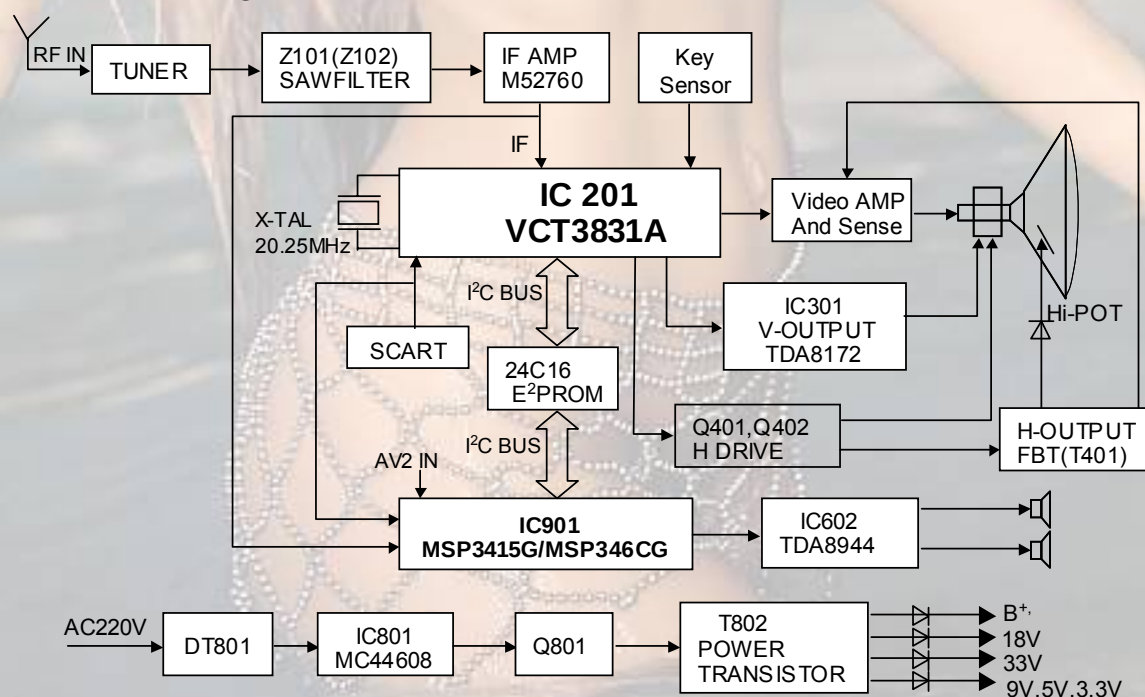
6. Vertical output section

IC VCT3831A outputs vertical saw-tooth waveform from Pin33. It comes to pin1 of TDA8172 with DC coupling. And it is amplified by inner difference amplifier. Pin7 of TDA8172 is the same phase input terminal. R302 is DC offset resistances. In application to M35, pin7 of TDA8172 is connected with Pin34 vert0. The amplified saw tooth-wave comes out from pin5 and make the deflect coil to generate the deflect current. R307 and C305 filtrate the inductive interference from the horizontal deflect coil. C307 is used to eliminate spurious oscillation generated by the deflect coil and distributed capacitance resonance. R312, R320 and accessory circuit are in charge of draw AC saw tooth wave out, and feedback to the input terminal of TDA8172 (pin1) to correct the linearity of horizontal scan. D302 and C301 make up of a voltage pump up circuit. TDA8172 output a vertical kickback impulse from pin6 to locate the OSD characters.

7. Horizontal Output And FBT Section

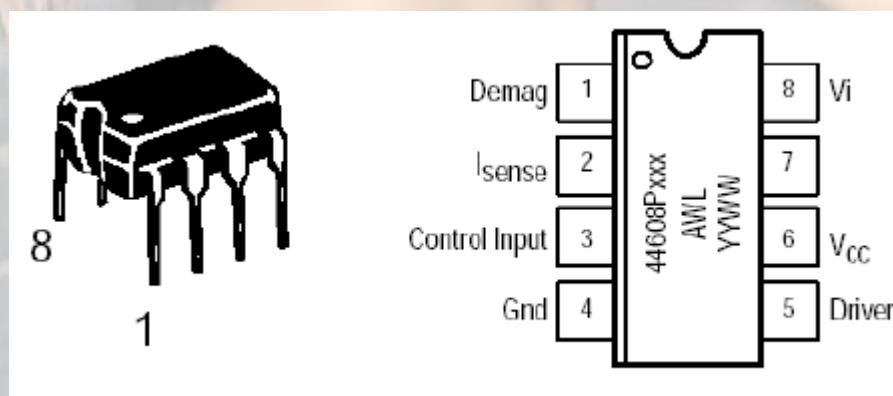
The processor outputs horizontal drive impulse from pin24 H-OUT. The drive impulse is done with voltage division by R268 and D401, and then comes to the base of the drive triode (Q401). C401 is used to eliminate the noise in the H drive impulse. T402 is a horizontal drive transformer. Q402 is a horizontal output triode with a damper inside. The deflect coil and the horizontal output triode have some resistance R while they are ducting. The resistance R will cause the non-linear distortion, which means that the right direction scanning speed of the electron beam becomes slower, and the right of the raster is compressed to generate distortion. We use a horizontal linear adjuster to compensate this kind of distortion. We use L402 as the H linear adjuster in horizontal scanning section of M35 chassis. R409, which is parallel connected with L402 and L401, is a despiking resistance for preventing the oscillation by compensating inductor and the stray capacitance. The linear adjuster is a transducer coil with a magnetic core inside. If the current, which pass the linear adjuster coil, increase to a certain value, the magnetic core becomes saturated to decrease the inductance of the linear adjustment inductor. If the +B is steady, the increase speed of Iy is faster to compensate the reducing of deflecting current by the resistance R mention above. We can adjust the magnetic core to change the inductance of the linear compensate inductor to adjust the H linearity.

※M36 Block Diagram (Consult above M35 part for Brief Introduction on Chassis)



PART IV. IC Pin Description**1. MC44608-High Voltage PWM Controller**

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



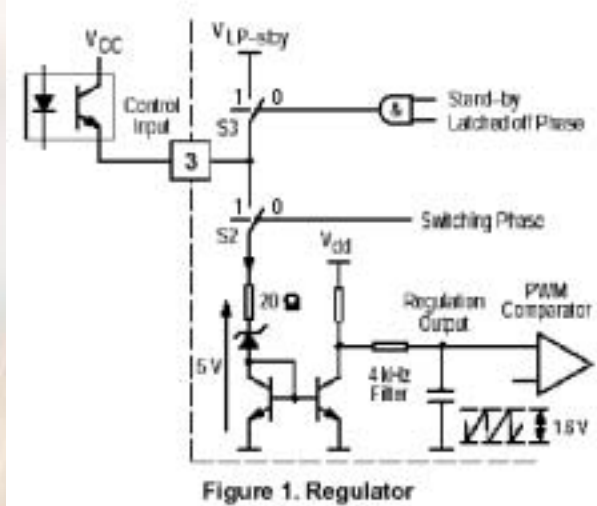
OPERATING DESCRIPTION

Regulation

The pin 3 senses the feedback current provided by the opto-coupler. During the switching phase the switch S2 is closed and the shunt regulator is accessible by the pin 3. The shunt regulator voltage is typically 5V. The dynamic resistance of the shunt regulator represented by the zener diode is 20 .

The gain of the Control input is given on Figure 10 which shows the duty cycle as a function of the current injected into the pin 3.

The maximum current sense threshold is fixed at 1V. The peak A 4KHz filter network is inserted



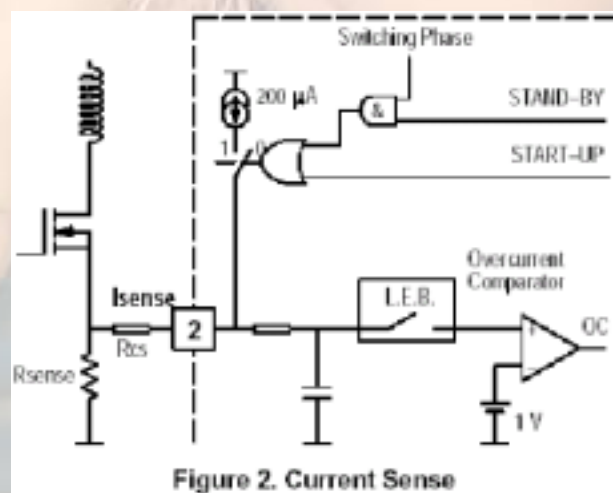
between the shunt regulator and the PWM comparator to cancel the high frequency residual noise.

The switch S3 is closed in Stand-by mode during the Latched Off Phase while the switch S2 remains open. (See section PULSED MODE DUTY CYCLE CONTROL).

The resistor Rdpulsed (Rduty cycle burst) has no effect on the regulation process. This resistor is used to determine the burst duty cycle.

PWM Latch

The MC44608 works in voltage mode. The on-time is controlled by the PWM comparator that compares the oscillator sawtooth with the regulation block output.



The PWM latch is initialized by the oscillator and is reset by the PWM comparator or by the current sense comparator in case of an over current. This configuration ensures that only a single pulse appears at the circuit output during an oscillator cycle.

Current Sense

The inductor current is converted to a positive voltage by inserting a ground reference sense resistor RSense in series with the power switch.

The maximum current sense threshold is fixed at 1V. The peak current is given by the following equation:

$$I_{pkmax} = 1/R_{sense} \text{ (A)}$$

In stand-by mode, this current can be lowered as due to the activation of a 200 A current source:

$$I_{pkMAX-STBY}$$

The current sense input consists of a filter (6k , 4pF) and of a leading edge blanking. Thanks to that, this pin is not sensitive to the power switch turn on noise and spikes and practically in most applications, no filtering network is required to sense the current.

Finally, this pin is used:

- The overcurrent propagation delay is reduced by producing a sharp output turn off (high slew rate). This results in an abrupt output turn off in the event of an over current and in the majority of the pulsed mode switching sequence.



The MC44608 demagnetization detection consists of a comparator designed to compare the VCC winding voltage to a reference that is typically equal to 50mV.

A latch is incorporated to turn the demagnetization block output into a low level as soon as a voltage less than 50 mV is detected, and to keep it in this state until a new pulse is generated on the output. This avoids any ringing on the input signal which may alter the demagnetization detection.

For a higher safety, the demagnetization block output is also directly connected to the

The demagnetization pin is also used for the quick programmable OVP. In fact, the demagnetization input current is sensed so that the circuit output is latched off when this current is detected as higher than 120 μ A.

Oscillator

The MC44608 contains a fixed frequency oscillator. It is built around a fixed value capacitor CT successively charged and discharged by two distinct current sources ICH and IDCH. The window comparator senses the CT voltage value and activates the sources when the voltage is reaching the 2.4V/4V levels.

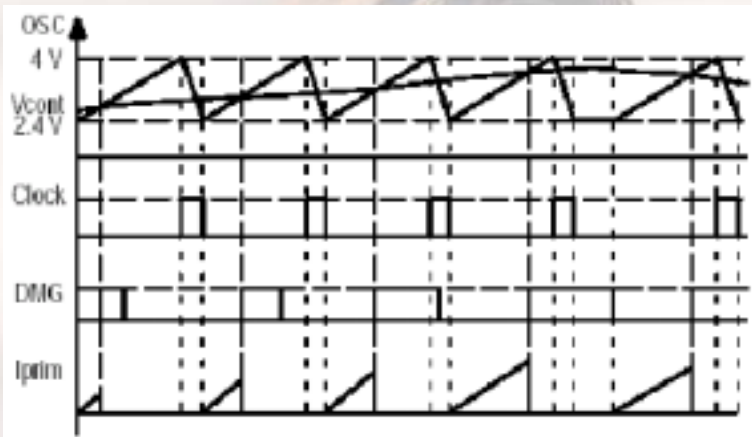


Figure 5.

The complete demagnetization status DMG is used to inhibit the recharge of the CT capacitor.

Thus in case of incomplete transformer demagnetization the next switching cycle is postpone until the DMG signal appears.

The oscillator remains at 2.4V corresponding to the sawtooth valley voltage. In this way the SMPS is working in the so called SOPS mode (Self Oscillating Power Supply). In that case the effective switching frequency is variable and no longer depends on the oscillator timing but on the external working conditions (Refer to DMG signal in the Figure 5).

The OSC and Clock signals are provided according to the Figure 5. The Clock signals correspond to the CT capacitor discharge. The bottom curve represents the current flowing in the sense resistor R_{cs} . It starts from zero and stops when the sawtooth value is equal to the control voltage V_{cont} . In this way the SMPS is regulated with a voltage mode control.

Overvoltage Protection

The MC44608 offers two OVP functions:

- a fixed function that detects when V_{CC} is higher than 15.4V
- a programmable function that uses the demag pin. The current flowing into the demag pin is mirrored and compared to the reference current I_{ovp} (120 μ A). Thus this OVP is quicker as it is not impacted by the V_{CC} inertia and is called QOVP.

In both cases, once an OVP condition is detected, the output is latched off until a new circuit

START-UP.

Start-up Management

The Vi pin 8 is directly connected to the HV DC rail V_{in} . This high voltage current source is

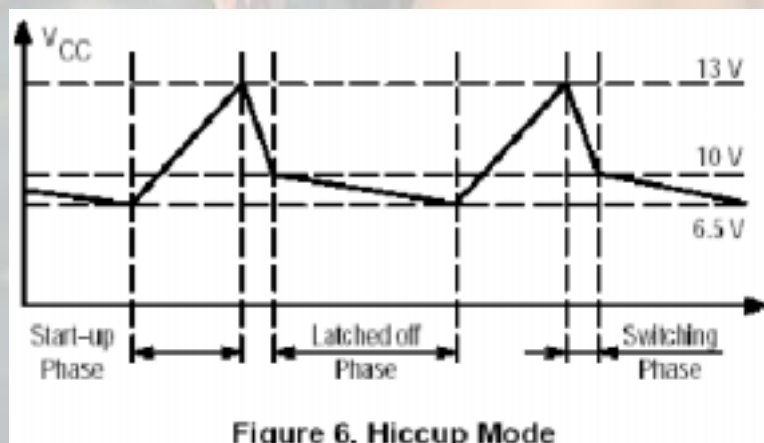


Figure 6. Hiccup Mode

internally connected to the V_{CC} pin and thus is used to charge the V_{CC} capacitor. The V_{CC} capacitor charge period corresponds to the Start-up phase. When the V_{CC} voltage reaches 13V, the high voltage 9mA current source is disabled and the device starts working. The device enters into the switching phase.

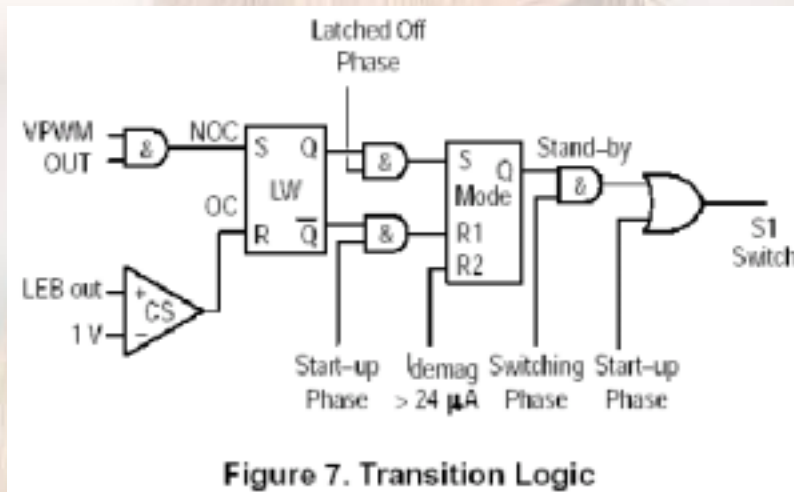
It is to be noticed that the maximum rating of the Vi pin 8 is 700V. ESD protection circuitry is not currently added to this pin due to size limitations and technology constraints. Protection is limited by the drain-substrate junction in avalanche breakdown. To help increase the application safety against high

voltage spike on that pin it is possible to insert a small wattage 1k series resistor between the Vin rail and pin 8.

The Figure 6 shows the VCC voltage evolution in case of no external current source providing current into the VCC pin during the switching phase. This case can be encountered in SMPS when the self supply through an auxiliary winding is not present (strong overload on the SMPS output for example).

The Figure16 also depicts this working configuration.

In case of the hiccup mode, the duty cycle of the switching phase is in the range of 10%.



Mode Transition

The LW latch Figure 7 is the memory of the working status at the end of every switching sequence. Two different cases must be considered for the logic at the termination of the SWITCHING PHASE:

- 1.No Over Current was observed
- 2.An Over Current was observed

These 2 cases are corresponding to the signal labeled NOC in case of “No Over Current” and “OC” in case of Over Current. So the effective working status at the end of the ON time memorized in LW corresponds to Q=1 for no over current and Q=0 for over current.

This sequence is repeated during the Switching phase.

Several events can occur:

1. SMPS switch OFF
2. SMPS output overload
3. Transition from Normal to Pulsed Mode
4. Transition from Pulsed Mode to Normal Mode

1. SMPS SWITCH OFF

When the mains is switched OFF, so long as the bulk electrolytic bulk capacitor provides energy to the SMPS, the controller remains in the switching phase. Then the peak current reaches its maximum peak value, the switching frequency decreases and all the secondary voltages are reduced. The VCC voltage is also reduced. When VCC is equal to 10V, the SMPS stops working.

2. Overload

In the hiccup mode the 3 distinct phases are described as follows (refer to Figure 6):

The SWITCHING PHASE: The SMPS output is low and the regulation block reacts by increasing the ON time ($d_{max} = 80\%$). The OC is reached at the end of every switching cycle. The LW latch (Figure 7) is reset before the VPWM signal appears. The SMPS output voltage is low. The VCC voltage cannot be maintained at a normal level as the auxiliary winding provides a voltage which is also reduced in a ratio similar to the one on the output (i.e. $V_{out\ nominal} / V_{out\ short-circuit}$). Consequently the VCC voltage is reduced at an operating rate given by the combination VCC capacitor value together with the ICC working consumption (3.2mA) according to the equation 2. When VCC crosses 10V the WORKING PHASE gets

terminated. The LW latch remains in the reset status.

The LATCHED–OFF PHASE: The VCC capacitor voltage continues to drop. When it reaches 6.5V this phase is terminated. Its duration is governed by equation 3.

The START–UP PHASE is reinitiated. The high voltage start–up current source ($-ICC1 = 9mA$) is activated and the MODE latch is reset. The VCC voltage ramps up according to the equation 1. When it reaches 13V, the IC enters into the SWITCHING PHASE.

The NEXT SWITCHING PHASE: The high voltage current source is inhibited, the MODE latch ($Q=0$) activates the NORMAL mode of operation. Figure 2 shows that no current is injected out pin 2.

The over current sense level corresponds to 1V.

As long as the overload is present, this sequence repeats. The SWITCHING PHASE duty cycle is in the range of 10%.

3. Transition from Normal to Pulsed Mode

In this sequence the secondary side is reconfigured (refer to the typical application schematic). The high voltage output value becomes lower than the NORMAL mode regulated value. The TL431 shunt regulator is fully OFF. In the SMPS stand–by mode all the SMPS outputs are lowered except for the low voltage output that supply the wake–up circuit located at the isolated side of the power supply. In that mode the secondary regulation is performed by the zener diode connected in parallel to the TL431.

The secondary reconfiguration status can be detected on the SMPS primary side by measuring the voltage level present on the auxiliary winding Laux. (Refer to the Demagnetization Section). In the reconfigured status, the Laux voltage is also reduced. The VCC self–powering is no longer possible thus the SMPS enters in a hiccup mode similar to the one described under the Overload condition.

In the SMPS stand–by mode the 3 distinct phases are:

The SWITCHING PHASE: Similar to the Overload mode. The current sense clamping level is reduced according to the equation of the current sense section. The C.S. clamping level depends on the power to be delivered to the load during the SMPS stand–by mode. Every switching sequence ON/OFF is terminated by an OC as long as the secondary Zener diode voltage has not been reached. When the Zener voltage is reached the ON cycle is terminated by a true PWM action. The proper SWITCHING PHASE termination must correspond to a NOC condition. The LW latch stores this NOC status.

The LATCHED OFF PHASE: The MODE latch is set.

The START–UP PHASE is similar to the Overload Mode. The MODE latch remains in its set status ($Q=1$).

The SWITCHING PHASE: The Stand–by signal is validated and the $200\ \mu A$ is sourced out of the Current Sense pin 2.

4. Transition from Stand–by to Normal

The secondary reconfiguration is removed. The regulation on the low voltage secondary rail can no longer be achieved, thus at the end of the SWITCHING PHASE, no PWM condition can be encountered. The LW latch is reset.

At the next WORKING PHASE a NORMAL mode status takes place.

In order to become independent of the recovery time SWITCHING PHASE constant on the secondary side of the SMPS an additional reset input R2 is provided on the MODE latch. The condition $I_{demag} < 24\ \mu A$ corresponds to the activation of the secondary reconfiguration status. The R2 reset insures a return into the NORMAL mode following the first corresponds to 1V. START–UP PHASE.

Pulsed Mode Duty Cycle Control

During the sleep mode of the SMPS the switch S3 is closed and the control input pin 3 is connected to a 4.6V voltage source thru a 500 Ω resistor. The discharge rate of the VCC capacitor is given by $ICC-latch$ (device consumption during the LATCHED OFF phase) in addition to the current drawn out of the pin 3. Connecting a resistor between the Pin 3 and GND (RDPULSED) a programmable current is drawn from the VCC through pin 3. The duration of the LATCHED OFF phase is impacted by the presence of the resistor RDPULSED. The equation 3 shows the relation to the pin 3 current.

Pulsed Mode Phases

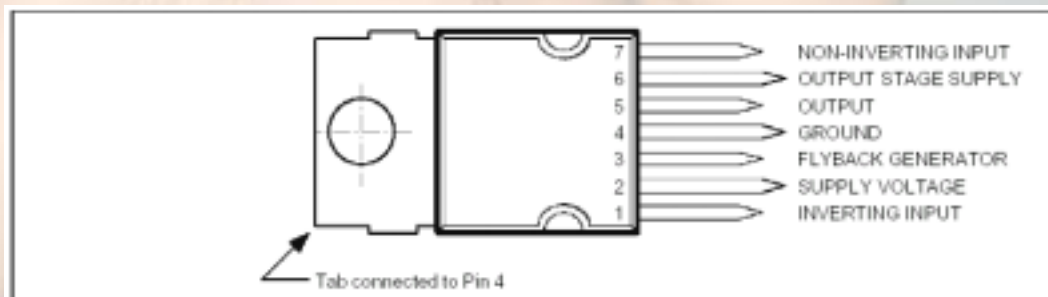
Equations 1 through 8 define and predict the effective behavior during the PULSED MODE operation. The equations 6, 7, and 8 contain K, Y, and D factors. These factors are combinations of measured parameters. They appear in the parameter section "K factors for pulsed mode operation". In equations 3 through 8 the pin 3 current is the current defined in the above section "Pulsed Mode Duty Cycle Control".

2. TDA8172 TV Vertical Deflection Output Circuit

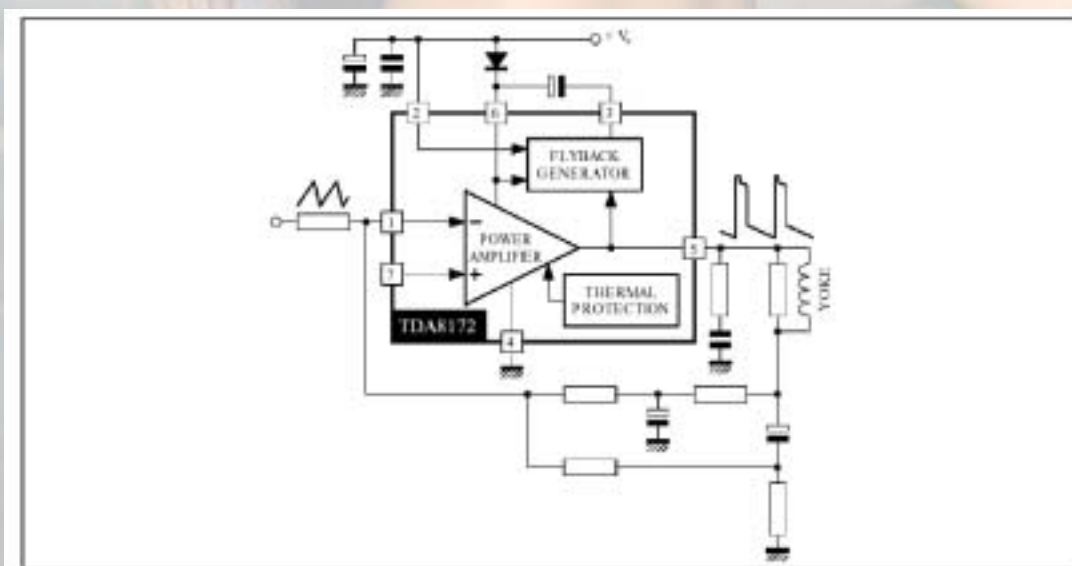
■ General Description

The TDA8172 is a monolithic integrated circuit. It is a high efficiency power booster for direct driving of vertical windings of TV yokes. It is intended for use in Color and B&W television.

■ Pin Connections (top view)



■ Block Diagram



3. TDA8944 2×7W stereo Bridge Tied Load (BTL) Audio Amplifier

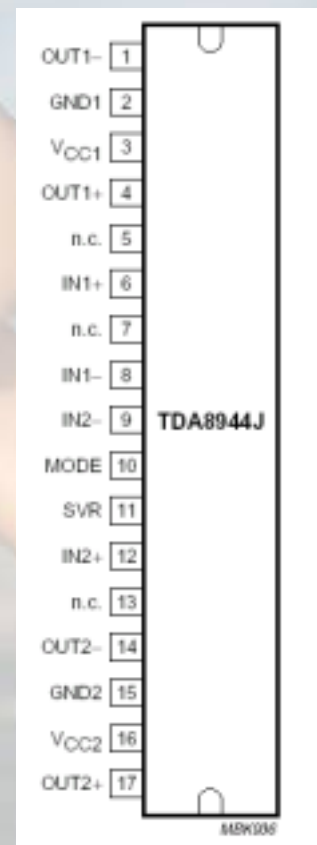
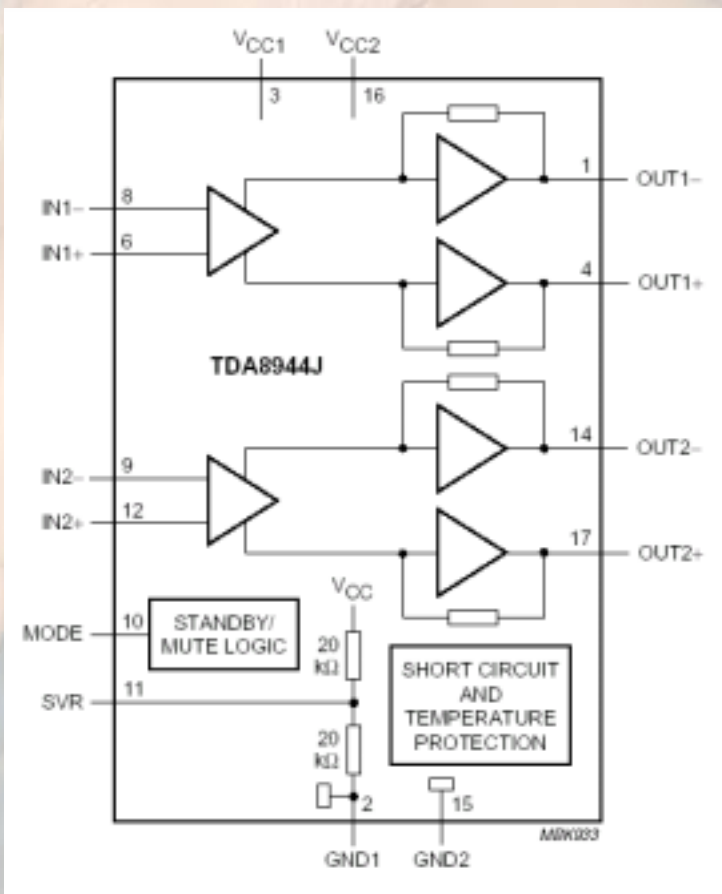
■ General Description

The TDA8944 is a dual-channel audio power amplifier with an output power of $2 \times 7W$ at an 8Ω load and a 12V supply. The circuit contains two Bridge Tied Load (BTL) amplifiers with an all-NPN output stage and standby/mute logic. The TDA8944 comes in a 17-pins DIL-bent-SIL (DBS) power package.

■ Features

- Few external components
- Fixed gain
- Standby and mute mode
- No on/off switching plops
- Low standby current
- High supply voltage ripple rejection
- Outputs short-circuit protected to ground, supply and across the load
- Thermally protected
- Printed-circuit board compatible.

■ Block Diagram and Pin Configuration



■ Pin Description

No.	Symbol	Pin	Description
1	OUT1-	1	negative loudspeaker terminal 1
2	GND1	2	ground channel 1
3	VCC1	3	supply voltage channel 1
4	OUT1+	4	positive loudspeaker terminal 1
5	n.c.	5	not connected
6	IN1+	6	positive input 1
7	n.c.	7	not connected

No.	Symbol	Pin	Description
8	IN1–	8	negative input 1
9	IN2–	9	negative input 2
10	MODE	10	mode selection input (standby, mute, operating)
11	SVR	11	half supply voltage decoupling (ripple rejection)
12	IN2+	12	positive input 2
13	n.c.	13	not connected
14	OUT2–	14	negative loudspeaker terminal 2
15	GND2	15	ground channel 2
16	VCC2	16	supply voltage channel 2
17	OUT2+	17	positive loudspeaker terminal 2

■ Functional Description

The TDA8944J is a stereo BTL audio power amplifier capable of delivering $2 \times 7\text{ W}$ output power to an $8\ \Omega$ load at THD = 10%, using a 12 V power supply and an external heat sink. The voltage gain is fixed at 32 dB. With the three-level MODE input the device can be switched from 'standby' to 'mute' and to 'operating' mode. The TDA8944J outputs are protected by an internal thermal shutdown protection mechanism and a short-circuit protection.

1 Input configuration

The TDA8944J inputs can be driven symmetrical (floating) as well as asymmetrical. In the asymmetrical mode one input pin is connected via a capacitor to the signal ground which should be as close as possible to the SVR (electrolytic) capacitor ground. Note that the DC level of the input pins is half of the supply voltage V_{CC} , so coupling capacitors for both pins are necessary.

2 Power amplifier

The power amplifier is a Bridge Tied Load (BTL) amplifier with an all-NPN output stage, capable of delivering a peak output current of 2 A.

The BTL principle offers the following advantages:

- Lower peak value of the supply current
- The ripple frequency on the supply voltage is twice the signal frequency
- No expensive DC-blocking capacitor
- Good low frequency performance.

3 Mode selection

The TDA8944J has three functional modes, which can be selected by applying the proper DC voltage to pin MODE.

Standby - In this mode the current consumption is very low and the outputs are floating. The device is in standby mode when $(V_{CC} - 0.5\text{ V}) < V_{MODE} < V_{CC}$, or when the MODE pin is left floating (high impedance). The power consumption of the TDA8944J will be reduced to $< 0.18\text{ mW}$.

Mute - In this mode the amplifier is DC-biased but not operational (no audio output); the DC level of the input and output pins remain on half the supply voltage. This allows the input coupling and Supply Voltage Ripple Rejection (SVRR) capacitors to be charged to avoid pop-noise. The device is in mute mode when $3\text{ V} < V_{MODE} < (V_{CC} - 1.5\text{ V})$.

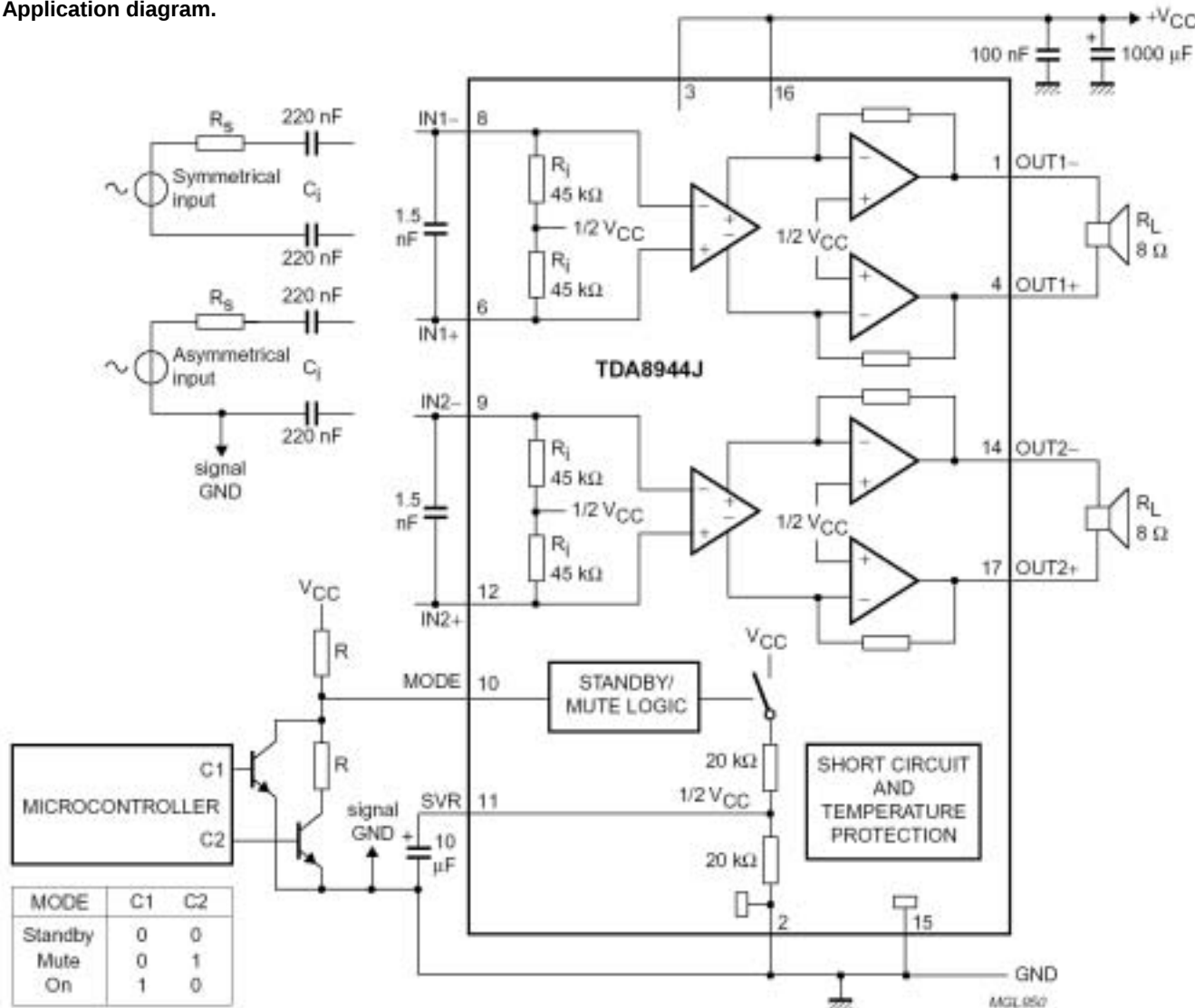
Operating - In this mode the amplifier is operating normally. The operating mode is activated at $V_{MODE} < 0.5\text{ V}$.

Internal Circuitry

No.	Pin	Symbol	Equivalent Circuit
1	6 and 8 12 and 9	IN1+ and IN1- IN2+ and IN2-	
2	1 and 4 14 and 17	OUT1- and OUT1+ OUT2- and OUT2+	
3	10	MODE	
4	11	SVR	

■ Application Information

Application diagram.



4. TDA8945 15 W mono Bridge Tied Load (BTL) audio amplifier

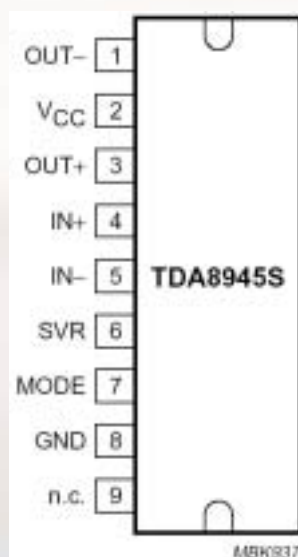
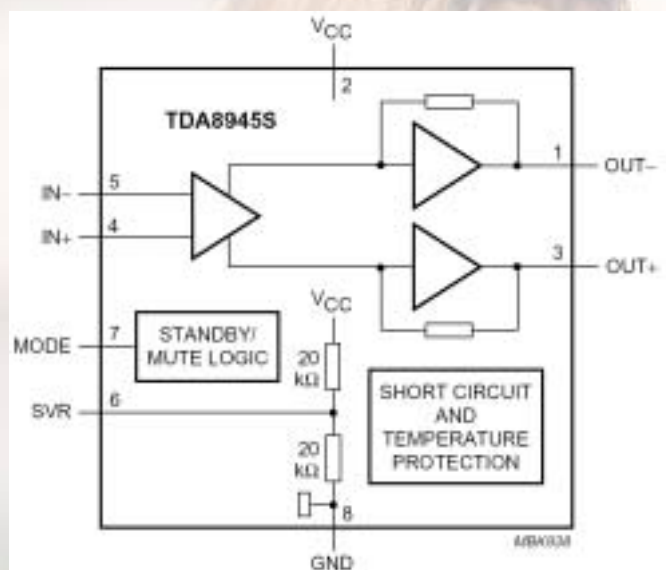
■ General description

The TDA8945S is a single-channel audio power amplifier with an output power of 15 W at an 8 Ω load and an 18 V supply. The circuit contains a Bridge Tied Load (BTL) amplifier with an all-NPN output stage and standby/mute logic. The TDA8945S comes in a 9-lead single in-line (SIL) power package.

■ Features

The same as TDA8944.

■ Block Diagram and Pin Configuration



■ Pin Description

No.	Symbol	Pin	Description
1	OUT-	1	negative loudspeaker terminal
2	Vcc	2	supply voltage
3	OUT+	3	positive loudspeaker terminal
4	IN+	4	positive input
5	IN-	5	negative input
6	SVR	6	half supply voltage decoupling (ripple rejection)
7	MODE	7	mode selection input (standby, mute, operating)
8	GND	8	ground
9	n.c.	9	not connected

■ Functional Description

The TDA8945S is a mono BTL audio power amplifier capable of delivering 15 W output power to an 8 Ω load at THD = 10%, using an 18 V power supply and an external heatsink. The voltage gain is fixed at 32 dB. With the three-level MODE input the device can be switched from 'standby' to 'mute' and to 'operating' mode. The TDA8945S outputs are protected by an internal thermal shutdown protection mechanism and a short-circuit protection.

1 Input configuration

The TDA8945S inputs can be driven symmetrical (floating) as well as asymmetrical. In the asymmetrical mode one input pin is connected via a capacitor to the signal ground which should be as close as possible to the SVR (electrolytic) capacitor ground. Note that the DC level of the input pins is half of the supply voltage Vcc, so coupling capacitors for both pins are necessary.

2 Power amplifier

The power amplifier is a Bridge Tied Load (BTL) amplifier with an all-NPN output stage, capable of delivering a peak output current of 2 A.

The BTL principle offers the following advantages:

- Lower peak value of the supply current
- The ripple frequency on the supply voltage is twice the signal frequency

- No expensive DC-blocking capacitor
- Good low frequency performance.

3 Mode selection

The TDA8945S has three functional modes, which can be selected by applying the proper DC voltage to pin MODE.

Standby- In this mode the current consumption is very low and the outputs are floating. The device is in standby mode when $(V_{CC} - 0.5 \text{ V}) < V_{\text{MODE}} < V_{CC}$, or when the MODE pin is left floating (high impedance). The power consumption of the TDA8945S will be reduced to $< 0.18 \text{ mW}$.

Mute- In this mode the amplifier is DC-biased but not operational (no audio output); the DC level of the input and output pins remain on half the supply voltage. This allows the input coupling and Supply Voltage Ripple Rejection (SVRR) capacitors to be charged to avoid pop-noise. The device is in mute mode when $3 \text{ V} < V_{\text{MODE}} < (V_{CC} - 1.5 \text{ V})$.

Operating- In this mode the amplifier is operating normally. The operating mode is activated at $V_{\text{MODE}} < 0.5 \text{ V}$.

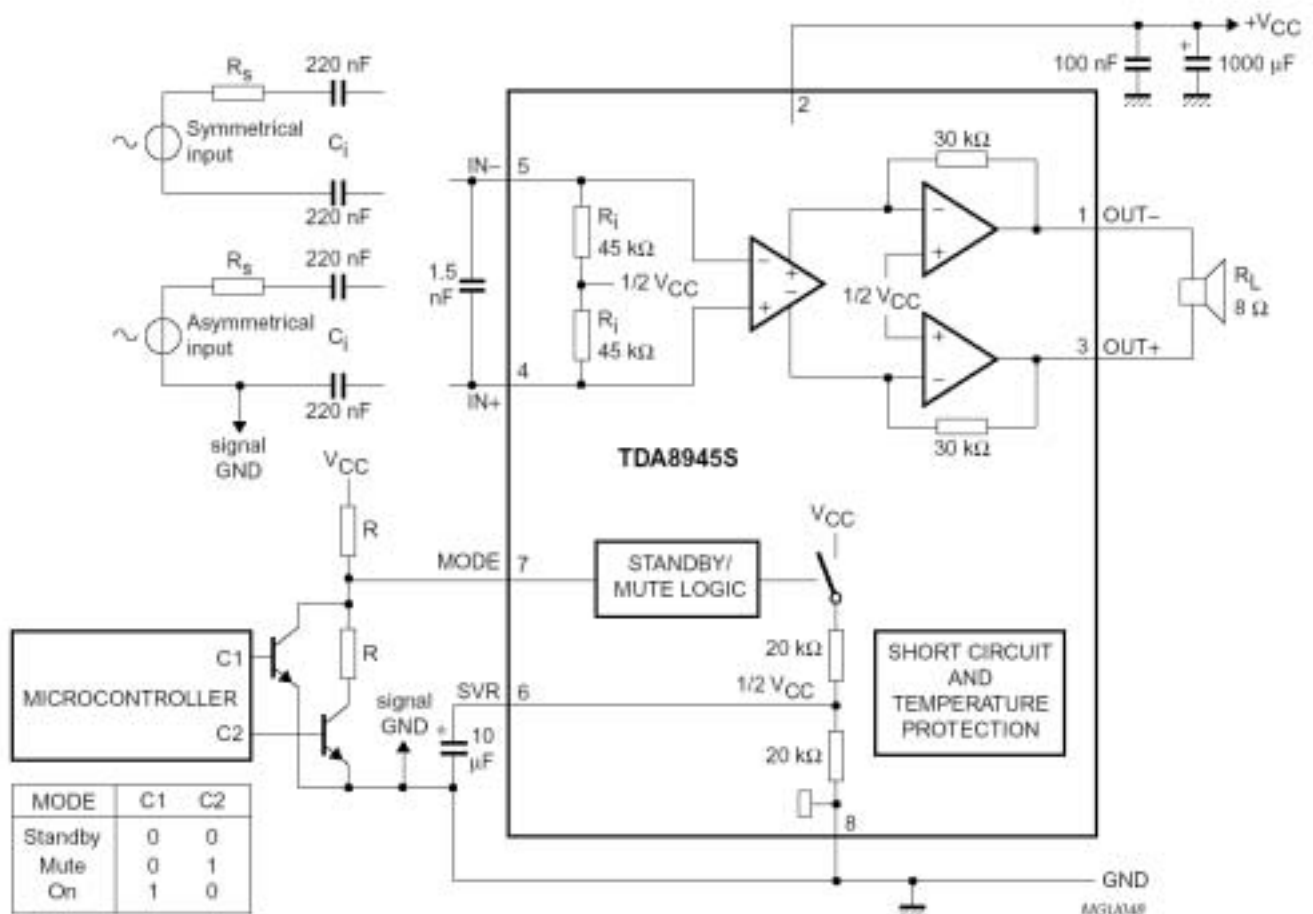
■ Internal Circuitry

No.	Pin	Symbol	Equivalent Circuit
1	4 and 5	IN+ and IN-	
2	1 and 3	OUT- and OUT+	
3	7	MODE	

No.	Pin	Symbol	Equivalent Circuit
4	6	SVR	

■ Application Information

Application diagram.



6. TDA7057AQ Audio Output Amplifier

■ GENERAL DESCRIPTION

1. The TDA7057AQ is a stereo BTL output amplifier with DC volume control. The device is designed for use in TVs and monitors.

2. Missing Current Limiter (MCL)

A MCL protection circuit is built-in. The MCL circuit is activated when the difference in current between the output terminal of each amplifier exceeds 100 mA (typical 300 mA). This level of 100 mA allows for single-ended headphone applications.

■ FEATURES

- DC volume control
- Few external components
- Mute mode
- Thermal protection
- Short-circuit proof
- No switch-on and switch-off clicks
- Good overall stability
- Low power consumption
- Low HF radiation
- ESD protected on all pins.

■ FUNCTIONAL DESCRIPTION

The TDA7057AQ is a stereo output amplifier with two DC volume control stages. The device is designed for TVs and monitors. In conventional DC volume control circuits the control or input stage is AC-coupled to the output stage via external capacitors to keep the offset voltage low.

In the TDA7057AQ the two DC volume control stages are integrated into the input stages so that no coupling capacitors are required and a low offset voltage is still maintained. The minimum supply voltage also remains low. The BTL principle offers the following advantages:

- Lower peak value of the supply current
- The frequency of the ripple on the supply voltage is twice the signal frequency.

Consequently, a reduced power supply with smaller capacitors can be used which results in cost reductions.

For portable applications there is a trend to decrease the supply voltage, resulting in a reduction of output power at conventional output stages. Using the BTL principle increases the output power.

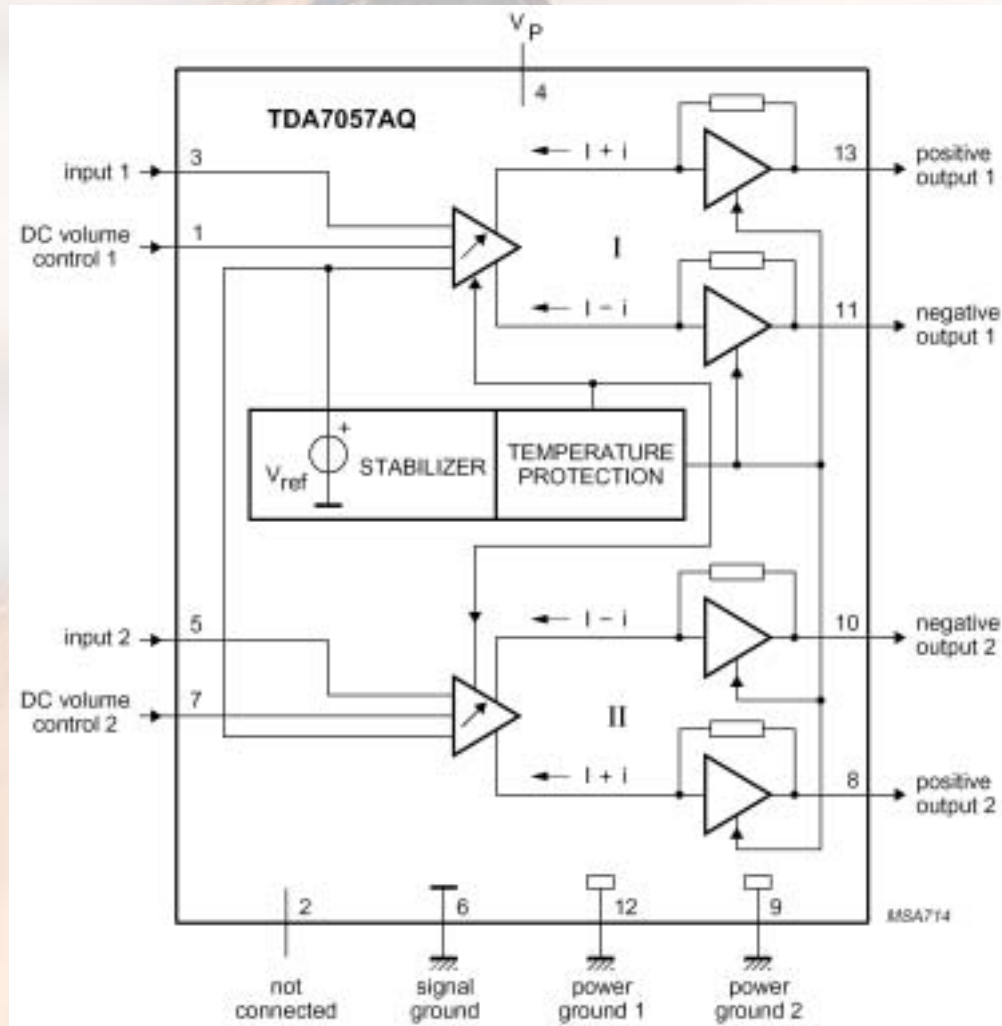
The maximum gain of the amplifier is fixed at 40.5 dB.

The DC volume control stages have a logarithmic control characteristic. Therefore, the total gain can be controlled from +40.5 dB to -33 dB. If the DC volume control voltage falls below 0.4 V, the device will switch to the mute mode.

The amplifier is a short-circuit protected to ground, VP and across the load. A thermal protection circuit is also implemented. If the crystal temperature rises above +150 °C the gain will be reduced, thereby reducing the output power.

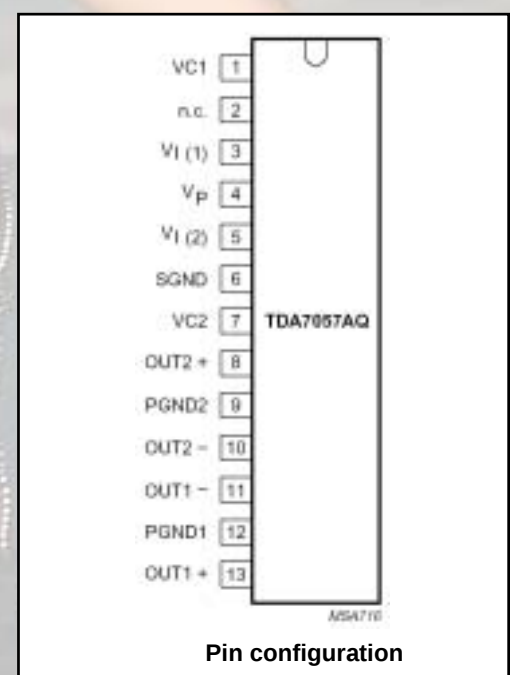
Special attention is given to switch-on and switch-off clicks, low HF radiation and a good overall stability.

■ BLOCK DIAGRAM

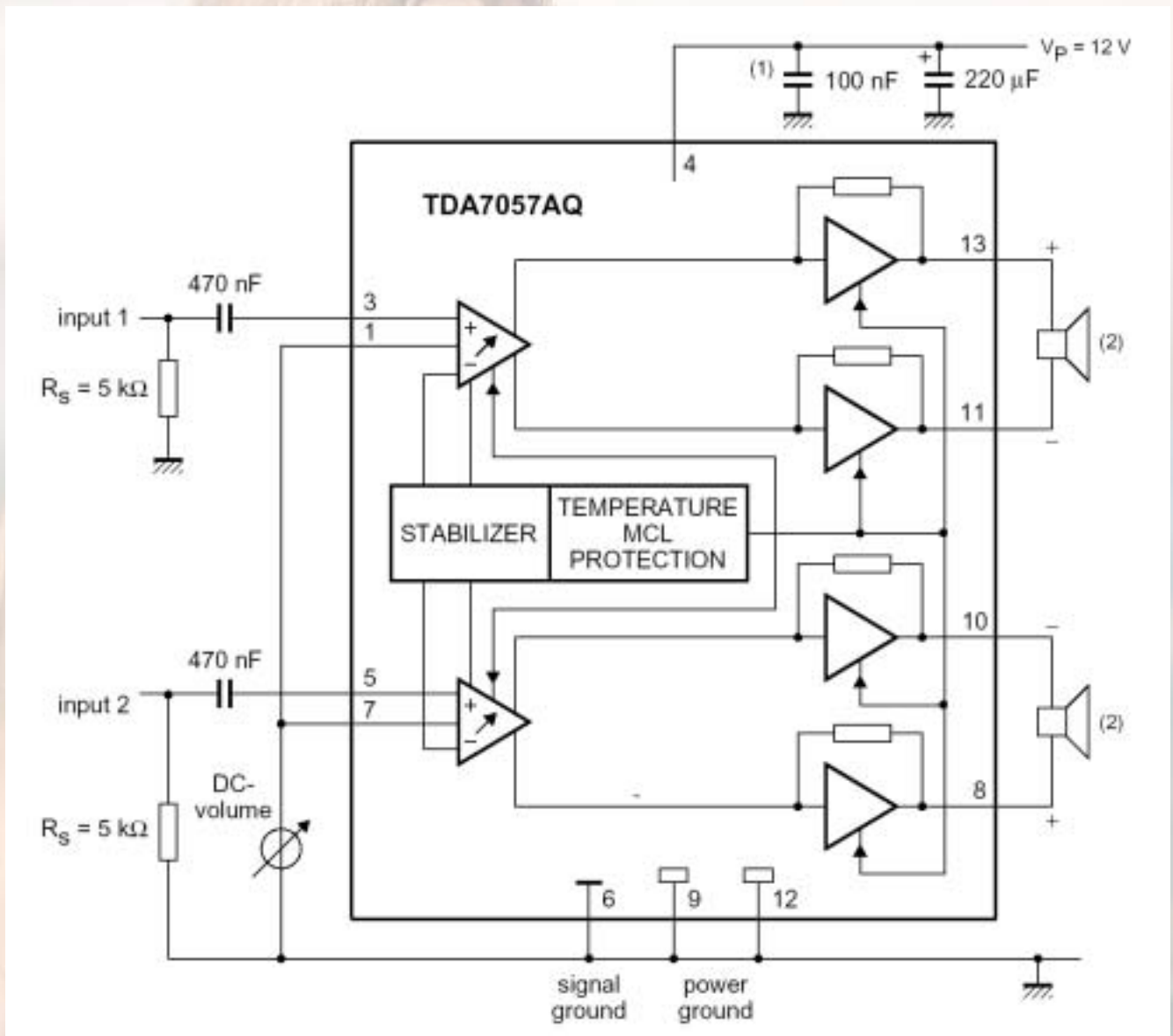


■ PINNING

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



■ APPLICATION DIAGRAM



Remark for “(1)”&“(2)”:

- (1) This capacitor can be omitted if the 220 μF electrolytic capacitor is connected close to pin 5.
- (2) R_L = 16 Ω.

6. M52760SP PLL-SPLIT VIF/SIF IC

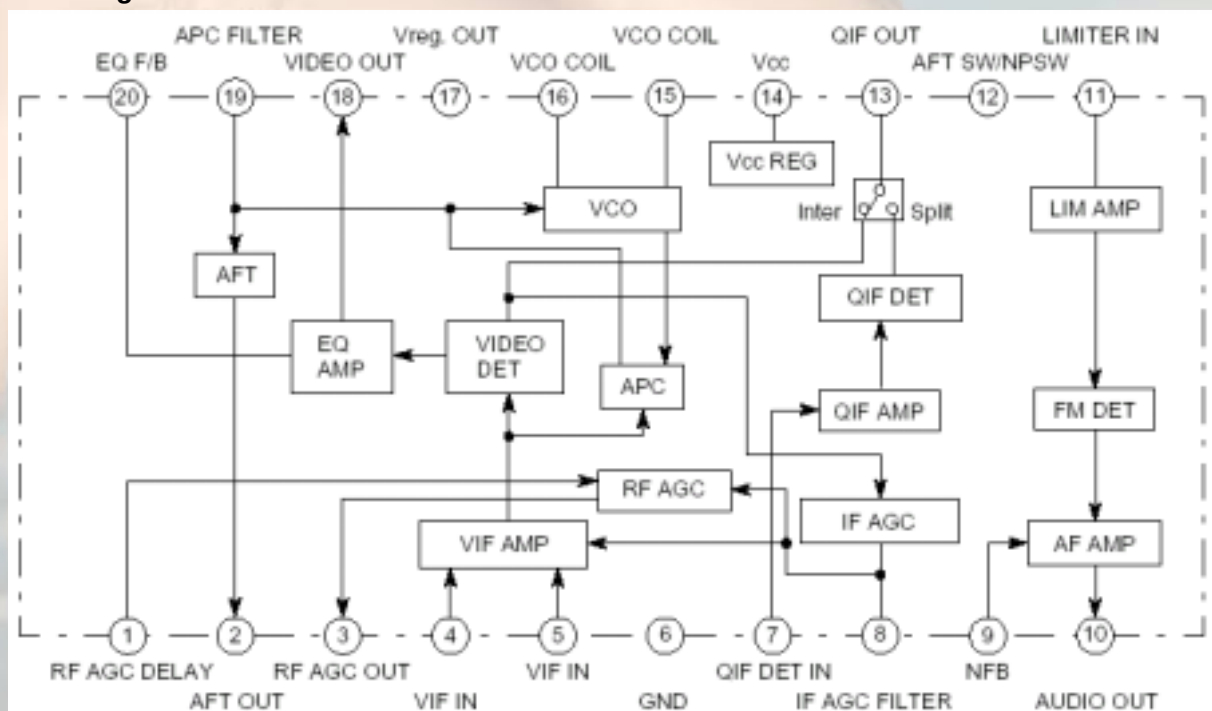
■ General Description

The M52760SP is IF signal-processing IC for VCRs and TVs. It enable the PLL detection system despite size as small as that of conventional quasi-synchronous VIF/SIF detector, IF/RF AGC, SIF limiter, FM detector and EQ AMP.

■ Features

- Video detection output is $2V_{P-P}$. It has built-in EQ AMP.
- The package is a 20-pin shrink-DIP, suitable for space saving.
- The video detector uses PLL for full synchronous detection circuit. It produces excellent characteristics of DG, DP, 920kHz beat, and cross color.
- Dynamic AGC realizes high speed response with only single filter.
- Video IF and sound IF signal processings are separated from each other. VCO output is used to obtain intercarrier. This PLL-SPLIT method provide good sound sensitivity and reduces buzz.
- As AFT output voltage uses the APC output voltage, VCO coil is not used.
- Audio FM demodulation uses PLL system, so it has wide frequency range with no external parts and no adjustment.
- QIF AMP has a fixed gain, and good characteristic for NICAM.

■ Block Diagram



7. MSP3415G Multistandard Sound Processor

■ Introduction

The MSP 3415G family of single-chip Multistandard Sound Processors covers the sound processing of all analog TV standards worldwide, as well as the NICAM digital sound standards. The full TV sound processing, starting with analog sound IF signal-in, down to processed analog AF-out, is performed in a single chip.

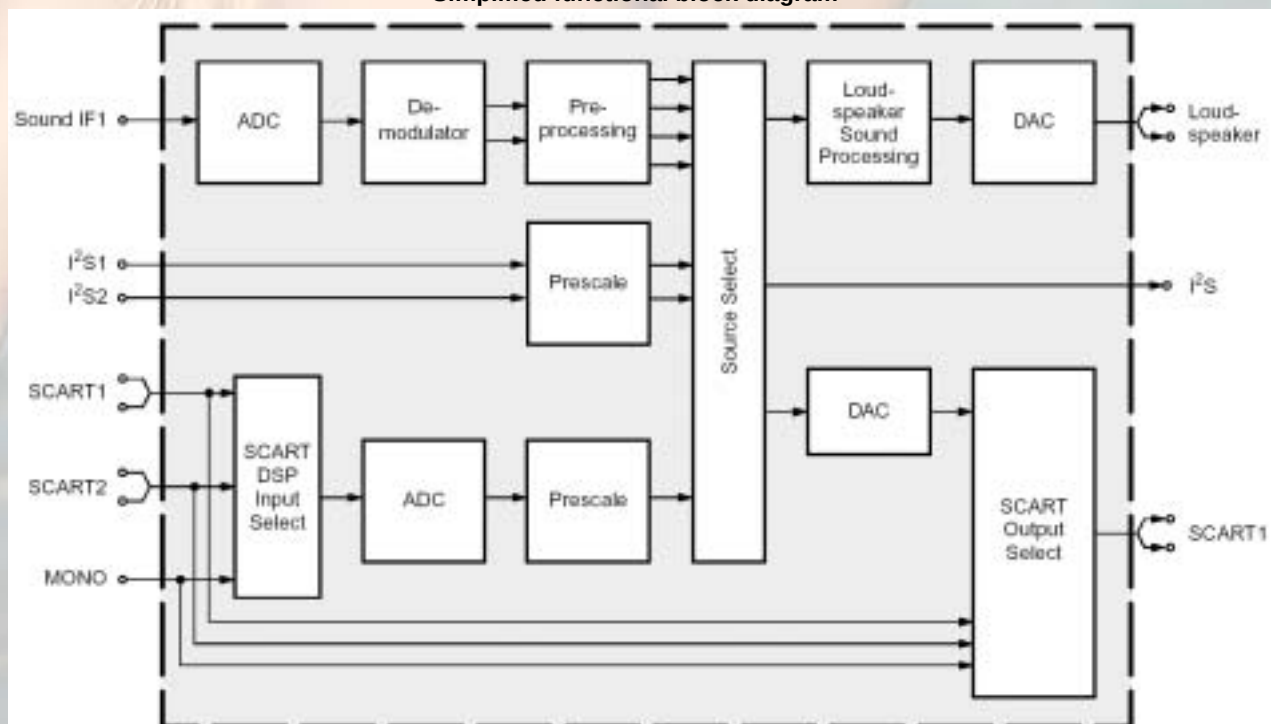
These TV sound processing ICs include versions for processing the multichannel television sound (MTS) signal conforming to the standard recommended by the Broadcast Television Systems Committee (BTSC).

The DBX noise reduction, or alternatively, Micronas Noise Reduction (MNR) is performed alignment free. Other processed standards are the Japanese FM-FM multiplex standard (EIA-J) and the FM-Stereo-Radio standard. Current ICs have to perform adjustment procedures in order to achieve good stereo separation for BTSC and EIA-J. The MSP 34x5G has optimum stereo performance without any adjustments.

The MSP 3415G has built-in automatic functions: The IC is able to detect the actual sound standard automatically (Automatic Standard Detection). Furthermore, pilot levels and identification signals can be evaluated internally with subsequent switching between mono/stereo/bilingual; no I²C interaction is necessary (Automatic Sound Selection).

The MSP 34x5G can handle very high FM deviations even in conjunction with NICAM processing. This is especially important for the introduction of NICAM in China.

Simplified functional block diagram



■ Features

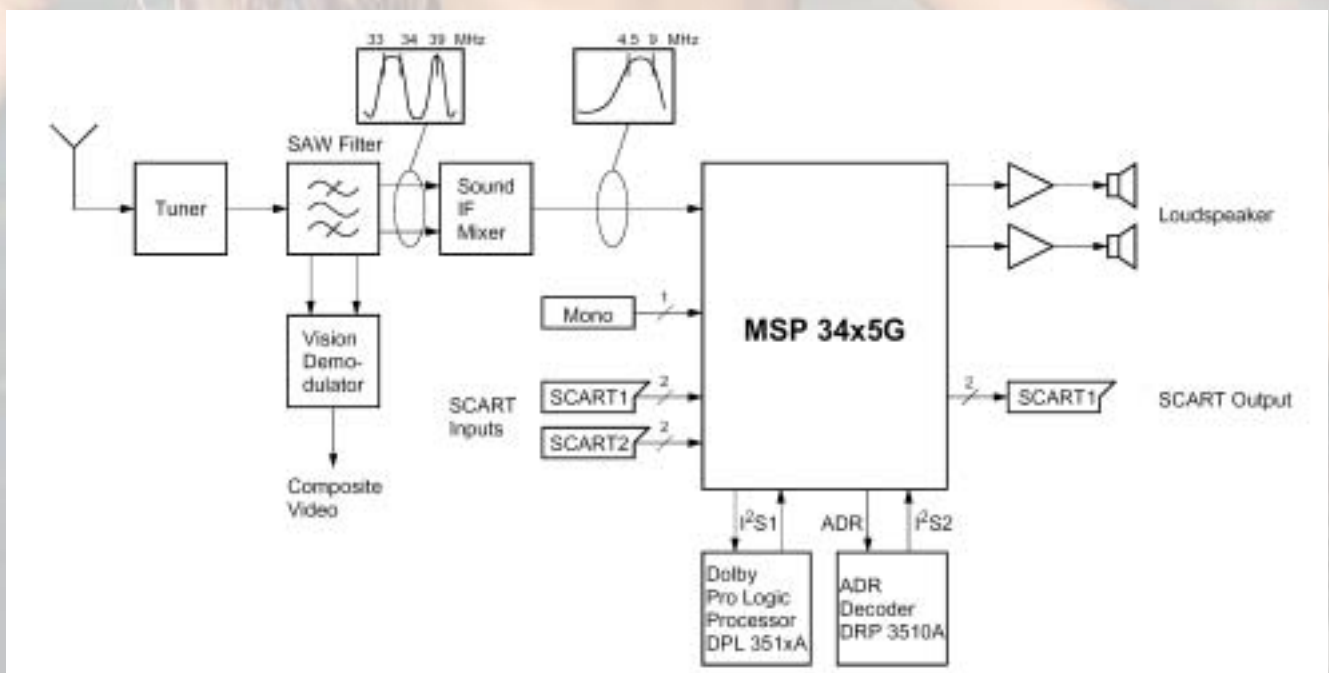
- Standard Selection with single I²C transmission
- Automatic Standard Detection of terrestrial TV standards
- Automatic Sound Selection (mono/stereo/bilingual), new registers MODUS, STATUS
- Automatic Carrier Mute function
- Interrupt output programmable (indicating status change)

- Loudspeaker channel with volume, balance, bass, treble, loudness
- AVC: Automatic Volume Correction
- Spatial effect for loudspeaker channel
- Two Stereo SCART (line) inputs, one Mono input; one Stereo SCART outputs
- Complete SCART in/out switching matrix
- Two I²S inputs; one I²S output
- All analog Mono sound carriers including AM-SECAM L
- All analog FM-Stereo A2 and satellite standards
- All NICAM standards
- Simultaneous demodulation of (very) high-deviation FM-Mono and NICAM
- Adaptive deemphasis for satellite (Wegener-Panda, acc. to ASTRA specification)
- ASTRA Digital Radio (ADR) together with DRP 3510A
- Korean FM-Stereo A2 standard

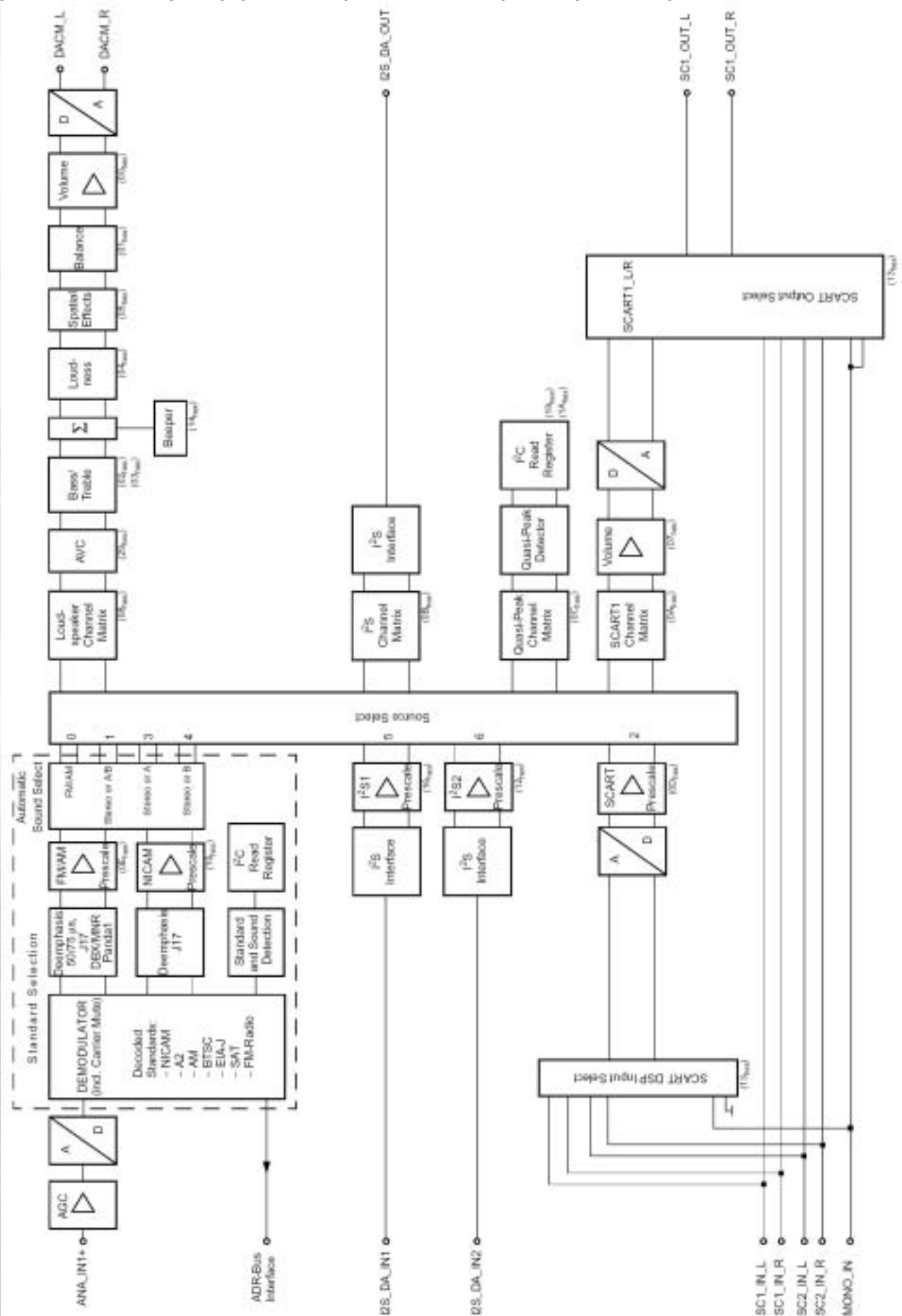
■ Application Fields

As below table provides an overview of TV sound standards that can be processed by the MSP 3415G.

TV-System	Position of Sound Carrier/MHz	Sound Modulation	Color System	Broadcast e.g. in:
B/G	5.5/5.7421875	FM-Stereo (A2)	PAL	Germany
	5.5/5.85	FM-Mono/NICAM	PAL	Scandinavia, Spain
L	6.5/5.85	AM-Mono/NICAM	SECAM-L	France
I	6.0/6.552	FM-Mono/NICAM	PAL	UK, Hong Kong
D/K	6.5/6.2578125	FM-Stereo (A2, D/K1)	SECAM-East.	Slovak. Rep
	6.5/6.7421875	FM-Stereo (A2, D/K2)	PAL	currently no broadcast
	6.5/5.7421875	FM-Stereo (A2, D/K3)	SECAM-East	Poland
	6.5/5.85	FM-Mono/NICAM (D/K, NICAM)	PAL	China, Hungary
Satellite	6.5 7.02/7.2 7.38/7.56 etc.	FM-Mono FM-Stereo ASTRA Digital Radio (ADR) with DRP 3510A	PAL	Europe Sat. ASTRA
M/N	4.5/4.724212	FM-Stereo (A2)	NTSC	Korea



Signal flow block diagram (input and output names correspond to pin names).



■ Functional Description

1.1. Sound IF Processing

1.1.1. Analog Sound IF Input

The input pins ANA_IN1+ and ANA_IN- offer the possibility to connect sound IF (SIF) sources to the MSP 34x5G. The analog-to-digital conversion of the sound IF signal is done by an A/D-converter. An analog automatic gain circuit (AGC) allows a wide range of input levels. The high-pass filter formed by the coupling capacitor at pin ANA_IN1+ is sufficient in most cases to suppress video components. Some combinations of SAW filters and sound IF mixer ICs, however, show large picture components on their outputs. In this case, further filtering is recommended.

1.2.2. Demodulator: Standards and Features

The MSP 3415G is able to demodulate all TV sound standards worldwide including the digital NICAM system. Depending on the MSP 3415G version, the following demodulation modes can be performed:

A2-Systems: Detection and demodulation of two separate FM carriers (FM1 and FM2), demodulation and evaluation of the identification signal of carrier FM2.

NICAM-Systems: Demodulation and decoding of the NICAM carrier, detection and demodulation of the analog (FM or AM) carrier. For D/K-NICAM, the FM carrier may have a maximum deviation of 384 kHz.

Very high deviation FM-Mono: Detection and robust demodulation of one FM carrier with a maximum deviation of 540 kHz.

BTSC-Stereo: Detection and FM demodulation of the aural carrier resulting in the MTS/MPX signal. Detection and evaluation of the pilot carrier, AM demodulation of the (L-R)-carrier and detection of the SAP subcarrier. Processing of the DBX noise reduction or Micronas Noise Reduction (MNR).

BTSC-Mono + SAP: Detection and FM demodulation of the aural carrier resulting in the MTS/MPX signal. Detection and evaluation of the pilot carrier, detection and FM demodulation of the SAP-subcarrier. Processing of the DBX noise reduction or Micronas Noise Reduction (MNR).

Japan Stereo: Detection and FM demodulation of the aural carrier resulting in the MPX signal. Demodulation and evaluation of the identification signal and FM demodulation of the (L-R)-carrier.

FM-Satellite Sound: Demodulation of one or two FM carriers. Processing of high-deviation mono or narrow bandwidth mono, stereo, or bilingual satellite sound according to the ASTRA specification.

FM-Stereo-Radio: Detection and FM demodulation of the aural carrier resulting in the MPX signal. Detection and evaluation of the pilot carrier and AM demodulation of the (L-R)-carrier.

The demodulator blocks of MSP 3415G versions have identical user interfaces. Even completely different systems like the BTSC and NICAM systems are controlled the same way. Standards are selected by means of MSP Standard Codes. Automatic processes handle standard detection and identification without controller interaction. The key features of the MSP 34x5G demodulator blocks are

Standard Selection: The controlling of the demodulator is minimized: All parameters, such as tuning frequencies or filter bandwidth, are adjusted automatically by transmitting one single value to the STANDARD SELECT register. For all standards, specific MSP standard codes are defined.

Automatic Standard Detection: If the TV sound standard is unknown, the MSP 34x5G can automatically detect the actual standard, switch to that standard, and respond the actual MSP standard code.

Automatic Carrier Mute: To prevent noise effects or FM identification problems in the absence of an FM carrier, the MSP 34x5G offers a configurable carrier mute feature, which is activated automatically if the TV sound standard is selected by means of the STANDARD SELECT register. If no FM carrier is detected at one of the two MSP demodulator channels, the corresponding demodulator output is muted. This is indicated in the STATUS register.

1.2.3. Preprocessing of Demodulator Signals

The NICAM signals must be processed by a deemphasis filter and adjusted in level. The analog demodulated signals must be processed by a deemphasis filter, adjusted in level, and dematrixed. The correct deemphasis filters are already selected by setting the standard in the STANDARD SELECT register. The level adjustment has to be done by means of the FM/AM and NICAM prescale registers. The necessary dematrix function depends on the selected sound standard and the actual broadcasted sound mode (mono, stereo, or bilingual). It can be manually set by the FM Matrix Mode register or automatically by the Automatic Sound Selection.

1.2.4. Automatic Sound Select

In the Automatic Sound Select mode, the dematrixfunction is automatically selected based on the identification information in the STATUS register. No I2C interaction is necessary when the broadcasted sound mode changes (e.g. from mono to stereo).

The demodulator supports the identification check by switching between mono-compatible standards (standards that have the same FM-Mono carrier) automatically and non-audible. If B/G-FM or B/G-NICAM is selected, the MSP will switch between these standards. The same action is performed for the standards: D/K1-FM, D/K2-FM, D/K3-FM and D/K-NICAM. Switching is only done in the absence of any stereo or bilingual identification. If identification is found, the MSP keeps the detected standard.

In case of high bit-error rates, the MSP 3415G automatically falls back from digital NICAM sound to analog FM or AM mono.

- **“FM/AM” channel:** Analog mono sound, stereo if available. In case of NICAM, analog mono only (FM or AM mono).
- **“Stereo or A/B” channel:** Analog or digital mono sound, stereo if available. In case of bilingual broadcast, it contains both languages A (left) and B(right).
- **“Stereo or A” channel:** Analog or digital mono sound, stereo if available. In case of bilingual broadcast, it contains language A (on left and right).
- **“Stereo or B” channel:** Analog or digital mono sound, stereo if available. In case of bilingual broadcast, it contains language B (on left and right).

Note: The analog primary input channel contains the signal of the mono FM/AM carrier or the L+R signal of the MPX carrier. The secondary input channel contains the signal of the 2nd FM carrier, the L-R signal of the MPX carrier, or the SAP signal

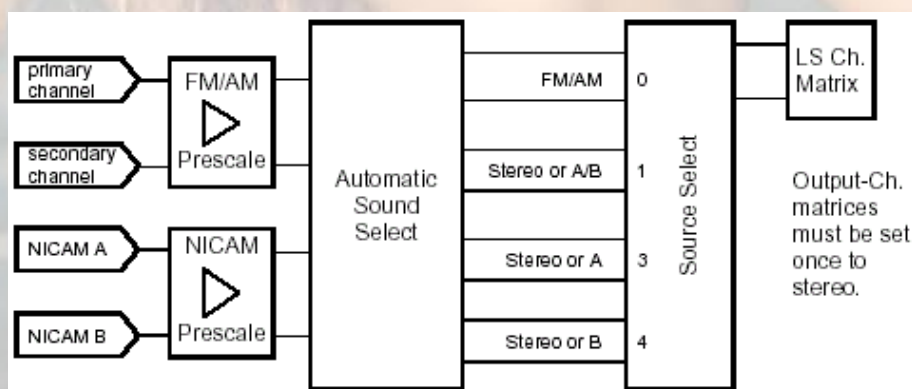
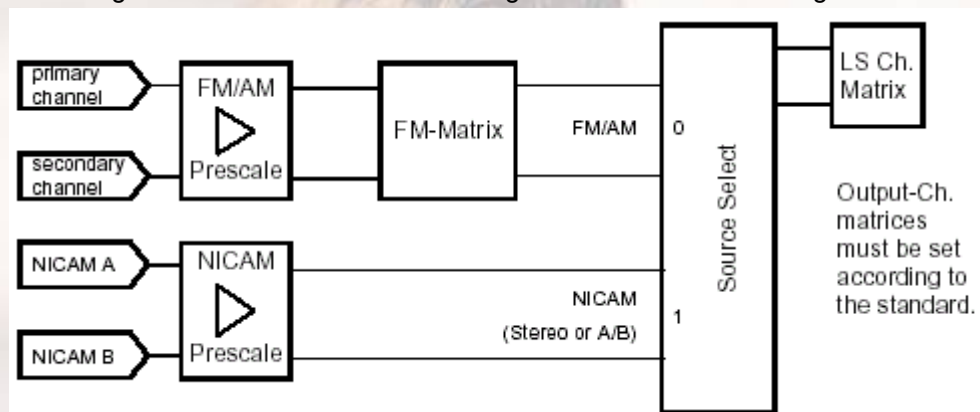


Fig.: Source channel assignment of demodulated signals in Automatic Sound Select Mode

1.2.5. Manual Mode

Below Fig. shows the source channel assignment of demodulated signals in case of manual mode.



1.3. Preprocessing for SCART and I²S Input Signals

The SCART and I²S inputs need only be adjusted in level by means of the SCART and I²S prescale registers.

1.4. Source Selection and Output Channel Matrix

The Source Selector makes it possible to distribute all source signals (one of the demodulator source channels or SCART) to the desired output channels (loudspeaker, etc.). All input and output signals can be processed simultaneously. Each source channel is identified by a unique source address.

For each output channel, the sound mode can be set to sound A, sound B, stereo, or mono by means of the output channel matrix. If Automatic Sound Select is on, the output channel matrix can stay fixed to stereo (transparent) for demodulated signals.

1.5. Audio Baseband Processing

1.5.1. Automatic Volume Correction (AVC)

Different sound sources (e.g. terrestrial channels, SAT channels, or SCART) fairly often do not have the same volume level. Advertisements during movies usually have a higher volume level than the movie itself. This results in annoying volume changes. The AVC solves this problem by equalizing the volume level. To prevent clipping, the AVC's gain decreases quickly in dynamic boost conditions. To suppress oscillation effects, the gain increases rather slowly for low level inputs. The decay time is programmable by means of the AVC register. For input signals ranging from -24 dB to 0 dB, the AVC maintains a fixed output level of -18 dB. Below Fig. shows the AVC output level versus its input level. For prescale and volume registers set to 0 dB, a level of 0 dB corresponds to full scale input/output. This is

- SCART input/output 0 dB = 2.0 V_{rms}
- Loudspeaker output 0 dB = 1.4 V_{rms}

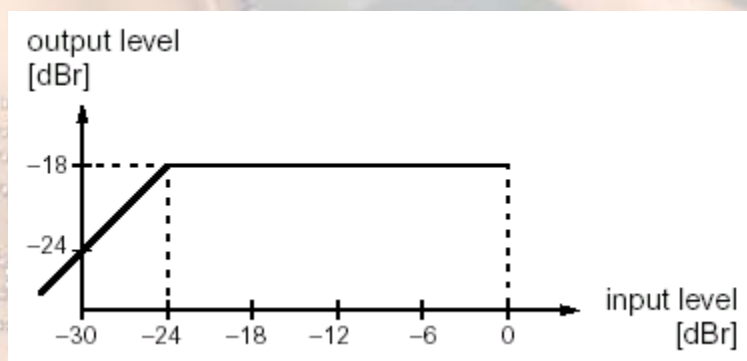
1.5.2. Loudspeaker Outputs

The following baseband features are implemented in the loudspeaker output channels: bass/treble, loudness, balance, and volume. A square wave beeper can be added to the loudspeaker channel.

1.5.3. Quasi-Peak Detector

The quasi-peak readout register can be used to readout the quasi-peak level of any input source. The feature is based on following filter time constants:

attack time: 1.3 ms



Simplified AVC characteristics

decay time: 37 ms

1.6. SCART Signal Routing

1.6.1. SCART DSP In and SCART Out Select

The SCART DSP Input Select and SCART Output Select blocks include full matrix switching facilities. To design a TV set with two pairs of SCART-inputs and one pair of SCART-outputs, no external switching hardware is required. The switches are controlled by the ACB user register.

1.6.2. Stand-by Mode

If the MSP 34x5G is switched off by first pulling STANDBYQ low and then (after >1 s delay) switching off DVSUP and AVSUP, but keeping AHVSUP

('Stand-by'-mode), the SCART switches maintain their position and function. This allows the copying from selected SCART-inputs to SCART-outputs in the TV set's stand-by mode.

In case of power on or starting from stand-by (switching on the DVSUP and AVSUP, RESETQ going high 2 ms later), all internal registers except the ACB register are reset to the default configuration. The reset position of the ACB register becomes active after the first I²C transmission into the Baseband Processing part. By transmitting the ACB register first, the reset state can be redefined.

■ Pin Connections and Short Descriptions

NC = not connected; leave vacant

LV = if not used, leave vacant

DVSS: if not used, connect to DVSS

X = obligatory; connect as described in circuit diagram

AHVSS: connect to AHVSS

No.	Pin Name	Pin No.	Type	Connection (if not used)	Short Description
1	TP	1		LV	Test pin
2	NC	2		LV	Not connected
3	D_CTR_I/O_1	3	IN/OUT	LV	D_CTR_I/O_1
4	D_CTR_I/O_0	4	IN/OUT	LV	D_CTR_I/O_0
5	ADR_SEL	5	IN	X	I ² C Bus address select
6	STANDBYQ	6	IN	X	Standby (low-active)
7	I2C_CL	7	IN/OUT	X	I ² C clock
8	I2C_DA	8	IN/OUT	X	I ² C data
9	I2C_CL	9		LV	I ² C clock
10	I2C_WS	10		LV	I ² C word strobe
11	I2C_DA_OUT	11		LV	I ² C data output
12	I2C_DA_IN1	12		LV	I ² C data input
13	ADR_DA	13		LV	ADR data output
14	ADR_WS	14		LV	ADR data strobe
15	ADR_CL	15		LV	ADR clock
16	DVSUP	16		X	Digital power supply +5V
17	DVSS	17		X	Digital ground
18	I2C_DA_IN2	18		LV	I ² C2-data input
19	NC	19		LV	Not connected
20	RESETQ	20	IN	X	Power-on-reset
21	NC	21		LV	Not connected
22	NC	22		LV	Not connected
23	VREF2	23		X	Reference ground 2 high-voltage part
24	DACM_R	24	OUT	LV	Loudspeaker out, right
25	DACM_L	25	OUT	LV	Loudspeaker out, left
26	NC	26		LV	Not connected
27	NC	27		LV	Not connected
28	NC	28		LV	Not connected

No.	Pin Name	Pin No.	Type	Connection (if not used)	Short Description
29	VREF1	29		X	Reference ground 1 high-voltage part
30	SC1_OUT_R	30	OUT	LV	SCART 1 output, right
31	SC1_OUT_L	31	OUT	LV	SCART 1 output, left
32	NC	32		LV	Not connected
33	AHVSUP	33		X	Analog power supply 8.0V
34	CAPL_M	34		X	Volume capacitor MAIN
35	AHVSS	35		X	Analog ground
36	AGNDC	36		X	Analog reference voltage high-voltage part
37	NC	37		LV	Not connected
38	NC	37		LV	Not connected
39	SC2_IN_L	39	IN	LV	SCART 2 input, left
40	SC2_IN_R	40	IN	LV	SCART 2 input, right
41	SC1_IN_L	41	IN	LV	SCART 1 input, left
42	SC1_IN_R	42	IN	LV	SCART 1 input, right
43	VREFTOP	43		X	Reference voltage IF A/D converter
44	MONO_IN	44	IN	LV	Mono input
45	AVSS	45		X	Analog ground
46	AVSUP	46		X	Analog power supply +5V
47	ANA_IN1+	47	IN	LV	IF input 1
48	ANA_IN-	48	IN	LV	IF common
49	NC	49		LV	Not connected
50	TESTEN	50	IN	X	Test pin
51	XTAL_IN	51	IN	X	Crystal oscillator
52	XTAL_OUT	52	OUT	X	Crystal oscillator

■ Pin Description

Pin 1, **TP** – Test pin

Pins 2, **NC** – Pins not connected

Pins 3, 4, **D_CTR_I/O_1/0** – Digital Control Input/Output Pins (Fig. 9)

General purpose input/output pins. Pin D_CTR_I/O_1 can be used as an interrupt request pin to the controller.

Pin 5, **ADR_SEL** – I²C Bus Address Select (Fig. 6)

By means of this pin, one of 3 device addresses for the MSP can be selected. The pin can be connected to ground (I²C device addresses 80/81hex), to +5V supply (84/85hex) or left open (88/89hex).

Pin 6, **STANDBYQ** – Standby

In normal operation, this pin must be high. If the MSP 3415G is switched off by first pulling STANDBYQ

low and then (after >1 μ s delay) switching off DVSUP and AVSUP, but keeping AHVSUP ('Standby'-mode), the SCART switches maintain their position and function.

Pin 7, **I2C_CL** – I²C Clock Input/Output (Fig. 8)

Via this pin the I²C bus clock signal has to be supplied. The signal can be pulled down by the MSP in case of wait conditions.

Pin 8, **I2C_DA** – I²C Data Input/Output (Fig. 8)

Via this pin the I²C bus data is written to or read from the MSP.

Pin 9, **I2S_CL** – I²S Clock Input/Output (Fig. 9)

Clock line for the I²S bus. In master mode, this line is driven by the MSP; in slave mode, an external I²S clock has to be supplied.

Pin 10, **I2S_WS** – I²S Word Strobe Input/Output

(Fig. 9)

Word strobe line for the I²S bus. In master mode, this line is driven by the MSP; in slave mode, an external I²S word strobe has to be supplied.

Pin 11, **I2S_DA_OUT** – I²S Data Output (Fig. 13)

Output of digital serial sound data of the MSP on the I²S bus.

Pin 12, **I2S_DA_IN1** – I²S Data Input 1 (Fig. 7)

First input of digital serial sound data to the MSP via the I²S bus.

Pin 13, **ADR_DA** – ADR Bus Data Output (Fig. 13)

Output of digital serial data to the DRP 3510A via the ADR bus.

Pin 14, **ADR_WS** – ADR Bus Word Strobe Output (Fig. 13)

Word strobe output for the ADR bus.

Pin 15, **ADR_CL** – ADR Bus Clock Output (Fig. 13)

Clock line for the ADR bus.

Pins 16, **DVSUP*** – Digital Supply Voltage

Power supply for the digital circuitry of the MSP. Must be connected to a +5-V power supply.

Pins 17, **DVSS*** – Digital Ground

Ground connection for the digital circuitry of the MSP

Pin 18, **I2S_DA_IN2** – I²S Data Input 2 (Fig. 7)

Second input of digital serial sound data to the MSP via the I²S bus.

Pins 19, **NC** – Pins not connected

Pin 20, **RESETQ** – Reset Input (Fig. 1)

In the steady state, high level is required. A low level resets the MSP 34x0G.

Pins 21, 22 **NC** – Pins not connected

Pin 23, **VREF2** – Reference Ground 2

Reference analog ground. This pin must be connected separately to ground (AHVSS). VREF2 serves as a MSP (except IF input).

clean ground and should be used as the reference for analog connections to the loudspeaker and headphone outputs.

Pins 24, 25, **DACM_R/L** – Loudspeaker Outputs (Fig. 11)

Output of the loudspeaker signal. A 1nF capacitor to AHVSS must be connected to these pins. The DC offset on these pins depends on the selected loudspeaker volume.

Pins 26, 27, 28, **NC** – Pins not connected

Pin 29, **VREF1** – Reference Ground 1 Reference analog ground. This pin must be connected separately to ground (AHVSS). VREF1 serves as a clean ground and should be used as the reference for analog connections to the SCART outputs.

Pins 30, 31, **SC1_OUT_R/L** – SCART1 Outputs (Fig. 12)

Output of the SCART1 signal. Connections to these pins must use a 100 ohm series resistor and are intended to be AC coupled.

Pin 32, **NC** – Pin not connected

Pin 33, **AHVSUP*** – Analog Power Supply High Voltage Power is supplied via this pin for the analog circuitry of the MSP (except IF input). This pin must be connected to the +8V supply.

Pin 34, **CAPLM** – Volume Capacitor Loudspeakers (Fig. 14)

A 10 μ F capacitor to AHVSUP must be connected to this pin. It serves as smoothing filter for loudspeaker volume changes in order to suppress audible plops. The value of the capacitor can be lowered to 1 μ F if faster response is required. The area encircled by the trace lines should be minimized, keep traces as short as possible. This input is sensitive for magnetic induction.

Pins 35, **AHVSS*** – Ground for Analog Power Supply High Voltage

Ground connection for the analog circuitry of the

Pins 36, **AGNDC** – Internal Analog Reference Voltage
This pin serves as the internal ground connection for the analog circuitry (except IF input). It must be connected to the VREF pins with a 3.3 μ F and a 100 nF capacitor in parallel. This pins shows a DC level of typically 3.73 V.

Pin 37, 38, **NC** – Pins not connected.

Pins 39, 40, **SC2_IN_L/R** – SCART2 Inputs (Fig. 4)

The analog input signal for SCART2 is fed to this pin. Analog input connection must be AC coupled.

Pins 41, 42, **SC1_IN_L/R** – SCART1 Inputs (Fig. 4)

The analog input signal for SCART1 is fed to this pin. Analog input connection must be AC coupled.

Pin 43, **VREFTOP** – Reference Voltage IF AD Converter (Fig. 5)

Via this pin, the reference voltage for the IF AD converter is decoupled. It must be connected to AVSS pins with a 10 μ F and a 100nF capacitor in parallel. Traces must be kept short.

Pin 44, **MONO_IN** – Mono Input (Fig. 4)

The analog mono input signal is fed to this pin. Analog input connection must be AC coupled.

Pins 45, **AVSS*** – Ground for Analog Power Supply Voltage

Ground connection for the analog IF input circuitry of the MSP.

Pins 46, **AVSUP*** – Analog Power Supply Voltage Power is supplied via this pin for the analog IF input circuitry of the MSP. This pin must be connected to the +5 V supply.

Pin 47, **ANA_IN1+** – IF Input 1 (Fig. 5)

The analog sound if signal is supplied to this pin. Inputs must be AC coupled. This pin is designed as symmetrical input: ANA_IN1+ is internally connected to one input of a symmetrical op amp, ANA_IN. to the other.

Pin 48, **ANA_IN.** – IF Common (Fig. 5)

This pin serves as a common reference for ANA_IN1/2+ inputs.

Pin 49, **NC** – Pin not connected

Pin 50, **TESTEN** – Test Enable Pin (Fig. 2)

This pin enables factory test modes. For normal operation it must be connected to ground.

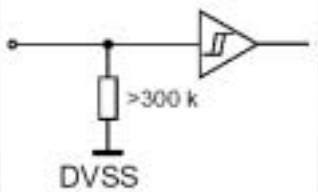
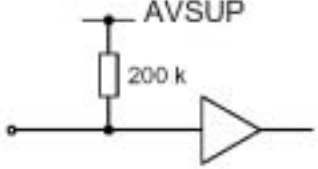
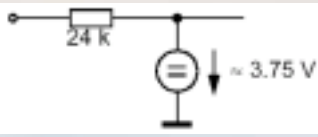
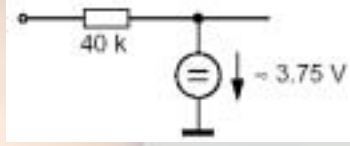
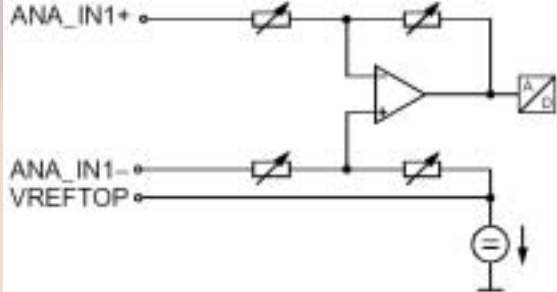
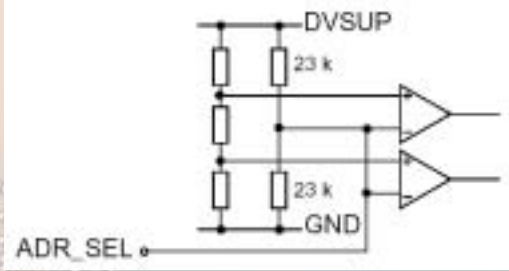
Pins 51, 52, **XTAL_IN XTAL_OUT** – Crystal Input and Output Pins (Fig. 10)

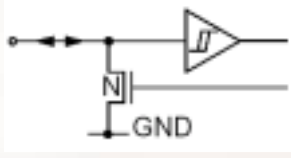
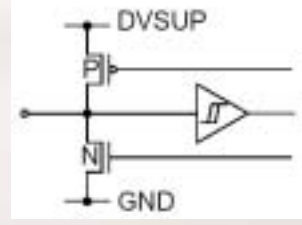
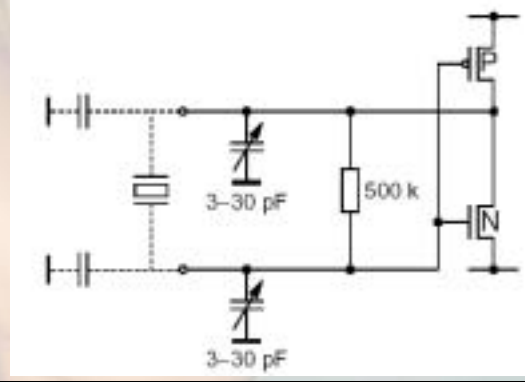
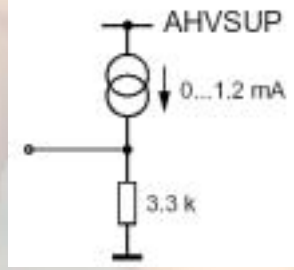
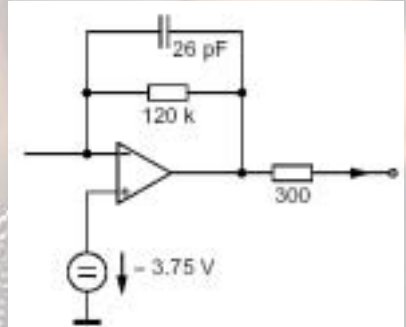
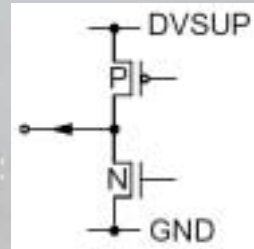
These pins are connected to an 18.432 MHz crystal oscillator which is digitally tuned by integrated shunt capacitances. An external clock can be fed into XTAL_IN. The audio clock output signal AUD_CL_OUT is derived from the oscillator. External capacitors at each crystal pin to ground (AVSS) are required. It should be verified by layout, that no supply current for the digital circuitry is flowing through the ground connection point.

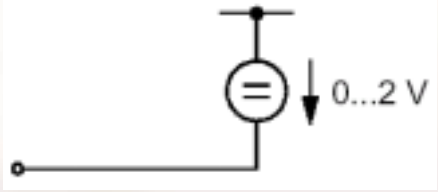
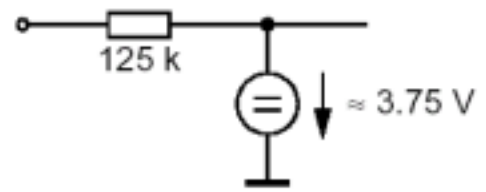
* Application Note:

All ground pins should be connected to one low-Resistive ground plane. All supply pins should be connected separately with short and low-resistive lines to the power supply. Decoupling capacitors from DVSUP to DVSS, AVSUP to AVSS, and AHVSUP to AHVSS are recommended as closely as possible to these pins. Decoupling of DVSUP and DVSS is most important. We recommend using more than one capacitor. By choosing different values, the frequency range of active decoupling can be extended. In our application boards we use: 220 pF, 470 pF, 1.5 nF, and 10 μ F. The capacitor with the lowest value should be placed nearest to the DVSUP and DVSS pins.

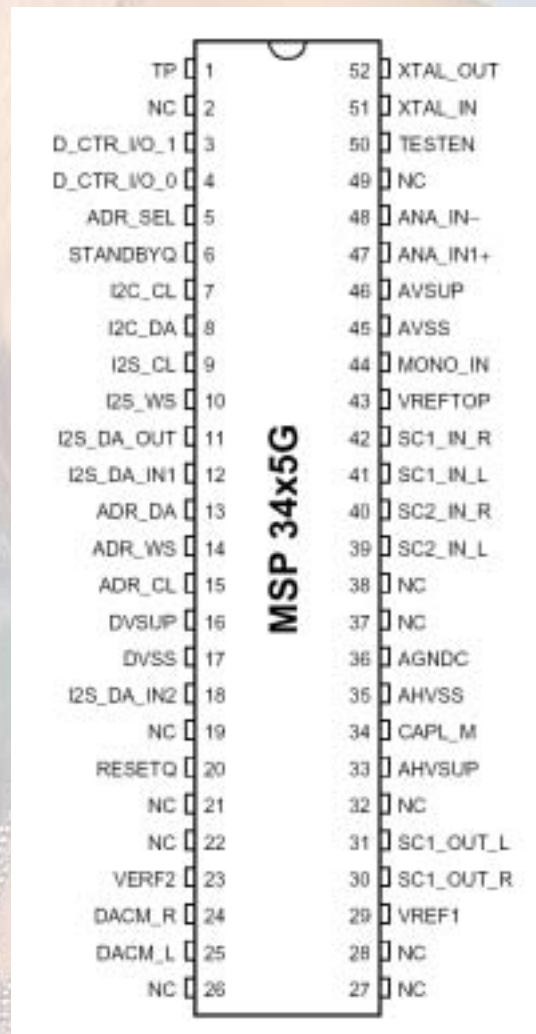
■ Pin Circuits

Pin No.	Pin Name	Type	Pin Circuit
20	RESETQ	Input Pin	Fig. 1 
50	TESTEN	Input Pin	Fig. 2 
44	MONO_IN	Input Pin	Fig. 3 
39 40 41 42	SC2_IN_L SC2_IN_R SC1_IN_L SC1_IN_R	Input Pin	Fig. 4 
43 47 48	VREFTOP ANA_IN1+ ANA_IN.	Input Pin	Fig. 5 
5	ADR_SEL	Input Pin	Fig. 6 
12 18 6	I2S_DA_IN1 I2S_DA_IN2 STANDBYQ	Input Pin	Fig. 7 

Pin No.	Pin Name	Type	Pin Circuit
7 8	I2C_CL I2C_DA	Input/Output Pin	Fig. 8 
9 10 3 4	I2S_CL I2S_WS D_CTR_I/O_1 D_CTR_I/O_0	Input/Output Pin	Fig. 9 
51 52	XTAL_IN XTAL_OUT	Input/Output Pin	Fig. 10 
24 25	DACM_R DACM_L	Output Pin	Fig. 11 
30 31	SC1_OUT_R SC1_OUT_L	Output Pin	Fig. 12 
11 13 14 15	I2S_DA_OUT ADR_DA ADR_WS ADR_CL	Output Pin	Fig. 13 

Pin No.	Pin Name	Type	Pin Circuit
34	CAPL_M	Capacitor Pin	Fig. 14 
36	AGNDC	Pin	Fig. 15 

■ Pin Configuration



7. VCT3831A Video/Controller/Teletext IC

■ Introduction

The VCT 3831A is a high-quality singlechip TV processors. Modular design and a submicron technology allow the economic integration of features in all classes of TV sets. VCT 3831A contains the entire video, display and deflection processing for 4:3 and 16:9 50/60-Hz TV sets. The integrated microcontroller is supported by a powerful OSD generator with integrated teletext acquisition which can be upgraded with onchip page memory. With volume control and audio input select the basic audio features for mono TV sets are integrated.

■ Features

1. Video Features

- four composite video inputs, two S-VHS inputs
- analog YCrCb input
- composite video monitor
- multistandard color decoder (1 crystal)
- multistandard sync decoder
- black-line detector
- adaptive 2H comb filter Y/C separator
- horizontal scaling (0.25 to 4)
- Panoramavision
- black-level expander
- dynamic peaking
- soft limiter (gamma correction)
- color transient improvement
- programmable RGB matrix
- analog RGB/Fastblank input
- half-contrast switch
- picture frame generator
- scan velocity modulation output
- high-performance H/V deflection
- angle and bow correction
- separate ADC for tube measurements
- EHT compensation

2. Microcontroller Features

- 8-bit, 10-MHz CPU (65C02)
- 96 kB program ROM on chip
- 1 kB program RAM on chip
- memory banking
- 16-input, 16-level interrupt controller
- patch modul for 10 ROM locations
- two 16-bit reloadable timers
- capture compare modul
- watchdog timer
- 14-bit PWM for voltage synthesis
- four 8-bit PWMs
- 10-bit ADC with 15:1 input MUX

- I2C bus master interface
- 24 programmable I/O ports

3. OSD Features

- 3 kB OSD RAM on chip
- WST level 1.5 compliant
- WST level 2 parallel attributes
- 32 foreground/background colors
- programmable color look-up table
- 1024 mask programmable characters
- 24 national languages
(Latin, Cyrillic, Greek, Arabic, Farsi, Hebrew)
- character matrix 8x8, 8x10, 8x13, 10x8, 10x10, 10x13
- vertical soft scroll
- 4-color mode for user font

4. Teletext Features

- four programmable video inputs
- acquisition is independent from display part
- adaptive data slicer
- signal quality detection
- WST, PDC, VPS, and WSS acquisition
- high-level command language
- EPG, FLOF, and TOP support
- 10 pages memory on chip
- up to 500 pages with external SRAM

5. Audio Features

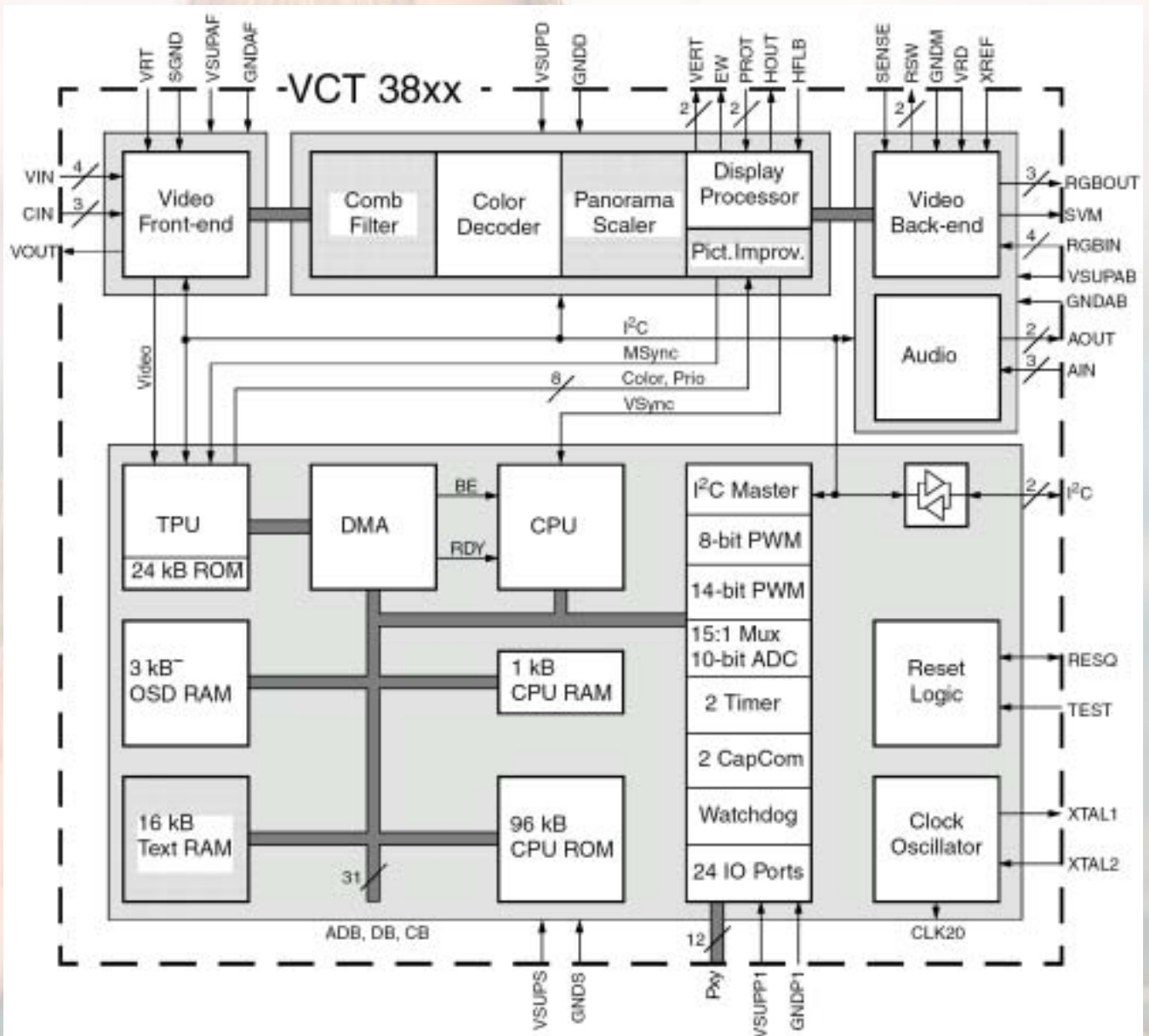
- three mono inputs
- two mono outputs
- programmable channel select
- volume control for one mono channel

6. General Features

- submicron CMOS technology
- low-power standby mode
- single 20.25-MHz crystal
- 64-pin PSDIP package
- 128-pin PMQFP package
- emulator chip for software development

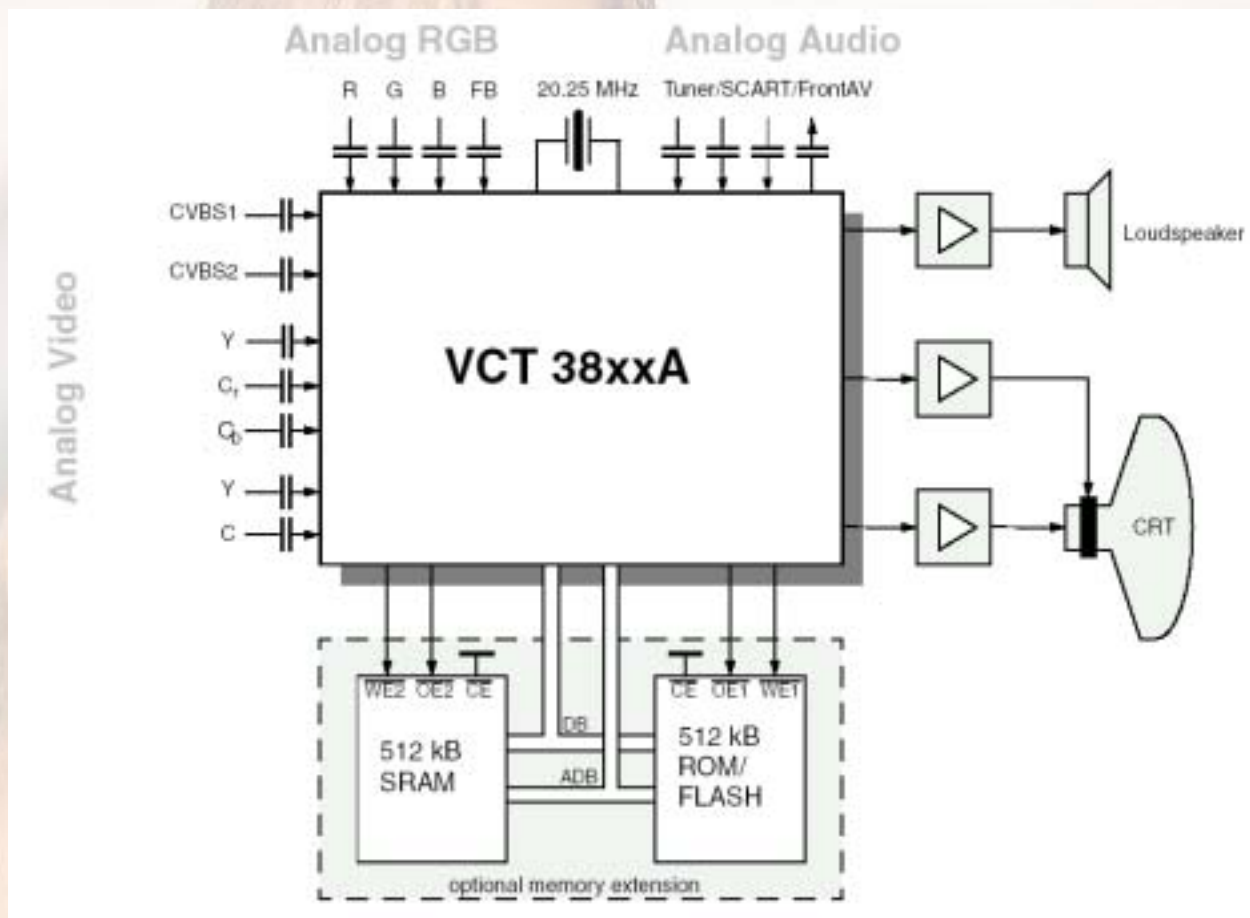
■ Chip Architecture

Fig.: Block diagram of the VCT 3831A (shaded blocks are optional)



■ System Application

Fig. : Single-chip TV with VCT 3831A



■ Pin Connections and Short Descriptions

NC = not connected

LV = if not used, leave vacant

X = obligatory; connect as described in circuit diagram

IN = Input

OUT = Output

SUPPLY = Supply

No.	Pin Name	Pin No.	Type	Connection (if not used)	Short Description
1	P17	1	IN/OUT	LV	Port 1, Bit 7
2	P16	2	IN/OUT	LV	Port 1, Bit 6
3	VSUP _{P1}	3	SUPPLY	X	Supply Voltage, Port 1
4	GND _{P1}	4	SUPPLY	X	Ground, Port 1
5	P15	5	IN/OUT	LV	Port 1, Bit 5
6	P14	6	IN/OUT	LV	Port 1, Bit 4
7	P13	7	IN/OUT	LV	Port 1, Bit 3
8	P12	8	IN/OUT	LV	Port 1, Bit 2
9	P11	9	IN/OUT	LV	Port 1, Bit 1
10	P10	10	IN/OUT	LV	Port 1, Bit 0
11	VOUT	11	OUT	LV	Analog Video Output
12	VRT	12	IN	X	Reference Voltage Top, Video ADC
13	SGND	13	IN	GND _{AF}	Signal Ground for Analog Input
14	GND _{AF}	14	SUPPLY	X	Ground, Analog Front-end
15	VSUP _{AF}	15	SUPPLY	X	Supply Voltage, Analog Front-end
16	CBIN	16	IN	VRT	Analog Component Cb Input
17	CIN1	17	IN	VRT	Analog Chroma 1 Input
18	CIN2/CRIN	18	IN	VRT	Analog Chroma 2 Input/ Analog Component Cr Input
19	VIN1	19	IN	VRT	Analog Video 1 Input
20	VIN2	20	IN	VRT	Analog Video 2 Input
21	VIN3	21	IN	VRT	Analog Video 3 Input
22	VIN4	22	IN	VRT	Analog Video 4 Input
23	TEST	23	IN	GND _S	Test Pin, reserved for Test
24	HOUT	24	OUT	X	Horizontal Drive Output
25	VSUP _D	25	SUPPLY	X	Supply Voltage, Digital Circuitry
26	GND _D	26	SUPPLY	X	Ground, Digital Circuitry
27	FBLIN	27	IN	GND _{AB}	Fast Blank Input
28	RIN	28	IN	GND _{AB}	Analog Red Input
29	GIN	29	IN	GND _{AB}	Analog Green Input
30	BIN	30	IN	GND _{AB}	Analog Blue Input
31	VPROT	31	IN	GND _D	Vertical Protection Input
32	SAFETY	32	IN	GND _D	Safety Input
33	HFLB	33	IN	HOUT	Horizontal Flyback Input
34	VERTQ	34	OUT	LV	Differential Vertical Sawtooth Output
35	VERT	35	OUT	LV	Differential Vertical Sawtooth Output
36	EW	36	OUT	LV	Vertical Parabola Output
37	SENSE	37	IN	GND _{AB}	Sense ADC Input
38	GNDM	38	SUPPLY	X	Ground, MADC Input
39	RSW1	39	OUT	LV	Range Switch 1 for Measurement ADC
40	RSW2	40	OUT	LV	Range Switch 2 for Measurement ADC
41	SVMOUT	41	OUT	VSUP _{AB}	Scan Velocity Modulation Output
42	ROUT	42	OUT	VSUP _{AB}	Analog Red Output
43	GOUT	43	OUT	VSUP _{AB}	Analog Red Output
44	BOUT	44	OUT	VSUP _{AB}	Analog Blue Output
45	VSUP _{AB}	45	SUPPLY	X	Supply Voltage, Analog Back-end
46	GND _{AB}	46	SUPPLY	X	Ground, Analog Back-end
47	VRD	47	IN	X	DAC Reference
48	XREF	48	IN	X	Reference Input for RGB DACs
49	AIN3	49	IN	GND _S	Analog Audio 3Input
50	AIN2	50	IN	GND _S	Analog Audio 2Input

No.	Pin Name	Pin No.	Type	Connection (if not used)	Short Description
51	AIN1	51	IN	GND _S	Analog Audio 1 Input
52	AOUT2	52	OUT	LV	Analog Audio 2 Input
53	AOUT1 ₁	53	OUT	LV	Analog Audio 2 Input
54	VSUP _S	54	SUPPLY	X	Supply Voltage, Standby
55	GND _S	55	SUPPLY	X	Ground, Standby
56	XTAL1	56	IN	X	Analog Crystal Input
57	XTAL2	57	OUT	X	Analog Crystal Output
58	RESQ	58	IN/OUT	X	Reset Input/Output, Active Low
59	SCL	59	IN/OUT	X	I ² C Bus Clock
60	SDA	60	IN/OUT	X	I ² C Bus Data
61	P23	61	IN/OUT	LV	Port2, Bit 3
62	P22	62	IN/OUT	LV	Port2, Bit 2
63	P21	63	IN/OUT	LV	Port2, Bit 1
64	P20	64	IN/OUT	LV	Port2, Bit 0

■ Pin Descriptions

Pin 1,2,5-10, **P10.P17** . I/O Port (Fig.1)

These pins provide CPU controlled I/O ports.

Pin 3, **VSUPP1*** . Supply Voltage, Port 1 Driver

This pin is used as supply for the I/O port 1 driver.

Pin 4, **GNDP1*** . Ground, Port 1 Driver

This is the ground reference for the I/O port 1 driver.

Pin 11, **VOUT** . Analog Video Output (Fig. 2)

The analog video signal that is selected for the main (luma, CVBS) adc is output at this pin. An emitter follower is required at this pin.

Pin 12, **VRT** . Reference Voltage Top (Fig.3)

Via this pin, the reference voltage for the A/D converters is decoupled. The pin is connected with 10 F/47 nF to the Signal Ground Pin.

Pin 13, **SGND** . Signal GND for Analog Input

This is the high quality ground reference for the video input signals.

Pin 14, **GNDAF*** . Ground, Analog Front-end

This pin has to be connected to the analog ground. No supply current for the digital stages should flow through this line.

Pin 15, **VSUPAF*** . Supply Voltage, Analog Front-end

This pin has to be connected to the analog supply

voltage. No supply current for the digital stages should flow through this line.

Pin 16,18, **CBIN CRIN** . Analog Chroma Component Input (Fig. 5)

These pins are used as the chroma component (CB, CR) inputs required for the analog YUV Interface. The input signal must be AC-coupled. The CRIN pin can alternatively be used as the second SVHS chroma input (CIN2).

Pin 17,18, **CIN1 CIN2** . Analog Chroma Input (Fig. 4)

These are the analog chroma inputs. A S-VHS chroma signal is converted using the chroma (Video 2) AD converter. A resistive divider is used to bias the input signal to the middle of the converter input range. The input signal must be AC-coupled. The CIN2 pin can alternatively be used as the chroma component (CR) input required for the analog YUV Interface.

Pins 19,22, **VIN1-4** . Analog Video Input (Fig. 6)

These are the analog video inputs. A CVBS or S-VHS luma signal is converted using the luma (Video 1) AD converter. The input signal must be AC-coupled.

Pin 23, **TEST** . Test Input (Fig. 7)

This pin enables factory test modes. For normal

operation, it must be connected to ground.

Pin 24, **HOUT** . Horizontal Drive Output (Fig. 8)

This open drain output supplies the drive pulse for the horizontal output stage. The polarity and gating with the flyback pulse are selectable by software.

Pin 25, **VSUPD*** . Supply Voltage, Digital Circuitry

Pin 26, **GNDD*** . Ground, Digital Circuitry

This is the ground reference for the digital circuitry.

Pin 27, **FBLIN** . Fast Blank Input (Fig. 9)

These pins are used to switch the RGB outputs to the external analog RGB inputs. The active level (low or high) can be selected by software.

Pin 28,29,30, **RIN GIN BIN** . Analog RGB Input (Fig. 10)

These pins are used to insert an external analog RGB signal, e.g. from a SCART connector which can be switched to the analog RGB outputs with the fast blank signal. The analog back-end provides separate brightness and contrast settings for the external analog RGB signals.

Pin 31, **VPROT** . Vertical Protection Input (Fig. 11)

The vertical protection circuitry prevents the picture tube from burn-in in the event of a malfunction of the vertical deflection stage. During vertical blanking, a signal level of 2.5V is sensed. If a negative edge cannot be detected, the RGB output signals are blanked.

Pin 32, **SAFETY** . Safety Input (Fig. 11)

This is a three-level input. Low level means normal function. At the medium level RGB output signals are blanked. At high level RGB output signals are blanked and horizontal drive is shut off.

Pin 33, **HFLB** . Horizontal Flyback Input (Fig. 11)

Via this pin the horizontal flyback pulse is supplied to the VCT 38xxA.

Pin 34, **VERTQ** . Inverted Vertical Sawtooth Output (Fig.12)

This pin supplies the inverted signal of VERT. Together

with the VERT pin it can be used to drive symmetrical deflection amplifiers. The drive signal is generated with 15-bit precision. The analog voltage is generated by a 4 bit current-DAC with external resistor and uses digital noise shaping. Alternatively this pin supplies the interlace information, the polarity is programmable.

Pin 35, **VERT** . Vertical Sawtooth Output (Fig. 12)

This pin supplies the drive signal for the vertical output stage. The drive signal is generated with 15-bit precision. The analog voltage is generated by a 4 bit current-DAC with external resistor and uses digital noise shaping.

Pin 36, **EW** . East-West Parabola Output (Fig. 13)

This pin supplies the parabola signal for the East-West correction. The drive signal is generated with 15 bit precision. The analog voltage is generated by a 4 bit current-DAC with external resistor and uses digital noise shaping.

Pin 37, **SENSE** . Measurement ADC Input (Fig. 14)

This is the input of the analog to digital converter for the picture and tube measurement. Three measurement ranges are selectable with RSW1 and RSW2.

Pin 38, **GNDM** . Measurement ADC Reference Input

This is the ground reference for the measurement A/D converter. Connect this pin to GNDAB

Pin 39, 40, **RSW1, RSW2** . Range Switch for Measuring ADC (Fig. 15)

These pins are open drain pulldown outputs. RSW1 is switched off during cutoff and whitedrive measurement. RSW2 is switched off during cutoff measurement only.

Pin 41, **SVMOUT** . Scan Velocity Modulation Output (Fig. 16)

This output delivers the analog SVM signal. The D/A converter is a current sink like the RGB D/A converters. At zero signal the output current is 50% of the maximum output current.

Pin 42, 43, 44, **ROUT GOUT BOUT** . Analog RGB

Output (Fig. 16)

These pins are the analog Red/Green/Blue outputs of the back-end. The outputs are current sinks.

Pin 45, **VSUPAB*** . Supply Voltage, Analog Back-end

This pin has to be connected to the analog supply voltage. No supply current for the digital stages should flow through this line.

Pin 46, **GNDAB*** . Ground, Analog Back-end

This pin has to be connected to the analog ground. No supply current for the digital stages should flow through this line.

Pin 47, **VRD** . DAC Reference Decoupling (Fig. 17)

Via this pin the DAC reference voltage is decoupled by an external capacitor. The DAC output currents depend on this voltage, therefore a pulldown transistor can be used to shut off all beam currents. A decoupling capacitor of 4.7 μ F in parallel to 100 nF (low inductance) is required.

Pin 48, **XREF** . DAC Current Reference (Fig. 17)

External reference resistor for DAC output currents, typical 10 k. to adjust the output current of the D/A converters. (see recommended operating conditions). This resistor has to be connected to analog ground as closely as possible to the pin.

Pin 49, 50, 51, **AIN1.3** . Analog Audio Input (Fig. 18)

The analog input signal from TUNER or SCART is fed to this pin. The input signal must be AC-coupled. Alternatively these pins can be used as digital I/O ports (Fig. 18').

Pin 52,53, **AOUT1 AOUT2** . Analog Audio Output (Fig. 19)

These pins are the analog audio outputs. Connections to these pins must use a 680 ohm series resistor as closely as possible to these pins. The output signals are intended to be AC coupled. Alternatively these pins can be used as digital I/O ports (Fig. 18').

Pin 54, **VSUPS*** . Supply Voltage, Standby

Pin 55, **GNDS*** . Ground, Standby

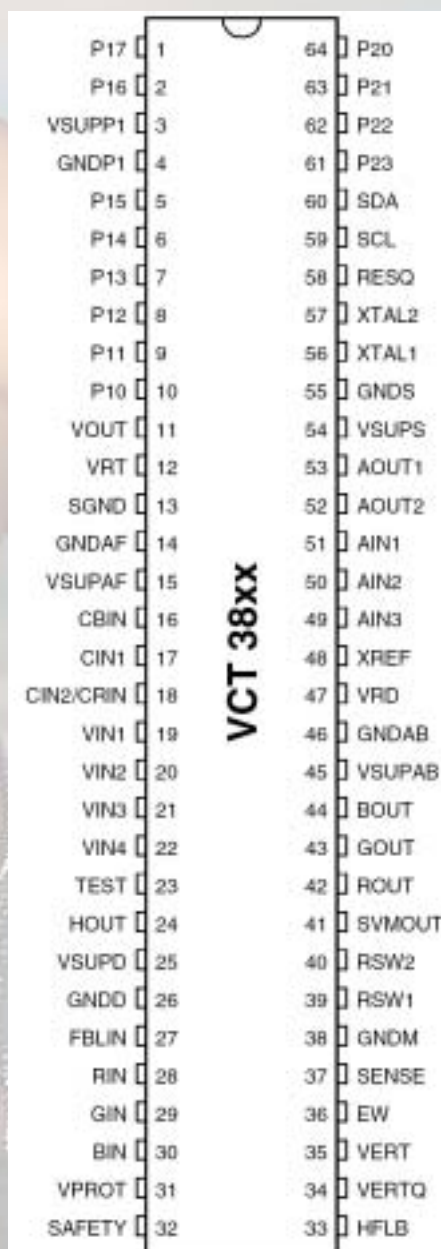
This is the ground reference for the standby circuitry.

Pins 56 and 57, **XTAL1** Crystal Input and **XTAL2** Crystal Output (Fig. 20)

These pins are connected to an 20.25 MHz crystal oscillator which is digitally tuned by integrated shunt capacitances. The CLK20 clock signal is derived from this oscillator.

Pin 58, **RESQ** . Reset Input/Output (Fig. 21)

A low level on this pin resets the VCT 38xxA. The internal CPU can pull down this pin to reset external devices connected to this pin.



Pin 59, **SCL** . I2C Bus Clock

(Fig. 21)

This pin connects to the I2C bus clock line.

The signal can be pulled down by external slave ICs to slow down data transfer.

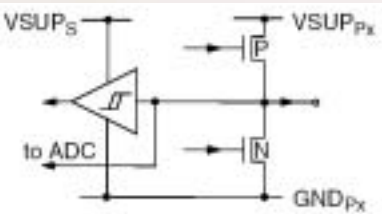
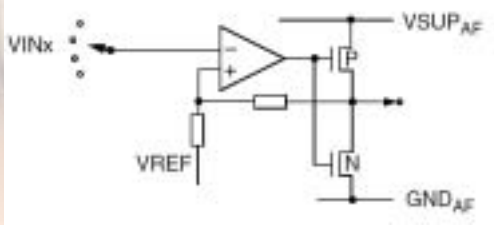
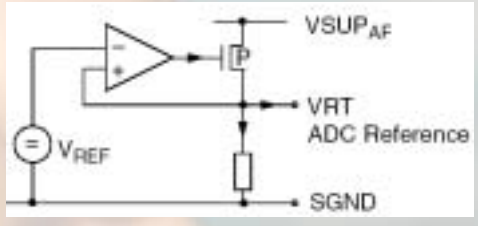
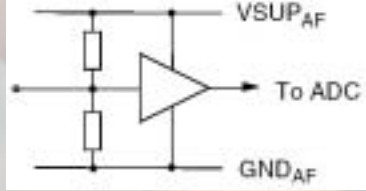
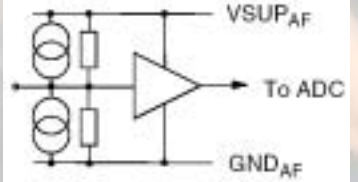
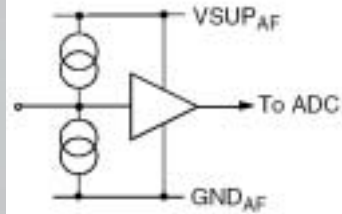
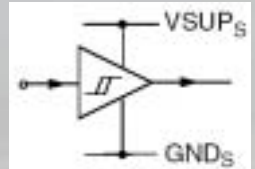
Pin 60, **SDA** . I2C Bus Data (Fig. 21)

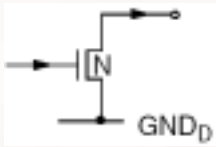
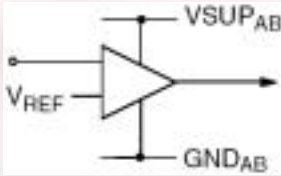
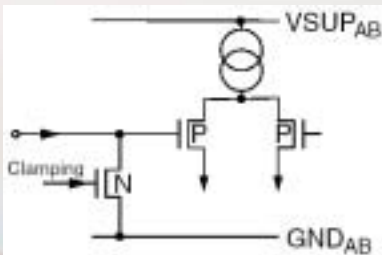
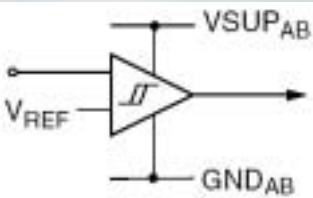
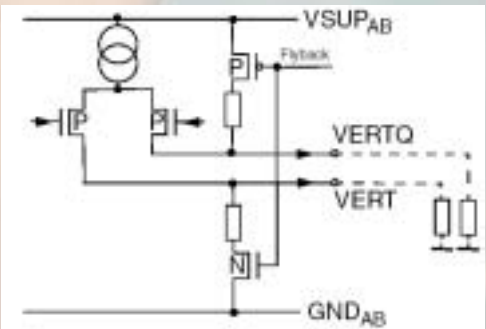
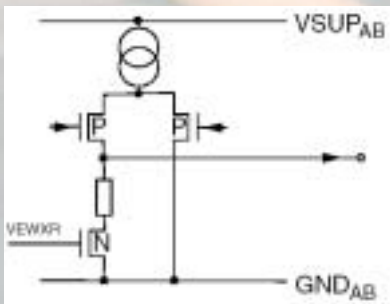
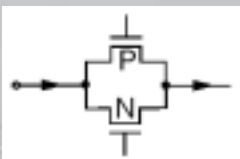
This pin connects to the I2C bus data line.

Pin 61.64, **P20.P23** . I/O Port (Fig. 1)

These pins provide CPU controlled I/O ports.

■ Pin Circuits

Pin No.	Pin Name	Type	Pin Circuit
1 2 5-10 61-64	P10-P17 P20-P27	Input/Output Pin	Fig. 1 
11	VOUT	Output Pin	Fig. 2 
12 13	VRT SGND	Supply Pin	Fig. 3 
17 18	CIN1 CIN2	Input Pin	Fig. 4 
16 18	CBIN CRIN	Input Pin	Fig. 5 
19 20 21 22	VIN1 VIN2 VIN3 VIN4	Input Pin	Fig. 6 
23	TEST	Input Pin	Fig. 7 

Pin No.	Pin Name	Type	Pin Circuit
24	HOUT	Output Pin	Fig. 8 
27	FBLIN	Input Pin	Fig. 9 
28 29 30	RIN GIN BIN	Input Pin	Fig. 10 
31 32 33	VPROT SAFETY HFLB	Input Pin	Fig. 11 
34 35	VERTQ VERT	Output Pin	Fig. 12 
36	EW	Output Pin	Fig. 13 
37	SENSE	Input Pin	Fig. 14 

Pin No.	Pin Name	Type	Pin Circuit
39 40	RSW1 RSW2	Output Pin	Fig. 15
41 42 43 44	SVMOUT ROUT GOUT BOUT	Output Pin	Fig. 16
47 48	VRD XREF	Supply Pin	Fig. 17
49 50 51	AIN3 AIN2 AIN1	Input Pin	Fig. 18 Fig. 18'
52 53	AOUT 2 AOUT1	Output Pin	Fig. 19
56 57	XTAL1 XTAL2	Input/Output Pin	Fig. 20
58 59 60	RESQ SCL SDA	Input/Output Pin	Fig. 21

PART V. Adjusting Description**1.VCT383X+TCL M35&36 Chassis software adjustment specification****(M36 SAMPLING MODEL:2959M2 M35 SAMPLING MODEL:2118M1)****1) Adjustment of B+ Voltage**

1. Apply 180~240V to main power input, and Philips Standard Testing Pattern to RF input;
2. Adjust VR830 in STANDARD mode until voltage (B+) is 140V $\pm$ 0.5V(M36), [112V $\pm$ 0.5V(M35)]

2) Adjustment of AFT

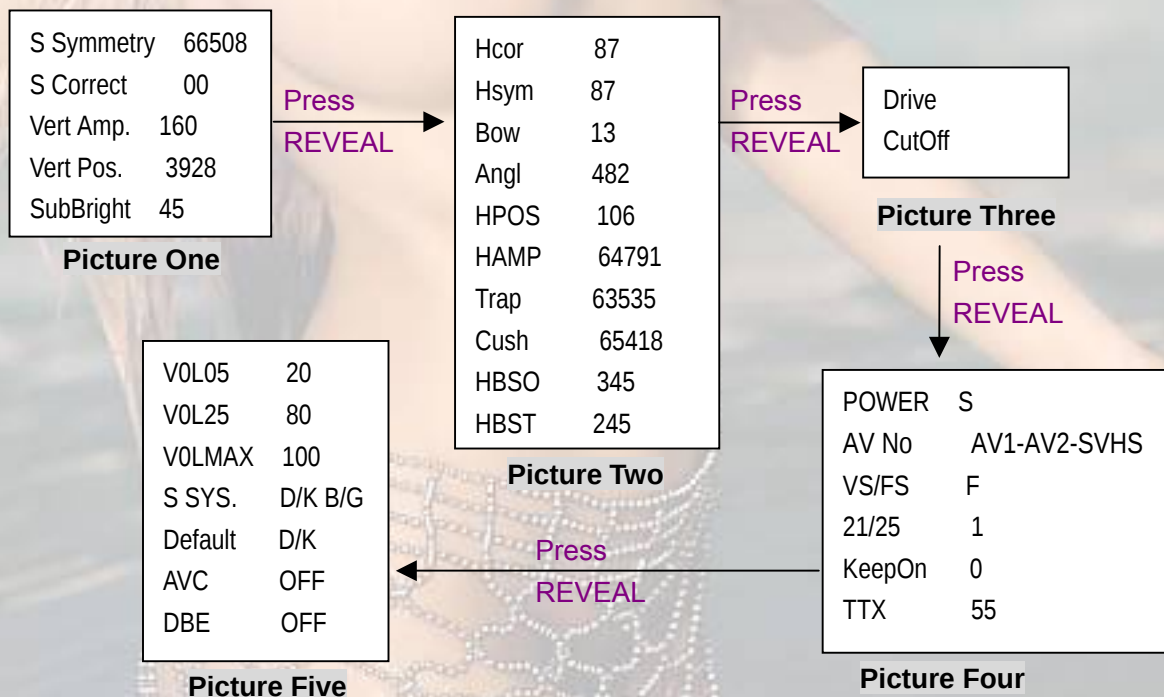
1. Disconnect IF of tuner;
2. Apply a 38.9MHz gray scale & color bar signal to the IF input via C110 by PM5418 TDS color TV Pattern generator;
3. Monitor the DC Voltage at Pin2 of IC101;
4. Adjust T101 until the voltage at Pin2 of IC101 becomes 2.5V;
5. It means AFT adjusted well when add/reduce 0.1MHz, <2.5V> the voltage at Pin2 of IC101 is changed obviously.

3) Adjustment of AGC

1. Connect IF of Tuner and IC101;
2. Apply a 60dB gray scale & color bar signal TV signal from Tuner;
3. Adjust VR102 to the exactly point that the noise waked up.

4) Adjustment of Screen Voltage

1. Enter the Factory Mode;
2. Press [CAPS] key, then press [REVEAL] key in three seconds, "Picture One" will display in screen*:

*** Key P-, P+: Choose the Item****Key V-, V+: Change/adjust the Value/Mode, or Enter into the Submenu****Key REVEAL: Choose the Picture****Key OK: Save and Quit Factory Mode**

3. Enter into **Cutoff** in "Picture Three", press [P-] to Cathode Current (G2) mode menu;
4. Press [PIC] key and then adjust Screen Voltage of FBT until the screen will become a horizontal line.

5) Adjustment of Vertical Parameter

1. Apply a PAL cross & hatch pattern;
2. Enter into "Picture One", adjust the parameters to make the picture in best status;
3. The best status means that the 2nd dark bar(from dark to bright) of 8 level gray scales just can be seen.

6) Adjustment of Horizontal Parameter

1. Adjust PAL status

- a. Apply a Philips Test Pattern / a PAL cross & hatch pattern;
- b. Enter into "Picture Two", adjust the following items to make the picture in best status.

Hcor Hsym Bow Angl HAMP Trap Cush

- c. Enter into "Picture Two", adjust the following items to make the picture in best status.

HPOS

- ❑ Apply RGB color bar pattern by 54200 Pattern generator via SCART COIL;
- ❑ Enter into **HPOS** in "Picture Two";
- ❑ Press [V+]/[V-] to adjust the RGB and CVBS position to make the halftone picture overlap the screen picture.;
- ❑ Press [P+] into RGB hor.pos.
- ❑ Press [V+]/[V-] to make picture in best position.
- ❑ Press [OK] to save and quit.

- d. Enter into "Picture Two", adjust the following items to make the picture in best status.

HBSO HBST

[ANNT: HBSO 345 <Horizon Blank Stop> HBST 245 <Horizon Blank Start>

Please apply a Blue Signal to adjust these two items. But generally it is unnecessary to adjust.]

2. Adjust NTSC status

- a. Apply a Philips Test Pattern / a NTSC cross & hatch pattern;
- b. Repeat Step a. b. c. d. to adjust NTSC status.

7) Factory Manu Setting

1. Press [CAPS] key, then press [REVEAL] key Enter into "Picture Four"

The item in "Picture Four"		Detail Description
POWER	S	O: Skip Standby when Power On
		S: Standby On when Power On
AV No	AV1-AV2-SVHS	AV1-AV2
		SCART-AV2
		SCART-AV2-SVHS
		SCART
		AV1-AV2-SVHS
VS/FS	F	V: VS TUNER
		F: FS TUNER
21/25	1	1: 21" and below 21"
		5: 25" and above 25"
KeepOn	0	0: Blue Background when no signal, and auto standby if no signal in 15 minutes
		1: Noise Background

TTX	55	55 70 6 48 40	Choose different area/countries (the code please see appendix)
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Appendix Teletext Selection

6	38	40	55	70
English	Polish	English	English	English
French	French	French	French	Slovakian
Swedish	Swedish	Swedish	Swedish	Hungarian
Czech	Czech	Czech	Turkish	Serbian
German	German	German	German	Albanian
Spanish	Serbian	Spanish	Spanish	Polish
Italian	Italian	Italian	Italian	Turkish
Estonian	Estonian	Estonian	Estonian	Rumanian

2. Sound Adjustment

a. Enter into "Picture Five";

b.

VOL01	55(min10)	}	Adjust Sound Curve (Base on standard or customers' requirement)
VOL25	98		
VOLMAX	118(max127)		
S SYS.	D/K B/G	→	D/K I ; B/G I ; D/K B/G; *
Default	D/K	→	D/K;I; B/G;I ; D/K;B/G;
AVC	OFF	→	On : Auto Volume Control ON Off : Auto Volume Control OFF
DBE	OFF **		

Picture Five

Remark: * Sound System is auto and unnecessary to setup, when there is MSP 3415G(3465G) IC.

** Only for MSP3463

Adjustment of White Balance.

a. Enter into "Picture Three";

b.

Drive →	Drive ref:	128(H)	128(G)	128(B)
	Controlled:	800	800	800
	Measured:	128	128	128
CutOff →	Cutoff ref:	128(H)	128(G)	128(B)
	Controlled:	130	130	130
	Measured:	128	128	128

Picture Three

8) Others

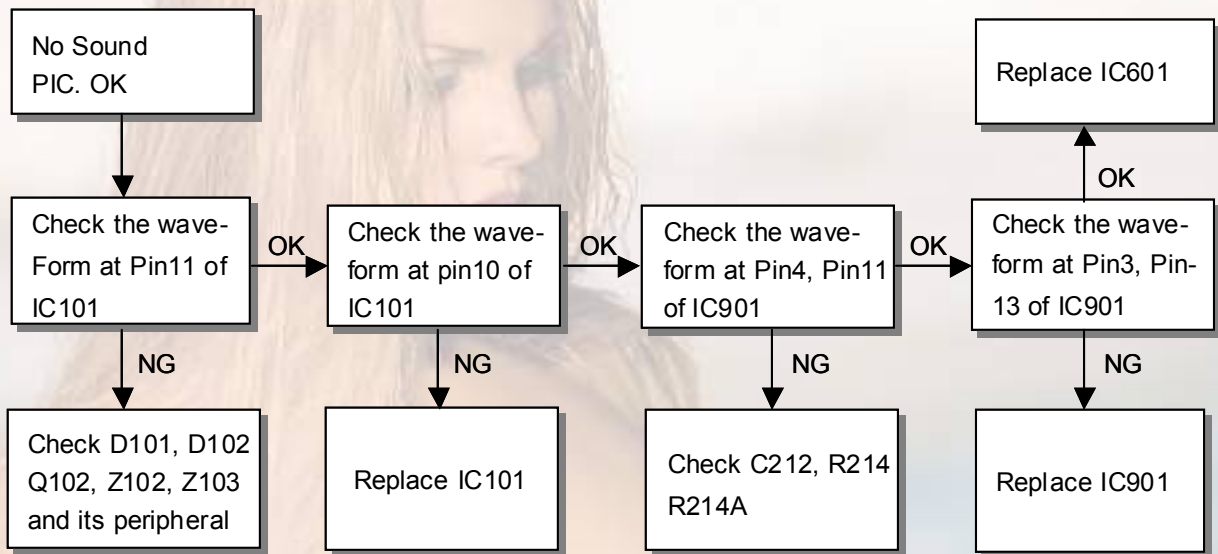
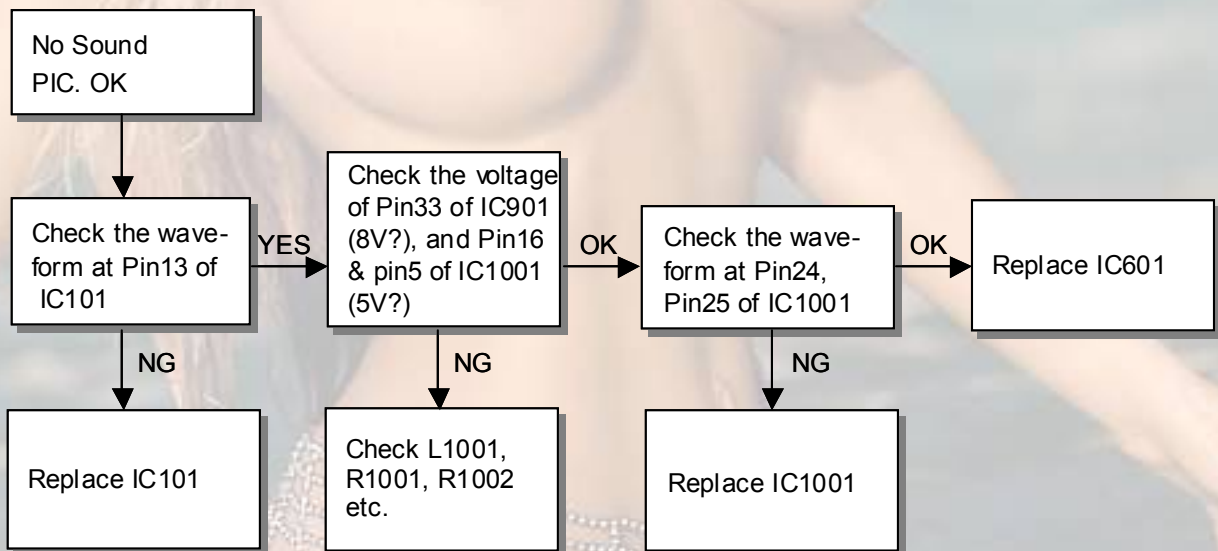
1. Adjustment of Anode Current

a. Enter into **S Symmetry** in "Picture One"b. Press [P+] to choose **NVM**

- c. Press [V-] to make the Address=184
- d. Press [Color sys (-)] or [Display (+)] to adjust the Data.
Initial data=60
- 2. Adjustment of Deleting Anode Voltage
 - a. Enter into **S Symmetry** in "Picture One";
 - b. Press [P+] to choose **NVM**
 - c. Press [V-] to make the Address=492
 - d. Press [Color sys (-)] or [Display (+)] to adjust the Data.
Initial data=200
- C. Adjustment of OSD brightness
 - a. Enter into **S Symmetry** in "Picture One" ;
 - b. Press [P+] to choose **NVM**;
 - c. Press [V-] to make the Address=209
 - d. Press [Color sys (-)] or [Display (+)] to adjust the Data.
- D. Adjustment of OSD transparent;
 - a. Enter into **S Symmetry** in "Picture One";
 - b. Press [P+] to choose **NVM**;
 - c. Press [V-] to make the Address=14;
 - d. Press [Color sys (-)] or [Display (+)] to adjust the Data.
But generally it is unnecessary to adjust the item.

PART VI. Troubleshooting

(Fig.1&2 only for M35, Fig.3 only for M36, the others is common)

Flow chart**Fig.1 No Sound, PIC OK (If hasn't MSP)****Fig.2 No Sound, PIC OK (If has MSP)**

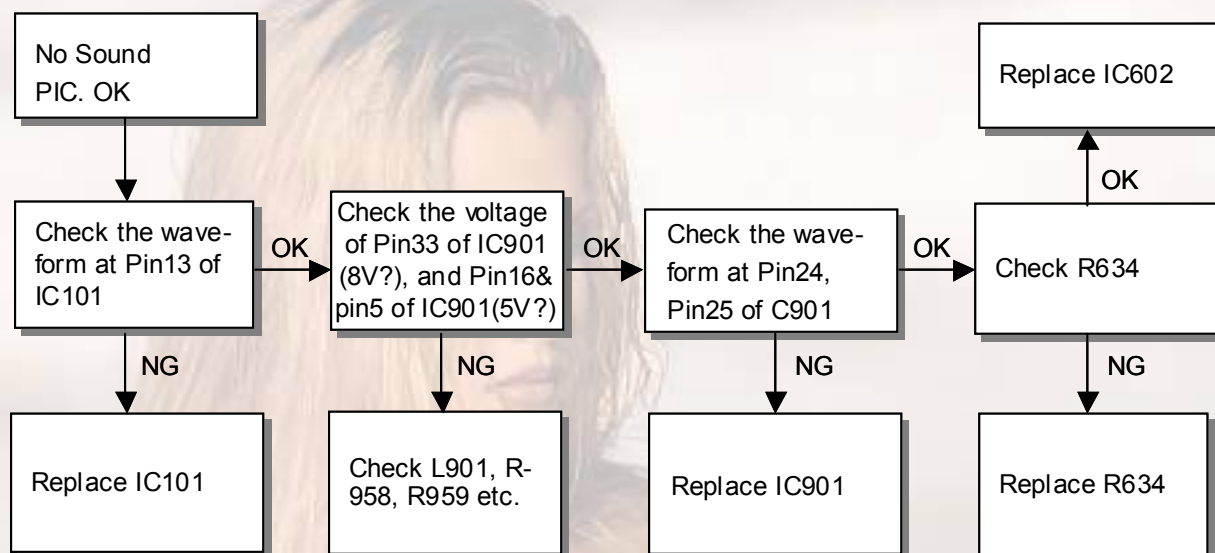


Fig.3 No Sound, PIC OK

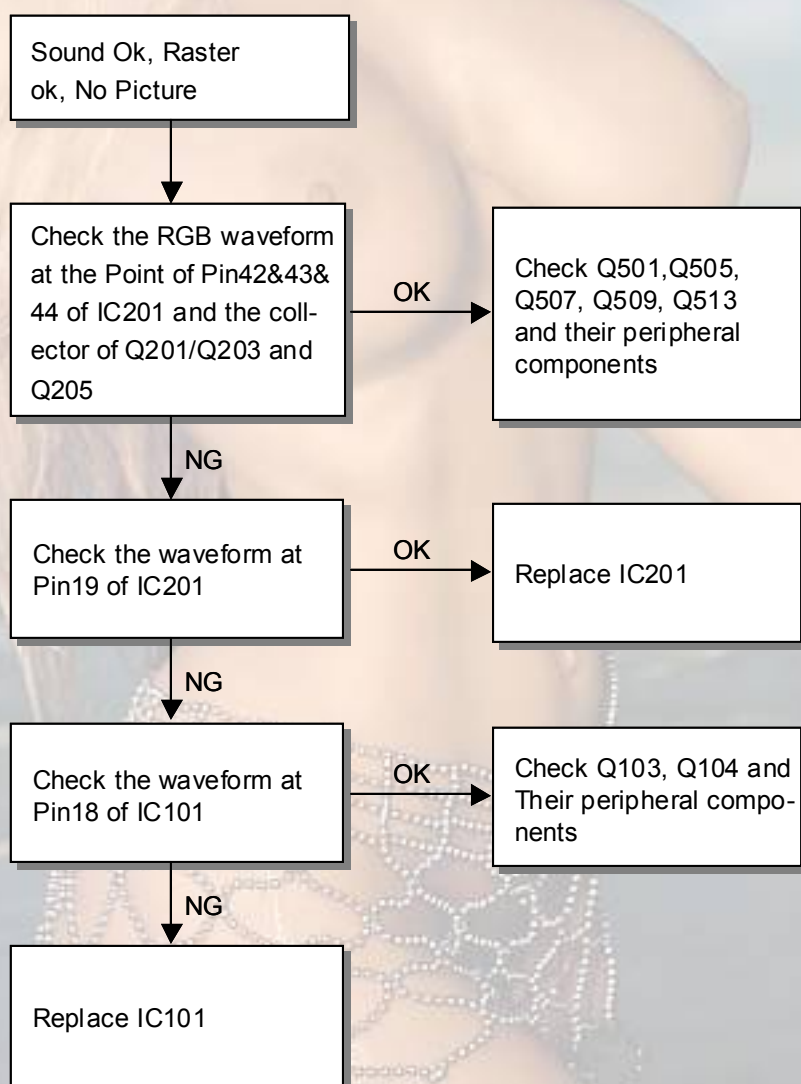
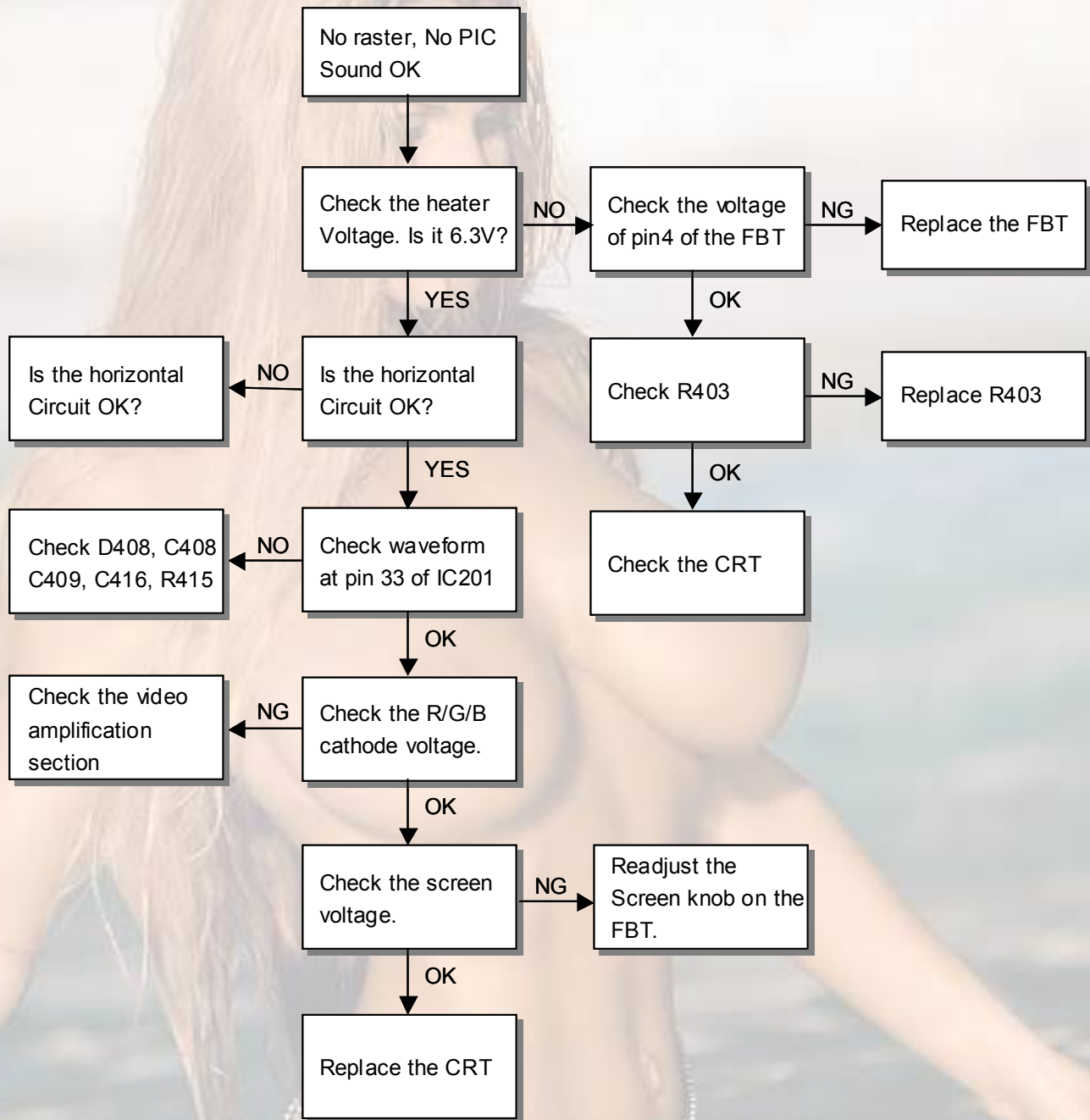
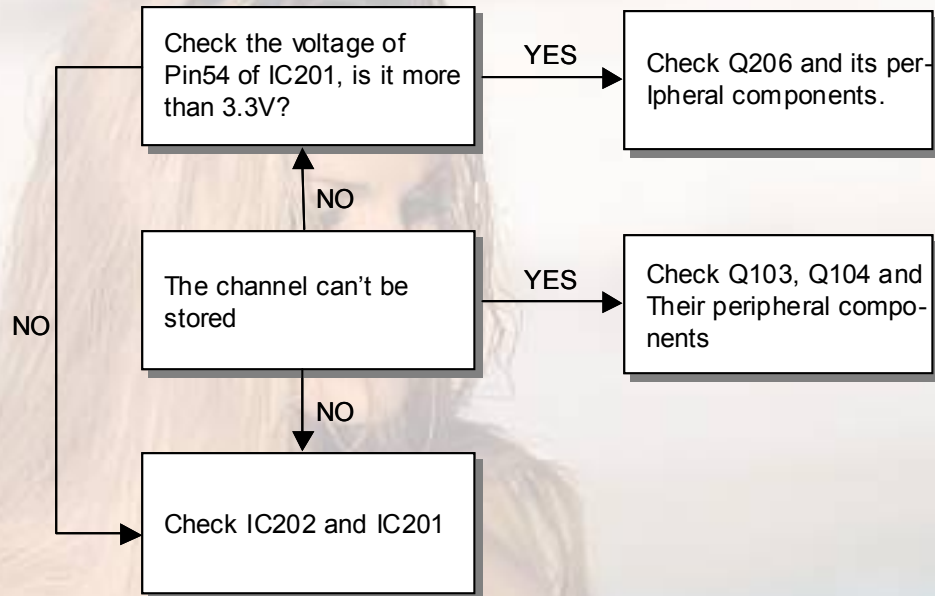
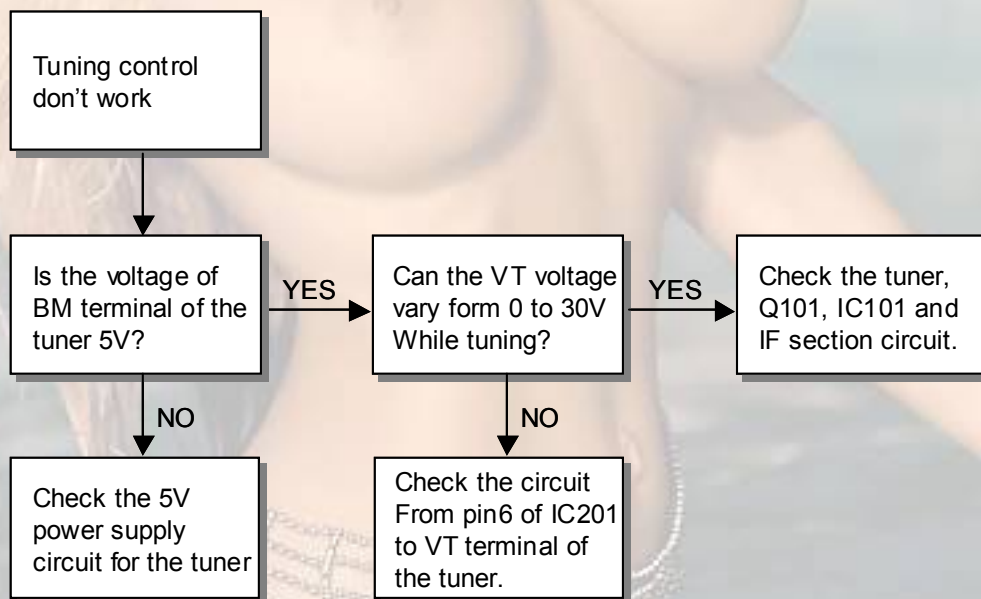


Fig.4 Sound OK, Raster OK, No Picture

**Fig.5 No raster, no picture, sound OK**

**Fig.6 The channel can't be stored****Fig.7 Tuning control don't work**

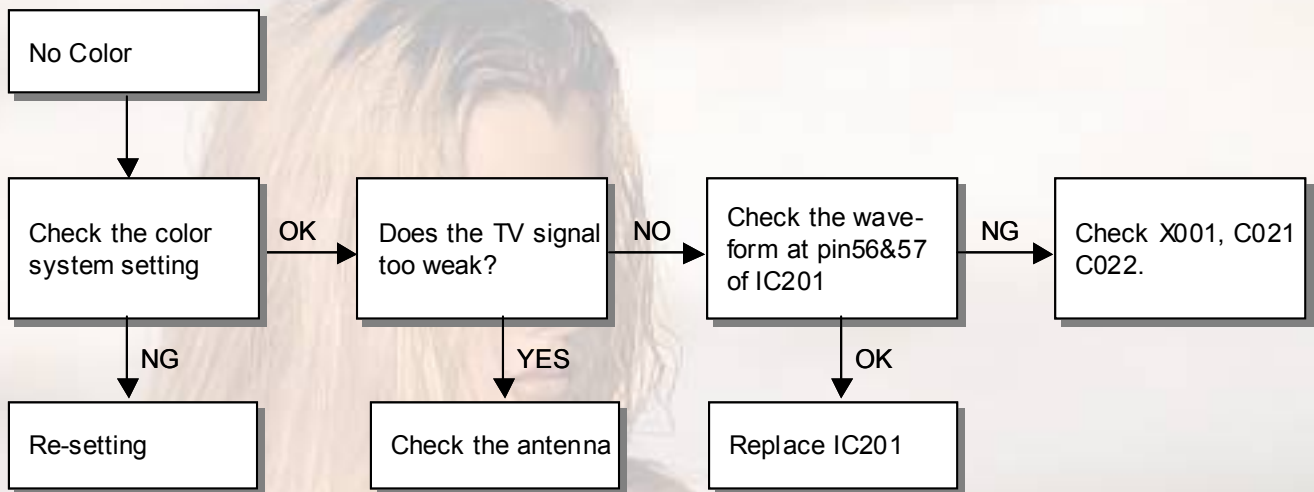


Fig.8 No color

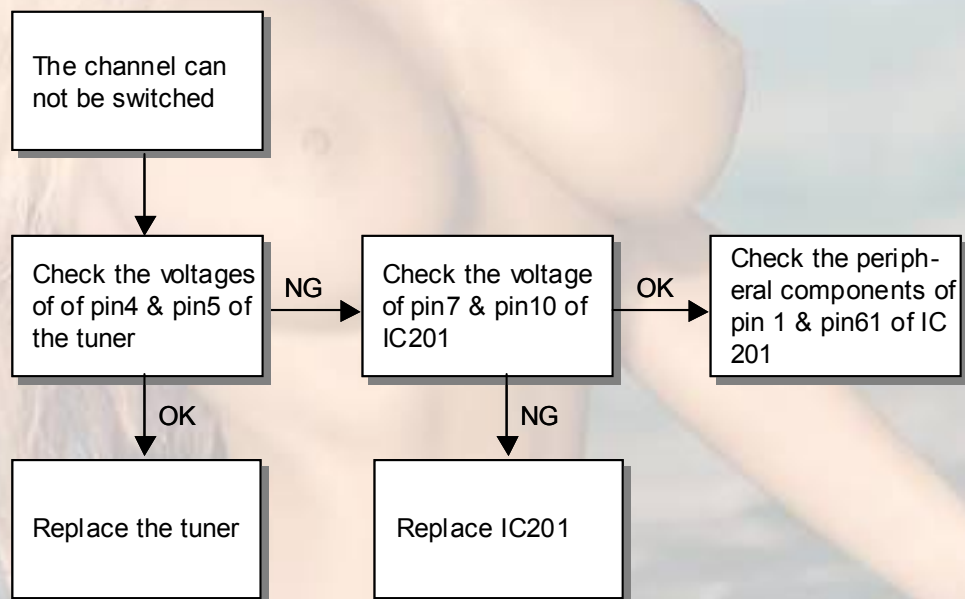
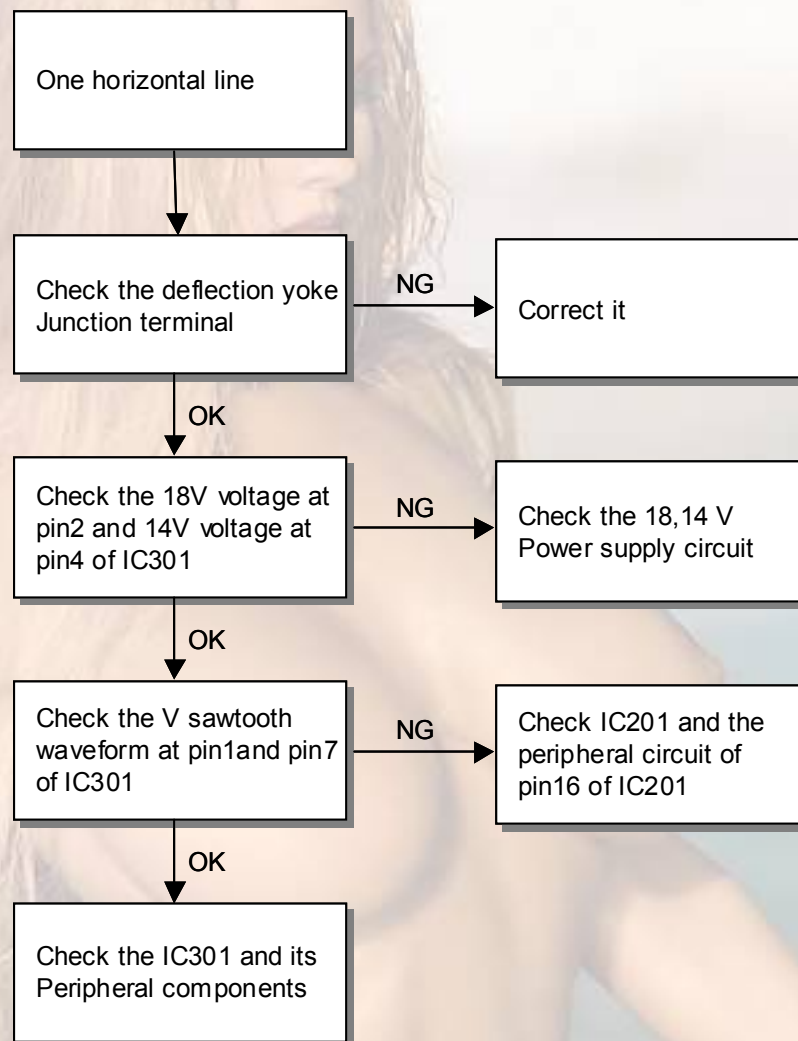
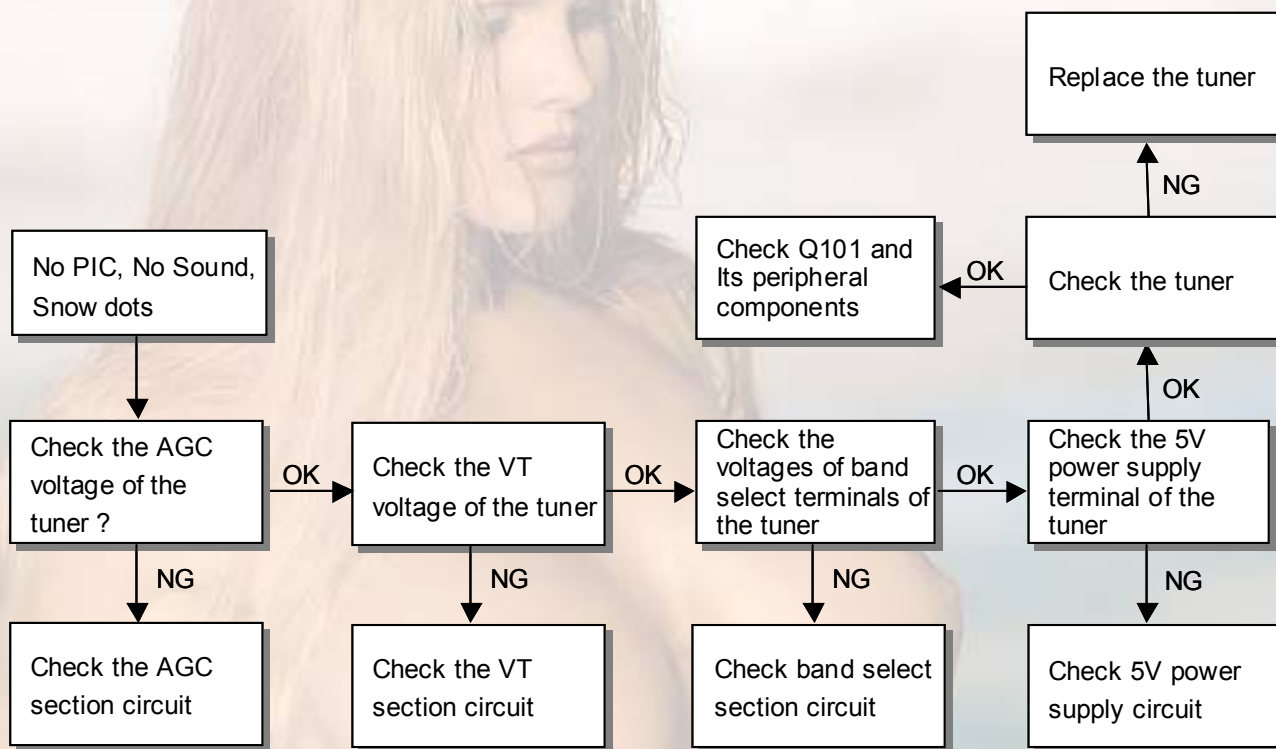


Fig.9 The channel can not be switched

**Fig.10 One horizontal line**

**Fig.11 No picture, no sound, snow dots**

PART VII. (1) SPARE PARTS LIST OF M35 (ONLY FOR YOUR REFERENCE)

Item No.	Description	QTY	Position	Remarks
08-2118M1-CRN	ASS'Y - CRT BD	1		
10-0BAV21-ABX	DIODE BAV21 (SW)	1	D501	
10-0BAV21-ABX	DIODE BAV21 (SW)	1	D502	
10-0BAV21-ABX	DIODE BAV21 (SW)	1	D503	
10-0BAV21-ABX	DIODE BAV21 (SW)	1	D504	
10-0BAV21-ABX	DIODE BAV21 (SW)	1	D505	
10-0BAV21-ABX	DIODE BAV21 (SW)	1	D506	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D507	
11-0BF422-0BX	TRANSISTOR BF422 (NPN)	1	Q507	
11-0BF422-0BX	TRANSISTOR BF422 (NPN)	1	Q503	
11-0BF422-0BX	TRANSISTOR BF422 (NPN)	1	Q506	
11-0BF422-0BX	TRANSISTOR BF422 (NPN)	1	Q502	
11-0BF422-0BX	TRANSISTOR BF422 (NPN)	1	Q510	
11-0BF422-0BX	TRANSISTOR BF422 (NPN)	1	Q511	
11-0BF423-0BX	TRANSISTOR BF423 (PNP)	1	Q504	
11-0BF423-0BX	TRANSISTOR BF423 (PNP)	1	Q508	
11-0BF423-0BX	TRANSISTOR BF423 (PNP)	1	Q512	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q501	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q505	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q509	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q513	
18-CB0222-JNX	RES. C.F. 2.2k OHM 1/6W +/-5%	1	R501	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R506	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R507	
18-CB0222-JNX	RES. C.F. 2.2k OHM 1/6W +/-5%	1	R511	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R516	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R518	
18-CB0222-JNX	RES. C.F. 2.2k OHM 1/6W +/-5%	1	R521	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R526	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R528	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R504	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R514	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R524	
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R509	
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R519	
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R529	
18-CB0270-JNX	RES. C.F. 27 OHM 1/6W +/-5%	1	R534	
18-CB0391-JNX	RES. C.F. 390 OHM 1/6W +/-5%	1	R533	
18-CB0332-JNX	RES. C.F. 3.3k OHM 1/6W +/-5%	1	R502	
18-CB0332-JNX	RES. C.F. 3.3k OHM 1/6W +/-5%	1	R512	
18-CB0332-JNX	RES. C.F. 3.3k OHM 1/6W +/-5%	1	R522	
18-CE0154-JNX	RES. C.F. 150k OHM 1/2W +/-5%	1	R531	
18-FE0102-JNX	RES. M.O. 1K OHM 1/2W +/-5%	1	R510	
18-FE0102-JNX	RES. M.O. 1K OHM 1/2W +/-5%	1	R520	
18-FE0102-JNX	RES. M.O. 1K OHM 1/2W +/-5%	1	R530	
18-FF0104-JGX	RES. M.O. 100K OHM 1W +/-5%	1	R503	
18-FF0104-JGX	RES. M.O. 100K OHM 1W +/-5%	1	R513	
18-FF0104-JGX	RES. M.O. 100K OHM 1W +/-5%	1	R523	
18-FG0183-JHX	RES. M.O. 18K OHM 2W +/-5%	1	R505	
18-FG0183-JHX	RES. M.O. 18K OHM 2W +/-5%	1	R515	
18-FG0183-JHX	RES. M.O. 18K OHM 2W +/-5%	1	R525	
26-AIC102-KB1	CAP. CER 1000 PF 500V +/-10% B	1	C501	
26-AIC102-KB1	CAP. CER 1000 PF 500V +/-10% B	1	C502	
26-AIC102-KB1	CAP. CER 1000 PF 500V +/-10% B	1	C503	
26-AMK102-KRX	CAP. CER 1000 pF 2KV +/-10% R	1	C508	
27-AGQ104-J0X	CAP. M.PP 0.1 UF 250V +/-5%	1	C507	
34-R100K2-1BX	COIL CHOKE 10 UH +/-10%	1	L501	
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	L502	

41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J503	
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J501	
46-10967W-01X	PIN BASE *1 TJC1-1A	1	P504	FOR CRT GROUND HOUS.
46-30615H-04X	HS 4P24 460 F/W TJC3-4Y/SCN-4	1	P502	FOR M.BD S402
46-37031H-06X	HS 6P 2468#24 500 TJC3-6Y/SCN	1	P501	FOR S201
27-PBC103-J0X	CAP. P.E. 0.01UF 63V +/-5%	1	C510	
26-ABC150-JZX	CAP. CER 15 PF 50V +/-5% SL	1	C512	
18-CB0751-JNX	RES. C.F. 750 OHM 1/6W +/-5%	1	R532	
26-ABC509-CZX	CAP. CER 5 PF 50V +/-0.25 SL	1	C511	
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	L505	
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	L506	
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	L507	
25-BCB470-M1X	CAP. ELEC 47 UF 16V +/-20%	1	C505	
47-CRT004-XX0	CRT SOCKET GZS10-2-108	1	P503	
40-000036-CRE	P.C.B. CRT BD	1		
35-139730-00X	FERR. BEAD BF60	2		FOR C515
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C515	
08-2118M1-FCN	ASS'Y - FRONT CABINET	1		
02-GND021-XX0	ASS'Y - CRT GND WIRE&HOUSE	1		
42-51208E-XX0	SPEAKER 50MMX120MM 8 OHM 6W	1	W601	
42-51208E-XX0	SPEAKER 50MMX120MM 8 OHM 6W	1	W602	
44-210FLS-SZ1A	CRT A51KQK99X01 (AFSA)	1	CRT01	
46-13902H-02X	HS 2P 2468#22 360 S11-2Y/7mm	1	P601H	FOR M.BD
46-27688H-04X	HS 4P A/B 400/13 RBGW TJC1/4Y	1	P401H	FOR D.Y COIL
46-35196H-02X	HS 2P22 570/7 TJC3-2Y	1	P602H	FOR M.BD
54-113970-0U0	PVC TUBE #5 L=ROLL	0.32		FOR SPK HOUSING
54-205140-000	SPACER CRT MOUNTING T=2MM	4		MTG CRT & F.CAB
54-205140-000	SPACER CRT MOUNTING T=2MM	2		FOR CRT & FRONT CAB.
54-205140-000	SPACER CRT MOUNTING T=2MM	4		
54-314740-0X0	CRT FIBRE SHEET (22mmX22mmX0.8mm)	8		
54-347230-000	SPONGE (3MMX3MMX280MM)	2		STICK ON SPK
55-2118FP-EHA9B	FRONT PANEL	1		
56-2118FB-EHA9A	FUCNTION BUTTON	1		
56-2118LE-0HCAA	LENS	1		
56-2118PK-0HA9A	POWER KNOB	1		
58-344790-5UI9C	INLAY SIDE AV	1		
59-130460-00X	RUBBER PAD (25mmX7mm)	2		STICK ON F.CAB. (FOOTING)
59-130460-00X	RUBBER PAD (25mmX7mm)	2		FOR CRT & FRONT CAB.
59-312160-000	SPEAKER RUBBER CUSHION	8		MTG SPK
59-377680-000	RUBBER PAD (22X22X5mm)	2		
62-10654X-00F	UNI-TIE (2.5mmX95mm)	4		
62-216340-0UA	HOLDER POWER CORD	1		
62-312090-0HA	ADAPTER-POWER KNOB (NEW PCB)	1		
63-H60250-OB4	S/T SCREW H 6 X 25	4		MTG CRT & F.CAB
63-W30080-AB4	S/T SCREW W 3 X 8 AB	2		MTG SIDE AV BD & FRONT CAB.
63-W30100-AB4	S/T SCREW W 3 X 10 AB	3		MTG PUSH BUTTON & FRONT CAB.
63-W30140-HS4	S/T SCREW W 3 X 14 HS	8		MTG SPK & F.CAB
65-A60200-20E	WASHER 6 X 20 X 2MM	4		MTG CRT
67-126680-0E0	SPRING CRT 6MMX40MMX0.5MM	1		
67-249700-0E0	SPRING PWR KNOB	1		
36-DEG210-BX3	DEGAUSSING COIL 2500mm	1		
55-2118FC-1CA9A	FRONT CABINET	1		
63-W26080-BF4	S/T SCREW W 2.6 X 8 BF	1		MTG LENS & FRONT PANEL
08-2118M1-MAN	ASS'Y - MAIN BD	1		
07-389VI5-NX4	TUNER UV1355-BK2(BG/HB/IEC/5V	1	TU101	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D202	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D203	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D204	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D205	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D206	

10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D212
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D213
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D303
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D601
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D406
11-SC2482-0BX	TRANSISTOR 2SC2482	1	Q401
11-2N3904-0BX	TRANSISTOR 2N3904 (NPN)	1	Q210
11-IRR001-1X0	IR RECEIVER MODULE HS0038A2	1	IR001
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q201
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q203
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q204
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q205
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q207
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q904
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q905
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q104
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q103
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q202
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q206
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q208
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q601
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q903
11-SC3779-DBX	TRANSISTOR 2SC3779D (RF AMPL)	1	Q101
13-0AT24C-16P	IC EEPROM 16K AT24C16	1	IC001
13-0TDA81-72S	IC TDA8172	1	IC301
13-M52760-SPP	IC M52760SP	1	IC101
13-TDA705-7AS	IC TDA7057AQ (R/L AUDIO O/P)	1	IC601
14-LED05R-XX1	LED RED FB205	1	D001A
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R203
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R207
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R208
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R233
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R250
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R121
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R271
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R272
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R109
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R120
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R206
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R922
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R244
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R247
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R924
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R264
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R404
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R913
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R914
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R935
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R937
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R257
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R001
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R006
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R217
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R230
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R236
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R241
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R253
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R254
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R255
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R314

18-CB0912-JNX	RES. C.F. 9.1K OHM 1/6W +/-5%	1	R601
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R947
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R602A
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R603A
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R259
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R010
18-CB0104-JNX	RES. C.F. 100K OHM 1/6W +/-5%	1	R104
26-EBP471-JZX	CAP. CER 470 PF 50V +/-5% SL	1	C304
18-CB0121-JNX	RES. C.F. 120 OHM 1/6W +/-5%	1	R107
18-CB0121-JNX	RES. C.F. 120 OHM 1/6W +/-5%	1	R238
18-CB0122-JNX	RES. C.F. 1.2k OHM 1/6W +/-5%	1	R239
18-CB0330-JNX	RES. C.F. 33 OHM 1/6W +/-5%	1	R111
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R125
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R126
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R222
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R227
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R232
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R910
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R916
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R928
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R948
18-CB0154-JNX	RES. C.F. 150k OHM 1/6W +/-5%	1	R105
18-CB0220-JNX	RES. C.F. 22 OHM 1/6W +/-5%	1	R251
18-CB0221-JNX	RES. C.F. 220 OHM 1/6W +/-5%	1	R127
18-CB0222-JNX	RES. C.F. 2.2k OHM 1/6W +/-5%	1	R237
18-CB0222-JNX	RES. C.F. 2.2k OHM 1/6W +/-5%	1	R008
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R243
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R604
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R909
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R917
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R929
18-CB0242-JNX	RES. C.F. 2.4k OHM 1/6W +/-5%	1	R112
18-CB0330-JNX	RES. C.F. 33 OHM 1/6W +/-5%	1	R219
18-CB0330-JNX	RES. C.F. 33 OHM 1/6W +/-5%	1	R224
18-CB0330-JNX	RES. C.F. 33 OHM 1/6W +/-5%	1	R231
18-CB0331-JNX	RES. C.F. 330 OHM 1/6W +/-5%	1	R268
18-CB0331-JNX	RES. C.F. 330 OHM 1/6W +/-5%	1	R918
18-CB0331-JNX	RES. C.F. 330 OHM 1/6W +/-5%	1	R930
18-CB0331-JNX	RES. C.F. 330 OHM 1/6W +/-5%	1	R128
18-CB0333-JNX	RES. C.F. 33K OHM 1/6W +/-5%	1	R209
18-CB0333-JNX	RES. C.F. 33K OHM 1/6W +/-5%	1	R101
18-CB0333-JNX	RES. C.F. 33K OHM 1/6W +/-5%	1	R256
18-CB0333-JNX	RES. C.F. 33K OHM 1/6W +/-5%	1	R301
18-CB0333-JNX	RES. C.F. 33K OHM 1/6W +/-5%	1	R320
18-CB0391-JNX	RES. C.F. 390 OHM 1/6W +/-5%	1	R220
18-CB0391-JNX	RES. C.F. 390 OHM 1/6W +/-5%	1	R225
18-CB0391-JNX	RES. C.F. 390 OHM 1/6W +/-5%	1	R229
18-CB0392-JNX	RES. C.F. 3.9K OHM 1/6W +/-5%	1	R009
18-CB0392-JNX	RES. C.F. 3.9K OHM 1/6W +/-5%	1	R252
18-CB0393-JNX	RES. C.F. 39K OHM 1/6W +/-5%	1	R106
18-CB0394-JNX	RES. C.F. 390K OHM 1/6W +/-5%	1	R124
18-CB0470-JNX	RES. C.F. 47 OHM 1/6W +/-5%	1	R002
18-CB0471-JNX	RES. C.F. 470 OHM 1/6W +/-5%	1	R110
18-CB0471-JNX	RES. C.F. 470 OHM 1/6W +/-5%	1	R911
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R210
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R211
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R602
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R603
18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R920
18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R921

18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R933
18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R934
18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R923
18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R925
18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R936
18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R938
18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R308
18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R309
18-CB0513-JNX	RES. C.F. 51k OHM 1/6W +/-5%	1	R104A
18-CB0560-JNX	RES. C.F. 56 OHM 1/6W +/-5%	1	R108
18-CB0680-JNX	RES. C.F. 68 OHM 1/6W +/-5%	1	R123
18-CB0682-JNX	RES. C.F. 6.8K OHM 1/6W +/-5%	1	R272A
18-CB0682-JNX	RES. C.F. 6.8K OHM 1/6W +/-5%	1	R271A
18-CB0682-JNX	RES. C.F. 6.8K OHM 1/6W +/-5%	1	R007
18-CB0750-JNX	RES. C.F. 75 OHM 1/6W +/-5%	1	R943
18-CB0750-JNX	RES. C.F. 75 OHM 1/6W +/-5%	1	R945
18-CB0750-JNX	RES. C.F. 75 OHM 1/6W +/-5%	1	R946
18-CB0750-JNX	RES. C.F. 75 OHM 1/6W +/-5%	1	R949
18-CB0752-JNX	RES. C.F. 7.5K OHM 1/6W +/-5%	1	R004
18-CB0820-JNX	RES. C.F. 82 OHM 1/6W +/-5%	1	R912
18-CB0820-JNX	RES. C.F. 82 OHM 1/6W +/-5%	1	R915
18-CB0820-JNX	RES. C.F. 82 OHM 1/6W +/-5%	1	R927
18-CB0821-JNX	RES. C.F. 820 OHM 1/6W +/-5%	1	R205
18-CD0109-JNX	RES. C.F. 1 OHM 1/4W +/-5%	1	R265
18-CD0121-JNX	RES. C.F. 120 OHM 1/4W +/-5%	1	R266
18-CD0122-JNX	RES. C.F. 1.2K OHM 1/4W +/-5%	1	R263
18-CD0223-JNX	RES. C.F. 22K OHM 1/4W +/-5%	1	R415
18-CD0100-JNX	RES. C.F. 10 OHM 1/4W +/-5%	1	R262
18-CE0229-JNX	RES. C.F. 2.2 OHM 1/2W +/-5%	1	R307
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	J002A
18-CE0331-JNX	RES. C.F. 330 OHM 1/2W +/-5%	1	R274
18-CB0303-JNX	RES. C.F. 30K OHM 1/6W +/-5%	1	R103
18-EF0109-JGX	RES. FUS. 1 OHM 1W +/-5% (LS)	1	R401
18-EF0109-JGX	RES. FUS. 1 OHM 1W +/-5% (LS)	1	R402
18-EF0109-JGX	RES. FUS. 1 OHM 1W +/-5% (LS)	1	R403
18-FF0103-JGX	RES. M.O. 10k OHM 1W +/-5%	1	R416
18-FF0151-JGX	RES. M.O. 150 OHM 1W +/-5%	1	R315
18-FG0102-JHX	RES. M.O. 1K OHM 2W +/-5%	1	R409
18-FG0229-JHX	RES. M.O. 2.2 OHM 2W +/-5%	1	R312
18-GF0109-JGX	RES WIRE ROUND 1 OHM 1W +/-5%	1	R322
18-GF0109-JGX	RES WIRE ROUND 1 OHM 1W +/-5%	1	R323
18-GJ0332-JTX	RES. CEMENT 3.3K OHM 5W +/-5%	1	R411
20-TR502H-5CX	TRIMMER B5K HORIZ TYPE	1	VR102
25-BBB101-M1X	CAP. ELEC 100UF 10V +/-20%	1	C118
25-BBB101-M1X	CAP. ELEC 100UF 10V +/-20%	1	C252
25-BBB220-M1X	CAP. ELEC 22 UF 10V +/-20%	1	C106
25-BBB470-M1X	CAP. ELEC 47 UF 10V +/-20%	1	C124
25-BBB470-M1X	CAP. ELEC 47 UF 10V +/-20%	1	C209
25-BBB470-M1X	CAP. ELEC 47 UF 10V +/-20%	1	C217
25-BBB470-M1X	CAP. ELEC 47 UF 10V +/-20%	1	C224
25-BBB470-M1X	CAP. ELEC 47 UF 10V +/-20%	1	C230
25-BBB470-M1X	CAP. ELEC 47 UF 10V +/-20%	1	C235
27-MBC104-J0X	CAP. M.P.E 0.1 UF 63V +/-5%	1	C112
25-BJA100-M1X	CAP. ELEC 10 UF 160V +/-20%	1	C414
25-BJG101-M1X	CAP. ELEC 100 UF 160V +/-20%	1	C401
26-ABC102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C218
26-ABC339-CZX	CAP. CER 3.3 PF 50V +/-0.25 SL	1	C207
26-ABC339-CZX	CAP. CER 3.3 PF 50V +/-0.25 SL	1	C208
26-EBP473-ZFX	CAP. CER 0.047UF 50V +80/-20% F	1	C232
26-ABC683-ZFX	CAP. CER 0.068 UF 50V +80/-20%F	1	C220

26-ABC683-ZFX	CAP. CER 0.068 UF 50V +80/-20%F	1	C221
26-AGK221-KRX	CAP. CER 220 PF 250V +/-10%	1	C403
26-AGK472-KRX	CAP. CER 4.7 NF 250V +/-10%	1	C409
26-AIC102-KB1	CAP. CER 1000 PF 500V +/-10% B	1	C417
26-AIC221-KB1	CAP. CER 220 PF 500V +/-10% B	1	C406
26-AIC221-KB1	CAP. CER 220 PF 500V +/-10% B	1	C407
26-EBP101-JCX	CAP. CER 100PF 50V +/-5% CH	1	C201
26-EBP101-JCX	CAP. CER 100PF 50V +/-5% CH	1	C203
26-EBP101-JCX	CAP. CER 100PF 50V +/-5% CH	1	C204
26-EBP101-JCX	CAP. CER 100PF 50V +/-5% CH	1	C234
26-EBP101-JCX	CAP. CER 100PF 50V +/-5% CH	1	C245
26-EBP102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C410
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C103
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C104
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C107
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C210
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C216
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C223
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C231
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C236
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C238
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C243
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C109
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C110
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C111
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C108
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	C002
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C130
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C117
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C215
26-EBP102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C237
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C251
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C253
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C206
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C604
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C904
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C125
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C240
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C241
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C255
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C256
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C257
26-EBP470-JCX	CAP. CER 47PF 50V +/-5% CH	1	C416
26-EBP103-ZFX	CAP. CER 0.01UF 50V +80/-20% F	1	J108A
26-EBP472-KBX	CAP. CER 4700PF 50V +/-10% B	1	C602
26-EBP472-KBX	CAP. CER 4700PF 50V +/-10% B	1	C606
26-EBP820-JZX	CAP. CER 82 pF 50V +/-5%	1	C120
27-AGR434-J0X	CAP M.PP 0.43 UF 250V +/-5%	1	C413
27-ALR392-J0X	CAP. M.PP 3900 PF 1.6KV +/-5%	1	C422
27-ALR722-J0X	CAP. M.PP 7200 PF 1.6KV +/-5%	1	C411
27-MBC104-J0X	CAP. M.P.E 0.1 UF 63V +/-5%	1	C101
27-MBC104-J0X	CAP. M.P.E 0.1 UF 63V +/-5%	1	C102
27-MBC104-J0X	CAP. M.P.E 0.1 UF 63V +/-5%	1	C242
27-MBC104-J0X	CAP. M.P.E 0.1 UF 63V +/-5%	1	C421
27-MBC474-J0X	CAP. M.P.E 0.47UF 63V +/-5%	1	C226
27-MBC474-J0X	CAP. M.P.E 0.47UF 63V +/-5%	1	C227
27-MBC474-J0X	CAP. M.P.E 0.47UF 63V +/-5%	1	C228
27-MCC104-J0X	CAP. M.P.E 0.1UF 100V +/-5%	1	C307
27-PBA224-J0X	CAP. P.E 0.22UF 63V +/-5%	1	C305
27-PBC223-J0X	CAP. P.E 0.022 UF 63V +/-5%	1	C244

27-PBC223-J0X	CAP. P.E 0.022 UF 63V +/-5%	1	C246
27-PBC223-J0X	CAP. P.E 0.022 UF 63V +/-5%	1	C247
27-PCC223-J0X	CAP. P.E 0.022 UF 100V +/-5%	1	C418
34-A100K0-1IX	COIL CHOKE 10UH +/-10%	1	L201
34-A100K0-1IX	COIL CHOKE 10UH +/-10%	1	L202
34-A100K0-1IX	COIL CHOKE 10UH +/-10%	1	L203
34-A109K0-1IX	COIL CHOKE 1 UH +/-10%	1	L101
34-R100J2-0EX	COIL PL - 10 UH +/-5%	1	L104
34-R120J2-0EX	COIL PL - 12 UH +/-5%	1	L102
36-LIN450-XX1	COIL LINEARITY 45 UH	1	L402
36-WID960-XX1	COIL WIDTH 96 UH	1	L401
37-SC2502-74H0X	FLYBACK BSC25-0274H	1	T401
38-236560-00X	COIL I.F.T. 236560 FOR VCO	1	T101
40-2135AA-MAG	P.C.B. MAIN BD	1	
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	J483
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	J105
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	J001
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	J901
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	R905
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	R907
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	J918
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	J919
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	J929
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J125
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J119
41-WJ0070-B00	WIRE BARE JUMPER 7MM	1	J931
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J117
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J911
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J244
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J248
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J249
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J250
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J407
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J922
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J923
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	R273
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	R258
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	R101A
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	J118
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J213
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J234
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J239
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J603
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J924
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J106
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J201
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J202
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J904A
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J204
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J602
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J902
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	R218
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	R223
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J214
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	R228
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J101
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J103
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J112
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J231
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J301

41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J408
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J255
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J257
41-WJ0110-B00	WIRE BARE JUMPER 11MM	1	J254
41-WJ0110-B00	WIRE BARE JUMPER 11MM	1	J229
41-WJ0110-B00	WIRE BARE JUMPER 11MM	1	J206
41-WJ0110-B00	WIRE BARE JUMPER 11MM	1	J108
41-WJ0110-B00	WIRE BARE JUMPER 11MM	1	J109
41-WJ0120-B00	WIRE BARE JUMPER 12MM	1	J124
41-WJ0120-B00	WIRE BARE JUMPER 12MM	1	J608
41-WJ0135-B00	WIRE BARE JUMPER 13.5MM	1	J303
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J113
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J207
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J216
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J217
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J218
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J238
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J240
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J242
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J243
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J302
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J406
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J906
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J907
41-WJ0145-B00	WIRE BARE JUMPER 14.5MM	1	J921
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J114
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J104
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	J201A
41-WJ0130-B00	WIRE BARE JUMPER 13MM	1	J222A
41-WJ0130-B00	WIRE BARE JUMPER 13MM	1	J903
41-WJ0130-B00	WIRE BARE JUMPER 13MM	1	R126A
41-WJ0135-B00	WIRE BARE JUMPER 13.5MM	1	R104B
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J115
41-WJ0145-B00	WIRE BARE JUMPER 14.5MM	1	J905A
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J215
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J220
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J221
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J223
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J224
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J401
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J402
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J403
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J404
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J484
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J925
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J926
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J927
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	L403
41-WJ0155-B00	WIRE BARE JUMPER 15.5MM	1	J225
41-WJ0155-B00	WIRE BARE JUMPER 15.5MM	1	J912
41-WJ0155-B00	WIRE BARE JUMPER 15.5MM	1	J913
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J203
41-WJ0155-B00	WIRE BARE JUMPER 15.5MM	1	J915
41-WJ0155-B00	WIRE BARE JUMPER 15.5MM	1	J212
41-WJ0175-B00	WIRE BARE JUMPER 17.5MM	1	J606
41-WJ0175-B00	WIRE BARE JUMPER 17.5MM	1	J604
41-WJ0175-B00	WIRE BARE JUMPER 17.5MM	1	J605
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J253
41-WJ0180-B00	WIRE BARE JUMPER 18MM	1	J405
41-WJ0185-B00	WIRE BARE JUMPER 18.5MM	1	J208

41-WJ0185-B00	WIRE BARE JUMPER 18.5MM	1	J209	
41-WJ0185-B00	WIRE BARE JUMPER 18.5MM	1	J210	
41-WJ0185-B00	WIRE BARE JUMPER 18.5MM	1	J211	
41-WJ0190-B00	WIRE BARE JUMPER 19MM	1	J123	
45-OSC20M-2Y0	CRYSTAL 20.25MHZ	1	X201	
45-SAW395-3M0	SAW FILTER K3953M(PIF 38.9MHz)	1	Z101	
45-TRA5M5-0Y0	CER TRAP TPS 5.5MHZ	1	Z104	
45-TRA6M5-0Y0	CER TRAP TPS 6.5MHZ	1	Z105	
46-10964W-067	PIN BASE *6 TJC3-6A	1	S201	FOR CRT BD P501
46-10964W-06X	PIN BASE *6 S11-06W	1	S904	
46-12866W-02X	PIN BASE *2 S11-02Y	1	S601	FOR F.CAB(SPK)
46-20598W-04X	PIN BASE *4 TJC1-4A	1	S401	FOR D.Y DOIL
46-33079W-04X	PIN BASE *4 TJC3-4A	1	P103	
46-33079W-02X	PIN BASE *2 TJC3-2A	1	S602	FOR F.CAB(SPK)
46-35179W-04X	PIN BASE TJC3-4A	1	S402	
47-SCA001-XX0	SCART SOCKET 21 PINS SS101-P	1	P903	
48-TAC002-XX0	TACT SWITCH	1	K001	
48-TAC002-XX0	TACT SWITCH	1	K002	
48-TAC002-XX0	TACT SWITCH	1	K004	
48-TAC002-XX0	TACT SWITCH	1	K005	
48-TAC002-XX0	TACT SWITCH	1	K006	
48-TAC002-XX0	TACT SWITCH	1	K007	
62-226920-0HA	LED HOLDER	1		
64-P30100-104	M/C SCREW P 3 X 10	1		FOR IC301
64-P30100-104	M/C SCREW P 3 X 10	1		FOR Q402
64-P30100-104	M/C SCREW P 3 X 10	2		FOR IC601
65-Z30050-23M	NUT M 3	1		FOR IC301
65-Z30050-23M	NUT M 3	1		FOR Q402
65-Z30050-23M	NUT M 3	2		FOR IC601
67-H30752-1A0	HEAT SINK	1		FOR Q402
67-H30752-1A0	HEAT SINK	1		FOR IC601
67-H30752-6A0	HEAT SINK	1		FOR IC301
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J930	
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J933	
46-33079W-03X	PIN BASE *3 TJC3-3A	1	P104	
41-WJ0175-B00	WIRE BARE JUMPER 17.5MM	1	J607	
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J932	
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	J201B	
34-A100K0-1IX	COIL CHOKE 10UH +/-10%	1	R248	
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J259	
26-EBP471-JZX	CAP. CER 470 PF 50V +/-5% SL	1	C303	
26-EBP471-JZX	CAP. CER 470 PF 50V +/-5% SL	1	C922	
26-EBP471-JZX	CAP. CER 470 PF 50V +/-5% SL	1	C923	
26-EBP471-JZX	CAP. CER 470 PF 50V +/-5% SL	1	C926	
26-EBP471-JZX	CAP. CER 470 PF 50V +/-5% SL	1	C927	
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C920	
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C921	
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C924	
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C925	
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R950	
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R951	
34-A229K0-1IX	COIL CHOKE 2.2 UH +/-10%	1	L901	
34-A229K0-1IX	COIL CHOKE 2.2 UH +/-10%	1	L902	
18-CD0152-JNX	RES. C.F. 1.5K OHM 1/4W +/-5%	1	R262A	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D002	
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R003	
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R018	
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q001	
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J002	
45-SAW926-0M0	SAW FILTER K9260M (SIF 33.4)	1	Z101A	

18-CB0183-JNX	RES. C.F. 18k OHM 1/6W +/-5%	1	R102	
26-AMK561-KRX	CAP. CER 560pF 2KV +/-10%	1	C408	
10-0FR104-FBX	DIODE FR104 (FAST RECTIFIER)	1	D302	
10-0FR104-FBX	DIODE FR104 (FAST RECTIFIER)	1	D401	
10-0FR104-FBX	DIODE FR104 (FAST RECTIFIER)	1	D402	
10-0FR104-FBX	DIODE FR104 (FAST RECTIFIER)	1	D403	
10-0FR104-FBX	DIODE FR104 (FAST RECTIFIER)	1	D409	
10-HS3V9A-DBX	DIODE 500mW 3.9HSA	1	D208	
10-HS3V9A-DBX	DIODE 500mW 3.9HSA	1	D210	
10-HS3V9A-DBX	DIODE 500mW 3.9HSA	1	D209	
10-HS5V1B-DBX	DIODE 500mW 5.1HSB	1	D207	
10-HS5V1B-DBX	DIODE 500mW 5.1HSB	1	D211	
10-79C8V2-DBX	DIODE ZENER 8V2 1/2W 5%	1	D408	
36-HDR001-AX1	TRANSFOR HOR. DRIVE (MAGNETIC CORE)	1	T402	
66-382330-0B7	RIVET 2.0X3.7X3.5	2		FOR R411
66-343730-0B0	HOLLOW RIVET 1.6X3.0XL3.2	4		FOR T401
66-343730-0B0	HOLLOW RIVET 1.6X3.0XL3.2	2		FOR L401
66-343730-0B0	HOLLOW RIVET 1.6X3.0XL3.2	2		FOR L402
66-343730-0B0	HOLLOW RIVET 1.6X3.0XL3.2	2		FOR C411
66-343730-0B0	HOLLOW RIVET 1.6X3.0XL3.2	2		FOR C422
66-343730-0B0	HOLLOW RIVET 1.6X3.0XL3.2	2		FOR Q402
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	C225	
46-33079W-03X	PIN BASE *3 TJC3-3A	1	P105	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C114	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C202	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C205	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C233	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C250	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C905	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C906	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C908	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C909	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C911	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C912	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C605	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C619	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C254	
25-BCB101-M1X	CAP. ELEC 100 UF 16V +/-20%	1	C239	
25-BCB101-M1X	CAP. ELEC 100 UF 16V +/-20%	1	C607	
25-BCB101-M1X	CAP. ELEC 100 UF 16V +/-20%	1	C904A	
25-BCB331-M1X	CAP. ELEC 330 UF 16V +/-20%	1	C258	
25-BCB470-M1X	CAP. ELEC 47 UF 16V +/-20%	1	C001	
25-BDA471-M1X	CAP. ELEC 470 UF 25V +/-20%	1	C404	
25-BDA471-M1X	CAP. ELEC 470 UF 25V +/-20%	1	C405	
25-BDA471-M1X	CAP. ELEC 470 UF 25V +/-20%	1	C603	
25-BFB100-M1X	CAP. ELEC 10 UF 50V +/-20%	1	C903	
25-BFB101-M1X	CAP. ELEC 100 UF 50V +/-20%	1	C301	
25-BFB229-M1X	CAP. ELEC 2.2 UF 50V +/-20%	1	C601	
25-BFB339-M1X	CAP. ELEC 3.3 UF 50V +/-20%	1	C214	
25-BFB470-M1X	CAP. ELEC 47 UF 50V +/-20%	1	C907	
25-BFB470-M1X	CAP. ELEC 47 UF 50V +/-20%	1	C910	
25-BFB478-M1X	CAP. ELEC 0.47 UF 50V +/-20%	1	C119	
11-C144ES-0BX	TRANSISTOR PDTC144ES (NPN)	1	Q002	
13-VCT383-1FP	IC VCT3831F(FLASH)	1	IC201	
46-33079W-03X	PIN BASE *3 TJC3-3A	1	S202	
11-DD1555-0AX	TRANSISTOR 3DD1555	1	Q402	
46-33079W-03X	PIN BASE *3 TJC3-3A	1		S202 FOR W.BAL. ADJUST
25-BLA100-M1X	CAP. ELEC 10 UF 250V +/-20%	1	C402	
08-2118M1-NIY	ASS'Y - NICAM BD	1		
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D1001	

13-MSP341-5GP	MULTISTANDARD SOUND PROCESSOR	1	IC1001	
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R1016	
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R1017	
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R1018	
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R1021	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R1002	
18-CB0470-JNX	RES. C.F. 47 OHM 1/6W +/-5%	1	R1001	
26-ABC339-CZX	CAP. CER 3.3 PF 50V +/-0.25 SL	1	C1026	
26-ABC339-CZX	CAP. CER 3.3 PF 50V +/-0.25 SL	1	C1027	
26-EBP102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C1006	
26-EBP102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C1007	
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C1012	
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C1019	
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C1021	
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C1002	
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C1017	
26-EBP560-JCX	CAP. CER 56PF 50V +/-5%	1	C1024	
26-EBP560-JCX	CAP. CER 56PF 50V +/-5%	1	C1025	
26-EBP560-JCX	CAP. CER 56PF 50V +/-5%	1	C1028	
27-MBC334-J0X	CAP. M.P.E 0.33UF 63V +/-5%	1	C1035	
27-MBC334-J0X	CAP. M.P.E 0.33UF 63V +/-5%	1	C1029	
27-MBC334-J0X	CAP. M.P.E 0.33UF 63V +/-5%	1	C1030	
27-MBC334-J0X	CAP. M.P.E 0.33UF 63V +/-5%	1	C1031	
27-MBC334-J0X	CAP. M.P.E 0.33UF 63V +/-5%	1	C1032	
27-MBC334-J0X	CAP. M.P.E 0.33UF 63V +/-5%	1	C1033	
27-MBC334-J0X	CAP. M.P.E 0.33UF 63V +/-5%	1	C1034	
34-R100J2-0EX	COIL PL - 10 UH +/-5%	1	L1001	
41-WJ0070-B00	WIRE BARE JUMPER 7MM	1	C1024A	
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	J1004	
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J1001	
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J1002	
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J1006	
45-OSC18M-4Y0	CRYSTAL 18.432M	1	X1001	
46-21550W-03X	HEADER *3 TS3B-SQ-1	1	P1002	FOR M.BD P102
46-21550W-06X	HEADER *6 TS6B-SQ-1	1	P1001	FOR M.BD P101
46-30966H-04X	HS 2468 #24 160 TJC3-4Y/SCN-4Y	1	P1003	FOR M.BD P103
67-257870-1T0	BRACKET IF BD	1		
67-257870-2T0	BRACKET IF BD	1		
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C1023	
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R1022	
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R1023	
26-EBP471-JZX	CAP. CER 470 PF 50V +/-5% SL	1	C1018	
46-28150H-03X	HS 3P24 F/W 140 TJC3-3Y/SCN-3Y	1	P1004	TO M.BD P104
46-28150H-03X	HS 3P24 F/W 140 TJC3-3Y/SCN-3Y	1	P1005	TO M.BD P105
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J1003	
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	J1005	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C1003	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C1014	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C1015	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C1022	
25-BCB100-M1X	CAP. ELEC 10 UF 16V +/-20%	1	C1016	
25-BCB470-M1X	CAP. ELEC 47 UF 16V +/-20%	1	C1001	
25-BCB470-M1X	CAP. ELEC 47 UF 16V +/-20%	1	C1013	
25-BFB339-M1X	CAP. ELEC 3.3 UF 50V +/-20%	1	C1020	
08-2118M1-PAN	ASS'Y - FRONT CABINET	1		
72-2118M1-E039A	OPERATION MANUAL	1		
74-022032-6WE	POLYBAG (23cmX34cmX0.06mm)	1		FOR OPERATION MANUAL
74-120120-80HAA	POLYBAG W/SUFFOCATION WARNING	1		
75-2118LL-CC0	POLYFOAM (LL)	1		
75-2118LR-CC0	POLYFOAM (LR)	1		

75-2118UL-CC0	POLYFOAM (UL)	1	
75-2118UR-CC0	POLYFOAM (UR)	1	
76-002118-0AT	CARTON BOX	1	
49-382550-BAT	BATTERY R06P AA 1.5V 5#	2	
08-2118M1-PW1	ASS'Y - POWER PARTS	1	
10-0RU3YX-F0X	DIODE RU3YX (FAST RECTIFIER)	1	D830
10-1N4001-EBX	DIODE 1N4001 (RECTIFIER)	1	D836
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D804
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D805
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D836A
10-HER108-FBX	DIODE HER108	1	D806
10-HER108-FBX	DIODE HER108	1	D831
10-PC574J-DJX	DIODE ZENER UPC 574J	1	D834
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q831
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q832
13-00TLP6-21P	PHOTO COUPLER TLP621(GRH)	1	IC802
13-44608P-40P	IC MC44608P40	1	IC801
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R809
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R840
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R844
18-CB0104-JNX	RES. C.F. 100K OHM 1/6W +/-5%	1	R804A
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R838
18-CB0392-JNX	RES. C.F. 3.9K OHM 1/6W +/-5%	1	R807
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R806
18-CD0220-JNX	RES. C.F. 22 OHM 1/4W +/-5%	1	R811A
18-CD0221-JNX	RES. C.F. 220 OHM 1/4W +/-5%	1	R833
18-CD0332-JNX	RES. C.F. 3.3K OHM 1/4W +/-5%	1	R834
18-CD0392-JNX	RES. C.F. 3.9K OHM 1/4W +/-5%	1	R835
18-CD0471-JNX	RES. C.F. 470 OHM 1/4W +/-5%	1	R811
18-CE0479-JNX	RES. C.F. 4.7 OHM 1/2W +/-5%	1	R832
18-CE0563-JNX	RES. C.F. 56k OHM 1/2W +/-5%	1	R831
18-FF0479-JGX	RES. M.O. 4.7 OHM 1W +/-5%	1	R841
18-FG0123-JHX	RES. M.O. 12K OHM 2W +/-5%	1	R839
18-FG0223-JHX	RES. M.O. 22K OHM 2W +/-5%	1	R837
18-GG0228-JHX	RES WIRE ROUND 0.22 OHM 2W 5%	1	R810A
18-GJ0103-KTX	RES. CEMENT 10K OHM 5W +/-10%	1	R836
18-GJ0223-KTX	RES. CEMENT 5W 22K OHM +/-10%	1	R808
20-TR502H-5CX	TRIMMER B5K HORIZ TYPE	1	VR830
22-NTC479-XX0	NTC 4.7 OHM +/-18% NTC4.7D2-14	1	R802
22-PTC200-XX0	POSISTOR 20 OHM (25-34)	1	RT801
25-BJG101-M1X	CAP. ELEC 100 UF 160V +/-20%	1	C835
25-BMJ221-M1X	CAP. ELEC 220 UF 400V +/-20%	1	C806
26-AIC221-KBX	CAP. CER 220 PF 500V +/-10% B	1	C833
26-AIM103-KBX	CAP. CER 0.01UF 500V +/-10% B	1	C805
26-AIM103-KBX	CAP. CER 0.01UF 500V +/-10% B	1	C834
26-AMK102-KBX	CAP. CER 1000 PF 2KV +/-10% B	1	C815
26-APK471-KBX	CAP. CER 470PF 400VAC +/-10% B	1	C803
26-APK471-KBX	CAP. CER 470PF 400VAC +/-10% B	1	C804
26-AQK472-ZFX	CAP. CER 4700PF 250VAC+80-20%F	1	C807
26-AQK472-ZFX	CAP. CER 4700PF 250VAC+80-20%F	1	C808
26-EBP101-JCX	CAP. CER 100PF 50V +/-5% CH	1	C814
26-EBP102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C809
26-EBP102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C837
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C813
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C831
26-EBP104-ZFX	CAP. CER 0.1UF 50V +80%/-20%	1	C842
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C830
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C841
27-MHM104-K01	CAP. M.PE 0.1 UF 400V +/-10%	1	C802A
27-MBC104-J0X	CAP. M.P.E 0.1 UF 63V +/-5%	1	C839

27-RJK472-J0X	CAP. PP 4700PF 630V +/-5%	1	C806A	
34-R101K2-1BX	COIL CHOKE 100 UH +/-10%	1	L801	
34-R101K2-1BX	COIL CHOKE 100 UH +/-10%	1	L802	
35-139730-00X	FERR. BEAD BF60	1	L810	
35-139730-00X	FERR. BEAD BF60	1	L811	
35-139730-00X	FERR. BEAD BF60	1	L812	
35-139730-00X	FERR. BEAD BF60	1	L813	
35-139730-00X	FERR. BEAD BF60	1	L814	
35-139730-00X	FERR. BEAD BF60	1	L815	
35-139730-00X	FERR. BEAD BF60	2		FOR D806
36-304090-002	LINE FILTER LCL-2826	1	T801	
36-TRF048-AX3	TRANSFORMER CONV. BCK-4001-72b	1	T803	
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J801A	
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J820	
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J811	
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J821	
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J817	
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J808	
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J812	
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J822	
41-WJ0130-B00	WIRE BARE JUMPER 13MM	1	J804	
41-WJ0145-B00	WIRE BARE JUMPER 14.5MM	1	J809	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J801	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J805	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J806	
41-WJ0155-B00	WIRE BARE JUMPER 15.5MM	1	J810	
41-WJ0165-B00	WIRE BARE JUMPER 16.5MM	1	J813	
41-WJ0165-B00	WIRE BARE JUMPER 16.5MM	1	J814	
41-WJ0165-B00	WIRE BARE JUMPER 16.5MM	1	J815	
41-WJ0165-B00	WIRE BARE JUMPER 16.5MM	1	J816	
41-WJ0175-B00	WIRE BARE JUMPER 17.5MM	1	J807	
41-WJ0200-B00	WIRE BARE JUMPER 20MM	1	J803	
46-10962W-02X	PIN BASE *2 TJC2-2A	1	S803	FOR DEGAUSSING COIL
46-28559W-02X	PIN BASE *2 TJC1-2A	1	S802	FOR AC CORD
48-256460-0C0	SWITCH POWER TV8(PCB MOUNTING)	1	SW801	
50-02000D-1GS1	FUSE 2.0AT 250VAC 5mmX20mm	1	F801	
64-P30060-104	M/C SCREW 3 X 6 (ZINC)	1		FOR Q801
64-P30060-104	M/C SCREW 3 X 6 (ZINC)	1		FOR IC804
64-P30100-104	M/C SCREW P 3 X 10	1		FOR IC803
66-20516X-0B0	FUSE HOLDER	2		
67-H34464-1A0	HEAT SINK (H=40MM)	1		FOR IC803
67-H27292-3A0	HEAT SINK	1		FOR IC804
67-H35984-5A0	HEAT SINK	1		FOR Q801
71-DYP000-WX1	LABEL	1		FOR Q801(H.SINK)
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R842	
18-CB0471-JNX	RES. C.F. 470 OHM 1/6W +/-5%	1	R836A	
10-79C16V-DBX	DIODE ZENER 16V 1/2W 5%	1	D838	
11-SC2688-LAX	TRANSISTOR 2SC2688L (NPN)	1	Q830	
11-SK2996-OAX	TRANSISTOR 2SK2996 (MOS)	1	Q801	
10-1N4007-EBX	DIODE 1N4007	1	D802	
10-0FR104-FBX	DIODE FR104 (FAST RECTIFIER)	1	D833	
10-HS6V2B-DBX	DIODE 6V2 500mW	1	D840	
10-79C8V2-DBX	DIODE ZENER 8V2 1/2W 5%	1	D839	
51-DC0243-0CH01	POWER CORD VDE PLUG W/HOUSING	1		
18-KE0105-JN3	RES. H.VOLT. CC 1M OHM 1/2W +/-5%	1	R801	
18-KF0825-JH3	RES. H.VOLT.CC 8.2M OHM 1W +/-5%	1	R812	
26-APK222-ME4	CAP. CER 2200PF 400VAC +/-20% E	1	C816	
27-AQT224-MVH	CAP. M.PP 0.22 UF 250VAC 20%	1	C801	
27-AQT224-MVH	CAP. M.PP 0.22 UF 250VAC 20%	1	C802	
66-382330-0B7	RIVET 2.0X3.7X3.5	2		FOR SW801

66-382330-0B7	RIVET 2.0X3.7X3.5	2		FOR C806
66-382330-0B7	RIVET 2.0X3.7X3.5	2		FOR R808
66-382330-0B7	RIVET 2.0X3.7X3.5	2		FOR R836
66-343730-0B0	HOLLOW RIVET 1.6X3.0XL3.2	4		FOR T803
35-139730-00X	FERR. BEAD BF60	2		FOR D804
66-343730-0B0	HOLLOW RIVET 1.6X3.0XL3.2	2		FOR DT801
25-BCA102-M1X	CAP. ELEC 1000 UF 16V +/-20%	1	C838	
25-BCB101-M1X	CAP. ELEC 100 UF 16V +/-20%	1	C844	
25-BCB101-M1X	CAP. ELEC 100 UF 16V +/-20%	1	C845	
25-BCB470-M1X	CAP. ELEC 47 UF 16V +/-20%	1	C844A	
25-BCB471-M1X	CAP. ELEC 470 UF 16V +/-20%	1	C843	
25-BDB479-M1X	CAP. ELEC 4.7 UF 25V +/-20%	1	C812	
25-BDG222-M1X	CAP. ELEC 2200 UF 25V +/-20%	1	C832	
25-BEB101-M1X	CAP. ELEC 100 UF 35V +/-20%	1	C836	
11-C144ES-0BX	TRANSISTOR PDTC144ES (NPN)	1	Q833	
18-CD0123-JNX	RES. C.F. 12K OHM 1/4W +/-5%	1	R804	
26-EBP680-JZX	CAP. CER 68PF 50V +/-5% SL TUBE	1	C804A	
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	R807A	
13-UA7805-C0S	IC UA7805C	1	IC804	
13-L7809C-VAP	IC L7809CV	1	IC803	
10-D3SB60-H7X	DIODE D3SB60 (BRIDGE RECT.)	1	DT801	
08-2118M1-RCN	ASS'Y - REAR CABINET	1		
54-114000-00X	FELT TAPE (150mmX19mmX0.3mm)	12		STICK ON R.CAB
58-2118MP-JKT9F	PLATE MODEL NO.	1		
58-2118RI-5UI	INLAY TERMINAL BD (SCART)	1		
58-2118RI-5UIAA	INLAY TERMINAL BOARD	1		
59-130460-00X	RUBBER PAD (25mmX7mm)	2		FOR FOOTING OF R.CAB
62-301490-0UN	SUPPORTER (FOR FBT)	1		
63-B40300-AB2	S/T SCREW B 4 X 30 AB	4		MTG MTG FFRONT & REAR CABINET
63-W30100-AB4	S/T SCREW W 3 X 10 AB	2		MTG SUPPORTER & R.CAB
59-257570-00X	SPONGE RUBBER (20MMX7MMX3MM)	4		STICK ON R.CAB
55-2118RC-1CNAA	REAR CABINET	1		
06-015W36-A101X	ASSY - REMOTE HANDSET (M36-2)	1		
08-2118M1-SIY	ASS'Y - SIDE AV BD	1		
40-2118MU-SIC	P.C.B SIDE AV BD	1		
46-39049H-06X	CONN. 6P 1185#26 400 TJC3-6Y/SCN-6Y	1		P1104B FOR M.BD S904 P1104B FOR M.BD S904
47-RCA022-XX1	RCA SOCKET RCA-3316P1 Y/W/R	1	P1101	

(2) SPARE PARTS LIST OF M36 (PREPARE BOM, ONLY FOR YOUR REFERENCE)

Item No.	Description	QTY	POSITION	Remarks
02-2959M2-RMN	ASS'Y - IR HANDSET	1		
08-2959M2-CRN	ASS'Y - CRT BD	1		
10-0BAV21-ABX	DIODE BAV21 (SW)	1	D501	
10-0BAV21-ABX	DIODE BAV21 (SW)	1	D502	
10-0BAV21-ABX	DIODE BAV21 (SW)	1	D503	
10-0BAV21-ABX	DIODE BAV21 (SW)	1	D504	
10-0BAV21-ABX	DIODE BAV21 (SW)	1	D505	
10-0BAV21-ABX	DIODE BAV21 (SW)	1	D506	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D507	
11-0BF422-0BX	TRANSISTOR BF422 (NPN)	1	Q507	
11-0BF422-0BX	TRANSISTOR BF422 (NPN)	1	Q503	
11-0BF422-0BX	TRANSISTOR BF422 (NPN)	1	Q511	
11-0BF423-0BX	TRANSISTOR BF423 (PNP)	1	Q504	
11-0BF423-0BX	TRANSISTOR BF423 (PNP)	1	Q508	
11-0BF423-0BX	TRANSISTOR BF423 (PNP)	1	Q512	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q501	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q505	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q509	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q513	
11-SC4544-0AX	TRANSISTOR 2SC4544	1	Q502	
11-SC4544-0AX	TRANSISTOR 2SC4544	1	Q506	
11-SC4544-0AX	TRANSISTOR 2SC4544	1	Q510	
18-CB0222-JNX	RES. C.F. 2.2k OHM 1/6W +/-5%	1	R501	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R506	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R507	
18-CB0222-JNX	RES. C.F. 2.2k OHM 1/6W +/-5%	1	R511	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R516	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R518	
18-CB0222-JNX	RES. C.F. 2.2k OHM 1/6W +/-5%	1	R521	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R526	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R528	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R504	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R514	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R524	
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R509	
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R519	
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R529	
18-CB0270-JNX	RES. C.F. 27 OHM 1/6W +/-5%	1	R534	
18-CB0391-JNX	RES. C.F. 390 OHM 1/6W +/-5%	1	R533	
18-CB0332-JNX	RES. C.F. 3.3k OHM 1/6W +/-5%	1	R502	
18-CB0332-JNX	RES. C.F. 3.3k OHM 1/6W +/-5%	1	R512	
18-CB0332-JNX	RES. C.F. 3.3k OHM 1/6W +/-5%	1	R522	
18-CE0154-JNX	RES. C.F. 150k OHM 1/2W +/-5%	1	R531	
18-FE0102-JNX	RES. M.O. 1K OHM 1/2W +/-5%	1	R510	
18-FE0102-JNX	RES. M.O. 1K OHM 1/2W +/-5%	1	R520	
18-FE0102-JNX	RES. M.O. 1K OHM 1/2W +/-5%	1	R530	
18-FF0104-JGX	RES. M.O. 100K OHM 1W +/-5%	1	R503	
18-FF0104-JGX	RES. M.O. 100K OHM 1W +/-5%	1	R513	
18-FF0104-JGX	RES. M.O. 100K OHM 1W +/-5%	1	R523	
18-FG0183-JHX	RES. M.O. 18K OHM 2W +/-5%	1	R505	
18-FG0183-JHX	RES. M.O. 18K OHM 2W +/-5%	1	R515	
18-FG0183-JHX	RES. M.O. 18K OHM 2W +/-5%	1	R525	
26-AIC102-KB1	CAP. CER 1000 PF 500V +/-10% B	1	C501	
26-AIC102-KB1	CAP. CER 1000 PF 500V +/-10% B	1	C502	
26-AIC102-KB1	CAP. CER 1000 PF 500V +/-10% B	1	C503	
27-AGQ104-J0X	CAP. M.PP 0.1 μ F 250V +/-5%	1	C507	
34-R100K2-1BX	COIL CHOKE 10 μ H +/-10%	1	L501	
41-VJ0050-B00	WIRE BARE JUMPER 5MM	1	L502	

41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J503	
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J501	
46-10967W-01X	PIN BASE *1 TJC1-1A	1	P504	FOR CRT GROUND HOUS.
46-37031H-06X	HS 6P 2468#24 500 TJC3-6Y/SCN	1	P501	FOR S201
18-CB0751-JNX	RES. C.F. 750 OHM 1/6W +/-5%	1	R532	
34-R220J2-0EX	COIL PL - 22 μ H +/-5%	1	L505	
34-R220J2-0EX	COIL PL - 22 μ H +/-5%	1	L506	
34-R220J2-0EX	COIL PL - 22 μ H +/-5%	1	L507	
46-30615H-04X	HS 4P24 460 F/W TJC3-4Y/SCN-4	1		P502 FOR S402
25-BCB470-M1X	CAP. ELEC 47 μ F 16V +/-20%	1	C505	
26-AMK102-KRX	CAP. CER 1000 PF 2KV +/-10% R	1	C508	
47-CRT004-XX0	CRT SOCKET GZS10-2-108	1	P503	
26-ABC509-CZX	CAP. CER 5 PF 50V +/-0.25 SL	1	C512	
26-ABC509-CZX	CAP. CER 5 PF 50V +/-0.25 SL	1	C513	
26-ABC509-CZX	CAP. CER 5 PF 50V +/-0.25 SL	1	C511	
40-000036-CRE	P.C.B. CRT BD	1		
35-139730-00X	FERR. BEAD BF60	2		FOR C515
26-EBP103-ZFX	CAP. CER 0.01 μ F 50V +80/-20% F	1	C515	
08-2959M2-FBY	ASS'Y - FRONT CTL & SW BD	1		
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D002	
11-IRR001-1X0	IR RECEIVER MODULE HS0038A2	1	IR001	
14-LED05R-XX1	LED RED FB205	1	D001	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R001	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R006	
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R010	
18-CB0222-JNX	RES. C.F. 2.2K OHM 1/6W +/-5%	1	R007	
18-CB0392-JNX	RES. C.F. 3.9K OHM 1/6W +/-5%	1	R008	
18-CB0470-JNX	RES. C.F. 47 OHM 1/6W +/-5%	1	R002	
18-CB0682-JNX	RES. C.F. 6.8K OHM 1/6W +/-5%	1	R009	
40-000M36-FBC	P.C.B. FRONT CTL BD	1		
41-WJ0070-B00	WIRE BARE JUMPER 7MM	1	J081	
46-28559W-02X	PIN BASE *2 TJC1-2A	1	P802A	FOR AC CORD
46-33630H-05X	HS 5P24 280 F/W TJC3-5Y/SCN-5Y	1	P002	FOR M.BD S202
48-TAC002-XX0	TACT SWITCH	1	S002	
48-TAC002-XX0	TACT SWITCH	1	S003	
48-TAC002-XX0	TACT SWITCH	1	S004	
48-TAC002-XX0	TACT SWITCH	1	S005	
48-TAC002-XX0	TACT SWITCH	1	S006	
51-GC0220-0HB	POWER CORD 2.2M TJC1-2Y	1		
62-357320-0HA	LIGHT BRACKET	1		
62-367740-0UN	FRONT CTL BD BRACKET	1		
63-W30100-AB4	S/T SCREW W 3 X 10 AB	3		MTG F.CTL & SW BD TO F.CTL BKT
48-POW007-AX0	SWITCH POWER PS5E-B	1	SW801	
18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R004	
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R003	
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q001	
46-28559W-02X	PIN BASE *2 TJC1-2A	1	P801A	FOR M.BD S801
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	J080	
48-TAC002-XX0	TACT SWITCH	1	S001	
46-32269H-02X	HS 2P22 200 TJC1-2Y/TJC1-2Y	1		P801A FOR M.BD S801
25-BCB470-M1X	CAP. ELEC 47 μ F 16V +/-20%	1	C001	
11-C144ES-0BX	TRANSISTOR PDT144ES (NPN)	1	Q002	
08-2959M2-FCN	ASS'Y - FRONT CABINET	1		
02-GND029-XX0	ASS'Y-CRT GND WIRE & HOUS. (29)	1		
36-DEG290-XX2	DEGAUSSING COIL 3100MM	1		
42-61308F-XX3	SPEAKER 8 OHM 8W	2	SP601, SP602	
44-29SFLN-LG1A	CRT A68KYN690X54M (ASCH)	1	CRT01	
46-26514H-04X	HS 4P A/B 500/13 RBGW TJC1-4Y	1	P411H	FOR DY TO M.BD
46-27580H-02X	HS 2P22 600/7 TJC3-2Y	1	P601	
46-27580H-02X	HS 2P22 600/7 TJC3-2Y	1	P602	

54-113970-0U0	PVC TUBE #5 L=ROLL	0.07		FOR P601 & P602
54-205130-000	SPACER CRT MOUNTING T=3MM	2		
54-205140-000	SPACER CRT MOUNTING T=2MM	4		FOR CRT TO F.CAB
54-314740-0X0	CRT FIBRE SHEET (22mmX22mmX0.8mm)	12		
55-B159FC-0CN9A	FRONT CABINET	1		
56-B159FB-0HAAA	PUSH BUTTON	1		
56-B159LE-0HCAA	LENS	1		
56-B159PK-0HAAA	POWER KNOB	1		
56-B159SL-0HNCA	SPEAKER GRILLE (LEFT)	1		
56-B159SR-0HNCA	SPEAKER GRILLE (RIGHT)	1		
58-B159SI-1UI9A	INLAY SIDE AV	1		
59-130460-00X	RUBBER PAD (25mmX7mm)	2		STICK ON F.CAB
59-312160-000	SPEAKER RUBBER CUSHION	8		MTG SPK TO F.CAB
62-10654X-00F	UNI-TIE (2.5mmX95mm)	8		
62-216340-0UA	HOLDER POWER CORD	1		
62-265160-0HA	POWER SW. ADAPTOR	1		
63-B30080-BT4	S/T SCREW B 3 X 8 BT	2		MTG SIDE AV BD TO F.CAB
63-H60300-BT4	S/T SCREW H 6 X 30 BT	4		MTG CRT TO F.CAB
63-W30100-AB4	S/T SCREW W 3 X 10 AB	4		MTG PUSH BUTTON & LED TO F.CAB
63-W30140-HS4	S/T SCREW W 3 X 14 HS	8		MTG SPK TO F.CAB
65-A60180-20E	EXT. TOOTH WASHTER 6 X 18 X 2	4		MTG CRT TO F.CAB
67-216790-0E0	SPRING CRT 6MMX50MMX0.6MM	2		
67-242830-0E0	SPRING POWER KNOB	1		
67-2960LG-1A0	LOGO TCL	1		
71-TVATU0-X03	LABLE CRT	1		
71-TVSDSW-X01	LABEL CRT	1		
89-343720-JZ001	LABEL	0		
54-310140-000	SPONGE 50 X 20MM (BKK)	2		
90-SK5370-JY1	SILICON GREASE TSK5370	0		
08-2959M2-MAN	ASS'Y - MAIN BD	1		
07-389V15-NX4	TUNER UV1355-BK2(BG/HB/IEC/5V	1	TU101	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D202	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D203	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D204	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D205	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D206	
10-HS3V9A-DBX	DIODE 500mW 3.9HSA	1	D209	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D212	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D213	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D303	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D604	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D406	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D605	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D901	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D902	
11-SC2482-0BX	TRANSISTOR 2SC2482	1	Q401	
11-2N3904-0BX	TRANSISTOR 2N3904 (NPN)	1	Q210	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q201	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q203	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q204	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q205	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q207	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q601	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q481	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q104	
11-SA1015-YBX	TRANSISTOR 2SA1015Y	1	Q482	
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q103	
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q202	
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q206	
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q208	

11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q904
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q903
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q209
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q901
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q902
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q905
11-SC3779-DBX	TRANSISTOR 2SC3779D (RF AMPL)	1	Q101
13-AT24C1-6LP	IC EEPROM 16K AT24C16	1	IC001
13-M52760-SPP	IC M52760SP	1	IC101
13-MSP341-5GP	MULTISTANDARD SOUND PROCESSOR	1	IC901
13-TDA8944-JS	IC TDA8944J	1	IC602
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R203
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R207
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R208
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R233
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R250
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R121
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R240
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R950
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R951
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R956
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R271
18-CB0101-JNX	RES. C.F. 100 OHM 1/6W +/-5%	1	R272
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R109
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R120
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R922
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R244
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R247
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R924
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R264
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R404
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R913
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R914
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R935
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R937
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R257
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R217
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R230
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R236
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R241
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R253
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R254
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R255
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R314
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R636
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R903
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R904
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R957
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R484
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R259
18-CB0104-JNX	RES. C.F. 100K OHM 1/6W +/-5%	1	R104
18-CB0104-JNX	RES. C.F. 100K OHM 1/6W +/-5%	1	R635
18-CB0109-JNX	RES. C.F. 1 OHM 1/6W +/-5%	1	R964
18-CB0109-JNX	RES. C.F. 1 OHM 1/6W +/-5%	1	R962
18-CB0121-JNX	RES. C.F. 120 OHM 1/6W +/-5%	1	R107
18-CB0121-JNX	RES. C.F. 120 OHM 1/6W +/-5%	1	R238
18-CB0122-JNX	RES. C.F. 1.2k OHM 1/6W +/-5%	1	R239
18-CB0330-JNX	RES. C.F. 33 OHM 1/6W +/-5%	1	R111
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R125
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R126

18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R222
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R227
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R232
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R248
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R249
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R963
18-CB0151-JNX	RES. C.F. 150 OHM 1/6W +/-5%	1	R961
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R959
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R910
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R916
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R928
18-CB0154-JNX	RES. C.F. 150k OHM 1/6W +/-5%	1	R105
18-CB0222-JNX	RES. C.F. 2.2k OHM 1/6W +/-5%	1	R485
18-CB0184-JNX	RES. C.F. 180K OHM 1/6W +/-5%	1	R481
18-CB0201-JNX	RES. C.F. 200 OHM 1/6W +/-5%	1	R128
18-CB0220-JNX	RES. C.F. 22 OHM 1/6W +/-5%	1	R251
18-CB0222-JNX	RES. C.F. 2.2k OHM 1/6W +/-5%	1	R237
18-CB0222-JNX	RES. C.F. 2.2k OHM 1/6W +/-5%	1	R632
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R243
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R909
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R917
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R929
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R639
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R906
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R908
18-CB0242-JNX	RES. C.F. 2.4k OHM 1/6W +/-5%	1	R112
18-CB0330-JNX	RES. C.F. 33 OHM 1/6W +/-5%	1	R219
18-CB0330-JNX	RES. C.F. 33 OHM 1/6W +/-5%	1	R224
18-CB0330-JNX	RES. C.F. 33 OHM 1/6W +/-5%	1	R231
18-CB0331-JNX	RES. C.F. 330 OHM 1/6W +/-5%	1	R268
18-CB0331-JNX	RES. C.F. 330 OHM 1/6W +/-5%	1	R918
18-CB0331-JNX	RES. C.F. 330 OHM 1/6W +/-5%	1	R930
18-CB0331-JNX	RES. C.F. 330 OHM 1/6W +/-5%	1	R127
18-CB0331-JNX	RES. C.F. 330 OHM 1/6W +/-5%	1	R905
18-CB0331-JNX	RES. C.F. 330 OHM 1/6W +/-5%	1	R907
18-CB0332-JNX	RES. C.F. 3.3k OHM 1/6W +/-5%	1	R607
18-CB0333-JNX	RES. C.F. 33K OHM 1/6W +/-5%	1	R209
18-CB0333-JNX	RES. C.F. 33K OHM 1/6W +/-5%	1	R101
18-CB0333-JNX	RES. C.F. 33K OHM 1/6W +/-5%	1	R256
18-CB0512-JNX	RES. C.F. 5.1k OHM 1/6W +/-5%	1	R637
18-CB0333-JNX	RES. C.F. 33K OHM 1/6W +/-5%	1	R301
18-CB0333-JNX	RES. C.F. 33K OHM 1/6W +/-5%	1	R320
18-CB0391-JNX	RES. C.F. 390 OHM 1/6W +/-5%	1	R220
18-CB0391-JNX	RES. C.F. 390 OHM 1/6W +/-5%	1	R225
18-CB0391-JNX	RES. C.F. 390 OHM 1/6W +/-5%	1	R229
18-CB0392-JNX	RES. C.F. 3.9K OHM 1/6W +/-5%	1	R252
18-CB0393-JNX	RES. C.F. 39K OHM 1/6W +/-5%	1	R106
18-CB0394-JNX	RES. C.F. 390K OHM 1/6W +/-5%	1	R124
18-CB0470-JNX	RES. C.F. 47 OHM 1/6W +/-5%	1	R952
18-CB0470-JNX	RES. C.F. 47 OHM 1/6W +/-5%	1	R954
18-CB0470-JNX	RES. C.F. 47 OHM 1/6W +/-5%	1	R958
18-CB0471-JNX	RES. C.F. 470 OHM 1/6W +/-5%	1	R110
18-CB0471-JNX	RES. C.F. 470 OHM 1/6W +/-5%	1	R911
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R210
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R211
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R258
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R483
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R482
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R486
18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R308

18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R309
18-CB0513-JNX	RES. C.F. 51k OHM 1/6W +/-5%	1	R130
18-CB0560-JNX	RES. C.F. 56 OHM 1/6W +/-5%	1	R108
18-CB0680-JNX	RES. C.F. 68 OHM 1/6W +/-5%	1	R123
18-CB0682-JNX	RES. C.F. 6.8K OHM 1/6W +/-5%	1	R271A
18-CB0682-JNX	RES. C.F. 6.8K OHM 1/6W +/-5%	1	R235
18-CB0682-JNX	RES. C.F. 6.8K OHM 1/6W +/-5%	1	R272A
18-CB0752-JNX	RES. C.F. 7.5K OHM 1/6W +/-5%	1	R201
18-CB0820-JNX	RES. C.F. 82 OHM 1/6W +/-5%	1	R912
18-CB0820-JNX	RES. C.F. 82 OHM 1/6W +/-5%	1	R915
18-CB0820-JNX	RES. C.F. 82 OHM 1/6W +/-5%	1	R927
18-CB0820-JNX	RES. C.F. 82 OHM 1/6W +/-5%	1	R901
18-CB0820-JNX	RES. C.F. 82 OHM 1/6W +/-5%	1	R902
18-CB0829-JNX	RES. C.F. 8.2 OHM 1/6W +/-5%	1	R631
18-CB0829-JNX	RES. C.F. 8.2 OHM 1/6W +/-5%	1	R633
18-CD0109-JNX	RES. C.F. 1 OHM 1/4W +/-5%	1	R265
18-CD0121-JNX	RES. C.F. 120 OHM 1/4W +/-5%	1	R266
18-CD0152-JNX	RES. C.F. 1.5K OHM 1/4W +/-5%	1	R263
18-CD0223-JNX	RES. C.F. 22K OHM 1/4W +/-5%	1	R415
18-CD0330-JNX	RES. C.F. 33 OHM 1/4W +/-5%	1	R262
18-CE0229-JNX	RES. C.F. 2.2 OHM 1/2W +/-5%	1	R307
18-CE0331-JNX	RES. C.F. 330 OHM 1/2W +/-5%	1	R418
18-CE0331-JNX	RES. C.F. 330 OHM 1/2W +/-5%	1	R274
18-DB0303-FNX	RES. M.F. 30K OHM 1/6W +/-1%	1	R103
18-EF0109-JGX	RES. FUS. 1 OHM 1W +/-5% (LS)	1	R401
18-EF0109-JGX	RES. FUS. 1 OHM 1W +/-5% (LS)	1	R470
18-FF0331-JGX	RES. M.O. 330 OHM 1W +/-5%	1	R315
18-FG0102-JHX	RES. M.O. 1K OHM 2W +/-5%	1	R409
18-FG0103-JHX	RES. M.O. 10K OHM 2W +/-5%	1	R416
18-FG0129-JHX	RES. M.O. 1.2 OHM 2W +/-5%	1	R403
18-FG0159-JHX	RES. M.O. 1.5 OHM 2W +/-5%	1	R312
18-FG0399-JHX	RES. M.O. 3.9 OHM 2W +/-5%	1	R480
18-FH0472-JIX	RES. M.O. 4.7K OHM 3W +/-5%	1	R411
18-FH0472-JIX	RES. M.O. 4.7K OHM 3W +/-5%	1	R412
18-GF0109-JGX	RES WIRE ROUND 1 OHM 1W +/-5%	1	R322
18-GF0109-JGX	RES WIRE ROUND 1 OHM 1W +/-5%	1	R323
20-TR502H-5CX	TRIMMER B5K HORIZ TYPE	1	VR102
25-264610-M1X	CAP. ELEC 4.7μF 50V +/-20% NP	1	C480
25-BBB331-M1X	CAP. ELEC 330 μF 10V +/-20%	1	C641
25-BJA100-M1X	CAP. ELEC 10 μF 160V +/-20%	1	C414
25-BJG101-M1X	CAP. ELEC 100 μF 160V +/-20%	1	C401
25-BLA220-M1X	CAP. ELEC 22 μF 250V +/-20%	1	C402
26-ABC102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C218
26-ABC339-CZX	CAP. CER 3.3 PF 50V +/-0.25 SL	1	C207
26-ABC339-CZX	CAP. CER 3.3 PF 50V +/-0.25 SL	1	C208
26-ABC339-CZX	CAP. CER 3.3 PF 50V +/-0.25 SL	1	C948
26-ABC339-CZX	CAP. CER 3.3 PF 50V +/-0.25 SL	1	C949
26-ABC473-ZFX	CAP. CER 0.047 μF 50V +80-20%F	1	C232
26-AGK221-KRX	CAP. CER 220 PF 250V +/-10%	1	C403
26-AGK472-KRX	CAP. CER 4.7 NF 250V +/-10%	1	C409
26-AIC102-KB1	CAP. CER 1000 PF 500V +/-10% B	1	C417
26-AIC221-KB1	CAP. CER 220 PF 500V +/-10% B	1	C406
26-AIC221-KB1	CAP. CER 220 PF 500V +/-10% B	1	C407
26-AIC332-KBX	CAP. CER 3300 PF 500V +/-10% B	1	C419
26-AMK561-KRX	CAP. CER 560PF 2KV +/-10%	1	C408
26-EBP101-JCX	CAP. CER 100PF 50V +/-5% CH	1	C201
26-EBP101-JCX	CAP. CER 100PF 50V +/-5% CH	1	C203
26-EBP101-JCX	CAP. CER 100PF 50V +/-5% CH	1	C204
26-EBP101-JCX	CAP. CER 100PF 50V +/-5% CH	1	C234
26-EBP101-JCX	CAP. CER 100PF 50V +/-5% CH	1	C245

26-EBP102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C410
26-EBP102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C644
26-EBP102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C645
26-EBP102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C925
26-EBP102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C926
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C103
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C104
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C107
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C210
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C216
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C223
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C231
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C236
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C238
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C243
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C109
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C110
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C111
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C237
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C211
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C932
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C631
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C639
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C482
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C920
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C130
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C117
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C215
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C934
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C251
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C253
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C206
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C924
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C904
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C125
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C108
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C940
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C942
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C240
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C241
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C255
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C256
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C257
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C960
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C961
26-EBP470-JCX	CAP. CER 47PF 50V +/-5% CH	1	C416
26-EBP471-JZX	CAP. CER 470 PF 50V +/-5% SL	1	C303
26-EBP471-JZX	CAP. CER 470 PF 50V +/-5% SL	1	C304
26-EBP560-JCX	CAP. CER 56PF 50V +/-5%	1	C945
26-EBP560-JCX	CAP. CER 56PF 50V +/-5%	1	C946
26-EBP560-JCX	CAP. CER 56PF 50V +/-5%	1	C947
27-ALR222-J0X	CAP. M.PP 2200 PF 1.6KV +/-5%	1	C422
27-ALR602-J0X	CAP. M.PP 6000 PF 1.6KV +/-5%	1	C412
27-ALR822-J0X	CAP. M.PP 8200 PF 1.6KV +/-5%	1	C411
27-MBC104-J0X	CAP. M.PE 0.1 μF 63V +/-5%	1	C101
27-MBC104-J0X	CAP. M.PE 0.1 μF 63V +/-5%	1	C102
27-MBC104-J0X	CAP. M.PE 0.1 μF 63V +/-5%	1	C242
27-MBC104-J0X	CAP. M.PE 0.1 μF 63V +/-5%	1	C421
27-MBC104-J0X	CAP. M.PE 0.1 μF 63V +/-5%	1	C634
27-MBC104-J0X	CAP. M.PE 0.1 μF 63V +/-5%	1	C636

27-MBC104-J0X	CAP. M.P.E 0.1 μ F 63V +/-5%	1	C638
27-MBC334-J0X	CAP. M.P.E 0.33 μ F 63V +/-5%	1	C936
27-MBC334-J0X	CAP. M.P.E 0.33 μ F 63V +/-5%	1	C937
27-MBC334-J0X	CAP. M.P.E 0.33 μ F 63V +/-5%	1	C938
27-MBC334-J0X	CAP. M.P.E 0.33 μ F 63V +/-5%	1	C939
27-MBC474-J0X	CAP. M.P.E 0.47 μ F 63V +/-5%	1	C226
27-MBC474-J0X	CAP. M.P.E 0.47 μ F 63V +/-5%	1	C227
27-MBC474-J0X	CAP. M.P.E 0.47 μ F 63V +/-5%	1	C228
27-MBC474-J0X	CAP. M.P.E 0.47 μ F 63V +/-5%	1	C225
27-MBC474-J0X	CAP. M.P.E 0.47 μ F 63V +/-5%	1	C927
27-MCC154-J0X	CAP. M.P.E 0.15 μ F 100V +/-5%	1	C307
27-PBA224-J0X	CAP. P.E 0.22 μ F 63V +/-5%	1	C305
27-PBC103-J0X	CAP. P.E. 0.01 μ F 63V +/-5%	1	C229
27-PBC103-J0X	CAP. P.E. 0.01 μ F 63V +/-5%	1	C902
27-PBC103-J0X	CAP. P.E. 0.01 μ F 63V +/-5%	1	C632
27-PBC103-J0X	CAP. P.E. 0.01 μ F 63V +/-5%	1	C633
27-PBC103-J0X	CAP. P.E. 0.01 μ F 63V +/-5%	1	C263
27-PBC103-J0X	CAP. P.E. 0.01 μ F 63V +/-5%	1	C262
27-PBC223-J0X	CAP. P.E 0.022 μ F 63V +/-5%	1	C244
27-PBC223-J0X	CAP. P.E 0.022 μ F 63V +/-5%	1	C246
27-PBC223-J0X	CAP. P.E 0.022 μ F 63V +/-5%	1	C247
27-PBC333-J0X	CAP. P.E 0.033 μ F 63V +/-5%	1	C219
27-PCC223-J0X	CAP. P.E 0.022 μ F 100V +/-5%	1	C418
34-A100K0-1IX	COIL CHOKE 10 μ H +/-10%	1	L201
34-A100K0-1IX	COIL CHOKE 10 μ H +/-10%	1	L202
34-A100K0-1IX	COIL CHOKE 10 μ H +/-10%	1	L203
34-A109K0-1IX	COIL CHOKE 1 μ H +/-10%	1	L101
34-A608K6-1BX	COIL CHOKE 0.6 μ H +/-10%	1	L402
34-R100J2-0EX	COIL PL - 10 μ H +/-5%	1	L104
34-R100J2-0EX	COIL PL - 10 μ H +/-5%	1	L901
34-R100J2-0EX	COIL PL - 10 μ H +/-5%	1	L102
36-LIN210-XX1	COIL LINEARITY 21 μ H	1	L401
36-WID801-XX1	COIL WIDTH 800 μ H	1	L480
37-SC2901-79B0X	FLYBACK BSC29-0179B	1	T401
38-236560-00X	COIL I.F.T. 236560 FOR VCO	1	T101
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	J416
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	C944
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	J417
41-WJ0050-B00	WIRE BARE JUMPER 5MM	1	J428
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	J303
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	J215
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	J110
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	J904
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J105
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J104
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J113
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J114
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J234
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J102
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J308
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J609
41-WJ0070-B00	WIRE BARE JUMPER 7MM	1	J233
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J213
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J301
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J302
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J401
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J402
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J404
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J202
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J212

41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J214
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J203
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J905
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J903
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	R273
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J111
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J207
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	J112
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J240
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J606
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J916
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J917
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J918
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J605
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J604
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J409
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J410
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J408
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J407
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J121
41-WJ0180-B00	WIRE BARE JUMPER 18MM	1	J239
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	R218
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	R223
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	R228
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J919
41-WJ0095-B00	WIRE BARE JUMPER 9.5MM	1	J906
41-WJ0095-B00	WIRE BARE JUMPER 9.5MM	1	J907
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R606
41-WJ0095-B00	WIRE BARE JUMPER 9.5MM	1	J235
41-WJ0095-B00	WIRE BARE JUMPER 9.5MM	1	J926
41-WJ0095-B00	WIRE BARE JUMPER 9.5MM	1	J927
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J103
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J403
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J922
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J924
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J405
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J611
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J612
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J614
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J615
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J217
41-WJ0105-B00	WIRE BARE JUMPER 10.5MM	1	J101
41-WJ0105-B00	WIRE BARE JUMPER 10.5MM	1	J908
41-WJ0110-B00	WIRE BARE JUMPER 11MM	1	J610
41-WJ0110-B00	WIRE BARE JUMPER 11MM	1	J915
41-WJ0115-B00	WIRE BARE JUMPER 11.5MM	1	J216
41-WJ0115-B00	WIRE BARE JUMPER 11.5MM	1	J616
41-WJ0115-B00	WIRE BARE JUMPER 11.5MM	1	J617
41-WJ0115-B00	WIRE BARE JUMPER 11.5MM	1	J603
41-WJ0120-B00	WIRE BARE JUMPER 12MM	1	J912
41-WJ0120-B00	WIRE BARE JUMPER 12MM	1	J201
41-WJ0120-B00	WIRE BARE JUMPER 12MM	1	J913
41-WJ0120-B00	WIRE BARE JUMPER 12MM	1	J914
41-WJ0120-B00	WIRE BARE JUMPER 12MM	1	J226
41-WJ0120-B00	WIRE BARE JUMPER 12MM	1	J909
41-WJ0120-B00	WIRE BARE JUMPER 12MM	1	J910
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J106
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J206
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J116
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J122

41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J208	
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J236	
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J204	
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J209	
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J211	
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J613	
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J108	
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J115	
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J210	
41-WJ0135-B00	WIRE BARE JUMPER 13.5MM	1	J118	
41-WJ0135-B00	WIRE BARE JUMPER 13.5MM	1	J119	
41-WJ0135-B00	WIRE BARE JUMPER 13.5MM	1	J406	
41-WJ0135-B00	WIRE BARE JUMPER 13.5MM	1	J601	
41-WJ0140-B00	WIRE BARE JUMPER 14MM	1	J230	
41-WJ0140-B00	WIRE BARE JUMPER 14MM	1	J231	
41-WJ0140-B00	WIRE BARE JUMPER 14MM	1	J232	
41-WJ0140-B00	WIRE BARE JUMPER 14MM	1	J411	
41-WJ0140-B00	WIRE BARE JUMPER 14MM	1	J412	
41-WJ0140-B00	WIRE BARE JUMPER 14MM	1	J413	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J220	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J237	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J309	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J923	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J238	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	R431	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	R432	
41-WJ0155-B00	WIRE BARE JUMPER 15.5MM	1	J607	
41-WJ0155-B00	WIRE BARE JUMPER 15.5MM	1	J608	
41-WJ0160-B00	WIRE BARE JUMPER 16MM	1	J921	
41-WJ0160-B00	WIRE BARE JUMPER 16MM	1	J920	
41-WJ0165-B00	WIRE BARE JUMPER 16.5MM	1	J120	
41-WJ0165-B00	WIRE BARE JUMPER 16.5MM	1	J304	
41-WJ0165-B00	WIRE BARE JUMPER 16.5MM	1	J305	
41-WJ0170-B00	WIRE BARE JUMPER 17MM	1	J221	
41-WJ0170-B00	WIRE BARE JUMPER 17MM	1	J223	
41-WJ0170-B00	WIRE BARE JUMPER 17MM	1	J224	
41-WJ0170-B00	WIRE BARE JUMPER 17MM	1	J225	
41-WJ0170-B00	WIRE BARE JUMPER 17MM	1	J222	
41-WJ0175-B00	WIRE BARE JUMPER 17.5MM	1	J229	
41-WJ0175-B00	WIRE BARE JUMPER 17.5MM	1	J227	
41-WJ0175-B00	WIRE BARE JUMPER 17.5MM	1	J228	
41-WJ0185-B00	WIRE BARE JUMPER 18.5MM	1	J602	
41-WJ0200-B00	WIRE BARE JUMPER 20MM	1	J911	
45-OSC18M-4Y0	CRYSTAL 18.432M	1	X901	
45-OSC20M-2Y0	CRYSTAL 20.25MHZ	1	X201	
45-TRA5M5-0Y0	CER TRAP TPS 5.5MHZ	1	Z104	
45-TRA6M5-0Y0	CER TRAP TPS 6.5MHZ	1	Z105	
46-12866W-02X	PIN BASE *2 S11-02Y	1	S602	FOR F.CAB(SPK)
46-12866W-02X	PIN BASE *2 S11-02Y	1	S601	FOR F.CAB(SPK)
46-33079W-04X	PIN BASE *4 TJC3-4A	1	S903	
46-33079W-04X	PIN BASE *4 TJC3-4A	1	S901	
46-33079W-06X	PIN BASE *6 TJC3-6A	1	S201	FOR CRT BD P501
46-33079W-06X	PIN BASE *6 TJC3-6A	1	S902	FOR SIDE AV BD
46-33079W-05X	PIN BASE *5 TJC3-5A	1	S202	FOR F.CTL & SW BD
46-33079W-06X	PIN BASE *6 TJC3-6A	1	S203	FOR SCART BD
46-35184W-04X	PIN BASE *4 TJC1-4A	1	S401	FOR D.Y DOIL
54-128700-0X0	FIBRE WASHER 3.3 X 10 X 0.8	2		MTG FBT TO M.BD
63-B30080-BT4	S/T SCREW B 3 X 8 BT	3		MTG F.CTL BKT TO M.BD BKT
63-B30100-BT4	S/T SCREW B 3 X 10 BT	2		FOR FBT TO M.BD
63-W30100-AB4	S/T SCREW W 3 X 10 AB	8		FOR REAR AV & M.BD TO M.BD BKT

64-P30080-104	M/C SCREW P 3 X 8	1		FOR IC301
64-P30100-104	M/C SCREW P 3 X 10	1		FOR Q402
64-P30100-104	M/C SCREW P 3 X 10	5		FOR IC602,IC603,Q480
65-Z30050-23M	NUT M 3	1		FOR IC301
65-Z30050-23M	NUT M 3	1		FOR IC402
67-H27292-1A0	HEAT SINK-REGULATOR & DPC A=60	1		FOR Q480
67-H30147-1A0	HEAT SINK FOR HORIZ	1		FOR Q402
67-H34423-AA0	HEAT SINK (A=50 C=17.5MM)	2		FOR IC603
67-H34423-BA0	HEAT SINK	1		FOR IC602
11-DD2553-0AX	TRANSISTOR (HORIZ) 3DD2553	1	Q402	
10-0FR104-FBX	DIODE FR104 (FAST RECTIFIER)	1	D302	
10-0FR104-FBX	DIODE FR104 (FAST RECTIFIER)	1	D401	
10-0FR104-FBX	DIODE FR104 (FAST RECTIFIER)	1	D402	
10-0FR104-FBX	DIODE FR104 (FAST RECTIFIER)	1	D403	
10-0FR104-FBX	DIODE FR104 (FAST RECTIFIER)	1	D409	
10-0FR104-FBX	DIODE FR104 (FAST RECTIFIER)	1	D405	
10-HS3V9A-DBX	DIODE 500mW 3.9HSA	1	D208	
10-HS3V9A-DBX	DIODE 500mW 3.9HSA	1	D210	
10-HS5V1B-DBX	DIODE 500mW 5.1HSB	1	D207	
10-HS5V1B-DBX	DIODE 500mW 5.1HSB	1	D211	
10-79C8V2-DBX	DIODE ZENER 8V2 1/2W 5%	1	D408	
36-HDR002-AX0	TRANSFORMER HORIZ DRIVE	1	T402	
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R934	
27-MBC104-J0X	CAP. M.P.E 0.1 μ F 63V +/-5%	1	C112	
66-343730-0B0	HOLLOW RIVET 1.6X3.0XL3.2	10		FOR L480 & L401 & T401 & Q402
66-343730-0B0	HOLLOW RIVET 1.6X3.0XL3.2	12		FOR C411,C412,C413,C422,D404
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C914	
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C915	
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C916	
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C917	
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C918	
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C919	
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C943	
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C950	
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C951	
26-EBP271-JCX	CAP. CER 270PF 50V +/-5% CH	1	C952	
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R921	
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R931	
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R932	
34-R229J2-0EX	COIL PL - 2.2 μ H +/-5%	1	L903	
34-R229J2-0EX	COIL PL - 2.2 μ H +/-5%	1	L904	
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q603	
18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R215	
10-HS5V1B-DBX	DIODE 500mW 5.1HSB	1	D601	
18-CB0473-JNX	RES. C.F. 47K OHM 1/6W +/-5%	1	R605	
18-CB0100-JNX	RES. C.F. 10 OHM 1/6W +/-5%	1	R960	
18-CB0100-JNX	RES. C.F. 10 OHM 1/6W +/-5%	1	R960A	
18-CD0102-JNX	RES. C.F. 1k OHM 1/4W +/-5%	1	R261	
18-CB0183-JNX	RES. C.F. 18k OHM 1/6W +/-5%	1	R103A	
45-SAW926-0M0	SAW FILTER K9260M (SIF 33.4)	1	Z101	
26-EBP103-ZFX	CAP. CER 0.01 μ F 50V +80/-20% F	1	J108A	
63-W30100-AB4	S/T SCREW W 3 X 10 AB	4		FOR EMC TO M.BD BKT
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R920	
45-SAW395-3M0	SAW FILTER K3953M(PIF 38.9MHz)	1	(Z101)	(1~5)
41-WJ0160-B00	WIRE BARE JUMPER 16MM	1	J241	
46-35179W-04X	PIN BASE TJC3-4A	1	S402	
25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C114	
25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C205	
25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C233	
25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C250	

25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C905	
25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C906	
25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C908	
25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C909	
25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C911	
25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C912	
25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C929	
25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C930	
25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C931	
25-BCB100-M1X	CAP. ELEC 10 μ F 16V +/-20%	1	C941	
25-BCB101-M1X	CAP. ELEC 100 μ F 16V +/-20%	1	C239	
25-BCB101-M1X	CAP. ELEC 100 μ F 16V +/-20%	1	C254	
25-BCB101-M1X	CAP. ELEC 100 μ F 16V +/-20%	1	C118	
25-BCB101-M1X	CAP. ELEC 100 μ F 16V +/-20%	1	C252	
13-0TDA81-72S	IC TDA8172	1	IC301	
25-BCB101-M1X	CAP. ELEC 100 μ F 16V +/-20%	1	C913	
25-BCB101-M1X	CAP. ELEC 100 μ F 16V +/-20%	1	C308	
25-BCB101-M1X	CAP. ELEC 100 μ F 16V +/-20%	1	C605	
25-BCB470-M1X	CAP. ELEC 47 μ F 16V +/-20%	1	C124	
25-BCB470-M1X	CAP. ELEC 47 μ F 16V +/-20%	1	C209	
25-BCB470-M1X	CAP. ELEC 47 μ F 16V +/-20%	1	C217	
25-BCB470-M1X	CAP. ELEC 47 μ F 16V +/-20%	1	C224	
25-BCB470-M1X	CAP. ELEC 47 μ F 16V +/-20%	1	C230	
25-BCB470-M1X	CAP. ELEC 47 μ F 16V +/-20%	1	C235	
25-BCB470-M1X	CAP. ELEC 47 μ F 16V +/-20%	1	C901	
25-BCB470-M1X	CAP. ELEC 47 μ F 16V +/-20%	1	C923	
25-BCB470-M1X	CAP. ELEC 47 μ F 16V +/-20%	1	C483	
25-BCB470-M1X	CAP. ELEC 47 μ F 16V +/-20%	1	C921	
25-BCB471-M1X	CAP. ELEC 470 μ F 16V +/-20%	1	C258	
25-BDA102-M1X	CAP. ELEC 1000 μ F 25V +/-20%	1	C635	
25-BDA471-M1X	CAP. ELEC 470 μ F 25V +/-20%	1	C404	
25-BDA471-M1X	CAP. ELEC 470 μ F 25V +/-20%	1	C405	
25-BDB100-M1X	CAP. ELEC 10 μ F 25V +/-20%	1	C637	
25-BFB100-M1X	CAP. ELEC 10 μ F 50V +/-20%	1	C903	
25-BFB101-M1X	CAP. ELEC 100 μ F 50V +/-20%	1	C301	
25-BFB339-M1X	CAP. ELEC 3.3 μ F 50V +/-20%	1	C214	
25-BFB339-M1X	CAP. ELEC 3.3 μ F 50V +/-20%	1	C935	
25-BFB470-M1X	CAP. ELEC 47 μ F 50V +/-20%	1	C907	
25-BFB470-M1X	CAP. ELEC 47 μ F 50V +/-20%	1	C910	
25-BFB478-M1X	CAP. ELEC 0.47 μ F 50V +/-20%	1	C119	
25-BFB479-M1X	CAP. ELEC 4.7 μ F 50V +/-20%	1	C106	
10-0BY228-F0X	DIODE BY228	1	D404	
11-630MFP-0AX	TRANSISTOR IRF630MFP	1	Q480	
26-EBP820-JZX	CAP. CER 82 PF 50V +/-5%	1	C120	
46-33079W-03X	PIN BASE *3 TJC3-3A	1	S205	
13-VCT383-1FP	IC VCT3831F(FLASH)	1	IC201	
27-RHQ223-J0X	CAP. PP 0.022 μ F 400V +/-5%	1	C420	
67-H30179-7A0	HEAT SINK	1		FOR IC301
27-MBC474-J0X	CAP. M.P.E 0.47 μ F 63V +/-5%	1	C642	
27-MBC474-J0X	CAP. M.P.E 0.47 μ F 63V +/-5%	1	C643	
27-AGR434-JSX	CAP. M.P.P 0.43 μ F 250V +/-5%	1	C413	
40-2959M2-MAB	P.C.B. MAIN BD	1		
26-EBP223-ZFX	CAP. CER 0.022 μ F 50V +80/-20%F	1	C220	
26-EBP223-ZFX	CAP. CER 0.022 μ F 50V +80/-20%F	1	C221	
18-GG0228-JHX	RES WIRE ROUND 0.22 OHM 2W 5%	1	R634	
62-B159MB-2UN	MAIN BD BRACKET	1		
08-2959M2-PAN	ASS'Y - PACKING	1		
49-267710-BAT	BATT. R6P AA SUM3 5#	2		
70-TV0000-B03	WARRANTY CARD	1		
70-TV0000-W03	SERVICE INDEX	1		

71-A2959U-H00	LABEL SERIAL NO.	1		
71-TV0000-H03	PASS CARD	1		
71-YSTZ00-001	CRISPNESS LABEL	2		
72-2959M2-E049A	OPERATION MANUAL	1		
74-022032-6WE	POLYBAG (23cmX34cmX0.06mm)	1		FOR OPERATION MANUAL
74-130130-3WD	POLYBAG (130CMX130CM)	1		FOR TV
75-B159LL-CC0	POLYFOAM (LL)	1		
75-B159LR-CC0	POLYFOAM (LR)	1		
75-B159UL-CC0	POLYFOAM (UL)	1		
75-B159UR-CC0	POLYFOAM (UR)	1		
76-A2959U-0AT	CARTON BOX	1		
89-26772S-00001	PACKING TAPE 72mmX45Y	0.04		
89-26772S-00002	TRANSPARENT PACKING TAPE 72mmX45Y	0.04		
08-2959M2-PWY	ASS'Y - POWER	1		
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D804	
10-1N4148-ABX	DIODE 1N4148 (SWITCHING)	1	D805	
10-D3SB60-H7X	DIODE D3SB60 (BRIDGE RECT.)	1	DB801	
10-HER108-FBX	DIODE HER108	1	D806	
10-HER108-FBX	DIODE HER108	1	D833	
10-PC574J-DJX	DIODE ZENER UPC 574J	1	D834	
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q831	
11-SC1815-YBX	TRANSISTOR 2SC1815Y	1	Q832	
11-SK2996-OAX	TRANSISTOR 2SK2996 (MOS)	1	Q801	
13-00TLP6-21P	PHOTO COUPLER TLP621(GRH)	1	IC802	
13-44608P-40P	IC MC44608P40	1	IC801	
18-CB0102-JNX	RES. C.F. 1K OHM 1/6W +/-5%	1	R809	
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R840	
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R844	
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R838	
18-CB0392-JNX	RES. C.F. 3.9K OHM 1/6W +/-5%	1	R807	
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R806	
18-CD0220-JNX	RES. C.F. 22 OHM 1/4W +/-5%	1	R811A	
18-CD0221-JNX	RES. C.F. 220 OHM 1/4W +/-5%	1	R833	
18-CD0332-JNX	RES. C.F. 3.3K OHM 1/4W +/-5%	1	R834	
18-CD0471-JNX	RES. C.F. 470 OHM 1/4W +/-5%	1	R811	
18-CE0479-JNX	RES. C.F. 4.7 OHM 1/2W +/-5%	1	R832	
18-CE0753-JNX	RES. C.F. 75K OHM 1/2W +/-5%	1	R831	
18-DD0104-FNX	RES. M.F. 0.1M OHM 1/4W +/-1%	1	R804A	
18-DD0392-FNX	RES. M.F. 3.9K OHM 1/4W +/-1%	1	R835	
18-DD0472-FNX	RES. M.F. 4.7K OHM 1/4W +/-1%	1	R804	
18-FF0479-JGX	RES. M.O. 4.7 OHM 1W +/-5%	1	R841	
18-FG0223-JHX	RES. M.O. 22K OHM 2W +/-5%	1	R837	
18-FG0223-JHX	RES. M.O. 22K OHM 2W +/-5%	1	R839	
18-GG0188-JHX	RES. WIRE ROUND 0.18 OHM 2W +/-5%	1	R810A	
18-GJ0103-KTX	RES. CEMENT 10K OHM 5W +/-10%	1	R836	
18-GJ0223-KTX	RES. CEMENT 5W 22K OHM +/-10%	1	R808	
20-TR502H-5CX	TRIMMER B5K HORIZ TYPE	1	VR830	
22-NTC479-XX0	NTC 4.7 OHM +/-18% NTC4.7D2-14	1	R802	
25-BJG101-M1X	CAP. ELEC 100 μ F 160V +/-20%	1	C835	
25-BMJ221-M1X	CAP. ELEC 220 μ F 400V +/-20%	1	C806	
26-AGK472-KRX	CAP. CER 4.7 NF 250V +/-10%	1	C807	
26-AGK472-KRX	CAP. CER 4.7 NF 250V +/-10%	1	C808	
26-AIC221-KBX	CAP. CER 220 PF 500V +/-10% B	1	C833	
26-AIM103-KBX	CAP. CER 0.01 μ F 500V +/-10% B	1	C805	
26-AMK102-KBX	CAP. CER 1000 PF 2KV +/-10% B	1	C815	
26-APK471-KBX	CAP. CER 470PF 400VAC +/-10% B	1	C803	
26-APK471-KBX	CAP. CER 470PF 400VAC +/-10% B	1	C804	
26-EBP101-JCX	CAP. CER 100PF 50V +/-5% CH	1	C814	
26-EBP102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C809	
26-EBP102-KBX	CAP. CER 1000 PF 50V +/-10% B	1	C837	

26-EBP104-ZFX	CAP. CER 0.1 μ F 50V +80%/-20%	1	C813	
26-EBP104-ZFX	CAP. CER 0.1 μ F 50V +80%/-20%	1	C831	
26-EBP104-ZFX	CAP. CER 0.1 μ F 50V +80%/-20%	1	C842	
26-EBP104-ZFX	CAP. CER 0.1 μ F 50V +80%/-20%	1	C846	
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C830	
26-EBP221-JCX	CAP. CER 220PF 50V +/-5% CH	1	C841	
27-MBC104-J0X	CAP. M.P.E 0.1 μ F 63V +/-5%	1	C839	
27-RJK472-J0X	CAP. PP 4700PF 630V +/-5%	1	C818	
34-R101K2-1BX	COIL CHOKE 100 μ H +/-10%	1	L801	
34-R101K2-1BX	COIL CHOKE 100 μ H +/-10%	1	L802	
35-139730-00X	FERR. BEAD BF60	1		FOR L810
35-139730-00X	FERR. BEAD BF60	1		FOR L811
35-139730-00X	FERR. BEAD BF60	1		FOR L812
35-139730-00X	FERR. BEAD BF60	1		FOR L813
35-139730-00X	FERR. BEAD BF60	1		FOR L814
35-139730-00X	FERR. BEAD BF60	1		FOR L815
35-139730-00X	FERR. BEAD BF60	2		FOR D806
35-139730-00X	FERR. BEAD BF60	2		FOR D804
36-TRF046-XX1	TRANSFORMER CONV. BCK-4201-39m	1	T803	
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	J820A	
41-WJ0060-B00	WIRE BARE JUMPER 6mm	1	J820B	
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J817	
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J818	
41-WJ0065-B00	WIRE BARE JUMPER 6.5MM	1	J819	
41-WJ0090-B00	WIRE BARE JUMPER 9MM	1	J816	
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J805	
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J814	
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	L816	
41-WJ0105-B00	WIRE BARE JUMPER 10.5MM	1	J827	
41-WJ0130-B00	WIRE BARE JUMPER 13MM	1	J828	
41-WJ0130-B00	WIRE BARE JUMPER 13MM	1	J830	
41-WJ0140-B00	WIRE BARE JUMPER 14MM	1	J823	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J813	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J810	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J811	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J821	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J822	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J812	
41-WJ0150-B00	WIRE BARE JUMPER 15MM	1	J804	
41-WJ0175-B00	WIRE BARE JUMPER 17.5MM	1	J808	
41-WJ0175-B00	WIRE BARE JUMPER 17.5MM	1	J809	
41-WJ0180-B00	WIRE BARE JUMPER 18MM	1	J815	
41-WJ0195-B00	WIRE BARE JUMPER 19.5MM	1	J807	
46-28559W-02X	PIN BASE *2 TJC1-2A	1	S801A	FOR EMC P804
64-P30100-104	M/C SCREW P 3 X 10	1		FOR IC803
64-P30100-104	M/C SCREW P 3 X 10	1		FOR IC804
64-P30100-104	M/C SCREW P 3 X 10	1		FOR Q801
67-H27292-3A0	HEAT SINK	1		FOR IC804
67-H27292-5A0	HEAT SINK	1		FOR IC803
67-H35984-2A0	HEAT SINK	1		FOR Q801
10-79C16V-DBX	DIODE ZENER 16V 1/2W 5%	1	D838	
11-SC2688-LAX	TRANSISTOR 2SC2688L (NPN)	1	Q830	
10-1N4007-EBX	DIODE 1N4007	1	D802	
10-HS6V2B-DBX	DIODE 6V2 500mW	1	D840	
10-79C8V2-DBX	DIODE ZENER 8V2 1/2W 5%	1	D839	
18-KF0825-JH3	RES. H.VOLT.CC 8.2M OHM 1W +/-5%	1	R812	
26-APK222-ME4	CAP. CER 2200PF 400VAC +/-20% E	1	C816	
66-382330-0B7	RIVET 2.0X3.7X3.5	4		FOR S803 & C806
66-382330-0B7	RIVET 2.0X3.7X3.5	4		Heat sinks of IC602 & IC603
66-382330-0B7	RIVET 2.0X3.7X3.5	4		FOR R836 & R808

66-343730-0B0	HOLLOW RIVET 1.6X3.0XL3.2	4		FOR D830 & D831
27-MBC104-J0X	CAP. M.P.E 0.1 μ F 63V +/-5%	1	C848	
46-28559W-02X	PIN BASE *2 TJC1-2A	1	S801	FOR F.CTL P801A
46-28559W-02X	PIN BASE *2 TJC1-2A	1	S801B	FOR EMC P802
18-KE0105-JNX	RES. H. VOLT. CC 1M OHM 1/2W	1	R801	
27-AQT224-MV1	CAP. M.P.P 0.22 μ F 250VAC +/-20%	1	C801	
27-AQT224-MV1	CAP. M.P.P 0.22 μ F 250VAC +/-20%	1	C802	
27-AHQ104-JSX	CAP. M.P.P 0.1 μ F 400V +/-5%	1	C802A	
22-PTC200-XX0	POSISTOR 20 OHM (25-34)	1	RT801	
66-20516X-0B0	FUSE HOLDER	2		FOR F801
41-WJ0075-B00	WIRE BARE JUMPER 7.5MM	1	J801A	
36-238300-017	LINE FILTER 20 mH	1	T801	
50-26931D-1VS	FUSE 3.15AT 250VAC 5X20MM BELL	1	F801	
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	J801	
66-343730-0B0	HOLLOW RIVET 1.6X3.0XL3.2	5		FOR T803 & Q801
46-10962W-02X	PIN BASE *2 TJC2-2A	1	S803	
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J824	
41-WJ0080-B00	WIRE BARE JUMPER 8 MM	1	J825	
41-WJ0125-B00	WIRE BARE JUMPER 12.5MM	1	J826	
10-1N4001-EBX	DIODE 1N4001 (RECTIFIER)	1	D836A	
25-BCB101-M1X	CAP. ELEC 100 μ F 16V +/-20%	1	C844	
25-BCB101-M1X	CAP. ELEC 100 μ F 16V +/-20%	1	C845	
25-BCB471-M1X	CAP. ELEC 470 μ F 16V +/-20%	1	C843	
25-BCB471-M1X	CAP. ELEC 470 μ F 16V +/-20%	1	C838	
25-BDG222-M1X	CAP. ELEC 2200 μ F 25V +/-20%	1	C832	
25-BEB101-M1X	CAP. ELEC 100 μ F 35V +/-20%	1	C836	
11-C144ES-0BX	TRANSISTOR PDTC144ES (NPN)	1	Q833	
26-AIM103-KBX	CAP. CER 0.01 μ F 500V +/-10% B	1	C834	
26-AMK561-JZX	CAP. CER 560 PF 2KVDC +/-5% SL	1	C817	
41-WJ0100-B00	WIRE BARE JUMPER 10MM	1	R807A	
13-UA7805-C0S	IC UA7805C	1	IC804	
13-L7809C-VAP	IC L7809CV	1	IC803	
10-0RU3AM-F0X	DIODE RU3AM (FAST RECOVERY)	1	D831	
66-343730-0B0	HOLLOW RIVET 1.6X3.0XL3.2	11		FOR T801,L801,C835,RT801
25-BDB100-M1X	CAP. ELEC 10 μ F 25V +/-20%	1	C812	
10-0RU3YX-F0X	DIODE RU3YX (FAST RECTIFIER)	1	D830	
08-2959M2-RCN	ASS'Y - REAR CABINET	1		
42-14006H-XX0	SPEAKER 6 OHM 15W	1	SP603	
46-27322H-02X	HS 2P24 360/7 F/W SM-2P WH	1		FROM SP603 TO S603
54-114000-00X	FELT TAPE (150mmX19mmX0.3mm)	9		STICK ON R.CAB
54-354210-000	SPONGE (255mmX15mmX2mm)	2		STICK ON WOOFER HOLDER(2)
55-366690-0CN	WOOFER BOX	1		
55-B159RC-0CNAA	REAR CABINET	1		
58-2959MP-0UI9A	PLATE MODEL NO.	1		
58-369460-4UI9A	INLAY REAR AV	1		
58-369730-3UI9A	INLAY SCART	1		
59-130460-00X	RUBBER PAD (25mmX7mm)	2		
59-345380-000	RUBBER PAD	4		MTG SPKER TO WOOFER
62-354140-0HN	WOOFER HOLDER (I)	2		
62-354150-0HN	WOOFER HOLDER (II)	2		
62-357350-0HI	WOOFER HEADER	1		
62-357360-6HI	WOOFER PIPE (L=220MM)	1		
62-357360-7HI	WOOFER PIPE (L=235MM)	1		
62-367720-0HA	SCREW POST	4		MTG WOOFER TO R.CAB
63-B40150-AB3	S/T SCREW B 4 X 15 AB (BLACK)	4		MTG WOOFER BOX TO R.CAB
63-B40150-AB3	S/T SCREW B 4 X 15 AB (BLACK)	4		MTG WOOFER PIPE TO R.CAB
63-B40250-AB3	S/T SCREW B 4 X 25 AB (BLACK)	10		MTG R.CAB TO F.CAB
63-F30100-BT3	S/T SCREW F 3 X 10 BT (BLACK)	2		MTG REAR AV BKT & R.CAB
63-W35120-AB3	S/T SCREW W 3.5 X 12 AB	12		MTG SCREW POST TO R.CAB
63-W35150-AB4	S/T SCREW W 3.5 X 15 AB	4		FOR WOOFER TO WOOFER BOX

65-A50200-20E	WASHER 5 X 20 X 2MM	4		MTG WOOFER BOX TO R.CAB
08-2959M2-SCY	ASS'Y - SCART BD	1		
18-CB0103-JNX	RES. C.F. 10K OHM 1/6W +/-5%	1	R947	
18-CB0750-JNX	RES. C.F. 75 OHM 1/6W +/-5%	1	R942	
18-CB0750-JNX	RES. C.F. 75 OHM 1/6W +/-5%	1	R943	
18-CB0750-JNX	RES. C.F. 75 OHM 1/6W +/-5%	1	R945	
18-CB0750-JNX	RES. C.F. 75 OHM 1/6W +/-5%	1	R946	
18-CB0750-JNX	RES. C.F. 75 OHM 1/6W +/-5%	1	R949	
46-30966H-04X	HS 2468 #24 160 TJC3-4Y/SCN-4Y	1	P906	FOR M.BD S903
46-30966H-04X	HS 2468 #24 160 TJC3-4Y/SCN-4Y	1	P908	FOR M.BD S901
46-32271H-06X	HS 6P24 160 TJC3-6Y/SCN-6Y	1	P907	FOR M.BD S203
47-SCA002-XX0	SCART SOCKET - 21 PINS (VERTICAL TYPE)	1	P904	
62-368760-0HN	REAR AV BRACKET	1		
63-W30100-AB4	S/T SCREW W 3 X 10 AB	4		FOR SCART BD REAR AV BKT
18-CB0153-JNX	RES. C.F. 15k OHM 1/6W +/-5%	1	R948	
40-002959-SCE	P.C.B. SCAN BD	1		
08-2959M2-SIY	ASS'Y - SIDE AV BD	1		
40-2918MY-SIA	P.C.B. SIDE AV BD	1		
46-30790H-06X	HS 6P24 400 TJC3-6Y/SCN-6Y	1	P1101	FOR M.BD S902
47-RCA022-XX1	RCA SOCKET RCA-3316P1 Y/W/R	1	P1002	
63-B30080-BT4	S/T SCREW B 3 X 8 BT	2		MTG SIDE AV BD BKT
08-2959M2-WFY	ASS'Y - WOOFER PARTS	1		
13-TDA894-5SS	IC TDA8945S	1	IC603	
18-CB0104-JNX	RES. C.F. 100K OHM 1/6W +/-5%	1	R601	
18-CB0123-JNX	RES. C.F. 12k OHM 1/6W +/-5%	1	R623	
18-CB0123-JNX	RES. C.F. 12k OHM 1/6W +/-5%	1	R622	
18-CB0223-JNX	RES. C.F. 22k OHM 1/6W +/-5%	1	R604	
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R602	
18-CB0472-JNX	RES. C.F. 4.7k OHM 1/6W +/-5%	1	R603	
18-CB0829-JNX	RES. C.F. 8.2 OHM 1/6W +/-5%	1	R621	
18-GG0228-JHX	RES WIRE ROUND 0.22 OHM 2W 5%	1	R624	
26-EBP103-ZFX	CAP. CER 0.01μF 50V +80/-20% F	1	C621	
26-EBP104-ZFX	CAP. CER 0.1μF 50V +80%/-20%	1	C625	
27-PBA224-J0X	CAP. P.E 0.22μF 63V +/-5%	1	C623	
27-PBC333-J0X	CAP. P.E 0.033μF 63V +/-5%	1	C624	
27-PBC683-J0X	CAP. P.E 0.068 μF 63V +/-5%	1	C602	
46-32282H-02X	HS 2P22 300 F/W SCN-2Y/SM-2Y	1	S603	FOR WOOFER
18-CB0332-JNX	RES. C.F. 3.3k OHM 1/6W +/-5%	1	R936	
25-BCB220-M1X	CAP. ELEC 22 μF 16V +/-20%	1	C920	
25-BDB100-M1X	CAP. ELEC 10 μF 25V +/-20%	1	C626	
25-BFB229-M1X	CAP. ELEC 2.2 μF 50V +/-20%	1	C601	
25-BFB479-M1X	CAP. ELEC 4.7 μF 50V +/-20%	1	C603	
25-BFB479-M1X	CAP. ELEC 4.7 μF 50V +/-20%	1	C604	
25-BDA102-M1X	CAP. ELEC 1000 μF 25V +/-20%	1	C622	
08-2959M2-EMY		1		
40-T2575S-EMA	P.C.B. EM BD	1		
46-28559W-02X	PIN BASE *2 TJC1-2A	1	P804	FOR POWER S801A
46-28559W-02X	PIN BASE *2 TJC1-2A	1	P802	FOR POWER S801B
46-32269H-02X	HS 2P22 200 TJC1-2Y/TJC1-2Y	1		FROM P804 TO S801A
46-32269H-02X	HS 2P22 200 TJC1-2Y/TJC1-2Y	1		FROM P802 TO S801B
36-DIF002-JX0	SUPPRESSER HCS01-433	1	T802	
06-015W37-A101X	ASSY - REMOTE HANDSET (M36-1)	1		

PART VIII. Safety & EMC Components

In order to guarantee the safety & EMC of the product, ensure to replace the following components with ones that have the same type and specification.

Safety components M35		
No.	Name	Location No.
1	Isolating resistor	R812
2	Isolating Capacitor	C816
3	Degaussing Coil	L803
4	Switch Transformer	T803
5	Flyback Transformer	T401
6	Socket CRT	P503
7	Fuse	F801
8	Power Switch	SW801
9	PCB	
10	Rear Cabinet	
11	Power Cord	
12	CRT	
EMC Components M35		
No.	Name	Location No.
1	Tuner	TU101
2	Rectifier Diode	DT801
3	Power Filter	T801
4	SAW Filter	Z101
5	Switch Transformer	T803

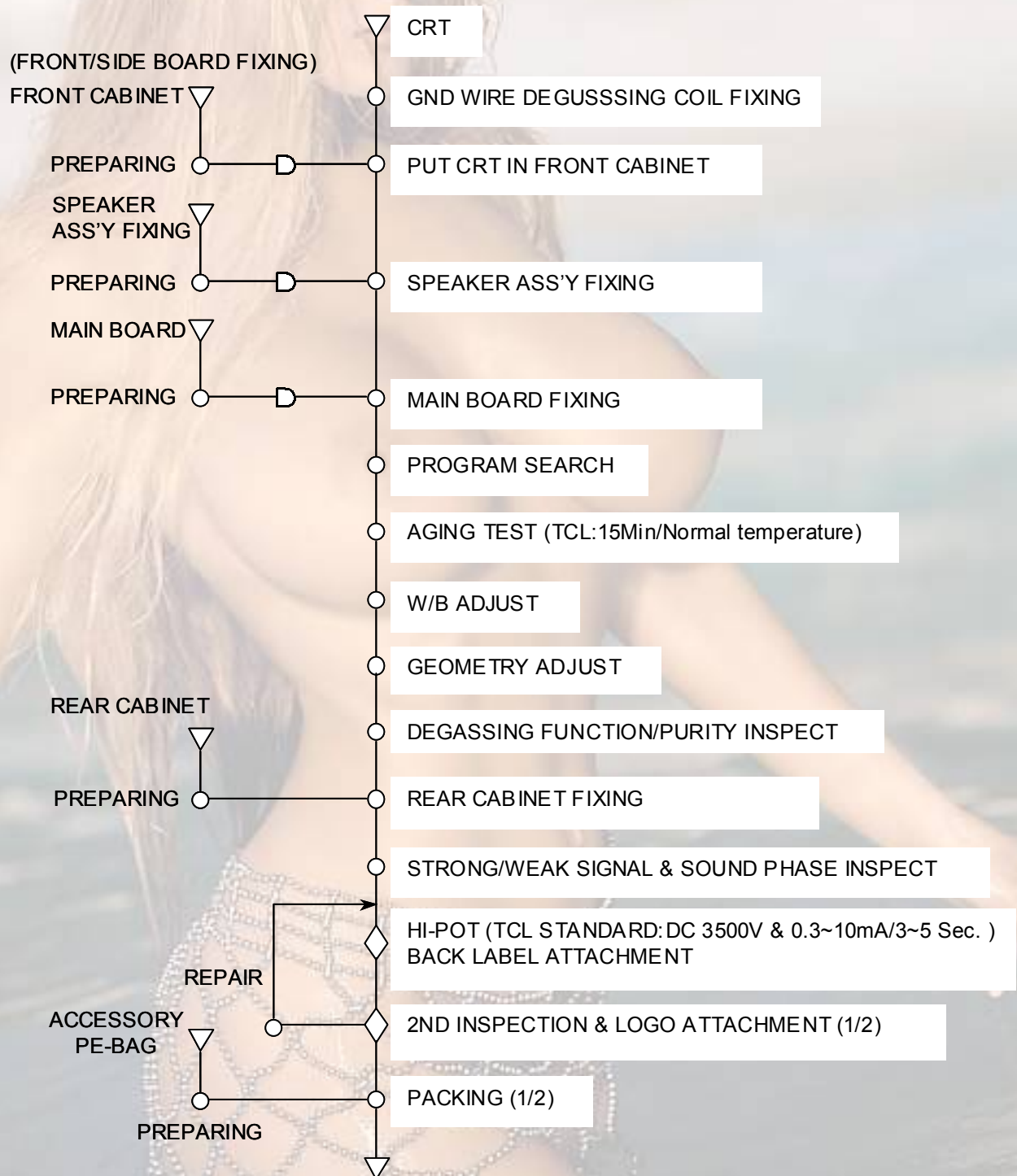
Safety components M36		
No.	Name	Location No.
1	Isolating resistor	R812
2	Isolating Capacitor	C816
3	Degaussing Coil	L803
4	Switch Transformer	T803
5	Flyback Transformer	T401
6	Socket CRT	P503
7	Fuse	F801
8	Power Switch	SW801
9	PCB	
10	Rear Cabinet	
11	Power Cord	
12	CRT	
EMC Components M36		
No.	Name	Location No.
1	Tuner	TU101
2	Rectifier Diode	DB801
3	Power Filter	T801
4	SAW Filter	Z101
5	Switch Transformer	T803
6	Resonant Current Press	T802

PART IX. Working Guide

DESIGN
LEXUS SUN

WORKING GUIDE

VERSION
1.0



PART X. Technical Support List

Document No.: _____

Date: _____

Technical Support List

Model No. : _____ Sale Destination: _____
 Shipment format: ☐ SKD ☐ CKD ☐ CBU _____
 Product Safety Requirement: _____ ODF No.: _____

<u>ITEM</u>	<u>OPTION</u>	<u>REMARK</u>
1. BOM	【Yes ☐ No ☐ 】	
2. Working Guide	【Yes ☐ No ☐ 】	
3. Product Specification	【Yes ☐ No ☐ 】	
4. Service manual	【Yes ☐ No ☐ 】	
5. Engineering sample 1 PCS (Dismantle)	【Yes ☐ No ☐ 】	
6. Cosmetic and Quality 1PCS (Not Dismantle)	【Yes ☐ No ☐ 】	
7. Circuit Diagram	【Yes ☐ No ☐ 】	
8. Special Equipment/JIGS	【Yes ☐ No ☐ 】	
9. Factory Remote Control Hand Set	【Yes ☐ No ☐ 】	QTY: PCS
10. Alignment Procedure	【Yes ☐ No ☐ 】	
11. Service training	【Yes ☐ No ☐ 】	
12. Key Component (CRT 、 FBT、 IC) Specification	【Yes ☐ No ☐ 】	

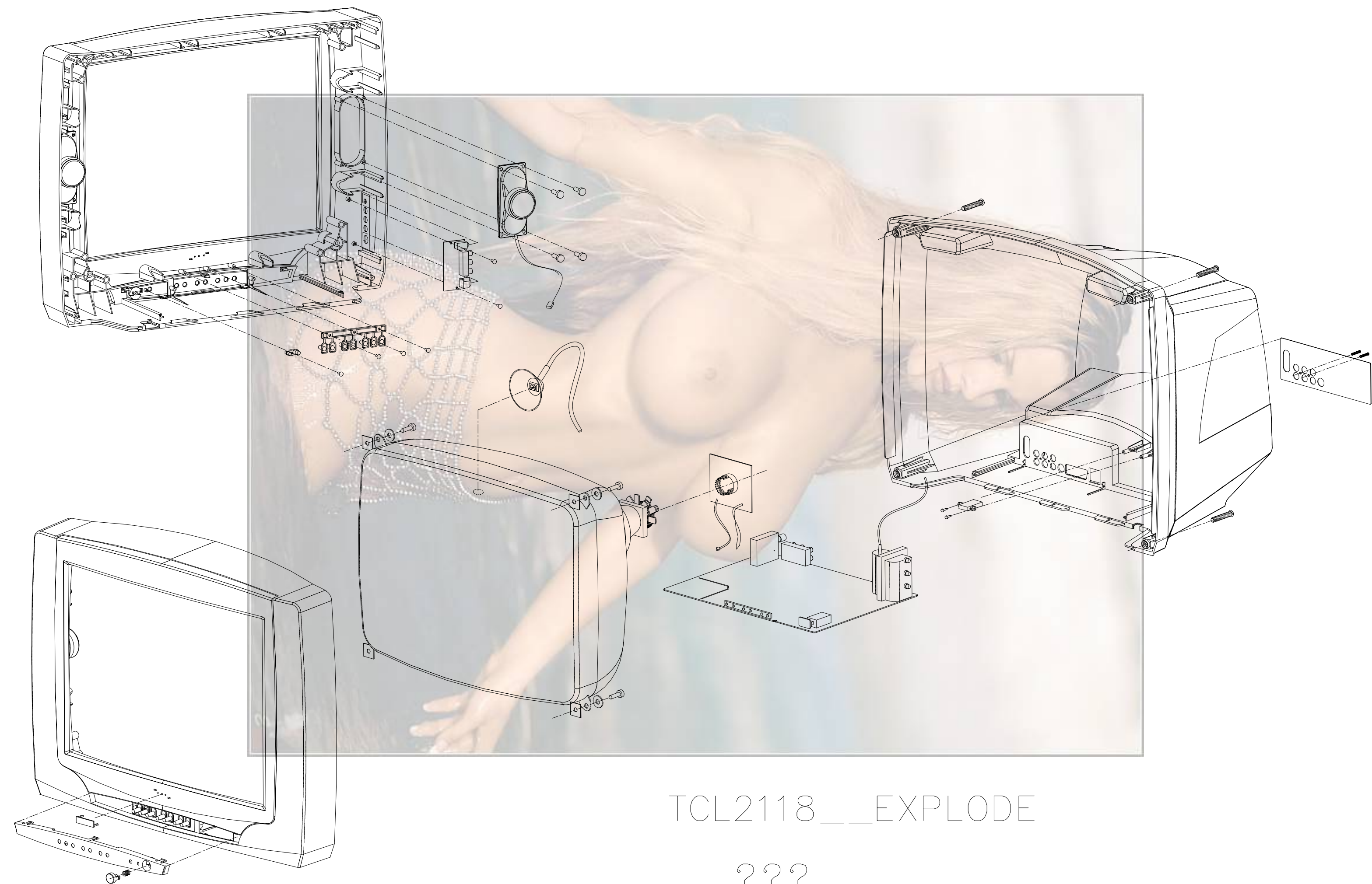
Prepared By: _____ (Marketing Dept.)

Confirmed By: _____ (Overseas Manufacturing Management Dept.)

TCL Overseas Manufacturing Management Dept.

TCL OVERSEAS MANUFACTURING MANAGEMENT DEPARTMENT

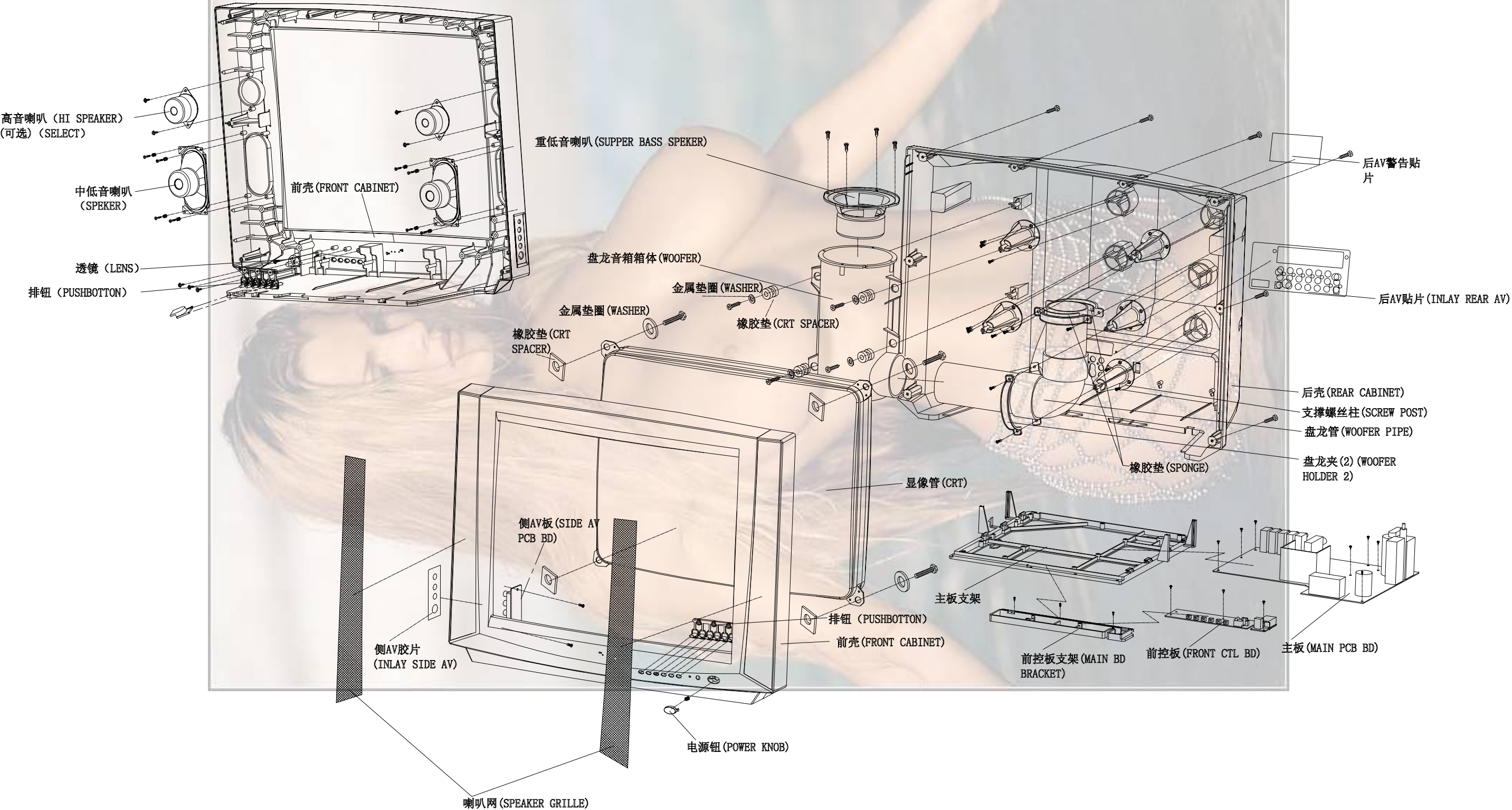
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Duncan Zhai	Overseas Factory Management	86-752-2607905	duncan@tcl.com	
Homer Xiang		86-752-2603986	xianghp@tcl.com	
Michael Fan	Complaint	86-752-2607897	michaelfan@tcl.com	
Zhenggui Wang		86-752-2605260	wangzhengui@tcl.com	
Lexus Sun	Technical support	86-752-2607965	sunlz@tcl.com	
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Bin Wu		86-752--2607965	wubin@tcl.com	
Haiqiang Chen	Spare Part	86-752-2612763	chenk@tcl.com	
Demei Xie(Ms.)		86-752-2605260	dmxie@tcl.com	
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Yueming Wang	Receptionist	86-752-2607984	wangym@tcl.com	
Alice Peng(Ms.)	Office Assistant	86-752-2607897	pengcan@tcl.com	



TCL2118__EXPLODE

???

2959爆炸图 (2959explode)



M35

CIRCUIT CONSTANTS AND CIRCUIT ITSELF ARE SUBJECT TO CHANGE WITHOUT NOTICE

A

B

C

D

E

F

G

H

I

J

A

B

C

D

E

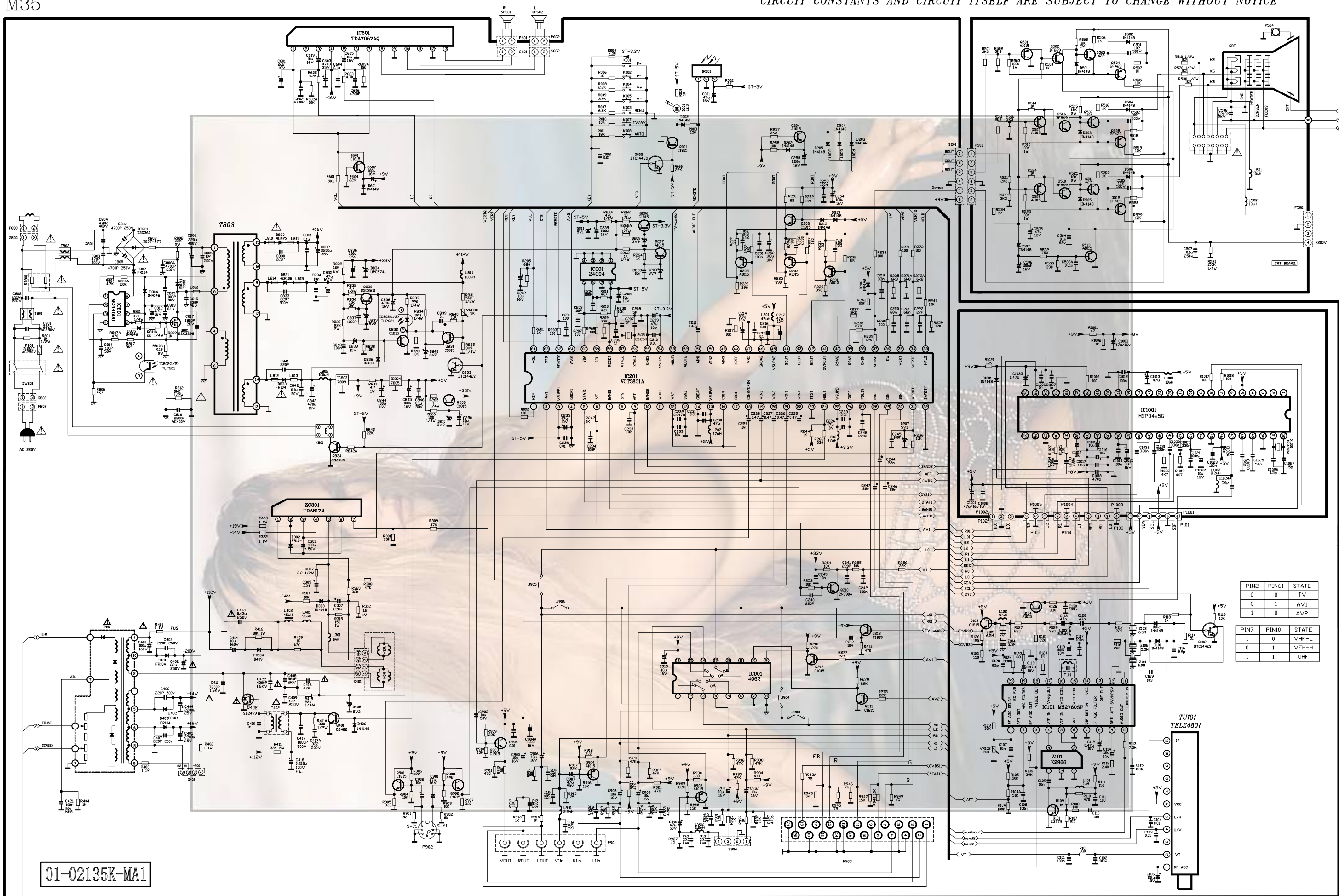
F

G

H

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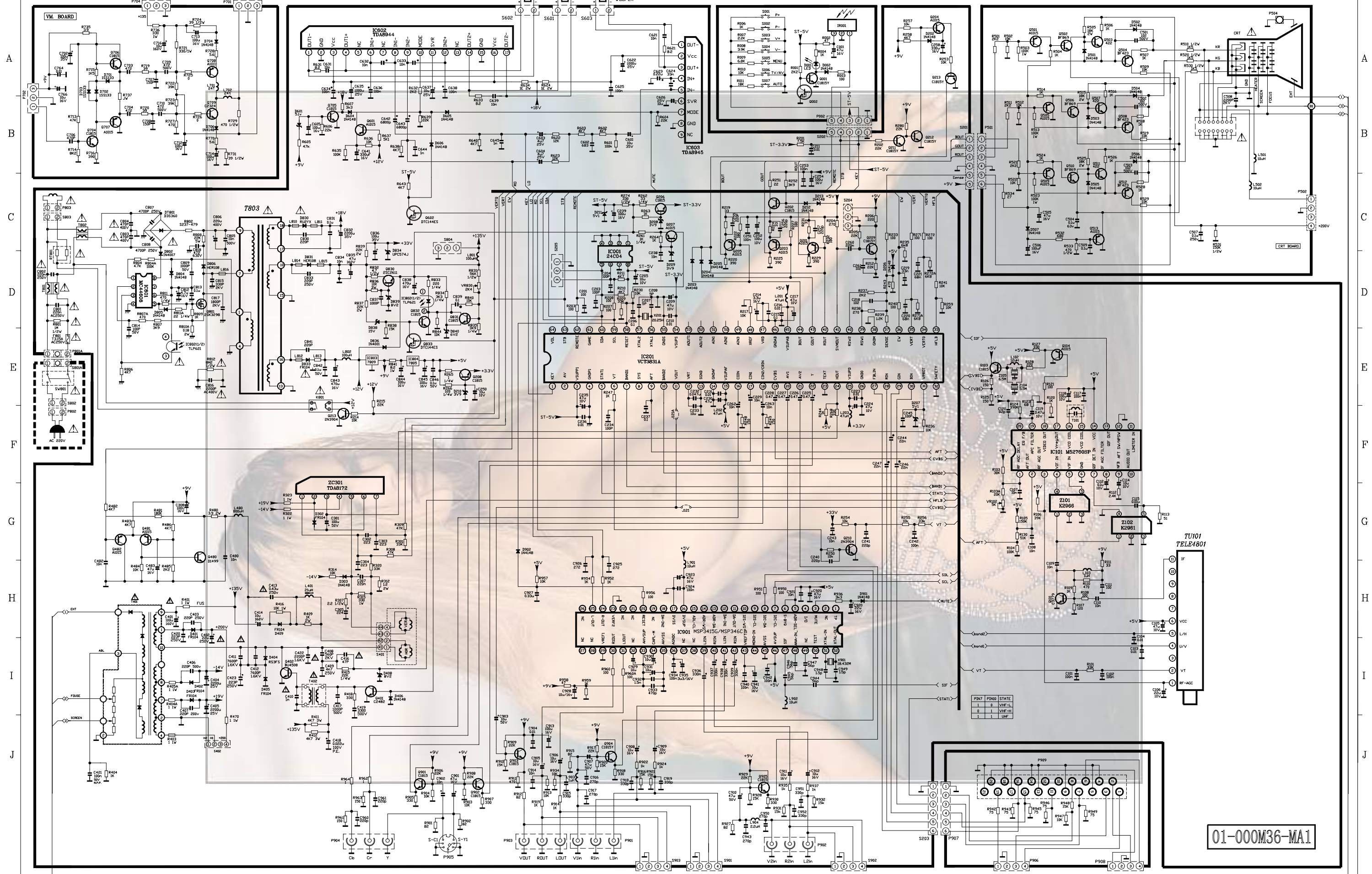


PIN2	PIN61	STATE
0	0	TV
0	1	AV1
1	0	AV2

PIN7	PIN10	STATE
1	0	VHF-L
0	1	VHF-H
1	1	UHF

M36(2959): PAL/S BG/DK TEXT NICAM WOOFER

CIRCUIT CONSTANTS AND CIRCUIT ITSELF ARE SUBJECT TO CHANGE WITHOUT NOTICE



01-000M36-MA1