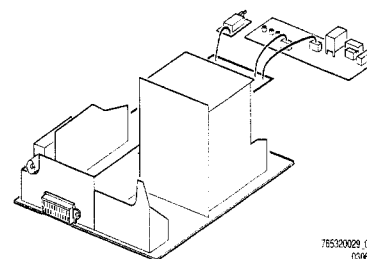


Service Service Service



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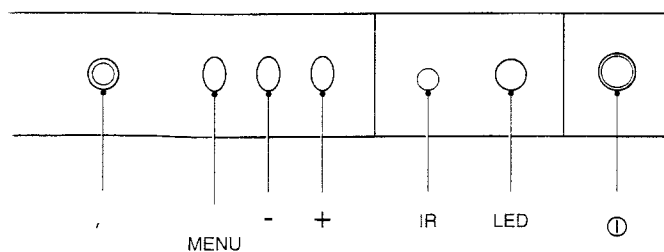
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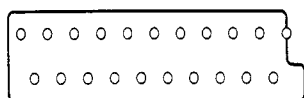
PHILIPS

1 Technical specifications

ains Voltage:	: 220-240V $\pm$ 10% AC; 50-60Hz ($\pm$ 5%)
ains frequency	: 50 Hz : 60 Hz
ower Consumption in stand-by	: < 5 Watt
ower Consumption normal mode	: 28" : 75Watt +/- 10%
erial input impedance TV	: 75 Ohm - coax
lin. aerial input VHF:	: 30mV
lin. aerial input UHF:	: 40mV
ax. aerial input VHF/UHF:	: 180mV
ull-in range colour sync:	: $\pm$ 300Hz
ull-in range horizontal sync:	: $\pm$ 600Hz
ull-in range vertical sync:	: $\pm$ 5Hz
icture tube range	: 25" and 28"
ound output power	: 3 Watt mono execution : 2 X 3 Watt stereo execution
TV Systems:	: PAL I : PAL BG : PAL BG / SECAM DK : PAL BG / SECAM LL'
indications:	: On Screen Display (OSD) green/red : 1 LED (red high intensity, red low intensity, : "RC5" and error codes blinking red)
/CR programs:	: 0
Tuning and operating system:	: VST
JV913E / IEC (VST):	: VHFa:46 - 102 MHz : VHFb:138 - 224 MHz : UHF:471 - 855 MHz
JV915E / IEC (VST):	: VHFa:48 - 168 MHz : VHFb:175 - 448 MHz : UHF300 - 860 MHz
JV917E / IEC (VST):	: VHFa:48 - 118 MHz : VHFb:118 - 300 MHz : UHF:470 - 861 MHz
943 / IEC (VST):	: UHF:470 - 861 MHz
ocal operating functions:	: MENU / - / +



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1- Audio	R ($0.5V_{rms} \leq 1k\Omega$)
2- Audio	R ($0.5V_{rms} \geq 10k\Omega$)
3- Audio	L ($0.5V_{rms} \leq 1k\Omega$)
4- Audio	
5- Blue	
6- Audio	L ($0.5V_{rms} \geq 10k\Omega$)
7- Blue	($0.7V_{pp}/75\Omega$)
8- CVBS- status	0-1.3V:INT, 4.5-7V:EXT 16:9, 9.5- 12V:EXT 4:3
9- Green	
10-	
11- Green	($0.7V_{pp}/75\Omega$)
12-	
13- Red	
14-	
15- Red	($0.7V_{pp}/75\Omega$)
16- RGB- status	(0-0.4V:INT, 1-3V:EXT/ 75Ω)
17- CVBS	
18- CVBS	
19- CVBS	($1V_{pp}/75\Omega$)
20- CVBS	($1V_{pp}/75\Omega$)
21- Earth socket	



3 Safety instructions, Maintenance instruction,

3.1 Safety instructions for repairs



Figure 3-1

1. Safety regulations require that during a repair:
 - the set should be connected to the mains via an isolating transformer;
 - safety components, indicated by the symbol (see fig. 3.1), should be replaced by components identical to the original ones;
 - when replacing the CRT, safety goggles must be worn.

2. Safety regulations require that after a repair the set must be returned in its original condition. In particular attention should be paid to the following points.

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

Note: This resoldering is advised to prevent bad connections due to metal fatigue in solder joints and is therefore only necessary for television sets older than 2 years. The wire trees and EHT cable should be routed correctly and fixed with the mounted cable clamps.

- The insulation of the mains lead should be checked for external damage.
- The mains lead strain relief should be checked for its function in order to avoid touching the CRT, hot components or heat sinks.
- The electrical DC resistance between the mains plug and the secondary side should be checked (only for sets which have a mains isolated power supply). This check can be done as follows:
 - unplug the mains cord and connect a wire between the two pins of the mains plug;
 - set the mains switch to the on position (keep the mains cord unplugged!);
 - measure the resistance value between the pins of the mains plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 MW and 12 MW;
 - switch off the TV and remove the wire between the two pins of the mains plug.
- The cabinet should be checked for defects to avoid touching of any inner parts by the customer.

- When the set is used in circumstances with higher dust, grease or moisture levels, for example in a kitchen, the recommended interval is 1 year.
- The maintenance inspection contains the following actions:
 - Execute the above mentioned 'general repair instruction'.
 - Clean the power supply and deflection circuitry on the chassis.
 - Clean the picture tube panel and the neck of the picture tube.

3.3 Warnings



1. ESD

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.

 - Available ESD protection equipment:
 - anti-static table mat (large 1200x650x1.25mm) 4822 466 10953
 - anti-static table mat (small 600x650x1.25mm) 4822 466 10958
 - anti-static wristband 4822 395 10223
 - connection box (3 press stud connections, 1 M ohm) 4822 320 11307
 - extension cable (2 m, 2 M ohm; to connect wristband to connection box) 4822 320 11305
 - connecting cable (3 m, 2 M ohm; to connect table mat to connection box) 4822 320 11306
 - earth cable (1 M ohm; to connect any product to mat or connection box) 4822 320 11308
 - complete kit ESD3 (combining all 6 prior products - small table mat) 4822 310 10671
 - wristband tester 4822 344 13999
2. In order to prevent damage to ICs and transistors, all high-voltage flashovers must be avoided. In order to prevent damage to the picture tube, the method shown in Fig. 3.2 should be used to discharge the picture tube. Use a high-voltage probe and a multimeter (position DC-V). Discharge until the meter reading is 0V (after approx. 30s).
3. Together with the deflection unit and any multipole unit, the flat square picture tubes used from an integrated unit. The deflection and the multipole units are set optimally at the factory. Adjustment of this unit during repair is therefore not recommended.
4. Be careful during measurements in the high-voltage section and on the picture tube.
5. Never replace modules or other components while the unit is switched on.
6. When making settings, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.
7. Wear safety goggles during replacement of the picture tube.

3.2 Maintenance instruction

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

- When the set is used under normal circumstances, for example in a living room, the recommended interval is 3 to 5 years.

3.4 Notes

1. The direct voltages and oscillograms should be measured with regard to the tuner earth, or hot earth as this is called (see fig. 3.3)
2. The direct voltages and oscillograms shown in the diagrams are indicative and should be measured in the Service Default Mode (see chapter 8) with a colour bar signal and stereo sound (L:3 kHz, R:1 kHz unless stated otherwise) and picture carrier at 475.25 MHz.

3. Where necessary, the oscillograms and direct voltages are measured with and without aerial signal. Voltages in the power supply section are measured both for normal operation and in standby. These values are indicated by means of the appropriate symbols (see fig. 3.3).
4. The picture tube PWB has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aquadag coating.
5. The semiconductors indicated in the circuit diagram and in the parts lists are completely interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

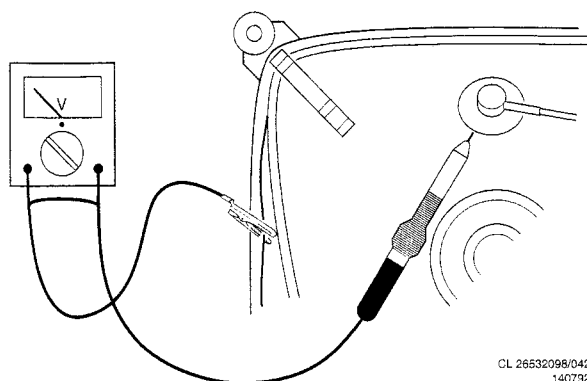


Figure 3-2

⊥ tuner earth tuner aarde la masse du tuner Tuner-Erde massa del tuner tierra del sintonizador	⊥ ⚡ hot earth hete aarde la terre directe heißen Erde massa calda tierra caliente
⊥ with aerial signal met antenne signaal avec signal d'antenne mit Antennensignal con segnale d'antenna con la señal de antena	⊥ without aerial signal zonder antenne signaal sans signal d'antenne ohne Antennensignal senza segnale d'antenna sin la señal de antena
ⓘ normal condition normaal bedrijf fonctionnement normal normaler Betrieb funzionamento normale funcionamiento normal	ⓘ stand by stand by position de veille in Bereitschaft modo di attesa posición de espera

Figure 3-3

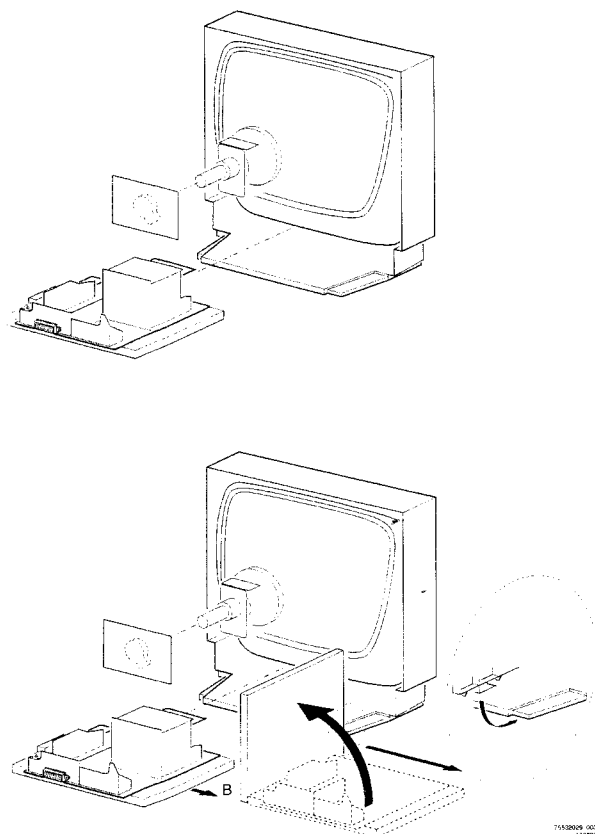
4 Mechanical instructions

For the main carrier two service positions are possible:

- a. For faultfinding on the component side of the main carrier
- b. For (de)soldering activities on the copper side of the main carrier.

Position A can be reached by first removing the mains cord from its fixation, then loosen the carrier lips and then pulling the carrier panel for approximately 10 cm.

Position B can be reached from position A after disconnecting the degaussing cable. A stable service position can be created with the left hand side clip on the carrier panel and the cabinet (see fig.4.1).



5.1 Functional blocks

On both the service printing on the copper and the component side, functional blocks are indicated by lines and text.

5.1.1 Test points

The L6 chassis is equipped with test points in the service printing on both sides of mono-board. These test points are referring to the functional blocks as mentioned above:

- P1-P2-P3, etc: Test points for the power supply
- L1-L2-L3, etc: Test points for the line drive and line output circuitry
- F1-F2-F3, etc: Test points for the frame drive and frame output circuitry
- S1-S2-S3, etc: Test points for the synchronisation circuitry
- V1-V2-V3, etc: Test points for the video processing circuitry
- A1-A2-A3, etc: Test points for the audio processing circuitry
- C1-C2-C3, etc: Test points for the control circuitry
- T1-T2-T3, etc: Test points for the teletext processing circuitry

The numbering is done in a for diagnostics logical sequence; always start diagnosing within a functional block, in the sequence of the relevant test points, for that functional block.

5.1.2 Service default-alignment mode (SDAM)

The service default-alignment mode is a pre-defined mode which can be used for faultfinding (especially when the TV gives no picture at all). All oscillograms and DC voltages in this service manual are measured in the service default-alignment mode.

Activating the service default-alignment mode can be done in 2 ways:

1. By short-circuiting the service pins S1 and S2 of the microcomputer (pin 14 of IC7600).
2. From normal operation mode by pressing the button "DEFAULT" or "ALIGN" on the DST (Dealer Service Tool) RC7150.

Leaving the service default-alignment mode to normal operation can only be done by the stand-by on the remote control or by pressing diagnose 99 followed by the OK-button on the DST (so not via mains switch "off"; after mains switch "off" and then "on" again the set will start up in the service default-alignment mode again to enable easy faultfinding).

Functions of the service default-alignment mode:

1. All analogue settings (volume, contrast, brightness and saturation) are in the mid position.
2. Set is tuned to program number 1
3. Delta volume settings are not used (delta volume setting = a delta on the volume setting)
4. OSD error message (present available error code) is displayed continuously
5. The OSD-key will act as search and auto store on the maximum program number.
6. Automatic switch off function (set switches "off" after 15 minutes no IDENT) will be switched off
7. Hotel mode will be disabled
8. All other functions remain normal controllable

Service default-alignment menu: new option settings are activated immediately.

1. Software version of the microprocessor used in that typical set is displayed in the right top corner
2. A counter in the middle of the screen indicate the normal operation hours of the set in a hexadecimal code (every time the set is switched "on" the counter is incremented by 1 hour, so +1 at the counter).
3. The "S" in the middle of the screen next to the counter indicate that the set is in the service default-alignment mode
4. Option code This code indicates the Options setting of the set.
5. Error code history;

The 5 last different error codes occurred are stored in the EEPROM memory; last error code detected will be displayed on the left side (see for an overview of all possible error codes Fig. 8.x), so e.g.:

0 0 0 0 0 means no error codes present in the buffer

3 0 0 0 0 means one error code present in the buffer; error code 3

3 2 0 0 0 means two error codes present in the buffer; last detected error code is error code 3, previous detected error code is error code 2

The error code history buffer is cleared when the Service Menu is left by the stand-by command or by diagnose 99 command. In case the Service Menu is left by the mains switch "off" the error code history buffer will not be cleared.

Option code + Counter + "S" for service menu active + software version-->	001	0023S	1.0
Error code history -->		2300)	
Option setting row -->	-	SYSTEM BG + I	+

Option setting:

In the bottom line the options are given.

Control of the options is with the following keys on the remote control:

- PROGRAM +/-: Select the option to be changed; Via the "PROGRAM +/-" button the option to be changed can be selected. The selected option is implemented immediately.
- CONTROL up/down: Changes the setting of the option.
- MENU +/-: Changes to a submenu; via "MENU +/-" buttons a submenu is selected in which in a stereo version the sound/sync alignment can be done.

The options are stored immediately in the EEPROM.

The following table indicates the possible hardware and software options and their technical consequences:

Text displayed in the option row in the service menu	The technical consequence for the selected option
SINGLE	--> For a PAL BG only or PAL BG/SECAM BGDK set

SYSTEM I:UK	--> For a PAL I only set
SYSTEM BG+LL'	-->For a PAL BG/SECAM LL' set
SYSTEM BG+DK	--> For a PAL BGI/SECAM LL' set
NATIONAL BRAND MAXxxxx -->	Selects MENU-Layout National Brand styling

5.1.3 Error messages

The microcomputer also detects errors in circuits connected to the I2C (Inter IC) bus. These error messages are communicated via OSD (On Screen Display) and a flashing LED in the service default-alignment mode. (error code history buffer):

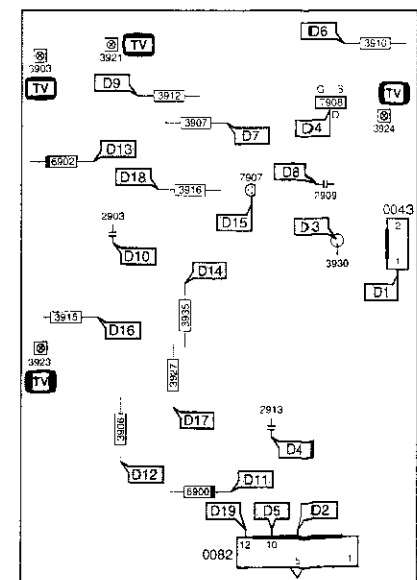
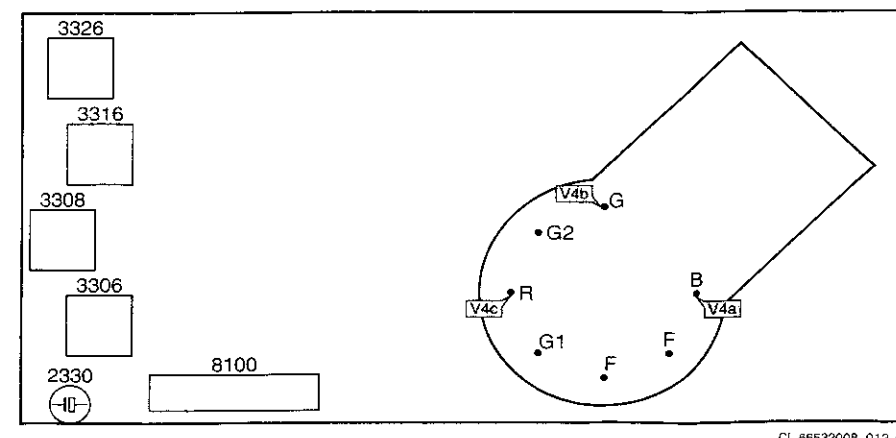
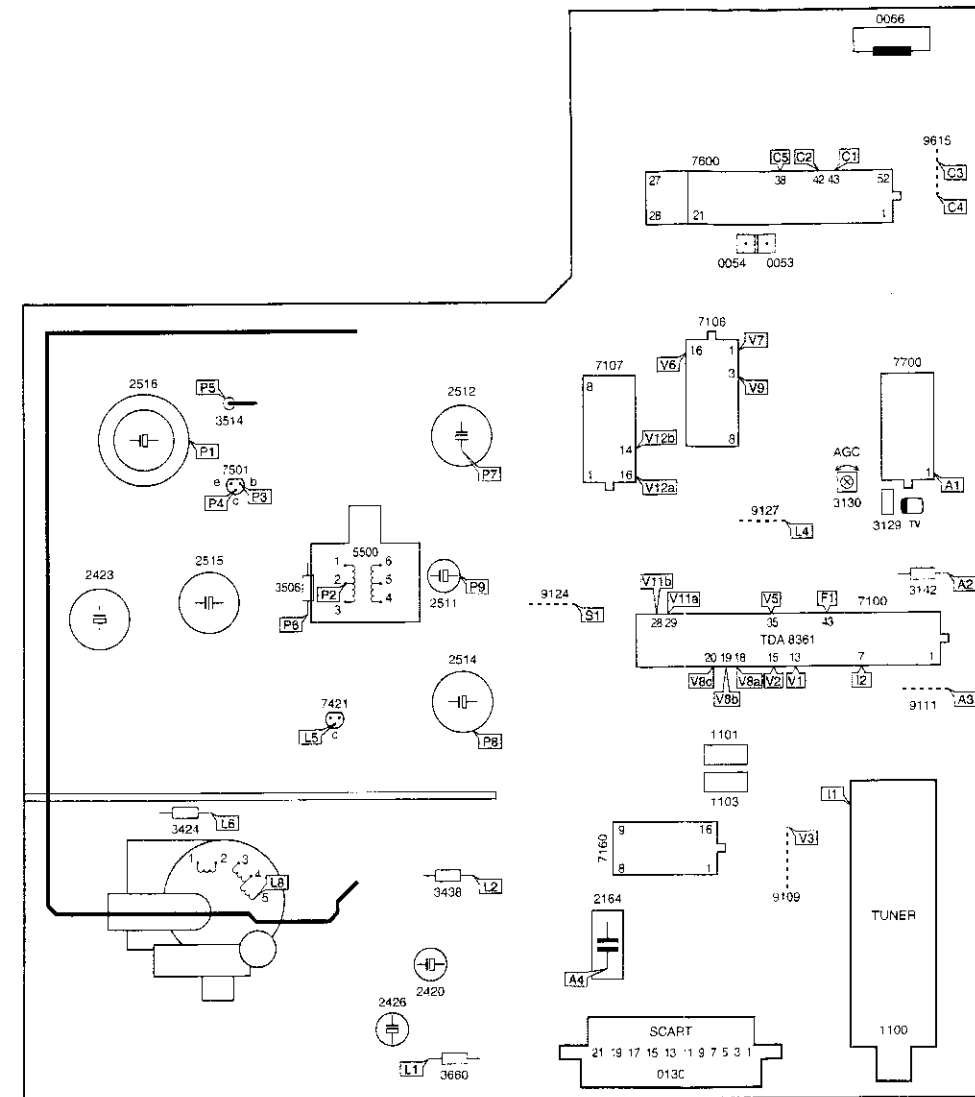
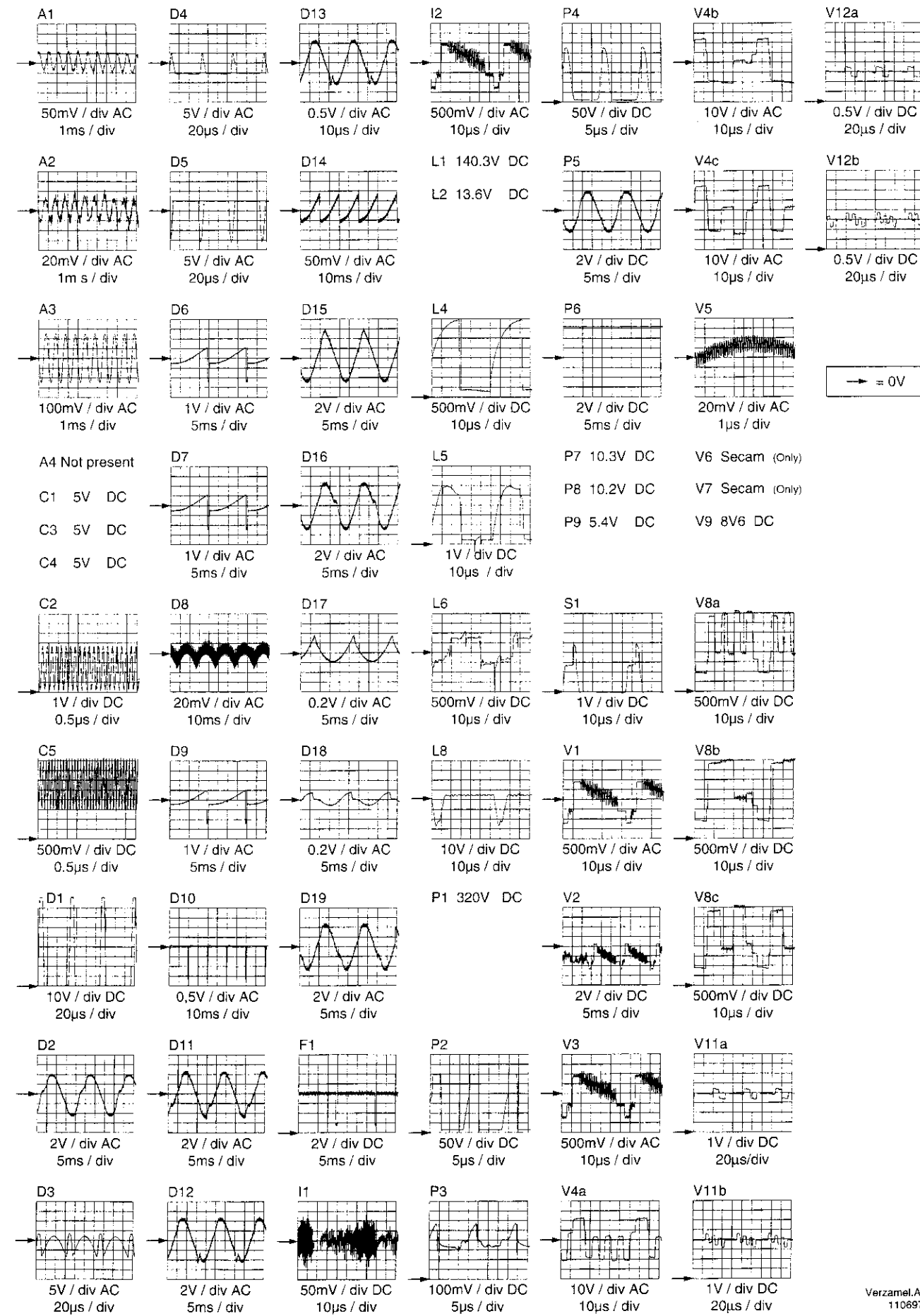
1. In normal operation; in normal operation no errors are indicated.
2. In the service default-alignment mode; in the service default-alignment mode both the "OSD error message" and the "LED error" indication will display the present detected error continuously.

"OSD error number" (servicemenu)	"LED behaviour"	Error description	Possible defective component
0	No blinking LED	No error	--
1	LED blinks ones	mC error	IC7600
2	LED blinks twice	General I2C error	I2C bus is blocked
3	LED blinks three times	EEPROM error	IC7605

6 Overview oscillograms

L6.3

9

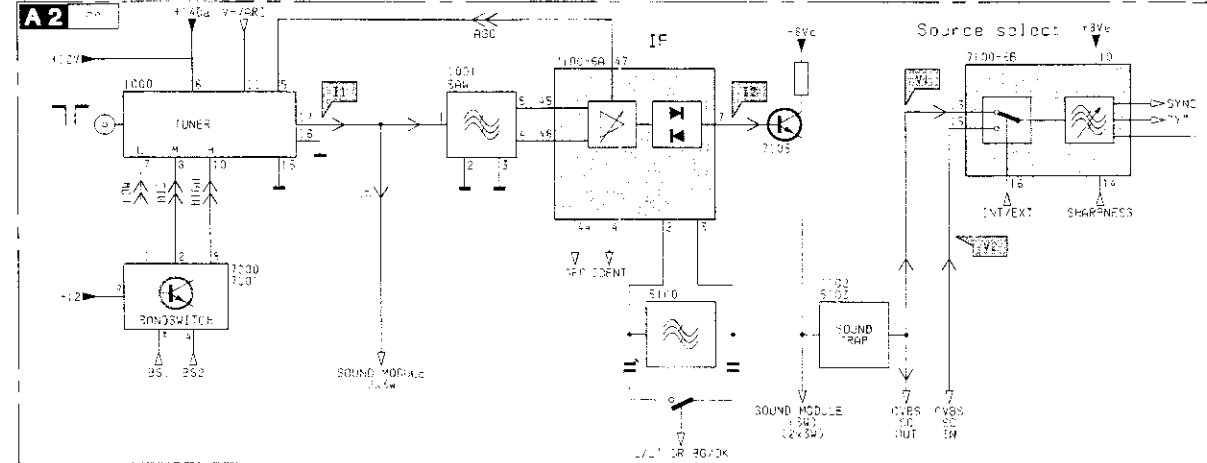


6 Overview oscillograms

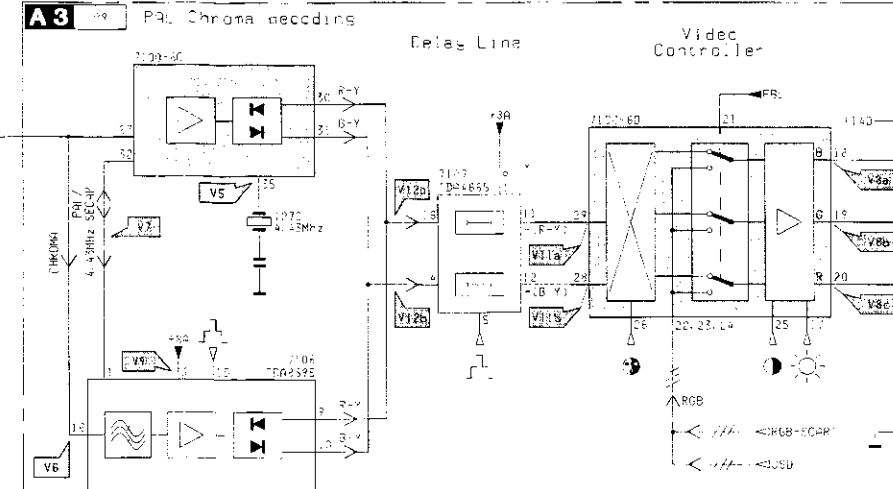
L6.3

10

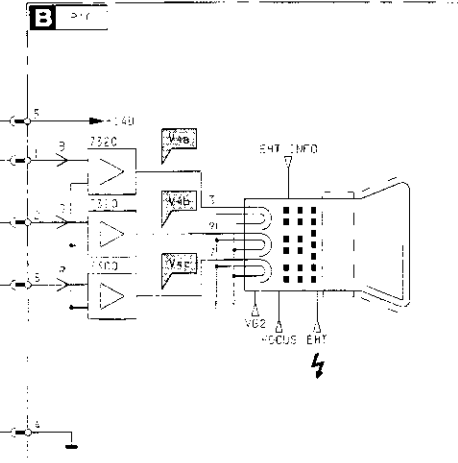
TUNING + IF/Abstimmeneinheit/SYNTONISEUR



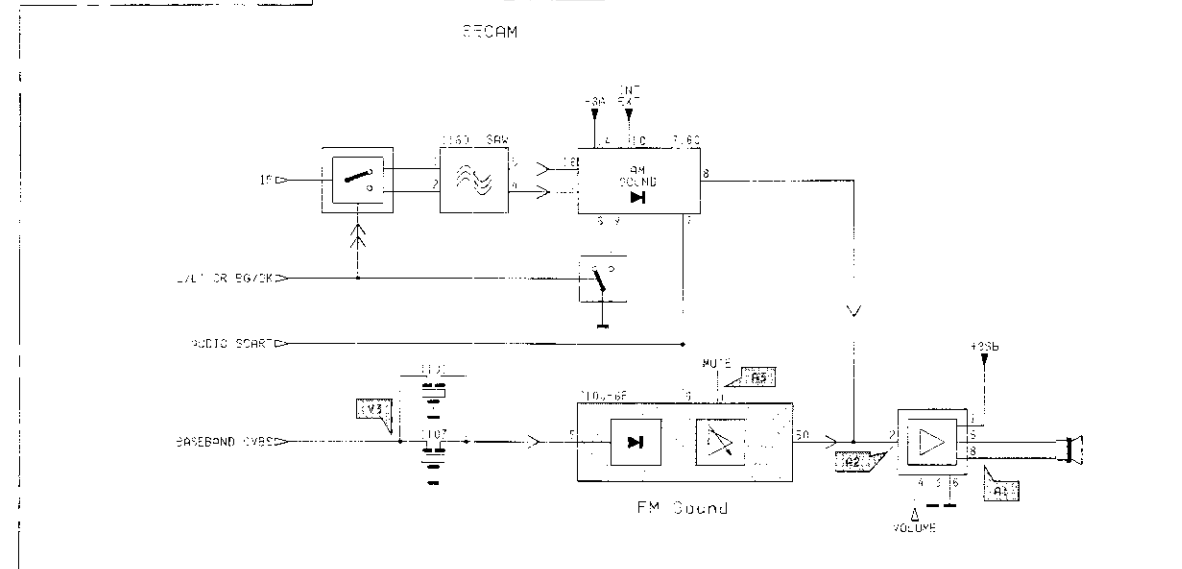
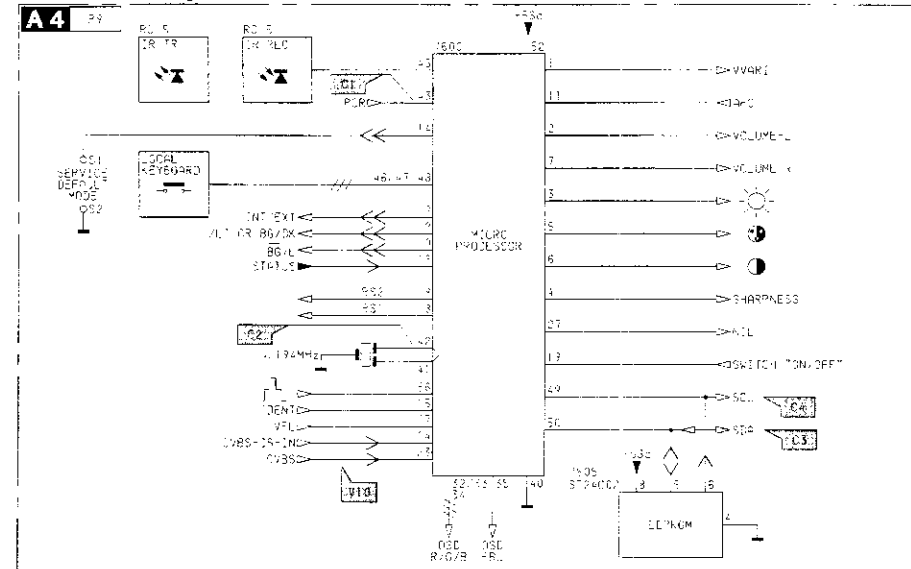
VIDEO + SOUND/Video + Ton/VIDEO + SON



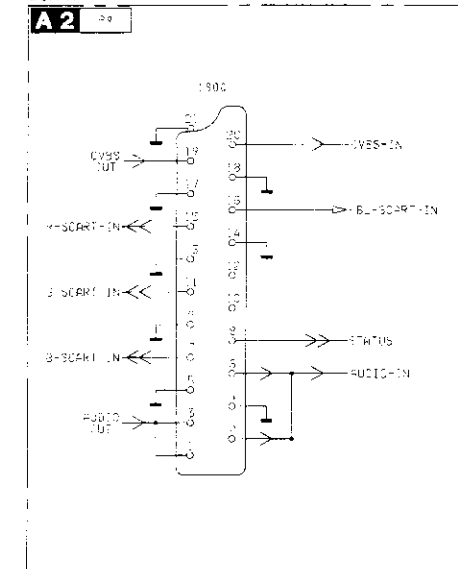
CRT MODULE/CRT Module/CRT MODULE



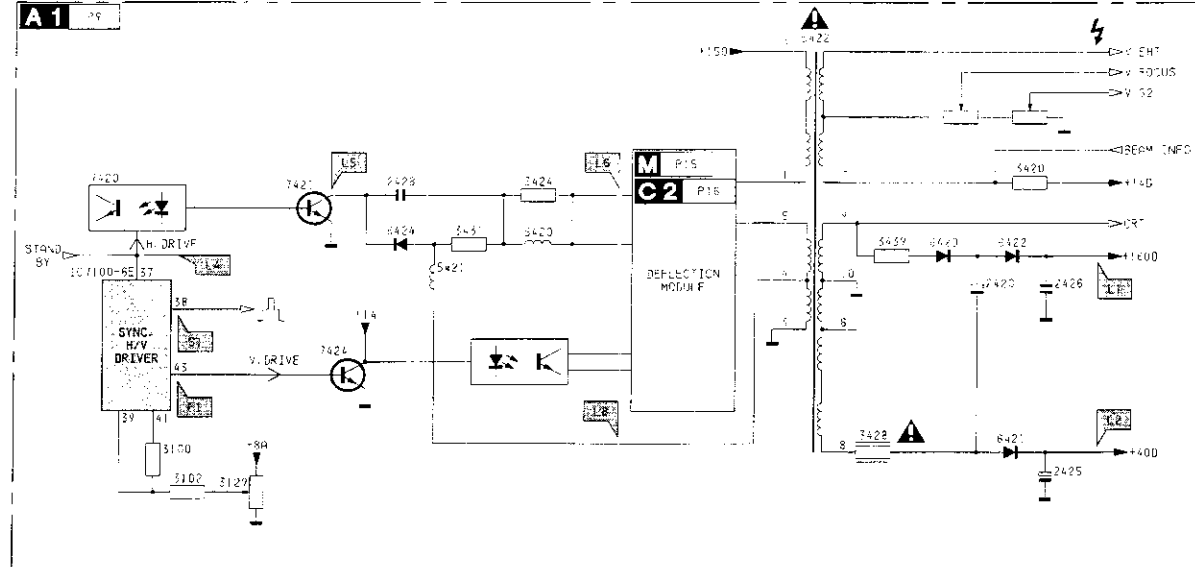
CONTROL/Bedienung/COMMANDE



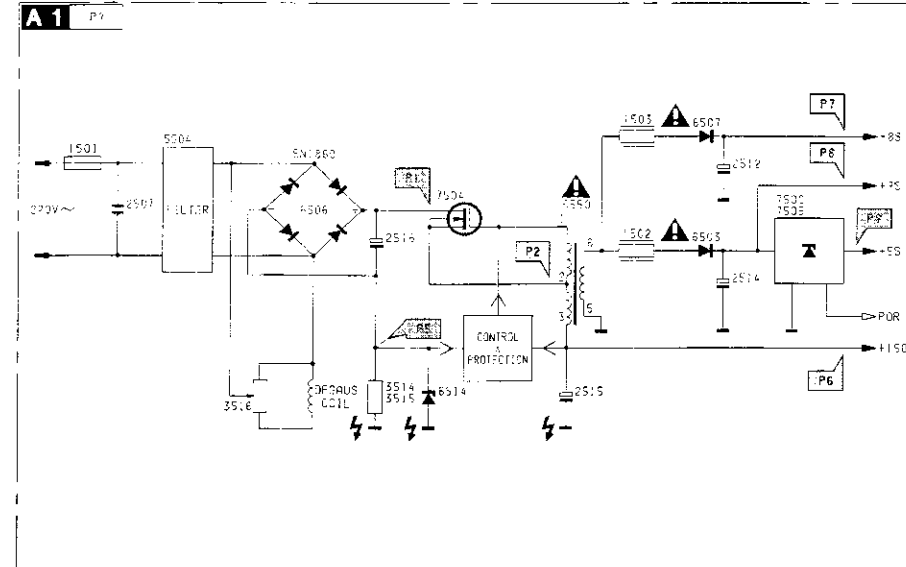
SCART



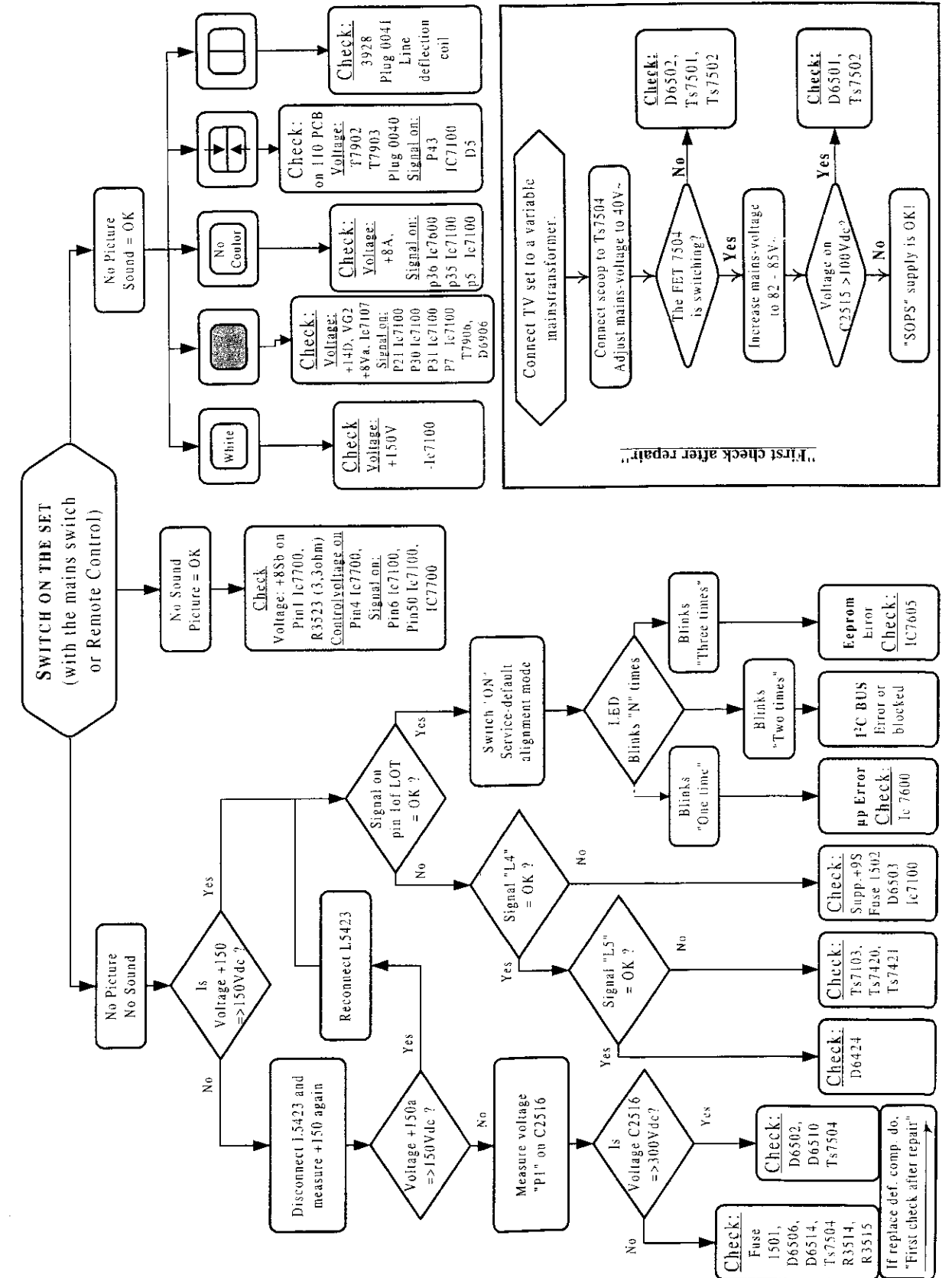
SYNC & DEFLECTION



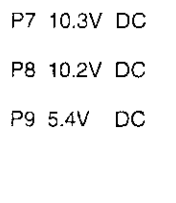
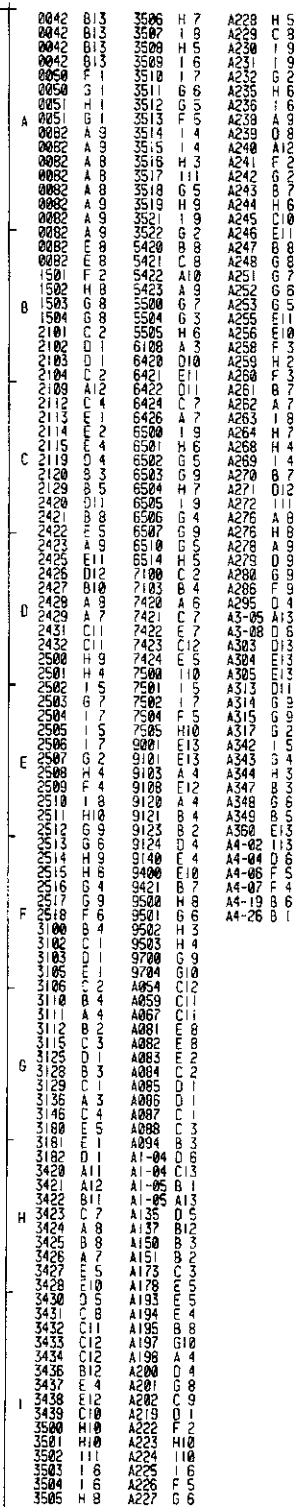
POWER SUPPLY/Netzteil/ALIMENTATION



INSIDE IC7100

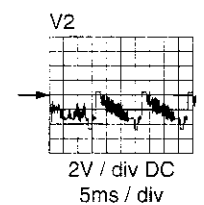
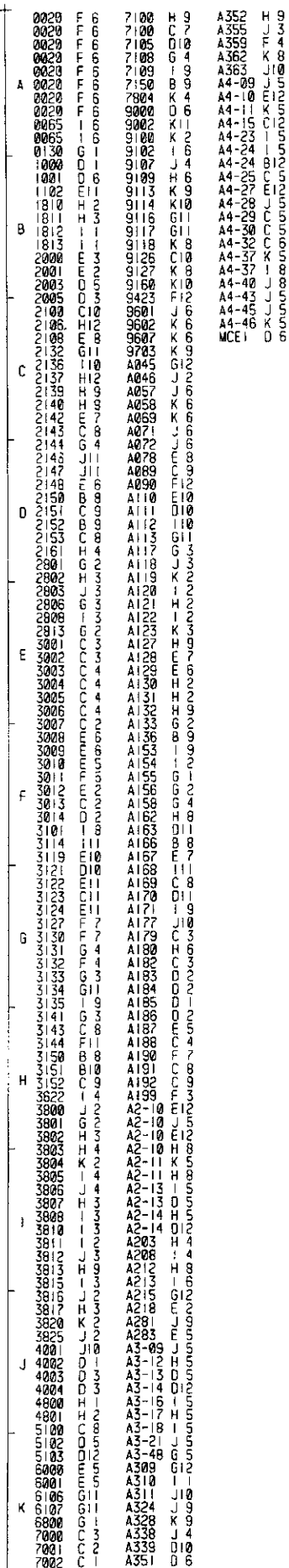


12



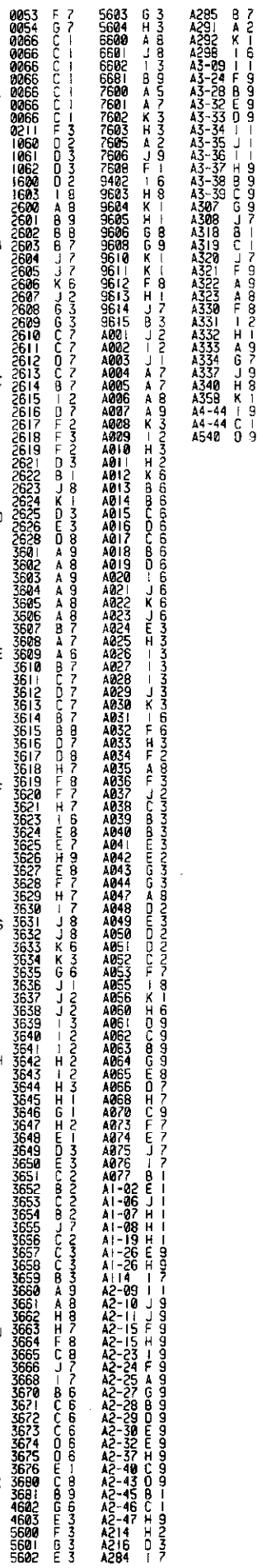
OSC_A1.A1

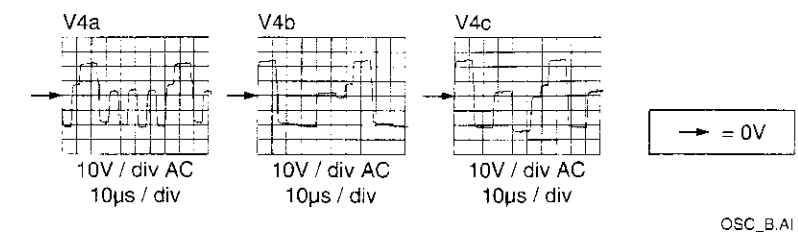
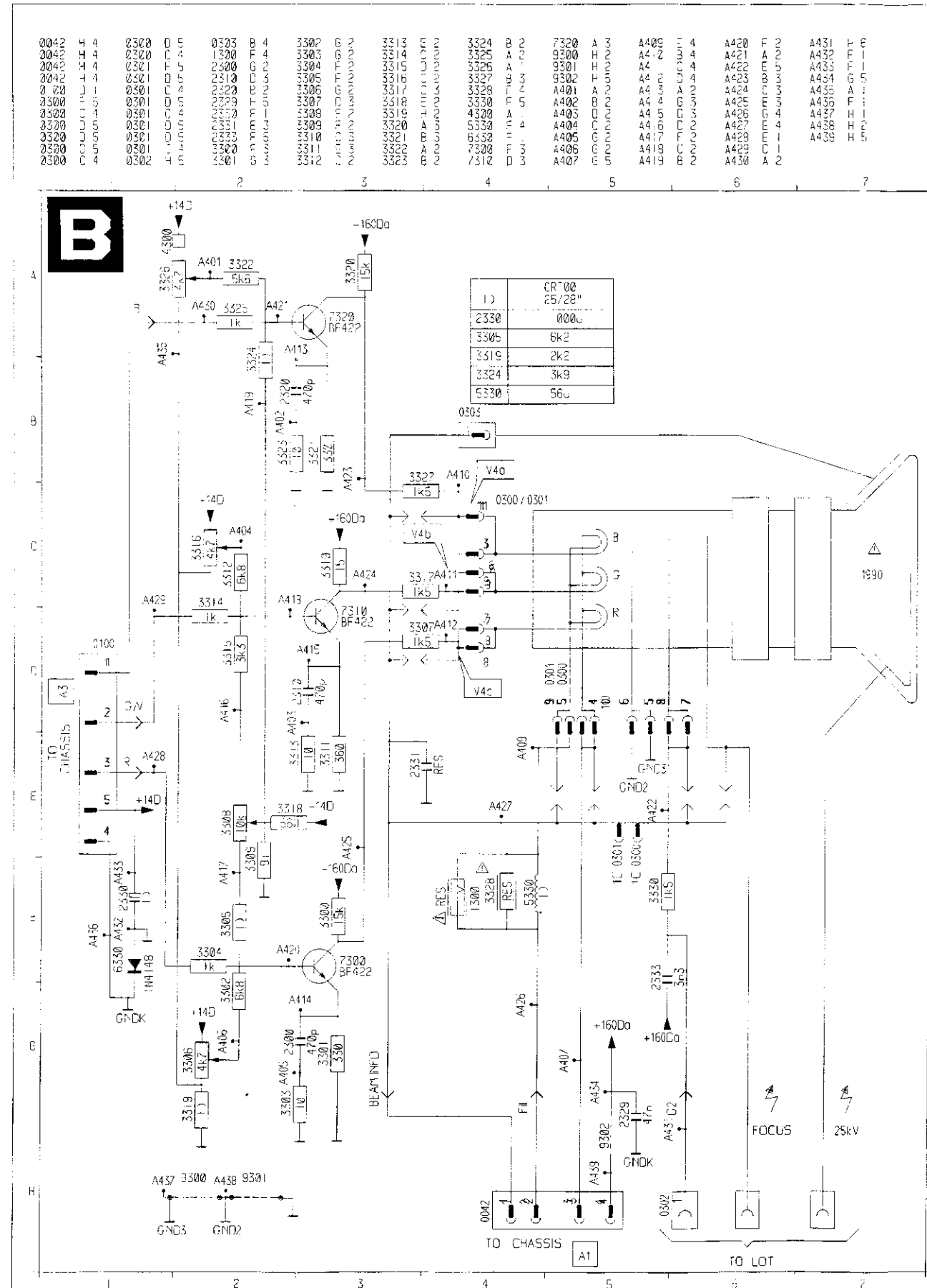
13

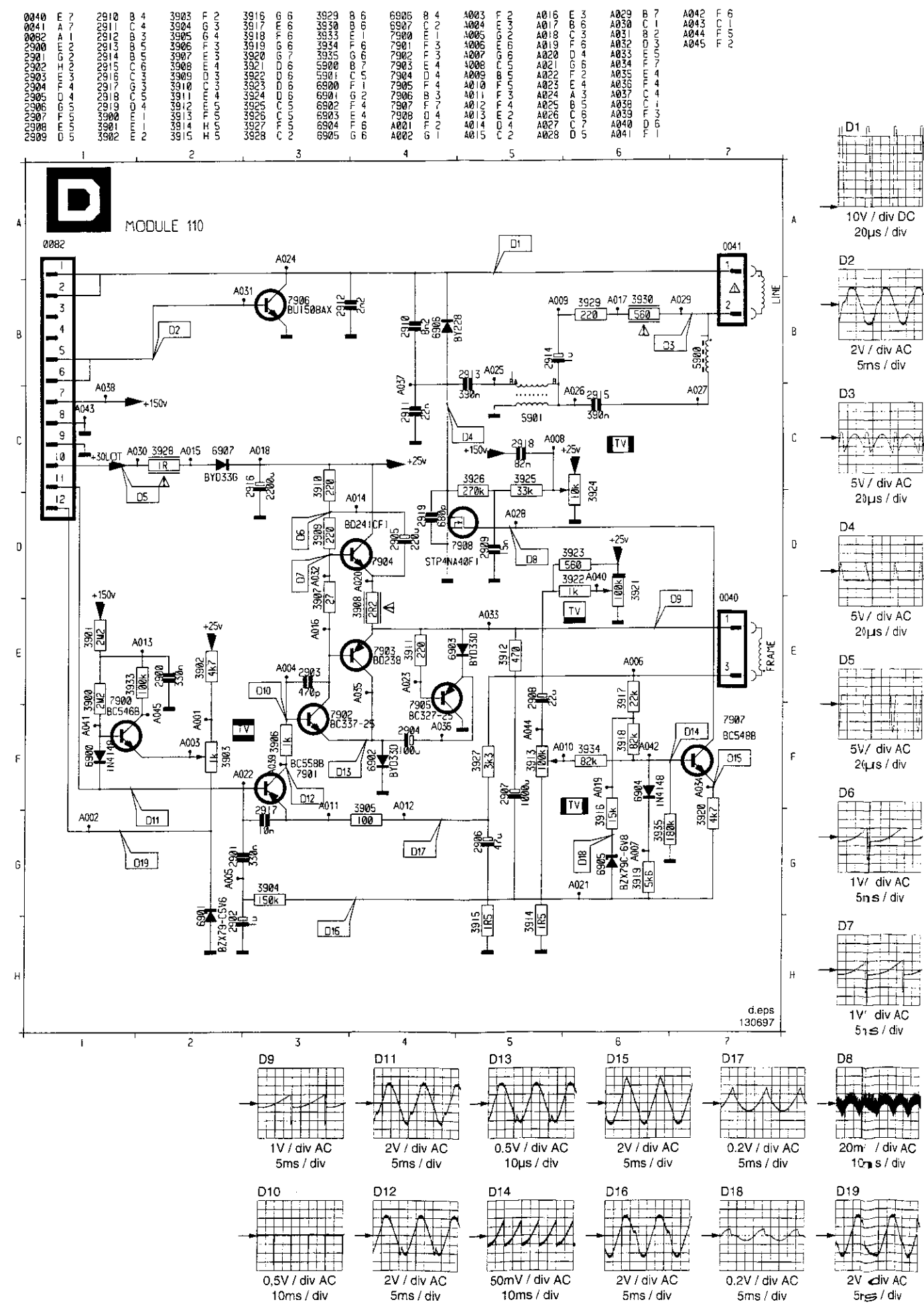
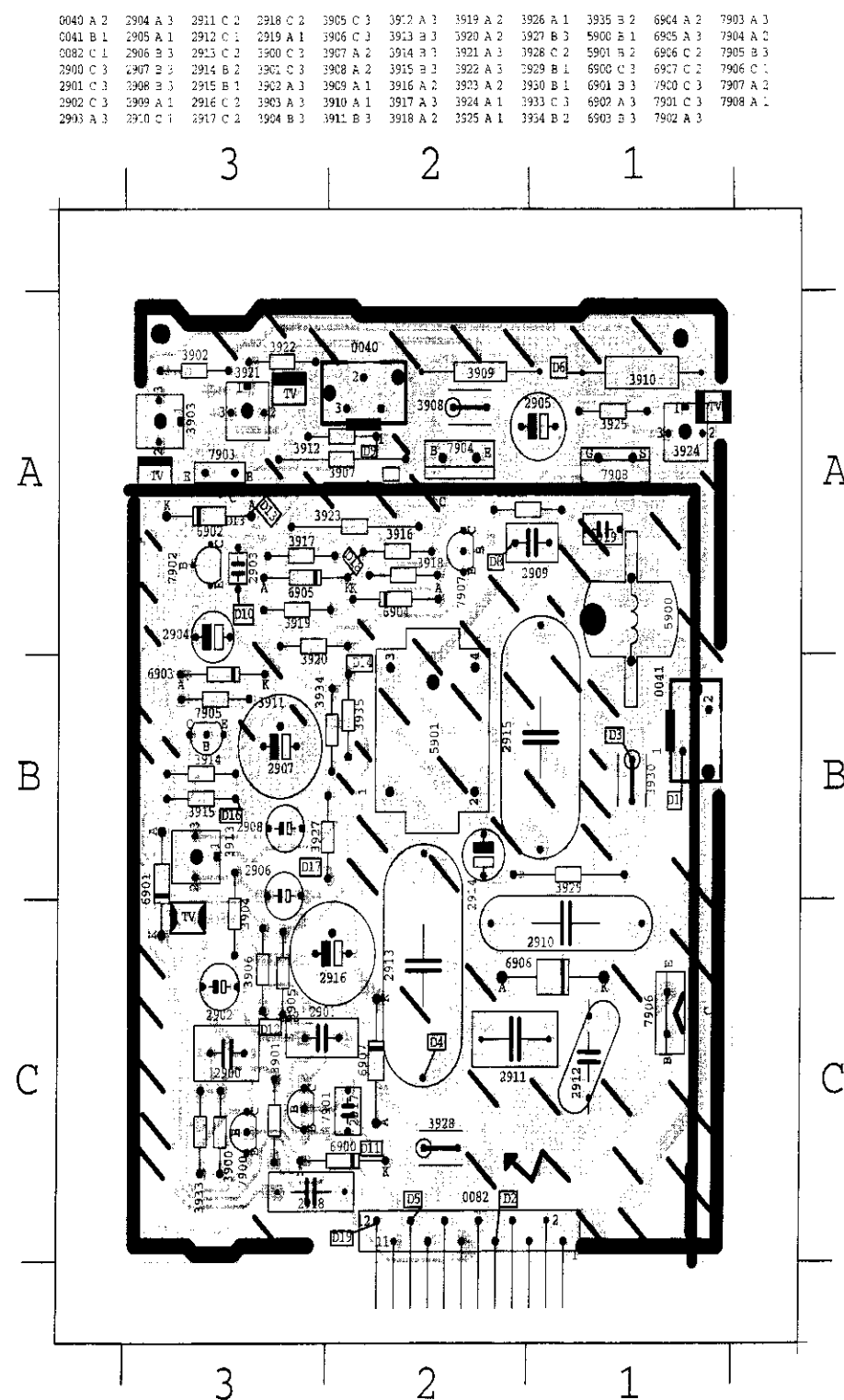


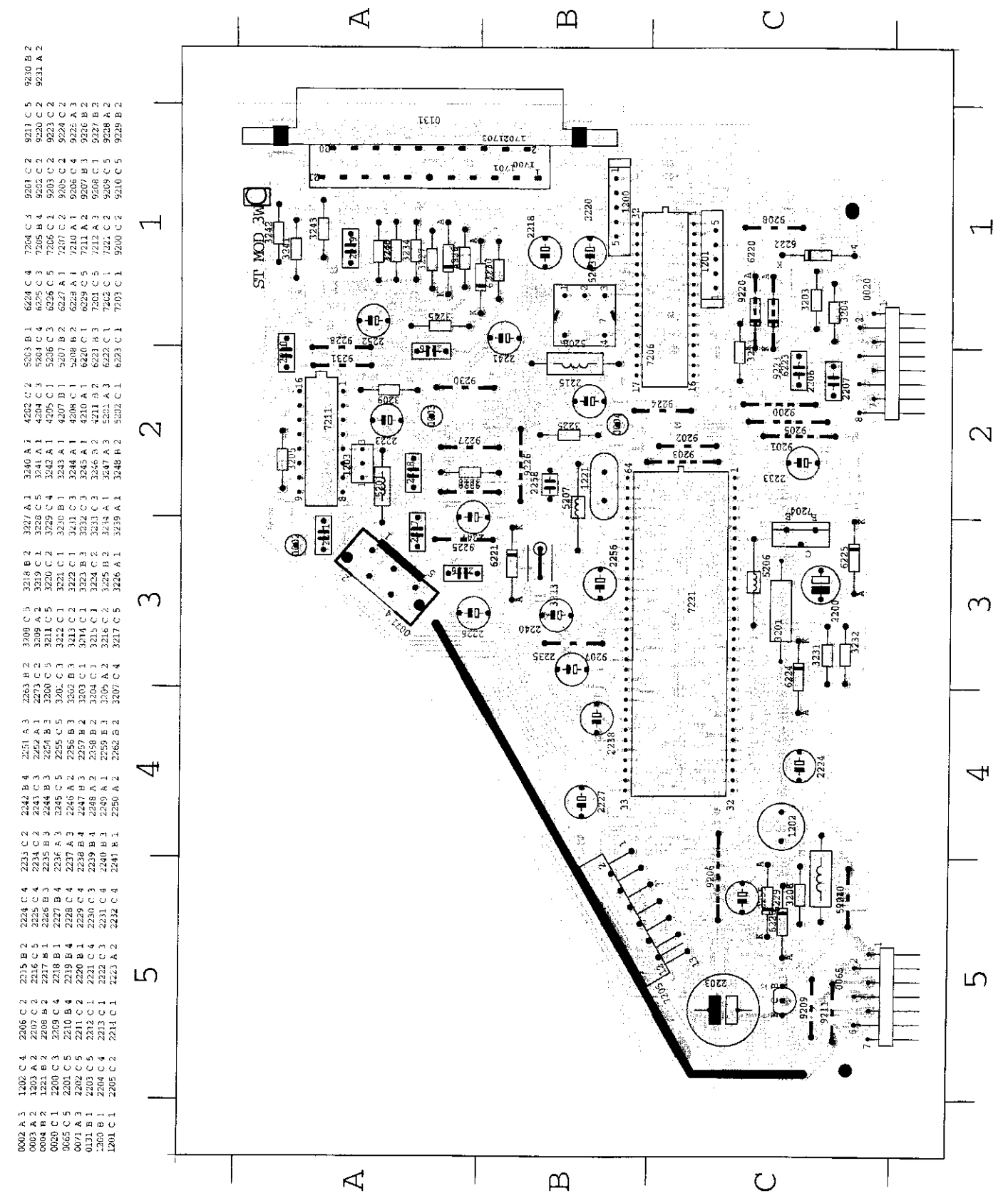
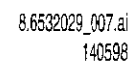
OSC_A2.A1

L6.3 15

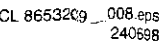


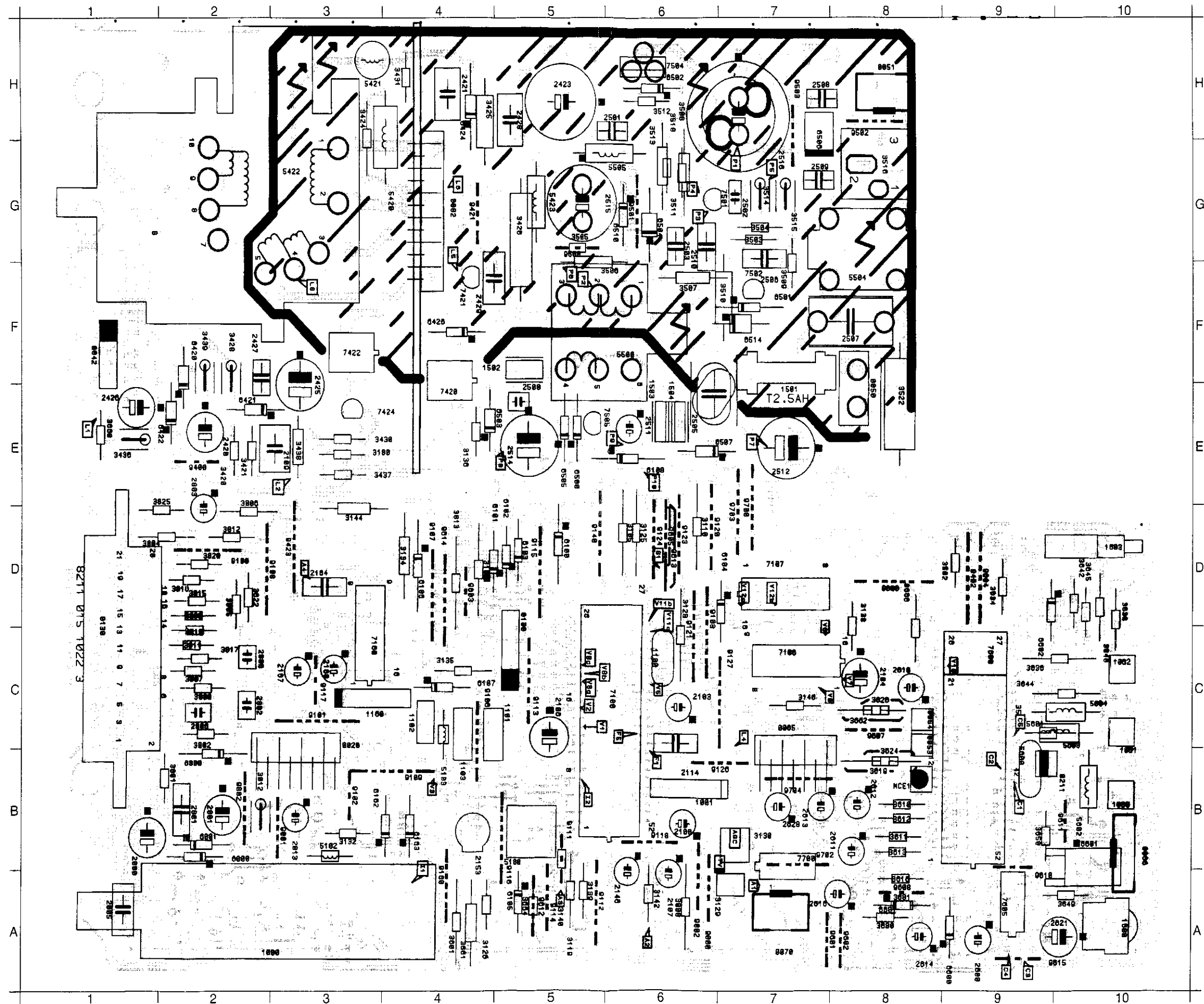


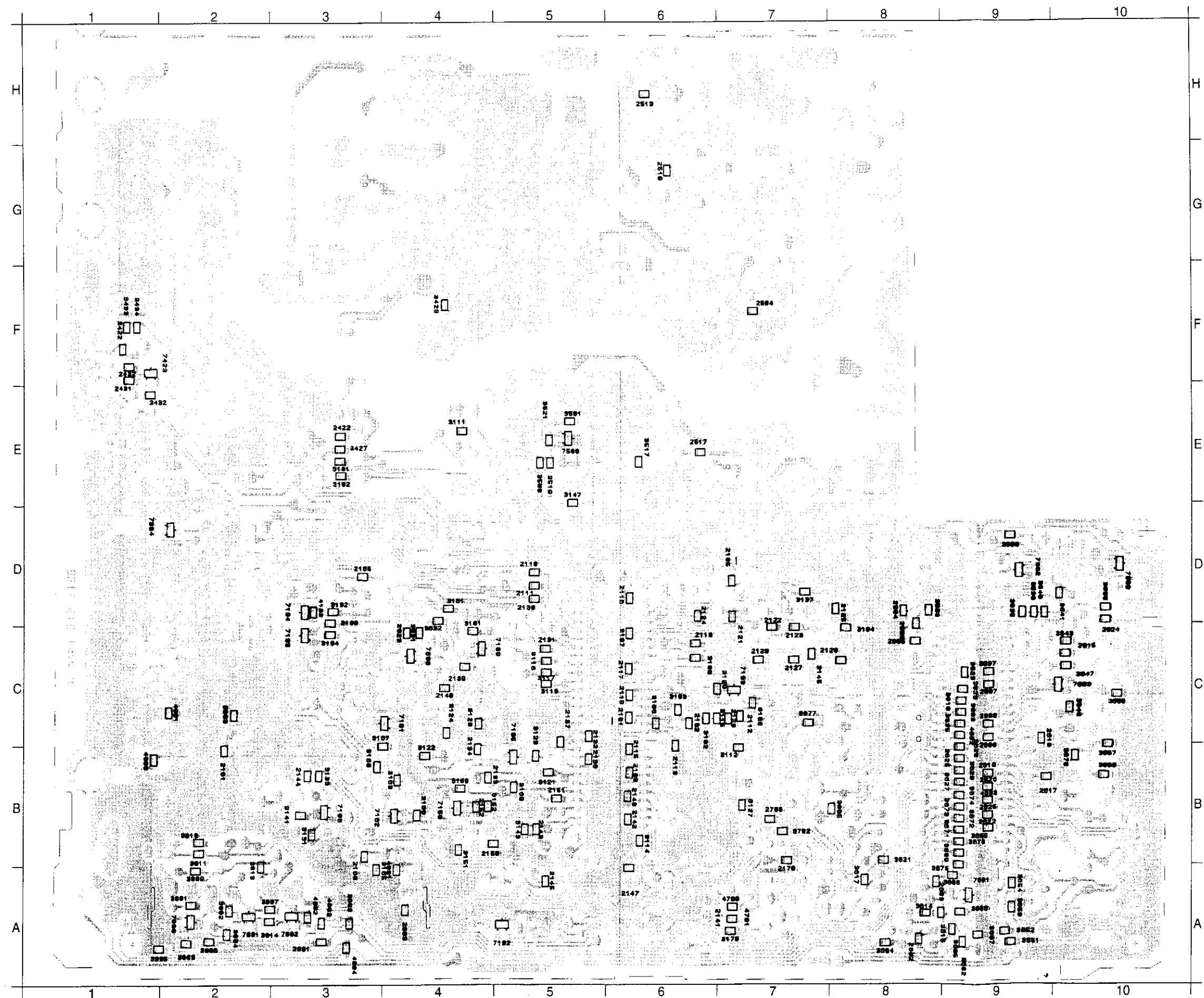


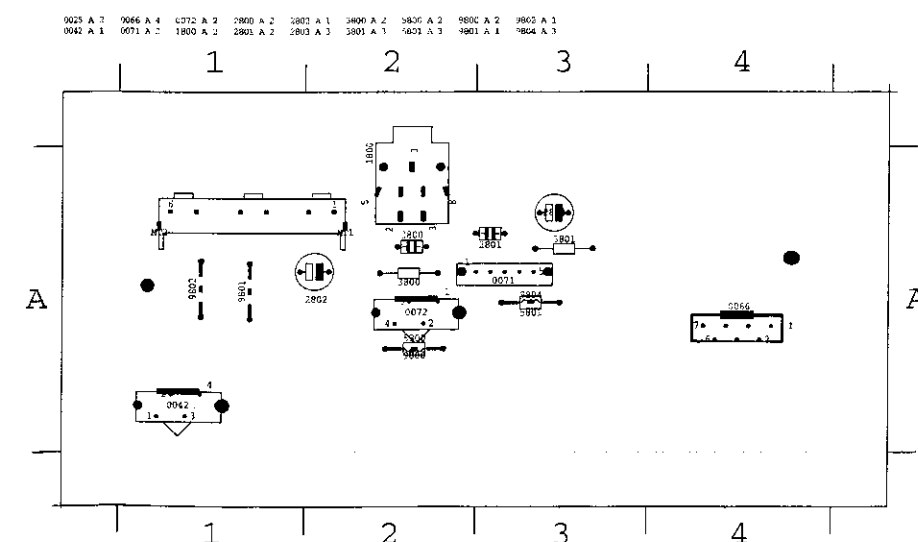
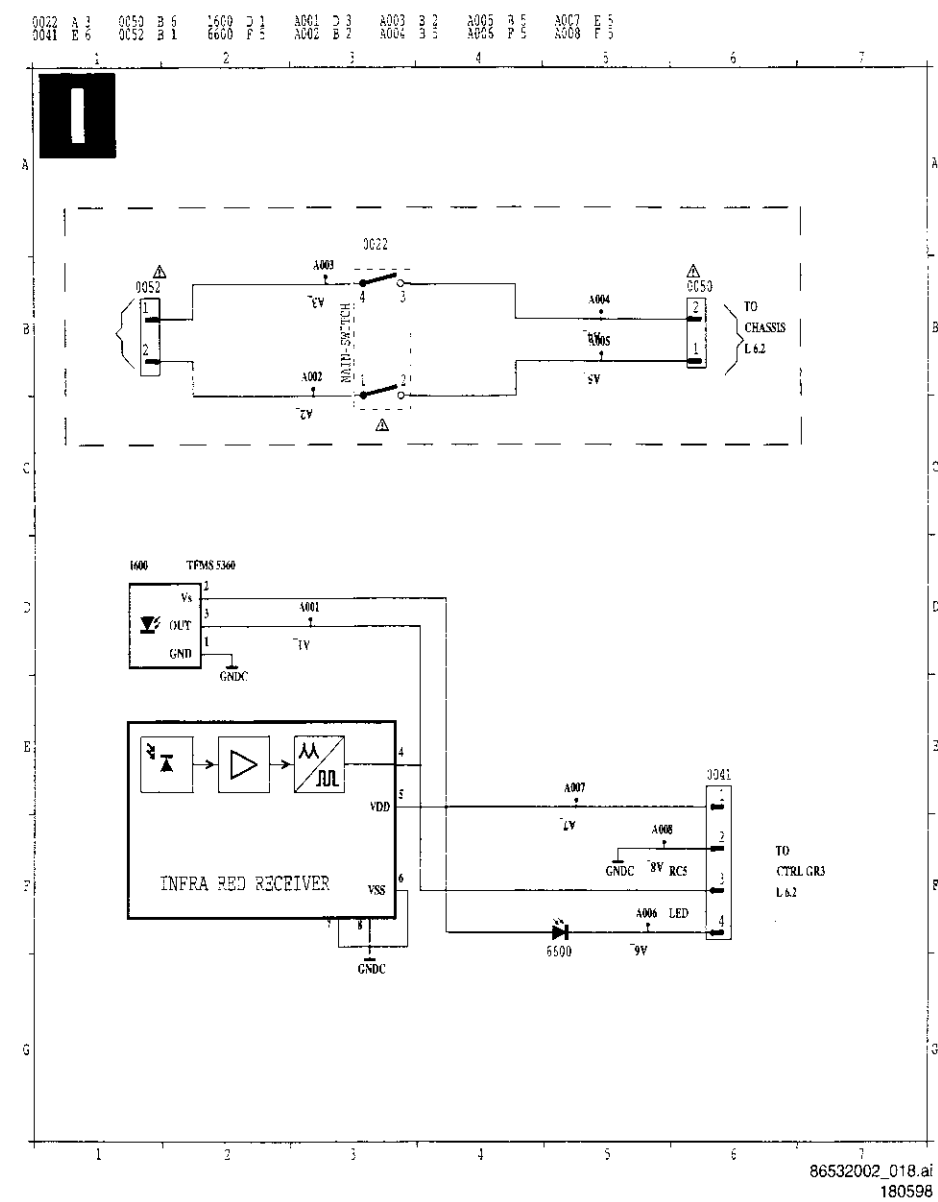
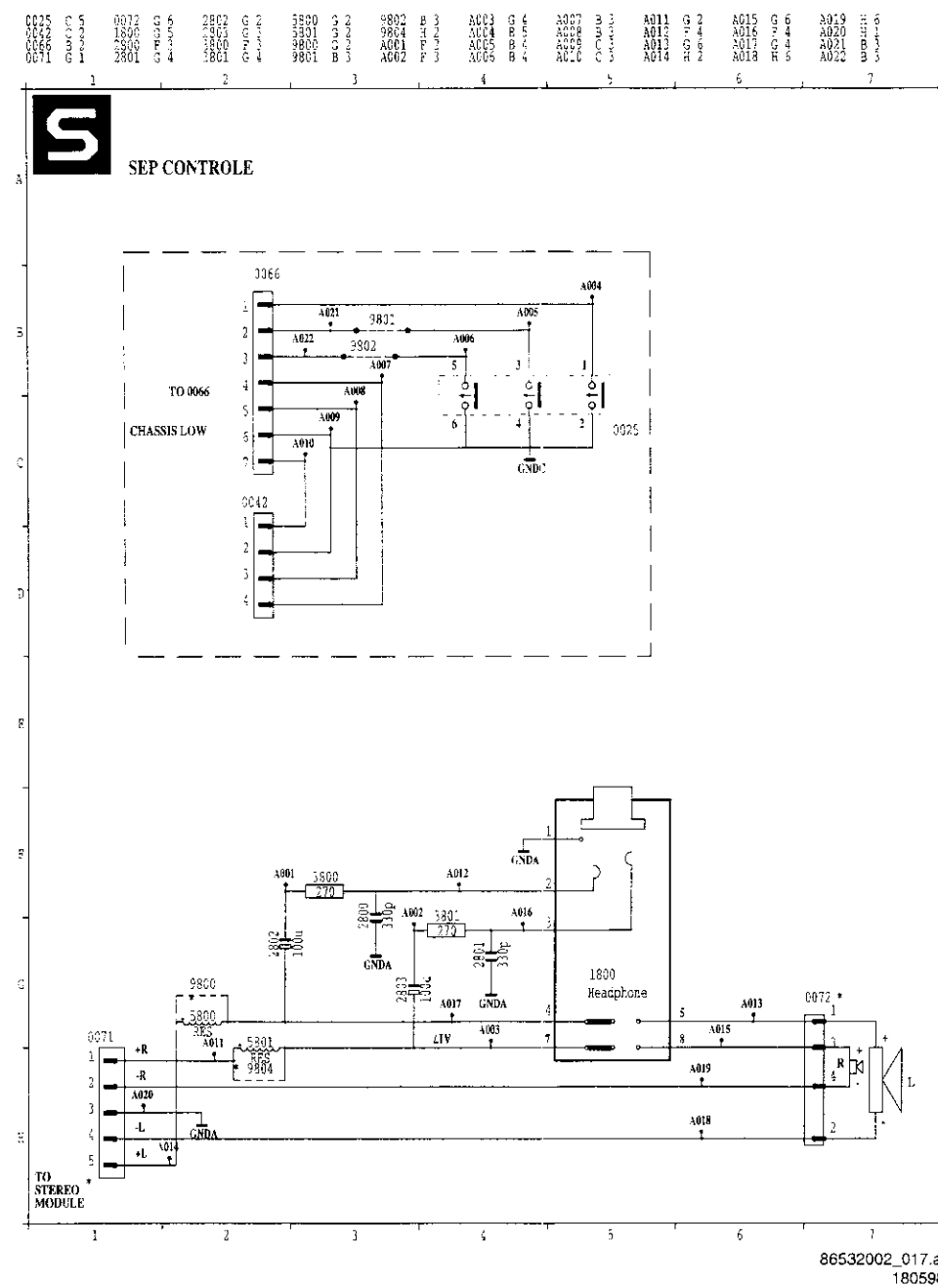


L6.3 19









8.1 Adjustments on the 110 module panel

1. Horizontal amplitude: Is adjusted with potentiometer R3924
2. Vertical centring: Is adjusted with potentiometer R3921
3. Picture height: Is adjusted with potentiometer R3903
4. East-west correction: Is adjusted by potentiometer R3913
5. Horizontal centring (main pcb): Is adjusted with potentiometer R3129 on the main PCB
6. Focusing: Is adjusted with the focusing potentiometer in the line output transformer
7. AFC
 - Adjustment of the AFC and picture demodulator (all versions).
 - Select a non secam L/L' system in the SDAM mode (negative modulation). Switch the tuner to HIGH BAND (pin 11 of tuner 1100 grounded). Connect a pattern generator to pin 17 of the tuner via a capacitor of 4.7nF and put a 82W resistor from the output of the generator to ground. Connect a DC voltmeter to pin 44 of IC7100. Adjust coil 5100 to get 3V5 on pin 44 of IC7100.
 - The signal of the generator has to be 38.9 MHz.
 - Adjustment of the AFC and picture demodulator. (BAND 1 L. France versions only).
 - Same story as a) only the frequency of the generator has to be 33.9Mhz with positive modulation.
8. RF AGC
9. If the picture of a strong local transmitter is reproduced distorted, adjust potentiometer R3130 until the picture is undistorted.
or: Connect a pattern generator (e.g. PM5518) to the aerial input with RF signal amplitude = 1mV. Connect a multimeter (DC) at pin 5 of the tuner. Adjust R3130 so that voltage at pin 5 of the tuner is 8V5 +/- 0V5 DC.

8.2 Adjustments on the CRT panel

VG2 cut-off points of picture tube

Apply a black CVBS signal at the input pin 20 of scart. Adjust the brightness in order to have 1.6V during the line at the R,G,B outputs of the BIMOS pin 18,19,20 of IC7100. Put potentiometers R3326, R3316 and R3306 to the minimum value (maximum voltage on the CRT cathodes). Adjust now VG2 till the colour that luminates first is not visible anymore. Adjust now the other two potentiometers in such a way that they just don't luminate.

Potentiometer R3308 should always be in the mid-position.

3.1 Description of the power supply:

3.1.1 General

Note: The voltages +96S and +96s are not mains isolated.

The power-supply used in this chassis is a self-oscillating down converter with an auxiliary winding to help the FET to switch.

3.1.2 Principle of the down-converter (Fig 8.1):

When switch TS7504 is closed, the voltage on L2-3 is $V_{in}-V_{out}$. During this time, energy is stored in the coil and energy is delivered to the load. When switch TS7504 opens, the energy stored in the coil will be stored in the output capacitor (C2515). This is due to the fact that the current through the coil has to decrease linear. When the switch is open the current is floating through D6504, L2-3 and C2515. By controlling the duty-cycle of the switch, the output voltage can be regulated.

3.1.3 Start-up (see diagram A1):

When the switch TS7504 is closed, the input voltage is placed over winding 2-3 of transformer 5500, which acts as coil L2-3 in Fig 8.1. Via resistors R3513, R3518 and R3512 the switch is turned on for the first time. Zener diode D6502 prevents that the U_{gs} of the FET becomes higher than 15V. When the input voltage is on winding 2-3, there is also a voltage on winding 1-2. Via winding 1-2 the correct switching voltage is obtained. The DC-part of this voltage is blocked by capacitor C2503. Diode D6510 acts as a protection in start-up and in short-circuit situations. During start-up the output capacitor C2515 is empty. It takes a relative long time to charge the gate to a voltage high enough to switch on the FET. This is due to the fact the diode D6510 is conducting. When this diode is conducting, the current that would normally flow into the gate of the fet to switch on the FET, is now flowing into C2515. In this way a smooth start-up is guaranteed.

3.1.4 General way of working (Fig 8.2):

The state of the power-supply can be divided into three areas:

- T-on; In this state the FET is conducting and energy is stored in the coil and in the output capacitor.
- T-off; In this state the fet is non conducting and the energy stored in the coil is fed to the output capacitor.
- T-dead; Fet is out of conduction and there is no energy in the coil.

T-on; In the T-on state, switch TS7540 is switched on. When the switch is on the voltage over resistors R3514-R3515 is a direct measure for the current through winding 2-3. This is a negative voltage. When this voltage becomes below a certain level, TS7501 starts conducting and will switch off the fet. In this way it is prevented that the coil can go into saturation. This could be the case when the output voltage is very low. (long on time of the FET). When the output-voltage becomes too high during T-on the FET will be switched off. (see Output-voltage regulation)

T-off; Due to the stored energy a current will start to flow through D6504, C2515 and winding 2-3. Due to the fact that the current is flowing through this circuit, a voltage with reverse polarity is on winding 1-2. In this way the fet remains off until the current through winding 2-3 reaches zero. Now a new cycle will start. The fet will be switched on and all starts over again.

T-dead; If the output voltage is too high (for example in a low load situation) the FET remains off till the output-voltage is not to high anymore.

9.1.5 Output voltage regulation:

This is done by the circuit D6501, R3509, TS7502, R3505, R3507, R3510. Transistor TS7502 can only conduct when the voltage on the base is 0V7 lower than the voltage the voltage on the emitter. This means that the voltage drop over resistors R3505 and R3507 should be 5V6(zenerdiode) + 0V7(base-emitter). This is reached when the output voltage exceeds the 100V. Now transistor TS7502 starts conducting, which brings transistor TS7501 in conduction. As a consequence the gate voltage of the fet becomes very low and the fet stops conducting. As long as the output voltage is too high the fet stays out of conduction.

9.2 Protections:

9.2.1 Overvoltage protection:

A disadvantage of a down converter is that if the switch becomes a short-circuit, the output voltage will increase to the input voltage. This could damage circuits. In this power-supply there is a protection to prevent this. If the output voltage becomes higher than 130V, zenerdiode D6514 starts to conduct. The V_{in} will be short circuited. This will blown the main fuse 1501 and protect in this way all the other circuits.

9.2.2 Short-circuit and start-up protection:

The short-circuit protection works the same as the start-up protection. If the output-voltage is very low in case of a start-up or a short-circuit condition, The gate will be charged very slowly due to the fact that zenerdiode D6510 is conducting. So the current is not only charging the gate but is also flowing into the output capacitor. In this way it takes a few milliseconds to switch on the fet. Diode D6510 takes also care that the fet never remains in his power consuming (linear) area.

9.2.3 Undervoltage protection

If the output voltage is very low, it also takes a large time before the current through winding 2-3 reaches zero. The power supplied to the circuit is in this way very low and protects in this way the circuit.

9.2.4 Other output voltages:

The output voltages +8S, +9S and +5S are made by winding 5-6. During the time that the fet TS7504 is not conducting, energy is transformed to this winding (flyback principle) and the voltages mentioned above are created. From the +9S, the +5S voltage is derived. This voltage is stabilized by transistors TS7505, TS7500 and zenerdiode D6500. D6500 is the reference voltage and TS7505 is delivering the current. When zenerdiode D6500 starts conducting, the voltage over resistor R3502 becomes high and a POR signal is created.

9.3 Degaussing:

R3516 is a dual PTC (2 PTC's in one housing). After switching "on" the set, the PTC is cold, so low ohmic. This makes the degaussing current high. After degaussing the PTC is heated, so high ohmic. This makes the degaussing current low. After degaussing the PTC remains heated by the mains.

9.4 Line-circuit (Diagram A1):

The primary side of the line-circuit and the deflection coil are connected to the hot earth. The driver-circuit contains an op-to-coupler to create isolation between the low-signal parts and the

mains. The optocoupler is driven by pin 37 of IC7100-6E via transistor TS7103. When TS7103 is not conducting, (the LED of the optocoupler is also out of conduction) TS7421 is also not conducting. In this way TS7422 will conduct and the 96V is placed over winding 2-1 of the LOT. A voltage over winding 2-1 of the LOT will cause a voltage over the windings 8-10, 6-10 and 9-10. Now energy will be transformed from the primary to the secondary-side and charge capacitors C2424 and C2425.

C2430 will be charged to the difference of the +40D and +14D (=26V) when TS7422 is conducting. When TS7422 stops conducting, the voltage of pin 8 of the LOT will become very negative. This forces C2430 to be charged to 26V plus the absolute value of pin 8. When TS7422 starts conducting again the voltage of pin 8 of the LOT will increase and so the voltage on the anode of D6422. In this way the 160V is created. This means that during the off-time of TS7422, C2430 is charged and during the on-time of TS7422, the energy in C2430 is given to C2426. When transistor TS7103 conducts, the LED of the opto-coupler will be activated. This causes the transistor of the opto-coupler to conduct, which drives TS7421 in conduction. This brings TS7422 out of conduction. Due to this construction, this circuit is protected against missing line-drive pulses. When a line-drive pulse is missed, the line-transistor stays out of conduction, due to the fact that the diode of the opto-coupler is forced into conduction by TS7103. In this way nothing can be damaged when there is no line-drive.

Winding 4-3 is an extra winding to help TS7422 to switch.

On the secondary-side of the LOT there is a circuit consisting of TS7423, R3422, R3433, R3434, C2431 and C2432. This circuit creates a pulse when TS7422 switches off. This pulse indicates that horizontal flyback takes place. This information is fed to IC7100-6E to blank the picture.

9.5 Stand-by:

The standby signal from the mC is low in case of stand-by. Now TS7103 is brought into conduction by R3100. As mentioned before this will switch off the line-output stage completely.

9.6 Deflection :

9.6.1 Horizontal deflection:

The voltage over capacitor C2422 is the same as the voltage over C2515 (96V). When TS7422 is conducting this voltage is placed over the horizontal deflection coil. This causes a linear increasing current through this coil. In this way deflection is created. When TS7422 switches off flyback takes place and it starts all over again. L5424 is used for linearity correction.

9.6.2 Vertical deflection:

Vertical deflection is based on a balance amplifier. Or TS7401 or TS7402 is conducting. This depends on the signal V-drive. If V-drive is high TS7401 conducts and the voltage of C2401 is placed over the deflection coil. Now the picture is written. When V-drive is low, TS7402 conducts and the +40V supply voltage minus the voltage over C2401 is placed over the deflection coil. Flyback takes now place. In this way deflection is generated.

R3407 is used to adjust the vertical shift. With this resistor the level of the signal VFB is adjusted. R3402 and C2404 are used to damp oscillation of the deflection coil with his parasitic capacitance. The signal NIL from the mC is used to create a non-interlaced mode. This is done by creating a small DC current through the deflection coil.

9.7 110 degrees deflection module

For the 25" and 28" sets a 110 degrees module is needed for East/West correction. This panel is allocated on the right hand side of the mainboard (seen from the rear). East/west correction in this module is based on the diode-modulator principle; the current through the horizontal deflection coil is modulated. As this is done by a parabolic-shaped voltage, E/W distortion is corrected. This parabolic-shaped voltage is derived from a saw-tooth-shaped voltage of the frame deflection.

9.7.1 Frame (time base frame)

Because the raster part is fed by the primary side a galvanic isolator must be applied between IC 7100 (= so called Bimos ic) in the secondary side and the raster amplifier on primary side. This is realised by opto coupler (7422); this opto coupler will be switched and it will block the saw-tooth of the Bimos ic. So we don't use the saw-tooth of the Bimos((pin 42) or the feedback frame input(pin 41)). The only information from the Bimos ic (=IC7100) is the flyback command(pin 43). The output of this pin is a pulse of 6 to 0 Volts during 1 mS with a period of 20mS. This signal blocks transistor 7424 and this causes conduction of the opto coupler diode (7422). The internal transistor also conduct and pins 11 and 12 (connector 00820) of the 110 module will be short circuited.

9.7.2 Raster part

A saw-tooth must be created because we don't use it from the Bimos ic(see annex 5). Via 150V C2901 will be charged via R3901, R3900 and D6900; the function of D6901 is to determine the lower part of the potential level. After 20mS a signal coming from the Bimos ic will short-circuit pins 11 and 12 of connector 0082 and C2901 will be discharged. It is a must to have an amplitude on the screen independent of the 50Hz or 60Hz frequency of the mains; see circuit diagram annex 6. The emitter voltage of T7900 can be adjusted with potentiometer 3903; this is the top Voltage of the saw-tooth. This is the circuit for adjusting the vertical amplitude independent of the 50/60Hz frequency. The saw-tooth will control T7901 and this transistor controls the amplifier (= T7902, T7903 and T7904). D6902, D6903, T7905 and C2904 determines the flyback. This flyback pulse is negative and is created by an inverted polarity of C2904. During the deflection T7905 is blocked and C2904 charges; during the flyback T7905 conducts and the flyback pulse will be made.

9.7.3 East-West modulator

The parabola is taken on C2907; R3916 and D6905 determines the shape of the parabola and they corrects the upper and lower parts. The parabola is fed via C2908 to potentiometer 3913; this for adjusting the pin-cushion correction. Via T7904 this signal goes to MosFet 7908; the Vgs command has two functions by changing the Voltage of Vgs by potentiometer 3924: pin-cushion correction and horizontal amplitude adjustment.

Special components:

- D6904 + R3916: temperature compensation of Vbe (T7904)
- R3935: trapezium correction
- C2909: to avoid external radiation
- C2918: to avoid "twisted or broken" lines

3.7.4 Line timebase

The control voltage of pin 37 of the Bimos ic (=ic7100) is derived via opto coupler pos 7420 to transistor T7421; then send via C2428 and C2421 to pins 5 and 6 of connector 0082; this is the control of the base of T7906 (=BU1508AX). At the flyback diode between collector and mass there are two parts present to allow the East/west modulation. One part of this modulator consists of D6906, T7908, C2910 and C2911. The second part another diode is not visible in the circuit diagram but it is present in the MosFet 7908.

On pins 1 and 2 of the module the primary side of the LOT is connected. The LOT supplies the following voltages:

- 3-5 : 26 Volts after smoothing
- 10-8: 14 Volts
- 9 : 160 volts for video amplifiers.

3.8 BIMOS IC: PAL I Version

3.8.1 Introduction

The TDA 8361 is a single chip video and audio processor and it incorporates a built in IF-detector, Luminance and Chrominance separator, PAL/NTSC Chroma Decoder, RGB processing, Horizontal and Vertical Oscillators, Sync Separators and the FM Sound demodulation circuit.

3.8.2 Bimos Start Up

The Bimos device (Line Oscillator) starts up via pin 36, however it will only start up when the voltage on this pin has reached 5.6 Volts. At 5.6 Volts the output frequency will be about 25kHz. The supply voltage at this pin (Pin 36) is produced by the Switched Mode Power Supply and not by the Line Out Put Stage. Once the supply voltage on Pin 10 has (Line Output Stage) reached the 8-volt threshold the output frequency will switch to 15.625 kHz. The voltage on this pin is prevented from exeeding 8 volts by zener diode 6106 (Page 10)

3.8.3 Horizontal Sync Separator

This functional block separates the horizontal sync pulses from the CVBS and then locks the pulses to the free running horizontal sawtooth generator. However both the vertical and horizontal oscillators are also internally locked to the 4.43 MHz Chroma reference Crystal item 1100.

- The Horizontal Oscillator Saw Tooth Generator The sawtooth is converted to a square waveform with a variable duty cycle. This square waveform is then fed to the Line O/P stage via a Galvanic Isolator. The correct line time constant is automatically determined, internally by the BIMOS IC.
- Pin 38 This is pin has two purposes, these are.
 1. The Sandcastle Pulse O/P
 2. Horizontal Flyback Pulse Input
- 1. The Sandcastle Pulse has an output current of a few micro amps; the amplitudes of the sandcastle pulse components are: Burst 5V3; Line Blanking 3V and Frame Blanking 2V.
- 2. The HOR FLYBACK input has a current of 100-300 uA. The Horizontal flyback pulse input, allows the phase of the flyback pulse to be compared internally with the phase of the horizontal oscillator; if the phase is not correct, the horizontal oscillators duty cycle will be adjusted accordingly.

9.9 Vertical Synchronisation and Frame Amplifier

9.9.1 The Vertical Sync Separator

This functional block separates the Frame Synchronisation pulses from the CVBS signal, once these pulses have been separated the pulses are then used to synchronise the Frame Oscillator.

9.9.2 Amplitude

The voltage on pin 42 of the BIMOS device determines the amplitude of the frame sawtooth.

9.9.3 Frame Pre Amplifier

This internal amplifier increases the amplitude of the Frame sawtooth, from here the frame sawtooth is available at pin 43.

9.9.4 BCI Input Pin

This Input is fed into the BIMOS device form the Tube Base Board, It is used to provide frame correction for changes in the EHT voltage. For example if the EHT decreases (more white) the picture will get larger. This results in the BCI decreasing and the picture size being automatically corrected by the BIMOS.

9.9.5 The IF Demodulator

The IF bandpass characteristic is determined by SAW filter 1001. The IF signal is then fed from here into BIMOS pins 45 and 46. Pin 1 of the IC is used for the selection of positive or negative video modulation. It is high for positive modulation and low for negative.

9.9.6 AGC

Pin 47 is used for AGC (AGC is used to adjust the gain of the Tuner so that over modulation is avoided).

9.9.7 AGC Threshold Adjustment

Variable resistor R3130 which is connected to pin 49 adjusts the AGC Threshold

9.9.8 Automatic Frequency Control/ Pin 44

The AFC control signal is available at pin 44 of the BIMOS device. It is obtained from the internal IF reference signal. C2100 is used to smooth the AFC voltage.

9.9.9 IDENT Signal/ Pin 4

The IDENT signal on pin 4 is "High" when horizontal sync is detected in the video signal and low when no sync is detected. The IDENT line is connected to the main Microprocessor. (Pin15)

9.9.10 What does the IDENT line do ?

It is used for tuning control (for switching from fast to the slow tuning mode) Pin 4 (BIMOS) is also used by the microprocessor (Pin15) for "No Signal Standby" after 15 minutes. Used to provide a stable OSD - Time constant switched by the BIMOS.

9.9.11 IF Source Select, Luminance And Chrominance Separation.

The Baseband Video signal (normal amplitude 2Vpp) at Pin 7 also contains the incarcier sound signal, however the sound signal has to be filtered out before the Video signal can be used. Ceramic filter 1102 (6 MHz) is used for this purpose. After the filter has removed the sound, the Video signal is then fed back into the IC at Pin13. From here the signal is internally fed to a source selector switch, Pin16 is used for source select control. If Pin 16= 0V This is Internal Video Input Mode If Pin 16= 8V External Video Input Mode Is Selected BIMOS Pin 16 is controlled via the STATUS and the External 2 switching signals, which originate from the main microprocessor.

9.9.12 Luminance And Chrominance Separation

The Chrominance signal is filtered out by using a Notch Filter, the Notch Filter provides -20db of attenuation. The Notch Filter is accurately internally calibrated by the subcarrier frequency (4.43 MHz).

9.9.13 Sharpness Control-Pin 14

Picture Sharpness is adjusted at Pin 14 of the BIMOS IC. The voltage variation expected here will be between 2.5V-5V. Picture Sharpness is adjusted in the on screen Picture Menu.

9.9.14 Crominance Decoder

The Chrominance signal originating from the CVBS signal (Pin 7) is filtered and then applied back into the BIMOS via either pins13or15. Pin16 is connected to the Microprocessor (Pin17) and is used for internal/external video switching. The internal Chroma Decoder is then internally fed with this selected feed, see page 11. From here the Chroma is fed to a pre amplifier and then on to the Burst Demodulator, the next stage is the R-Y and B-Y Demodulator. The Line and Frame Oscillators also use the 4.43 MHz reference signal available at pin 35.

9.9.15 Pin 27

Is used for Chroma standards selection, however as these sets are PAL only this pin is permanently forced in the PAL system via this pin. To facilitate this 5.5 Volts is applied to this pin via R3104 and R3145, 4K7.

9.9.16 Pin 32

This pin is used in combination with a separate SECAM decoder, it is used to select either the PAL or SECAM colour systems.

For PAL only sets, this pin will be set at 1V5 volts.

9.10 Video Controller Section: RGB-Dematrixing

This block dematrixes the -(R-Y), -(B-Y) and the Y signals into RGB signals; the Sandcastle pulse, which is derived internally, synchronises the internal RGB dematrixing process, it is also used to suppresses the RGB output signals during Frame Flyback.

9.10.1 Analogue Control

- 0-4V5 /Contrast Pin 25
- 0-5V /Brightness Pin 17
- 0-2V5 /Saturation Pin 26

9.10.2 Fast Blanking

Via the FAST BLANKING signal available at pin 21 RGB input selection is also made.

9.10.3 OSD FAST BL

Originates from the OSD generator; this signal is "high" (>1V) to insert OSD characters.

9.10.4 F.BL.SCART

This is the fast blanking signal form pin 16 of Scart 1. This signal is "high" (>1V) to switch the RGB source select into external input mode.

Note: Scart 2 does not have RGB capability.

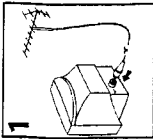
9.10.5 F.BL. TXT

Fast Blanking signal from the Teletext Decoder. This pin is high (>1V) to switch the RGB source select into external mode. Pin 22 Red, 23 Green and 24 Blue.

Setting up your television

Please read the safety and care information at the back of this booklet before you connect this television to the electricity supply.

Make the connections



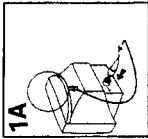
The aerial
Connect the aerial lead to the aerial socket at the back of the television (see diagram 1). We have supplied a loop aerial which fits in a hole at the back of the television (see diagram 1A). If reception conditions are good enough you may be able to get high-quality picture and sound by using the loop aerial. You will need a good-quality aerial to receive Teletext on model 1465TS.

Other equipment

If you have a video recorder, you will need to connect the aerial lead to the video recorder. Then, connect the aerial output lead from the video recorder to the television aerial socket. There is information about connecting aerials and other equipment in 'How to connect scart cables' on page 8.9.

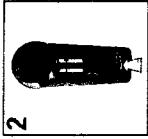
The scart (AV) socket

This television has a special socket called 'scart' (AV). This allows you to connect your television to other equipment. You don't have to use this straight away, but using scart cables gives you the best picture and sound quality and can get rid of picture interference. If you have other equipment with scart sockets, please read 'How to connect scart cables' on page 8.9.



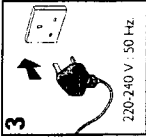
Putting the batteries in the remote control

- Slide your thumbnail under the edge of the battery cover where it says 'open' and press with your thumbnail while lifting the cover up (see diagram 2).
- Put in the two batteries that came with your television (size AAA or LR3).
- Make sure that the (+) and (-) marks on the batteries agree with the (+) and (-) marks inside the battery compartment.
- Replace the cover by sliding it into position and pressing down at the end marked 'open'.
- Throw away old batteries carefully. Do not put them on a fire.



Power supply

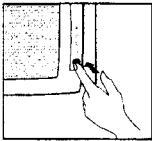
Plug your television into the mains supply (220 to 240 volts, 50Hz).



Moving the television

The earth's magnetic field can affect the colour quality of the picture, but your television has a built-in demagnetisation system to prevent this. The system works whenever the mains power is switched on while the television is cool. So if you have to move the television, leave it for at least 15 minutes before you switch it on.

Switching the television on and off



Switch the television on with the main power button (⦿) on the television. The red light on the television control panel will light up. If the screen does not light up after a few seconds, it probably means the television is in stand-by mode (see below).

Stand-by mode

Stand-by mode allows you to turn the television on and off with the remote control or the built-in timer. When the television is on stand-by, it is nearly all switched off and uses little power. You can switch it back on again by pressing any of the following buttons:

- One of the number buttons 0 to 9 on the remote control.
- The P+ or P- button on the remote control.
- The + or - button on the front panel of the television.

The stand-by light will get dimmer and after a few seconds the screen will light up. Press the red (⦿) button on the remote control to put the television back on stand-by. The red light on the television control panel will get brighter when the television is on stand-by.

Switching the television off

The television remembers if it is on stand-by. If the main power switch is switched off when the television is on stand-by, when you switch the television back on with the main power switch, the television will stay on stand-by. Please see 'Stand-by mode' above for how to switch the television on.

Automatic power-saving feature

If no signal is received through the aerial cable after about five minutes, the television will automatically turn to stand-by mode (see 'Stand-by mode' above).

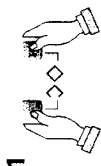
Tuning in the programmes

Before you start

- If you have a video recorder connected with the aerial lead, switch it on to produce a test picture, or play a video tape.
- If you have a satellite receiver (or any other equipment as well as the video recorder) connected with the aerial lead, make sure that mains power is supplied to it, and that it is on stand-by.
- Switch your television on. If the screen does not light up, please see 'Switching the television on' on page 2.

We recommend that you follow the instructions below, but there is another way of tuning in the programmes which automatically stores all the signals your television can receive. Afterwards you can store the channels on the appropriate programme numbers. For example, BBC 1 on programme one, BBC 2 on programme two and so on. To do it this way, please read 'Auto store tuning' on page 10.

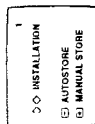
Which buttons to press on the remote control



1

What the screen will show

When $\diamond$ and $\diamond$ are pressed together, the installation menu will appear on the screen. The symbols are just underneath the buttons.



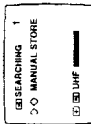
2

Press the menu + button and 'manual store' will appear on the screen.



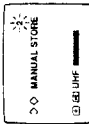
3

Press the menu + button again and 'searching' will appear. A bar on the screen will move to show the progress of tuning. When the television finds a signal, 'searching' will go off the screen, and the programme number will flash. If the picture quality is poor, there may be a better signal on another frequency, so start searching again by pressing the menu + button again. The best signals are usually in a group, one after the other.



4

When your television has found a good signal, decide which programme number you want it on, for example programme 1 for BBC1. Make sure you can recognise the test picture from any other pieces of equipment if you have them connected. While the programme number is flashing, press the P+ or P- button to change the number. You can't use zero.



5

When you press $\diamond$ and $\diamond$ together again, 'stored' will appear on the screen and the television will store the television channel on the programme number you have chosen.



6

Repeat steps 3 to 6 to store each programme.

7

Press the menu button twice to leave the manual store display.



Tips for tuning

Changing the programme number of a television channel

- Press the $\diamond$ and $\diamond$ buttons together to get the installation menu on the screen.
- Press the menu + button to get the manual store menu on the screen.
- Select the channel you want to change by pressing the P+, P-, or the 0 to 9 buttons.
- Press the $\diamond$ and $\diamond$ buttons together again to make the programme number flash.
- Press P+, P-, or the 0 to 9 buttons to enter the programme number you want to give to that channel. You can't use 0 because it is reserved for the start (AV) channel.
- Press the $\diamond$ and $\diamond$ buttons together once more to make 'stored' appear. The television has now stored the television channel on the programme number you have chosen.
- Repeat steps 3 to 6 if you want to change the programme numbers of other channels.
- Press the menu button twice to get back to normal viewing. (You can turn off any of the on-screen displays by pressing the menu button several times.)

Picture interference from other equipment

If you have used the aerial lead to connect a video recorder, satellite receiver or other piece of equipment, switch the equipment on one piece at a time and

check the picture on all your programmes. The pieces of equipment that are not switched on must be on stand-by. If any of your programmes have wavy lines on the picture when the equipment is switched on, you will have to change the output frequency of the equipment. Please read the instruction book for the equipment to find out how to do this. Change the output frequency a little at a time (or in 8MHz steps) and keep checking all your programmes. When there are no wavy lines (or other interference) on any of the pictures, re-tune the programme number that you have chosen for your equipment (see 'Tuning in the programmes', on pages 2 to 3). Do the same for each piece of equipment, but after you've finished with each one, leave it switched on while you check the next piece of equipment. Continue until you have all the pieces of equipment working together without interfering with each other. If you cannot get rid of the interference, you may have to connect the equipment with a scart cable, (see 'How to connect scart cables' on page 8 9).

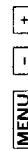
Changing channels without leaving the installation mode

As long as the programme number is not flashing, you can change channels while the installation menu is still on the screen.

Features on the television

Main power switch

Please read 'Switching the television on and off' on page 2.



Keep pressing the menu button to display the symbols for the items you can adjust: $\triangle$ (volume), $\square$ (brightness), $\bullet$ (contrast), $\square$ (sharpness), $\odot$ (colour) and $\odot$ (the time). If you don't make any adjustments, the menu display will automatically disappear after 10 seconds.

When there is no symbol shown on the screen, the - button selects the previous programme number and the + button selects the next programme number. Volume is for making the sound louder or quieter. Brightness, contrast, colour and sharpness are picture adjustments. Your television displays a bar to show the adjustment. Press + to increase the item you are adjusting, and the bar will get longer. Press - to reduce the item you are adjusting, and the bar will get shorter.

Menu adjustments

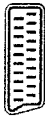
The timer

When the timer symbol is displayed during menu adjustments, you can set the television to automatically go on stand-by after a certain length of time. The time is displayed like a 24-hour digital clock (for example, 7pm is shown as 19:00). Each press of the menu + button increases the time in 10 minute steps up to 24 hours, then it goes back to zero again. You can reduce the time by pressing the menu - button. When 00:00 is displayed, the timer is off. If you need to check how much time is left before the television will go on stand-by, press the **⏻** (screen information) button on the remote control. During the last minute before the television switches off, a seconds count-down will be displayed. Press the **⏻** button again to make the time display go off the screen.



You connect your aerial to this socket; see 'Setting up your television' on page 1.

Aerial socket



If you want to connect other equipment which has scart sockets, please read 'How to connect scart cables' on page 8-9.

Scart socket

Using the remote control

When you press one of the buttons on the remote control, point the remote control at the television control panel. Stay within 7 metres of the control panel and keep more-or-less straight in front of it.

The button

	Standby
	Programme selection
	Numbered keys
	Volume
	Mute

The result

- The television goes on stand-by (see 'Stand-by mode' on page 2).
- The number is displayed on the picture for a short time.
P- selects the previous programme number and P+ selects the next programme number. If the television is on stand-by, pressing P+ or P- will turn it back on.
- The number is displayed on the picture for a short time and the programme changes. For a 2-digit number, you must press the second number before the dash after the displayed number disappears.
- + turns the sound up.
- turns the sound down.
- * If the sound won't get loud enough, hotel mode might be working. Please read 'Hotel mode' on page 11.

If you press the button once, the sound will go off and will appear on the screen. If you press the button again, the sound will come back on and will disappear.

The button

	Menu
	Menu adjustment
	Storing adjustments
	Personal preferences
	Screen information
	Sound mode

The result

Keep pressing the menu button to display the symbols for the items that you can adjust: (volume), (balance), (treble) or (bass), (brightness), (contrast), (sharpness), (colour) and (the timer).

You can adjust any of the items in just the same way as when you use the menu and menu adjustment buttons on the television (please see 'Features of the television' on pages 4 to 5). The + and - buttons do not change the programme number.

Keep pressing the menu button until the symbol of the item you want to adjust is displayed (except the timer). Before the symbol goes off, press the two buttons marked and together (the symbols are just underneath the buttons). Stored will appear on the screen, and the television will store all the menu adjustments you have made (except the timer) as your personal preference (PP).

Press this button to recall your stored picture and sound adjustments.

Press this button to display the programme number on the right of the screen. If the timer is on, the amount of time that is left before the television will go on stand-by will also be displayed. Press this button again to turn the display off. The type of sound is also displayed (see below), but it only stays on the screen for about 5 seconds.

This button lets you choose the type of sound.

Which type of sound you can choose depends on the type of sound in the television broadcast you are watching. Press the I/II button to switch between the different types of sound. These are shown below with their on-screen display symbol. The sound will normally go back to stereo when you change channels.

On-screen display symbol	Meaning
None	FM mono sound
MONO	Nicam mono sound
I or II	Nicam dual language broadcast
STEREO	Nicam stereo sound

If the signal strength is very poor, your television may automatically go to FM mono sound.

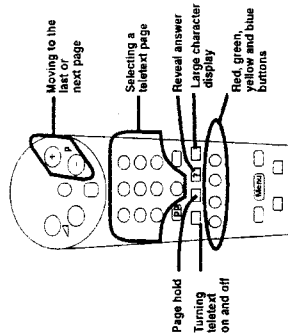
If I or II is displayed, it means you are listening to the first or second sound channel of a broadcast in which each channel carries different sound, such as different languages.

Nicam sound

Nicam is an acronym for a way of broadcasting high-quality sound signals along with the television picture and lower-quality monophonic FM sound. Different types of sound can be carried by NICAM, such as stereo, different languages or high-quality mono.

Teletext

The teletext service is an on-screen magazine that is carried on a television broadcast signal. Teletext information can also be carried by a signal fed into the scart or AV input of the television.



Turning teletext on and off

- 1 Turn on your television and choose a programme.
- 2 Press the **0** (teletext) button to switch the television to teletext mode. As long as the programme you have chosen has teletext, the main index page will soon be displayed. If there is no teletext programme, P100 will appear but the screen will stay black. In this case, turn teletext off by pressing the **1** button and try another programme.
- 3 To turn teletext off, press the **1** button again.

Choosing a teletext page

- 1 Use the number buttons on the remote control to enter the page number you want to see. You must enter the page number as a complete three-figure number. The page number you have chosen is displayed on the top left-hand side of the screen. As soon as you enter the third number, the page number in the middle of the top line of the display will start to change, this shows that the television is looking for the new page. When the television finds the new page, the number in the centre will stop changing.
- 2 To choose a new page, simply use the number buttons on the remote control to enter a new page number.
- 3 If you enter the wrong number, press more numbers until you have entered three numbers, then enter the correct page number.
- 4 To return to normal television viewing press the **1** button again.

Moving to the last or next page

To go to the page above the one you are on, press the

The scart sockets

The scart sockets at the back of the television are a convenient way of connecting audio and video (AV) signals to and from the television. As the signals are in a more basic form than the signal at the aerial socket, they are less likely to be affected by interference and other things that can reduce picture quality.

To select the scart channel

Press the **0** button on the remote control. EXT 1 will be displayed for a few seconds and you will see the picture from any equipment that is connected to the number 1 scart socket (if that equipment is switched on). If there is no signal at the scart socket, the screen will remain dark. Press the **0** button again and EXT 2 will be displayed to tell you that you have selected the number 2 scart socket.



The table below describes the facilities supported by the scart sockets on your television.

AV features	Connector type	AV in	AV out (pin 8)	Where the AV output comes from	RGB blanking (pin 16)
EXT 1	Scart	Yes	Yes	Inner	Yes
EXT 2	Scart	Yes	Yes	Screen	No

Video

Most equipment produces a 'composite video, blanking and synchronisation' signal (CVBS), usually just called 'video'.

RGB

The sharpest and clearest possible picture is reproduced from separate red, green and blue signals (RGB). Only certain computers and high-quality digital equipment produce this form of signal. Only the EXT 1 scart socket is wired for RGB input.

Automatic AV mode or video switching

Some equipment provides an automatic switching signal, so that the video recorder (and so on) 'tells' the television to reproduce its video and audio signals. For example, if you play a video tape, you will not have to press the **0** button on your remote control, as the television will automatically switch to the video channel.

Automatic switching priority

EXT 1 has priority over EXT 2. If a piece of equipment tells EXT 2 to come on at the same time as a piece of equipment tells EXT 1 to come on, the television will always go to EXT 1. You can change between EXT 1 and EXT 2 by pressing the zero button on the remote control.

Equipment that can be connected to the television

You can usually connect video recorders, camcorders, satellite receivers, PAL video disc players, audio amplifiers and video games to this television, but we cannot guarantee that all combinations of equipment will work. You can buy many different cables to connect these things.

Recording from the television

You can connect a video recorder to scart socket EXT 2 and record from the television. Whatever you see on the screen is what you will record through the scart socket of the video recorder, unless you are displaying RGB (please see above for a description of RGB).

P+ button. To go to the page below the one you are on, press the P- button. This television has a page memory which stores a few pages above the one you are reading. When you press the P+ button the next page will appear almost instantly, as long as the television has had time to store it since you last changed page.

Newsflash and subtitle pages

These special pages are displayed as a small box of text on the television picture. The page numbers are given by the service provider (for example, on BBC1 Cefax, page 888 gives you subtitles).

Fast text pages (the red, green, yellow and blue buttons)

The four coloured page headings at the bottom of the screen are associated with the displayed page. To see the page corresponding to one of these headings, press the matching coloured button. Each time you change the page, while you are reading the page you just selected your television is loading a new set of associated pages. Once it has done this, you can display any of these pages almost instantly by pressing one of the coloured buttons.

Sub-pages

Some teletext pages contain too much information to fit on the screen at once, so they are split up into sub-pages and shown in order. The service provider usually displays a label in the top right-hand corner of the screen to show which sub-page is being shown. For example, 3/6 shows that you are looking at the third of six pages.

Page hold

When information on one teletext page will not fit on the screen, sub-pages are shown in order (see 'Sub-pages above'). To keep a sub-page on the screen for longer than usual, press the **2** button. To cancel page hold mode, press **2** again.

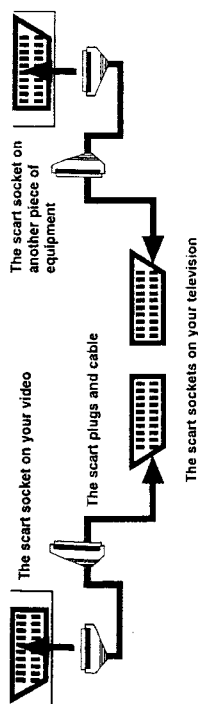
Large character display

Keep pressing the **1** button to change the character size. Press the **1** button once to display the top half of the page at twice its normal height. Press the **1** button again to display the bottom half of the page at twice its normal height. Press the **1** button again to return the text to its normal size.

Reveal answer

Use this button on certain pages to reveal the solutions to quizzes and so on. Press the **1** button once to reveal a hidden answer and press it again to hide it.

Typical connections for a satellite receiver with three scart sockets and a video recorder and a surround sound amplifier.



How to connect a video recorder only

Connect the video recorder scart socket to the EXT 1 scart socket on your television. If your video recorder has two scart sockets, use the one marked TV. The television aerial should go to the video recorder, then to the television.

How to connect a satellite receiver only

Connect the satellite receiver scart socket to the EXT 1 scart socket on your television. If your satellite receiver has more than one scart socket, use the one marked TV. Your television aerial should go to the satellite receiver, then to your television.

How to connect a satellite receiver with one scart socket and a video recorder with one scart socket

If your video recorder has only one scart socket, connect it to the EXT 1 scart socket on your television. Your television aerial should go to the satellite receiver, then to the video recorder, then to your television. So that you can record satellite broadcasts, you will have to tune one programme number on your video recorder to the satellite receiver (please see your video and satellite instruction books for details of how to do that). So that you can watch satellite television while you are recording normal television, you should also tune one programme on your television to the satellite receiver (please see 'Tuning in the programmes' on pages 2 to 3 for details).

How to connect a satellite receiver with one scart socket and a video recorder with two scart sockets

If your video recorder has two scart sockets, connect one (which may be marked TV) to the EXT 1 scart socket on your television and connect the other to your satellite receiver. Your television aerial should go to the satellite receiver, then to the video recorder, then to your television. You may need to read your video recorder instructions to find out which is the best scart socket to connect to your television and

how to record from the scart socket you have connected to your satellite receiver. So that you can watch satellite television while you are recording normal television, you should also tune one programme on your television to the satellite receiver (please see 'Tuning in the programmes' on pages 2 to 3).

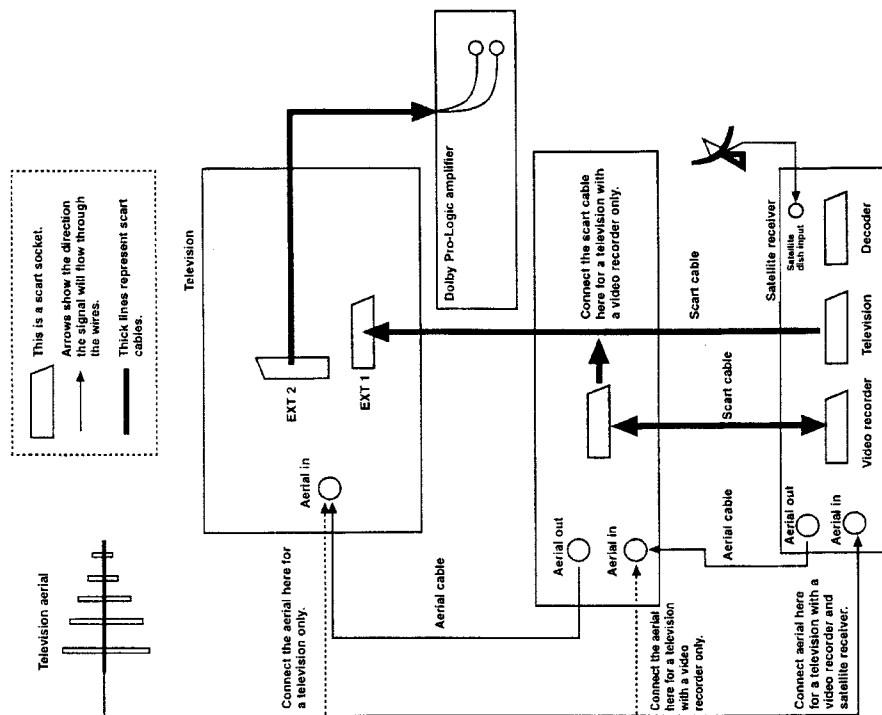
How to connect a satellite receiver with three scart sockets and a video recorder with one or two scart sockets

If your video recorder has two scart sockets, only use one of them. Connect your video recorder to the scart socket marked VCR on the satellite receiver. You may need to read your video recorder instructions to find out which is the best scart socket to use and how to record from the scart socket you have connected to your satellite receiver. Connect the scart socket marked TV on the satellite receiver to the EXT 1 scart socket on your television. Your television aerial should go to the satellite receiver, then to the video recorder, then to your television.

- For all of these connections you must put the satellite receiver on stand by to send the audio and video signals from the video recorder to your television. If you want to watch satellite while you are recording normal television, select a channel on the satellite receiver and press the 0 button on your television remote control.
- If you decide to watch normal television while you are recording satellite, you may find you automatically get satellite pictures and sound from your television. If this happens, use your remote control to select the programme number you want to watch.

What is the second scart socket for?

There are other possible combinations besides the ones we have given you. You might want to change the connections and use of the extra socket. You may also find it useful for feeding sound signals to a surround sound amplifier.



11 List of Abbreviations

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+96S	Supply voltage from the SMPS to the line output stage. This voltage is 104V for 21" sets.	IDENT	Status signal from IC7015-6B; "low" for no CVBS signal (horizontal sync not present), "high" in case CVBS signal is present (horizontal sync present) from the IF-detector IC7015-6B to the μ C.
+160V	Supply voltage from the LOT for the CRT-panel.	IF	Intermediate frequency signal from the tuner to the AM-demodulator IC7125.
+40D	Supply voltage from the LOT for vertical deflection.	LF-input	Low frequency sound-signal. Input signal for sound amplifier.
+8V	Supply voltage for AM-sound.	L/BG	Switching signal from μ C; "low" for LL reception (positive modulation, AM sound), "high" for BGIDK reception (negative modulation, FM sound). The μ C makes BG/L "high" in case EUROPE or UK is selected, and "low" in case FRANCE is selected.
+8Vx	+8V Supply voltage from the SMPS for the whole small signal part. x can be (a,b,c,d).	L/L' or BGDK	In case of a LL' set, selection is made between L and L'. In case of a BGDK set, selection is made between BG and DK. If this pin is "high" then L' or DK is selected.
+5Sx	+5V supply voltage from the SMPS to the μ C and periphery. x can be (a,b,c,d).	NIL	Non Inter Laced; 25 Hz block-shaped signal from the μ C to the frame amplifier for coinciding the odd & even frames.
mC	Microcomputer.	OSD-B	Blue info from OSD generator in μ C to the video controller IC7015-6D for inserting blue info on the screen.
AFC	Automatic Frequency Control.	OSD-G	Green info from OSD generator in μ C to the video controller IC7015-6D for inserting green info on the screen.
AGC	Automatic Gain Control.	OSD-R	Red info from OSD generator in μ C to the video controller IC7015-6D for inserting red info on the screen.
AQUA	Aquadag on the rear side of the picture tube to pin 8 of the LOT.	POR	Power On Reset; ensures the μ C starts up its software only if the power supply of the μ C itself is high enough.
ATS	Automatic Table Setting (auto install system for Germany only).	PP	Personal Preference.
AUDIO-OUT	Outgoing audio signal from pin 15 IC7140 to pin 1 and 3 from scart.	R-SC-IN	Red input signal from the scart to the video controller IC7015-6D.
B-SC-IN	Blue input signal from the scart to the video controller IC7015-6D.	RAM	Random Access Memory.
BASEBAND	CVBSBaseband CVBS signal from the IF-detector IC7015-6B to the FM-demodulator IC7015-6F.	ROM	Read Only Memory.
BEAM INFO	Beam Current Info; If beam current increases the BCI signal decreases. BCI is used for contrast reduction (if beam current is too high) and picture correction (if beam current increases (more white), EHT decreases so picture will become too big, BCI decreases and the picture will be corrected).	SANDCASTLE	Sandcastle signal from IC7015-6F to delay line IC7271 and SECAM chroma decoder IC7250.
BRIGHTNESS	Control signal (from μ C, but on DC level via RC network) for brightness control of the video controller IC7015-6D (0-5V).	SANDCASTLE1	Sandcastle signal from IC7015-6F to μ C.
BS1	Switching signal from the μ C to select tuner-band.	SATURATION	Control signal (from μ C, but on DC level via RC network) for saturation control of the video controller IC7015-6D (0-2V5).
BS2	Switching signal from the μ C to select tuner-band.	SAW	Surface Acoustic Wave; high precision bandpass filter.
C	Chrominance part of the video signal; this signal is also directly input at the SVHS plug.	SCL	Clock line of the I2C-bus.
CCT	Computer Controlled Teletext.	SDA	Data line of the I2C-bus.
CONTRAST	Control signal (from μ C, but on DC level via RC network) for contrast control of the video controller IC7015-6D (0-4V5).	SDAM	Service Default-Alignment Mode; predefined mode for faultfinding (see chapter 8).
CVBS	Colour Video Blanking Synchronisation (present behind soundtrap 1102).	SHARPNESS	Control signal on DC level (0.5V) from μ C to IF-detector IC7015-6B) for sharpness control.
CVBS-SC-IN	Incoming CVBS signal from pin 20 of scart to the external input pin 15 IC7015-6B.	SM	Service Menu.
EEPROM	Electrical Erasable Programmable Read Only Memory.	SMPS	Switched Mode Power Supply.
ESD	Electrical Static Discharge.	SND-SC-l	Incoming audio signal from pin 6 from the scart. This signal is the left audio-channel.
FBL	Fast blanking signal made by adding the fast blanking signals of the μ C and the SCART fast blanking signals.	SND-SC-r	Incoming audio signal from pin 2 and pin 6 from scart. In case of a stereo set this is the scart-input for the right sound channel.
FBL-SCART	Fast blanking input signal from scart which is added to the other fast blanking signals to control the video controller IC7015-6D.	SND-SC-L	Outgoing audio signal from pin 3 to the scart. This signal is the left audio-channel.
FBL- μ P	Fast blanking signal from the μ P which is added to the other fast blanking signals to control the video controller IC7015-6D.	SND-SC-R	Outgoing audio signal from pin 1 and pin 3 to scart. In case of a stereo set this is the scart-output for the right sound channel.
ff	Filament (heater voltage) from LOT to the picture tube.	STANDBY/AFC	Switching signal from μ C; "low" for standby (power supply will be switched to stand-by mode), "high" for normal operation. This pin acts also as an input for AFC.
FLOF	Full Level One Feature.	STATUS	Switching signal; "low" for internal CVBS, "high" for external CVBS.
FM	FM demodulated sound from the FM-demodulator IC7015-6F.	TOP	Table Of Pages.
G-SC-IN	Green input signal from the scart to the video controller IC7015-6D.		
H.DRIVE	Horizontal drive signal from IC7015-6E to line output stage.		
HFB	Horizontal flyback pulse (15625 Hz) used for locking the horizontal oscillator in IC7015-6E.		
I2C	Digital control bus of the microcomputer.		

11 List of Abbreviations

nP INT/EXT	Switching signal from the μ C for internal or external audio + video switching ("low" for external and "high" for internal).
/DRIVE	Vertical drive signal from IC7015-6E to frame amplifier.
/-vari	Tuning voltage from μ C to the tuner (0-30V DC).
/FB	50 Hz vertical flyback pulse used for locking the vertical oscillator in IC7015-6E.
/FL	Signal to inform the μ C that vertical flyback takes place.
/g2	Voltage on grid 2 of the picture tube.
/VIP	Video Input Processor.
/VOLUME-L	Control signal (from μ C, but on DC level via RC network) for volume control in mono BG-sets.
VOL-LEVEL	Control signal (from μ C, but on DC level via RC network) for volume control in mono multi-france sets.
WST	World System Teletext.
/	Luminance part of the video signal; this signal is also directly input at the SVHS plug.

12 Spare parts list

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Chassis (incl CRT-panels)											
Various											
Δ	4822 265 10438	CONNECTOR 2P MALE	2516	4822 124 11995	100μF 20% 400V	3324	4822 116 52276	3k9 5% 0.5W	3659Δ	4822 051 20472	4k7 5% 0.1W
Δ	4822 265 30389	2P MALE	2517Δ	5322 122 34123	1nF 10% 50V	3325	4822 050 11002	1k 1% 0.4W	3660	4822 116 52283	4k7 5% 0.5W
	4822 267 50621	7P MALE WHITE	2600Δ	4822 124 41579	10μF 20% 50V	3326	4822 101 11191	10k 30%LIN 0.1W	3661Δ	4822 053 10103	10k 5% 1W
	4822 265 10703	CONN. EURO 21P	2601	4822 126 13061	220nF 20% 25V	3327	4822 117 11896	1k5 20% 0.5W	3666	4822 050 11001	100Ω 1% 0.4W
Δ	4822 265 11253	FUSE HOLDER 2P	2602	4822 126 13061	220nF 20% 25V	3330	4822 117 11896	1k5 20% 0.5W	3671	4822 117 11449	2k2 1% 0.1W
	4822 492 70871	SPRING GR2	2604Δ	4822 126 10002	100nF 20% 25V	3420	4822 116 52238	12k 5% 0.5W	3672	4822 117 11449	2k2 1% 0.1W
Δ	4822 502 13712	TORX SCREW 12X3	2605Δ	4822 126 10002	100nF 20% 25V	3420	4822 116 83864	10k 5% 0.5W	3673	4822 117 11449	2k2 1% 0.1W
Δ	4822 255 70261	CRT SOCKET FL1	2606Δ	4822 126 10002	100nF 20% 25V	3421	4822 116 52303	8k2 5% 0.5W	3674	4822 117 11449	2k2 1% 0.1W
1000Δ	4822 210 10464	U943C/IEC	2608Δ	4822 126 10002	100nF 20% 25V	3422	4822 117 12955	2k7 1% 0.1W 0805	3675	4822 117 11449	2k2 1% 0.1W
1001	4822 242 81436	OFWK3953M	2609Δ	4822 126 10002	100nF 20% 25V	3423	4822 051 20561	560Ω 5% 0.1W	3676	4822 117 10833	10k 1% 0.1W
1100	4822 242 10692	CER (4,433619MHz)	2610	4822 124 40769	4.7μF 20% 100V	3424	4822 116 52176	10Ω 5% 0.5W	3681	4822 050 11002	1k 1% 0.4W
		TPS6.0MB-TF21	2611	4822 124 40769	4.7μF 20% 100V	3424	4822 116 52195	47Ω 5% 0.5W	3800	4822 050 17509	75Ω 1% 0.4W
		1802.5(2.5A)	2612	4822 124 40769	4.7μF 20% 100V	3425	4822 053 11129	12Ω 5% 2W	3801	4822 116 83883	470Ω 5% 0.5W
		fuse (0.630A)	2613	4822 124 40769	4.7μF 20% 100V	3426	4822 053 12103	10k 5% 3W	3802	4822 050 11203	12k 1% 0.4W
		fuse (2.500A)	2615Δ	5322 122 34123	1nF 10% 50V	3426Δ	4822 053 12153	15k 5% 3W	3804	4822 050 11001	100Ω 1% 0.4W
			2617	5322 122 32659	33pF 5% 50V	3427Δ	4822 051 20472	4k7 5% 0.1W	3805	4822 116 52283	4k7 5% 0.5W
			2618	5322 122 32659	33pF 5% 50V	3428Δ	4822 052 11108	1Ω 5% 0.5W	3806	4822 116 83872	220Ω 5% 0.5W
			2619Δ	4822 122 33177	10nF 20% 50V	3430	4822 116 52243	1k5 5% 0.5W	3807	4822 116 52219	330Ω 5% 0.5W
			2621	4822 124 40255	100μF 20% 63V	3431	4822 116 83883	470Ω 5% 0.5W	3808	4822 116 83961	6k8 5%
			2624Δ	4822 126 10002	100nF 20% 25V	3432	4822 051 20105	1M 5% 0.1W	3810	4822 116 52219	330Ω 5% 0.5W
			2625Δ	4822 126 10002	100nF 20% 25V	3432	4822 051 20225	2M2 5% 0.1W	3811	4822 050 17509	75Ω 1% 0.4W
			2626Δ	4822 126 10002	100nF 20% 25V	3433	4822 117 11149	82k 1% 0.1W	3812	4822 050 11002	1k 1% 0.4W
			2801	4822 122 31175	1nF 10% 500V	3434	4822 051 20223	22k 5% 0.1W	3813	4822 116 52176	10Ω 5% 0.5W
			2802Δ	4822 126 13185	680pF 10% 500V	3436Δ	4822 052 10151	150Ω 5% 0.33W	3815	4822 116 52219	330Ω 5% 0.5W
			2803Δ	4822 124 41579	10μF 20% 50V	3437	4822 116 52283	4k7 5% 0.5W	3816	4822 050 17509	75Ω 1% 0.4W
			2808	4822 126 13597	330pF 10% 500V	3438	5322 116 53564	3Ω 5% 0.5W	3817	4822 050 17509	75Ω 1% 0.4W
			2813Δ	4822 124 41579	10μF 20% 50V	3439Δ	4822 052 10228	2Ω 5% 0.33W	3820	4822 050 17509	75Ω 1% 0.4W
						3500Δ	4822 051 20471	470Ω 5% 0.1W	3825	4822 050 13901	390Ω 1% 0.4W
						3501Δ	4822 051 20101	100Ω 5% 0.1W	4xxx	4822 051 10008	Ω 5% 0.25W (1206)
						3502	4822 116 83864	10k 5% 0.5W	4xxx	4822 051 20008	Ω 5% 0.25W (0805)
						3503	4822 116 83961	6k8 5%			
						3504	4822 116 52249	1k8 5% 0.5W			
						3505	4822 116 52175	100Ω 5% 0.5W			
						3505	4822 116 83868	150Ω 5% 0.5W			
						3506	4822 117 12094	5% PRO1			
						3507	4822 050 21302	1k3 1% 0.6W			
						3508	4822 053 10682	6k8 5% 1W			
						3509	4822 116 83884	47k 5% 0.5W			
						3510	4822 117 12096	22k 1%			
						3510	4822 117 12707	33k 1% 1.3W			
						3511	4822 116 52269	3k3 5% 0.5W			
						3512	4822 116 52297	68k 5% 0.5W			
						3513	4822 053 10334	330k 5% 1W			
						3514Δ	4822 052 10108	1Ω 5% 0.33W			
						3515Δ	4822 052 10108	1Ω 5% 0.33W			
						3516Δ	4822 116 40137	PTC 36Ω 365V			
						3516Δ	4822 117 12027	18Ω-3k 25%			
						3517	4822 051 10102	1k 2% 0.25W			
						3518	4822 116 52239	120k 5% 0.5W			
						3519	4822 051 20681	680Ω 5% 0.1W			
						3521	4822 117 11504	270Ω 1% 0.1W			
						3601	4822 116 52283	4k7 5% 0.5W			
						3602	4822 051 20223	22k 5% 0.1W			
						3603	4822 051 20104	100k 5% 0.1W			
						3604	4822 117 10833	10k 1% 0.1W			
						3605Δ	4822 051 20153	15k 5% 0.1W			
						3606	4822 051 20339	33Ω 5% 0.1W			
						3607	4822 051 20224	220k 5% 0.1W			
						3608	4822 117 10833	10k 1% 0.1W			
						3609Δ	4822 051 20332	3k3 5% 0.1W			
						3610	4822 116 83864	10k 5% 0.5W			
						3611	4822 116 83864	10k 5% 0.5W			
						3612	4822 116 52304	82k 5% 0.5W			
						3613	4822 116 83864	10k 5% 0.5W			
						3614Δ	4822 051 20008	Ω jumper . (0805)			
						3616	4822 050 11002	1k 1% 0.4W			
						3618	4822 117 11449	2k2 1% 0.1W			
						3619	4822 116 52252	180k 5% 0.5W			
						3620	4822 051 20394	390k 5% 0.1W			
						3621	4822 051 20394	390k 5% 0.1W			
						3622	4822 116 83864	10k 5% 0.5W			
						3623Δ	4822 051 20472	4k7 5% 0.1W			
						3626	4822 050 11002	1k 1% 0.4W			
						3627Δ	4822 051 20472	4k7 5% 0.1W			
						3628Δ	4822 051 20472	4k7 5% 0.1W			
						3629Δ	4822 051 20472	4k7 5% 0.1W			
						3630	4822 116 83883	470Ω 5% 0.5W			
						3631Δ	4822 051 20471	470Ω 5% 0.1W			
						3632Δ	4822 051 20471	470Ω 5% 0.1W			
						3633	4822 051 20273	27k 5% 0.1W			
						3634	4822 050 11002	1k 1% 0.4W			
						3635Δ	4822 051 20472	4k7 5% 0.1W			
						3636	4822 116 83872	220Ω 5% 0.5W			
						3638	4822 117 11449	2k2 1% 0.1W			
						3639	4822 117 11449	2k2 1% 0.1W			
						3640	4822 117 11449	2k2 1% 0.1W			
						3641	4822 051 20392	3k9 5% 0.1W			
						3642	4822 116 52244	15k 5% 0.5W			
						3643	4822 051 20822	8k2 5% 0.1W			

*424	4822 130 40937	BC548B
*500	5322 130 41983	BC858B
*501	4822 130 61675	BF487
*502	4822 130 41646	BF423
*504	4822 130 63725	STP4NA40FI
*505A	4822 130 41344	BC337-40
*600	4822 209 16928	SAAS296PS/095
*600	4822 209 17219	SAAS296PS
*601A	4822 209 73852	PMBT2369
*602	5322 130 60159	BC846B
*603	4822 130 60511	BC847B
*605	4822 209 12948	ST24C02B6
*606A	5322 130 41982	BC848B
*608A	5322 130 41982	BC848B
*904	4822 130 60511	BC847B
Δ	4822 267 31858	1 P
	4822 267 51033	SINGLE CONNECTOR

Stereo amplifier panel

Various

	4822 265 10841	8 P MALE 2.50 F-PININ
	4822 267 10543	7 P MALE 2.50 F-PIN
	4822 265 30899	5 P-FOR
	4822 492 62076	TRANSISTORS
*010	4822 212 11313	MOD AUDI STEREO NICAM L
*010	4822 212 11314	MOD AUDIO STEREO NICAM BG
*010	4822 212 11315	MOD AUDIO STEREO BG
*200	4822 242 10688	OFWK9456M
*200	4822 242 81854	B39389-G9353-M100
*201	4822 242 81436	OFWK3953M
*202A	4822 071 53151	19372(315MA)
*221	4822 242 10434	CER(18,432MHz)

-II-

*200	4822 124 41643	100μF 20% 16V
*201A	4822 126 10002	100nF 20% 25V
*202	4822 126 13473	220nF 80-20% 50V
*203	4822 124 40723	2200μF 20% 16V
*204	4822 126 13473	220nF 80-20% 50V
*205A	4822 126 10002	100nF 20% 25V
*206	4822 122 31175	1nF 10% 500V
*207A	4822 126 13185	680pF 10% 500V
*208	4822 126 13692	47pF 1% 63V
*209	4822 124 41751	47μF 20% 50V
*210A	4822 126 10002	100nF 20% 25V
*211	4822 126 13692	47pF 1% 63V
*212	4822 122 33797	47nF 20% 50V
*213A	5322 126 10223	4.7nF 10% 63V
*214	4822 126 13473	220nF 80-20% 50V
*215	4822 124 40763	2.2μF 100 V
*216	4822 126 13296	100nF 10% 16V
*217A	4822 126 10002	100nF 20% 25V
*218	4822 124 40763	2.2μF 100 V
*219A	4822 126 10002	100nF 20% 25V
*220	4822 124 40763	2.2μF 100 V
*221	5322 126 10511	1nF 5% 50V
*222	4822 126 13473	220nF 80-20% 50V
*224A	4822 124 41579	10μF 20% 50V
*225	5322 126 10511	1nF 5% 50V
*228	5322 126 10511	1nF 5% 50V
*229	5322 126 10511	1nF 5% 50V
*230A	4822 126 10002	100nF 20% 25V
*231A	4822 122 33172	390pF 5% 50V
*232A	4822 122 33172	390pF 5% 50V
*233A	4822 124 41579	10μF 20% 50V
*234A	4822 126 10002	100nF 20% 25V
*235	4822 124 40769	4.7μF 20% 100V
*238A	4822 124 41579	10μF 20% 50V
*239A	4822 126 10002	100nF 20% 25V
*240A	4822 124 41579	10μF 20% 50V
*242A	4822 126 10002	100nF 20% 25V
*243	5322 122 32268	470pF 10% 50V
*244	5322 122 32268	470pF 10% 50V
*254A	4822 126 10002	100nF 20% 25V
*256A	4822 124 41579	10μF 20% 50V
*257A	4822 126 10002	100nF 20% 25V
*258	4822 126 13614	4N710% 50V
*259	4822 126 13692	47pF 1% 63V
*262	5322 122 32286	3.3pF 5% 50V
*263	5322 122 32286	3.3pF 5% 50V
*273A	5322 126 10223	4.7nF 10% 63V



*201A	4822 053 11189	18Ω 5% 2W
*202	4822 051 20159	15Ω 5% 0.1W
*203	4822 116 83883	470Ω 5% 0.5W
*204	4822 116 52238	12k 5% 0.5W

3206A	4822 051 20472	4k7 5% 0.1W
3207A	4822 051 20472	4k7 5% 0.1W
3208	4822 117 11449	2k2 1% 0.1W
3210	4822 051 20223	22k 5% 0.1W
3211A	4822 051 20472	4k7 5% 0.1W
3212	4822 051 20223	22k 5% 0.1W
3213	4822 116 52304	82k 5% 0.5W
3214A	4822 051 20472	4k7 5% 0.1W
3215A	4822 051 20472	4k7 5% 0.1W
3216	4822 117 11449	2k2 1% 0.1W
3217	4822 051 20104	100k 5% 0.1W
3219	4822 051 20562	5k6 5% 0.1W 0805
3220	4822 051 20104	100k 5% 0.1W
3221	4822 051 20223	22k 5% 0.1W
3221A	4822 051 20472	4k7 5% 0.1W
3221	4822 117 11448	180Ω 1% 0.1W
3222	4822 117 11448	180Ω 1% 0.1W
3223A	4822 052 10151	150Ω 5% 0.33W
3224	4822 117 11454	820Ω 1% 0.1W
3228	4822 051 20273	27k 5% 0.1W
3229	4822 051 20273	27k 5% 0.1W
3231	4822 116 83872	220Ω 5% 0.5W
3232	4822 116 83872	220Ω 5% 0.5W
3233	4822 117 10834	47k 1% 0.1W
4xxx	4822 051 10008	0Ω 5% 0.25W (1206)
4xxx	4822 051 20008	0Ω 5% 0.25W (0805)

5202	4822 157 10586	2.2μH 10% 0805
5203	4822 157 11014	IND 78mH
5204	4822 157 71403	15μH
5206	4822 152 20677	10μH
5207	4822 152 20677	10μH



6220A	4822 130 30621	1N4148
6221	4822 130 34382	BZX79-B8V2
6222A	4822 130 31024	BZX79-B18
6223A	4822 130 30621	1N4148
6224A	4822 130 30621	1N4148
6225A	4822 130 34173	BZX79-B5V6
6226A	4822 130 30621	1N4148



7202A	5322 130 41982	BC848B
7203A	5322 130 41982	BC848B
7204	5322 130 42631	BD243
7205	4822 209 13646	TDA7057AQ/N2
7206	4822 209 13003	TDA9811/V3
7207A	5322 130 41982	BC848B
7208	5322 130 41983	BC858B
7221	4822 209 13099	MSP3400C/C6
7221	4822 209 15832	MSP3410D-PP-B4

Deflection panels

Various

	4822 212 11359	DEFL MODULE 110 DEGR PCB
	4822 212 11533	DEFL MODULE 90 DEGR PCB
Δ	4822 265 30877	3P
Δ	4822 265 30389	2P MALE
	4822 267 10645	CON 12P. MALE
	4822 255 10386	HEATSINK LINE/FRAME
201A	4822 492 62076	SPRING FOR TRANSISTORS
	4822 492 70871	SPRING GR2
203A	4822 492 70871	SPRING GR2
	4822 492 62076	FOR TRANSISTORS
	4822 492 70871	SPRING GR2
204	4822 492 42769	IC SPRING
	4822 492 70871	SPRING GR2



2900	5322 121 42498	680nF 5% 63V
2900	5322 121 42661	330nF 5% 63V
2901	4822 121 41673	220nF 10% 100V
2901	5322 121 42661	330nF 5% 63V
2902	4822 124 40242	1μF 20% 63V
2903	4822 126 10334	470pF 10% 50V
2904	4822 124 41751	47μF 20% 50V
2904	4822 124 81029	100μF 20% 25V
2905	4822 124 22263	220μF 20% 25V
2906A	4822 124 40433	47μF 20% 25V
2906	4822 124 41751	47μF 20% 50V
2907	5322 124 41468	1000μF 20% 40V
2908	4822 124 81151	22μF 50V
2909	4822 121 51305	15nF 10% 50V
2910	4822 121 10701	11nF 5% 1KV

2910A	4822 121 70637	8.2nF 5% 1600V
2911	4822 121 40516	22nF 10% 250V
2912A	4822 126 13451	2.2nF 10% 2KV
2913A	4822 121 10518	250V 390nF 5%
2914	4822 124 80341	1μF 20% 160V
2915	4822 121 10506	250V 560nF 5% TYPE222374
2915A	4822 121 10518	250V 390nF 5%
2916	4822 124 11558	2200μF 20% 250V
2916	5322 124 41468	1000μF 20% 40V
2917	4822 122 30043	10nF 80% 63V
2918	4822 121 10692	82nF 10% 250V
2919A	4822 126 13185	680pF 10% 500V



3900	4822 050 22205	2M2 1% 0.6W
3901	4822 050 22205	2M2 1% 0.6W
3901	4822 116 52235	1M 5% 0.5W
3902	4822 116 52283	4k7 5% 0.5W
3903	4822 101 11187	1k 30%LIN 0.1W
3904	4822 116 52235	1M 5% 0.5W
3904	4822 116 52245	150k 5% 0.5W
3905	4822 116 52175	100Ω 5% 0.5W
3906	4822 050 11002	1k 1% 0.4W
3907	4822 116 52188	27Ω 5% 0.5W
3907	4822 116 52199	68Ω 5% 0.5W
3908A	4822 052 10228	2Ω 5% 0.33W
3908A	4822 052 10478	4Ω 5% 0.33W
3909A	4822 053 10221	220Ω 5% 1W
3909	4822 117 12851	4k7 5% 3W
3910	4822 053 11221	220Ω 5% 2W
3910	4822 116 83883	470Ω 5% 0.5W
3911	4822 116 83872	220Ω 5% 0.5W
3912	4822 116 83883	470Ω 5% 0.5W
3913	4822 100 11819	100k 30%LIN 0.1W
3914	4822 116 80676	1Ω 5% 0.5W
3915	4822 116 80676	1Ω 5% 0.5W
3916	4822 116 83882	39k 5% 0.5W
3917	4822 116 52257	22k 5% 0.5W
3918	4822 116 52304	82k 5% 0.5W
3919	4822 116 52289	5k6 5% 0.5W
3920	4822 116 52283	4k7 5% 0.5W
3921	4822 100 11819	100k 30%LIN 0.1W
3922	4822 050 11002	1k 1% 0.4W
3923	4822 116 52225	560Ω 5% 0.5W
3923	4822 116 52256	2k2 5% 0.5W
3924	4822 101 11191	10k 30%LIN 0.1W
3925	4822 116 52271	33k 5% 0.5W
3926	4822 116 83878	270k 5% 0.5W
3927	4822 116 52256	2k2 5% 0.5W
3927	4822 116 52269	3k3 5% 0.5W
3928A	4822 052 11108	1Ω 5% 0.5W
3929	4822 116 83872	220Ω 5% 0.5W
3930	4822 052 11561	560Ω 5% 0.5W
3933	4822 050 11002	1k 1% 0.4W
3933	4822 116 52234	100k 5% 0.5W
3934	4822 116 52252	180k 5% 0.5W
3935	4822 116 52252	180k 5% 0.5W



5900A	4822 157 11397	LIN. CORECTOR COIL
5900A	4822 157 63079	AT4042/97
5901A	4822 157 11193	FXC COIL ASSY - C115



6900A	4822 130 30621	1N4148
6900	4822 130 34382	BZX79-B8V2
6901A	4822 130 34173	BZX79-B5V6
6901	4822 130 34382	BZX79-B8V2
6902	4822 130 42488	BYD33D
6903	4822 130 42488	BYD33D
6904A	4822 130 30621	1N4148
6905	4822 130 34278	BZX79-B6V8
6906	4822 130 11369	BY278-20
6906A	4822 130 32896	BYD33M
6906A	4822 130 41275	BY228
6907A	4822 130 42489	BYD33G



7900A	4822 130 44461	BC546B
7901A	4822 130 44197	BC558B
7902	4822 130 40855	BC337
7902A	4822 130 40981	BC337-25
7903	4822 130 40917	BD238
7904	4822 130 63574	BD241CFI
7905	4822 130 41246	BC327-25
7906A	4822 130 10206	BUT11AX
7906A	4822 130 10864	BU1508AX
7907	4822 130 40937	BC548B
7908	4822 130 63725	STP4NA40FI

S.O.P.S Kit



5163#2015175

Art. Code: 03
Sachgebiet: CTV

Memo: DE10BEA

SI

Wichtig für die Werkstatt!

3645

Nummer: 4822 830 03013

Datum: 17.03.1999

Service Information

Betrifft: L 6.2 / L 6.3

Verteiler: S1,F1

Im Service-Manual für das L6.2-Chassis (4822 727 21532) fehlt die Stückliste der Ersatzteile für das 110 Grad Ablenkmodul.

Bitte benutzen Sie hierzu das Service-Manual für das Chassis L6.3 AA

Bestellnummer: 4822 727 21674