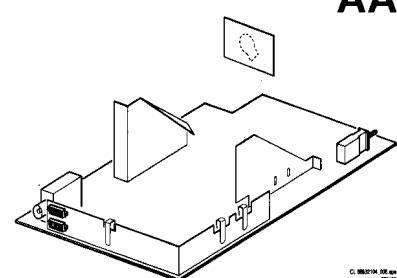


Service Service Service



Service Manual

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1 Technical Specifications

Mains voltage : 90V - 276Vac; 50-60Hz

Maximum power consumption

- 25" : 75W +/- 10%
- 28" : 90W +/- 10%
- 29" : 90W +/- 10%

Standby power consumption : 6W +/- 10%

Colour Synchronisation :

Sub-carrier pull in range : +/- 300Hz

Horizontal Synchronisation :

Catching range : +/- 600 Hz

Holding range : +/- 1200 Hz

Vertical Lock Range : 49 Hz - 61Hz

Tuners : UV 1316/AI-2 (PAL/SECAM)

2.1 Specification of the terminal sockets

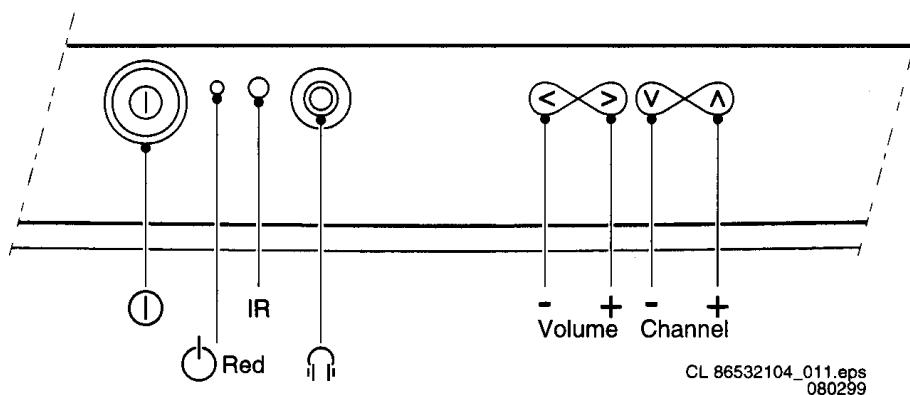


Figure 2-1

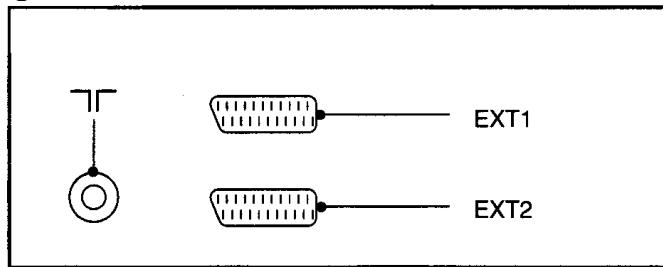


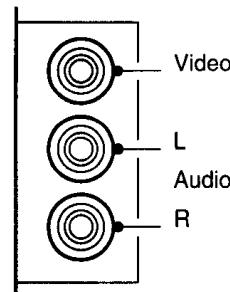
Figure 2-2

2.1.1 Scart 1: CVBS(in/out) + RGB(in) - tuner at output

1-	Audio Out R (0.5Vrms <= 1kΩ)	⊕
2-	Audio In R (0.2-2Vrms >= 10kΩ)	⊕
3-	Audio Out L (0.5Vrms <= 1kΩ)	⊕
4-	Earth screen	—
5-	Earth screen	—
6-	Audio In L (0.2-2Vrms >= 10kΩ)	⊕
7-	Blue (0.7Vpp/75Ω)	⊕
8-	CVBS status (INT = 0-2V, EXT(16:9) = 4.5-7V, EXT(4:3) = 9.5-12V)	—
9-	Earth screen	—
10-	-	—
11-	Green (0.7Vpp/75Ω)	⊕
12-	-	—
13-	Earth screen	—
14-	Earth screen	—
15-	Red (0.7Vpp/75Ω)	⊕
16-	FBL (>0.9V RGB mode)	—
17-	Earth screen	—
18-	Earth screen	—
19-	CVBS	⊕
20-	CVBS (1Vpp/75Ω)	—
21-	Earth screen	—

9-	9-	Earth screen
10-	10-	-
11-	11-	-
12-	12-	-
13-	13-	Earth screen
14-	14-	Earth screen
15-	15-	C (300mVpp/75Ω)
16-	16-	-
17-	17-	Earth screen
18-	18-	Earth screen
19-	19-	CVBS
20-	20-	CVBS/Y (1Vpp/75Ω)
21-	21-	Earth screen

2.1.3 Cinch - audio/video in

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2.1.2 Scart 2: CVBS (in/out) + SVHS(in)

Input = EXT2 => output = tuner

1-	CVBS (yellow)(1Vpp 75Ω)
2-	Audio L (red) (0.2-2Vrms 10kΩ)
3-	Audio R (white) (0.2-2Vrms 10kΩ)

Input = tuner/EXT1 => output = tuner/EXT1

1-	Audio Out R (0.5Vrms <= 1kΩ)
2-	Audio In R (0.2-2Vrms >= 10kΩ)
3-	Audio Out L (0.5Vrms <= 1kΩ)
4-	Earth screen
5-	Earth screen
6-	Audio In L (0.2-2Vrms >= 10kΩ)
7-	-
8-	CVBS status (INT = 0-2V, EXT(16:9) = 4.5-7V, EXT(4:3) = 9.5-12V)

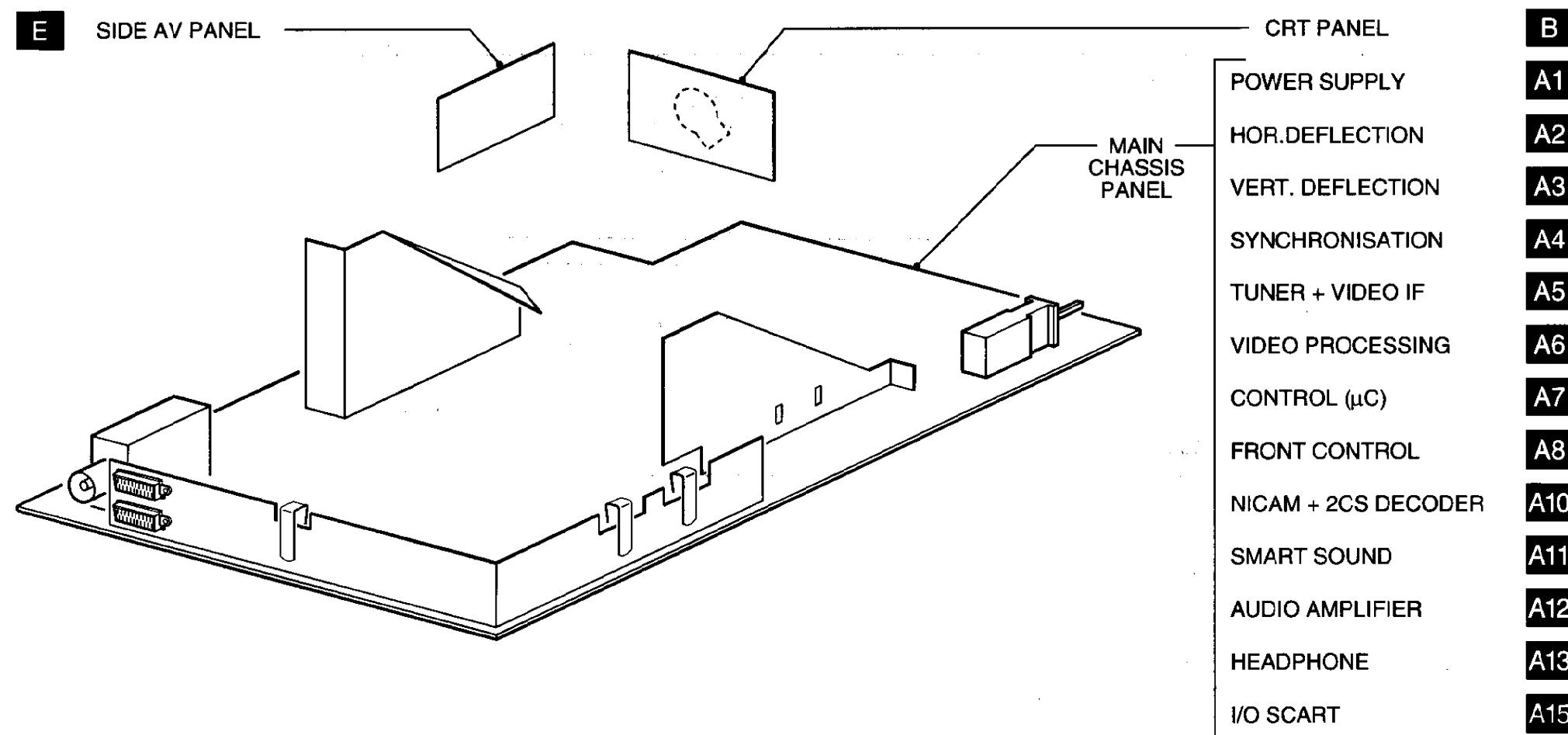
2.1.4 Headphone

1- 8-600Ω (4mW)



2 Connection facilities and chassis overview

2.2 PCB location drawing



4 Mechanical instructions

L9.1E

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4.1 Service positions

See figure 4.1 for the service position.

1. Disconnect the connecting cable feeding the right-hand speaker, also disconnect the degaussing cable.

2. The mono-carrier is removed by pushing the two centre clips (1) at both chassis brackets outwards and pulling the panel forward. (2)
3. Flip the mono-carrier over so that the component side of the board faces towards the CRT.
4. Slide the metal heat sink underneath the left chassis bracket (3) until the carrier is locked in position.

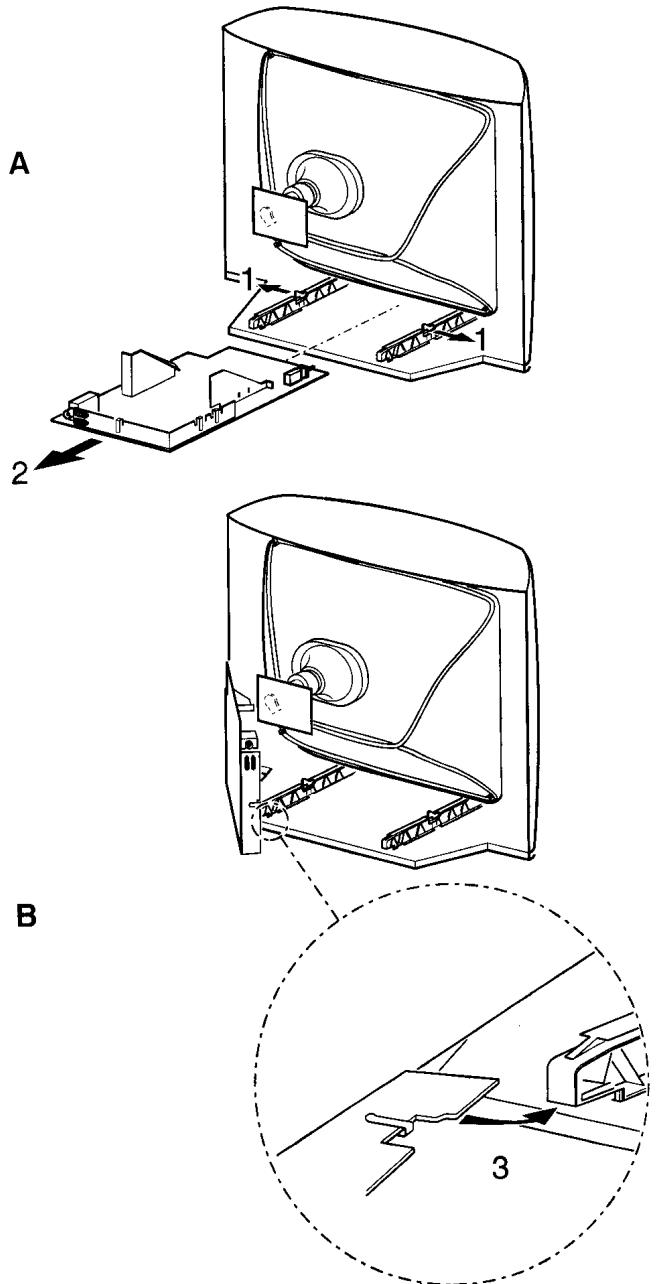


Figure 4-1

5 Fault finding and repair tips

This chapter includes information covering:

- 5.1 Test points
- 5.2 Service Modes and Dealer Service Tool (DST)
- 5.3 The menus and submenus
- 5.4 Error code buffer and error codes
- 5.5 The "blinking LED" procedure
- 5.6 Trouble shooting tips
- 5.7 Customer service mode
- 5.8 Compair
- 5.9 Ordering Compair

5.1 Test points

The L9.1E chassis is equipped with easily identifiable test points. These are clearly marked on the PCB. The test points refer to specific functional blocks, these are:

- A1-A2-A3, etc.: Test points for the Nicam + 2CS decoder / Audio amplifier
- C1-C2-C3, etc.: Test points for the control circuit / front control
- F1-F2-F3, etc.: Test points for the vertical deflection circuit
- I1-I2-I3, etc.: Test points for the intermediate frequency circuit
- L1-L2-L3, etc.: Test points for the horizontal deflection circuit
- P1-P2-P3, etc.: Test points for the power supply
- S1-S2-S3, etc.: Test points for the synchronisation circuit
- V1-V2-V3, etc.: Test points for the video processing circuitry / CRT panel

Measurements are performed under the following conditions:

Video: colour bar signal; audio: 3kHz left, 1kHz right

5.2 Service modes and Dealer Service Tool (DST)

For easy installation and diagnosis, the dealer service tool (DST) RC7150 can be used. When there is no picture (to access the error code buffer via the OSD). The DST can enable the set to display the entire contents of the error code buffers by using the flashing LED procedure.

Important Note: The L9.1E does not incorporate two way Infra red communication.

The part number for the DST (RC7150) is 4822 218 21232.

5.2.1 Installation features for the dealer

The dealer can use the RC7150 for programming the TV-set with presets. 10 Different program tables can be programmed into the DST via a GFL TV, MD or MG set (downloading from the TV to the DST; for example see the GFL service manuals) or by the DST-I (DST interface; part number 4822 218 21277). For an explanation of the installation features of the DST, please see the directions of use for use of the DST (for the L9.1E chassis, download code 4 should be used).

5.2.2 Diagnosis features for the servicer

L9.1E models can be put into either of the two available service modes by using the RC7150. These are the Service Default Mode (SDM) and the Service Alignment Mode (SAM).

5.2.3 Service Default Mode (SDM)

The purpose of the SDM is:

- Used to provide a pre defined situation (pre-defined parameters), so that the same measurements can be obtained as per the service manual.
- Overrides the 5V protection when the internal method of SDM is used (connecting together pin 24 and pin 25).
- starts the LED flashing procedure
- Setting up of options codes
- Inspect the error buffer

Entering the SDM:

- By transmitting the "DEFAULT" command with the RC7150 Dealer Service Tool (this works both while the set is in normal operation mode or in the SAM)
- Standard RC sequence 062596 followed by the key "MENU"
- By connecting test-points M25 and M24s together (on the mono-carrier) while switching on the set. After switching on the set the link should be removed (Caution!! By entering the SDM mode you Override the 5V protections).

Exit the SDM:

Switch the set to Standby or press EXIT on the DST (the error buffer is also cleared).

Note: When the mains power is switched off while the set is in SDM, the set will switch to SDM immediately when the mains is switched on again. (The error buffer will be cleared).

The SDM sets the following pre-defined conditions:

- Pal/Secam sets: tuning at 475.25 PAL (For France select the L'-signal)

Volume level is set to 25% (of the maximum volume level). Other picture and sound settings are set to 50%. The following functions are "ignored" in SDM since they interfere with diagnosing/repairing a set. "Ignoring" means that the event that is triggered is not executed, the setting remains unchanged.

- (Sleep)Timer
- Blue mute
- Auto switch off
- Hotel or Hospitality Mode
- Child lock or Parental lock
- Skipping, blanking of "Not favourite" present/channels
- Automatic storing of Personal Preset settings
- Automatic user menu time-out

All other controls operate normally.

5.2.4 Special functions in SDM

Access to normal user menu

Pressing the "MENU" button on the remote control will enter the normal user menu (TV lock, Installation, Brightness, colour and contrast) while "SMD" remains displayed in top of screen). Pressing the "MENU" key again will return to the last SDM status.

Error buffer

Pressing the "OSD" button of the remote control shows all OSD (incl. error buffer).

Access to SDM

By pressing the "CHANNEL DOWN" and "VOLUME DOWN" buttons on the local keyboard simultaneously the set switches from SDM to SAM or pressing "ALIGN" on the DST

5 Fault finding and repair tips

L9.1E

9

In the SDM the following information is displayed on the screen:

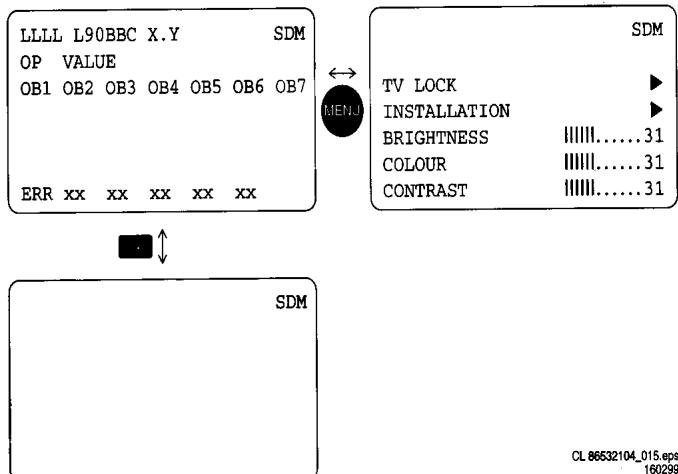


Figure 5-1 : Service Default Mode screens and structure

Explanation notes/references:

(1) "LLLL" Operation hours timer (hexadecimal)

(2) Software identification of the main micro controller (L90BBC X.Y)

- L90 is the chassis name for L9.0E
- BBC is a 2 letter and 1 digit combination that indicates the software type and the supported languages:
- X = (main version number)
- Y = (subversion number) BB = (range specification)

(3) "SDM" To indicate that the TV set is in de service mode

(4) "OP" Options Code consist of 2 characters. It is possible to change each option code

"VALUE" The value of the selected option (ON/OFF or a combination of 2 letters)

"XXX" Value of the options bytes (OB1 .. OB7)

"ERR" The last five detected errors; The left most number indicates the most recent error detected.

The MENU UP or MENU DOWN command can be used to select the next/previous option; The MENU LEFT and MENU RIGHT command can be used to change the option value.

Remark: When the option-code RC = OFF, the P+ and the P- key have the same functions as the MENU UP/DOWN keys while the VOL- and the VOL+ key have the same function as the MENU LEFT/RIGHT keys. It is not possible to change the channel pre-set or to adjust the volume when in SAM/SDM menu when the option RC = OFF.

Using a L9.1E remote control, option-code RC = ON, the P+, P-, VOL- and VOL+ can be used to change the pre-set and/or to adapt the volume, while the menu-cursor keys are used to select the option and to change its value.

For an extended overview of the option codes see Chapter 8 - Options

5.2.5 Service Alignment Mode (SAM)

The SAM allows adjustment of the Demodulator I.F, align the white tone, adjust the picture geometry and sound adjustments.

For easy identification of the SAM mode, "SAM" is displayed in the top of the right side of the screen

Entering SAM:

- By transmitting the "ALIGN" command with the RC7150 Dealer Service Tool
- By pressing the "CHANNEL DOWN" and "VOLUME DOWN" key on the local keyboard simultaneously when the set is in SDM
- Standard RC sequence 062596 followed by the key "OSD"
- By shorting test-point M28 and M29 on the mono-carrier while switching on the set. After switching on the set the short-circuit can be removed. (Caution!! Override of 5V protections).

Exiting the SAM:

Switch the set to standby or press EXIT on the DST (the error buffer is not cleared).

Note: When the mains power is switched off while the set is in SAM, the set will switch to SAM immediately when the mains is switched on again. (The error buffer will not be cleared).

In the SAM the following information is displayed on the screen:

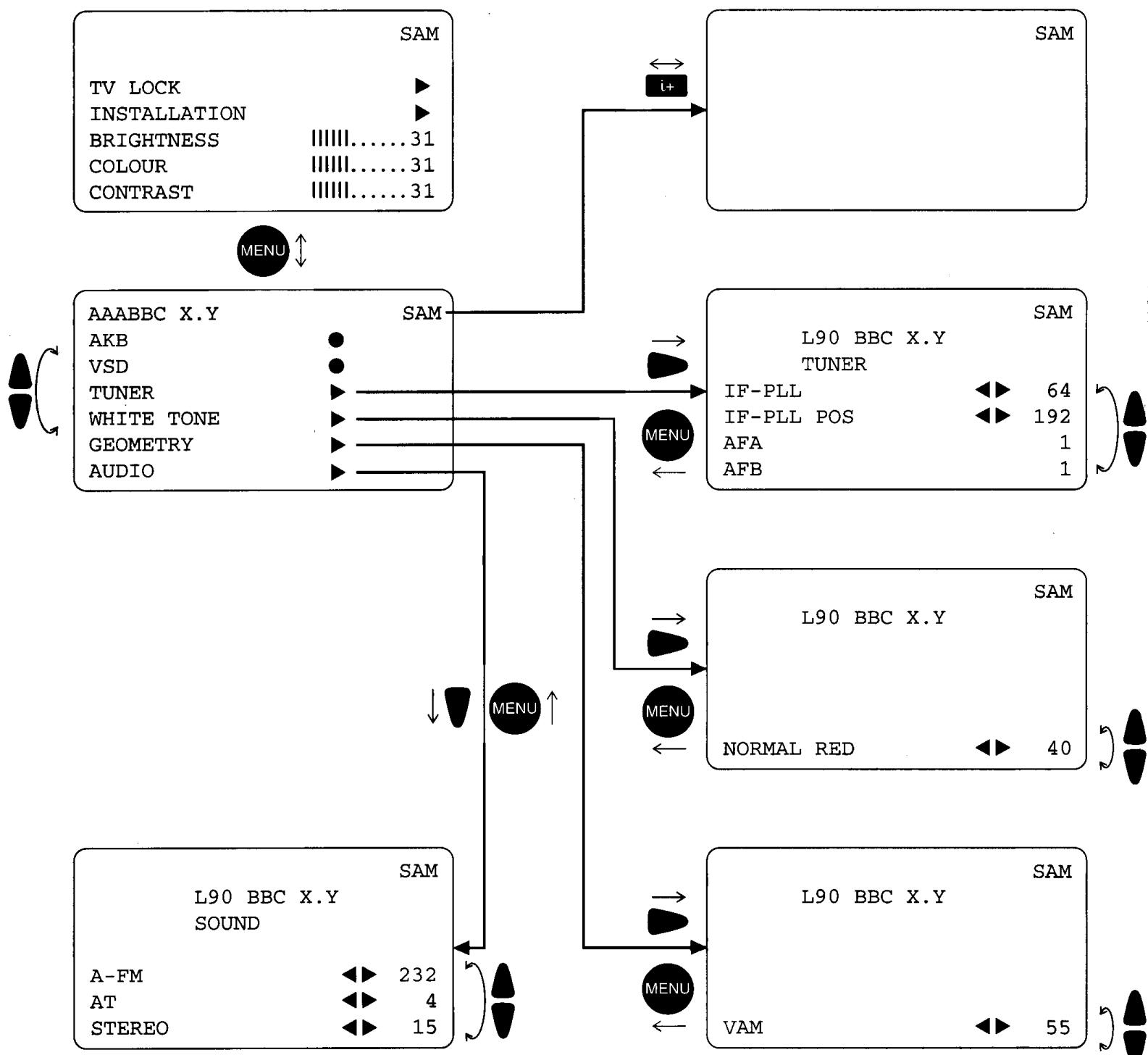


Figure 5-2 : Service Alignment Mode screens and structure

Access to normal user menu

Pressing the "MENU" button on the remote control will enter the normal user menu (TV lock, installation, brightness, colour and contrast) while "SAM" remains displayed in top of screen. Pressing the "MENU" key again will return to the last SAM status.

Pressing the "OSD" button of the remote control shows only "SAM" in the top of screen

Access to SDM

Pressing the "DEFAULT" button on the DST

SAM menu control

Menu items (AKB, VSD, Tuner, White tone, Geometry and Sound) can be selected with the MENU Up or MENU DOWN key. Entry into the selected items (sub menus) is done by the MENU LEFT or MENU RIGHT key. The selected item will be highlighted.

With the cursor LEFT/RIGHT keys, it is possible to increase/decrease the value of the selected item.

5.3 The menus and submenus

5.3.1 Tuner sub menu

The tuner sub menu contains the following items:

- IF_PLL: PLL Alignment for all PAL/SECAM systems, excluding SECAM-LL'
- IF_PLL POS: PLL Alignment for SECAM-LL'
- IF_PLL OFFSET: Default value = 48 ; Do not align
- AFW: AFC Window
- AGC: AGC take-over point
- YD: Default value = 12 ; Do not align
- CL: Default value = 4 ; Do not align
- AFA
- AFB

The items AFA and AFB can not be selected, they are for monitoring purposes only.

The commands MENU UP and MENU DOWN are used to select the next/previous item.

The commands MENU LEFT and MENU RIGHT are used to increase/decrease the value of the selected item. The changed values will be sent directly to the related hardware.

The item values are stored in NVM if this sub menu is left.

5.3.2 White tone sub menu

The white tone sub menu contains the following items:

- NORMAL RED
- NORMAL GREEN
- NORMAL BLUE
- DELTA COOL RED
- DELTA COOL GREEN
- DELTA COOL BLUE
- DELTA WARM RED
- DELTA WARM GREEN
- DELTA WARM BLUE

OSD is kept to a minimum in this menu, in order to make white tone alignment possible.

The commands MENU UP and MENU DOWN are used to select the next/previous item.

The commands MENU LEFT and MENU RIGHT are used to increase/decrease the value of the selected item. The changed values will be send directly to the related hardware.

The item values are stored in NVM if this sub menu is left.

The Contrast Plus feature (black stretch) is set to OFF when the white tone submenu is entered.

5.3.3 Audio sub menu

The audio sub menu contains the following items:

- A-FM: Default value = 232 ; Do not align
- AT: Default value = 4 ; Do not align
- STEREO: Default value = 15 ; Do not align
- DUAL: Default value = 12 ; Do not align

The sound adjustments sub menu are not available in Mono sets.

The presence of an item in the menu is dependent on the selected soundboard (option SB).

The commands MENU UP and MENU DOWN are used to select the next/previous item.

The commands MENU LEFT and MENU RIGHT are used to increase/decrease the value of the selected item. The changed values will be sent directly to the related hardware.

The item values are stored in NVM if this sub menu is left.

5.3.4 Geometry sub menu

The geometry sub menu contains the following items:

- SBL : Service blanking
- VSL : Vertical slope
- VAM : Vertical amplitude
- VSH : Vertical shift
- HSH : Horizontal shift
- VSC : Vertical S correction
- H60 : Default value = 10 ; Do not align
- V60 : Default value = 12 ; Do not align
- EWC : E-W corner
- EWT : E-W trapezium
- EWP : E-W parabola
- EWW : E-W width

5.4 Error code buffer and error codes

5.4.1 Error code buffer

The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right.

- when an error occurs that is not yet in the error code buffer, the error is written at the left side and all other errors shift one position to the right
- the error code buffer will be cleared in the following cases:
 1. exiting SDM or SAM with the "Standby" command on the remote control
 2. transmitting the commands "EXIT" with the DST (RC7150)
 3. transmitting the commands "DIAGNOSE-9-9-OK" with the DST.
- By leaving SDM or SAM with the mains switch, the error buffer is not reset.

5 Fault finding and repair tips

Examples:

ERROR: 0 0 0 0 0 : No errors detected

ERROR: 6 0 0 0 0 : Error code 6 is the last and only detected error

ERROR: 5 6 0 0 0 : Error code 6 was first detected and error code 5 is the last detected (newest) error

5.4.2 Error codes

In the case of non-intermittent faults, clear the error buffer before starting the repair to prevent "old" error codes being present. If possible check the entire contents of the error buffers. In some situations an error code is only the RESULT of another error code (and not the actual cause).

Note: a fault in the protection detection circuitry can also lead to a protection.

Error 0 = No error

Error 1 = X-ray (Only for USA sets)

Error 2 = High beam current protection and E/W Horizontal protection

High beam protection active; set is switched to protection; error code 2 is placed in the error buffer; the LED will blink 2 times (repeatedly).

As the name implies, the cause of this protection is a too high beam current (bright screen with flyback lines). Check whether the +200V supply to the CRT panel is present. If the voltage is present, the most likely cause is a fault on the CRT panel. Disconnect the CRT panel to determine the cause. If the +200V voltage is not present, check R3340 (CRT panel - B), R3485 and D6485 (Horizontal Deflection - A2)

EW protection:

If this protection is active, the causes could be one of the following;

- horizontal deflection coil 5445
- linearity coil 5457
- S-correction capacitor 2466/2468
- flyback capacitor 2465
- line output stage
- short circuit of:
- flyback diode 6460
- EW transformer (bridge coil) 5465/5470 or 5463/5471 (version dependent)
- S-correction capacitor 2457
- EW power-transistor 7460 or driver-transistor 7461

Error 3 = Vertical / Frame protection

There are no pulses detected at pin 47 of the main microprocessor 7600 (panel A7).

If this protection is active, the causes could be one of the following items;

- IC 7401 is faulty
- Open circuit of vertical deflection coil
- Vlotaux +11V not present and/or Vlotaux -11V not present
- Resistor 3409

Error 4 = Sound processor I2C error (MSP3415D)

Sound processor does not respond to the micro controller

Error 5 = Bimos start-up error (POR bit)

Bimos start-up register is corrupted or the I2C line to the Bimos is always low or no supply at pin 12 of the Bimos). This error is usually detected during start-up and hence will prevent the set from starting up.

Error 6 = Bimos (TDA8844) I2C error

Note that this error may also be reported as a result of error codes 4 (in that case the Bimos might not be the actual problem)

Error 7 = General I2C error. This will occur in the following cases:

- SCL or SDA is shorted to ground
- SCL is shorted to SDA
- SDA or SCL connection at the micro controller is open circuit.

Error 8 = Microprocessor internal RAM error

The micro controller internal RAM test indicated an error of the micro controller internal memory (tested during start-up);

Error 9 = EEPROM Configuration error (Checksum error); EEPROM is corrupted.

Error 10 = I2C error EEPROM error. NV memory (EEPROM) does not respond to the micro controller

Error 11 = I2C error PLL tuner. Tuner is corrupted or the I2C line to the Tuner is low or no supply voltage present at pin 9, pin 6 or pin 7 of the tuner.

Error 12 = Black current loop instability protection. The black current could not be stabilised. The possible cause could be a defect in one or more of the RGB amplifiers, RGB guns or RGB driving signals.

5.5 The "blinking LED" procedure

The contents of the error buffer can also be made visible via the "blinking LED" procedure. This is especially useful when there is no picture. There are two methods of access:

1. When the SDM is entered, the LED will blink the number of times, equal to the value of the last (newest) error code (repeatedly).
2. With the DST all error codes in the error buffer can be made visible. Transmit the command: "DIAGNOSE x OK" where x is the position in the error buffer to be made visible x ranges from 1, (the last (actual) error) to 6 (the first error). The LED will operate in the same way as in point 1, but now for the error code on position x.

Example:

Error code position 1 2 3 4 5

Error buffer: 8 9 5 0 0

- after entering SDM: blink (8x) - pause - blink (8x) - etc.
- after transmitting "DIAGNOSE- 2- OK" with the DST blink (9x) - pause - blink (9x) - etc.
- after transmitting "DIAGNOSE- 3- OK" with the DST blink(5x) - pause - blink(5x) - etc.
- after transmitting "DIAGNOSE- 4- OK" with the DST nothing happens

5.6 TROUBLE SHOOTING TIPS

In this paragraph some trouble shooting tips for the deflection and power supply circuitry are described. For detailed diagnostics, use the fault finding tree or use COMPAIR.

5.6.1 THE DEFLECTION CIRCUIT:

1. Check that the +VBATT (140V) is present across 2551 (A1 POWER SUPPLY). If the voltage is not present, disconnect coil 5551 (A1 Power Supply) (Horizontal deflection stage is disconnected). If the voltage is present then the fault might be caused by the deflection circuit.
Possible Candidates Are:
 - Transistor 7460 is faulty
 - The driver circuit around transistor 7461 is faulty
 - No horizontal drive signal coming from the BIMOS 7250-D pin 40 (A4 - Synchronisation)
2. Note: If the Collector of 7460 is shorted to the Emitter, a tripping noise will be heard from the power supply circuit.
3. To determine whether the fault is present in the horizontal deflection circuit or in the E/W circuit (A2 - Horizontal Deflection), de-solder jumper 9465 and insert a jumper into position number 9461. This disables the E/W protection. If the basic deflection stage now works correctly (parabolic picture) then the fault is present in the E/W circuit. If there is still no horizontal deflection, then the fault is present in the basic deflection circuitry.
4. The 25V-version (26" tube) and the 27V-version (29" tube) do not have an E/W correction circuit.
5. Also don't forget the protection circuits in the line output stage. If any of these circuits are activated, the set will shut down. Depending on the protection, the led will blink according to the fault defined. In order to determine which protection circuit is active, isolation of each separate circuit is necessary. These protection circuits are:
 - High beam current protection (LED blinks repetitively 2 times) - CRT panel (B)
 - E/W Horizontal protection (LED blinks repetitively 2 times) - Horizontal deflection (A2)
 - Vertical protection (LED blinks repetitively 3 times) - Vertical deflection (A3)

5.6.2 THE POWER SUPPLY

To trouble shoot the L9.1E SMPS, first check the Vaux voltage on C2561. If this voltage is not present, check fuse F1572 and D6560. If F1572 or D6560 is not open circuit, the problem might be caused on the primary side of the switching supply. Check the output of the bridge rectifier on the C2508 for approximately 300V DC. If this voltage is missing, check the bridge rectifier 6505 and the fuse 1500. If fuse F1500 is found to be open circuit, check MOSFET 7518 to make sure that there is no short circuit present and check R3518. If the 300V DC is present on C2508, check for a start-up voltage of approx. 13V on pin 1 of IC7520. If no start-up voltage is present, check if R3510 is open; zener 6510 is a short-circuit. It is necessary to have a feedback signal from the hot primary side of switch mode transformer T5545 at pin 8 and pin 9 for the power supply to oscillate. If this start-up voltage is present on pin 1 of IC7520 and the supply is not oscillating, check R3529 and D6540.

Check for a drive signal at the gate of MOSFET 7518, square wave signal - P2. Check pin 3 of IC7520, R3525 and D6514

To determined whether OVP is active, check whether Vaux is present at C2561.

5.7 Customer Service Mode (CSM)

All L9.1E sets are equipped with the "Customer Service Mode" (CSM). CSM is a special service mode that can be activated and deactivated by the customer, following a request from the service technician/dealer perhaps during a telephone conversation to identify the status of the set. This CSM is a 'read only' mode, therefore modifications or changes while the set is in this mode are not possible.

Entering the Customer Service Mode. The Customer Service Mode can be switched on by pressing simultaneously the button (MUTE) on the remote control and any key on the control buttons (P+, P-, VOL +, VOL -) on the TV for at least 4 seconds.

When the CSM is activated:

- picture and sound settings are set to nominal levels
- "Service unfriendly modes" are ignored

Exit the Customer Service Mode.

The Customer Service Mode will switch off after:

- pressing any key on the remote control handset (except "P+" or "P-")
- switching off the TV set with the mains switch.

All settings that were changed when CSM was activated are set back to the initial values

5.7.1 The Customer Service Mode information screen

The following information is displayed on screen:

- Line number for every line (to make CSM language independent)
- Operating hours
- Software version L90BBC X.Y)
- Text "CSM" on the first line
- Error buffer contents
- Option code information
- Configuration information
- Service unfriendly modes

1 HHHH L90BBC-X.Y	CSM
2 CODES xx xx xx xx xx	
3 OP xxx xxx xxx xxx xxx xxx	
4 SYS: xxxxxxxxxxxx	
5 NOT TUNED	
6 TIMER	
7 LOCKED	
8 (HOSPITAL) (HOTEL)	
9 VOL LIM <value>	

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Figure 5-3 : Screen lay-out Customer Service Mode

SYS: xxxxxx = xxxxxx is the SYSTEM THAT IS SET FOR THIS PRESET

NOT TUNED = no ident signal present

TIMER = (SLEEP) TIMER is activated

LOCKED = Channel/preset locked via parental lock, child lock

HOTEL = HOTEL mode activated; HOSPITAL = HOSPITAL mode activated

VOL LIM > = Volume limiter activated and set to >

5.7.2 Exit

Any key (RC or local keyboard) except "channel up" / "channel down" (standby switched to standby, mains OFF switches set off, other keys switch to normal operation)

5.8 Compair

5.8.1 Introduction

Compair (Computer Aided Repair) is a service tool for Philips Consumer Electronics products. Compair is a further development on the DST service remote control allowing faster and more accurate diagnostics. Compair has three big advantages:

- Compair helps you to quickly get an understanding how to repair the L9.1E in short time by guiding you step by step through the repair procedures.
- Compair allows very detailed diagnostics (on I2C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I2C commands yourself; Compair takes care of this.
- Compair speeds up the repair time since it can automatically communicate with the L9.1E (when the micro processor is working) and all repair information is directly available. When Compair is installed together with the SearchMan L9.1E electronic manual, schematics and PCBs are only a mouse-click away.

Compair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The Compair interface box is connected to the PC via a serial or RS232 cable. In case of the L9.1E chassis, the Compair interface box and the L9.1E communicate via an I2C cable (bi-directional) and via infra red communication (uni-directional; from Compair interface box to L9.1E)

The Compair fault finding program is able to determine the problem of the defective television. Compair can gather diagnostic information in 2 ways:

1. Communication to the television (automatic)
2. Asking questions to you (manually)

Compair combines this information with the repair information in its database to find out how to repair the L9.1E.

Automatic information gathering

Reading out the error buffer, Compair can automatically read out the contents of the entire error buffer.

Diagnosis on I2C level. Compair can access the I2C bus of the television. Compair can send and receive I2C commands to the micro controller of the television. In this way it is possible for Compair to communicate (read and write) to devices on the I2C busses of the L9.1E.

Manual information gathering

Automatic diagnosis is only possible if the micro controller of the television is working correctly and only to a certain extend. When this is not the case, Compair will guide you through the fault finding tree by asking you questions and showing you examples. You can answer by clicking on a link (e.g. text or an waveform pictures) that will bring you to the next step in the faultfinding process.

A question could be: Do you see snow? (Click on the correct answer)

YES / NO

An example can be: Measure testpoint I7 and click on the correct oscillogram you see on the oscilloscope

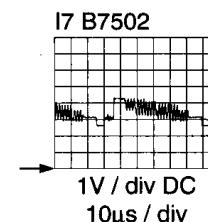


Figure 5-4

By a combination of automatic diagnostics and an interactive question/answer procedure, Compair will enable you to find most problems in a fast and effective way.

Additional features

Beside fault finding, Compair provides some additional features like:

- Uploading/downloading of presets
- Managing of preset lists
- Emulation of the Dealer Service Tool

5.8.2 Connecting the Compair interface

The Compair Browser software should be installed and setup before connecting Compair to the L9.1E. (See the Compair Browser Quick Reference Card for installation instructions.)

1. Connect the RS232 interface cable to a free serial (COMM) port on the PC and the Compair interface PC connector (connector marked with "PC").
2. Place the Compair interface box straight in front of the television with the infrared window (marked "IR") directed to the television LED. The distance between Compair interface and television should be between 0.3 and 0.6 meter. (Note: make sure that (also) in the service position, the Compair interface infra red window is pointed to the standby LED of the television set (no objects should block the infra red beam))
3. Connect the mains adapter to the connector marked "POWER 9V DC" on the Compair interface
4. Switch the Compair interface OFF
5. Switch the television set OFF with the mains switch
6. Remove the rear cover of the television set
7. Connect the interface cable (4822 727 21641) to the connector on the rear side of the Compair interface that is marked "I2C" (See Figure 5.6)
8. Connect the other end of the interface cable to the Compair connector on the monocarrier (see figure 5.7)
9. Plug the mains adapter in the mains outlet and switch ON the interface. The green and red LEDs light up together. The red LED extinguishes after approx. 1 second (the green LED remains lit).
10. Start-up Compair and select "File" menu, "Open..."; select "L9.1E Fault finding" and click "OK"
11. Click on the icon (fig. 5.5) to switch ON the communication mode (the red LED on the Compair interface wil light up)
12. Switch on the television set with the mains switch
13. When the set is in standby. Click on "Start-up in Compair mode from standby" in the Compair L9.1E fault finding tree, otherwise continue.

5 Fault finding and repair tips

L9.1E

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Figure 5-5

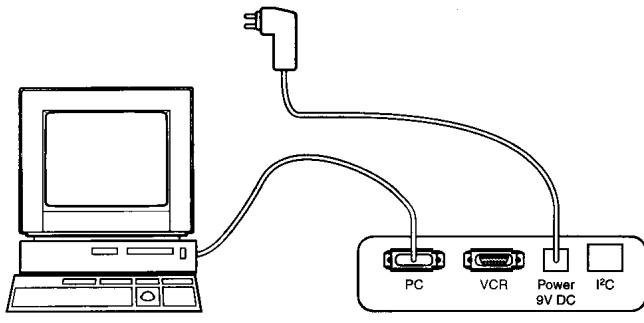


Figure 5-6

The set has now started up in Compair mode. Follow the instruction in the L9.1E fault finding tree to diagnose the set. Note that the OSD works but that the actual user control is disabled

5.8.3 Preset installation

Presets can be installed in 2 ways with the L9.1E.

- Via infra red
 - only sending TO the television
 - the rearcover does NOT have to be removed

Click on "File" "Open" and select "TV - use Compair as DST" to use infra red

- Via cable
 - sending TO the television and reading FROM the television
 - the rearcover has to be removed

Click on "File" "Open" and select "L9.1E fault finding" to use the cable

Presets can be installed via menu "Tools", "Installation", "Presets".

5.9 Ordering Compair

Compair order codes:

- Starterkit Compair+SearchMan software + Compair interface (excluding transformer): 4822 727 21629
- Compair interface (excluding transformer): 4822 727 21631
- Compair transformer (continental) Europe: 4822 727 21632
- Compair transformer United Kingdom: 4822 727 21633
- Starterkit Compair software: 4822 727 21634
- Starterkit SearchMan software: 4822 727 21635
- Starterkit Compair+SearchMan software: 4822 727 21636
- Compair CD (update): 4822 727 21637
- SearchMan CD (update): 4822 727 21638
- Compair interface cable (for L9.1E): 4822 727 21641

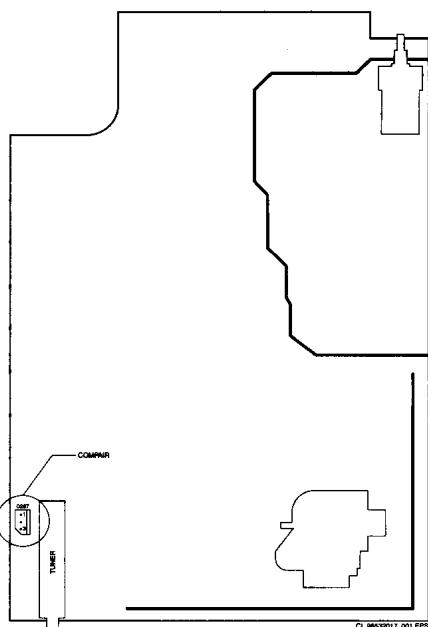
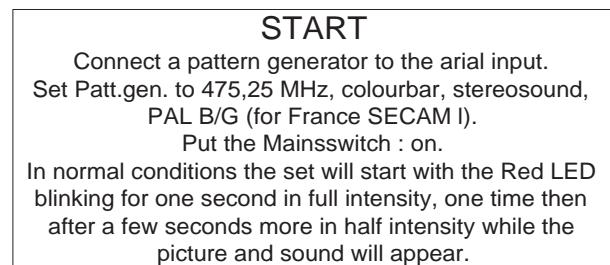


Figure 5-7

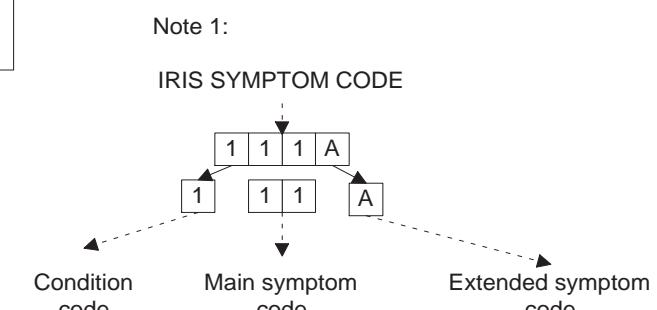
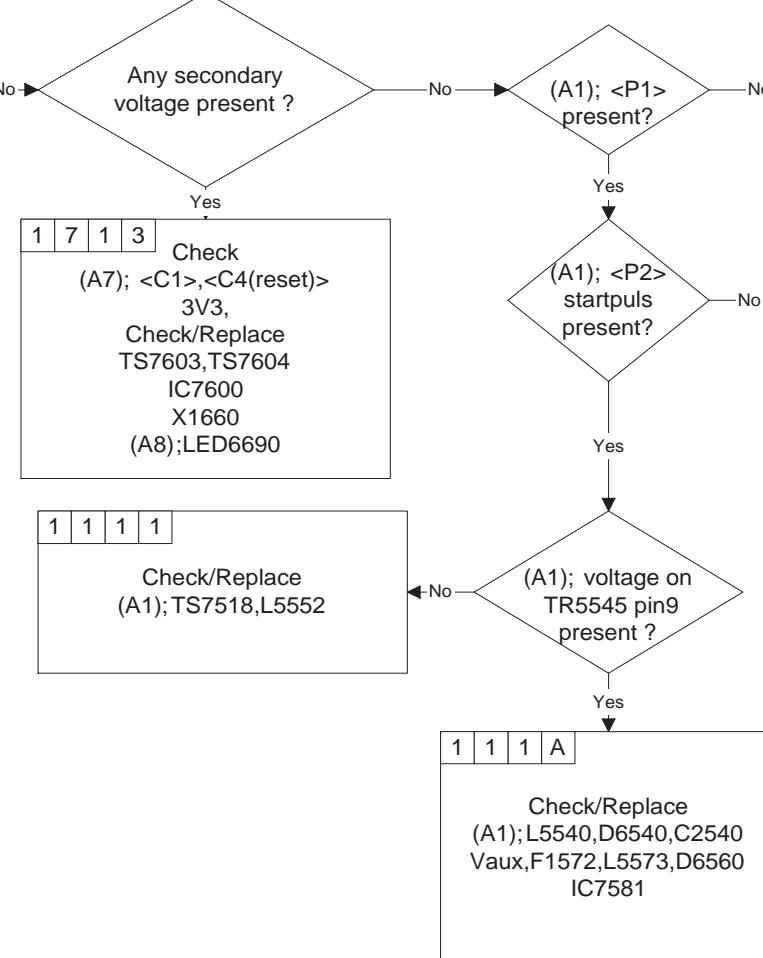
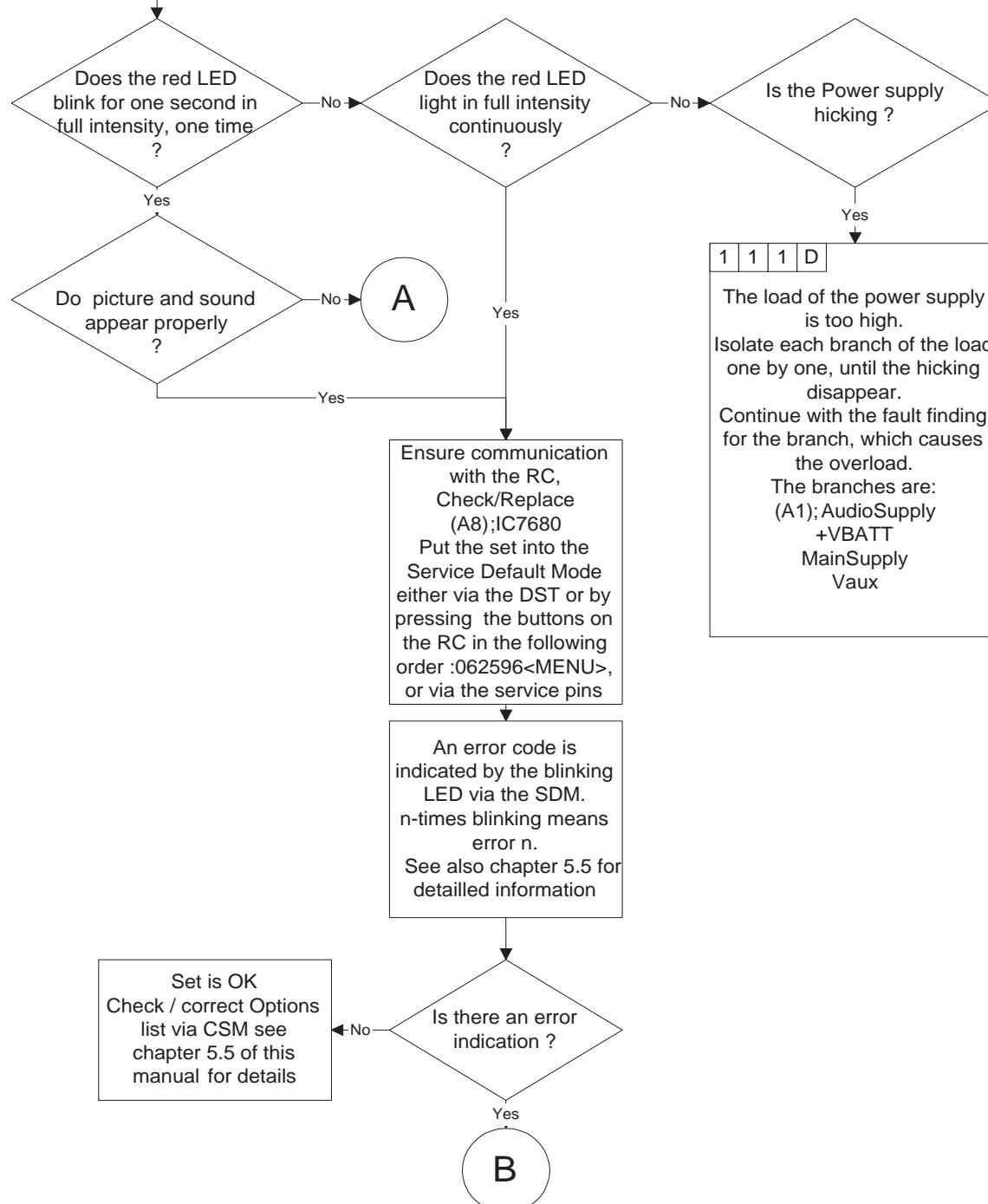
6 Fault finding trees, diagrams and overviews

L9.1E

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Remark :
In normal operation the
Red LED lights in half
intensity and in
standby-mode the LED
lights in full intensity

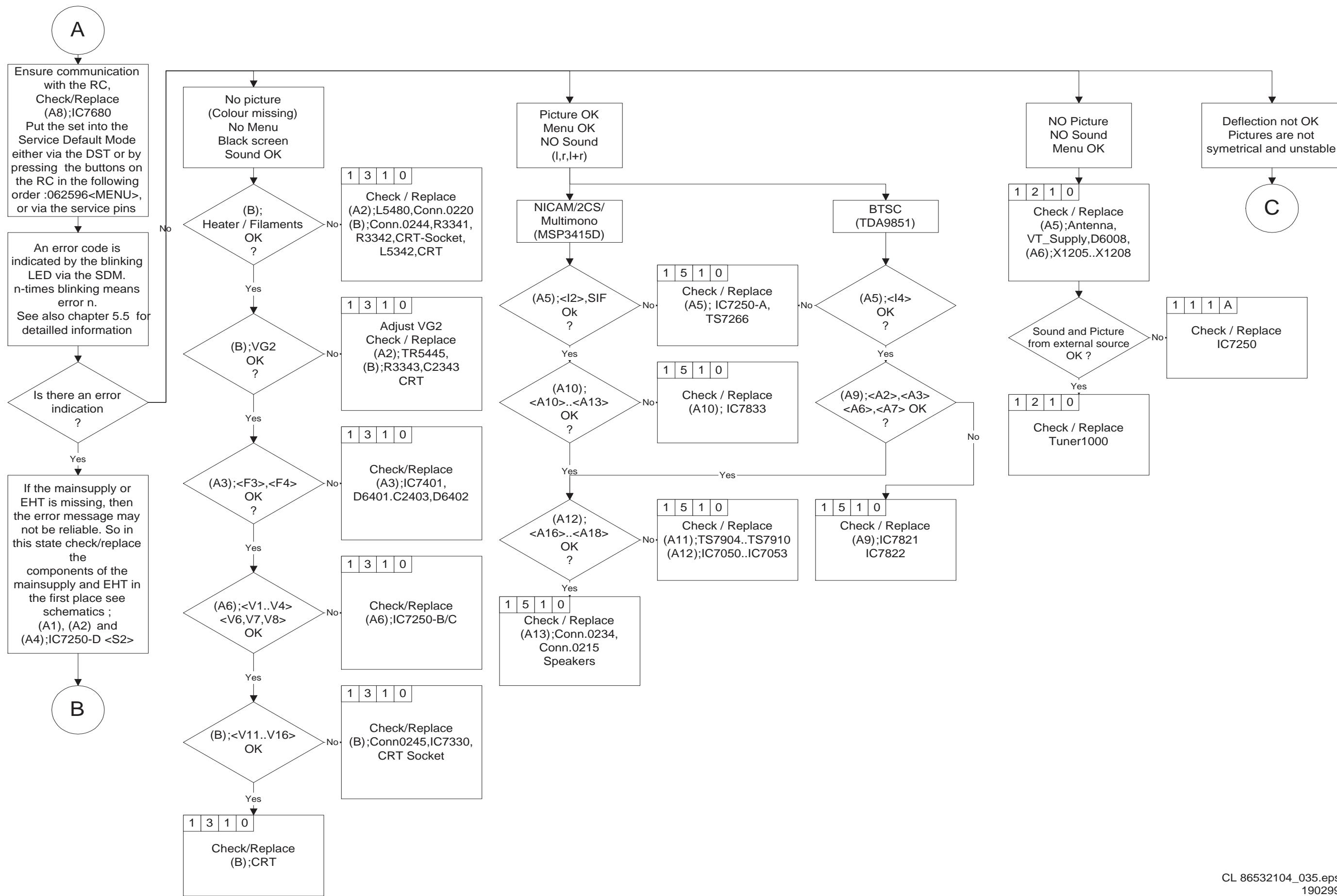


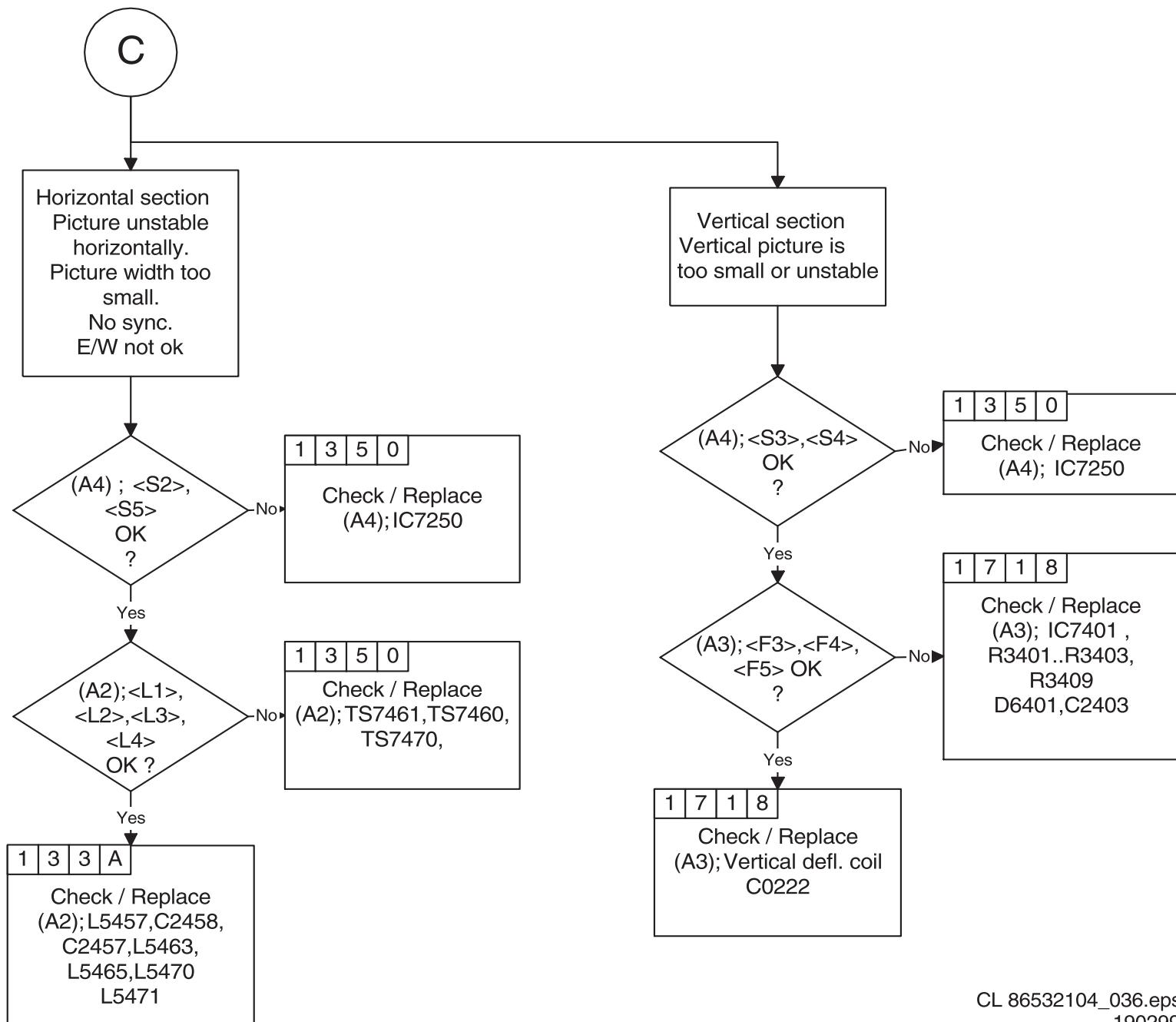
Note 2:
(A1) means Drawing A1
<P1> means Test point P1

6 Fault finding trees, diagrams and overviews

L9.1E

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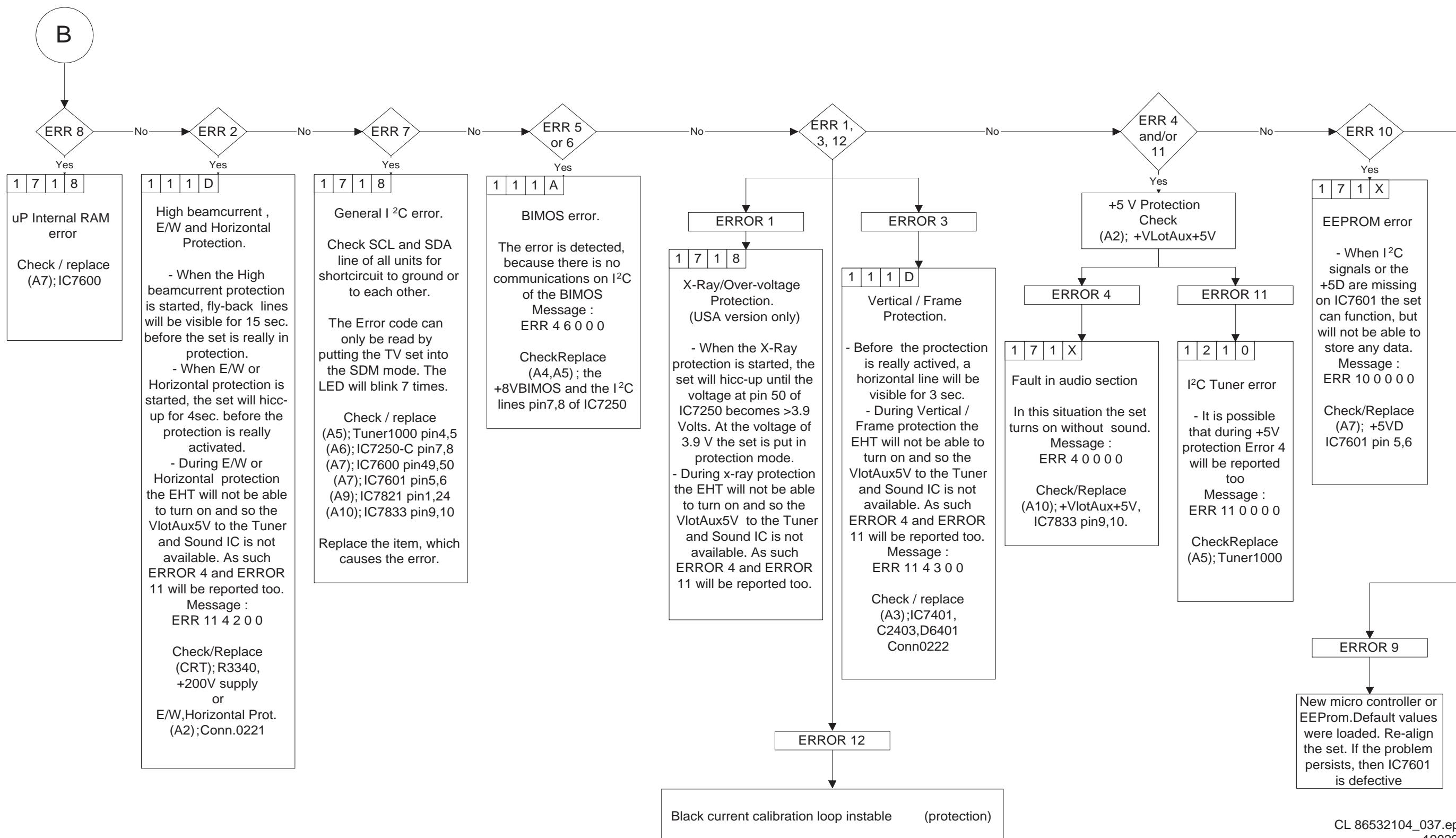


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190299

6 Fault finding trees, diagrams and overviews

L9.1E

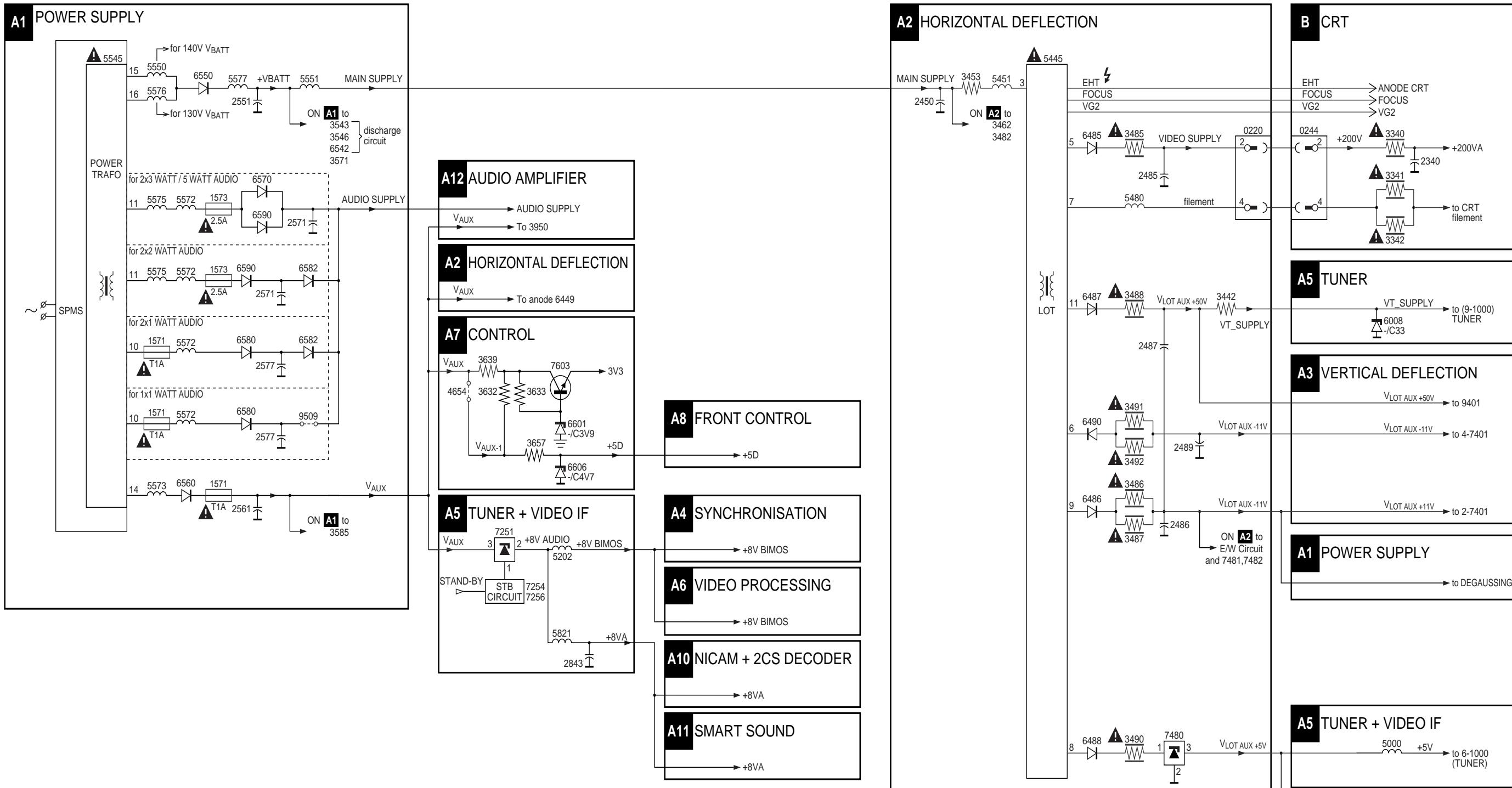
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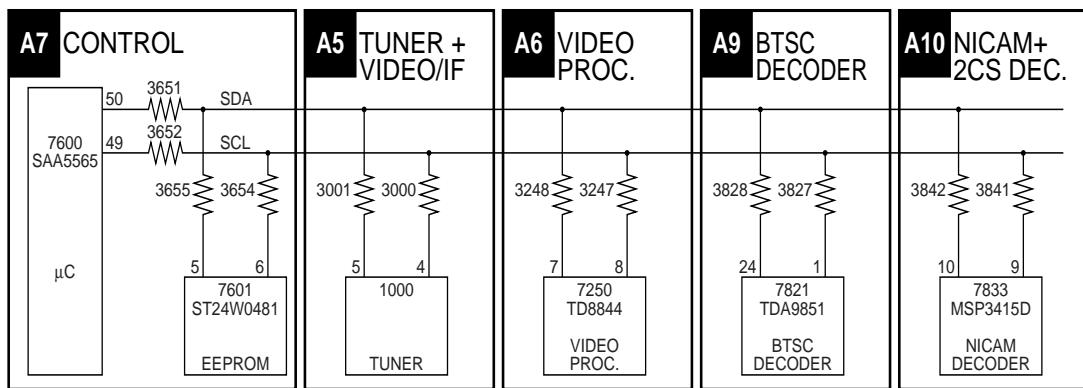
6 Fault finding trees, diagrams and overviews

L9.1E

21



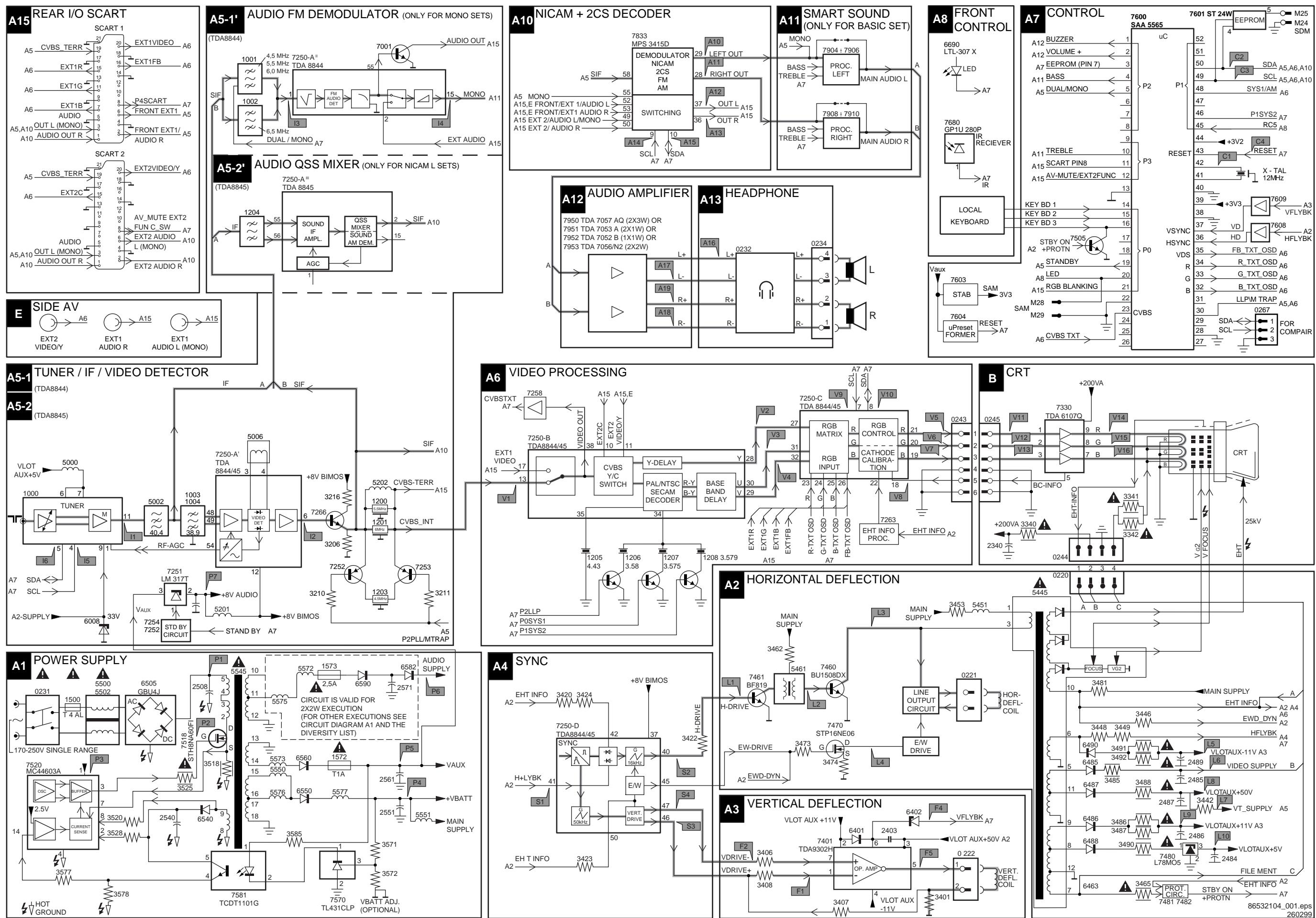
IIC BUS INTERCONNECTION DIAGRAM



6 Fault finding trees, diagrams and overviews

L9.1E

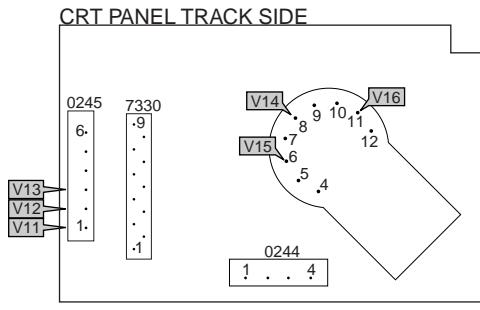
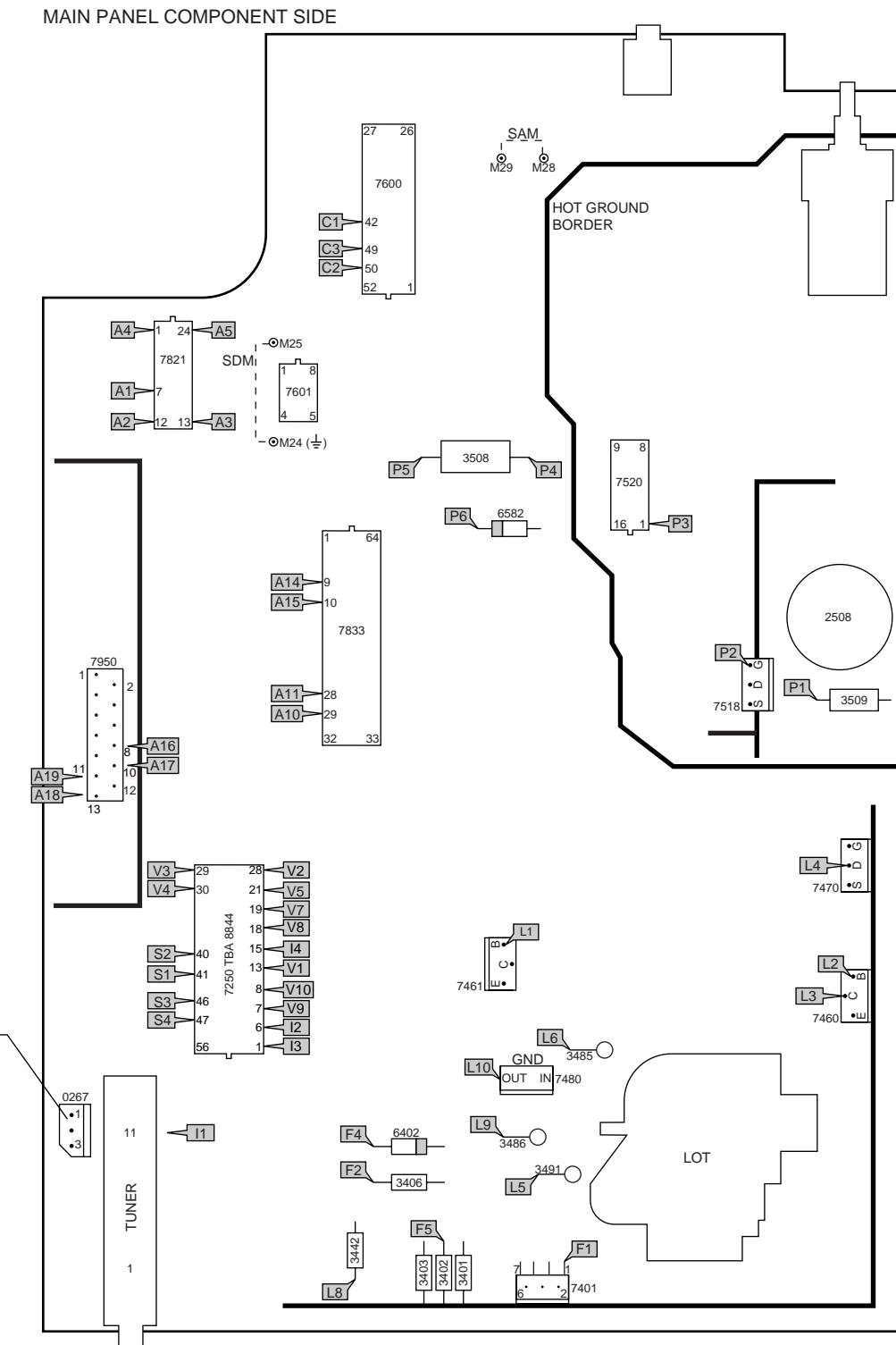
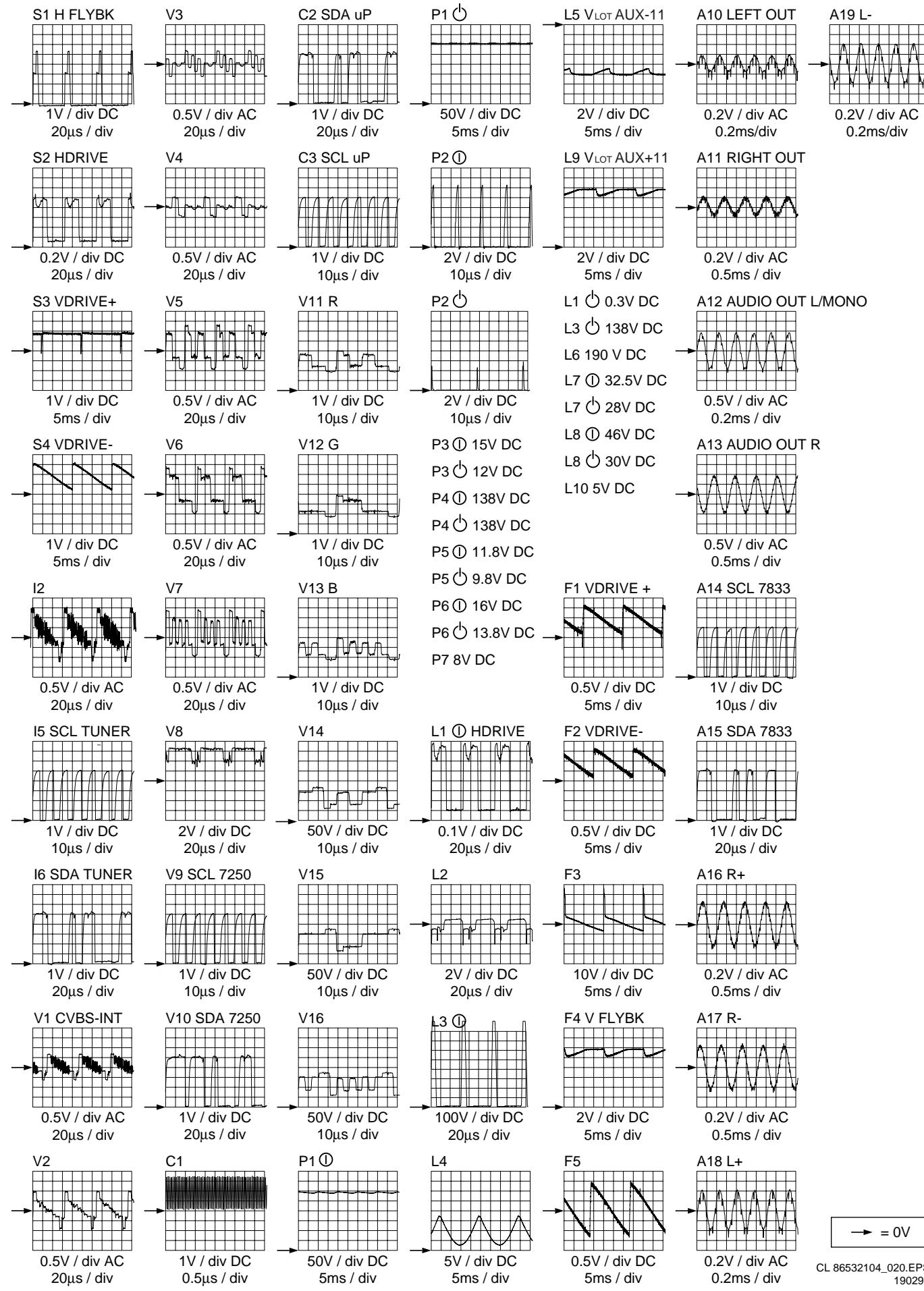
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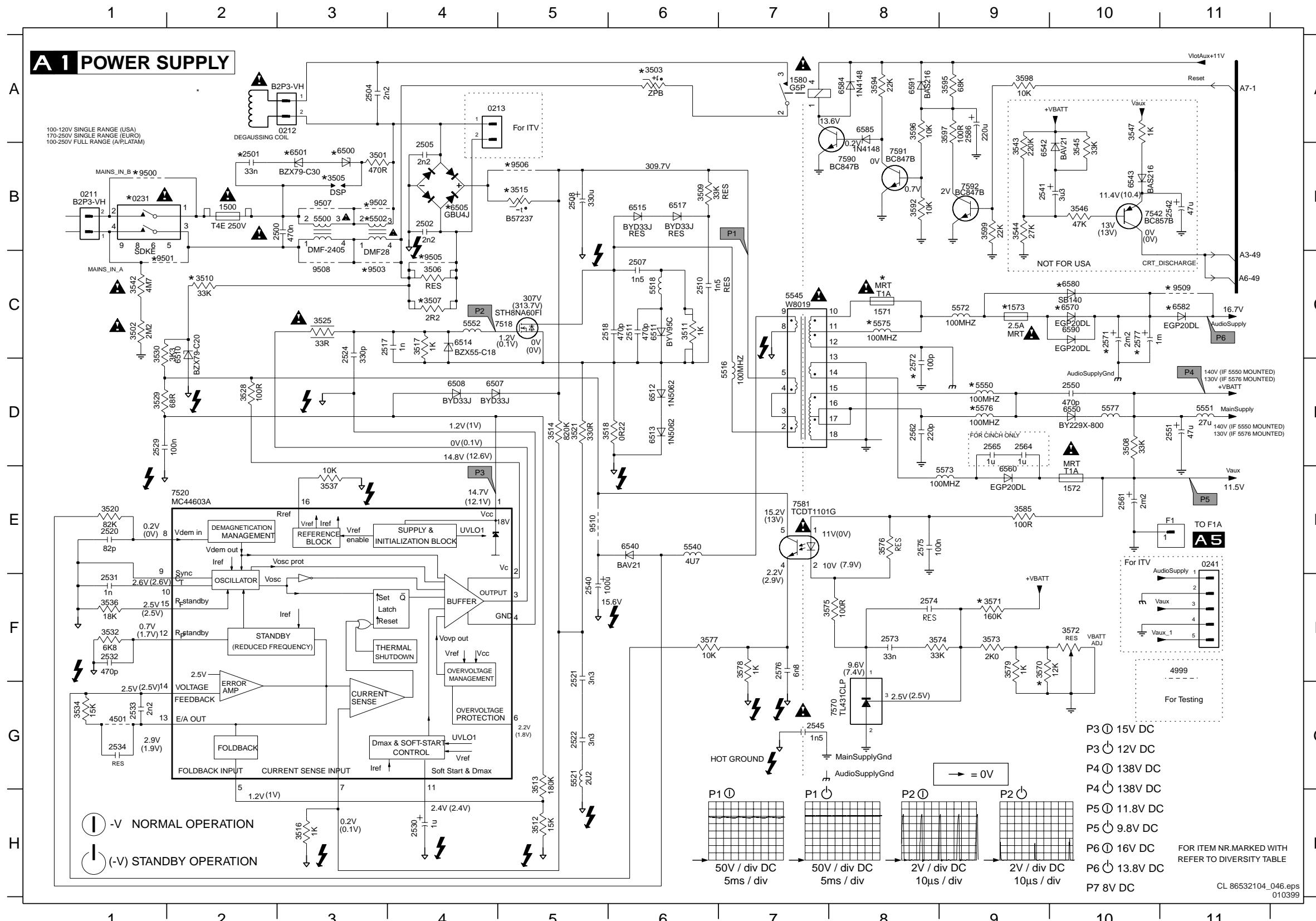
6 Fault finding trees, diagrams and overviews

L9.1E

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260299



F1 E11	3596 A8
0211 B1	3597 A9
0212 A3	3598 A9
0213 A4	3599 B9
0231 B1	4501 G1
0241 E11	4999 F11
1500 B2	5500 B3
1571 C8	5502 B3
1572 E10	5516 D7
1573 C9	5518 C6
1580 A7	5521 G5
2500 B3	5540 E6
2501 B2	5545 C7
2502 B4	5550 D9
2503 A3	5551 D11
2504 A4	5552 C4
2507 C6	5572 C9
2508 B5	5573 E9
2510 C6	5575 C8
2511 C6	5576 D9
2517 C3	5577 D10
2518 C5	5600 B3
2520 E1	5601 B3
2521 F5	5605 B4
2522 G5	5607 D4
2524 C3	5608 D4
2529 D1	5610 C2
2530 H4	5611 C6
2531 F1	5612 D6
2532 F1	5613 D6
2533 G1	5614 C4
2534 G1	5615 B6
2540 F5	5617 B6
2541 B9	6540 E6
2542 B11	6542 B9
2545 G7	6543 B10
2550 D10	6550 D10
2551 D11	6560 D9
2561 E10	6570 C10
2562 D8	6580 C10
2564 D9	6582 C11
2565 D9	6584 A8
2571 C10	6585 A8
2572 D8	6590 C10
2573 F8	6591 A8
2574 F8	7518 C4
2575 E6	7520 E2
2576 F7	7542 B10
2577 C10	7570 G8
2586 A9	7581 E7
3501 B3	7590 B9
3502 C1	7591 B8
3503 A6	7592 B9
3505 B3	9500 B1
3506 C4	9501 C1
3507 C4	9502 B3
3508 D10	9503 C3
3509 B6	9505 B5
3510 C2	9506 B5
3511 C6	9507 B3
3512 H5	9508 C3
3516 H3	9509 C11
3517 C4	9510 E5
3518 D6	3520 E1
3521 D5	3525 C3
3522 C3	3529 D1
3530 C1	3532 F1
3534 G1	3536 F1
3536 F1	3537 E3
3537 E3	3542 C1
3542 C1	3543 B9
3543 B9	3544 B9
3544 B9	3545 B10
3545 B10	3546 B10
3546 B10	3547 A10
3547 A10	3570 F9
3570 F9	3571 F9
3571 F9	3572 F10
3572 F10	3573 F9
3573 F9	3574 F8
3574 F8	3575 F8
3575 F8	3576 E8
3576 E8	3577 F6
3577 F6	3578 F7
3578 F7	3579 F9
3579 F9	3585 E9
3585 E9	3592 B8
3592 B8	3594 A8
3594 A8	3595 A9

FOR ITEM NR.MARKED WITH REFER TO DIVERSITY TABLE

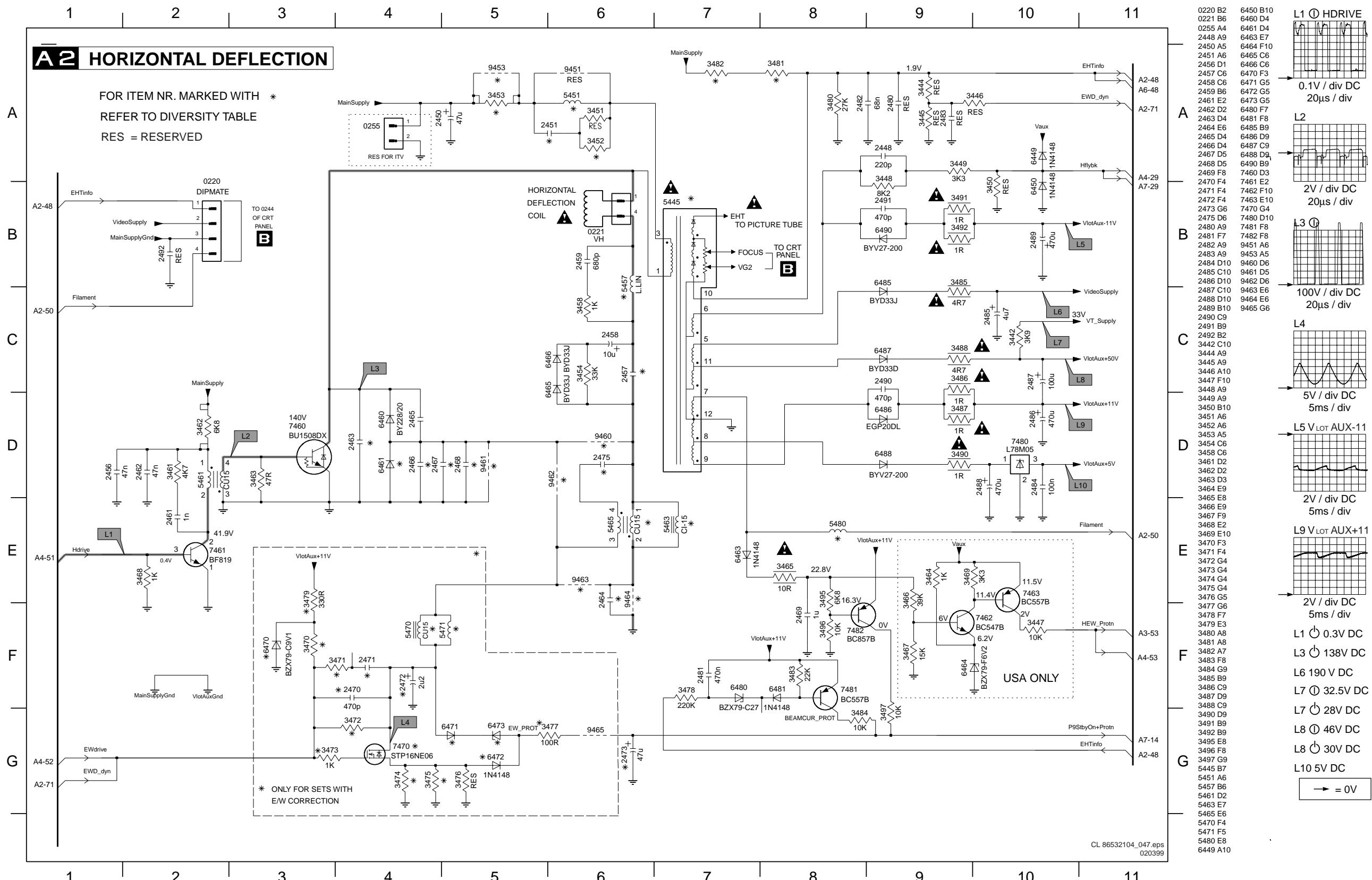
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DIVERSITY TABLE FOR POWER SUPPLY

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ITEM	FR_CIS 25I/29I AP	LR USA	FR_NONCIS AP	HR 25I/29I EUROPE	HR_CIS 25I/29I AP	PS_FR_US	PS_FR_LA	HR 25I/29I CHINA	PS_FR NONCIS IND	ITV	140V VBATT	130V VBATT	2X3w/5w AUDIO	2X1w AUDIO	1X1w AUDIO	2X2w AUDIO	INDIA SVBW006ER	
0231	YES	---	YES	YES	YES	---	---	YES	YES	---	---	---	---	---	---	---	---	
1571	---	---	---	---	---	---	---	---	---	---	---	T1.0A	---	---	---	---	---	
1573	---	---	---	---	---	---	---	---	---	---	---	T2.5A	---	T2.5A	---	---	---	
2501	---	---	YES	---	---	---	---	YES	---	---	---	---	---	---	---	---	---	
2508	330/400V	470/200V	330/400V	220/400V	220/400V	330/400V	220/450V	330/450V	220/400V	---	---	---	---	---	---	---	---	
2561	3300u	1000u	3300u	3300u	3300u	1000u	3300u	3300u	3300u	---	---	---	---	---	---	---	---	
2571	---	---	---	---	---	---	---	---	---	---	---	2200/25V	---	---	2200/25V	2200/25V	2200/25V	
2572	---	330p	---	---	---	---	---	---	---	---	---	---	---	---	---	---	22n	
2577	---	---	---	---	---	---	---	---	---	---	---	1000/16V	1000/16V	---	---	---	33n	
3503	220V/9R	110V/10R	220V/9R	220V/9R	220V/9R	220V/9R	220V/9R	220V/9R	220V/9R	---	---	---	---	---	---	---	470p	
3505	YES	YES	---	YES	YES	YES	---	YES	---	---	---	---	---	---	---	---	2u2	
3507	---	---	---	2R2/5w	2R2/5w	---	2R2/5w	---	2R2/5w	---	---	---	---	---	---	---	47u	
3510	33K/3w	33K/3w	33K/3w	68K/3w	68K/3w	33K/3w	68K/3w	33K/3w	68K/3w	---	---	---	---	---	---	---	---	
3515	NTC 2R5	NTC 2R5	NTC 2R5	---	---	NTC 2R5	NTC 2R5	NTC 2R5	NTC 2R5	---	---	---	---	---	---	---	---	
3570	---	---	---	---	---	---	---	---	---	10K	15K	---	---	---	---	---	33k	
3571	---	---	---	---	---	---	---	---	---	160K	150K	---	---	---	---	---	1k	
5502	DMF2810	---	---	DMF2820	DMF2820	DMF2820	DMF2820	DMF2820	DMF2820	---	---	---	---	---	---	---	4R7	
5550	---	---	---	---	---	---	---	---	---	YES	---	---	---	---	---	---	100R	
5575	---	---	---	---	---	---	---	---	---	---	YES	---	---	---	---	---	100R	
5576	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	100R	
6500	---	BZX79-C30	---	---	---	BZX79-C30	---	BZX79-C30	---	---	---	---	---	---	---	---	100R	
6501	---	BZX79-C30	---	---	---	BZX79-C30	---	BZX79-C30	---	---	---	---	---	---	---	---	100R	
6505	GBU6JL	GBU6JL	GBU6JL	GBU4JL	GBU4JL	GBU6JL	GBU6JL	GBU4JL	GBU6JL	---	---	---	---	---	---	---	100R	
6570	---	---	---	---	---	---	---	---	---	---	---	ECP20D	---	---	ECP20D	---	100R	
6580	---	---	---	---	---	---	---	---	---	---	---	SB140	BYV27-200	---	---	---	330R	
6582	---	---	---	---	---	---	---	---	---	---	---	ECP20D	---	ECP20	ECP20	---	330R	
6590	---	---	---	---	---	---	---	---	---	---	---	ECP20D	---	ECP20D	ECP20D	---	330R	
9500	---	YES	---	---	---	YES	---	---	---	---	---	---	---	---	---	---	330R	
9501	---	YES	---	---	---	YES	---	---	---	---	---	---	---	---	---	---	330R	
9502	---	YES	YES	---	---	YES	YES	---	YES	---	---	---	---	---	---	---	330R	
9503	---	YES	YES	---	---	YES	YES	---	YES	---	---	---	---	---	---	---	330R	
9505	YES	YES	YES	---	---	YES	YES	---	YES	---	---	---	---	---	---	---	330R	
9506	---	---	---	YES	YES	---	---	YES	---	---	---	---	---	---	---	---	330R	
9509	---	---	---	---	---	---	---	---	---	---	YES	---	YES	---	---	---	330R	

DIVERSITY TABLE FOR HORIZONTAL DEFLECTION

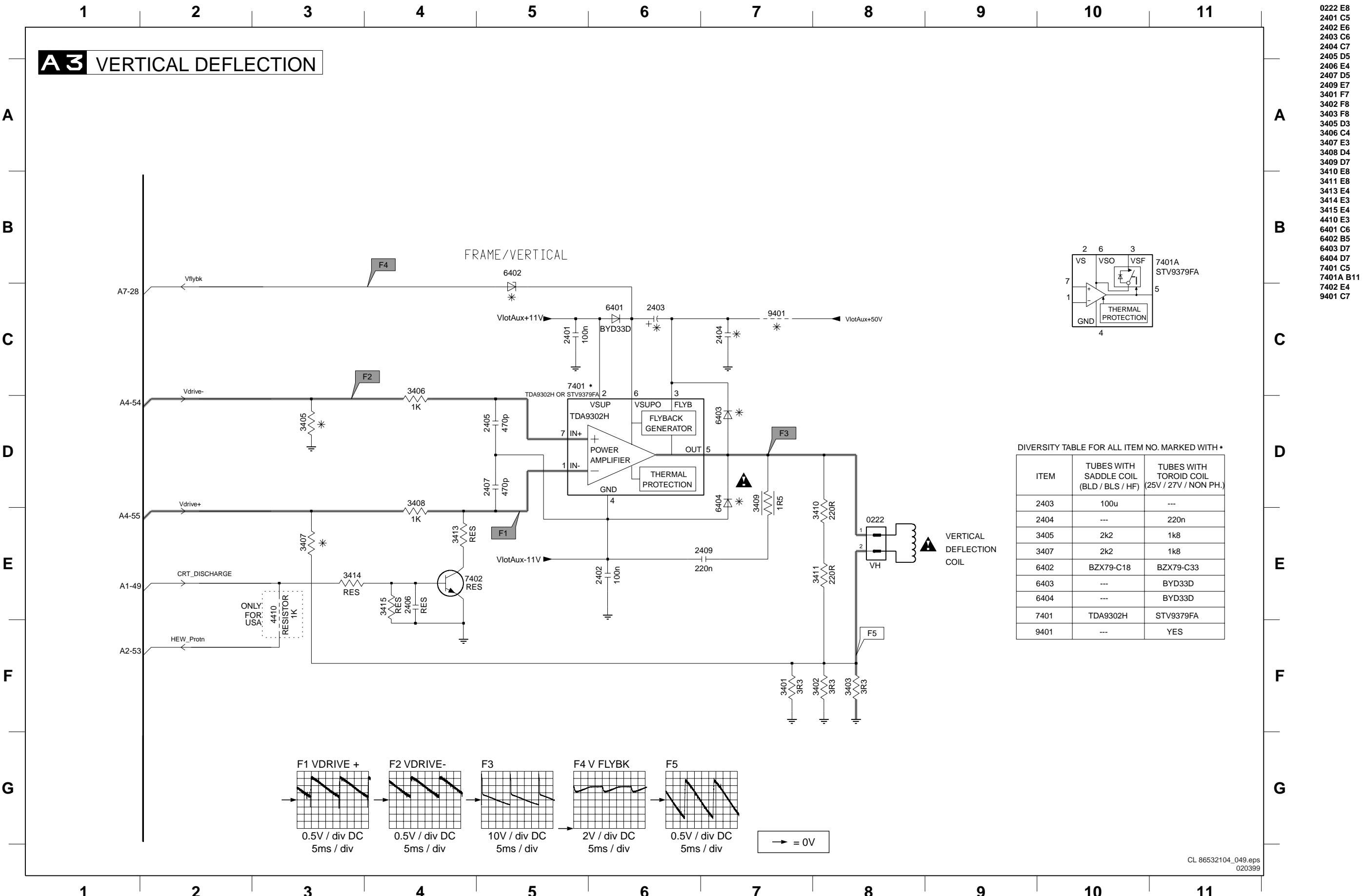
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2451	15n	15n	15n	15n	15n	15n/12n China
2457	390n	390n	390n	390n	390n	360n
2463	1n	1n	820p	470p	680p	820p/in China
2464	---	---	---	---	---	2u2
2465	9n1	9n1	9n1	10n	10n	10n
2466	10n	10n	10n	---	---	---
2467	---	---	---	---	---	22n
2468	18n	18n	18n	---	---	33n
2470	470p	470p	470p	---	---	470p
2471	470n	470n	470n	---	---	---
2472	2u2	2u2	2u2	---	---	2u2
2473	47u	47u	47u	---	---	47u
2475	560n	560n	510n	---	---	---
425 (A4)	56k	56k	56k	150k	120k	150k
3452	33R	33R	33R	22R	22R	22R
3453	---	---	4R7	4R7	4R7	---
3470	33k	33k	33k	---	---	33k
3471	220k	220k	220k	---	---	---
3472	100k	100k	120k	---	---	82k
3473	1k	1k	1k	---	---	1k
3474	3R3	3R3	3R3	---	---	4R7
3475	3R3	3R3	3R3	---	---	4R7
3477	100R	100R	100R	---	---	100R
3479	330R	330R	330R	---	---	330R
3481/82	Refer to part list	videocontrol	Depends on country.	USA:242253102326	242253102327	China:312813820691
5445	242253102325	312813820681	242253102326	242253102327	242253102326	242253102326
5451	33uH	33uH	33uH	27uH	27uH	27uH
5457	312813853111	312813853111	312813853111	312813853241	312813853241	312813853241
5463	---	---	---	---	---	312813834021
5465	312813834011	312813834011	312813834011	---	---	---
5470	311233830531	311233830531	311			



7 Electrical diagrams and print lay-outs

L9.1E

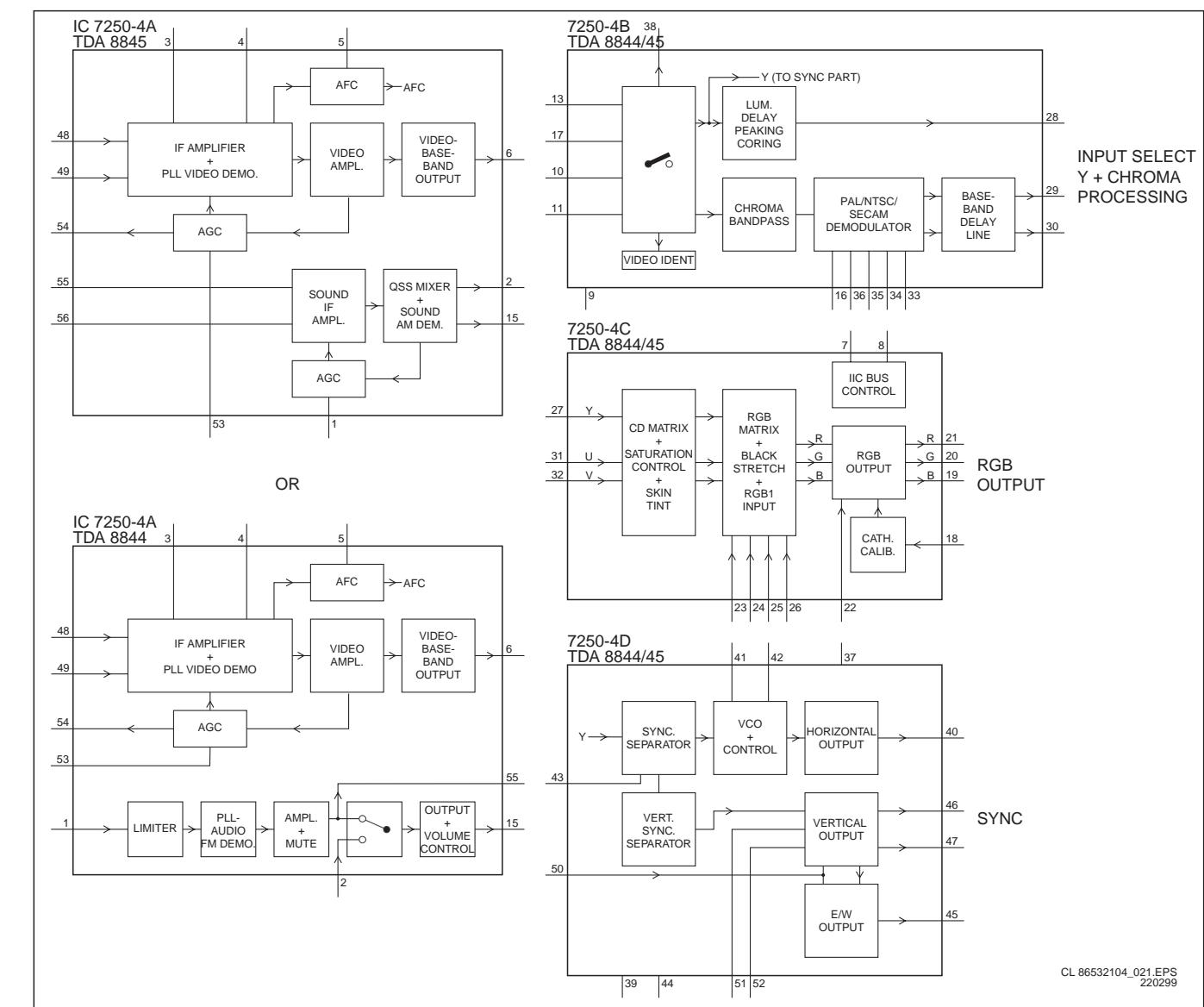
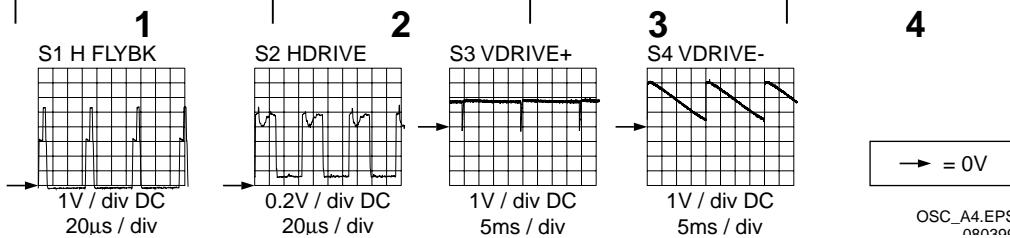
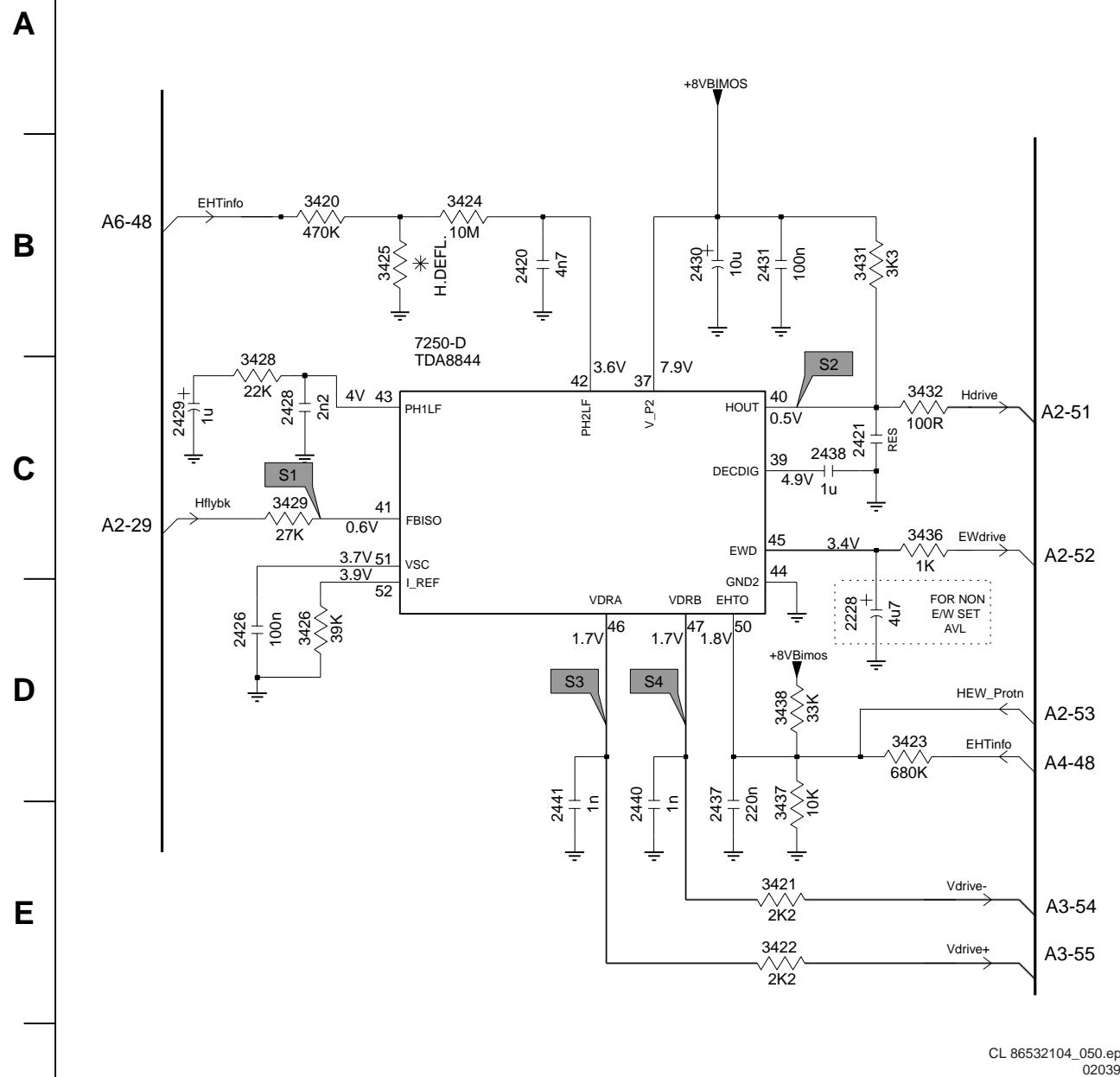
27

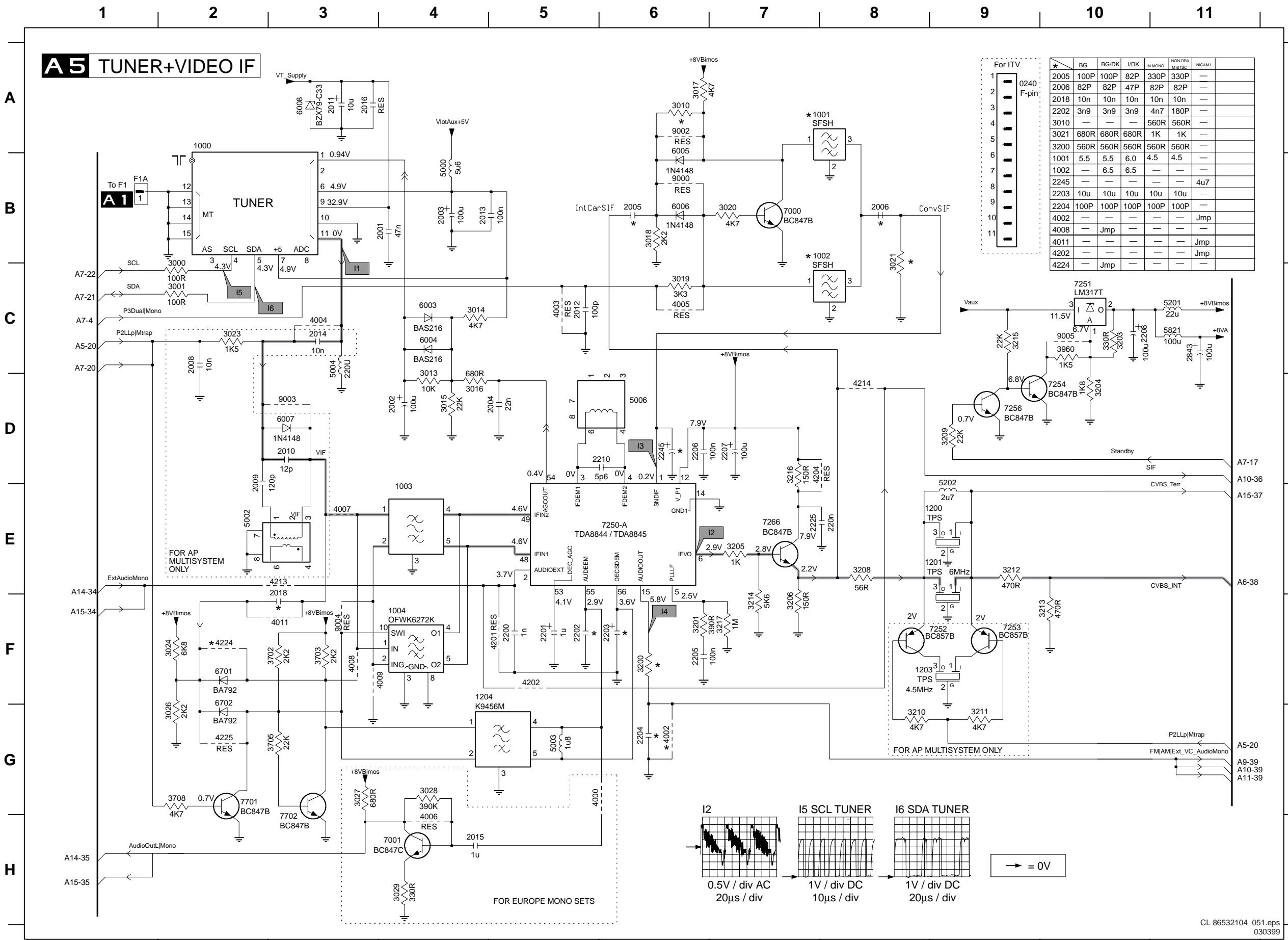


2228 D4 2426 D1 2430 B3 2438 C4 3420 B1 3423 D4 3426 D1 3431 B4 3437 E3
 2420 B2 2428 C1 2431 B3 2440 E3 3421 E3 3424 B2 3428 C1 3432 C4 3438 D3
 2421 C4 2429 C1 2437 E3 2441 E2 3422 E3 3425 B2 3429 C1 3436 C4 7250-D B2

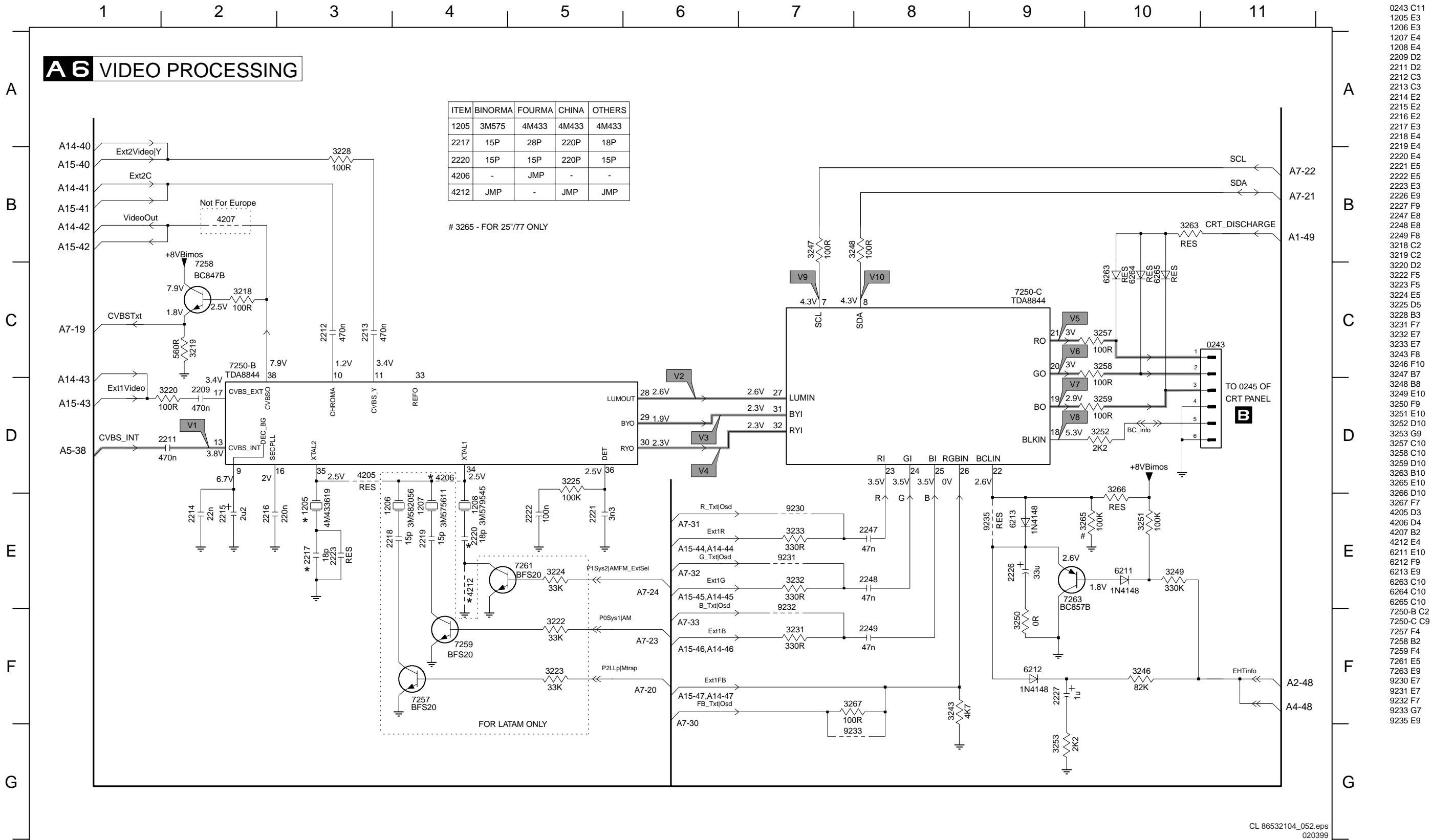
1 2 3 4

A4 SYNCHRONISATION

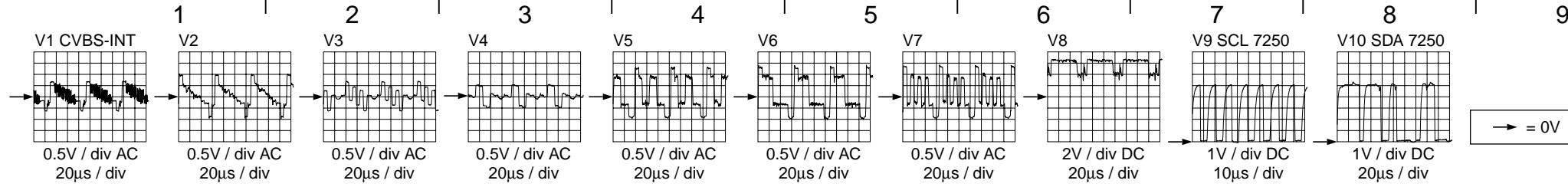




F1A B1	5004 C3
0240 A9	5006 D6
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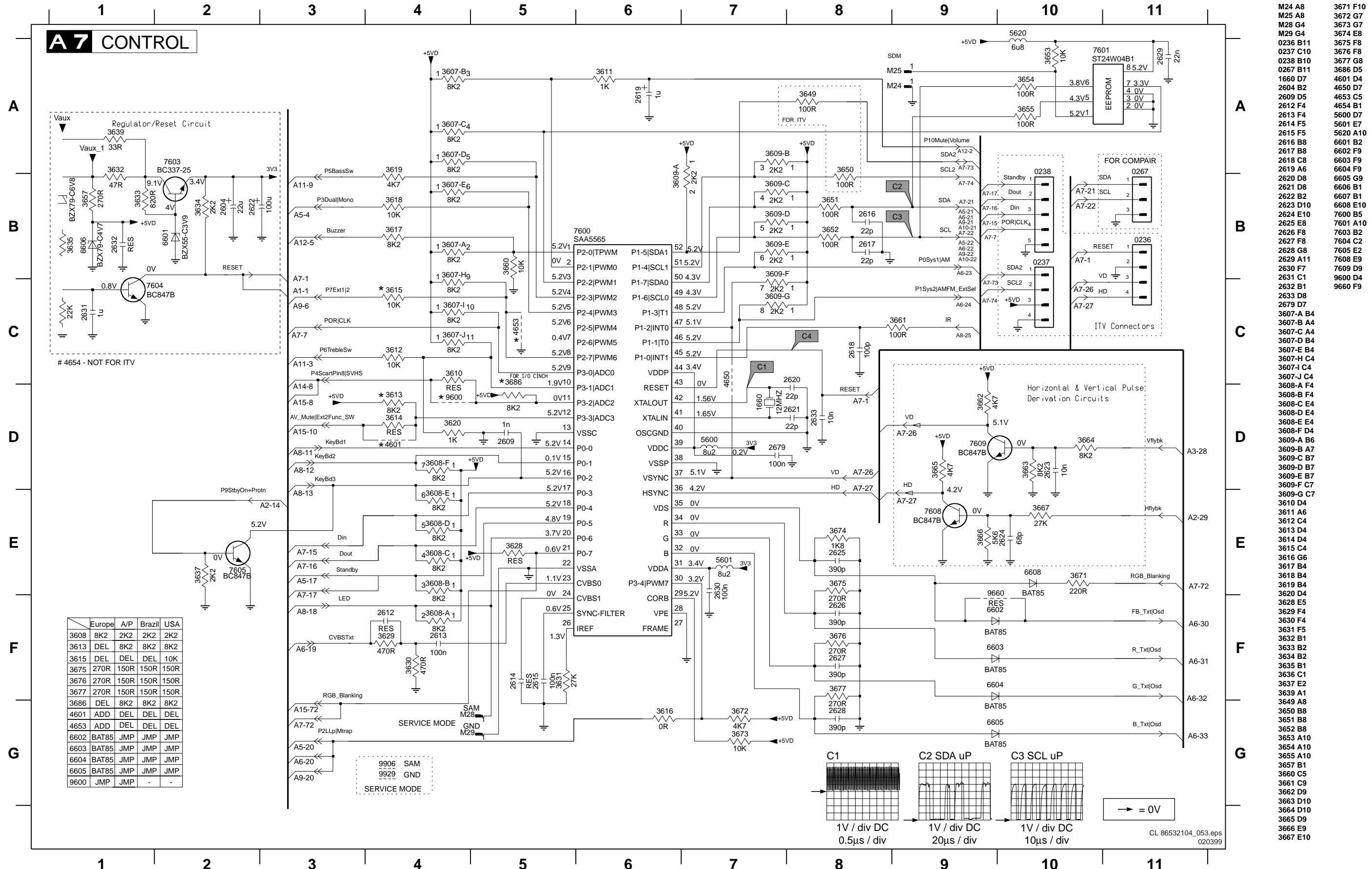
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7 Electrical diagrams and print lay-outs

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7 Electrical diagrams and print lay-outs

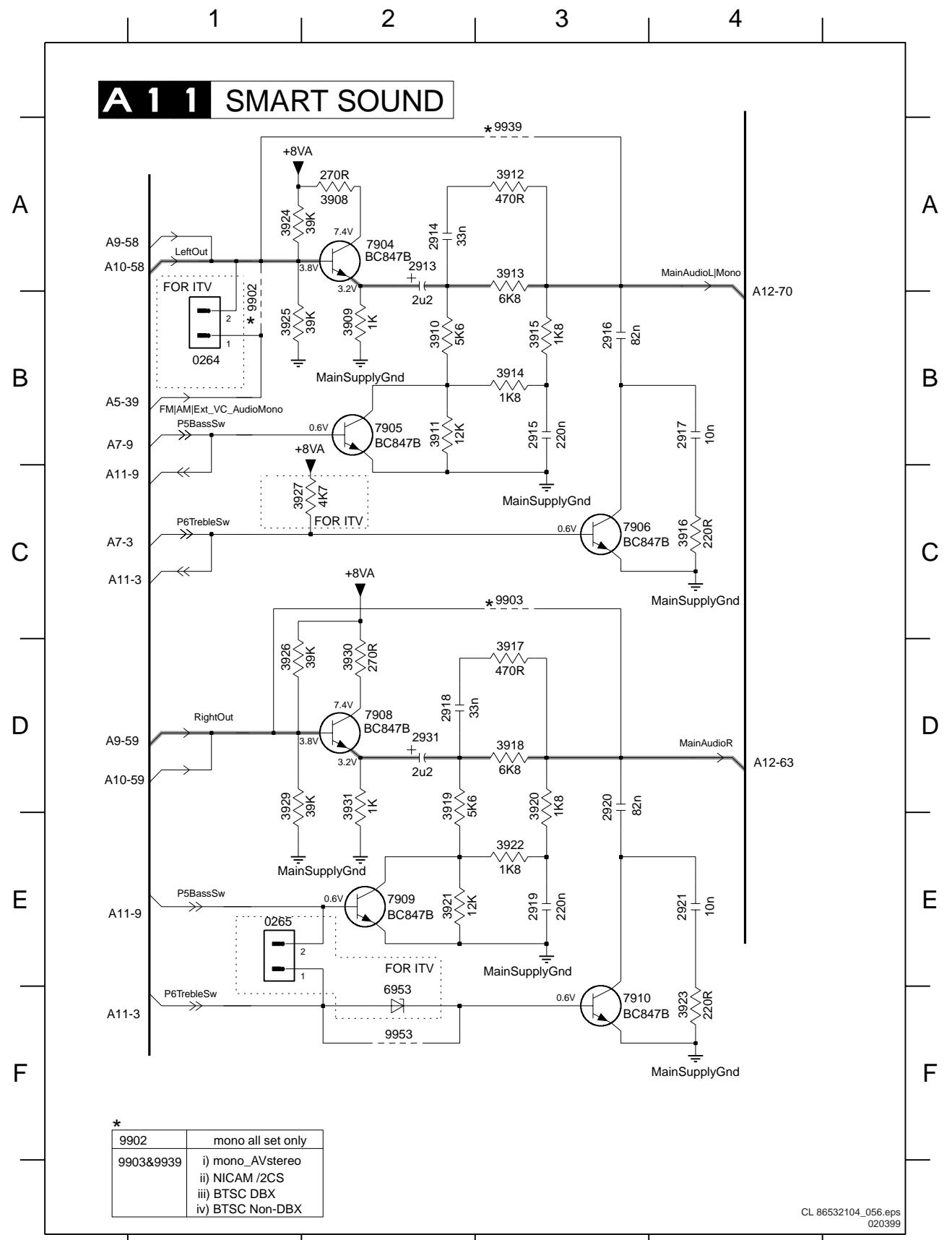
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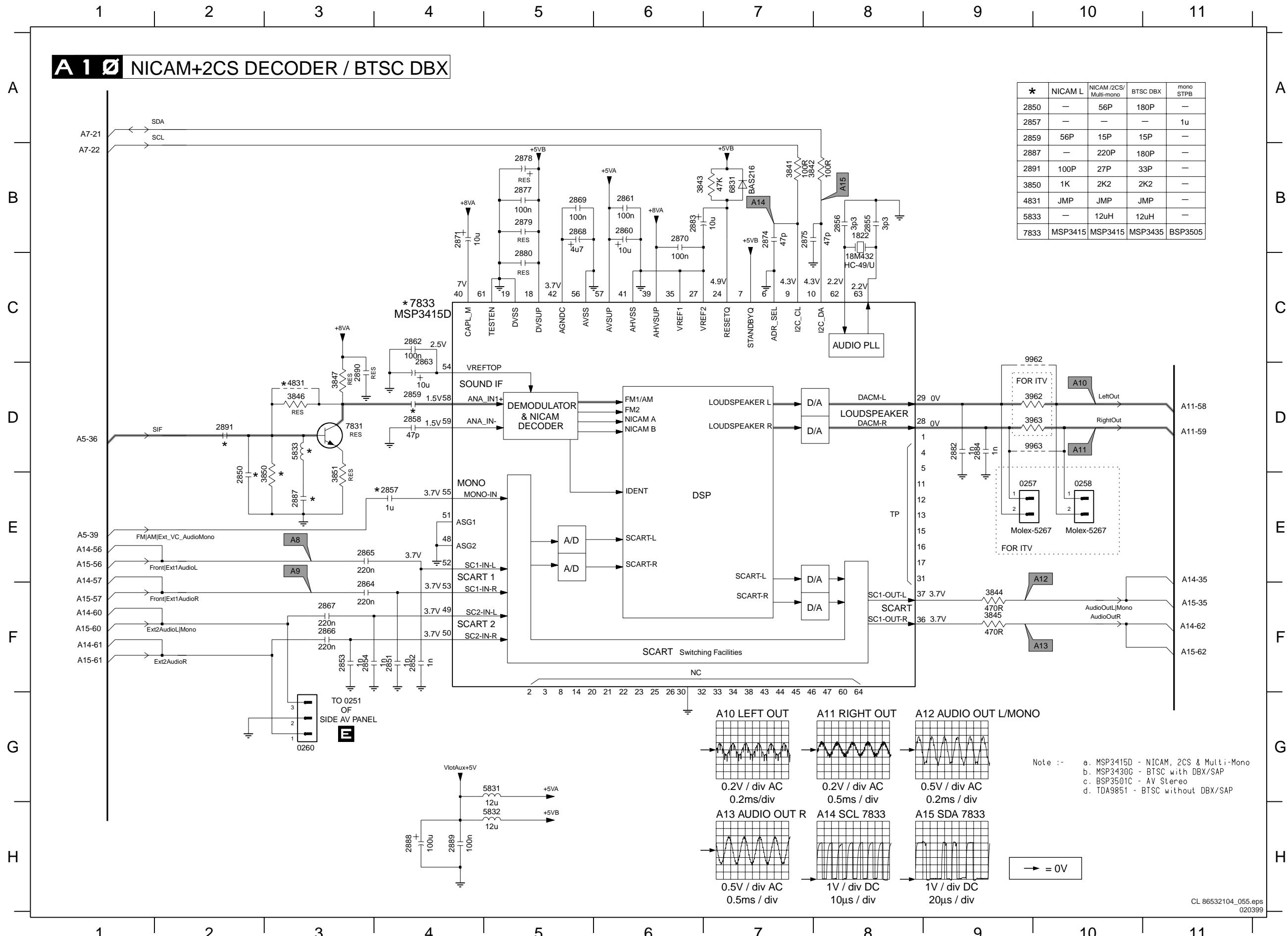
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7 Electrical diagrams and print lay-outs

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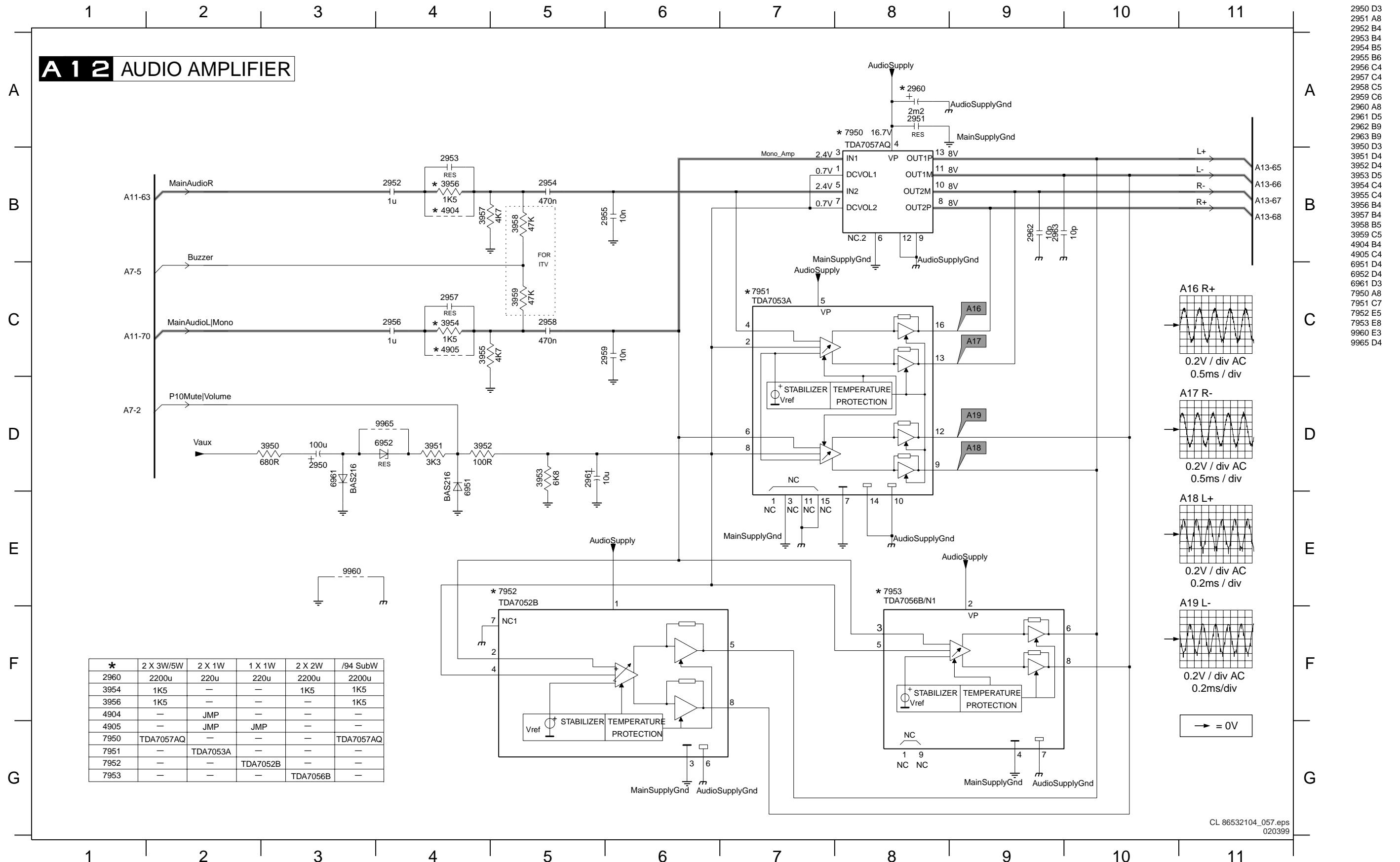


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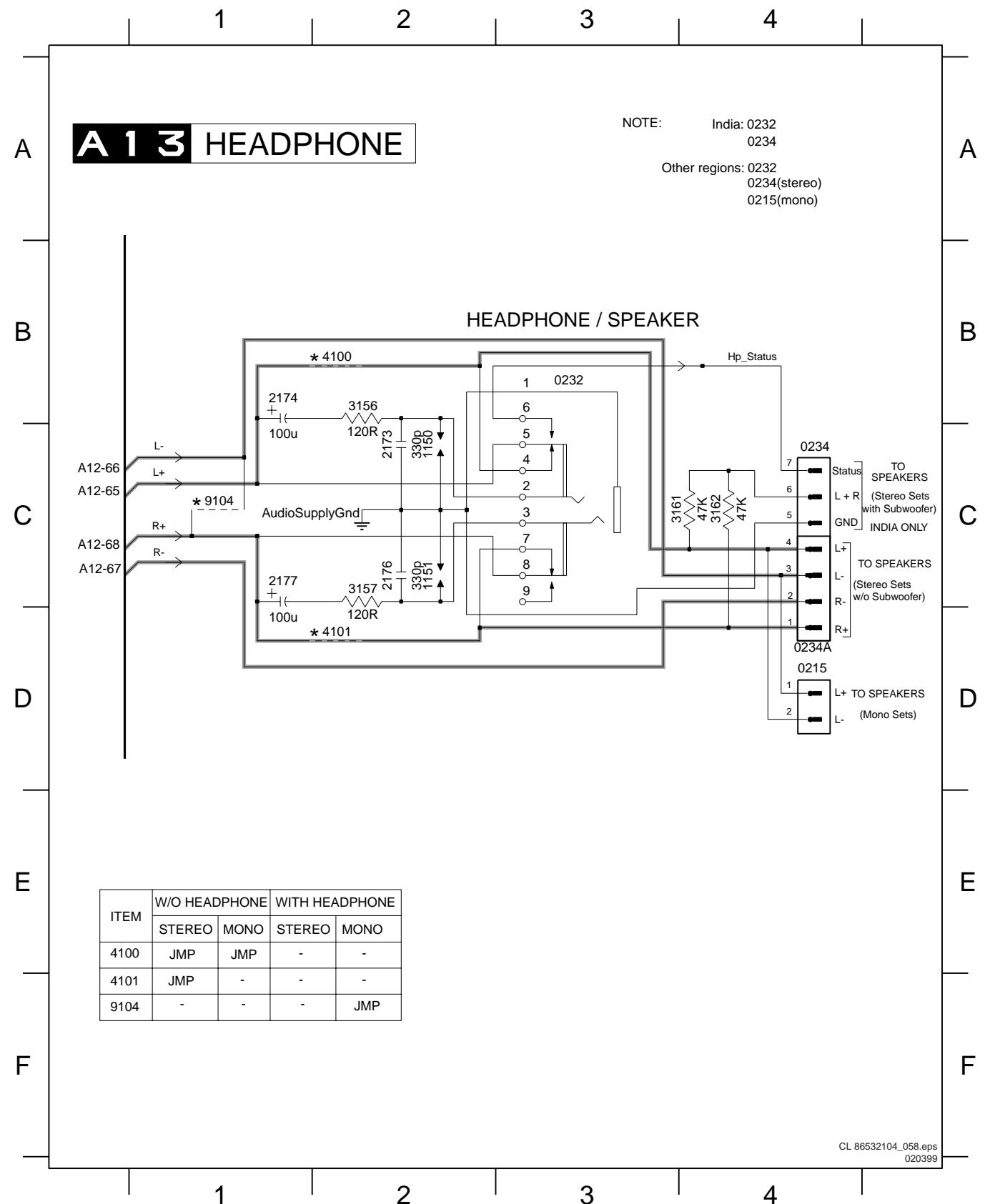
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0215 D4	0234 C4	1150 C2	2173 C2	2176 C2	3156 B2	3161 C4	4100 B2	9104 C1
0232 B3	0234A D4	1151 C2	2174 B1	2177 C1	3157 C2	3162 C4	4101 D2	

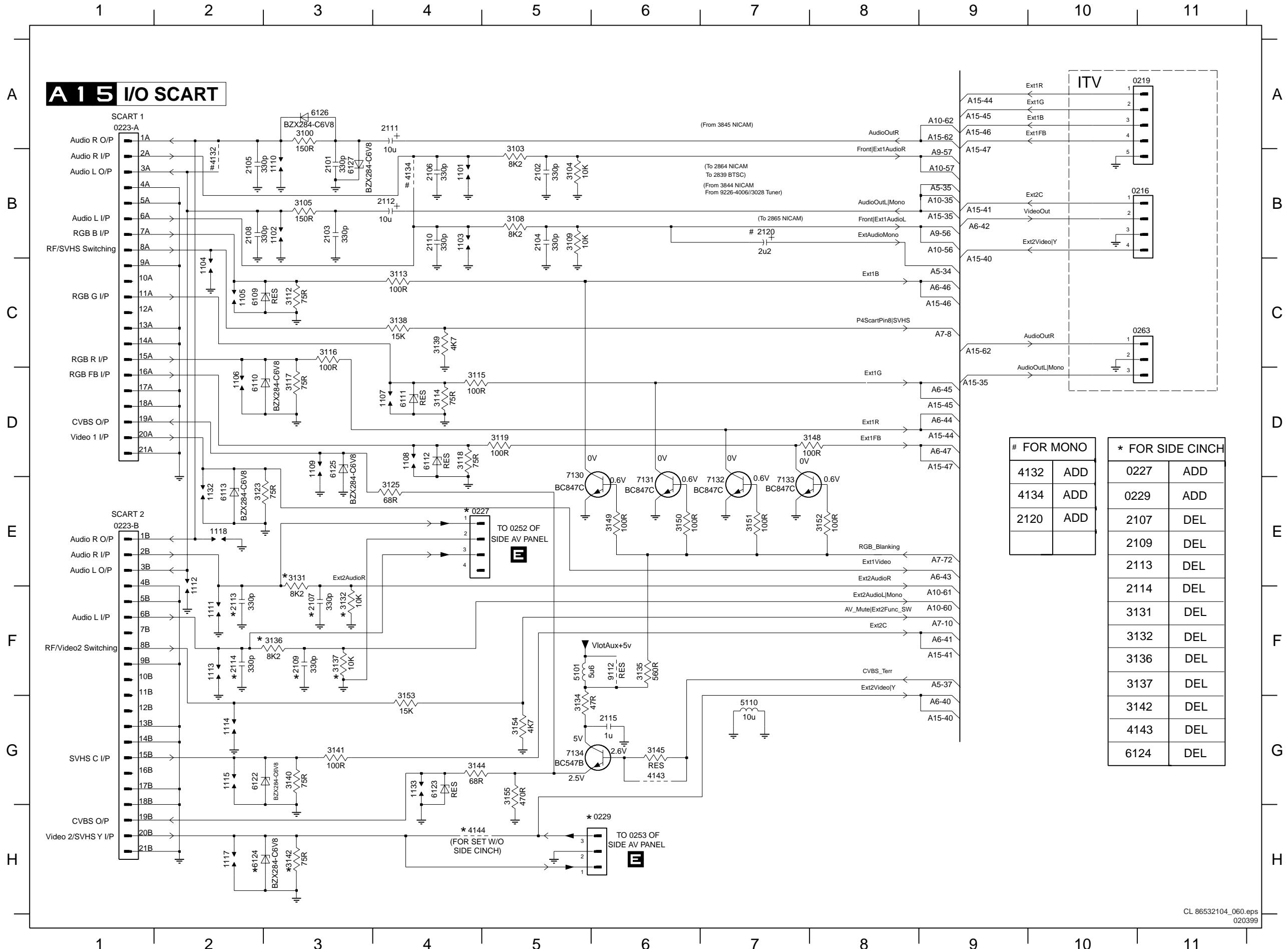


Personal notes:

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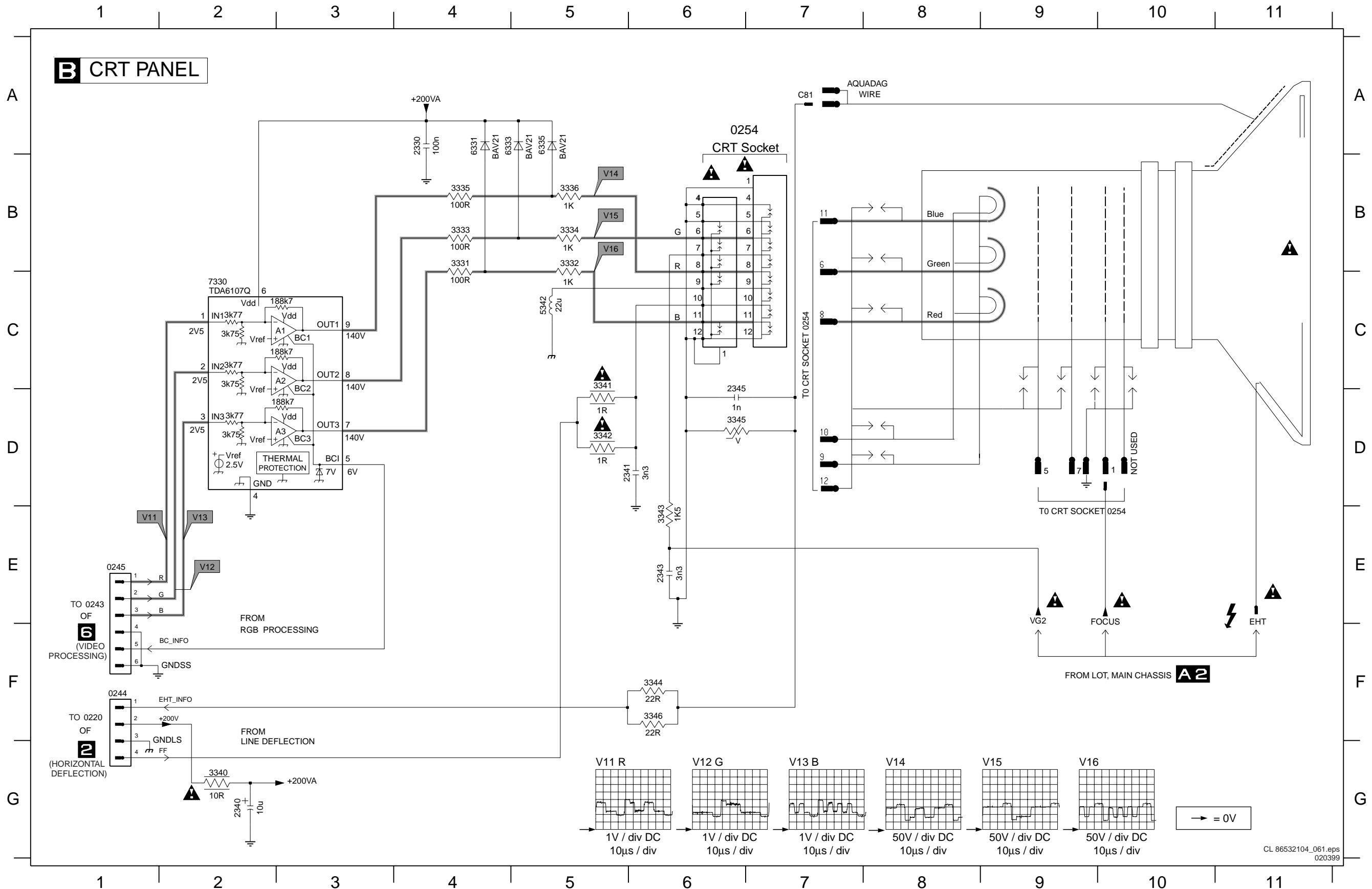


0216 B10	7132 E7
0219 A10	7133 E7
0223-A A1	7134 G5
0223-B E1	9112 F6
0227 E4	
0229 H6	
0263 C10	
1101 B4	
1102 B3	
1103 B4	
1104 C2	
1105 C2	
1106 D2	
1107 D4	
1108 D4	
1109 D3	
1110 B3	
1111 F2	
1112 E2	
1113 F2	
1114 G2	
1115 G2	
1117 H2	
1118 E2	
1119 E2	
1133 G4	
2101 B3	
2102 B5	
2103 B3	
2104 B5	
2105 B2	
2106 B4	
2107 F3	
2108 B2	
2109 F3	
2110 B4	
2111 A4	
2112 B4	
2113 F2	
2114 F2	
2115 G6	
2120 B7	
3100 A3	
3103 B5	
3104 B5	
3105 B3	
3108 B5	
3109 B5	
3112 C3	
3113 C4	
3114 D4	
3116 C3	
3117 D3	
3118 D4	
3119 D5	
3123 E2	
3125 E4	
3132 E3	
3134 F3	
3135 F6	
3136 F3	
3137 F3	
3138 C4	
3139 C4	
3140 G3	
3141 G3	
3142 H3	
3144 G4	
3145 G6	
3148 D8	
3149 E6	
3150 E6	
3151 E7	
3152 E8	
3153 G4	
3154 G5	
3155 G5	
4132 B2	
4134 B4	
4143 G6	
4144 H4	
5101 F5	
5110 G7	
6109 C2	
6110 D2	
6111 D4	
6112 D4	
6113 E2	
6122 G2	
6123 G4	
6124 H2	
6125 D3	
6126 A3	
6127 B3	
7130 E5	
7131 E6	

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C81 A7
 0244 F1
 0245 E1
 0254 A6
 2330 A4
 2340 G2
 2341 D6
 2343 E6
 2345 D6
 3331 B4
 3332 B5
 3333 B4
 3334 B5
 3335 B4
 3336 B5
 3340 G2
 3341 C5
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 3344 F6
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 3346 F6
 5342 C5
 6331 A4
 6333 A4
 6335 A5
 7330 C2

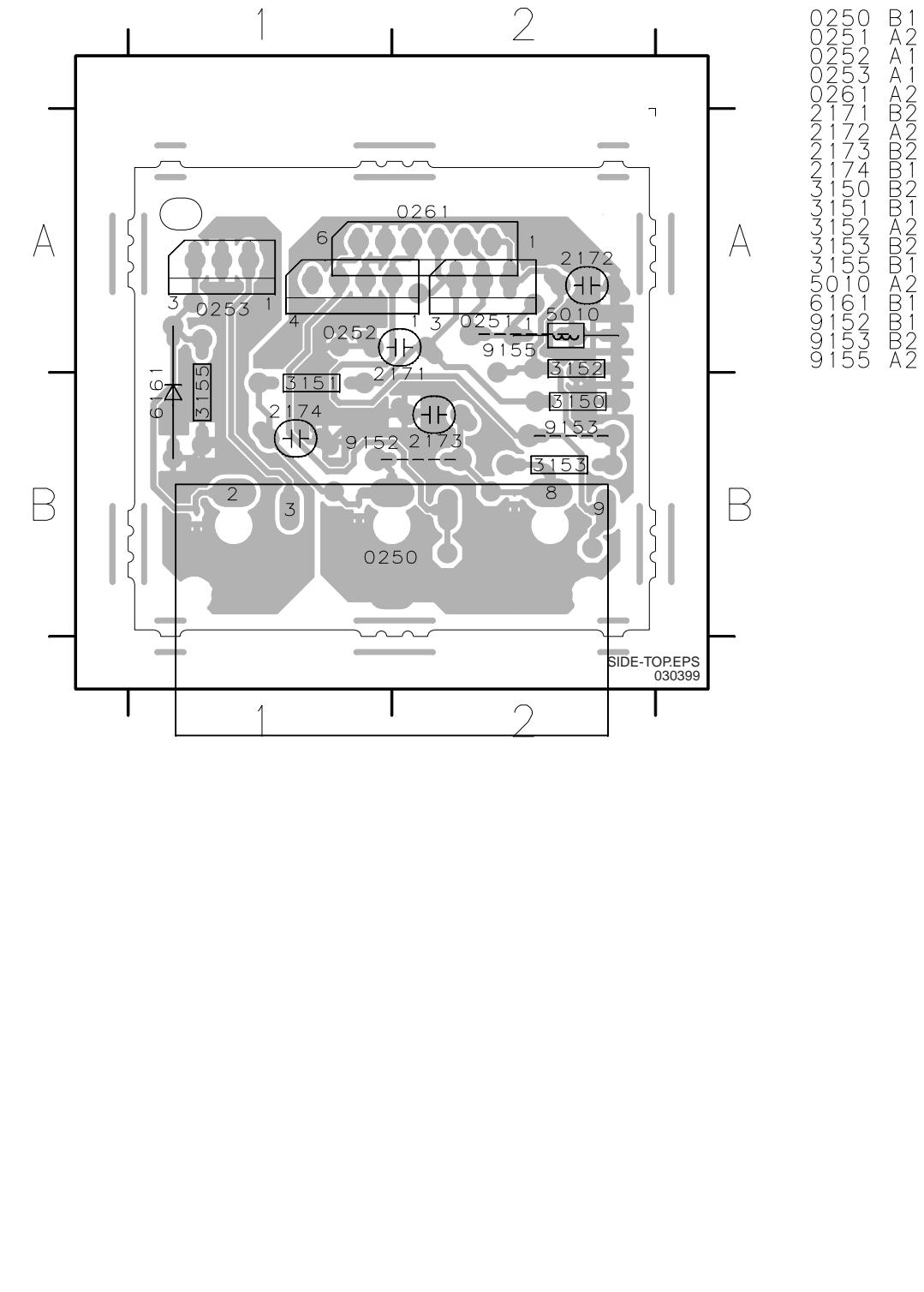
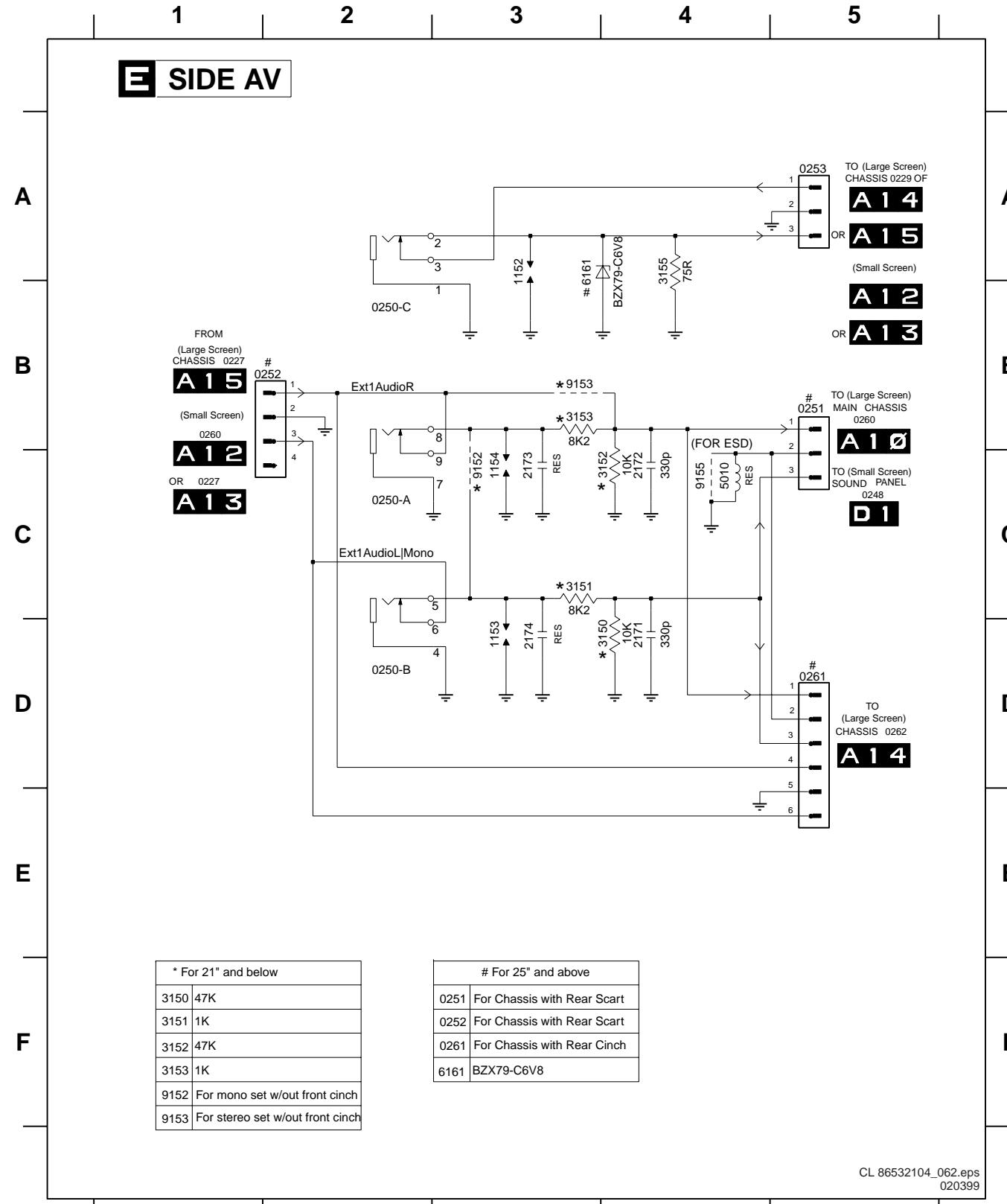
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0250-A C2 **0250-C B2** **0252 B2** **0261 D5** **1153 D3** **2171 D4** **2173 C3** **3150 D4** **3152 C4** **3155 A4** **6161 A3** **9153 B3**
0250-B D2 **0251 B5** **0253 A5** **1152 A3** **1154 C3** **2172 C4** **2174 D3** **3151 C3** **3153 B3** **5010 C4** **9152 C3** **9155 C4**



0250	B1
0251	A2
0252	A1
0253	A1
0261	A2
0267	AB2
0271	AB2
0272	BB1
0273	BB1
0274	BB1
0315	BB1
031501	B1
031522	A2
031533	A2
031555	B1
031610	A2
031611	BB1
031623	BB1
031655	B2
031999	AA2