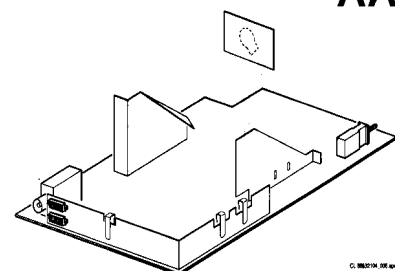


Service Service Service

L9.1E
AA



Service Manual

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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

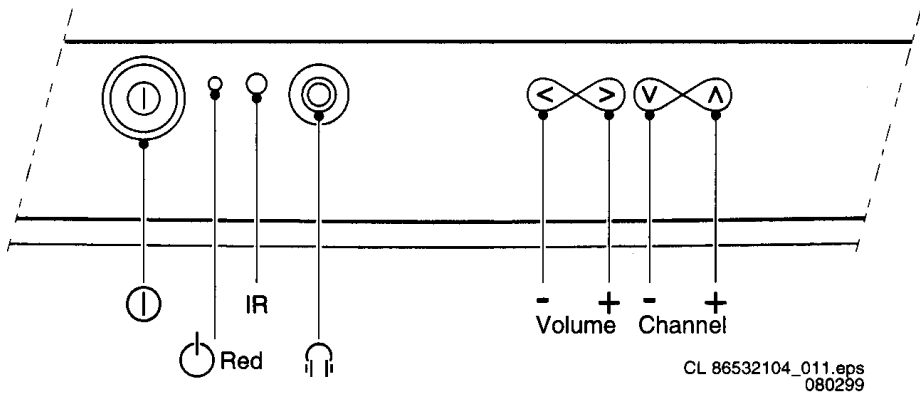


Figure 2-1

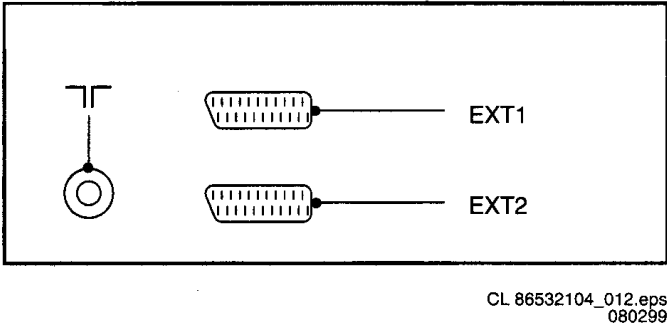


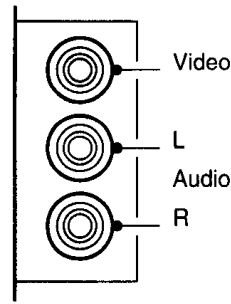
Figure 2-2

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

2.1.3 Cinch - audio/video in



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

Input = EXT2 => output = tuner		
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)	⊕

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

2.1.4 Headphone

1-	8-600Ω (4mW)	⊕
----	--------------	---

2 Connection facilities and chassis overview

2.2 PCB location drawing

E

SIDE AV PANEL

CRT PANEL

B

POWER SUPPLY

A1

HOR. DEFLECTION

A2

VERT. DEFLECTION

A3

SYNCHRONISATION

A4

TUNER + VIDEO IF

A5

VIDEO PROCESSING

A6

CONTROL (μ C)

A7

FRONT CONTROL

A8

NICAM + 2CS DECODER

A10

SMART SOUND

A11

AUDIO AMPLIFIER

A12

HEADPHONE

A13

I/O SCART

A15

MAIN
CHASSIS
PANEL

4 Mechanical instructions

L9.1E

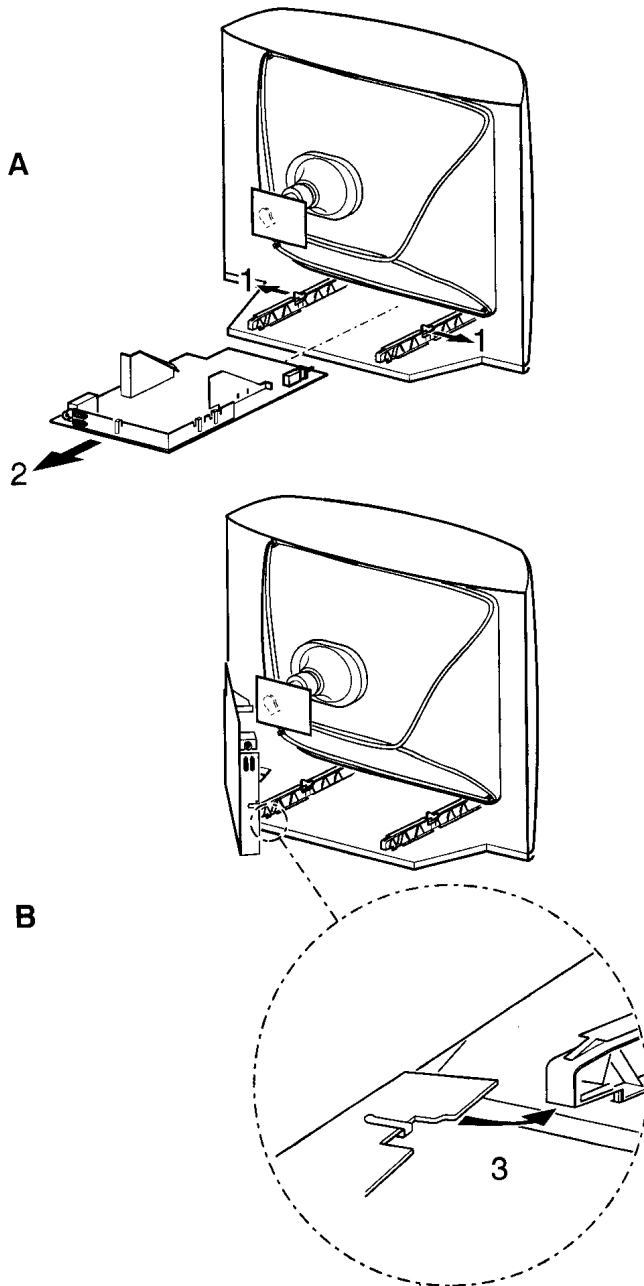
7

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.



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Figure 4-1

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 Compar
- 5.9 Ordering Compar

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 service

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

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

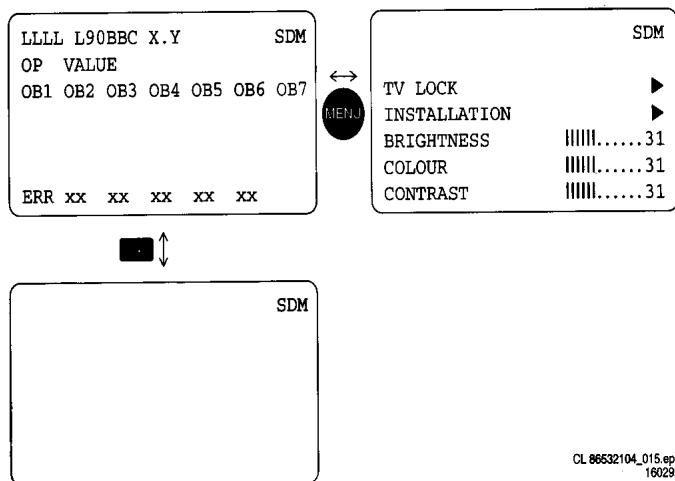


Figure 5-1 : Service Default Mode screens and structure

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:

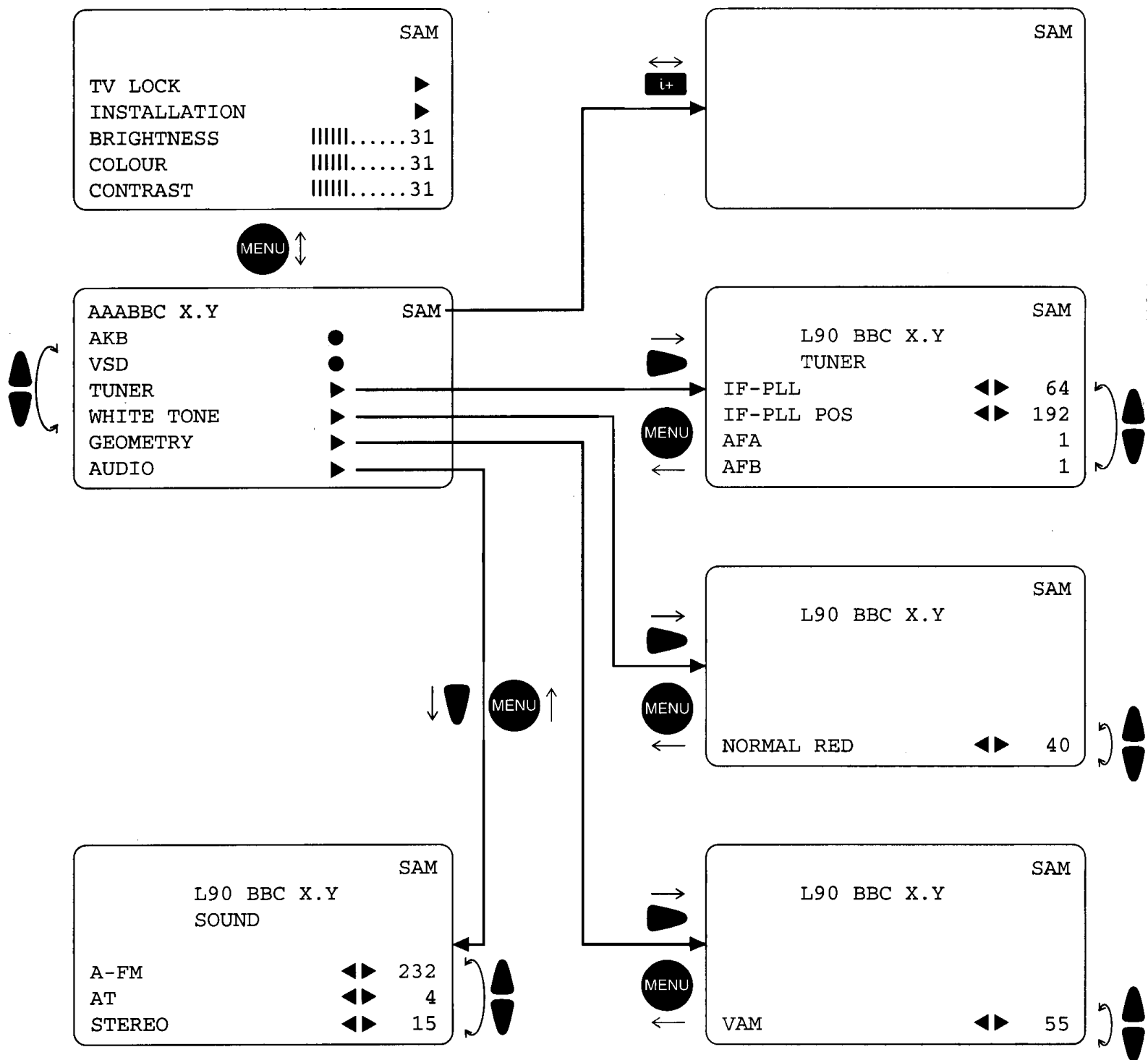


Figure 5-2 : Service Alignment Mode screens and structure

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 send 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>

CL 86532104_014.eps
080299

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

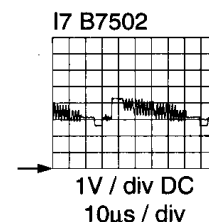


Figure 5-4

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.



Figure 5-5

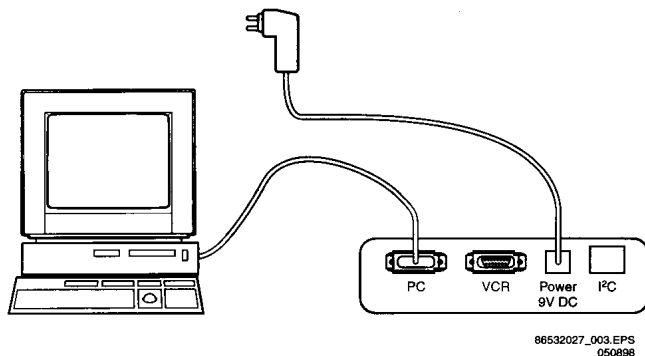


Figure 5-6

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

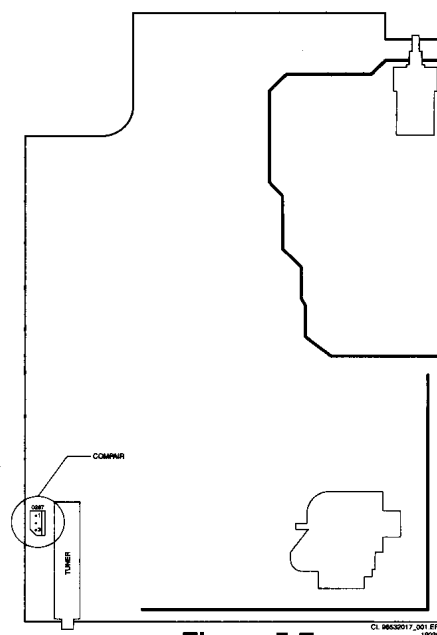


Figure 5-7

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

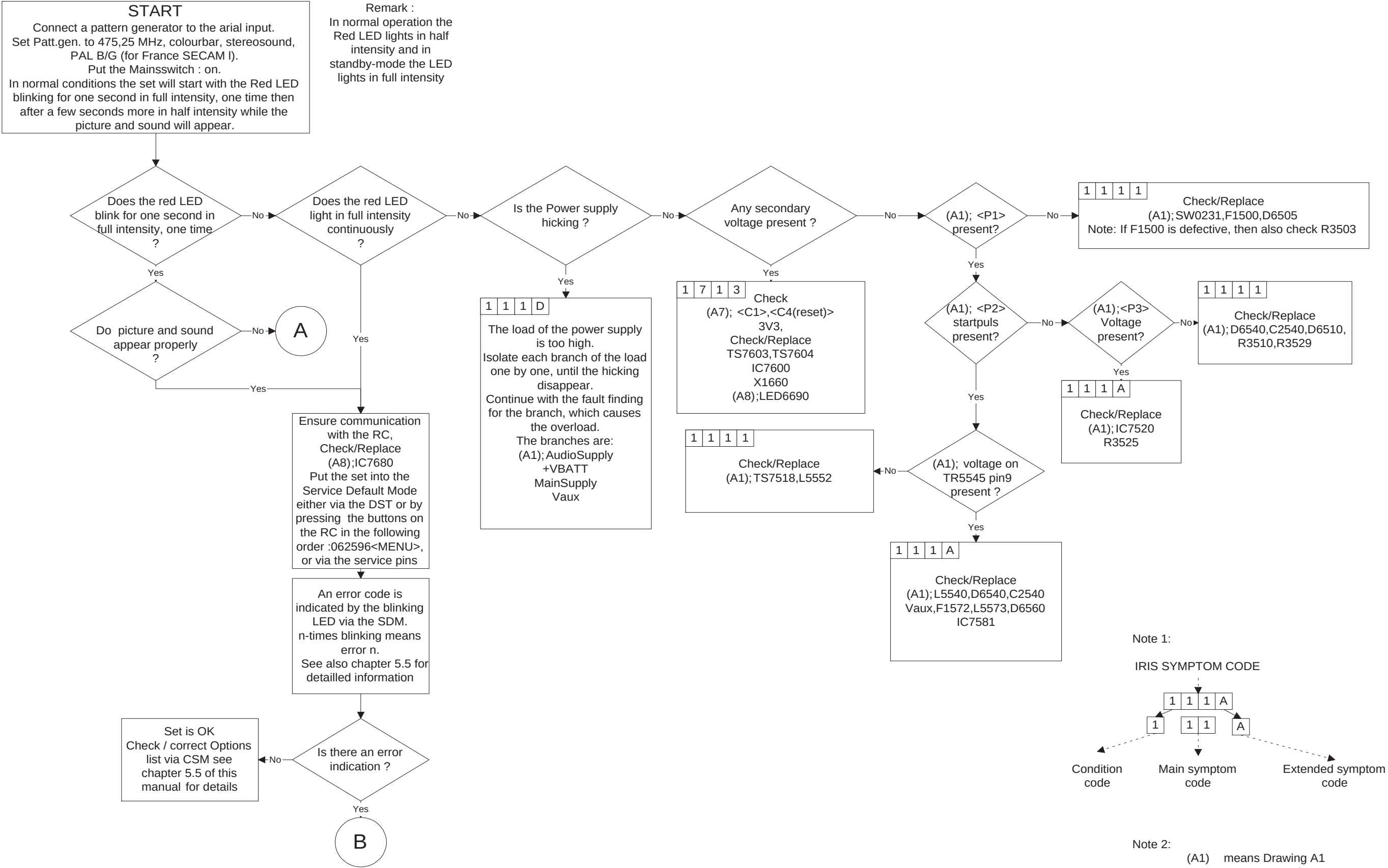
Click on "File" "Open" and select "L9.1E fault finding" to use the cable

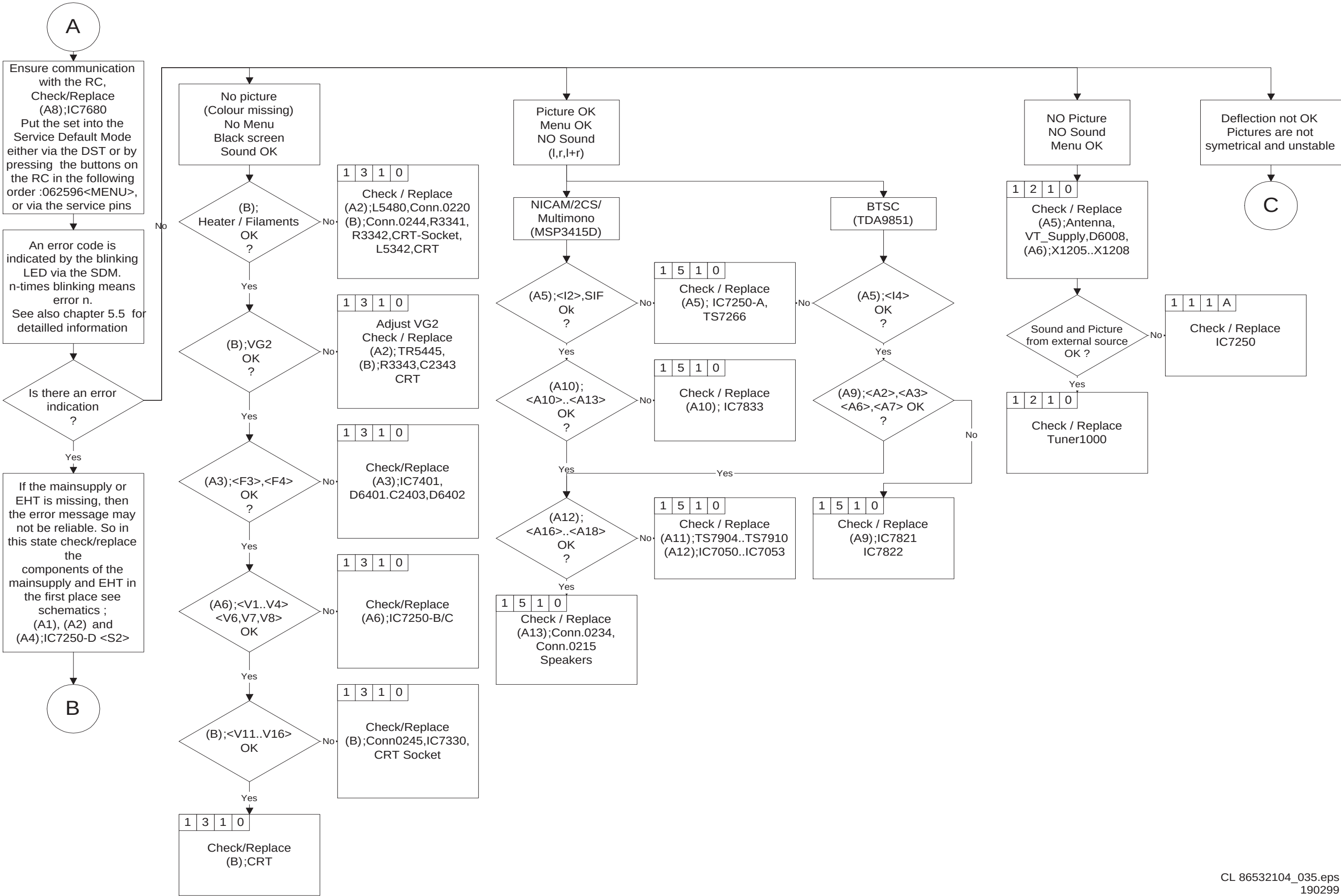
Presets can be installed via menu "Tools", "Installation", "Presets".

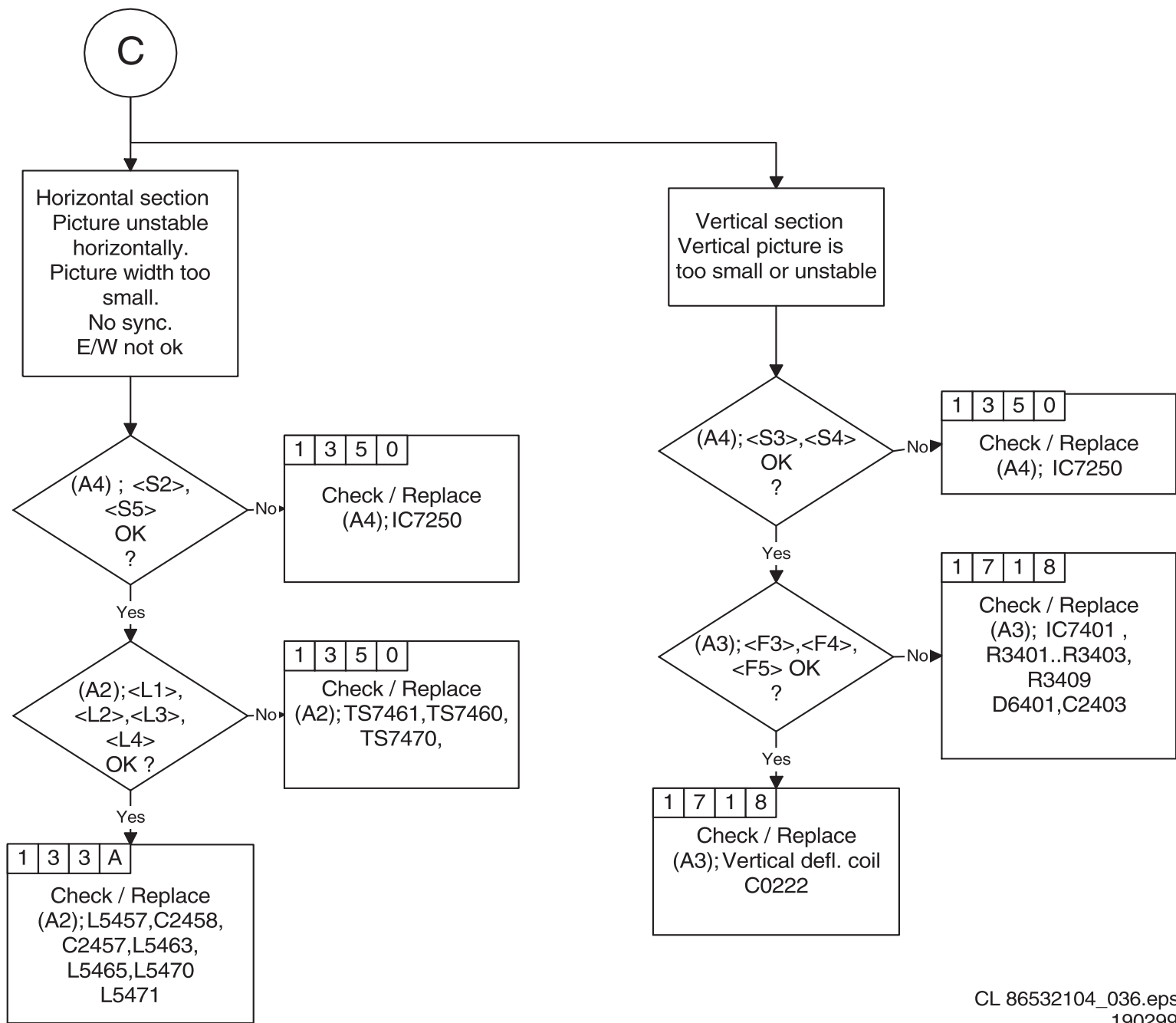
5.9 Ordering Compair

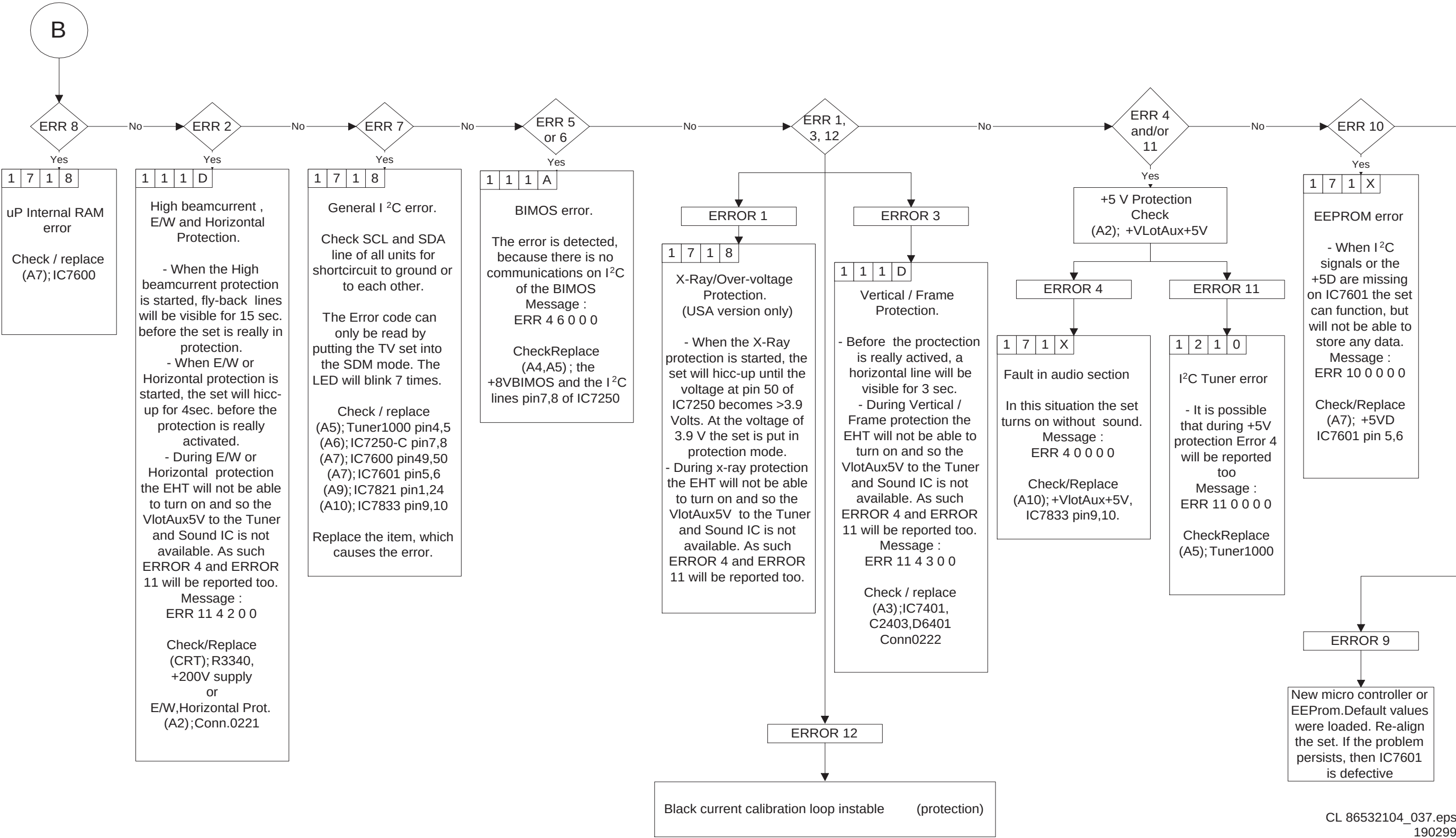
Compair order codes:

- 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

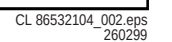




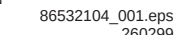


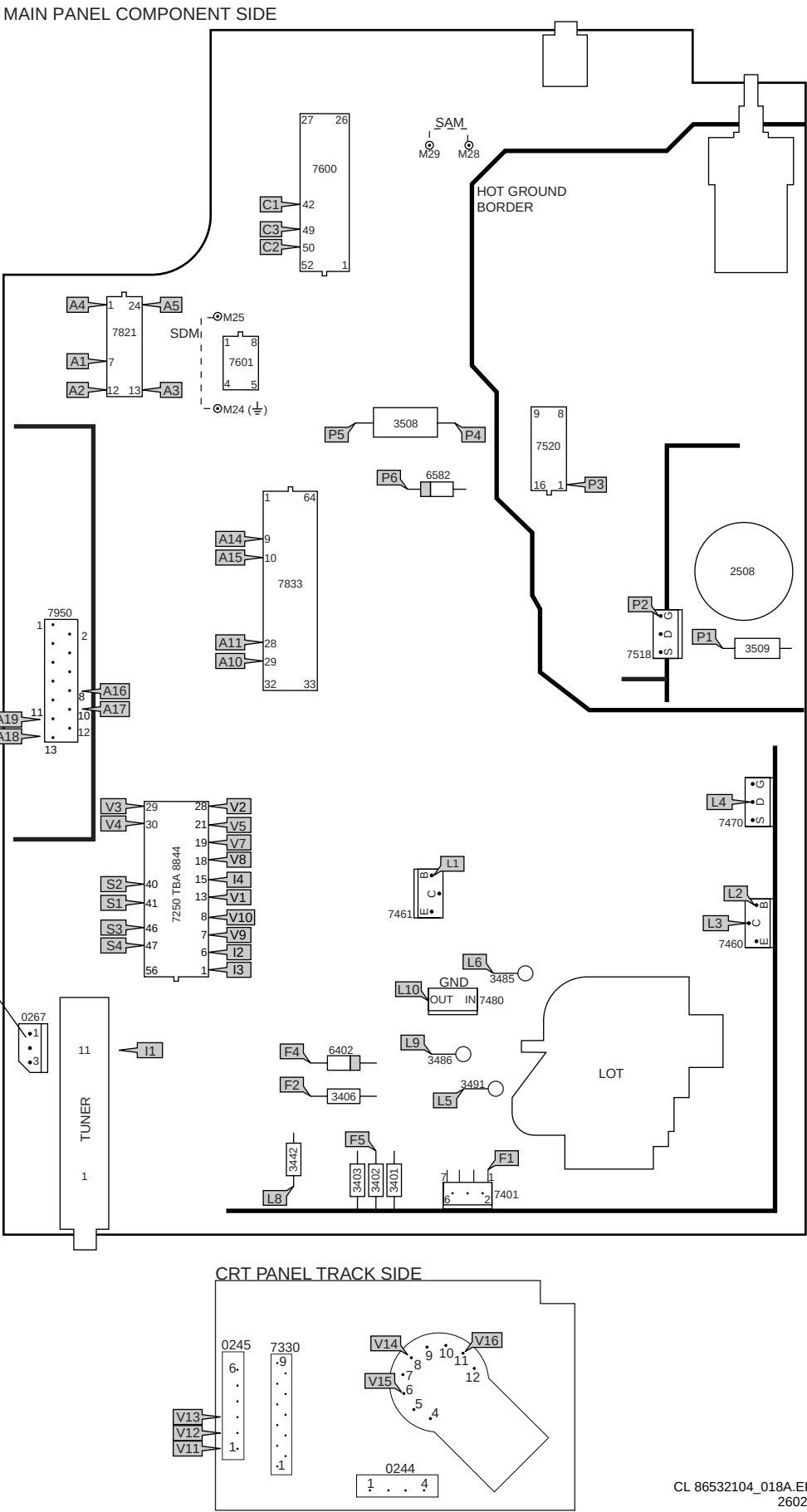
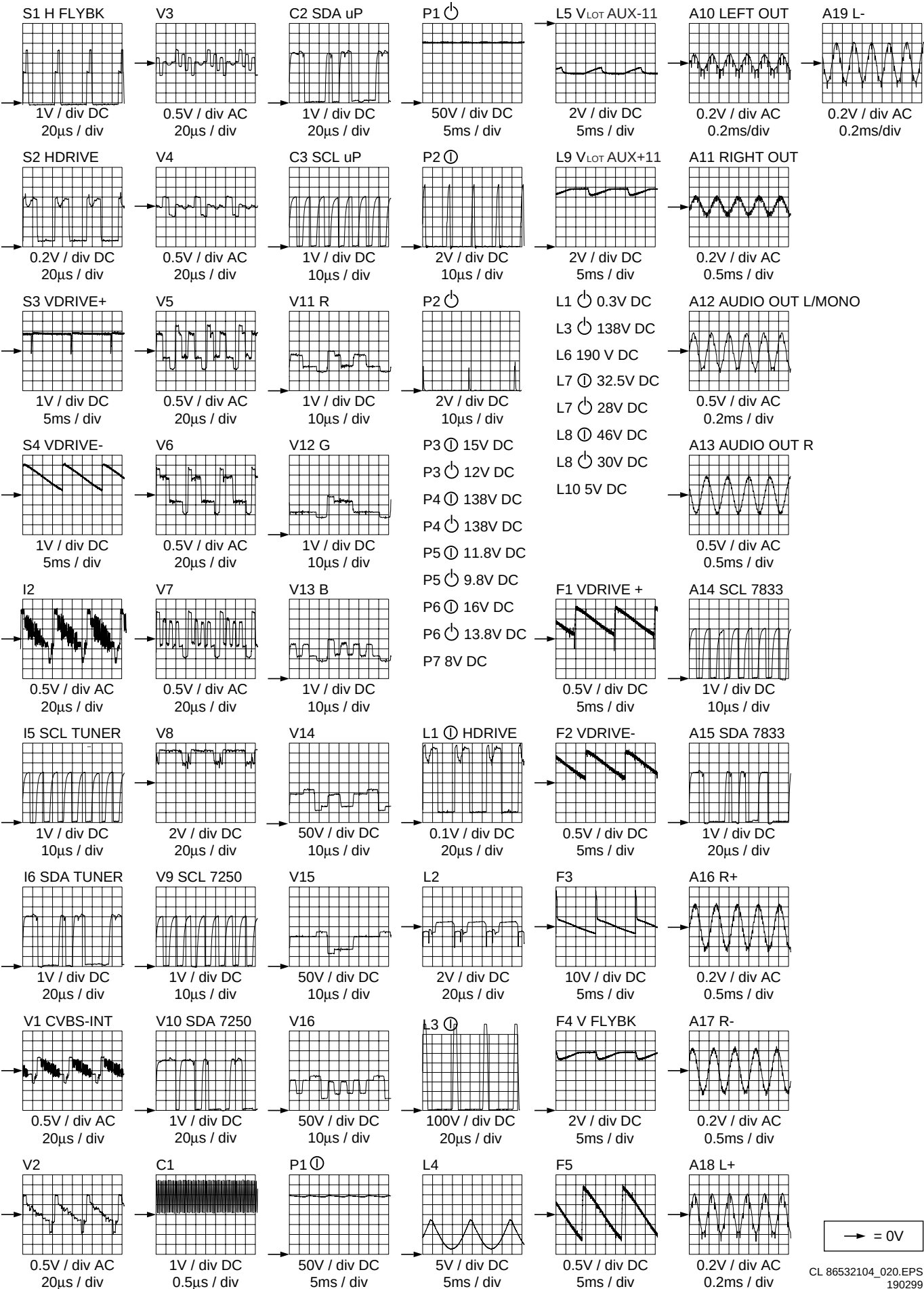


21

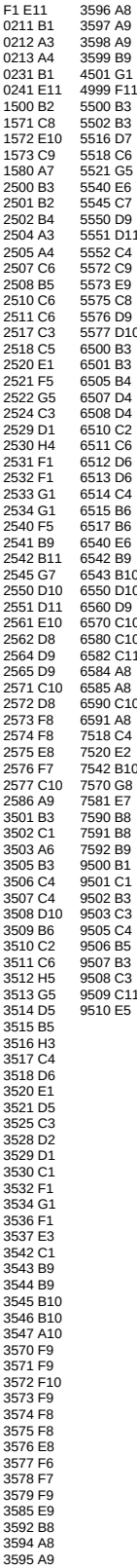


L9.1E 22





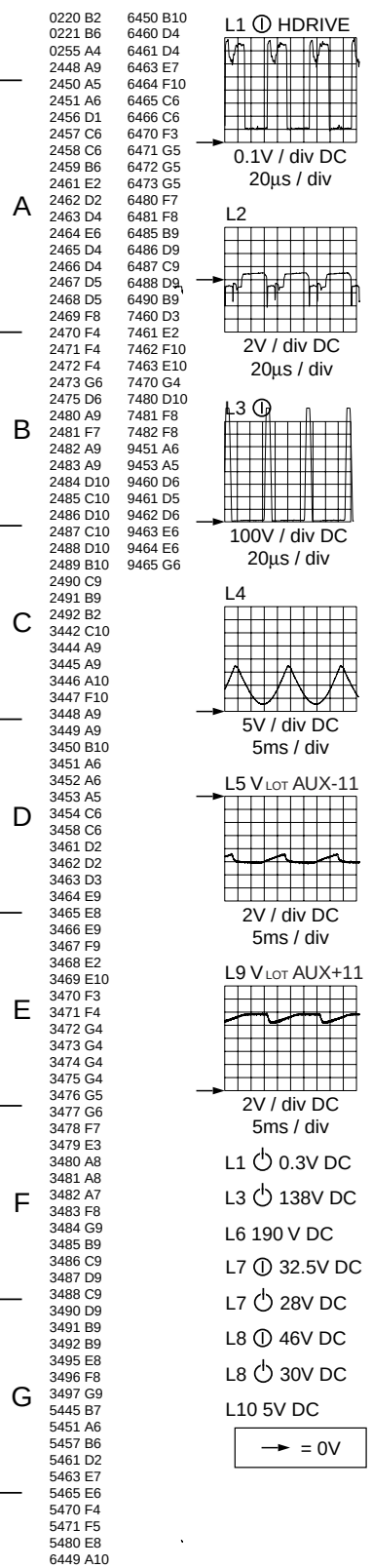
L9.1E 24

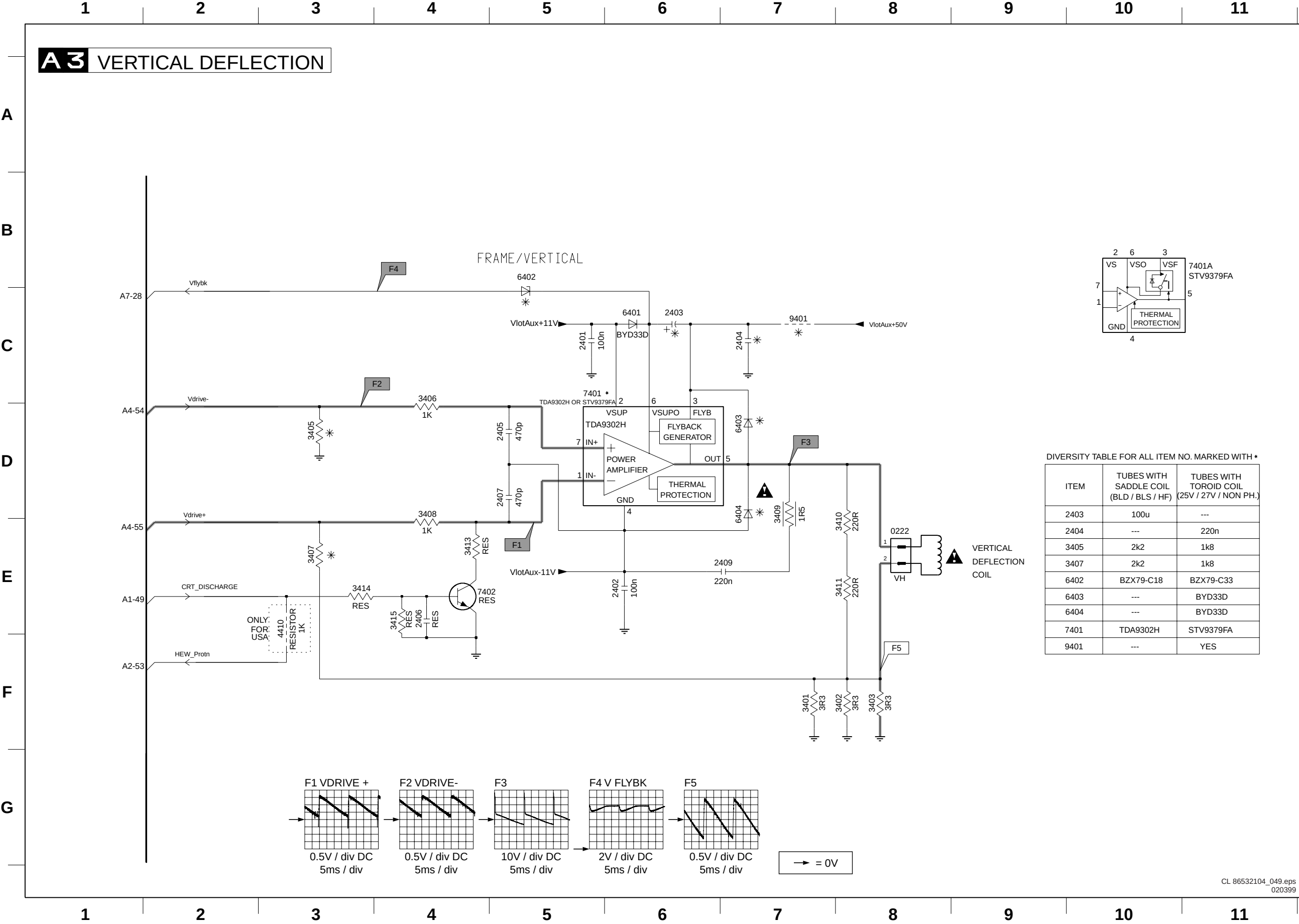


	1	2	3	4	5	6	7	8	9	10	11											
A	DIVERSITY TABLE FOR POWER SUPPLY												A									
	DIVERSITY TABLE FOR ALL ITEM NO. MARKED WITH *																					
B	ITEM	FR_CIS 25I/29I AP	LR USA	FR_NONCIS AP	HR 25I/29I EUROPE	HR_CIS 25I/29I AP	PS_FR_US	PS_FR_LA	HR 25I/29I CHINA	PS_FR NONCIS IND	ITV	140V VBATT	130V VBATT	2X3w/5w AUDIO	2X1w AUDIO	1X1w AUDIO	2X2w AUDIO	INDIA SVBW006ER	B			
	0231	YES	---	YES	YES	YES	---	YES	YES	---	YES	---	---	---	---	---	---	---				
C	1571	---	---	---	---	---	---	---	---	---	---	---	---	---	T1.0A	T1.0A	---	---	C			
	1573	---	---	---	---	---	---	---	---	---	---	---	---	T2.5A	---	---	T2.5A	---				
D	2501	---	---	YES	---	---	---	YES	---	YES	---	---	---	---	---	---	---	---	D			
	2508	330/400V	470/200V	330/400V	220/400V	220/400V	330/400V	330/400V	220/450V	330/450V	220/400V	---	---	---	---	---	---	---				
E	2561	3300u	1000u	3300u	3300u	3300u	1000u	3300u	3300u	3300u	---	---	---	---	---	---	---	---	E			
	2571	---	---	---	---	---	---	---	---	---	---	---	---	2200/25V	---	---	2200/25V	2200/25V				
F	2572	---	330p	---	---	---	---	---	---	---	---	---	---	---	1000/16V	1000/16V	---	---	F			
	2577	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---				
A	3503	220V/9R	110V/10R	220V/9R	220V/9R	220V/9R	220V/9R	220V/9R	220V/9R	---	220V/9R	---	---	---	---	---	---	---	A			
	3505	YES	YES	---	YES	YES	YES	---	YES	---	---	---	---	---	---	---	---	---				
B	3507	---	---	---	2R2/5w	2R2/5w	---	---	2R2/5w	---	2R2/5w	---	---	---	---	---	---	---	B			
	3510	33K/3w	33K/3w	33K/3w	68K/3w	68K/3w	33K/3w	33K/3w	68K/3w	33K/3w	---	---	---	---	---	---	---	---				
C	3515	NTC 2R5	NTC 2R5	NTC 2R5	---	---	NTC 2R5	NTC 2R5	---	NTC 2R5	---	---	---	---	---	---	---	---	C			
	3570	---	---	---	---	---	---	---	---	---	---	10K	15K	---	---	---	---	---				
D	3571	---	---	---	---	---	---	---	---	---	---	160K	150K	---	---	---	---	---	D			
	5502	DMF2810	---	---	DMF2820	DMF2820	---	---	DMF2820	---	---	---	---	---	---	---	---	---				
E	5550	---	---	---	---	---	---	---	---	---	---	YES	---	---	---	---	---	---	E			
	5575	---	---	---	---	---	---	---	---	---	---	---	---	YES	---	---	YES	YES				
F	5576	---	---	---	---	---	---	---	---	---	---	---	YES	---	---	---	---	---	F			
	6500	---	---	BZX79-C30	---	---	---	BZX79-C30	---	BZX79-C30	---	---	---	---	---	---	---	---				
A	6501	---	---	BZX79-C30	---	---	---	BZX79-C30	---	BZX79-C30	---	---	---	---	---	---	---	---	A			
	6505	GBU6JL	GBU6JL	GBU6JL	GBU4JL	GBU4JL	GBU6JL	GBU6JL	GBU4JL	GBU6JL	---	---	---	---	---	---	---	---				
B	6570	---	---	---	---	---	---	---	---	---	---	---	---	EGP20D	---	---	---	---	B			
	6580	---	---	---	---	---	---	---	---	---	---	---	---	---	SB140	BYV27-200	---	EGP20D				
C	6582	---	---	---	---	---	---	---	---	---	---	---	---	EGP20D	---	---	EGP20	EGP20	C			
	6590	---	---	---	---	---	---	---	---	---	---	---	---	EGP20D	---	---	EGP20D	EGP20D				
D	9500	---	YES	---	---	---	YES	---	---	---	---	---	---	---	---	---	---	---	D			
	9501	---	YES	---	---	---	YES	---	---	---	---	---	---	---	---	---	---	---				
E	9502	---	YES	YES	---	---	YES	YES	---	YES	---	---	---	---	---	---	---	---	E			
	9503	---	YES	YES	---	---	YES	YES	---	YES	---	---	---	---	---	---	---	---				
F	9505	YES	YES	YES	---	---	YES	YES	---	YES	---	---	---	---	---	---	---	---	F			
	9506	---	---	---	YES	YES	---	---	YES	---	YES	---	---	---	---	---	---	---				
A	9509	---	---	---	---	---	---	---	---	---	---	---	---	---	YES	YES	---	---	A			
DIVERSITY TABLE FOR HORIZONTAL DEFLECTION											DIVERSITY TABLE FOR HORIZONTAL DEFLECTION											
DIVERSITY TABLE FOR ALL ITEM NO. MARKED WITH *											DIVERSITY TABLE FOR ALL ITEM NO. MARKED WITH *											
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2451	15n	15n	15n	15n	15n	15n/ 12n China	2451	15n	15n	15n	15n	15n	15n/ 12n China									
2457	390n	390n	390n	390n	390n	360n	2457	390n	390n	390n	390n	390n	360n									
2463	1n	1n	820p	470p	680p	820p/1n China	2463	1n	1n	820p	470p	680p	820p/1n China									
2464	---	---	---	---	---	2u2	2464	---	---	---	---	---	2u2									
2465	9n1	9n1	9n1	10n	10n	10n	2465	9n1	9n1	9n1	10n	10n	10n									
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2467	---	---	---	---	---	22n	2467	---	---	---	---	---	22n									
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2473	47u	47u	47u	---	---	47u	2473	47u	47u	47u	---	---	47u									
2475	560n	560n	510n	---	---	---	2475	560n	560n	510n	---	---	---									
425 (A4)	56k	56k	56k	150k	120k	150k	425 (A4)	56k	56k	56k	150k	120k	150k									
3452	33R	33R	33R	22R	22R	22R	3452	33R	33R	33R	22R	22R	22R									
3453	---	---	---	4R7	4R7	---	3453	---	---	---	4R7	4R7	---									
3470	33k	33k	33k	---	---	33k	3470	33k	33k	33k	---	---	33k									
3471	220k	220k	220k	---	---	---	3471	220k	220k	220k	---	---	---									
3472	100k	100k	120k	---	---	82k	3472	100k	100k	120k	---	---	82k									
3473	1k	1k	1k	---	---	1k	3473	1k	1k	1k	---	---	1k									
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3475	3R3	3R3	3R3	---	---	4R7	3475	3R3	3R3	3R3	---	---	4R7									
3477	100R	100R	100R	---	---	100R	3477	100R	100R	100R	---	---	100R									
3479	330R	330R	330R	---	---	330R	3479	330R	330R	330R	---	---	330R									
3481/82	Refer to	part list	videocontrol	Depends on	country.	---	3481/82	Refer to	part list	videocontrol	Depends on	country.	---									
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5451	33uH	33uH	33uH	27uH	27uH	27uH	5451	33uH	33uH	33uH	27uH	27uH	27uH									
5457	312813853111	312813853111	312813853111	312813853241	312813853241	312813853241	5457	312813853111	312813853111	312813853111	312813853241	312813853241	312813853241									
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5465	312813834011	312813834011	312813834011	---	---	---	5465	312813834011	312813834011	312813834011	---	---	---									
5470	311233830531	311233830531	311233830531	---	---	---	5470	311233830531	311233830531	311233830531	---	---	---									
5471	---	---	---	---	---	1mH	5471	---	---	---	---	---	1mH									
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6461	BYW95C/20	BYW95C/20	BYW95C/20	---	---	BYW95C/20	6461	BYW95C/20	BYW95C/20	BYW95C/20	---	---	BYW95C/20									
6470	BZX79-C9V1	BZX79-C9V1	BZX79-C9V1	---	---	BZX79-C9V1	6470	BZX79-C9V1	BZX79-C9V1	BZX79-C9V1	---	---	BZX79-C9V1									
6471	1N4148	1N4148	1N4148	---	---	---	6471	1N4148	1N4148	1N4148	---	---	---									
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6473	BZX79-C39	BZX79-C39	BZX79-C39	---	---	---	6473	BZX79-C39	BZX79-C39	BZX79-C39	---	---	---									
7470	STP16NE	STP16NE	STP16NE	---	---	STP16NE	7470	STP16NE	STP16NE	STP16NE	---	---	STP16NE									
9453	YES	YES	YES	---	---	YES	9453	YES	YES	YES	---	---	YES									
9460	---	---	---	YES	YES	YES	9460	---	---	---	YES	YES	YES									
9461	---	---	---	YES	YES	---	9461	---	---	---	YES	YES	---									
9462	YES	YES	YES	---	---	---	9462	YES	YES	YES	---	---	---									
9463	---	---	---	---	---	YES	9463	---	---	---	---	---	YES									
9464	YES	YES	YES	---	---	---	9464	YES	YES	YES	---	---	---									

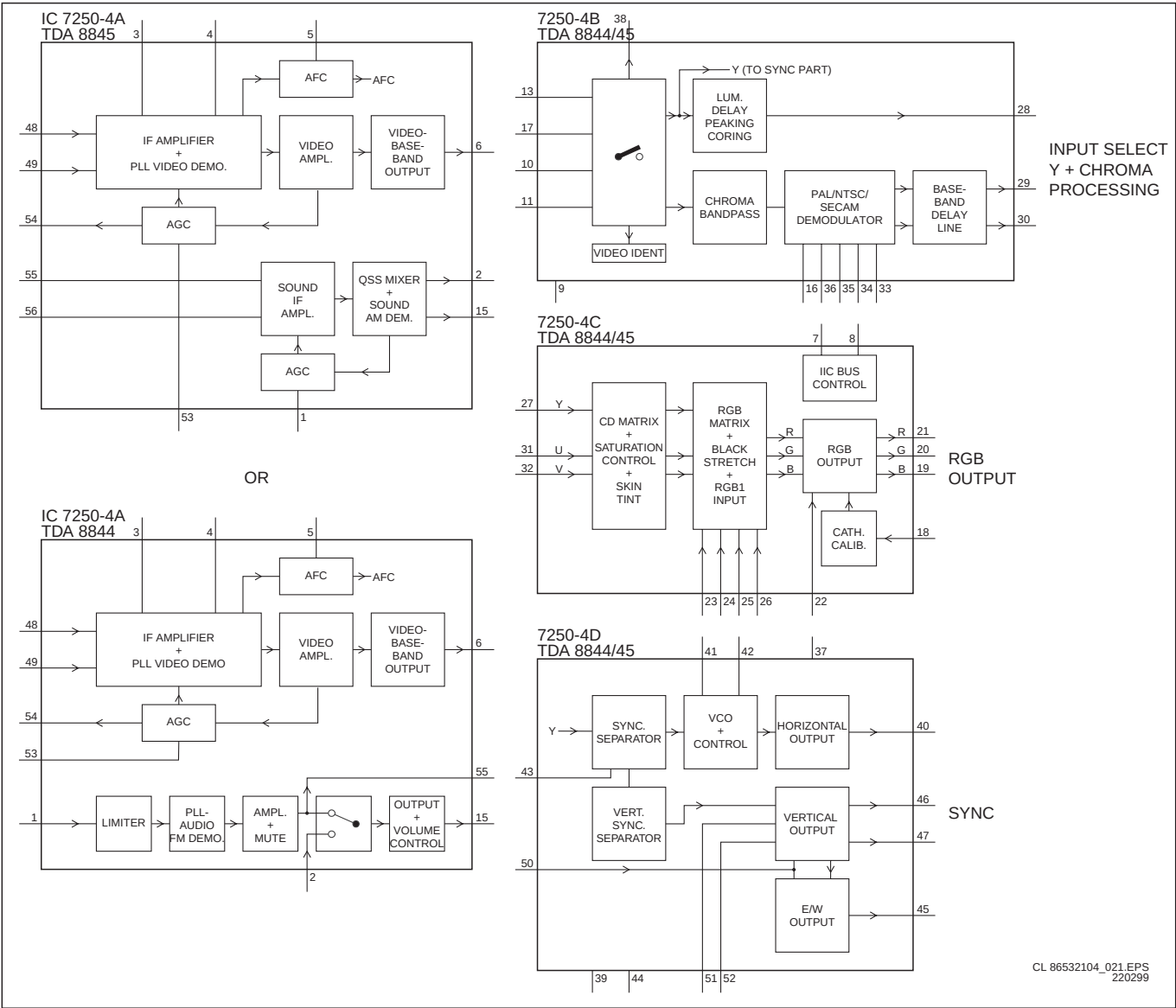
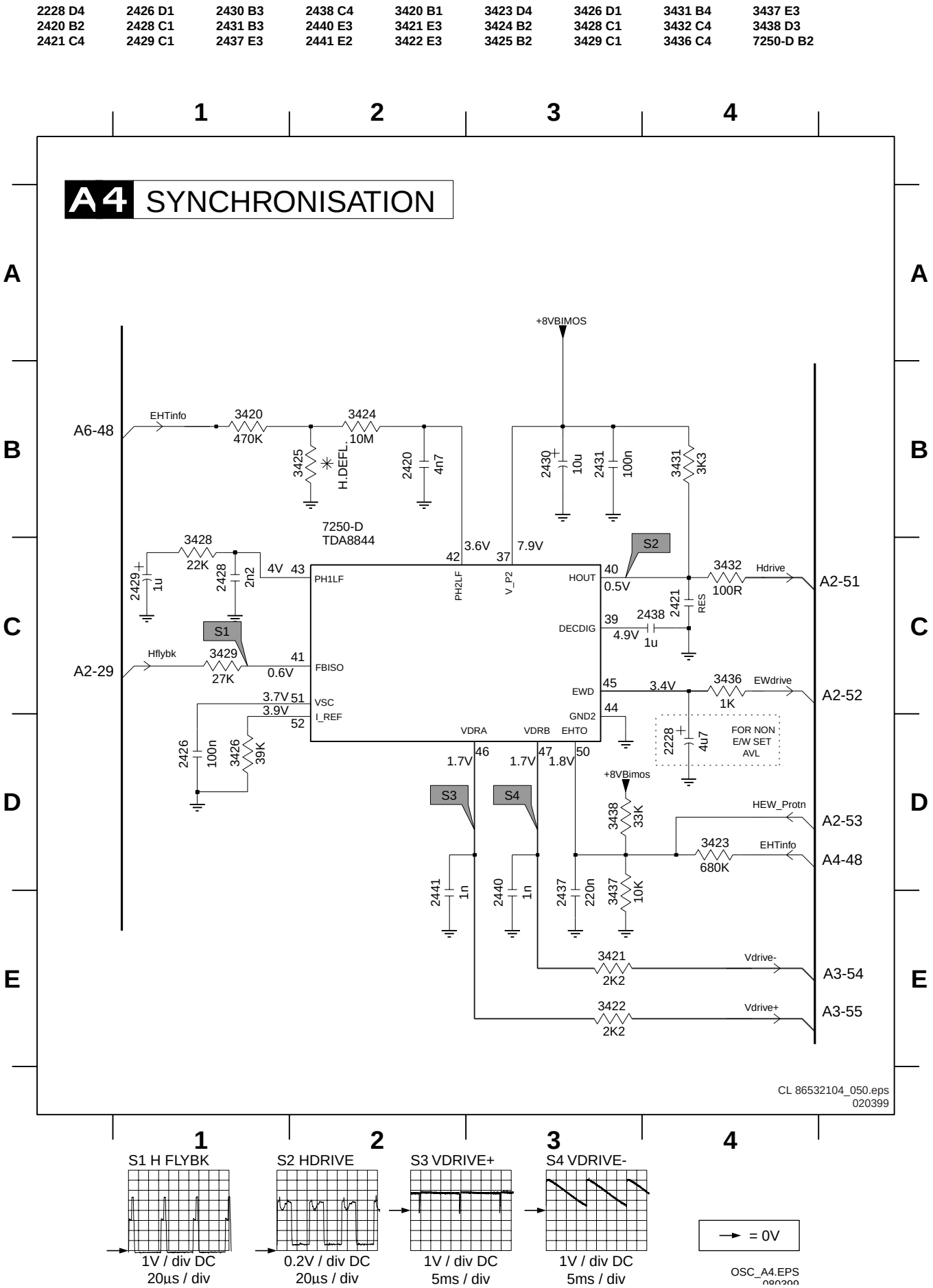
CL 86532104_048.eps
020399

L9.1E 26





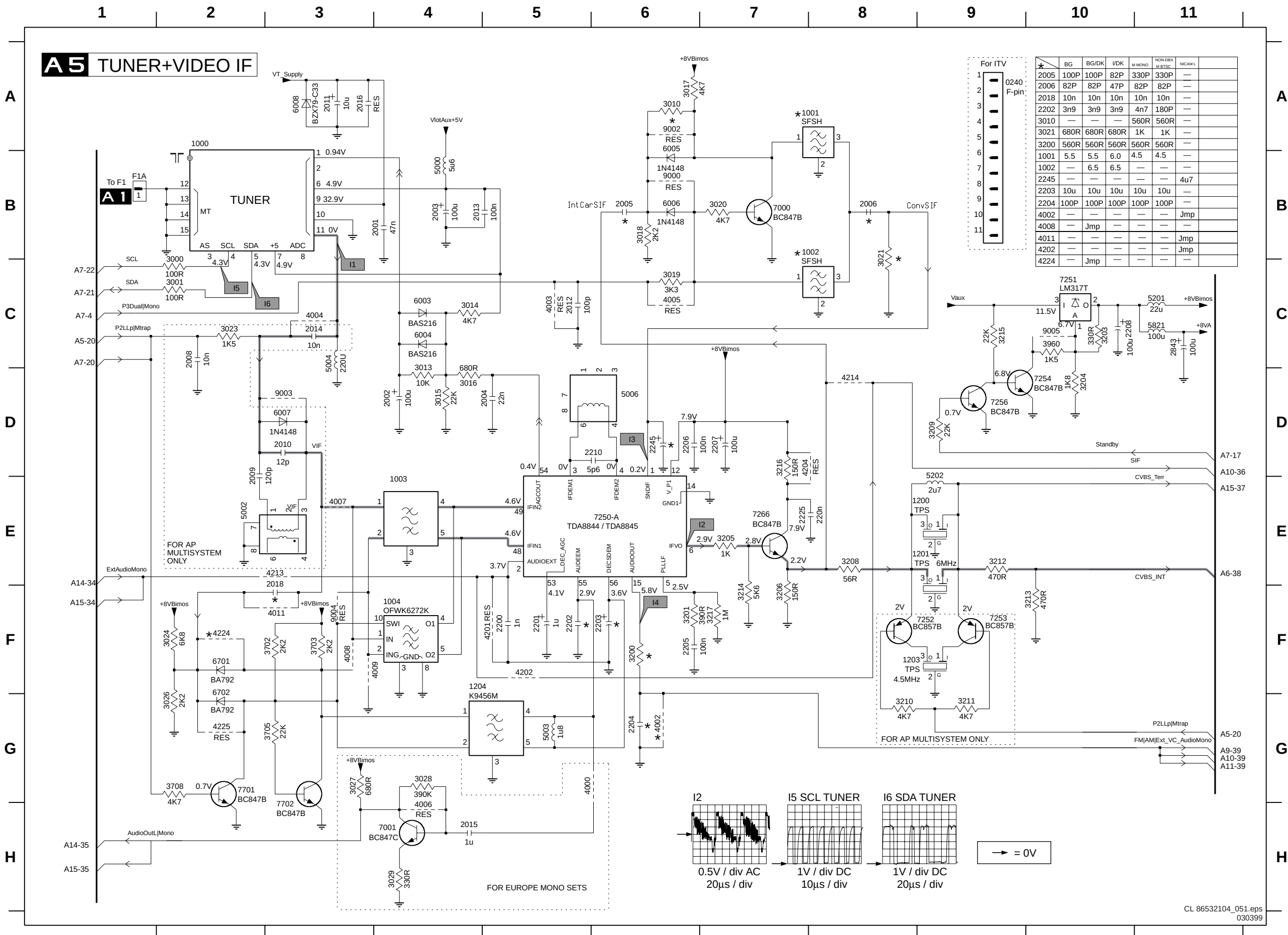
0222 E8
2401 C5
2402 E6
2403 C6
2404 C7
2405 D5
2406 E4
2407 D5
2409 E7
3401 F7
3402 F8
3403 F8
3405 D3
3406 C4
3407 E3
3408 D4
3409 D7
3410 E8
3411 E8
3413 E4
3414 E3
3415 E4
4410 E3
6401 C6
6402 B5
6403 D7
6404 D7
7401 C5
7401A B11
7402 E4
9401 C7



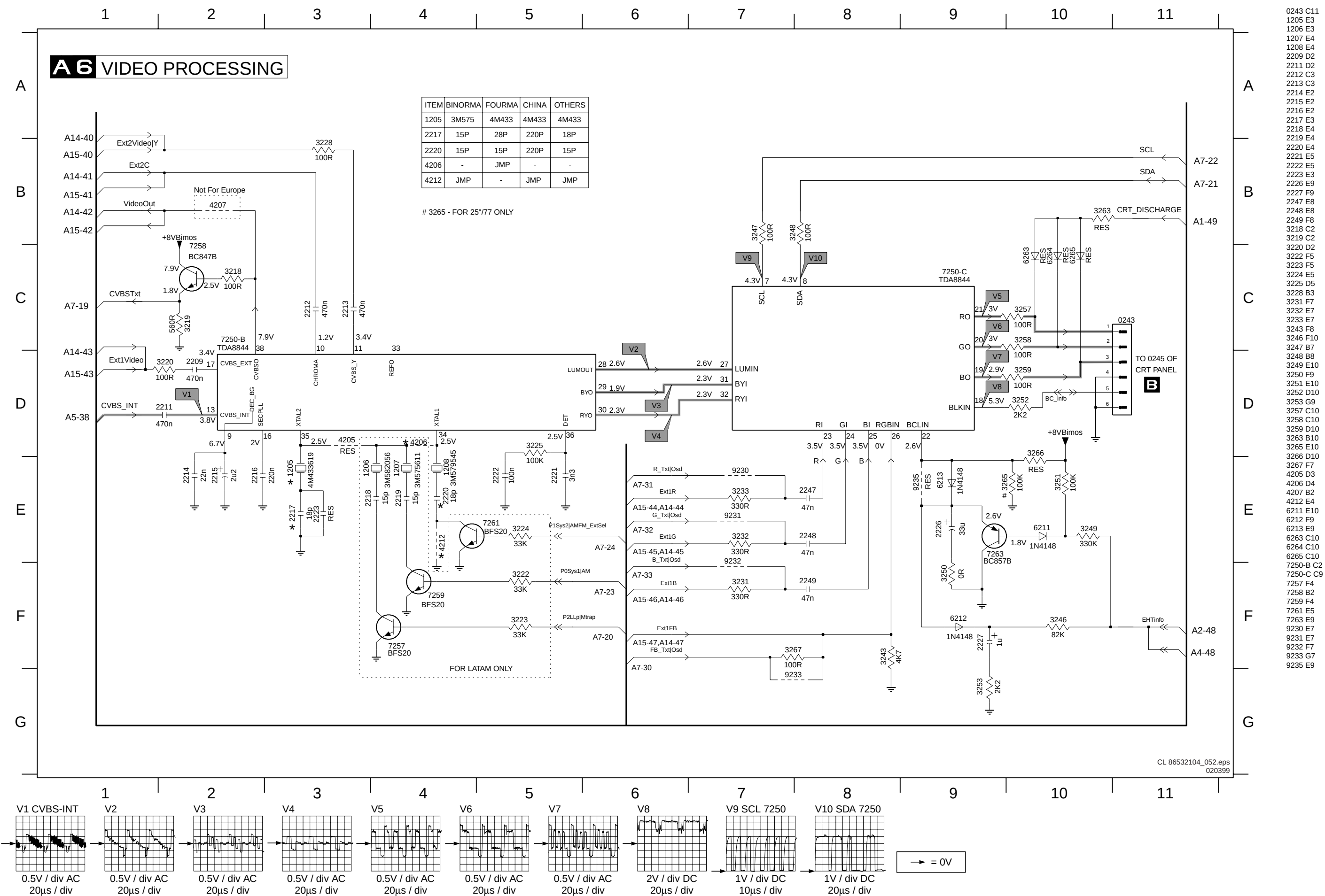
7 Electrical diagrams and print lay-outs

L9.1E

29



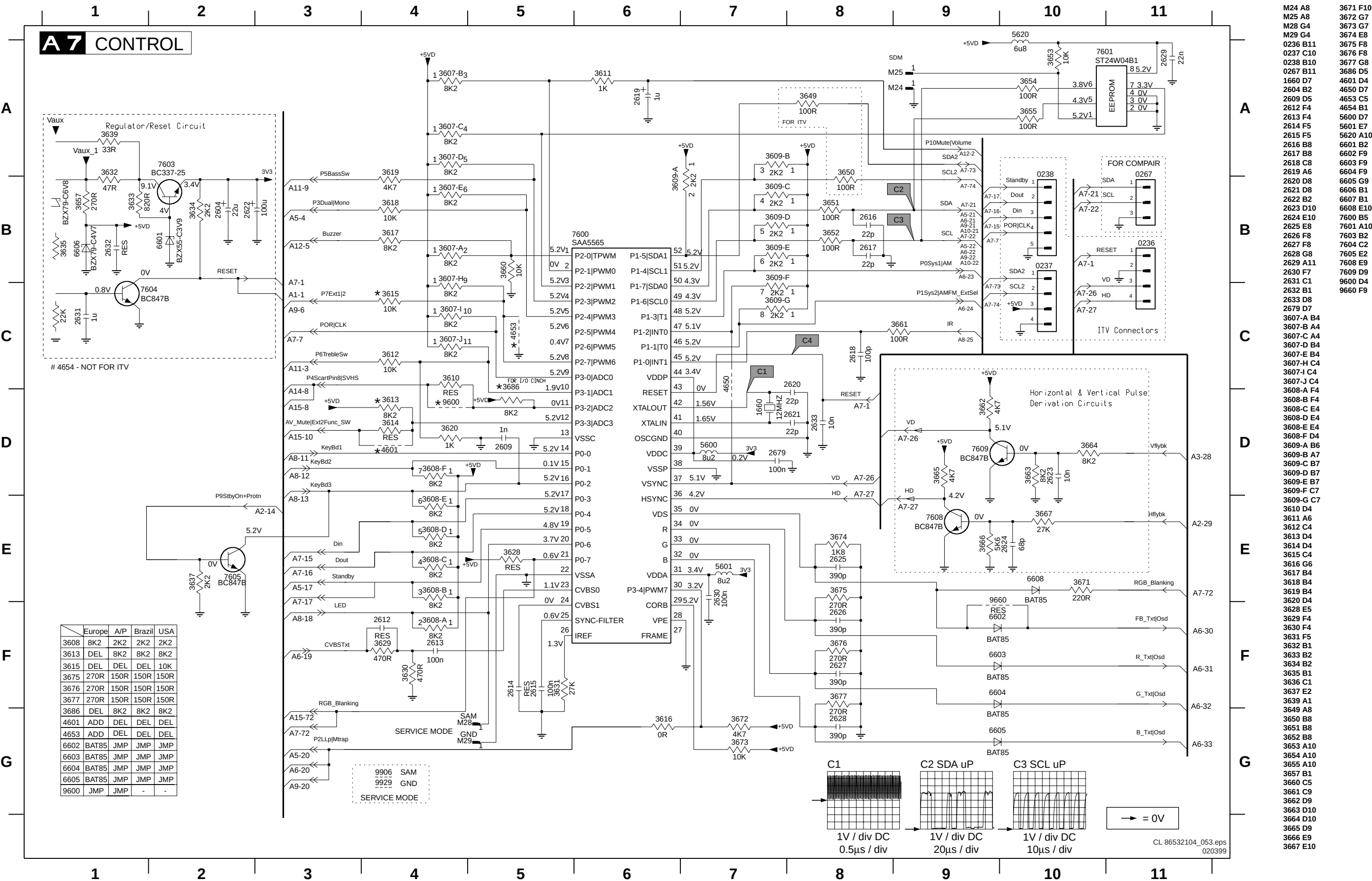
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0240 A9	5006 D6
1000 A2	5201 C11
1001 A7	5202 E9
1002 B7	5821 C11
1003 E4	6003 C4
1004 F4	6004 C4
1200 E9	6005 B6
1201 E9	6006 B6
1203 F9	6007 D3
1204 G5	6008 A3
2001 B4	6701 F2
2002 D4	6702 G2
2003 B4	7000 B7
2004 D5	7001 H4
2005 B6	7250-A E6
2006 B8	7251 C10
2008 C2	7252 F8
2009 D2	7253 F9
2010 D3	7254 D10
2011 A3	7256 D9
2012 C5	7266 E7
2013 B4	7701 G2
2014 C3	7702 H3
2015 H4	9000 B6
2016 A3	9002 A6
2018 F3	9003 D3
2200 F5	9004 F3
2201 F5	9005 C10
2202 F5	
2203 F6	
2204 G6	
2206 D6	
2207 D7	
2208 C10	
2210 D6	
2225 E7	
2245 D6	
2843 C11	
3000 C2	
3001 C2	
3010 A6	
3013 D4	
3014 C4	
3015 D4	
3016 D4	
3017 A6	
3018 B6	
3019 C6	
3020 B7	
3021 B8	
3023 C2	
3024 F2	
3026 G2	
3027 G3	
3028 G4	
3029 H4	
3200 F6	
3201 F6	
3203 C10	
3204 D10	
3205 E7	
3206 F7	
3208 E8	
3209 D9	
3210 G8	
3211 G9	
3212 E9	
3213 F10	
3214 F7	
3215 C10	
3216 D7	
3217 F7	
3702 F3	
3703 F3	
3705 G3	
3708 G2	
3960 C10	
4000 G5	
4002 G6	
4003 C5	
4004 C3	
4005 C6	
4006 H4	
4007 E3	
4008 F3	
4009 F4	
4011 F3	
4201 F5	
4202 F5	
4204 D7	
4213 E3	
4214 D8	
4224 F2	
4225 G2	
5000 B4	
5002 E2	
5003 G5	



7 Electrical diagrams and print lay-outs

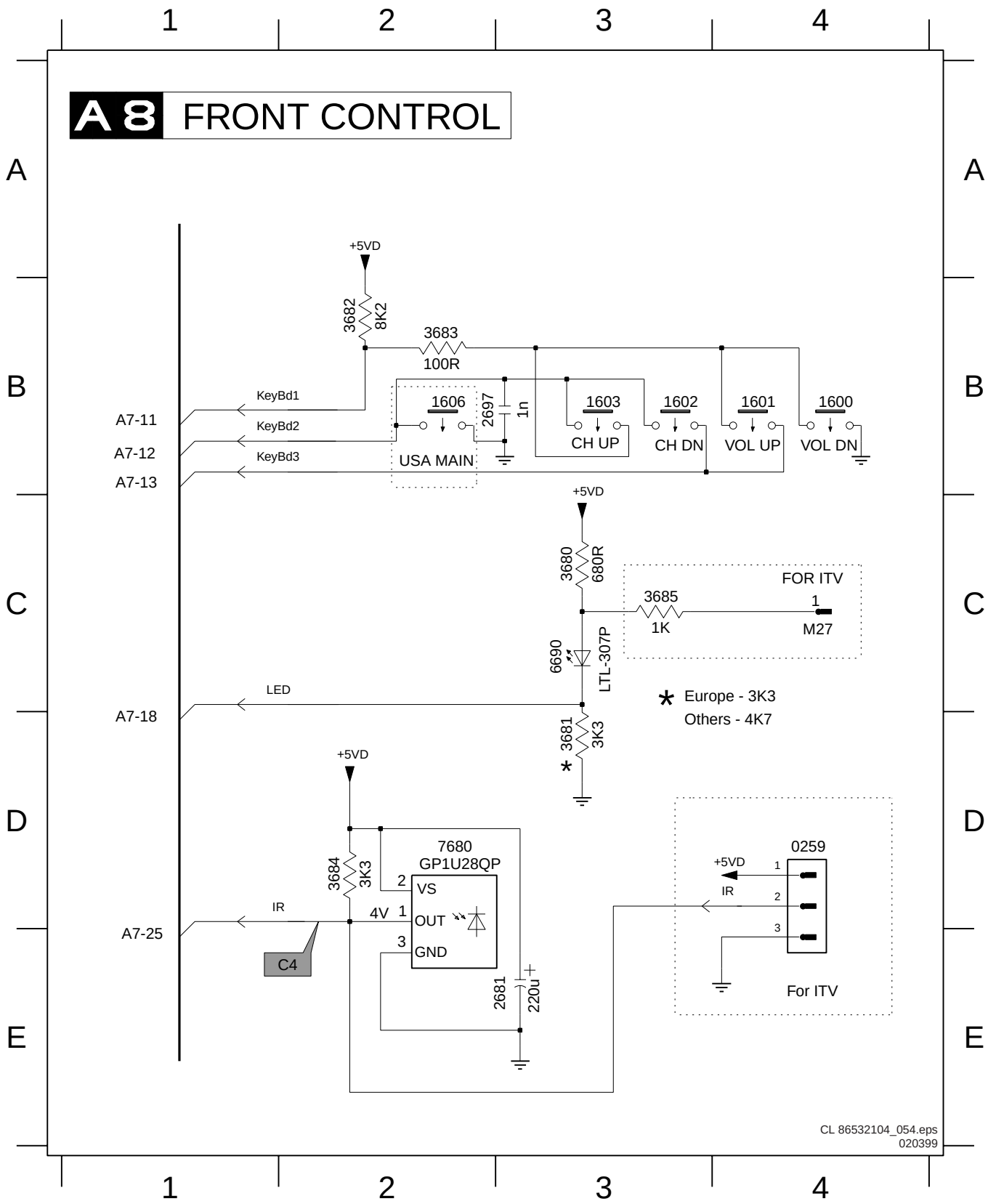
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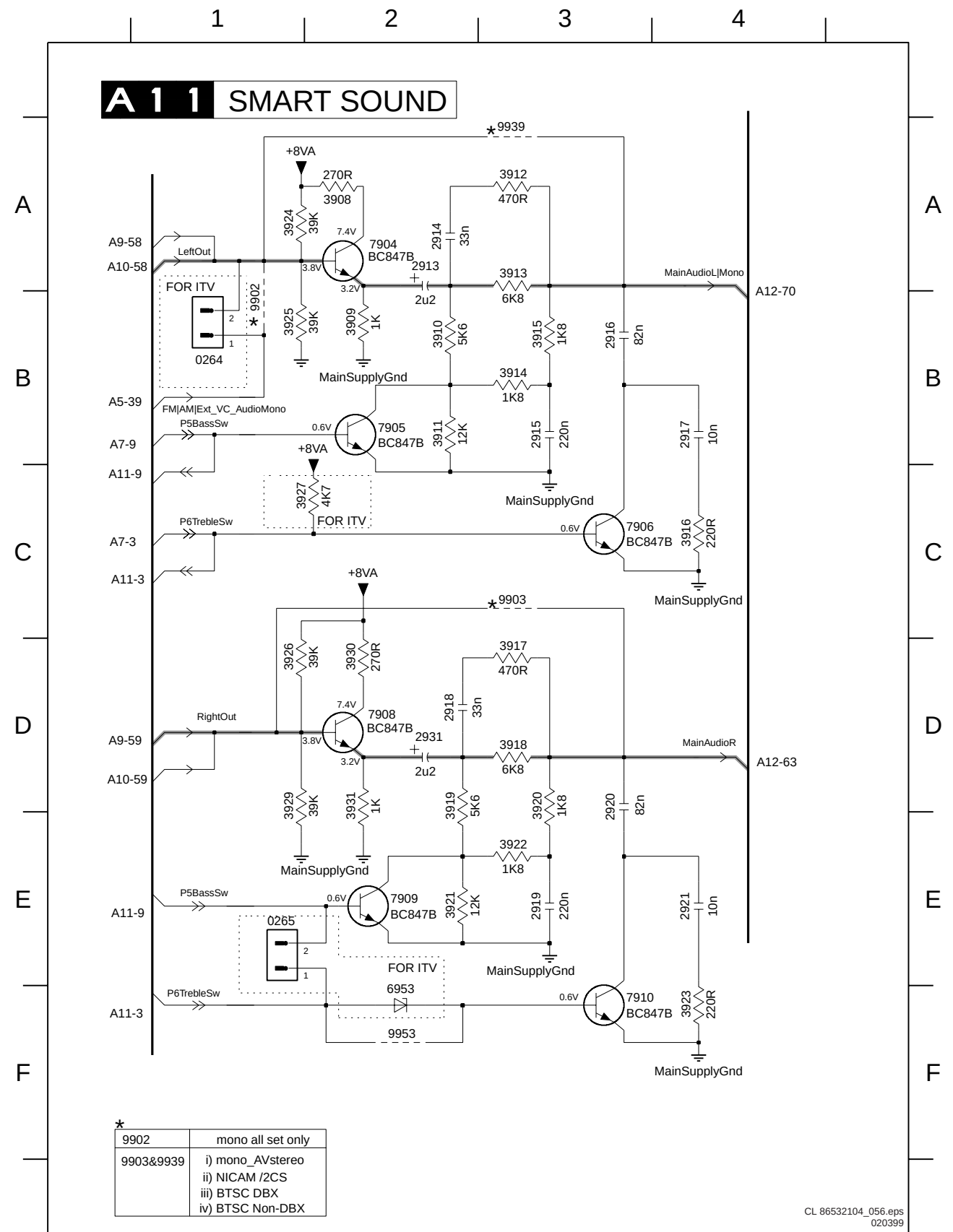
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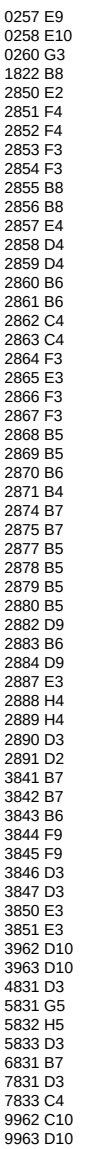


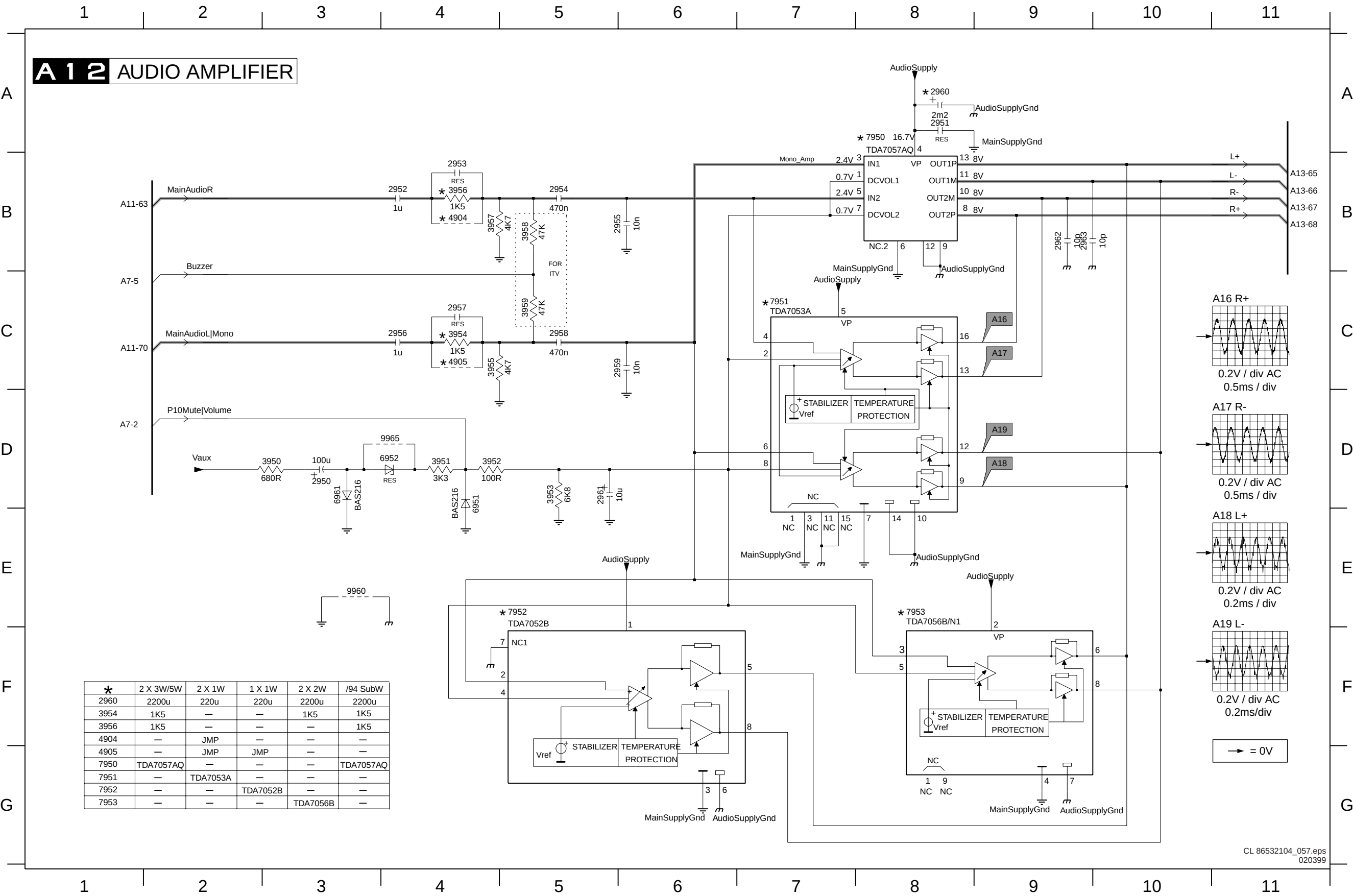
7 Electrical diagrams and print lay-outs

0264 B1	2915 B3	2919 E3	3908 A2	3912 A3	3916 C4	3920 D3	3924 A1	3929 D1	7904 A2	7909 E2	9939 A3
0265 E1	2916 B3	2920 D3	3909 B2	3913 A3	3917 D3	3921 E2	3925 B1	3930 D2	7905 B2	7910 F3	9953 F2
2913 A2	2917 B4	2921 E4	3910 B2	3914 B3	3918 D3	3922 E3	3926 D1	3931 D2	7906 C3	9902 B1	
2914 A2	2918 D2	2931 D2	3911 B2	3915 B3	3919 D2	3923 F4	3927 C2	6953 E2	7908 D2	9903 C3	



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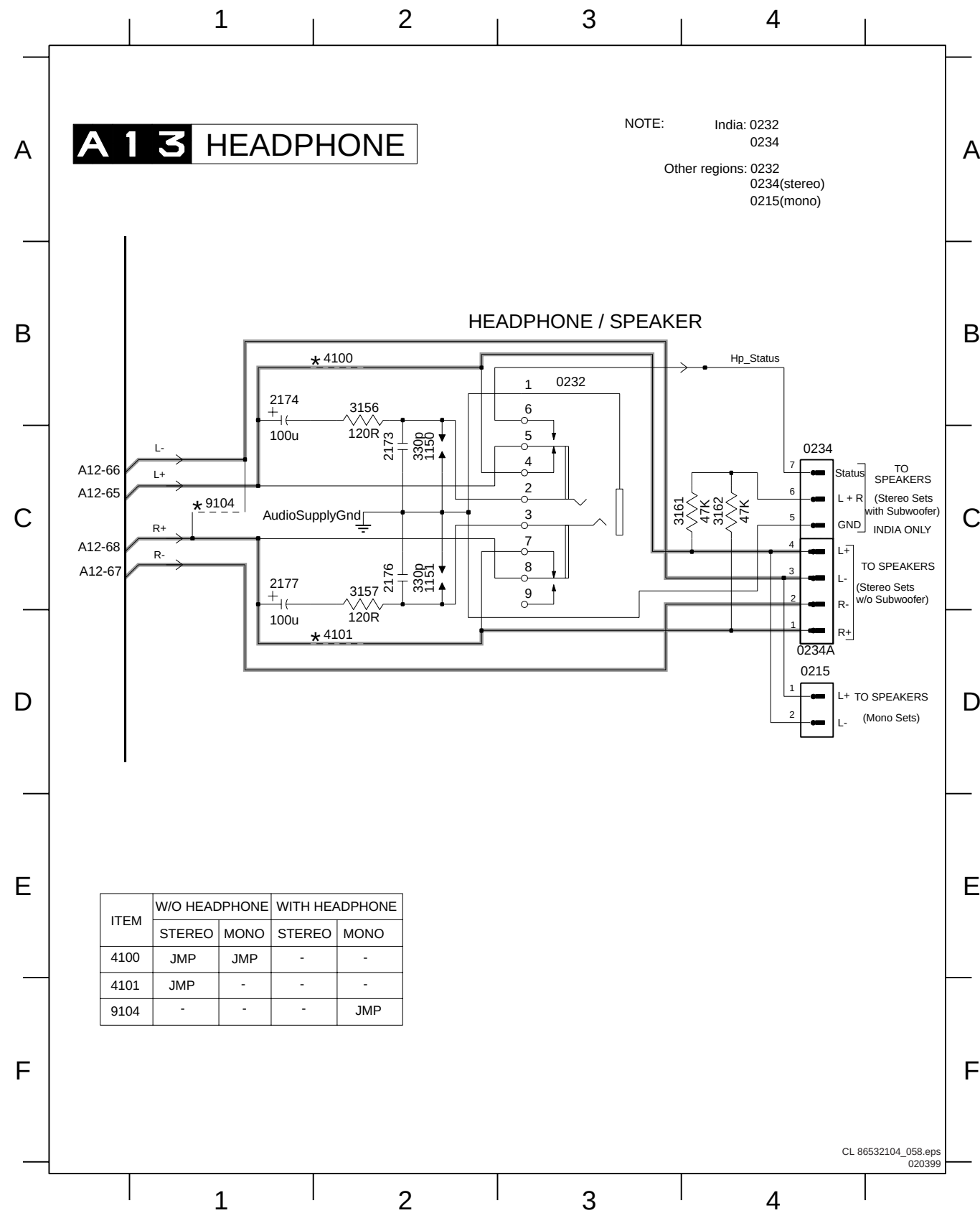




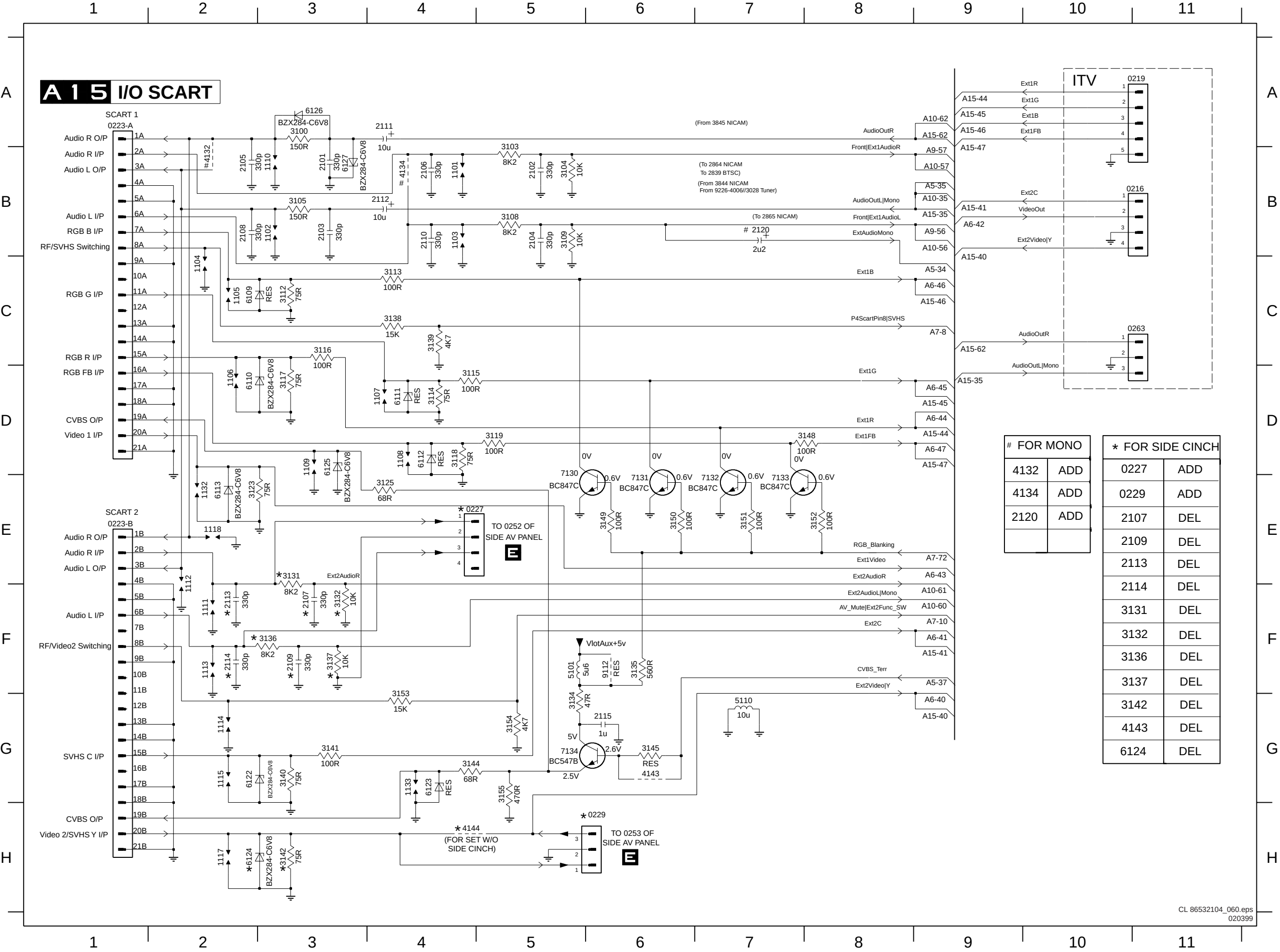
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2951 A8
2952 B4
2953 B4
2954 B5
2955 B6
2956 C4
2957 C4
2958 C5
2959 C6
2960 A8
2961 D5
2962 B9
2963 B9
3950 D3
3951 D4
3952 D4
3953 D5
3954 C4
3955 C4
3956 B4
3957 B4
3958 B5
3959 C5
4904 B4
4905 C4
6951 D4
6952 D4
6961 D3
7950 A8
7951 C7
7952 E5
7953 E8
9960 E3
9965 D4

7 Electrical diagrams and print lay-outs

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	

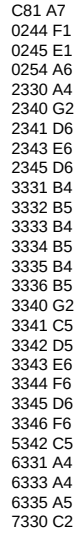


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- 0216 B10
- 0219 A10
- 0223-A A1
- 0223-B E1
- 0227 E4
- 0229 H6
- 0263 C10
- 1101 B4
- 1102 B3
- 1103 B4
- 1104 C2
- 1105 C2
- 1106 D2
- 1107 D4
- 1108 D4
- 1109 D3
- 1110 B3
- 1111 F2
- 1112 E2
- 1113 F2
- 1114 G2
- 1115 G2
- 1117 H2
- 1118 E2
- 1132 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
- 3115 D4
- 3116 C3
- 3117 D3
- 3118 D4
- 3119 D5
- 3123 E2
- 3125 E4
- 3131 E3
- 3132 F3
- 3134 G5
- 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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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

