

Service
Service
Service

RTV servis Horvat

Kešinci, 31402 Semeljci

031-856-139

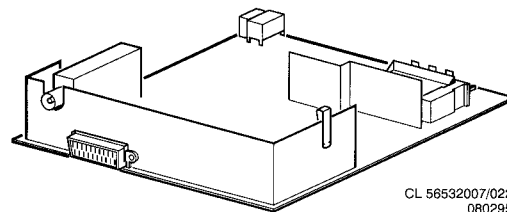
031-856-637

098-788-319

rtv-servis-horvat@os.tel.hr

Croatia

AA5
AB





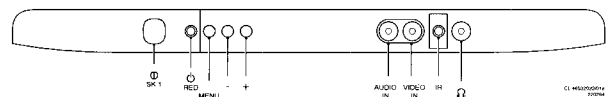
CL 56532007/022
080295

Service Manual

| Table of contents | Page | |
|---|----------------|------------|
| 1. Technical specifications | | 2 |
| 2. Connection facilities | | 2 |
| 3. Safety instructions, Maintenance instructions, Warnings and notes | | 3 |
| 4. Mechanical instructions | | 3 |
| 5. Overview oscillograms | | 4 |
| Survey of testpoints | | 4 |
| Block diagram | | 5 |
| 6. <i>Electrical diagrams and print lay-outs</i> | <i>Diagram</i> | <i>PWB</i> |
| Power supply (Diagram A1+A2) | 7 | 6 |
| Deflection (Diagram A3) | 8 | 6 |
| Synchronisation (Diagram A4) | 9 | 6 |
| Controls (Diagram A5) | 10 | 6 |
| Tuner+IF+connections (Diagram A6) | 11 | 6 |
| Video+sound (Diagram A7) | 12 | 6 |
| Teletext (Diagram A9) | 13 | 6 |
| SVHS connection (Diagram A8) | 13 | 6 |
| 14-15-17-21" mini neck CRT panel (Diagram B1) | 14 | 15 |
| 20" narrow neck CRT panel (Diagram B2) | 14 | 15 |
| 7. Electrical adjustments | | 15 |
| 8. <i>Repair facilities</i> | | |
| Description power supply | | 16 |
| Test points, Service Default Mode, Service Menu, Error codes | | 18 |
| Block diagram supply voltages | | 19 |
| Fault finding tree | | 19 |
| 9. Directions for use | | 20 |
| 10. List of abbreviations | | 22 |
| 11. Spare parts list | | 23 |

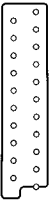

1. Technical specifications

| | |
|---|--|
| Mains voltage | : 220 - 240 V \pm 10% AC; 50 Hz (\pm 5%) |
| Power cons. at 220V~ | : 14" 43 W (stand-by \leq 6 W) : 15" 45 W (stand-by \leq 6 W) : 17" 45 W (stand-by \leq 6 W) : 20" 52 W (stand-by \leq 6 W) : 21" 63 W (stand-by \leq 6 W) |
| Aerial input impedance TV | : 75 Ω - coax |
| Min. aerial input VHF | : 30 μ V |
| Min. aerial input UHF | : 40 μ V |
| Max. aerial input VHF/UHF | : 180mV |
| Pull-in range colour sync | : \pm 300Hz |
| Pull-in range horizontal sync | : \pm 600Hz |
| Pull-in range vertical sync | : \pm 5Hz |
| Picture tube range | : 14", 15", 17", 20", 21" |
|  | : 1 W mono execution: 4" full range round 25 Ω 2W : 3 W mono execution: 4" woofer round 16 Ω 3W : 2" tweeter round 16 Ω 3W |
| TV Systems | : PAL BG : PAL I : PAL BG / SECAM BGDK : PAL BGI / SECAM BGLL' |
| Indications | : On Screen Display (OSD) green : 1 LED (red high intensity, red low intensity, "RC5" and blinking red at error code) |
| VCR programs | : 0 (SVHS optional) |
| Tuning and operating system | :  VST / PLL |
| UV913 / IEC (VST) | : VHFa: 46 - 102 MHz : VHFb: 138 - 224 MHz : UHF: 471 - 855 MHz |
| UV915E / IEC (VST) | : VHFa: 48 - 118 MHz : VHFb: 118 - 300 MHz : Hyper: 300 - 470 MHz : UHF: 470 - 861 MHz |
| UV916E / IEC (PLL) | : VHFa: 48 - 118 MHz : VHFb: 118 - 300 MHz : Hyper: 300 - 470 MHz : UHF: 470 - 861 MHz |
| UV917E / IEC (VST) | : VHFa: 48 - 118 MHz : VHFb: 118 - 300 MHz : UHF: 470 - 861 MHz |
| U943 / IEC (VST) | : UHF: 470 - 861 MHz |
| U944 / IEC (PLL) | : UHF: 470 - 861 MHz |
| Local operating functions | : MENU / - / + |





2. Connection facilities

Euroconnector:


| | |
|---|---|
|  | 1 - Audio \rightarrow R (0V5 RMS \leq 1k Ω) |
| | 2 - Audio \rightarrow R (0V2 - 2V RMS \geq 10k Ω) |
| | 3 - Audio \rightarrow L (0V5 RMS \leq 1k Ω) |
| | 4 - Audio \perp |
| | 5 - Blue \perp |
| | 6 - Audio \rightarrow L (0V2 - 2V RMS \geq 10k Ω) |
| | 7 - Blue (0V7 _{pp} /75 Ω) |
| | 8 - CVBS-status 1 \rightarrow (0-2V int., 10-12V ext.) |
| | 9 - Green \perp |
| | 10 - - |
| | 11 - Green (0V7 _{pp} /75 Ω) |
| | 12 - - |
|  | 13 - Red \perp |
| | 14 - - |

| | |
|------|---|
| 15 - | Red (0V7 _{pp} /75 Ω) |
| 16 - | RGB-status (0-0V4 int.)(1-3V ext. 75 Ω) |
| 17 - | CVBS \perp |
| 18 - | CVBS \perp |
| 19 - | CVBS \rightarrow (1V _{pp} /75 Ω) |
| 20 - | CVBS \rightarrow (1V _{pp} /75 Ω) |
| 21 - | Earthscreens |

CINCH:


| | | |
|---|-------|--|
|  | CINCH | Audio \rightarrow (0V2 _{eff} - 2 V _{eff} \geq 10k Ω) |
|  | CINCH | CVBS \rightarrow (1V _{pp} /75 Ω) |

Head phone:

| | |
|---|------------------------|
|  | 8 - 600 Ω /15mW |
|---|------------------------|

3. Safety instructions, Maintenance instructions, Warnings and notes

Safety Instructions for Repairs

1. Safety regulations require that during a repair:
 - the set should be connected to the mains via an isolating transformer
 - safety components, indicated by the symbol , should be replaced by components identical to the original ones
 - when replacing the CRT, safety goggles must be worn.
2. Safety regulations require also that after a repair:
 - the set should be returned in its original condition
 - the cabinet should be checked for defects to avoid touching, by the customer, of inner parts
 - the insulation of the mains lead should be checked for external damage
 - the mains lead strain relief should be checked on its function
 - the cableform and EHT cable are routed correctly and fixed with the mounted cable clamps in order to avoid touching of the CRT, hot components or heat sinks
 - the electrical resistance between mains plug and the secondary side is checked. This check can be done as follows:
 - unplug the mains cord and connect a wire between the two pins of the mains plug
 - switch on the TV with the main switch
 - measure the resistance value between the pins of the mains plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 MΩ and 12 MΩ.
 - switch off the TV and remove the wire between the two pins of the mains plug
 - thermally loaded solder joints should be resoldered. This includes components like LOT, the line output transistor, fly-back capacitor.

Maintenance Instructions

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

- When the set is used in a living room the recommended interval is 3 to 5 years. When the set is used in the kitchen or garage this interval is 1 year.
- During the maintenance inspection the above mentioned "safety instructions for repair" should be carried out. The power supply and deflection circuitry on the chassis, the CRT panel and the neck of the CRT should be cleaned.

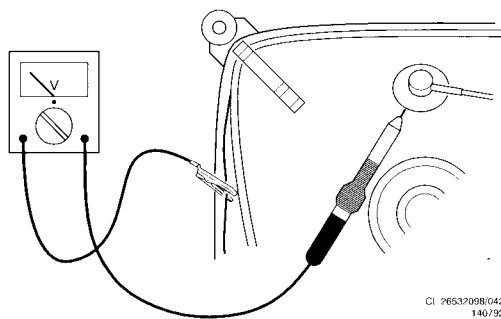







Fig. 3.1

Warnings

1. In order to prevent damage to IC's and transistors any flash-over of the EHT should be avoided. To prevent damage to the picture tube the method, indicated in Fig. 3.1, has to be applied to discharge the picture tube. Make use of an EHT probe and a universal meter (position DC-V). Discharge until the reading of the meter is 0V (after approx 30s).
2. **ESD** 

All IC's and many other semi-conductors are sensitive to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools on the same potential.
3. Proceed with care when testing the EHT section and the picture tube.
4. Never replace any modules or any other parts while the set is switched on.
5. Use plastic instead of metal alignment tools. This will prevent any short circuits and the danger of a circuit becoming unstable.
6. Upon a repair of a transistor or an IC assembly (e.g. a transistor or IC with heatsink and spring) remounting should be carried out in the following order:
 1. Mount transistor or IC on heatsink with spring.
 2. Resolder the joints.

Notes

1. Do not use heatsinks as earth reference.
2. The direct voltages and waveforms should be measured relative to the nearest earthing point on the printed circuit board.
3. The direct voltages and waveforms are measured in the Service Default Mode (see chapter 8). Use a colour bar pattern of a pattern generator (e.g. PM5518)
4. The DC voltages and oscillograms are where necessary measured with  and without  aerial signal (settings as in Service Default Mode; see chapter 8). Voltages and oscillograms in the power supply section have been measured for both normal operation () and in the stand-by mode (). As an input signal a colour bar pattern has been used.
5. The picture tube PWB has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aguadag coating.

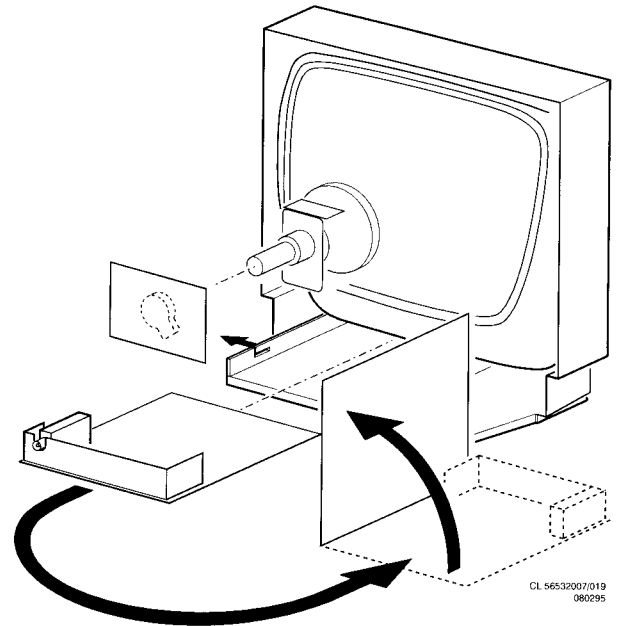
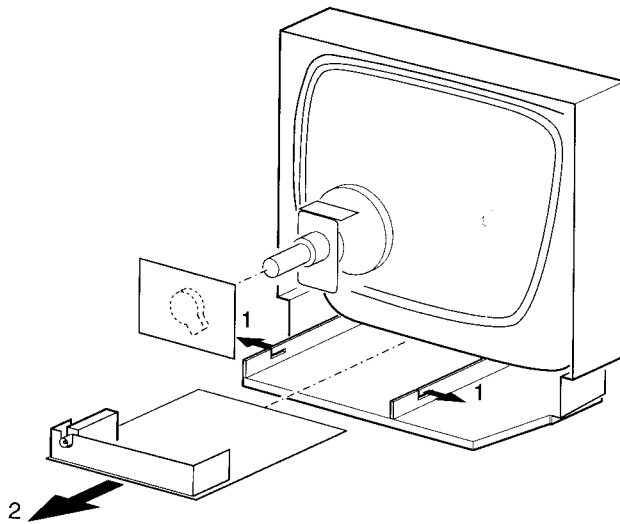
4. Mechanical instructions

For the main carrier two service positions are possible:

- A: For faultfinding on the component side of the main carrier
- B: For (de)soldering activities on the copper side of the main carrier

Position A can be reached by first removing the mains cord from it's fixation, then loosen the carrier lips (1) and then pulling the carrier panel (2) for approximately 10 cm.

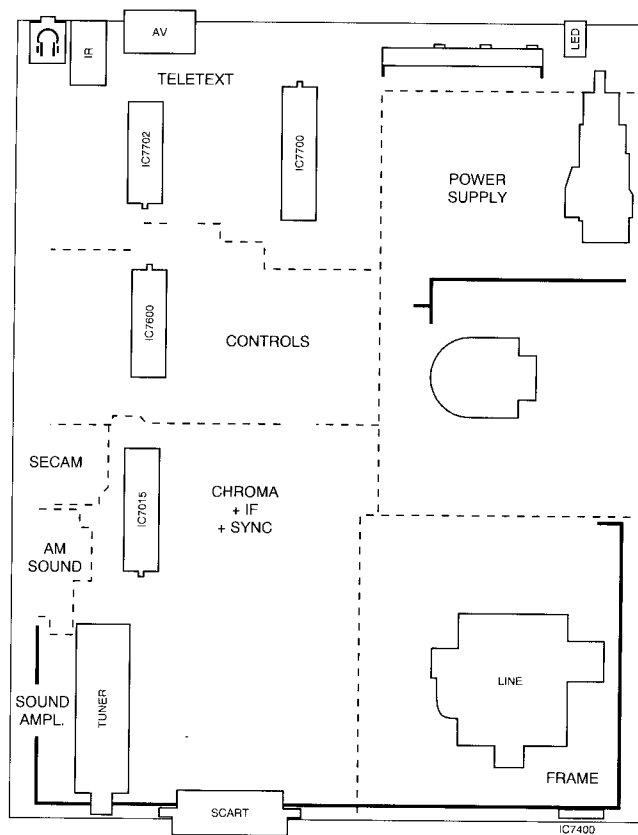
Position B can be reached from position A after disconnecting the degaussing cable. Put the carrier on the line transformer side.



CL 56532007/019
080295

A

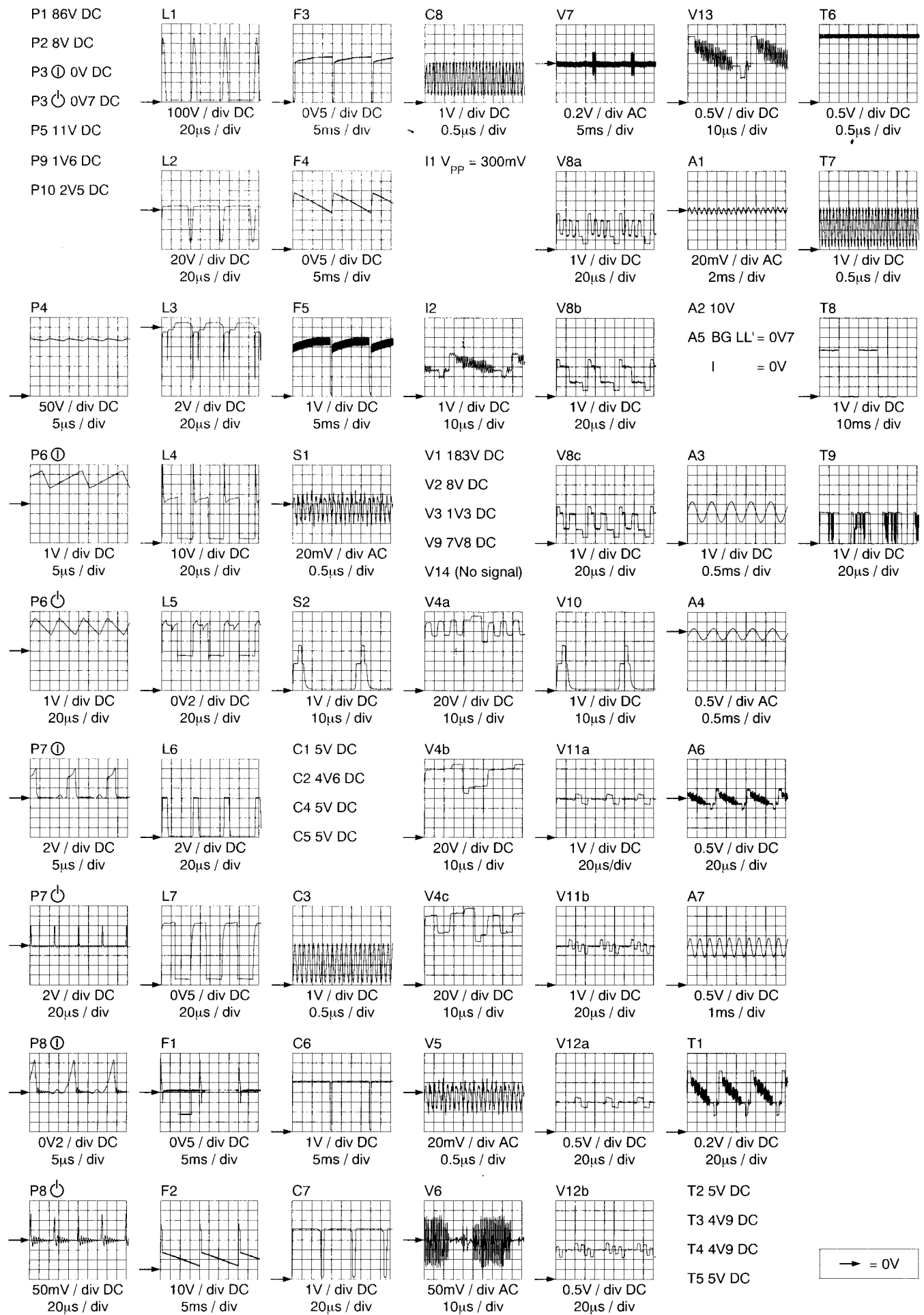
B



IC7400
CL 56532007/12B
080295

Functional block overview
(component side)

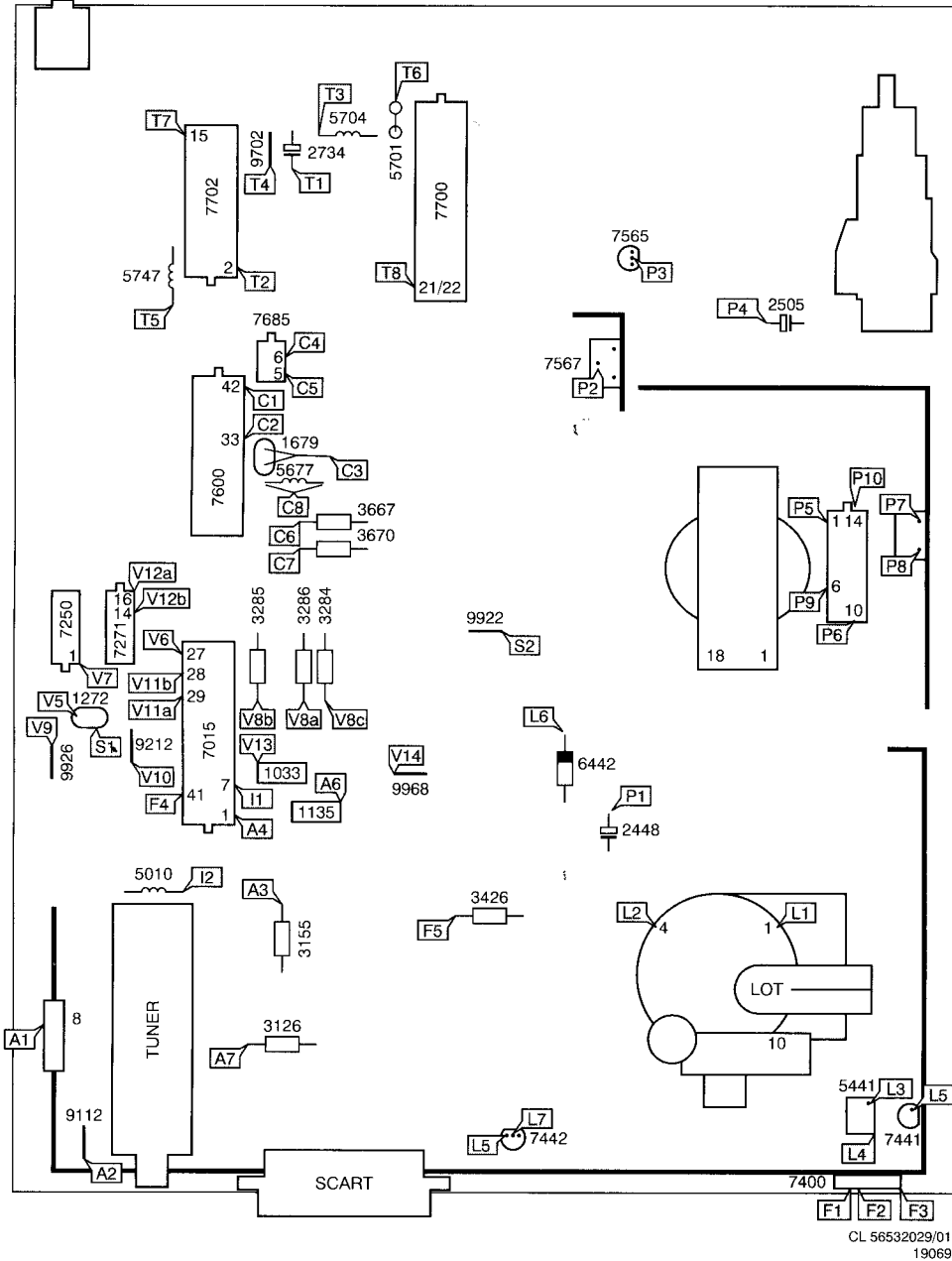
5. Overview oscillograms / Übersicht Oszillogramme / Vue d'ensemble des oscillogrammes



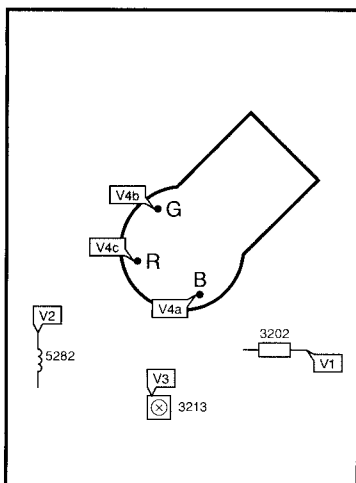
Survey of testpoints / Übersicht über die Teststellen / Presentation des points à tester

BI

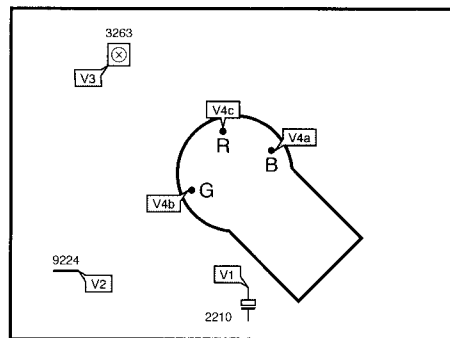
Main carrier (Component side)



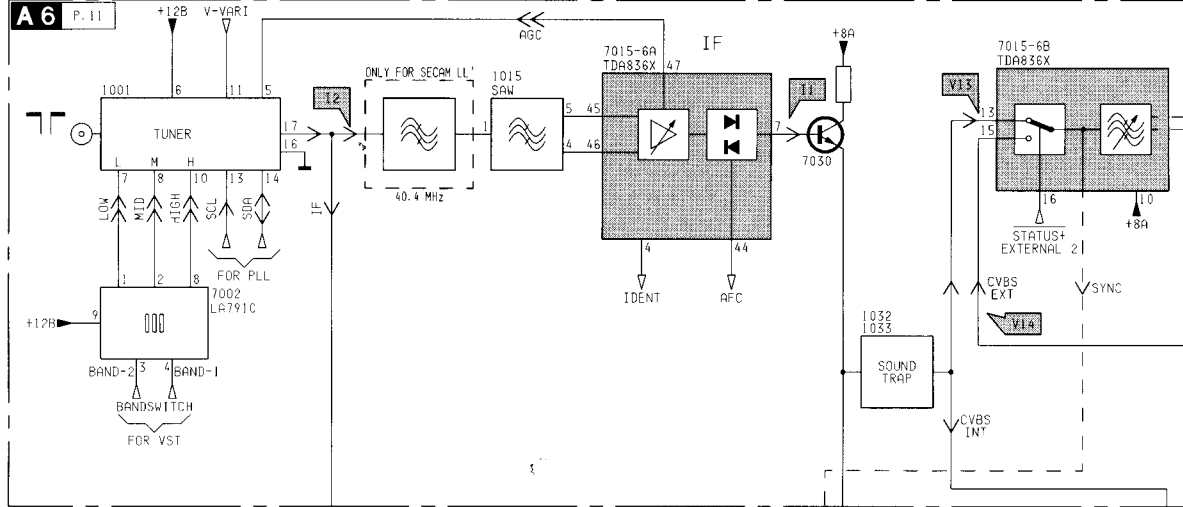
Mini neck CRT panel (Back view)



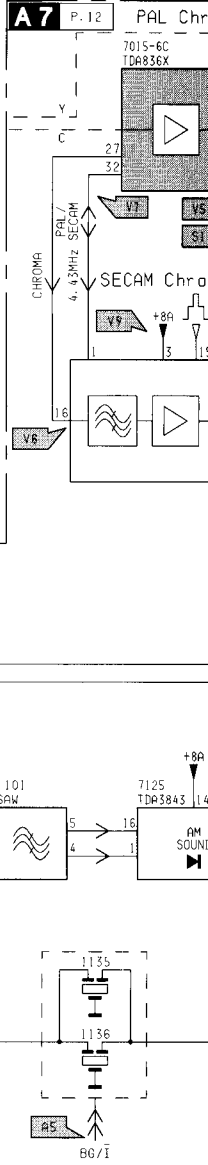
Narrow neck CRT panel (Back view)



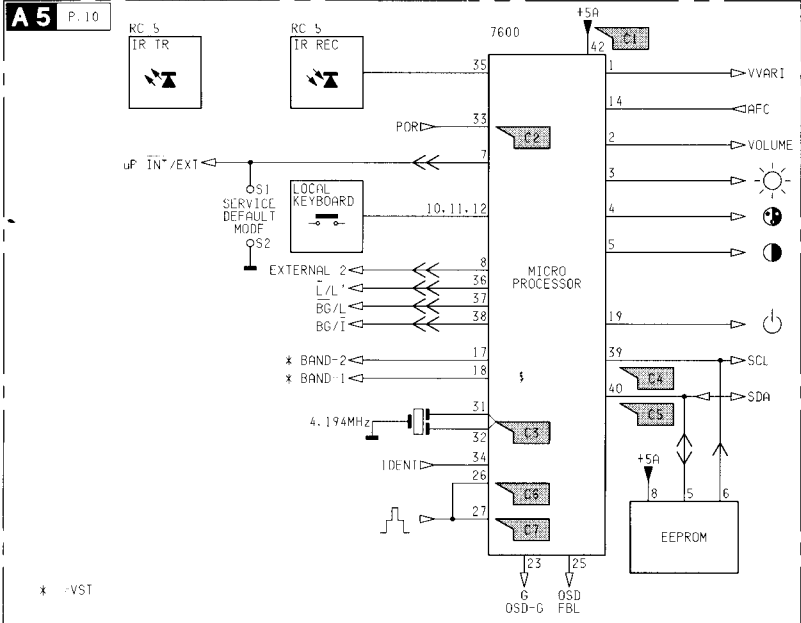
TUNING + IF



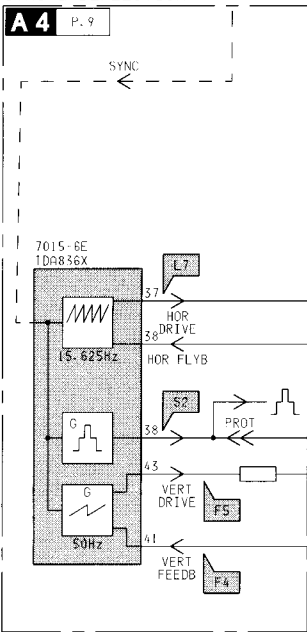
VIDEO + SOUND



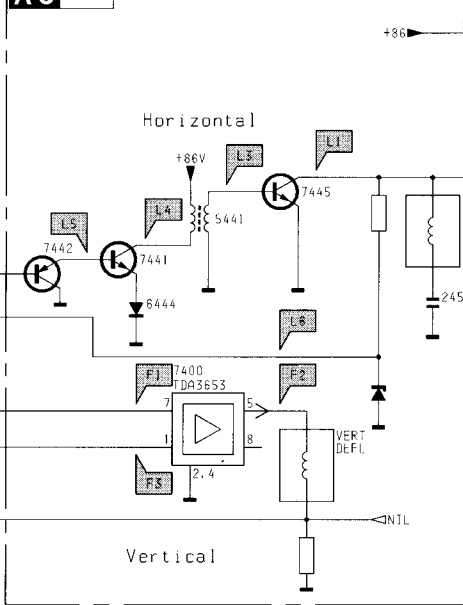
CONTROL



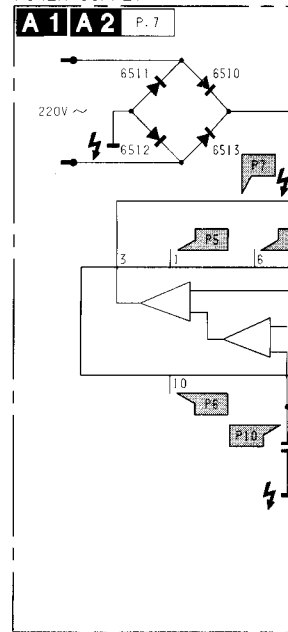
SYNC & DEFLECTION



Horizontal



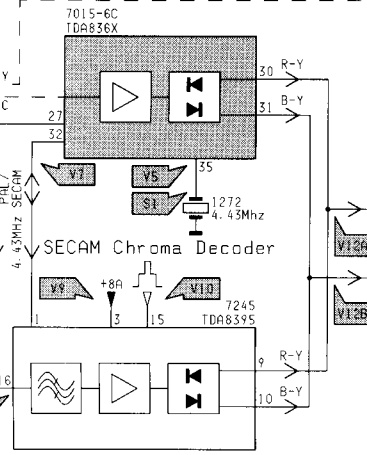
POWER SUPPLY



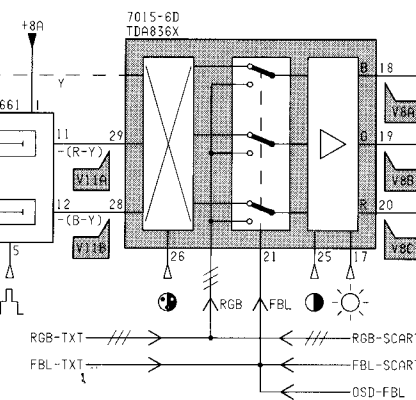
- - - - - = SIGNAL LINE
 [] = INSIDE IC7015

VIDEO + SOUND

A7 P. 12 PAL Chroma decoder

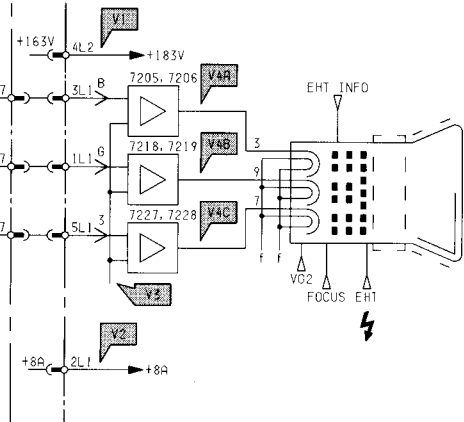


Delay Line Video Controller



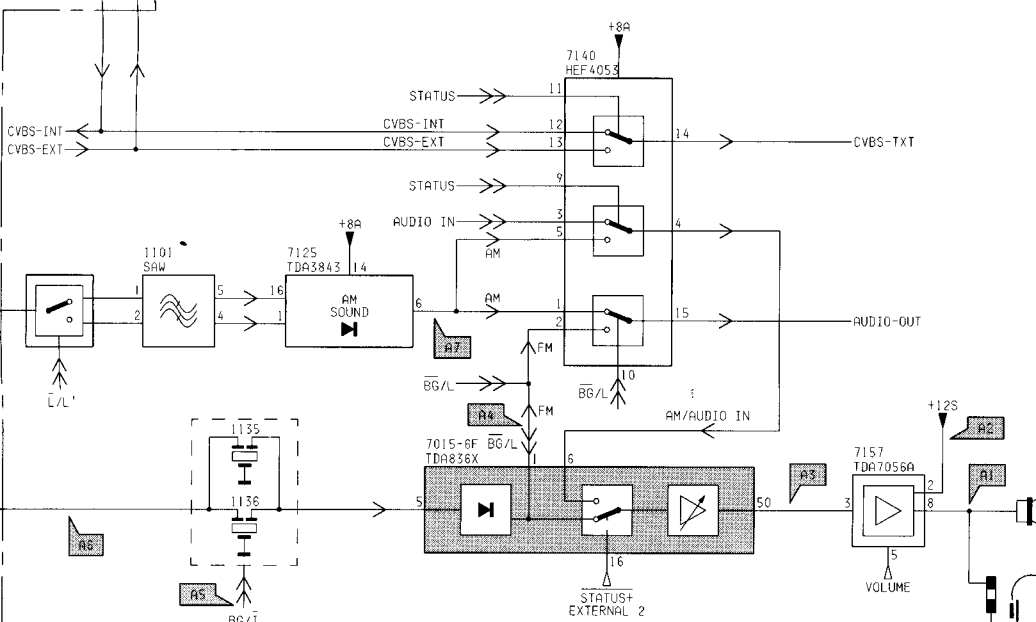
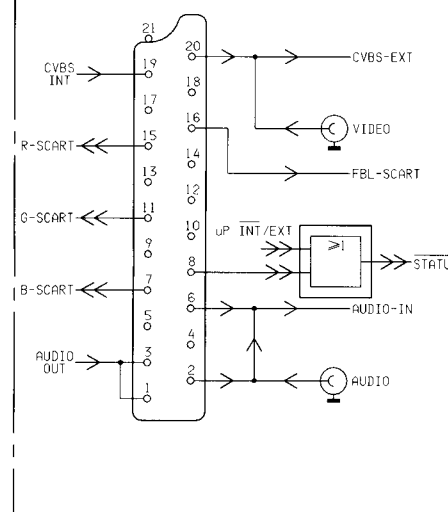
CRT PANEL

B1 B2 P. 14



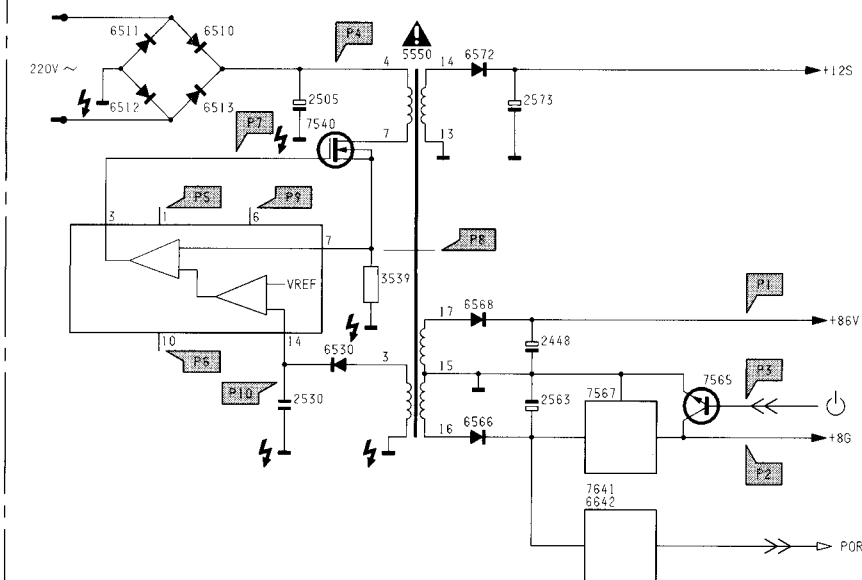
CONNECTIONS

A6 P. 11



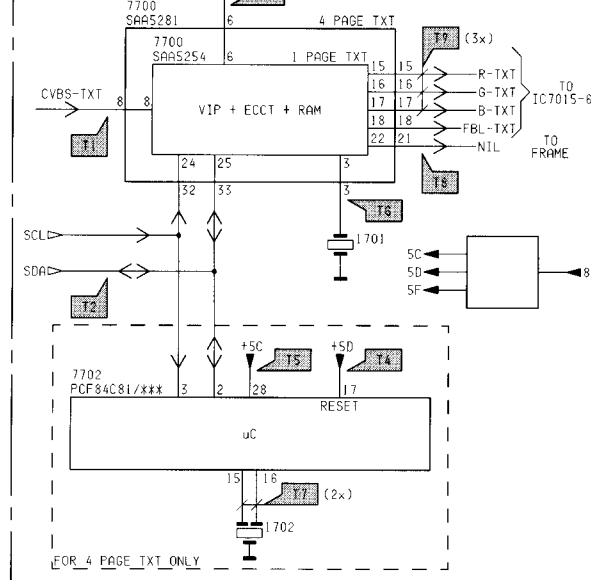
POWER SUPPLY

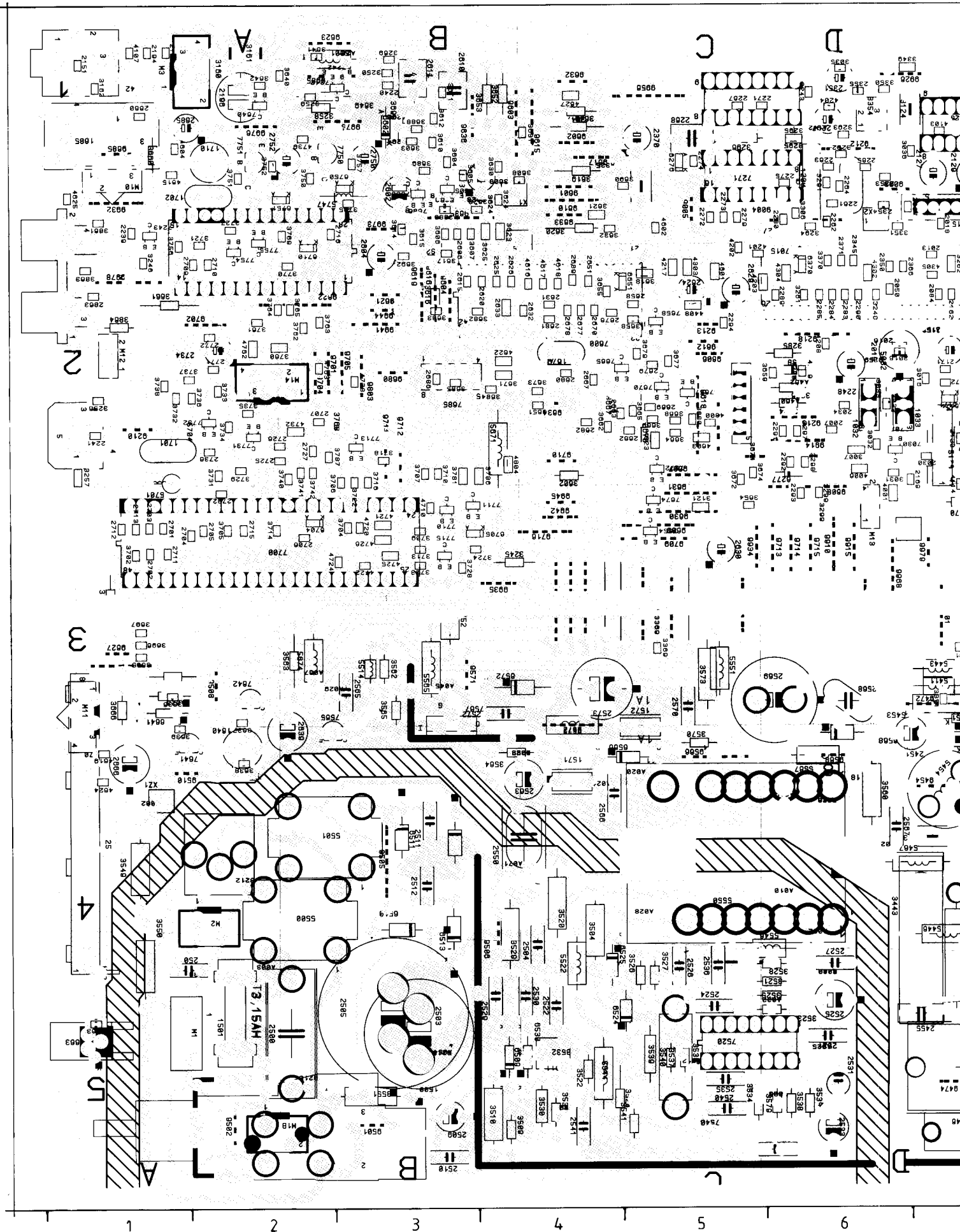
A1 A2 P. 7



TELETEXT

A9 P. 13





1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160

161

162

163

164

165

166

167

168

169

170

171

172

173

174

175

176

177

178

179

180

181

182

183

184

185

186

187

188

189

190

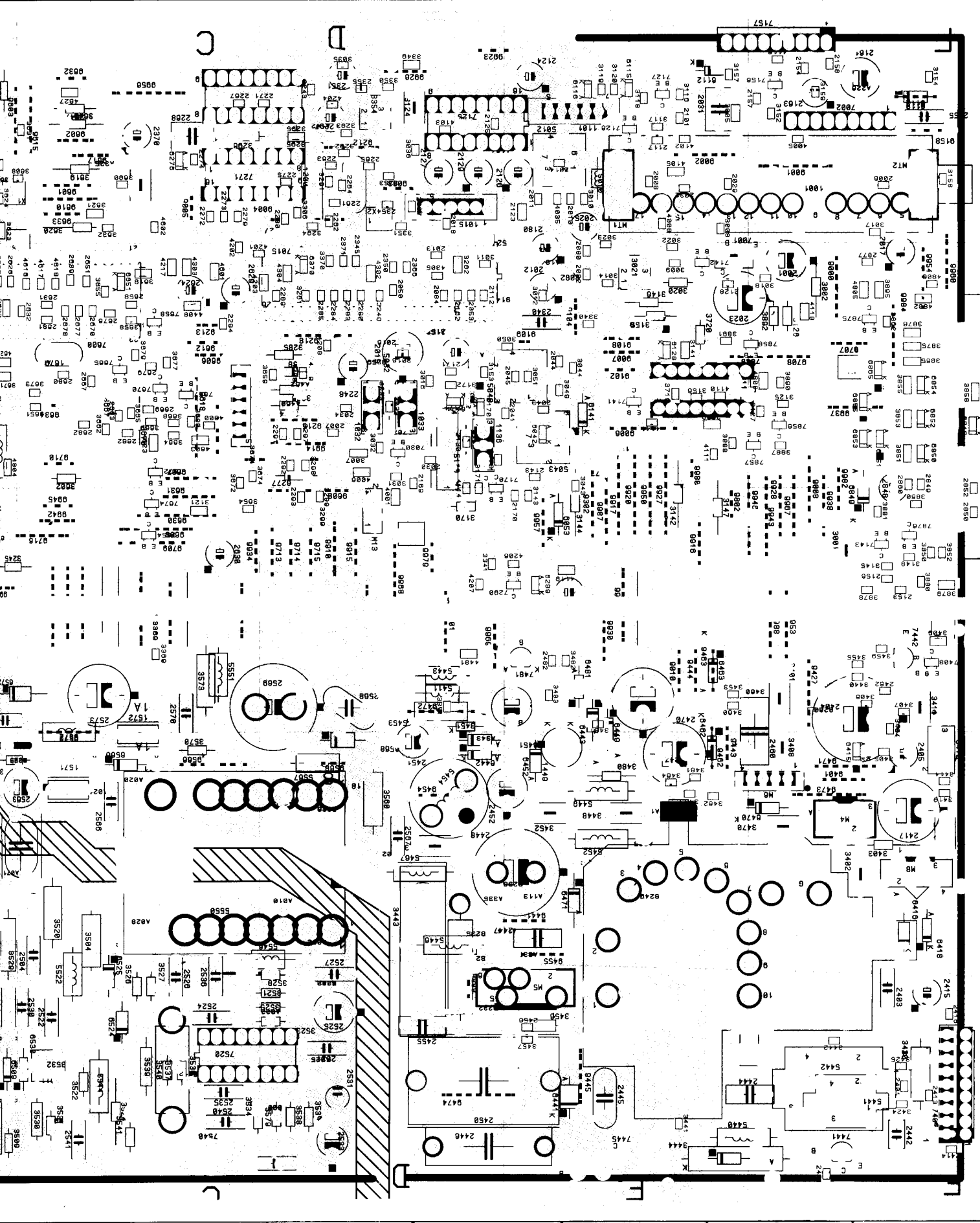
191

192

193

194

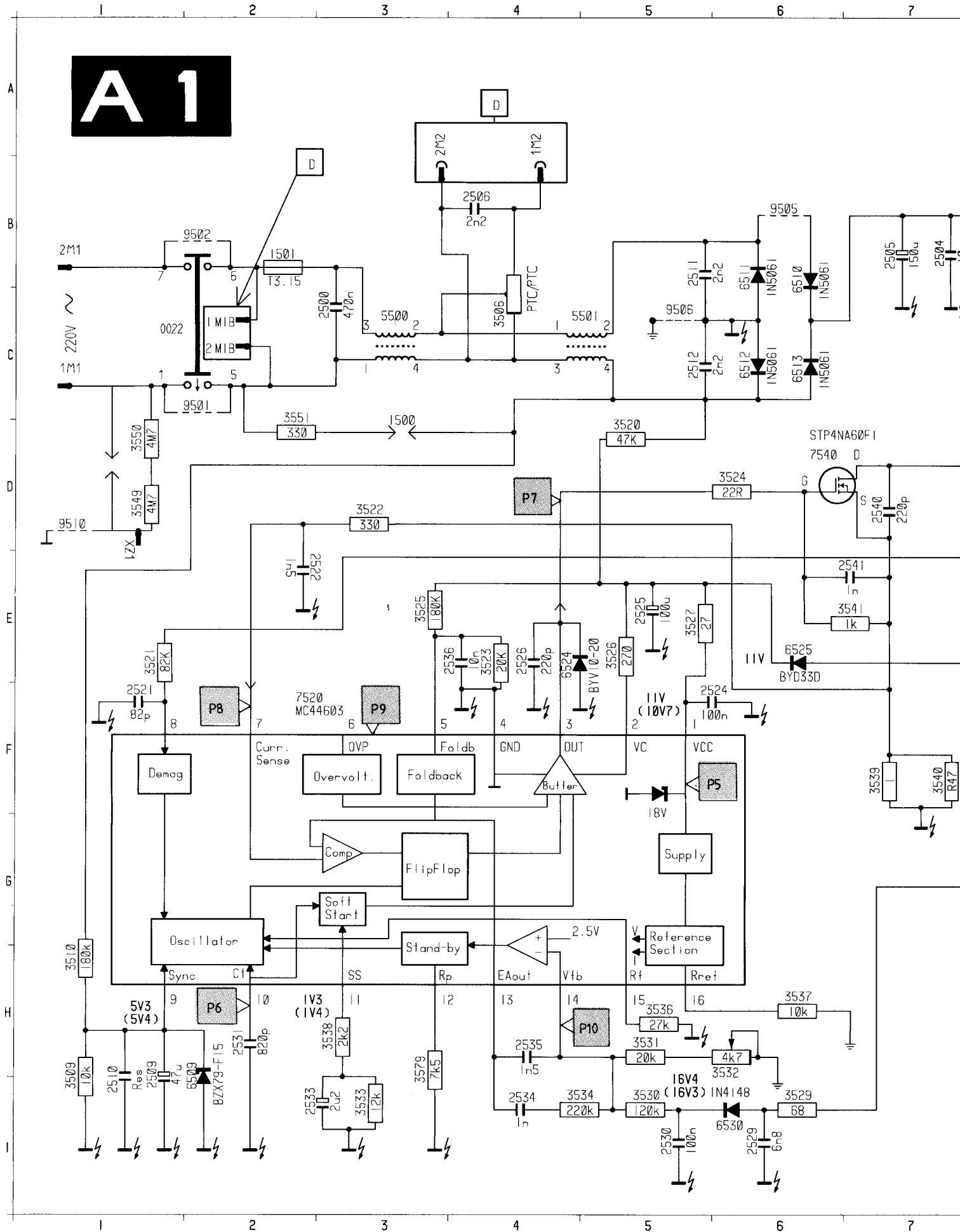
195

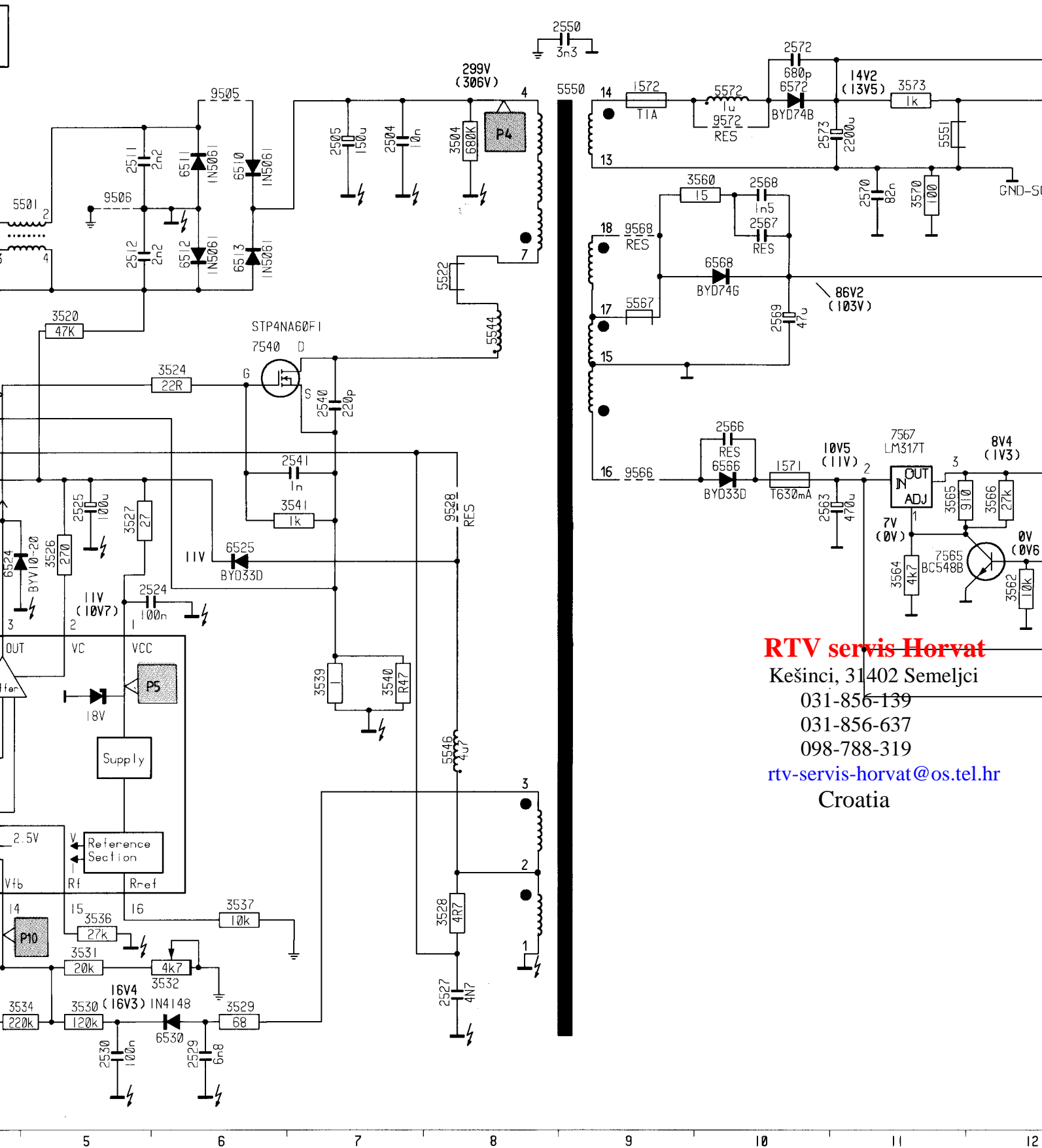


A
B
C
D
E
F
G
H
I

4
5
6
7
8
9
10

A1





RTV servis Horvat

Kešinci, 31402 Semeljci

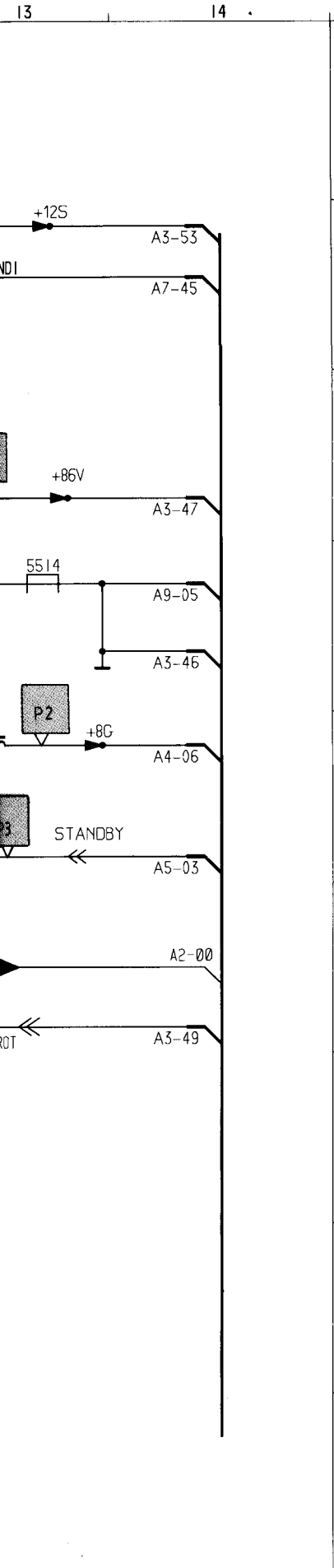
031-856-139

031-856-637

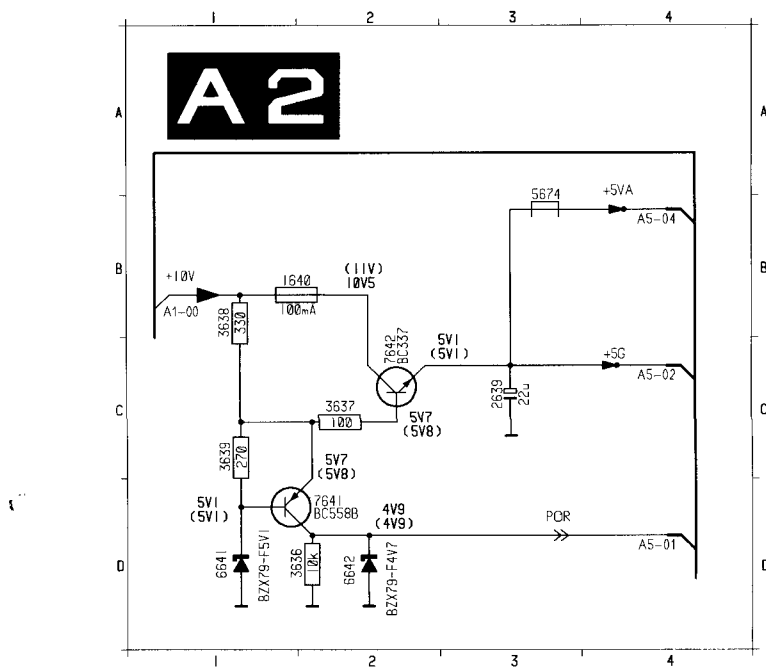
098-788-319

rtv-servis-horvat@os.tel.hr

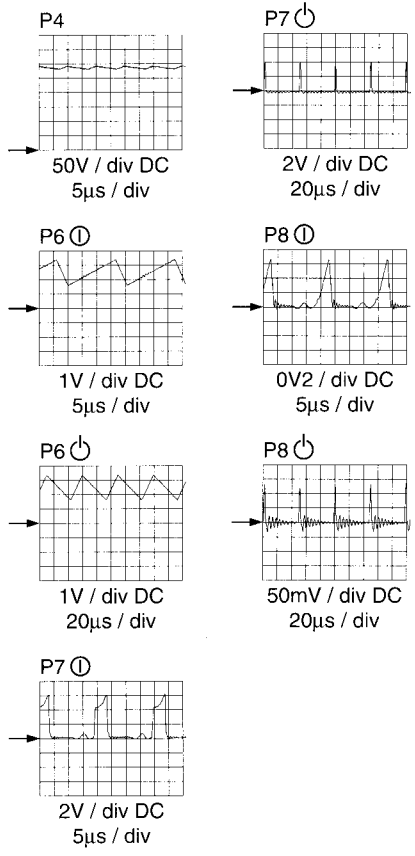
Croatia



| | | | |
|------|------|-------|------|
| 0022 | C 1 | 7520 | E 3 |
| 1500 | D 3 | 7540 | D 6 |
| 1501 | B 2 | 7565 | E 11 |
| 1571 | E 10 | 7567 | D 11 |
| 1572 | B 9 | 9501 | C 2 |
| 2500 | B 3 | 9502 | B 2 |
| 2504 | B 7 | 9505 | B 6 |
| 2505 | B 7 | 9506 | B 5 |
| 2506 | B 4 | 9510 | D 8 |
| 2509 | H 1 | 9528 | E 8 |
| 2510 | H 1 | 9566 | E 9 |
| 2511 | B 5 | 9568 | F 9 |
| 2512 | B 5 | 9571 | F 12 |
| 2521 | F 2 | 9572 | B 10 |
| 2522 | F 2 | A2-00 | F 14 |
| 2524 | F 6 | M1 | C 1 |
| 2525 | F 5 | M1 | B 1 |
| 2526 | E 4 | M1B | C 2 |
| 2527 | I 1 | M1B | C 3 |
| 2529 | I 1 | M2 | A 4 |
| 2530 | I 5 | M2 | A 4 |
| 2531 | H 2 | S-03 | E 14 |
| 2533 | I 2 | S-05 | D 14 |
| 2534 | I 4 | S-06 | E 14 |
| 2535 | H 4 | S-45 | B 14 |
| 2536 | E 4 | S-46 | D 14 |
| 2540 | D 7 | S-47 | C 14 |
| 2541 | E 7 | S-48 | B 14 |
| 2550 | A 9 | S-49 | F 14 |
| 2563 | E 10 | XZ1 | D 1 |
| 2565 | E 12 | | |
| 2566 | D 10 | | |
| 2567 | C 10 | | |
| 2568 | C 10 | | |
| 2569 | D 10 | | |
| 2570 | C 11 | | |
| 2572 | B 10 | | |
| 2573 | B 10 | | |
| 3504 | B 8 | | |
| 3506 | C 4 | | |
| 3509 | H 1 | | |
| 3510 | D 5 | | |
| 3520 | D 3 | | |
| 3521 | E 4 | | |
| 3522 | D 3 | | |
| 3523 | E 4 | | |
| 3524 | D 6 | | |
| 3525 | E 5 | | |
| 3526 | E 5 | | |
| 3527 | E 5 | | |
| 3528 | H 8 | | |
| 3529 | I 1 | | |
| 3530 | I 5 | | |
| 3531 | H 5 | | |
| 3532 | H 3 | | |
| 3533 | I 3 | | |
| 3534 | I 5 | | |
| 3536 | H 6 | | |
| 3537 | H 6 | | |
| 3538 | H 3 | | |
| 3539 | F 7 | | |
| 3540 | F 7 | | |
| 3541 | E 7 | | |
| 3549 | D 1 | | |
| 3550 | D 2 | | |
| 3551 | C 10 | | |
| 3560 | F 12 | | |
| 3562 | E 12 | | |
| 3563 | E 11 | | |
| 3564 | E 11 | | |
| 3565 | E 11 | | |
| 3566 | E 12 | | |
| 3570 | C 11 | | |
| 3573 | B 11 | | |
| 3579 | H 3 | | |
| 5500 | C 3 | | |
| 5501 | C 5 | | |
| 5514 | D 3 | | |
| 5522 | C 8 | | |
| 5544 | D 8 | | |
| 5546 | G 8 | | |
| 5550 | B 8 | | |
| 5551 | B 11 | | |
| 5565 | E 13 | | |
| 5567 | C 9 | | |
| 5572 | B 10 | | |
| 6509 | H 1 | | |
| 6510 | B 6 | | |
| 6511 | B 6 | | |
| 6512 | C 6 | | |
| 6513 | C 6 | | |
| 6524 | E 4 | | |
| 6525 | E 1 | | |
| 6530 | I 6 | | |
| 6566 | E 10 | | |
| 6568 | C 10 | | |
| 6572 | B 10 | | |



| | |
|------|-----|
| 1640 | B 1 |
| 2639 | C 2 |
| 3638 | C 3 |
| 3637 | C 3 |
| 3638 | B 1 |
| 3639 | B 3 |
| 5674 | D 2 |
| 6641 | D 2 |
| 6642 | D 2 |
| 7641 | D 2 |
| 7642 | D 2 |
| S-01 | D 4 |
| S-02 | C 4 |
| S-04 | B 4 |

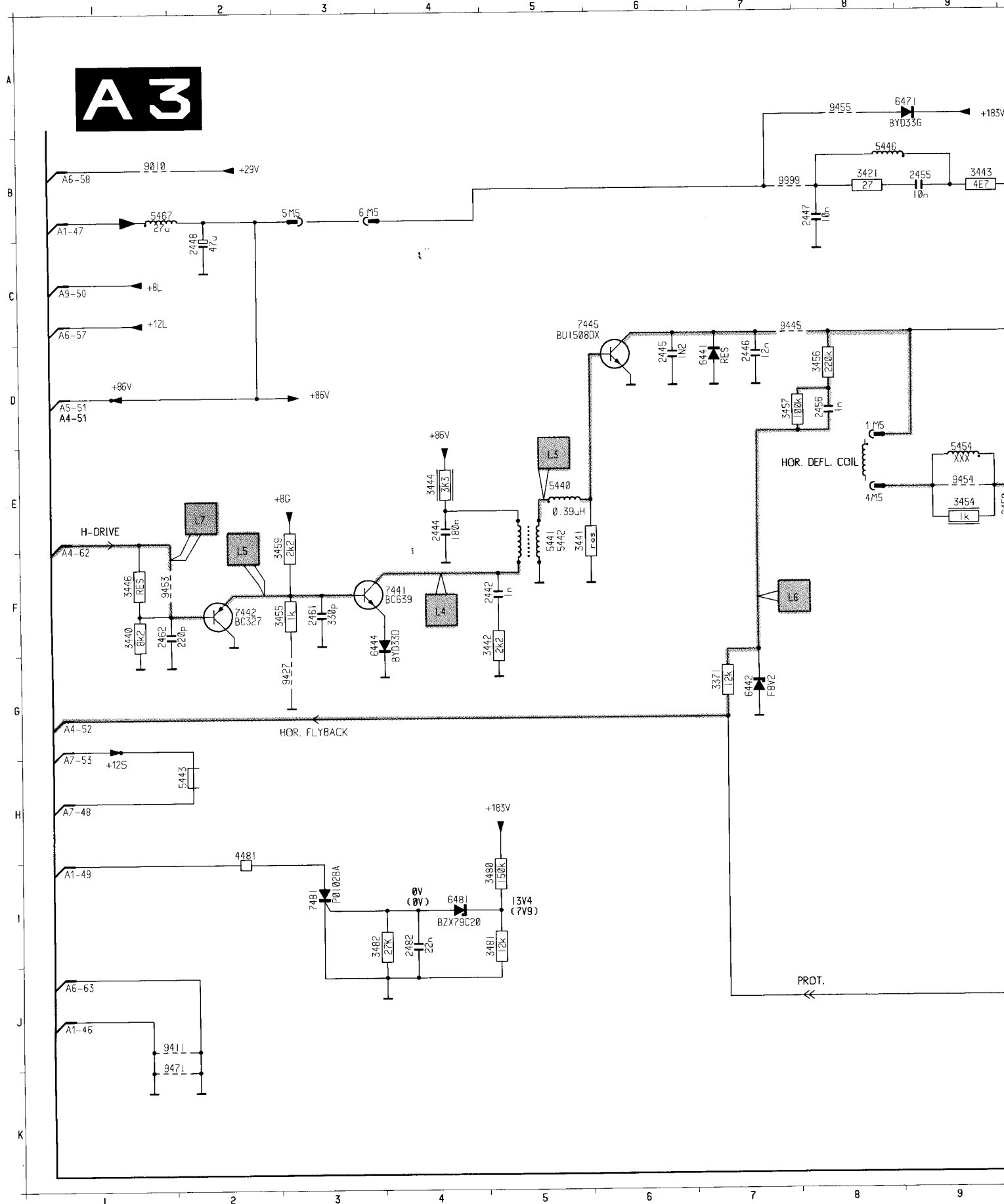


- P1 86V DC
- P2 8V DC
- P3 0V DC
- P3 0V7 DC
- P5 11V DC
- P9 1V6 DC
- P10 2V5 DC

Deflection / Ablenkung / Déflexion

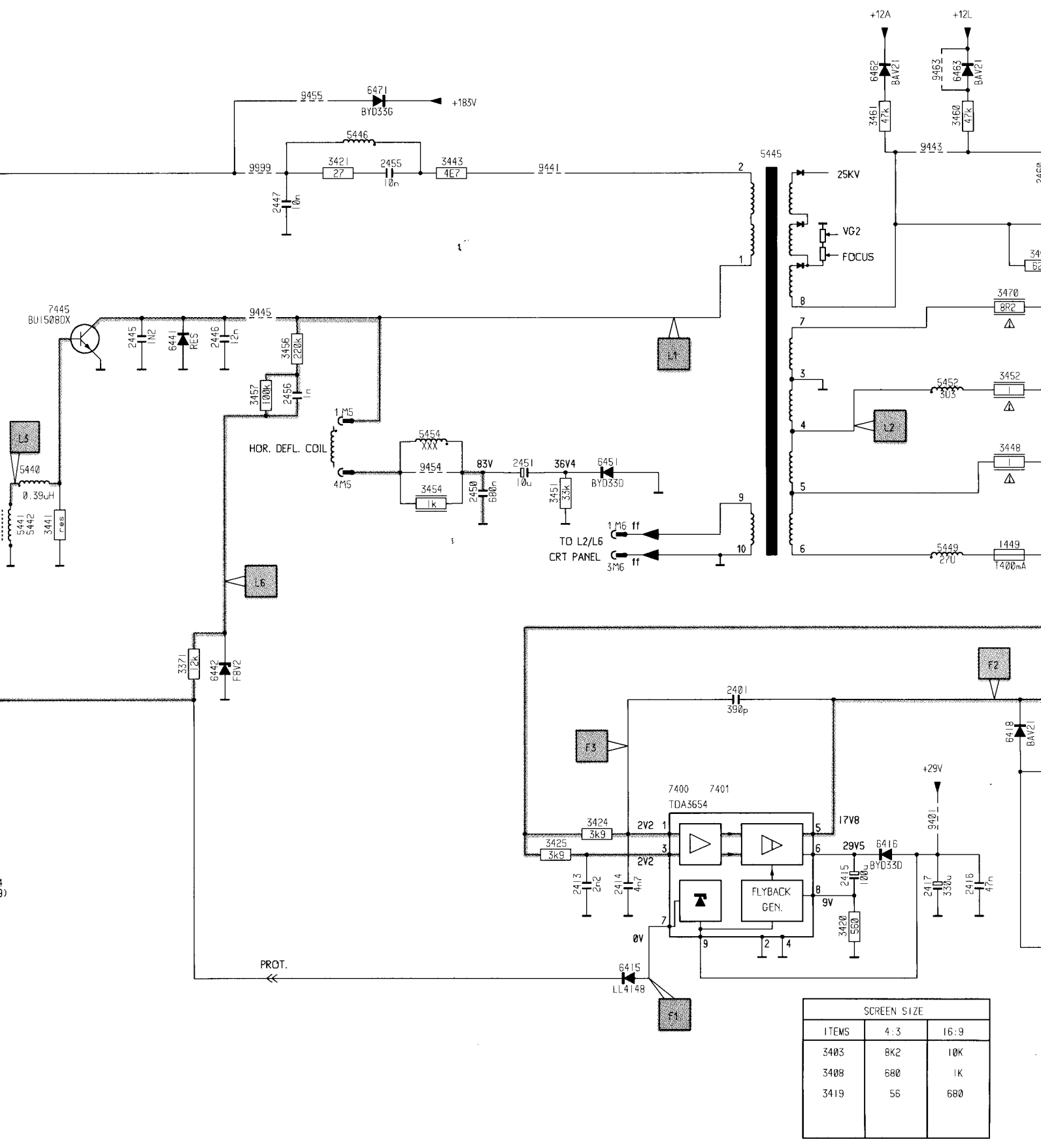
Deflec

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|------|------|-----|------|-----|------|-----|------|-----|------|-----|------|------|------|-----|
| 1449 | F15 | 2414 | I11 | 2444 | E 4 | 2451 | E10 | 2461 | F 3 | 3402 | H16 | 3408 | I15 | 3419 | K17 | 3441 | E 5 | 3451 | E10 | 3457 | D 7 | 3464 | C16 | 5440 | F 5 | 5449 | F14 | 6416 | I 1 |
| 2401 | G12 | 2415 | I13 | 2445 | D 6 | 2452 | D16 | 2462 | F 1 | 3403 | I16 | 3409 | J18 | 3420 | I13 | 3442 | F 6 | 3452 | D15 | 3459 | E 3 | 3470 | C16 | 5441 | F 5 | 5452 | D14 | 6418 | G 1 |
| 2403 | H16 | 2416 | I14 | 2446 | D 7 | 2453 | F16 | 2470 | D16 | 3404 | I16 | 3410 | J17 | 3421 | B 8 | 3443 | B 9 | 3453 | B10 | 3460 | A14 | 3480 | C16 | 5442 | F 5 | 5453 | D14 | 6441 | G 2 |
| 2404 | I16 | 2417 | I14 | 2447 | B 8 | 2455 | B 9 | 2482 | I 4 | 3405 | I17 | 3411 | J16 | 3424 | H11 | 3444 | F 4 | 3454 | B11 | 3461 | A13 | 3481 | C16 | 5443 | F 5 | 5454 | F 9 | 6442 | F 3 |
| 2405 | I17 | 2442 | F 5 | 2448 | C 2 | 2456 | D 8 | 3371 | G 7 | 3406 | I17 | 3412 | J16 | 3425 | F 10 | 3445 | F 1 | 3455 | D 8 | 3462 | C15 | 3482 | C16 | 5444 | B 8 | 5455 | B 11 | 6443 | F 4 |
| 2413 | I11 | 2443 | E16 | 2450 | E10 | 2460 | B15 | 3401 | H15 | 3407 | J17 | 3414 | J17 | 3440 | F 11 | 3448 | E15 | 3456 | D 8 | 3463 | C15 | 4481 | H 2 | 5446 | B 8 | 5446 | B 8 | 6415 | J11 |



Deflection / Ablenkung / Déflexion

5 6 7 8 9 10 11 12 13 14 15



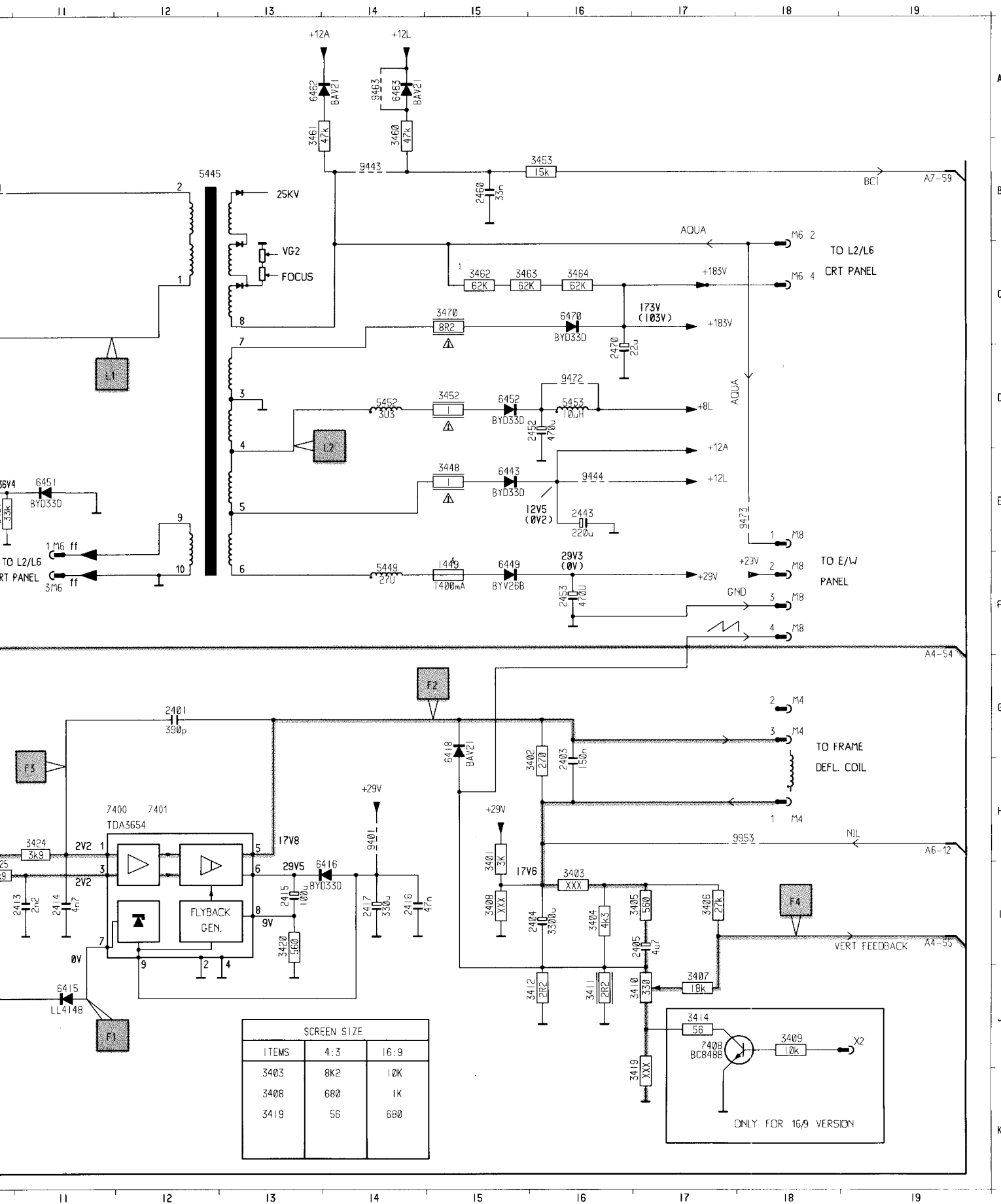
5 6 7 8 9 10 11 12 13 14 15

Ablenkung / Déflexion

AA5

8

| | | | | | | | | | | | | | | | | | | | |
|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|----|-----|----|-----|----|-----|
| 6471 | A 9 | 7442 | F 2 | 9427 | G 3 | 9454 | E 9 | 9953 | H18 | D-50 | C 1 | D-57 | C 1 | M4 | H18 | M5 | D 8 | M8 | F18 |
| 6481 | I 4 | 7445 | C 5 | 9441 | B10 | 9455 | A 8 | 9999 | B 7 | D-51 | D 1 | D-58 | B 1 | M4 | G18 | M6 | F11 | M8 | F18 |
| 7400 | H11 | 7481 | I 3 | 9443 | B14 | 9463 | A14 | D-46 | J 1 | D-52 | G 1 | D-59 | B19 | M4 | B18 | M6 | F11 | M8 | F18 |
| 7401 | H12 | 9010 | B 1 | 9444 | E16 | 9471 | K 1 | D-47 | B 1 | D-53 | H 1 | D-60 | F19 | M5 | B 3 | M6 | C18 | X2 | J19 |
| 7408 | J17 | 9401 | H14 | 9445 | C 7 | 9472 | D16 | D-48 | H 1 | D-54 | G19 | D-62 | F 1 | M5 | B 3 | M6 | B18 | | |
| 7441 | F 4 | 9411 | J 1 | 9453 | F 1 | 9473 | E18 | D-49 | I 1 | D-55 | I19 | D-63 | J 1 | M5 | F 8 | M8 | F18 | | |



Synchronization / Synchronisierung /

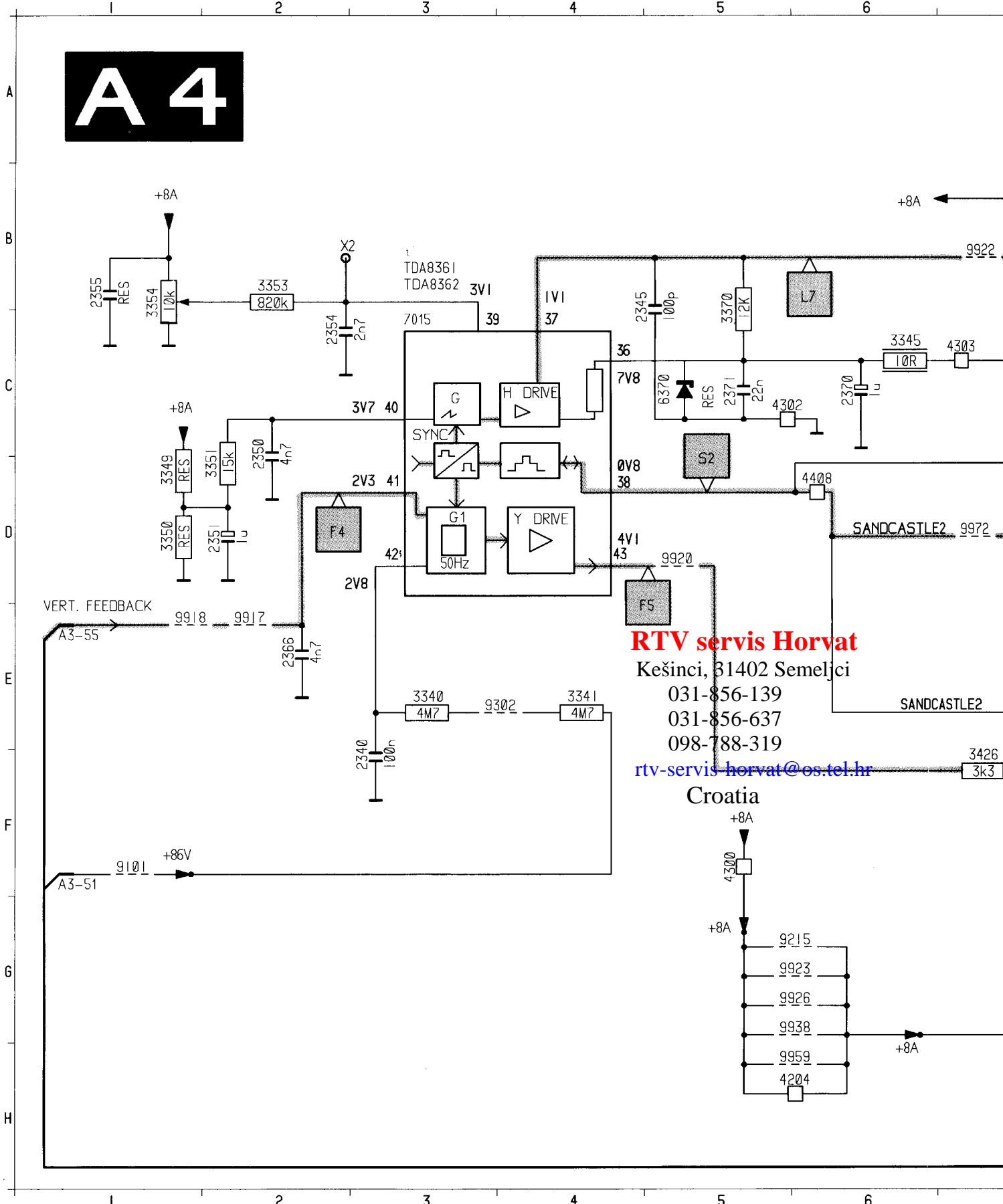
AA5

9

Sym

| | | | | | | | | | | | | | | | | | | | | |
|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|--------|-----|-------|-----|------|
| 2340 | F 3 | 2355 | B 1 | 3341 | E 4 | 3353 | B 2 | 3426 | F 7 | 4302 | C 5 | 9101 | F 1 | 9920 | D 5 | 9938 | G 6 | A6-75 | H 8 | B-29 |
| 2345 | B 5 | 2366 | F 2 | 3345 | C 6 | 3354 | B 1 | 3664 | F 8 | 4303 | C 7 | 9215 | G 6 | 9922 | B 7 | 9959 | H 6 | A7-75 | H 8 | B-37 |
| 2350 | C 2 | 2370 | C 5 | 3349 | D 1 | 3368 | D 8 | 3668 | F 8 | 4408 | D 6 | 9302 | E 4 | 9923 | G 6 | 9972 | D 7 | A8-75 | H 8 | B-41 |
| 2351 | D 2 | 2371 | C 5 | 3350 | D 1 | 3369 | D 7 | 4204 | H 6 | 6370 | C 5 | 9917 | E 2 | 9924 | B 7 | A3-202 | D 8 | B-06 | B 8 | B-41 |
| 2354 | C 2 | 3340 | F 3 | 3351 | D 2 | 3370 | B 5 | 4300 | F 5 | 7015 | C 3 | 9918 | E 1 | 9926 | G 6 | A5-75 | H 8 | B-28 | E 8 | B-51 |

A 4



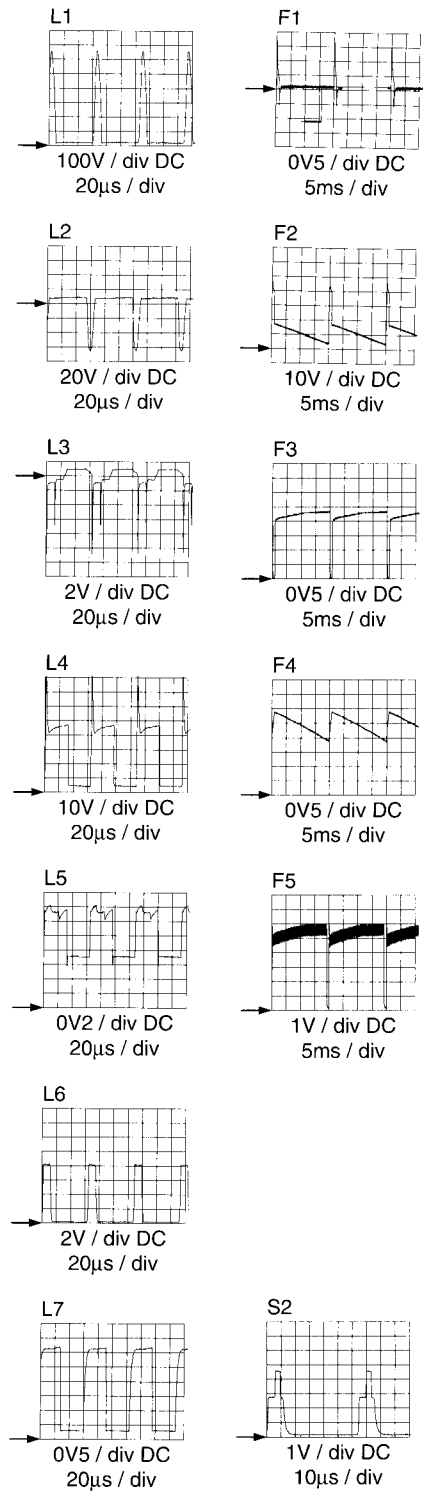
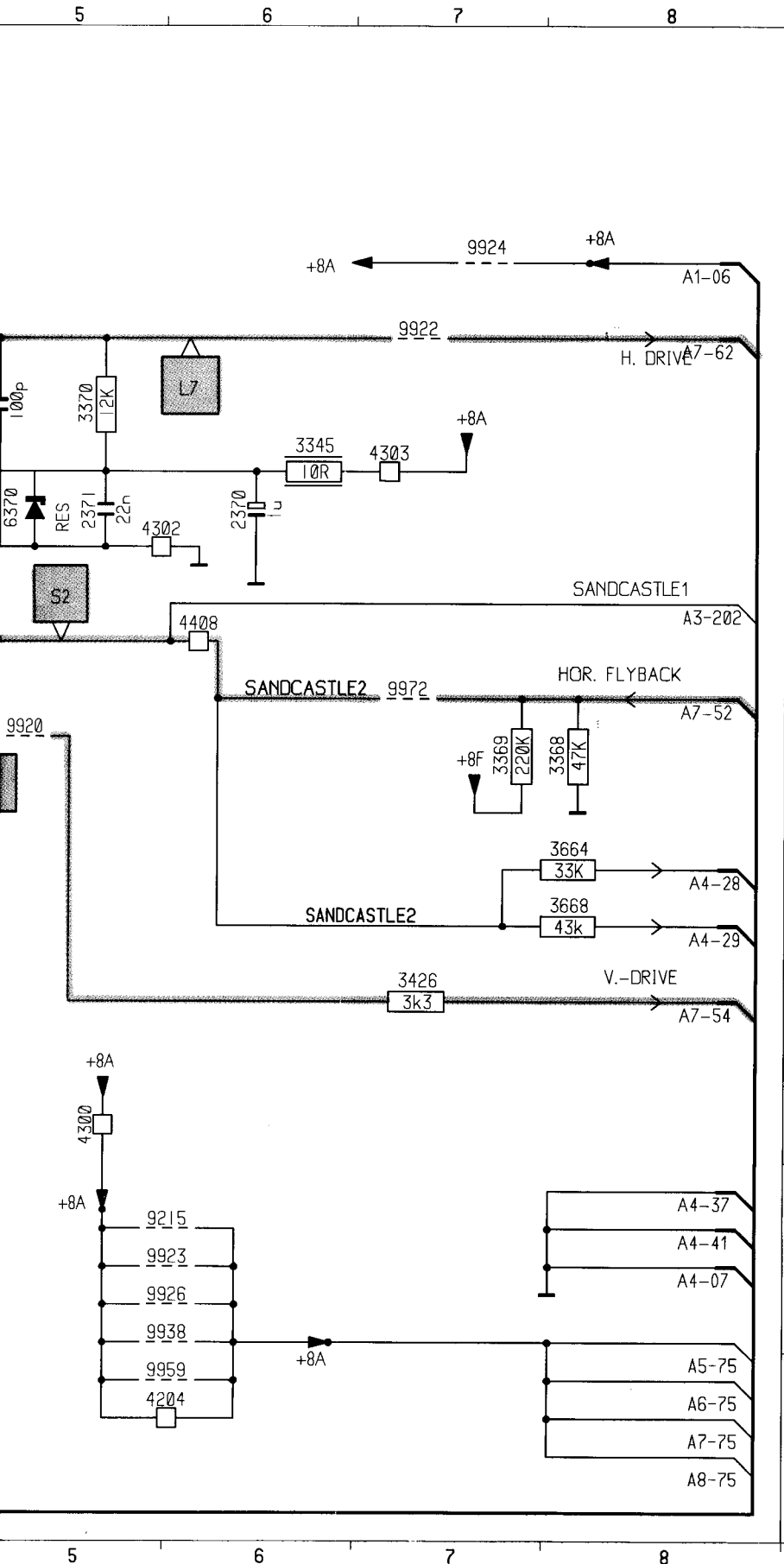
RTV servis Horvat
 Kešinci, 31402 Semeljci
 031-856-139
 031-856-637
 098-788-319

rtv-servis-horvat@os.tel.hr

Croatia

Synchronisation

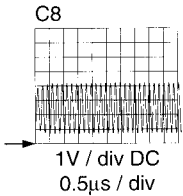
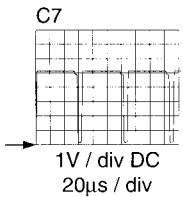
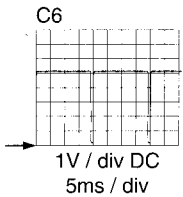
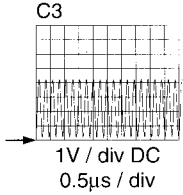
| | | | | | | | | | | |
|---|------|-----|--------|-----|-------|-----|------|-----|------|-----|
| 1 | 9920 | D 5 | 9938 | G 6 | A6-75 | H 8 | B-29 | E 8 | B-52 | D 8 |
| 4 | 9922 | B 7 | 9959 | H 6 | A7-75 | H 8 | B-37 | G 8 | B-54 | F 8 |
| 4 | 9923 | G 6 | 9972 | D 7 | A8-75 | H 8 | B-41 | G 8 | B-55 | E 1 |
| 2 | 9924 | B 7 | A3-202 | D 8 | B-06 | B 8 | B-41 | G 8 | B-62 | B 8 |
| 1 | 9926 | G 6 | A5-75 | H 8 | B-28 | E 8 | B-51 | F 1 | X2 | B 2 |



- C1 5V DC
- C2 4V6 DC
- C4 5V DC
- C5 5V DC

A5

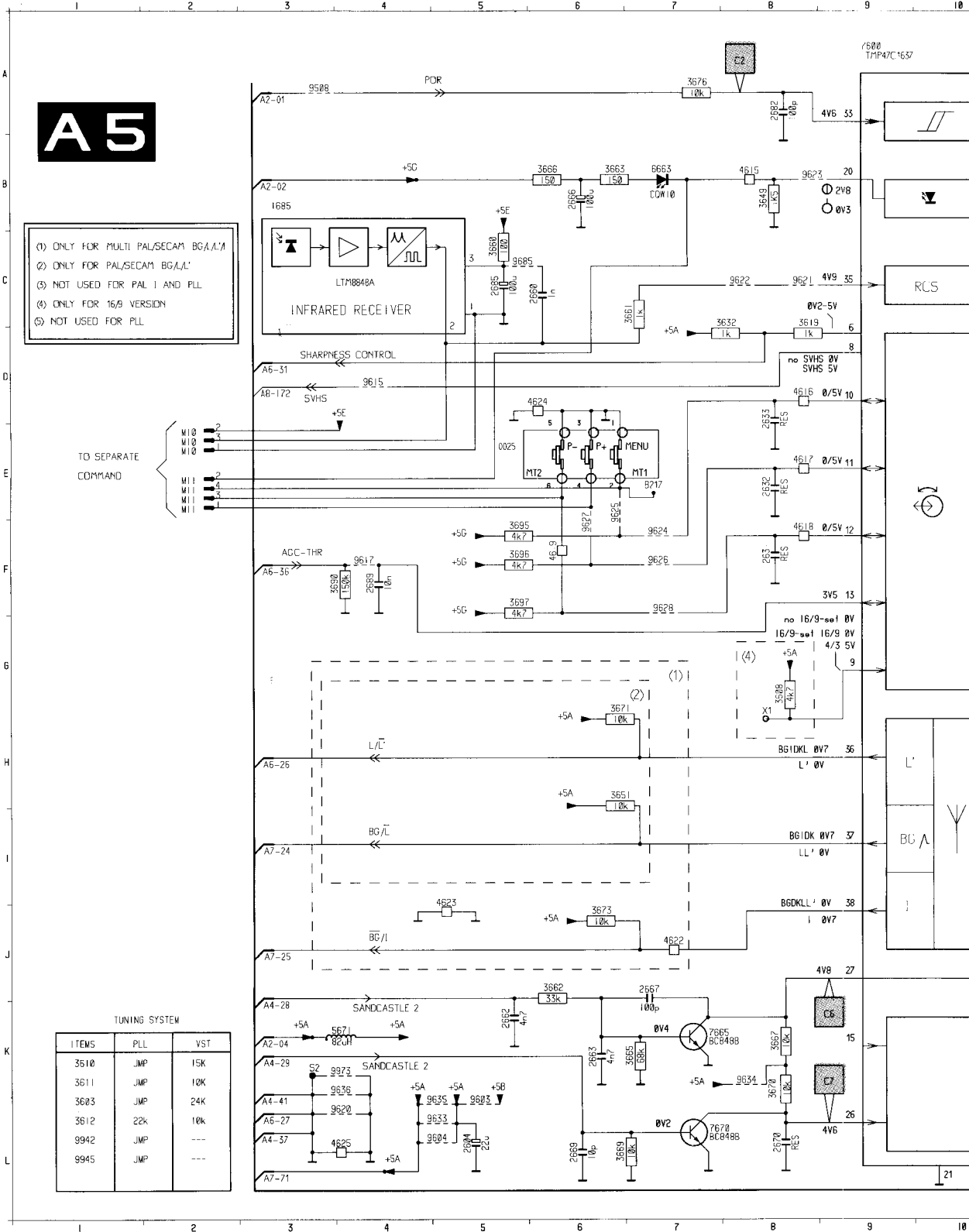
(1) ONLY FOR MULTI PAL/SECAM BG/L/L'
 (2) ONLY FOR PAL/SECAM BG/L/L'
 (3) NOT USED FOR PAL I AND PLL
 (4) ONLY FOR 16/9 VERSION
 (5) NOT USED FOR PLL

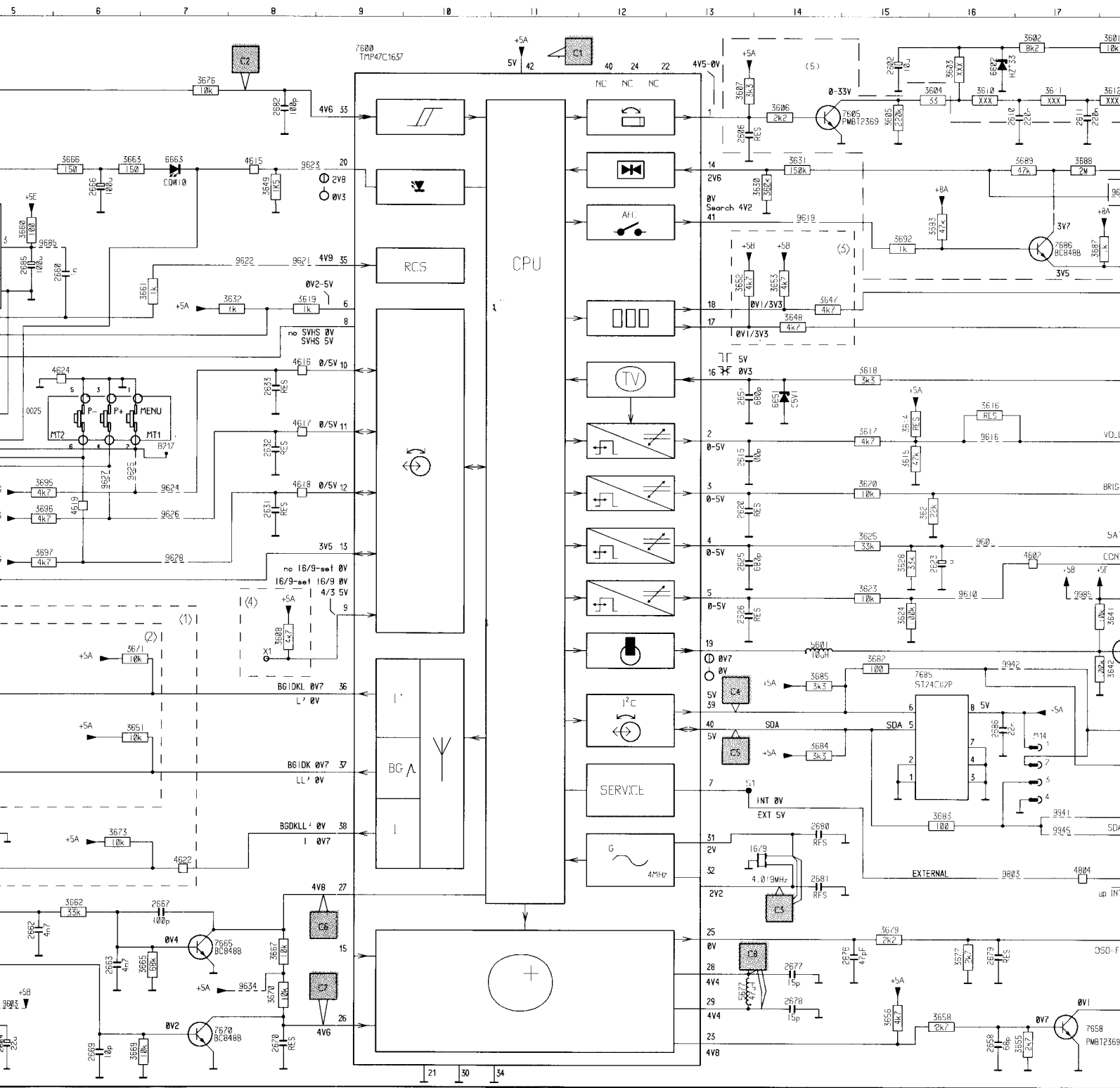


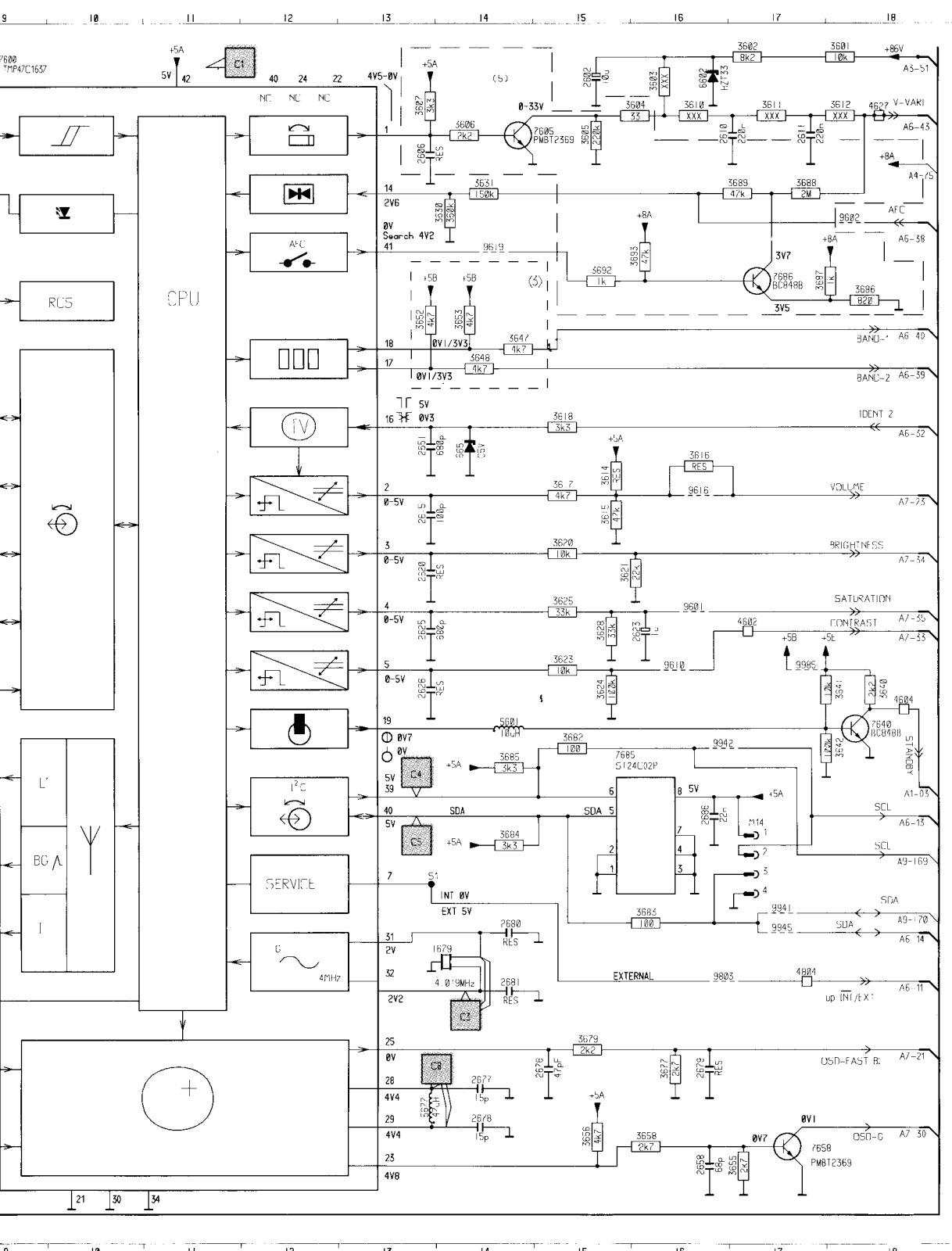
TO SEPARATE
COMMAND

TUNING SYSTEM

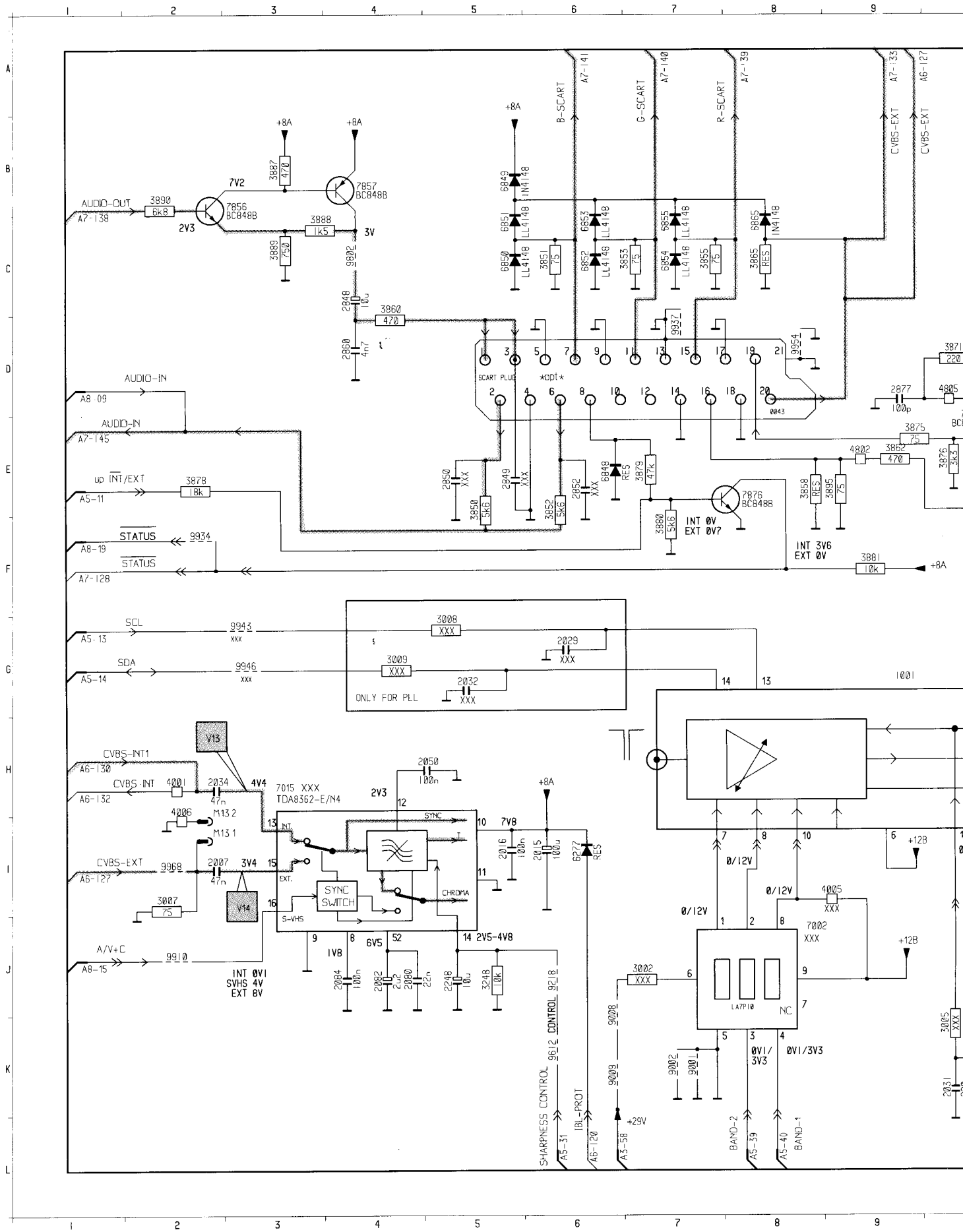
| ITEMS | PLL | VST |
|-------|-----|-----|
| 3610 | JMP | 15K |
| 3611 | JMP | 10K |
| 3603 | JMP | 24K |
| 3612 | 22k | 10k |
| 9942 | JMP | --- |
| 9945 | JMP | --- |

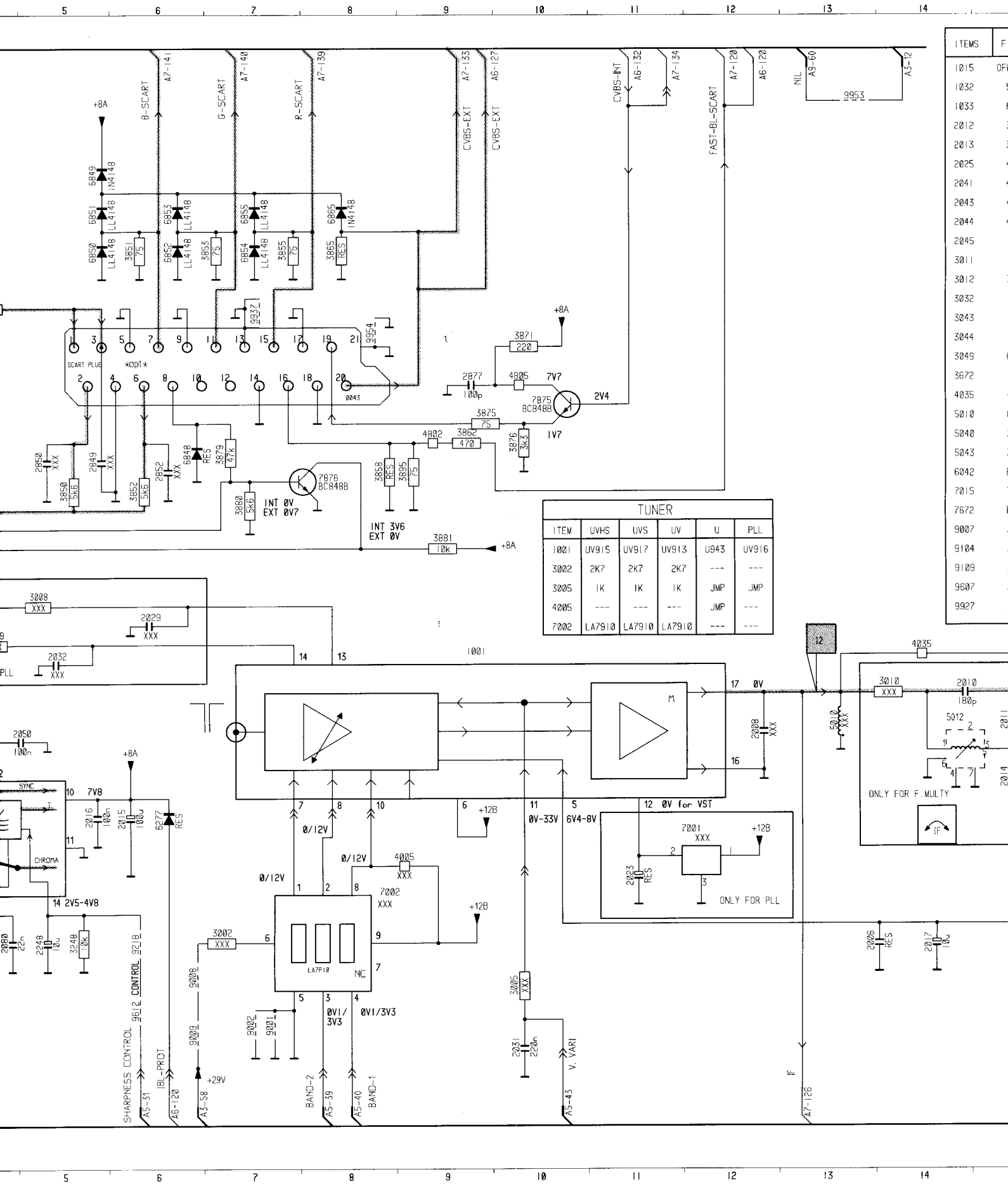






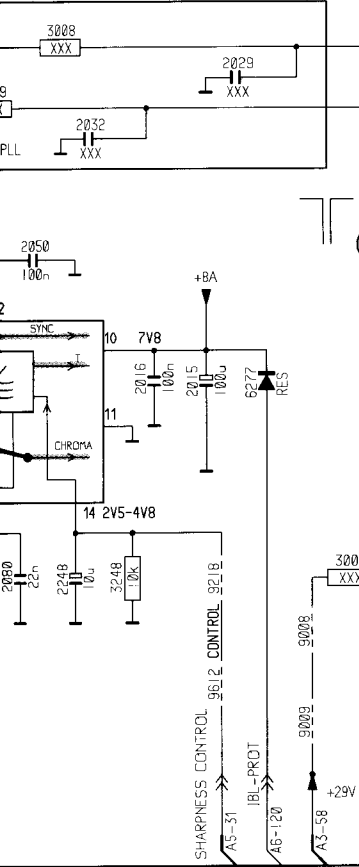
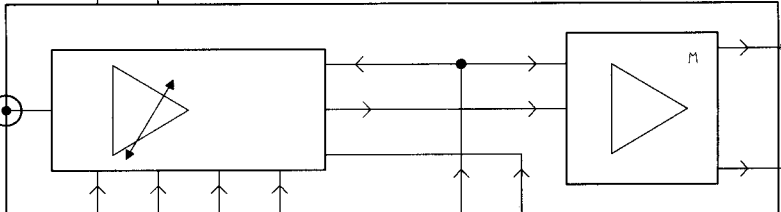
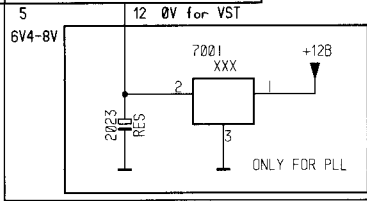
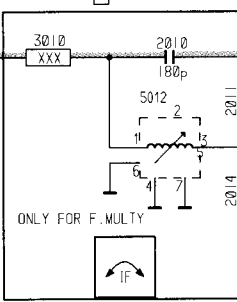
| | | |
|------|------|------|
| 0025 | E 5 | 9610 |
| 1979 | K 4 | 9611 |
| 1980 | K 5 | 9612 |
| 1981 | A 15 | 9613 |
| 2004 | L 5 | 9614 |
| 2006 | B 15 | 9615 |
| 2010 | A 16 | 9616 |
| 2011 | A 17 | 9617 |
| 2015 | E 13 | 9618 |
| 2020 | F 13 | 9619 |
| 2022 | F 16 | 9620 |
| 2025 | F 13 | 9621 |
| 2026 | G 13 | 9622 |
| 2031 | F 16 | 9623 |
| 2032 | G 16 | 9624 |
| 2033 | G 18 | 9625 |
| 2035 | G 18 | 9626 |
| 2051 | E 13 | 9627 |
| 2052 | G 18 | 9628 |
| 2053 | G 18 | 9629 |
| 2054 | G 18 | 9630 |
| 2055 | G 18 | 9631 |
| 2056 | G 18 | 9632 |
| 2057 | G 18 | 9633 |
| 2058 | G 18 | 9634 |
| 2059 | G 18 | 9635 |
| 2060 | G 18 | 9636 |
| 2061 | G 18 | 9637 |
| 2062 | G 18 | 9638 |
| 2063 | G 18 | 9639 |
| 2064 | G 18 | 9640 |
| 2065 | G 18 | 9641 |
| 2066 | G 18 | 9642 |
| 2067 | G 18 | 9643 |
| 2068 | G 18 | 9644 |
| 2069 | G 18 | 9645 |
| 2070 | G 18 | 9646 |
| 2071 | G 18 | 9647 |
| 2072 | G 18 | 9648 |
| 2073 | G 18 | 9649 |
| 2074 | G 18 | 9650 |
| 2075 | G 18 | 9651 |
| 2076 | G 18 | 9652 |
| 2077 | G 18 | 9653 |
| 2078 | G 18 | 9654 |
| 2079 | G 18 | 9655 |
| 2080 | G 18 | 9656 |
| 2081 | G 18 | 9657 |
| 2082 | G 18 | 9658 |
| 2083 | G 18 | 9659 |
| 2084 | G 18 | 9660 |
| 2085 | G 18 | 9661 |
| 2086 | G 18 | 9662 |
| 2087 | G 18 | 9663 |
| 2088 | G 18 | 9664 |
| 2089 | G 18 | 9665 |
| 2090 | G 18 | 9666 |
| 2091 | G 18 | 9667 |
| 2092 | G 18 | 9668 |
| 2093 | G 18 | 9669 |
| 2094 | G 18 | 9670 |
| 2095 | G 18 | 9671 |
| 2096 | G 18 | 9672 |
| 2097 | G 18 | 9673 |
| 2098 | G 18 | 9674 |
| 2099 | G 18 | 9675 |
| 2100 | G 18 | 9676 |
| 2101 | G 18 | 9677 |
| 2102 | G 18 | 9678 |
| 2103 | G 18 | 9679 |
| 2104 | G 18 | 9680 |
| 2105 | G 18 | 9681 |
| 2106 | G 18 | 9682 |
| 2107 | G 18 | 9683 |
| 2108 | G 18 | 9684 |
| 2109 | G 18 | 9685 |
| 2110 | G 18 | 9686 |
| 2111 | G 18 | 9687 |
| 2112 | G 18 | 9688 |
| 2113 | G 18 | 9689 |
| 2114 | G 18 | 9690 |
| 2115 | G 18 | 9691 |
| 2116 | G 18 | 9692 |
| 2117 | G 18 | 9693 |
| 2118 | G 18 | 9694 |
| 2119 | G 18 | 9695 |
| 2120 | G 18 | 9696 |
| 2121 | G 18 | 9697 |
| 2122 | G 18 | 9698 |
| 2123 | G 18 | 9699 |
| 2124 | G 18 | 9700 |





| TUNER | | | | |
|-------|--------|--------|--------|------|
| ITEM | UVHS | UVS | UV | PLL |
| 1001 | UV915 | UV917 | UV913 | U943 |
| 3002 | 2K7 | 2K7 | 2K7 | --- |
| 3005 | 1K | 1K | 1K | JMP |
| 4005 | --- | --- | --- | JMP |
| 7002 | LA7910 | LA7910 | LA7910 | --- |

| ITEMS | F. |
|-------|-----|
| 1015 | OF |
| 1032 | 5 |
| 1033 | 6 |
| 2012 | 1 |
| 2013 | 2 |
| 2025 | 4 |
| 2041 | 4 |
| 2043 | 4 |
| 2044 | 4 |
| 2045 | 1 |
| 3011 | 1 |
| 3012 | 3 |
| 3032 | 1 |
| 3044 | 1 |
| 3049 | 6 |
| 3672 | 1 |
| 4035 | --- |
| 5010 | 0 |
| 5040 | 3 |
| 5043 | 3 |
| 6042 | 8 |
| 7015 | 1 |
| 7672 | 6 |
| 9007 | --- |
| 9104 | --- |
| 9109 | --- |
| 9607 | --- |
| 9927 | --- |

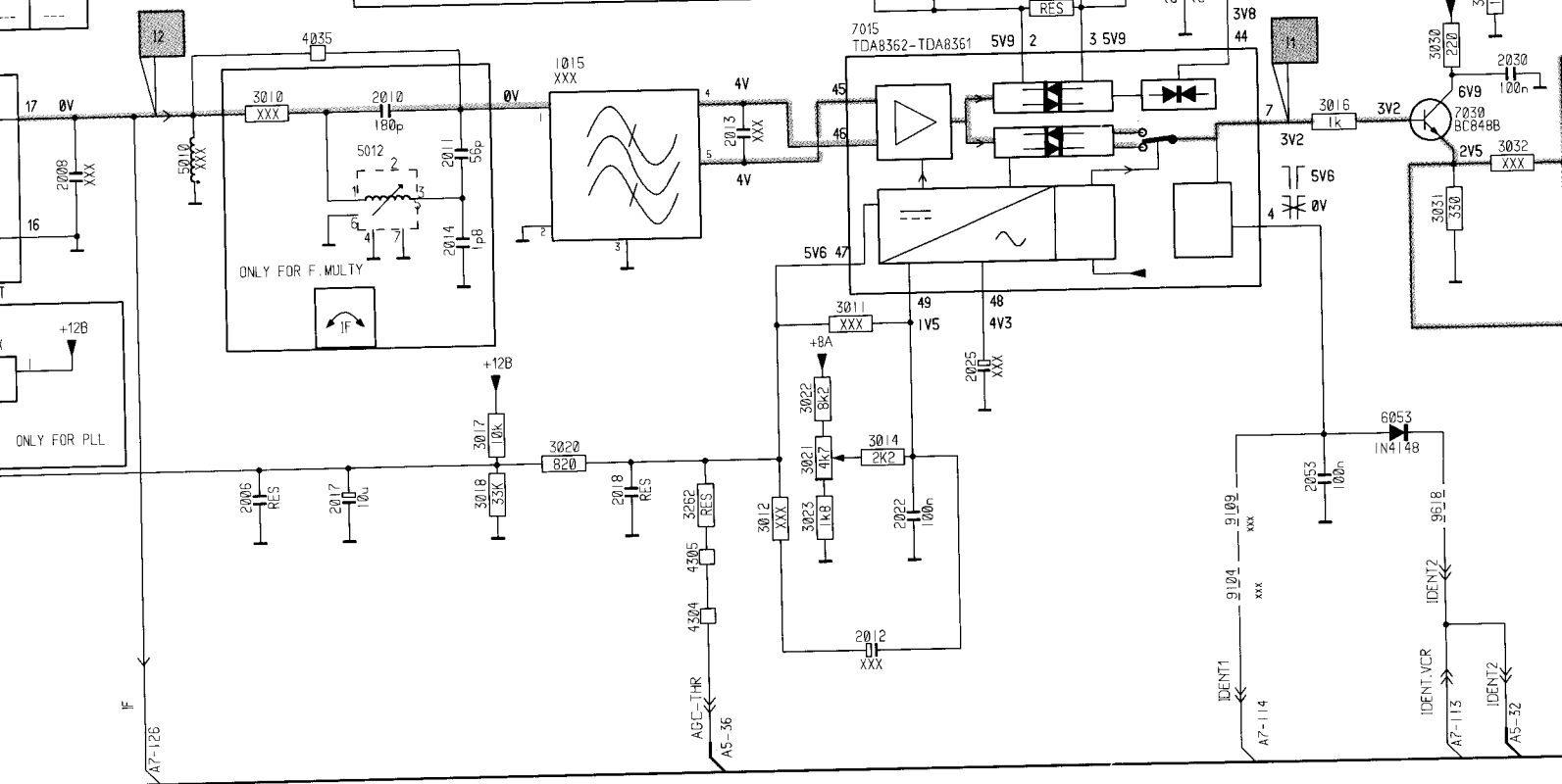


12 13 14 15 16 17 18 19 20 21 22

A6

| ITEMS | F. MULTY | PAL BG | PAL I | PAL /S BG-DK | PAL BG-DK |
|-------|----------|----------|----------|--------------|-----------|
| 1015 | DFWG1965 | DFWG1961 | DFWJ1952 | DFWK2955 | DFWK2955 |
| 1032 | 5.5MHz | 5.5MHz | --- | 5.5MHz | 5.5MHz |
| 1033 | 6 MHz | --- | 6 MHz | 6.5MHz | 6.5MHz |
| 2012 | 33u | --- | --- | --- | --- |
| 2013 | 3p9 | --- | --- | --- | --- |
| 2025 | 4u7 | 2u2 | 2u2 | 2u2 | 2u2 |
| 2041 | 4n7 | --- | --- | --- | --- |
| 2043 | 4n7 | --- | --- | --- | --- |
| 2044 | 4n7 | --- | --- | --- | --- |
| 2045 | 10p | 12p | 12p | 12p | 12p |
| 3011 | 150K | --- | --- | --- | --- |
| 3012 | 3K3 | --- | --- | --- | --- |
| 3032 | 120 | 150 | 150 | 150 | 150 |
| 3043 | 10K | --- | --- | --- | --- |
| 3044 | 10K | --- | --- | --- | --- |
| 3049 | 68K | --- | --- | --- | --- |
| 3672 | 1K | --- | --- | --- | --- |
| 4035 | --- | JMP | JMP | JMP | JMP |
| 5010 | 0.39u | 0.56u | 0.56u | 0.56u | 0.56u |
| 5040 | 33.9MHz | 38.9MHz | 38.9MHz | 38.9MHz | 38.9MHz |
| 5043 | 38.9MHz | --- | --- | --- | --- |
| 6042 | BA682 | --- | --- | --- | --- |
| 7015 | TDA8362 | TDA8361 | TDA8361 | TDA8362 | TDA8361 |
| 7672 | BC848B | --- | --- | --- | --- |
| 9007 | JMP | --- | --- | --- | --- |
| 9104 | JMP | --- | --- | --- | --- |
| 9109 | JMP | --- | --- | --- | --- |
| 9607 | JMP | --- | --- | --- | --- |
| 9927 | JMP | --- | --- | --- | --- |

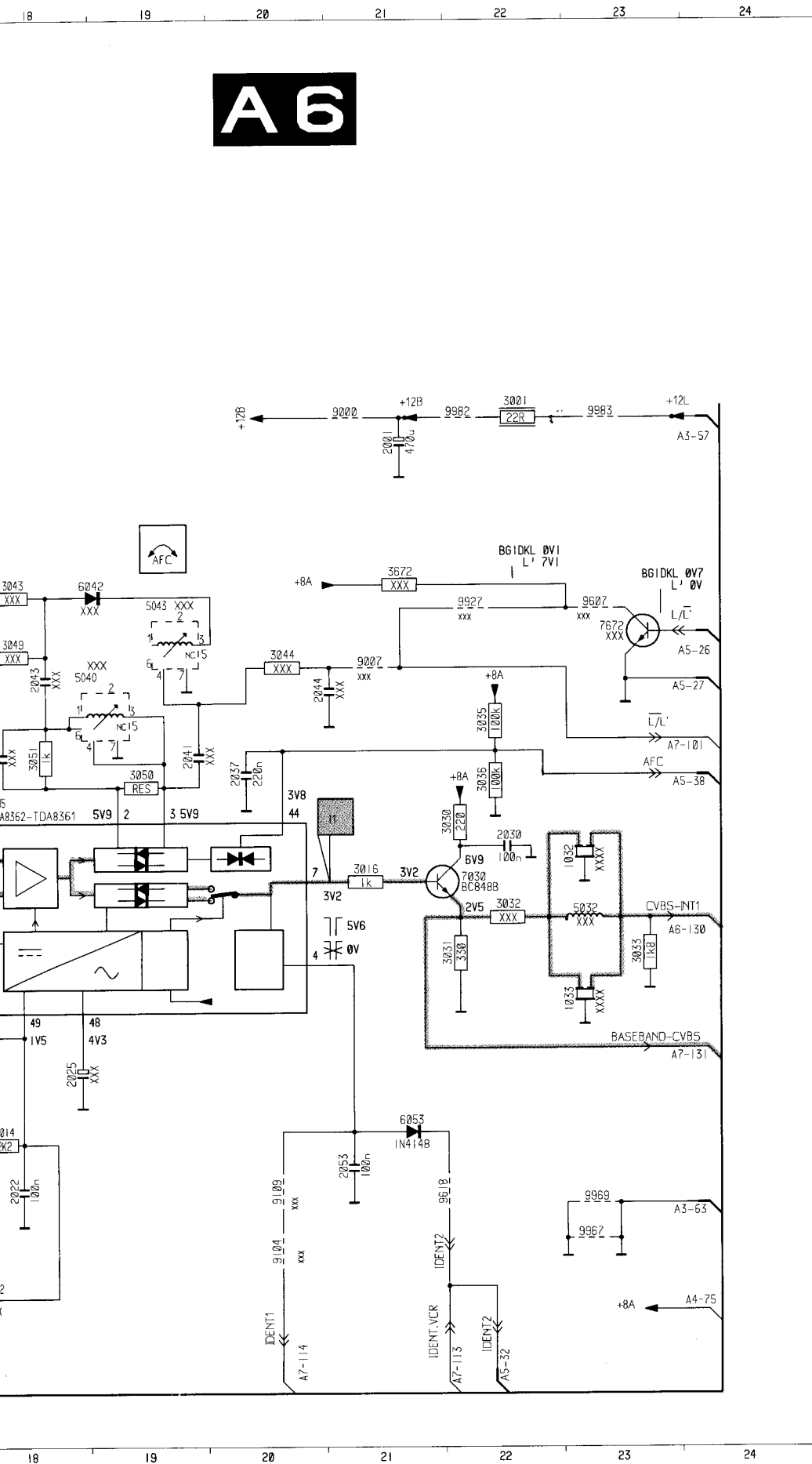
| U | PLL |
|------|-------|
| 9043 | UV916 |
| JMP | JMP |
| JMP | --- |



12 13 14 15 16 17 18 19 20 21 22

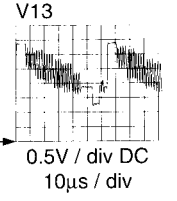
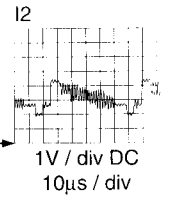
Tuner + FI + Connexions

A6

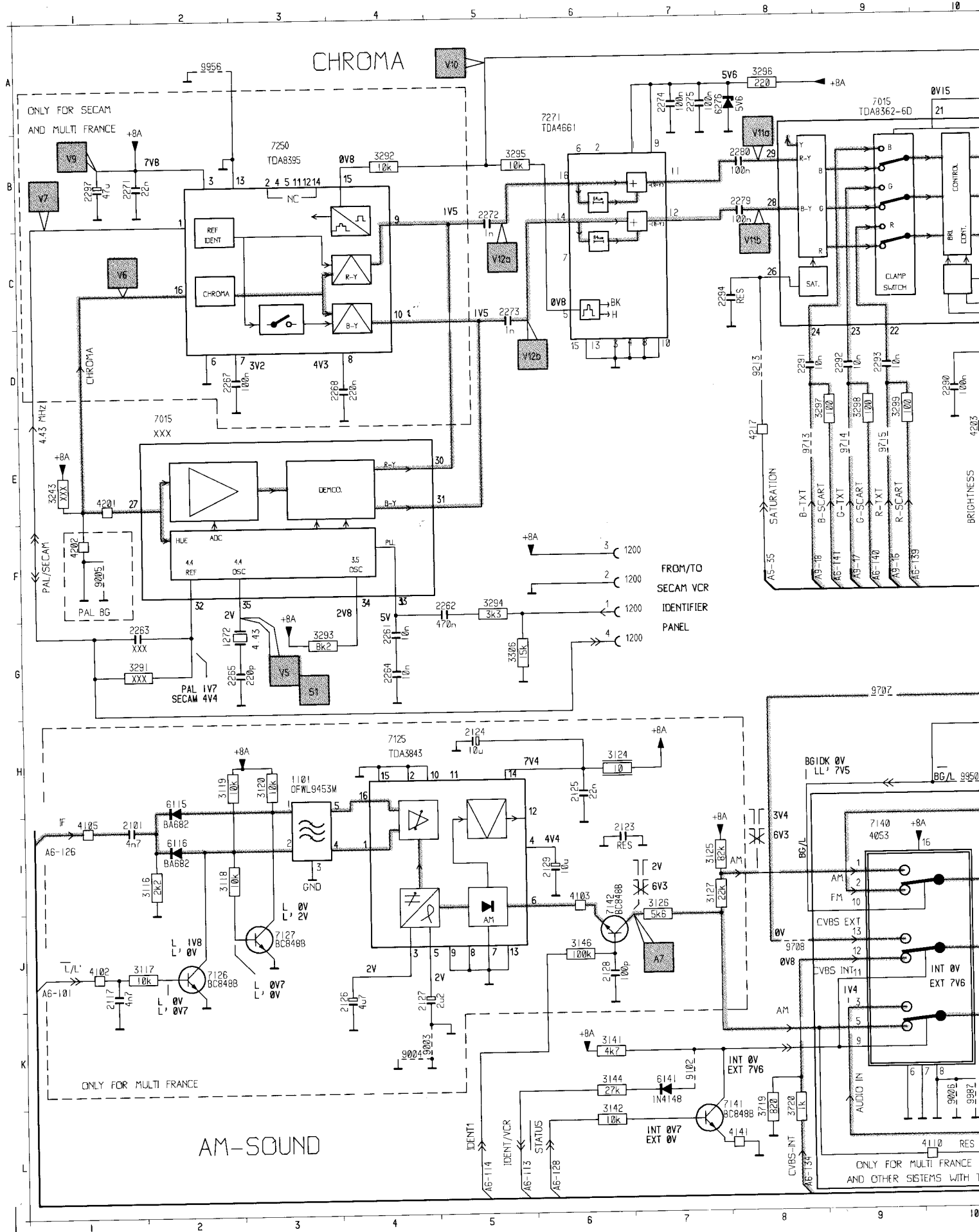


| | | | |
|------|-----|--------|-----|
| 0043 | D 8 | 7875 | E10 |
| 0061 | D 7 | 7876 | F 8 |
| 1015 | G19 | 9000 | D21 |
| 1032 | H23 | 9001 | K 7 |
| 1033 | I23 | 9002 | K 7 |
| 2001 | D21 | 9007 | F21 |
| 2006 | J13 | 9008 | J 6 |
| 2007 | I 2 | 9009 | K 6 |
| 2008 | H12 | 9104 | K20 |
| 2010 | G14 | 9109 | J20 |
| 2011 | H15 | 9218 | J 6 |
| 2012 | K16 | 9507 | E23 |
| 2013 | H17 | 9612 | K 6 |
| 2014 | H15 | 9618 | J22 |
| 2015 | I 6 | 9802 | C 4 |
| 2016 | I 5 | 9910 | J 2 |
| 2017 | J14 | 9927 | E22 |
| 2018 | J16 | 9934 | F 2 |
| 2022 | J18 | 9937 | D 7 |
| 2023 | I11 | 9943 | G 3 |
| 2025 | I11 | 9946 | G 3 |
| 2029 | G 6 | 9953 | A13 |
| 2030 | G22 | 9954 | D 8 |
| 2031 | K10 | 9967 | K23 |
| 2032 | G 5 | 9968 | I 2 |
| 2034 | H 2 | 9969 | J25 |
| 2037 | G20 | 9983 | D22 |
| 2041 | G19 | 9983 | D23 |
| 2043 | F19 | A4-75 | K24 |
| 2044 | F20 | A6-120 | L 6 |
| 2045 | G18 | A6-120 | A12 |
| 2050 | H 5 | A6-127 | I 1 |
| 2053 | J21 | A6-127 | A10 |
| 2060 | J 4 | A6-130 | H 1 |
| 2082 | J 4 | A6-130 | H24 |
| 2084 | J 4 | A6-132 | A11 |
| 2248 | J 4 | A7-101 | G24 |
| 2548 | F18 | A7-101 | G24 |
| 2849 | E55 | A7-113 | L22 |
| 2850 | E55 | A7-114 | L20 |
| 2852 | E56 | A7-120 | A12 |
| 2860 | D 4 | A7-126 | L13 |
| 2877 | D 9 | A7-128 | F 1 |
| 3001 | D22 | A7-131 | I24 |
| 3002 | J 7 | A7-133 | A19 |
| 3005 | K10 | A7-34 | A11 |
| 3007 | I 2 | A7-38 | C 1 |
| 3008 | G 5 | A7-39 | A 8 |
| 3009 | G 4 | A7-40 | A 7 |
| 3010 | G14 | A7-141 | A 6 |
| 3011 | I18 | A7-145 | E 1 |
| 3012 | J17 | B-09 | D 1 |
| 3014 | J18 | B-11 | E 1 |
| 3016 | H21 | B-13 | A14 |
| 3017 | J15 | B-15 | G 1 |
| 3018 | J15 | B-14 | G 1 |
| 3020 | J16 | B-15 | J 1 |
| 3021 | J17 | B-19 | F 1 |
| 3022 | J17 | B-26 | F24 |
| 3023 | J17 | B-27 | F24 |
| 3030 | G22 | B-31 | L 6 |
| 3031 | H22 | B-32 | L22 |
| 3032 | H22 | B-36 | L17 |
| 3033 | H23 | B-38 | G24 |
| 3035 | F22 | B-39 | L 8 |
| 3036 | G22 | B-40 | L 8 |
| 3043 | E18 | B-43 | L10 |
| 3044 | F20 | B-57 | D24 |
| 3049 | F18 | B-58 | L 6 |
| 3050 | G19 | B-58 | A13 |
| 3051 | G19 | D-65 | K24 |
| 3248 | J 5 | M13 | I 2 |
| 3262 | J16 | M13 | H 2 |
| 3672 | E21 | | |
| 3850 | E 5 | | |
| 3851 | G 6 | | |
| 3852 | G 6 | | |
| 3853 | G 7 | | |
| 3855 | G 7 | | |
| 3856 | G 7 | | |
| 3889 | C 4 | | |
| 3892 | C 4 | | |
| 3895 | C 4 | | |
| 3896 | C 4 | | |
| 3897 | C 4 | | |
| 3898 | C 4 | | |
| 3899 | C 4 | | |
| 3900 | C 4 | | |
| 3995 | H 2 | | |
| 4001 | I 1 | | |
| 4005 | I 1 | | |
| 4006 | H 2 | | |
| 4035 | G14 | | |
| 4304 | K16 | | |
| 4305 | K16 | | |
| 4802 | E19 | | |
| 4805 | D10 | | |
| 5010 | H13 | | |
| 5011 | H14 | | |
| 5035 | H23 | | |
| 5040 | F18 | | |
| 5043 | E19 | | |
| 6042 | E19 | | |
| 6053 | J21 | | |
| 6277 | I 6 | | |
| 6848 | F 6 | | |
| 6849 | F 6 | | |
| 6850 | F 6 | | |
| 6852 | C 6 | | |
| 6853 | C 6 | | |
| 6854 | C 7 | | |
| 6855 | C 7 | | |
| 6865 | C 8 | | |
| 7001 | I 1 | | |
| 7002 | J 6 | | |
| 7015 | H 2 | | |
| 7016 | G18 | | |
| 7030 | H22 | | |
| 7672 | F23 | | |
| 7856 | B 3 | | |
| 7857 | B 4 | | |

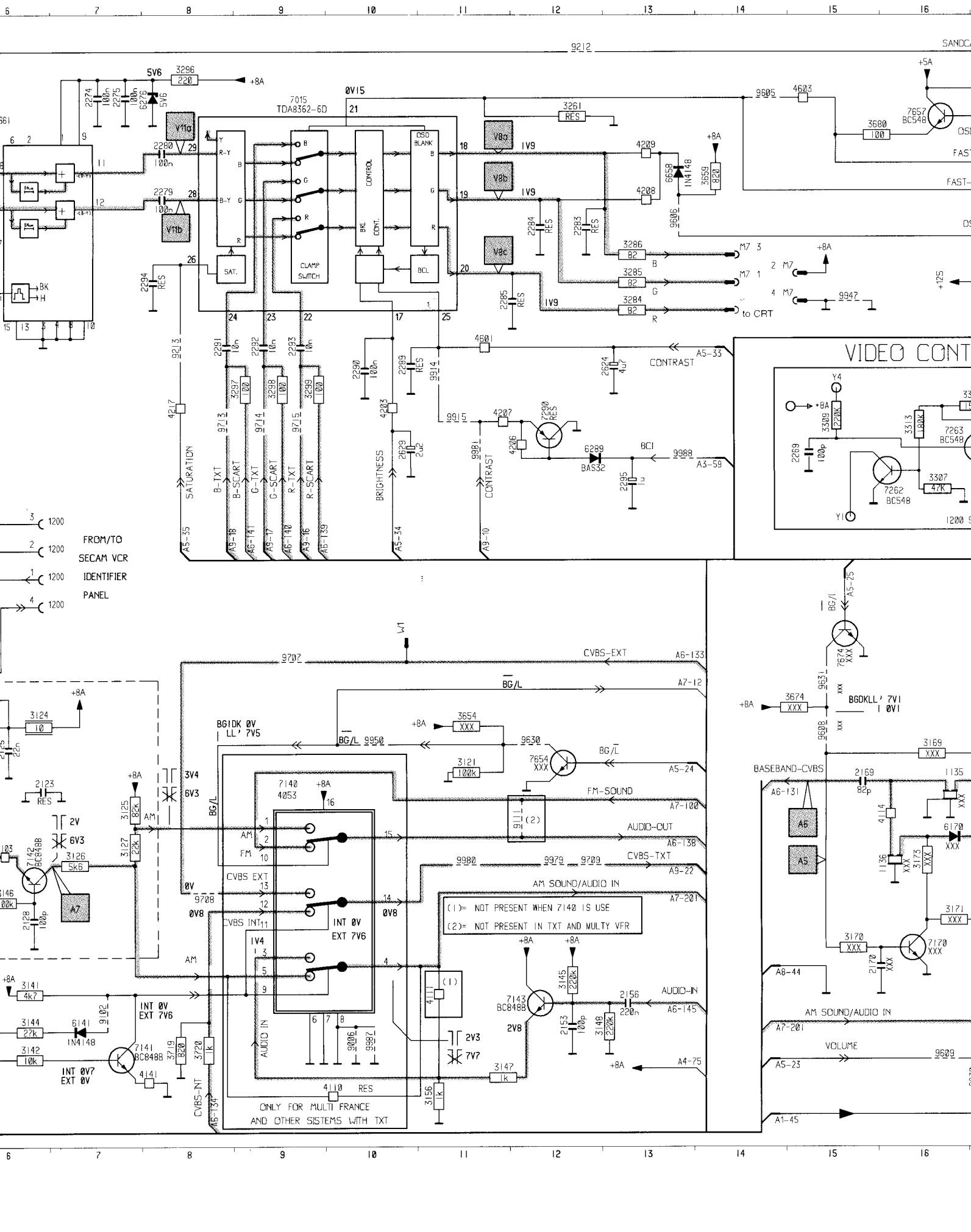
I1 V_{PP} = 300mV



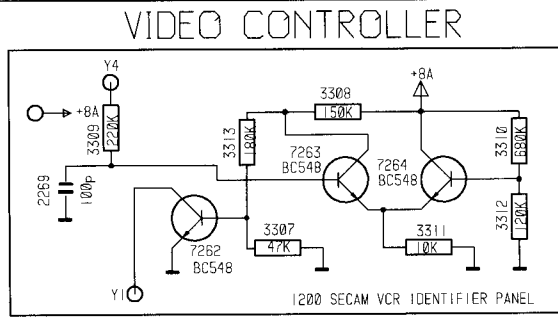
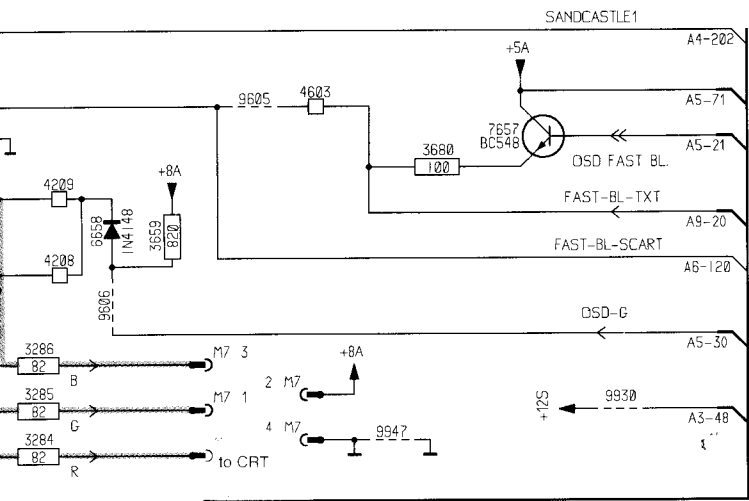
V14 (No signal)



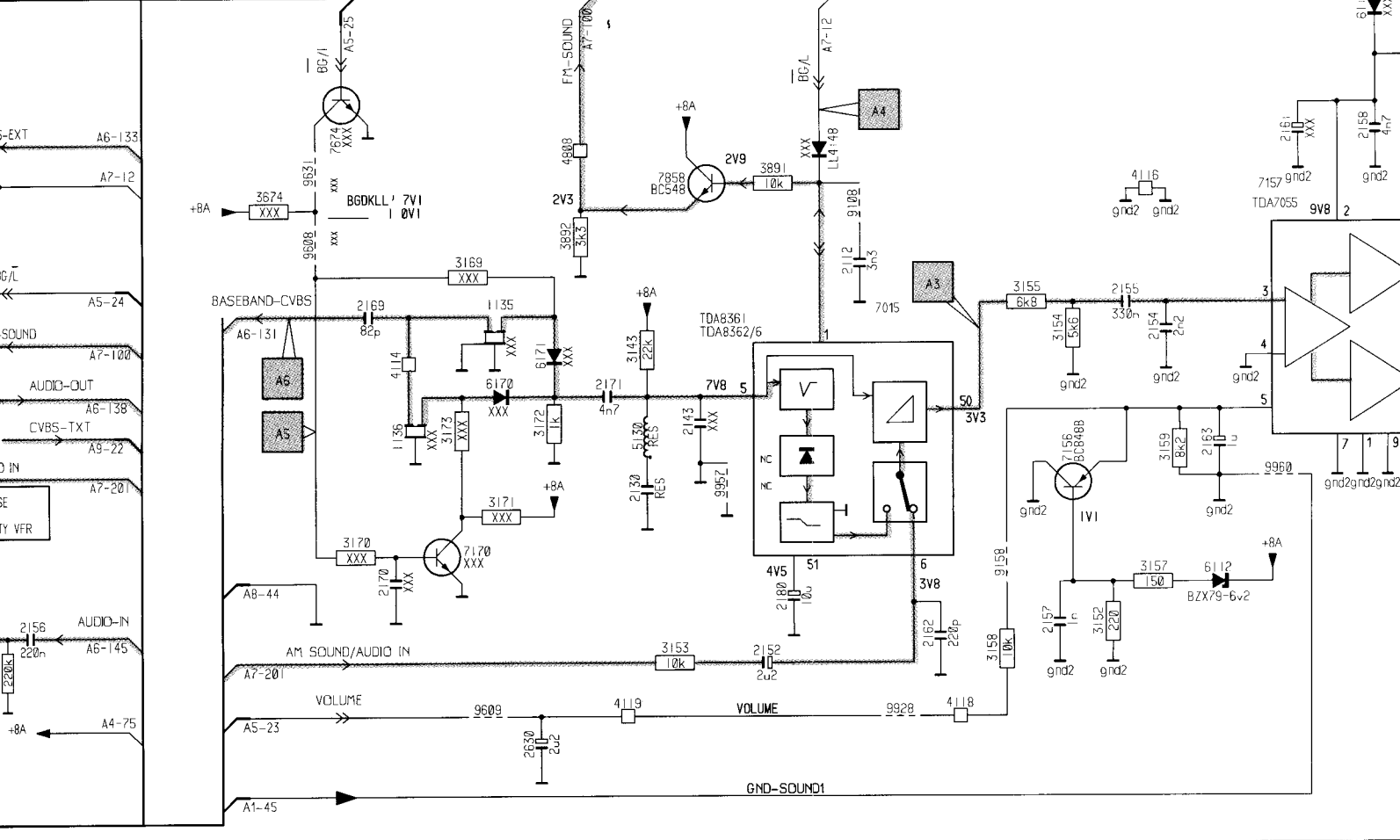
Video + sound / Ton / Son



13 14 15 16 17 18 19 20 21 22 23



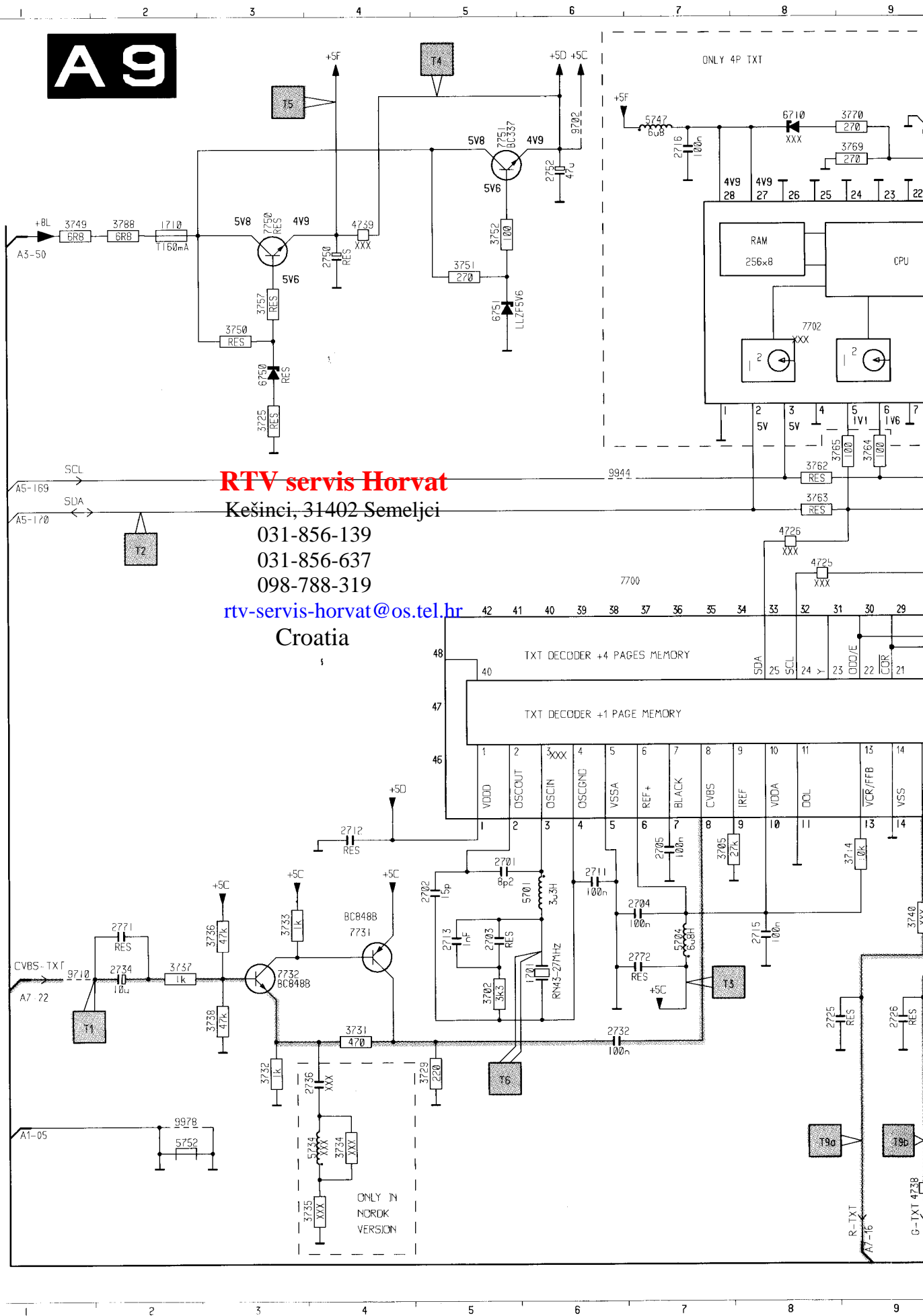
FM-SOUND



| SYSTEM | | | | | |
|--------|------------|---------|---------|-------------|-----------|
| ITEMS | FULL MULTY | PAL BG | PAL I | PAL/S BG/DK | PAL BG/DK |
| 1135 | 5.5 MHz | 5.5 MHz | 6 MHz | 5.5 MHz | 5.5 MHz |
| 1136 | 6MHz | --- | --- | 6.5 MHz | 6.5 MHz |
| 1200 | PRESENT | --- | --- | PRESENT | --- |
| 2170 | 10n | --- | --- | --- | --- |
| 2263 | 22n | --- | --- | 22n | --- |
| 3169 | 10K | --- | --- | --- | --- |
| 3170 | 10K | --- | --- | --- | --- |
| 3171 | 2K2 | --- | --- | --- | --- |
| 3173 | 10K | --- | --- | --- | --- |
| 3243 | 10K | --- | --- | 10K | --- |
| 3291 | 5K6 | --- | --- | 5K6 | --- |
| 3294 | 3K3 | 18K | 10K | 3K3 | 18K |
| 3306 | 15K | JMP | JMP | 15K | JMP |
| 3654 | 1K | --- | --- | --- | --- |
| 3674 | 1K | --- | --- | --- | --- |
| 4114 | JMP | --- | --- | JMP | JMP |
| 6128 | LL4148 | --- | --- | --- | --- |
| 6170 | BA682 | JMP | JMP | JMP | JMP |
| 6171 | BA682 | JMP | JMP | JMP | JMP |
| 7015 | TDA8362 | TDA8361 | TDA8361 | TDA8362 | TDA8361 |
| 7170 | BC848B | --- | --- | --- | --- |
| 7654 | BC848B | --- | --- | --- | --- |
| 7674 | BC848B | --- | --- | --- | --- |
| 9608 | JMP | --- | --- | --- | --- |
| 9630 | JMP | --- | --- | --- | --- |
| 9631 | JMP | --- | --- | --- | --- |

13 14 15 16 17 18 19 20 21 22 23

A9



RTV servis Horvat

Kešinci, 31402 Semeljei

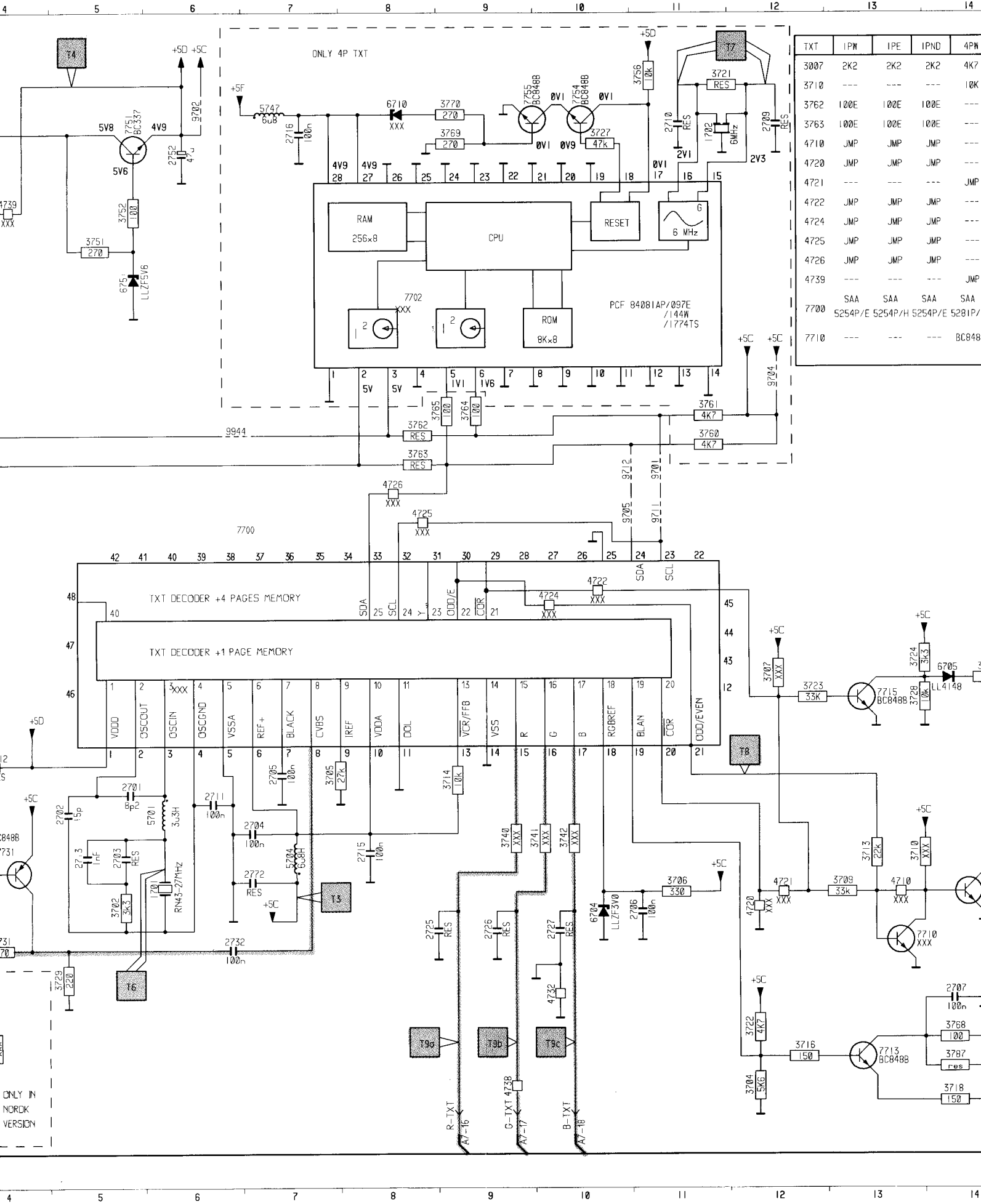
031-856-139

031-856-637

098-788-319

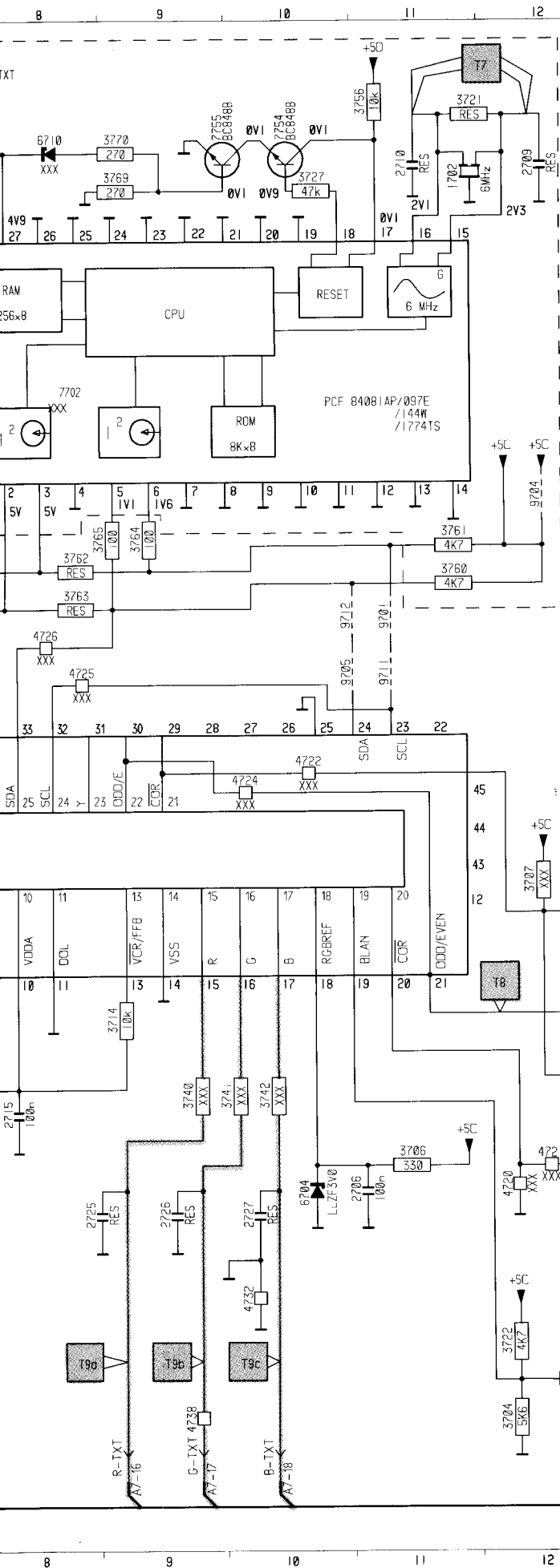
rtv-servis-horvat@os.tel.hr

Croatia



| TXT | 1P/W | 1PE | 1PND | 4PW |
|------|---------|---------|---------|---------|
| 3007 | 2K2 | 2K2 | 2K2 | 4K7 |
| 3710 | --- | --- | --- | 10K |
| 3762 | 100E | 100E | 100E | --- |
| 3763 | 100E | 100E | 100E | --- |
| 4710 | JMP | JMP | JMP | --- |
| 4720 | JMP | JMP | JMP | --- |
| 4721 | --- | --- | --- | JMP |
| 4722 | JMP | JMP | JMP | --- |
| 4724 | JMP | JMP | JMP | --- |
| 4725 | JMP | JMP | JMP | --- |
| 4726 | JMP | JMP | JMP | --- |
| 4739 | --- | --- | --- | JMP |
| 7700 | SAA | SAA | SAA | SAA |
| | 5254P/E | 5254P/H | 5254P/E | 5281P/E |
| 7710 | --- | --- | --- | BC848 |

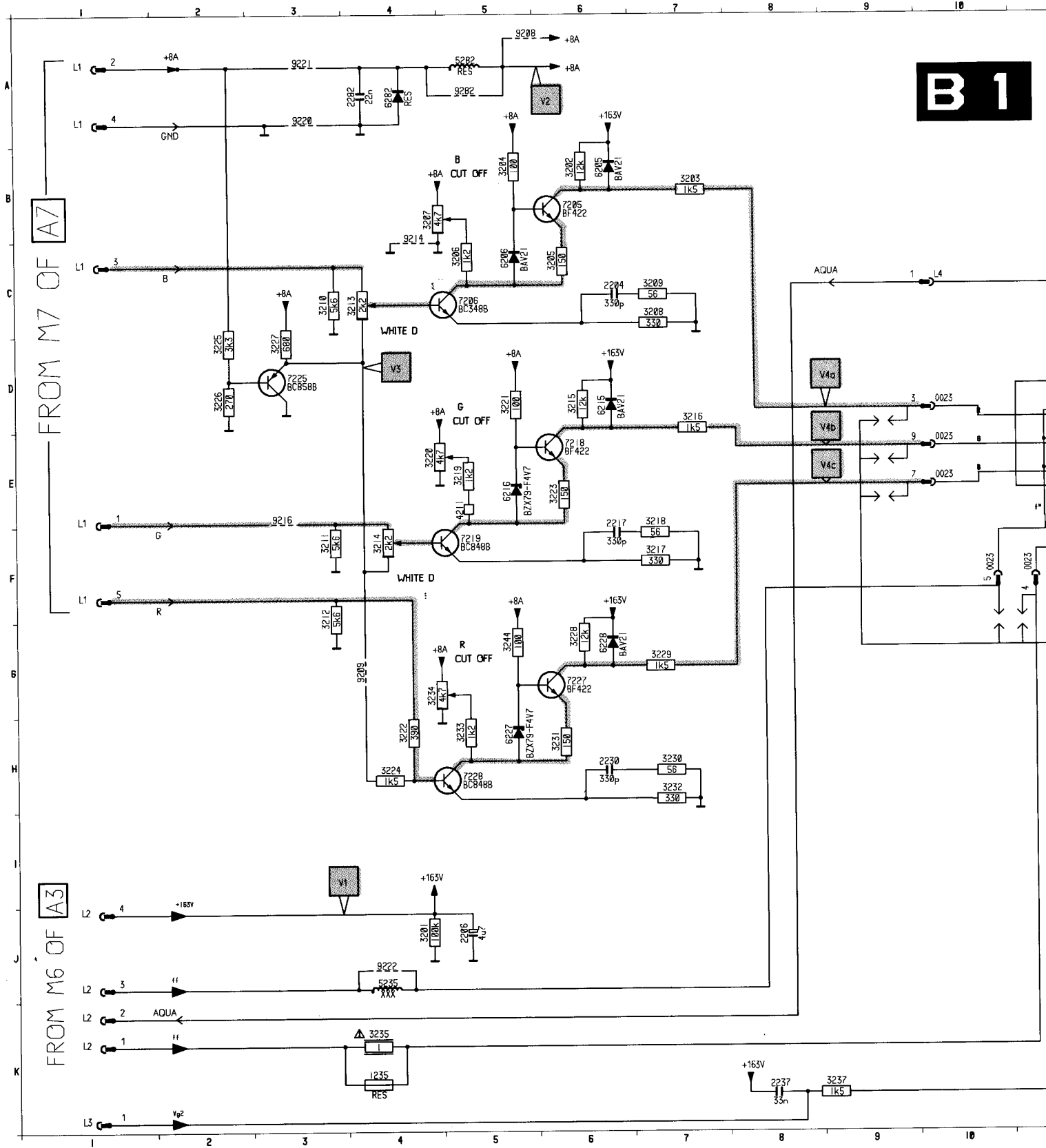
ONLY IN NORDK VERSION

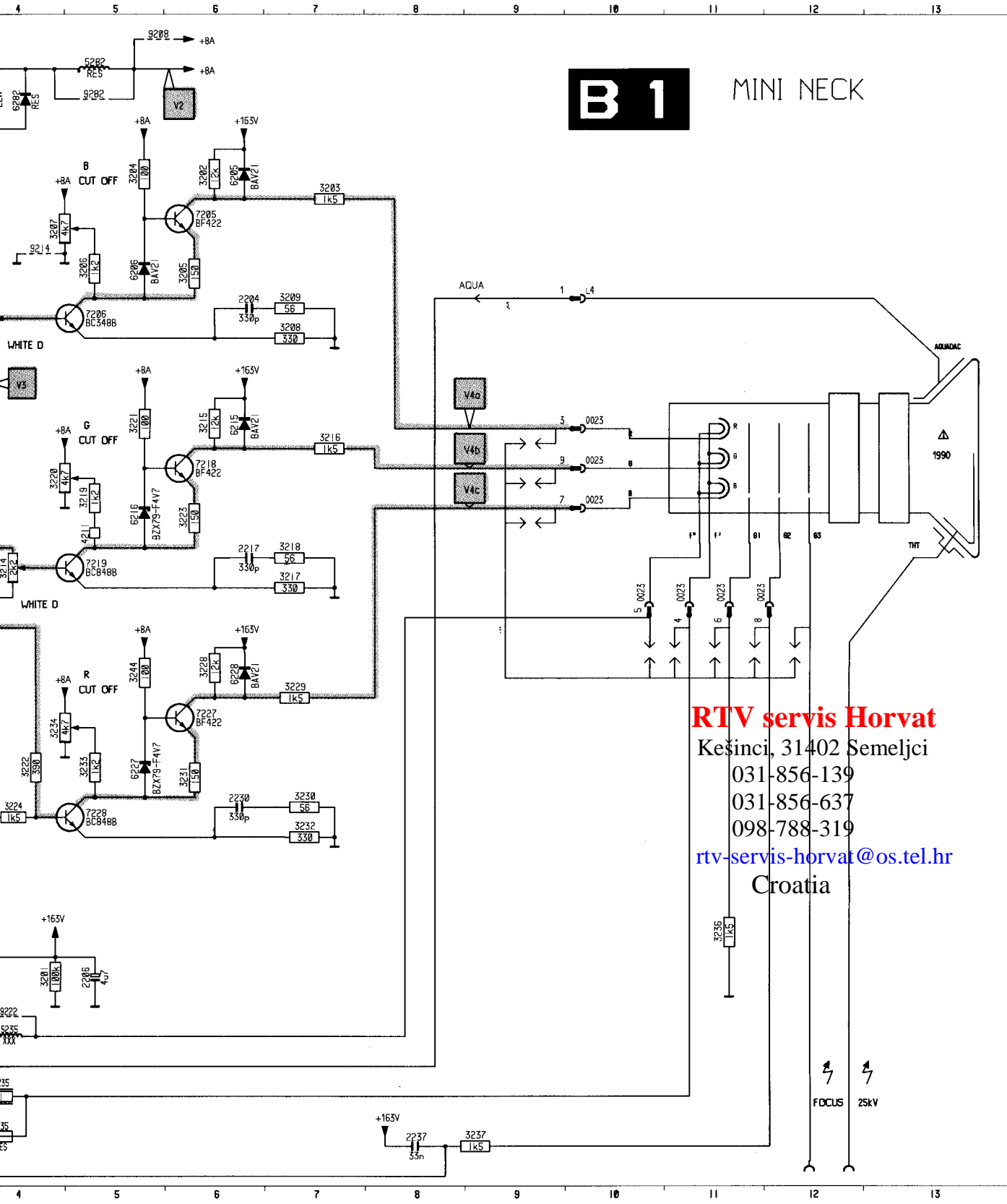


| TXT | IPW | IPE | IPND | 4PW | 4PE | 4PND | 4PWATS | 4PR |
|------|---------|---------|---------|---------|---------|---------|---------|---------|
| 3007 | 2K2 | 2K2 | 2K2 | 4K7 | 4K7 | 4K7 | 4K7 | 4K7 |
| 3710 | --- | --- | --- | 10K | 10K | 10K | 10K | 10K |
| 3762 | 100E | 100E | 100E | --- | --- | --- | --- | --- |
| 3763 | 100E | 100E | 100E | --- | --- | --- | --- | --- |
| 4710 | JMP | JMP | JMP | --- | --- | --- | --- | --- |
| 4720 | JMP | JMP | JMP | --- | --- | --- | --- | --- |
| 4721 | --- | --- | --- | JMP | JMP | JMP | JMP | JMP |
| 4722 | JMP | JMP | JMP | --- | --- | --- | --- | --- |
| 4724 | JMP | JMP | JMP | --- | --- | --- | --- | --- |
| 4725 | JMP | JMP | JMP | --- | --- | --- | --- | --- |
| 4726 | JMP | JMP | JMP | --- | --- | --- | --- | --- |
| 4739 | --- | --- | --- | JMP | JMP | JMP | JMP | JMP |
| 7700 | SAA | SAA | SAA | SAA | SAA | SAA | SAA | SAA |
| | 5254P/E | 5254P/H | 5254P/E | 5281P/E | 5281P/H | 5281P/E | 5281P/E | 5281P/R |
| 7710 | --- | --- | --- | BC848B | BC848B | BC848B | BC848B | BC848B |

- 1701 I 6
- 1702 B11
- 1710 B 2
- 2701 H 5
- 2702 I 5
- 2703 I 5
- 2704 H 7
- 2705 H 7
- 2706 J11
- 2707 K14
- 2709 B12
- 2710 B11
- 2711 I 6
- 2712 H 4
- 2713 I 5
- 2715 I 8
- 2716 B 7
- 2725 J 8
- 2726 J 9
- 2727 J10
- 2732 J 6
- 2734 I 2
- 2736 J 4
- 2739 C 4
- 2752 C 6
- 2771 I 2
- 2772 I 5
- 3702 J 5
- 3704 K12
- 3705 H 7
- 3706 I11
- 3707 G12
- 3709 I13
- 3710 I13
- 3713 H 9
- 3716 K12
- 3718 L14
- 3721 A11
- 3722 K12
- 3723 G12
- 3724 G13
- 3725 D 3
- 3727 B10
- 3728 G13
- 3729 J 5
- 3731 J 3
- 3732 J 3
- 3733 K 4
- 3734 K 4
- 3735 L 4
- 3736 I 3
- 3737 I 2
- 3738 J 3
- 3740 I 9
- 3741 I10
- 3742 I10
- 3749 B 3
- 3750 C 3
- 3751 B 3
- 3752 C 3
- 3755 A11
- 3757 C 3
- 3760 E11
- 3761 E11
- 3762 E 8
- 3763 G14
- 3764 E 8
- 3765 E 8
- 3768 K14
- 3769 B 9
- 3770 A 9
- 3781 I14
- 3786 G14
- 3788 B 2
- 4710 I13
- 4720 J12
- 4721 I12
- 4722 F10
- 4724 F10
- 4725 F 8
- 4726 E 8
- 4732 K10
- 4738 K 9
- 4739 B 6
- 5700 I 7
- 5704 I 7
- 5734 K 4
- 5747 A 7
- 5752 K 2
- 6704 J10
- 6705 G14
- 6750 A 8
- 6751 D 3
- 7700 C 5
- 7702 F 8
- 7710 J13
- 7711 I14
- 7713 K13
- 7715 G13
- 7731 I 4
- 7732 I 3
- 7750 B 3
- 7751 B 5
- 7754 A10
- 7755 A 9
- 9701 E11
- 9702 A 6
- 9704 D12
- 9705 F10
- 9710 I 1
- 9711 F11
- 9712 E10
- 9716 L14
- 9944 E 6
- 9978 K 2
- A5-169 E
- A5-170 E
- C-05 K 1
- C-10 G15
- C-12 I15
- C-16 L19
- C-17 L 9
- C-18 L10
- C-20 L15
- C-22 J 1
- C-50 C 1

B 1



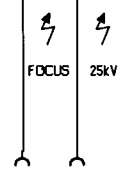


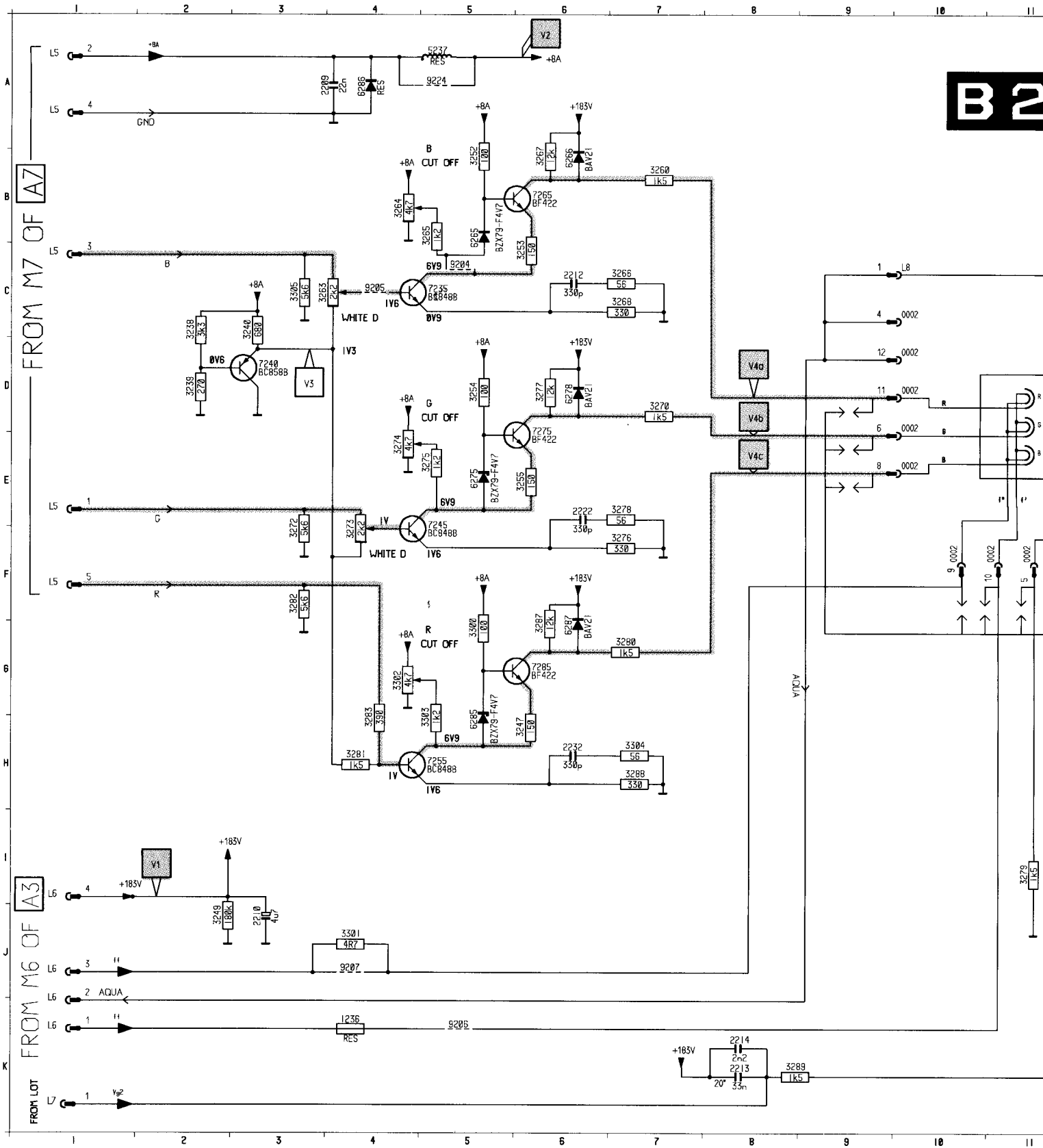
B 1

MINI NECK

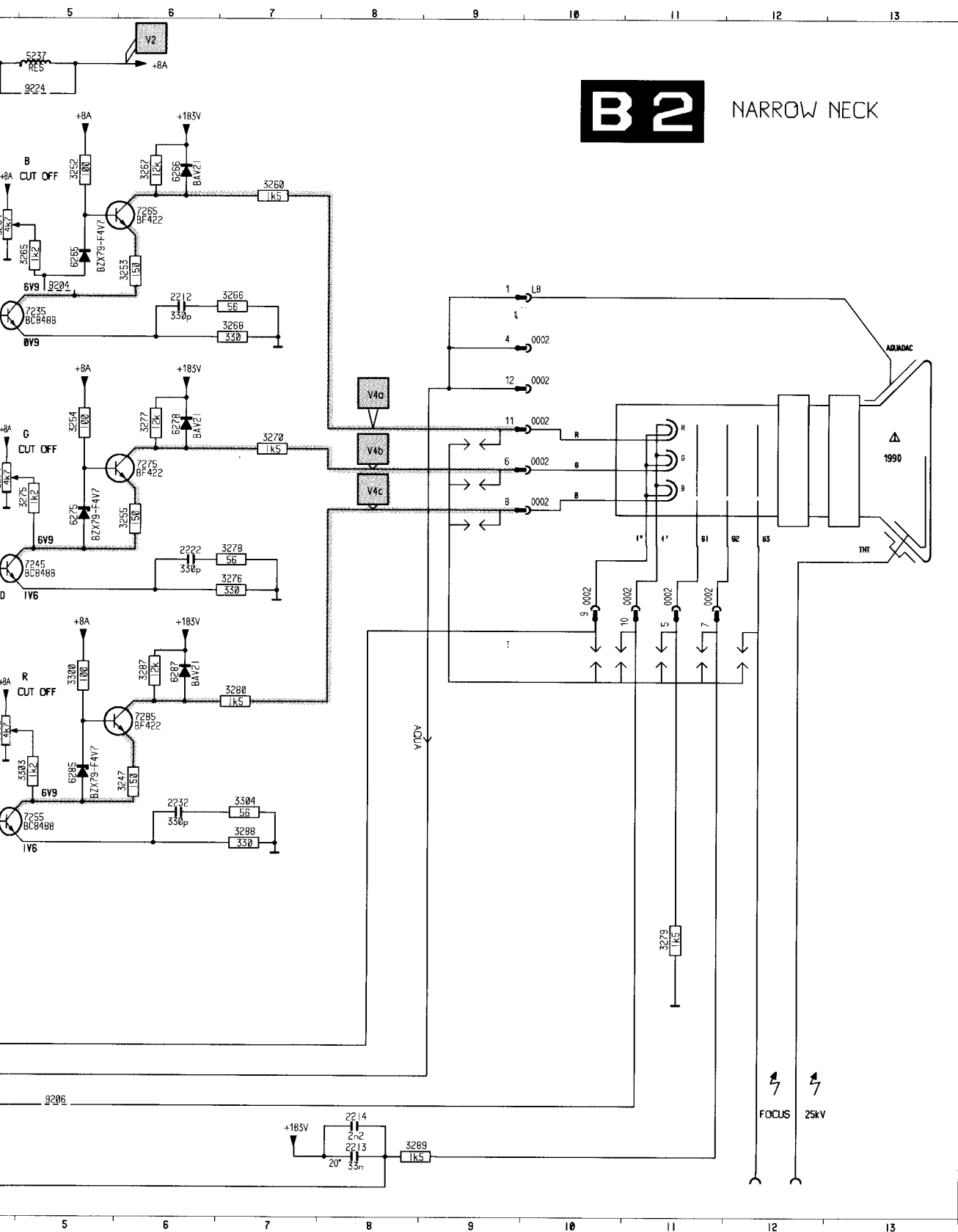
0023 E10
0023 D10
0023 F10
0023 F11
0023 F14
1235 K 4
2204 C 6
2206 L 5
3217 T 6
3230 K 4
3237 K 4
2202 A 4
3201 J 4
3200 G 5
3205 G 5
3206 C 5
3207 J 4
3208 G 5
3209 G 5
3210 C 5
3211 G 5
3212 G 5
3213 G 5
3214 A 4
3215 D 6
3216 D 7
3217 T 7
3218 T 7
3219 G 5
3220 D 6
3221 D 5
3222 H 4
3223 E 6
3224 A 4
3225 D 2
3226 D 2
3227 D 2
3228 H 6
3229 G 5
3230 H 7
3231 H 7
3232 H 7
3233 H 7
3234 K 4
3235 K 4
4211 I 1
3237 K 4
3244 K 4
3245 K 4
3246 I 1
3247 L 1
3248 G 5
3249 G 5
3250 G 5
3251 G 5
3252 G 5
3253 G 5
3254 G 5
3255 G 5
3256 G 5
3257 G 5
3258 G 5
3259 G 5
3260 G 5
3261 G 5
3262 G 5
3263 G 5
3264 G 5
3265 G 5
3266 G 5
3267 G 5
3268 G 5
3269 G 5
3270 G 5
3271 G 5
3272 G 5
3273 G 5
3274 G 5
3275 G 5
3276 G 5
3277 G 5
3278 G 5
3279 G 5
3280 G 5
3281 G 5
3282 G 5
3283 G 5
3284 G 5
3285 G 5
3286 G 5
3287 G 5
3288 G 5
3289 G 5
3290 G 5
3291 G 5
3292 G 5
3293 G 5
3294 G 5
3295 G 5
3296 G 5
3297 G 5
3298 G 5
3299 G 5
3300 G 5
3301 G 5
3302 G 5
3303 G 5
3304 G 5
3305 G 5
3306 G 5
3307 G 5
3308 G 5
3309 G 5
3310 G 5
3311 G 5
3312 G 5
3313 G 5
3314 G 5
3315 G 5
3316 G 5
3317 G 5
3318 G 5
3319 G 5
3320 G 5
3321 G 5
3322 G 5
3323 G 5
3324 G 5
3325 G 5
3326 G 5
3327 G 5
3328 G 5
3329 G 5
3330 G 5
3331 G 5
3332 G 5
3333 G 5
3334 G 5
3335 G 5
3336 G 5
3337 G 5
3338 G 5
3339 G 5
3340 G 5
3341 G 5
3342 G 5
3343 G 5
3344 G 5
3345 G 5
3346 G 5
3347 G 5
3348 G 5
3349 G 5
3350 G 5
3351 G 5
3352 G 5
3353 G 5
3354 G 5
3355 G 5
3356 G 5
3357 G 5
3358 G 5
3359 G 5
3360 G 5
3361 G 5
3362 G 5
3363 G 5
3364 G 5
3365 G 5
3366 G 5
3367 G 5
3368 G 5
3369 G 5
3370 G 5
3371 G 5
3372 G 5
3373 G 5
3374 G 5
3375 G 5
3376 G 5
3377 G 5
3378 G 5
3379 G 5
3380 G 5
3381 G 5
3382 G 5
3383 G 5
3384 G 5
3385 G 5
3386 G 5
3387 G 5
3388 G 5
3389 G 5
3390 G 5
3391 G 5
3392 G 5
3393 G 5
3394 G 5
3395 G 5
3396 G 5
3397 G 5
3398 G 5
3399 G 5
3400 G 5
3401 G 5
3402 G 5
3403 G 5
3404 G 5
3405 G 5
3406 G 5
3407 G 5
3408 G 5
3409 G 5
3410 G 5
3411 G 5
3412 G 5
3413 G 5
3414 G 5
3415 G 5
3416 G 5
3417 G 5
3418 G 5
3419 G 5
3420 G 5
3421 G 5
3422 G 5
3423 G 5
3424 G 5
3425 G 5
3426 G 5
3427 G 5
3428 G 5
3429 G 5
3430 G 5
3431 G 5
3432 G 5
3433 G 5
3434 G 5
3435 G 5
3436 G 5
3437 G 5
3438 G 5
3439 G 5
3440 G 5
3441 G 5
3442 G 5
3443 G 5
3444 G 5
3445 G 5
3446 G 5
3447 G 5
3448 G 5
3449 G 5
3450 G 5
3451 G 5
3452 G 5
3453 G 5
3454 G 5
3455 G 5
3456 G 5
3457 G 5
3458 G 5
3459 G 5
3460 G 5
3461 G 5
3462 G 5
3463 G 5
3464 G 5
3465 G 5
3466 G 5
3467 G 5
3468 G 5
3469 G 5
3470 G 5
3471 G 5
3472 G 5
3473 G 5
3474 G 5
3475 G 5
3476 G 5
3477 G 5
3478 G 5
3479 G 5
3480 G 5
3481 G 5
3482 G 5
3483 G 5
3484 G 5
3485 G 5
3486 G 5
3487 G 5
3488 G 5
3489 G 5
3490 G 5
3491 G 5
3492 G 5
3493 G 5
3494 G 5
3495 G 5
3496 G 5
3497 G 5
3498 G 5
3499 G 5
3500 G 5

RTV servis Horvat
Kešinci, 31402 Semeljci
031-856-139
031-856-637
098-788-319
rtv-servis-horvat@os.tel.hr
Croatia



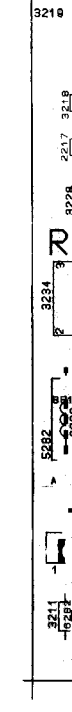


20-21" Narrow neck CRT panel / Bildröhren Platte / Platine TRC



| | |
|------|-----|
| 0002 | E18 |
| 0002 | D18 |
| 0002 | D18 |
| 0002 | C18 |
| 0002 | F18 |
| 0002 | F11 |
| 0002 | F11 |
| 0002 | F11 |
| 1236 | K44 |
| 2289 | A44 |
| 2218 | L44 |
| 2212 | K44 |
| 2214 | K44 |
| 2222 | H44 |
| 2232 | H44 |
| 3238 | C44 |
| 3239 | C44 |
| 3240 | C44 |
| 3247 | H44 |
| 3249 | B44 |
| 3252 | B44 |
| 3254 | B44 |
| 3255 | B44 |
| 3268 | B44 |
| 3273 | B44 |
| 3274 | B44 |
| 3275 | B44 |
| 3276 | B44 |
| 3277 | B44 |
| 3278 | B44 |
| 3279 | B44 |
| 3280 | B44 |
| 3282 | T44 |
| 3283 | H44 |
| 3287 | H44 |
| 3288 | H44 |
| 3289 | H44 |
| 3300 | L44 |
| 3301 | L44 |
| 3302 | L44 |
| 3303 | H44 |
| 3304 | H44 |
| 3305 | H44 |
| 5237 | A44 |
| 6265 | B44 |
| 6266 | B44 |
| 6267 | B44 |
| 6268 | B44 |
| 6269 | B44 |
| 6270 | B44 |
| 6271 | B44 |
| 6272 | B44 |
| 6273 | B44 |
| 6274 | B44 |
| 6275 | B44 |
| 6276 | B44 |
| 6277 | B44 |
| 6278 | B44 |
| 6279 | B44 |
| 6280 | B44 |
| 6281 | B44 |
| 6282 | B44 |
| 6283 | B44 |
| 6284 | B44 |
| 6285 | B44 |
| 6286 | B44 |
| 6287 | B44 |
| 6288 | B44 |
| 6289 | B44 |
| 6290 | B44 |
| 6291 | B44 |
| 6292 | B44 |
| 6293 | B44 |
| 6294 | B44 |
| 6295 | B44 |
| 6296 | B44 |
| 6297 | B44 |
| 6298 | B44 |
| 6299 | B44 |
| 6300 | B44 |
| 6301 | B44 |
| 6302 | B44 |
| 6303 | B44 |
| 6304 | B44 |
| 6305 | B44 |
| 6306 | B44 |
| 6307 | B44 |
| 6308 | B44 |
| 6309 | B44 |
| 6310 | B44 |
| 6311 | B44 |
| 6312 | B44 |
| 6313 | B44 |
| 6314 | B44 |
| 6315 | B44 |
| 6316 | B44 |
| 6317 | B44 |
| 6318 | B44 |
| 6319 | B44 |
| 6320 | B44 |
| 6321 | B44 |
| 6322 | B44 |
| 6323 | B44 |
| 6324 | B44 |
| 6325 | B44 |
| 6326 | B44 |
| 6327 | B44 |
| 6328 | B44 |
| 6329 | B44 |
| 6330 | B44 |
| 6331 | B44 |
| 6332 | B44 |
| 6333 | B44 |
| 6334 | B44 |
| 6335 | B44 |
| 6336 | B44 |
| 6337 | B44 |
| 6338 | B44 |
| 6339 | B44 |
| 6340 | B44 |
| 6341 | B44 |
| 6342 | B44 |
| 6343 | B44 |
| 6344 | B44 |
| 6345 | B44 |
| 6346 | B44 |
| 6347 | B44 |
| 6348 | B44 |
| 6349 | B44 |
| 6350 | B44 |
| 6351 | B44 |
| 6352 | B44 |
| 6353 | B44 |
| 6354 | B44 |
| 6355 | B44 |
| 6356 | B44 |
| 6357 | B44 |
| 6358 | B44 |
| 6359 | B44 |
| 6360 | B44 |
| 6361 | B44 |
| 6362 | B44 |
| 6363 | B44 |
| 6364 | B44 |
| 6365 | B44 |
| 6366 | B44 |
| 6367 | B44 |
| 6368 | B44 |
| 6369 | B44 |
| 6370 | B44 |
| 6371 | B44 |
| 6372 | B44 |
| 6373 | B44 |
| 6374 | B44 |
| 6375 | B44 |
| 6376 | B44 |
| 6377 | B44 |
| 6378 | B44 |
| 6379 | B44 |
| 6380 | B44 |
| 6381 | B44 |
| 6382 | B44 |
| 6383 | B44 |
| 6384 | B44 |
| 6385 | B44 |
| 6386 | B44 |
| 6387 | B44 |
| 6388 | B44 |
| 6389 | B44 |
| 6390 | B44 |
| 6391 | B44 |
| 6392 | B44 |
| 6393 | B44 |
| 6394 | B44 |
| 6395 | B44 |
| 6396 | B44 |
| 6397 | B44 |
| 6398 | B44 |
| 6399 | B44 |
| 6400 | B44 |

| | |
|---|--|
| A | |
| B | |
| C | |
| D | |
| E | |
| F | |
| G | |
| H | |
| I | |
| J | |
| K | |

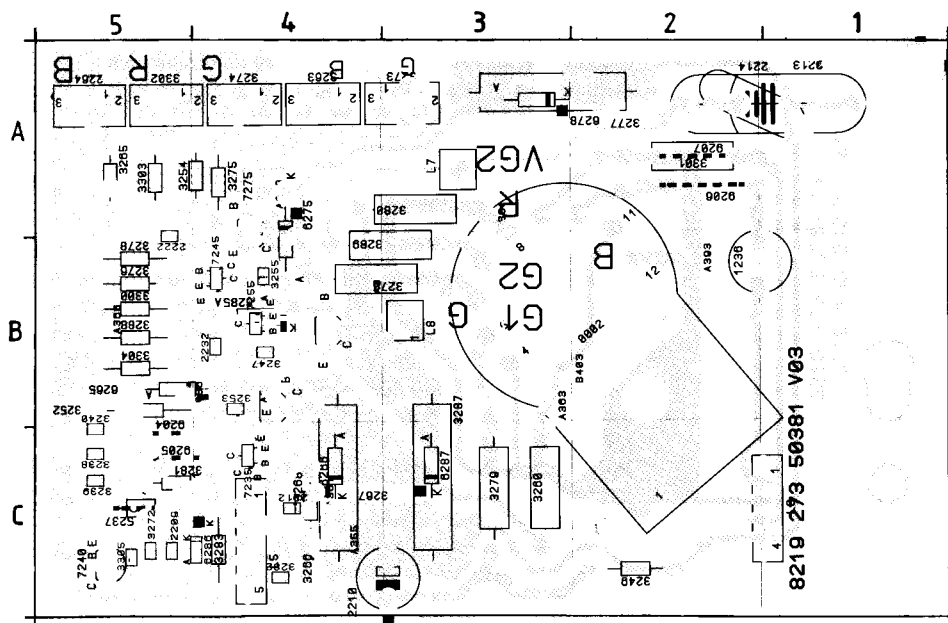


20-21" CRT panel (Narrow neck)

AA5

15

7.

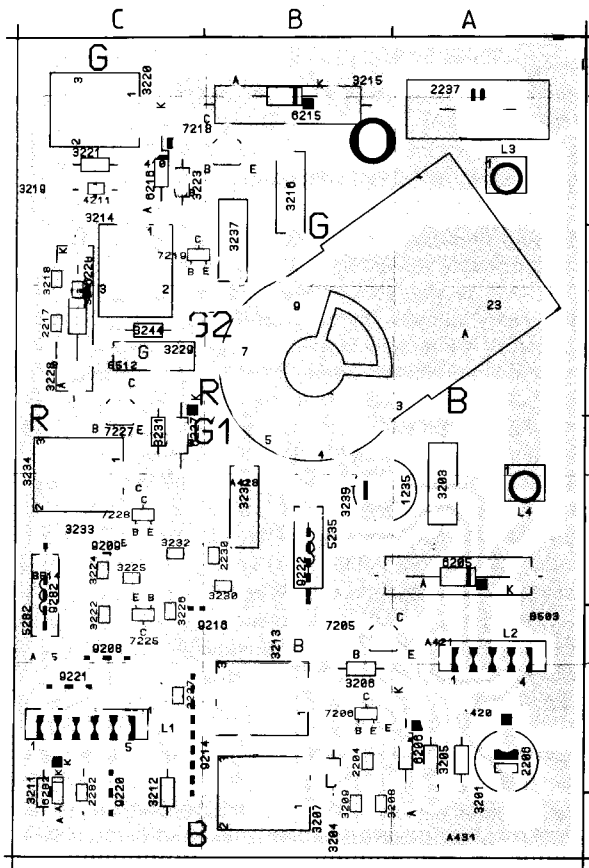


| | | | | | |
|------|-----|------|-----|------|-----|
| L5 | C4 | 3268 | C4 | 6286 | C4* |
| L6 | C1 | 3270 | B4 | 6287 | C3 |
| L7 | A3 | 3272 | C5* | 7235 | C4* |
| L8 | B3 | 3273 | A3 | 7240 | C5 |
| 0002 | B2 | 3274 | A4 | 7245 | B4* |
| 1236 | B1 | 3275 | A4 | 7255 | B4* |
| 2209 | C5* | 3276 | B5 | 7265 | B4 |
| 2210 | C3 | 3277 | A3 | 7275 | A4 |
| 2212 | C4* | 3278 | B5 | 7285 | B4 |
| 2214 | A2 | 3279 | C3 | 9204 | C5 |
| 2222 | B5* | 3280 | A3 | 9205 | C5 |
| 2232 | B4* | 3281 | C5 | 9206 | A2 |
| 3000 | A6* | 3282 | C4* | 9207 | A2 |
| 3000 | A6* | 3283 | C4 | 9224 | C5 |
| 3238 | C5* | 3287 | C3 | 9901 | B6 |
| 3239 | C5* | 3288 | B5 | 9902 | B6 |
| 3240 | C5* | 3289 | B3 | 9904 | C6 |
| 3247 | B4* | 3300 | B5 | 9905 | C6 |
| 3249 | C2 | 3301 | A2 | 9907 | C6 |
| 3252 | B5 | 3302 | A5 | 9908 | C6 |
| 3253 | B4* | 3303 | A5 | | |
| 3254 | A4 | 3304 | B5 | | |
| 3255 | B4* | 3305 | C5* | | |
| 3260 | C3 | 5237 | C5 | | |
| 3263 | A4 | 6265 | B5 | | |
| 3264 | A5 | 6266 | C4 | | |
| 3265 | A5 | 6275 | B4 | | |
| 3266 | C4 | 6278 | A3 | | |
| 3267 | C4 | 6285 | B4 | | |

*: SMD component

1.1
1.2
1.3
1.4

14-15-17-21" CRT panel (Mini neck)



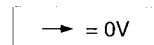
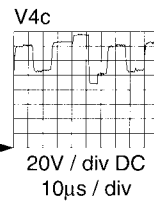
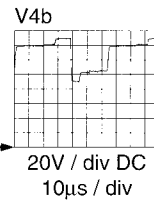
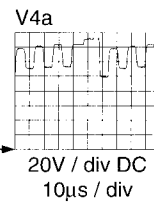
| | | | |
|------|-----|------|-----|
| L1 | C2 | 6215 | B5 |
| L2 | A2 | 6216 | B4 |
| L3 | A4 | 6227 | B3 |
| L4 | A3 | 6228 | C4 |
| 23 | B4 | 6282 | C1* |
| 1235 | A3 | 7205 | A2 |
| 2204 | A2* | 7206 | A2* |
| 2206 | A2 | 7218 | B4 |
| 2217 | C4* | 7219 | B4* |
| 2230 | B3* | 7225 | B2* |
| 2237 | A5 | 7227 | C3 |
| 2282 | C1* | 7228 | B3* |
| 3201 | A2 | 9208 | C2 |
| 3202 | A3 | 9209 | C3 |
| 3203 | A3 | 9214 | B2 |
| 3204 | A2 | 9216 | B2 |
| 3205 | A2 | 9220 | C1 |
| 3206 | A2 | 9221 | C2 |
| 3207 | B1 | 9222 | B3 |
| 3208 | A1* | 9282 | C3 |
| 3209 | A1* | 9900 | C1 |
| 3210 | C1 | 9903 | B1 |
| 3211 | C1 | 9906 | B1 |
| 3212 | B1 | | |
| 3213 | B2 | | |
| 3214 | B4 | | |
| 3215 | B5 | | |
| 3216 | B4 | | |
| 3217 | C4* | | |
| 3218 | C4* | | |
| 3219 | C4 | | |
| 3220 | C4 | | |
| 3221 | C4 | | |
| 3222 | C2* | | |
| 3223 | C4 | | |
| 3224 | C3* | | |
| 3225 | B3* | | |
| 3226 | B2* | | |
| 3227 | B2* | | |
| 3228 | C4 | | |
| 3229 | B4 | | |
| 3230 | B3* | | |
| 3231 | B3 | | |
| 3232 | B3* | | |
| 3233 | B3 | | |
| 3234 | C3 | | |
| 3235 | A3 | | |
| 3236 | B3 | | |
| 3237 | B4 | | |
| 3244 | B4 | | |
| 4211 | C4* | | |
| 5235 | B3 | | |
| 5282 | C3 | | |
| 6205 | A3 | | |
| 6206 | A2 | | |

*: SMD component

V1 183V DC

V2 8V DC

V3 1V3 DC



1.6
1.7
a.

1.8

7. Electrical adjustments

1. Adjustments on the main panel (Fig. 7.1)

1.1 +100V power supply voltage

Connect a voltmeter (DC) across C2530. Adjust **R3532** at a black picture (beam current 0 mA) for a voltage of:

- +100V for 14-15-17"
- +92V5 for 20" narrow neck (neck diameter approx 30 mm) and 21" mini neck (neck diameter approx 20 mm) at a black picture
- +86V for 21" narrow neck (neck diameter approx 30 mm)

1.2 Horizontal centring

Is adjusted with potentiometer **R3354**.

1.3 Picture height

Is adjusted with potentiometer **R3410**.

1.4 Vertical centring

Can be adjusted by eventually mounting one of the resistors **R3401** and/or **R3408**.

1.5 Focusing

Is adjusted with the focusing potentiometer in the line output transformer.

1.6 IF filter (only for sets with SECAM LL' reception possibility):

Connect a signal generator (e.g. PM5326) via a capacitor of 5p6 to pin 17 of the tuner and adjust the frequency for 40.4 MHz.

Connect an oscilloscope to pin 1 of filter 1015. Switch on the set and select system Europe (BG/L is "low" for BGIDK reception).

Adjust **L5012** for a minimum amplitude.

1.7 AFC

- a. For sets with SECAM LL' reception possibility:
Connect a signal generator (e.g. PM5326) as indicated in point 1.6. Connect a voltmeter to pin 44 of IC7015/6A.

Adjust the frequency for 33.9 MHz and select system France (L/L' is "high" for L' reception). Adjust **L5040** for 3V5 (DC).

Next adjust the frequency for 38.9 MHz and select system Europe (L/L' is "low" for BGILDK reception). Adjust **L5043** for 3V5 (DC).

- b. For sets without SECAM LL' reception possibility:
Connect a signal generator (e.g. PM5326) as indicated above and adjust the frequency for 38.9 MHz (for PAL I at 39.5 MHz). Connect a voltmeter to pin 44 of IC7015/6A. Adjust **L5040** for 3V5 (DC).

1.8 RF AGC

If the picture of a strong local transmitter is reproduced distorted, adjust potentiometer **R3021** until the picture is undistorted.

Or: Connect a pattern generator (e.g. PM5518) to the aerial input with RF signal amplitude = 1 mV. Connect a multimeter (DC) at pin 5 of tuner. Adjust **R3021** so that voltage at pin 5 of tuner is 7V5 ± 0V5 (DC).

2. Adjustments on the CRT panel (Fig. 7.2)

2.1 Vg2 cut-off points of picture tube

Apply a pattern generator (e.g. PM5518) and set it to a white raster pattern. Adjust contrast and Vg2 at minimum (Vg2 with potentiometer in line output transformer to the left). Adjust brightness until the DC voltage across potentiometer 3213 is 0V. Adjust **R3207** (B), **R3220** (G) and **R3234** (R) for a level of 125V for 14-15-17-21" mini neck (neck diameter of approx 20 mm) on the collector of transistors 7205, 7218 and 7227. Adjust **R3264** (B), **R3274** (G) and **R3302** (R) for a level of 150V for 20" narrow neck and 160V for 21" narrow neck (both neck diameter of approx 30 mm) on the collectors of TS7265 7275 and 7285. Adjust **Vg2** potentiometer until the light from the gun that first emits light is just no longer visible. Adjust the two **other** guns with the respective controls (3207, 3220 or 3234 or for mini neck and 3264, 3274 or 3302 for narrow neck) until just no light will be visible.

2.2 Grey scale (white D)

Apply a grey scale and adjust the set for normal operation. Allow the set to warm up for about 10 minutes. Adjust **R3213** and **R3214** (**R3263** and **R3273** for 20-21" narrow neck) until the desired grey scale has been obtained.

Main carrier (component side)

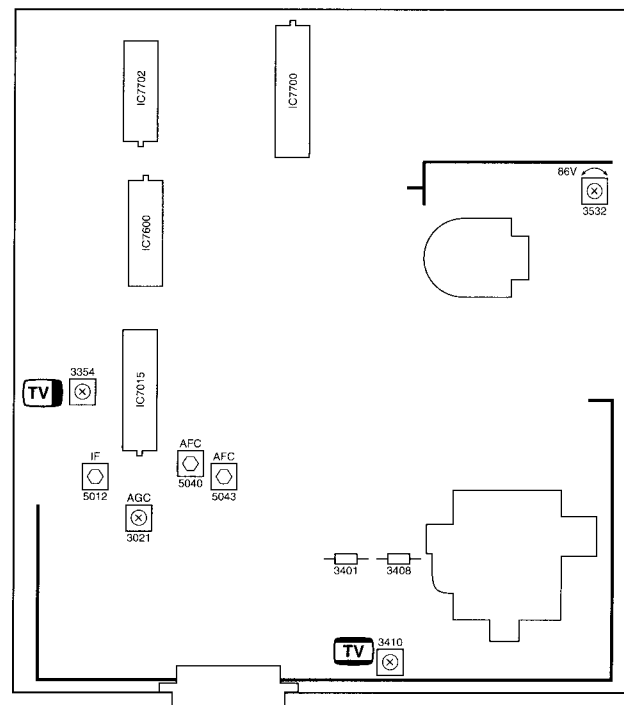


Fig. 7.1

CRT panel mini neck CRT panel narrow neck 20" 14-15-17-21"

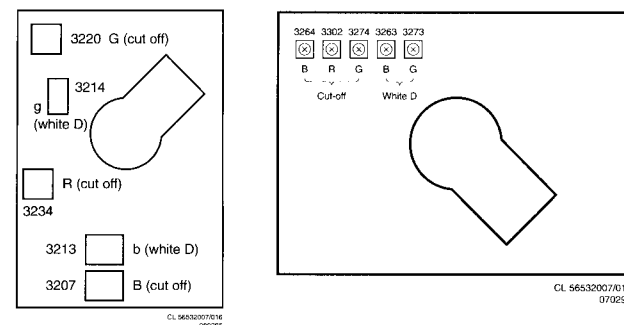


Fig. 7.2

For the description of the line, frame, audio, video and teletext processing see the description in the AA5 AA service manual

Description Switched Mode Power Supply (SMPS) for AA5 AB

Introduction

The AA5 switched mode power supply (SMPS) is mains isolated. The control IC7520 (MC44603) gives the pulses for driving FET 7540 with duty cycle control at a fixed frequency of nominal 50 kHz in normal operation (in standby, slow-start and overload situation the SMPS runs at other frequencies than these 50 kHz). The AA5 SMPS works with a switching FET, no opto-coupler and no thyristor switching windings on the secondary side.

IC7520 is featured with a slow-start circuitry and has over- and undervoltage-protection of the secondary supply voltages. Unload and overload (short-circuit) protection is also included. In case the load decreases under a certain threshold level the SMPS will switch into standby-mode (in stand-by the SMPS is in the so called "reduced frequency mode"; nominal 20 kHz). The +86V output gives a stabilised +86V in normal operation and approx +105V DC in stand-by mode (the supply voltage +8G is "down" so IC7015 is "down", so the line is shut "down").

The output voltages are:

- * +86V for the line output stage and the tuning system
- * +12V for the sound output amplifier
- * +8G for the small signal circuitry
- * +5A for the μ C and periphery (see diagram A5)
- * POR to ensure the μ C only starts up its software when the supply voltages are high enough (see diagram A5)

Duty cycle of the power supply depends on T-on of FET TS7540 which is controlled by pin 3 of IC7520. The IC detects the variations of the +86V (the secondary side of T5550) via sensing-winding 3-1 at the primary side of T5550.

The switching period of FET 7540 is divided in three main areas; T-on, T-off and T-dead (see Fig. 1).

During T-on FET 7540 conducts and so the energy which is extracted from the mains, is stored into the primary winding 4-7 of transformer T5550 with a linear increasing primary current (slope depends on the voltage across C2505). Via T-on regulation by pin 3 IC7520 the duty cycle of the SMPS and so the +86V is controlled.

During T-off FET 7540 does not conduct and so all energy "inside" the transformer is supplied to the load via secondary windings of T5550 and the secondary diodes (D6572, D6568 and D6566). The current through the secondary side of the transformer decreases with a linear slope (slope depends on the voltage at the secondary side of T5550).

During T-dead FET 7540 does not conduct and so no energy is extracted or supplied (I_{sec} is zero).

Primary side

Degaussing: R3506 is a dual PTC (2 PTC's in one housing). After switching "on" the set, the PTC is cold so low-ohmic and so the degaussing current is very high. After degaussing, the PTC is heated, so high-ohmic, so in normal operation the degaussing current is very low.

Mains voltage is filtered by L5500, full wave rectified by diodes 6510-6513 and smoothed by C2505 to the DC input voltage for the SMPS at pin 4 of T5550 (300V DC for 220V AC mains).

Start-up: Via the start-up circuitry R3520 and R3527 one side of the 220V AC mains is used to start-up IC7520 via the supply pin (V_{pin1}).

As long as V_{pin1} has not reached 14V5, IC7520 does not start up and only sinks 0.3 mA; As soon as V_{pin1} reaches the 14V5, IC7520 starts (FET 7540 into conduction) and pin 1 sinks a typical supply current of 17 mA. This supply current can not be delivered by the start-up circuit, so a take-over circuit has to be available. If no take-over takes place, the voltage on pin 1 will decrease and IC7520 switches off. In that case the restart will start again.

Note; This power supply is a SMPS (switched mode power supply) but not a SOPS (self oscillating power supply).

Take over of IC7520: During start-up a voltage across winding 2-1 is built up. At the moment the voltage across winding 2-1 reaches approx +12V, D6525 starts conducting and takes over the supply voltage V_{pin1} of IC7520 (take over current is approx 17 mA).

Control circuitry

IC7520 controls the T-on of FET 7540 in all operation modes by 3 mechanisms:

1. "Secondary-output-voltage-sensing" controls the secondary output voltages (via the feedback voltage V_{pin14}).
2. "I-prim current sensing" controls both the secondary output voltages and the maximum I-prim (via the current sense voltage V_{pin7}).
3. "Demagnetisation control" prevents the transformer T5550 from going into saturation via the so called "DEMAG" function at pin 8 (this causes slow-start operation).

Secondary output voltages feedback (pin 14 of IC7520):

Sense winding 3-1 has the same polarity as the secondary windings which are supplying the load. During T-off the secondary windings and so sense winding 3-1 are positive. D6530 conducts and so charges C2530; the DC level across C2530 is a reference for the secondary output voltages (e.g. the +86V). Via R3530, R3531 and potentiometer R3532 (for adjusting the +86V) this DC-voltage is brought to the required level for the error amplifier in IC7520 at pin 14. This voltage V_{pin14} is called feedback voltage and is used to control the secondary output voltages.

I-prim sensing (pin 7 of IC7520): The current sense voltage V_{pin7} is a measure for the I-prim through FET 7540. The I-prim is converted into a voltage by R3539 and R3540. The current sense voltage V_{pin7} is used to control both the secondary output voltages and the maximum I-prim (see peak current limiting).

Demagnetisation control (via pin 8 of IC7520): Supply winding 2-1 has the same polarity as the secondary windings which are supplying the load. As a result the voltage across this winding is negative during T-on, positive during T-off and oscillating during T-dead. The so called demagnetisation (block "DEMAG" in IC7520) function at pin 8 of IC7520 is used for blocking the output V_{pin3} during the time that there is still energy in the transformer (I_{sec} not zero). This is realised by delaying the T-on until the demagnetisation is completely finished. In this way the currents and voltages at the moment of switching "on" the FET are controlled.

IC7520 control (see Fig. 2 and Fig. 3): The error amplifier (block A in Fig 2) compares the feedback voltage V_{pin14} with an internal reference voltage of 2V5. The output voltage $V_{error-out}$ of this error amplifier is fed to another comparator (block B in Fig 2). This comparator compares the $V_{error-out}$ and the current sense voltage V_{pin7} . As soon as the current sense voltage V_{pin7} becomes higher than the output-voltage of the error amplifier $V_{error-out}$, the comparator B gives a spike (the output of comparator B is the so called current sensing output-voltage $V_{cs out}$).

Flip flop (block C in Fig 2) drives the output pin 3 (V_{pin3}) via a buffer amplifier (block D). The flip flop is set by positive edge of the output of the oscillator (V_{osc}) and reset by the spike $V_{cs out}$.

As a result the positive edge (T-on stops) in case the t slow-start pr **Stable load**

1. In case of (and so a remains will remain
2. In case of decrease which ca will give (longer T output vo new balanc reference As a resu so more more ene
3. In case of increase causes V give the (shorter output vo new balanc reference As a resu so less e less ene
4. In case of the posit cycle, wil starting p so the fre used dur

Peak current 1V DC. Via th the maximum 7540) is dete In case the lo the I-prim is overload prot protection).

Cycle-by-cy cycle-by-cycl This means t doing so the and all prote

Slow-start: This will be d and the duty following 3 p

1. The frequ (50 kHz f realised v "DEMAG" tion (T-on demagne
2. The volta start-up th also grad overload
3. The duty lowest du determin uncharge lowest po

As a result the pulse V_{pin3} becomes "high" (T-on starts) by the positive edge of V_{osc} from the internal oscillator and "low" (T-on stops) by the spike of $V_{CS\ out}$ (the T-on start will be delayed in case the transformer is not yet demagnetised; see the slow-start procedure).

Stable load and increasing / decreasing load (see Fig. 3):

1. In case of a stable load, the feedback voltage V_{pin14} (and so also the maximum current sense voltage V_{pin7}) remains the same. As a result the T-on and so the duty cycle will remain the same.
2. In case of an increasing load, the secondary output voltages decreases. The voltage on pin 14 would like to decrease which causes $V_{error-out}$ to increase. As a result comparator B will give the pulse later; V_{pin3} will be "high" for a longer period (longer T-on so the duty cycle increase) and so the secondary output voltages will be increased (corrected). This will give a new balance of feedback voltage V_{pin14} and the internal 2V5 reference voltage, at a new larger duty cycle. As a result of the longer T-on, the maximum I-prim increases, so more energy can be stored in the transformer. In this way more energy will be supplied to the load.
3. In case of a decreasing load, the secondary output voltages increases. The voltage on pin 14 would like to increase which causes $V_{error-out}$ to decrease. As a result comparator B will give the pulse earlier; V_{pin3} will be "high" for a shorter period (shorter T-on so the duty cycle decrease) and so the secondary output voltages will be decreased (corrected). This will give a new balance of feedback voltage V_{pin14} and the internal 2V5 reference voltage, at a new smaller duty cycle. As a result of the shorter T-on, the maximum I-prim decreases, so less energy can be stored in the transformer. In this way less energy will be supplied to the load.
4. In case the demagnetisation of the transformer is not finished, the positive edge from the oscillator, which will start a new cycle, will be overruled (via buffer block D) as being the starting point of T-on. As a result the T-on will be delayed and so the frequency of the SMPS will go down. This procedure is used during start-up.

Peak current limiting is realised by an internal clamp at V_{pin7} at 1V DC. Via this clamp the V_{pin7} can never exceed 1V DC and so the maximum value of I-prim (maximum current through FET 7540) is determined.

In case the load needs more than the maximum power, by then the I-prim is already at his maximum level so the SMPS will go in overload protection (see foldback principle explained at overload protection).

Cycle-by-cycle control: The T-on control is controlled on a cycle-by-cycle basis (because of the flip flop block C in IC7520). This means that in every cycle the T-on is determined again. By doing so the secondary voltages control, peak current limitation and all protections can be very accurate and fast.

Slow-start: As soon as $V_{pin1} > 14V5$ DC the SMPS will start-up. This will be done by a slow-start procedure (both the frequency and the duty cycle will be built up during slow-start). The following 3 phenomenas take place during start-up:

1. The frequency will slowly increase up to the nominal frequency (50 kHz for normal operation and 20 kHz for stand-by). This is realised via the demagnetisation function at pin 8; via this "DEMAG" function, FET 7540 will only be driven into conduction (T-on will only become "high") when T5550 is totally demagnetised.
2. The voltage at pin 5 determines the foldback point. As during start-up this V_{pin5} is gradually built-up, the foldback point will also gradually increase (see foldback principle explained at overload protection).
3. The duty cycle will slowly increase beginning at the absolute lowest duty cycle possible. The maximum duty cycle is determined by C2533 at pin 11 IC7520; as C2533 is uncharged at start-up, the power supply starts up at the lowest possible duty cycle.

Stand-by mode: In stand-by mode the load decreases (see description of stand-by on the secondary side) under a certain threshold level. The SMPS will determine this threshold level and so switch to the so called "reduced frequency mode" at 20 kHz. This minimal load threshold level is determined by R3579 at pin 12. (in AA5 the SMPS does not have a burst mode in stand-by, only a reduced frequency mode).

50 kHz: In normal operation mode the internal oscillator gives 50 kHz. This frequency is controlled by C2531 at pin 10 IC7520 and by R3537 pin 16 IC7520.

20 kHz: In stand-by mode the internal oscillator gives 20 kHz. This frequency is controlled by R3536 at pin 15 IC7520.

FET 7540 gate regulation: D6524 prevents pin 3 of IC7520 from becoming negative (this will destroy the IC) due to stray inductance in the gate part. The safety resistor R3524 limits the drive current to the gate of FET 7540. The C2526 has a ESD protection function.

Pin 9 IC7520: Pin 9 is the sync pin of the internal oscillator in IC7520. When V_{pin9} is between 0V7 and 3V7, the oscillator is disabled so:

1. at switching "on" the TV, the oscillator is enabled as soon as $V_{pin9} > 3V7$.
2. at switching "off" the TV, the oscillator is disabled as soon as $V_{pin9} < 3V7$.

This switching "off" behaviour is used to switch "off" the SMPS very fast. In this way also the LED switches "off" immediately in case the set is switched "off" (via the mains switch or the stand-by command).

Typical values for the AA5 SMPS:

- * In a stable situation V_{pin14} is typical 2V5.
- * At maximum output power of 100W the V_{pin7} is 1V DC ($I_{prim\ max} = 2.5A$)
- * At medium output power of 50W the V_{pin7} is 0V5 DC ($I_{prim\ max} = 1.25A$)

Protections

Overvoltage protection of the secondary voltages: After start-up is the supply voltage V_{pin1} taken over by positive winding 2-1, and so after start up V_{pin1} is a measuring point for the secondary output voltages. After start-up (via an internal switch) this V_{pin1} is internally tapped (voltage divided) to a voltage which can be measured at pin 6 (so V_{pin6} is also a measuring point for the secondary output voltages).

As soon as the voltage $V_{pin6} > 2V5$, the logic in IC7520 will shut down the output at pin 3. This 2V5 threshold at V_{pin6} , is equivalent to a V_{pin1} of 16V DC which is equivalent to a voltage at the supply voltage +86V of approx 110V DC (normal operation) and 130V DC (stand-by). After switching "off" because of overvoltage protection, the IC starts up again (see slow-start).

→ In case an overvoltage situation is sensed at the secondary output voltages, the SMPS will go in overvoltage protection. In case the overvoltage situation remains present, the SMPS will give overvoltage protection, slow-start, overvoltage protection, slow-start, etc → a very good audible hick-up mode.

Undervoltage protection of the secondary voltages: If the supply voltage $V_{pin1} < 9V$ DC the output pulse at pin 3 will be shut down. As soon as $V_{pin1} < 7V5$, the IC7520 will be totally shut "off". V_{pin1} of 9V DC is equivalent to a voltage at +86V of approx 65V DC (normal operation) and 80V DC (stand-by), V_{pin1} of 7V5 is equivalent to a voltage at +86V of approx 54V DC (normal operation) and 65V DC (stand-by).

→ In case an undervoltage is sensed at the secondary output voltages, the SMPS will first switch "off" the pulse and then switch "off" the complete IC7520. In case the IC7520 is switched "off", the SMPS will switch "off". In case the undervoltage situation remains present, the SMPS will give undervoltage protection, slow-start, undervoltage protection, slow-start, etc → a very good audible hick-up mode.

Unload protection: In case the load goes down (e.g. the line goes down because of stand-by mode or some failure in the line) this is detected by IC7520 via I-prim and secondary output voltages sensing.

In case the load decreases below a certain threshold the SMPS will switch in "reduced frequency mode" of 20 kHz (this threshold is determined by the voltage level at pin 12 IC7520);

→ In case of an unload situation the set will switch to "low frequency mode" or stand-by mode.

Whether this unload situation of the SMPS is caused by the stand-by command or by a failure (e.g in the line), can only be determined by switching on the set again which the remote control; in case of stand-by mode the TV will switch "on" again, in case of an unload situation the set will not switch "on".

Overload (short-circuit) protection (see Fig. 4): If the secondary load becomes too high, I-prim becomes too high which is sensed by the current sense voltage V_{pin7} . This voltage V_{pin7} is not allowed to exceed 1V DC by IC7520 and so gives current limiting. As the I-prim is limited, the secondary output voltages will also drop and so supply voltage V_{pin1} will drop. As soon as $V_{pin1} < 9V$ DC the driving pulse at pin 3 will stop. As a result of these 2 mechanism in case of an overload the secondary voltages will drop very fast. This is called the foldback mechanism; the foldback point can be adjusted by pin 5 IC7520 (for AA5 this point is adjusted to a maximum tolerable output power of 100W).

After this foldback, the IC starts up again (see slow-start). In case the overload situation remains present, the SMPS will give foldback again, slow-start, foldback, slow-start, etc;

→ As a result in case of a short-circuit (or overload) the TV will be in a very good audible hick-up mode.

Secondary side

+86V for the line output stage and the tuning system is made via the positive winding 18-15, rectifier diode D6561 and smoothing capacitor C2569.

+12S for the sound output amplifier is made via the positive winding 14-13, rectifier diode D6572 and smoothing capacitor C2573.

+8A (for the whole small signal part), **+5A** (for the μC and periphery) and the **POR** is made via the positive winding 16-15, rectifier diode D6566 and smoothing capacitor C2563. Positive winding 15-16 gives after rectification and smoothing a DC voltage of approx 10V DC across C2563 in normal operation. This 10V DC is stabilised to +8A by IC7567 and to +5A via a stabilizer circuit around TS7641 and TS7642.

Power On Reset (POR): In order to ensure that the μC starts up correctly, a POR signal (Power On Reset) must be given. The POR procedure consists of keeping the reset pin 33 of the μC "low" for at least 1 msec after switching on the set with the mains switch.

The POR is kept "low" by means of TS7641 and zener D6641; TS7641 only starts conducting when the emitter of TS7641 becomes $5V1 (D6560) + 0V7 (TS7561) = 5V8$. D6642 makes sure the POR signal will never exceed the 4V7.

Stand-by: The STANDBY command from the μC is "low" for stand-by operation. So in stand-by mode TS7640 does not conduct, so TS7565 conducts. As a result the +8A is reduced to 1V2 in stand-by mode. The whole small signal part including IC7015 will not be supplied any more. As also IC7015-6E does not work any more, the line will be shut. Because the line is shut, the load of the SMPS will drastically drop. IC7520 detects that the load is under a certain level (see unloaded protection) and so the SMPS will go into stand-by mode (reduced frequency mode; 20 kHz).

In normal operation the +86V supply voltage has a value of approx +86V DC, in stand-by mode this +86 has a value of approx +105V DC.

No protections are available at the secondary side.

side.

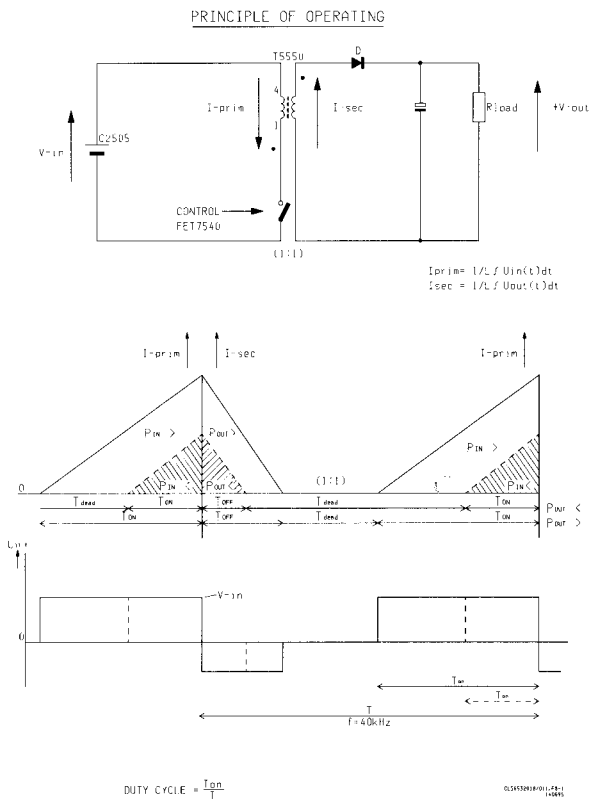


Fig. 1

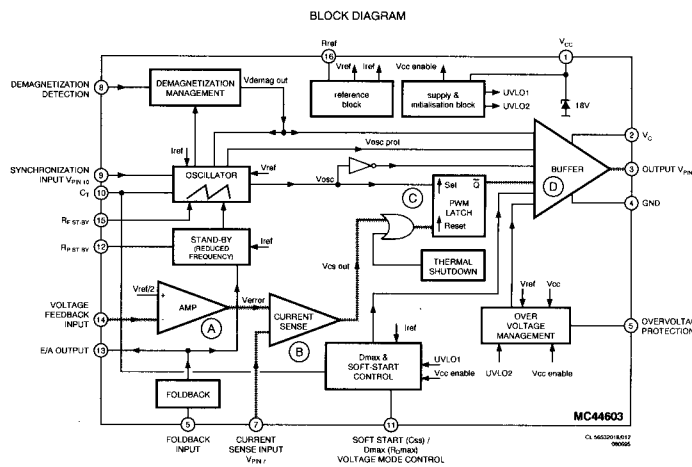


Fig. 2

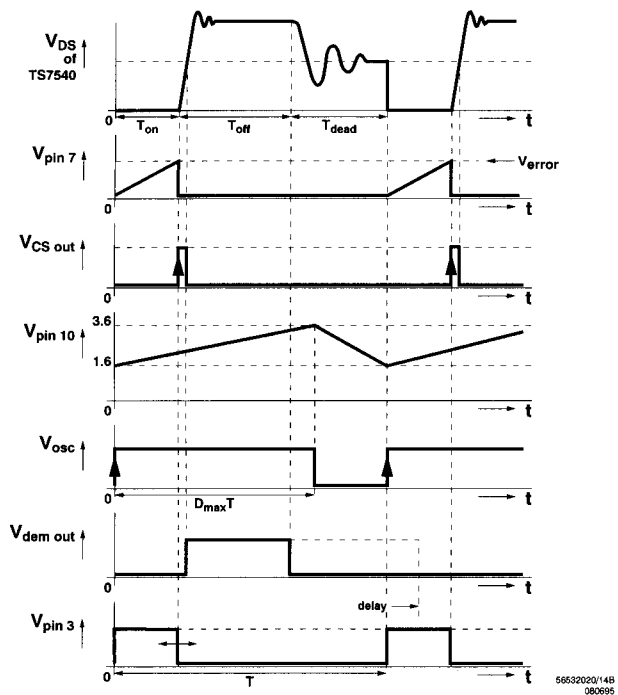


Fig. 3

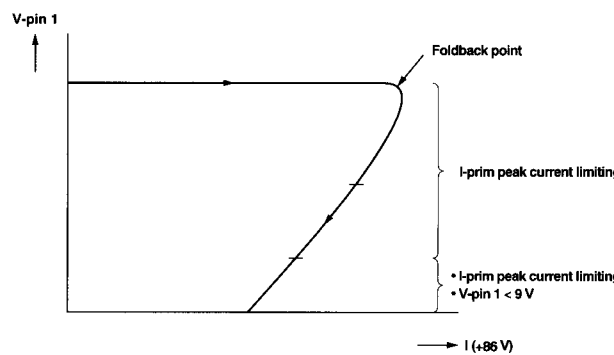


Fig. 4

8. Repair facilities

Functional blocks

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

Test points

The AA5 chassis is equipped with test points in the service printing on both sides of mono-board. These test points are referring to the functional blocks as mentioned above:

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

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

Service default mode (SDM)

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

Entering the service default mode can be done in 2 ways:

1. By short-circuiting the service pins S1 and S2 of the microcomputer (pin 7 of IC7600) while switching on the set with the mains switch
2. From normal operation mode by pressing the button "DEFAULT" on the DST (Dealer Service Tool) RC7150.

Leaving the service default mode to normal operation can only be done by the stand-by on the remote control (so not via mains switch "off"; after mains switch "off" and then "on" again the set will start up in the Service Default Mode again to enable easy faultfinding).

Functions of the service default mode (see Fig. 8.1):

1. All analog settings (volume, contrast, brightness and saturation) are in the mid position (in μC with V1.0 the volume in the SDM is set at 25%, from V1.1 onwards the volume in the SDM is set at 50%).
2. For VST sets are to program number 1 indicated in the right top corner
3. For PLL sets are tuned to 475.25 MHz
4. Delta volume settings are not used (delta volume setting per program in reference with the PP volume setting which is valid for all programs)
5. OSD error message (present available error code) is displayed continuously
6. Store open and store close commands will act as search and auto store
7. Automatic switch off function (set switches "off" after 15 minutes no IDENT) will be switched off
8. Hotel mode will be disabled
9. All other functions remain normal controllable
10. A counter in the middle of the screen indicate the normal operation hours of the set in a hexadecimal code (every time the set is switched "on" the counter is incremented by 1 hour, so +1 at the counter).
11. An "S" in the middle of the screen (next to the counter) indicate that the set is in the service default mode

Counter + "S" for SDM active + prog nr. →

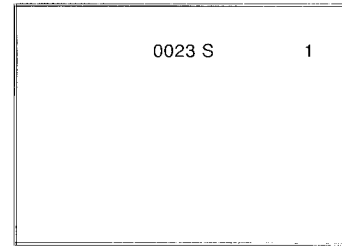


Fig. 8.1

Service Menu (SM)

Entering the service menu can be done in 2 ways:

1. From service default mode by simultaneously pressing the buttons "-" and "+" buttons on the local keyboard.
2. From normal operation mode by pressing the button "ALIGN" on the DST RC7150.

Leaving the service menu to normal operation can be done in 2 ways:

1. Via the stand-by on the remote control
2. Via mains switch "off"

For reading a new option setting, the set must be switched "on" by the mains switch (so not by stand-by as by then the EEPROM-settings are not read).

Functions of the service menu (see Fig. 8.2):

1. Software version of the microprocessor used in that typical set is displayed in the right top corner
2. A counter in the middle of the screen indicate the normal operation hours of the set in a hexadecimal code (every time the set is switched "on" the counter is incremented by 1 hour, so +1 at the counter).
3. The "S" in the middle of the screen next to the counter indicate that the set is in the service default mode
4. Error code history: The 5 last different error codes occurred are stored in the EEPROM memory; last error code detected will be displayed on the right side (see for an overview of all possible error codes Fig. 8.4), so e.g.:

- 0 0 0 0 0 means no error codes present in the buffer
- 0 0 0 0 3 means one error code present in the buffer; error code 3
- 0 0 0 3 2 means two error codes present in the buffer; last detected error code is error code 2, previous detected error code is error code 3

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

Counter + "S" for SM active + software version →

Error code history →

Option setting bar →

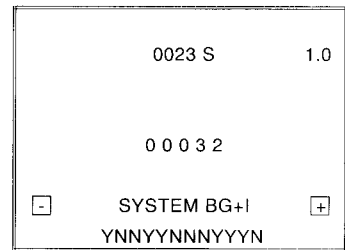


Fig. 8.2

5. Option setting:

The options of the set can be changed in the service menu. In the 2 bottom lines the options are given. Control of the options is with the following keys on the remote control:

- * PROGRAM +/-
Select the option to be changed:
Via the "PROGRAM +/-" button to option to be changed can be selected by scrolling through the possible options in the upper row from left to right (via the "PROGRAM +" button) or from right to left (via the "PROGRAM -" button). The selected option will be displayed in the upper row, the

| |
|--|
| Text displayed in the upper option in the service me |
| SINGLE SYSTEM I SYSTEM BG+L SYSTEM BG+L+ |
| PLL TUNER |
| NO TXT 1P TXT 4P TXT 16/9 SWITCH |
| S-VIDEO |
| SCART |
| SHARPNESS |
| LOCAL MENU |
| 40 PROGRAMS |
| SLEEPTIMER |
| FOR GERMANY ONLY |

Error

The mi the I²C via OS operati
1. In "LE Th will
2. In an det and
3. In err the the cor

present "Y" or "N" status of that option (see table 8.3) will be blinking in the bottom row (when arrived at the end of the row the scrolling will be continued at the other side).

* MENU +/-

Change the selected option; via "MENU +/-" buttons the selected option can be changed. The selected Y (yes) or N (no) blinks and via either "MENU +" or the "MENU -" you toggle through the "Y" or "N" possibility.

The options (both the changed and the not-changed options) are stored in the EEPROM as soon as the service menu is left (by stand-by or mains switch "off"). The new option settings are only read after mains switch "on" (so not after switching on the set from stand-by mode).

The following table indicates the possible options and there technical consequences:

| Text displayed in the upper option row in the service menu | In case the "N" or "Y" blinks, it can be changed | The technical consequence for the selected option |
|--|--|--|
| SINGLE SYSTEM I SYSTEM BG+L SYSTEM BG+L+I | → NN → NY → YN → YY | → For a PAL BG only set → For a PAL I only set → For a PAL BG + SECAM LL' set → For a PAL BGI (or PAL BGDK) + SECAM LL' set |
| PLL TUNER | N Y | → For a VST tuner set → For a PLL tuner set |
| NO TXT 1P TXT 4P TXT | → NN → NY → YN | → For a set without teletext → For a set with 1 page WST teletext → For a set with 4 page FLOF teletext |
| 16/9 SWITCH | N Y | → Disable 16/9 switching possibility → Enable 16/9 switching possibility |
| S-VIDEO | N Y | → For a set without SVHS connectors → For a set with SVHS connectors |
| SCART | N Y | → For a set without a scart connector → For a set with a scart connector Note: The SCART option can only be changed when the S-VIDEO option is "N" |
| SHARPNESS | N Y | → Disable sharpness control → Enable sharpness control |
| LOCAL MENU | N Y | → No ring menu after pressing "MENU" on the local keyboard → Ring menu after pressing "MENU" on the local keyboard |
| 40 PROGRAMS | N Y | → 70 programs can be stored → 40 programs can be stored |
| SLEEPTIMER | N Y | → Disable sleeptimer function → Enable sleeptimer function |
| FOR GERMANY ONLY | N Y | → Disable ATS function → Enable ATS function (only works when ATS software is present) |

Fig. 8.3

Error messages

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

1. In normal operation;

In normal operation both the "OSD error message" and the "LED error" indication will display the present detected error. The displaying of both the OSD and the LED error indication will only take a limited time.

2. In the service default mode;

In the service default mode both the "OSD error message" and the "LED error" indication will display the present detected error. In the service default mode both the OSD and the LED error indication will be displayed permanently.

3. In the service menu;

In the service menu both the "OSD error number" (in the error code history) and the "LED error" indication will display the present detected error. In the service default mode both the OSD and the LED error indication will be displayed continuously.

| "OSD error message" (normal operation) | "OSD error number" (service menu) | "LED error" "on"/"off" in SEC | Error description | Possible defective component |
|--|-----------------------------------|-------------------------------|--------------------------|---------------------------------|
| No indication | 0 | No blinking LED | No error | -- |
| ERROR: RAM | 1 | 1 sec on / 1 sec off | µC error | IC7600 |
| ERROR: BUS | 2 | 2 sec on / 2 sec off | General I ² C | I ² C bus is blocked |
| ERROR: EEPROM | 3 | 3 sec on / 3 sec off | EEPROM error | IC7685 |
| ERROR: TELETEXT | 4 | 4 sec on / 4 sec off | Teletext error | IC7700/7702 or option wrong |
| ERROR: TUNER | 5 | 5 sec on / 5 sec off | PLL tuner error | PLL tuner or option wrong |

Fig. 8.4

Reset volume/program (delta volume) for all programs at once

It is also possible to leave the service menu with the MENU button. After one time pressing the MENU button in the service menu, a new menu is entered (see Fig. 8.5) in which the volume/programs-settings (also called delta volume settings) of all programs can be deleted. In case YES is selected via the MENU+ button, all volume/program-settings are deleted at once. After another time pressing the MENU button the TV will switch to normal operation (when the service menu is entered via the pins S1 and S2) or service default mode (when the service menu is entered with the DST).

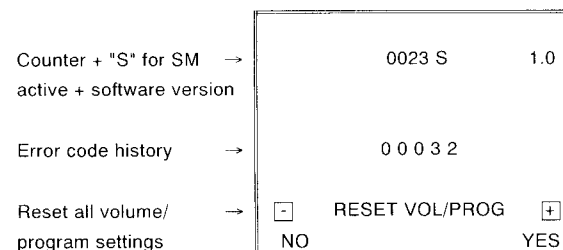


Fig. 8.5

Hotel mode

* Hotel mode "on"

The hotel is activated when pressing simultaneously the "MENU" button on the local keyboard and the "SLEEPTIMER or OSD" button on the remote control while program 38 is selected for at least 3 seconds.

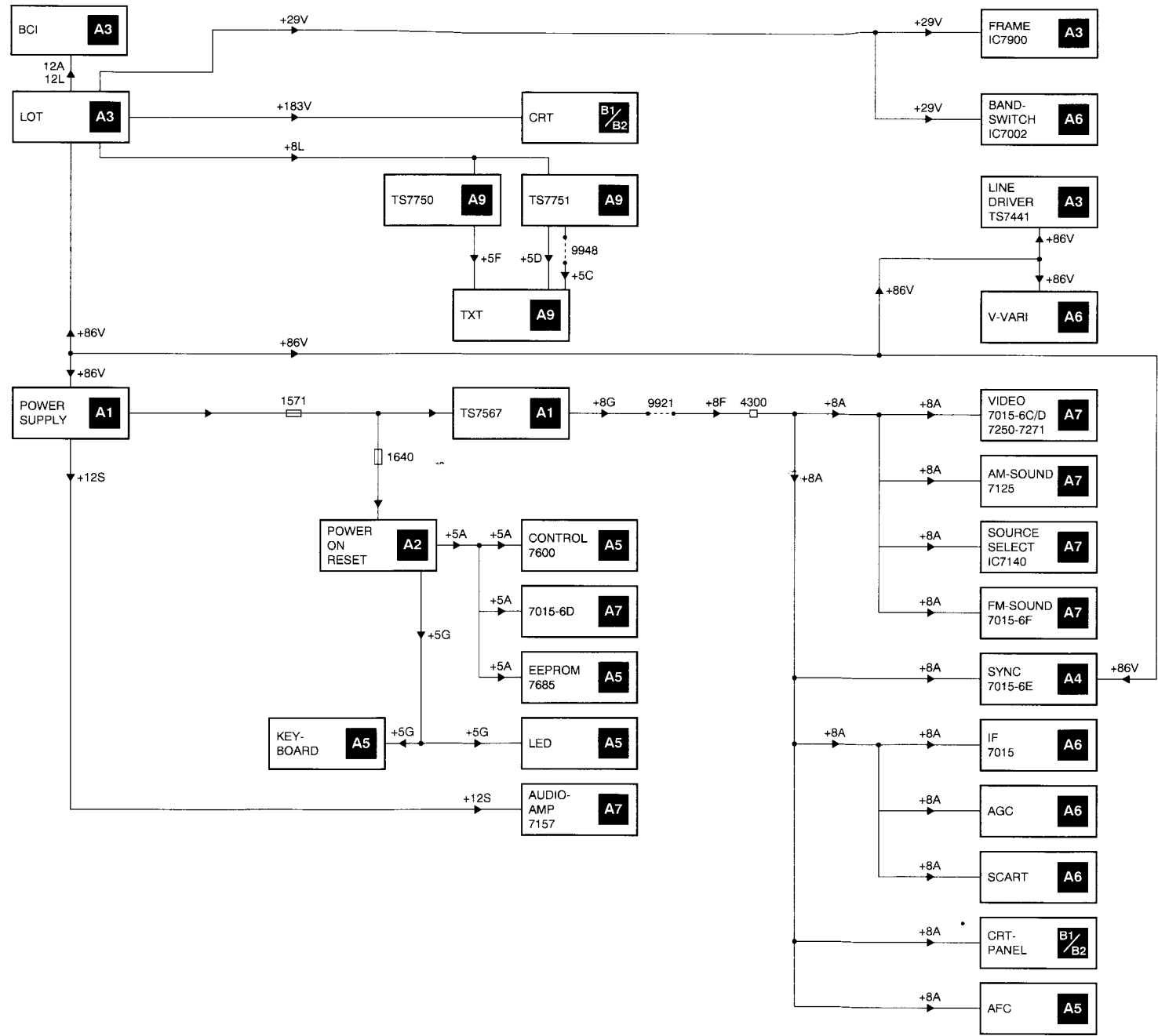
When the hotel mode is activated, this is indicated by a "H+" on the OSD (this will be displayed until the set is switched of by the mains switch or via stand-by).

* Hotel mode "off"

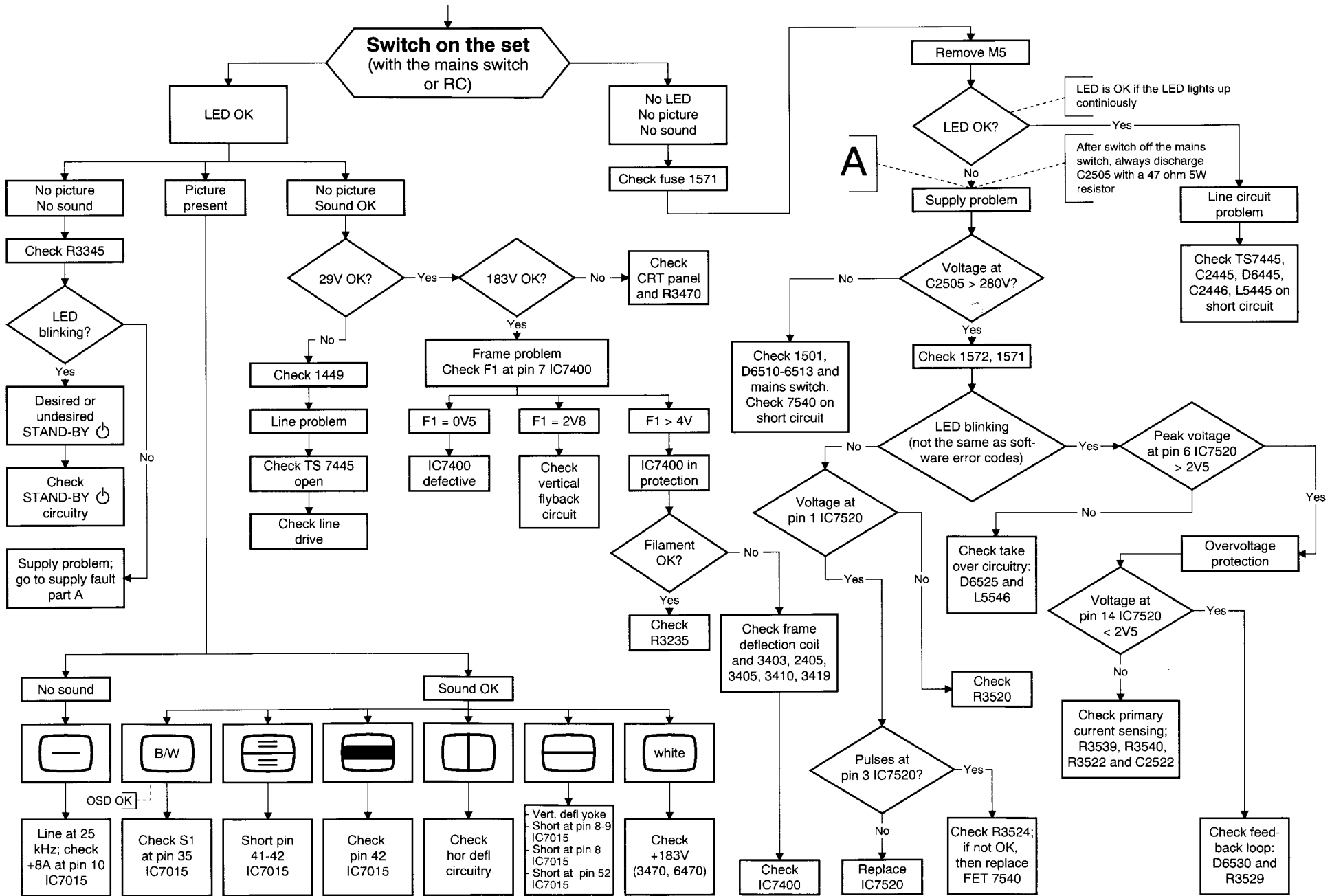
Repeat above mentioned procedure once again. When the hotel mode is de-activated, this is indicated by a "H-" on the OSD (this will be displayed until the set is switched of by the mains switch or via stand-by).

* Functions of the hotel mode

- The volume present on the moment the hotel mode was switched "on" is the maximum volume level in the hotel mode.
- The install mode can not be opened (the message "LOCKED" will be displayed for 3 seconds if a store open command is given).
- The delta volume menu can not be entered.
- PP (personal preference) can not be stored (the message "LOCKED" will be displayed for 3 seconds if a PP-store command is given).
- At switch "on" (by mains switch or remote control) program number 1 will always be selected.



565342029/14A
130695



Installation


- Follow the instructions very closely and step by step.
- This circle in front of a sentence indicates that you have to do something.
- This arrow in front of a sentence indicates the result of what you have done.
- Text in italic indicates help information.*

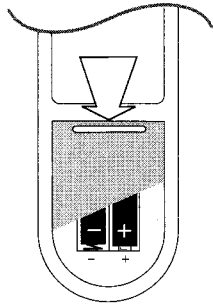
Place the TV on a solid base.
Leave at least 5 cm around each side of the TV for ventilation.

To prevent any faults and unsafe situations, do not place any objects on top of the sets.

The TV can only operate at a mains voltage of 220/240 V~, 50 Hz; consult your dealer if the mains supply is different.

Make sure that the connection facilities to any TV installed in your house are in good condition. Only use good quality aerial connectors and cables.
The aerial plugs should be tightly connected.

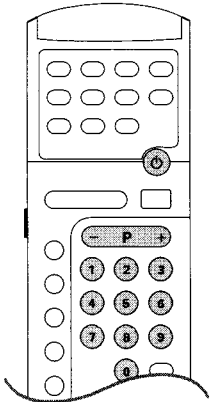
- Connect the TV tightly to the mains supply socket.
- Connect the aerial (indoor or outdoor) plug tightly to the  socket on the back of the TV.





Remote control

- Remove the battery cover from the remote control.
- Insert the batteries, as indicated on the remote control.
- Replace the battery cover.


The batteries supplied with the remote control of your TV do not contain the heavy metals mercury and cadmium. In many countries flat batteries may not be disposed off with your household waste. **Please ensure that batteries are disposed off in accordance with any local regulations.**



Switching TV on and off

- Press  on the front of the TV.
- The TV is switched on.
- Is the TV still switched off? Then the TV is on Stand-by.
- Press **P** - or + or a digit button on the remote control, or - or + on the TV, to switch on the TV.
- Press  again to switch off the TV.

Stand-by

- By pressing  on the remote control you can temporarily switch the TV off.
- Press **P** - or + or a digit button on the remote control, or - or + on the TV, to switch on the TV again.

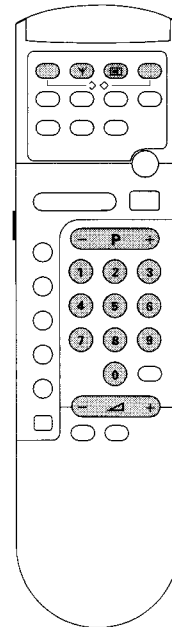
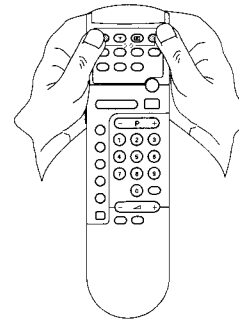
Automatic switch off

If after a period of 15 minutes no aerial signal is received, the TV automatically switches to Stand-by.


Televisions consume energy in the stand-by mode. Energy consumption contributes to air and water pollution. We advice you to switch off your TV overnight instead of leaving it on stand-by. You save energy and the picture tube is demagnetised which supports good picture quality.

Auto Store

The Auto Store function can be used to find and store all available channels quickly. Channels are stored on program numbers in the same sequence as they are found. After Auto Store is




Storing TV channels

Write down the TV channels and the assigned program numbers while storing.
Storing TV channels can be stopped by pressing simultaneously the two  buttons.

69 TV channels (1 to 69) can be stored on program numbers.

Follow carefully steps **1, 2, 3, 4, 5.**

1.



- Press simultaneously the two  buttons.
- INSTALLATION** appears on the screen.

2.

- Not all countries broadcast TV programmes in the same way. We speak of different TV systems. You can select a different TV-system for each separate program number.
- Press **Y** one or more times to select the required TV-system. You can select among the following TV-systems:

| Region | TV-system | Used in |
|--------------|---------------------|---|
| EUROPE | PAL BG - SECAM BG | West European countries except France, except United Kingdom and Ireland. |
| FRANCE UK | SECAM L L' PAL I | France. United Kingdom and Ireland. |

3.

- Press  to start the search.
- The TV automatically searches until a TV channel is found.
- If you want to continue searching for a specific TV channel then press  again.


4.

- Press **P** - or + to select the program number (1 to 69) where you want to store the TV channel.
- The selected program number is displayed on the screen.

Important

You cannot store TV channels on program number 0.
Program number 0 is reserved to select electronic equipment connected to the TV. See "Peripheral connections".

5.

- Press simultaneously the two  buttons to store this selection.
- The message **STORED** appears for a few seconds on the screen.

Repeat steps **1, 2, 3, 4, 5** until all the TV channels you require have been stored on program numbers.

The stored picture and sound values can also be recalled by pressing **PP**.

- Press **MENU**.
- VOLUME** appears, adjust the volume by pressing - or +.

Auto Store

The Auto Store function can be used to find and store all available channels quickly. Channels are stored on program numbers in the same sequence as they are found. After Auto Store is started, the TV starts searching for a TV channel. When a TV channel is found, it will be automatically stored on program number 69. Searching will start again automatically. If another TV channel is found, it will be stored on program 68, etc.

Your TV can receive different TV systems. With Auto Store the TV searches automatically through all TV systems and stores all TV channels available.

The TV systems are automatically selected as in the following sequence and channels in those TV systems are searched for automatically:

- 1 - TV system FRANCE (SECAM L.L')
- 2 - TV system EUROPE (PAL/SECAM BG)
- 3 - TV system UK (PAL I)

- Press simultaneously the two \diamond buttons longer than 4 seconds.
- **INSTALLATION** appears.
- Press + (YES) to start the **AUTOSTORE** function.
- The Auto Store is stopped by pressing simultaneously the two \diamond buttons.

At the end of the Auto Store cycle the TV switches to program 69.

To reorganize the sequence of the TV channels stored by the Autostore, refer to the section "Storing TV channels" following steps 1, 4, 5.

Operation

On Screen Display

The On Screen Display (OSD) information allows you to see the program number on which a TV channel is stored, the timer status and a moving bar if the volume is adjusted.

- Press \square to display information on the screen.
- Press \square again to switch off information.

Selecting TV channels

- Press **P** - or + or press one or two digit buttons on the remote control.
- To select a program number from 0 to 9 press one digit button.
- To select a program number from 10 to 69 you must press two digit buttons in less than 4 seconds.

- or
- Press - or + on the TV.

Volume control

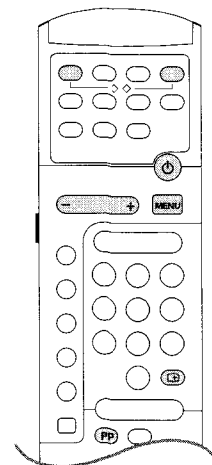
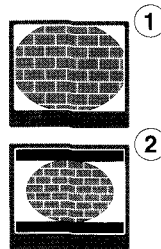
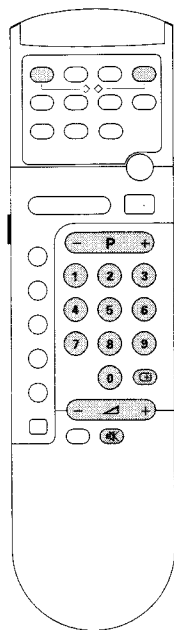
- Press \triangle - or + on the remote control.
- Press M to switch off the sound.
- Press M again or \triangle + to switch on the sound.

Menu on screen

With the menu on the screen you can change and store the picture and sound settings. You can also set the timer, select the screen format and pre-select the external electronic equipment connected to the TV.

When you switch on your TV, the picture and sound settings have certain values. These values are initially stored by the factory. Using the menu on screen you can change these values. Also if you store these values (by pressing simultaneously the two \diamond buttons after a change), the TV will switch on with your stored picture and sound values.

If you want to leave the menu, for example after changing the contrast setting, you can either wait approximately 10 seconds or continue to press the MENU button until the menu disappears from the screen.



The stored picture and sound values can also be recalled by pressing **PP**.

- Press MENU.
- **VOLUME** appears, adjust the volume by pressing - or +.
- If you want to store this setting press simultaneously the two \diamond buttons.
- Press MENU again.
- **BRIGHTNESS** appears, adjust the brightness by pressing - or +.
- If you want to store this setting press simultaneously the two \diamond buttons.
- Press MENU again.
- **CONTRAST** appears, adjust the contrast by pressing - or +.
- If you want to store this setting press simultaneously the two \diamond buttons.
- Press MENU again.
- **SHARPNESS** appears, adjust the sharpness by pressing - or +.
- If you want to store this setting press simultaneously the two \diamond buttons.
- Press MENU again.
- **COLOUR** appears, adjust the colour by pressing - or +.
- If you want to store this setting press simultaneously the two \diamond buttons.

- Press MENU again.

(The following function is only present on certain TV models).

- **SCREENFORMAT** appears, adjust the screenformat by pressing - or +.
- This function can be used if you receive a picture which looks like indicated in drawing 1. By pressing +, you select **WIDE** (wide) and the picture will be changed as indicated in drawing 2.
- Press MENU again.

(The following function is only present on certain TV models).

- **EXTERNAL** appears.
- If you select the program 0 the picture of a device connected to the TV can be displayed on the screen (see also "Peripheral connection").
- By pressing - or +, you can select:

Program 0 = **AV**: For devices connected via Euroconnector (scart) or via front Audio-Video connector.

or
Program 0 = **S-VIDEO**: For devices connected via front S-VIDEO connector.

When changing the selection, program 0 will be automatically selected and **AV** or **S-Video** will be displayed on the screen.

Note: If you see a double or black and white picture on the screen, check whether the selection of the device connection is made correctly (see also "Peripheral connection").

- Press MENU again.
- **TIMER** appears.
- The timer can be used to switch on or off the TV automatically after the time you want. You can set the time after which the TV switches on or off in steps of 10 minutes to a maximum of 24.00 hours.

Switching off automatically:

- Press - or + to select the time after which the TV should switch off. The count down starts immediately. You can see the remaining time by pressing \square on the remote control.
- During the final minute of the selected time period, the seconds remaining are automatically shown on the screen.
- At the end of this time period the TV switches to stand-by mode.

Switching on automatically:

- Press - or + to select the time after which the TV should switch on. The count down starts immediately.
- Press O to switch the TV temporarily off.
- The TV will switch on after the time you have selected.

Note: If you switch on your TV again before the selected time has elapsed, the timer will be switched off automatically. If you do not press any button within 3 hours after the TV has switched on automatically, the TV will switch automatically to Stand-by again.

If you want to stop the TIMER press - or + until the selected period on the screen is 00.00.

- Press MENU.
- The menu disappears.

Different volume level for a specific TV channel

Not all TV channels are broadcasting the volume at the same level. With this function you can align the volume level of a specific TV channel (which is louder or soft) to the other TV channels.

- Press MENU longer than 4 seconds.
- Immediately **VOLUME** appears, keep on pressing until "**∟/PROGRAM**" appears.
- Press **P** — or + to select the program number of the TV channel that you want to adjust the volume level.
- Press — or + to adjust the volume level.
- Press simultaneously the two ◊◊ buttons to store the volume level.
- **STORED** appears for a few seconds.
- Select another TV channel to adjust the volume level or press several times MENU to leave the menu.

Teletext

A number of TV channels broadcast information via teletext. Teletext is an information system which can be consulted the same way as a newspaper or magazine.

Teletext Time

The time can only be called up if the TV channel you are watching is also broadcasting teletext.

- Press **⏻**.
- The time appears.
- Press **⏻** again to switch off the time.

Switching Teletext On and Off

- Select the TV channel for the desired teletext broadcast.
- Press **⏻** to switch on the teletext.
- The contents appear on the screen together with an information line at the top. In the information line appears:
 - the number of the page requested.
 - the page counter.
 - date and time.

• only **P 100** if there is no teletext broadcast.

- Press **⏻** again to switch off the teletext.
- The TV channel reappears.

Selecting a Teletext Page

Direct page selection

- Enter the desired page number with the digit buttons. The number of pages always includes 3 digits.
- The page counter seeks the page.
- If the counter keeps searching, then the page is not available or does not exist.

*Does **P 1...** appear or have you entered an incorrect number?
First complete the number with random figures and then enter the correct page number again.*

Selection with the options line

Signs red — and blue + of the option line enable the direct selection of the following or the previous page.

- Press the red button or the blue button on the remote control to select either the previous or the following page.
- or Certain teletext systems allows a quicker access to the headings: in this case the section names are displayed in the option line.
- Select the desired subject with the corresponding colour button on the remote control.

Special teletext functions

Hold a rotating page

Sometimes the information is contained on several pages following each other. In this case they are automatically displayed in rotation. The total number of subpages and the subpage displayed are indicated on the screen. For example: 1/4, meaning page 1 out of 4 is being displayed.

- Press **⏻** to hold a page.
- **1/4** appears in the information line. The information in this subpage is not being updated anymore.
- Press **⏻** again.
- The page rotation starts again.

Reveal concealed information

Some pages contain concealed information, such as solutions to riddles and puzzles.

- Press **?** to call up concealed information.
- Press **?** again to switch off the concealed information.

Enlarge a page

- Press **⏻** to enlarge the top half of the teletext page.
- Press **⏻** again to enlarge the bottom half of the teletext page.
- Press **⏻** once more to return to normal page size.

Overlay of the teletext on the TV image

- Press **⏻**.
- The teletext page is superimposed over the TV program on the screen.
- Press **⏻** again.
- Only the teletext page is displayed.

Selecting a specific subpage

Sometimes the information is contained on several pages following each other. By adding a subcode you can call up a subpage and hold it.

- Enter the page number.
- Press **⏻**.
- Enter the subpage with 4 digits: e.g. 0003 for subpage 3. In the meantime, you may return to the picture broadcasted from the TV channel.
- Press **X**.
- The TV channel appears. **⏻** indicates that you are still in the teletext mode. When the page has been found, the information line appears on your screen.
- Press **X** again.
- Teletext reappears.
- Press **⏻** to return to the normal teletext function.

Return to the contents

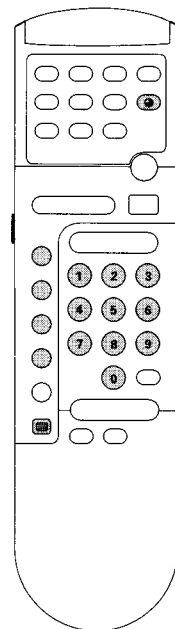
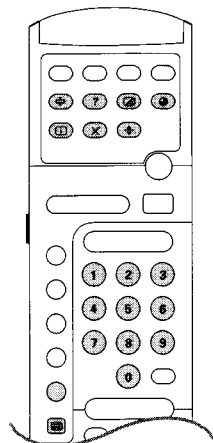
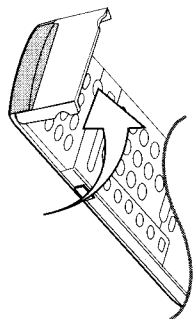
- Press **⏻** or the white button.
- The table of contents will appear.

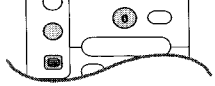
Temporary interrupt of the teletext display

The search for a page may sometimes be quite long. In the meantime, you may return to the picture broadcasted from the TV channel. Before interrupting teletext, you can select a page number.

- Press **X**.
- The TV channel appears. **⏻** indicates that you are still in the teletext mode. When the page has been found, the information line appears on your screen.
- Press **X** again.
- Teletext reappears.

*Teletext can always be switched off by pressing **⏻**.*





- Press the red button or the blue button on the remote control to select either the previous or the following page.
- or Certain teletext systems allow a quicker access to the headings; in this case the section names are displayed in the option line.
- Select the desired subject with the corresponding colour button on the remote control.

5

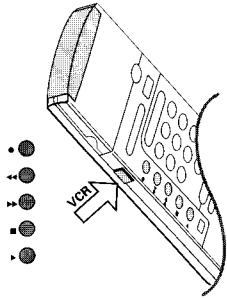
6

Peripheral connections

Using the TV remote control for the videorecorder

You can use your TV remote control to operate most of the videorecorders of our range.

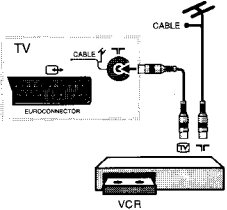
- Press and hold the VCR button, then press the buttons you need to operate your videorecorder. Refer to the videorecorder instruction for use to see the related buttons and functions.



Aerial connection

You can connect your videorecorder or other equipment via the aerial connection on the back of the TV.

- Unplug the aerial plug from your TV and insert it into the aerial input of your equipment.
- Connect another aerial plug to the output of your equipment, connect the other side to the aerial input of your TV.
- Switch on your equipment.
- Check in the handbook of the particular equipment to see what the test signal looks like.
- Now, refer to the section **Storing TV channels** to search for and store this signal on a programme number from 1 to 69 (you cannot store the signal on the program number 0). After that, you can receive signals from your equipment on this programme number.



Euroconnection (scart) for e.g. videorecorder

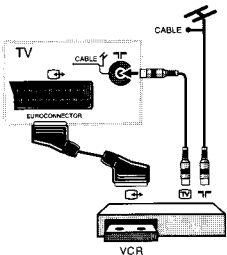
You can connect for example a videorecorder or satellite tuner to your TV via the euroconnector socket on the back of the TV. Ask your dealer for the appropriate cable.

- Connect the eurocable to the euroconnector socket of your videorecorder and to the euroconnector socket of your TV.
- Connect an aerial cable to the output of your video recorder and to the aerial input of your TV.
- Normally if the videorecorder is switched on, the picture will automatically appear on the TV screen.

If you do not see the picture, select program number 0 by pressing **P+** or **-**.

NOTE: If you do not see the picture from the connected videorecorder, check by the "Menu on screen" (EXTERNAL item), if program 0= AV has been selected properly.

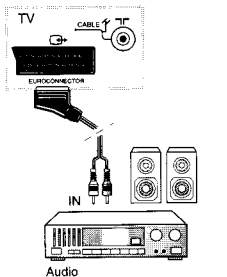
Do not use the Audio-Video front socket and the euroconnector socket at the same time.



Euroconnection (scart) for audio amplifier

An external audio amplifier can be used to listen to your TV sound. In this case you need a special euroconnector cable, provided with audio out plugs. Ask your dealer for an appropriate cable.

- Connect the audio plugs into the audio input of your audio amplifier.
- Connect the euroconnector into the euroconnector socket of your TV.

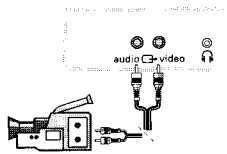


Audio/Video front connections

You can connect audio/video equipment, like a camcorder or game-computer, to the **Audio/Video** input on the front of your TV. Ask your dealer for an appropriate cable.

- Connect your equipment to the **Audio/Video** input of your TV.
- Press **START** or **PLAY** on your equipment.
- Select program number 0.
- The picture from your equipment appears on the screen.

Do not use the Audio-Video front socket and the euroconnector socket at the same time.



- Press **X**.
- The TV channel appears.
- indicates that you are still in the teletext mode. When the page has been found, the information line appears on your screen.
- Press **X** again.
- Teletext reappears.

Teletext can always be switched off by pressing .

S-Video front connection

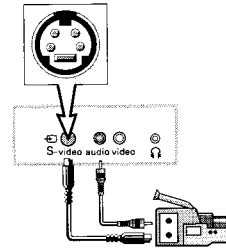
The S-Video socket is only present on certain TV models.

You can connect S-VHS or Hi-8 audio-video equipment to the **S-Video** socket on the front of your TV. Ask your dealer for an appropriate cable.

- Connect your equipment to the **S-Video** socket of your TV.
- Press several times **MENU** on the remote control until **EXTERNAL** appears.
- Press **+** to select **S-Video**.
- Press **MENU** several times to leave the menu on screen.
- Press **START** or **PLAY** on your equipment.
- Select program number 0.
- The picture from your equipment appear on the screen.

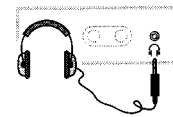
NOTE: If you do not see the picture from the connected equipment, check by the "Menu on screen" (EXTERNAL item), if program 0= S-Video has been selected properly.

Do not use the S-Video socket and the Euroconnector or Audio/Video socket at the same time.



Headphones

- Connect the headphones plug to the headphones socket on front of the TV.
- The internal loudspeakers of your TV are automatically switched off.



Tips

To clean the TV

- Clean the TV using a slightly damp chamois leather.
- **Never use aggressive cleaning agents.**

Poor or no picture:

Are the plugs tightly connected to the aerial socket and are the connection facilities to any other installed TV in good condition? Do you use good quality aerial connectors and cables?

Double or black and white picture on the screen using peripheral connections:

NOTE: If you do not see the picture from the connected equipment, check by the "Menu on screen" (EXTERNAL item), if S-Video (for S-VHS or Hi-8 audio-video equipment socket) or AV (for euroconnector or front Audio/Video socket) has been selected properly.

No solution:

- Switch your TV off and on again with the **0** button.
- **Never attempt to repair a defective TV set yourself.**
- Switch off the TV and call your dealer or TV-technician when nothing helps or when:
 - A white horizontal stripe appears across the whole screen.
 - The red lamp below the screen starts blinking when no buttons are pressed on the remote control.



Environmental information

Your TV contains material which can be recycled and reused. At end of life specialized companies can dismantle the discarded TV to concentrate the reusable materials and to minimize the amount of materials to be disposed off.

Please find out about local regulations on disposal of your old TV set.

10. List of abbreviations

List of abbreviations (incl. all signal names)

| | | |
|-------------------|--|--------------------------|
| | | IDENT.VCR |
| +183V (+163V) | +183V/163V supply voltage from the LOT to the picture tube panel | IDENT1 |
| +86V | +100V/92V5/86V supply voltage from the SMPS to the line output stage and the tuning system | |
| +29V | +29V supply voltage from the LOT to the frame amplifier IC7400 | IDENT2 |
| +12S | +12V supply voltage from the SMPS to the sound output amplifier and the line drive circuitry | |
| +8A | +8V supply voltage from the SMPS for the whole small signal part | IF |
| +8L | +8V supply voltage from the LOT to the supply voltages +5C and +5D for teletext processing | IVT |
| +5A | +5V supply voltage from the SMPS to the μ C and periphery | L/L' |
| +5C | +5V supply voltage from +8L to teletext processing | |
| +5D | +5V supply voltage from +8L to teletext processing | |
| +5F | +5V supply voltage from +8L to teletext processing | |
| +5G | +5V supply voltage from the SMPS for the LED and the keyboard | |
| μ C | Microcomputer | NIL |
| 16/9 | Switching signal from the μ C to the frame amplifier used for switching the frame output stage in 16/9 mode; "high" for 4/3, "low" for 16/9 | OSD FAST BL |
| AFC | Automatic Frequency Control | |
| AGC THR | DC input signal from the IF-detector IC7015-6B to the μ C which gives the value of the AGC control (only used by the factory to timely increase the tuning speed) | OSD-G |
| AGC | Automatic Gain Control | |
| AM SOUND/AUDIO IN | AM demodulated sound signal or AUDIO-IN signal from scart or audio cinch; this signal is fed to IC7015-6F for source select | POR PP PROT |
| AQUA | Aquadag on the rear side of the picture tube to pin 8 of the LOT | |
| ATS | Automatic Table Setting (auto install system for Germany only) | |
| AUDIO-IN | Incoming audio signal from pin 2 and 6 from scart or the audio cinch. Both signals go to source select IC7140 | |
| AUDIO-OUT | Outgoing audio signal from pin 15 IC7140 to pin 1 and 3 from scart | R-SCART |
| AV+C | AV switching signal (0V aerial, 4V SVHS, 8V scart) with chrominance part of the SVHS signal (C) superimposed on it | R-TXT RAM ROM |
| B-SCART | Blue input signal from the scart to the video controller IC7015-6D | SANDCASTLE |
| B-TXT | Blue input signal from the teletext decoder to the video controller IC7015-6D | SANDCASTLE |
| BAND-1 | Switching signal from μ C for bandswitching to the 2 to 3 decoder IC7002 | SATURATION |
| BAND-2 | Switching signal from μ C for bandswitching to the 2 to 3 decoder IC7002 | |
| BASEBAND CVBS | Baseband CVBS signal from the IF-detector IC7015-6B to the FM-demodulator IC7015-6F | |
| BCI | Beam Current Info; If beam current increases the BCI signal decreases. BCI is used for contrast reduction (if beam current is too high) and picture correction (if beam current increases (more white), EHT decreases so picture will become too big, BCI decreases and the picture will be corrected) | SAW SCL SDA SDM |
| BG//DK/LL' | Sound system BG//DK/LL' indicates frequency distance between sound and picture carriers (5.5 MHz for BG, 6.0 MHz for I, 6.5 MHz for DK and LL') | SHARPNESS |
| BG/L | Switching signal from μ C; "low" for BGIDK reception (negative modulation, FM sound), "high" for LL' reception (positive modulation, AM sound). The μ C makes BG/L "low" in case EUROPE or UK is selected, and "high" in case FRANCE is selected | SM SMPS STANDBY |
| BG/I | Switching signal from μ C; "low" for I reception (6.0 MHz FM sound), "high" for BG reception (5.5 MHz FM sound). The μ C makes BG/I "low" in case UK is selected, and "high" in case EUROPE or FRANCE is selected | STATUS |
| BRIGHTNESS | Control signal (from μ C, but on DC level via RC network) for brightness control of the video controller IC7015-6D (0-5V) | TOP uP INT/EXT |
| C | Chrominance part of the video signal; this signal is also directly input at the SVHS plug | |
| CCT | Computer Controlled Teletext | V.DRIVE |
| CONTRAST | Control signal (from μ C, but on DC level via RC network) for contrast control of the video controller IC7015-6D and the teletext decoder (0-4V5) | V-vari VERT FEEDB |
| CVBS | Colour Video Blanking Synchronisation | Vg2 VIP |
| CVBS-EXT | Incoming CVBS signal from pin 20 of scart to the external input pin 15 IC7015-6B | VOLUME |
| CVBS-INT | Outgoing CVBS signal from sound trap on pin 7 IC7015-6A (IF detector) to output pin 19 of scart | WST |
| CVBS-TXT | CVBS signal coming from the CVBS-INT or CVBS-EXT (IC7140 source select) to the teletext decoder | Y |
| EEPROM | Electrical Erasable Programmable Read Only Memory | |
| ESD | Electrical Static Discharge | |
| EXTERNAL 2 (SVHS) | Switching signal from μ C to input circuitry IC7015-6B; "high" for SVHS mode, "low" for non-SVHS mode | |
| FAST BLANKING | Fast blanking signal made by adding the OSD, TXT and SCART fast blanking signals. | |
| FAST-BL-SCART | Fast blanking input signal from scart which is added to the other fast blanking signals to control the video controller IC7015-6D | |
| FAST-BL-TXT | Fast blanking signal from teletext which is added to the other fast blanking signals to control the video controller IC7015-6D | |
| ff | Filament (heater voltage) from LOT to the picture tube | |
| FLOF | Full Level One Feature | |
| FM | FM demodulated sound from the FM-demodulator IC7015-6F to source select IC7140 | |
| G-SCART | Green input signal from the scart to the video controller IC7015-6D | |
| G-TXT | Green input signal from the teletext decoder to the video controller IC7015-6D | |
| H.DRIVE | Horizontal drive signal from IC7015-6E to line output stage | |
| HOR FLYBACK | Horizontal flyback pulse (15625 Hz) used for locking the horizontal oscillator in IC7015-6E | |
| I ² C | Digital control bus of the microcomputer | |

| | |
|-------------------|--|
| IDENT.VCR | Status signal which is "high" in external mode; this signal overrides the IDENT from IC7015-6A as otherwise the TV would switch "off" after 15 minutes (normally if 15 minutes no IDENT the μ C will switch off the set) |
| IDENT1 | IDENT signal coming from IC7015-6A used for muting the AM sound signal in case no CVBS is detected. |
| IDENT2 | IDENT1 is "high" in case CVBS is detected and so TS7142 only conducts in case CVBS is detected by IC7015. |
| IF | Status signal from IC7015-6B; "low" for no CVBS signal (horizontal sync not present), "high" in case CVBS signal is present (horizontal sync present) from the IF-detector IC7015-6B to the μ C |
| IVT | Intermediate frequency signal from the tuner to the AM-demodulator IC7125 |
| L/L' | Integrated Video input processor and Teletext decoder |
| | Switching signal from μ C; "low" for BGIDKL (picture at 38.9 MHz) reception, "high" for L' reception (picture at 33.4 MHz). |
| | In case FRANCE is selected and the tuning is in the lower part of the VHF1 band, the μ C makes L/L' "high" |
| | In case FRANCE is selected and the tuning is in the upper VHF1 or VHF3 or UHF band, the μ C makes L/L' "low". |
| | Also in case EUROPE and UK is selected the μ C makes L/L' "low". |
| NIL | Non Inter Laced; 25 Hz block-shaped signal from teletext to the frame amplifier for coinciding the odd & even frames |
| OSD FAST BL | Fast blanking info from OSD generator in μ C to video controller IC7015-6D for blanking the RGB info to enable OSD-G insertion which is added to the other fast blanking signals to control video controller IC7015-6D |
| OSD-G | Green info from OSD generator in μ C to the video controller IC7015-6D for inserting green OSD info on the screen |
| POR | Power On Reset; ensures the μ C starts up its software only if the power supply of the μ C itself is high enough |
| PP | Personal Preference |
| PROT | Protection signal from frame IC7400; in case the vertical flyback generator in IC7400 is not activated, the voltage on pin 8 IC7400 becomes < 2V. By then the protection circuit in IC7400 will make pin 7 "high" overriding the HOR FLYBACK and SANDCASTLE. The constant "high" sandcastle is fed to the chrominance decoders (IC7015-6D and IC7250) and so the picture will become "black" |
| R-SCART | Red input signal from the scart to the video controller IC7015-6D |
| R-TXT | Red input signal from the teletext decoder to the video controller IC7015-6D |
| RAM | Random Access Memory |
| ROM | Read Only Memory |
| SANDCASTLE1 | Sandcastle signal from IC7015-6F to delay line IC7271 and SECAM chroma decoder IC7250 |
| SANDCASTLE2 | Sandcastle signal from IC7015-6F to μ C |
| SATURATION | Control signal (from μ C, but on DC level via RC network) for saturation control of the video controller IC7015-6D (0-2V5) |
| SAW | Surface Acoustic Wave; high precision bandpass filter |
| SCL | Clock line of the I ² C-bus |
| SDA | Data line of the I ² C-bus |
| SDM | Service Default Mode; predefined mode for faultfinding (see chapter 8) |
| SHARPNESS CONTROL | Control signal on DC level (0-5V) from μ C to IF-detector IC7015-6B) for sharpness control |
| SM | Service Menu |
| SMPS | Switched Mode Power Supply |
| STANDBY | Switching signal from μ C; "low" for standby (power supply will be switched to stand-by mode), "high" for normal operation |
| STATUS | Switching signal; "high" for internal CVBS, "low" for external CVBS; "low" in case uP INT/EXT is "high" and/or pin 8 of the scart is "high") |
| TOP | Table Of Pages |
| uP INT/EXT | Switching signal from the μ C for internal or external audio + video switching ("low" for internal and "high" for external). This uP INT/EXT signal together with pin 8 of the scart makes the switching signal STATUS |
| V.DRIVE | Vertical drive signal from IC7015-6E to frame amplifier IC7400 |
| V-vari | Tuning voltage from μ C to the tuner (0-30V DC) |
| VERT FEEDBACK | 50 Hz vertical flyback pulse used for locking the vertical oscillator in IC7015-6E |
| Vg2 | Voltage on grid 2 of the picture tube |
| VIP | Video Input Processor |
| VOLUME | Control signal (from μ C, but on DC level via RC network) for volume control of sound processing in IC7015-6F |
| WST | World System Teletext |
| Y | Luminance part of the video signal; this signal is also directly input at the SVHS plug |

Table with 4 columns: Part Number, Description, and Quantity/Value. It lists various electronic components such as resistors (e.g., 4822 051 20103 10k 5% 0.1W), capacitors (e.g., 4822 051 20472 4k7 5% 0.1W), and transformers (e.g., 4822 051 20681 680Ω 5% 0.1W).

Service
Service
Service

AA5
95.01

Service Information

Ⓒ

1. New chassis for 14"-15"-17"-21" mini neck (neck diameter 20 mm) and 20"-25"-28" narrow neck (neck diameter 30 mm) AA5 sets

In 14-15-17-21" mini neck and 20"-25"-28" narrow neck AA5 sets with production code PM/QG 05 and higher, a new power supply is introduced. This new power supply is the SMPS power supply of the AA5 AB, in stead of the SOPS power supply of the AA5 AA. As a result the AA5 AB service manual can be used (on the rear side of these sets, AA5 AB is indicated) except for some component values. These different component values and there service codes are indicated in this service information. The PWB is the same as in the AA5 AB service manual.

To conclude: For 14"-15"-17"-21" mini neck and 20"-25"-28" narrow neck AA5 sets with PM/QG code 05 and higher, use the AA5 AB service manual (4822 727 20783 up to and included 4822 727 20788) together with this service information.

2. 110° East/West correction panel for 25" and 28" AA5 AB chassis (diagram C)

For the 25 and 28" AA5 sets a 110° panel is needed for E/W correction. This panel is allocated on the right hand side of the chassis (seen from the rear). The panel inclusive the bracket can be released from the heatsink by pulling it back. The panel itself can be taken out of the bracket by releasing the catching lips. To put the main carrier in the service position (see service manual), the 110° panel has to be released first and put aside of the main carrier. In this service information the description, the adjustments, the PWB and the spare parts list of 110° panel are published.

Description E/W panel 25" and 28" AA5 AB chassis (diagram C):

E/W correction is in this panel based on the diode-modulator principle. This panel consists of D6401-D6402-C2403 and C2404. By modulating the voltage on the cathode of D6402, the current through the horizontal deflection coil is modulated. As this is done by a parabolic-shaped voltage, E/W distortion is corrected. This parabolic-shaped voltage is derived from the sawtooth-shaped voltage of the frame deflection. This is done by transistor TS7403. E/W correction is adapted for 4/3 and 16/9 mode by Transistors TS7405 and TS7406. Coil 5401, R3402, R3423 and R3424 are for the linearity correction. R3402, R3423 and R3424 are for the linearity correction. D6404, R3403 and C2402 compensate the Mannheim effect.

Transformer 5402 takes care for optimal functioning of the diode-modulator. A too high beam-current influences the EHT-voltage and will in this way distortion the picture. This is corrected by feeding the beam-info to TS7402.

Adjustments:

- R3421 takes care for the vertical picture shift.
- R3411 is for adjusting the picture-width.
- R3413 is for correcting the E/W distortion.

3. Separate control panel AA5 AB chassis (diagram D)

The separate controls panel (diagram D) is allocated underneath the picture tube. To release the panel first the main carrier should be in its service position. After that the fixing screw of the bracket holding the separate control panel can be loosened. By then, the panel the separate control panel can be taken out of its bracket. In this service information the PWB and the spare parts list of the separate control panel is published.

Separate control panel is in functionality equal to the controls on the main carrier. The following selection table is valid:

| | |
|---------------|---|
| 1 speaker 16Ω | 2 speakers 8Ω in series |
| 1H34 - 2H34 | 1H34 - 3H34 speaker right 1H35 - 3H35 speaker left |

4. Difference tables

Comparing the diagrams published in the AA5 AB service manual (4822 727 20783 ... 4822 727 20788) there are several value changes for the different screen sizes. This different values are published in the following difference tables.

Ⓒ

1. Nieuw chassis voor AA5-toestellen met 14"-15"-17"-21" mini neck (diameter hals 20 mm) en met 20"-25"-28" narrow neck (diameter hals 30 mm)

In AA5-toestellen met 14-15-17-21" mini neck en met 20"-25"-28" narrow neck met productiecode PM/QG 05 en hoger, wordt een nieuwe voeding geïntroduceerd. Deze nieuwe voeding is de SMPS-voeding van de AA5 AB, in plaats van de SOPS-voeding van de AA5 AA. Daardoor kan de AA5 AB service manual worden gebruikt (aan de achterkant van deze toestellen staat AA5 AB aangegeven) behalve voor sommige componentwaarden. Die andere componentwaarden en de

druckte Schaltung und die Ersatzteilliste für die gesonderte Steuerplatine.

Die gesonderte Steuerplatine ist hinsichtlich ihrer Funktion mit dem Hauptträger vergleichbar. Es gilt folgende Auswahltable:

| | |
|-----------------------------------|---|
| 1 Lautsprecher 16Ω 1H34 - 2H34 | 2 Lautsprecher 8Ω, Serienschaltung 1H34 - 3H34 Lautsprecher, rechts 1H35 - 3H35 Lautsprecher, links |
|-----------------------------------|---|

4. Unterschied-Tabellen

Bei einem Vergleich der Pläne in der AA5-AB-Service-Anleitung (4822 727 20783 ... 4822 727 20788) fällt auf, daß sich einige Werte für die verschiedenen Bildschirm-Größen geändert haben. Die folgenden Unterschied-Tabellen zeigen diese unterschiedlichen Werte auf.

F

1. Nouveau châssis pour appareils AA5 à mini-col 14"-15"-17"-21" (diamètre de col 20 mm) et à col étroit 20"-25"-28" (diamètre de col 30 mm)

Une nouvelle alimentation est introduite pour les appareils AA5 à mini-col 14"-15"-17"-21" et à col étroit 20"-25"-28", munis de PM/QG code 05 et plus. Cette nouvelle alimentation est l'alimentation SMPS de l'AA5 AB au lieu de l'alimentation SOPS de l'AA5 AA. De ce fait, le manuel de service AA5 AB peut être utilisé (AA5 AB est indiqué à l'arrière de ces appareils) à l'exception de certaines valeurs de composants. Ces valeurs de composants différentes et ces codes de service sont mentionnés dans le présent document de service. La CCI est la même que celle du manuel de service AA5 AB.

Pour conclure: Pour les appareils AA5 à mini-col 14"-15"-17"-21" et à col étroit 20"-25"-28", munis de PM/QG code 05 et plus, utilisez le manuel de service AA5 AB (4822 727 20783 à 4822 727 20788 inclus) conjointement à ce document de service.

2. Platine de correction Est/Ouest 110° pour châssis AA5 AB 25" et 28" (schéma C)

Pour les appareils AA5 25" et 28", la correction E/O nécessite une platine 110°. Cette platine est située à droite du châssis (vu de derrière). La platine, console comprise, peut être dégagée radiateur en la tirant vers l'arrière. La platine elle-même peut être dégagée de la console en retirant les attaches. Pour mettre le support principal en position de service (voir manuel de service), la platine 110° doit être dégagée en premier et mise à l'écart du support principal. Ce manuel de service contient la description, les réglages, la CCI et la liste de pièces de la platine 110°.

Description de la platine E/O du châssis AA5 AB 25" et 28" (schéma C):

Dans cette platine, la correction E/O est basée sur le principe du modulateur à diode. Cette platine se compose de D6401-D6402-C2403 et C2404. En modulant la tension sur la cathode de D6402, le courant traversant la bobine de déviation horizontale est modulé. La distorsion E/O est corrigée dans la mesure où cette modulation est réalisée par une tension parabolique. Cette tension parabolique dérive d'une tension en dent de scie du balayage trame; laquelle est fournie par le transistor TS7403. La correction E/O est adaptée pour les modes 4/3 et 16/9 par les transistors TS7405 et TS7406. La bobine 5401, R3402, R3423 et R3424 sont destinés à la correction de la linéarité. D6404, R3403 et C2402 compensent l'effet de Mannheim. Le transformateur 5402 assure le fonctionnement optimal du modulateur à diode. Un courant de faisceau trop élevé influence la tension THT et provoque une distorsion de l'image. Cette distorsion est corrigée en acheminant un signal frein de faisceau vers TS7402.

Réglages:

- R3421 assure le déplacement vertical de l'image.
- R3411 est destiné au réglage de la largeur de l'image.
- R3413 est destiné à la correction de la distorsion E/O.

3. Platine de commande distincte du châssis AA5 AB (schéma D)

La platine de commande distincte (schéma D) est située sous le tube image. Pour dégager cette platine, le support principal doit être d'abord mis en position de service. On peut ensuite retirer la vis de fixation de la console qui supporte la platine de commande distincte. La platine de commande distincte peut alors être dégagée de sa console. Ce manuel de service contient des informations sur la CCI et la liste de pièces de la platine de commande distincte.

La platine de commande distincte assure les réglages présents sur le support principal. Les correspondances sont les suivantes:

| | |
|-----------------------------------|--|
| 1 haut-parleur 16Ω 1H34 - 2H34 | 2 haut-parleurs 8Ω, en série 1H34 - 3H34 haut-parleur de droite 1H35 - 3H35 haut-parleur de gauche |
|-----------------------------------|--|

4. Modifications

En comparaison aux schémas publiés dans le manuel de service AA5 AB (4822 727 20783 ... 4822 727 20788), il y a plusieurs modifications de valeurs pour les différentes tailles d'écran. Ces différentes valeurs sont publiées dans les paragraphes suivants.

I

1. Nuovo chassis per apparecchi AA5 da 14"-15"-17"-21" con mini neck (diametro del collo 20 mm) e da 20"-25"-28" con narrow neck (diametro del collo 30 mm)

Negli apparecchi AA5 da 14"-15"-17"-21" con mini neck e da 20"-25"-28" con narrow neck con codice di produzione a partire da PM/QG 05 è stato introdotto un nuovo alimentatore. Questo nuovo alimentatore è di tipo SMPS per AA5 AB, invece dell'alimentatore tipo SOPS per AA5 AA. Come risultato il manuale di servizio AA5 AB può essere usato (sul lato posteriore di questi apparecchi viene indicato AA5 AB) tranne che per i valori di alcuni componenti. Questi diversi valori dei componenti ed i codici di servizio vengono indicati nelle informazioni di servizio. Lo stampato è lo stesso del manuale di servizio AA5 AB.

Per concludere: per gli apparecchi AA5 da 14"-15"-17"-21" con mini neck e da 20"-25"-28" con narrow neck con codice di produzione a partire da PM/QG 05 utilizzare il manuale di servizio AA5 AB (da 4822 727 20783 fino a 4822 727 20788 compreso) insieme alle informazioni di servizio.

2. Pannello di correzione Est/Ovest 110° per chassis AA5 AB da 25" e da 28" (diagramma C)

Per gli apparecchi AA5 da 25" e da 28" è necessario un pannello 110° per una correzione Est/Ovest. Questo pannello si trova sul lato destro dello chassis (visto da dietro). Per staccare il pannello, compreso il supporto, basta estrarlo. Il pannello stesso può essere staccato dal supporto allentando le alette di bloccaggio. Per posizionare il pannello principale nella posizione di servizio (si veda il manuale di servizio), deve essere prima rimosso il pannello 110°. In queste informazioni di servizio sono pubblicate la descrizione, le regolazioni, il circuito stampato e l'elenco delle parti di ricambio del pannello 110°.

Descrizione del pannello Est/Ovest dello chassis AA5 AB 25" e 28" (diagramma C):

La correzione Est/Ovest in questo pannello è basata sul principio del diodo modulatore. Questo pannello è costituito

da D6401 catodo di bobina di tuato da Ovest vie deriva dal quadro. C zione Est, transistor e R3424 e C2402 e 5402 si tore. Una EHT e, in retta invi

Regolazio

- R342
- R341
- R341

3. Pannello (schéma D)

Il pannello pio. Per a principale allentare il nullo di co può esser di servizio di parti di ric

Il funzio valente al principale

| |
|-----------|
| 1 altopar |
| 1H34 - 2 |

4. Tabelle

Paragona AA5 AB (4 modifich Questi div delle diffe

E

1. Nuevo c de 14", 1 cuello es 30 mm).

En los ap y de cuell ción PM/Q fuente de la fuente de Conmutac Por consig AB (en la AB) excep diferentes corresponsi servicio. L manual de

Nota:

da D6401-D6402-C2403 e C2404. Modulando la tensione sul catodo di D6402 viene modulata la corrente attraverso la bobina di deflessione orizzontale. Poiché questo viene effettuato da una tensione a forma di parabola, la distorsione Est/Ovest viene corretta. Questa tensione a forma di parabola deriva dalla tensione a dente di sega della deflessione di quadro. Ciò viene effettuato dal transistor TS7403. La correzione Est/Ovest viene adattata per il modo 4:3 e 16:9 dai transistor TS7405 e TS7406. La bobina 5401, R3402, R3423 e R3424 sono per la correzione della linearità. D6404, D3403 e C2402 compensano l'effetto Mannheim. Il trasformatore 5402 si occupa del funzionamento ottimale del diodo modulatore. Una corrente del fascio troppo alta influenza la tensione EHT e, in questo modo, distorce l'immagine. Questa viene corretta inviando l'informazione della corrente di fascio a TS7402.

Regolazioni:

- R3421 si occupa dello shift verticale dell'immagine
- R3411 regola la larghezza dell'immagine
- R3413 corregge la distorsione Est/Ovest.

3. Pannello di controllo separato per telaio AA5 AB (schema D)

Il pannello di controllo (diagramma D) si trova sotto il cinescopio. Per allentare il pannello si deve mettere prima il pannello principale nella posizione di servizio. Dopo di che si può allentare la vite di fissaggio del supporto che blocca il pannello di controllo. Di seguito, il pannello di controllo separato può essere estratto dal suo supporto. In queste informazioni di servizio vengono pubblicate lo stampato e l'elenco delle parti di ricambio del pannello di controllo separato.

Il funzionamento del pannello di controllo separato è equivalente al funzionamento del controllo situato sul pannello principale. E' valida la seguente tabella di selezione:

| | |
|--------------------|---|
| 1 altoparlante 16Ω | 2 altoparlanti da 8Ω, in serie |
| 1H34 - 2H34 | 1H34 - 3H34 altoparlante destro, 1H35 - 3H35 altoparlante sinistro |

4. Tabelle delle differenze

Paragonando il diagramma pubblicato nel manuale di servizio AA5 AB (4822 727 20783 ... 4822 727 20788) ci sono diverse modifiche di valore per le diverse dimensioni dello schermo. Questi diversi valori sono pubblicati nelle seguenti tabelle delle differenze.

E

1. Nuovo chasis para aparatos AA5 de cuello miniatura de 14", 15", 17" y 21" (diámetro cuello 20 mm) y de cuello estrecho de 20"-25"-28" (diámetro de cuello 30 mm).

En los aparatos AA5 de cuello miniatura de 14", 15", 17" y 21" y de cuello estrecho de 20"-25"-28" con el código de producción PM/QG 05 y superiores se ha introducido una nueva fuente de alimentación. Este nueva fuente de alimentación es la fuente de alimentación SMPS (Modo con Alimentación Conmutada) del AA5 AB, en lugar de la SMPS del AA5 AA. Por consiguiente, se puede usar el manual de servicio AA5 AB (en la parte trasera de estos aparatos, está indicado AA5 AB) excepto para algunos valores de componentes. Estos diferentes valores de componentes y sus códigos de servicio correspondientes están indicados en la información de servicio. La tarjeta de circuito impreso es idéntica a la del manual de servicio AA5 AB.

Nota: Para aparatos AA5 de cuello miniatura de 14", 15", 17" y 21" y de cuello estrecho de 20"-25"-28" con el código PM/QG 05 y superiores, utilizar el manual de servicio AA5 AB (4822 727 20783 hasta 4822 727 20788, ambos inclusive) junto con la presente información de servicio.

2. Panel de 110° para la corrección Este/Oeste para el chasis AA5 AB de 25" y 28" (esquema C)

Para los aparatos AA5 de 25" y 28" se necesita un panel de 110° para la corrección E/O. Este panel se encuentra en la parte derecha del mismo, visto por detrás del chasis. El panel con el soporte se puede soltar del disipador de calor, tirándolo hacia atrás. El panel mismo se saca del soporte aflojando las lengüetas. Antes de colocar el portador principal en la posición de servicio (ver el manual de servicio), aflojar primero el panel de 110° y ponerlo al lado del portador principal. La presente información de servicio recoge la descripción, los ajustes, la tarjeta de circuito impreso y la lista de componentes del panel de 110°.

Descripción del panel E/O de 25" y 28" del chasis AA5 AB (esquema C):

La corrección E/O en este panel está basada en el principio del modulador de diodos. Este panel consiste en D6401-D6402-C2403 y C2404. Al alterar la tensión en el cátodo de D6402, se altera asimismo la corriente que pasa por la bobina de deflexión horizontal. Como quiera que esta alteración es realizada por una tensión parabólica, se corrige la distorsión E/O. Esta tensión parabólica que es derivada de la tensión de diente de sierra de la deflexión vertical la realiza el transistor TS7403. La corrección este-oeste es adaptada para el modo 4/3 y 16/9 por los transistores TS7405 y TS7406. La bobina 5401 y las resistencias R3402, R3423 y R3424 cuidan de la corrección lineal. D6404, R3403 y C2402 compensan el efecto Mannheim. El transformador 5402 se encarga del funcionamiento óptimo del modulador de diodos. Una corriente del haz demasiado elevada influye la tensión extremadamente alta y deformará de esta manera la imagen. Este fenómeno se corrige, enviando la información del haz a TS7402.

Ajustes:

- R3421 cuida del desplazamiento de imagen vertical.
- R3411 es para el ajuste de la anchura de imagen.
- R3413 es para la corrección de la distorsión E/O.

3. Separado panel de mando del chasis AA5 AB (esquema D)

El panel separado de mando (esquema D) se encuentra debajo del tubo de imagen. Para aflojarlo, es necesario colocar el portador principal en su posición de servicio. El panel se afloja, destornillando el tornillo de fijación del soporte que sostiene al panel separado de mando. Ahora es posible sacar dicho panel de su soporte. La información de servicio recoge la tarjeta de circuito impreso y la lista de recambios del panel separado de mando.

La funcionalidad del panel separado de mando equivale a los mandos en el portador principal. La tabla de selección siguiente es válida:

| | |
|---------------|--|
| 1 altavoz 16Ω | 2 altavoces 8Ω, en serie |
| 1H34 - 2H34 | 1H34 - 3H34 altavoz derecho 1H35 - 3H35 altavoz izquierdo |

4. Diferencia entre tablas

Comparando el esquema reflejado en el manual de servicio AA5 AB (4822 727 20783 ... 4822 727 20788), se observan varios cambios de valores para los diferentes tamaños de pantalla. Estos diferentes valores están recogidos en las siguientes tablas de diferencias.

Différentes tables

Diagram A4;

| ITEM | 14"-15"- 17"-21" MN | 20" NN | 21" NN | 25" & 28" |
|------|------------------------|--------|--------|-----------|
| 3340 | 5M6 | 4M7 | 4M7 | |
| 3341 | 6M8 | 6M8 | 4M7 | |
| 9101 | JMP | JMP | JMP | --- |

R3101 is a resistor parallel to jumper 9101 /
 R3029 ist ein mit Steckbrücke 6030 parallelgeschalteter Widerstand /
 R3029 est une résistance parallèle au fil de connexion 6030

Diagram A6;

| ITEM | 14"-15"- 17" | 20" NN 21" MN | 21" NN | 25" & 28" |
|------|--------------|------------------|--------|-----------|
| 3001 | 56R | 39R | 18R | 22R |
| 3029 | 1K5 | 1K5 | --- | --- |

R3029 is a resistor parallel to diode 6030 /
 R3029 ist ein mit Diode 6030 parallelgeschalteter Widerstand /
 R3029 est une résistance parallèle à la diode 6030

Diagram B1;

| ITEM | 14" | 15"-17" 21" MN |
|------|-------|-------------------|
| 2204 | 390pF | 330pF |
| 2217 | 390pF | 330pF |
| 2230 | 390pF | 330pF |

Diagram A5;

| ITEM | 25" & 28" | OTHERS |
|------|-----------|--------|
| 3601 | 15K | 10K |
| 3602 | 3K3 | 8K2 |
| 3632 | 1K | 1K |

R3621 is only placed in 20"-21" NN sets.
 IC7600 TMP47C....V3.0 for non ATS
 TMP47C....V2.1 for ATS /
 R3621 ist nur in 20"-21"-NN-Geräten vorhanden.
 IC7600 TMP47C...V3,0 für Nicht-ATS
 TMP47C...V2,1 für ATS /
 R3621 est installée uniquement dans les appareils NN 20"-21"
 IC7600 TMP47C...V3.0 pour non ATS
 TMP47C...V2.1 pour ATS

Diagram A9;

| ITEM | 14" | 370K RB22- TC38 | 15" 17" | 20" NN | 21" MN | 21" NN |
|------|-----|-----------------------|------------|-----------|-----------|-----------|
| 3740 | 1K5 | 1K5 | 1K2 | 1K2 | 1K2 | 1K2 |
| 3741 | 1K5 | 1K5 | 1K2 | 1K2 | 1K2 | 1K2 |
| 3742 | 1K5 | 1K5 | 1K2 | 1K2 | 1K2 | 1K2 |
| 3749 | 6R8 | 6R8 | 6R8 | 6R8 | 6R8 | 4R7 |
| 3781 | 15K | 15K | 8K2 | 8K2 | 8K2 | 8K2 |

Diagram B2;

| ITEM | A48EEV 13X31 | A48ECR 11X19 | 21" | 25" & 28" |
|------|-----------------|-----------------|--------|-----------|
| 1236 | T1A | T1A | T500mA | --- |
| 2212 | 330p | 330p | 330p | 470p |
| 2222 | 330p | 330p | 330p | 470p |
| 2232 | 330p | 330p | 270p | 470p |
| 3238 | 3K3 | 3K3 | 3K3 | 2K2 |
| 3265 | 1K2 | 1K2 | 1K2 | 1K8 |
| 3266 | 56R | 56R | 56R | 82R |
| 3267 | 12K | 12K | 12K | 15K |
| 3275 | 1K2 | 1K2 | 1K2 | 1K8 |
| 3277 | 12K | 12K | 12K | 15K |
| 3278 | 56R | 56R | 56R | 82R |
| 3283 | 390R | 390R | 390R | 560R |
| 3287 | 12K | 12K | 12K | 15K |
| 3301 | --- | --- | 4R7 | --- |
| 3303 | 1K2 | 1K2 | 1K2 | 1K8 |
| 3304 | 56R | 56R | 56R | 82R |
| 3307 | --- | --- | 22R | --- |
| 5207 | 10µH | --- | --- | --- |
| 9207 | --- | YES | --- | --- |

R3307 and R5207 are resistors parallel to jumper 9207 /
 R3307 und R5207 sind mit Steckbrücke 9207 parallelgeschaltete
 Widerstände /
 R3307 et R5207 sont des résistances parallèles au fil de connexion 9207

| 25" & 28" |
|-----------|
| YES |
| 1nF |
| 1500µF |
| 6µ8 |
| 1n2 |
| 12nF |
| 680nF |
| --- |
| 470µF |
| 22nF |
| 1nF |
| 47nF |
| --- |
| 7K5 |
| 4K3 |
| 150R |
| 27K |
| --- |
| 1R5 |
| 1R5 |
| 1R2 |
| 1K |
| 27R |
| 4K7 |
| --- |
| 1R |
| --- |
| 100K |
| 27K |
| 56K |
| 82K |
| 82K |
| 68K |
| --- |
| 8R2 |
| LOT110 |
| 33µH |
| --- |
| --- |
| BAV21 |
| BAV21 |
| BF819 |
| JMP |
| JMP |
| --- |
| JMP |

rité parallèle au fil de

rité parallèle au

allèle à C2450

(GB)

5. Different picture-tubes in Anubis A AC and AA5 20"

In Anubis A AC and chassis AA5 20" different picture-tubes are used: A48ECR11X19 and A48EEV13X31. There are several differences in components:

Special attention has to be taken by connecting the yoke because the connections are a slightly different.

(NL)

5. Verschillende beeldbuizen in Anubis A AC en AA5 20"

In Anubis A AC en chassis AA5 20" worden verschillende beeldbuizen gebruikt: A48ECR11X19 en A48EEV13X31. Er zijn meerdere verschillen in de componenten:

Speciale aandacht moet worden geschonken aan het correct aansluiten van het juk, omdat de aansluitingen enigszins verschillen.

(D)

5. Unterschiedliche Bildröhren für Anubis A AC und AA5 20"

Im Anubis A AC und Chassis AA5 20" werden unterschiedliche Bildröhren verwendet: A48ECR11X19 und A48EEV13X31. Es gibt mehrere Unterschiede hinsichtlich der Komponenten:

Besondere Aufmerksamkeit ist beim Anschließen des Jochs geboten, da die Anschlüsse geringfügig anders sind.

(F)

5. Différents tubes images dans l'Anubis A AC et AA5 20"

Dans le châssis Anubis A AC et AA5 20", différents tubes images sont employés: A48ECR11X19 et A48EEV13X31. Il y a plusieurs différences pour les composants:

Une attention particulière doit être prêtée lors de la connexion de la bobine de déviation car les connexions sont légèrement différentes.

(I)

5. Cinescopio differente in Anubis A AC ed AA5 da 20"

Sull'Anubis A AC e nello chassis AA5 20" sono usati dei cinescopi diversi: A48ECR11X19 e A48EEV13X31. Ci sono diverse differenze fra i componenti:

Si deve fare particolare attenzione al collegamento del morsetto perché i collegamenti sono leggermente diversi.

(E)

5. Otros tubos de imagen en el Anubis A AC y chasis AA5 20"

En el Anubis A AC y chasis AA5 20" se han usado otros tubos de imagen, en concreto: A48ECR11X19 y A48EEV13X31. Hay algunas diferencias en los componentes:

En particular se debe dedicar atención a la conexión correcta del yugo, ya que estas conexiones se diferencian ligeramente.

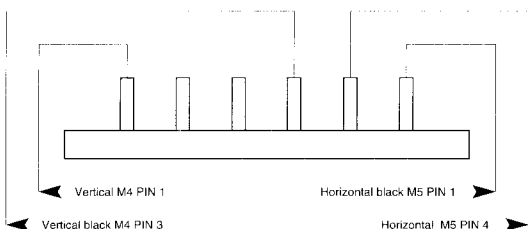
Anubis A AC:

| ITEM | A48EEV13X31 | | A48ECR11X19 | |
|------|----------------|------------|----------------|------------|
| 2445 | 4822 126 13435 | 1n2 2KV | 4822 126 13517 | 820pF 1KV |
| 2446 | 4822 121 70649 | 9n1 1.6KV | 4822 121 70434 | 11nF 1.6KV |
| 2450 | 4822 121 70458 | 680nF 200V | 4822 121 42442 | 560nF 200V |
| 3401 | 4822 116 52259 | 2K4 | 4822 052 10202 | 2K |
| 3403 | 4822 116 52266 | 3K | 4822 116 52276 | 3K9 |
| 3405 | 4822 051 10181 | 180E | 4822 051 10271 | 270E |
| 3408 | 4822 053 10681 | 680E | 4822 052 10122 | 1K2 |
| 5236 | 5322 157 53016 | 10μH | 4822 157 71915 | 5.6μH |

AA5 20":

| ITEM | A48EEV13X31 | | A48ECR11X19 | |
|------|----------------|-----------|----------------|------------|
| 2445 | 4822 126 11503 | 820pF 2KV | 4822 126 12267 | 470pF 2KV |
| 2446 | 4822 121 70649 | 9n1 1.6KV | 4822 121 70618 | 12nF 1.6KV |
| 5236 | 4822 157 71736 | 10μH | ---- | |
| 9207 | ---- | | present | |

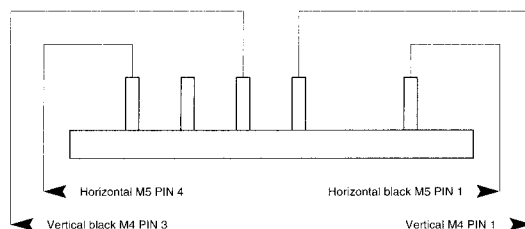
A 48 EEV 13x31



Looking from backside

CL 9632043 015 A1
131085

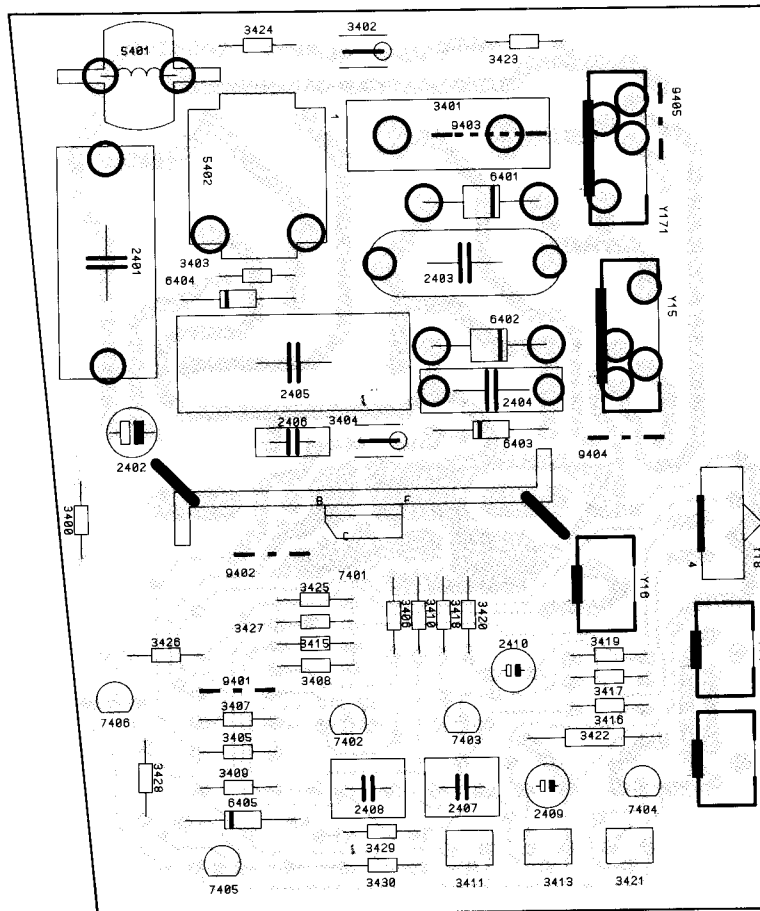
A 48 ECR 11x19



Looking from backside

CL 9632043 014 A1
131085

110° EW CORRECTION PANEL



RTV servis Horvat

Kešinci, 31402 Semeljci

031-856-139

031-856-637

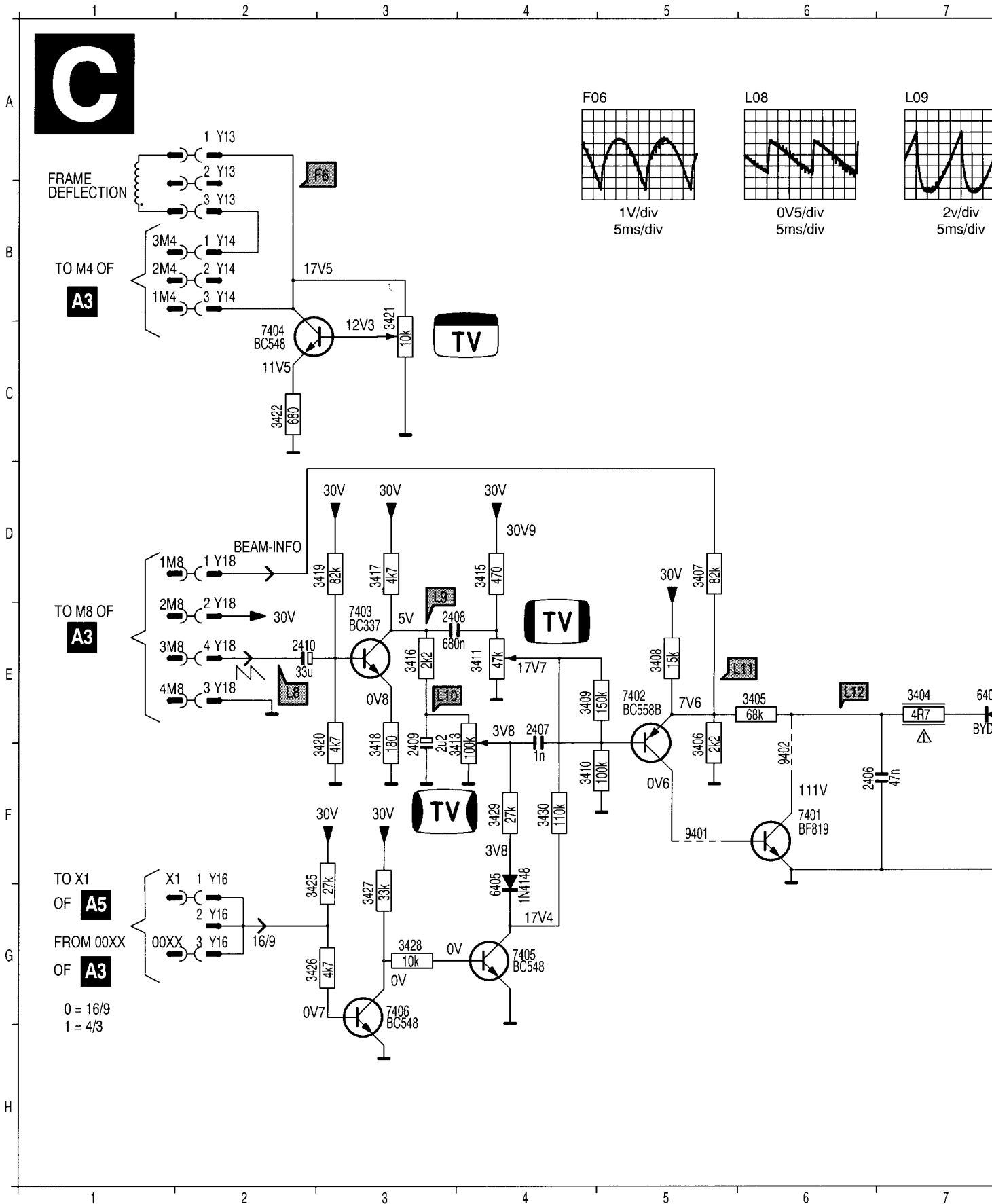
098-788-319

rtv-servis-horvat@os.tel.hr

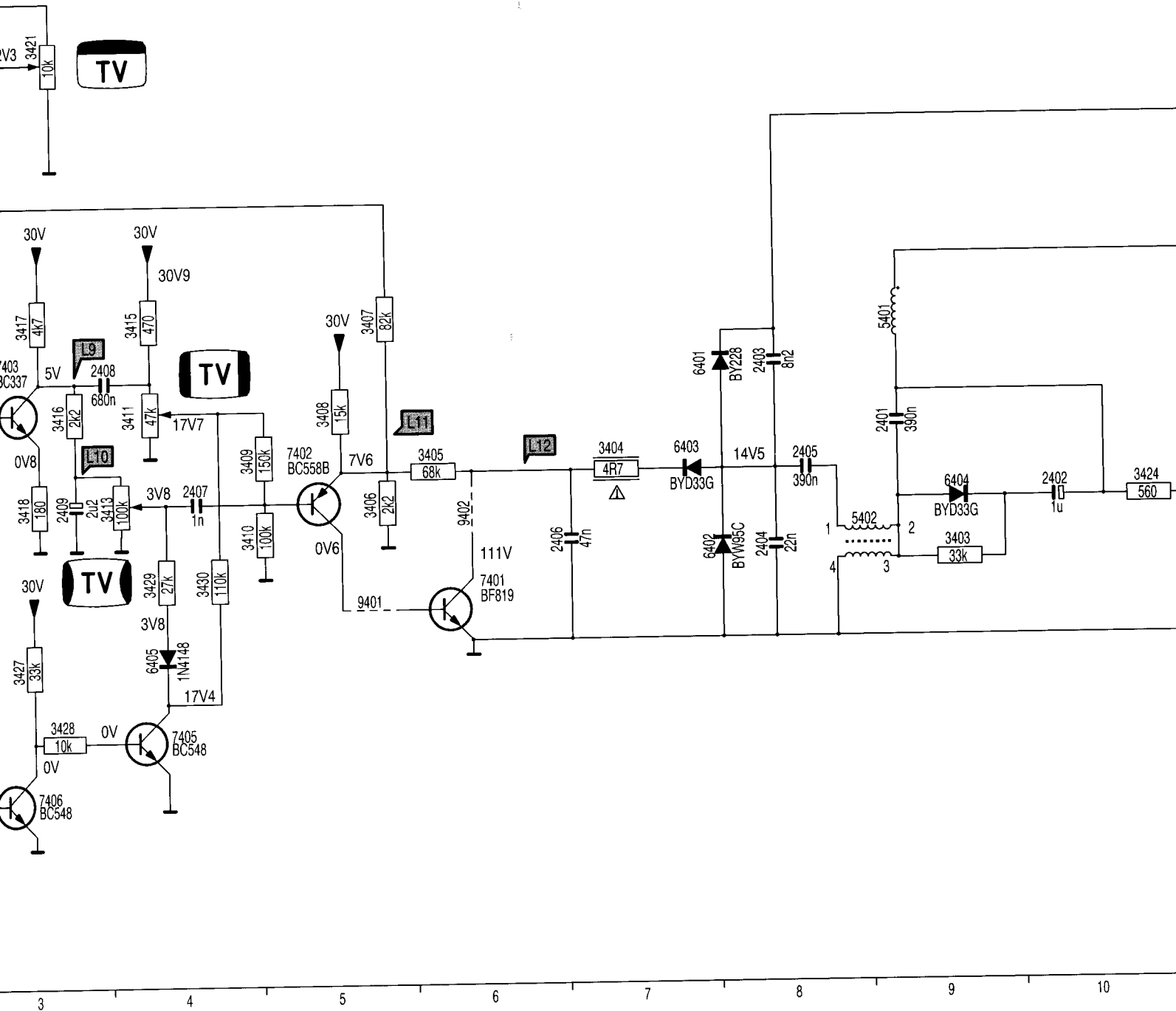
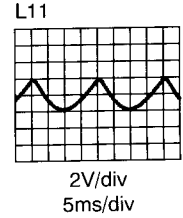
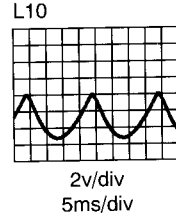
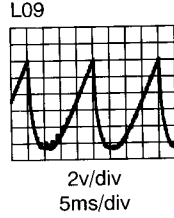
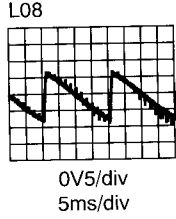
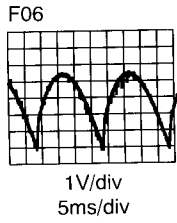
Croatia

110° EW correction panel /

| | | | | | | | | | | |
|-----------|----------|-----------|----------|----------|----------|----------|-----------|----------|----------|----------|
| 2401 E 9 | 2405 E 8 | 2409 E 4 | 3403 F 9 | 3407 D 6 | 3411 E 4 | 3417 D 3 | 3421 B 3 | 3425 F 3 | 3429 F 4 | 6401 E 8 |
| 2402 E 10 | 2406 F 7 | 2410 E 3 | 3404 F 7 | 3408 E 5 | 3413 F 4 | 3418 E 3 | 3422 C 3 | 3426 G 3 | 3430 F 4 | 6402 F 8 |
| 2403 E 8 | 2407 E 4 | 3401 E 12 | 3405 E 6 | 3409 E 5 | 3415 D 4 | 3419 D 3 | 3423 E 11 | 3427 G 3 | 5401 D 9 | 6403 E 8 |
| 2404 F 8 | 2408 E 4 | 3402 E 10 | 3406 E 6 | 3410 F 5 | 3416 E 3 | 3420 E 3 | 3424 E 11 | 3428 G 3 | 5402 F 9 | 6404 E 9 |



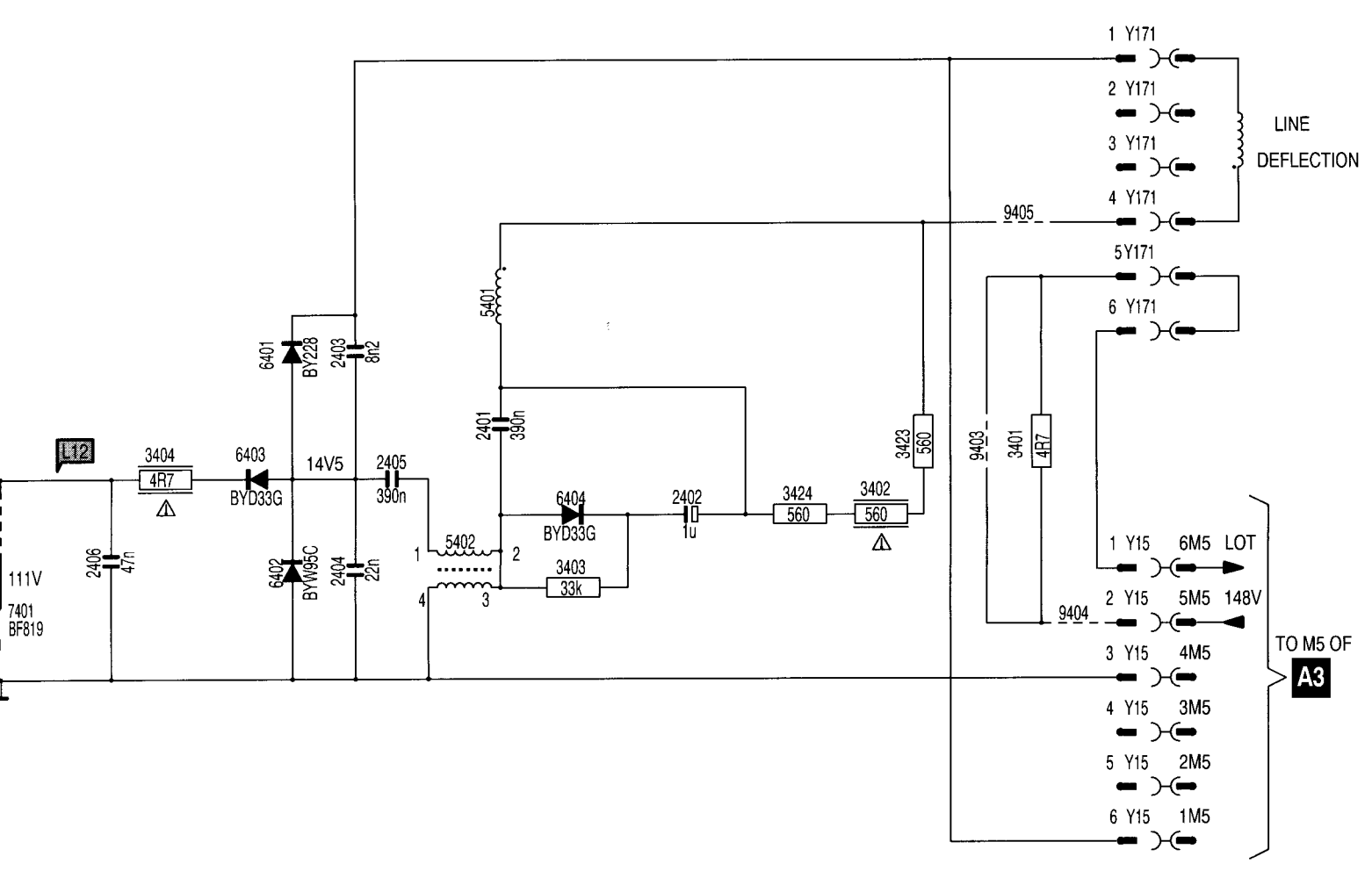
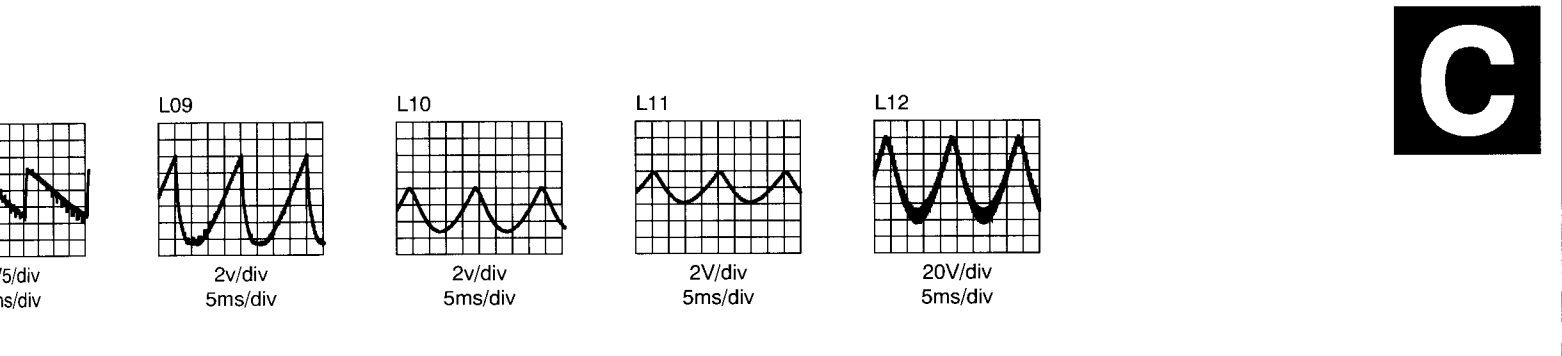
| | | | | | | | | | | | |
|----------|----------|----------|-----------|----------|----------|----------|----------|----------|-----------|---------|---------|
| 3407 D 6 | 3411 E 4 | 3417 D 3 | 3421 B 3 | 3425 F 3 | 3429 F 4 | 6401 E 8 | 6405 F 4 | 7404 B 3 | 9402 F 6 | Y13 A 2 | Y14 B 2 |
| 3408 F 5 | 3413 E 4 | 3418 F 3 | 3422 C 3 | 3426 G 3 | 3430 F 4 | 6402 F 8 | 7401 F 6 | 7405 G 4 | 9403 E 11 | Y13 A 2 | Y14 B 2 |
| 3409 F 5 | 3415 D 4 | 3419 D 3 | 3423 F 11 | 3427 G 3 | 5401 D 9 | 6403 F 8 | 7402 F 5 | 7406 G 3 | 9404 F 12 | Y13 A 2 | Y15 G 1 |
| 3410 F 5 | 3416 F 3 | 3420 F 3 | 3424 E 11 | 3428 G 3 | 5402 F 9 | 6404 E 9 | 7403 F 3 | 9401 F 6 | 9405 D 12 | Y14 B 2 | Y15 G 1 |



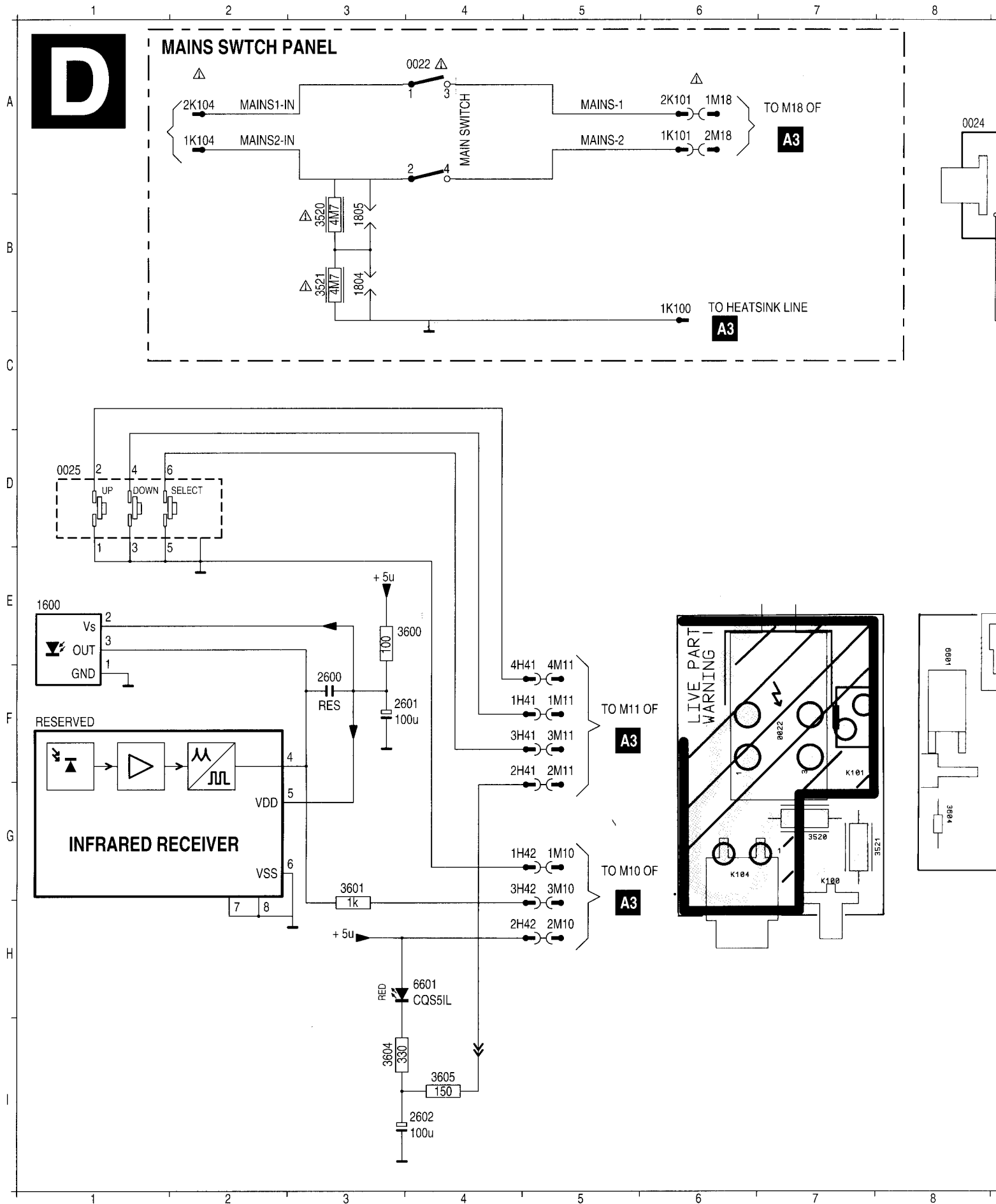
110°-OW-Korrektur-Platine / Platine de correction E/O 110°

| | | | | | | | | | | | | | | | | | | | | | | |
|-----|------|-----|------|-----|------|-----|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|------|-----|
| F 3 | 3429 | F 4 | 6401 | F 8 | 6405 | F 4 | 7404 | B 3 | 9402 | F 6 | Y13 | A 2 | Y14 | B 2 | Y15 | F12 | Y16 | G 2 | Y18 | E 2 | Y171 | D12 |
| G 3 | 3430 | F 4 | 6402 | F 8 | 7401 | F 6 | 7405 | G 4 | 9403 | E11 | Y13 | A 2 | Y14 | B 2 | Y15 | F12 | Y16 | G 2 | Y18 | E 2 | Y171 | D12 |
| G 3 | 5401 | D 9 | 6403 | F 8 | 7402 | E 5 | 7406 | G 3 | 9404 | F12 | Y13 | A 2 | Y15 | G12 | Y15 | G12 | Y16 | F 2 | Y18 | D 2 | Y171 | C12 |
| G 3 | 5402 | F 9 | 6404 | F 9 | 7403 | E 3 | 9401 | F 6 | 9405 | D12 | Y14 | B 2 | Y15 | G12 | Y15 | F12 | Y18 | E 2 | Y171 | D12 | Y171 | C12 |

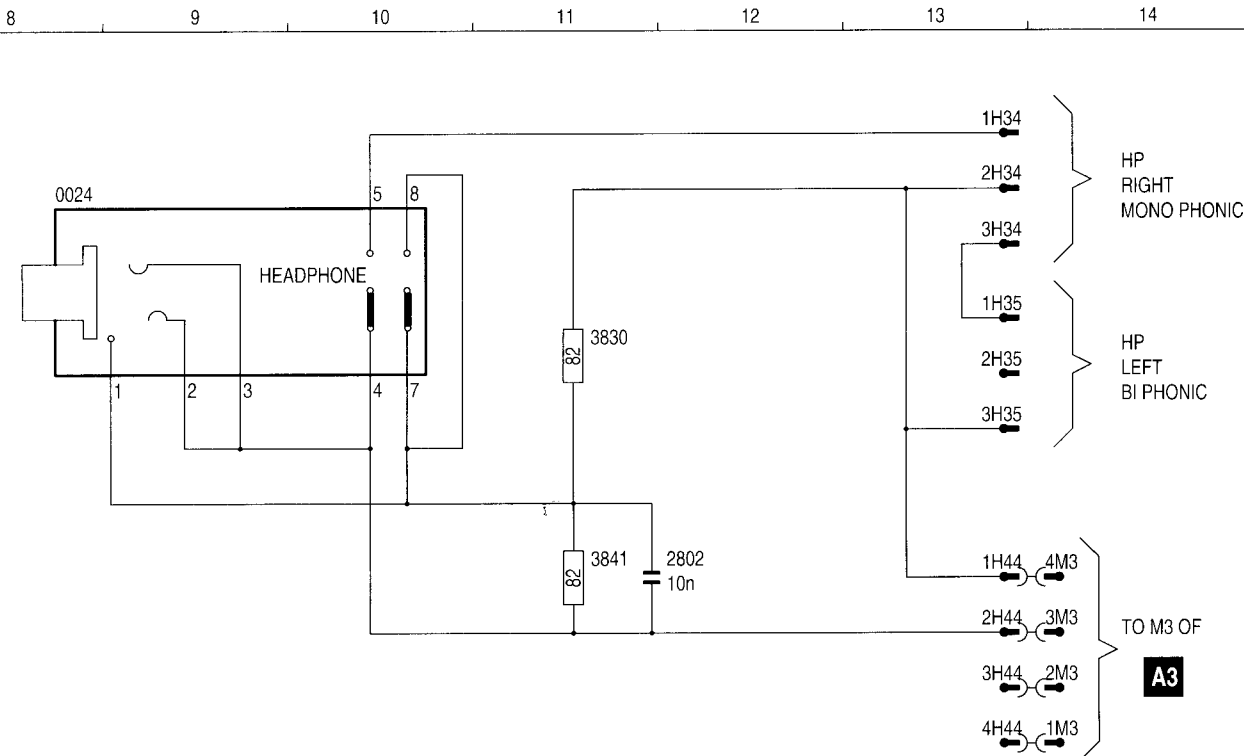
6 7 8 9 10 11 12 13



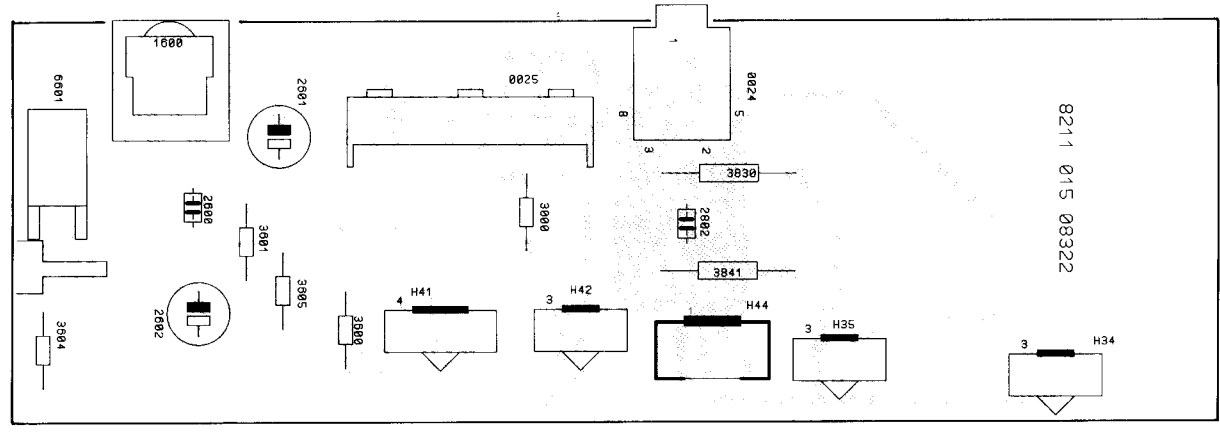
CHASSIS AA 5
SCHEMA C.EPS
121095



Gesonderte Steuerplatine / Platine de commande distincte



| | |
|------|------|
| 0022 | A 4 |
| 0024 | A 8 |
| 0025 | D 1 |
| 1600 | E 1 |
| 2600 | F 3 |
| 2601 | F 3 |
| 2602 | I 3 |
| 2602 | I 3 |
| 2802 | C 12 |
| 3520 | B 3 |
| 3521 | B 3 |
| 3600 | E 3 |
| 3601 | G 3 |
| 3604 | I 3 |
| 3605 | I 4 |
| 3830 | B 11 |
| 3841 | C 11 |
| 6601 | H 3 |
| H34 | A 13 |
| H34 | A 13 |
| H34 | A 13 |
| H35 | B 13 |
| H35 | B 13 |
| H35 | B 13 |
| H41 | F 5 |
| H41 | F 5 |
| H41 | F 5 |
| H41 | F 5 |
| H42 | G 5 |
| H42 | G 5 |
| H42 | G 5 |
| H42 | G 5 |
| H44 | H 5 |
| H44 | C 13 |
| H44 | C 13 |
| H44 | C 13 |
| H44 | D 13 |
| H44 | D 13 |
| K100 | C 6 |
| K101 | A 6 |
| K101 | A 6 |
| K104 | A 2 |
| K104 | A 2 |



CHASSIS AA 5
 SCHEMA_D.EPS
 161095

