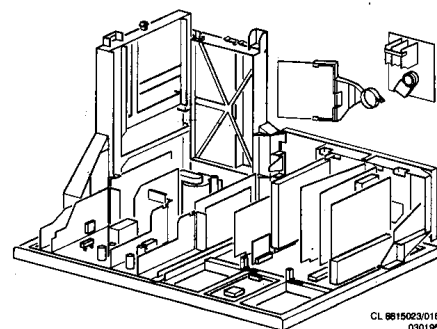


Service
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GFL2.20 E

AA



Service Manual

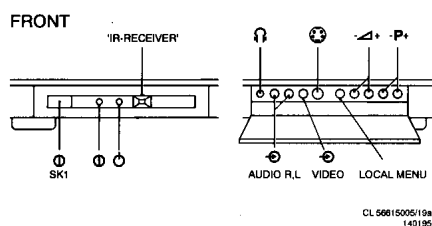
Contents	Page	Contents	Page
1. Technical data	2	Sound processing (Diagram S3)	19
2. Connection facilities and Chassis overview	2	Video processing (Diagram S5)	20
3. Safety instructions, Maintenance instruction, Warnings and Notes	3	Teletext (SSP) (Diagram S7)	20
4. Mechanical instructions	3	Video processing RGB (Diagram S6)	21
5. Block diagram	4	Connector panel (FL 2, FL 4) (Diagram H)	21
6. <i>Electrical diagrams and PWB lay-out</i>		Keyboard panel (FL 2, FL 4) (Diagram B)	22
Power supply (Diagram L2)	7	LED/RC5 panel (FL 2, FL 4) (Diagram X)	22
Line and frame deflection (Diagram L1)	8	Keyboard/connector panel (FL 5) (Diagram AV)	22
Mains switch (FL 2, FL 4) (Diagram K)	9	Source selection CINCH (Diagram I)	23
Mains switch/RC5 panel (FL 5) (Diagram AW)	10	Source selection (Diagram I1)	24
FFS Drive panel (Diagram N)	10	Source selection (Diagram I2)	25
Multi Voltage panel (Diagram M)	11	NICAM decoder (Diagram G)	26
Stand-by supply (ELPS) (Diagram AU)	12	AFU (Dolby) panel (Diagram Z)	27
PANA-DAF (Diagram AB)	13	Audio power amplifier (Diagram A)	28
North/South correction (Diagram AP)	13	I/O (Dolby) panel (Diagram U)	29
Subwoofer filter (Diagram AK)	13	Incredible sound (Diagram AY)	29
SCAVEM Amplifier		Global Sound Decoder (Diagram G)	30
(+ picture rotation 16:9) (Diagram V)	14	Feature Box (100 Hz Digital Scan) (Diagram F)	33
DDP panel (Diagram J)	15	Feature Box AI panel (Diagram AR)	34
Picture tube panel (Diagram R)	16	Comb filter panel (Diagram O)	35
Block diagram 1 SSP (Diagram Sa)	17	VCI panel (RGB Clipper) (Diagram W)	36
Block diagram 2 SSP (Diagram Sb)	18	Teletext panel (Diagram AQ)	37
Tuner (Diagram S1)	19	Picture in Picture (PIP) (Diagram P)	38
Stereo decoder (Diagram S2)	19	7. Electrical adjustments	39
Control (Diagram S8)	19	8. Circuit description	41
Headphones amplifier (Diagram S4)	19	9. Direction for use	49
		10. Electrical parts list	53

1. Technical data

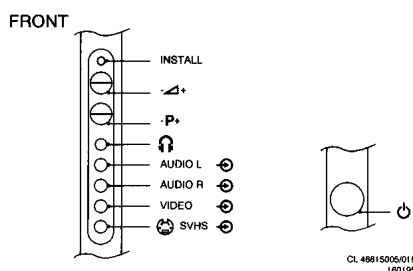
Mains voltage	: 220 - 240 V (± 10%)
	: 50 Hz - 60 Hz (± 5%)
Aerial input impedance	: 75 Ω - coaxial
Minimum aerial voltage	: 30 μV (VHF), 40 μV (UHF)
Maximum aerial voltage VHF/S/UHF	: 180 mV
Programmes	: 0 - 99
VCR programmes	: 0, 50 - 99

2. Connection facilities and Chassis overview

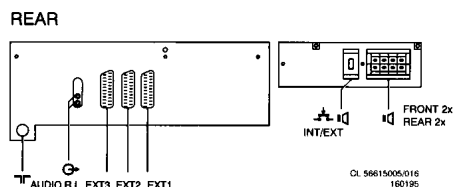
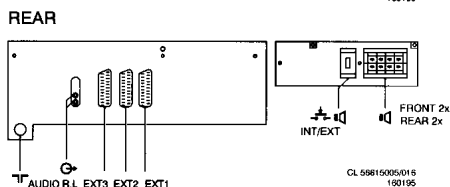
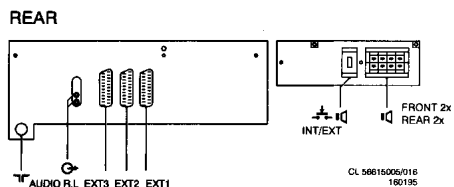
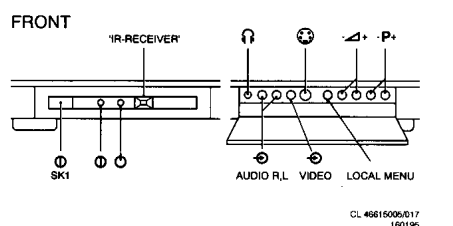
FL 5



FL 2



FL 4



Specification of the connectors

EXT 1 (AUX): RGB+CVBS+Y/C

1	-Audio → R (0,5VRMS ≤ 1kΩ)
2	-Audio ⊖ R (0,2-2VRMS ≥ 10kΩ)
3	-Audio → L (0,5VRMS ≤ 1kΩ)
4	-Audio ⊥
5	-Blue ⊥
6	-Audio ⊖ L (0,2-2VRMS ≥ 10kΩ)
7	-Blue (0,7V _{pp} /75Ω)
8	-CVBS-status ⊖ 0-2V: INT 4,5-7V: EXT 16:9 9,5-12V: EXT 4:3
9	-Green ⊥
10	--
11	-Green (0,7V _{pp} /75Ω)
12	--
13	-Red ⊥
14	-RGB-status ⊥
15	-Red (0,7V _{pp} /75Ω)
16	-RGB-status (0-0,4V: INT) (1-3V: EXT/75Ω)
17	-CVBS ⊥
18	-CVBS ⊥
19	-CVBS → (1V _{pp} /75Ω)
20	-CVBS ⊖ (1V _{pp} /75Ω)
21	-Earthscreen

EXT2 (VCR): Y/C+CVBS+RGB

1	-Audio → R (0,5VRMS ≤ 1kΩ)
2	-Audio ⊖ R (0,2-2VRMS ≥ 10kΩ)
3	-Audio → L (0,5VRMS ≤ 1kΩ)
4	-Audio ⊥
5	-Blue ⊥
6	-Audio ⊖ L (0,2-2VRMS ≥ 10kΩ)
7	-Blue (0,7V _{pp} /75Ω)
8	-CVBS-status ⊖ 0-2V: int 4,5-7V: EXT 16:9 9,5-12V: EXT 4:3
9	-Green ⊥
10	--
11	-Green (0,7V _{pp} /75Ω)
12	--
13	-Red ⊥
14	-RGB-status ⊥
15	-Red (0,7V _{pp} /75Ω)
16	-RGB-status (0-0,4V: INT) (1-3V: EXT/75Ω)
17	-CVBS ⊥
18	-CVBS ⊥
19	-CVBS → (1V _{pp} /75Ω)
20	-CVBS/Y ⊖ (1V _{pp} /75Ω)
21	-Earthscreen

EXT3: CVBS+RGB

1	--
2	-Audio ⊖ R (0,2-2VRMS ≥ 10kΩ)
3	--
4	-Audio ⊥
5	-Blue ⊥ (Euro only)
6	-Audio ⊖ L (0,2-2VRMS ≥ 10kΩ)
7	-Blue (0,7V _{pp} /75Ω)
8	--
9	-Green ⊖
10	--
11	-Green (0,7V _{pp} /75Ω)
12	--
13	-Red ⊥
14	-RGB-status ⊥
15	-Red (0,7V _{pp} /75Ω)
16	--
17	-CVBS ⊥
18	-CVBS ⊥
19	--
20	-CVBS ⊖ (1V _{pp} /75Ω)
21	-Earthscreen

EXT3 (front)

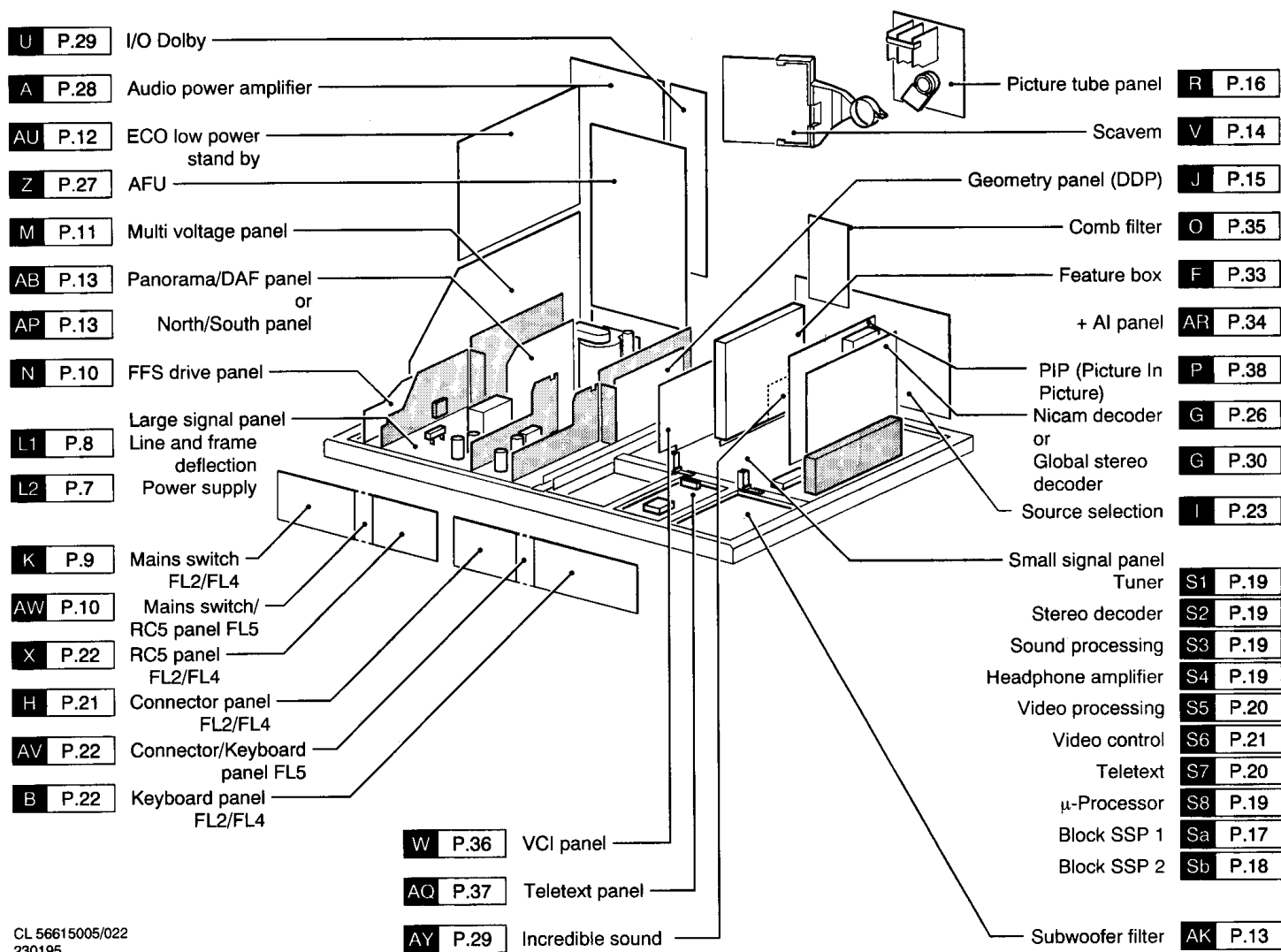
- ⊙ CINCH Video ⊖ 300mV_{pp}/75Ω
- ⊙ CINCH Audio ⊖ L (0,5VRMS; ≥ 10kΩ)
- ⊙ CINCH Audio ⊖ R (0,5VRMS; ≥ 10kΩ)

- SVHS
- 1 - ⊥
- 2 - ⊥
- 3 - Y ⊖ (1V_{pp}; 75Ω)
- 4 - C ⊖ (0,3V_{pp}; 75Ω)

Audio out (rear)

- ⊙ CINCH Audio → L (0,5VRMS; ≤ 1kΩ)
- ⊙ CINCH Audio → R (0,5VRMS; ≤ 1kΩ)

3.5mm 32-2000Ω ≥ 10mW



CL 56615005/022
230195

3. Safety instructions, maintenance instruction, 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 that after a repair the set must be returned in its original condition. In particular attention should be paid to the following points:

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

Note:

This resoldering is advised to prevent bad connections due to metal fatigue in solder joints and is therefore only necessary for television sets older than 2 years.

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

Maintenance instruction

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

- when the set is used under normal circumstances, for example in a living room, the recommended interval is 3 to 5 years;
- when the set is used in circumstances with higher dust, grease or moisture levels, for example in a kitchen, the recommended interval is 1 year.

The maintenance inspection contains the following actions:

- execute the above mentioned 'general repair instruction';
- clean the power supply and deflection circuitry on the chassis;
- clean the picture tube panel and the neck of the picture tube.

Warnings

1.
- In order to prevent damage to ICs and transistors, all high-voltage flashovers must be avoided. In order to prevent damage to the picture tube, the method shown in Fig. 3.1 should be used to discharge the picture tube. Use a high-voltage probe and a multimeter (position DC-V). Discharge until the meter reading is 0V (after approx. 30s).
2.
- ESD



All ICs and many other semiconductors are sensitive to electrostatic discharges (ESD). Careless handling during repair can drastically shorten the life. Make sure that during repair you are connected by a pulse band with resistance to the same potential as the earth of the unit. Keep components and tools also at this same potential.
3.
- Together with the deflection unit and any multipole unit, the flat square picture tubes used form an integrated unit. The deflection and the multipole units are set optimally at the factory. Adjustment of this unit during repair is therefore not recommended.
4.
- Be careful when taking measurements in the high-voltage section and on the picture tube.
5.
- Never replace modules or other components while the unit is switched on.
6.
- When making settings, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.
7.
- On this unit the 141 volt supply voltage is not supplied via an interconnection on the deflection yoke to the line output transformer. When the deflection cable is detached, the + 141 volt supply remains loaded. In order to unload the + 141 volts, coil 5136 should be removed.

Notes

1.
- The direct voltages and oscillograms should be measured with regard to the tuner earth (⊥), or hot earth (⊥⚡) as this is called.
2.
- The direct voltages and oscillograms shown in the diagrams should be measured in the **Service Default Mode** (see chapter 8) with a colour bar signal and stereo sound (L:3 kHz, R:1 kHz unless stated otherwise) and picture carrier at 475.25 MHz.
3.
- Where necessary, the oscillograms and direct voltages are measured with (⌚) and without aerial signal (✕). Voltages in the power supply section are measured both for normal operation (Ⓢ) and in standby (Ⓟ). These values are indicated by means of the appropriate symbols.
4.
- The picture tube PWB has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aquadag coating.
5.
- The semiconductors indicated in the circuit diagram and in the parts lists are completely interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

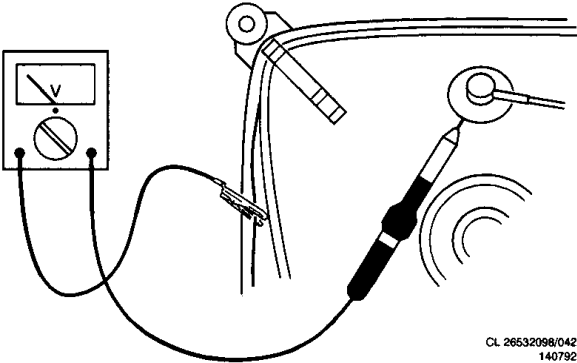
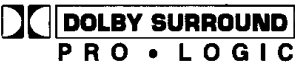


Fig. 3.1

6.
- 

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4. Mechanical instructions

The GFL chassis has predefined service positions for different panels (Fig. 1 + 2).

To get access to the chassis, do the following steps:

- a remove the sub woofer grill;
- b disconnect the cable from the subwoofer;
- c remove the screws from the back cover and the two chassis cover plates;
- d remove the back cover.

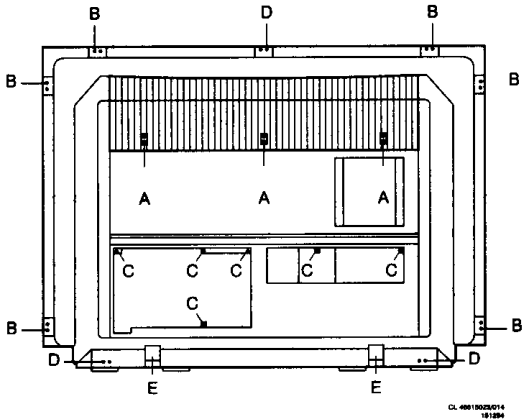


Fig. 1

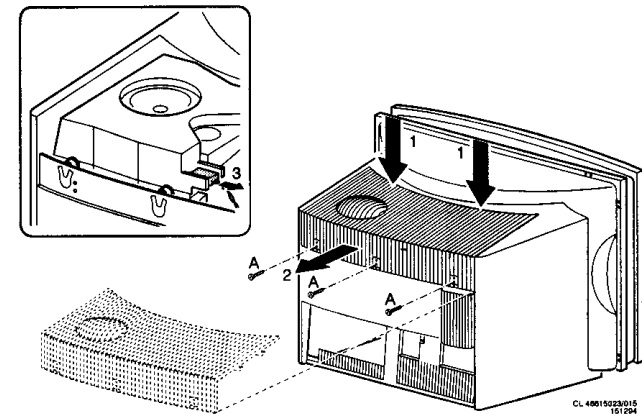


Fig. 2

1.1 The overview position (Fig. 3)

To get a better overview over the chassis, the whole chassis can be put one step backwards by lifting the whole bracket out of the holes and locating it again in the holes next to them. While doing this loosen cables from clips.

1.2 The service position of the Large Signal Panel (LSP) and the Small Signal Panel (SSP) (Fig. 3)

To get access to the solder sides of the SSP and the LSP, do the following steps:

- a disconnect the cables from the loudspeakers;
- b disconnect the cable from the degaussing coil;
- c eventually also the cables to the front inputs and the headphone output can be disconnected (do not disconnect the wires to the local control knobs and the remote control LED's, otherwise communication between the Dealer Service Tool and the chassis is impossible);

- d pay attention to the cable routing in order safeguard the original routing;
- e loosen the cables from clips at SSP side and from the mains filter bracket;
- f loosen the cables from clips above the line output transformer;
- g take the mains lead out of the strain relief and remove the whole relief by turning it over 90 degrees before it can be taken out;
- h lift the whole chassis bracket while turning it over 90 degrees and put the bracket in the holes of the bottom plate. Fix the bracket to the hook on top of the cabinet.

This service position is designed to perform service at the customers home without the use of a table or workbench.

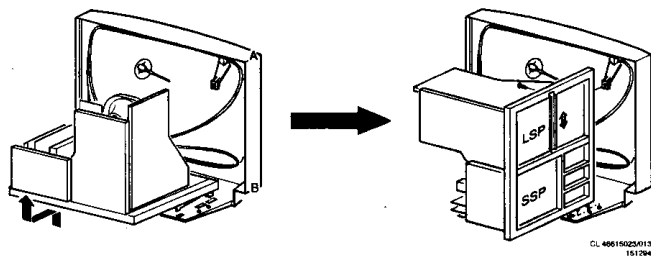


Fig. 3

4.3 The service position of the other panels (Fig. 4)

The three vertical brackets can be turned down when the chassis is in the overview position. The stand-by supply bracket and the audio amplifier bracket can be turned down after removing the screws and the two fixing brackets. Before turning the brackets have to be lifted. The I/O bracket can be turned down the same way. Be careful not to forget the screw and the clip near the front-end.

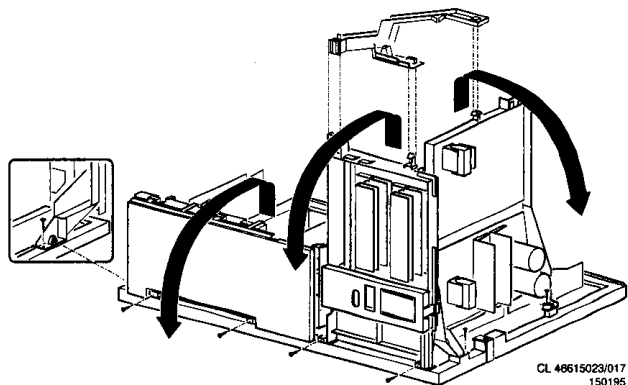


Fig. 4

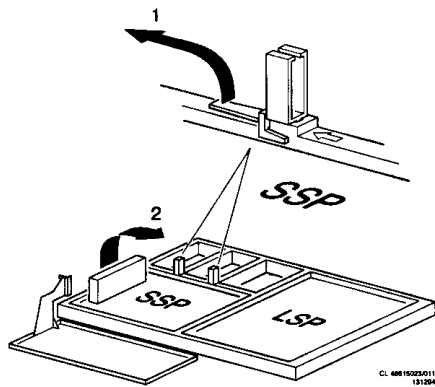


Fig. 5

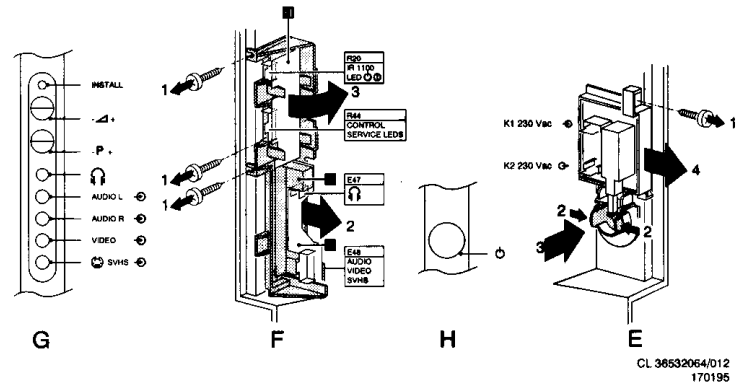


Fig. 8

4.4 Removing the Small Signal Panel (Fig. 5)

To remove the SSP, first turn the I/O bracket down. After that remove all cables from their connectors, followed by the removal of the two red coloured clips by lifting the lip and moving to the left. Now the SSP can be taken out of the bracket.

4.5 Removing the Large Signal Panel (Fig. 4)

To remove the LSP first the stand-by bracket and the audio bracket have to be turned down. After that the metal line output transformer support bracket has to be shifted by loosening the screw at the right hand side. Now the metal bracket can be shifted to the right until it stops. The chassis lock between the SSP and the LSP becomes free then and can be pulled back and bend away from the LSP. Finally loosen the red clamps at the front side of the LSP and the wires from their connectors. The LSP can then be taken out of the bracket.

4.6 Removing panels located under the picture tube

The fixation of the panels located under the picture tube depends on the cabinet type.

FL2 cabinets (Fig. 6 + 7 + 8)

For FL2 cabinets the knobs are located at the side of the cabinet, the LED's are located under the picture tube. These panels can be taken out by loosening the clicks.

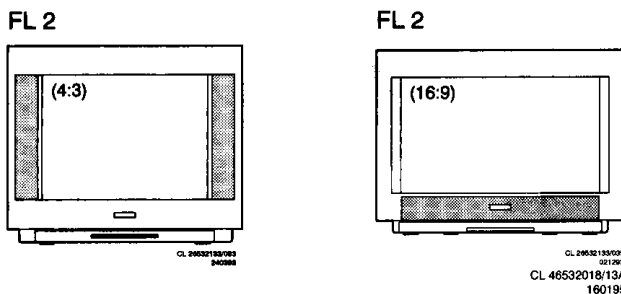


Fig. 6 + Fig. 7

FL4 cabinets (Fig. 9)

In FL4 cabinets both knobs and LED's are located under the picture tube. Before they can be taken out, first their screws have to be removed. Access to the screws can be created by taking the whole chassis away from the bottom plate.

The centre speakers of FL4 are mounted via the front side of the cabinet. To get access first the grill has to be removed. The centre grill is fixed with clicks and also screws are used. The screws are located at the inner side of the cabinet, under the picture tube. After the screws have been removed, open the door and carefully put a screwdriver between the grill and the cabinet. By turning the screwdriver the right click will loose. To loose the left click, put the whole set at the edge of a table first. Then put the screwdriver at the underside of the set between the grill and the cabinet.

FL 4

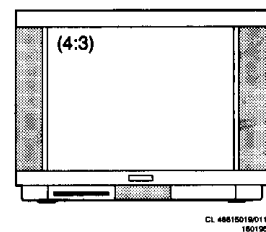


Fig. 9

FL5 cabinets (Fig. 10)

In FL5 cabinets both knobs and LED's are located under the picture tube. All front panels and centre loudspeakers are mounted in a plastic bracket which can be removed as a whole.

To remove the bracket, the screws between the picture tube and the bottom plate have to be removed, but also the screws which are located at the underside of the cabinet.

To remove these screws the set has to be turned. Before turning preferably the backcover of the set is mounted. Turn the set with the picture tube face downwards and put it carefully on a soft and clean surface. After the screws have been removed the set can be put back in the normal position.

After removing the screws at the inner side, the bracket can be taken away from the underside.

FL 5

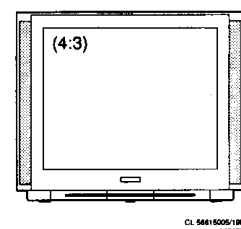
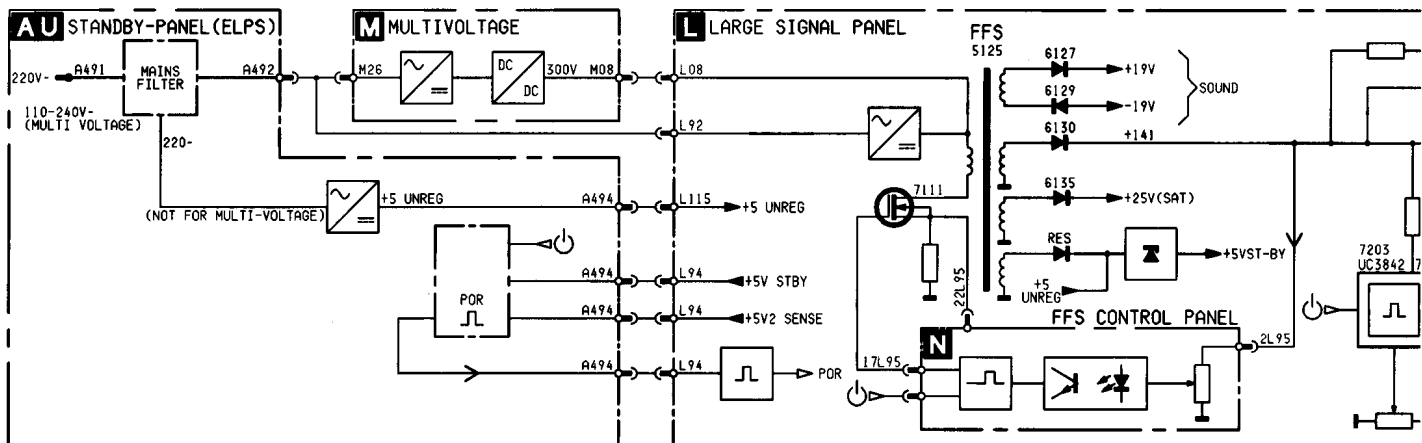
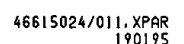


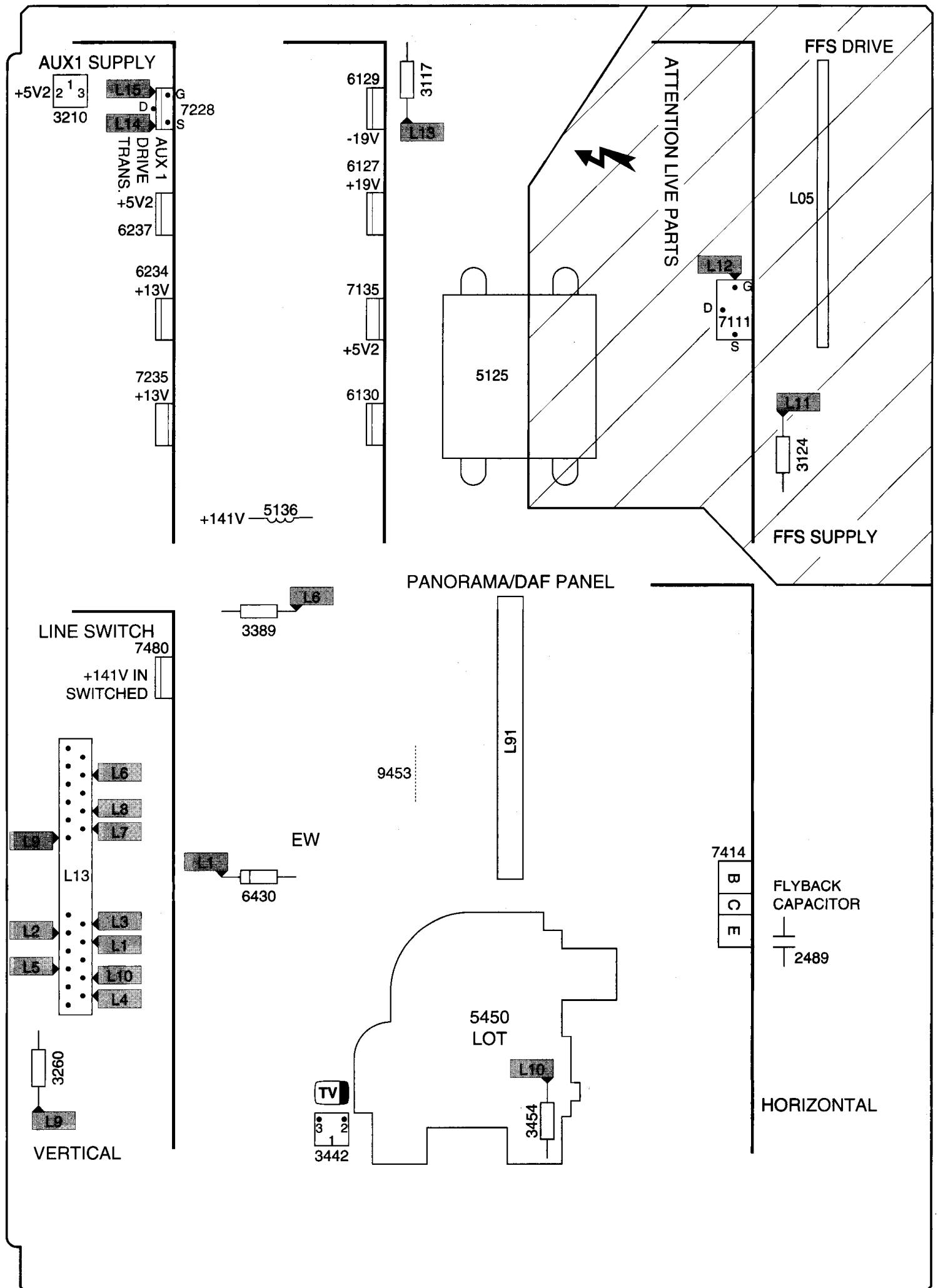
Fig. 10

4

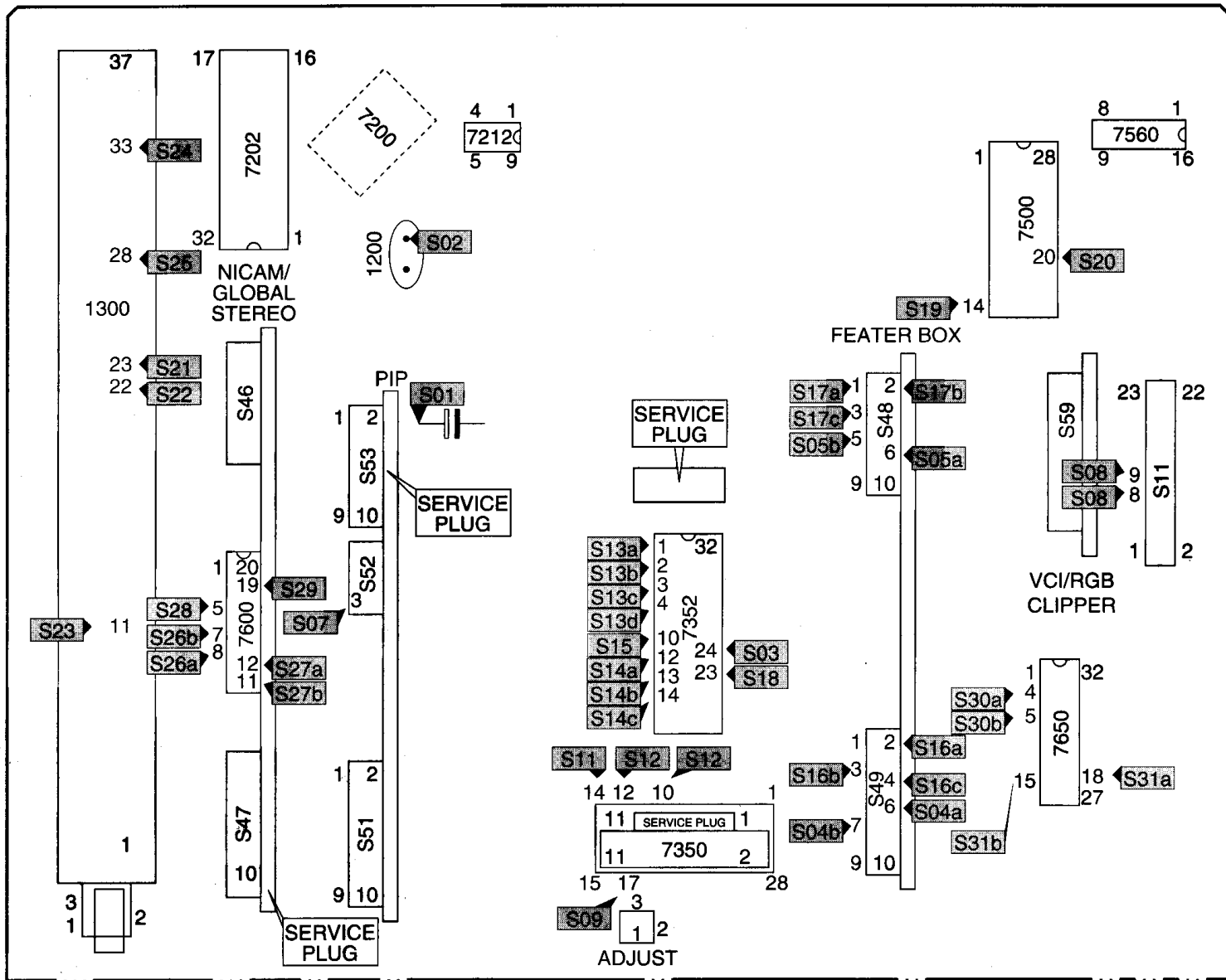




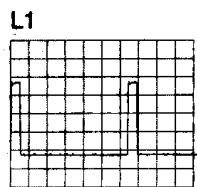
Large signalpanel / Groß-Signal Platte / Platine forts signaux



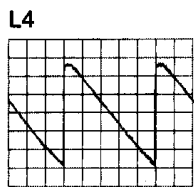
Small signal panel / Klein-signal Platte / Platine à petites signaux



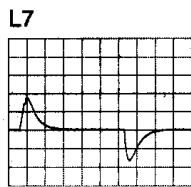
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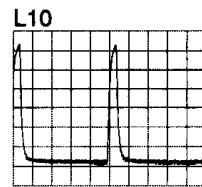
1V/div
5 μ s/div



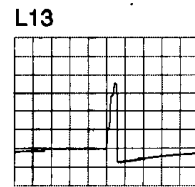
100mV/div
2ms/div



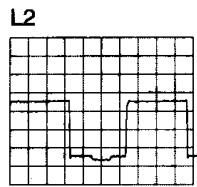
500mV/div
0.5s/div



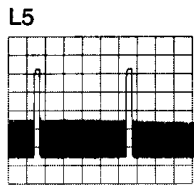
2V/div
2ms/div



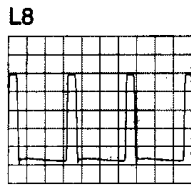
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50ms/div



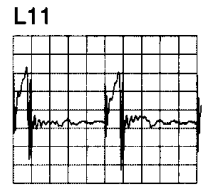
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5μs/div



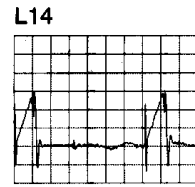
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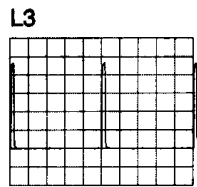
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10μs/div



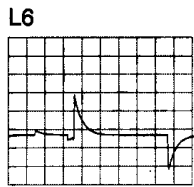
200mV/div
5μs/div



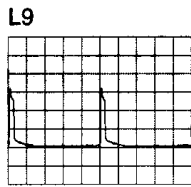
200mV/div
2μs/div



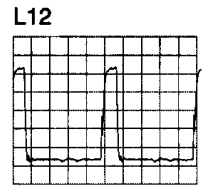
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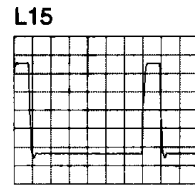
2V/div
0.5s/div



5V/div
2ms/div



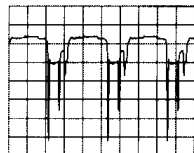
2V/div
5μs/div



2V/div
2μs/div

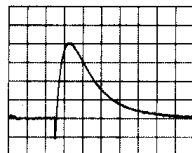
Oscillograms / Oscillogrammen / Oscillogrammes

TS7414b



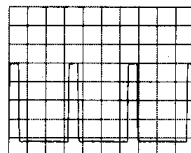
2V/div
10 μ s/div

S1



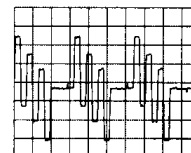
200mV/div
0.5s/div

S7



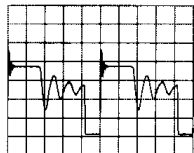
1V/div
10 μ s/div

S13c



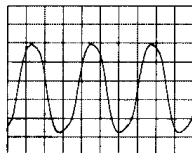
200mV/div
20 μ s/div

TS7111d



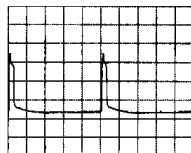
100V/div
5 μ s/div

S2



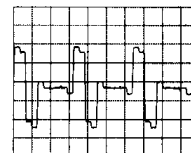
1V/div
0.2mV/div

S8



5V/div
2ms/div

S13d



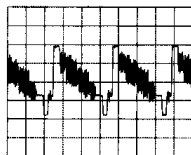
200mV/div
20 μ s/div

S3



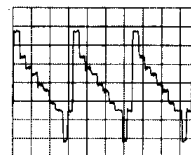
50mV/div
20 μ s/div

S9



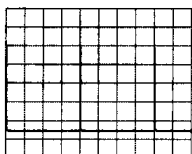
500mV/div
20 μ s/div

S14a



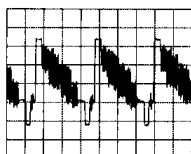
200mV/div
20 μ s/div

S4a



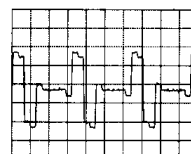
1V/div
5ms/div

S10



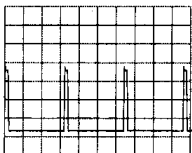
200mV/div
20 μ s/div

S14b



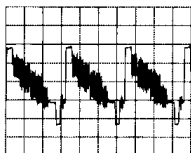
200mV/div
20 μ s/div

S4b



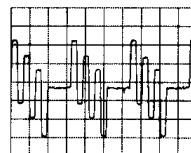
1V/div
20 μ s/div

S11



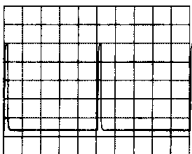
200mV/div
20 μ s/div

S14c



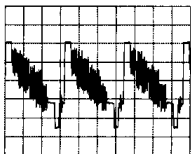
200mV/div
20 μ s/div

S5a



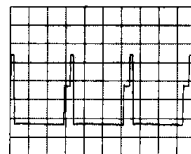
1V/div
2ms/div

S12



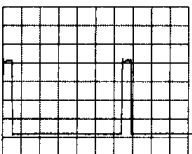
200mV/div
20 μ s/div

S15



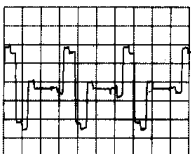
1mV/div
20 μ s/div

S5b



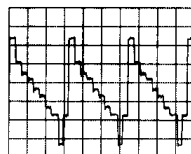
1V/div
5 μ s/div

S13a



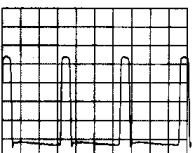
100mV/div
20 μ s/div

S16a



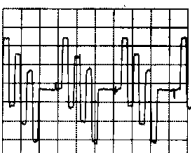
200mV/div
20 μ s/div

S6



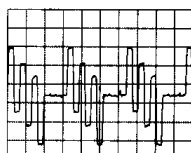
1V/div
10 μ s/div

S13b

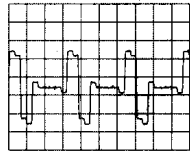


100mV/div
20 μ s/div

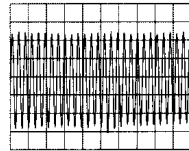
S16b



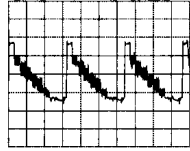
200mV/div
20 μ s/div

S16c

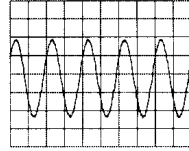
200mV/div
20 μ s/div

S22

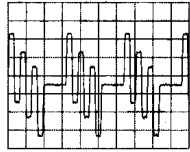
50mV/div
0.5 μ s/div

S17a

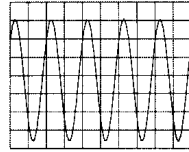
100mV/div
10 μ s/div

S26

200mV/div
0.5 μ s/div

S17b

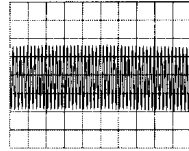
200mV/div
10 μ s/div

S27

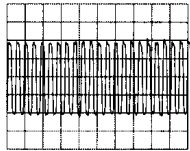
200mV/div
0.5 μ s/div

S17c

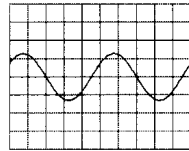
200mV/div
10 μ s/div

S29

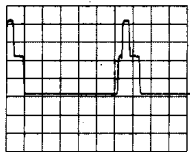
100mV/div
0.5 μ s/div

S18

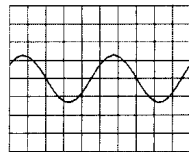
50mV/div+4DC
0.5 μ s/div

S30a

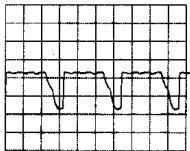
500mV/div
0.2ms/div

S19

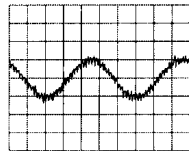
1V/div
5 μ s/div

S30b

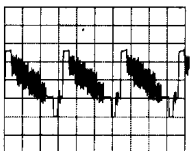
500mV/div
0.2ms/div

S20

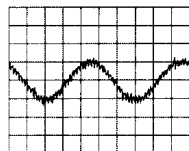
2V/div
10 μ s/div

S31a

500mV/div
0.2ms/div

S21

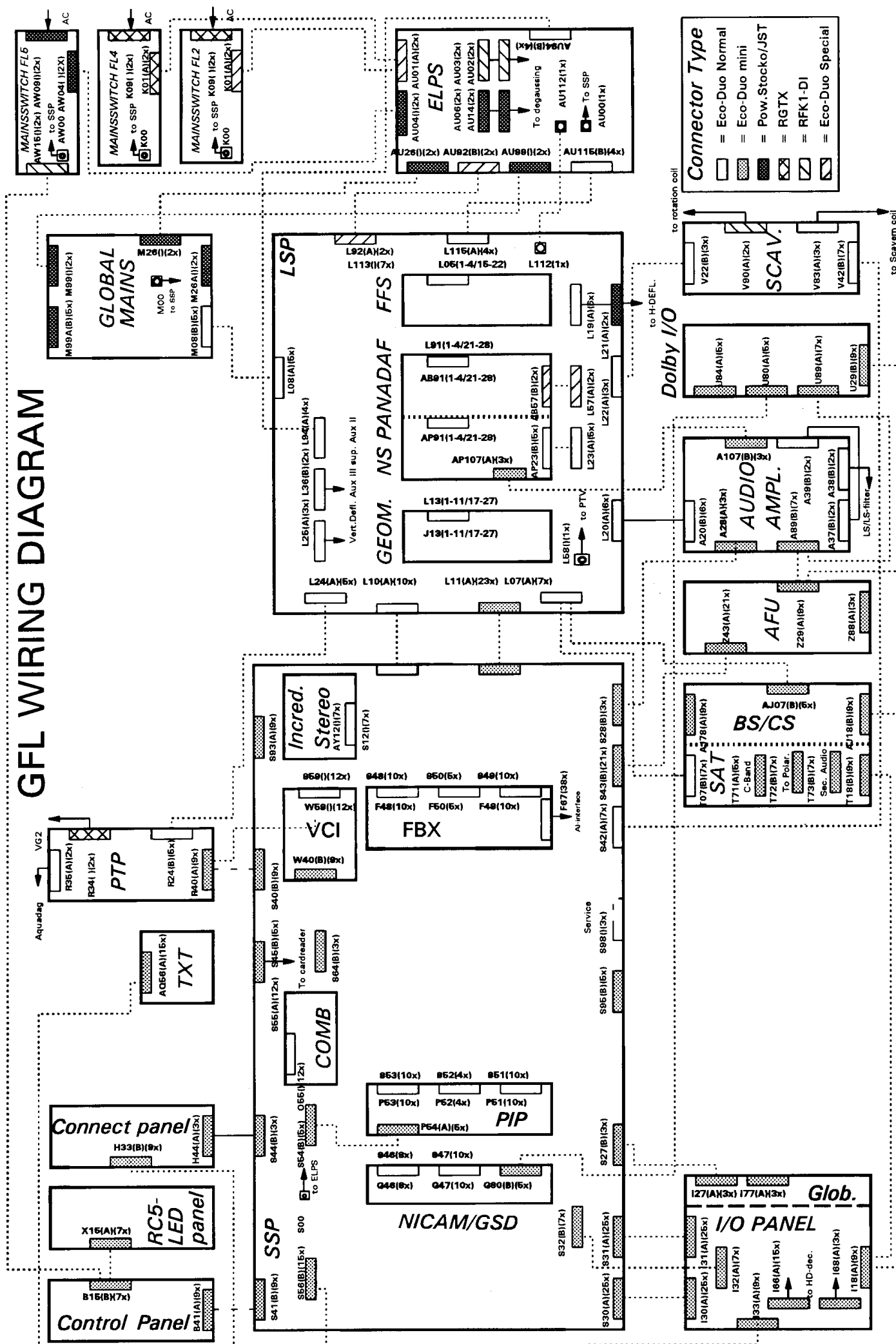
500mV/div
20 μ s/div

S31b

500mV/div
0.2ms/div

Wiring diagram / Verdrahtungsschema / Schema de câblage

GFL WIRING DIAGRAM



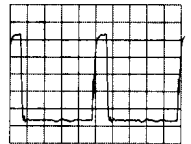
* 1135	2105 D 6	2115 E 6	2124 H 8	2133 G13	2141 H10	2216 J15	2227 T19	2242 J20	2264 D24	2473 D20	3114 J 4	3122 I10	3131 F13	3140
1137	2106 D 7	2116 E 7	2125 H 9	2134 G11	2142 J 9	2220 G16	2228 T18	2243 J21	2266 D25	2474 D17	3115 J 5	3123 G 5	3132 F 6	3141
1138	2107 D 8	2117 E 8	2126 H 10	2135 G10	2143 J10	2221 G16	2229 T17	2244 J22	2267 D26	2475 D18	3116 J11	3124 H 6	3133 F 7	3142
1139	2108 D 9	2118 E 9	2127 H 11	2136 G10	2144 K 6	2222 J16	2230 T16	2245 K 5	2268 D27	2476 D19	3117 J12	3125 H 7	3134 G10	3143
1140	2109 D 10	2119 E 10	2128 H 12	2137 H 9	2145 K 7	2223 J16	2231 T15	2246 K 6	2269 D28	2477 D20	3118 J13	3126 H 8	3135 G11	3144
1141	2110 D 11	2120 E 11	2129 H 13	2138 H10	2146 K 8	2224 J16	2232 T14	2247 K 7	2270 D29	2478 D21	3119 J14	3127 H 9	3136 G12	3145
1142	2111 D 12	2121 E 12	2130 H 14	2139 H11	2147 K 9	2225 H17	2233 T13	2248 K 8	2271 D30	2479 D22	3120 F17	3128 D13	3137 G13	3146
1143	2112 D 13	2122 E 13	2131 F10	2140 I 8	2204 G14	2226 T17	2234 T12	2249 K 9	2272 D31	2480 D23	3121 F17	3129 D14	3138 K 6	3147
1144	2113 D 14	2123 G 5							2273 D32	2481 D24	3122 H 4	3130 F13		3201

L2**LARGE SIGNAL PANEL**

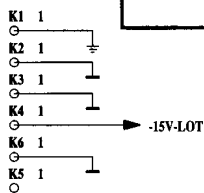
WARNING: DO NOT MEASURE VOLTAGES ACROSS D-S OF TS7111 AND TS7228

L11

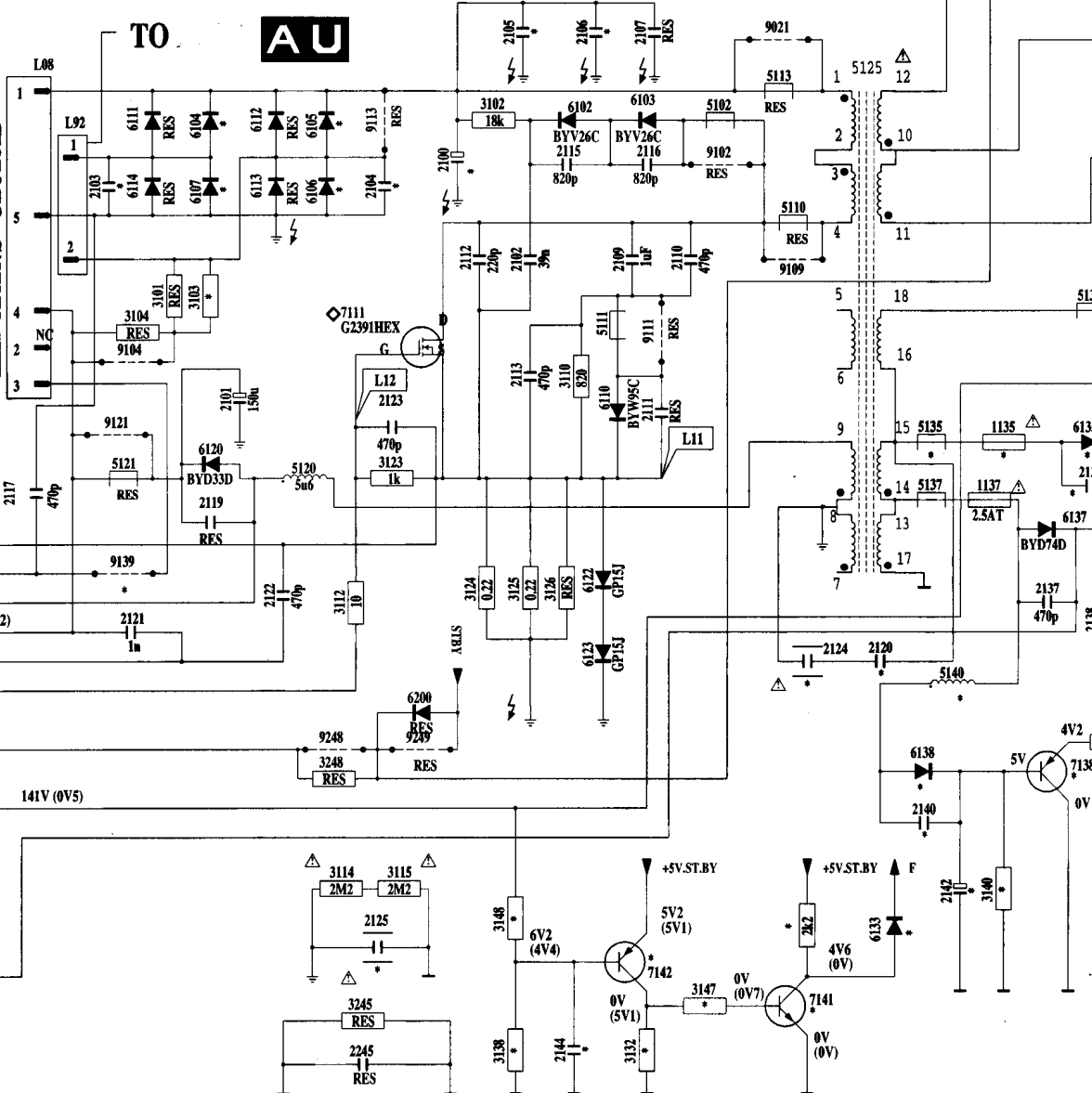
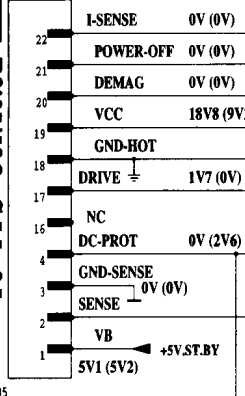
200mV/div
5µs/div

L12

2V/div
5µs/div

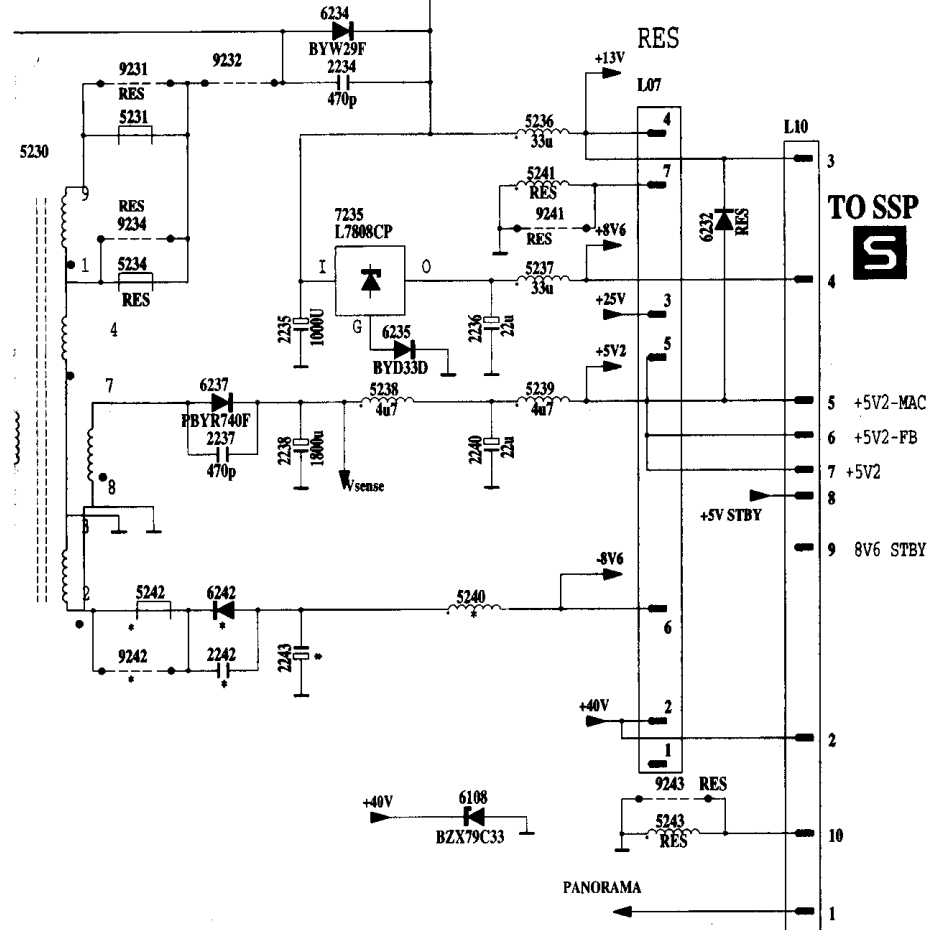
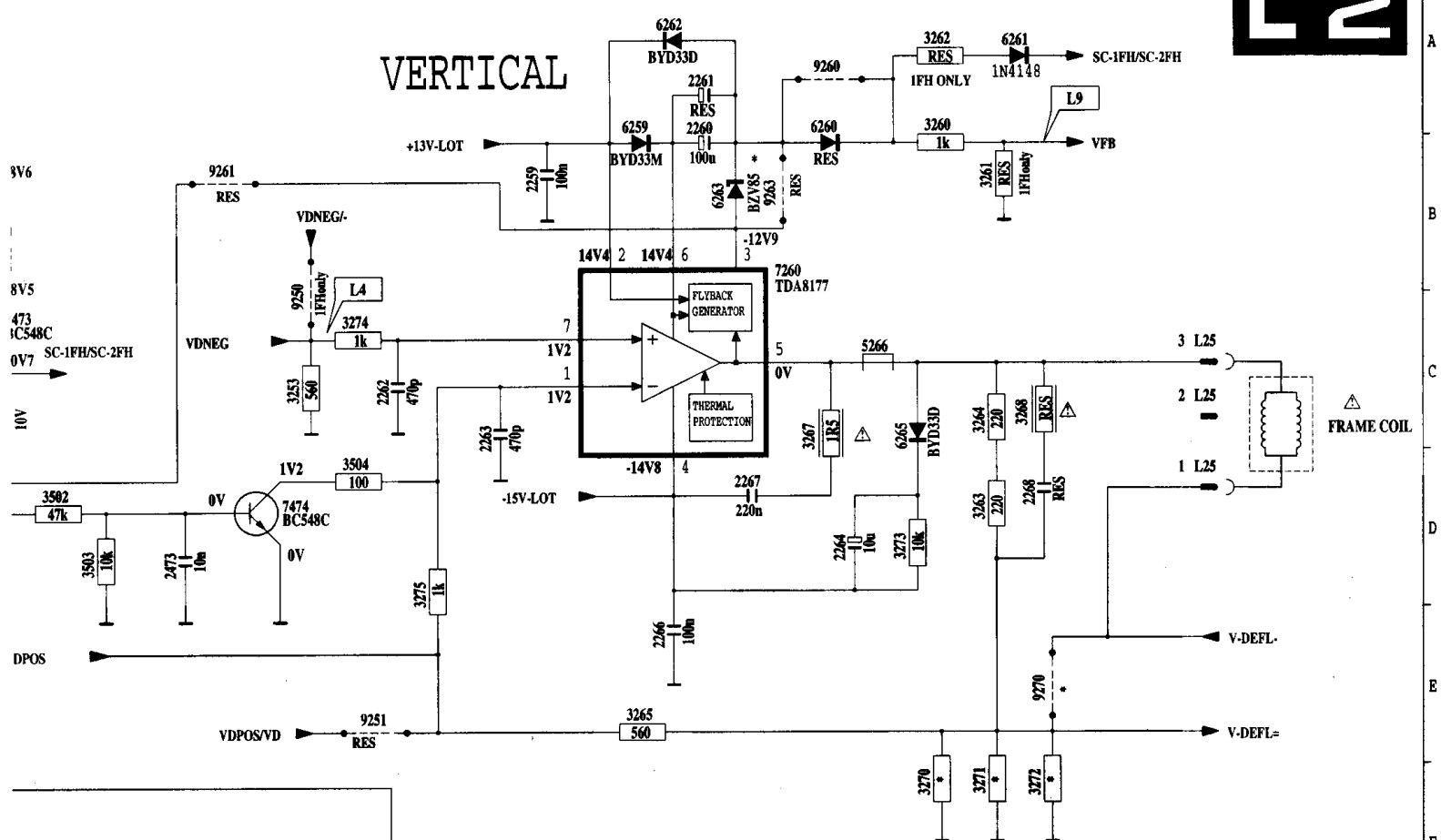
**MAIN FFS-SUPPLY**

TO

AU**ELPS****MAINS GLOBAL****TO FFS CONTROL****ELPS****AU**

(--V) = STANDBY

L2



DIVERSITYLIST SUPPLY GFL-V2					
POS	EUROPE	GLOBAL	POS	NON-SAT	SAT
2100	220uF/385V	RES	1135	RES	2.5AT
2103	2n2	RES	2135	RES	470pF
2104	2n2	RES	2136	RES	680uF
2105	RES	680nF/400V	2242	RES	1n5
2106	RES	680nF/400V	2243	RES	220uF
2120	RES	470pF	3133	RES	5k6
2124	RES	100pF	5135	RES	BEAD
2125	3n3	1nF	5240	RES	33uH
2140	RES	470pF	6135	RES	BYD33D
2142	RES	4u7	6242	RES	BYD33D
2143	RES	4u7	9133	RES	YES
2144	33n	RES	9242	RES	YES
3103	22k	RES			
3122	RES	2K2			
3132	10k	RES			
3138	5k6	RES			
3140	RES	1k			
3141	RES	10			
3142	RES	1k5			
3146	2K2	RES			
3147	22K	RES			
3148	120K	RES			
5140	RES	33uH			
6104	GP15J-16	RES			
6105	GP15J-16	RES			
6106	GP15J-16	RES			
6107	GP15J-16	RES			
6133	1N4148	RES			
6138	RES	BYD33D			
6139	RES	1N4148			
6140	RES	C6V8			
7138	RES	BC328/40			
7141	BC548B	RES			
7142	BC558B	RES			
9139	RES	YES			

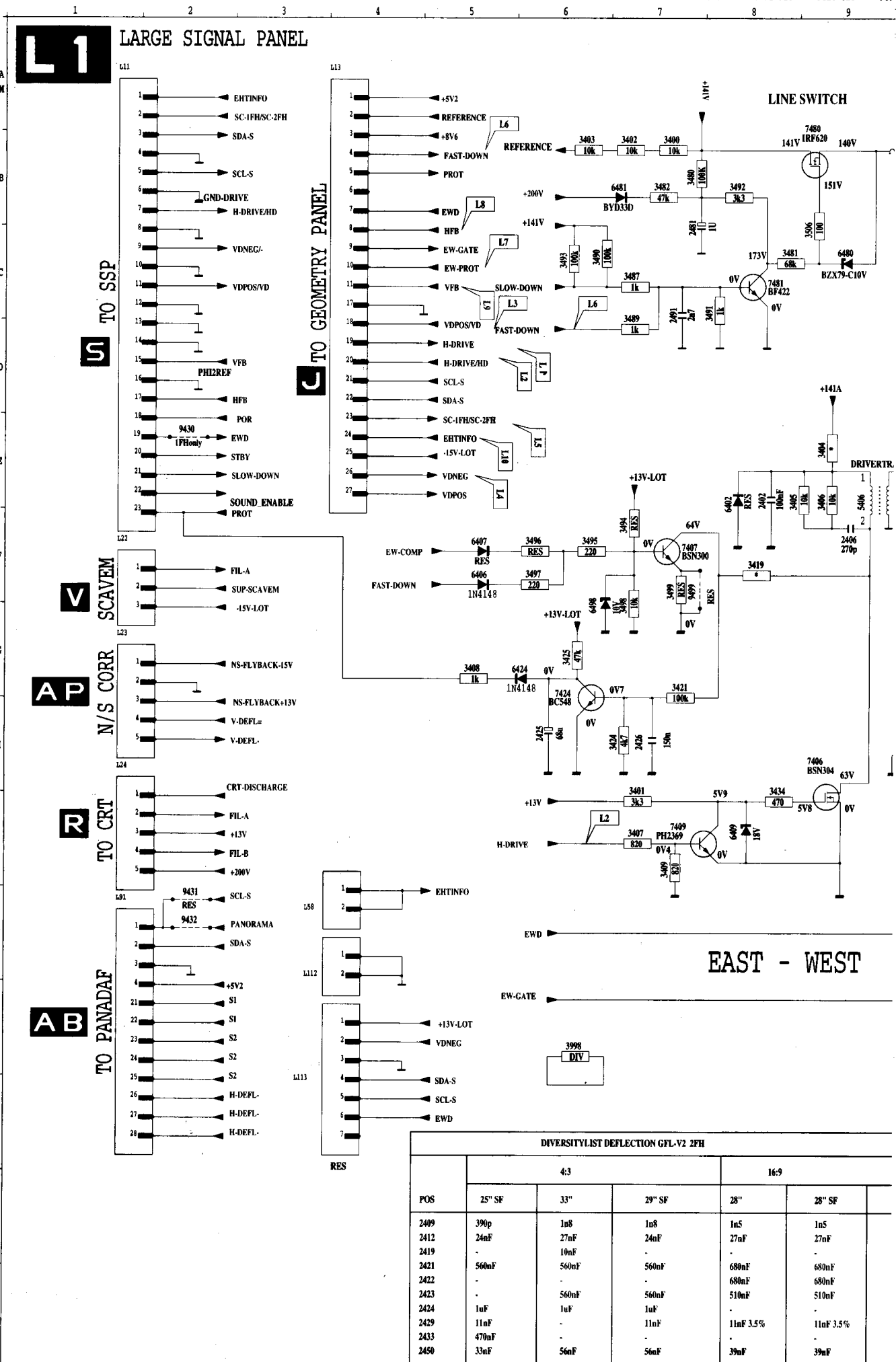
CHASSIS-GFL

CL46615018/051,LSP2
170195

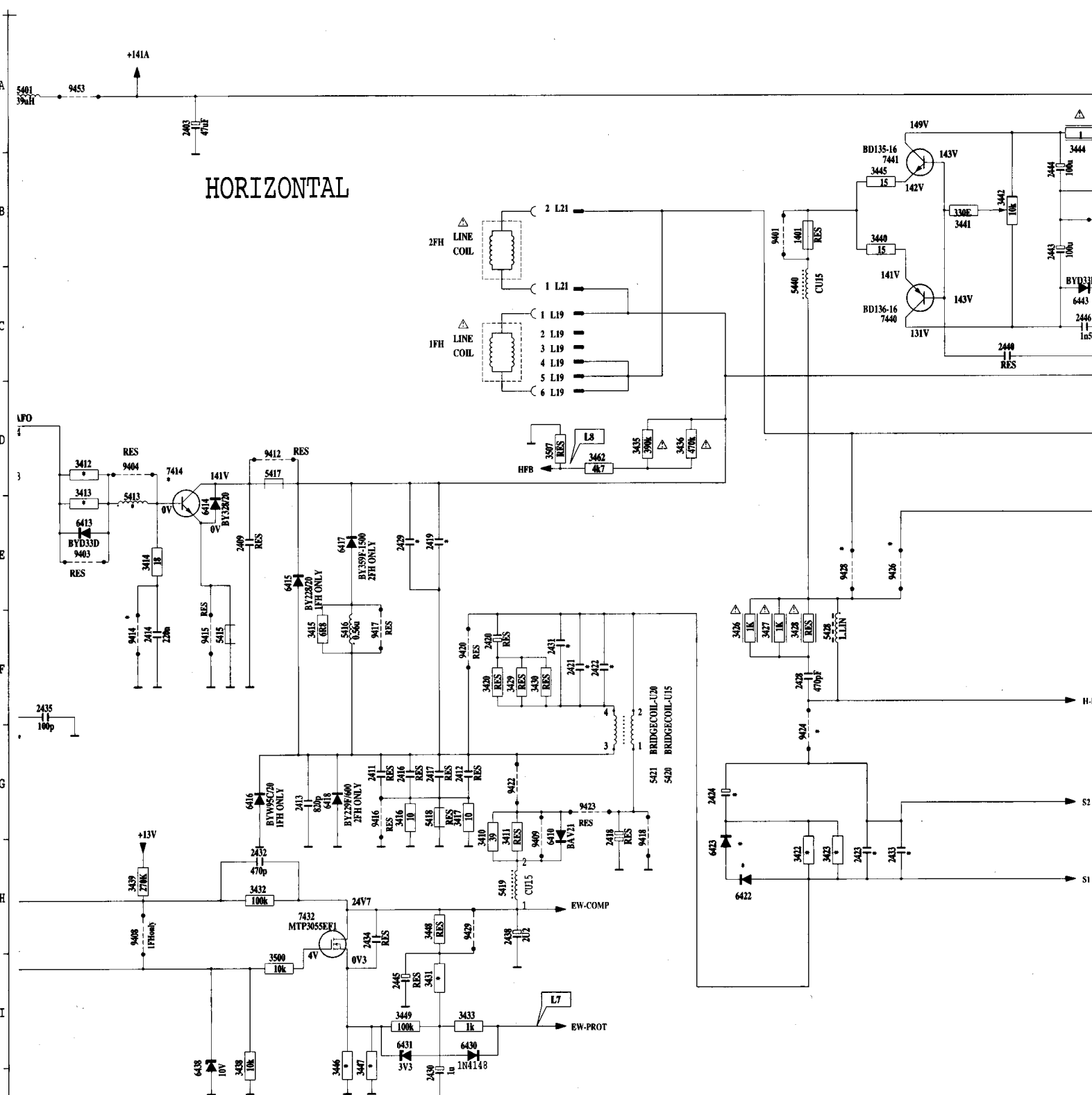
170195

Line and frame deflection / Raster- und Leitungsausgangsstufe /

1400	C21	2411	I13	2418	I16	2424	I17	2431	G15	2440	D20	2450	G24	2458	J25	2464	I26	2481	B 7	3404	B 9	3410	I14	3416	I13	3423	J18	3429	J18
1401	C18	2412	I14	2419	F14	2425	H 6	2432	J12	2443	C20	2451	G25	2459	J25	2465	F23	2481	C 7	3405	B 8	3411	I15	3417	I14	3424	H 7	3429	J18
2402	E 8	2413	I12	2420	G14	2426	H 7	2433	J19	2444	B20	2452	G25	2460	I23	2466	F23	3400	B 7	3405	B 8	3412	I15	3418	I14	3425	G 6	3429	J18
2403	G11	2414	G11	2421	H15	2427	H18	2434	J13	2445	C21	2453	G24	2461	I23	2467	F23	3401	B 7	3406	B 8	3413	I15	3419	I14	3426	G 6	3429	J18
2406	F 9	2416	I13	2422	H15	2428	H18	2435	H10	2446	B21	2454	G25	2462	I23	2468	F23	3402	B 7	3407	B 8	3414	I15	3420	I18	3426	G 7	3429	J18
2409	F12	2417	I14	2423	J18	2430	L14	2436	J15	2447	B21	2456	F23	2463	H25	2476	B24	3403	B 6	3408	I 7	3415	G13	3421	G 7	3426	G 8	3429	J18



HORIZONTAL

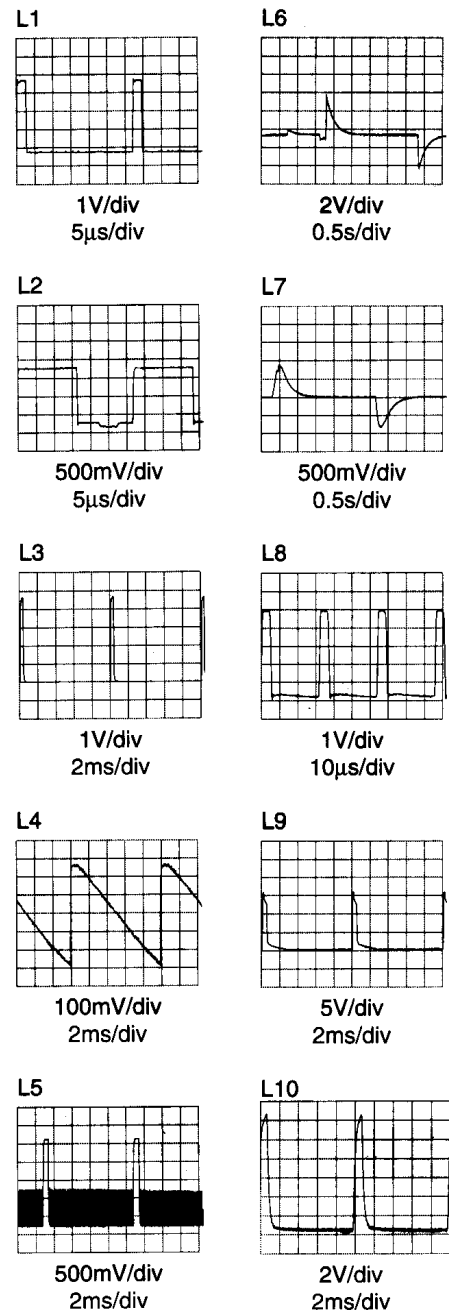
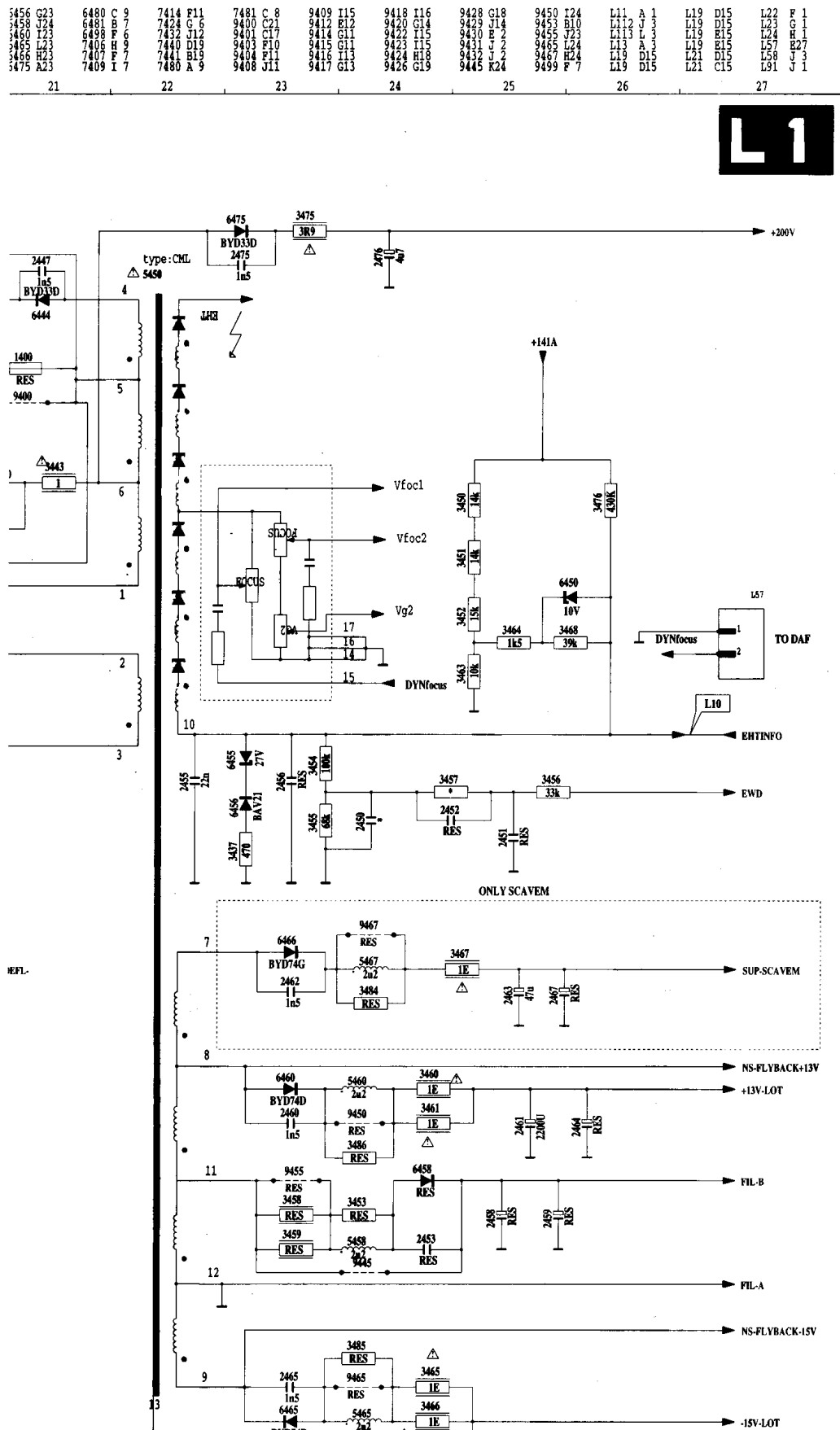


DIVERSITYLIST DEFLECTION GFL-V2 2FH

POS	4:3			16:9		
	25" SF	33"	29" SF	28"	28" SF	32" SF
3263	120	220	120	220	220	220
3264	150	220	150	220	220	220
3270	1	1	1	1R5	1R5	1R5
3271	1	1	1	1R5	1R5	1R5
3272	1	1	1	1R5	1R5	1R5
3404	1k8	2k2	1k8	2k2	2k2	1k5
3412	1R2	1R5	1R2	1R5	1R5	1R2
3413	1R2	1R5	1R5	1R5	1R5	1R2
3419	1k5	2k7	1k5	2k7	1k	1k
3422	33k	33k	33k	-	-	-
3423	33k	33k	33k	-	-	-
3431	5M6	5M6	5M6	7M5	7M5	7M5
3446	7R5	7R5	7R5	4R7	4R7	4R7
3447	7R5	7R5	7R5	10	10	10
3457	240k	200k	240k	180k	180k	180k

DIVERSITYLIST DEFLECTION GFL-V2 2FH

POS	4:3			28"
	25" SF	33"	29" SF	
5413	1u	0.50u	1u	0.50u
5420	-	-	-	3128 138
5421	3128 138 34062	3128 138 34401	3128 138 34062	3128 138
5428	3128 138 50231	3128 138 50141	3128 138 50231	3128 138
5450	3122 268 30304	3122 268 30992	3122 268 30304	3122 268
6263	13V	5V6	13V	13V
6422	BYD33M	BYD33M	BYD33M	-
6423	BYD33M	BYD33M	BYD33M	-
7414	BU2525A	2SC4288	BU2525A	2SC4288
9270	YES	YES	YES	YES
9424	YES	YES	YES	YES
9428	YES	YES	YES	YES
9432	-	-	-	YES

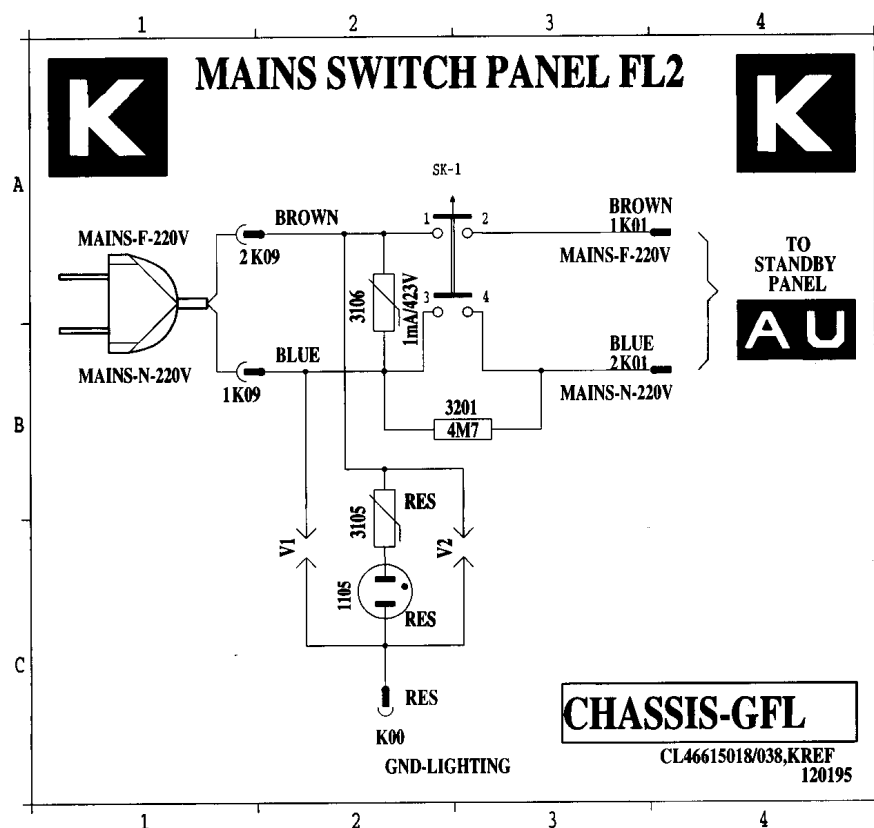


16:9		
	28" SF	32" SF
33311	0.56u	0.56u
	3128 138 33311	8228 001 14292
50251	3128 138 50251	3128 138 50561
30304	3122 268 30304	3122 268 30483
	13V	10V
	2SC4288	2SC4288
	YES	YES
	YES	YES
	YES	YES
	YES	YES

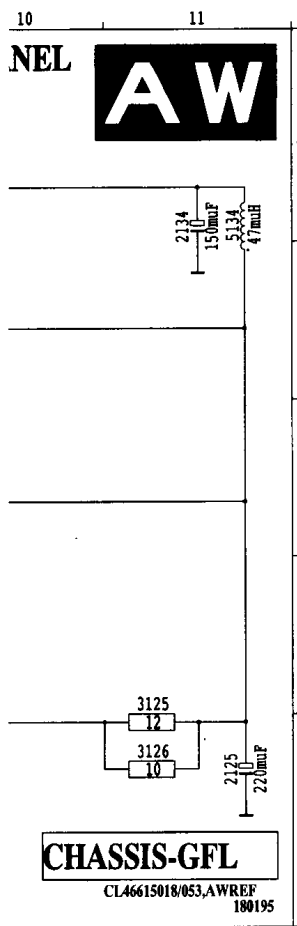
CHASSIS-GFL

CL46615018/050.LSP1
170195

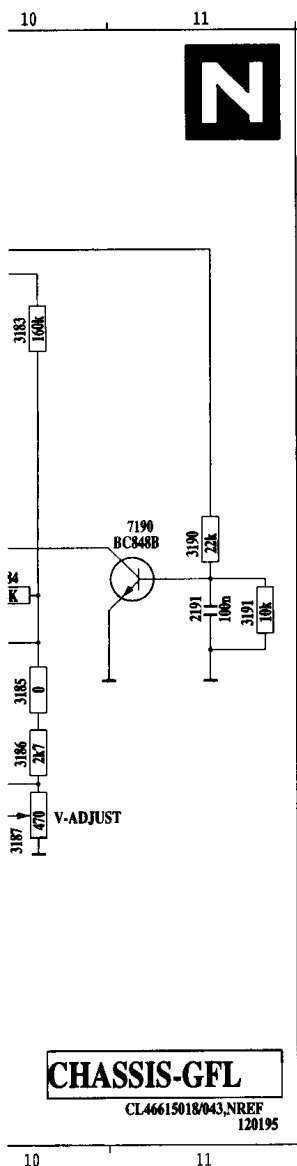
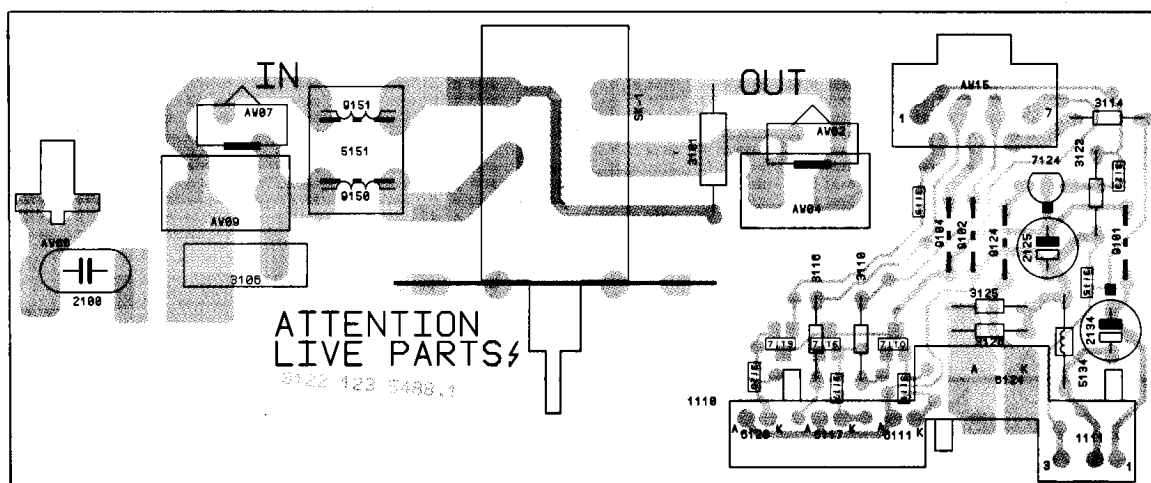
1105	C	2
3105	B	2
3106	A	2
3201	B	3
K00	C	2
K00	C	2
K01	A	3
K01	B	3
K09	B	2
K09	A	2
SK-1	A	3
V1	C	2
V2	C	2



1105	C	2
3105	B	2
3106	A	2
3201	B	3
K00	C	2
K01	A	3
K01	B	3
K09	B	2
K09	A	2
SK-1	A	2
V1	C	2
V2	C	2

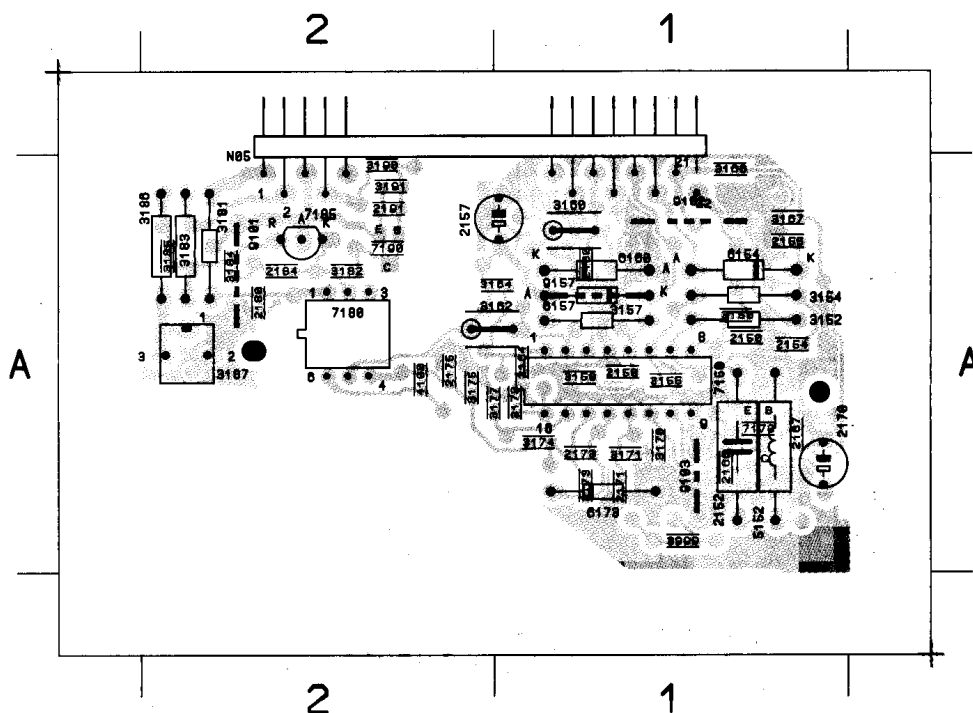


Mains switch FL5



FFS drive panel

2150 A 1	2164 A 1	2180 A 2	3157 A 1	3170 A 1	3181 A 2	3190 A 2	0100 A 1	0101 A 2
2152 A 1	2186 A 1	2184 A 2	3158 A 1	3171 A 1	3182 A 2	3191 A 2	0173 A 1	0102 A 1
2154 A 1	2167 A 1	2191 A 2	3180 A 1	3173 A 1	3183 A 2	3990 A 1	7150 A 1	0103 A 1
2155 A 1	2178 A 1	3150 A 1	3182 A 2	3174 A 1	3184 A 2	4100 A 2	7170 A 1	0157 A 1
2157 A 1	2171 A 1	3152 A 1	3184 A 1	3175 A 2	3185 A 2	5152 A 1	7180 A 2	N05 A 2
2158 A 1	2173 A 1	3154 A 1	3180 A 1	3177 A 2	3186 A 2	0154 A 1	7185 A 2	
2160 A 1	2175 A 2	3155 A 1	3157 A 1	3178 A 1	3187 A 2	0157 A 1	7190 A 2	



Multi voltage panel / Multi Voltage Platte /

GFL2.20 E

11

2050 C 4	2059 E 5	2064 C 9	2078 D11	3057 B 8	3063 C 8	3069 D12	3074 C12	3080 E13	3085 D10	6050 C 3
2052 C 6	2060 D 6	2065 B12	2079 F13	3058 F 5	3064 D 8	3070 E10	3076 D13	3081 D10	3086 D10	6051 C 3
2053 B 6	2061 D 7	2066 B 9	2080 F14	3059 F 5	3065 B13	3071 F11	3077 E13	3082 F12	5050 B 3	6052 B 7
2054 A 4	2062 D 8	2067 E 9	2084 C10	3061 D 8	3066 B10	3072 F12	3078 E12	3083 D11	5051 B 4	6058 F 4
2058 F 5	2063 D 9	2073 F10	3050 C 4	3062 B 8	3068 E 9	3073 F10	3079 F12	3084 C10	5065 B12	6059 F 4

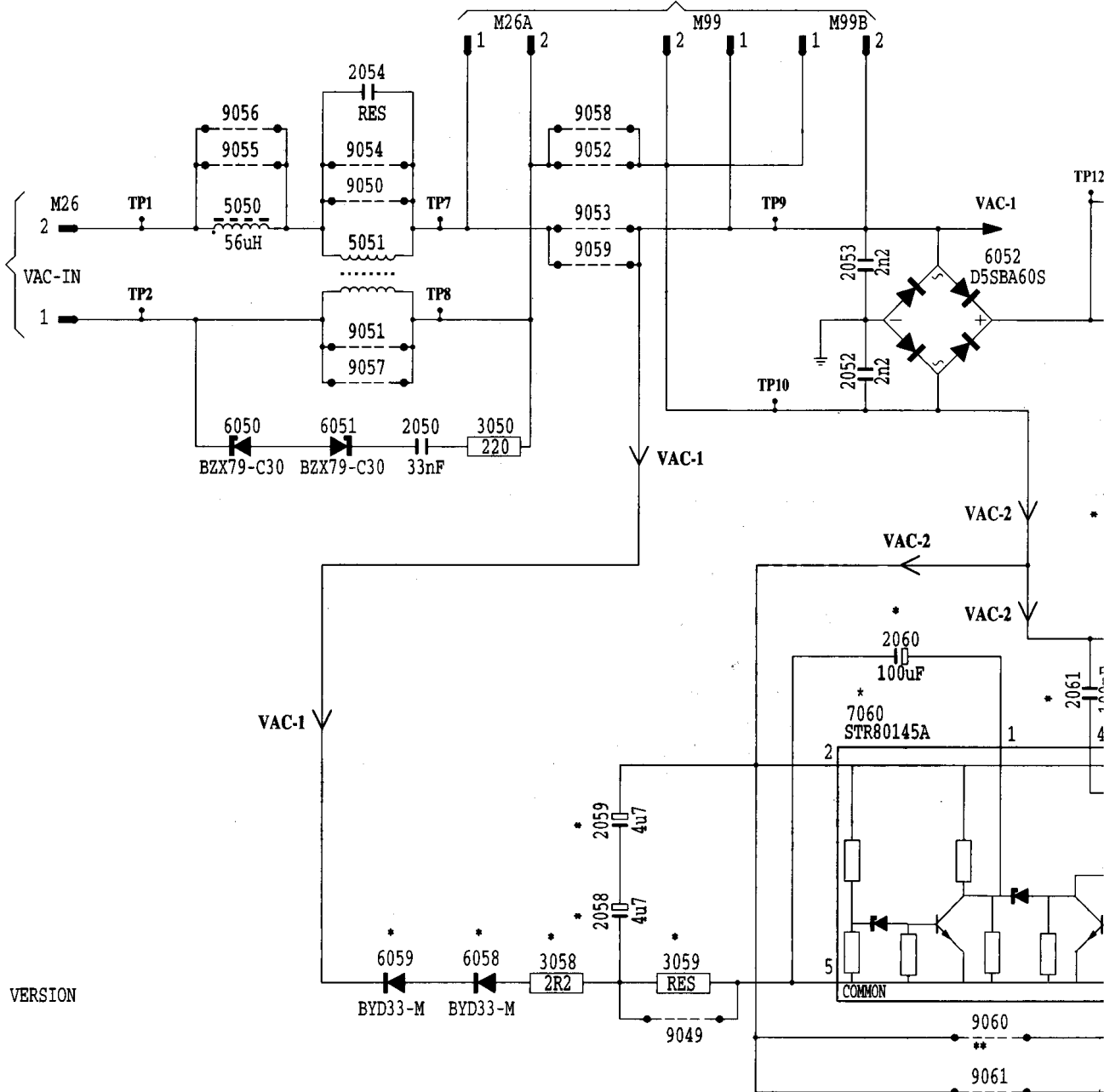


GLOBAL MAINS PANEL

TO STANDBY PANEL



FROM MAINS FILTER



* MULTIVOLTAGE VERSION

** 110V ONLY

Platine Multi Voltage

6062 B 8	6067 C12	6078 D11	7079 F13	9052 A 5	9057 C 4	9065 B13	M26A A 4
6063 C 8	6068 E12	6085 C10	7085 C11	9053 B 5	9058 A 5	9066 C13	M99 A 5
6064 B12	6069 E 9	7060 D 6	9049 F 5	9054 A 4	9059 B 5	9076 D13	M99B A 6
6065 B13	6070 F11	7064 C 9	9050 B 4	9055 A 3	9060 F 7	M08 B14	
6066 C12	6071 D12	7066 D12	9051 B 4	9056 A 3	9061 F 7	M26 B 2	

8

9

10

11

12

13

14



A

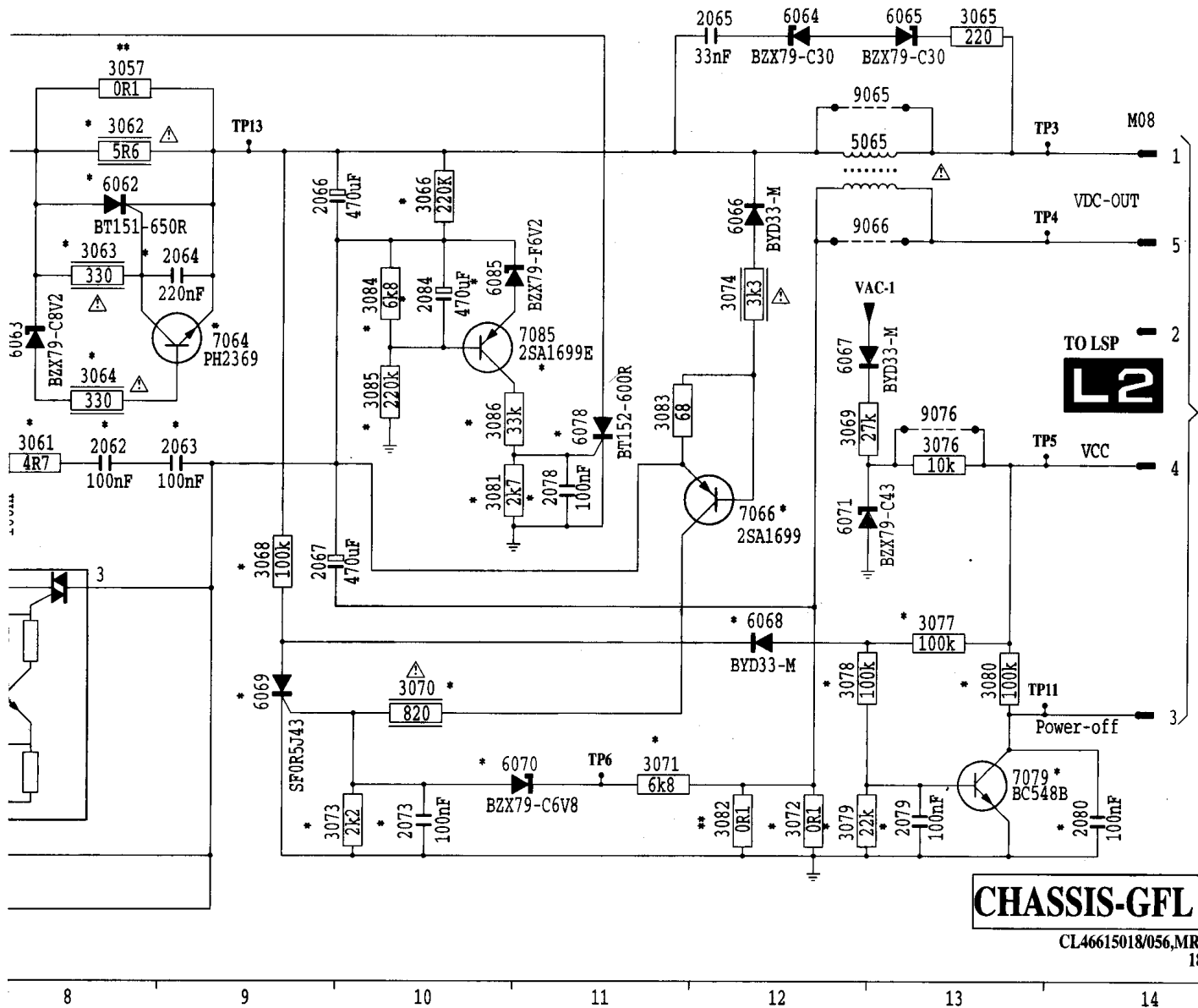
B

C

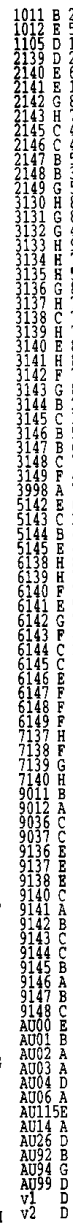
D

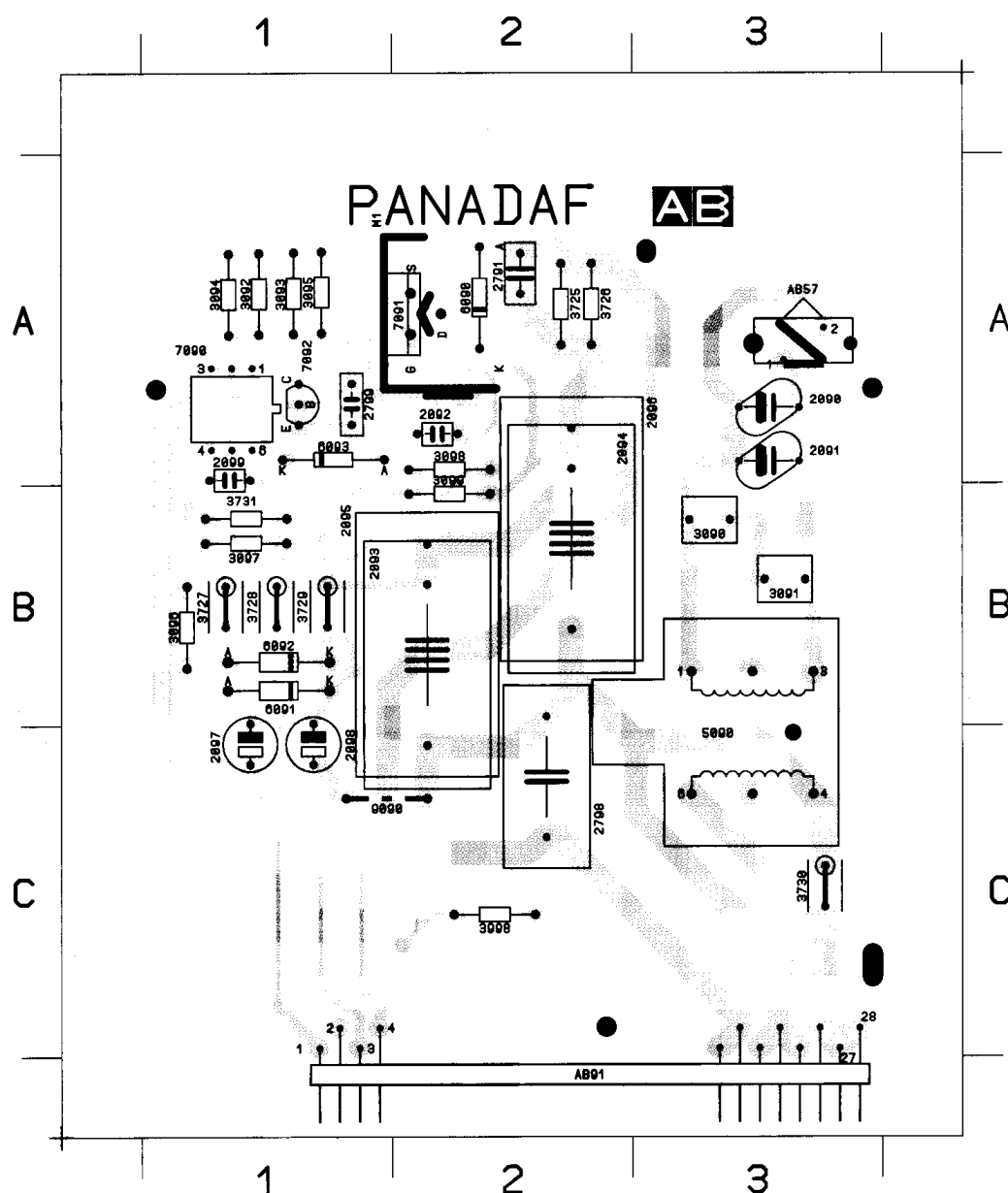
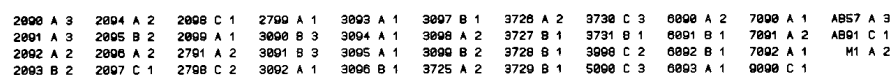
E

F

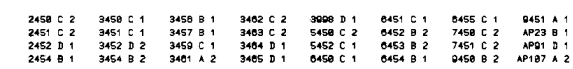


AU

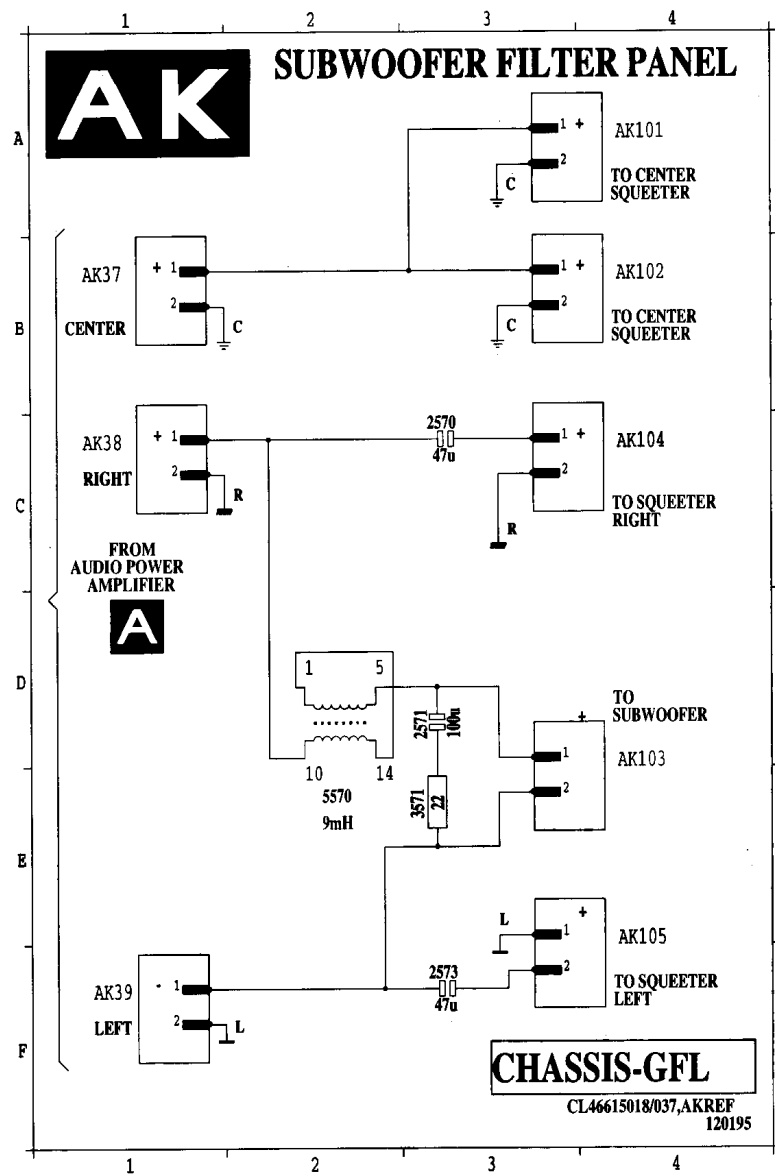




2450	B	4
2451	B	4
2452	C	4
2454	C	5
3450	D	1
3451	D	1
3452	D	4
3454	C	5
3456	B	5
3457	B	5
3459	D	2
3461	B	4
3462	B	4
3463	B	3
3464	D	2
3465	B	3
5450	D	3
5452	B	3
6450	C	1
6451	C	1
6452	C	6
6453	C	6
6454	C	5
6455	C	5
7450	D	5
7451	D	5
9450	C	4
AP107A	C	3
AP23	E	3

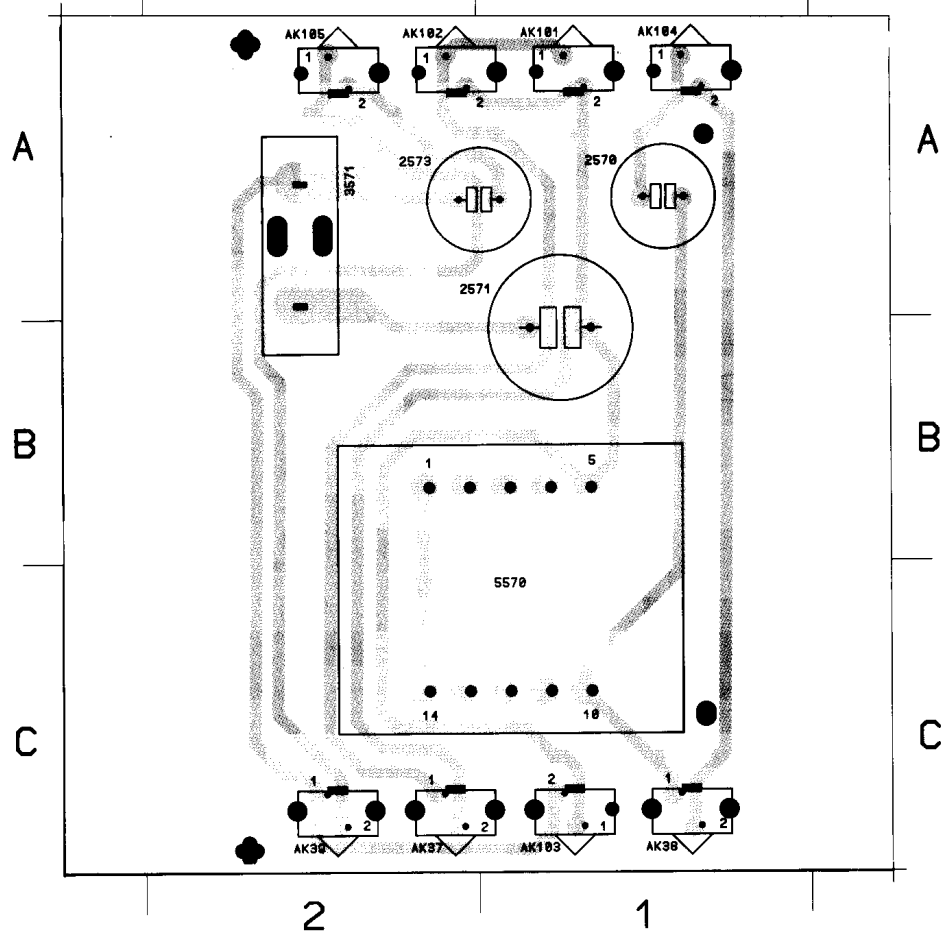


Subwoofer filter / Subwoofer-Filter / Filtre en subwoofer



2570 C 3
2571 D 3
2573 F 3
3571 E 3
5570 E 2
AK101A 4
AK102B 4
AK103D 4
AK104C 4
AK105E 4
AK37 B 1
AK38 C 1
AK39 F 1

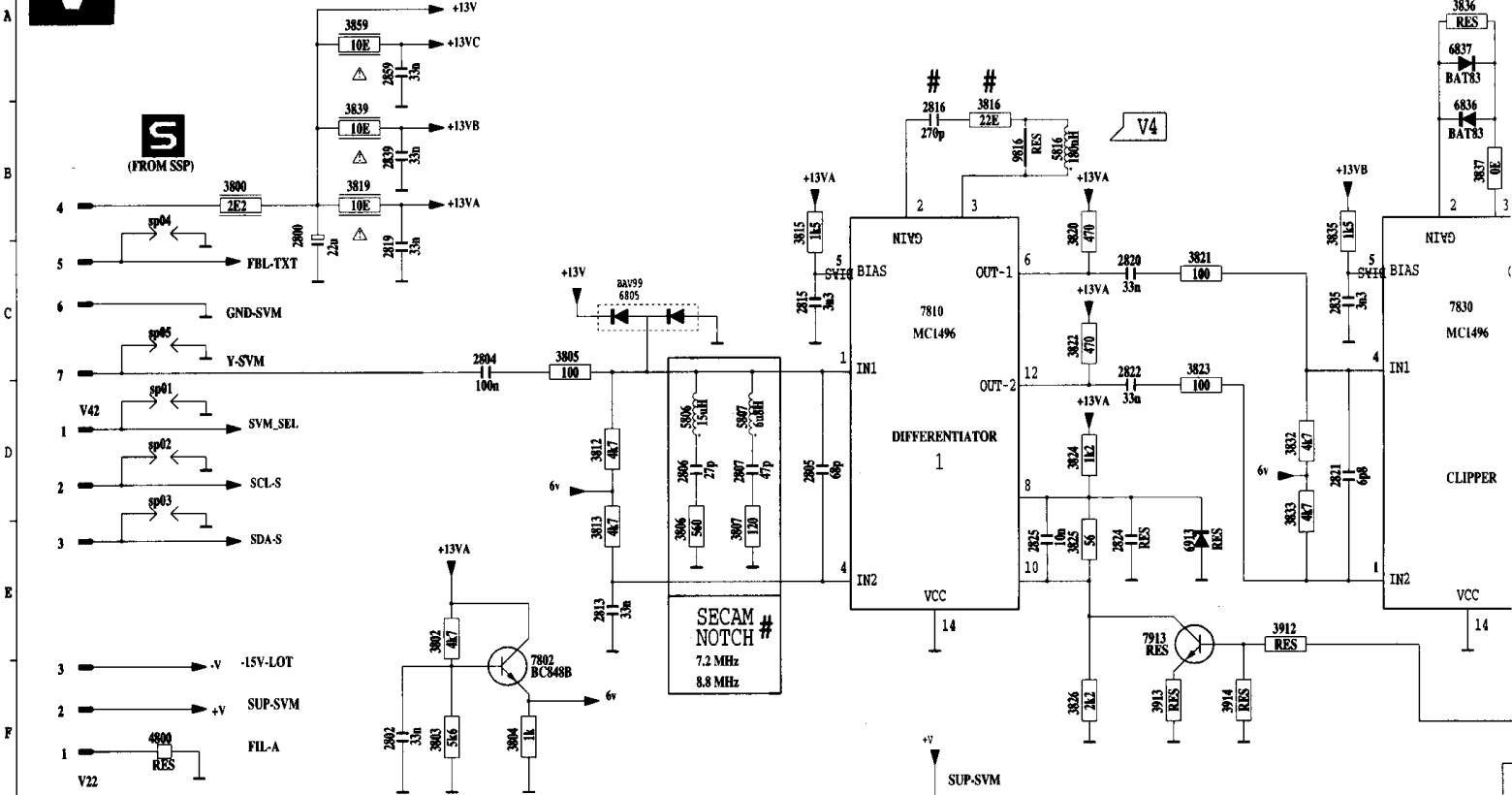
2570 A 1 2573 A 2 5570 B 2 AK38 C 1 AK101 A 1 AK103 C 1 AK105 A 2
2571 B 1 3571 A 2 AK37 C 2 AK39 C 2 AK102 A 2 AK104 A 1



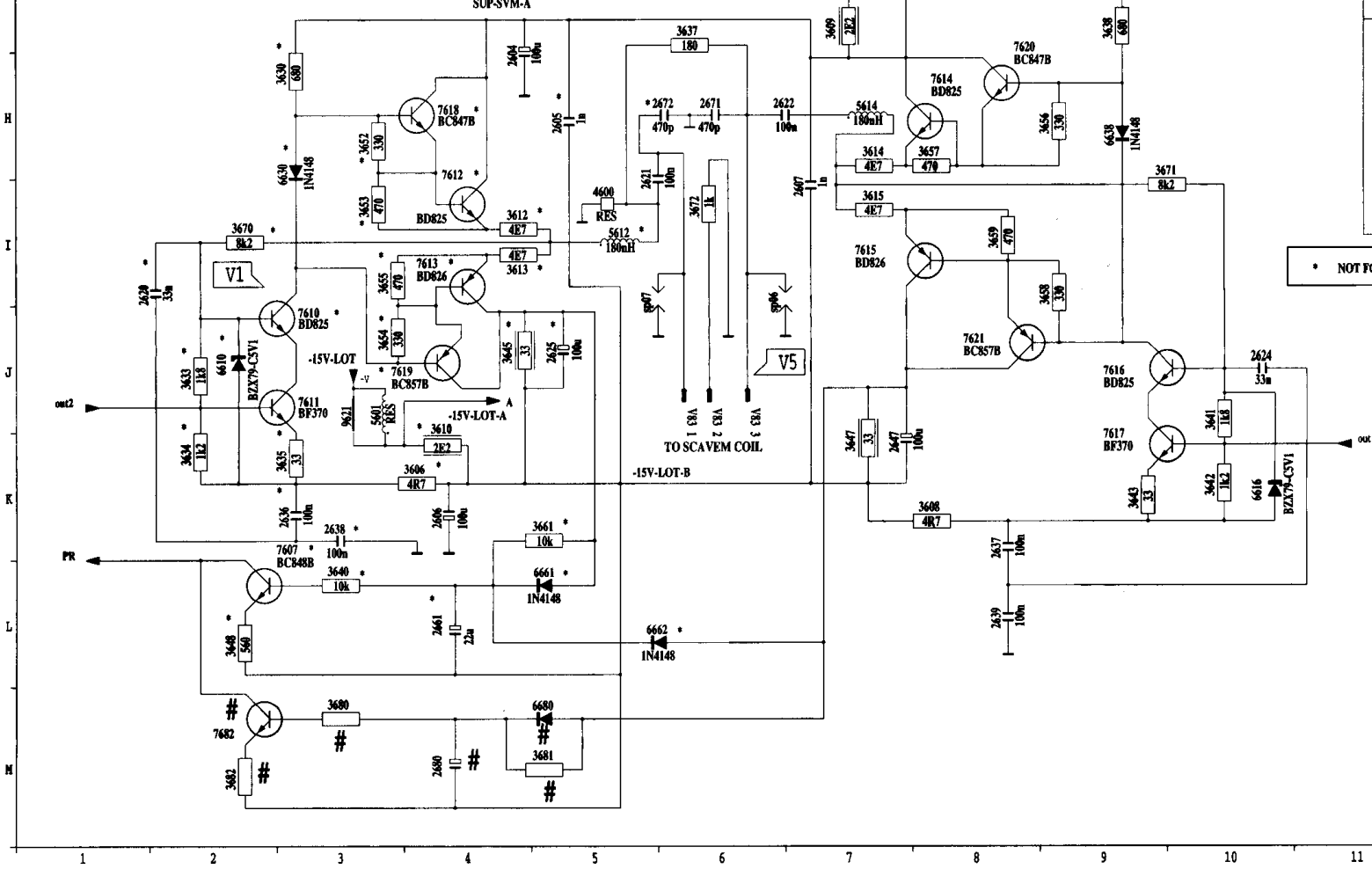


SCAVEM/PICTURE TILT (16:9)

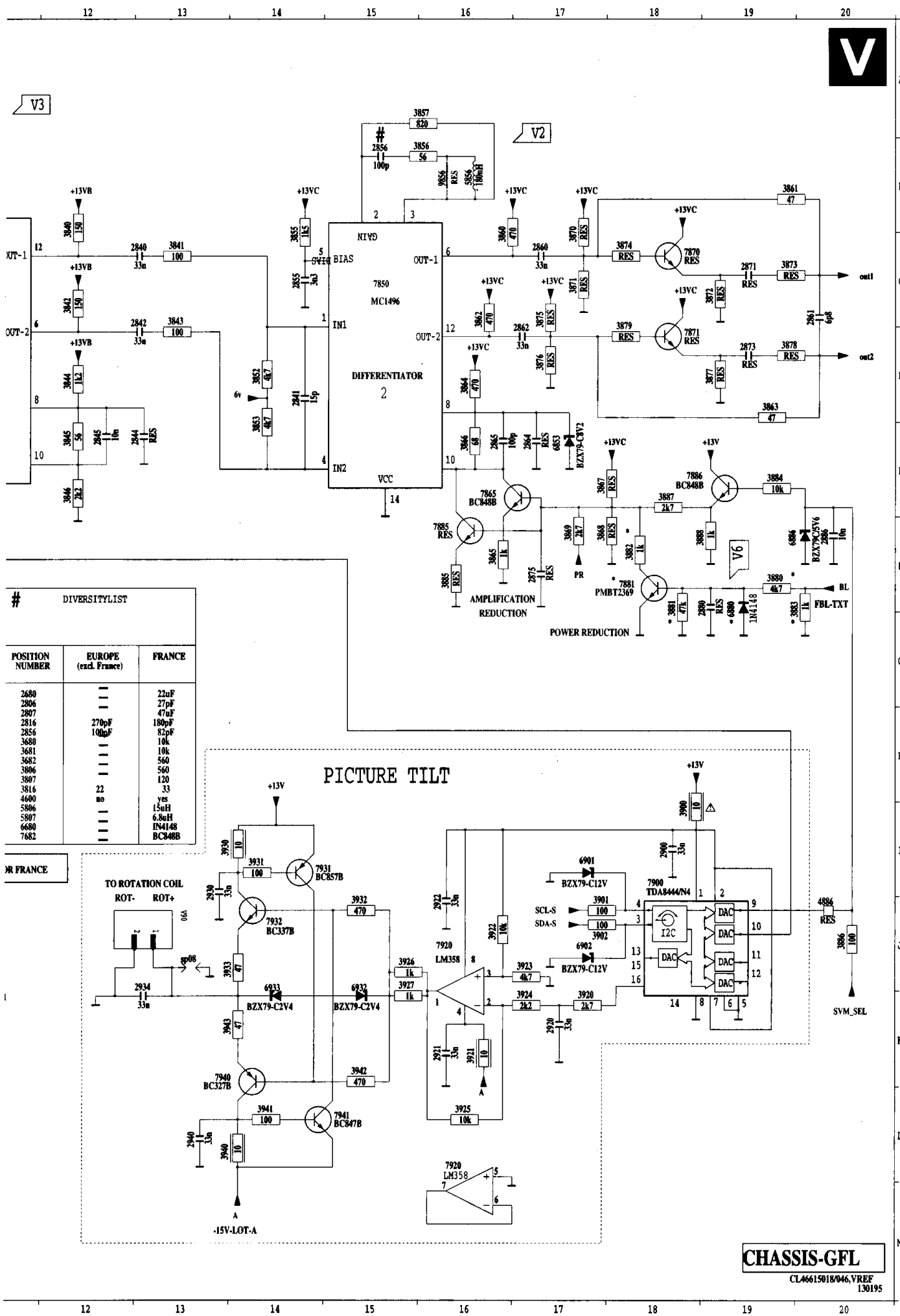
CONTROL STAGE



POWER STAGE

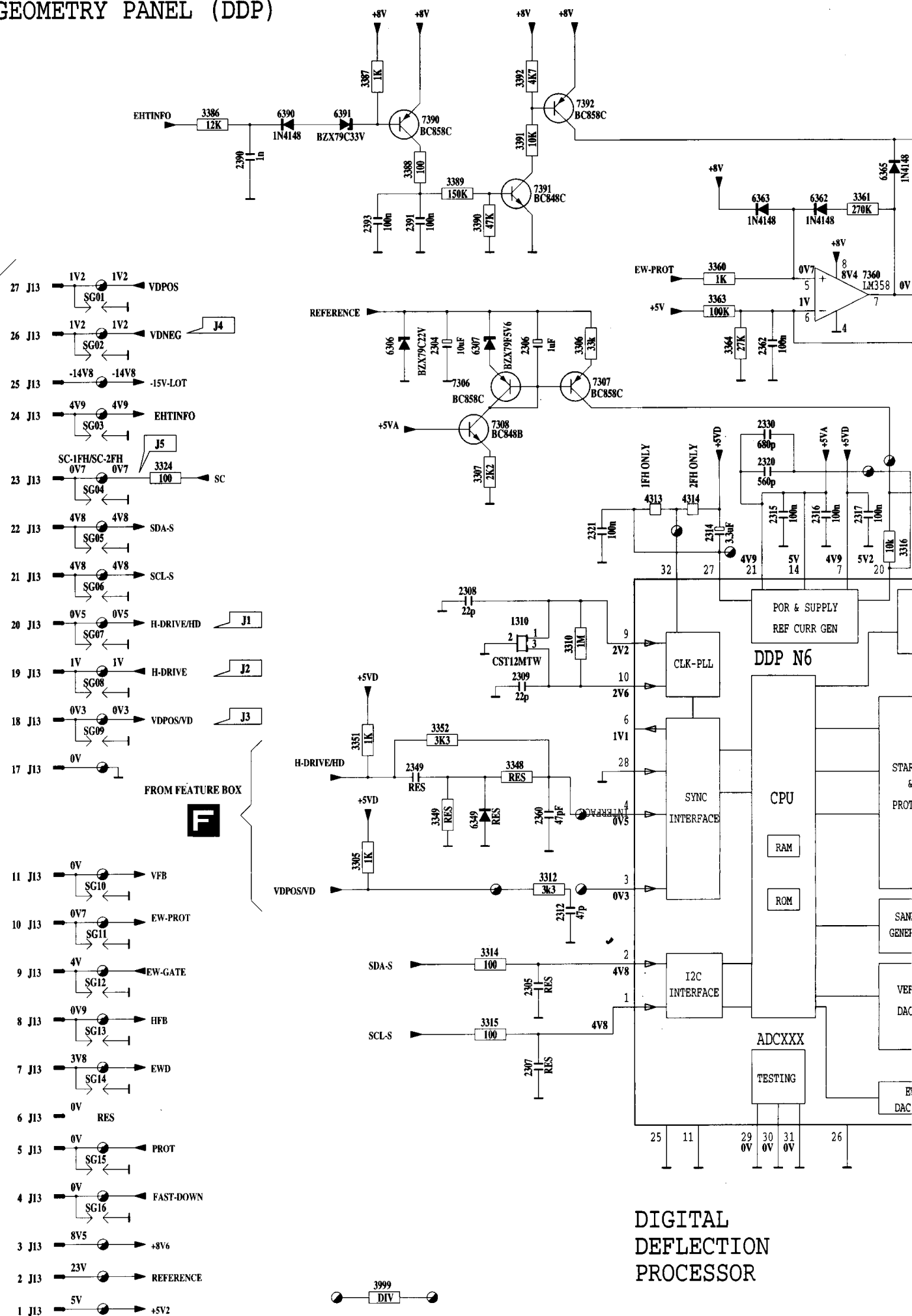


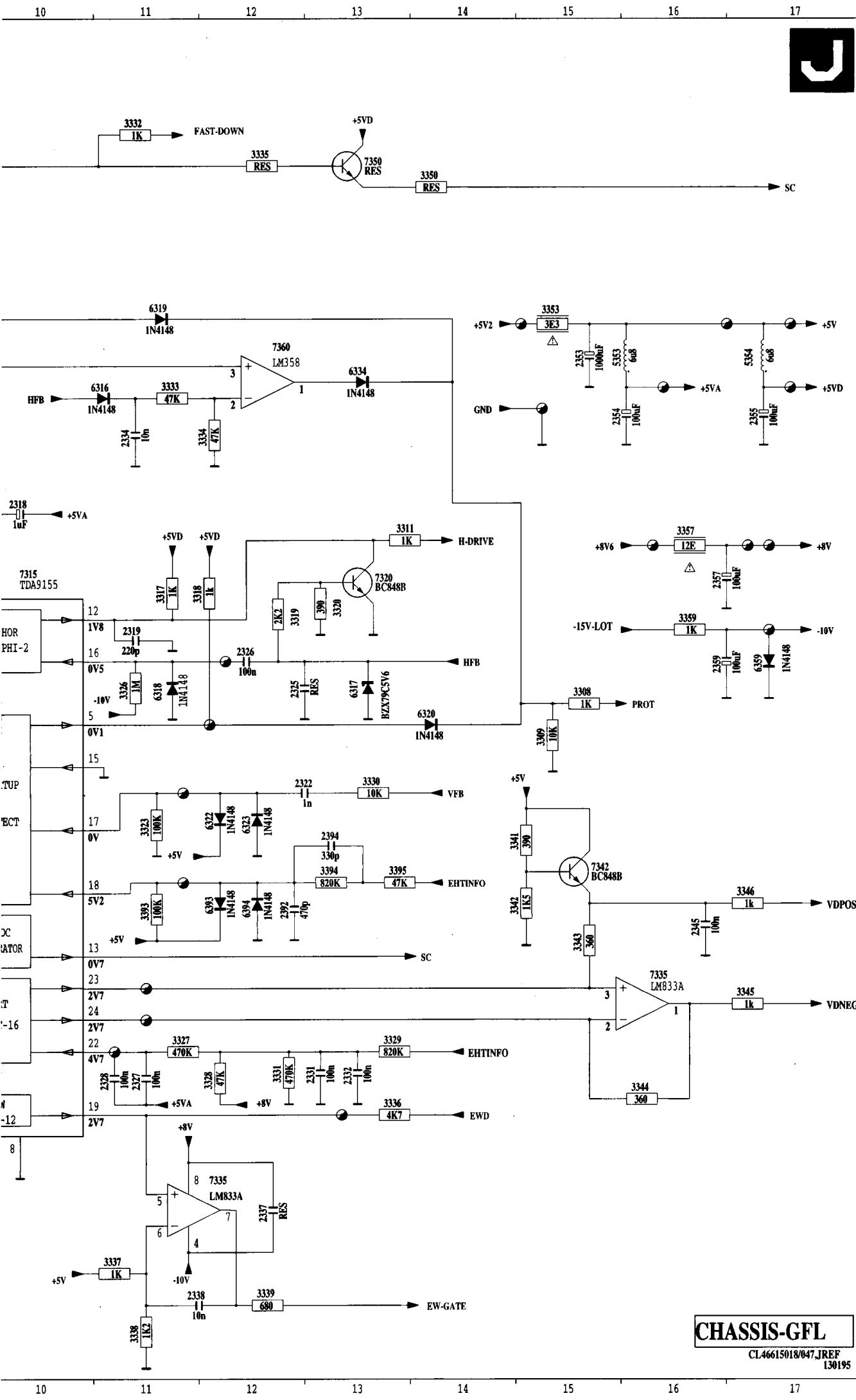
SCAVEM amplifier (+ picture rotation 16:9)



2604	G 4	3870	B17
2605	G 4	3871	C17
2606	G 4	3872	C19
2607	I 7	3873	C19
2608	I 7	3874	C18
2609	I 7	3875	C17
2610	I 7	3876	D17
2611	I 7	3877	D19
2612	I 7	3878	D19
2613	I 7	3879	D18
2614	I 7	3880	F19
2615	I 7	3881	F18
2616	I 7	3882	F18
2617	I 7	3883	F20
2618	I 7	3884	F16
2619	I 7	3885	J20
2620	I 7	3886	J20
2621	I 7	3887	E18
2622	I 7	3888	F19
2623	I 7	3889	F19
2624	I 7	3890	I18
2625	I 7	3891	J17
2626	I 7	3892	J17
2627	I 7	3893	J17
2628	I 7	3894	F 9
2629	I 7	3895	F 9
2630	I 7	3896	K17
2631	I 7	3897	K16
2632	I 7	3898	J16
2633	I 7	3899	J16
2634	I 7	3900	J16
2635	I 7	3901	J16
2636	I 7	3902	J16
2637	I 7	3903	J16
2638	I 7	3904	J16
2639	I 7	3905	J16
2640	I 7	3906	J16
2641	I 7	3907	J16
2642	I 7	3908	J16
2643	I 7	3909	J16
2644	I 7	3910	J16
2645	I 7	3911	J16
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2649	I 7	3915	J16
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2652	I 7	3918	J16
2653	I 7	3919	J16
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2657	I 7	3923	J16
2658	I 7	3924	J16
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2661	I 7	3927	J16
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2726	I 7	3992	J16
2727	I 7	3993	J16
2728	I 7	3994	J16
2729	I 7	3995	J16
2730	I 7	3996	J16
2731	I 7	3997	J16
2732	I 7	3998	J16
2733	I 7	3999	J16
2734	I 7	4000	J16

GEOMETRY PANEL (DDP)

DIGITAL
DEFLECTION
PROCESSOR



1310	J11	A6
1311	J11	A6
1312	J11	A6
1313	J11	A6
1314	J11	A6
1315	J11	A6
1316	J11	A6
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1499	J11	A6
1500	J11	A6

Picture tube panel / Bildröhren-Platte /

R

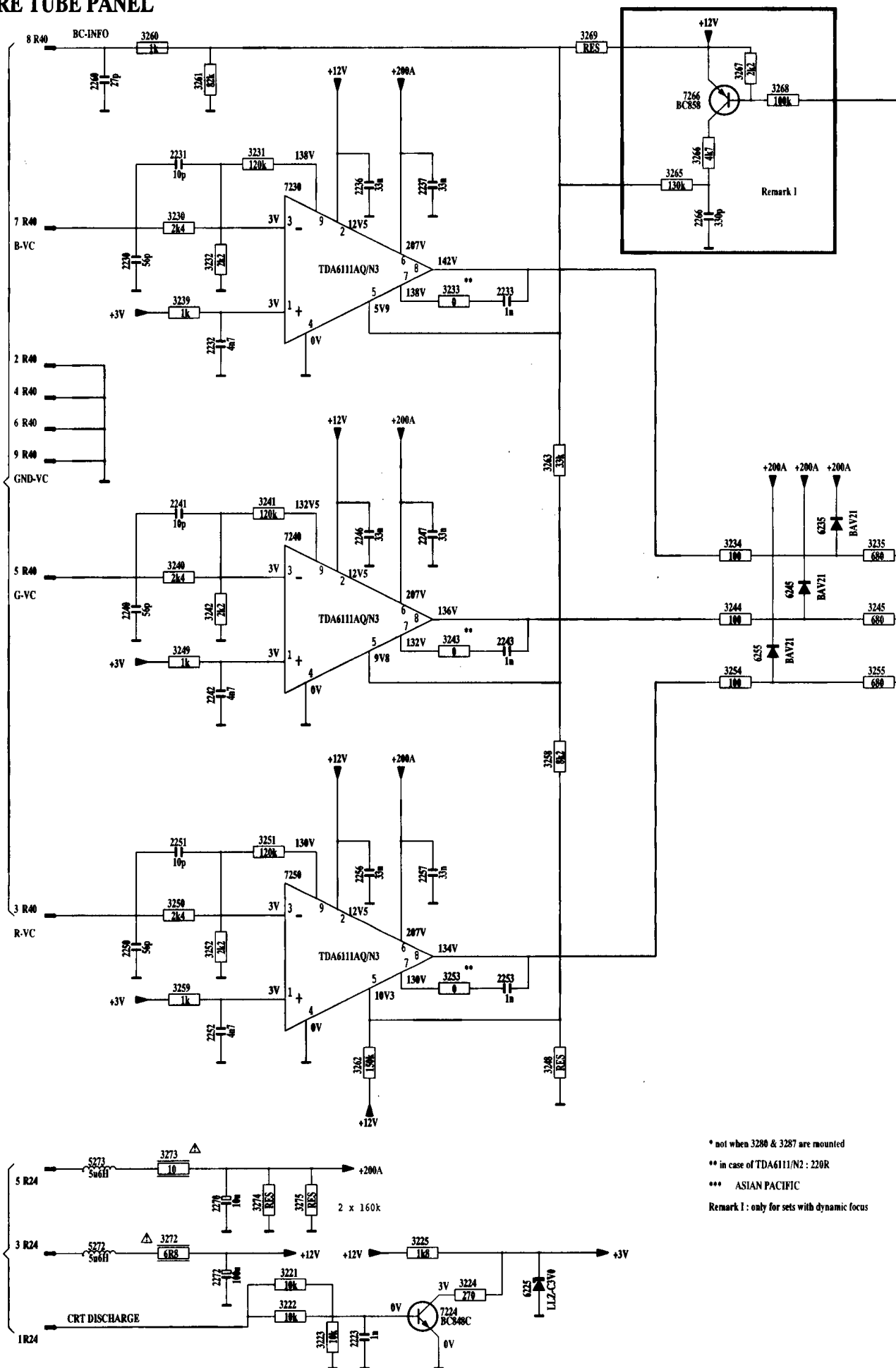
PICTURE TUBE PANEL

TO
VCI-PANEL

W

TO LSP

L1



* not when 3280 & 3287 are mounted

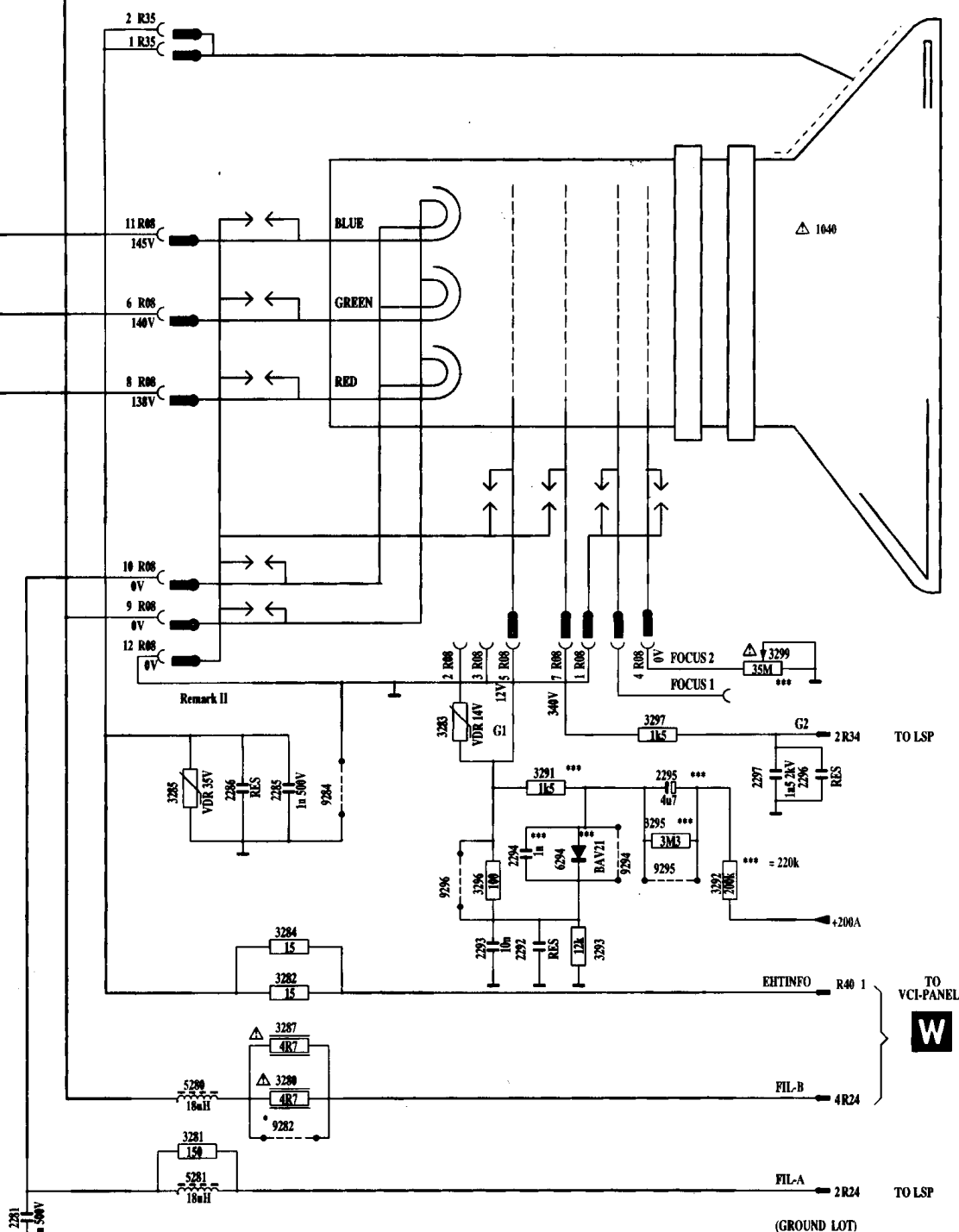
** in case of TDA6111/N2 : 220R

*** ASIAN PACIFIC

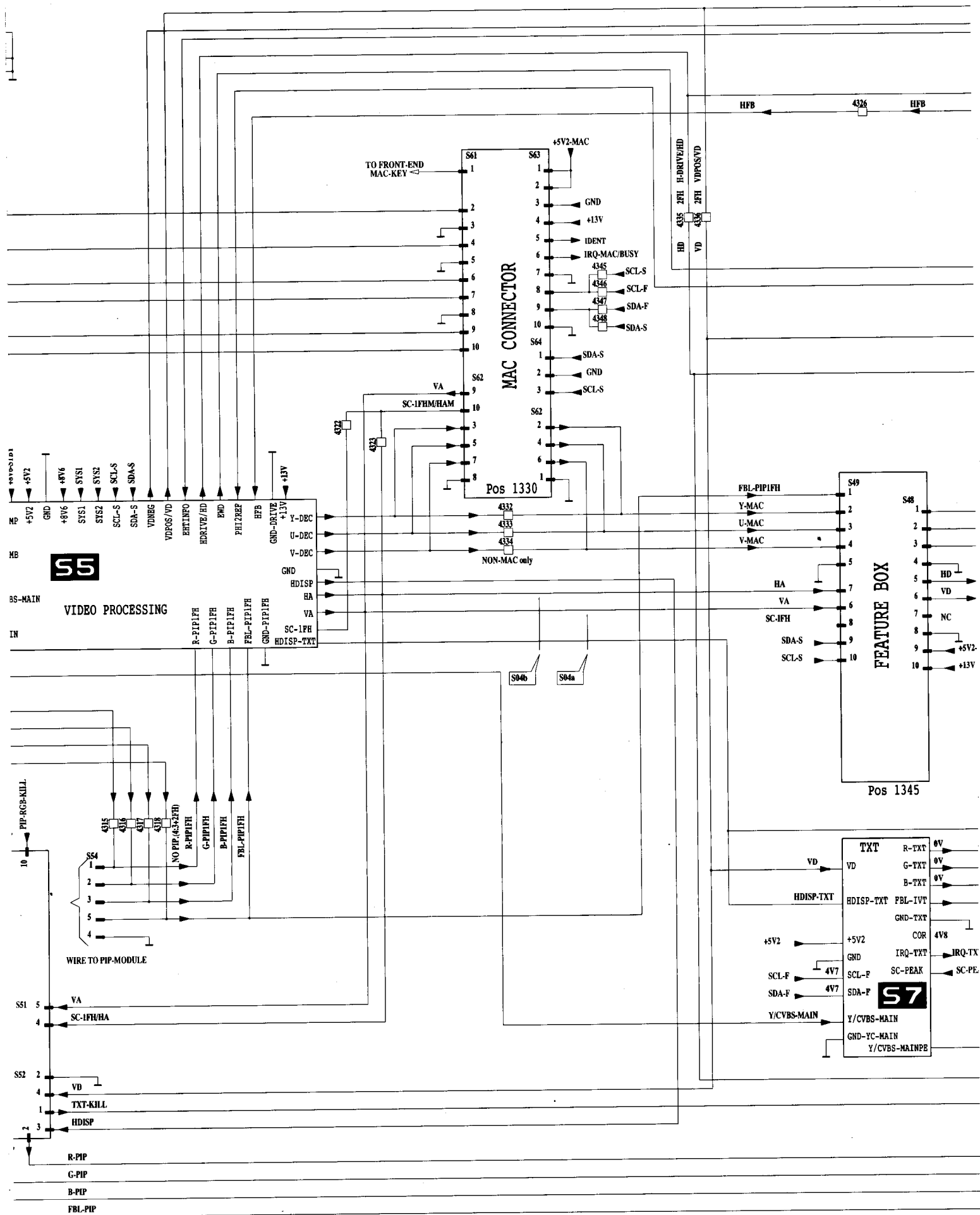
Remark 1 : only for sets with dynamic focus

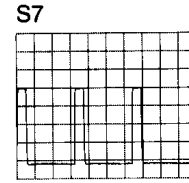
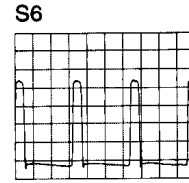
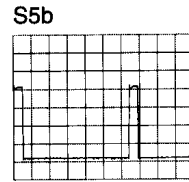
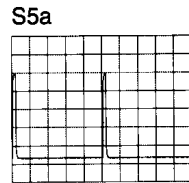
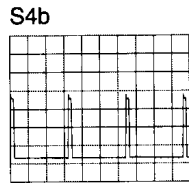
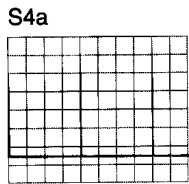
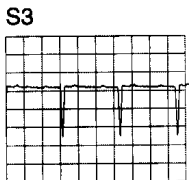
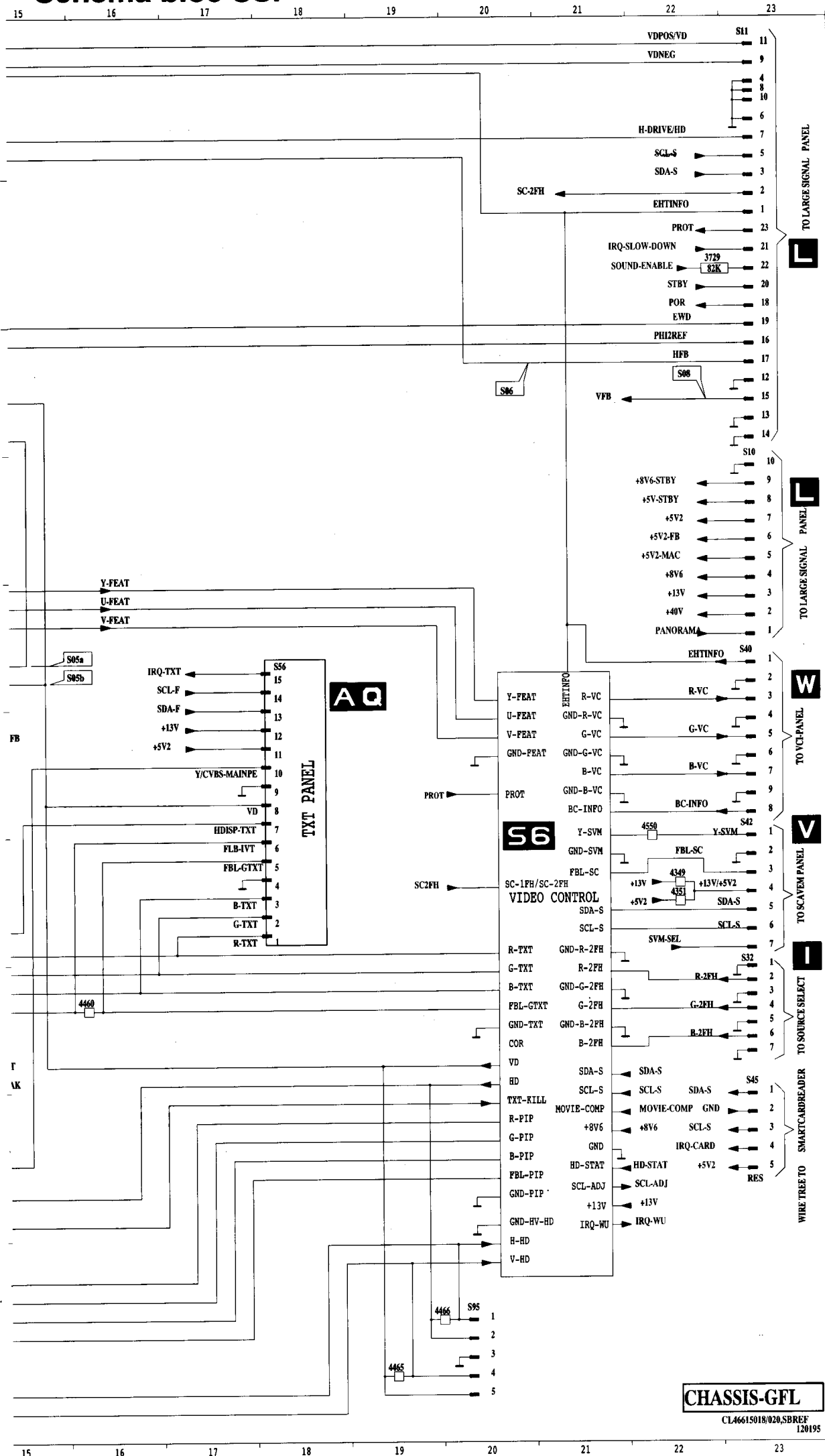
R

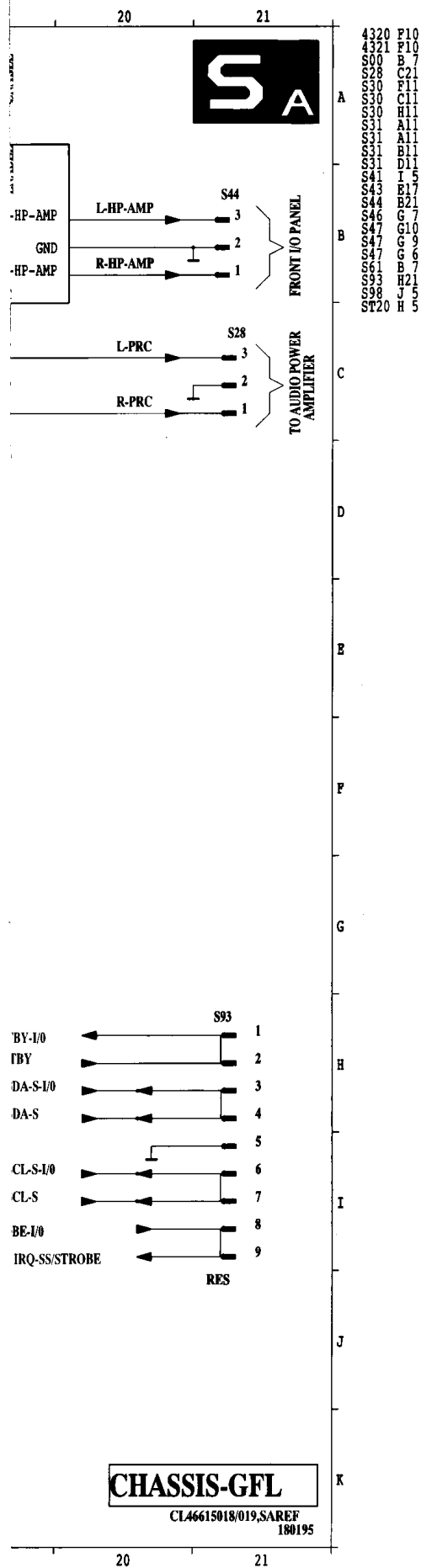
2223 M 5
2230 C 3
2231 B 3
2232 C 4
2233 C 6
2234 B 6
2235 B 6
2236 B 6
2237 B 6
2240 P 3
2241 E 3
2242 G 4
2243 P 6
2246 E 5
2247 E 6
2250 I 3
2251 H 4
2252 T 6
2253 T 6
2256 H 5
2257 H 6
2260 A 3
2266 B 8
2270 L 4
2272 L 4
2281 M 1
2285 J 3
2286 J 3
2292 K 5
2293 K 4
2294 J 5
2295 J 6
2296 J 7
2297 J 7
3221 L 4
3222 H 4
3223 L 6
3224 L 6
3225 L 6
3230 B 3
3231 B 4
3232 C 4
3233 C 6
3234 E 9
3235 E 10
3239 G 3
3240 G 3
3241 E 4
3242 P 4
3243 P 6
3244 P 9
3245 P 10
3248 J 7
3249 P 3
3250 I 3
3251 H 4
3252 T 6
3253 T 6
3254 G 9
3255 G 10
3258 G 7
3259 J 3
3260 A 3
3261 A 4
3262 J 5
3265 B 8
3266 B 8
3267 A 9
3268 A 9
3269 A 7
3272 L 3
3273 K 3
3274 L 4
3275 L 4
3280 L 1
3281 L 2
3282 K 3
3283 K 4
3284 K 3
3285 J 2
3287 K 3
3291 J 5
3292 J 6
3293 K 5
3295 I 6
3296 J 4
3297 I 6
3299 I 7
5272 L 3
5273 K 3
5280 L 2
5281 M 2
6225 L 7
6235 P 9
6245 P 9
6255 P 9
6294 J 5
7224 M 6
7230 B 4
7240 E 4
7250 H 4
7256 A 4
9282 L 3
9284 J 3
9294 J 6
9295 J 6
9296 J 4
R08 I 15
R08 I 14
R08 I 14
R08 I 16
R08 I 15
R08 I 15
R08 I 12
R08 H 12
R08 H 12
R08 E 12
R24 M 2
R24 M 1
R24 L 1
R24 K 2
R34 I 7
R35 D 12
R40 K 17
R40 D 2
R40 I 2
R40 D 2
R40 D 2
R40 B 2
R40 A 2
R40 E 2



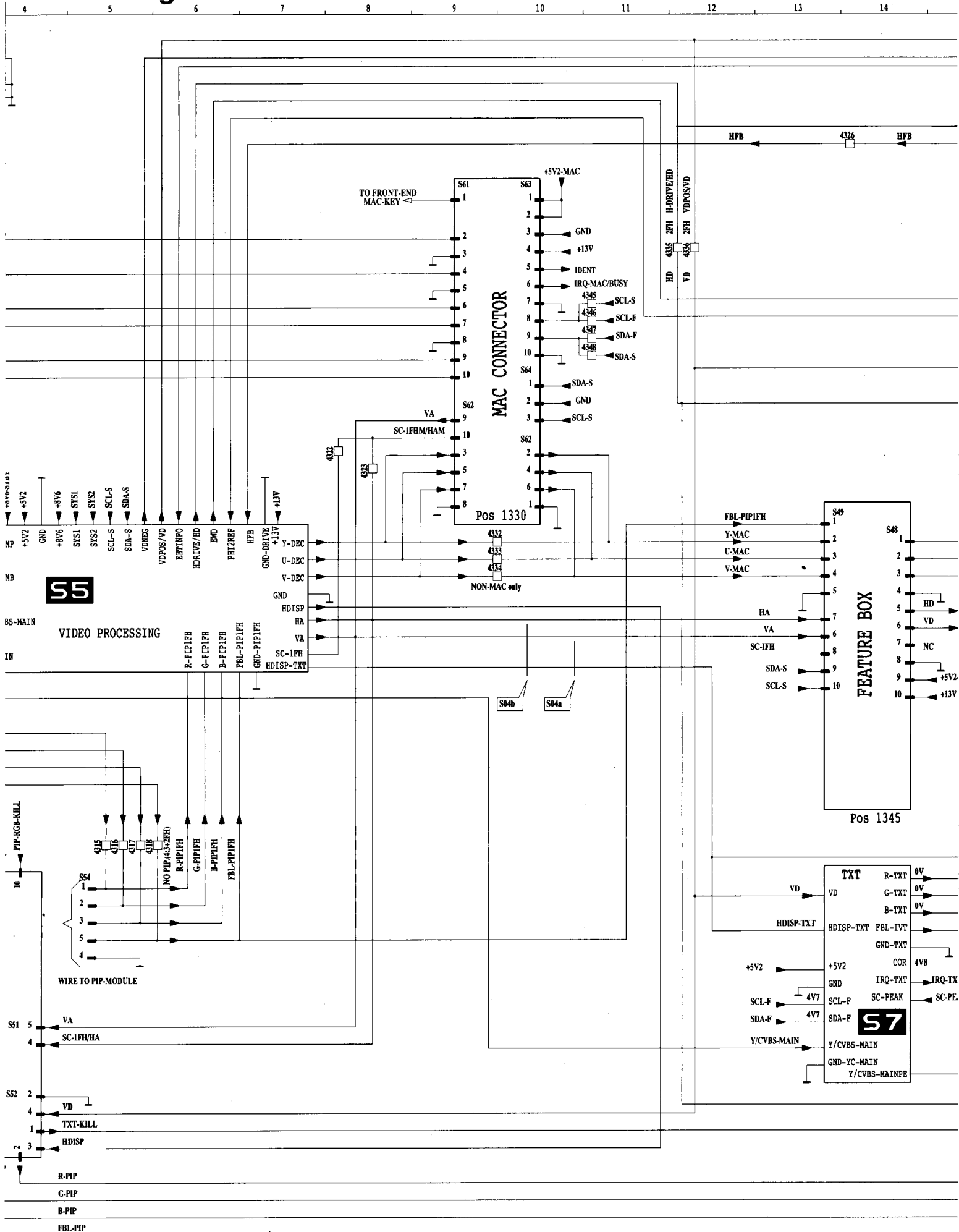
Block diagram SSP / Blockschaltbild SSP /

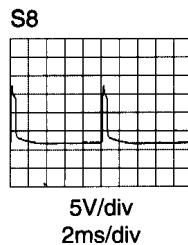
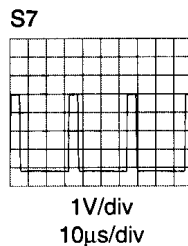
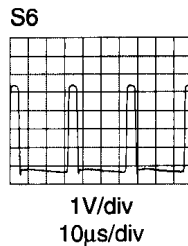
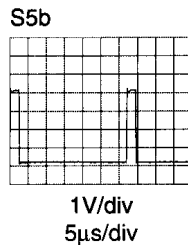
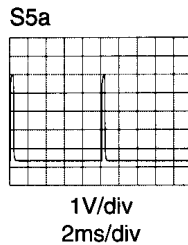
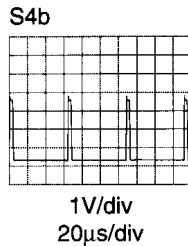
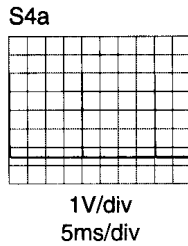
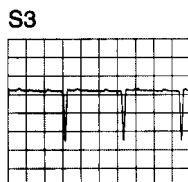
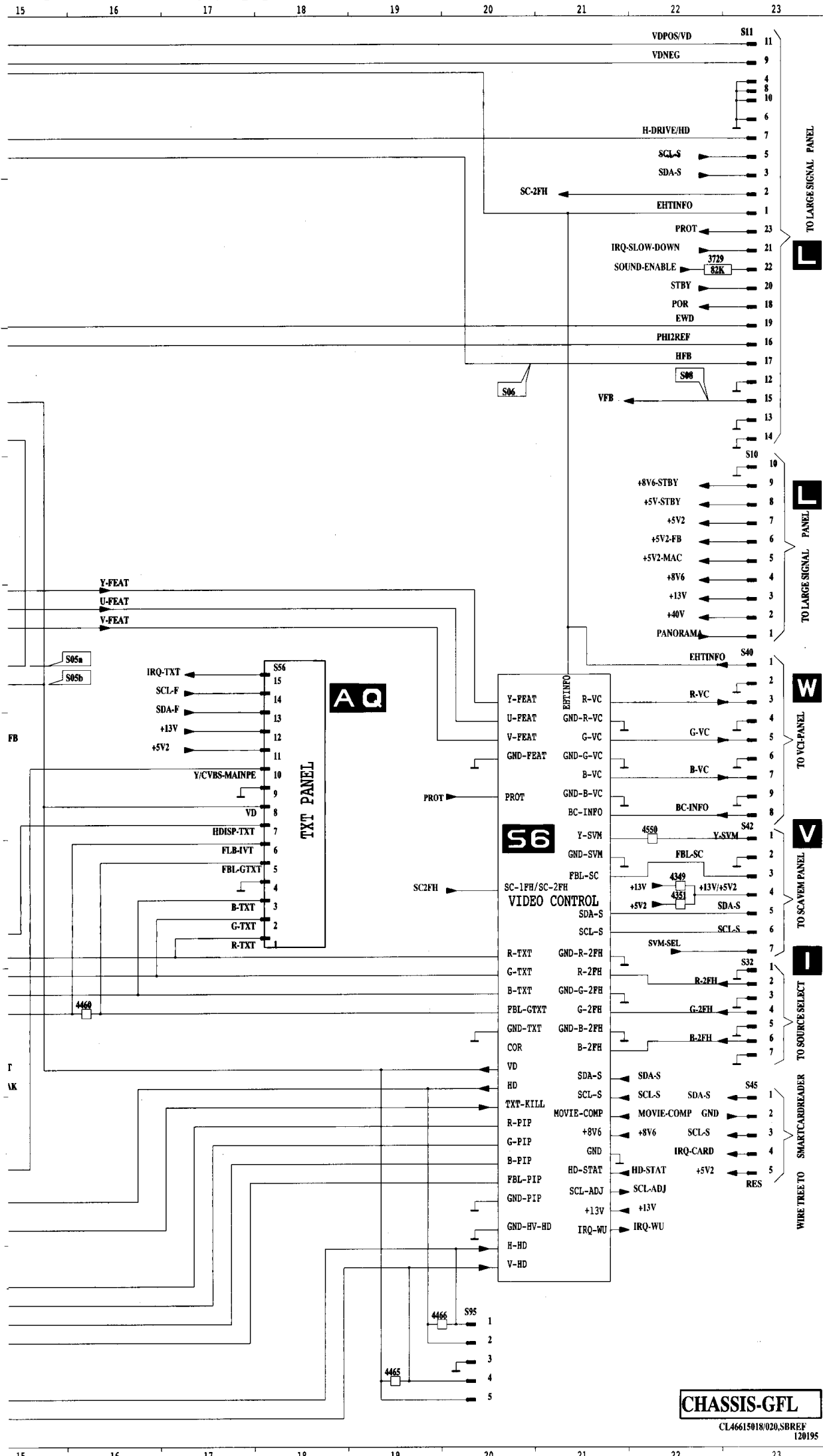


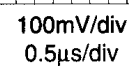
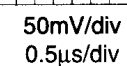
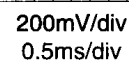
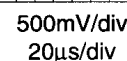
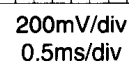
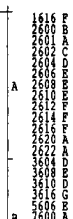
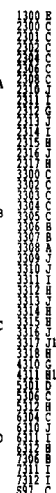




Block diagram SSP / Blockschaltbild SSP /





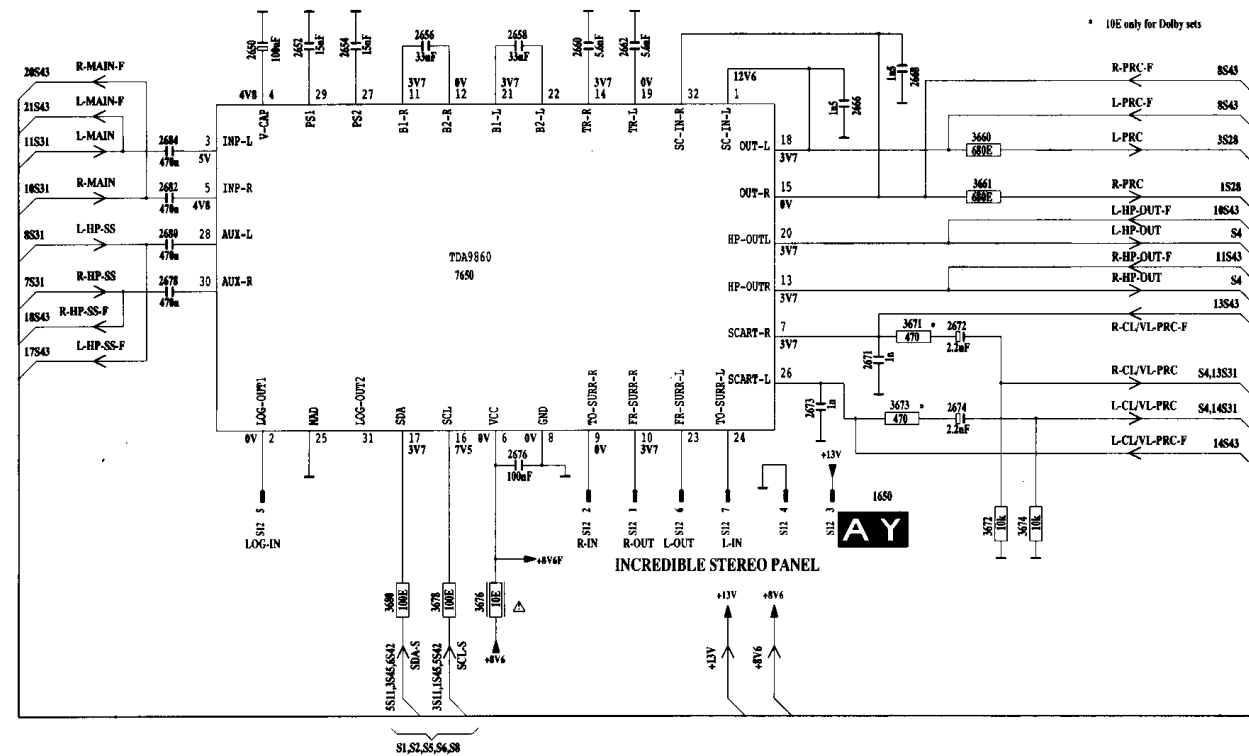


Sound processing / Tonsignal-Verarbeitung / Traitement audio

S3

SOUND PROCESSING

S3



S1-8

CHASSIS GFL

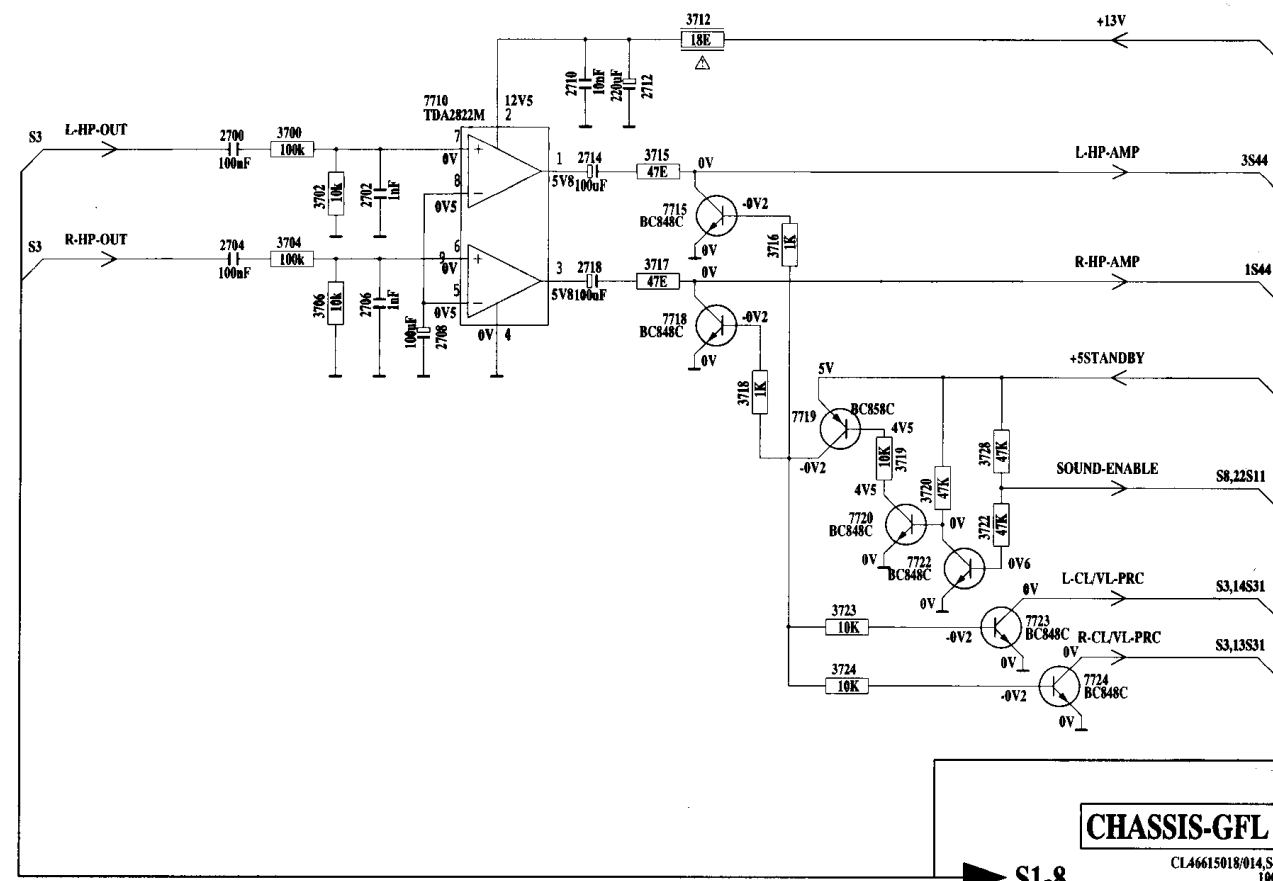
CL46615018/013.S3

100195

S4

HEADPHONES AMPLIFIER

S4



S1-8

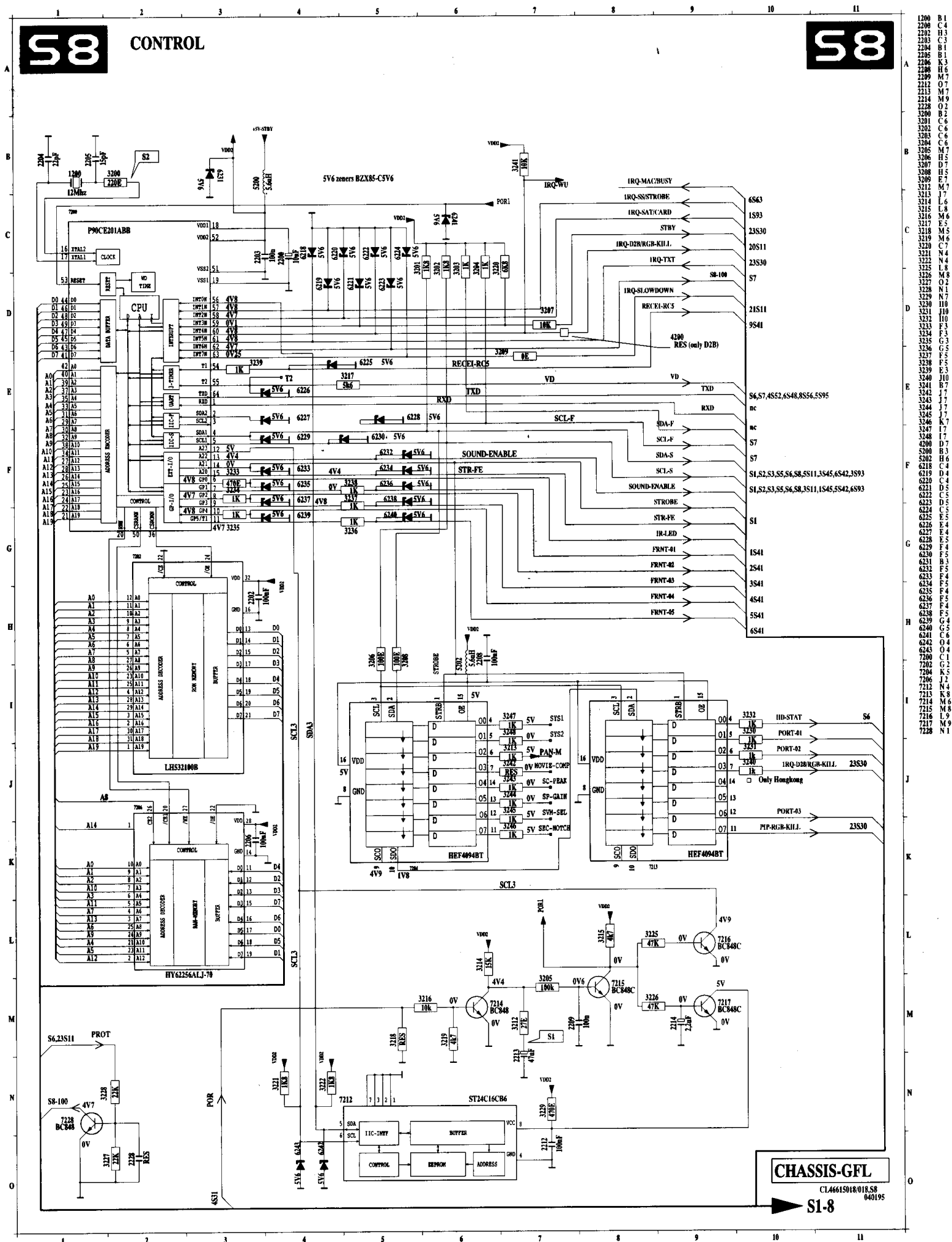
CHASSIS-GFL

CL46615018/014.S4

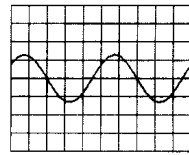
100195

CONTROL

58

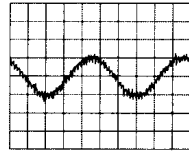


S30



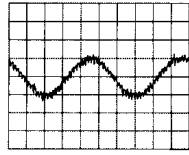
500mV/div
0.2ms/div

S31a



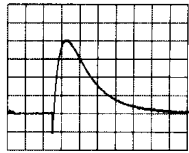
500mV/div
0.2ms/div

S31b



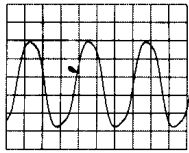
500mV/div
0.2ms/div

S1



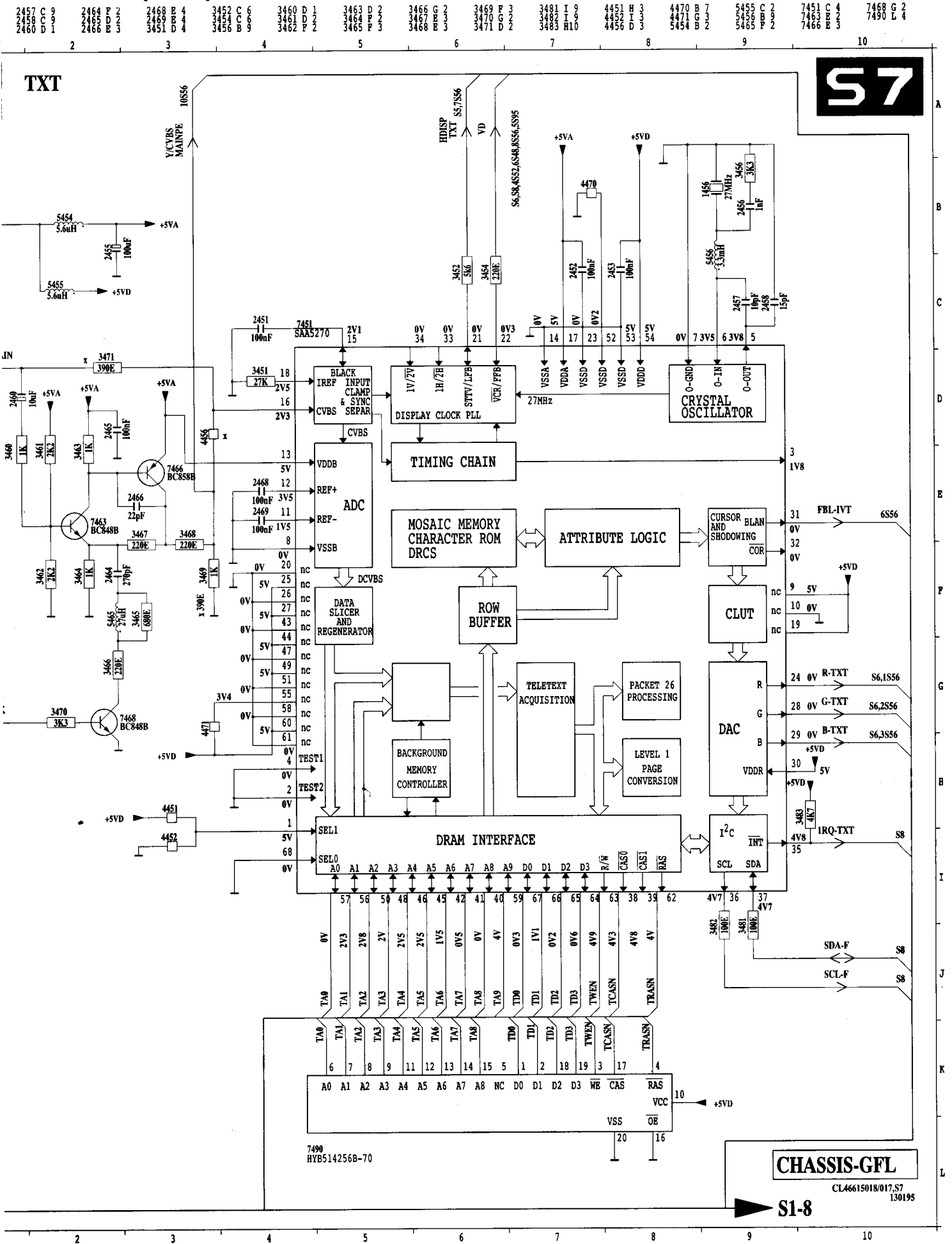
200mV/div
0.5s/div

S2

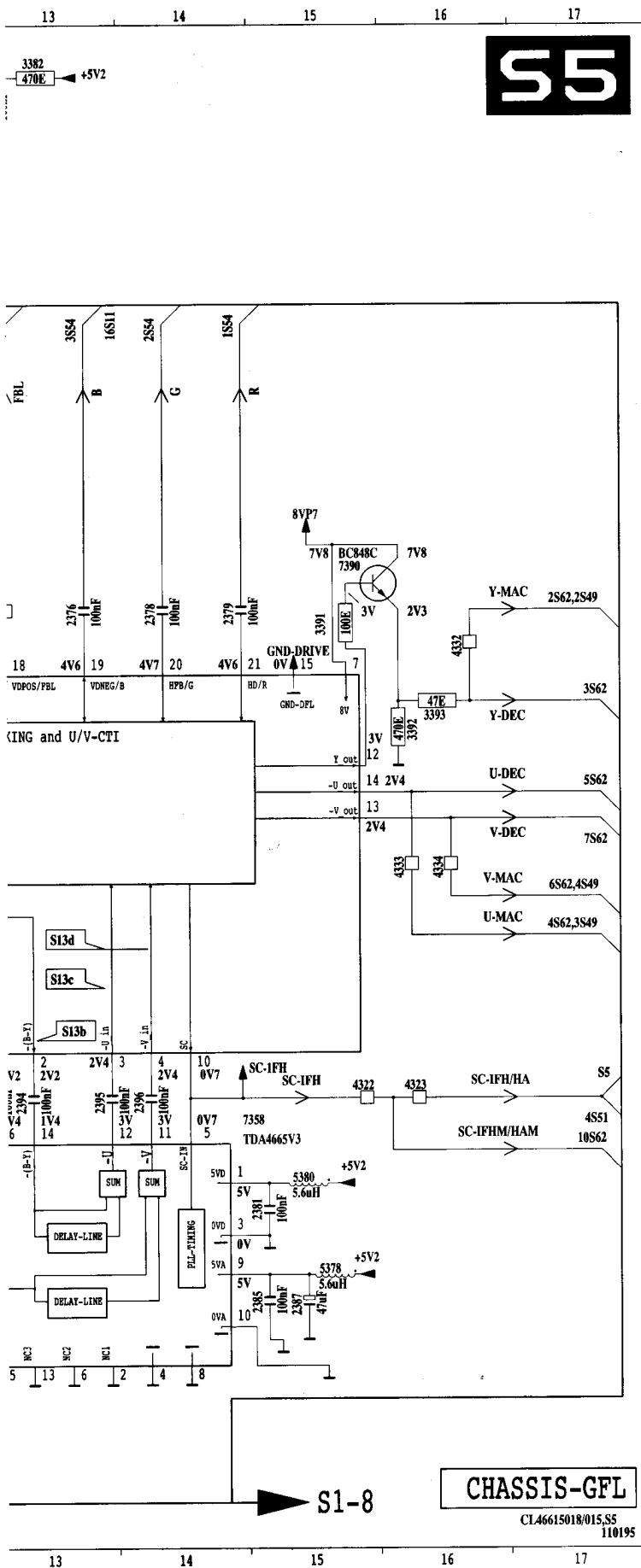


1V/div
0.2ms/div

Teletext (SSP) / Videotext Dekoder (SSP) / Decodeur Teletexte (SSP)



1456 B 9 2453 C 8
2451 C 4 2455 B 2
2452 C 7 2456 B 9

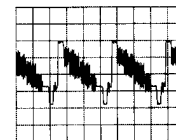


S5

CHASSIS-GFL

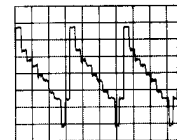
CL46615018/015.S5
110195

S9



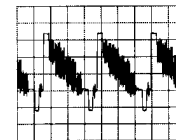
500mV/div
20μs/div

S14a



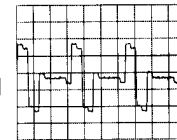
200mV/div
20μs/div

S10



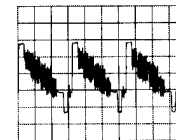
200mV/div
20μs/div

S14b



200mV/div
20μs/div

S11



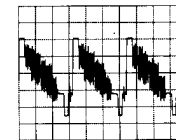
200mV/div
20μs/div

S14c



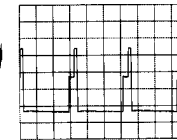
200mV/div
20μs/div

S12



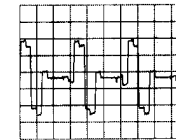
200mV/div
20μs/div

S15



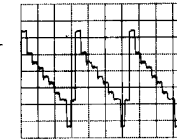
1V/div
20μs/div

S13a



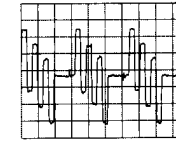
100mV/div
20μs/div

S16a



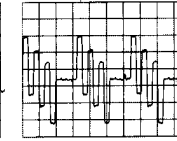
200mV/div
20μs/div

S13b



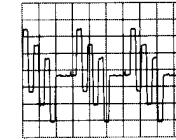
100mV/div
20μs/div

S16b



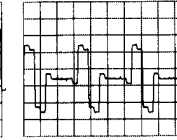
200mV/div
20μs/div

S13c



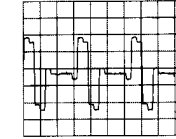
200mV/div
20μs/div

S16c



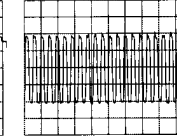
200mV/div
20μs/div

S13d



200mV/div
20μs/div

S18



50mV/div+4VDC
0.5μs/div

S7

+5V2

S5,21S31 Y/CVBS-M

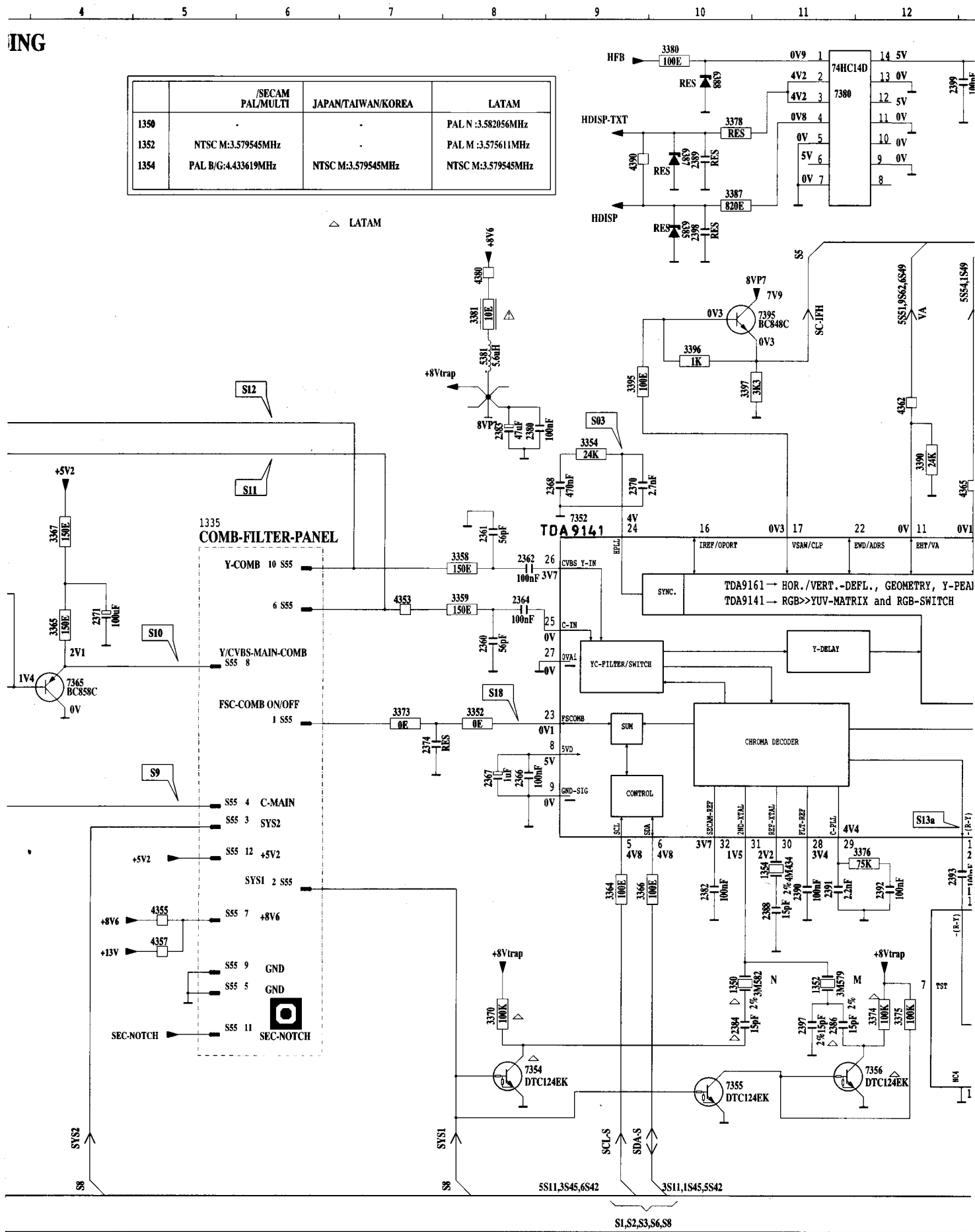
20S31

S8 SC-PEAK

Video processing / Videosignal-Verarbeitung /

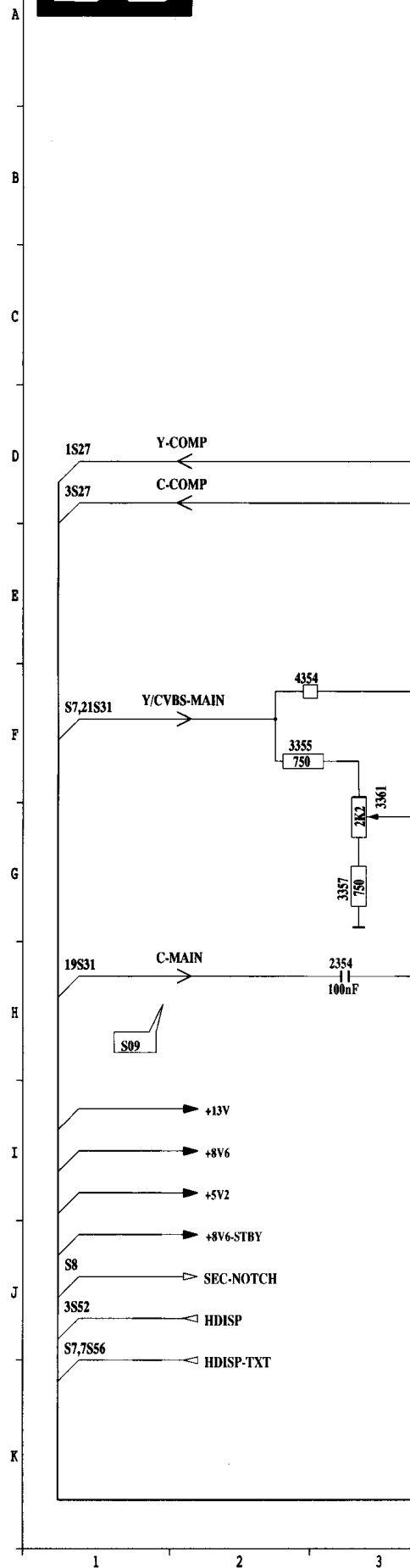
	/SECAM PAL/MULTI	JAPAN/TAIWAN/KOREA	LATAM
1350			PAL N :3.582056MHz
1352	NTSC M:3.579545MHz		PAL M :3.575611MHz
1354	PAL B/G:4.433619MHz	NTSC M:3.579545MHz	NTSC M:3.579545MHz

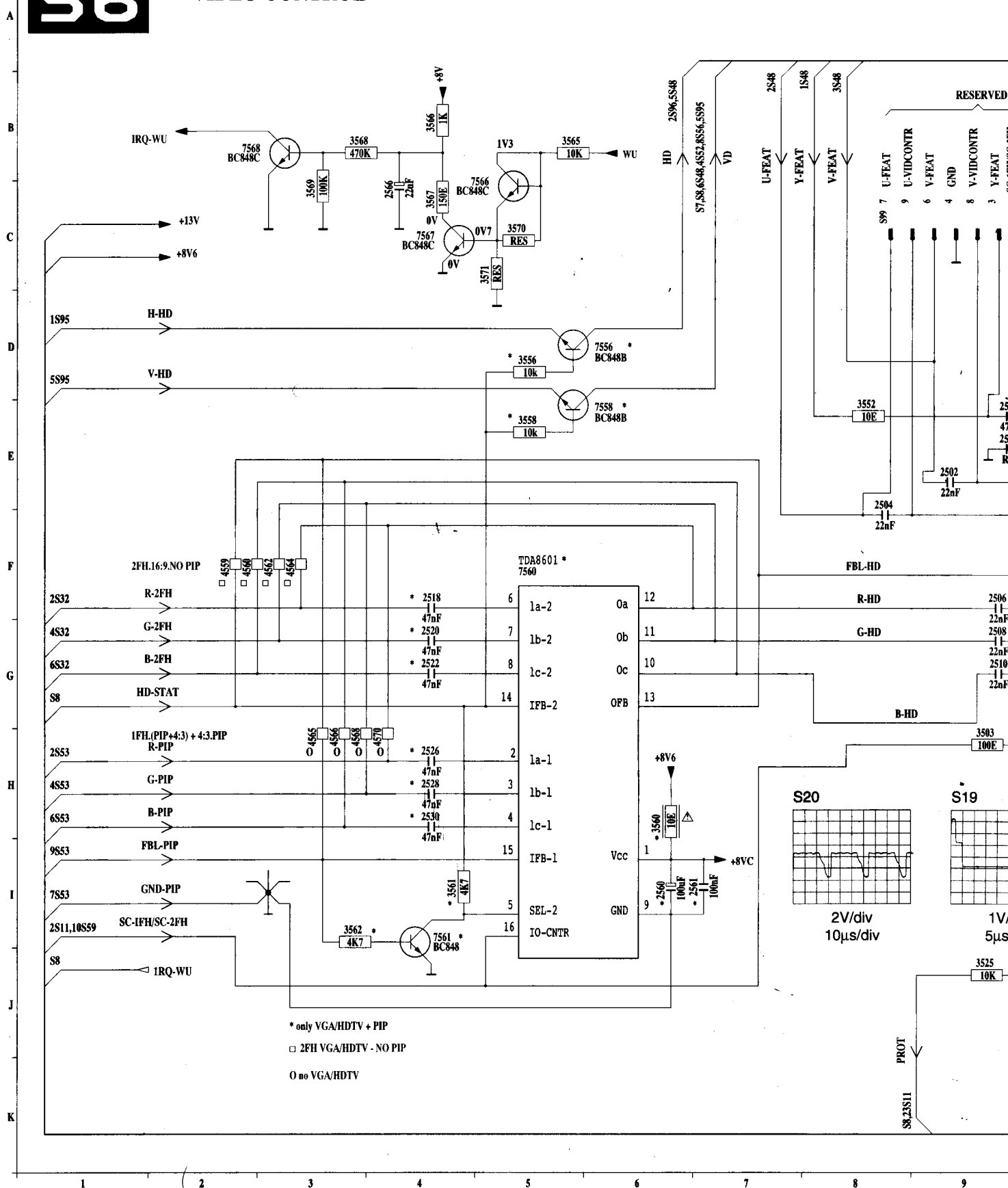
△ LATAM



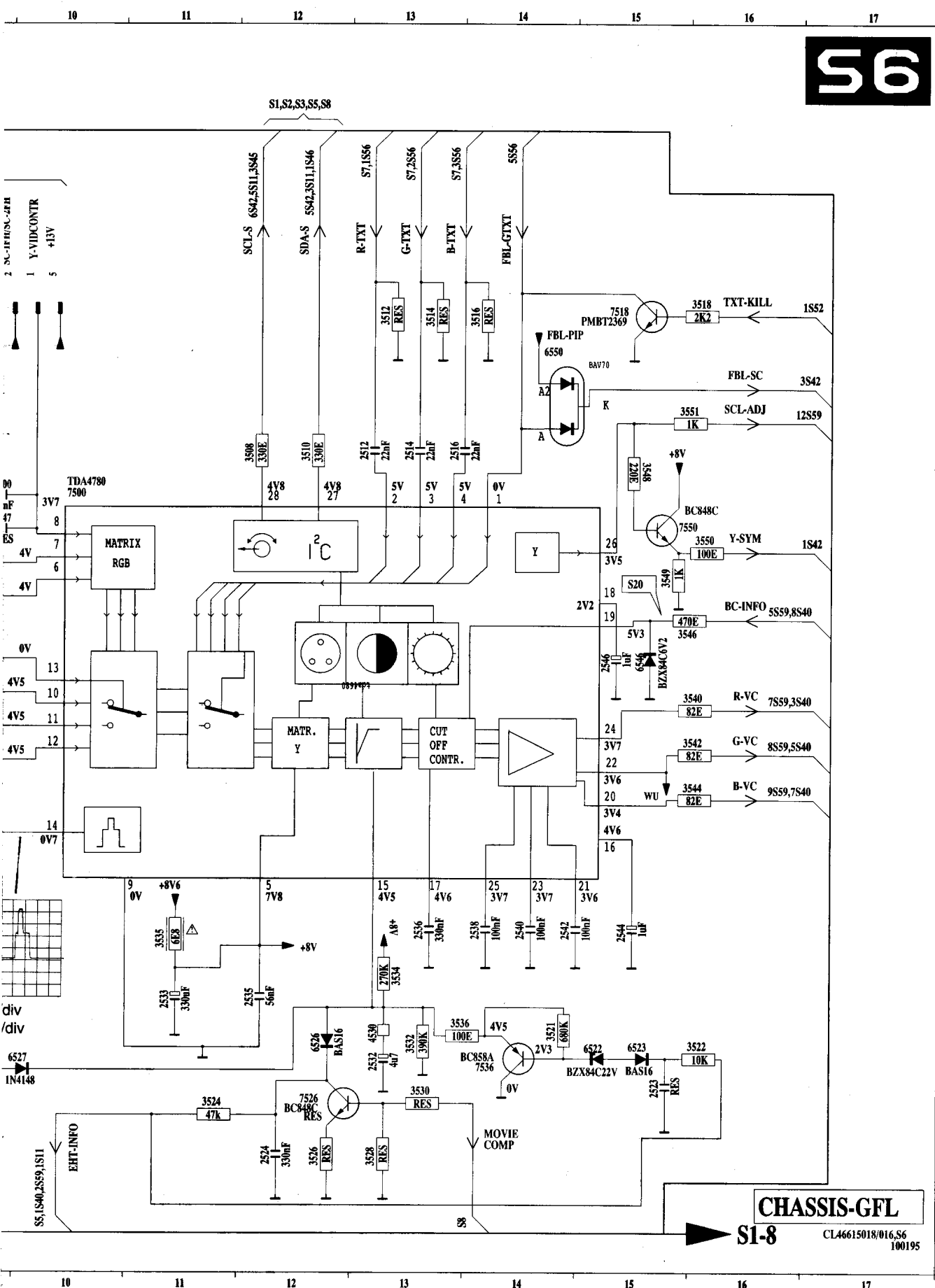


VIDEO PROCESS



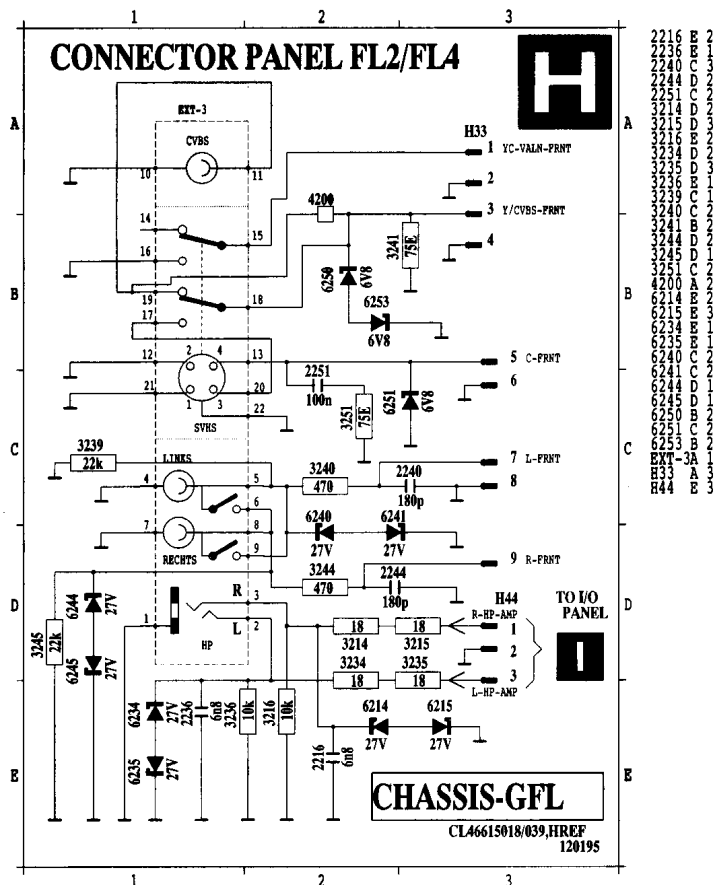
S6**VIDEO CONTROL**

Traitement Vidéo RGB



2500	E 9
2502	E 9
2504	E 8
2506	F 9
2508	G 9
2510	G 9
2512	D13
2514	D13
2516	D13
2518	F 4
2520	G 4
2522	G 4
2523	J15
2524	J12
2526	H 4
2528	H 4
2530	H 4
2532	J13
2533	I11
2535	I12
2536	H13
2538	H14
2540	H14
2542	H14
2544	H15
2546	F15
2547	E 9
2560	I 6
2561	I 7
2566	C 4
3503	H 9
3508	D12
3510	D12
3512	C13
3514	C13
3516	C14
3518	C16
3521	I14
3522	J16
3524	J11
3525	I 9
3526	J12
3528	J13
3530	J13
3532	I13
3534	I13
3535	I11
3536	I14
3540	F16
3542	G16
3544	G16
3546	F16
3548	D15
3549	E15
3550	E16
3551	D16
3552	E 8
3556	D 5
3558	E 5
3560	H 6
3561	I 4
3562	I 3
3565	B 5
3566	B 4
3567	C 4
3568	B 3
3569	C 3
3570	C 5
3571	C 5
4530	I13
4559	F 2
4560	F 2
4562	F 3
4564	F 3
4565	H 3
4566	H 3
4568	H 3
4570	H 4
6522	J15
6523	J15
6526	I12
6527	J10
6546	F15
6550	C14
7500	E10
7518	C15
7526	J12
7536	J14
7550	E15
7556	D 6
7558	E 6
7560	F 5
7561	I 4
7566	C 5
7567	C 4
7568	B 3
S99	C 8

Connector panel / Connector Platte / Platine connector

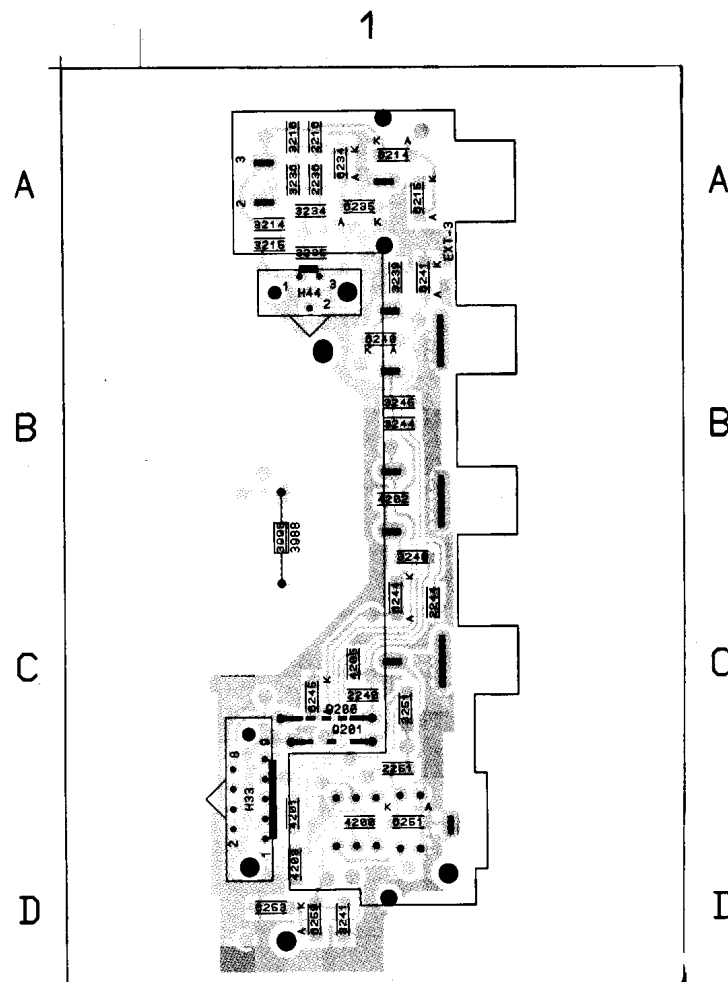
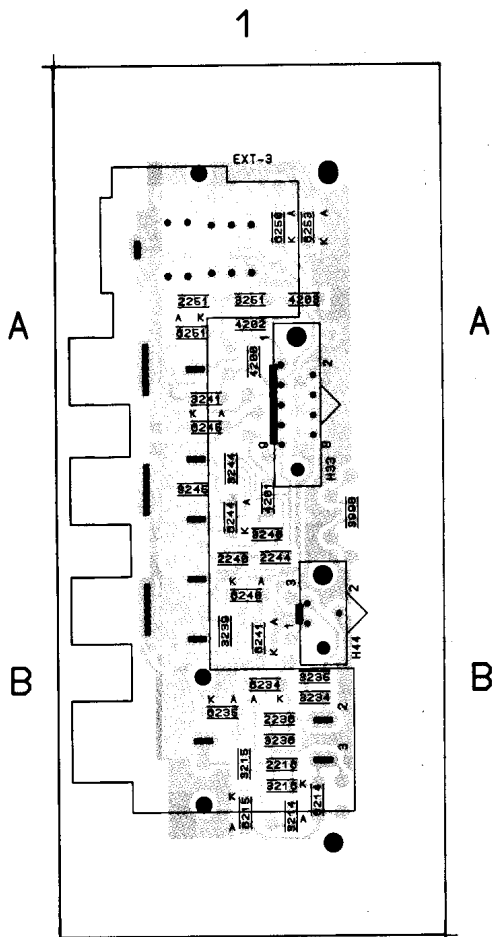


Connector panel FL4

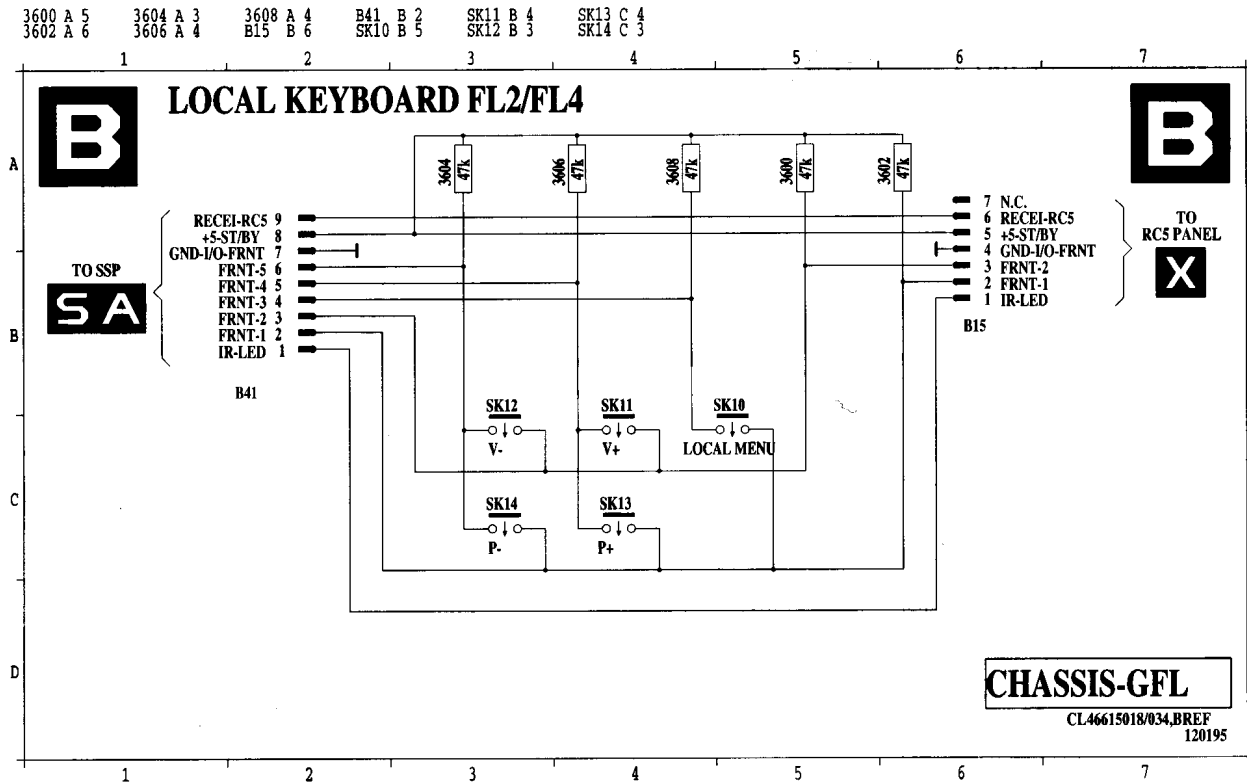
2216 B 1	3235 B 1	4200 A 1	6241 B 1
2236 B 1	3236 B 1	4201 A 1	6244 B 1
2240 B 1	3239 B 1	4202 A 1	6245 A 1
2244 B 1	3240 B 1	4203 A 1	6250 A 1
2251 A 1	3241 A 1	6214 B 1	6251 A 1
3214 B 1	3244 A 1	6215 B 1	6253 A 1
3215 B 1	3245 A 1	6234 B 1	EXT-3 B 1
3216 B 1	3251 A 1	6235 B 1	H33 A 1
3234 B 1	3008 B 1	6240 B 1	H44 B 1

Connector panel FL2

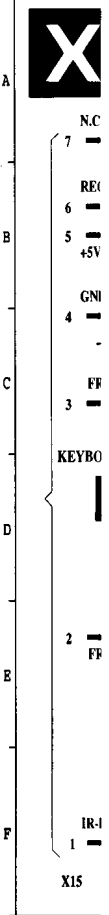
2216 A 1	3215 A 1	3240 C 1	3008 B 1	6214 A 1	6244 C 1	9201 C 1
2236 A 1	3216 A 1	3241 D 1	4200 D 1	6215 A 1	6245 C 1	EXT-3 A 1
2240 C 1	3234 A 1	3244 B 1	4201 D 1	6234 A 1	6250 D 1	H33 C 1
2244 C 1	3235 A 1	3245 B 1	4202 B 1	6235 A 1	6251 D 1	H44 A 1
2251 C 1	3236 A 1	3251 C 1	4203 D 1	6240 B 1	6253 D 1	
3214 A 1	3239 A 1	3008 B 1	4205 C 1	6241 A 1	9208 C 1	



Keyboard panel / Keyboard Platte / Platine keyboard



0022 D 3
1100 A 6
1101 A 6

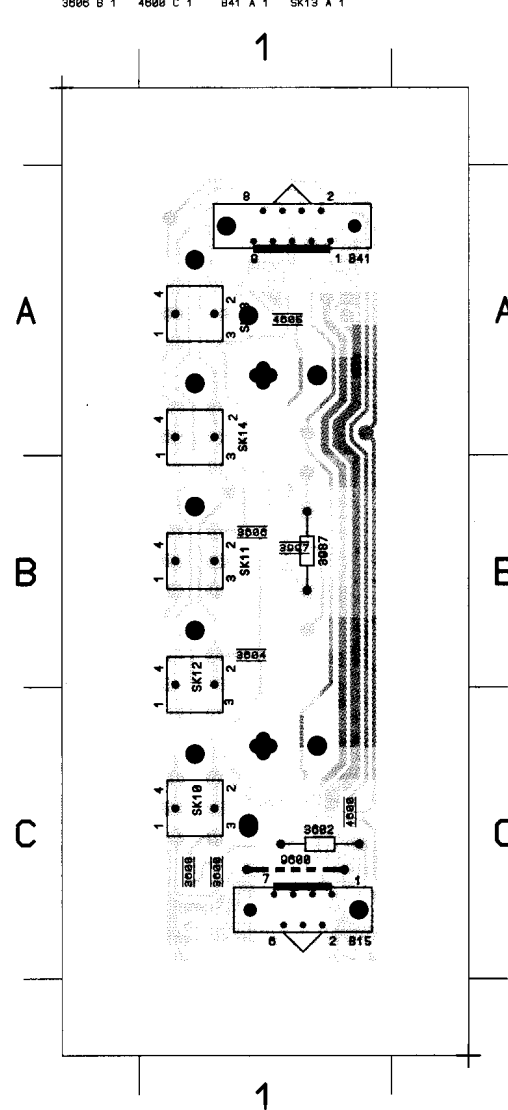
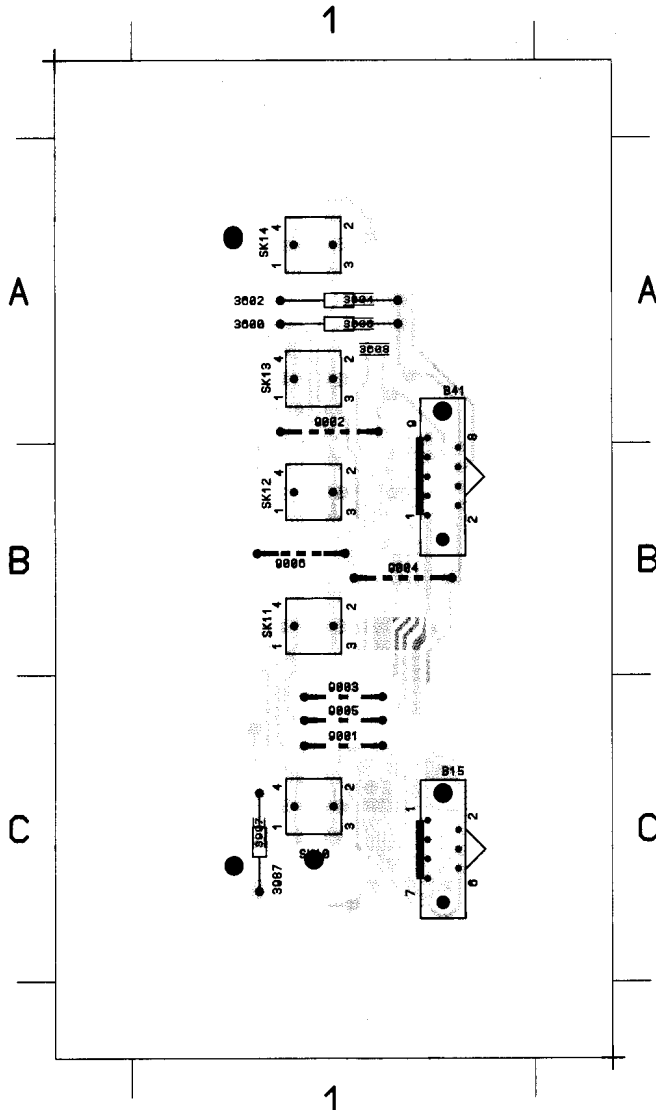


Keyboard FL2

Keyboard FL4

3600 A 1 3608 A 1 3607 C 1 0003 C 1 0009 B 1 SK10 C 1 SK13 A 1
3602 A 1 3606 A 1 0001 C 1 0004 B 1 B15 C 1 SK11 B 1 SK14 A 1
3604 A 1 3607 C 1 0002 A 1 0005 C 1 B41 B 1 SK12 B 1

3600 C 1 3608 C 1 4605 A 1 SK10 C 1 SK14 B 1
3602 C 1 3607 B 1 0000 C 1 SK11 B 1
3604 B 1 3607 B 1 B15 C 1 SK12 C 1
3606 B 1 4608 C 1 B41 A 1 SK13 A 1



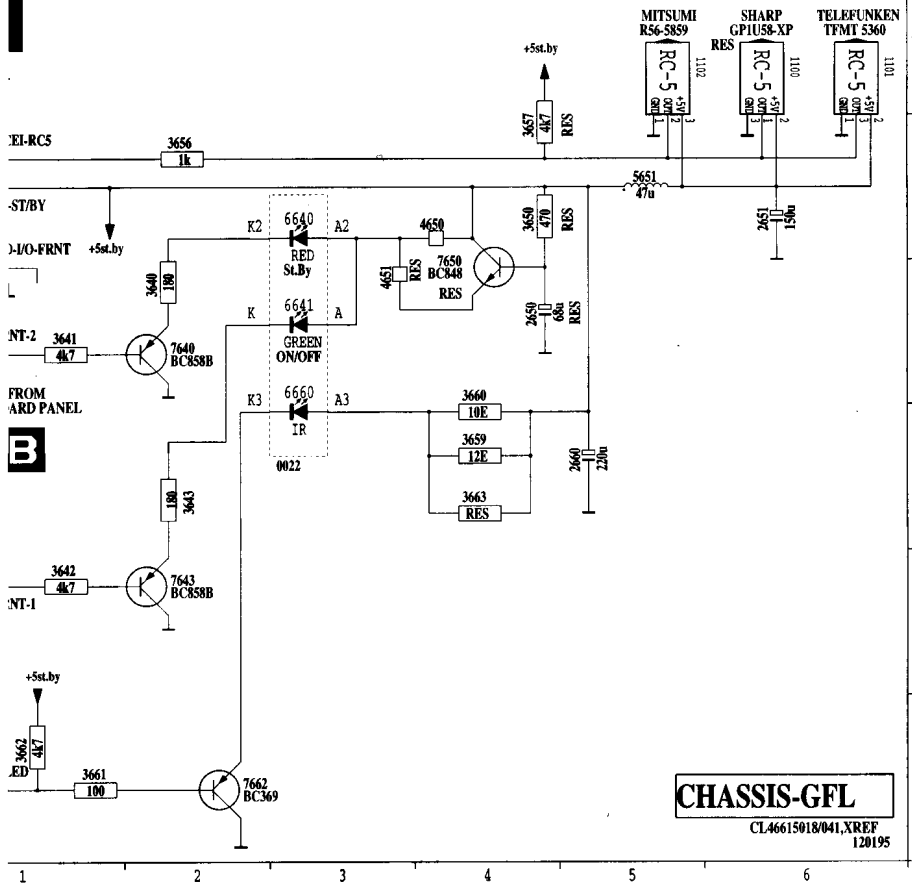
LED panel / LED Platte / Platine LED

GFL2.20 E

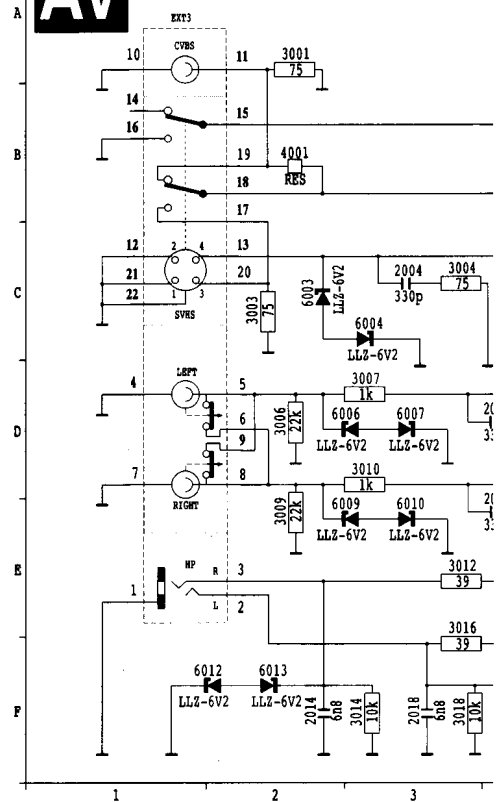
22

1102 A 5	2660 D 5	3642 B 1	3656 B 2	3660 C 4	3663 D 4	5651 B 5	7650 C 4
2650 C 4	3640 C 2	3643 D 2	3657 B 4	3661 F 1	4650 B 4	7640 C 3	7662 F 2
2651 B 6	3641 C 1	3650 B 4	3659 D 4	3662 F 1	4651 C 3	7643 B 2	X15 F 1

RC5-PANEL FL2/FL4

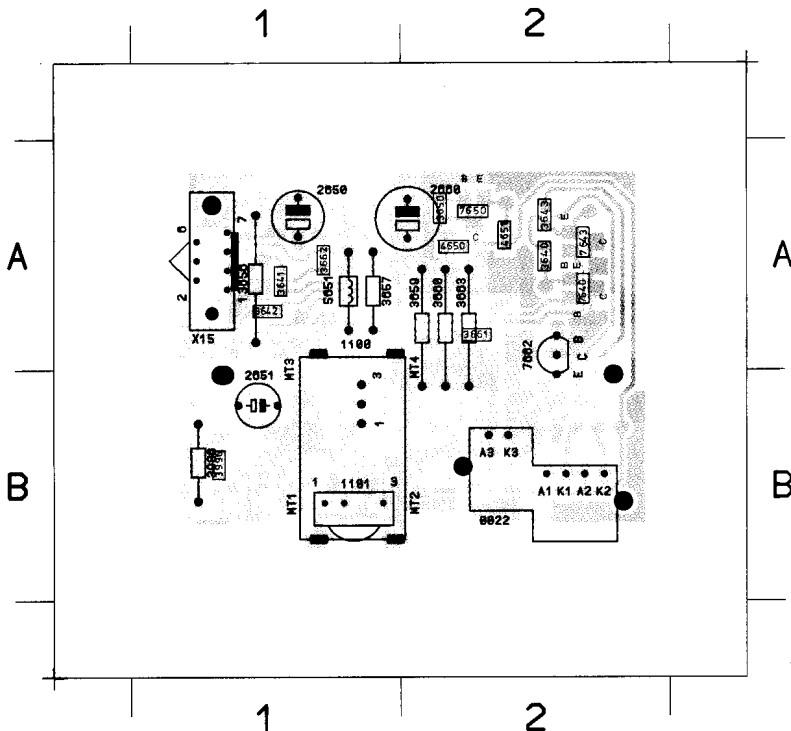


AV CONNECTOR PANEL FL5



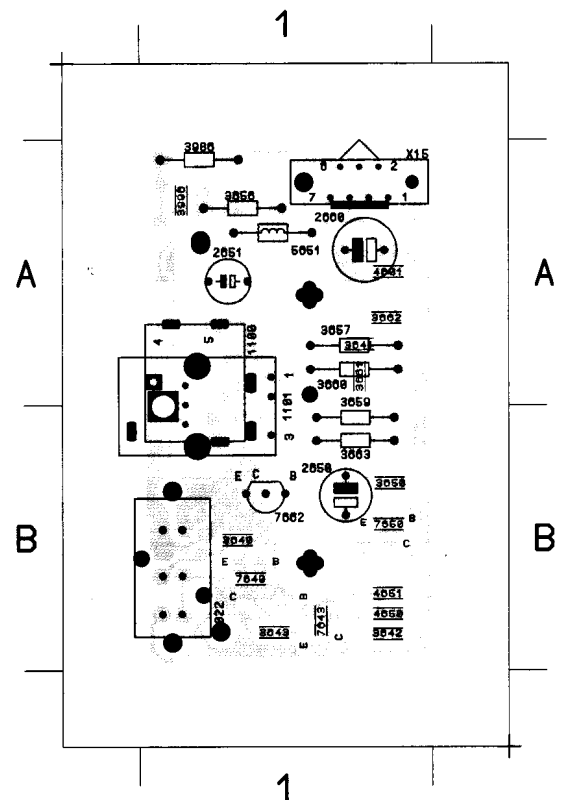
LED-RC5 panel FL2

0022 B 2	1101 B 1	2051 B 1	3050 A 1	3050 A 2	3063 A 2	5051 A 1
1100 B 1	2050 A 1	2060 A 2	3057 A 1	3060 A 2	3060 B 1	7002 A 2



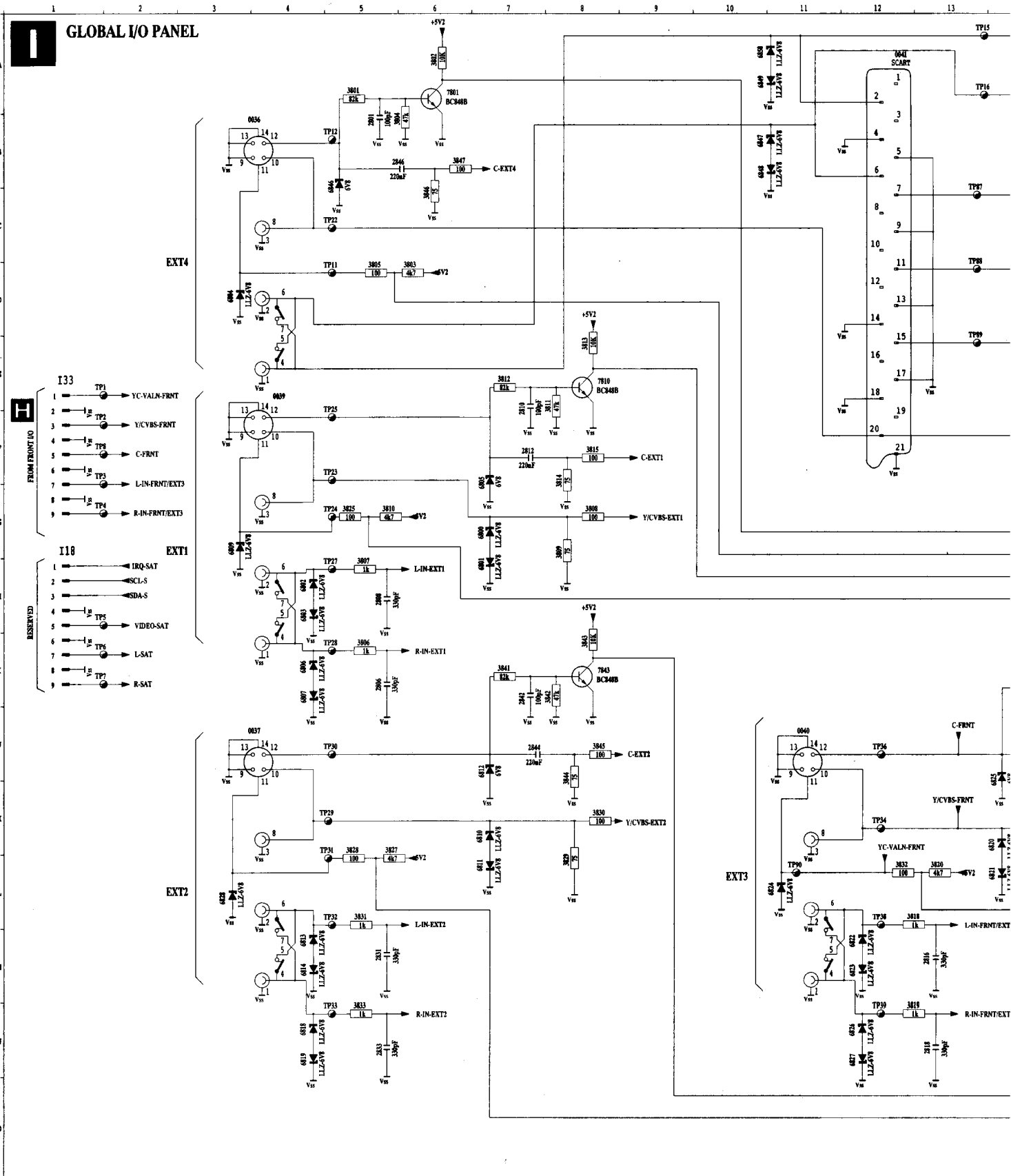
LED-RC5 panel FL4

0022 B 1	2000 A 1	3050 B 1	3061 A 1	4001 A 1	7043 B 1
1100 A 1	3040 B 1	3050 A 1	3062 A 1	4050 B 1	7050 B 1
1101 A 1	3041 A 1	3057 A 1	3063 B 1	4051 B 1	7002 B 1
2050 B 1	3042 B 1	3050 B 1	3060 A 1	5051 A 1	
2051 A 1	3043 B 1	3060 A 1	3060 A 1	7040 B 1	

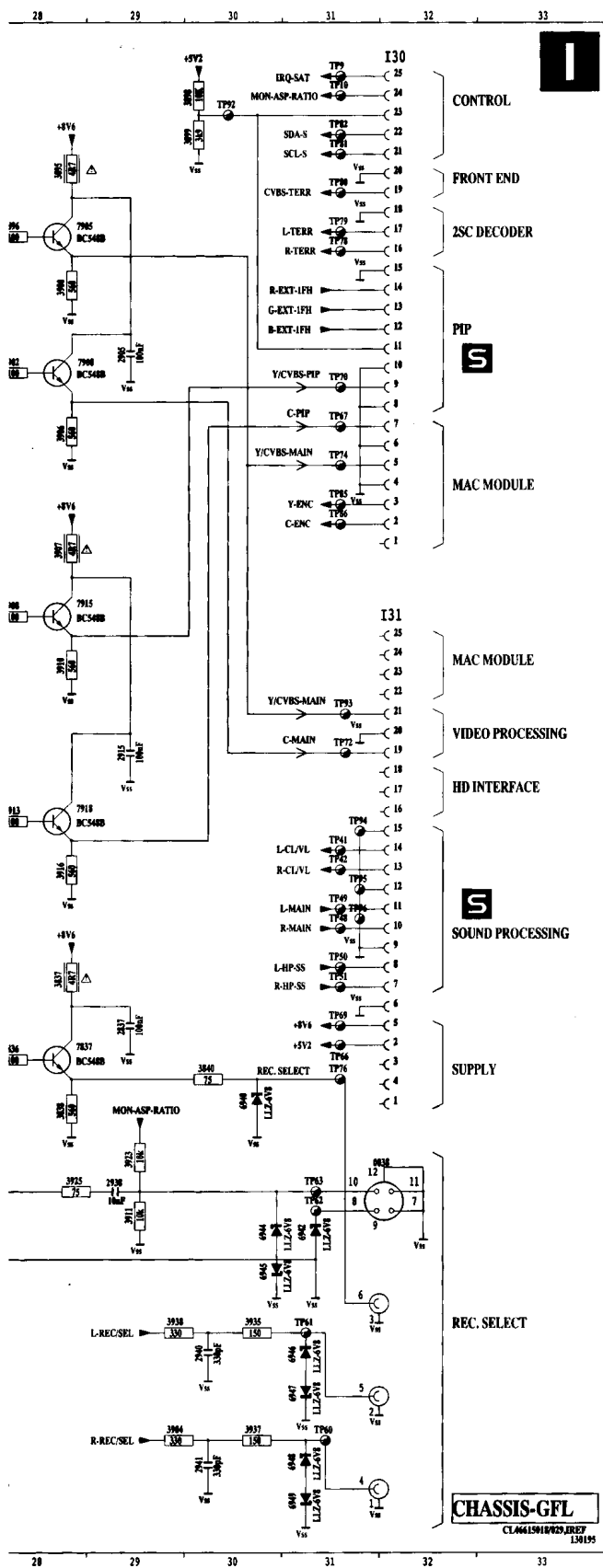


AV44 FB
EXT3 54



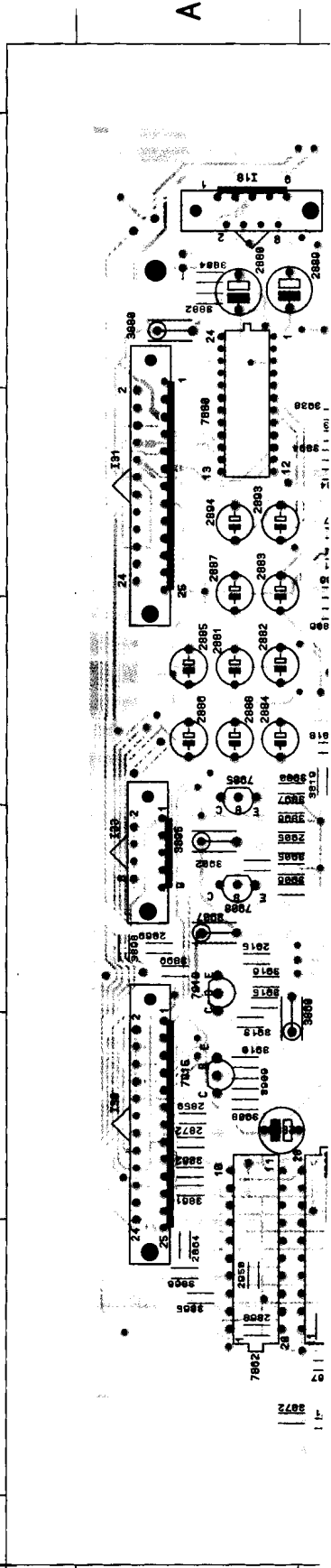


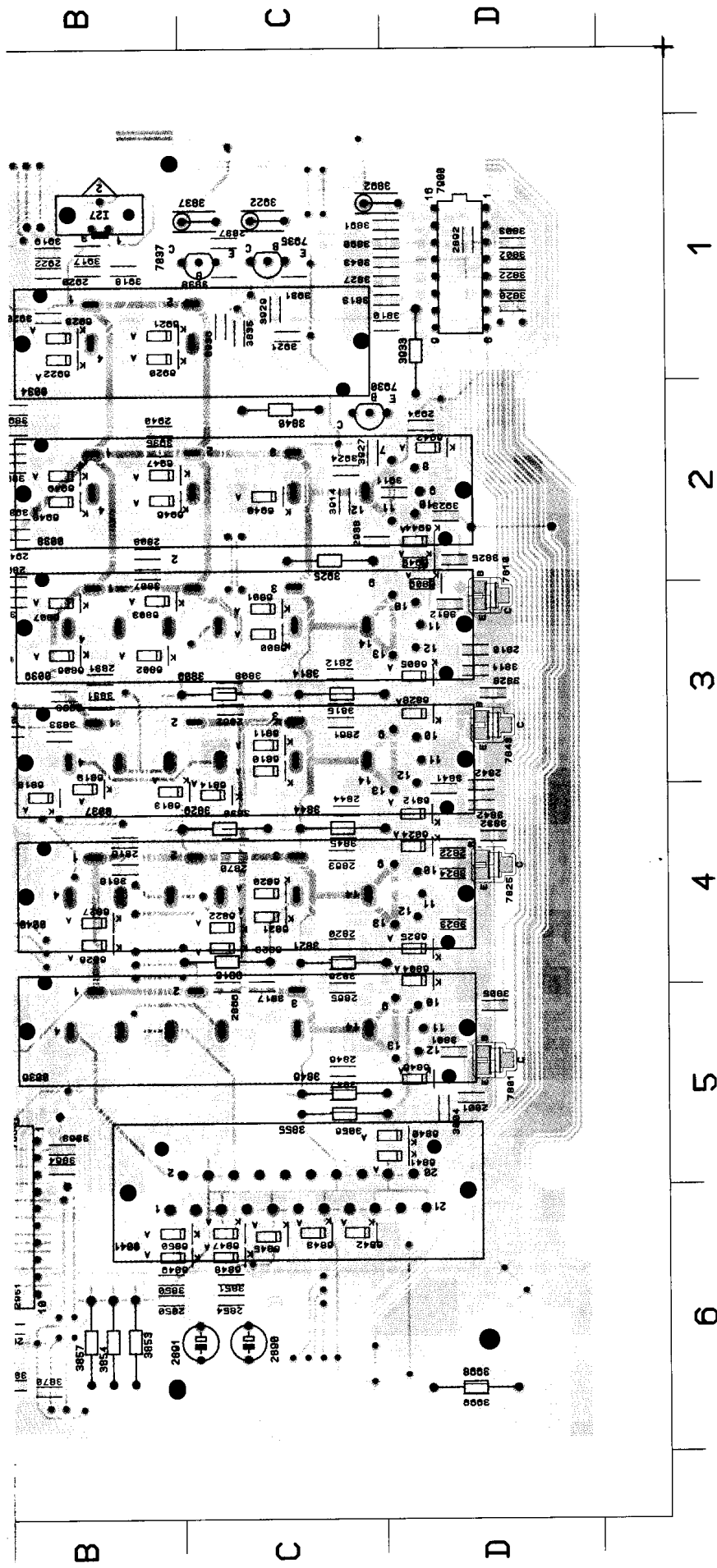
Source selection CINCH / Signalquellewahl CINCH / Sélection source



CL4615010/025.0007
130195

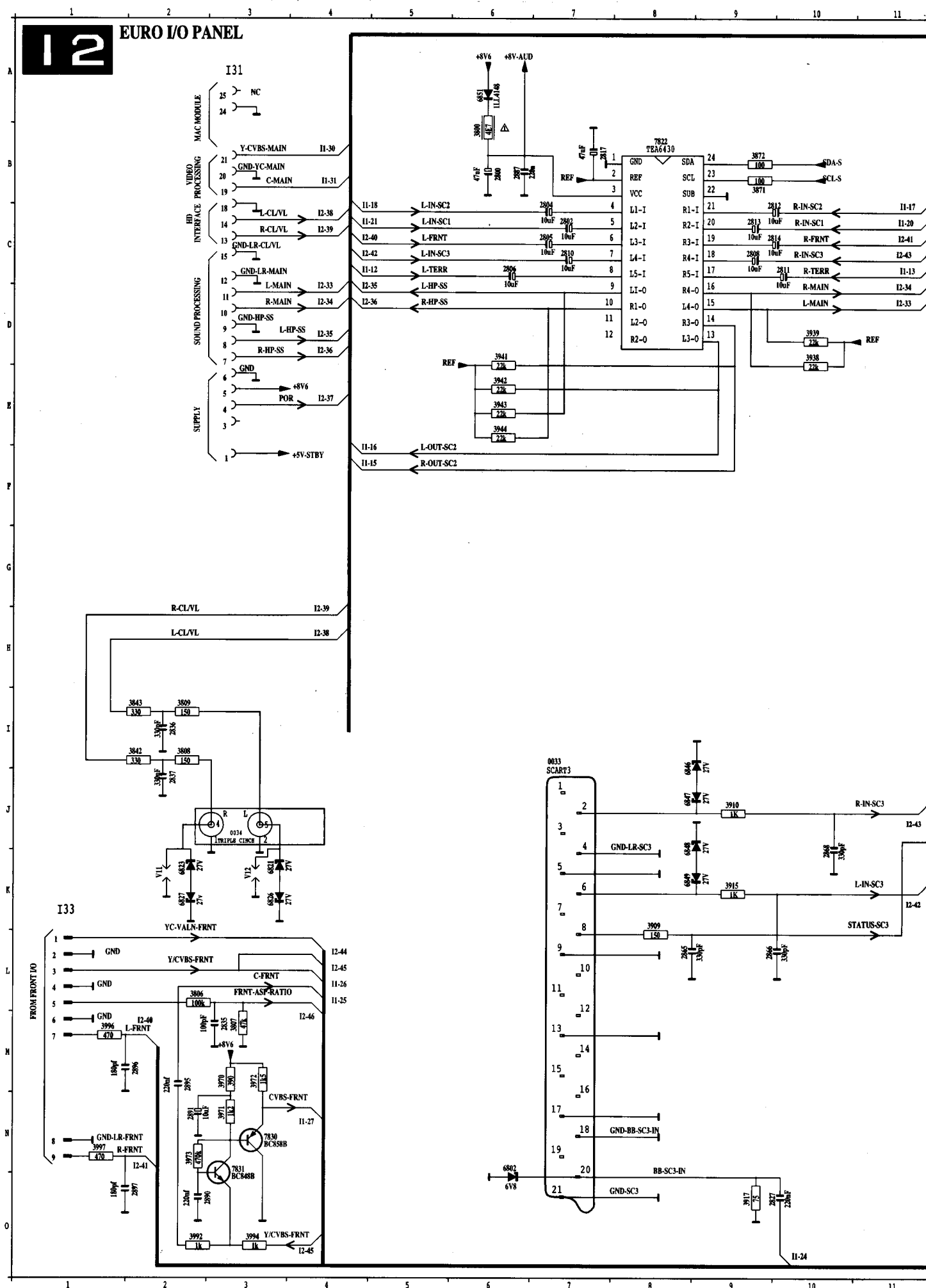
6800	C 7	
6801	C 4	
6802	C 4	
6803	C 4	
6804	C 4	
6805	C 4	
6806	C 4	
6807	C 4	
6808	C 4	
6809	C 4	
6810	C 4	
6811	C 4	
6812	C 4	
6813	C 4	
6814	C 4	
6815	C 4	
6816	C 4	
6817	C 4	
6818	C 4	
6819	C 4	
6820	C 4	
6821	C 4	
6822	C 4	
6823	C 4	
6824	C 4	
6825	C 4	
6826	C 4	
6827	C 4	
6828	C 4	
6829	C 4	
6830	C 4	
6831	C 4	
6832	C 4	
6833	C 4	
6834	C 4	
6835	C 4	
6836	C 4	
6837	C 4	
6838	C 4	
6839	C 4	
6840	C 4	
6841	C 4	
6842	C 4	
6843	C 4	
6844	C 4	
6845	C 4	
6846	C 4	
6847	C 4	
6848	C 4	
6849	C 4	
6850	C 4	
6851	C 4	
6852	C 4	
6853	C 4	
6854	C 4	
6855	C 4	
6856	C 4	
6857	C 4	
6858	C 4	
6859	C 4	
6860	C 4	
6861	C 4	
6862	C 4	
6863	C 4	
6864	C 4	
6865	C 4	
6866	C 4	
6867	C 4	
6868	C 4	
6869	C 4	
6870	C 4	
6871	C 4	
6872	C 4	
6873	C 4	
6874	C 4	
6875	C 4	
6876	C 4	
6877	C 4	
6878	C 4	
6879	C 4	
6880	C 4	
6881	C 4	
6882	C 4	
6883	C 4	
6884	C 4	
6885	C 4	
6886	C 4	
6887	C 4	
6888	C 4	
6889	C 4	
6890	C 4	
6891	C 4	
6892	C 4	
6893	C 4	
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6897	C 4	
6898	C 4	
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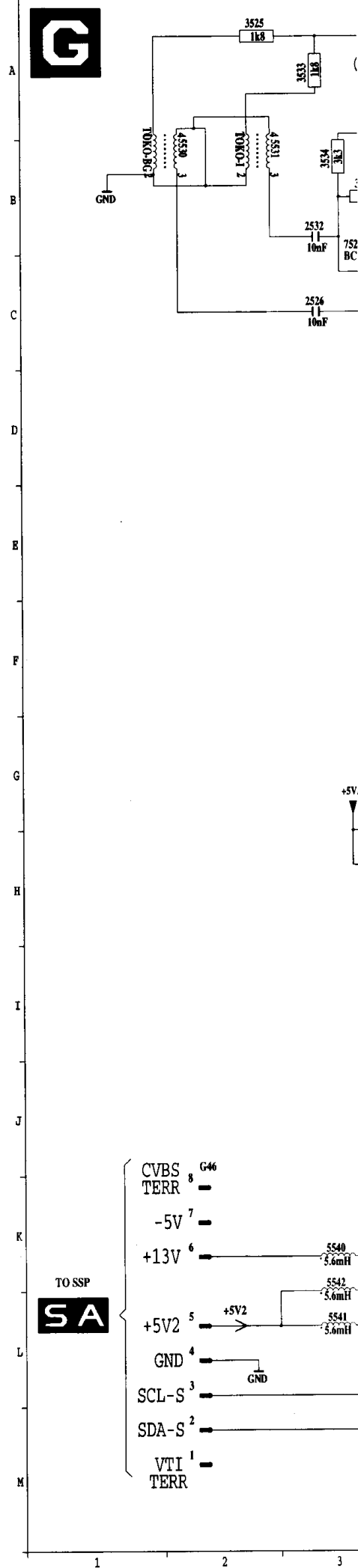




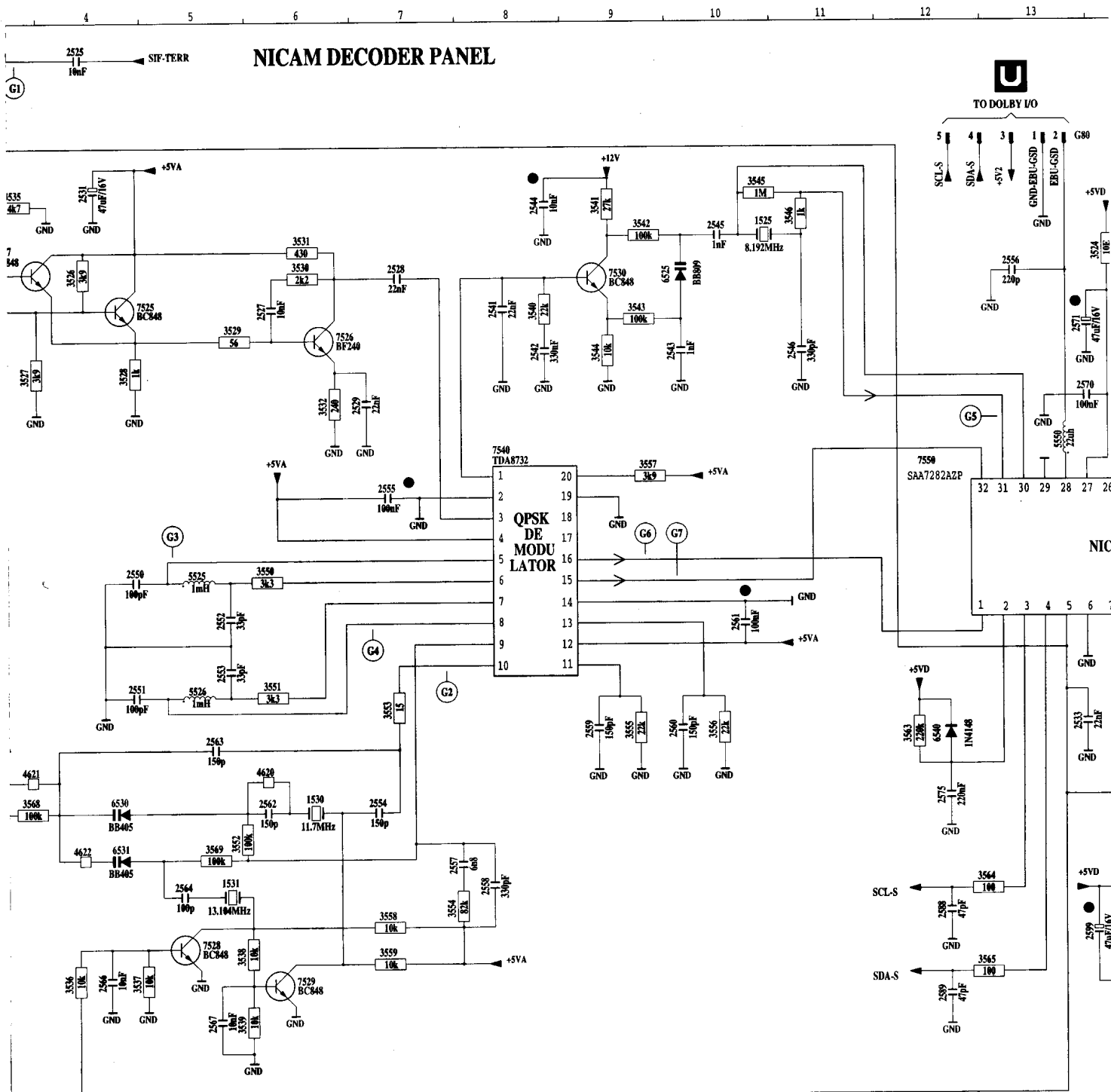
12

EURO I/O PANEL

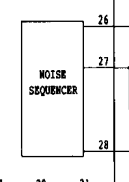




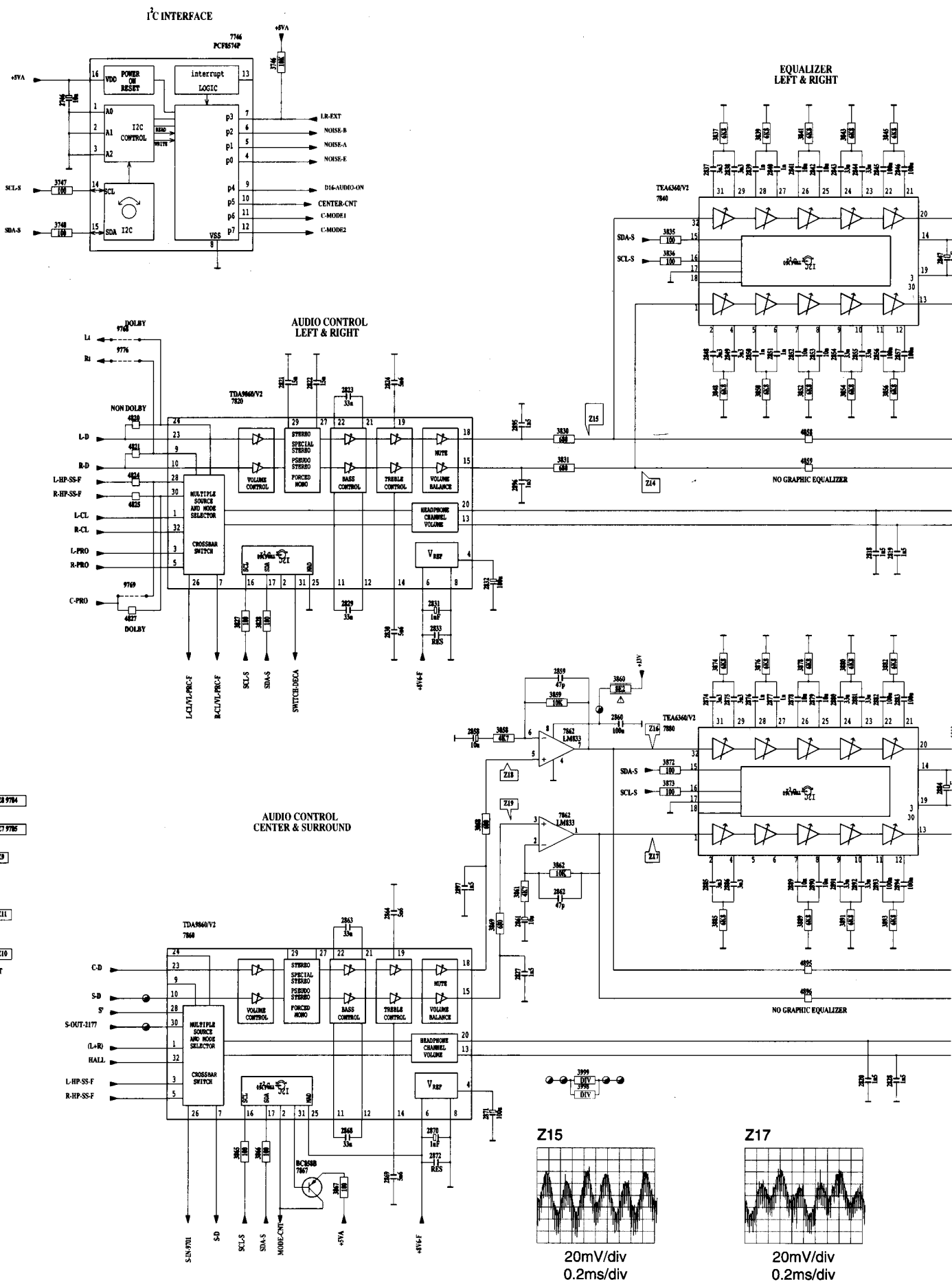
NICAM decoder / NICAM-Dekoder /



Item	NICAM BG	NICAM I	BI-NICAM	Item	NICAM BG	NICAM I	BI-NICAM	Item	NICAM BG	NICAM I	BI-NICAM
1530	11.7 MHz	13.104 MHz	11.7 MHz	3526	3k9	3k9	4k7	3572	10k	4k7	10k
1531	--	--	13.104 MHz	3527	3k9	3k9	3k3	3574	--	--	6k8
2532	--	--	10n	3533	--	--	1k8	3576	--	--	220k
2554	150p	100p		3534	--	--	3k3	3577	--	--	10k
2562	--	--	150p	3535	--	--	4k7	3578	--	--	2k7
2563	--	--	150p	3536	--	--	10k	3579	--	--	1k
2564	--	--	100p	3537	--	--	10k	3582	10k	2k2	10k
2566	--	--	10n	3538	--	--	10k	3583	33k	68k	33k
2567	--	--	10n	3539	--	--	10k	3584	10k	--	10k
2595	--	--	10uF/25V	3558	--	--	10k	3585	33k	--	33k
2597	--	--	10uF/25V	3559	--	--	10k	3586	--	--	6k8
2600	--	27n	--	3568	--	--	100k	3587	--	--	6k8
2617	--	--	10uF/25V	3569	--	--	100k	3588	--	2k4	--

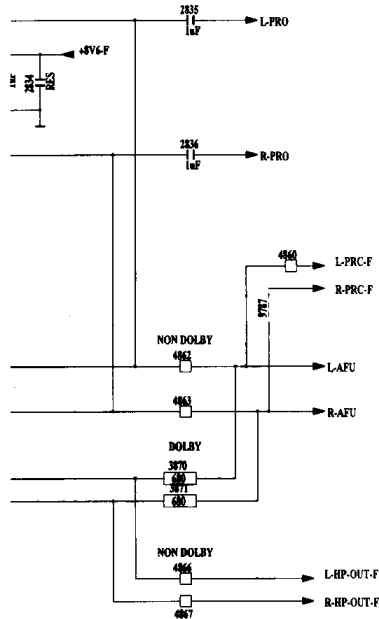
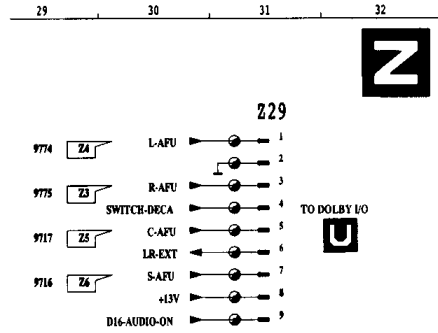


Platine AFU (dolby)

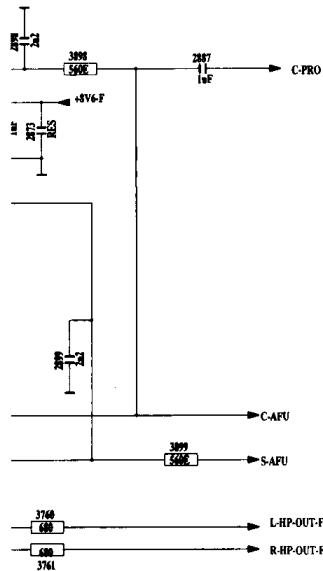


AFU (dolby) panel

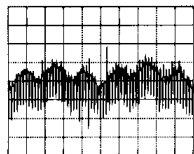
817
117
817
P31
H 1



EQUALIZER CENTER & SURROUND



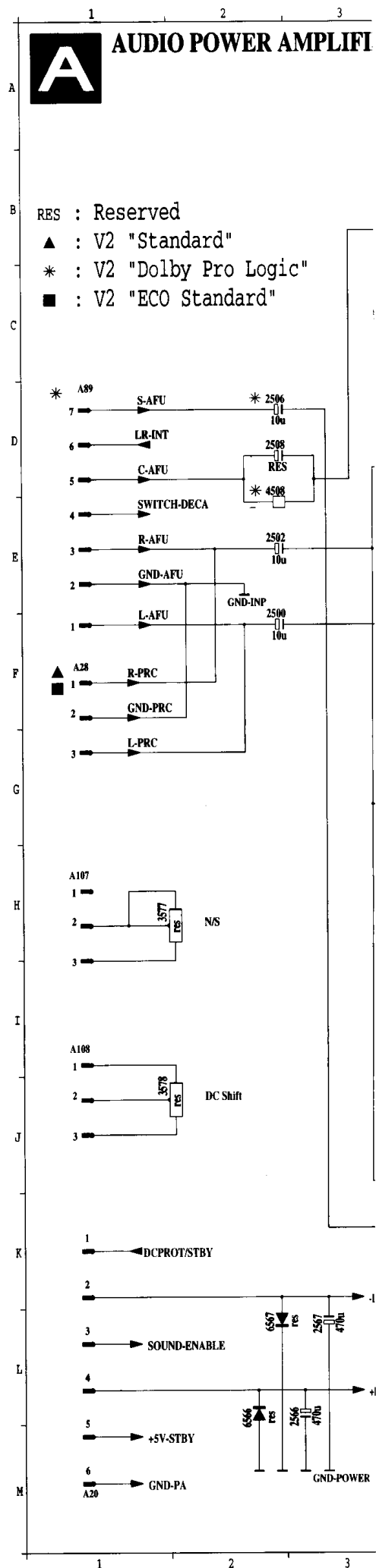
Z19



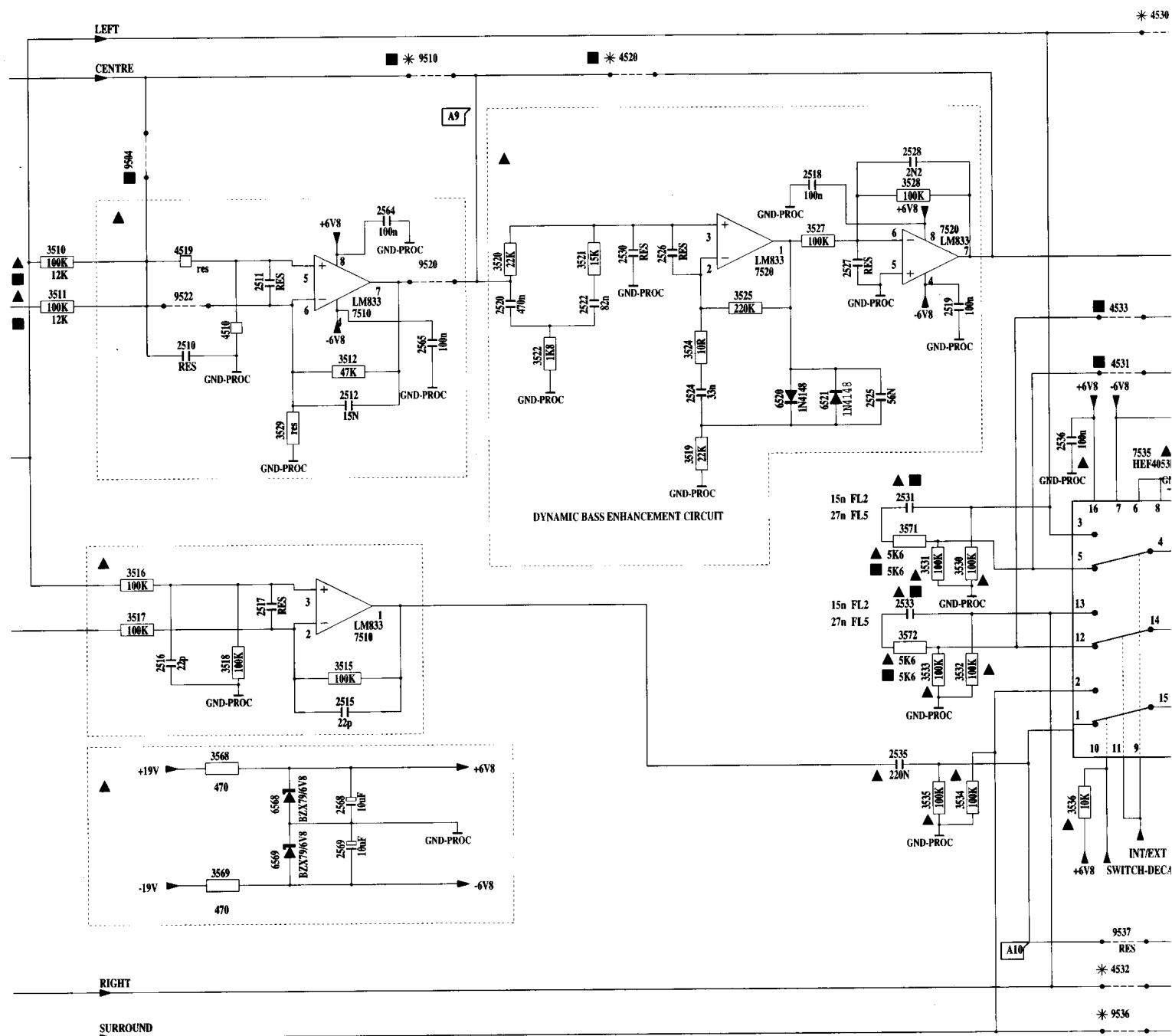
20mV/div
0.2ms/div

CHASSIS-GFL

CL4661501R021.ZREF
120195



ER



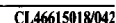
9V

9V

DYNAMIC BASS ENHANCEMENT



* ONLY FOR STANDARD DIG-OUT
** ONLY FOR DOLBY DIG-OUT





A



C

D

E

F

G

H

I

J

DDIG

K

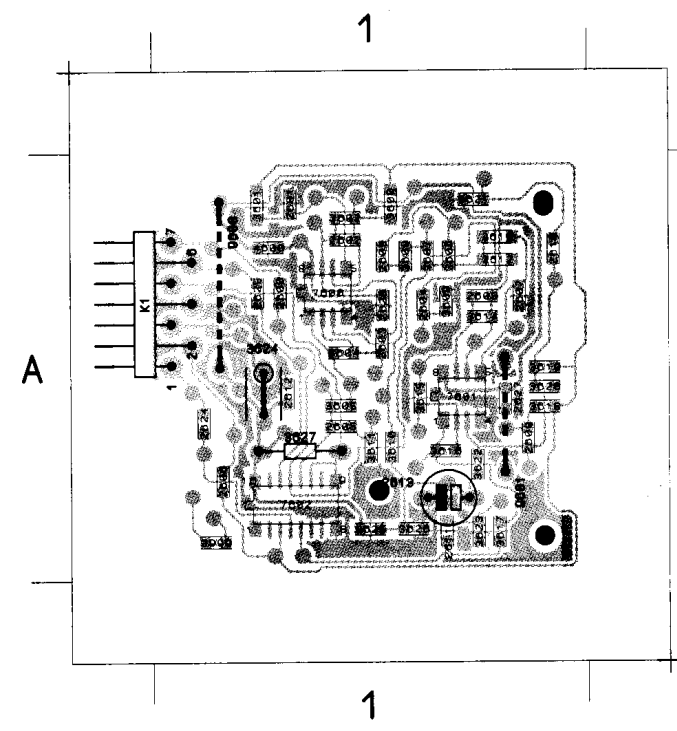
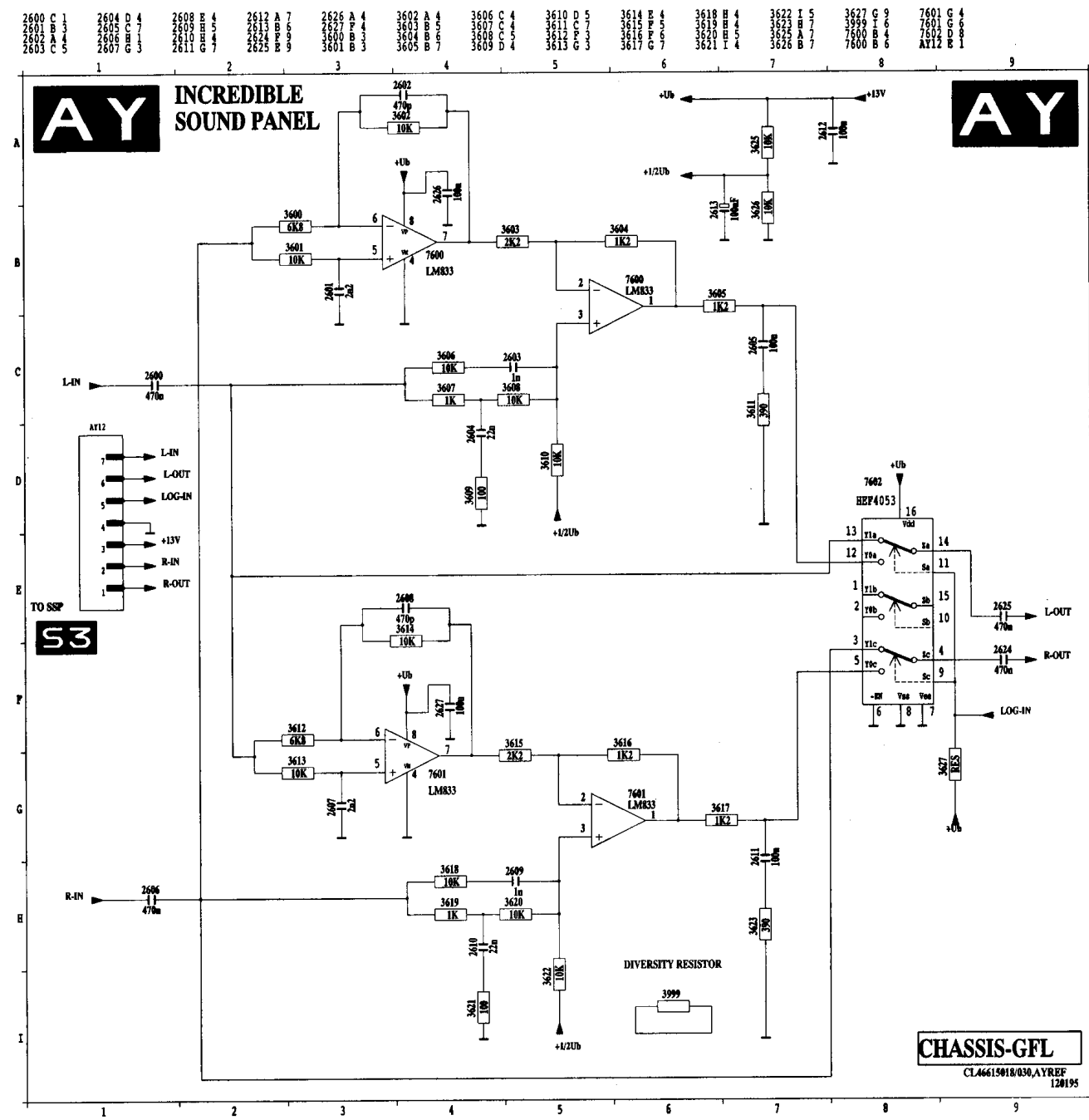
L



EF
0195

2570 A
2571 A
2572 F
2573 F
2574 B
2575 B
2576 B
2577 B
2578 B
2579 B
2580 B
2581 B
2582 B
2583 B
2584 B
2585 B
2586 B
2587 B
2588 B
2589 B
2590 B
2591 C
2592 C
2593 C
2594 C
2595 C
2596 C
2597 C
2598 C
2599 C
2600 C
2601 I
2602 I
2603 I
2604 I
2605 J
2606 J
2607 L
2608 H
2609 H
2610 H
2611 E
2612 E
2613 E
2614 E
2615 D
2616 C
2617 C
2618 D
2619 A
2620 A
2621 A
2622 F
2623 B
2624 B
2625 C
2626 B
2627 B
2628 C
2629 B
2630 B
2631 B
2632 B
2633 E
2634 E
2635 E
2636 E
2637 G
2638 G
2639 F
2640 F
2641 F
2642 F
2643 F
2644 F
2645 G
2646 G
2647 F
2648 F
2649 F
2650 F
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2652 F
2653 F
2654 F
2655 F
2656 F
2657 F
2658 F
2659 G
2660 H
2661 H
2662 H
2663 I
2664 I
2665 I
2666 K
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2669 L
2670 L
2671 K
2672 K
2673 L
2674 L
2675 H
2676 B
2677 B
2678 B
2679 C
2680 F
2681 F
2682 A
2683 A
2684 A
2685 F
2686 F
2687 F
2688 C
2689 F
2690 H
2691 H
2692 H
2693 H
2694 H
2695 I
2696 I
2697 J
2698 J
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2703 A
2704 J
2705 J
2706 J
2707 H
2708 H
2709 A

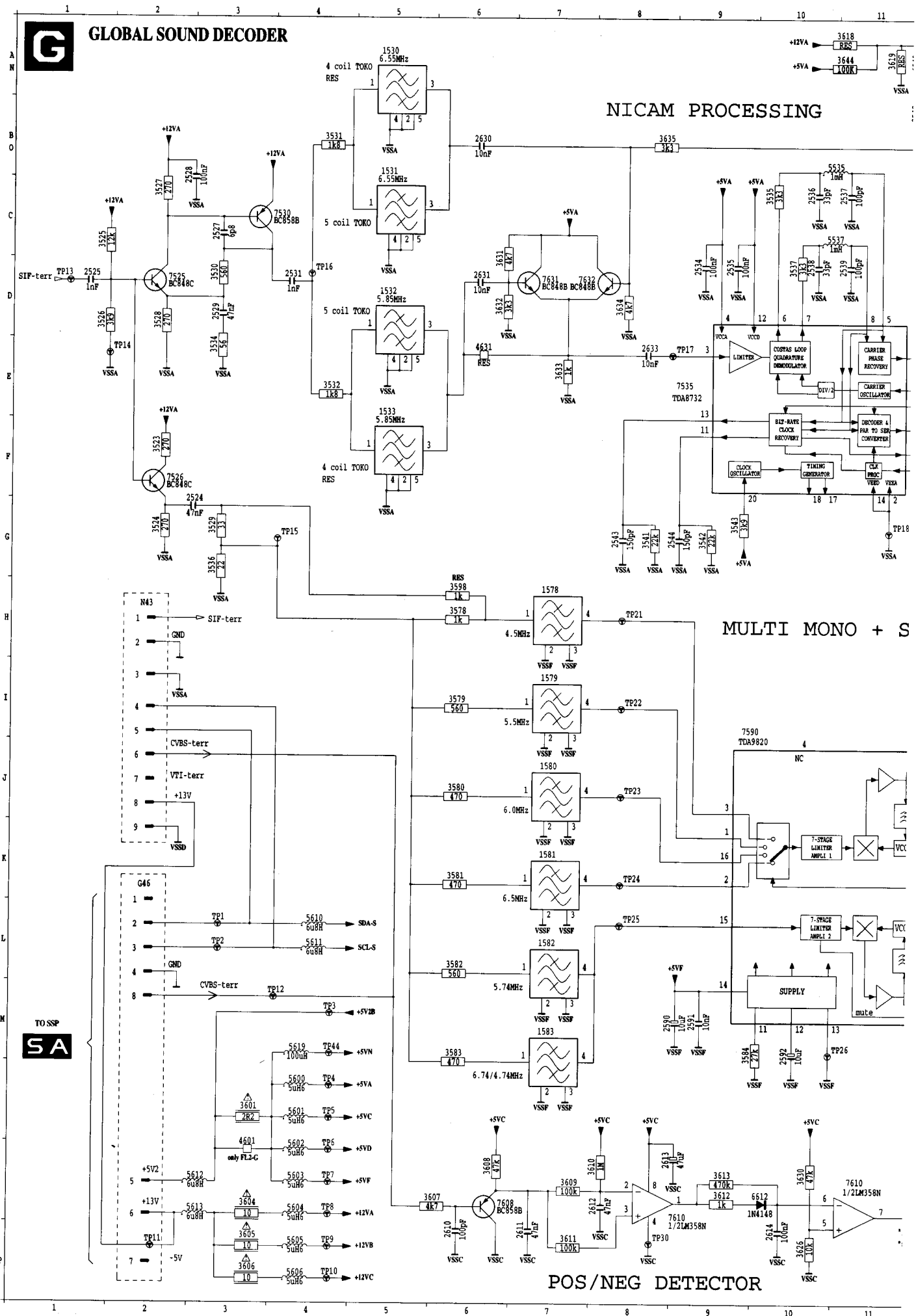
Incredible sound

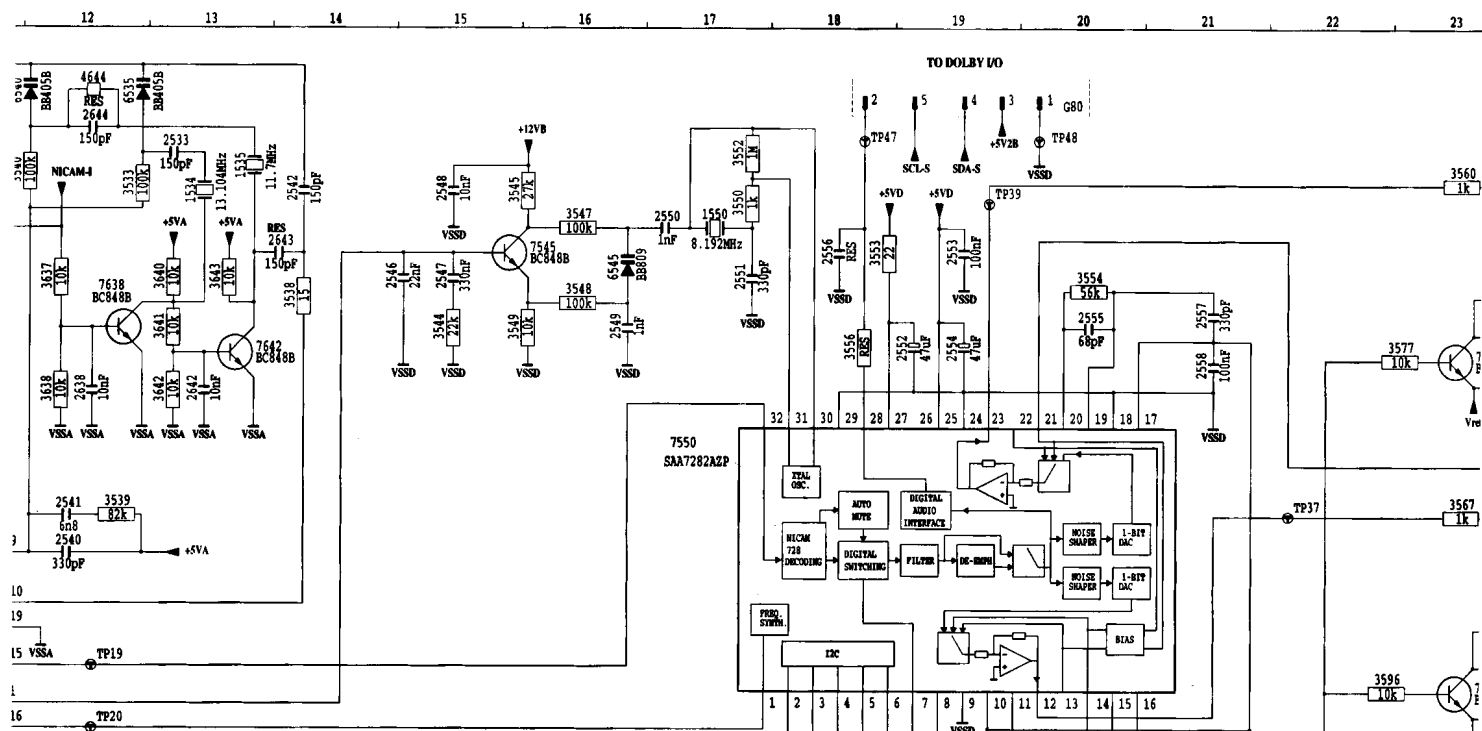


A

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2603	A	1
2604	A	1
2605	A	1
2606	A	1
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2613	A	1
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3601	A	1
3602	A	1
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3821	A	1

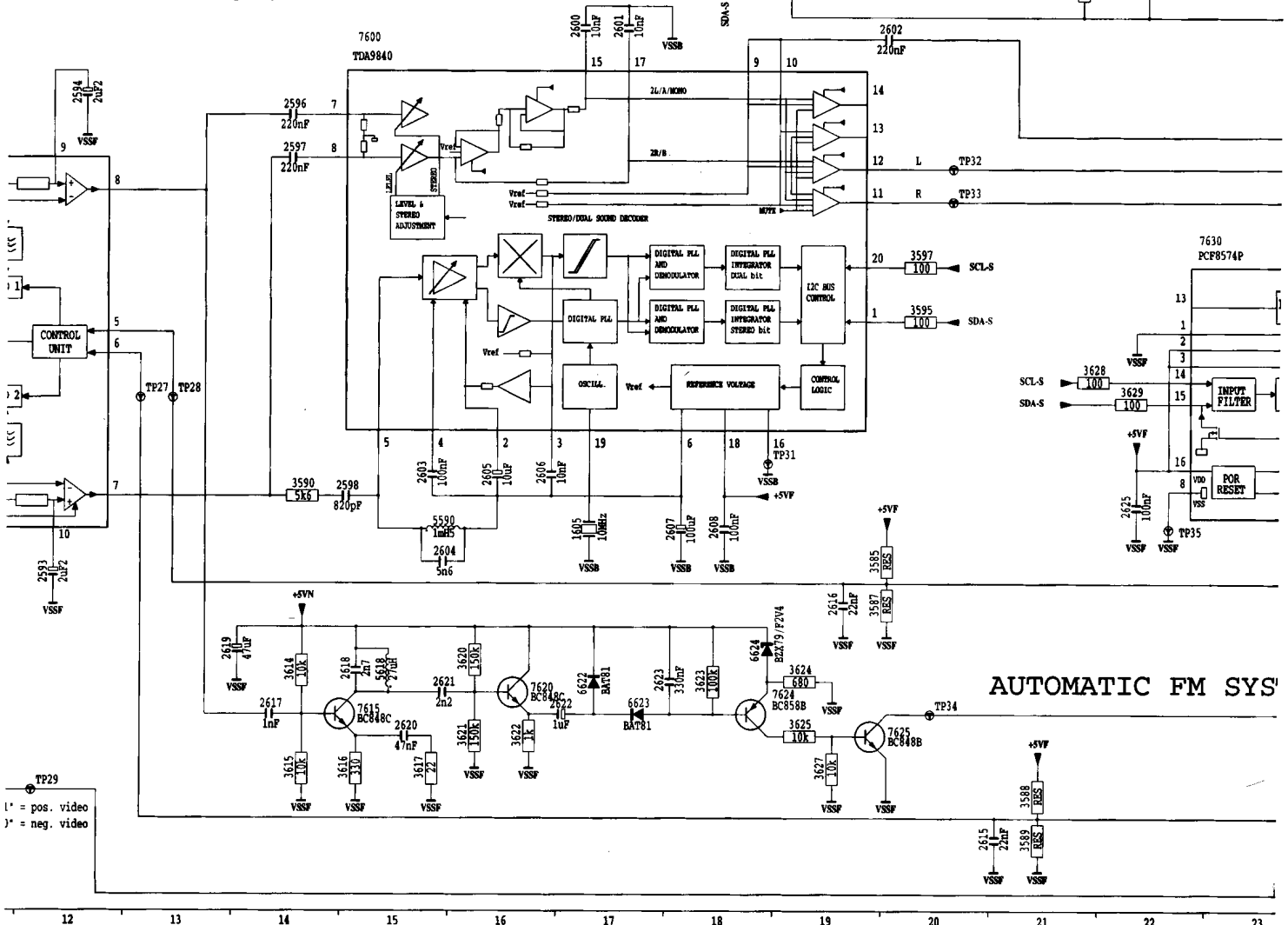
Global sound decoder / Global Sound Dekoder /





pin 6 of IC 7590	pin 5 of IC 7590	MODE
0	0	6.5
0	1	4.5
1	0	6.0
1	1	5.5

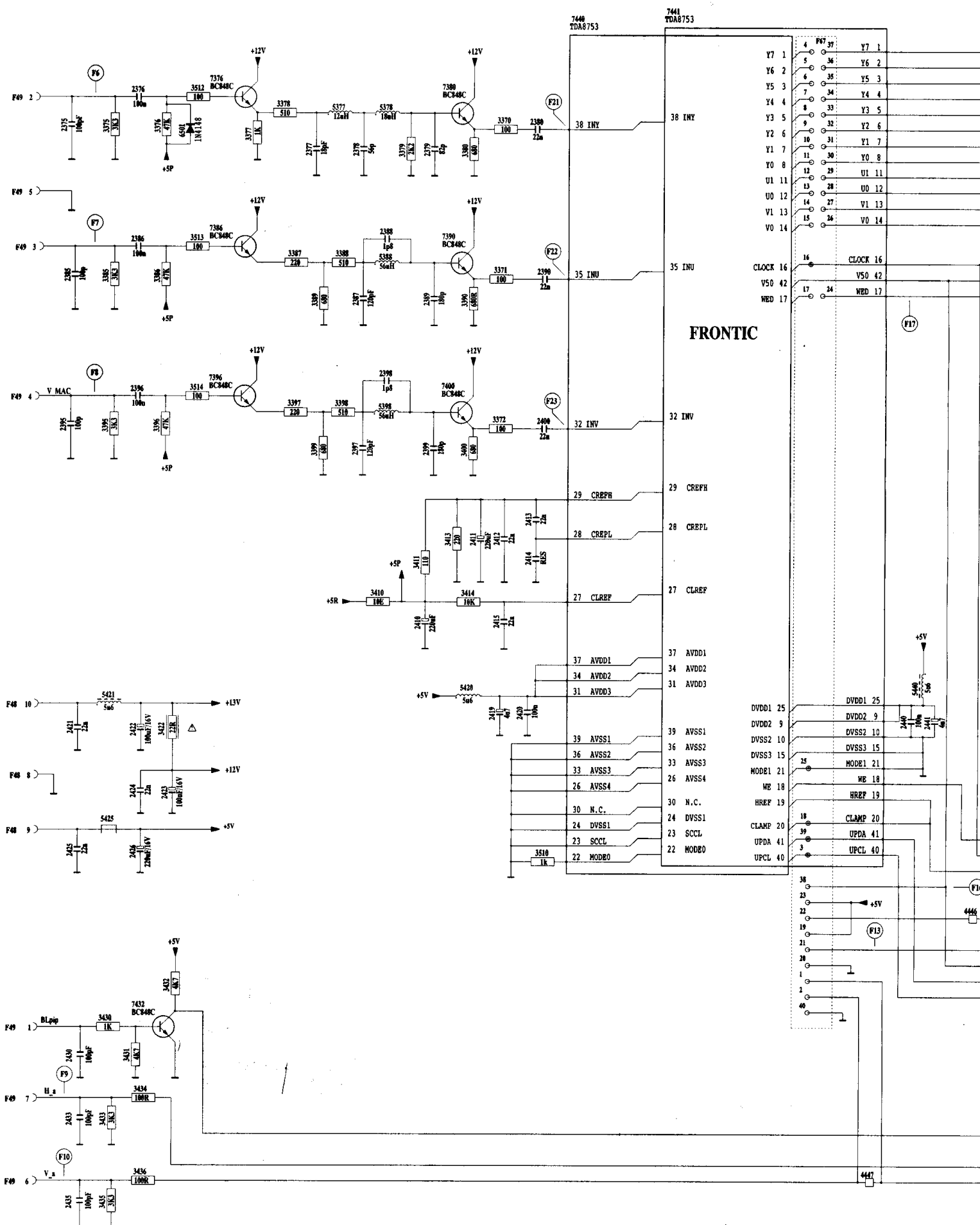
TEREO FM DEMOD.

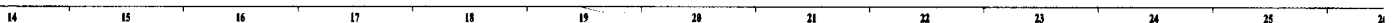


1' = pos. video
1'' = neg. video

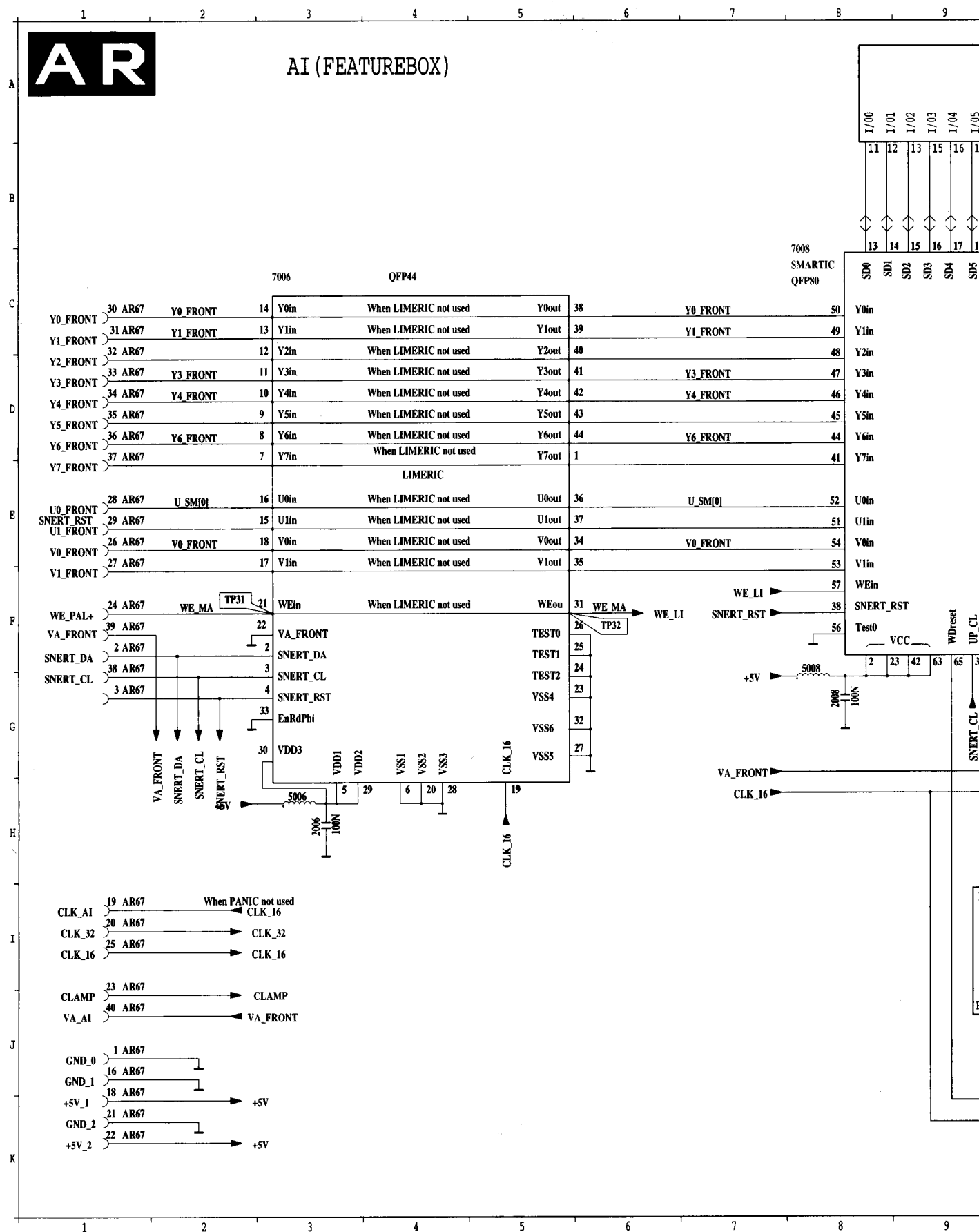


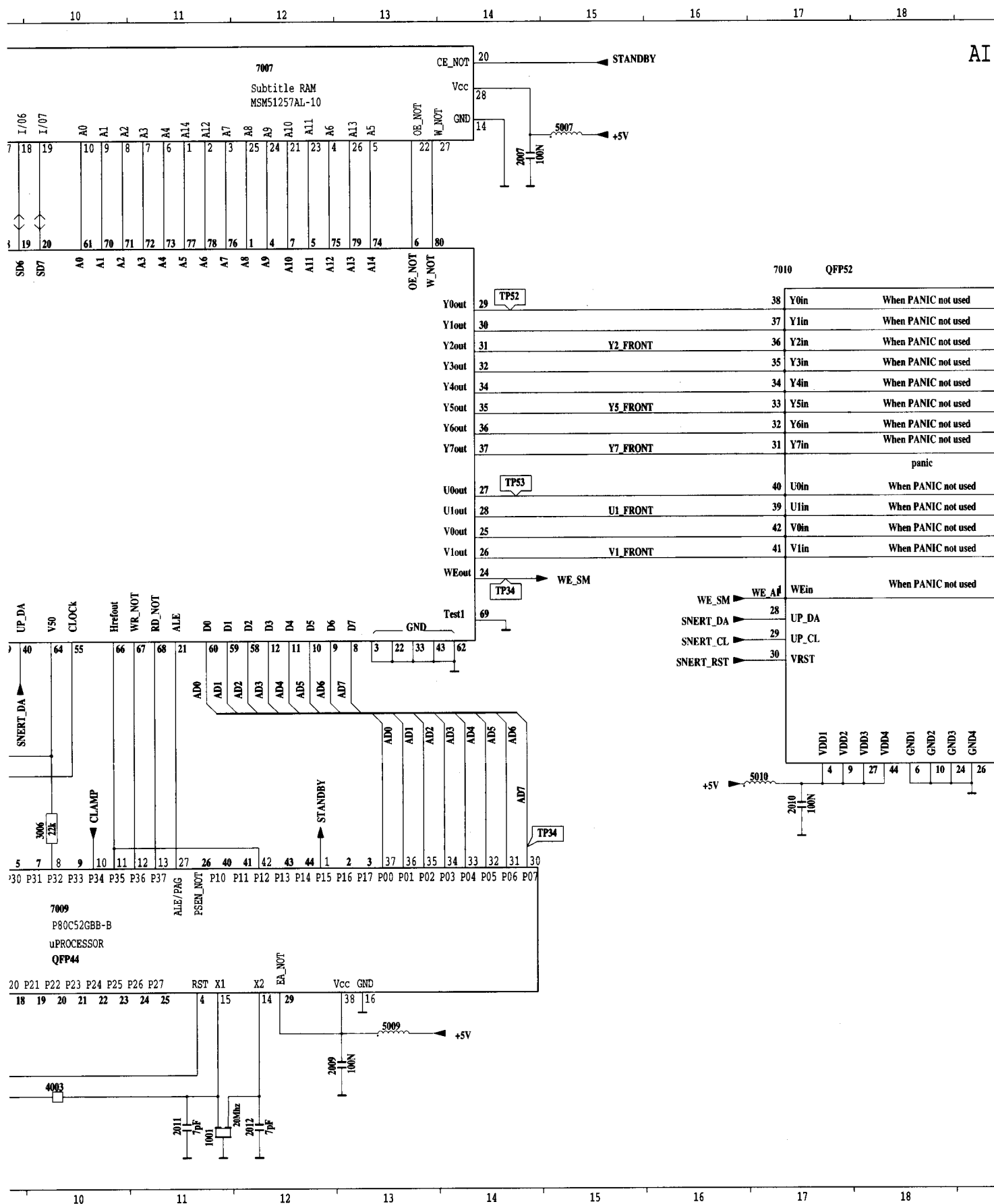
FEATURE BOX 3

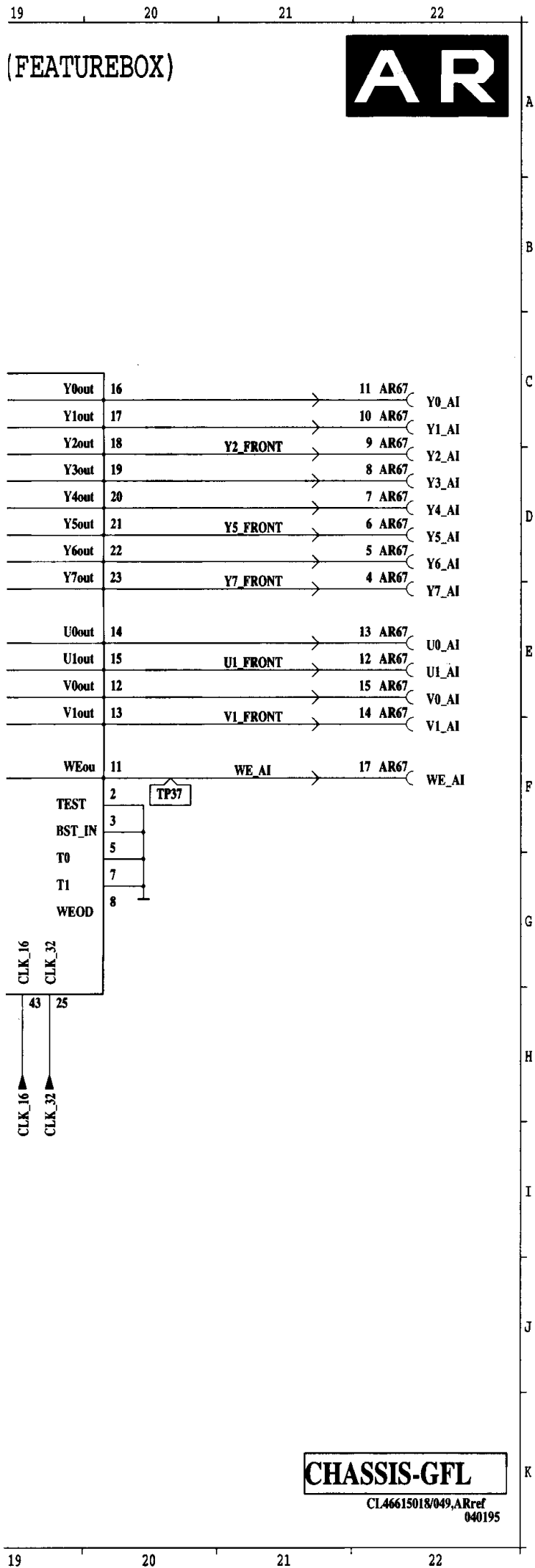


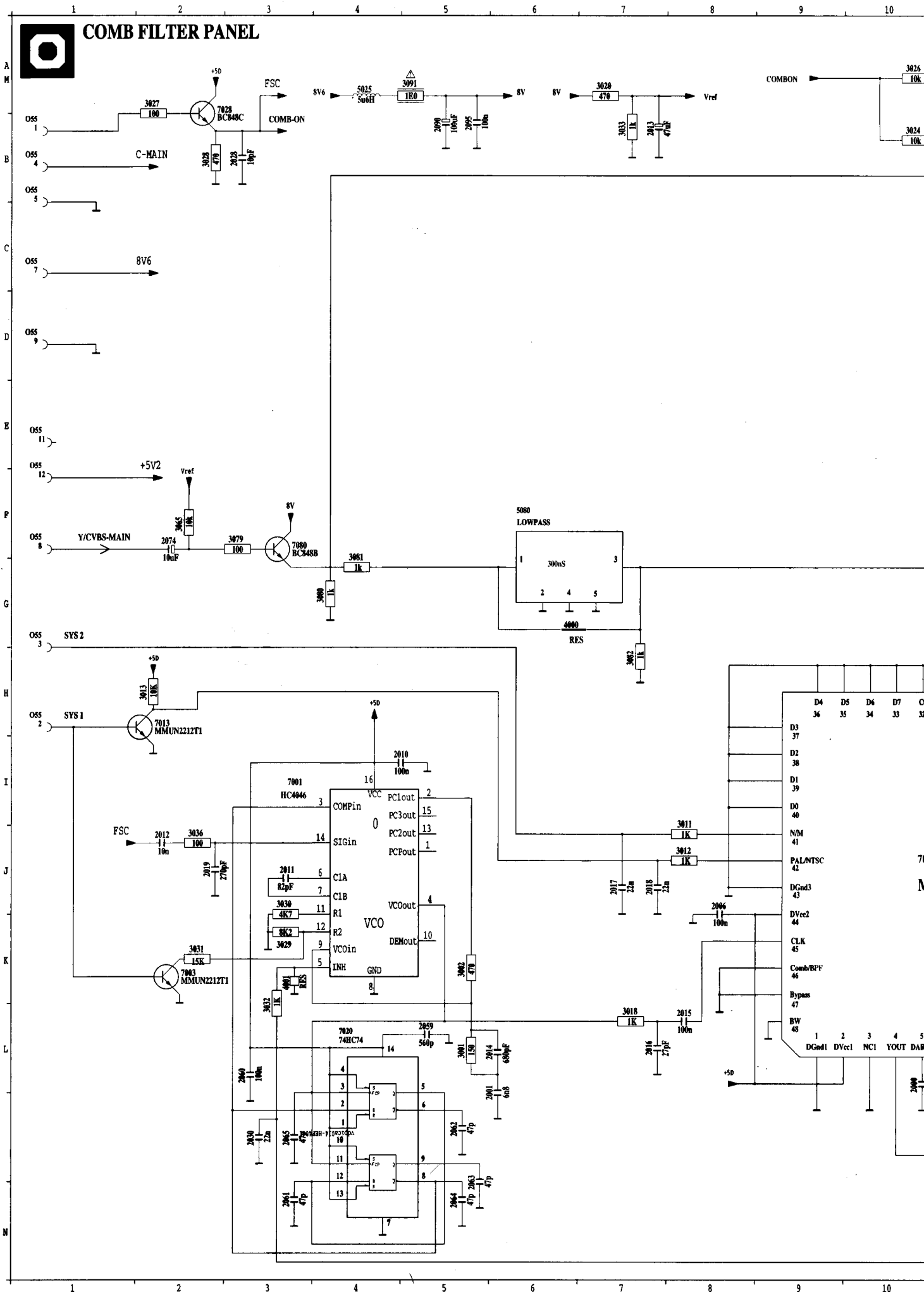


Feature box AI panel / Feature Box AI Platte /

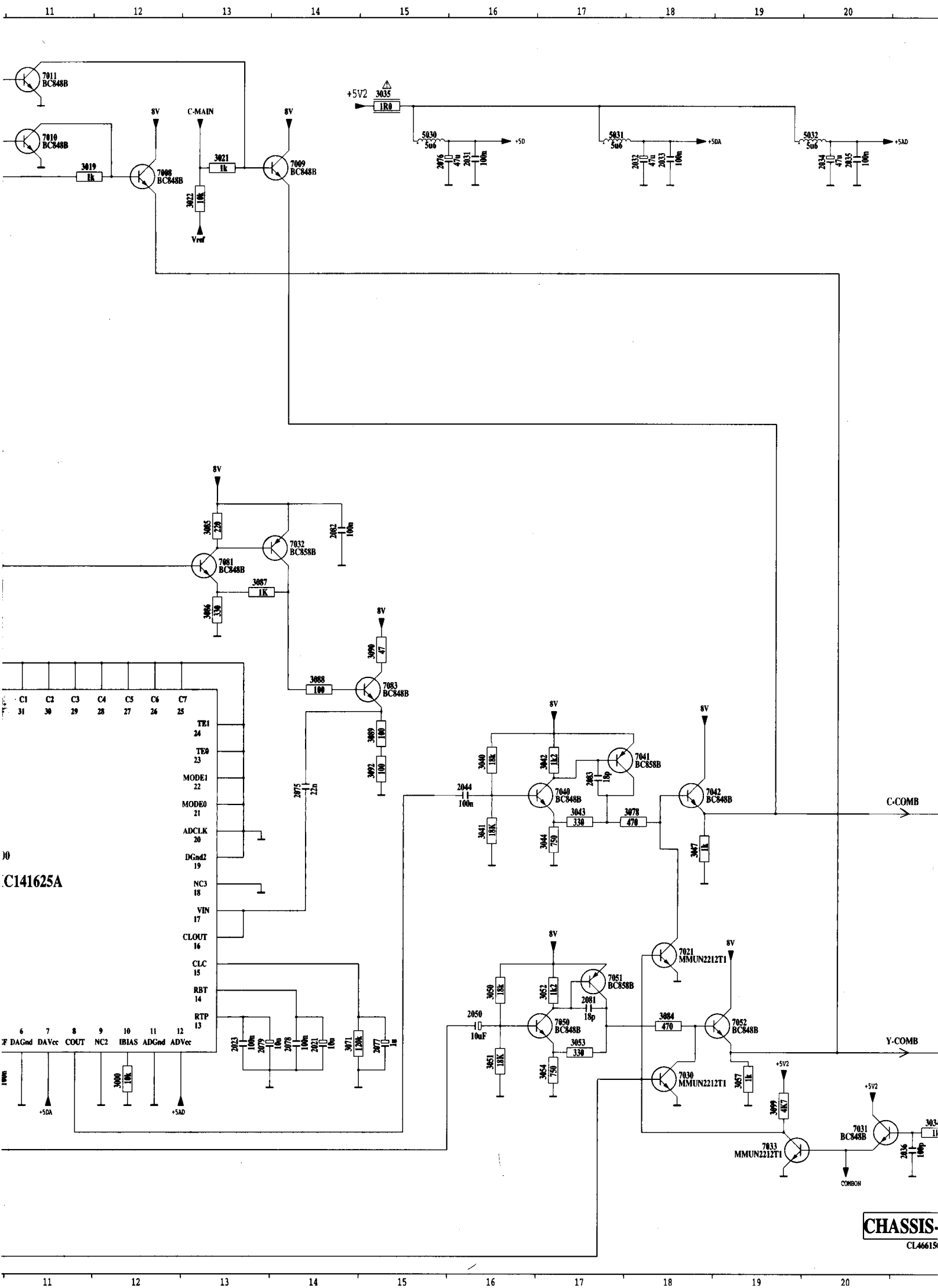








Platine filtre en peigne



A
M

B

C

D

E

F

G

H

I

—C 6055

J

K

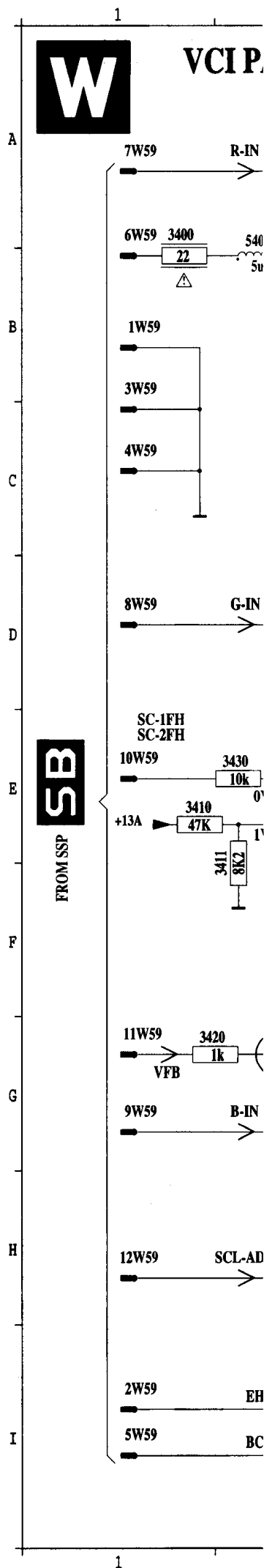
—C 10055

L

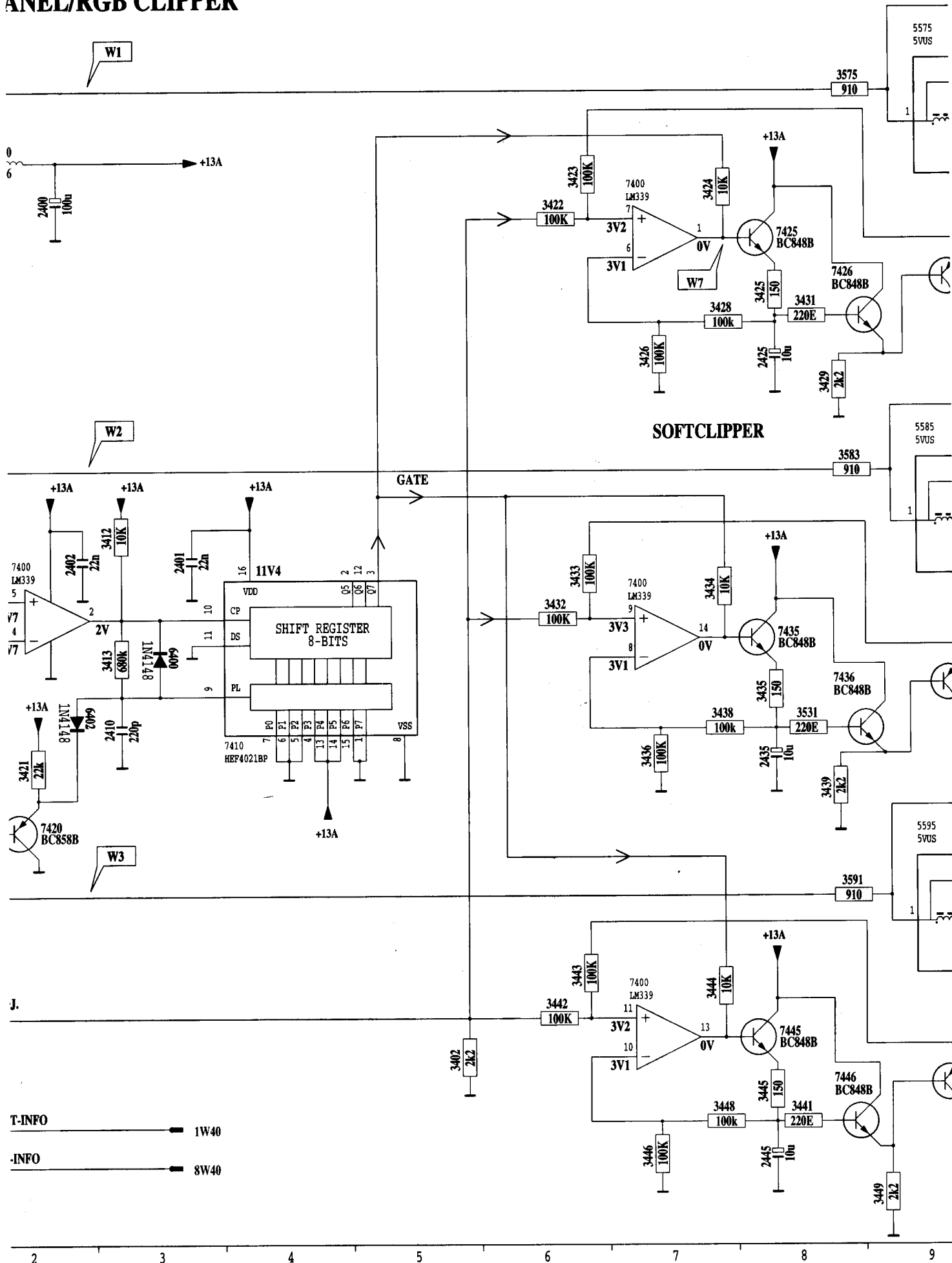

 COMB-ON

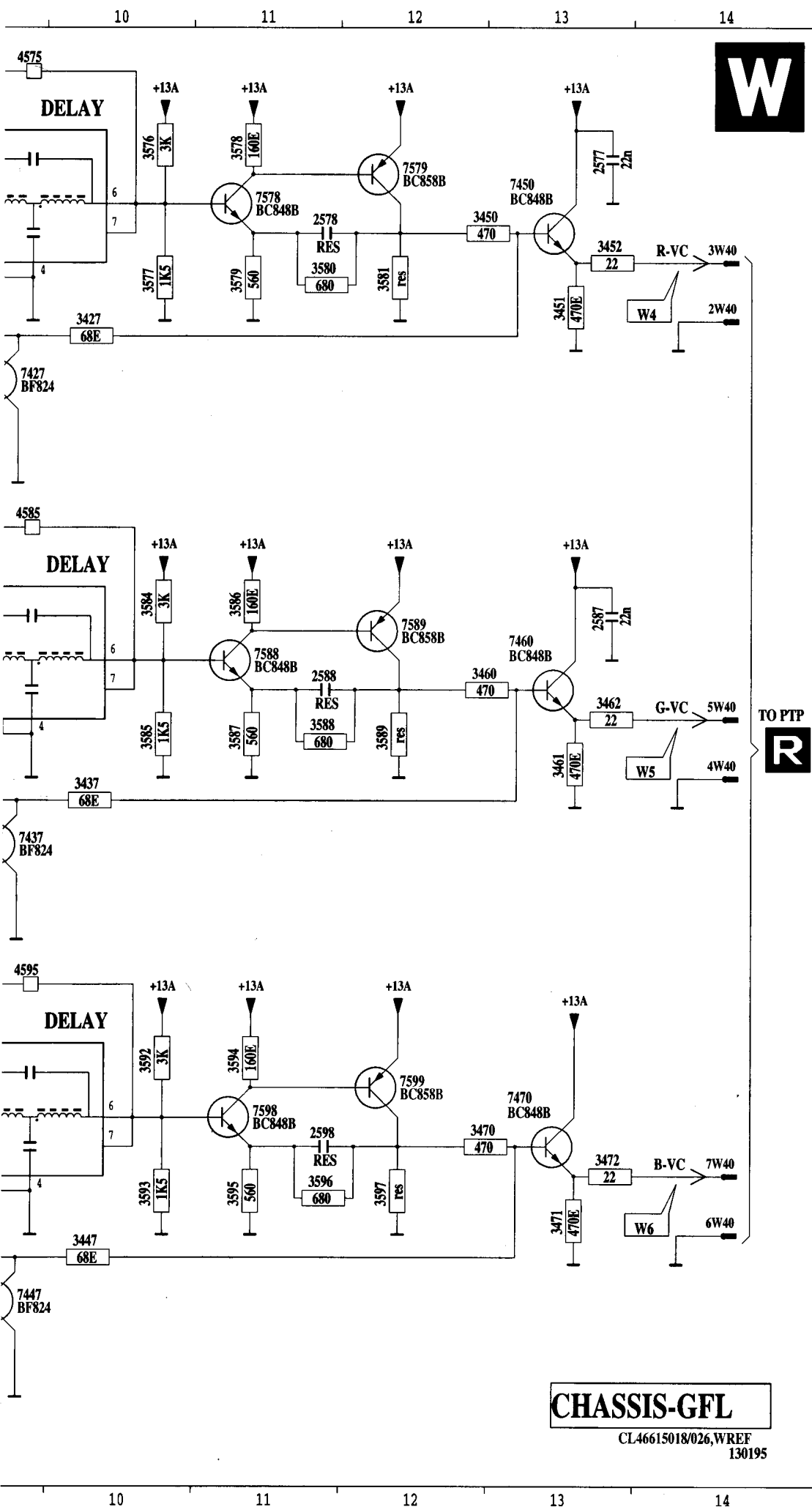
GFL
 018/027, OREF
 180195

N

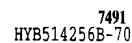


ANEL/RGB CLIPPER

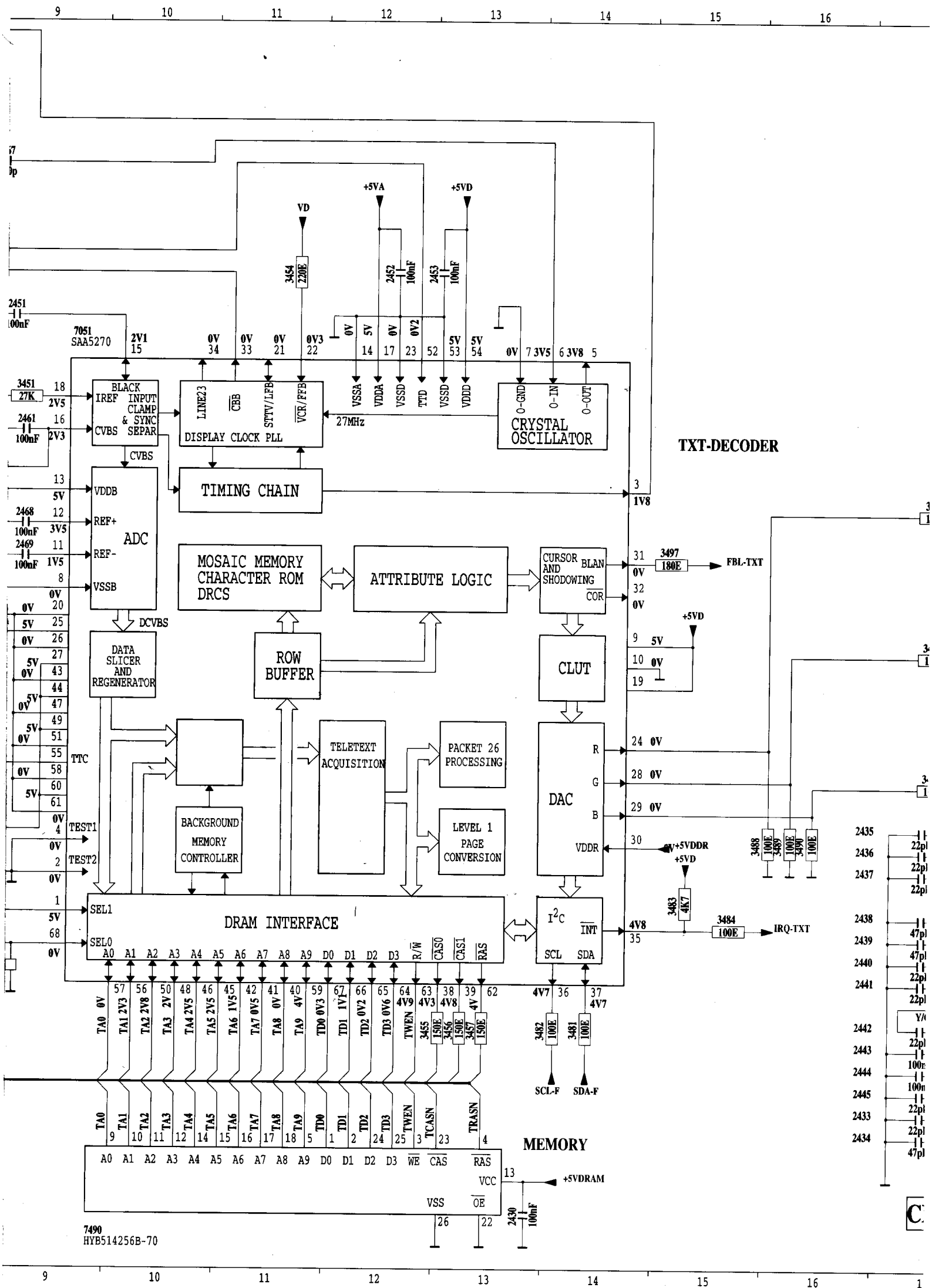




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2401	E	3	7447	I	9
2402	E	3	7450	A	13
2410	F	3	7460	D	13
2425	C	8	7470	G	13
2435	F	8	7578	A	11
2445	I	8	7579	A	12
2577	A	13	7588	D	11
2578	A	11	7589	D	12
2587	D	13	7598	G	11
2588	D	11	7599	G	12
2598	H	11	7W40	H	14
2W40	B	14			
3400	A	1			
3402	H	5			
3410	I	1			
3411	E	2			
3412	D	3			
3413	E	3			
3420	G	2			
3421	F	6			
3422	B	6			
3423	B	6			
3424	B	7			
3425	C	8			
3426	C	7			
3427	B	10			
3428	C	7			
3429	C	8			
3430	E	2			
3431	C	8			
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3433	E	6			
3434	E	7			
3435	F	8			
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3437	E	10			
3438	F	7			
3439	F	8			
3441	I	8			
3442	H	6			
3443	H	6			
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3445	I	7			
3446	I	7			
3447	H	10			
3448	I	7			
3449	I	9			
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3451	B	13			
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3594	G	11			
3595	H	11			
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3597	H	12			
3W40	B	14			
4575	A	9			
4585	C	9			
4595	F	9			
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5575	A	9			
5585	D	9			
5595	G	9			
5W40	E	14			
6400	E	3			
6402	F	2			
6W40	H	14			
7400	E	2			
7400	B	7			
7400	E	7			
7400	H	7			
7410	F	3			
7420	G	2			
7425	B	8			
7426	B	8			
7427	B	9			
7435	E	8			
7436	F	8			
7437	F	9			
7445	H	8			



Platine decodeur teletexte



AQ

A

B

C

D

E

F

G

H

I

J

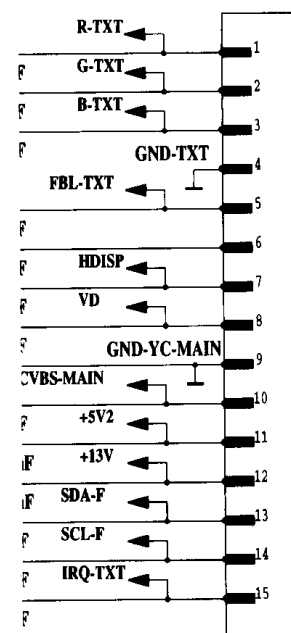
K

491
00E → R-TXT

493
00E → G-TXT

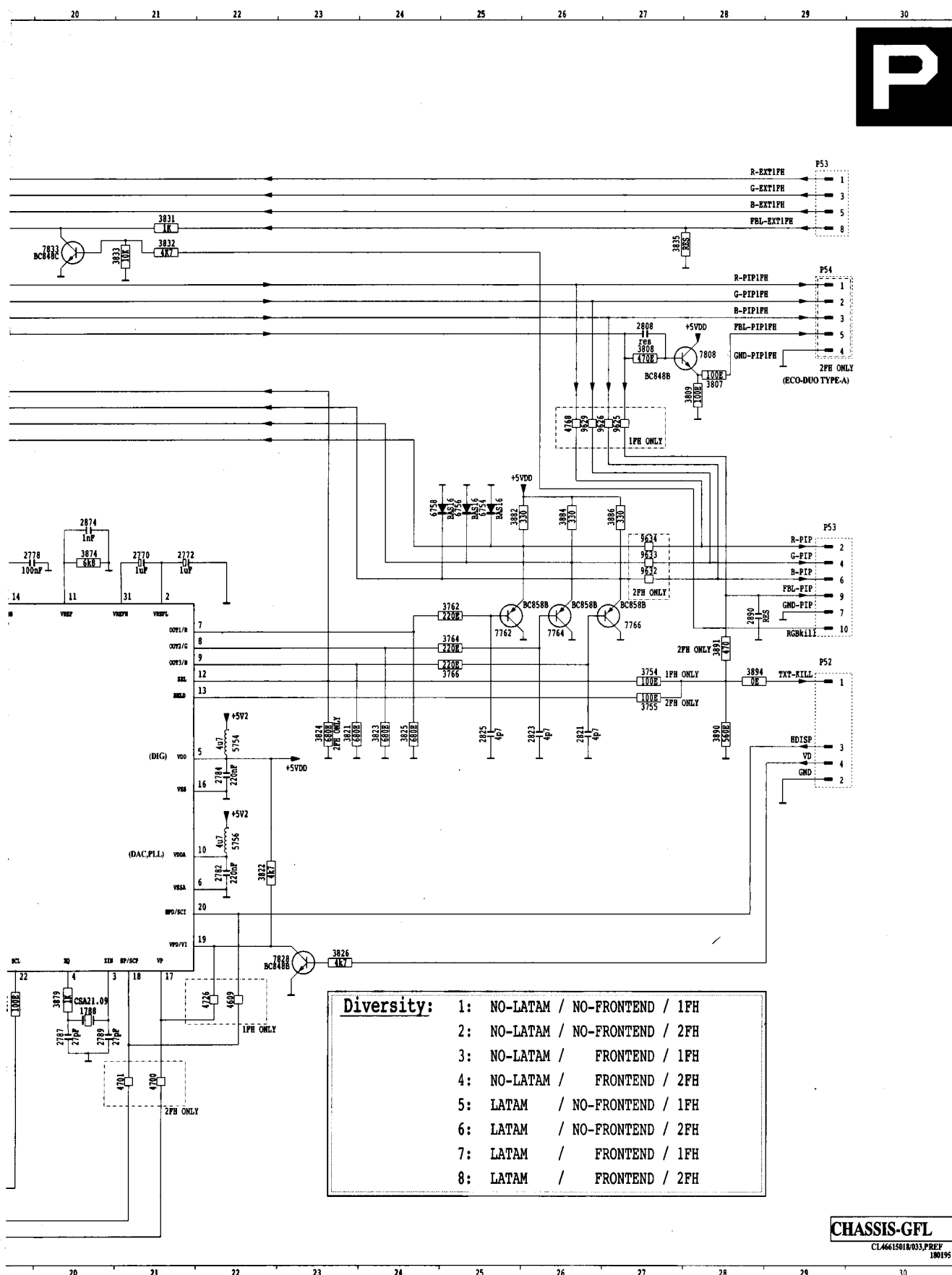
495
00E → B-TXT

AQ56



HASSIS-GFL

CL46615018/025,AQREF
110195

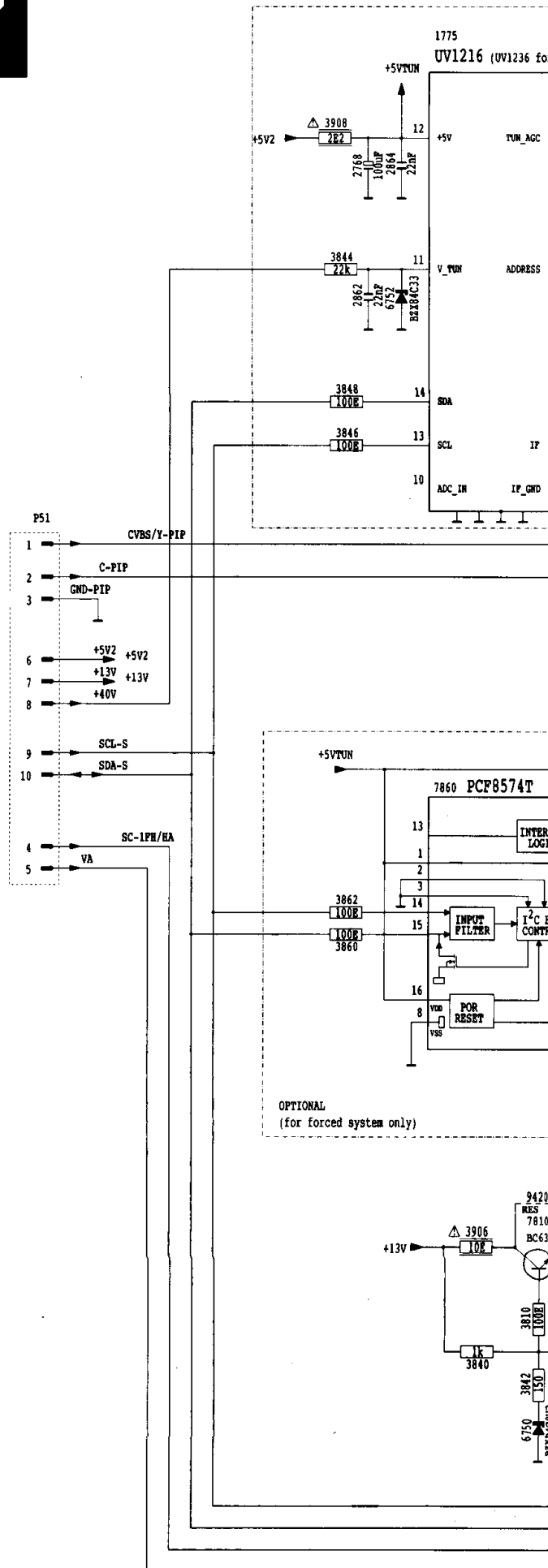


CHASSIS-GFL
CL46615018/033.PREF
180195

1750	K12	6813	B 7
1751	K13	6814	B 7
1752	K14	6815	B 7
1753	K15	6816	B 7
1754	K16	6817	B 7
1755	K17	6818	B 7
1756	K18	6819	B 7
1757	K19	6820	B 7
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1773	K35	6836	B 7
1774	K36	6837	B 7
1775	K37	6838	B 7
1776	K38	6839	B 7
1777	K39	6840	B 7
1778	K40	6841	B 7
1779	K41	6842	B 7
1780	K42	6843	B 7
1781	K43	6844	B 7
1782	K44	6845	B 7
1783	K45	6846	B 7
1784	K46	6847	B 7
1785	K47	6848	B 7
1786	K48	6849	B 7
1787	K49	6850	B 7
1788	K50	6851	B 7
1789	K51	6852	B 7
1790	K52	6853	B 7
1791	K53	6854	B 7
1792	K54	6855	B 7
1793	K55	6856	B 7
1794	K56	6857	B 7
1795	K57	6858	B 7
1796	K58	6859	B 7
1797	K59	6860	B 7
1798	K60	6861	B 7
1799	K61	6862	B 7
1800	K62	6863	B 7
1801	K63	6864	B 7
1802	K64	6865	B 7
1803	K65	6866	B 7
1804	K66	6867	B 7
1805	K67	6868	B 7
1806	K68	6869	B 7
1807	K69	6870	B 7
1808	K70	6871	B 7
1809	K71	6872	B 7
1810	K72	6873	B 7
1811	K73	6874	B 7
1812	K74	6875	B 7
1813	K75	6876	B 7
1814	K76	6877	B 7
1815	K77	6878	B 7
1816	K78	6879	B 7
1817	K79	6880	B 7
1818	K80	6881	B 7
1819	K81	6882	B 7
1820	K82	6883	B 7
1821	K83	6884	B 7
1822	K84	6885	B 7
1823	K85	6886	B 7
1824	K86	6887	B 7
1825	K87	6888	B 7
1826	K88	6889	B 7
1827	K89	6890	B 7
1828	K90	6891	B 7
1829	K91	6892	B 7
1830	K92	6893	B 7
1831	K93	6894	B 7
1832	K94	6895	B 7
1833	K95	6896	B 7
1834	K96	6897	B 7
1835	K97	6898	B 7
1836	K98	6899	B 7
1837	K99	6900	B 7
1838	K100	6901	B 7
1839	K101	6902	B 7
1840	K102	6903	B 7
1841	K103	6904	B 7
1842	K104	6905	B 7
1843	K105	6906	B 7
1844	K106	6907	B 7
1845	K107	6908	B 7
1846	K108	6909	B 7
1847	K109	6910	B 7
1848	K110	6911	B 7
1849	K111	6912	B 7
1850	K112	6913	B 7
1851	K113	6914	B 7
1852	K114	6915	B 7
1853	K115	6916	B 7
1854	K116	6917	B 7
1855	K117	6918	B 7
1856	K118	6919	B 7
1857	K119	6920	B 7
1858	K120	6921	B 7
1859	K121	6922	B 7
1860	K122	6923	B 7
1861	K123	6924	B 7
1862	K124	6925	B 7
1863	K125	6926	B 7
1864	K126	6927	B 7
1865	K127	6928	B 7
1866	K128	6929	B 7
1867	K129	6930	B 7
1868	K130	6931	B 7
1869	K131	6932	B 7
1870	K132	6933	B 7
1871	K133	6934	B 7
1872	K134	6935	B 7
1873	K135	6936	B 7
1874	K136	6937	B 7
1875	K137	6938	B 7
1876	K138	6939	B 7
1877	K139	6940	B 7
1878	K140	6941	B 7
1879	K141	6942	B 7
1880	K142	6943	B 7
1881	K143	6944	B 7
1882	K144	6945	B 7
1883	K145	6946	B 7
1884	K146	6947	B 7
1885	K147	6948	B 7
1886	K148	6949	B 7
1887	K149	6950	B 7
1888	K150	6951	B 7
1889	K151	6952	B 7
1890	K152	6953	B 7
1891	K153	6954	B 7
1892	K154	6955	B 7
1893	K155	6956	B 7
1894	K156	6957	B 7
1895	K157	6958	B 7
1896	K158	6959	B 7
1897	K159	6960	B 7
1898	K160	6961	B 7
1899	K161	6962	B 7
1900	K162	6963	B 7



PIP PANEL



7. Electrical adjustments

Adjustment conditions

All electrical adjustments should be performed under the following conditions:

- Power supply voltage: 220-240V $\pm$ 10% 50-60 Hz $\pm$ 5%
- Warm-up time $\sim$ 10 minutes
- The voltages and oscillograms are measured in relation to tuner earth. Never use the heat sinks as earth.
- Test probe: $R_i > 10 \text{ M}\Omega$; $C_i \leq 20 \text{ pF}$.

1. Adjustments on the large signal panel

1.1 +141V power supply voltage

Connect a voltmeter to L5316.

With the aid of R3187 adjust the power supply voltage on the FFS DRIVE CIRCUIT to +141V $\pm$ 0.5V.

1.2 +5V2 power supply voltage

Connect a voltmeter to pin 1 of L13.

With the aid of R3120 adjust the voltage to 5.2V $\pm$ 50mV.

1.3 Focusing

This is adjusted with the focus potentiometer (uppermost on the line transformer).

1.4 Vg2 adjustment

Switch on the Vg2 test pattern via the Service Alignment Menu (see 7.3).

With the aid of a DC voltmeter ($R_i > 1 \text{ M}\Omega$) measure the DC voltages on pin 9 of the RGB output amplifiers IC7230, IC7240 and IC7250 on the picture tube panel. Find the highest of the three voltages and with the aid of the Vg2 (SCREEN) potentiometer on the line output transformer adjust it to 158V $\pm$ 2V.

1.5 Horizontal centring (DC-offset)

Switch on the geometry test pattern via the Service Alignment Menu (See 7.5).

(For this purpose select in sequence: Alignments, Geometry, Test pattern on, picture width).

Using R3442 adjust the picture in such a manner that the test pattern appears in the middle of the picture tube.

Remarks:

The 'Horizontal Shift' adjustment in the Service Alignment Menu **cannot** be adjusted with the internal test pattern. An external test pattern from a generator or an aerial must be used for this purpose.

2. CVBS level adjustment on the small signal panel

Feed a CVBS colour bar signal with an amplitude of 700mV (between black and white level) to pin 20 of EXT1 and select the display from EXT1.

Using R3161 on the SSP [S5] adjust the amplitude of the signal on pin 8 of IC7500 (TDA4780) on the SSP [S6] to 325mV (between black and white level).

3. Adjustment North-South correction on 4:3 SF picture tubes

With the aid of R3461 on the N/S panel [AP] adjust the North-South geometry until this is optimum.

4. Adjustment of the PIP module [P]

This adjustment is only applicable to PIP modules equipped with a tuner.

Introduction

The AGC adjustment prevents the PIP tuner from being overdriven by a strong aerial signal. Overdriving is visible as a loss of colour and synchronisation in the PIP picture. The amplification must be adjusted to minimum level, but the signal should be as free from noise as possible. At maximum amplification R3912 is fully left, on minimum amplification R3912 is fully right.

Adjustment

Feed in a (strong) aerial signal of 4mV (72dB μ V).

Turn R3912 fully right (minimum amplification). Turn R3912 slowly left until the noise no longer decreases.

If an aerial signal is not available as a compromise adjust R3912 to 30% of the total adjustment range (100% is maximum adjustment, fully left).

5. Adjustments in the service alignment menu

Activate by:

- briefly short circuiting the service pins 'ALIGNMENT MODE' on the SSP;

or:

- pressing the ALIGN key on the Dealer Service Tool (DST) (RC7150), followed by entering the password 3140 and pressing the 'OK' key.

The Service Menu will now appear on the screen.

This displays the following information:

- 1 The software date ('Date') and version ('Ver.') of the ROM.
- 2 The total number of operation hours ('Operation Hours')
- 3 The contents of the error buffer ('Errors').
The most recent error is at the top, immediately following the 'ERRORS' indication.
- 4 The module that generated the error ('Defect. Module').
(If there are more errors in the buffer not caused by one individual module there is probably another error. The message 'UNKNOWN' is then displayed here).
- 5 Menu item 'Reset Error Buffer'. The error buffer can be erased via the key.
- 6 Menu item 'Functional Test'. All devices are tested via the key. Eventual errors are displayed at the error buffer location. (The error buffer is not erased; the contents return when the Functional Test is closed).
- 7 Menu item 'Alignments'. This enables the Alignments sub menu to be called up.

The following adjustments can be selected:

- 'General': Adjustment of 'White Drive', 'Cut-off', 'Soft clipper', 'Peak White Limiter', 'PIP brightness', 'Input level stereo decoder', 'Stereo channel separation'.
- 'Normal Geometry': General geometry adjustments.

- 'Super wide geometry': Geometry adjustments of the 'Panorama' position in 16:9 sets (not for other positions).
- 'Options': Setting of the initialisation codes in the set via text.
- 'Option number': All options together, expressed in two long numbers. The original factory settings of these numbers can be found on a picture tube sticker inside the set.
- 'Store': Preserving all adjustments.

The adjustments

General:

- After all adjustments have been completed the item 'STORE' must be selected to store all values in the permanent memory.
- When the option codes have been modified and stored the set should be switched off and on again with the mains switch in order to activate the new adjustments. (When switching off and on via stand-by the option code settings are NOT read in by the microprocessor).
- If an empty EAROM (permanent memory) is detected all options receive the pre-programmed standard values.
- In various menus a built-in test pattern can be called up. The test pattern generator can be activated with the item 'TEST PATTERN ON/OFF'. The test pattern only appears following the selection of the specific adjustment. The test patterns are generated by the teletext module.

5.1 Picture tube adjustments

White Drive

Before adjusting turn off DNR and 'Contrast Plus'. Use the internal test pattern (a white picture). Adjust the white level for the three adjustments 'WARM', 'NORMAL' and 'COOL'. Begin in the 'NORMAL' position and take the standard value for green (value 32) as a basis, and then adjust red and blue.

The factory settings of the colour temperatures are:

	<i>Europe</i>	<i>Hong Kong</i>
'Warm'	7200K	7200K
'Normal'	8700K	9500K
'Cool'	10200K	12000K

In case no colour analyzer is available the following values can be maintained for 'White Drive':

	<i>Cool</i>	<i>Normal</i>	<i>Warm</i>
R	25	26	28
G	26	26	25
B	18	16	13

Cut-off

Before adjusting turn off DNR and 'Contrast Plus', set the brightness adjustment to step 37 (brightness:

) , and contrast to maximum.

Use the internal test pattern (a black picture).

Use a Minolta CA-100 colour analyzer and adjust the light output for the adjustments 'COOL', 'NORMAL' and 'WARM' to 3 NIT with the colour temperatures below:

	<i>Europe</i>	<i>Hong Kong</i>
'Warm'	7200K	7200K
'Normal'	8700K	9500K
'Cool'	10200K	12000K

In case no colour analyzer is available the following values can be maintained for 'Cut-off':

	<i>Cool</i>	<i>Normal</i>	<i>Warm</i>
R	23	24	29
G	20	20	20
B	27	20	14

Soft-clipper

Use a black picture with a small white square in the middle as a test pattern. Adjust contrast to maximum. Adjust 'Peak White Limiter' temporarily to 63. Using a colour analyzer measure at the middle of the white square and with the aid of 'Peak White Limiter' adjust the light output as follows:

29"SF : 520 NIT
32" : 320 NIT
28"WS : 680 NIT

In case no colour analyzer is available the following values can be maintained for 'Soft Clipper':

29"SF : 'Soft Clipper' = 49

Peak White Limiter

Use a black picture with a small white square in the middle as a test pattern. Adjust contrast to maximum. Adjust 'Soft Clipper' temporarily to 63.

Using a colour analyzer measure at the middle of the white square and with the aid of 'Peak White Limiter' adjust the light output as follows:

29"SF : 520 NIT
32" : 320 NIT
28"WS : 780 NIT

In case no colour analyzer is available the following values can be maintained for 'Peak White Limiter':

29"SF : 'Peak White Limiter' = 22

5.2 Small signal adjustments

PIP brightness

Adjust PIP brightness in such a manner that the brightness of the PIP picture is the same as the main picture.

Stereo decoder input level

Feed in an aerial signal with a PAL BG signal and tune the set.

Select audio mode DUAL and modulate both audio channels with a 1kHz signal with equal amplitude. Adjust 'Input Level Stereo Decoder' to equal sound volume levels for language selections I and II.

Stereo channel separation

Feed in an aerial signal with a PAL BG signal and tune the set.

Select audio mode STEREO and modulate the left channel with a 1kHz signal, and the right channel with no signal. Switch off the left loudspeaker or adjust the audio balance fully right. Adjust 'Stereo Channel Separation' to minimum sound reproduction from the right loudspeaker.

5.3 Geometry adjustments

Normal Geometry

1. Vertical amplitude and centring
 - 1a. Select 'Test Pattern on'.
With the aid of 'V amplitude' adjust the vertical amplitude so that the test pattern is fully visible.
 - 1b. With the aid of 'V shift' adjust the vertical centring so that the test pattern is positioned vertically in the middle.
Repeat the adjustment of 'V amplitude'.
2. Vertical linearity
Select 'Test Pattern on'.
With the aid of 'V linearity' adjust the vertical linearity so that the picture has equal amplitude at both the top and the bottom.
3. Vertical S correction
Select 'Test Pattern on'.
With the aid of 'V S-correction' adjust the vertical S correction so that the vertical amplitude at the top of the picture is equal to the amplitude in the middle of the picture.
4. Horizontal centring and amplitude
 - 4a. Select 'Test Pattern on'.
With the aid of 'H-amplitude' adjust the horizontal amplitude so that the entire test pattern is visible.
 - 4b. Feed in an external test signal.
With the aid of 'H-shift' adjust the picture horizontally to the middle.
Repeat 4a if necessary.
5. East/West adjustment
Select 'Test Pattern on'.
 - 5a. With the aid of 'East/West parabola' adjust the vertical lines until straight.
 - 5b. With the aid of 'East/West corner' adjust the vertical lines in the corner until straight.
 - 5c. With the aid of 'East/West trapezium' adjust the picture until rectangular.
 - 5d. If necessary select 'East/West top compensation' and adjust it.
Repeat 5a to 5c if necessary.

Super wide geometry

Only applicable to 16:9 sets

1. Vertical amplitude and centring
 - 1a. Select 'Test Pattern on'.
With the aid of 'V amplitude' adjust the vertical amplitude so that the test pattern is fully visible.
 - 1b. With the aid of 'V shift' adjust the vertical centring so that the test pattern is positioned vertically in the middle.
Repeat the adjustment of 'V amplitude'.
2. Horizontal amplitude
Select 'Test Pattern on'.
With the aid of 'H-amplitude' adjust the horizontal amplitude so that the entire test pattern is visible.
3. S correction
Select 'Test Pattern on'.
With the aid of 'S-correction' adjust the S correction so that the vertical amplitude at the top of the picture is equal to the amplitude in the middle of the picture.

4. East/West parabola
Select 'Test Pattern on'.
With the aid of 'East/West parabola' adjust the vertical lines until straight.
5. Horizontal centring and amplitude
Feed in an external test signal.
With the aid of 'H-shift' adjust the picture horizontally to the middle.

5.4 Options

Introduction

The microprocessor communicates with a great number of IC's in the set. For good communication, and to make digital diagnosis possible, the microprocessor has to know which IC's have to be addressed. The presence of specific IC's or functions is made known with the aid of the option codes. Only correctly set option codes ensure a correctly functioning set, and the correct error message in case of a defect.

The options are divided into different groups. These groups contain the various options for which multiple choices are usually possible.

An overview follows below:
(See table)

5.5 Option number

IF the EARM has to be replaced all the options have to be set again. In order to be certain that the factory settings can be reproduced exactly the HW Opt No (Hardware option number) and the SW Opt No (software option number) have to be set. These numbers can be found on a sticker on the picture tube.

TV Systems	Tuner Type	FQ916(D)MF FQ916MR FV916MG FQ916MD FQ936D FS988 Chinese Tuner FQ944D	Select tuner type (type number is on the tuner)
Stereo Decoder	Nicam Type	Not Available BG or I BG and I Eco Nicam	No Nicam Nicam with 2 IC's and 1 input filter Nicam with 2 IC's and 2 input filters Nicam with 1 IC
	2 CS	Yes No	TDA9840 present on SSP TDA9840 not present on SSP
	Global	Yes No	Global sound decoder present Global sound decoder not present
Satellite	Sat. Mod. Available	Yes No	Satellite module present Satellite module not present
	Pulse Magnetic	Yes No	Polarizer panel present Polarizer panel not present
PIP	PIP Available	Yes No	PIP module present PIP module not present
	PIP Version	Euro Latam Japan	European PIP module South American PIP module (reserved) Japanese PIP module (reserved)
	PIP Tuner Type	Not Available Euro Latam Japan	no PIP tuner European PIP tuner South American PIP tuner (reserved) Japanese PIP tuner (reserved)
	PIP Processor	PIP1 PIP2	PIP with TDA4650 (no longer used) PIP with TDA8310
	Triple PIP	Yes No	(reserved)
	Forced Colour	Yes No	For PIP 1 yes For PIP 2 yes, if PCF8574 is present
Teletext	TXT	mem-128 mem-512 mem-1M	128 kB teletext memory 512 kB teletext memory (1x514256) 1 MB teletext memory (2x514256)
Communication	D2B	Yes No	D2B connector present D2B connector not present
	ESI	Yes No	reserved
	EACAM	Yes No	reserved
	Project 50	Yes No	reserved
Video	Frame	Digital Scan 100/120 Hz 50/60 Hz	Feature box present Eco feature box present No feature box present
	Combfilter	Not Present SAA4961 MC 141625	No Comb filter present Comb filter with SAA4961 Comb filter with MC 141625
	Scavem	No Yes	SCAVEM without TDA8444 SCAVEM with TDA8444
Source Selection	SS Type	Euro AV1 Euro AV2 Euro AV3 Cinch AV1	Fully populated double-sided EURO I/O panel (EURO) Semi populated double-sided EURO I/O panel (ECO) Single-sided EURO I/O panel CINCH I/O panel
	Euro AV3	None Normal	No 3rd EURO connector (only with EURO I/O) 3rd EURO connector present
	Euro AV4	None Normal	No 4th EURO connector (only with EURO I/O) 4th EURO connector present
	Euro AV	No Yes	No EURO connector (only with CINCH I/O) EURO connector present
CRT Type	4:3 16:9		4:3 picture tube 16:9 picture tube
Audio Repro	Basic Equalizer Eq. + Dolby		TDA9860 present on SSP AFU panel without Dolby AFU panel with Dolby
Digital Output	No Yes		no digital output present digital output present (NICAM also present)

8. Circuit description

8.1 Introduction

The GFL chassis is based on a Large Signal and a Small Signal panel. These panels are called LSP and SSP. The SSP contains the front-end which is a combination of tuner with IF circuit, the micro processor, the audio/video small signal processing and synchronisation part. The Teletext functions will also be on the SSP in future, but for now it is placed at a small separate panel for the introduction of the chassis. The SSP is based on a double sided printed wiring board with metallized holes and small SMD (surface mount device) components at the underside of the board. The LSP contains the power supply, line and frame output stages and the Digital Deflection Processor to control the geometry of the picture. The LSP is based on a robust printed wiring board without SMD components. The deflection processor and the power supply control circuit are placed on vertical panels on the LSP. The audio amplifiers are placed on a separate board.

8.2 The three power supplies

The GFL chassis contains three power supplies:

- the stand-by supply or also called ELPS;
- the main supply or also called FFS;
- the auxiliary supply or also called AUX1.

8.2.1 The stand by supply ELPS [AU]

The stand-by supply is placed vertically in a bracket together with the mains filter at the right hand side of the chassis. This supply delivers the +5.2 volt supply for the micro-processor and some parts of the I/O panel during stand-by and normal operation. In order to limit power to a maximum of 5 watts in stand-by the two power supplies (FFS and AUX1) are switched off. The stand-by voltage (+5V2) is provided by a separate power supply that delivers the +5V2 both during normal operation and in stand-by. The stand-by power supply is built up around S5145. The secondary voltage of S5145 is rectified by D6141, D6146, D6147 and D6148, and smoothed by C2138 and C2141. Stabilisation is performed by T7135, which is located on the LSP. D6134 provides a voltage increase of 0.2V, so that the stabilised voltage is 5V2.

8.2.2 The main supply (FFS) [L2] (Fig. 8.1)

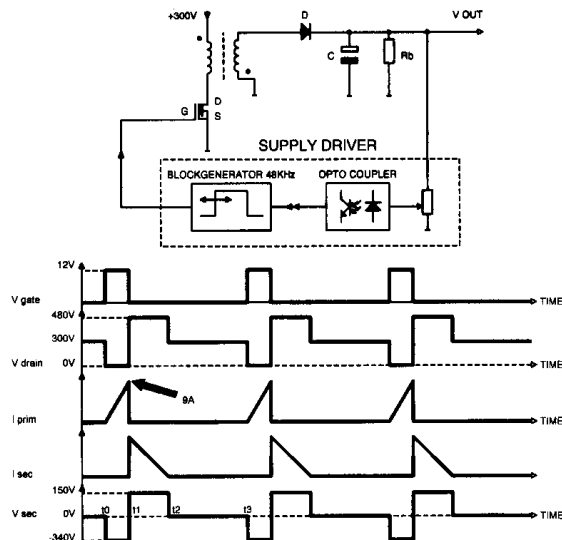


Fig. 8.1

The FFS (Fixed Frequency Supply) is a mains isolated switched power supply. The operational frequency is 40KHz and stabilisation is achieved by adjusting the duty cycle. The feedback of the output voltage is performed through an opto-coupler. The control and stabilisation circuits are located on the FFS-drive panel, which makes service simpler. The FFS can be switched to stand-by by the micro processor after the stand-by command is given or in a situation that the protection mode has to be activated. The power supply is short-circuit resistant and protected against overvoltage and overcurrent.

The FFS provides the following power supply voltages:

- +19V / -19V sound.
- +141V.
- +25V (SAT only).

Principle of the FFS power supply

At t_0 a positive voltage arrives on the gate of the switching FET 7111. This starts conducting and 300V is fed to the primary transformer coil, causing a linearly increasing current. The maximum current depends on the time the FET conducts. This conduct duration is regulated by IC 7150 on the FFS drive panel [N]. The duty cycle regulator is controlled via an opto-coupler by part of the output voltage. On t_1 the FET gate becomes negative, this blocks and the DRAIN current increases. The secondary voltage becomes positive, the rectifier diodes start conducting and a current starts flowing through the load. All the energy that was stored in the transformer during t_0-t_1 is now supplied to the load. During the time the energy is supplied to the load, the voltage on the primary side, at the drain of the FET, increases up to 480 volts. At t_2 the current through the secondary coil becomes zero. The secondary voltage is now also zero, causing the FET drain voltage to drop to 300V. If the FET is made to conduct once more, the cycle starts again.

Pulses on FFS transformer T5125 (Fig. 8.2)

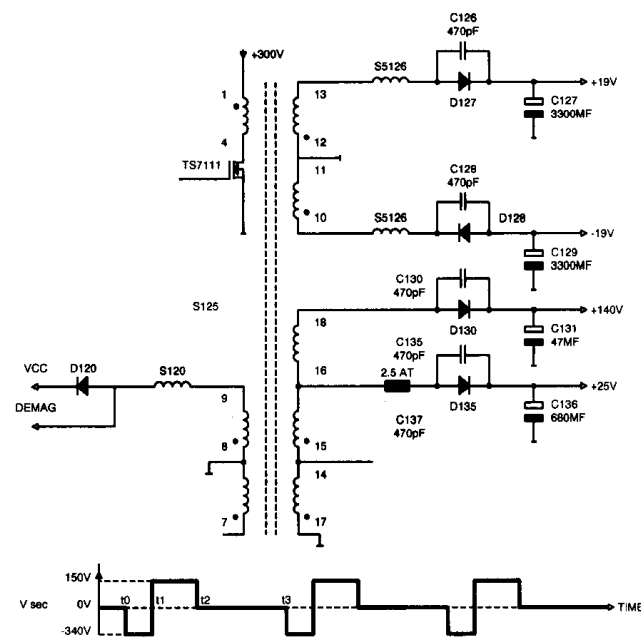


Fig. 8.2

During the time t_0-t_1 TS7111 becomes saturated. There is 300V over the primary coil. If the mains voltage increases or drops by 10% all secondary voltages will also increase or drop by 10% during this period:

- pin 13, pin 14, pin 16, pin 18 and pin 9 are negative so that diodes D6127, D6130, D6135, D6137 and D6120 block.
- pin 10 is positive so that D6128 blocks.

During the time t1-t2 TS7111 blocks. The voltage on C2131 is stabilised at 140V. All voltages have a fixed relation to this +140V and therefore constant. On overload the +140V therefore also drops with all secondary voltages.

- pin 13, pin 14, pin 16, pin 18 and pin 9 are positive so that the diodes D6127, D6130, D6135, D6137 and D6120 conduct. The capacitors are also charged.
- pin 10 is negative so that D6128 conducts.

The secondary side of the FFS drive circuit is supplied by the +5V ST-BY from the stand-by supply. Pin 9 of the FFS transformer supplies the power supply current for the primary side of FFS drive circuit.

The oscillator

The control of the FFS is done by the MC44603 IC at position 7150 on the FFS drive panel. The oscillator generates a saw-tooth pulse (pin 10, 7150), the frequency is set to 48KHz by C2166 and R3177.

Slow start and maximum duty cycle

The starting voltage for the IC is supplied through R3101/3103 and C2101. Once started, the primary coil of the transformer (pin 9) supplies the power supply current to the IC via S5120 and D6120. At start the power supply output voltage is still 0V, through which the FFS would start with max. duty cycle, which would result in a too high peak current through the switching FET.

To prevent this, C2170 on the FFS drive panel charges slowly after start up. The voltage on pin 11 therefore, increases slowly. As a result the power supply begins with a small duty cycle, avoiding the switching FET to become damaged. This is called the slow start.

The voltage on pin 11 determines the maximum duty cycle and is selected by an external resistor R3170.

Stabilisation

Stabilisation is performed on the 141V so that all secondary voltages are also stabilised, but derived from the 141V. With R3187 on the FFS drive panel the output voltage of 141 volt can be adjusted. The 141V is fed to parallel stabiliser IC7185 via a voltage divider. This is a zener IC (TL431) which current from the cathode (K) to the anode (A) is determined by the voltage on the regulation input (R). This voltage is compared internally with a 2.5 volts internal voltage source. If the voltage on the R input exceeds the 2.5 Volts, the current through the TL431 will increase, causing an increasing current through the opto-coupler. An increasing current through the opto-coupler results in an increasing voltage on pin 14 of the FFS control IC. The larger the voltage on pin 14 the smaller the duty cycle of the output to the switching FET. The smaller duty cycle causes at last a smaller FFS output voltage until the voltage on the R input of the TL431 becomes 2.5 volts again.

If the voltage on pin 14 of IC7150 increases, this results in a drop of the voltage on pin 13, as pin 14 is the inverting input of an op-amp and pin 13 the output. R3173 and C2173 determine the gain of the op-amp. The dropping voltage is compared to the current sense input via a comparator. The comparator output generates an earlier reset of the RS flip-flop so that the FET conducting time is shortened and that the output voltage drops to its set value.

Stand-by and DC protection

After the DC protection line is activated on the FFS drive panel, T7190 conducts and a large current flows through the opto-coupler. This means that the power supply voltage is adjusted back to 0V. This DC prot line can be activated by the stand-by command from the micro processor or from the protection circuit on the audio power amplifier.

Overcurrent protection

The voltage over R3124/3125/3126 is a measure for the current flowing through the primary side of FFS transformer 5125. That voltage is fed to the current sense input pin 7 of IC7150. The maximum current is limited internally in the IC. The max. current through the primary side is 9A.

In case the load of the power supply is increased further, the output voltage will drop. In order to limit dissipation during overload the foldback circuit is activated.

Foldback circuit

In case the load increases to a level the primary current should exceed 9A, the output voltage will drop. This voltage drop will affect the supply of the IC (pin 5 of IC7150) as the IC is supplied via pin 9 of the T5125, D6120, D6157, R3157 and R3158. In case the voltage drops below 1V the maximum current threshold is adjusted automatically.

A reduced primary current also means that the power supply delivers less output current. This causes an avalanche effect so that the power supply is quickly adjusted back.

Overvoltage protection

If the voltage on pin 6 of the IC becomes larger than 2.5V the power supply stops. Then voltage drops out and the power supply will restart, which can cause the voltage become larger than 2.5V again, the supply stops etc, so-called hiccupping or motorboating. The condition arises when the feedback loop is interrupted.

Demagnetisation

In order to avoid TS7111 from being switched on too soon, information is offered to pin 8 of IC7150 that originates from pin 9 of T5125 via S5120 and R3150. As long as this voltage is larger than 65mV TS7111 is prevented from conducting.

The output

Pin 3 of IC7150 controls the switching transistor (MOSFET). Pin 3 has a low output resistance, which benefits the switching speed.

Stand-by

If the power supply only has to supply low power (e.g. stand-by) this is measured via pin 12 of IC7150. The duty cycle becomes smaller and the power supply switches over to a lower oscillator frequency, namely 20kHz. In stand-by the FFS is switched off completely. The FFS is adjusted back fully via TS7190, resulting in the 141V output becoming 0V. The oscillator then also operates at 20kHz.

Switch-off voltage of the FET

The MOSFET switch in the FFS power supply is resistant to a Drain-Source voltage of max. 650V. Due to the short switch-off time, that voltage is actually $\pm 700V$. To protect the switching FET an extra loop has been added. Via D6102, D6103, R3102 and C2102 the switch-off voltage is limited to approximately 600V.

DV/DT limiter

Rapid voltage changes on the FET drain cause interference in the picture (Spook). When the FET is switched off, an extremely steep flank is generated. The steepness is limited by C2110 and D6110.

8.2.3 The auxiliary supply AUX1 [L2]

The AUX1 power supply is a DC/DC-converter that converts the 141V from the FFS to a number of DC voltages necessary to supply all small signal devices and the deflection processor:

- +13V
- +8V6
- +5V2
- -8V6 (for SAT sets only)

These AUX1 voltages are zero in stand-by mode. The AUX1 supply is placed on the LSP on the left hand side from the FFS.

Principal

The AUX1 supply (DC/DC converter) applied in the GFL is based on the Current Mode Controller principle; Regulation occurs through the measurement of a secondary voltage and a primary current. Depending on the voltages measured the switching transistor is driven for a longer or shorter period, resulting in a higher or lower primary voltage.

Pulses on transformer 5230

During the period t_0 - t_1 the switching FET TS7228 becomes saturated. 141V is present over the primary side of the transformer.

- pin 9 and pin 7 are negative so that the diodes 6234 and 6237 block.
- pin 2 is positive so that 6242 blocks.

During the period t_1 - t_2 TS7228 blocks. The voltage on pin 7 is stabilised at +5,2V, and the voltage on pin 9 at +13V.

The regulator IC7203 UC3842

The power supply voltage is connected to pin 7, this voltage must exceed 16V to start-up the IC (this may not drop below 10V during operation).

The oscillator

The IC contains an internal oscillator whose frequency and duty cycle is set by resistor R3216 and a capacitor C2216, connected to pin 8 and pin 4.

Stabilisation

By increasing the load on a secondary voltage, all secondary voltages will drop, resulting in a voltage drop on pin 2 of IC7203. This causes a delay in the MOSFET switch-off time. More energy is stored in the transformer while the MOSFET conducts longer, causing an increase in the secondary voltage.

Overload

During overload the secondary voltages drop rapidly, resulting in a strong drop of the voltage at pin 2. The regulating limit is reached internally, resulting that the maximum power is also being limited.

Short circuit

After short circuiting the power supply all secondary voltages drop, resulting in the supply voltage on pin 7 drops below 10V. Now the IC output is blocked and the MOSFET is no longer driven. Through the RC operation R3220 and C2221 the voltage on pin 7 slowly increases because the FFS 141V supply is still present. If the voltage on pin 7 becomes higher than 16V the IC restarts. If the voltage on pin 7 drops below 10V it will switch off once again.

The circuit

- The start circuit is formed by R3220 and C2221. On starting C2221 is charged via R3220. After start-up the supply is taken over by the AUX1 transformer via pin 9 and D6221.
- The external oscillator frequency is set by R3216 and C2216, the frequency is approximately 70kHz.
- Stabilisation occurs via the +13V and the +5V2 output voltages which are both fed back to pin 2 of the control IC. Voltage changes on the +5V2 are stabilised faster than those on the +13V. Adjustment of the +5V2 is performed through R3210.
- Current measurement is performed by R3231, which voltage is fed back to pin 3.
- To switch the power supply to stand-by TS7201 has been added. In stand-by TS7201 conducts, resulting in the -output of the 2nd internal op-amp of the control IC being connected to earth and causing the smallest of voltages across R3228 to switch off the switching transistor TS7228. All secondary voltages are now absent.

Video recognition

When CVBS is present at the front-end output this is reported to the microprocessor via the circuit built up around TS7311 and TS7312 on the SSP. This information is used to suppress the sound if there is no picture.

The emitter of TS7311 is set so that this transistor only blocks during the sync pulse. The collector then becomes high so that positive sync pulses are available. The circuit with C2314, D6312, D6311, R3315 and C2315 detects the pulses, TS7312 conducts and the video recognition becomes high (STR-FE). With noise the average voltage on the CVBS output of the FE is higher than with a video signal. TS7311 conducts continuously and there are no pulses on the collector. TS7312 blocks and the video recognition becomes low.

8.6 The source selection [I]

Just behind the backcover the source select panel is mounted. On this panel the complete source and record selection is done for all signal sources. This panel is also called 'I/O panel'. For Europe there are two versions available: the ECO and the EURO version. For Asian countries we have the Cinch version. The European versions have three 'EURO-AV' or also called 'SCART' connectors. The Cinch version has a large number of cinch connectors. The EURO version has some extra source selection circuitry to be used when the set has a built in satellite mode.

In the ECO version the most important characteristics are:

SCART 1 (VCR or UP-Down)

- no RGB-input
- CVBS and L/R-input
- SVHS in and SVHS out
- all outputs Record Select
- an Up-Down function: the microprocessor selects a priority if multiple signals are connected.

SCART 2 AUX

- RGB-input
- CVBS and L/R-input
- CVBS and L/R-output from front-end

SCART 3 HD

- CVBS and L/R input

Front

- S-VHS and L/R-input

A cinch L,R output that can be switched between constant level and variable level

The EURO Input-Output panel is the most comprehensive and is only applied in sets with a built in satellite module.

In addition to the ECO version, the EURO version has:

- SCART 1: RGB-input
- SCART 3: RGB (100Hz) with V-sync and H-sync
- D2B bus for a smart card reader
- A cinch plug (ESI) with control signals for an audio installation

The video path of the EURO-I/O

To switch all video signals use is made of 2 identical IC's, the TEA6425, which are connected in parallel.

The input signals on one selector are:

- CVBS Tuner
- Y/CVBS Euroconnector 1
- C Euroconnector 1
- CVBS Euroconnector 1
- Y/CVBS Front input
- C Front input

The input signals on the other selector are:

- BB/CVBS Euroconnector 3
- Video Satellite module

The following output signals are available:

- Y/CVBS main picture
- C main picture
- Y/CVBS PIP
- C PIP
- BB/CVBS Euroconnector 3 out
- Y/CVBS Euroconnector 1 out
- C Euroconnector 1 out

The TEA 6425 has an internal Y-C adding circuit to make a CVBS output signal from YC (S-VHS)

Video path ECO-I/O

The ECO I/O panel has less input signals, with the video matrix limited to 1 IC as a result, the TEA6417.

The input signals are the same as those of the first selector of the EURO I/O but:

- The TEA6417 has no internal Y-C adding circuit, so that this is done externally and fed to an extra CVBS (Y+C) input.
- CVBS euroconnector 3 in.

Output signals are the same as those of the selectors of the EURO I/O but:

- BB/CVBS Euroconnector 3 out is not present.

Sound path EURO-I/O

Use is made of the TEA6430 to switch all sound sources. Two switching IC's are applied in the Euro version, one in the ECO version.

Input signals switch 1

- L/R Front-end
- L/R Front input
- L/R Euroconnector 1
- L/R Euroconnector 2
- L/R Euroconnector 3

Input signals switch 2 (not for the ECO version)

- L/R Front-end
- I/II Front-end
- L/R SAT module

8.4 The control part [S8]

The control part of the GFL chassis consists of a micro processor, a 512k ROM with the operating software, 32k RAM as working memory and a 2k bytes non volatile memory to store all preset data and customer settings.

The micro processor of the GFL chassis is placed on the bottom side of the SSP and communicates with all devices via several I/O ports and three I²C serial busses.

Input signals come from:

- RC5 control;
- Local control;
- Status of IC's and modules via I²C;
- Direct input from certain circuits;
- Interrupt lines such as stand-by, TXT...

The micro processor, ROM, RAM and EAROM

Operating control is built up around a 16-bit microprocessor with an internal interface for ROM, RAM and direct input and output ports. Speedy interruption of the program can be achieved via the interrupt lines.

There are three I²C busses:

- The "SLOW" has a clock frequency of 100KHz;
- The "FAST" operates at 400KHz and is used to communicate to the Teletext processor only;
- The third bus is only used for the EAROM (Non Volatile Memory).

The software is located in the 512 kByte ROM, IC7202. In the future a 1 Mbyte ROM can also be used. If the output enable line on pin 24 is low 8 data bits are placed on the data bus.

The working memory consists of a 32 kByte RAM, IC7206. The 8 data bits are read out if pin 20 is low. If pin 27 is low the RAM can be written to. All temporarily changes to parameters in a set in operation are stored in this RAM. The contents are lost when the set is switched off.

The Non Volatile Memory, IC7212, contains the pre-programming of the transmitters, option codes, sound and picture adjustments, etc. The EAROM used has a capacity of 2 kByte (16 kB).

EAROM start-up protection

When the power supply voltage rises the POR (Power On Reset) becomes high making TS7214 on the SSP conduct and TS7215 block. TS7216 and TS7217 conduct. This causes both the EAROM power supply and clock (SCL) to be kept low. When the POR becomes low TS7214 blocks resulting in C2213 being charged via R3214 and R3212. At C2213 the test point S01 is coupled on which the presence of the POR pulse can be seen. Charging of C2213 provides a delay of 100 msec of the POR pulse, following which TS7215 conducts and POR 1 becomes low.

The microprocessor now starts up and TS7216 stops conducting so that the SCL line becomes active. Due to C2214 discharging, TS7217 blocks a little later, following which the EAROM power supply current is also present.

If the power supply voltage is too low the POR will become high again, resulting in POR 1 also becoming high. The SCL line and the power supply for the memory IC are interrupted once again.

8.5 The receiving part [S1]

In the GFL chassis the Tuner and the IF section are combined in one small box, the so called Front-end. This Front-end is placed on the SSP. To simplify removing of the Front-end from the SSP the holes in the SSP are extra wide. There are different types of Front-ends for different regions, and there are some types with a built in splitter if the set has an extra tuner for PiP. The Front-end is adjusted in the factory and will therefore be adjustment-free afterwards. The outputs of the Front-end are the CVBS baseband video signal, the LF audio signals to be fed to the stereo decoder and the IF signals for NICAM stereo decoding.

The following five types of front ends are used in the GFL chassis:

- FQ 916 ME/PH MK2 BG/L/M or European Multi
 - FQ 916 MF/PH MK2 BG/L/L/I or French Multi
- Sets for countries with BG-systems only, make use of the European multi front-end.
UK sets (PAL I) make use of the French multi front-end.

For both types of front-ends, there is a model with a built-in splitter:

- FQ 916 DME/PH MK2 BG/L/M
- FQ 916 DMF/PH MK2 BG/L/L/I

For sets with DK-system there is the version:

- FQ 916 MR/PH BG/DK/M.

There is no model with splitter in this type.

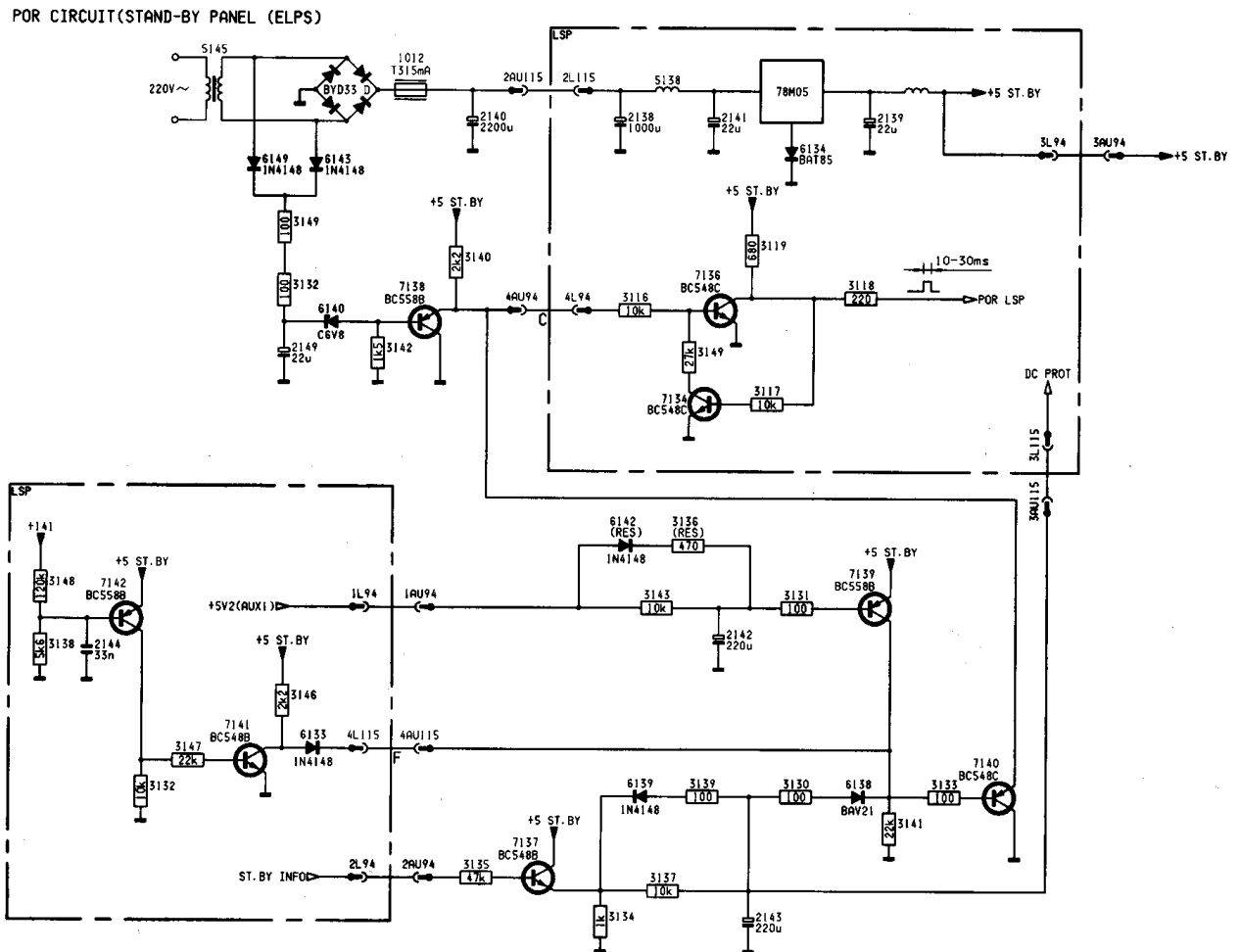
The following abbreviations are used in the front-end types:

- PH = PHono antenna connection (cinch input).
- D = Version with built in splitter
- MK2 = 2nd generation FQ916

The tuner section of the front-end contains the tuning stage and a combined oscillator-mixer. The tuner is I²C controlled. The full tuning range is divided into a low, mid and high band.

Tuning is achieved by sending a frequency (divider) to the PLL in the tuner. The tuning voltage of approximately 40V is derived from the 141V FFS and stabilised to 33V by zener D6304 on the SSP. Via R3305 a part of this voltage is fed to pin 11 of the front-end. The voltage at pin 11 changes with the tuning frequency. This voltage should increase during the search operation of the installation menu.

8.3 The Power On Reset pulse (POR) [L and AU] (fig 8.3)



CL56615005/014, E001
160195

Fig. 8.3

The POR circuit is divided over the LSP and the ELPS panel (stand-by supply). The complete circuit is present in the figure.

The POR pulse is used to initialise the microprocessor and other IC's. After switching on the set via the mains switch, the +5V2 stand-by is available virtually immediately, and as a result, the POR pulse via R3119 and R3118 becomes high immediately. C2149 is however discharged at the moment of switching on, through which D6140 does not conduct. The base of TS3138 is low, TS7134 conducts and TS7136 blocks. The POR pulse remains high.

After a certain time C2149 has charged up enough to make D6140 conduct. TS7138 blocks, TS7136 conducts and the POR becomes low. The length of the POR pulse depends on the mains input voltage, but is between 20 and 60ms.

The initialisation of various IC's starts at the descending flank of the POR pulse. Following this initialisation the set starts up and the stand-by info line originating from the microprocessor becomes low. Once the VCC voltage (the voltage across C2101) of the FFS has reached 18V the power supply starts up. Shortly after the 141V is present, the AUX1 supply starts up generating the 5V2 for the DDP, also causing the line output stage to start up.

Additional POR conditions

- Switching from on to stand-by and from stand-by to on: no POR pulse may be generated. This is realised via T7137, R3137, D6138 and TS7140. In stand-by the stand-by info line is high preventing TS7140 from conducting and no additional POR pulse can be generated.
- In stand-by the FFS must be switched off. The stand-by info line from the microprocessor is lead to the FFS (DC-PROT line) via R3135, resulting in stand-by mode of the FFS.
- On a voltage drop in the 141V below 70V a POR must be generated. In normal situations TS7142 will not conduct, through which TS7141 also blocks and the base of TS7140 is kept high via D6133. At a sudden drop in the 141V or on switching off the set the base voltage will drop below 5V, through which TS7142 starts conducting, TS7141 also conducts making the base of TS7140 low. TS7140 conducts and lowers the base of TS7136, resulting in the POR becoming high until TS7140 blocks.
- The POR pulse may not be influenced for as long as the 141V has not been activated. This is prevented by TS7139. This ensures that TS7140 remains blocked for as long as the 141V is absent. The +5V2 voltage at the base of TS7139 originates from the AUX1 supply which indicates that also the 141V is present.

Output signals

- L/R Loudspeakers
- L/R Headphones
- L/R Euroconnector 1 out

Dual languages

An extra feature of the EURO-I/O panel is that a choice can be made between language I and II for both loudspeakers and headphones separately because the front-end sound is supplied to 2 inputs.

RGB Path*ECO I/O*

In sets with an ECO-I/O there is only one RGB input located on euroconnector 2. This RGB signal is carried to the PIP panel. The PIP-RGB/EXT-RGB selection is done on the PIP panel. The selected signal is sent to the video processor TDA9141 on the SSP, where it is converted to YUV. This YUV signal is carried via the feature box to the video controller.

EURO I/O

In sets with an EURO I/O there are 3 RGB inputs; on Euroconnectors 1, 2 and 3, whereby EXT3 is a 2Fh (100Hz) input. A RGB-switch IC (TDA8601) is located on the I/O panel at position 7815 that makes a selection between EXT1-RGB, EXT2-RGB or no RGB.

A second RGB-switching IC is located at position 7825 on the I/O panel that can switch through the RGB of EXT3.

If the RGB signals selected on the I/O panel is a 50Hz signal (EXT1 or EXT2) it is sent to the PIP panel. The PIP-RGB/EXT-RGB selection is made on the PIP panel. The selected signal is sent to the video processor where it is converted to YUV. This YUV signal is carried via the feature box to the video controller.

If the RGB signal selected on the I/O panel is a 100Hz signal it also travels to the PIP panel. Here the selection is now made between 100Hz RGB-EXT or 100Hz RGB-PIP. The now selected RGB signal is directly fed to the video controller.

8.7 The video and synchronisation processing [S5]

In the middle of the SSP the TDA9141 is placed. In this IC the video processing and synchronisation functions are integrated.

In the video-processing the CVBS-main from the I/O panel in PAL and NTSC are switched through to the comb filter where Y and C are separated. In SECAM the chrominance and luminance filters are located in the SECAM notch filter. An S-VHS signal with separate Y and C is switched directly to the chrominance decoder. In the decoder Y and C are converted to Y, R-Y and B-Y. The TDA9141 has an internal RGB/YUV switch to create the possibility to insert an external RGB signal into the YUV signal path. The switch is used to insert the RGB signal from the PIP module to create multi-PiP or from a euroconnector.

The synchronisation provides a 50Hz horizontal, vertical and sand castle pulse. The horizontal and vertical outputs of the TDA9141 are called HA and VA respectively.

1Fh and 2Fh in stead of 50Hz and 100Hz

A 50Hz video signal has a horizontal frequency of 15.625 kHz. This basic line frequency is also called 1Fh (one time the horizontal frequency). A 100Hz based video signal will be therefore be called a 2Fh signal.

In line with a 1Fh line frequency, also a 1Fv frame frequency is the base of a normal video signal.

In a conventional 100Hz set both 1Fh and 1Fv are doubled to 2Fh and 2Fv. In case of a 60Hz based signal doubling the frame frequency to 120Hz to improve the picture is less necessary. To make optimal use of the digital scan system however, in case of a 60Hz based signal (eg. NTSC-M), the horizontal frequency 1Fh is doubled to 2Fh, but the vertical frequency is kept 1Fv. This display mode (2Fh, 1Fv) is called progressive scan and it results in a very stable non-interlaced picture. At all 60Hz based video signals, the set switches to progressive scan.

A 2Fh display sync pulse for PIP and TXT is derived from the 100Hz flyback pulse and generated by IC7380.

The Y, R-Y and B-Y signals are converted to 2Fh (100Hz) in the feature box. The synchronisation signals are also doubled in the featurebox. The outgoing sync signals are called HD and VD. These signals are fed to the deflection processor (DDP) on the large signal panel.

In the video-control circuit, the TDA4780 on the SSP, the Y, U and V signals are converted to RGB. With a first switch the 100Hz PIP picture can be mixed with the main picture. With a second switch TXT or OSD can be mixed. The PIP picture can interrupt this, making a PIP picture within TXT. The switched RGB signals undergo the necessary adjustments such as brightness, contrast, saturation,, black-stretch and blue-stretch.

Before the RGB signals are fed to the RGB amplifiers the signals pass the VCI panel. Here R, G and B are delayed for the correct operation of SCAVEM. The soft clipper limits the max. drive of the picture tube.

Synchronisation

The video processor TDA9141 provides vertical and horizontal sync pulses VA and HA that are synchronised with the incoming CVBS signal. These pulses are used in the Feature box, on the PIP panel and on the TXT panel. The frequencies are doubled in the Feature box and are synchronous with the 100Hz picture. The outgoing pulses, HD and VD are fed to the Digital Deflection Processor (DDP) that supplies the horizontal and vertical drive pulse and the 100Hz (2Fh) sandcastle. The vertical pulse VD from the featurebox is also used for PIP and TXT.

The 100Hz flyback pulse is fed to the video processing part and converted there into the 100Hz display pulse (2Fh). This is used by PIP and TXT to determine the location of PIP and TXT.

When no CVBS is offered to the video processor, the VA and HA pulses are then switched off in the video processor. The pulses HD and VD are then generated by the featurebox.

8.8 The feature box [F]

The Feature box has the following functions:

- Digital scan for 50Hz systems (PAL/SECAM BGLL') (100Hz)
- Progressive scan (525 lines per frame) for 60Hz systems NTSC-M) (60Hz non-interlaced)
- Digital CTI
- Digital luminance peaking
- Multi PiP processing
- 1 clock system
- Movie Phase Detection
- DNR Function
- Line Flicker Reduction
- Vertical and Horizontal Zoom function
- AI interface to add extra digital circuits, for example PALplus

The feature box is adjustment free.

At introduction of GFL FBX3 will be supplied, later on FBX4 will be introduced.

8.9 Teletext [AQ and S7]

The Teletext function is situated on a separate panel behind the SSP, but on later versions it will be fitted on the SSP board. The main part of the Teletext function is built in the SAA5270 Teletext processor. In the GFL chassis the teletext memory is 512kB with an extension possibility to 1MB. The Teletext decoding on a 50Hz level is synchronised with the line and frame synchronisation pulses from the video processor. The Teletext display part on 100Hz level is synchronised via the synchronisation signals coming from the featurebox and the horizontal flyback pulses. The OSD information and the user menu's are also generated via the Teletext processor. The RGB and blanking outputs of the SAA5270 are directly fed to the RGB and blanking inputs of the video controller. It will be clear that the Teletext data does not pass the featurebox. If the Teletext function is defective, no OSD or menu's can be generated. Also the service menu's will remain hidden.

8.10 The sound processing [S3 and AY]

The main sound channels left and right, coming from the source selection are fed to the sound processor TDA9860. This sound processor can be present on the small signal panel on the right hand side, but can also be placed on the Audio Featuring Unit in case of sets equipped with the Dolby system. In this case a connector is placed on the SSP at the position of the sound processor.

The Audio Featuring Unit [Z]

The Audio Featuring Unit or also AFU, is an extension to the basic sound processing of the GFL chassis. Besides the normal sound processing features of the TDA9860 which is present on the AFU, the AFU offers a graphic equalizer and Dolby Prologic sound decoding, and surround sound. If Dolby Prologic decoded software is offered, out of the incoming left and right signals, the four Dolby channels are extracted. The four Dolby channels are Left, Right, Centre, and Surround or L, R, C and S.

The surround channel is only one channel but it is played via two loudspeakers, connected in series. The AFU can also be equipped without Dolby Prologic. The equaliser function remains then.

Via the noise generator on the AFU panel (IC7800) which can be switched on via the sound menu, the four sound output channels can be tested easily.

8.11 The Digital Deflection Processor TDA9155 (DDP) [J and L]

The DDP panel is located on separate board on the LSP. This board is also called the Geometry panel. The DDP has the following functions:

- Synchronisation
- Drive of the frame, line and east/west output stages
- Protection

All geometry adjustments are performed via I²C and stored in the EARAM on the SSP (except DC shift).

Line drive

The horizontal drive pulses (pin 12 IC7315) for the line output stage are derived from the HD input pulses (pin 4 IC7315) from the feature box. For control the horizontal and vertical flyback pulses are fed back to pins 16 and 17.

The sandcastle generator (2 levels)

The sandcastle generator in the DDP provides line and frame blanking pulses at a level of 2.5V and burst key pulses at 4.7V. The sandcastle is used by the video controller TDA4780.

Frame driver

The DDP supplies a differential current to pin 23 and pin 24 that is converted by IC7335 to a voltage. The DC setting of IC7335A is determined by TS7342. Pin 3 of IC7335 is fixed at 2.5V via a voltage divider (R3341 and R3342) and an emitter follower. VD NEG is the frame drive pulse to drive the +input of the frame output stage (7260) on the LSP.

E/W driver

The DDP provides a full E/W drive signal at pin 19. The signal is fed via op-amp IC7335B to the E/W output stage at the LSP. The E/W output stage is built around FET 7432. Feedback from the E/W output stage is done via 3432 and 3336 (EWD signal).

The following geometry corrections are realised by the east-west drive: Picture width, Trapezium, Parabola (pin-cushion) and Corner correction. These settings can be adjusted in the service menu.

GFL protection diagram

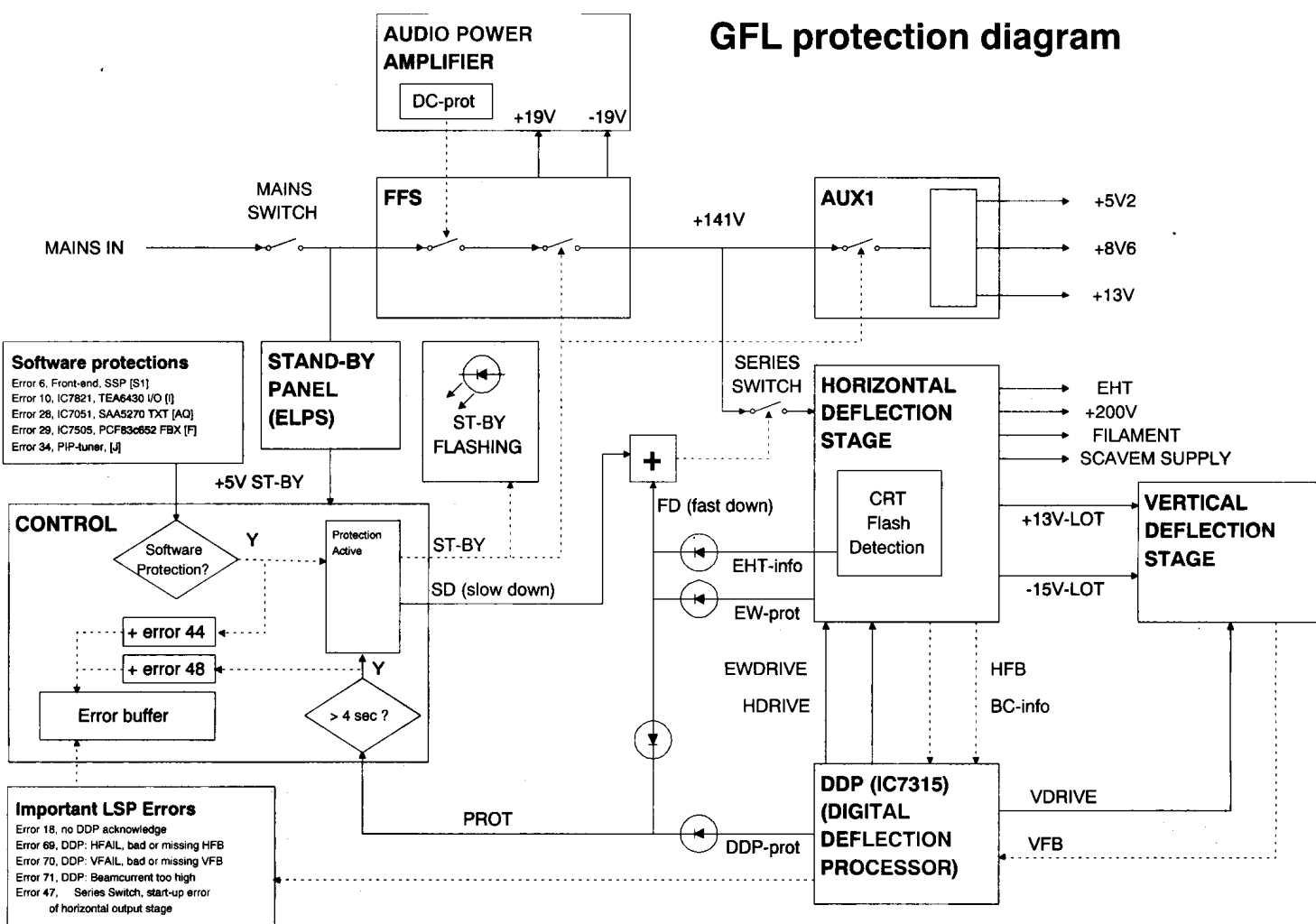


Fig. 8.4

The protection output of the DDP is also connected to this line. If the protection line is active for 4 seconds, the micro processor switches off both supplies via the stand-by signal (ST-BY). At the same time error 48 is placed in the error buffer and the stand-by LED starts flashing. With the DST the error number can be read.

The DDP can detect 3 errors:

- HFAL bad or missing HFB pulses result in error 69
- VFAL bad or missing VFB pulses result in error 70
- Overcurrent too much beamcurrent results in error 71

The East-West protection directly switches off the series switch via the Fast Down signal. The PROT line is also pulled high, so that the micro processor can take over the protection handling.

Measuring the E/W protection

Pin 7 of IC7360 on the DDP panel will become approximately 8V for a few seconds if the E/W protection is active.

The E/W protection becomes active when:

- Flyback capacitor C2419/C2429 is open
- Diode D6417 is short circuited
- Linearity corrector L5428 is open
- Horizontal deflection coil is open
- S-correction capacitor C2433 is open
- Capacitors C2421/C2422 are short circuited
- Bad solder connections in the line deflection part

During start-up the series switch is checked with help of the DDP. If the switch does not work properly, error 47 is generated.

Attention: error 47 is also generated at a failing start-up procedure of the horizontal deflection stage. So if error 47 occurs, further investigation is necessary.

A special protection is the EHT-info protection. After a flash in the picture tube, a high beam current peak, this protection switches off the line circuit via the fast-down signal. As this effect is only a temporarily effect, the horizontal circuit is started up again immediately. This protection is not registered by the micro processor. It takes less than a second to start up again.

8.12 The serial switch [L1]

The serial switch is a switching FET 7480 in the +141V supply line from the FFS to the line output stage. The purpose of the serial switch is:

To switch off the line output stage:

- on flash detection.
- in stand-by and protection

The serial switch is started via the 141V, R3480 and C2481. After the RC delay the gate of TS7496 becomes positive causing it to conduct. The line output stage can now start. In this condition TS7480 is not yet fully saturated, the gate voltage is still too low. For this reason the +200V from the line output stage is also coupled to the gate via D6481, R3482, R3492 and R3481 resulting in a higher gate voltage and a saturated FET. This causes the dissipation in TS7480 to be reduced to a low level. D6480 limits the GS voltage to $\pm 10V$.

Via R3400, R3402 and R3403, the reference current generator of the DDP is supplied.

The serial switch can be opened externally by two signals:

1. **SLOW-DOWN:** This is the direct line from the microprocessor. The line output stage is switched off to stand-by via this line.
2. **FAST-DOWN:** This line is used to switch off the line circuit in case of an urgent protection, without the help of the microprocessor.

8.13 The line output stage [L1]

The DDP supplies the control pulse for the line output stage via the H-drive signal. When the H-drive pulse is low TS7409 blocks making TS7406 conduct. This results in a linearly increasing current flowing through S5406 and a rectangular voltage across S5406. At this moment the base of transistor TS7414 is negative, causing the transistor to block.

After a certain time the base of TS7409 becomes high (via the DDP), TS7406 blocks. The Drain voltage of TS7406 increases strongly. The voltage on the secondary side of TS5406 reverses causing a base current to the line transistor TS7414. Due to the storage time of TS7414, TS7406 cannot release its energy immediately resulting in a very high peak voltage at the drain of TS7406. This voltage peak is absorbed by C2406, R3405 and R3406. S5413, R3414 and C2414 ensure the rapid switch-off of the line output transistor.

Limiting LOT power

After an urgent protection or a flash, the FAST-DOWN line becomes active, making TS7407 conduct. The result of this is that the primary voltage on the driver transformer S5406 is limited when TS7406 is not conducting. The secondary voltage will become lower, causing a limitation of the base current of the line transistor. The current through the line transistor will drop sequentially. The LOT power drops rapidly.

If the LOT operates at lower power, the power dissipation the line transistor will increase, which would adversely influence operational reliability. For this reason a protection circuit is added, built up around TS7424. During normal operation C2425 is charged via R3425 at the moment that TS7406 conducts. During the blocking of TS7406, TS7424 is conducting, which causes C2425 to discharge. In this situation the voltage in C2425 can never reach the protection level. At the moment that the FAST-DOWN line becomes high, TS7407 conducts causing TS7424 to block. After a certain time C2425 is charged to the protection level, through which the set is switched to protection mode and the power supplies are switched off.

The voltages generated by the LOT

The line output stage supplies various secondary voltages:

- SCAVEM supply via pin 7 of the LOT
- +13V LOT to the picture tube panel via pin 8 of the LOT
- -15V LOT to the DDP and the scavem circuit
- The filament of the picture tube between pins 11 and 12
- The +200V for the RGB output amplifiers is supplied via pin 6
- The DC shift circuit is supplied via pins 4 and 6
- The EHT is produced via a diode split. The focus and the VG2 voltage derived from the EHT. The focus and VG2 potentiometers are integrated in the transformer

The beam current flows through R3476 from the 141V. Components R3468, 3464, 3463, 3452, 3451, 3450, D6450 and C2405 determine the EHT info adjustment characteristics. On an increasing beam current the voltage on transformer pin 10 and across C2455 drops. To improve the focus on a 16:9 picture tube a dynamic focus is applied (DAF). A parabola on line frequency with the correct amplitude is superimposed on the focus voltage.

8.14 Protection structure (Fig. 8.4)

The GFL protection diagram shows the schematics of the protection system.

Via 4 switches the system can be activated.

To protect the loudspeakers the AUDIO amplifier can switch off the FSS main supply.

→ Disconnect this amplifier to determine if the defect is in this audio amplifier.

Two other switches are controlled simultaneously by the micro processor via the stand-by signal. They can switch the FFS and AUX1 to stand-by mode. This is always done in case of protection.

Via the series switch the horizontal defelection stage can be switched on and off. Normally the slow down signal (SD) controls the series switch, but in case of an urgent alarm the fast down signal (FD) switches off the line circuit immediately.

An urgent alarm is reported to the microprocessor via the protection line (PROT).

Software protection is performed on 5 IC's. They are mentioned in the protection diagram. If one of these does not give an acknowledge, the set switches to stand-by and the LED starts flashing. In this case error 44 is placed in the buffer.

If error 44 together with one of the 5 IC's is in the error buffer, this IC might be defective.

If however, a lot of errors are in the error buffer there will probably a supply problem or a general I²C problem.

After error 44 is in the placed in the buffer, the error logging stops. So error 44 will always be the last error reported.

Note: At start-up the TDA9141 is checked after the DDP is checked for acknowledge. If the SYNC IC TDA9141 on the SSP (IC7352) is not answering, further start-up is useless, the start-up is terminated, and the set switches to stand-by. The TDA9141 error 15 is placed in the error buffer.

The PROT line is a 'wired OR' of a the following protection circuits:

- The DDP PROT output
- The E/W hardware protection
- The series switch test circuit (only active during start -up)

There are three protections which are not generated by the processor, the so called hardware protections.

The first one is the East/West Protection, which detects a too high current through the East/West power stage around TS7432 on the large signal panel. A too high current through the East/West stage can be caused by a defect component in the line deflection circuit, for example a disconnected line deflection coil or an open fly back capacitor. This hardware protection generates the 'Fast Down' signal which switches off the line circuit immediately via the series switch. At the same time the micro-processor is informed about the protection via the PROT line and overrules the hardware protection by the software protection.

The second protection becomes active in case of a very fast beam current peak in the picture tube. This happens during a flash in the picture tube. The so called 'flash protection' prevents the line output stage from too high currents in the primary side and is only active for a very short moment. After a flash the 'Fast-down' signal switches the line circuit off via the series switch and immediately on again. This event is not reported to the micro processor. After a flash the picture will be blanked for less than half a second.

The third protection is the DC protection which is originated at the audio amplifier panel. This protection is connected directly to the stand-by line of the FFS. Via this protection the FFS can be switched off immediately. By disconnecting the audio amplifier this protection can be eliminated easily.

In case the DDP makes the PROT line high the status register of the DDP will then contain information concerning the reason for protection. After the microprocessor has read the status register via I²C, the PROT line is reset and the status register erased.

In case the error is repeated the PROT line becomes high again and the status register is filled.

The status register of the DDP can report following errors:

- Error 69 HFAIL, HFB pulses missing or in bad shape
- Error 70 VFAIL, VFB pulses missing or in bad shape
- Error 71 Overcurrent, Beamcurrent is too high (=EHT INFO)

E/W-protection

The east-west correction current is measured on the LSP via 2 precision resistors (R3446 and R3447). When an error occurs in the line output stage this current increases. The detected voltage is offered to the DDP panel.

The -input of IC7360 is DC adjusted to 1V. When the voltage on the +input of IC7360 becomes greater than 1V, pin 7 of IC7360 becomes high, and the PROT output becomes high via D6319. The FAST-DOWN becomes high via D6364.

The E/W protection can be measured easily at start up. Pin 7 of IC7360 on the DDP panel becomes 8V in case of protection. The 8V voltage remains for a few seconds.

Flash protection

On a flash (e.g. a flash-over in the picture tube) the EHT info signal becomes low. If the voltage becomes lower than $33V + 0.6 - 7.4V = -26V$, TS7390 conducts. Via an RC loop consisting of R3388 and C2391, C2391 is rapidly charged and then slowly discharged via R3389 and R3390 (20ms). The RC constant determines the conducting time of TS7391 and TS7392. Via D6364 the FAST-DOWN line becomes high resulting in the line output stage is switched off for a short time.

Serial switch: protection

To prevent the line output stage from being supplied by the 141V before the DDP is initialised an extra detection circuit has been added to determine a proper working of the switch.

After the DDP is started, the series switch is kept closed for a while by the microprocessor. During this time measurements for the presence of flyback pulses are made. If there are fly back pulses, there is a short circuit in the switch.

- No flyback pulses: pin 1 of IC7360 becomes high and PROT becomes high via D6334. Via this path the microprocessor is informed that the serial switch is OK.
- Flyback pulses: pin 1 of IC7360 becomes low. PROT remains low. Via this signal the microprocessor is informed that the serial switch is not OK. The set switches into stand-by. Error 47 (series switch) is written in the buffer.

8.15 The dealer service tool (DST)

Together with the GFL chassis a dealer remote control is introduced, the RC7150 which is called the Dealer Service Tool or DST.

The RC7150 is a remote control for the dealer and the servicer.

Installation features for the dealer

The dealer can use this remote control for programming the TV-set with presets, TV-settings, Dish settings and Logo's. Not only the GFL sets can be programmed with it, but also a lot of existing sets like FL, GR2, G90B, G110 and the new Philips VCR series using the so called NORA deck.

One of the innovative features of the Dealer Service Tool is the way in which it is programmed. A complete list of presets can simply be downloaded from the GFL into the Dealer Service Tool.

To make this download possible, a two way communication link, the so called "dealer link", is set up between the RC7150 and the GFL TV-set.

To establish this link, the GFL sets are equipped with an additional Infra-red transmitter LED and the RC7150 has an Infra Red receiver on board.

The Dealer Link however only works on short distance, up to 10 cm or 4 inches.

For explanation of the installation features of the DST, the directions for use are recommended.

Diagnose features for the servicer

Entering the service modes

The GFL sets can be put in the service alignment mode and the service default mode by connecting two pins on the SSP. With the RC7150 this can also be done:

- Press the "ALIGN" key to enter the Service Alignment Mode.
- Enter the password '3-1-4-0' and press OK.
- Press the "DEFAULT" key, to enter the Service Default Mode. In the service default mode the set is put in a default stage regarding tuning frequency, picture settings etceteras.
- Press the "DEALER" key, to enter the Dealer Mode. In the dealer mode some settings can be changed in order to customize the set.

The Service Default Mode can be switched off by switching the set off.

Reading error codes from the error buffer

If an error has been detected by the GFL chassis, protection mode might be activated or the set is put back into stand-by. Without the presence of a picture the errors can be read by the DST, as long as the microprocessor is still active (a LED must light up).

To transmit the errors to the DST:

- 1 Press the "DIAGNOSE" key.
- 2 Press "1" to view the last error detected.
- 3 Hold the DST 5 to 10 cm from in front of the stand-by LED of the set (the IR-sending LED of GFL is located near the stand-by LED).
- 4 Press the "OK" key.

The error is represented by a 3 digit number.

The 3 digits on the DST are displayed sequentially, with a pause before it is repeated. The digit after the pause is the 1st digit.

If the display reads 2 - 4 - 7, the error code is 247.

To read other error codes, press "DIAGNOSE" and one of the other digit keys.

If the DST cannot communicate to the GFL in a proper way, ERROR 2 is shown in the display. Trying again by changing the DST position a little bit might often help.

If the error buffer of GFL is empty, no errors are displayed by the DST; the display remains blank.

8.16 Faultfinding and repairing the GFL chassis

With most defects the GFL will give no picture and no sound.

Switch on the set via the mains-switch.

If the LED's behave properly it is likely that the microprocessor is OK.

The green LED shows that both FFS and AUX1 supplies are started up. If, after a few seconds, the stand-by LED is illuminated an error is detected. Now both supplies are in stand-by position again.

The stand-by LED can also start flashing. In this case protection became active. Restart is only possible via the mains-switch or the internal service pin's.

Via the DST we can read the error codes of the error buffer.

In case error 48 is displayed, the protection circuit was active and initiated by the PROT-line. Reading the next error code can give other information about the defect.

In the GFL protection diagram the most important errors are indicated. The faultfinding-table can help to find the defective function.

If, for example, the second error is 69, H-FAIL, which is detected by the DDP because the HFB pulses do not have a correct shape, we know that the line circuit is not working properly. By measuring some key components in the line deflection circuit, the defect can be located. With the Line Repair Kit the defect can be repaired.

If the supply is hickuping then it might be short circuited.

To find out if the line output stage generates the short circuit we measure the DC resistance of the series switch. Measure between coil 5126 and bridge wire 9453 between R3440 and R3445.

If this is a low resistance we know that the switch is defective. If the switch is defective, there must be another short circuit. Most likely something else caused the defective switch. Via the line repair kit, we can repair most of the line circuit defects.

Note: If the line transistor 7414 goes defective, then also the switch will become defective.

Error 18 indicates that the DDP does not communicate to the microprocessor.

→ Most likely the FFS or AUX1 supply is not working or short circuited.

We can easily check the operation of the FFS is on the audio amplifier panel during start-up.

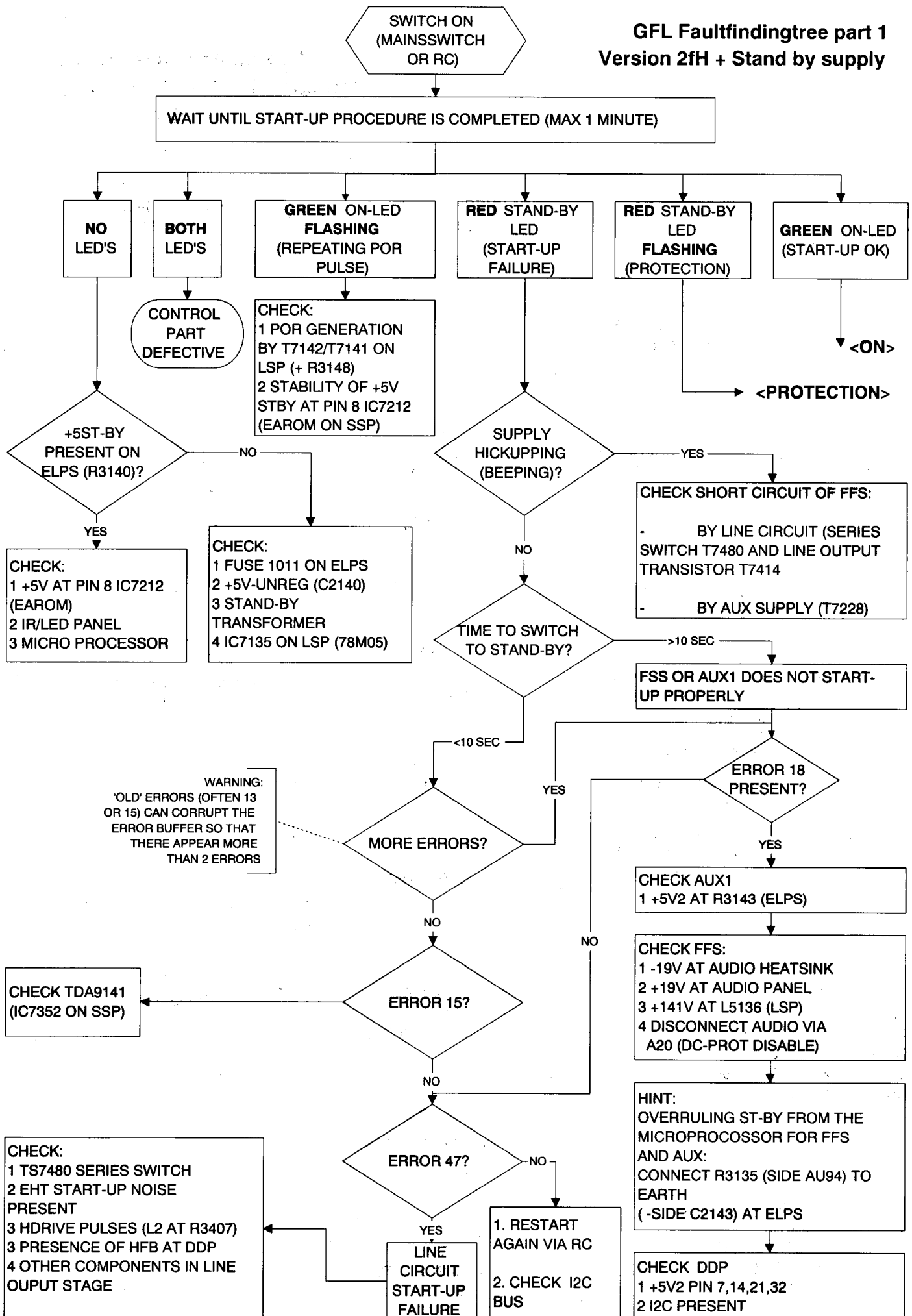
At the Stand-by panel at resistor 3143 we can check the +5V2 of the AUX1 supply.

If necessary we can repair one of them via the FFS or AUX1 repair kit.

Error number	Description of error
0	No error
1	I ² C, IC7212, SSP [S8] (ST24C02AB1) (not used)
2	I ² C, IC7212, SSP [S8] (ST24C04B1) (not used)
3	I ² C, IC7212, SSP [S8] (ST24C08B1) (not used)
4	I ² C, IC7212, SSP [S8] (ST24C16B1)
5	I ² C, IC7204, SSP [S8] (HEF4094)
6	I ² C, front-end, SSP [S1] (FQ9xx)
7	HEF STROBE, front-end, SSP [S1] (FQ9xx) (not used)
8	I ² C, IC7823, I/O [I] (TEA6425)
9	I ² C, IC7824, I/O [I] (TEA6425)
10	I ² C, IC7821, I/O [I] (TEA6430)
11	I ² C, IC7822, I/O [I] (TEA6430)
12	I ² C, IC7818, I/O [I] (MSM6307)
13	I ² C, IC7814, I/O [I] (TMP47C103N)
14	I ² C, IC7880, I/O [I] (TEA6422)
15	I ² C, IC7352, SSP [S5] (TDA9141/9181)
16	I ² C, IC7500, SSP [S6] (TDA4780)
17	not used
18	I ² C, IC7315, DDP (Geometry) [J] (TDA9155)
19	I ² C, IC7600, SSP [S2] (TDA9840)
20	I ² C, IC7550, NICAM [G] (SAA7282)
21	I ² C, IC7650, SSP [S3] (TDA9860)
22	I ² C, IC7820, AFU [Z] (TDA9860)
23	I ² C, IC7840, AFU [Z] (TEA6360)
24	not used
26	I ² C, IC7746, AFU [Z] (PCF8574)
27	I ² C, IC7601, I/O [U] (PCF8574)
28	I ² C, IC7051, TXT [S or AQ] (SAA5270)
29	I ² C, IC7505, FBX [F] (PCF83C652)
30	PCF8574 (16:9 compressor)
31	TDA8443A (16:9 compressor)
32	I ² C, IC7788, PIP [P] (SDA9288)
33	I ² C, IC7788, PIP [P] (SDA9288)
34	I ² C, PIP tuner [P]
35	not used
36	I ² C, IC7860 PIP [P] (PCF8574)
40	I ² C, PCF83CE652 (cardreader)
41	I ² C, PCF83CE654 (satellite)
42	I ² C, IC7900, I/O [I] (PCF8574P)
43	I ² C, IC , [G] (PCF8574)
44	supply protection error (front-end, IC7051 teletext, IC7505 featurebox, PIP tuner and IC7821 I/O)
45	not used
46	not used
47	+140V series switch protection
48	protection (prot-line)
49	I ² C, IC7823, I/O [I] (TEA6417)
50	I ² C, IC7788, PIP [P] (SDA9288)
60	BSCS microprocessor (satellite)
61	PCF8574 (3D combfilter)
62	PCF8574 (NTSC to Muse)
65	PCF8574 (HDI)
66	TDA4672 (PSI)
67	TDA8444 (Video Improvement Panel)
68	I ² C, AI without FBX, (TDA9170)
69	hfail, horizontal deflection error (DDP protection)
70	vfail, vertical deflection error (DDP protection)
71	overcurrent (DDP protection)
72	overvoltage (DDP protection) (not used)

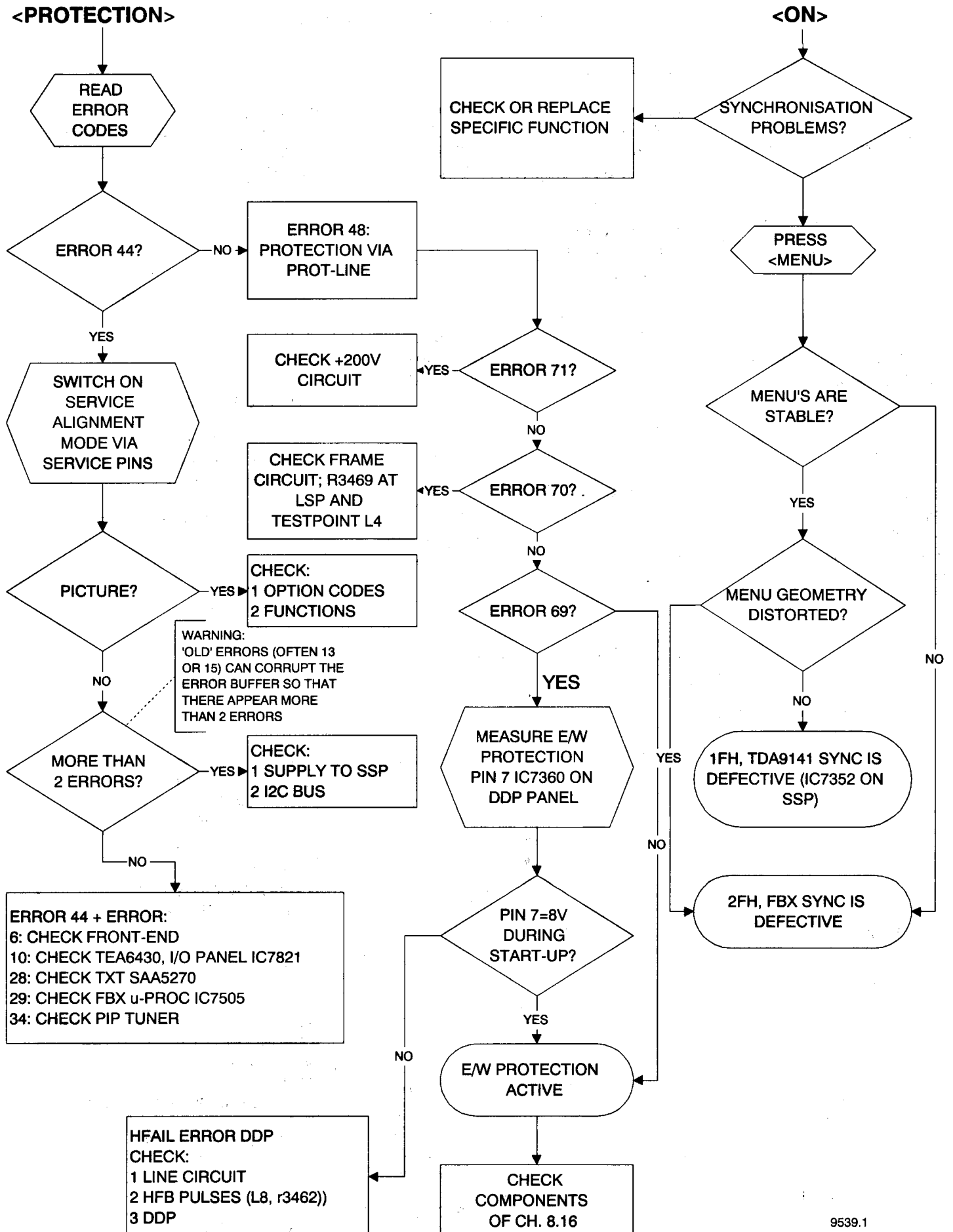
GFL Faultfindingtree part 1

Version 2fH + Stand by supply



GFL Faultfindingtree part 2

Version 2fH + Stand by supply



9539.1

Select the menu language

You can now choose which language the menus are presented in. When you switch on your set for the first time, the **MENU LANGUAGE** automatically appears on the screen. See the explanation on your screen. Alternately the explanation automatically appears in the different languages. If the **MENU LANGUAGE** menu does NOT automatically appear on the screen, proceed as follows :

- Press **MENU** on the remote control.
 - ▷ The **MAIN MENU** appears on the screen.
 - Keep the key  pressed and select **INSTALLATION**.
 - ▷ **INSTALLATION** lights up.
 - Press **OK**.
 - ▷ The **INSTALLATION** menu appears and **Menu Language** lights up.
 - Press **OK**.
 - ▷ The **MENU LANGUAGE** appears.
 - Select the language of your choice with the keys   or  and press **OK**.
 - ▷ The **INSTALLATION** menu reappears.
- From this point on, all menus are presented in the language of your choice.

*Have you pressed the wrong key ?
Press **OK** again and make a new choice.*

Select Country

- Press the keys  or  to select **Country**.
- ▷ **Country** lights up.
- Press **OK**.
- ▷ The menu **COUNTRY** appears.
- Select the country where you are now located with the keys  or  and press **OK**.
- Select **Other** when none of the countries applies.
- ▷ The **INSTALLATION** menu reappears.

Store TV channels

This can be done in two different ways : automatically or manually.

Automatic installation OR

Manual installation
All TV channels are searched for and stored automatically. As far as it is transmitted by the cable company or a TV channel a programme number and a name is attributed automatically as well and filled in in the programme list. If you wish the order of programme numbers and names of stored TV channels can be modified afterwards. Follow very closely and step by step the instructions of the Automatic Installation.

With manual installation it is possible to select whether TV channels are searched by frequency or channel number.

Follow very closely and step by step the instructions of the Manual Installation procedure. You must go through every step.

Go on to page 7.

Automatic installation

- Select **Automatic Installation** with the keys  or  and press **OK**.
- ▷ The menu **AUTOMATIC INSTALLATION** appears.
- Press **OK** again.
- Press the keys  or  to select **On**.
- ▷ The message **Searching** appears as the TV searches for all the channels available in your area.

*The automatic installation can be interrupted by pressing the **MENU** key.*

- ▷ Every time a TV channel is found it is automatically stored under the next free programme number in the programme list.
- ▷ The message **Ready** appears on the screen when the automatic installation is complete.
- ▷ If a cable system or a TV channel transmitting a teletext page with the frequencies and programme names of all the TV channels which can be received, is detected, the search is stopped and a programme list appears. The programme list is automatically filled with all the programme numbers and names of the TV channels transmitted.

*It is possible that the cable company or the TV channel displays a broadcast selection menu. Layout and items are defined by the cable company or the TV channel. Make your choice of the presented possibilities with the keys  or  and press **OK**.*

- Press **MENU**.
- ▷ The **INSTALLATION** menu reappears.

Go on to page 9.

Manual installation

- Select **Manual Installation** with the keys  or  and press **OK**.
- ▷ The menu **MANUAL INSTALLATION** appears.
- ▷ In the left upper corner of the screen a programme number, a system, a frequency or possibly a channel number are displayed.
- ▷ **Selection Mode** is only present and lights up if the country you selected in the **COUNTRY** menu also offers the channel option. In this case you can choose either channel or frequency mode.
- Press the keys  or  to select frequency. **C-channels** (aerial channels) or **S-channels** (broadcast by a cable company).

1

Select the TV system

Television pictures are not broadcast in the same way in all countries. We speak of different television systems (PAL, SECAM, NTSC,...).

- Select **System** with the keys  or .

You have your own aerial.....OR

- Select the country or part of the world from where you want to receive the TV channel with the keys  or .

You are connected to a cable system

- Select the country or part of the world where you now are located.

Go on to 2.

2

Search for a TV channel

- Select **Search** with the keys  or  and press **OK**.
- ▷ The TV searches for a channel.
- ▷ The frequency or the channel number increases until a TV channel is found. Dependent on the choice you made in the selection mode the searching stops at a frequency or at a channel number.
- ▷ In the bar, which appears briefly at the bottom of the screen, the broadcaster may transmit its programme name or the programme title being broadcast or another message.

Is the reception poor ?

You may be able to improve the reception of picture and sound of a TV channel, by adjusting the frequency with the **P** - or **+** key on the remote control. The frequency is adjusted in the block shown in the upper left corner of the screen.

Go on to 3 if you want to store the channel that has been found.

Do you want a different channel ?

- Press **OK** again to restart the search.

No channel found ?

- Interrupt the searching by pressing the keys  or  or the **MENU** key. Check that you have selected the correct TV system or that the aerial is connected properly. See Tips p. 37.

Direct selection of a TV channel

If you know the frequency, or the C- or S-channel number, it can be entered directly with the digit keys on the remote control and in this way call up the TV channel.

Ask for a list from your cable company or dealer, alternatively consult the Table of frequencies on the inside backcover of this handbook.

- Select **Search** with the keys  or .
- Enter the 3 digits of the desired frequency or the 2 digits in case of C- or S-channels.
- For frequencies under 100 MHz, first enter a 0. For example : 063.
- ▷ The frequency is automatically finetuned.

Have you entered a wrong number ?

First complete the frequency or the channel number with arbitrary numbers and then start again.

Go on to 3.

3

Enter the programme number

Now assign a number of your choice to the TV channel you have located. In this way you decide the order of all your TV channels.

- Select **Programme Number** with the keys  or .
- Select with the keys  or  or with the digit keys the desired programme number.

Go on to 4.

4

Store steps 1 to 3

Now the steps 1 to 3 must be stored in the memory.

- Select **Store** with the keys  or  and press **OK**.
- ▷ **Stored** appears briefly at the bottom of the screen.
- ▷ The programme is stored in the programme list after the message has disappeared.

repeat

If you want to store another TV channel.

- Repeat 1 to 4.

If you are connected to a cable system.

- Begin immediately with 2. You have already selected the TV system in 1 for all channels.

end

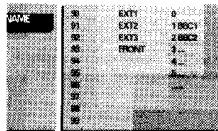
If you have finished storing TV channels.

- Press **MENU**.
- ▷ The **INSTALLATION** MENU reappears.

Enter or modify a programme name

It is possible to change the name stored in the memory or to assign a name to a TV channel which has not yet been entered. A name with a maximum of 5 letters or numbers can be given to the programme numbers 0 to 99. For example SUPER, BBC1,....
Between 99 and 0, you can also name any peripherals that are connected.

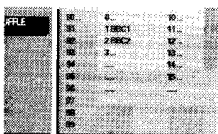
- Select **Give Name** with the keys or and press **OK**.
- ▶ The **GIVE NAME** menu appears.
- Select the TV channel to be modified or assigned a name with the keys , , or ◀ and press **OK**.
- ▶ A block appears on the first position of the name.
- Select with the keys ▶ or ◀ the position of the letter or number you want to change or to enter.
- Select with the keys or the letter or number you want to enter or to correct. Spaces or other special characters are located between Z and A.
- Did you fill in a wrong letter or number ?
Select with the keys ▶ or ◀ the position of the letter or number you want to modify.
Select with the keys or the correct letter or number.
- When the complete name is filled in.
- Press **OK**.
- Select another TV channel to be modified or assigned a name with the keys , , or ◀ and press **OK**.
- Repeat as described above.
- When you have finished entering or modifying programme names.
- Press **MENU**.
- ▶ The **INSTALLATION** menu reappears.



Reshuffle the programme list

According to your preference you can change the order of the stored TV channels.
When you are satisfied with the order of the programme list, go to page 10.

- Select **Reshuffle** with the keys or and press **OK**.
- ▶ The menu **RESHUFFLE** appears.
- Select the TV channel you want to change the programme number of with the keys , , ◀ or ▶ and press **OK**.
- Use the keys ◀ or ▶ to select another column of the programme list.
- ▶ The programme number and the name of the TV channel appear in a black block.
- Use the keys , , ▶ or ◀ to move to the number where you want to locate the TV channel.
- Press **OK**.
- ▶ The TV channel moves to the selected programme number.
- The TV channel which was located on that position automatically moves to the programme number of the TV channel you have modified.
- Repeat this for all the other TV channels you want to swap.
- When all the TV channels are allocated as you like.
- Press **MENU**.
- ▶ The **INSTALLATION** menu appears again.



Define Decoder/Descrambler prog. numbers

If you have connected a decoder or a descrambler, see p. 33, you can define one or more programme numbers as decoder programme numbers.

- Select **Decoder/Descrambler** with the keys or and press **OK**.
- ▶ The **DECODER/DESCRAMBLER** menu appears.
- Select **Programme** with the keys or .
- ▶ **Programme** lights up.
- Select the programme number under which you want to store the programme coming from your decoder with the digit keys.
- Select **Decoder Status** with the keys or .
- ▶ **Decoder Status** lights up.
- Press the keys ▶ or ◀ to select **Off**, **EXT1** or **EXT2**, the euroconnector where you connected your decoder.
- Select **Off** if you do not want the selected programme number being activated as a decoder programme number.

Select Favourite TV channels

During the installation all the stored TV channels have automatically been placed into the favourite list.
This will make selection of only your favourite TV channels a lot easier and faster.
In the Favourite Programmes menu you can indicate for each TV channel if you want to keep that TV channel as a favourite.
You can also do this for a programme number reserved for the programmes you receive from your decoder.

After leaving the installation you can quickly run through the TV channels by holding the **P** - or + pressed down, only those TV channels which are in the favourite list will be displayed. The non-favourite TV channels can still be selected with the digit keys.

- Select **Favourite Programmes** with the keys or and press **OK**.
- ▶ The **FAVOURITE PROGRAMMES** menu appears.
- ▶ **Programme Number** lights up.
- Select the programme number of a TV channel with the digit keys.
- Select **Favourite** with the keys or .
- Press the keys ▶ or ◀ to select **Yes** or **No**.
- In this way you decide whether you want to keep the selected TV channel as a favourite TV channel or not.
- Repeat this for every TV channel you like to change into a favourite or a non-favourite TV channel.
- Press **MENU** again if you have finished selecting TV channels in the favourite list.
- ▶ The **INSTALLATION** menu reappears.

Install TV Configuration

Different options can be selected depending on the different peripheral equipment you may have connected to your TV.

- Select **TV Configuration** with the keys or and press **OK**.
- ▶ The **TV CONFIG** menu appears and **Audio Output** lights up.

Audio Output

If you have audio equipment or another external sound source connected to your TV, you can select two types of audio output.

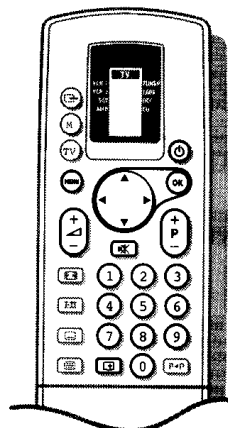
- Select **Variable** with the keys ▶ or ◀ if you want to adjust the volume of your audio equipment via the TV.
- Select **Constant** if you want to adjust the volume with the volume control of your audio equipment.

Ext2 Output

See Record with your video recorder, p. 35.

CD-i/Photo CD

See Connect Peripheral Equipment, TV and a CD-i/Photo CD, p. 31.



The following items deal with the installation of the Dolby Surround Sound possibilities.

- Select with the keys or the desired menu possibility.
- Select with the keys ◀ or ▶ the desired menu adjustment.

Surround Mode		Loudspeakers active ?		
Centre Mode	Ext. Amplifier	Front TV L & R	Front TV Centre	Rear L & R
Pro Logic (with Pro Logic broadcasting)	Normal	Yes	Yes	Yes
	Phantom	Yes	No	Yes
	Wide	Yes	Yes	Yes
No				
Dolby 3 (with stereo broadcasting)	Normal	Yes	Yes	No
	Phantom	Yes	No	No
	Wide	Yes	Yes	No
No				
Hall (with mono broadcasting)	Normal	Yes	No	Yes
	Phantom	Yes	No	Yes
	Wide	Yes	No	Yes
No				
(to select in Surr. mode Pro				
Off	Normal	Yes	No	No
	Phantom	Yes	No	No
	Wide	Yes	No	No
No				
(to select in Surr. mode Pro				

You have connected an audio amplifier to **AUDIO L** and **R** at the back of your TV. See Connect Peripheral Equipment, Audio equipment, p. 31.

- Select
 - Surround Mode : **Pro Logic** or **Dolby 3**
 - Centre Mode : **Normal** or **Wide**
 - Ext. Amplifier : **Yes**
- Press **MENU**.
- ▶ The **INSTALLATION** menu reappears.

Fast exit from the menus

- Keep the **MENU** key pressed to switch off all menus.

Operation

To be operational with the remote control your TV should be in the TV operation position.
If this is not the case, first press the **TV** key left of the display. The letters **TV** in the display of the remote control appear in a black block for a few seconds.

Every time you press a key on the remote control, a green lamp on the front of your TV set blinks.

Switch TV on

- Press **TV** on the front of your TV.
- A green lamp lights up and the programme appears.
- Does a red lamp light up ? Your TV is on standby. Read on.

Switch to standby

- Press the red standby key **TV** at the top of the remote control to switch the TV off temporarily.
- A red lamp on the TV lights up.
- Press the digit keys or **P** - or + in order to switch the TV on again.
- For a period of 10 minutes no aerial signal is received, then your set automatically switches to standby.

Your TV consumes energy in the standby mode. Energy consumption contributes to air and water pollution. We advise to switch off your TV overnight instead of leaving it on standby. You save energy and the picture tube is demagnetised which maintains good picture quality.

Select TV channels

- Select the TV channel with the digit keys or with the key **P** - or + on the remote control.
- For a two digit programme number, enter the second digit within 2 seconds.
- If you want to know which channel you are watching, press **CH**.
- Quickly run through the TV channels from the Favourite list.
- Hold the **P** - or + key pressed down.

Adjust the volume

- Press ◀ - or +.
- If you want to store the volume adjustment in the memory, see the Features menu, General PP Store, p. 20, to store the same volume adjustment for all the stored TV channels.

Sound Muted

Temporarily interrupt the sound

- Press **M**.
- The sound is temporarily interrupted.
- Press **M** again to get the sound back.

Switch menus on and off

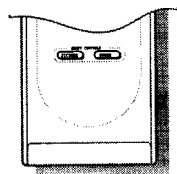
- Press **MENU** on the remote control.
- The **MAIN MENU** appears.
- Use the keys **◀** and **▶** to make a selection of the Main Menu items.
- Your selection lights up.
- Press the **OK** key on the remote control to activate the selected menu.
- Press **MENU** again to return to the previous menu.
- Keep the **MENU** key pressed to switch off all menus.

Main Menu

Select the picture settings

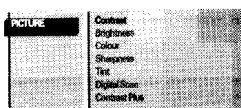
During manufacture four types of picture setting have been pre-defined. You can choose among these four different settings with the **PICTURE** key of the smart controls on the door of the remote control.

- Press the Smart Controls' key **PICTURE** repeatedly to select : **Soft**, **Natural**, **Rich** or **Personal**.
- The picture settings possibilities are displayed briefly on top of the screen. The picture settings correspond with a specific predefined setting of Brightness, Contrast and Colour.
- Personal** refers to the personal preference settings of brightness, contrast and colour you can adjust in the **PICTURE** menu and store with **General PP store** in the **FEATURES** menu.



Adjust picture settings

- Press **MENU** on the remote control.
- The **MAIN MENU** appears and **PICTURE** lights up.
- Press **OK**.
- The **PICTURE** menu appears.
- Select with the keys **◀** and **▶** the adjustments of **Contrast**, **Brightness**, **Colour**, **Sharpness**, **Tint**, **Digital Scan** and **Contrast Plus** you want to change.



When you are watching a TV channel in the NTSC-system, the option **Hue** also appears and can be adjusted in the **PICTURE** menu.

- Press the keys **◀** or **▶** to alter the selected adjustment.
- The **PICTURE** menu disappears and only the selected menu item remains (including its bar) on the screen.
- The **PICTURE** menu reappears after a few moments or by pressing **OK**. Now you can select another adjustment with the keys **◀** and **▶**.

Tint

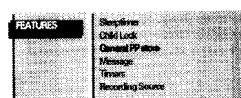
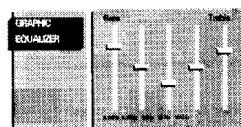
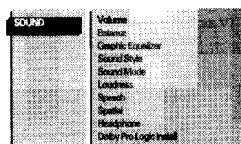
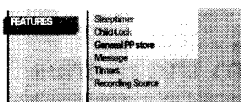
- Press **◀** or **▶** to select the colour temperature : **Normal**, **Warm** or **Cool**.
- Press **OK**.
- The **PICTURE** menu reappears.

Digital Scan (Line Flicker Reduction)

- In certain circumstances while watching TV programmes it may be preferred to switch off the digital scan line flicker reduction.
- Press the keys **◀** or **▶** to select **On** or **Off** and press **OK**.
- The **PICTURE** menu reappears.

If you want to store the modified adjustments for all the TV channels.

- Select **Features** in the Main Menu with the keys **◀** or **▶** and press **OK**.
- The **FEATURES** menu appears.
- Select **General PP Store** with the keys **◀** or **▶** and press **OK**.
- The message **Stored** appears briefly on the bottom of the screen.
- You have created and stored a new **Personal** sound style.



- Press **MENU**.
- The **MAIN MENU** reappears.
- Press **MENU** again to switch off the **MAIN MENU**.

Select the sound settings

During manufacture 6 types of sound style have been pre-defined. You can choose among these six different styles with the **SOUND** key of the smart controls on the door of the remote control.

- Press the Smart Controls' key **SOUND** repeatedly to select : **In concert**, **Classic**, **Jazz**, **Pop**, **Stadium** or **Personal**.
- The sound styles are displayed briefly on the top of the screen. Each sound style corresponds with a specific predefined setting of the graphic equalizer.
- Personal** refers to the personal preference settings of volume, balance, treble and bass you can adjust in the sound menu and store with **General PP store** in the **FEATURES** menu.

Adjust sound settings

- Press **MENU** on the remote control.
- The **MAIN MENU** appears.
- Select **SOUND** with the keys **◀** or **▶** and press **OK**.
- The **SOUND** menu appears.
- Select with the keys **◀** or **▶** the adjustments of **Volume** and **Balance**.
- Press the keys **◀** or **▶** to change the selected adjustment.
- Select **Graphic Equalizer** with the keys **◀** or **▶** and press **OK**.
- The **GRAPHIC EQUALIZER** menu appears.
- Press the keys **◀** or **▶** to select an equalizer setting.
- Press the keys **◀** or **▶** to adjust the **Treble** and **Bass** settings.

Select the sound styles with the sound menu

This menu item has the same function as the Smart Controls key **Sound** on the remote control as mentioned above.

- Select **Sound Style** in the menu **SOUND** with the keys **◀** or **▶**.
- Press the keys **◀** or **▶** to select the preferred sound style : **In concert**, **Classic**, **Jazz**, **Pop**, **Stadium** or **Personal**.

Select the sound mode

Depending on the sound the TV channel transmits and if your set is equipped with Ntcam, your TV will choose between stereo or digital sound unless you make a sound choice. In case of weak stereo or digital sound signals, due to the transmission, select analogue or mono.

- Select **Sound Mode** in the menu **SOUND** with the keys **◀** or **▶**.
- Press the keys **◀** or **▶** to select the preferred sound mode : **Stereo** or **Mono** if the channel transmits stereo sound, **Digital** or **Analogue** if the TV channel transmits digital sound.

Switch Loudness on or off

When **Loudness On** is selected, the low and high frequencies are amplified so that the natural balance is restored when listening to low volume sound.

Select Speech

When **Speech On** is selected, the treble settings are revealed and the bass settings are suppressed.

Select Spatial sound

When **Spatial On** is selected, it seems as though the loudspeakers are spread further apart from one another. You get a spatial sound effect.

Headphone selection

See Connect Peripheral Equipment, p. 32 for the connection of your headphone if you want to use it.

- Select **Headphone** with the keys **◀** or **▶** and press **OK**.
- The **HEADPHONE** menu appears.
- First select **Source** with the keys **◀** or **▶**.
- Source** lights up.
- Press the keys **◀** or **▶** to select the source you want to listen to with your headphone : **Automatic**, **TV**, **EXT1**, **EXT2**, **EXT3** or **FRONT**.
- Select **Automatic** if you want to listen to the sound of the picture you are watching on the screen.
- Select **TV** when you want to listen to the sound of a TV channel via your TV tuner and watch a programme via your video recorder or other peripheral. E.g. you can watch a film from your video recorder, but listen to the commentary of a broadcasted football match.
- In all other cases select the source where you connected your equipment. The equipment should be switched on, but you don't need to watch it.

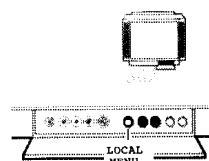
- Select with the keys **◀** or **▶** the adjustments **Volume** or **Balance**.
- The selected adjustment lights up.
- Press the keys **◀** or **▶** to regulate the selected adjustment.
- Press **MENU**.
- The **SOUND** menu reappears.

Adjust the basic picture and sound settings with the Local Menu key

Should your remote control be lost or broken you can still change some of its basic picture and sound settings.

- Press the **LOCAL MENU** key at the front of the TV.
- The adjustment **Volume**, including a bar, appears on the screen.
- Press the key **V** - or + behind the door at the front of the TV, to adjust the volume.
- Press the Local Menu key again or repeatedly to select a following adjustment
- The adjustments **Volume**, **Brightness**, **Colour** or **Contrast**, appear on the screen.
- Press the key **V** - or + at the front of the TV to regulate the selected adjustment.
- Press the **Local Menu** key again after you selected the last adjustment.
- The local menu adjustments disappear.

The Local Menu automatically switches off when after 10 sec. no action has been executed.



Dolby® Pro Logic Install

- Select **Dolby Pro Logic Install** with the keys **◀** or **▶** and press **OK**.
- The **DOLBY PRO LOGIC INSTALL** menu appears and **Test** lights up.

Most programmes will sound good with the volume balance between the centre, left and right and rear loudspeakers in an equally loud position. However, some programmes may benefit from an adjustment of the level of the respective speakers.

Which loudspeakers are active depends on the selection you have made in the TV-Configuration menu, p. 11.

- Select **Surround Mode** with the keys **◀** or **▶**.
- Press the keys **◀** or **▶** to select **Pro Logic**.
- Select **Test** again with the keys **◀** or **▶**.
- Press the keys **◀** or **▶** to switch **Test** on.
- A steady noise tone is switched sequentially through the left, centre, right and rear loudspeakers, for 2 seconds each. This enables you to adjust the volume of the separate loudspeakers.
- The loudspeakers activated light up in the on screen graphic.
- Select with the keys **◀** or **▶** **Centre Volume**, **Balance** or **Rear Volume**.
- The selected adjustment lights up.
- Press the keys **◀** or **▶** to alter the selected adjustment.
- Select **Test** again with the keys **◀** or **▶**.
- Press the keys **◀** or **▶** to switch **Test** off again.

Surround mode

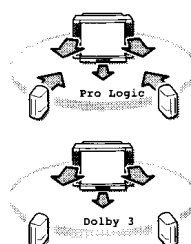
- Select **Surround Mode** with the keys **◀** or **▶**.
- Surround Mode** lights up.
- Press the keys **◀** or **▶** to select the preferred surround mode : **Pro Logic**, **Dolby 3**, **Hall** or **Off**.

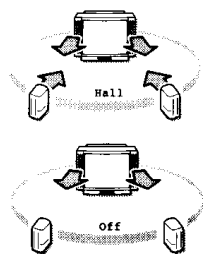
Pro Logic

- In addition to the left and right front speakers, the centre and the rear surround loudspeakers reproduce the Dolby Surround Pro Logic sounds. This 4-channel sound is always recorded when the movie or programme is marked with **DL** **Dolby Surround**. This mode is especially recommended with Dolby Surround or Dolby Surround Pro Logic encoded programmes or movies.

Dolby 3

- The Dolby 3 sound signal is now distributed over the front left, the front right and the centre loudspeakers.
- The rear loudspeakers do not produce any signal.





- Hall
 - The centre sound signal is distributed over the rear loudspeakers which creates a hall effect from the rear.
 - The centre loudspeaker does not produce any signal. This mode is recommended when you wish to add surround sound to a non Dolby Surround broadcast.
- Off
 - This mode reproduces only the left and right front sound signals. Dolby is not active. You only hear a stereo sound if the broadcast which you are watching or listening to is transmitted in stereo or digital sound.
- Press **MENU** twice.
- The **MAIN MENU** reappears.

"Dolby" "Pro Logic" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation. Manufactured under license from Dolby Laboratories Licensing Corporation.

Features

- Select **FEATURES** in the **MAIN MENU** with the keys or and press **OK**.
- The **FEATURES** menu appears.
- Use the keys and to make your selection in the **FEATURES** menu.
- Your selection lights up.

Sleeptimer

With the aid of the sleeptimer you can set a time period after which the TV should switch itself off to standby.

- Hold the key pressed down.
- The counter runs from **Off** up to **180 min.**
- Hold the key pressed down.
- The counter runs from **180 min.** down to **Off**.
- If you have set a time, then one minute before the TV switches off the remaining minute automatically appears on the screen together with the message **Good Night**. You can always switch off your set earlier or change the set time.

Child Lock

If the child lock is on, the TV can only be switched on with the remote control. The keys on the TV cannot be used. In this way you can prevent unauthorised use of your TV.

If the message **Child Lock ON** appears, the child lock must be switched off before you can use the keys on the TV.

- Press the keys or to select **On** or **Off**.

General PP Store

- Select **General PP Store** with the keys or .
- Press **OK**.
- **General PP Store** lights up and the message **Stored** appears briefly on the bottom of the screen.
- The adjustments of contrast, brightness and colour made in the picture menu and the adjustments of volume and balance made in the sound menu are stored in memory for all the stored TV channels.

Message

With this function you can enter a personal message which will be displayed automatically when the set is switched on from standby.
E.g. *I'll be late this evening. Don't wait for dinner.*

- Select **Message** with the keys or .
- Press **OK**.
- The **MESSAGE** menu appears and consists of a message part and a selection menu.
- Select **Change** with the keys or and press **OK**.
- A block appears on the first position of the first message line.
- Select with the or keys the letter or number you want to enter.
- Select with the key the next position.
- Enter the letters or numbers.
You can enter text on 2 lines of 27 characters each.

Did you fill in a wrong letter or number ?

- Select with the or keys the position of the letter or number you want to modify.
- Select with the or keys the correct letter or number.
- Press **OK** when you have entered the complete message.
- Press the or keys to make a different selection in the message menu.

Remove message

- Select **Clear** and press **OK** to remove a previous message.
- The previous message is removed.

Message type

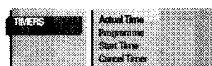
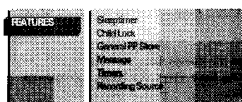
- Select **Type**.
- **Type** lights up.
- Press the keys or to select the way the message to be displayed : **Wipe**, **Slide**, **Fall** or **Fade**.

Run message

- Select **Run**.
- **Run** lights up.
- Press the keys or to select the displaying frequency : **Continuous**, **Once** or **No**.

Display message

- Switch the TV to standby.
- The message appears on the screen the moment the TV is switched on again.
When you selected **Once**, the message will disappear from the screen after 30 seconds.
When you selected **Continuous**, the message will appear on the screen continuously until the TV is switched off with the power key on the front of the TV.
The message does NOT appear when Continuous Subtitles have been switched **On** and is displayed on the bottom of the screen. See Teletext, p. 29.



Timers

With the Timers menu you can make your TV automatically switch to a specific programme number from standby or switch over to a different programme number at a specific time.

- Select **Timers** with the keys or in the **FEATURES** menu and press **OK**.
- The **TIMERS** menu appears and **Actual Time** lights up.

Actual time

On prog. no 1 you have installed a TV channel which also broadcasts teletext. See Teletext, p. 27.

- The time is downloaded from that TV channel.
- In case you want to enter another time use the digit keys.
- The time entered manually is updated every minute and remains until the TV set is switched off with the power key .

OR On prog. no 1 you have installed a TV channel which does NOT broadcast teletext. See Teletext, p. 27

- The time is set to **----** and should be set manually.
- Enter the actual time with the digit keys.
- The displayed time is updated every minute and remains until the TV set is switched off with the power key .

If you filled in an incorrect digit.

- First complete the actual time with arbitrary numbers and then start again.

Programme

- Select **Programme** with the keys or .
- **Programme** lights up.
- Enter with the digit keys the programme number of the TV channel you want your TV to switch over to.

Have you entered a wrong number ?

- Enter the right digit(s) again.

Start time

- Select **Start Time** with the keys or .
- **Start Time** lights up.
- Enter with the digit keys the start time of the selected TV programme you want your TV to switch over to.

- At the programmed time your TV will switch over from standby to the selected programme number.
- OR** ➤ At the programmed time your TV will switch over to the selected programme number when you are watching another TV channel.

Cancel timer

- Select **Cancel Timer** with the keys or and press **OK**.
- **Cancel Timer** lights up and the **Start Time** is reset to **----**.

- Press **MENU**.
- The **FEATURES** menu reappears.

Recording Source

See Peripheral Equipment, Recording with your video recorder, p. 35.

Select Programme list

- Select **PROGRAMMES** with the keys or in the **MAIN MENU** and press **OK**.
- A page with an overview of stored TV channels, together with the names you entered for the connected peripheral equipment appears. Programme numbers from the favourite list are displayed in white characters. Programme numbers which are not in the favourite list are displayed in black characters.
The current TV channel on the screen is indicated with a black block.
- Press the keys or to select a TV channel within the column.
- Press the keys or to select another column of the programme list.
- Press **OK** to select the desired TV channel.

- Press **MENU** twice.
- The **MAIN MENU** disappears.

Other functions

Vertical Squeeze

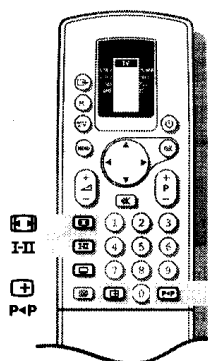
Movies and other new programmes may in the future be broadcast in a Wide Screen format.

Satellite programmes in the Wide Screen picture format recorded on a video recorder or prerecorded Wide Screen tapes can be reproduced on a normal TV screen in a conventional picture format.

- Press .
- The picture is compressed.
- There are black bars at the top and bottom of the screen.
- The message **Vertical Squeeze** appears for a moment in the left upper corner of the screen.
- Press again to switch off vertical squeeze.
- When you have a Wide Screen format video recorder connected with a eurocable, the pictures will be compressed automatically.

Bilingual broadcast

- Press the key repeatedly to select language **I** or **II** when the TV channel broadcasts in 2 languages, dubbed or original language (e.g. Eurosport) or to select analogue or digital when the TV channel broadcasts in digital sound.
- **Dual I** or **II** appears briefly on the screen.
The setting is stored in the memory for the selected TV channel when switching to another TV channel or to standby.



Information on screen

After the selection of a TV channel or a programme from a peripheral or after pressing the key  the following information may appear briefly or continuously on your screen :

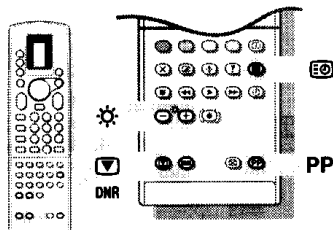
- the programme number and name of the selected TV channel
- information from the broadcaster in a bar at the bottom of the screen (e.g. the programme name or the programme title or another message)
- **Digital Sound available** if the TV channel transmits digital sound
- the currently selected sound mode if the TV channel transmits stereo or digital sound (not with a programme from a peripheral or coming from a decoder)
-  **Sound muted** when the sound is temporarily interrupted
- **Dual I or II** in case of bilingual broadcast
- the **Ext2 Output** selected in the TV Configuration menu (see p. 11)
- the selected DNR setting (see p. 25).

Permanent Programme Number

- Press  for a long time.
- ▷ The permanent programme number remains in the upper right corner of the screen when it was off, or disappears when it was on.

Select previous programme

- Press the **P+P** key.
- ▷ The previous selected TV channel is displayed.



Clock

- Open the door of the remote control.
 - Press .
 - ▷ The time, downloaded from the TV channel (with teletext) stored on programme number 1, or entered manually in the Timers menu, appears in the upper left hand corner of the screen.
- This is not possible when Continuous Subtitles have been switched on and  is displayed on the bottom of the screen. See Teletext, p. 27.
- Press  again in order to switch off the clock.

Adjust Brightness

- Open the door of the remote control.
- Press  - or + in order to adjust the brightness.

Freeze the picture

- Open the door of the remote control.
- Press .
- ▷ The picture is frozen.
- Press  in order to get moving pictures again.

DNR

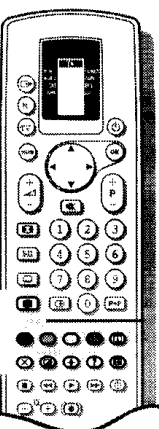
With DNR you can reduce the image noise and so improve picture quality when receiving weak signals.

- Open the door of the remote control.
 - Press  repeatedly to select **DNR Min**, **DNR Med**, **DNR Max** or **DNR Off**.
- DNR Med offers you optimum picture quality and is the usual setting for normal strength signals.
- ▷ DNR Max should only be used for poor picture quality.
 - ▷ Your selection appears for a moment at the top of the screen.
- The setting is stored in memory for the selected TV channel after the indication disappeared from the screen.

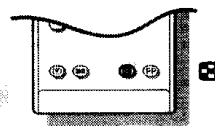
PP key

With the green **PP** key you can call up the picture and sound adjustments which have been stored with General PP Store in the Features menu, p. 20.

- Open the door of the remote control.
- Press **PP**.



Mosaic screen



- Open the door of the remote control.
- Press .
- ▷ A menu line **MOSAIC** appears on the bottom of the screen. It contains three functions : **Scan**, **Photo Fin.**, **Strobe**.
- Select with the keys  or  the function you want to activate and press **OK**.

Scan

- ▷ A scan of the stored TV channels is performed, starting with the favourite programme stored under the lowest programme number.

It is quite normal that during the scan you may notice a slight shaking or distortion of the picture.

Only TV channels placed in the favourite list are displayed. On the last position, a live picture is shown of the programme that was displayed before the mosaic screen was switched on, except when you were watching a picture from a peripheral. In this case the picture of the following favourite TV channel appears in the last position.

- Press **OK** again.
- ▷ A following series of stored TV channels from the favourite list or programmes from switched on peripherals is scanned.
- Each mosaic picture will contain its identifying programme number and name.
- Select a TV channel with the digit keys.
- ▷ The mosaic screen disappears and the selected TV programme is displayed.
- Press  to interrupt the scan function and to switch off the mosaic screen.

Never perform a scan while recording a TV programme with a video recorder recording from **EXTERNAL** for 2 since the scan will be recorded on tape.

Photo Finish

- ▷ The main picture is displayed in successive frozen pictures.
- The last picture on the bottom right will remain live.
- Press **OK** again.
- ▷ A new photo finish picture is displayed, overwriting the old one.
- Press  to switch off the photo finish function and the mosaic screen.

Strobe

- ▷ The picture is reproduced image by image. So you get an interrupted movement.
- Press **OK** again.
- ▷ The picture is reproduced image by image at a faster speed.
- Press  to switch off the strobe function and to switch off the mosaic screen.

Teletext

Most TV channels broadcast information via teletext. Each channel which broadcasts teletext transmits a page with information on how to use its teletext system. Look for the teletext page with the main index (usually page 100).

TV programmes are sometimes subtitled for the hard of hearing.

Depending on the TV channel, teletext is transmitted in different systems.

The system utilised can be recognised by the options line at the bottom of the screen.

The colours used in the options line correspond with the colour keys under the door of your remote control.

About the Easy Text system

The Easy Text system makes use of a memory with a high level of intelligence. By making maximum use of this intelligence it is possible that in most cases the selected page appears on the screen almost immediately.

The only condition is that the teletext broadcast of the particular TV channel is switched on for at least half a minute.

The major advantages of this Easy Text system are :

A considerable **reduced waiting time** by predicting what you will probably select and which results in :

- a fast and direct selection of previous and following pages which are in transmission
 - the precapturing of the page numbers referred to in the displayed page
 - the direct selection of the pages referred to in the options line
 - the creation of a **habit watcher list** : frequently used pages are put in a list of preferred pages so that they are immediately available afterwards.
- The pages are stored in the memory when switching off teletext or when switching to standby.
- The precapturing of up to **9 subpages** to be controlled by the teletext user.

Switch Teletext on and off

- Select the TV channel for the desired teletext broadcast.
 - Press  in order to switch on the teletext.
- If teletext is switched on when a menu is on the screen, the menu will automatically be removed.
- ▷ The main index page appears on the screen together with two information lines at the top and one option line at the bottom of the screen.
 - Press  again in order to switch off teletext.
 - ▷ The TV channel reappears.

Select a Teletext page

With the digit keys OR With the option line

- Enter the desired page number with the digit keys.
- ▷ The page counter seeks the page or the page appears immediately when the page number has been stored in the memory.
- ▷ A message appears when you have entered a non existent or an incorrect page number. Page numbers beginning with 0 or 9 do not exist.
- Enter the correct page number.
- Select with the colour keys, corresponding to the coloured options at the bottom of the screen and depending on the teletext system the selected TV channel transmits,
 - the previous  or the following  pages
 - the 2 previously selected pages
 - another subject

Quickly run through the teletext pages

- Press **P** - to run through the previous pages.
- Press **P** + to run through the following pages.

Select the previously selected teletext page

- Press the **P+P** key.
- The previously selected teletext page is displayed.

Select subpages

When a selected teletext page consists of different subpages, one of the subpages appears on the screen. The coloured number in the first information line refers to the displayed subpage.

The other subpages can be selected in 2 ways:

With the keys **◀** or **▶**.

OR

By adding a subcode.

- The other subpage numbers appear in white as soon as the transmission has found them and they are stored in the memory so that they are available while the teletext page is on screen.
- Select with the keys **◀** or **▶** the previous or the following subpage.

- Open the door of the remote control.
- Press **EQ**.
- Enter the desired subpage with the digit keys: e.g. 3 for the third page of seven subpages.
- The TV searches for the selected subpage.
- Press **EQ** again in order to cancel the subcode.
- Press **EQ** again.
- The information line with the available subpages appears.

Select the index teletext page

- Open the door of the remote control.
- Press the white colour key **□**.
- The main index, usually p. 100, appears.

OR

- Press **MENU**.
- A T.O.P. overview of the teletext subjects available appears.
- Not all TV channels broadcast the T.O.P. teletext.
- When the teletext system is not T.O.P. teletext, a message appears at the top of the screen.
- Select with the keys **◀**, **▶**, or the desired subject and pagenumber.
- Press **OK**.
- The selected page appears.

Select Continuous Subtitles

TV channels which broadcast teletext often transmit certain programmes with subtitling. Sometimes more than one subtitle page is available. For each TV channel you can store a subtitle page which will be displayed continuously if the programme being broadcast is transmitted with subtitles.

- Press **EQ** in order to switch on the teletext.
- Select the proper subtitle page with the digit keys.
- The selected subtitle page appears and also the subtitles when the programme transmitted is subtitled.
- Press **EQ** on the remote control.
- The message **Subtitle stored** appears.
- Press **EQ** in order to switch off the teletext.
- Every time a programme of the selected TV channel is subtitled, the subtitles will be available.
- When there are no subtitles available, only **EQ** is displayed on the bottom of the screen.
- Press **EQ** on the remote control to switch the subtitles on or off.
- The message **Subtitles On** or **Off** appears.

For every TV channel the subtitle page should be stored separately with the **EQ** key on the remote control.

Select Special teletext functions

- Press **EQ** in order to switch on the teletext.
- Open the door of the remote control.

Interrupt

- Press **X**.
- The TV programme appears.
- EQ** at the top of the screen indicates that you are still in the teletext mode. Before interrupting teletext, you can select a page number. The page number appears on your screen.
- Press **X** again.
- Teletext reappears.

Mix

- Press **EQ**.
- The teletext page and the TV programme appear on the screen at the same time.
- Press **EQ** again.
- Only the teletext page is displayed.

Enlarge

- Press **↑** to enlarge the top half of the teletext page.
- Press the keys **◀** or **▶** to scroll the text line per line.
- Press **↓** again to enlarge the bottom half of the teletext page.
- Press once more to return to normal page size.

Reveal

- Press **?** to call up concealed information, such as solutions to riddles and puzzles.
- Press **?** again in order to switch off the concealed information.

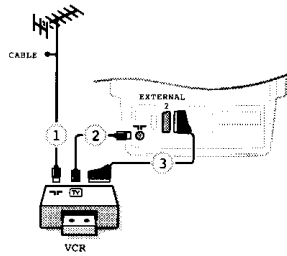
Connect Peripheral Equipment

There is a wide range of audio and video equipment that can be connected to your TV.

The following connection diagrams show you where the different equipment should be connected at the back or the front side of the TV.

TV and video recorder

- Connect the aerial cables **①** and **②** as shown opposite.
- Better picture quality can be obtained if you also connect a eurocable **③**.

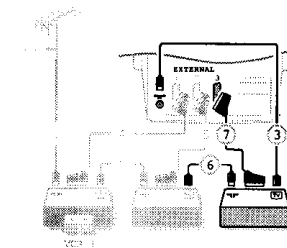
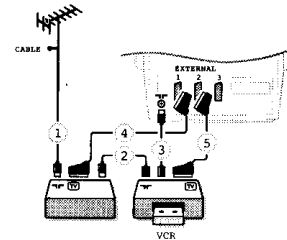


Search for and store the test signal of the video recorder

- Unplug the aerial cable **①** from the aerial socket **□** of your video recorder.
- Switch on your TV and put the video recorder on the test signal. (See the handbook for your video recorder.)
- Enter the Installation menu via the Main menu.
- Search for the test signal of your video recorder in the same way as you searched for and stored the TV signals. See Installation, Searching for and storing TV channels, Manual Installation, p. 7.
- Store the test signal either under programme number 0 or between 50 and 99.
- Replace the aerial cable in the aerial socket **□** of your video recorder once you have stored the test signal.

TV, video recorder and other peripherals (except CD-i/Photo CD)

- Connect the aerial cables **①**, **②** and **③** as shown opposite. Better picture quality can be obtained if you also connect eurocable **⑤** to **EXTERNAL 2** and a eurocable **④** to **EXTERNAL 1** or **3**.
- Look for the test signal of your peripheral in the same way as you do for a video recorder.



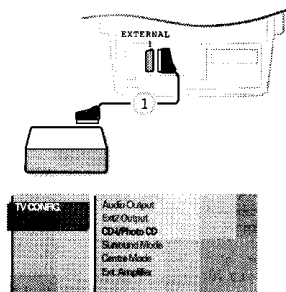
If you have more peripherals, they can also be connected to each other with an extra aerial cable **⑥** and an additional eurocable **⑦**.

When a video recorder is connected to **EXTERNAL 1** you can only record a programme from your TV.

Only when a video recorder is connected to **EXTERNAL 2** it is possible to record a programme from your TV as well as from other connected equipment. See Record with your video recorder, p. 35.

TV and a CD-i/Photo CD

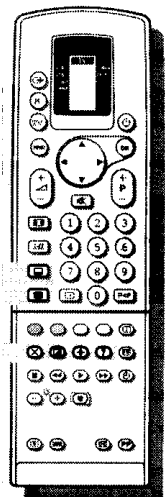
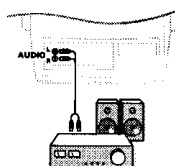
- Connect eurocable **①** as shown opposite.

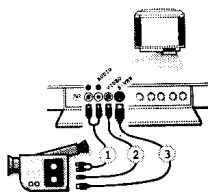


- Press **MENU** on the remote control.
- The **MAIN MENU** appears on the screen.
- Keep the key **▶** pressed and select **INSTALLATION**.
- INSTALLATION** lights up.
- Press **OK**.
- The **INSTALLATION** menu appears.
- Select **TV-Configuration** with the keys **◀** or **▶** and press **OK**.
- The **TV-CONFIGURATION** menu appears.
- Select **CD-i/Photo CD** with the keys **◀** or **▶**.
- CD-i/Photo CD** lights up.
- Press the keys **◀** or **▶** to select **Present**.
- This offers you optimum picture quality for your CD-i or Photo CD.

Audio equipment

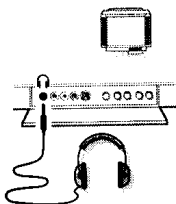
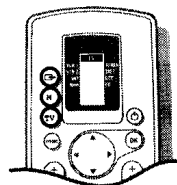
- You can listen to your TV sound via your audio equipment.
- Connect the audio cables to the audio input of your audio equipment and to **AUDIO L** and **R** at the back of your TV.
- Make your audio output selection in the Install TV Configuration menu. See p. 11.





Camera and camcorder

- Connect your camera or camcorder at the front side of your TV.
- Connect the equipment to **VIDEO (2)** and **AUDIO L (1)** for mono equipment.
- Also connect **AUDIO R (1)** for stereo equipment.
- Select stereo sound in the **SOUND** menu.
- S-VHS quality with a S-VHS camcorder is obtained by connecting the S-VHS cables with the S-VHS input (3) and AUDIO inputs (1).

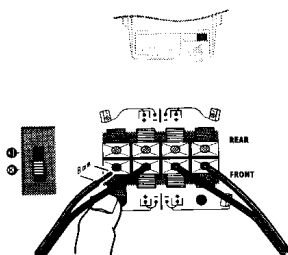


Headphone

- Insert the plug into the headphone socket at the front of the TV.
- Press **OK** on the remote control to switch off the internal loudspeakers of your TV.

The headphone socket has an impedance of between 8 and 4000 Ohm and is of the 3.5 mm jack type.

In the **SOUND** menu select **Headphone** to adjust the headphone volume and balance and to select the audio source for your headphone sound. See page 17.



Extra loudspeakers

You can replace the left and right internal loudspeakers of your set by two extra loudspeakers, min. 8 Ohm.

- Connect the loudspeakers to the connector clips at the back of the TV.
- Push the connector clip down and insert the ends of the wires into the openings: the negative wires to the black connector clips, the positive wires (the one with a black line) to the red connector clips. Do not insert the wires too far.
- Connect the front left loudspeaker to **FRONT L** and the front right loudspeaker to **FRONT R**.
- Put the loudspeaker switch on the back in the **OK** position.
- The internal right and left loudspeakers of your TV are now switched off.

Decoder

Cable TV offers you a wide choice of programmes. Most of them are free, others are to be paid for by the viewer. This means that you will need to subscribe to the broadcasting organisation whose programmes you wish to receive. This organisation will supply you a corresponding decoder unit to allow the programmes to be unscrambled. For further information, ask your dealer. See also the booklet supplied with your decoder.

Connect a decoder with an aerial socket to the TV

- Connect the aerial cable (1) as shown alongside.
- When your decoder has a euroconnector you can obtain better picture quality if you connect a eurocable (3) to **EXTERNAL 1**.

Connect a decoder without an aerial socket to the TV

- Connect the decoder to your TV with a eurocable (3) only.

Connect the decoder to the video recorder

Some video recorders have a special euroconnector for decoder.

- Connect a eurocable (4) to the euroconnector of your decoder and to the special euroconnector of your video recorder.
- See also the handbook of your video recorder.
- To connect your video recorder to the TV, see p. 30.

If you want to connect more equipment to your TV, consult your dealer.

Reproduce Picture and Sound of connected peripheral equipment

Most of the audio and video equipment from our range of products operated with the remote control of your TV. Press **M** on the remote control repeatedly until the arrow in the indicates the equipment you want to operate with this remote c

To operate your TV again, first press the **TV** key and enter programme number of the TV channel you want to watch digit keys.

- a. Reproduce picture and sound from equipment connected only v cable

- Switch your TV on.
- Select the programme number under which you have stored the with the digit keys.
- Switch on your equipment. (See the handbook for your equipment.)
- The picture and/or sound is reproduced.

If you want to watch TV channels again.

- Enter the programme number of the TV channel which you want to watch the digit keys.

- b. Reproduce picture and sound from equipment connected with:

- Switch your TV on.
- Switch on your equipment.
- Either the picture and/or the sound is reproduced or descrambled

If this is not the case:

- Press **CH** repeatedly until the designation **EXT1**, **EXT2**, **EXT3** appears on the screen, according to where you connected your the back or the front of your TV.
- Either the picture and/or the sound is reproduced or descrambled

If you want to watch TV channels again.

- Enter the programme number of the TV channel which you want to watch the digit keys.

- c. Reproduce picture and sound from equipment connected to the TV

- Switch your TV on.
- Press **CH** repeatedly until the indication **FRONT** appears on the screen.
- Switch on your equipment.
- The picture is reproduced.

If you want to watch the TV picture again.

- Enter the programme number of the TV channel which you want to watch the digit keys.

Record with your video recorder

If you have connected a S-VHS video recorder you can only receive quality from a S-VHS peripheral connected to the front side of a S-VHS camcorder). In this case go on as follows:

- Press **MENU**.
- Select **TV-Configuration** in the **INSTALLATION** menu with the arrow keys and press **OK**.
- Select **Ext2 Output** with the arrow keys or **OK**.
- Select **S-VHS Quality** with the arrow keys or **OK**.

In all other cases, whether you record with a VHS or S-VHS recorder, select **VHS Quality**.

- Keep **MENU** pressed for a short while to switch off each menu.

1. Record a TV programme

- only using an aerial cable
- Select the programme number on your video recorder.
- Set your video recorder to record. (See the handbook for your video recorder.)

- using a eurocable connected to the euroconnector **EXTERNAL**.
- With a video recorder connected to **EXTERNAL 2** it is possible to record from your TV as well as from other connected equipment.

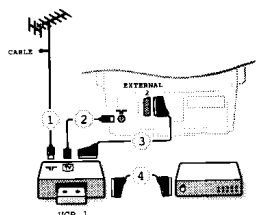
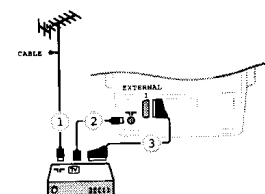
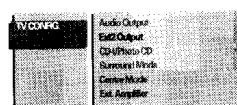
- Select the programme number on the TV.
- Press **MENU**.
- Select **FEATURES** with the arrow keys or **OK**.
- Select **Recording Source** with the arrow keys or **OK**.
- Press **Left** or **Right** to select the source you want to record: **Auto**.
- Select **Auto**: if you want to record what you are watching on.
- Select **TV** when you want to record a programme from a TV.
- Press **MENU** twice.
- The **FEATURES** menu and the **MAIN MENU** disappear.
- Set your video recorder to record. (See the handbook for your video recorder.)

- using a eurocable connected to the euroconnector **EXTERNAL**.
- With a video recorder connected to **EXTERNAL 1** you can only record a programme from your TV.

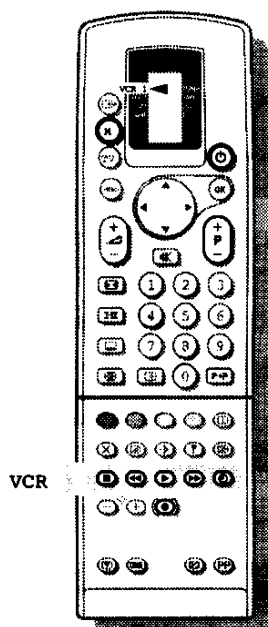
- Select the programme number on the TV.
- Set your video recorder to record. (See the handbook for your video recorder.)

2. Record a programme from Audio/Video equipment connected to **EXTERNAL 1**, **EXTERNAL 2** or **FRONT**

- Switch on the equipment.
- Press **MENU**.
- Select **FEATURES** with the arrow keys or **OK**.
- Select **Recording Source** with the arrow keys or **OK**.
- Select the connection **EXT1**, **EXT2** or **FRONT** from which you want to record with the arrow keys or **OK**.
- Press **MENU** twice.
- The **FEATURES** menu and the **MAIN MENU** disappear.
- Set your video recorder to record. (See the handbook for your video recorder.)



Operate the video recorder with the TV remote control



Most of the audio and video equipment from our range of products can be operated with the remote control of the TV.

- Press repeatedly on the **M** key of the remote control until the designation **VCR1** or **VCR2** is indicated by the arrow and according to which connected video recorder you want to operate.
- Press one of the video recorder keys of the remote control :

■ for stop

◀◀ for rewind

▶ for play

▶▶ for wind

⏸ for timer

● for record

⏮ to run quickly through the TV channels from your video recorder tuner

The digit keys to select TV channels from your video recorder tuner

The standby key ⏻ to switch off the video recorder temporarily.

Tips

Care of the screen

Clean the TV with a slightly damp soft cloth. Do not use abrasive solvent as it can damage the TV screen coating layer.

Poor Picture

Have you selected the correct TV system ? Is your TV set or house aerial located too close to loudspeakers, non-earthed audio equipment or neon lights, etc. ? Mountains or high buildings can cause double pictures or ghost images.

Sometimes you can improve the picture quality by changing the direction of the outside aerial.

Is the picture or teletext unrecognisable ?

Check if you have entered the correct frequency. See Installation, p. 8.

Are brightness and contrast out of adjustment ? Press the **PP** key.

Switch off your TV overnight with **⏻** on the front of the TV.

Sometimes poor picture quality is possible when having activated a S-VHS camera or camcorder connected to the front of your TV and another peripheral is connected to **EXT1** or **EXT2** at the same time. In this case switch off one of the other peripherals.

No picture

Is the aerial connected properly ? Are the plugs tightly connected in the aerial socket ?

Is the aerial cable in good condition and does it have suitable plugs ? Are the connection facilities to a possible second TV in good condition ? If in doubt, consult your dealer.

No picture means that the aerial peripheral equipment is transmitting no picture.

Have you pressed the correct keys on the remote control ? Try once more.

Did you press **⏻** again after switching on teletext ?

Has the child lock been switched off ?

See Features, p. 20.

Sound

Did you perhaps interrupt the sound with the **⏻** key ? Were the internal loudspeakers switched off by the switch on the back of your TV set ? See **Extra** loudspeakers, p. 32. Is the sound coming out of only one loudspeaker ? Is the balance perhaps set to one extreme ? See **SOUND** menu, p. 16.

Select **Spatial On** in the Sound menu if there is no sound coming out of the extra loudspeakers at the back. See **Spatial**, p. 17.

Remote control

If your TV no longer responds to the remote control. Check whether the remote control is in the TV operation position.

Press the **TV** key once more.

Perhaps the batteries are exhausted. See Preparation, p. 4.

You can still use the Local Menu keys at the front of your TV.

Menu

Have you selected the wrong menu ? Press **MENU** again to exit from the menu.

Connections

Check whether your peripheral equipment is properly connected. See p. 30.

Have you switched on the peripheral equipment ?

No solution

Switch your TV set off and then on again.

Never attempt to repair a defective TV yourself.

Check with your dealer or call a TV technician when in doubt.

End of life directives

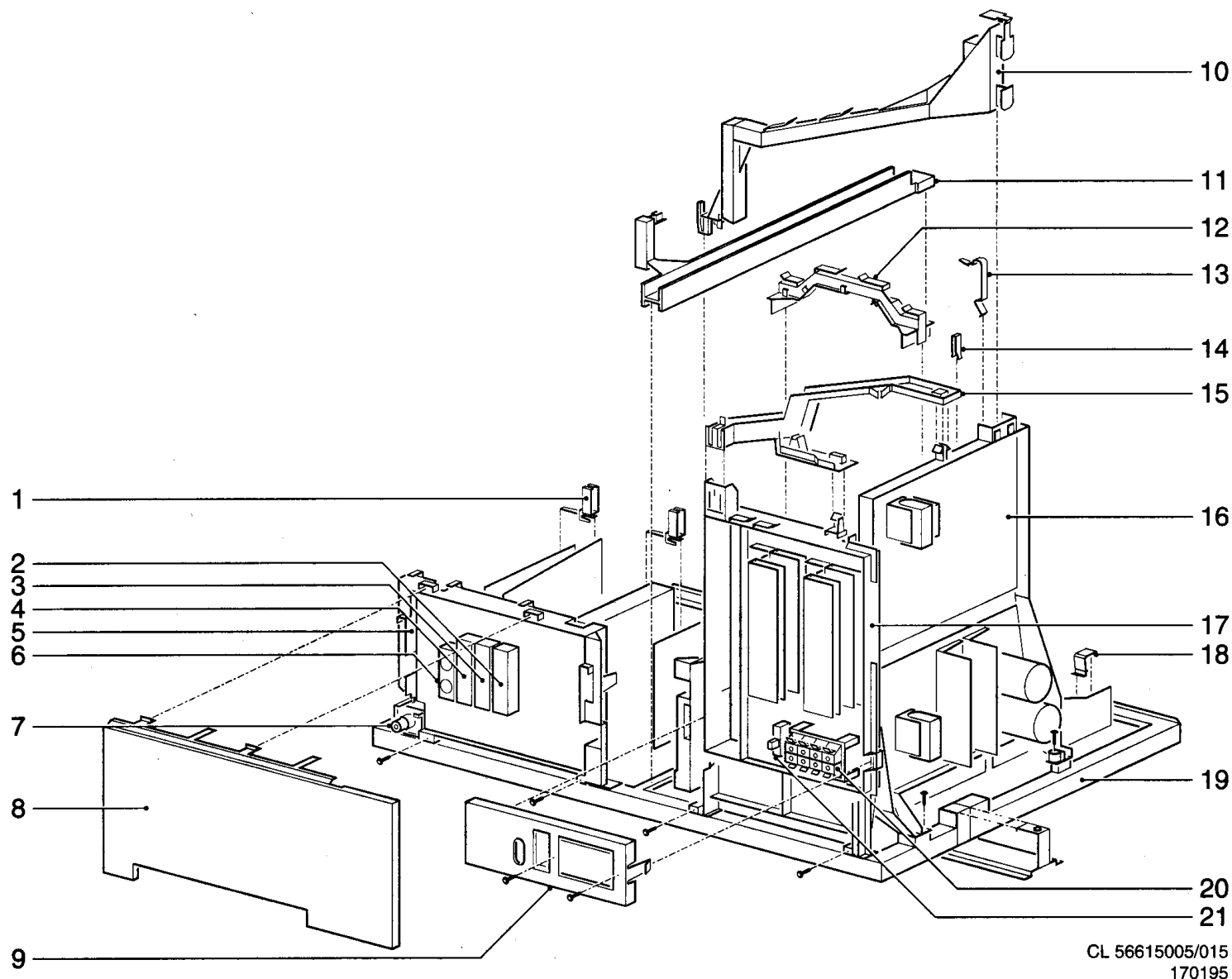
Your new TV contains materials which can be recycled and reused.

At the end of life specialised companies can dismantle the discarded TV to concentrate the reusable materials and to minimise the amount of materials to be disposed of.

Please ensure you dispose of your old TV set in accordance with any local regulations.

How to dispose of exhausted batteries ?

The Philips batteries supplied do not contain the heavy metals mercury and cadmium. Nevertheless in many countries exhausted batteries may not be disposed of with your household waste. Please ensure you dispose of exhausted batteries according to local regulations.



CL 56615005/015
170195

Mechanical parts list

1	4822 404 31441	Lock for SSP
2	4822 267 60398	Socket SCART black
3	4822 267 60399	Socket SCART blue
4	4822 267 60399	Socket SCART blue
5	4822 464 70657	Frame for source select panel
6	4822 267 31877	socket 2 x cinch
7	4822 320 11113	Cable IEC/Phono
8	4822 432 93334	Cover SSP
9	4822 432 93335	Cover audio
10	4822 404 31438	Bracket for ELPS frame
11	4822 404 31436	Chassis lock
12	4822 404 31445	Bracket for scavem
13	4822 492 70789	Spring for transistor
14	4822 492 71649	Spring for transistor
15	4822 404 31437	Bracket
16	4822 464 70658	Frame for ELPS
17	4822 464 70656	Frame for audio amplifier
18	4822 492 62076	Spring for transistor
19	4822 464 70655	Frame for chassis
20	4822 290 61229	Socket for ext. loudsp.
21	4822 277 30967	Switch loudsp. ON/OFF

Repair kits

FFS DRIVE REPAIR KIT GFL (4822 310 32214)

1011	4822 253 30467	Fuse 6,3A (ELPS)
1015	4822 310 32214	Supply drive panel
1135	4822 071 52502	Fuse 2,5A
1137	4822 071 52502	Fuse 2,5A
2102	4822 121 70586	39nF 1kV 5%
2109	4822 121 70581	1n5F 2kV 5%
2115	4822 126 11503	820pF 2kV 10%
2116	4822 126 11503	820pF 2kV 10%
3138	4822 113 80678	2Ω 7 10% 15W (ELPS) 33"
3148	4822 113 80603	1Ω5 10% 7W (ELPS) 29"

6102	4822 130 32343	BYV26C
6103	4822 130 32343	BYV26C
6104	4822 130 33887	GP15J-16
6105	4822 130 33887	GP15J-16
6106	4822 130 33887	GP15J-16
6107	4822 130 33887	GP15J-16
6110	4822 130 41602	BYW95C/20
7111	4822 130 63724	G2391HEX

AUX 1 DRIVE REPAIR KIT GFL (4822 310 32215)

2227	4822 121 70584	1nF8 2kV 5%
2228	4822 122 20054	270pF 2kV 10%
7203	4822 209 83909	UC3842N
7228	4822 130 63725	STP4N40FI

LINE REPAIR KIT GFL 25" SF (4822 310 32216)

2409	4822 121 70594	1nF 2kV 5%
2412	4822 121 70593	24nF 630V 5%
2421	4822 121 51563	560nF 250V 5%
2429	4822 121 70398	11nF 2kV 5%
2433	4822 121 51528	470nF 250V 5%
6414	4822 130 83825	BY328/20
6418	4822 130 33531	BY229F-600
7414	4822 130 63329	BU2525A
7432	4822 130 63726	MTP3055EFI
7480	4822 130 63728	IRF620

LINE REPAIR KIT GFL 29" SF (4822 310 32212)

2409	4822 121 70595	1nF2 2kV 5%
2412	4822 121 70585	27nF 630V 5%
2421	4822 121 51563	560nF 250V 5%
2423	4822 121 51563	560nF 250V 5%
2429	4822 121 70398	11nF 2kV 5%
6414	4822 130 83825	BY328/20
6418	4822 130 33531	BY229F-600
7414	4822 130 63329	BU2525A
7432	4822 130 63726	MTP3055EFI
7480	4822 130 63728	IRF620

LINE REPAIR KIT GFL 33" (4822 310 32213)

2409	4822 121 70581	1nF5 2kV 5%
2412	4822 121 70585	27nF 630V 5%
2419	4822 130 70435	10nF 2kV 5%
2421	4822 121 51563	560nF 250V 5%
2423	4822 121 51563	560nF 250V 5%
6414	4822 130 83825	BY328/20
6418	4822 130 33531	BY229F-600
7414	4822 130 62843	2SC4288A
7432	4822 130 63726	MTP3055EFI
7480	4822 130 63728	IRF620

PCS 41669

Spare parts list / Stükliste / Liste des pièces

2452▲	4822 124 40246	4,7μF 20% 63V	3510	4822 051 10102	1k 2% 0,25W	2772	4822 124 40756	1μF 20% 100V	3877	4822 051 20222	2k2 5% 0,1W
2453	4822 126 10002	100nF 20% 25V	3511	4822 051 10102	1k 2% 0,25W	2778	4822 126 10002	100nF 20% 25V	3878	4822 051 20112	1k1 5% 0,1W
2454	4822 124 20678	47μF 50% 10V	3512	4822 051 20101	100Ω 5% 0,1W	2780	4822 126 10002	100nF 20% 25V	3879	4822 051 10102	1k 2% 0,25W
2455	4822 124 41579	10μF 20% 50V				2781	4822 126 13473	220nF 20% 50V	3880	4822 051 20221	22Ω 5% 0,1W
2460▲	5322 122 32654	22nF 10% 63V	3513	4822 051 20101	100Ω 5% 0,1W	2782	4822 126 13473	220nF 20% 50V	3882	4822 051 20331	330Ω 5% 0,1W
2462▲	5322 122 32654	22nF 10% 63V	3514	4822 051 20101	100Ω 5% 0,1W	2784	4822 126 13473	220nF 20% 50V	3884	4822 051 20331	330Ω 5% 0,1W
2465	5322 122 32966	39pF 5% 50V	3515▲	4822 051 20008	0Ω 5% 0,1W	2786	4822 126 10002	100nF 20% 25V	3886	4822 051 20331	330Ω 5% 0,1W
			3999	4822 051 10102	1k 2% 0,25W	2787	5322 122 31946	27pF 5% 63V	3890	4822 051 20561	560Ω 5% 0,1W
			4xxx	4822 051 20008	0Ω 5% 0,1W	2788	4822 126 10002	100nF 20% 25V	3891	4822 051 20471	470Ω 5% 0,1W
									3894▲	4822 051 20008	0Ω 5% 0,1W
2466	5322 122 32531	100pF 5% 50V				2789	5322 122 31946	27pF 5% 63V	3906▲	4822 052 10229	22Ω 5% 0,33W
2467	5322 122 32481	15pF 5% 50V				2790▲	5322 122 32654	22nF 10% 63V	3908▲	4822 052 10228	22Ω 5% 0,33W
2468	5322 122 32658	22pF 5% 50V				2792	4822 126 10002	100nF 20% 25V	3912	4822 101 11191	10k 30% LIN
2469	5322 122 33538	150pF 2% 63V				2794	4822 126 12944	47nF 10% 50V	3914	4822 051 20822	8k2 5% 0,1W
2476	5322 122 32659	33pF 5% 50V	5377	4822 157 53303	12μH 10%	2796	4822 126 12944	47nF 10% 50V	3916	4822 051 20822	8k2 5% 0,1W
2477	5322 122 32287	4,7pF 5% 50V	5378	4822 153 20251	18μH 10%	2798	4822 126 10002	100nF 20% 25V	3999	4822 051 20279	27Ω 5% 0,1W
2478	5322 122 33861	120pF 10% 50V	5388	4822 157 63316	56μH 10%	2800	4822 122 33219	1,8nF 10% 50V	4xxx	4822 051 10008	0Ω 5% 0,25W
2481	5322 122 32659	33pF 5% 50V	5398	4822 157 63316	56μH 10%	2802	5322 122 32531	100pF 5% 50V			
2482	5322 122 32287	4,7pF 5% 50V	5420	4822 157 51216	5,6μH 10%	2810	4822 126 13473	220nF 20% 50V			
2483	5322 122 33861	120pF 10% 50V	5421	4822 157 51216	5,6μH 10%	2812	4822 126 10002	100nF 20% 25V			
			5425	4822 157 60147	2,2μH						
2485	5322 122 32448	10pF 5% 50V	5440	4822 157 51216	5,6μH 10%	2816	4822 126 10002	100nF 20% 25V			
2486	5322 122 32448	10pF 5% 50V	5445	4822 157 51216	5,6μH 10%	2821	5322 122 32287	4,7pF 5% 50V	5754	4822 157 60122	4,7μH 10%
2490	5322 122 32531	100pF 5% 50V	5446	4822 157 51216	5,6μH 10%	2822	4822 126 12944	47nF 10% 50V	5756	4822 157 60122	4,7μH 10%
2492	5322 122 32531	100pF 5% 50V				2823	5322 122 32287	4,7pF 5% 50V	5757	4822 157 60122	4,7μH 10%
2493	5322 122 32531	100pF 5% 50V	5447	4822 157 51216	5,6μH 10%	2824	4822 126 12944	47nF 10% 50V	5760	4822 157 60122	4,7μH 10%
2505	4822 126 10002	100nF 20% 25V	5453	4822 157 51216	5,6μH 10%	2825	5322 122 32287	4,7pF 5% 50V	5762	4822 157 60122	4,7μH 10%
2508	5322 122 32452	47pF 5% 63V	5454	4822 157 51216	5,6μH 10%	2826	4822 126 12944	47nF 10% 50V	5920	4822 157 53302	1μH 20%
2509	5322 122 32452	47pF 5% 63V	5465	4822 157 xxxxx	1,5μH 20%	2828	4822 126 12944	47nF 10% 50V			
			5466	4822 157 71443	1,8μH 20%	2830	4822 126 12944	47nF 10% 50V			
			5477	4822 157 60122	4,7ΩH 10%	2832	4822 126 12944	47nF 10% 50V			
			5482	4822 157 60122	4,7μH 10%						
			5490	4822 157 60147	2,2μH						
			5492	4822 157 60147	2,2μH	2844▲	5322 122 32654	22nF 10% 63V			
			5505	4822 157 51216	5,6μH 10%	2846	4822 126 10002	100nF 20% 25V	6750	5322 130 80255	BZX84-C8V2
						2848▲	5322 126 10223	4,7nF 10% 63V	6752	4822 130 80542	BZX84-C33
						2850▲	5322 126 10223	4,7nF 10% 63V	6754▲	4822 130 30621	1N4148
						2852	4822 122 33575	220pF 5% 50V	6756▲	4822 130 30621	1N4148
						2856	4822 122 33575	220pF 5% 50V	6758▲	4822 130 30621	1N4148
						2862▲	5322 122 32654	22nF 10% 63V	6813▲	5322 130 31928	BAS16
						2863	4822 122 32614	1,2nF 10% 50V	6814	5322 130 31928	BAS16
						2866	4822 126 12944	47nF 10% 50V			
						2867	4822 126 10002	100nF 20% 25V			
						2869	4822 122 32535	680pF 10% 63V			
						2874	5322 122 34123	1nF 10% 50V			
						2876	5322 122 32661	56pF 5% 50V			

Teletext panel [AQ]			
Various			
	5322 255 40677	68P-PLCC-S-HC	7049 4822 209 72042 MC78L05ACP
	4822 265 51384	15P male v 1,25	7050 4822 209 33465 74HCT4046AD
1031	4822 212 31852	TXT panel	7055 4822 130 42131 BF550
			7056▲ 5322 130 41982 BC848B
			7057▲ 5322 130 41982 BC848B
			7051 4822 209 90037 SAA5270WP/A
			7490 4822 209 90027 HYB514400BJ-70
-II-			
2430	4822 126 10002	100nF 20% 25V	
2433	5322 122 32658	22pF 5% 50V	
2434	4822 122 31772	47pF 2% 63V	
2435	5322 122 32658	22pF 5% 50V	
2436	5322 122 32658	22pF 5% 50V	
2437	5322 122 32658	22pF 5% 50V	
2438	5322 122 32452	47pF 5% 63V	
2440	5322 122 32531	100pF 5% 50V	
2441	5322 122 32658	22pF 5% 50V	
2442	5322 122 32658	22pF 5% 50V	
2443	4822 126 10002	100nF 20% 25V	
2444	4822 126 10002	100nF 20% 25V	
2445	4822 122 32482	22pF 2% 63V	
2446▲	5322 122 34123	1nF 10% 50V	
2447	5322 122 31866	6,8nF 10% 63V	
2448	4822 126 10002	100nF 20% 25V	
2449	4822 126 10002	100nF 20% 25V	
2451	4822 126 10002	100nF 20% 25V	
2452	4822 126 10002	100nF 20% 25V	
2453	4822 126 10002	100nF 20% 25V	
2454	4822 124 41643	100µF 20% 16V	
2455	4822 124 41643	100µF 20% 16V	
2459	4822 124 41643	100µF 20% 16V	
2461	4822 126 10002	100nF 20% 25V	
2462	4822 126 10002	100nF 20% 25V	
2463▲	5322 122 34123	1nF 10% 50V	
2464	4822 126 10002	100nF 20% 25V	
2465	5322 122 32658	22pF 5% 50V	
2466	4822 122 33575	220pF 5% 50V	
2467	4822 126 10326	180pF 5% 63V	
2468	4822 126 10002	100nF 20% 25V	
2469	4822 126 10002	100nF 20% 25V	
2470	4822 122 33575	220pF 5% 50V	
2472	4822 126 10002	100nF 20% 25V	
			
3148▲	4822 052 10279	27Ω 5% 0,33W	
3149	4822 051 20474	470k 5% 0,1W	
3151▲	4822 051 20472	4k7 5% 0,1W	
3152	4822 051 20471	470Ω 5% 0,1W	
3153	4822 051 20103	10k 5% 0,1W	
3154	4822 051 20103	10k 5% 0,1W	
3155▲	4822 051 20472	4k7 5% 0,1W	
3156	4822 051 20223	22k 5% 0,1W	
3451	4822 051 20273	27k 5% 0,1W	
3454	4822 051 20221	220Ω 5% 0,1W	
3455	4822 051 20151	150Ω 5% 0,1W	
3457	4822 051 20151	150Ω 5% 0,1W	
3461	4822 051 10102	1k 2% 0,25W	
3462	4822 051 20272	2k7 5% 0,1W	
3463	4822 051 20101	100Ω 5% 0,1W	
3464	4822 051 20221	220Ω 5% 0,1W	
3465	4822 051 20339	33Ω 5% 0,1W	
3481	4822 051 20101	100Ω 5% 0,1W	
3482	4822 051 20101	100Ω 5% 0,1W	
3483▲	4822 051 20472	4k7 5% 0,1W	
3484	4822 051 20101	100Ω 5% 0,1W	
3488	4822 051 20101	100Ω 5% 0,1W	
3489	4822 051 20101	100Ω 5% 0,1W	
3490	4822 051 20101	100Ω 5% 0,1W	
3491	4822 051 20101	100Ω 5% 0,1W	
3493	4822 051 20101	100Ω 5% 0,1W	
3495	4822 051 20101	100Ω 5% 0,1W	
3497	4822 051 20151	150Ω 5% 0,1W	
3999	4822 051 20279	27Ω 5% 0,1W	
			
5451	4822 157 53634	5,6µH 10%	
5452	4822 157 53634	5,6µH 10%	
5454	4822 157 53634	5,6µH 10%	
5455	4822 157 51216	5,6µH 10%	
5460	4822 157 71464	Coil trimm.	
-H-			
6001	5322 130 80119	BBY40	
6002▲	4822 130 30621	1N4148	

Service Information

1. Introduction of the V1.2 software

During production in week 9514 the V1.2 software was introduced. This software prevents the spontaneous appearance of 'Greek' characters in teletext. This software is fully compatible with the previous version. The code number of the V.1.2 software is 4822 900 10584.

2. Repair tip

Following the repair of a GFL it is recommended that connector connections L11, S11 and L21-Hdef be checked. If these do not make a good connection a defect in the line transistor may occur.

3. Correction source selection circuit diagrams (I1,I2)

The diagrams of the source selection circuit given in service manual GFL2.20E AA are not correct. New diagrams of the source selection circuit are provided in this service information. These pages (23/24 and 25/26) may be replaced in the service manual GFL2.20E AA.

4. Introduction eco NICAM panel

A new NICAM has been introduced during production. This new NICAM panel is fully compatible with the old one. It is however necessary to change the option for 'NICAM type' from 'BG or I' to 'Eco NICAM'. This new NICAM module has been introduced in sets with a serial number beginning with AG02 and higher. The circuit diagram, print layout and the parts list are provided in this service information.

5. Introduction eco I/O panel

A new I/O panel has been introduced during production. This new I/O panel is electrically but not mechanically compatible with the old panel. If the old panel is replaced by a new panel the SSP cover will also require replacement. This new I/O panel has been introduced in sets with a serial number beginning with AG02 and higher. The situation is now as follows:

AG00-01:	I/O panel	4822 212 31858
	SSP cover	4822 432 93334
≥AG02:	I/O panel	4822 212 31948
	SSP cover	4822 432 93343

The print layout and parts list for this panel are provided in this service information. The diagram is given in service manual GFL2.20E AA.

6. Introduction eco DDP

A new geometry panel has been introduced during production. This new geometry panel is fully compatible with the old one and has been introduced in sets with a serial number beginning with AG03 and higher. The geometry panel is recognizable by the colour of the print - the new panel is brown and the old panel is green. The code number of the new geometry panel is 4822 212 31926. The circuit diagram and parts list for this panel are provided in this service information. The print layout is given in service manual GFL2.20E AA.

7. New frontic IC on the featurebox-3-full

During production the frontic IC on the featurebox-3-full (IC7441) has been changed from a TDA8753N/C1 to a TDA8753AN/C1 (4822 209 90528). This change was introduced in week 9511.

Together with this IC a number of other components have also been changed, namely:

Changed

Position 3413 to 270Ω	4822 051 20271
Position 3414 to 5k6	4822 051 20562

Added

Position 4505 (jumper)	4822 051 20008
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8. Introduction 28" 16:9 set

In week 9522 the 28" 16:9 set was introduced. With the introduction of this set a number of new panels were also introduced, namely:

- LSP 28" 16:9
- PTP 28" 16:9
- TXT
- Panaview

For all these panels the diagram, print layout and parts list given in service manual GFL2.20E AA may be used, but with the addition of the code numbers below:

a. Large Signal Panel 28" 16:9 L1,L2]

2409	4822 121 70581	1,5nF 5% 2kV
2421	4822 121 43397	680nF 5% 250V
2422	4822 121 43397	680nF 5% 250V
2423	4822 121 70281	510nF 5% 400V
3270	4822 116 80676	1Ω5 5% 0.5W
3271	4822 116 80676	1Ω5 5% 0.5W

3272	4822 116 81039	1Ω8 5% 0.5W
3431	4822 050 27505	7M5Ω 1% 0.6W
3447	4822 116 52176	10Ω 5% 0.5W
3457	4822 116 52252	180k 5% 0.5W
5413	4822 157 71097	0,56μH
5420	4822 157 70871	Bridge coil 28" 16:9
5428	4822 157 50101	Linearity corr. 28" 16:9

b. Picture tube panel 28" 16:9 [R]

1030	4822 212 32159	PTP 28" 16:9
2286	4822 121 40483	10nF 10% 400V

c. Teletext panel [AQ]

1031	4822 212 32166	TXT-VT3/M3 panel
7051	4822 209 90323	SAA5270WP/B/M3

d. Panaview panel [AB]

The parts list for the Panaview panel is provided in this service information. The diagram and the print layout are given in service manual FL2.20E AA.

9. Introduction GFL2.20 H AA

In week 9521 the 28" 16:9 for the Hong Kong region was introduced. With the introduction of this set a number of new panels were also introduced, namely:

- LSP 28" 16:9 HK
- SSP 28" 16:9 HK
- TXT HK
- ELPS global
- Connector panel
- Multi voltage panel
- Global I/O panel
- Global sound decoder

For all these panels the diagram, print layout and parts list given in service manual GFL2.20E AA may be used, but with the addition of the code numbers below:

a. Large Signal Panel 28" 16:9 HK [L1,L2]

2105	4822 121 70657	680nF 5% 400V
2106	4822 121 70657	680nF 5% 400V
2120	4822 126 11157	470pF 10% 500V
2124	4822 126 12644	100pF 20% 400V
2125	4822 122 40602	1nF 20% 400V
2140	4822 126 11157	470pF 10% 500V
2142	4822 124 40246	47μF 20% 50V
2143	4822 124 40246	47μF 20% 50V
3122	4822 116 52256	2k2 5% 0.5W
3140	4822 050 11002	1k 1% 0.4W
3141	4822 116 52176	10Ω 5% 0.5W
3142	4822 116 52243	1k5 5% 0.5W
5140	4822 156 20915	33μH 10%
6138	4822 130 42488	BYD33D
6139	4822 130 30621	1N4148
6140	4822 130 34278	BZX79-C6V8
7138	4822 130 41715	BC328-40

b. Small Signal Panel [Sa,Sb]

1300	4822 210 10654	FV916MG/PH
3210	4822 051 20221	220Ω 5% 0.1W
3211	4822 051 10102	1k 2% 0.25W
3223	4822 051 10102	1k 2% 0.25W
3240	4822 050 11002	1k 1% 0.4W
3306	4822 051 20103	10k 5% 0.1W
3307	4822 051 20472	4k7 5% 0.1W
3308	4822 051 20122	1k2 5% 0.1W
3469	4822 051 20391	390Ω 5% 0.1W
3471	4822 051 20391	390Ω 5% 0.1W
3525	4822 051 20103	10k 5% 0.1W
6527	4822 130 80446	LL4148
7213	5322 209 11306	HEF4094BT
7306	5322 130 41982	BC848B

c. TXT-HK [AQ]

1031	4822 212 32185	TXT-HK
7051	4822 209 90361	SAA5270WP/A/M2E

d. Eco Low Power Standby global [AU]

1080	4822 212 32182	ELPS global
	4822 265 20722	2P red 7A
2146	4822 122 30045	27pF 2% 100V
2148	4822 121 70285	470nF 10% 250V
3145	4822 050 22201	220Ω 1% 0.6W
3147	4822 116 40247	PTC/PTC
5144	4822 212 32096	Mains filter CU28D3

e. Connector panel [H]

	4822 267 41217	Headph.+cinch+SVHS
6240	4822 130 82346	LLZ-C27
6241	4822 130 82346	LLZ-C27
6244	4822 130 82346	LLZ-C27
6245	4822 130 82346	LLZ-C27

f. Multi voltage panel [M]

The parts list for the Multi voltage panel is provided in this service information. The diagram and print layout are given in service manual GFL2.20E AA.

g. Global I/O panel [I]

The parts list for the Global I/O panel is provided in this service information. The diagram and print layout are given in service manual GFL2.20E AA.

h. Global sound decoder [G]

The parts list for the Global sound decoder is provided in this service information. The diagram and print layout are given in service manual GFL2.20E AA.

10. Introduction FL5 4:3 cabinets

In week 9512 the FL5 cabinet was introduced in production. These sets have been introduced with serial number AG03 and higher. With the introduction of this new cabinet a number of new panels have also been introduced, namely:

- LSP 25"
- PIP panel
- ELPS 25"
- A/I smartic panel
- Feature box 3 smartic
- Incredible sound
- Mainswitch panel and keyboard panel

For all of these panels, except the Feature box and Incredible sound, the print layout and parts list can be used that is given in service manual GFL2.20E AA, but with the addition of the code numbers below:

a. Large Signal Panel 25" [L1,L2]

2409	4822 121 70595	1,2nF 5% 2kV
2433	4822 121 51528	470nF 5% 250V
2450	5322 121 42489	33nF 5% 250V
3263	4822 116 52215	220Ω 5% 0.5W
3264	4822 116 52215	220Ω 5% 0.5W
3431	4822 050 27505	7M5Ω 1% 0.6W
5413	4822 157 71097	0,56μH
5421	4822 157 7135	Bridge coil
6263	5322 130 32296	BZV85-C10

b. PIP panel [P]

1340	4822 212 31931	PIP panel
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c. Eco Low Power Standby [AU]

1080	4822 212 31933	ELPS 25"
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d. A/I smartic panel [AR]

The parts list for the A/I smartic panel is provided in this service information. The diagram and print layout are given in service manual GFL2.20E AA.

e. Feature box 3 smartic [F]

A new diagram and print layout for the Feature box is provided in this service information. For the parts list the parts list in service manual GFL2.20E AA can be used with the following additions:

1345	4822 212 31927	Feature box 3 smartic
	4822 532 21513	Spacer
1485	4822 242 82001	Crystal 12MHz
2381	5322 122 32268	470pF 10% 50V
3381	4822 051 20751	750Ω 5% 0.1W
3413	4822 051 20271	270Ω 5% 0.1W
3414	4822 051 20562	5k6 5% 0.1W
4505	4822 051 20008	jumper
5381	4822 157 52333	100μH 10%
7440	4822 209 90528	TDA8753AN/C1
7505	4822 209 90335	P83C654FFA/542 V1.1

f. Incredible sound panel [AY]

A new diagram, print layout and parts list for the Incredible sound panel is provided in this service information.

g. Mainswitch panel and keyboard panel

The parts list for the mainswitch and keyboard panel is provided in this service information. The diagram and print layout are given in service manual GFL2.20E AA.

For the 25" picture tube several amendments have also been made to the electrical adjustments. The following paragraphs have been changed:

5.1 Picture tube adjustments**White Drive**

Turn off DNR and 'Contrast Plus' before adjusting. Use the internal test pattern (a white picture). Adjust the white level for the three settings 'WARM', 'NORMAL' and 'COOL'. Start in the 'NORMAL' position and take the standard value for green as a basis (value 26) and then adjust red and blue.

The factory settings for the colour temperatures are:

Tint	Temp K	X	Y
Warm	7200	303	314
Normal	8700 9500	289 284	299 292
Cool	10200 12000	280 272	287 278

	Europe	Hong kong
Warm	7200K	7200K
Normal	8700K	9500K
Cool	10200K	12000K

In case no colour analyzer is available the following values for 'White Drive' can be maintained:

25"	Cool	Normal	Warm
R	31	32	36
G	27	27	26
B	25	21	16

29"	Cool	Normal	Warm
R	25	26	28
G	26	26	25
B	18	16	13

Cut-off

Before adjusting turn off DNR and 'Contrast Plus', set brightness at step 37 (Brightness:

) and the contrast setting to maximum. Use the internal test pattern (a black picture). Use a Minolta CA-100 colour analyzer and adjust the light output for the settings 'Cool', 'Normal' and 'White' to 3NIT with the colour temperatures given below:

	Europe	Hong kong
Warm	7200K	7200K
Normal	8700K	9500K
Cool	10200K	12000K

In case no colour analyzer is available the following values for 'Cut-off' can be maintained:

25"	Cool	Normal	Warm
R	30	32	29
G	27	27	19
B	37	30	15

29"	Cool	Normal	Warm
R	23	24	29
G	20	20	20
B	27	20	14

Soft Clipper

Use a black picture with a small white square in the middle as a test pattern. Set contrast to maximum. Adjust 'White Peak Limiter' temporarily to 63. Using a colour analyzer measure in the middle of the white square and adjust the light output with the aid of 'Soft Clipper' as follows:

25" SF	: 800 NIT (Smartic)
29" SF	: 600 NIT (Smartic)
32"	: 320 NIT
28" WS	: 680 NIT
29" SF	: 520 NIT (Compact Dolby)

In case no colour analyzer is available the following values for 'Soft Clipper' can be maintained:

25" SF	: 'Soft Clipper' = 53
29" SF	: 'Soft Clipper' = 49

Peak White Limiter

Use a black picture with a small white square in the middle as a test pattern. Set contrast to maximum. Adjust 'Soft Clipper' temporarily to 63. Using a colour analyzer measure in the middle of the white square and adjust the light output with the aid of 'Peak White Limiter' as follows:

25" SF	: 700 NIT (Smartic)
29" SF	: 500 NIT (Smartic)
32"	: 320 NIT
28" WS	: 780 NIT
29" SF	: 520 NIT (Compact Dolby)

In case no colour analyzer is available the following values for 'Peak White Limiter' can be maintained:

25" SF	: 'Soft Clipper' = 23
29" SF	: 'Soft Clipper' = 22

Fig. 8.4

TV Systems	Tuner Type	FQ916(D)MF FQ916MR FV916MG FQ916MD FQ936D FS988 Tuner China FQ944D	Select tuner type (type number is on the tuner)
Stereo Decoder	Nicam Type	Not Available BG or I BG and I Eco Nicam	No Nicam Nicam with 2 IC's and 1 input filter Nicam with 2 IC's and 2 input filters Nicam with 1 IC
	2 CS	Yes No	TDA9840 present on SSP TDA9840 not present on SSP
	Global	Yes No	Global sound decoder present Global sound decoder not present
Satellite	Sat. Mod. Available	Yes No	Satellite module present Satellite module not present
	Pulse Magnetic	Yes No	Polarizer panel present Polarizer panel not present
PIP	PIP Available	Yes No	PIP module present PIP module not present
	PIP Version	Euro Latam Japan	European PIP module South American PIP module (reserved) Japanese PIP module (reserved)
	PIP Tuner Type	Not Available Euro Latam Japan	no PIP tuner European PIP tuner South American PIP tuner (reserved) Japanese PIP tuner (reserved)
	PIP Processor	PIP1 PIP2	PIP with TDA4650 (no longer used) PIP with TDA8310
	Triple PIP	Yes No	(reserved)
	Forced Colour	Yes No	For PIP 1 yes For PIP 2 yes, if PCF8574 is present
	Multi PIP	Yes No	
Teletext	TXT	mem-128 mem-512 mem-1M	128 kB teletext memory 512 kB teletext memory (1x514256) 1 MB teletext memory (2x514256)
Communication	D2B	Yes No	D2B connector present D2B connector not present
	ESI	Yes No	reserved
	EACAM	Yes No	reserved
	Project 50	Yes No	reserved
Video Repro	Frame	Digital Scan 100/120 Hz 50/60 Hz	Feature box present Eco feature box present No feature box present
	Combfilter	Not Present SAA4961 MC 141625	No Comb filter present Comb filter with SAA4961 Comb filter with MC 141625
	Scavem	No Yes	SCAVEM without TDA8444 SCAVEM with TDA8444
	Smartic	Yes No	Dynamic contrast present No dynamic contrast present
Source Selection	SS Type	Euro AV1 Euro AV2 Euro AV3 Cinch AV1	Fully populated double-sided EURO I/O panel (EURO) Semi populated double-sided EURO I/O panel (ECO) Single-sided EURO I/O panel CINCH I/O panel
	Euro AV3	None Normal	No 3rd EURO connector (only with EURO I/O) 3rd EURO connector present
	Euro AV4	None Normal	No 4th EURO connector (only with EURO I/O) 4th EURO connector present
	Euro AV	No Yes	No EURO connector (only with CINCH I/O) EURO connector present
CRT Type	4:3 16:9		4:3 picture tube 16:9 picture tube
Audio Repro	Basic Equalizer Eq. + Dolby		TDA9860 present on SSP AFU panel without Dolby AFU panel with Dolby
Digital Output	No Yes		no digital output present digital output present (NICAM also present)



A

B

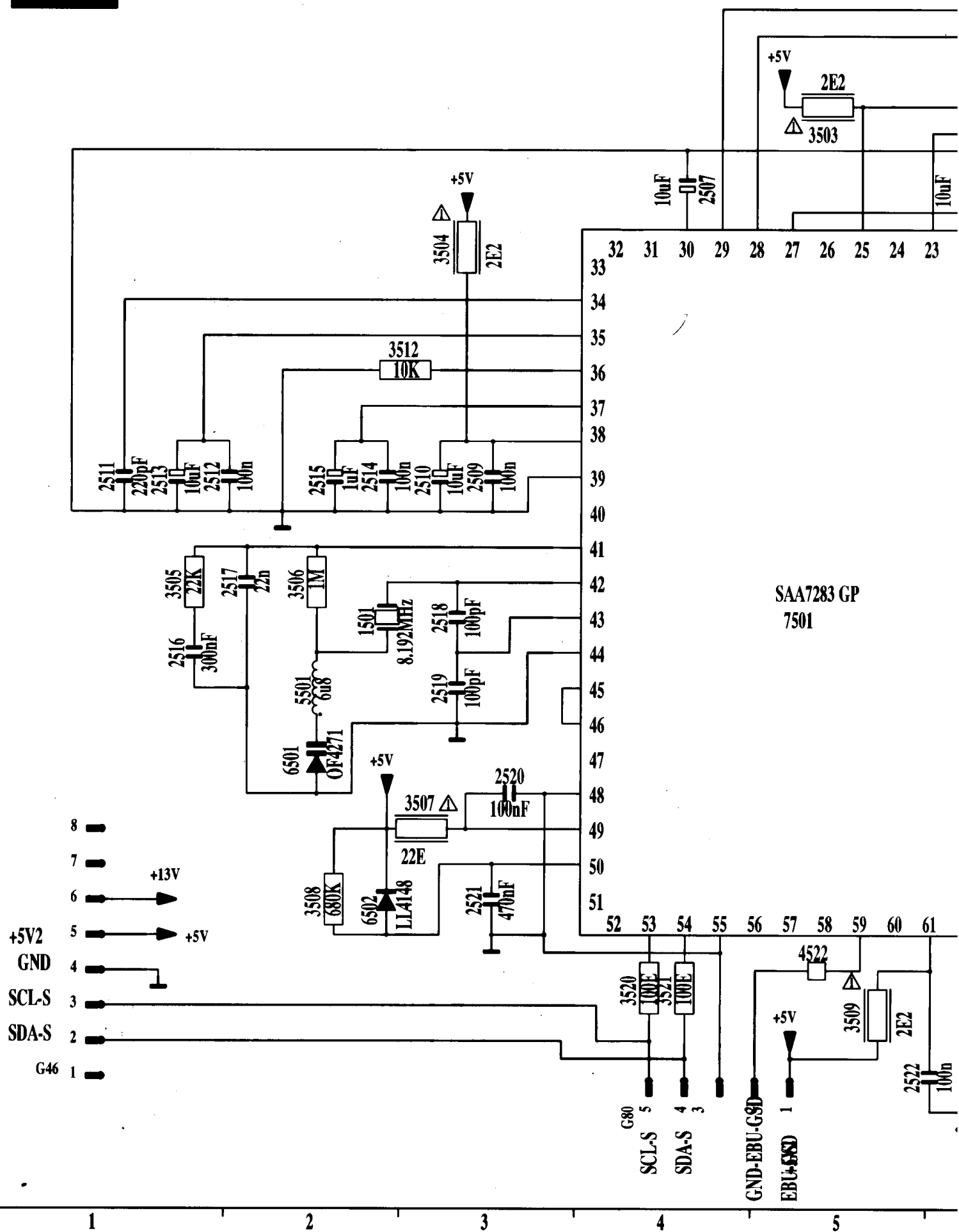
C

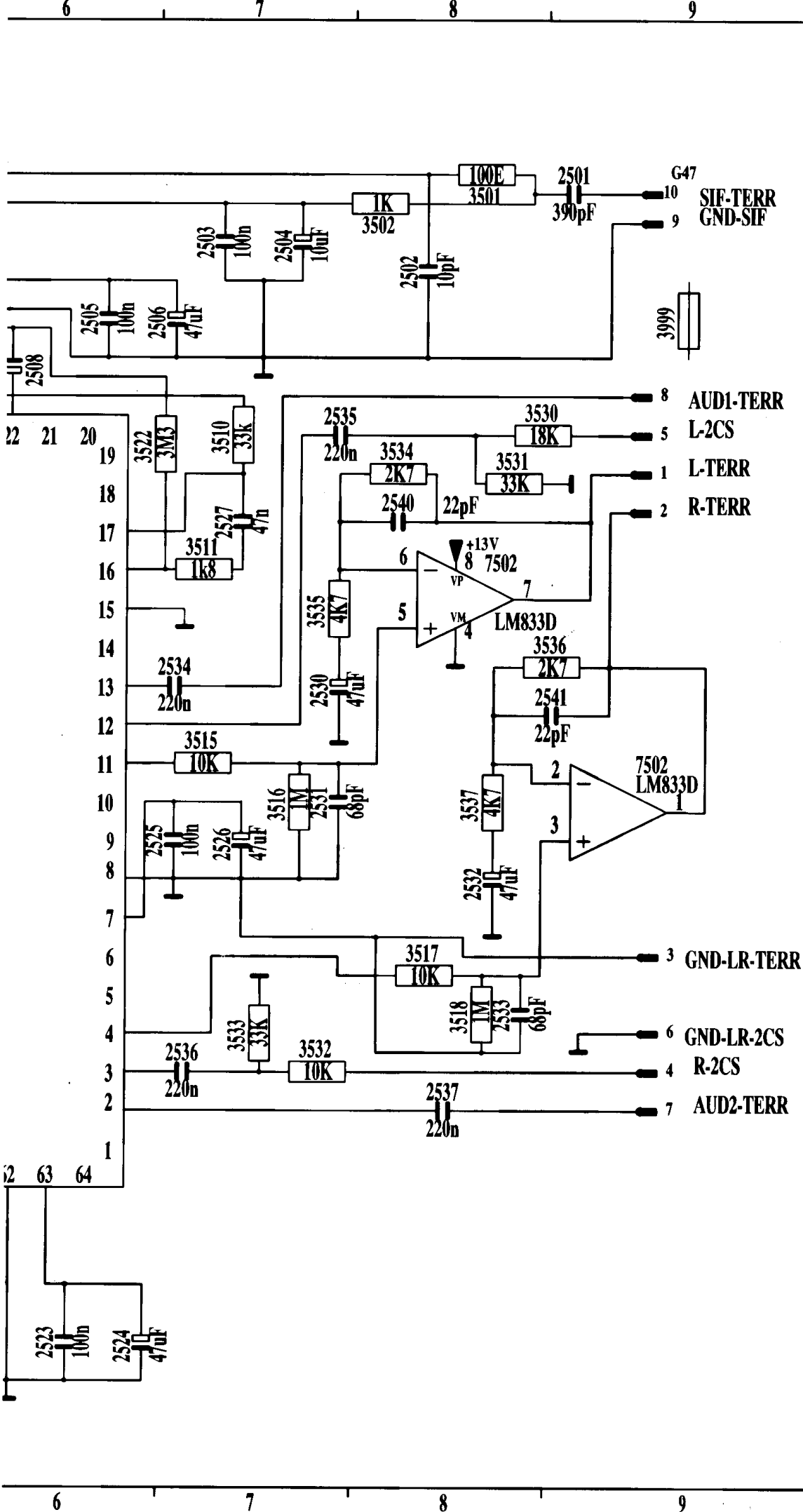
D

E

F

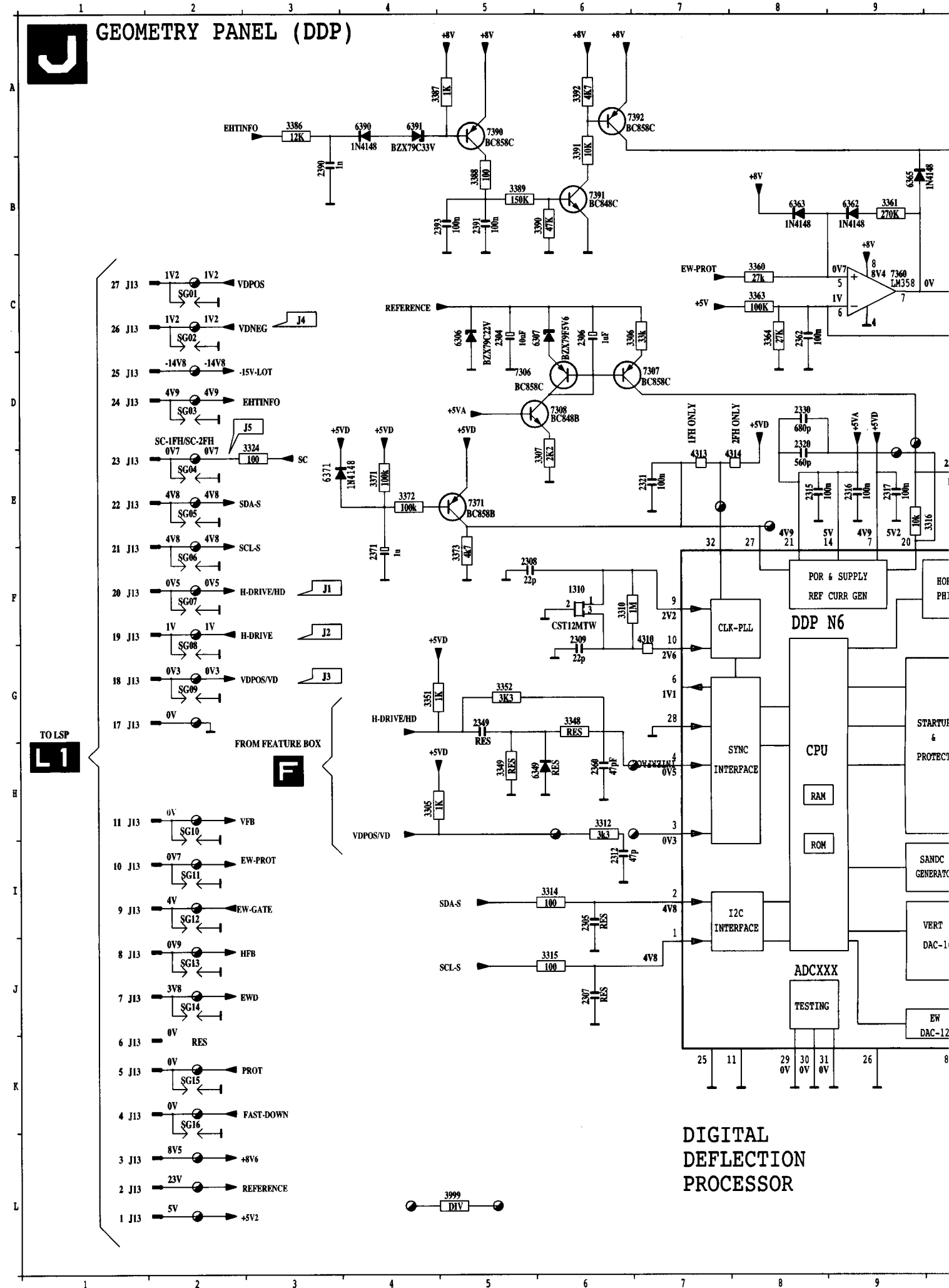
G





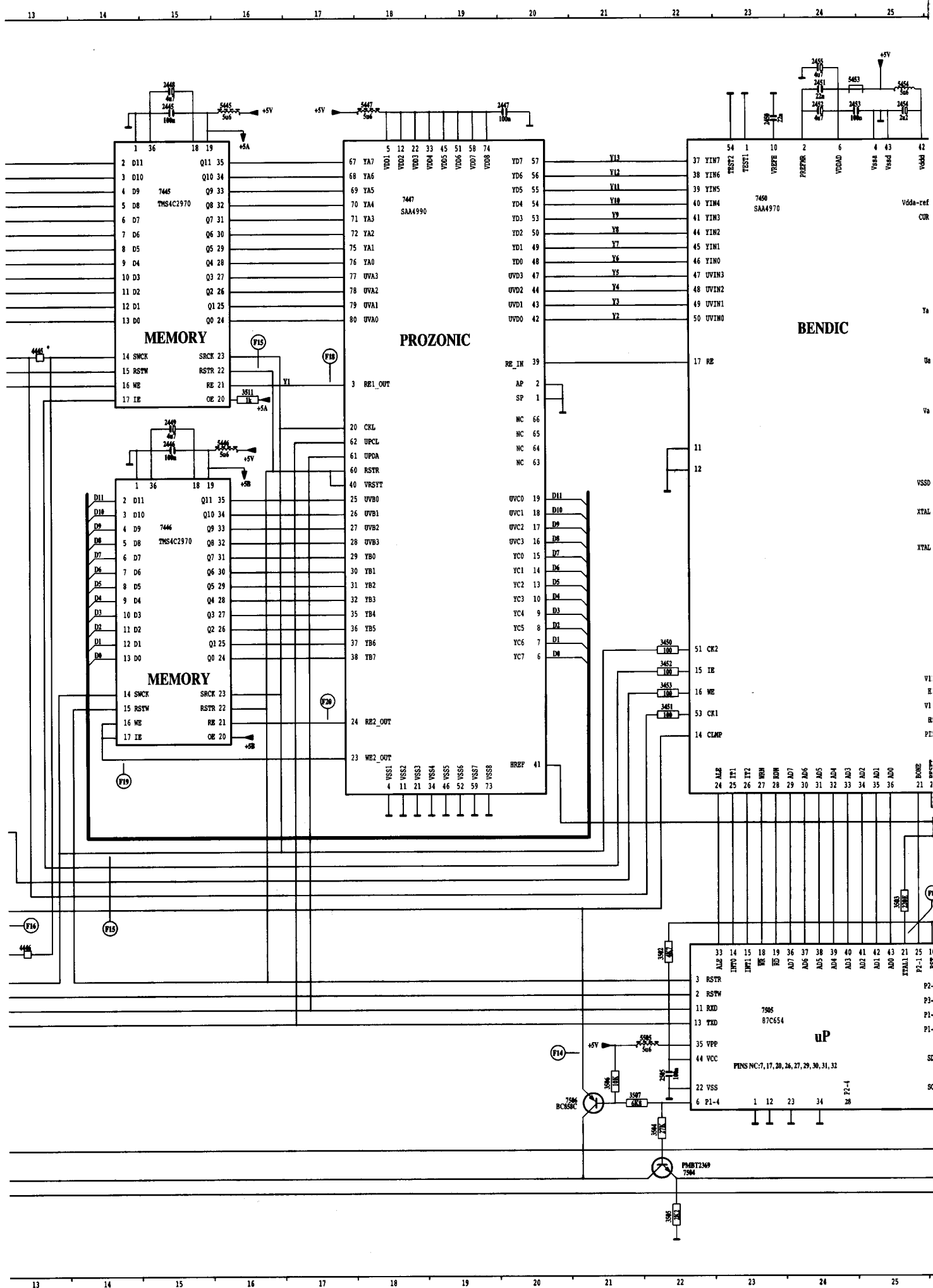
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1503	A	7
1504	A	7
1505	A	6
1506	B	7
1507	B	4
1508	B	6
1509	B	3
1510	D	3
1511	D	1
1512	D	1
1513	D	1
1514	D	2
1515	D	2
1516	D	2
1517	D	3
1518	D	3
1519	E	3
1520	E	3
1521	E	5
1522	C	6
1523	C	6
1524	C	6
1525	C	7
1526	C	7
1527	C	7
1528	C	7
1529	C	7
1530	C	7
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1593	C	7
1594	C	7
1595	C	7
1596	C	7
1597	C	7
1598	C	7
1599	C	7
1600	C	7

GEOMETRY PANEL (DDP)



26 27 28 29 30 31

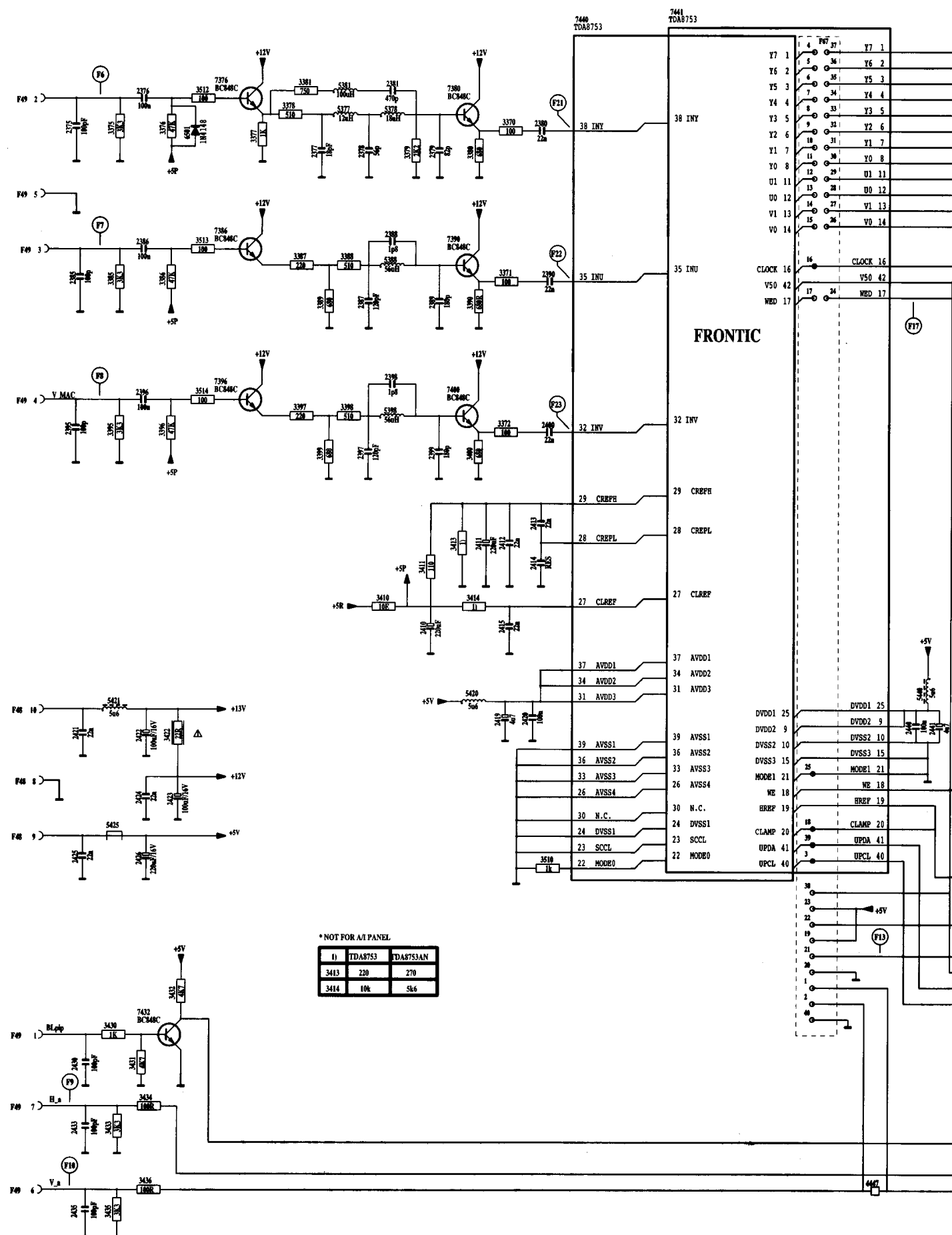




Platine Feature box (100 Hz Digital Scan)



FEATURE BOX 3



Service
Service
Service

GFL2.20E
GFL2.30E
96.01

Service Information

1. Restoration of the Multi PIP option in 4GFL2.20

With the introduction of software version V1.4 in week 9514, the Multi PIP option was also introduced in the 29PT826C and 29PT828C. With this new software it is possible to switch Multi PIP 'on' and 'off'. Previously Multi PIP was always 'on'. If the software in older sets is now replaced this bit is now 0, which means that the Multi PIP is 'off'. In order to enable Multi PIP again the SW option has to be increased by 64:
SW: xxxxxx yyyyyy where yyyyyy has to be changed to yyyyyy+64.

2. New Eco Low Power Standby panel

During production a new Eco Low Power Standby panel has been introduced.

This new ELPS is fully compatible with the old one. This new panel has been introduced in 4GFL2.20 sets with serial numbers beginning with AG04 and higher. The service information provides the circuit diagram, print layout and the parts list for this panel.

3. Introduction darker picture tube in GFL2.20 E 28" WS+ 16:9 sets

In type numbers 28PW9501 and 70WA9430 a darker picture tube (W66EWR002X42) was introduced in week 9548. This picture tube was introduced in sets with a serial number beginning with AG05 or higher. The code number of this picture tube is 4822 131 11071.

4. Introduction SF picture tube in GFL2.20 E 28" WS+ 16:9 sets

In week 9601 an SF picture tube (W66ESF002X44) was introduced in type numbers 28PW9501, 28PW9521 and 70WA9430. This picture tube was introduced in sets with a serial number beginning with AG06 or higher. The code number of this picture tube is 4822 131 20704.

At the same time as this modification the following components and panels were changed:

Cabinet FL2:	from 4822 430 50889 to 4822 449 80019
Large signal panel:	from 4822 212 32321 to 4822 212 10434
Picture tube panel:	from 4822 212 32159 to 4822 212 31829

ELPS:	from 4822 212 32316 to 4822 212 32314
Feature box:	from 4822 212 31803 to 4822 212 32368
Degaussing coil:	from 4822 157 71259 to 4822 157 71847

The modifications on the panels are as follows:

LSP

Modified:

Position 2429 in 11nF	4822 121 70398
Position 3270 in 1,8Ω	4822 116 81039
Position 3271 in 1,8Ω	4822 116 81039
Position 5428 in	4822 157 71831

Added:

Position 2436 390nF	4822 121 10494
Position 5421 bridge coil	4822 157 71828
Position 9428 (jumper)	

Removed:

Position 1028, 2423, 5420, 9426 en 9432

SSP

Modified:

Position 2544 in 4μF	4822 124 81264
Position 3522 in 120kΩ	4822 051 20124
Position 7202 in	4822 900 10714

Added:

Position 2330 4,7nF	4822 121 43856
Position 3210 220Ω	4822 051 20221
Position 3211 1kΩ	4822 051 10102
Position 3223 1kΩ	4822 051 10102
Position 3330 1kΩ	4822 050 11002
Position 3519 33k	4822 051 20333
Position 3539 1MΩ	4822 051 20105
Position 4520 (jumper)	4822 051 20008
Position 6527 LL4148	4822 130 80446

Removed:

Position 3521, 6522



PTP

Modified:

Position 3224 in 240Ω	4822 051 20241
Position 3233 in 220Ω	4822 051 20221
Position 3243 in 220Ω	4822 051 20221
Position 3253 in 220Ω	4822 051 20221
Position 3280 in 3,9Ω	4822 052 11398
Position 3287 in 3,9Ω	4822 052 11398
Position 7230 in TDA6101Q/N3	4822 209 91143
Position 7240 in TDA6101Q/N3	4822 209 91143
Position 7250 in TDA6101Q/N3	4822 209 91143

Added:

Position 2285 1nF	4822 122 31175
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Removed:

Position 2286

5. Introduction of Cyrillic menu in -/58 sets

In week 9546 new software for the Cyrillic menu was introduced in all -/58 GFL sets. This software has been introduced in the following sets:

2GFL2.20 ≥ AG04

4GFL2.20 ≥ AG06

5GFL2.20 ≥ AG04

5GFL2.30 ≥ AG04

The code number of this software is 4822 900 10738.

6. Introduction of Cyrillic teletext in -/58 sets

In week 99606 Cyrillic teletext was introduced in all -/58 GFL sets. This software has been introduced in the following sets:

2GFL2.20 ≥ AG07

4GFL2.20 ≥ AG07

5GFL2.20 ≥ AG05

5GFL2.30 ≥ AG05

The code number of the TXT module is 4822 212 10445.

The code number of the SAA5270WP/E/M3A is 4822 209 12877.

7. Introduction new small signal panel

In week 9616 a new small signal panel was introduced during production. This small signal panel has been introduced in sets with a serial number beginning with AG10 or higher. The reason for this new SSP is the introduction of the 'Philips comb filter' and 'easy link'. The new service SSP is fully compatible with the old service SSP providing the 'video' option 'comb filter' is set to SAA4961.

The code number of the new SSP is 4822 212 10573.

This service information includes the circuit diagram S5 and the new print layout. The difference with the old SSP panel is:

Modified:

Position 3352 in 4k7	4822 051 20472
Position 3365 in 330Ω	4822 051 20331
Position 3367 in 330Ω	4822 051 20331
Position 7202 in	8204 000 57490

Added:

Position 2350 100nF	4822 126 10002
Position 2351 100nF	4822 126 10002
Position 2352 220nF	4822 126 13561
Position 2353 22pF	5322 121 32658
Position 2355 100nF	4822 126 10002
Position 2356 100nF	4822 126 10002
Position 2358 100nF	4822 126 10002
Position 2359 100μF	4822 124 41525
Position 2363 680pF	5322 126 10184
Position 2365 100μF	4822 124 41525

Position 2369 100μF	4822 124 41525
Position 2375 100nF	4822 126 10002
Position 2377 22pF	5322 121 32658
Position 2400 220pF	4822 122 33575
Position 2401 1nF	5322 126 10511
Position 2624 4,7nF	5322 126 10223
Position 3351 68Ω	4822 051 20689
Position 3353 82Ω	4822 051 20829
Position 3368 1Ω	4822 051 20108
Position 3369 1k	4822 051 20102
Position 3371 1Ω	4822 051 20108
Position 3398 1k1	4822 051 20112
Position 3399 220Ω	4822 051 20221
Position 3400 22k	4822 051 20223
Position 3618 1k	4822 051 20102
Position 5313 0,33μH	4822 157 10401
Position 5350 10μH	4822 157 51462
Position 5351 10μH	4822 157 51462
Position 5352 10μH	4822 157 51462
Position 5353 27μH	4822 157 53001
Position 7350 SAA4961/V2/S1	4822 209 12998
Position 7351 BC858C	4822 130 42513
Position 7371 BC848C	5322 130 42136

Removed:

S55, 1335, 2371, 4353, 4355

8. Introduction 32" WS+ set

In week 9535 the 32" 16:9 set was introduced. With the introduction of this set a number of new panels were also introduced, namely:

- LSP 32" 16:9
- SSP 32" 16:9
- PTP 32" 16:9
- ELPS 32" 16:9
- Scavem 32" 16:9
- DAF panel
- FBX3-Panic

The circuit diagrams, print layouts and parts lists provided in service manual GFL2.20E AA may be used for all the above panels, but with the addition of the following code numbers:

a. Large signal panel 32" 16:9 [L1,L2]

2421	4822 121 43397	680nF 5% 250V
2422	4822 121 43397	680nF 5% 250V
2436	2222 375 04474	470n 5% 400V
3270	4822 116 81039	1,8Ω 5% 0,5W
3271	4822 116 81039	1,8Ω 5% 0,5W
3272	4822 116 81039	1,8Ω 5% 0,5W
3431	4822 050 27505	7M5 1% 0,6W
3447	4822 116 52176	10Ω 5% 0,5W
3457	4822 116 52252	180k 5% 0,5W
3476	4822 116 52272	330k 55 0,5W
5421	4822 157 71829	Bridge coil 32"
5428	4822 157 71833	Linearity corr. 32"
5450	4822 140 10541	L.O.T. 32"
6263	4822 130 70028	BZV85-C3V6

b. Small signal panel [Sa, Sb]

7202	4822 900 10714	Software
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c. Picture tube panel 32" 16:9 [R]

2266	4822 126 13597	330pF 10% 500V
3265	4822 051 20184	180k 5% 0,1W
3266	4822 051 20472	4k7 5% 0,1W
3267	4822 051 20222	2k2 5% 0,1W
3268	4822 116 52234	100k 5% 0,5W
5280	4822 157 71452	18μH 10%
7266	5322 130 41983	BC858B

d. Eco Low Power Supply [AU]

1080 4822 212 32314 ELPS 32"

e. Scavem [V]

2816 4822 126 10326 180pF 5% 63V
 2856 5322 122 33538 150pF 2% 63V
 2900 4822 122 33342 33nF 10% 63V
 2920 4822 122 33342 33nF 10% 63V
 2921 4822 122 33342 33nF 10% 63V
 2922 4822 122 33342 33nF 10% 63V
 2930 4822 122 33342 33nF 10% 63V
 2934 4822 122 33342 33nF 10% 63V
 2940 4822 122 33342 33nF 10% 63V
 3816 4822 051 20339 33Ω 5% 0,1W
 3856 4822 116 52193 39Ω 55 0,5W
 3857 4822 117 11139 1k5 1% 0,1W
 3900 4822 052 10109 10Ω 5% 0,33W
 3901 4822 051 20101 100Ω 5% 0,1W
 3902 4822 051 20101 100Ω 5% 0,1W
 3920 4822 051 20272 2k7 5% 0,1W
 3921 4822 052 10109 10Ω 5% 0,3W
 3922 4822 051 20103 10k 5% 0,1W
 3923 4822 051 20472 4k7 5% 0,1W
 3924 4822 051 20222 2k2 5% 0,1W
 3925 4822 051 20103 10k 5% 0,1W
 3926 4822 050 11002 1k 1% 0,4W
 3927 4822 050 11002 1k 1% 0,4W
 3930 4822 052 10109 10Ω 5% 0,3W
 3931 4822 051 20101 100Ω 5% 0,1W
 3932 4822 051 20471 470Ω 5% 0,1W
 3933 4822 116 52195 47Ω 5% 0,5W
 3940 4822 052 10109 10Ω 5% 0,3W
 3941 4822 051 20101 100Ω 5% 0,1W
 3942 4822 051 20471 470Ω 5% 0,1W
 3943 4822 116 52195 47Ω 5% 0,5W
 6901 4822 130 34197 BZX79-B12
 6902 4822 130 34197 BZX79-B12
 6932 4822 130 31253 BZX79-C2V4
 6933 4822 130 31253 BZX79-C2V4
 7900 4822 209 63995 TDA8444P/N4
 7920 5322 209 61487 LM358N
 7931 5322 130 60508 BC857B
 7932 4822 130 40981 BC337-25
 7940 4822 130 41246 BC327-25
 7941 4822 130 60511 BC847B

f. DAF panel [AB]

1028 4822 212 32391 DAF panel
 4822 265 20733 2P yellow
 4822 265 41468 Pin strip 12P
 2090 4822 126 12084 390pF 10% 2kV
 2091 4822 126 12084 390pF 10% 2kV
 3090 4822 116 21239 VDR
 3091 4822 116 21239 VDR
 5090 4822 148 81242 Transf. DAF

g. Featurebox 3 Panic [F]

1345 4822 212 32368 Feature box 3 Panic

The factory settings for the colour temperatures are:

Tint	Temp K	X	Y
Warm	7200	303	314
Normal	8700	289	299
	9500	284	292
Cool	10200	280	287
	12000	272	278

	Europe	Hong Kong
Warm	7200K	7200K
Normal	8700K	9500K
Cool	10200K	12000K

In case a colour analyzer is not available the following values for 'White Drive' can be maintained:

25"	Cool	Normal	Warm
R	31	32	36
G	27	27	26
B	25	21	16

29"	Cool	Normal	Warm
R	25	26	28
G	26	26	25
B	18	16	13

33"	Cool	Normal	Warm
R	44	46	50
G	40	40	41
B	36	32	27

28" WS+	Cool	Normal	Warm
R	35	37	41
G	31	31	31
B	27	23	19

32" WS+	Cool	Normal	Warm
R	34	35	39
G	25	26	26
B	22	19	15

28" SF	Cool	Normal	Warm
R	30	35	35
G	25	25	25
B	21	18	14

32" SF	Cool	Normal	Warm
R	30	35	35
G	25	25	25
B	21	18	14

9. Picture tube adjustments

White drive

Turn off DNR and 'Contrast Plus' before adjusting. Use the internal test pattern (a white picture). Adjust the white level for the three settings 'WARM', 'NORMAL' and 'COOL'.

Start in the 'NORMAL' position, take the standard value of green as a starting point (value 26), and then adjust red and blue.

Cut-off

Before adjusting turn off DNR and 'Contrast Plus', set brightness to step 37 (Brightness: ) and contrast to maximum.

Use the internal test pattern (a black picture). Use a Minolta CA-100 colour analyzer and adjust the light output for the settings 'Cool', 'Normal' and 'Warm' to 3NIT with the colour temperature below.

	Europe	Hong Kong
Warm	7200K	7200K
Normal	8700K	9500K
Cool	10200K	12000K

In case a colour analyzer is not available the following values for 'Cut-off' can be maintained:

25"	Cool	Normal	Warm
R	30	32	29
G	27	27	19
B	37	30	15

29"	Cool	Normal	Warm
R	23	24	29
G	20	20	20
B	27	20	14

33"	Cool	Normal	Warm
R	34	34	34
G	26	23	18
B	37	27	15

28" WS+	Cool	Normal	Warm
R	34	34	34
G	25	22	18
B	34	24	13

32" WS+	Cool	Normal	Warm
R	34	34	34
G	23	21	17
B	33	24	13

28" SF	Cool	Normal	Warm
R	34	34	34
G	26	26	17
B	36	29	14

32" SF	Cool	Normal	Warm
R	34	34	34
G	26	26	17
B	36	29	14

Soft clipper

Use a black picture with a small white square in the middle as test pattern. Adjust contrast to maximum. Temporarily adjust 'Peak White Limiter' to 63. Using a colour analyzer on the middle of the white square, and with the aid of 'Soft Clipper', adjust the light output as follows:

25" SF	: 800 NIT
29" SF	: 600 NIT (Smatic)
29" SF	: 520 NIT Compact Dolby)
33"	: 380 NIT
28" WS	: 750 NIT
32" WS	: 480 NIT
28" SF WS	: 620 NIT
32" SF WS	: 600 NIT

In case a colour analyzer is not available the following values for 'Soft clipper' can be maintained:

25" SF	: 'Soft Clipper' = 53
29" SF	: 'Soft Clipper' = 49
29" SF	: 'Soft Clipper' = 40
33"	: 'Soft Clipper' = 40
28" WS	: 'Soft Clipper' = 40
32" WS	: 'Soft Clipper' = 40
28" SF WS	: 'Soft Clipper' = 40
32" SF WS	: 'Soft Clipper' = 40

Peak White Limiter

Use a black picture with a small white square in the middle as test pattern. Adjust contrast to maximum. Temporarily adjust 'Soft Clipper' to 63. Using a colour analyzer on the middle of the white square, and with the aid of 'Peak White Limiter', adjust the light output as follows:

25" SF	: 700 NIT
29" SF	: 500 NIT (Smatic)
29" SF	: 520 NIT Compact Dolby)
33"	: 350 NIT
28" WS	: 650 NIT
32" WS	: 410 NIT
28" SF WS	: 550 NIT
32" SF WS	: 500 NIT

In case a colour analyzer is not available the following values for 'Peak White Limiter' can be maintained:

25" SF	: 'Peak White Limiter' = 23
29" SF	: 'Peak White Limiter' = 22
29" SF	: 'Peak White Limiter' = 25
33"	: 'Peak White Limiter' = 25
28" WS	: 'Peak White Limiter' = 25
32" WS	: 'Peak White Limiter' = 25
28" SF WS	: 'Peak White Limiter' = 25
32" SF WS	: 'Peak White Limiter' = 25

10. Overview Featureboxes for the GFL chassis

GFL sets can be fitted with the following basic feature boxes (FBX):

- GFL 2.20 FBX3 Digital Scan
- GFL 2.30 FBX4 Digital Scan Natural Motion

Two extra panels can be soldered onto the basic feature box for additional functions:

- AI panel for the 'Dynamic Contrast' and Digital Panorama Mode' functions.
- PALplus for the decoder of the 'Helper' signals and Motion Adaptive Colour Plus (MACP) only for FBX4).

Up to the present the AI panel can include two different functions:

- Dynamic contrast (AI-S) (via the SMARTIC IC (SAA4975H, IC7008)).
- Digital Panorama (AI-P) (via the PANIC IC (SAA4992WP/V1, IC7010) (this panel replaces the panorama panel on the LSP)).

The combination of both functions on the AI panel is indicated by means of AI-S/P.

A combination of FBX4, Ai and PALplus is also possible, but this has a different metal housing due to the presence of the so-called 'Back panel' that directly connects the three horizontally positioned PCBs to one another (FBX4 + AI + PALplus is thicker).

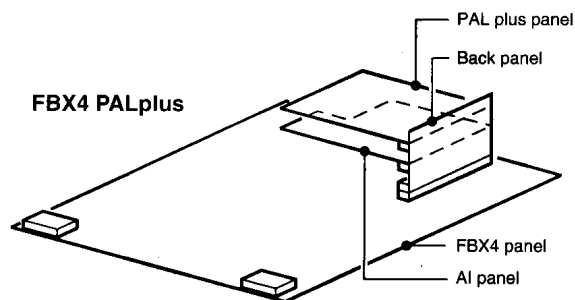
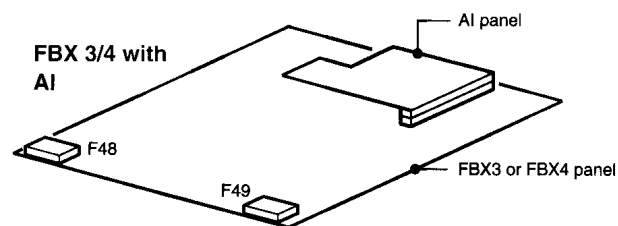
The different variations are given in the figure below:

Model/component		Basic panel		AI panel		Backpanel	PALplus panel
Model	Code number	FBX3	FBX4	Smartic	Panic		
FBX4-S/P-PALplus *)	4822 212 32366		X	X	X	X	X
FBX4-S/P	4822 212 32365		X	X	X		
FBX3-VGA	4822 212 32337	X					
FBX3-P	4822 212 32368	X			X		
FBX3-S	4822 212 31927	X		X			
FBX3	4822 212 31803	X					
AI-S	4822 212 31947			X			
AI-P	4822 212 32392				X		
AI-S/P	4822 212 32389			X	X		
AI-S/P for PALplus	4822 212 32373			X	X		
PALplus + AI-S/P	4822 212 32377			X	X	X	X

*) This article can be repaired via a central repair procedure.

Model/type number	
Model	Type number
FBX3	29PT82XC, 28PW95X1,
FBX3-S	25PT9XX1, 29PT9XX1, 33PT9XX1
FBX3-P	32PW95X1, 28PW95X1 ≥ AG06
FBX3-VGA	29PX8001, PD5029C1
FBX4-S/P	28PW96X1, 32PW96X1
FBX4-S/P-PALplus	28PW97X1, 32PW97

In the overview below the various options are given together with their service code numbers:



CL66615003_013.AI
040496

Microprocessor/software (IC7505) for the various feature boxes:

Feature box	Software
FBX3 with TDA8753	4822 209 90033
FBX3 with TDA8753AN/C	4822 209 90153
FBX4	4822 900 10745

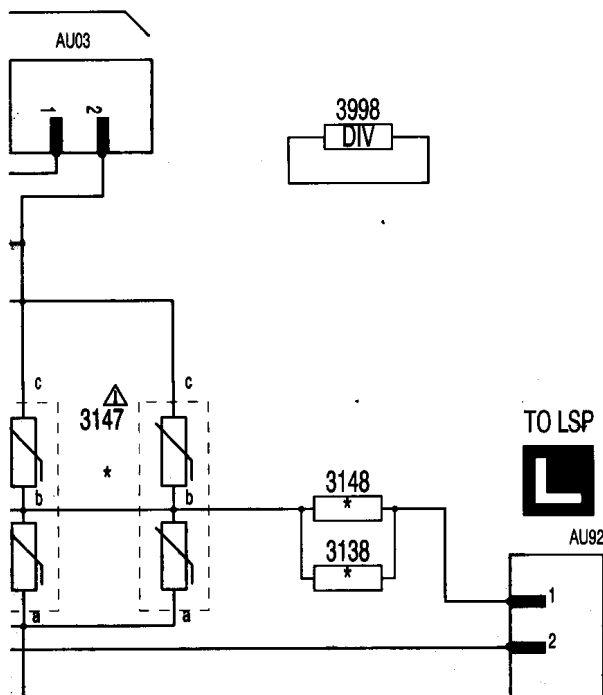
AU



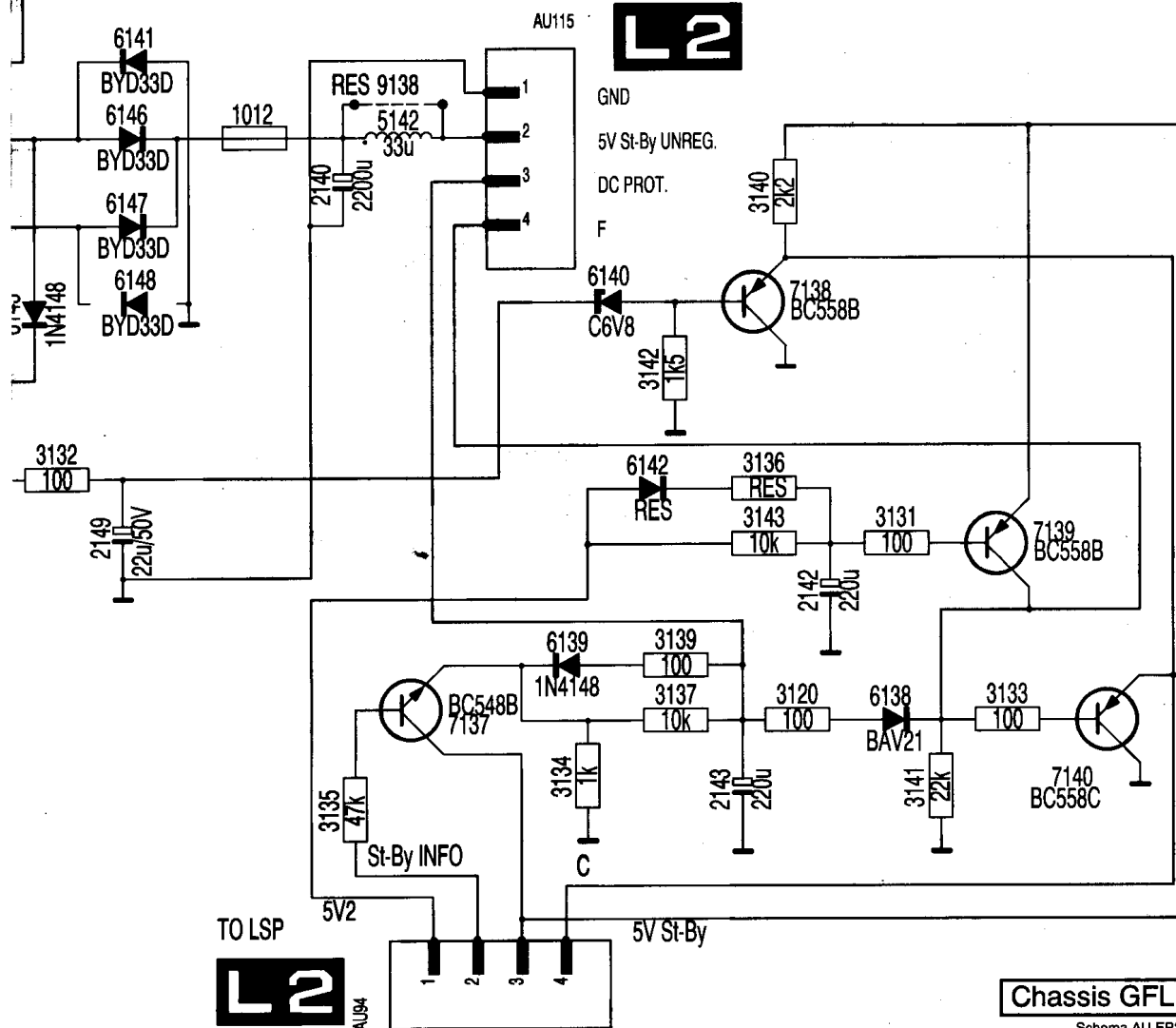
SERVICE INFO		
	PTC PRESENT	JUMPER 9146
25" SF	3146	YES
29" SF	3146	YES
33"	3146 - 3147	NO
28" WS/SF	3146 - 3147	YES
32" WS/SF	3146 - 3147	YES

Alimentation de veille (ELPS)

8 9 10 11 12



POS	EUROPE				
	28° 16.9 25°+29° SF	32° 16.9	33°	28° WSSF	32° WSSF
2137	*	*	*	*	*
2138	*	*	*	*	*
2141	*	*	*	*	*
2144	*	*	*	*	*
2150	*	*	*	*	*
2151	*	*	*	*	*
2152	*	*	*	*	*
2153	*	*	*	*	*
2154	*	*	*	*	*
2155	*	*	*	*	*
2156	*	*	*	*	*
2157	*	*	*	*	*
2158	*	*	*	*	*
2159	*	*	*	*	*
2160	*	*	*	*	*
2161	*	*	*	*	*
2162	*	*	*	*	*
2163	*	*	*	*	*
2164	*	*	*	*	*
2165	*	*	*	*	*
2166	*	*	*	*	*
2167	*	*	*	*	*
2168	*	*	*	*	*
2169	*	*	*	*	*
2170	*	*	*	*	*
2171	*	*	*	*	*
2172	*	*	*	*	*
2173	*	*	*	*	*
2174	*	*	*	*	*
2175	*	*	*	*	*
2176	*	*	*	*	*
2177	*	*	*	*	*
2178	*	*	*	*	*
2179	*	*	*	*	*
2180	*	*	*	*	*
2181	*	*	*	*	*
2182	*	*	*	*	*
2183	*	*	*	*	*
2184	*	*	*	*	*
2185	*	*	*	*	*
2186	*	*	*	*	*
2187	*	*	*	*	*
2188	*	*	*	*	*
2189	*	*	*	*	*
2190	*	*	*	*	*
2191	*	*	*	*	*
2192	*	*	*	*	*
2193	*	*	*	*	*
2194	*	*	*	*	*
2195	*	*	*	*	*
2196	*	*	*	*	*
2197	*	*	*	*	*
2198	*	*	*	*	*
2199	*	*	*	*	*
2200	*	*	*	*	*



A

B

C

D

E

F

G

H

AU02 A5
AU03 A7
AU04 C2
AU115 D10
AU26 C6
AU92 B10
AU94 H9
AU99 C6

1011 B4
1012 D8
1106 D4
2137 E5
2138 F2
2140 E9
2141 F1
2142 G11
2143 G10
2144 F4
2145 C5
2146 C5
2147 B7
2148 B4
2149 F8
2150 F2
3119 E2
3120 G11
3121 F1
3122 F2
3123 E2
3124 E3
3125 F1
3126 E3
3127 E5
3128 E2
3129 F3
3130 F4
3131 F11
3132 F7
3133 G12
3134 G10
3135 H9
3136 F11
3137 G10
3138 C9
3139 G10
3140 E11
3141 G11
3142 F10
3143 F11
3145 C5
3146 B7
3147 B7
3148 C9
3149 F7
3150 E3
3998 A9
5142 E9
5144 B5
5145 D6
6132 E2
6133 F2
6134 F4
6135 E4
6136 E4
6137 E6
6138 G11
6139 G10
6140 E10
6141 D8
6142 F10
6143 E7
6144 C4
6145 C4
6146 D8
6147 E8
6148 E8
6149 E7
7137 G9
7138 E11
7139 F12
7140 G12
7141 E4
7142 F1
7143 F4
7144 F5
7145 E1
9011 B4
9012 B4
9013 E6
9138 D9
9140 C5
9141 B5
9142 B5
9143 C6
9144 C5
9145 B6
9146 B7
9147 B6
9148 C6
9150 F1

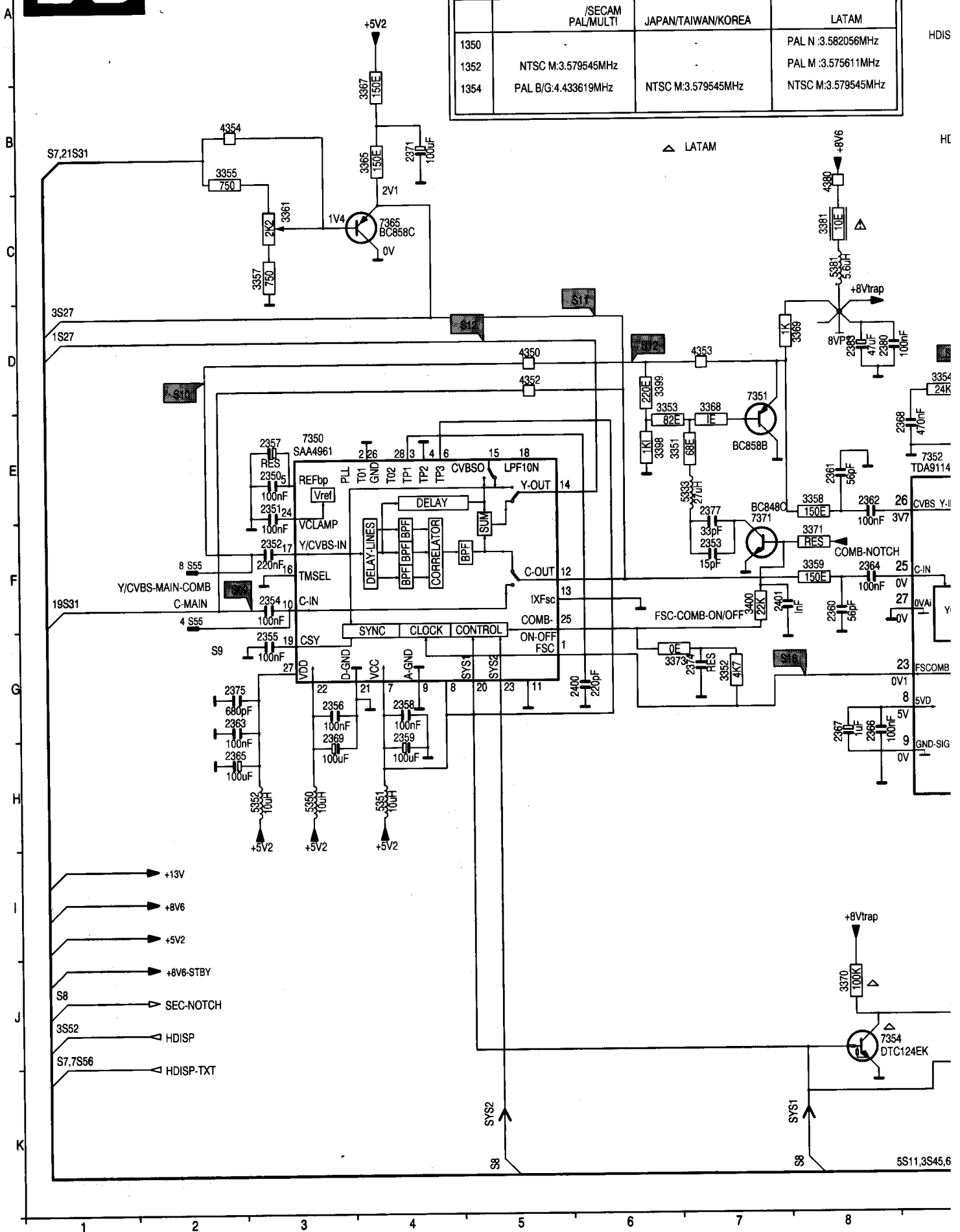
Chassis GFL

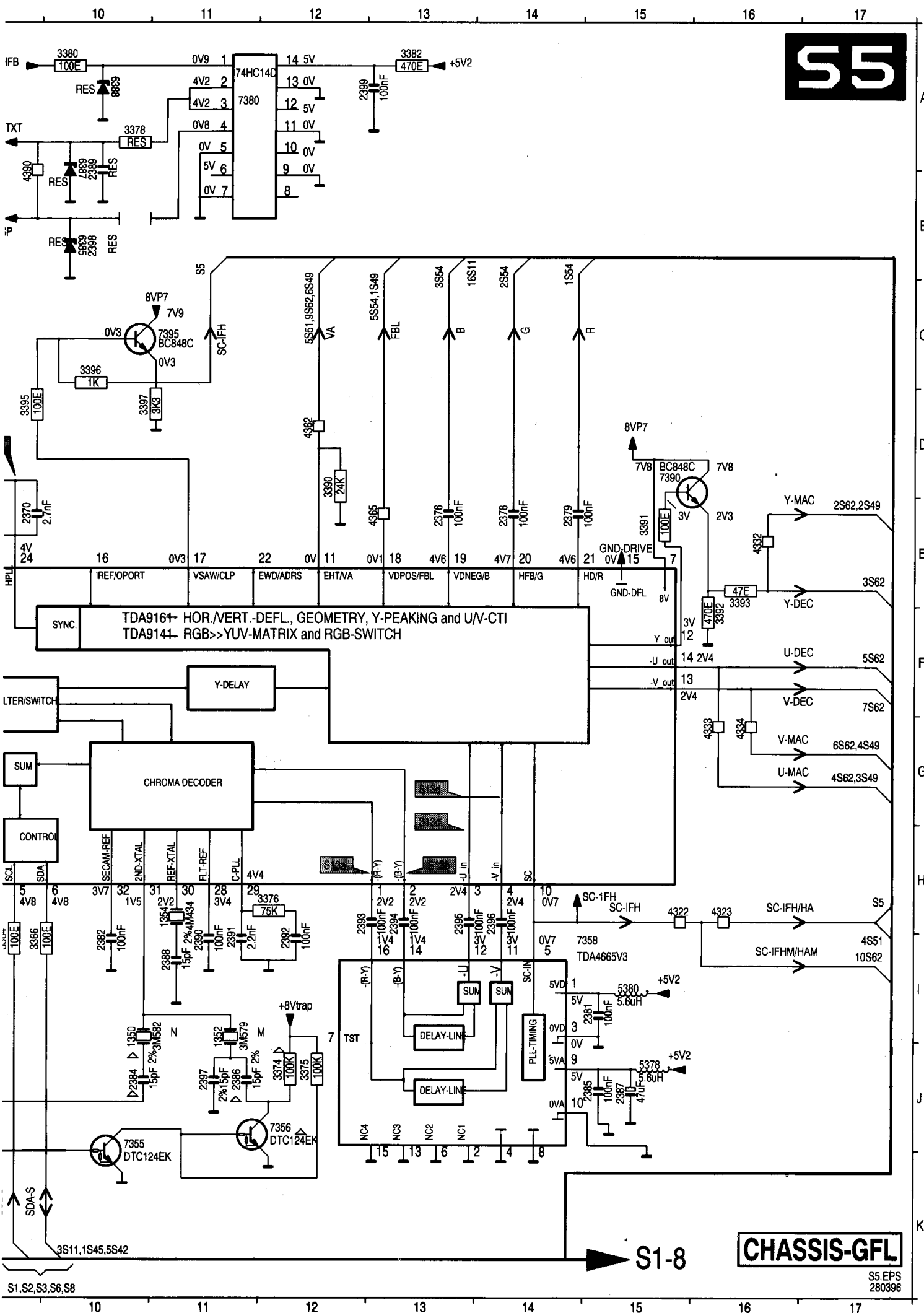
Schema AU EPS
280396

S5

VIDEO PROCESSING

	/SECAM PAL/MULTI	JAPAN/TAIWAN/KOREA	LATAM
1350			PAL N :3.582056MHz
1352	NTSC M:3.579545MHz		PAL M :3.575611MHz
1354	PAL B/G:4.433619MHz	NTSC M:3.579545MHz	NTSC M:3.579545MHz





S5

CHASSIS-GFL

S1-8

S5 EPS
280396