

Service
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FL 1.14 **FL 2.14**

FL 1.16 **FL 2.16**

FL 1.17

AA

Service Manual

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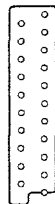
1. Technical data

Mains voltage	: 220 - 240 V ($\pm 10\%$)
	: 50 Hz - 60 Hz ($\pm 5\%$)
Aerial input impedance	: 75 Ω - coaxial
Minimum aerial voltage	: 30 μ V (VHF), 40 μ V (UHF)
Maximum aerial voltage VHF/S/UHF	: 180 mV
Programmes	: 0 - 59
VCR programmes	: 0, 50 - 59


2. Connection facilities

Specification of the connectors

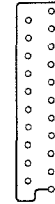
EXT1 (AUX): RGB+CVBS

	1 -Audio \odot	$R(0,5V_{RMS} \leq 1k\Omega)$
	2 -Audio \ominus	$R(0,5V_{RMS} \geq 10k\Omega)$
	3 -Audio \odot	$L(0,5V_{RMS} \leq 1k\Omega)$
	4 -Audio \perp	
	5 -Blue \perp	
	6 -Audio \ominus	$L(0,5V_{RMS} \geq 10k\Omega)$
	7 -Blue (0,7V _{pp} /75 Ω)	
	8 -CVBS-status \ominus	0-2V: INT


4,5-7V: EXT 16:9
9,5-12V: EXT 4:3

	9 -Green \perp	
	10 --	
	11 -Green (0,7V _{pp} /75 Ω)	
	12 --	
	13 -Red \perp	
	14 -RGB-status	
	15 -Red (0,7V _{pp} /75 Ω)	
	16 -RGB-status (0-0,4V: INT; 1-3V: EXT/75 Ω)	
	17 -CVBS \perp	
	18 -CVBS \perp	
	19 -CVBS \odot	(1V _{pp} /75 Ω)
	20 -CVBS \ominus	(1V _{pp} /75 Ω)
	21 -Earthscreens	


EXT2 (VCR): Y/C+CVBS

	1 -Audio \odot	$R(0,5V_{RMS} \leq 1k\Omega)$
	2 -Audio \ominus	$R(0,5V_{RMS} \geq 10k\Omega)$
	3 -Audio \odot	$L(0,5V_{RMS} \leq 1k\Omega)$
	4 -Audio \perp	
	5 -	
	6 -Audio \ominus	$L(0,5V_{RMS} \geq 10k\Omega)$
	7 --	
	8 -CVBS-status \ominus	0-2V: int


4,5-7V: EXT 16:9
9,5-12V: EXT 4:3
 \ominus 4,5 : EXT 16:9

	9 --	
	10 --	
	11 --	
	12 --	
	13 -CHROMA \perp	
	14 --	
	15 -CHROMA \ominus	(1V _{pp} /75 Ω)
	16 --	
	17 -CVBS \perp	
	18 -CVBS \perp	
	19 -CVBS \odot	(1V _{pp} /75 Ω)
	20 -CVBS/Y \ominus	(1V _{pp} /75 Ω)
	21 -Earthscreens	

EXT3 (front)

SVHS	1 - \perp	
	2 - \perp	
	3 - Y \ominus	(1V _{pp} ; 75 Ω)
	4 - C \ominus	(0,3V _{pp} ; 75 Ω)

\odot CINCH Video \ominus 300mV_{pp}/75 Ω
 \odot CINCH Audio \ominus L(0,2 - 2V_{RMS}; $\geq 10k\Omega$)
 \odot CINCH Audio \ominus R(0,2 - 2V_{RMS}; $\geq 10k\Omega$)

 32-2000 Ω $\geq 10mW$
3.5mm


Audio out (rear)

\odot CINCH Audio	\odot	L(0,5V _{RMS} ; $\leq 1k\Omega$)
\odot CINCH Audio	\odot	R(0,5V _{RMS} ; $\leq 1k\Omega$)




front : 2 x 16W / 8 Ω
rear : 2 x 6W / 8 Ω

EXT2 (SVHS) (rear)


SVHS	1 - \perp	
	2 - \perp	
	3 - Y \ominus	(1V _{pp} ; 75 Ω)
	4 - C \ominus	(0,3V _{pp} ; 75 Ω)

\odot CINCH Audio \ominus L(0,2 - 2V_{RMS}; $\geq 10k\Omega$)
 \odot CINCH Audio \ominus R(0,2 - 2V_{RMS}; $\geq 10k\Omega$)

SVHS	1 - \perp	
	2 - \perp	
	3 - Y \odot	(1V _{pp} ; 75 Ω)
	4 - C \odot	(0,3V _{pp} ; 75 Ω)

\odot CINCH Audio	\odot	L(0,2 - 2V _{RMS} ; $\leq 1k\Omega$)
\odot CINCH Audio	\odot	R(0,2 - 2V _{RMS} ; $\leq 1k\Omega$)

Warnings and Notes

Safety regulations require that the unit should be returned in its original condition and that components identical to the original components are used. The safety components are indicated by the symbol 

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).



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.

When repairing a unit, always connect it to the mains voltage via an isolating transformer.

Be careful when taking measurements in the high-voltage section and on the picture tube.

Never replace modules or other components while the unit is switched on.

It is recommended that safety goggles are worn when replacing the picture tube.

When making settings, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

After repair the wiring should be fastened once more in the cable clamps for this purpose.

In order to prevent measuring errors, the heat sinks should not be used as reference points for measurements. **The heat sink for the sound output amplifier is connected to the -11 volts.**

On this unit the 140 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 +140 volt supply remains loaded. In order to unload the +140 volts, coil 5511 should be removed.

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.

1. The direct voltages and oscillograms should be measured with regard to the tuner earth (\perp), or hot earth (\perp) 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 (\square) and without aerial signal (\times) Voltages in the power supply section are measured both for normal operation (\odot) and in standby (\ominus). These values are indicated by means of the appropriate symbols.
4. The picture tube PCB 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.*
6. The connectors used for the modules (board to board) are gold-plated and should only be replaced by the same type.

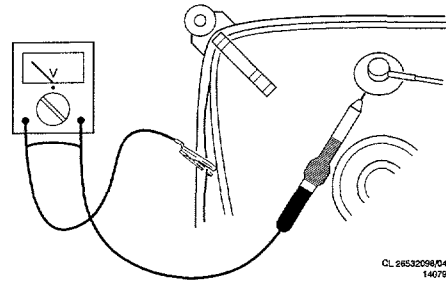
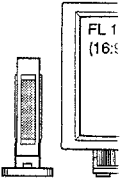
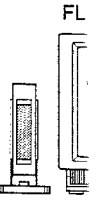


Fig. 3.1

4. M

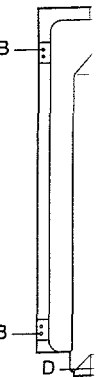
It is cabl that guar

1. Moc



2. Rem

Before subw FL1:C subw FL2:F fixed. so th: the re arrow Disco arrow prese Remc



4. Mechanical instructions

It is extremely important that following disassembly all cables are replaced in their original positions in order that safety and sound and picture quality may be guaranteed.

1. Model overview (fig.1)

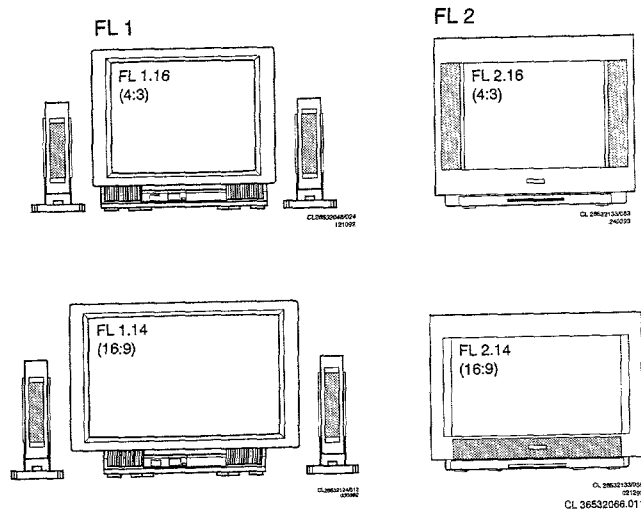


Fig.1

2. Removing the rear panel (fig.2 + 3)

Before the rear panel is removed the connection to the subwoofer should first be disconnected:

FL1: Open the flap in the rear panel. Disconnect the subwoofer cable. (connector L36)

FL2: Remove the three screws A with which the grille is fixed. Tap the grille downwards as indicated by arrow 1, so that the grille becomes loose. Remove the grille from the rear panel by pulling it in the direction indicated by arrow 2.

Disconnect the cable from the subwoofer as indicated by arrow 3. Remove screws B and C, and also screws D if present.

Remove the rear panel from the set.

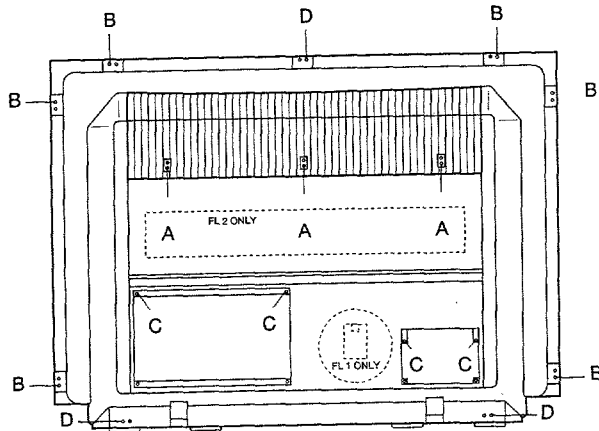


Fig.2

CL 26521231033
220493

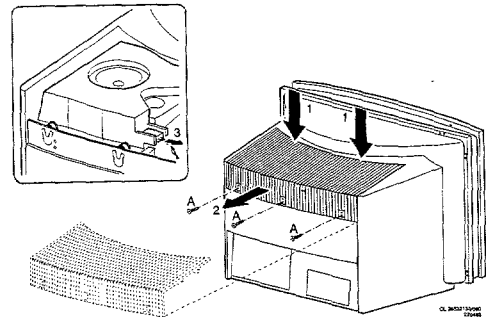


Fig.3

3. Service positions FL1

FL1 can be placed in two service positions. (Fig.4) Remove the rear panel.

Remove the screw behind the flap on the front side of the set.

Service position 1:

If present, press down the lugs with which the chassis is secured and pull both panels simultaneously to the rear, removing any hindering cables from the cable ties if necessary.

Place the panels vertically behind the set as illustrated in figure 4a.

Service position 2:

Disconnect connectors L01, L02 and L03 that connect the small (SSP) and large signal panel (LSP) together. Pull the panel concerned backwards out of the set. Using extension cable set 4822 320 20209 (fig.5) reconnect both panels together. Place the panel concerned behind the set as illustrated in figure 4b.

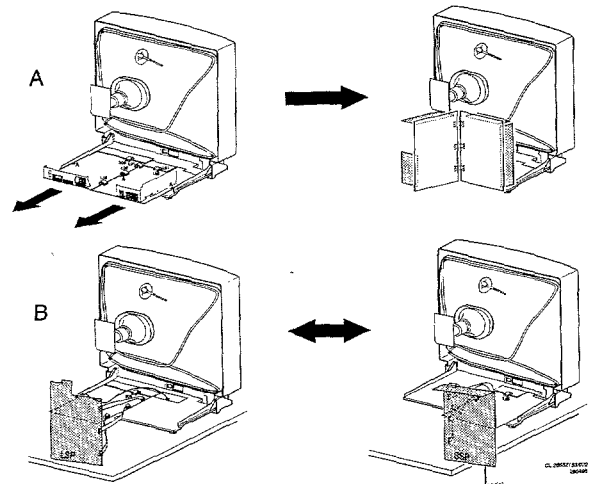


Fig.4

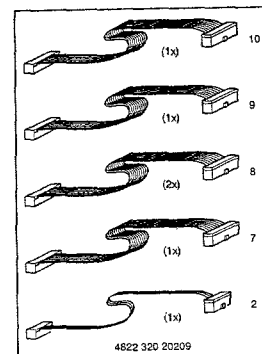


Fig.5

CL 26521231033
220493

4. Service positions FL2

FL2 can be placed in two service positions. (fig.6)

Remove the rear panel.

Service position 1:

Disconnect connectors E47 and E48. These connectors are located on the side of the set and connect the chassis with the audio, video and headphone connections (FRONT).

Lift the chassis frame at the rear and remove it from the cabinet, removing any hindering cables from the cabinet, taking care to ensure that the chassis frame lugs are located into the correct recesses.

Service position 2:

Place the chassis in service position 1.

Click the infra-red receiver (IR) out of the retainer located under the picture tube.

Remove the cables to the panel with buttons for local operation from their ties and then click the operating panel out of its holder.

Disconnect the cable to the degaussing coil on the picture tube from the mains filter panel. Remove the cables from and to the mains filter from their cable ties. Click the two service legs loose and place them vertically in the holes as indicated in the diagram. Tilt the entire chassis frame and place the entire unit on both service legs so that the solder side is accessible.

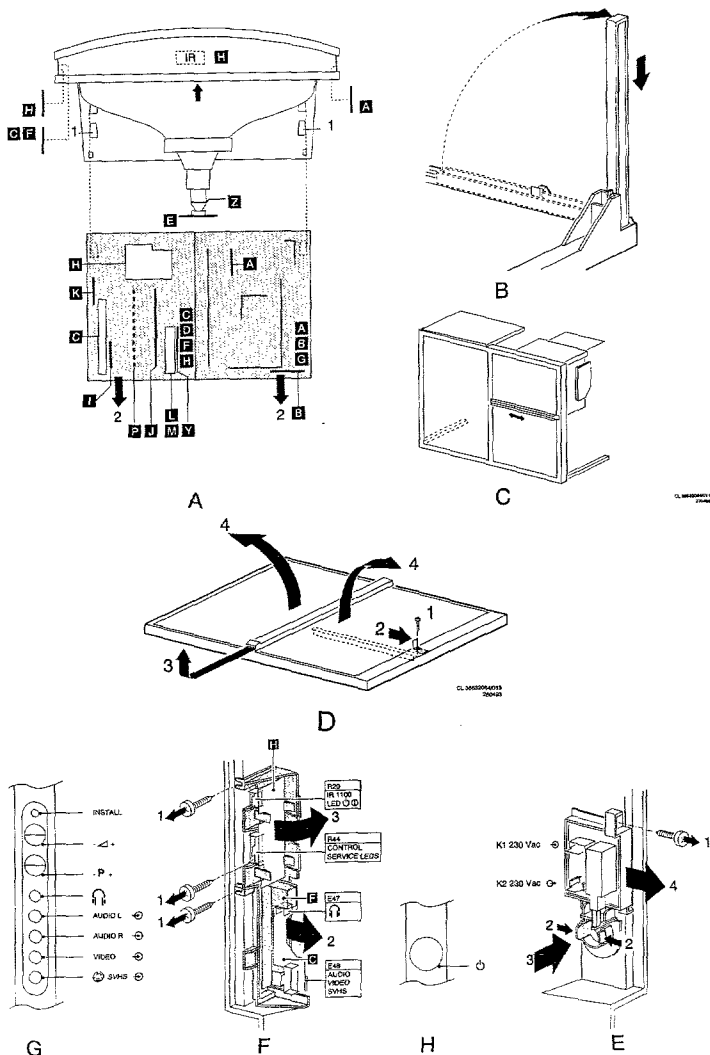


Fig.6

5. Removing the mask from FL2 (fig.7)

Remove the rear panel.

Remove the chassis frame with the chassis from the cabinet.

Remove screws E as indicated in the diagram. Loosen the snap connection under the picture tube. Remove the masker in the manner illustrated in the diagram.

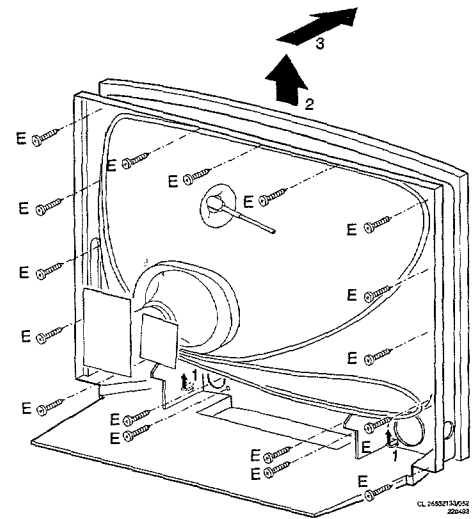


Fig.7

6. Replacing the picture tube.

Remove the rear panel.

Discharge the picture tube in the manner described in chapter 3.

Remove the chassis, or the chassis with the chassis frame from the cabinet.

Disconnect all cabling to the picture tube.

Tilt the set so that the front of the picture tube is pointing downwards, taking care that the picture tube comes to rest on a soft and clean surface.

Loosen the four bolt on the picture tube corners and drop the cabinet gently down onto the work surface. The picture tube can now be removed from the cabinet.

In FL2 special nylon picture tube tubular rivets have been applied. In order to guarantee optimum strength these should not be re-used. Take care to fit correctly when replacing.

Tighten the picture tube screws one-by-one until a torque of approximately 1kgm (10Nm) is achieved. The picture tube tubular rivets are obtainable under code numbers:

For 28" picture tubes and smaller: 4822 532 12243 (28")

For 29" picture tubes and larger: 4822 404 31294 (28")

Four tubular rivets are required per picture tube.

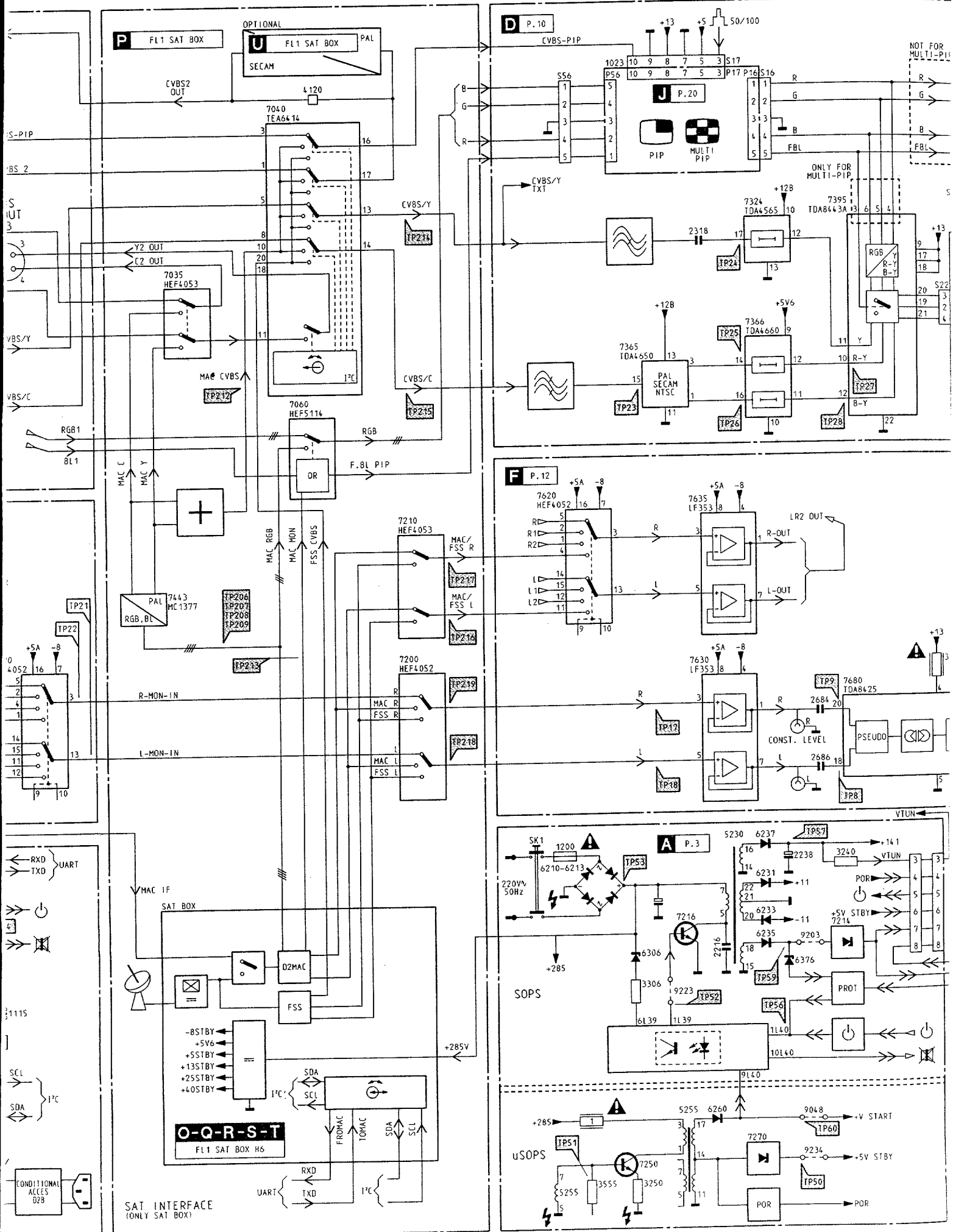
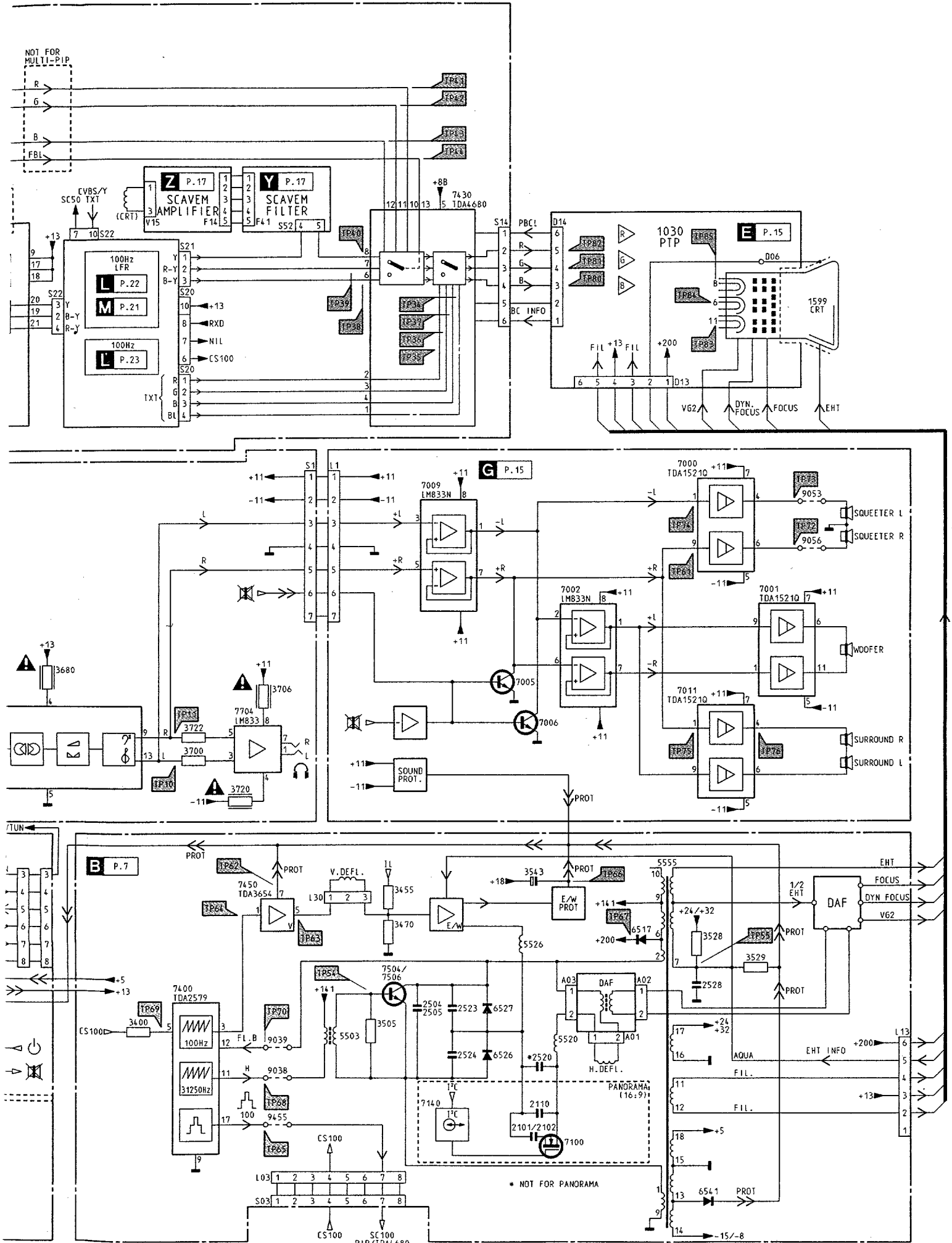
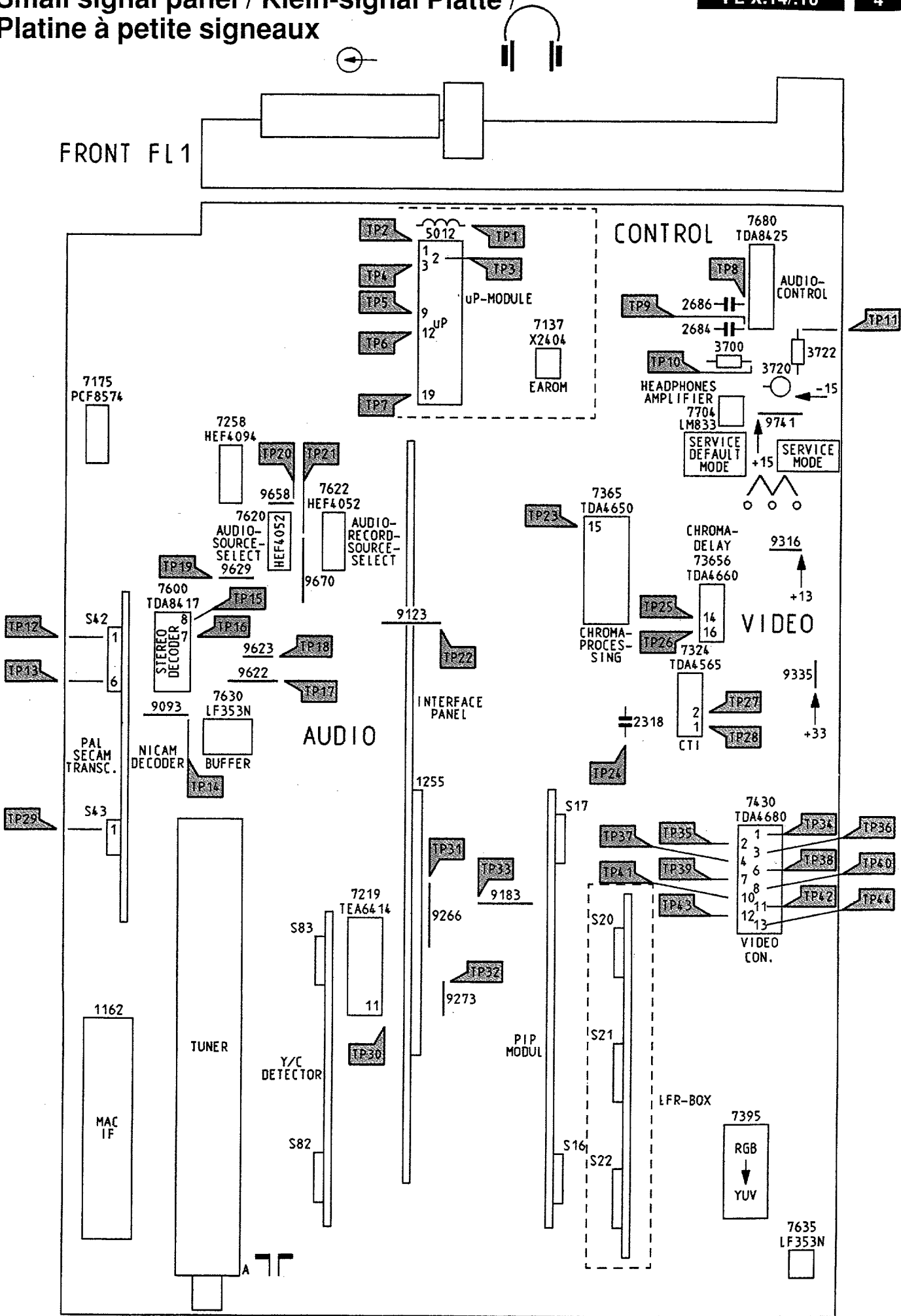


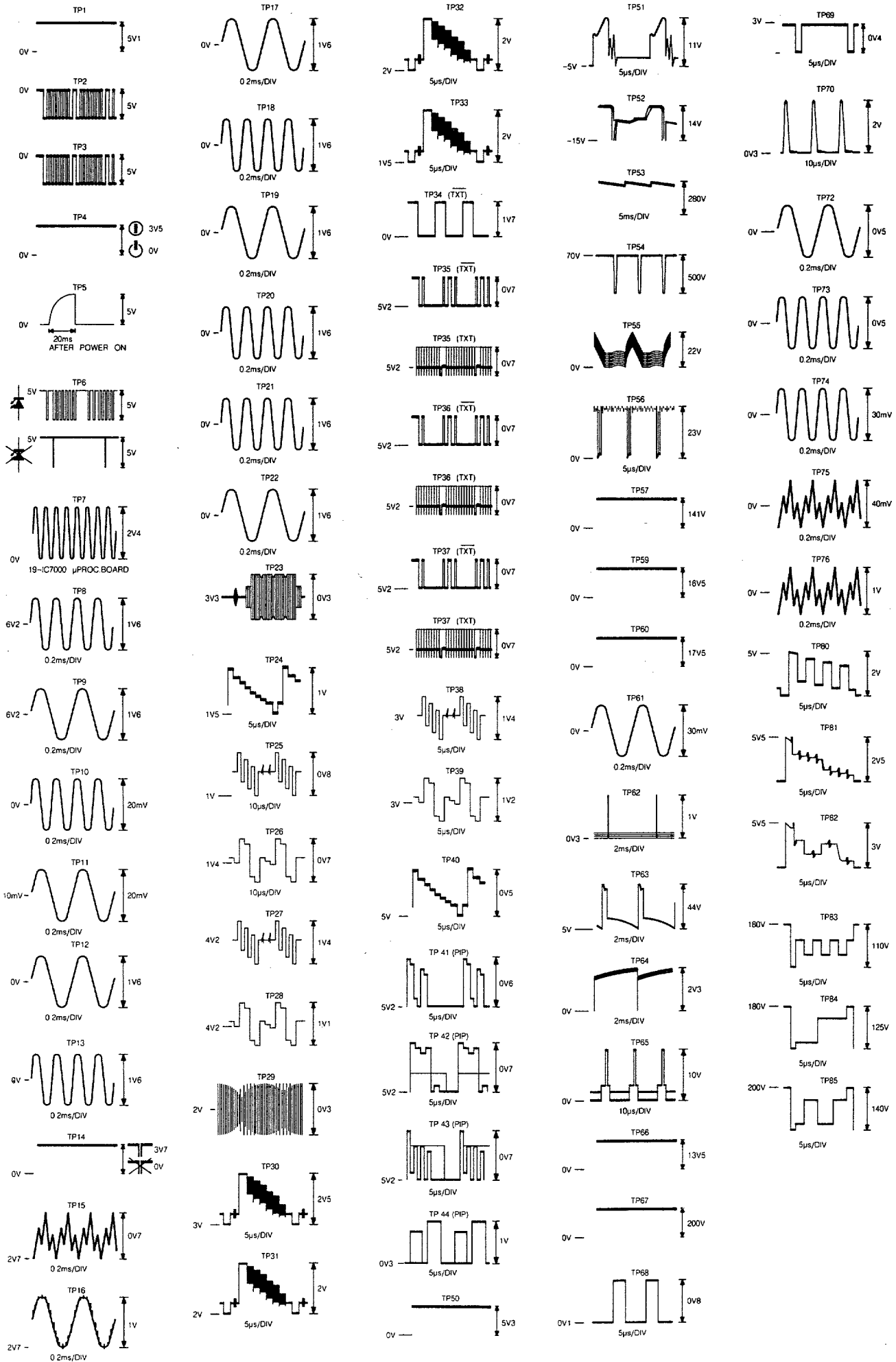
Diagramme schématique



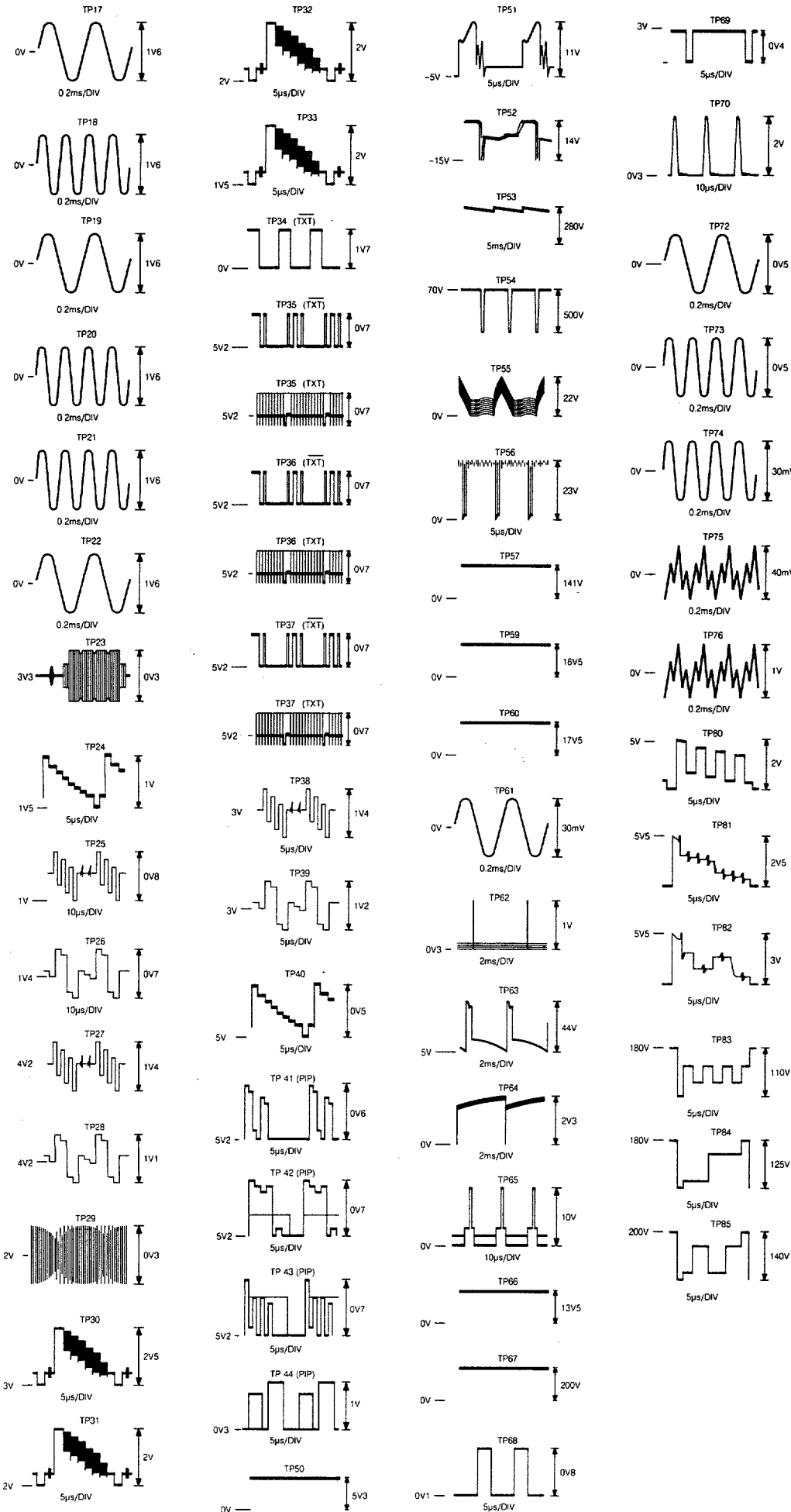
Small signal panel / Klein-signal Platte / Platine à petite signaux



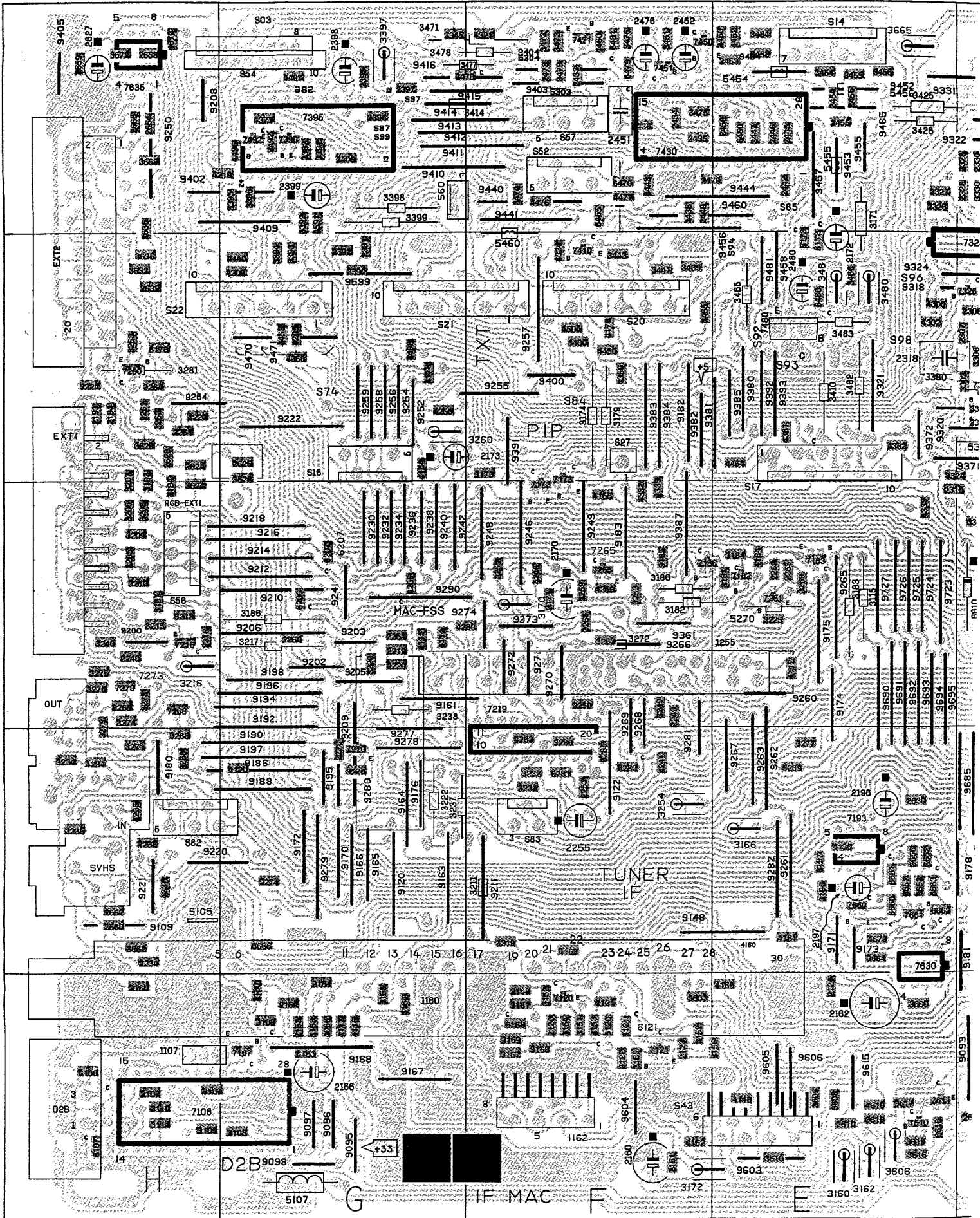
Oscillograms / Oscillogrammes



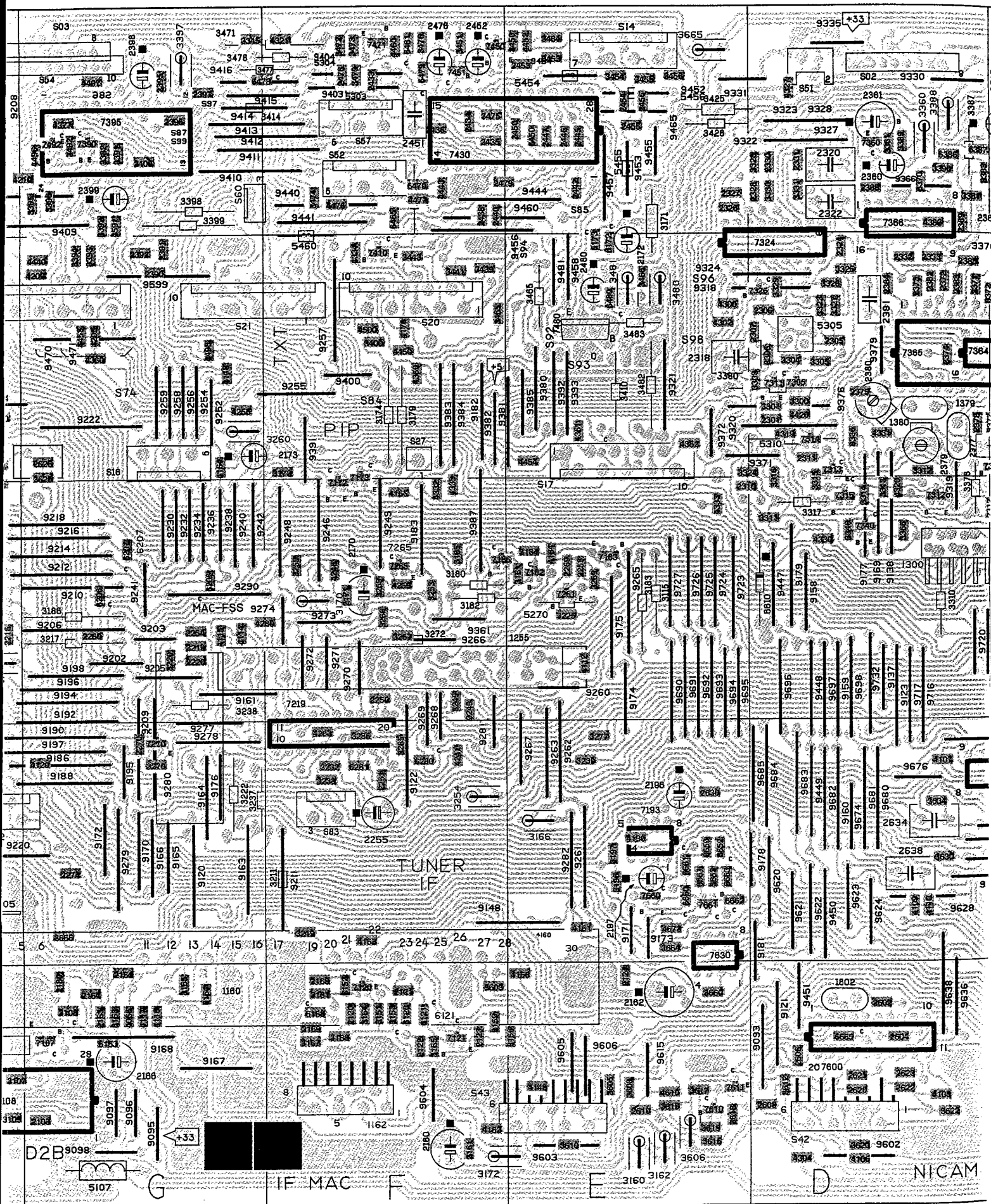
Oscillogrammes

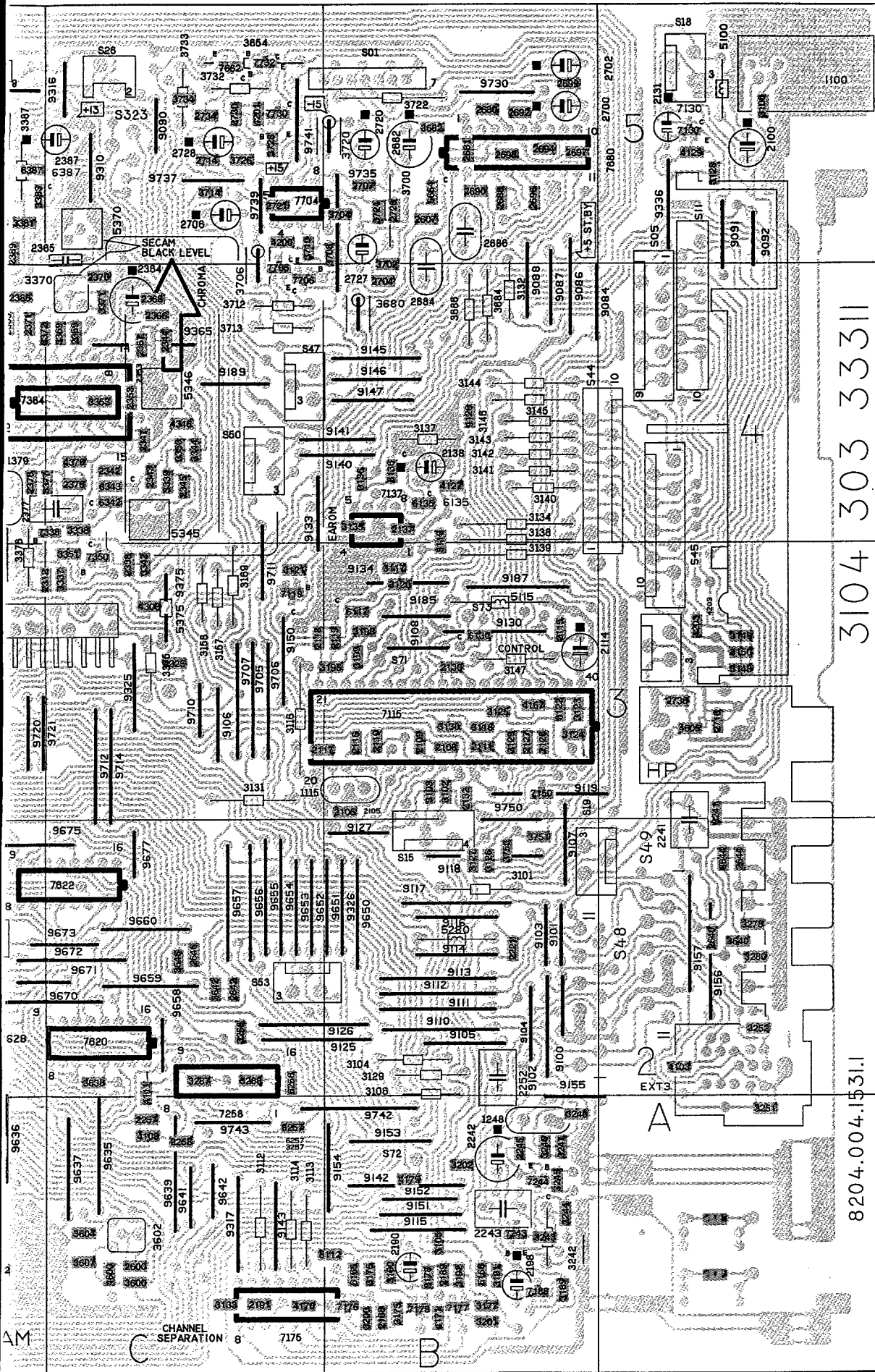


Small signal panel / Klein-signal Platte /



Panel / Klein-signal Platte /





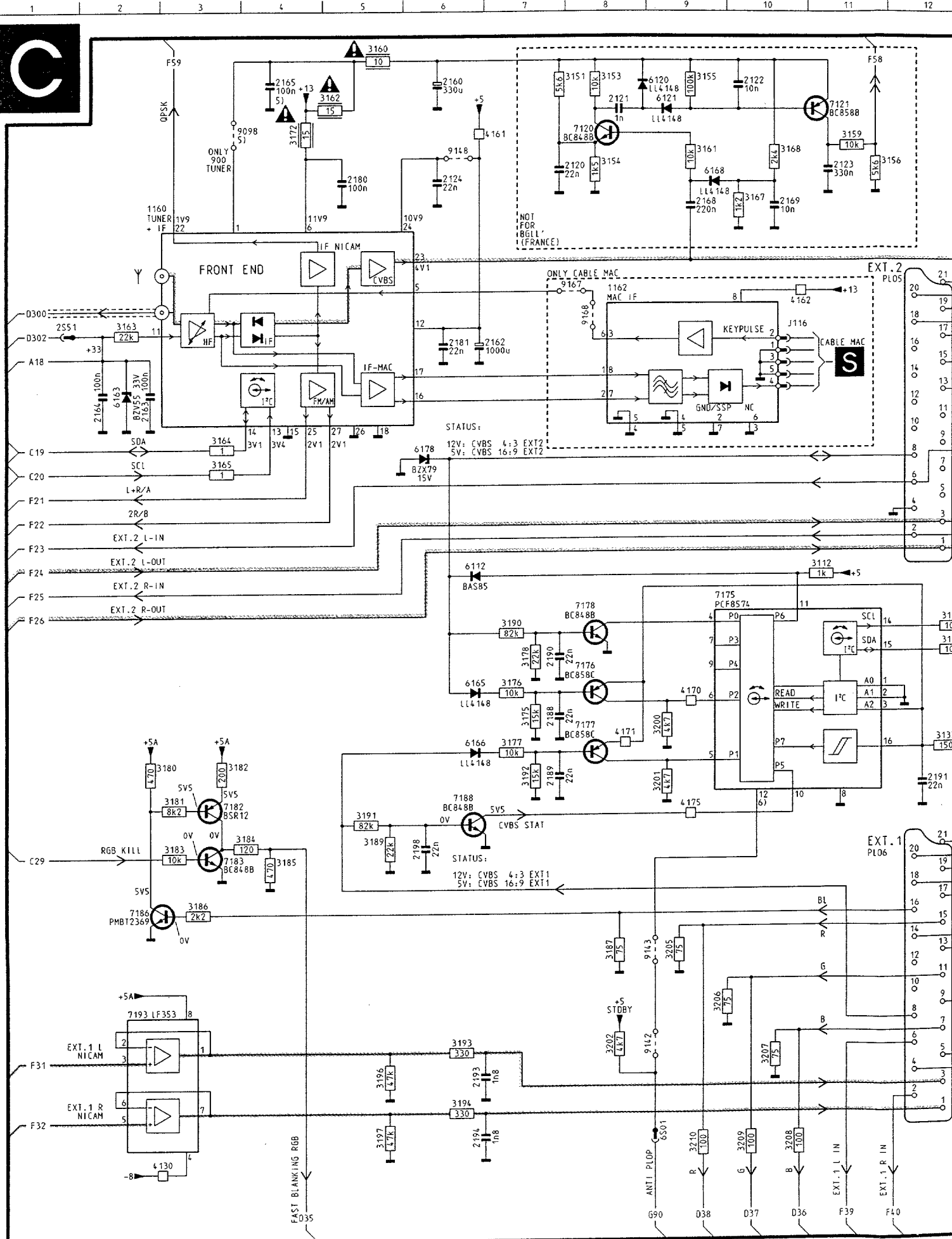
D2B	H1	2250	F3	2636
EXT1	H3	2251	F2	2638
EXT2	H4	2252	B2	2640
EXT3	A3	2253	E3	2642
SVHS	H2	2254	G3	2644
S01	B5	2255	F1	2646
S02	D5	2257	C1	2658
S03	H5	2258	C1	2659
S05	A4	2260	G3	2660
S11	A5	2261	H4	2662
S14	E5	2268	H3	2664
S15	B2	2269	E3	2666
S16	G4	2270	G2	2680
S17	E4	2274	G2	2681
S18	A5	2301	D4	2682
S19	B2	2305	D4	2684
S20	F4	2306	D4	2686
S21	F4	2307	D4	2688
S22	G4	2310	D3	2690
S26	C5	2311	D4	2692
S27	F4	2312	C3	2694
S42	D1	2318	E4	2696
S43	E1	2320	D5	2697
S44	B4	2322	D5	2698
S45	A4	2324	D4	2699
S46	A3	2326	E5	2700
S47	C4	2327	E5	2702
S48	B2	2328	D5	2704
S49	A2	2330	D5	2706
S50	A4	2331	D5	2707
S51	F5	2332	D4	2714
S52	F5	2333	D4	2716
S53	C2	2338	C3	2720
S54	H5	2342	C4	2721
S56	H3	2343	C4	2726
S57	F5	2344	C4	2727
S60	G5	2345	C4	2728
S82	G2	2347	C4	2734
S83	F2	2353	C4	2736
S100	F4	2360	D5	3100
S100	D3	2361	D5	3101
S105	H2	2364	C4	3102
S100	A5	2365	C4	3103
S107	G1	2366	C4	3104
S115	B3	2367	C4	3105
S160	E2	2368	C4	3106
S162	F1	2369	C4	3107
S248	B1	2370	C4	3108
S300	D3	2371	D4	3109
S379	D4	2372	D4	3110
S380	D4	2373	D4	3111
S602	D1	2374	D4	3112
S100	A5	2375	D4	3113
S203	G1	2376	C4	3114
S205	B3	2377	C4	3115
S207	H1	2378	D4	3116
S208	B3	2379	D4	3117
S209	B3	2380	D4	3118
S210	B3	2381	D4	3119
S211	B3	2382	D4	3120
S214	B3	2383	D4	3121
S215	B3	2384	D4	3122
S216	B3	2385	D4	3123
S217	B3	2387	C5	3124
S218	C3	2388	D5	3125
S219	B3	2389	D5	3126
S220	F1	2390	G4	3127
S221	F1	2391	G4	3128
S222	F1	2392	G4	3129
S223	F1	2395	G5	3130
S224	E1	2396	G5	3131
S226	B3	2397	G5	3132
S227	B3	2398	G5	3133
S229	B3	2399	G5	3134
S230	B3	2400	G5	3135
S231	A5	2433	F5	3136
S232	B3	2434	F5	3137
S237	B4	2435	F5	3138
S238	B4	2436	F5	3139
S260	F1	2438	F5	3140
S261	F1	2440	F5	3141
S262	E1	2442	E5	3142
S263	G1	2445	E5	3143
S264	G1	2448	E5	3144
S265	H1	2447	E5	3145
S266	G1	2450	E5	3146
S268	F1	2451	F5	3147
S269	F1	2452	F5	3148
S270	F3	2453	E5	3149
S271	F3	2454	E5	3150
S272	E4	2455	E5	3151
S273	G4	2456	E5	3152
S280	G1	2476	F5	3153
S281	G1	2478	F5	3154
S288	B1	2479	E5	3155
S289	B1	2480	E4	3156
S290	B1	2600	C1	3157
S291	C1	2602	D1	3158
S293	H4	2604	D1	3159
S294	H4	2606	D1	3160
S296	E2	2607	B5	3161
S297	E2	2608	D1	3162
S298	B1	2610	E1	3163
S216	H3	2620	D1	3164
S219	G3	2621	D1	3165
S220	G3	2622	D1	3166
S221	B2	2623	D1	3167
S234	H2	2624	H4	3168
S240	H3	2626	G4	3169
S241	A2	2627	H5	3170
S242	B1	2628	H4	3171
S243	B1	2630	E2	3172
S245	B1	2632	H4	3173
S249	F3	2634	D2	3174

3104 303 33311

8204.004.1531.

Platine à petites signaux

H1	2250	F3	2636	H4	3175	B1	3329	D4	3682	B5	4591	G5	7390	G5	9186	G2	9414	G5
H3	2251	F2	2638	H2	3176	B1	3330	D5	3684	B4	4600	C1	7395	G5	9187	B3	9415	F5
H4	2252	B2	2640	A2	3177	B1	3331	D5	3686	B4	4605	A3	7410	F4	9188	G2	9416	F5
A3	2253	G3	2642	C2	3178	B1	3332	D4	3700	B5	4610	E1	7430	E5	9189	C4	9440	F5
H2	2254	G3	2644	A2	3179	F4	3337	C3	3702	B4	4672	H5	7450	F5	9190	G2	9441	F5
B5	2255	F2	2646	C2	3180	F3	3338	C4	3704	B5	4673	E2	7451	F5	9192	G2	9444	E5
D5	2257	C1	2658	H5	3181	E3	3339	C4	3706	C4	5100	A5	7471	F5	9194	G3	9447	D3
H5	2258	C1	2659	H5	3182	F3	3342	C3	3708	B5	5107	G1	7480	E4	9195	G2	9448	D3
A4	2260	G3	2660	H2	3183	E3	3344	C4	3710	C5	5115	B3	7492	G5	9196	G3	9449	D2
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E5	2268	H3	2664	H5	3185	F3	3346	D3	3713	C4	5280	B2	7610	E1	9198	G3	9451	D1
B2	2269	G3	2666	H5	3186	G3	3350	C4	3714	C5	5303	F5	7611	E1	9200	H3	9452	E5
G4	2270	E2	2680	B5	3187	H3	3351	C3	3720	B5	5304	F5	7620	C2	9202	G3	9453	E5
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F1	2438	F5	3140	B4	3271	H2	3608	E1	4304	D1	7175	B1	9148	E2	9326	B2	9706	C3
F1	2440	F5	3141	B4	3272	F3	3610	E1	4306	C3	7176	B1	9150	C3	9327	D5	9707	C3
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G1	2446	E5	3144	B4	3275	H3	3616	E1	4321	F5	7182	E3	9153	B1	9331	E5	9712	C3
H1																		

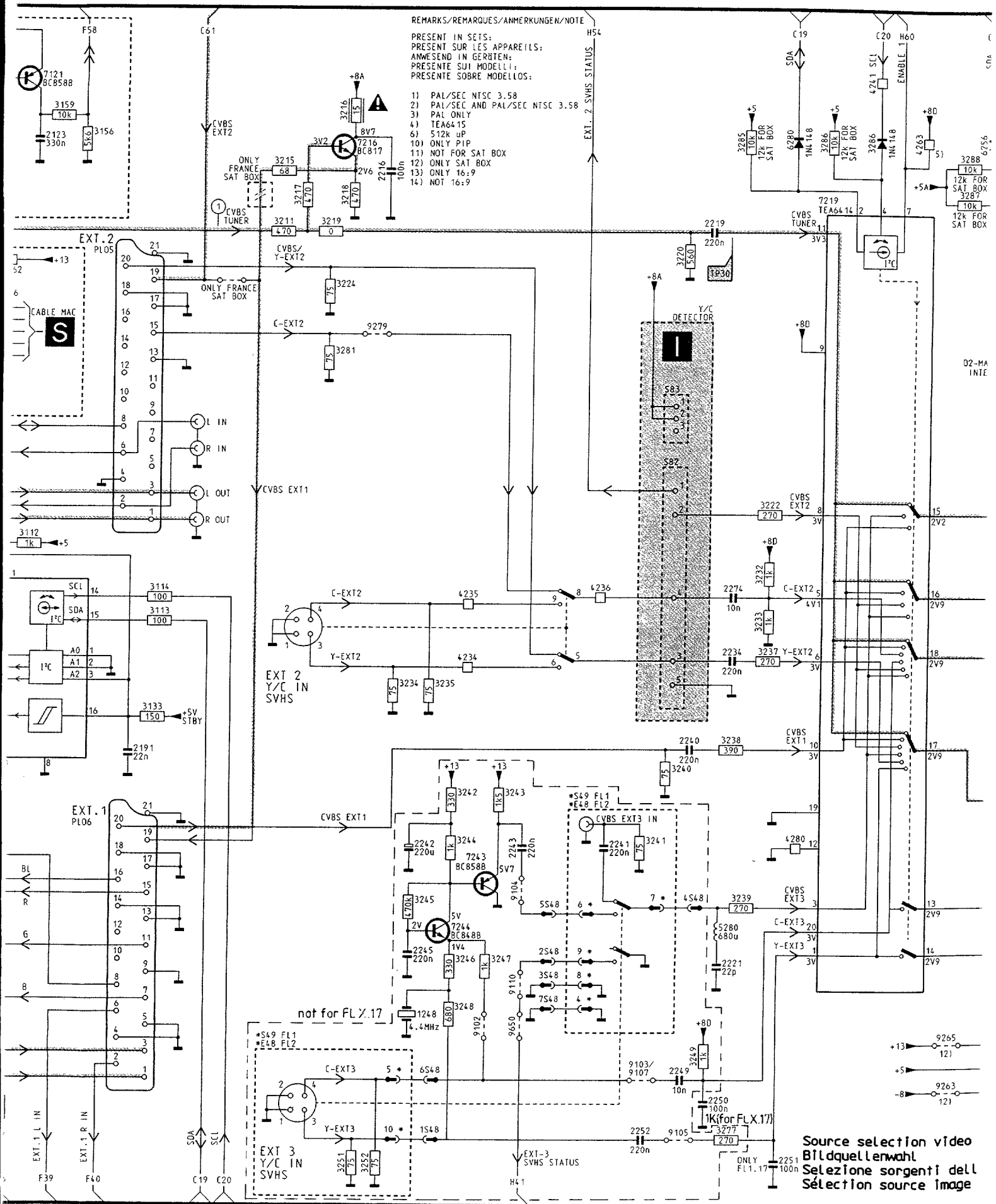


Sélection de source

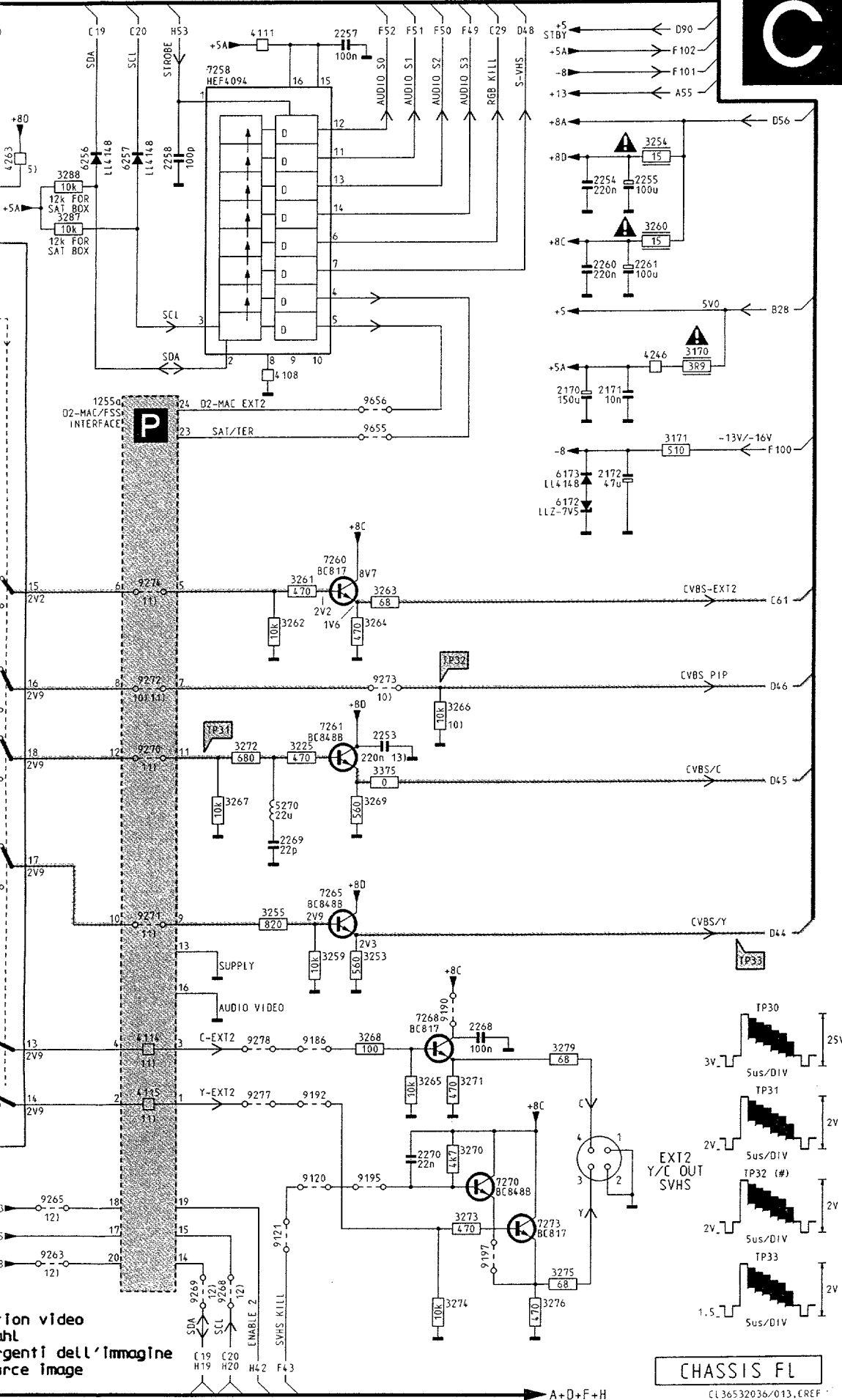
REMARKS/REMARQUES/ANMERKUNGEN/NOTE

PRESENT IN SETS:
PRESENT SUR LES APPAREILS:
ANWESSENT IN GERÄTEN:
PRESENTE SUI MODELLI:
PRESENTE SOBRE MODELOS:

- 1) PAL/SEC NTSC 3.58
- 2) PAL/SEC AND PAL/SEC NTSC 3.58
- 3) PAL ONLY
- 4) TEA6415
- 6) 512k uP
- 10) ONLY PIP
- 11) NOT FOR SAT BOX
- 12) ONLY SAT BOX
- 13) ONLY 16:9
- 14) NOT 16:9



Source selection video
Bildquellenwahl
Selezione sorgenti dell'
Sélection source Image



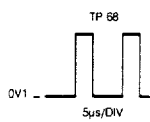
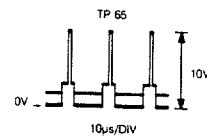
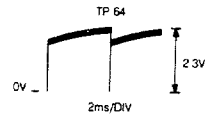
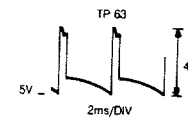
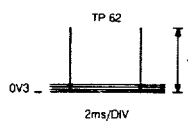
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1255	E23	3240	J19	9268	N24
2120	B 7	3241	K18	9269	N24
2121	A 8	3242	J16	9270	L23
2122	A10	3243	J17	9271	J23
2123	B11	3244	K16	9272	H23
2124	B 6	3245	L16	9273	H26
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2163	E 2	3248	M16	9278	L24
2164	E 2	3249	N19	9279	E15
2165	A 4	3251	O15	9650	M17
2168	C 9	3252	O15	9655	E26
2169	C10	3253	K25	9656	E26
2170	E28	3254	B29		
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2181	D 6	3261	G25		
2188	I 7	3262	G25		
2189	J 7	3263	G26		
2190	H 7	3264	G25		
2191	J12	3265	L26		
2193	M 6	3266	H26		
2194	N 6	3267	I24		
2198	K 6	3268	L26		
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2219	C19	3270	M27		
2221	L19	3271	L27		
2234	I19	3272	L24		
2240	J19	3273	N27		
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2242	K15	3275	N28		
2243	K17	3276	N27		
2245	L15	3277	O19		
2249	N19	3279	L28		
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2253	H26	3286	B21		
2254	C28	3287	C22		
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2268	L27	4115	L23		
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3114	H12	4175	J 9		
3133	I12	4234	I16		
3151	A 7	4235	H16		
3153	A 8	4236	H18		
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3155	A 9	4246	D29		
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3172	B 4	6173	F28		
3175	I 7	6178	F 6		
3176	I 7	6256	B23		
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3178	H 7	6280	B20		
3180	I 2	7120	B 8		
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3182	I 3	7175	H 9		
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3189	J 5	7186	K 2		
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3193	M 6	7219	C20		
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3196	M 5	7244	L16		
3197	N 5	7258	A24		
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3206	L 9	7270	M27		
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3210	N 9	9103	N18		
3211	C14	9104	K17		
3215	C14	9105	O19		
3216	B15	9110	M17		
3217	C14	9120	M25		
3218	C15	9121	H25		
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3220	D19	9143	L 9		
3222	G20	9148	B 6		
3224	D14	9167	D 8		
3225	L25	9168	D 8		
3232	H20	9186	L25		
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3234	L15	9192	L25		
3235	L16	9195	H26		

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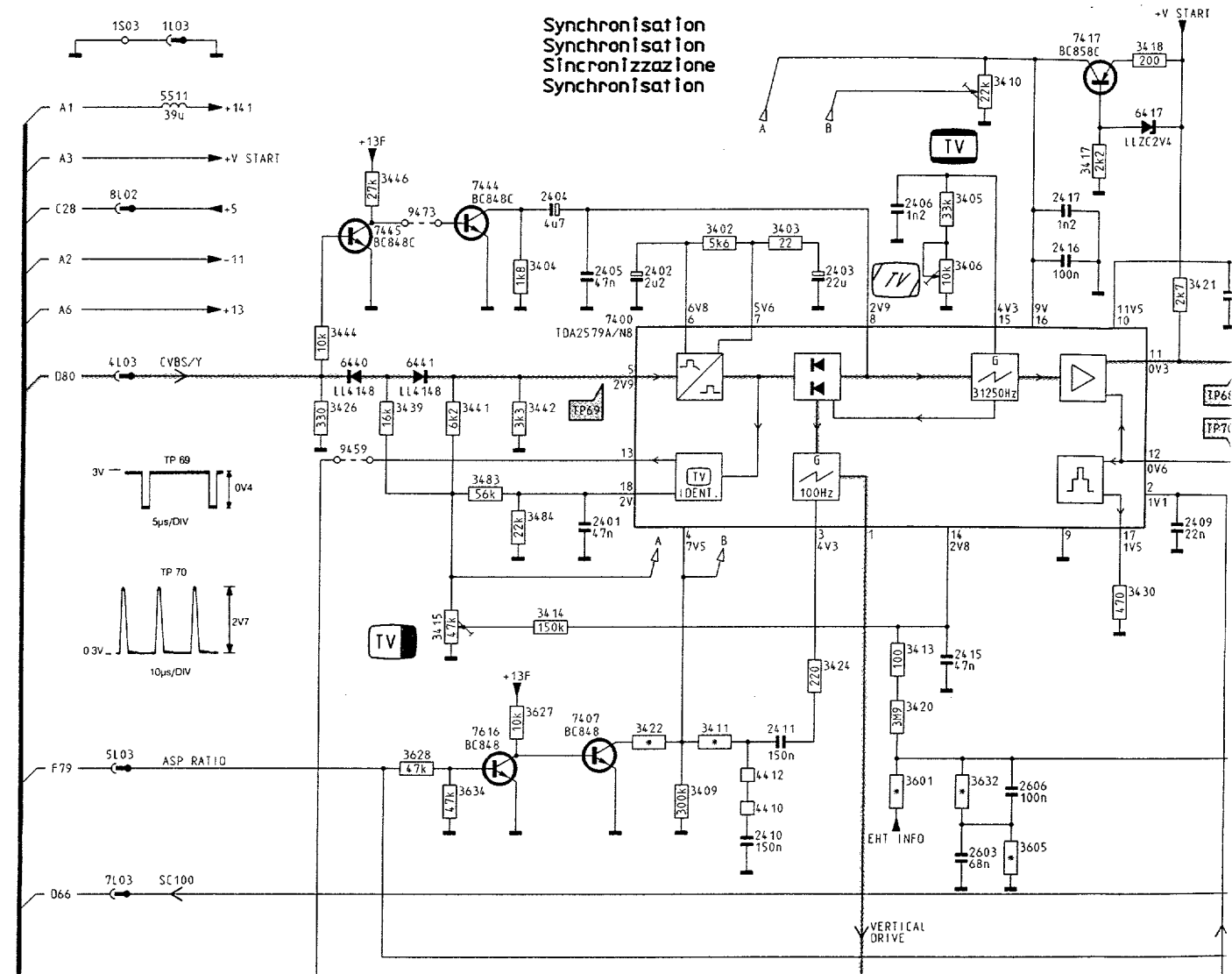
CHASSIS FL
 CL36532036/013, CREFF
 130593

Synchronization / Synchronisierung /

B

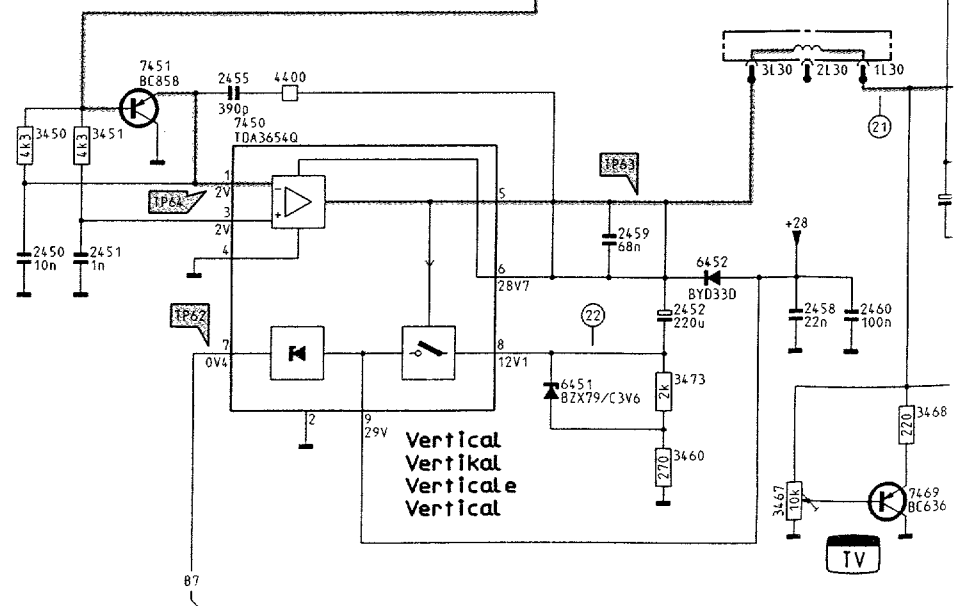


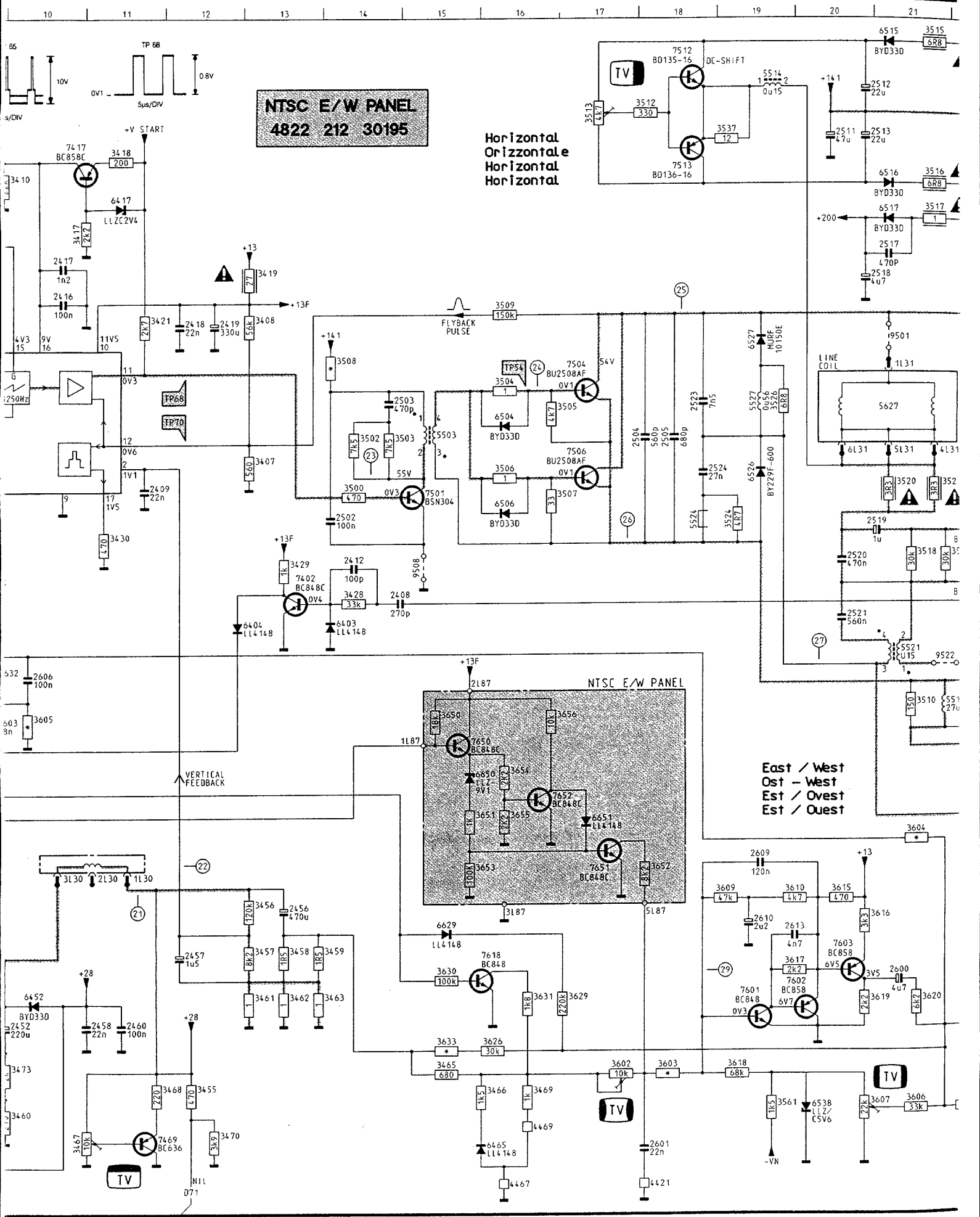
Synchronisation
Synchronisation
Sincronizzazione
Synchronisation



REMARKS/REMARQUES/ANMERKUNGEN/NOTE

*	25"	28"	33"
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2504	560p	560p	470p
2505	680p	680p	560p
2524	27n	27n	30n
2603	68n	47n	100n
2606	-	-	100n
3411	100k	91k	120k
3422	1M2	1M2	1M5
3456	120k	120k	130k
3457	8k2	8k2	9k1
3466	1k5	2k7	4k3
3469	1k	2k7	4k3
3505	33	33	4k7
3507	33	33	47
3508	1k8	1k5	1k5
3601	100k	150k	150k
3603	12k	12k	9k10
3604	160k	180k	180k
3605	13k	24k	24k
3622	100	100	15k
3626	270k	130k	270k
3632	100	15k	15k
3633	100k	200k	200k





NTSC E/W PANEL
4822 212 30195

Horizontal
Horizontal
Horizontal
Horizontal

NTSC E/W PANEL

East / West
Ost - West
Est / Ovest
Est / Ovest

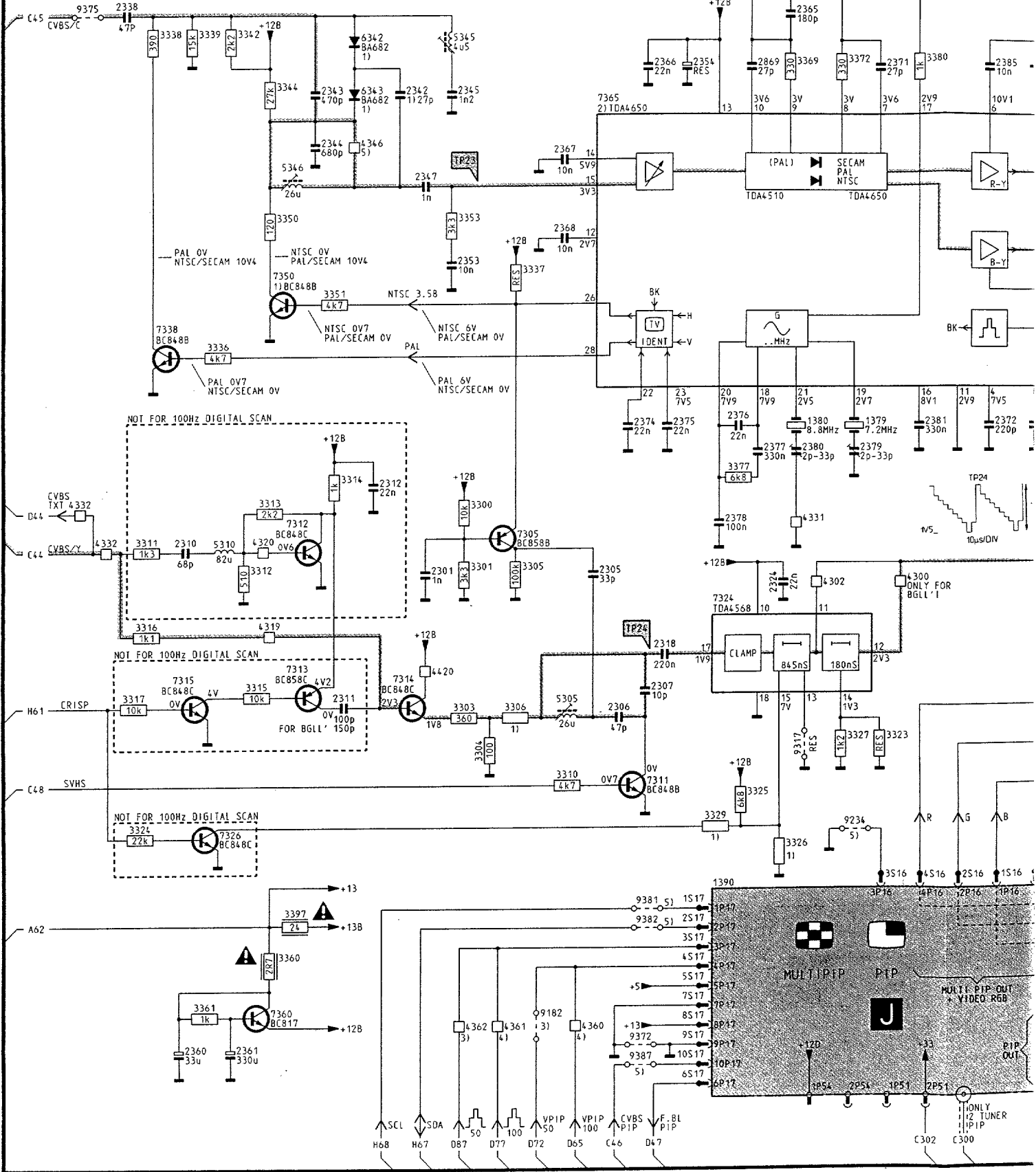
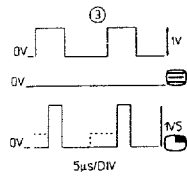
TV

TV

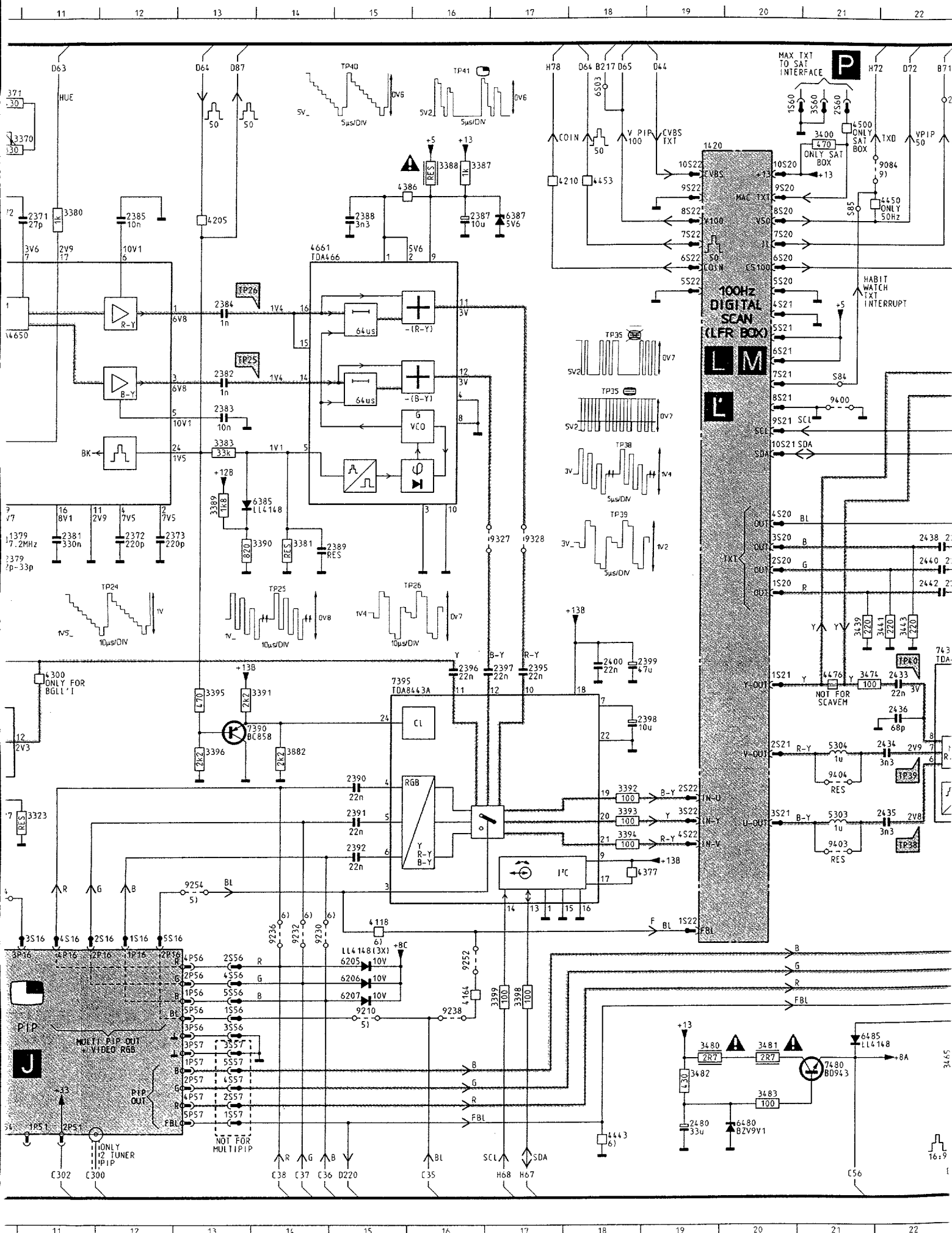
TV

D

Chrominance processing
 Chrominanz-Prozessor
 Traitement chrominance



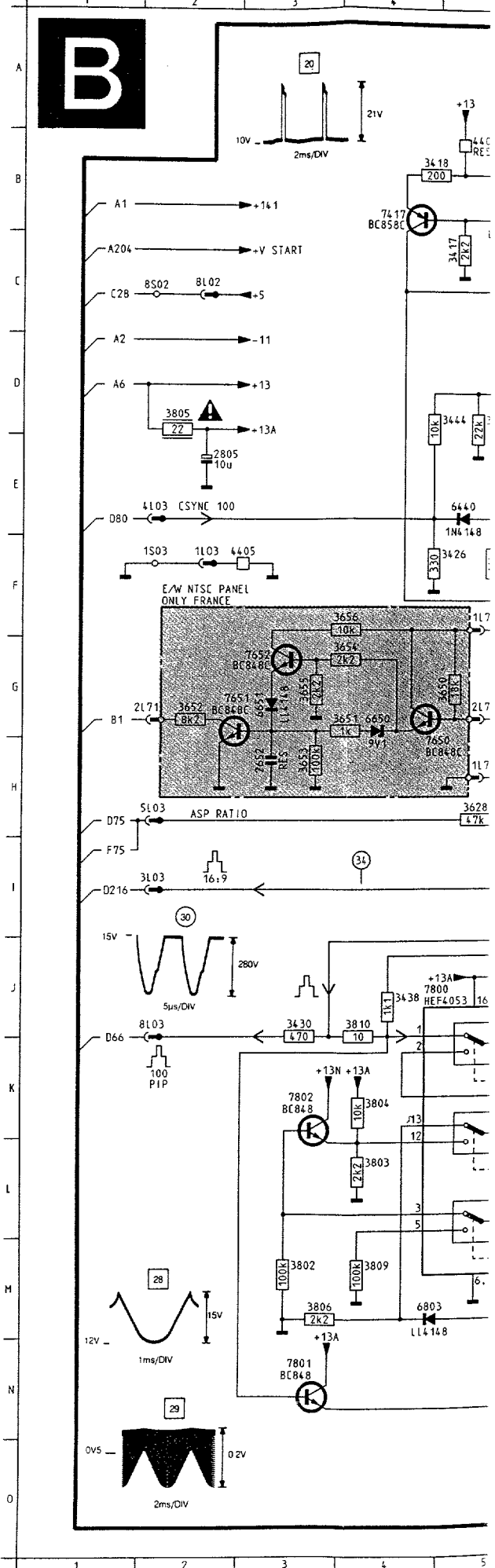
Traitement vidéo

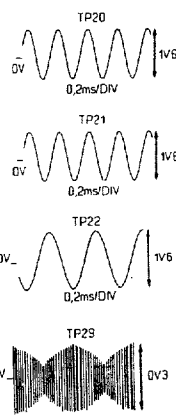
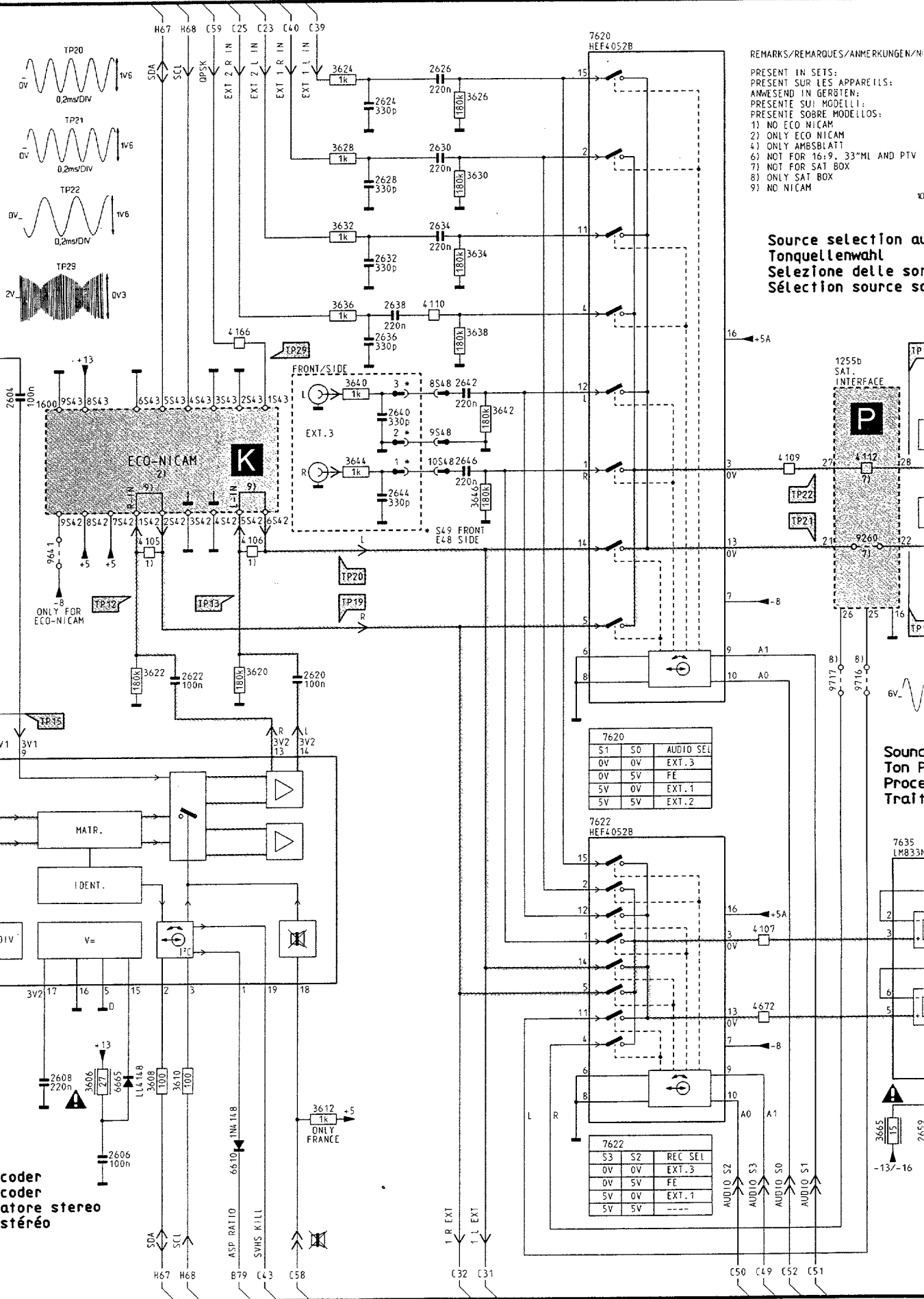


B16 9084 B21
F13 9182 N 7
G13 9210 M15
I13 9230 L14
J18 9232 L14
J18 9234 K10
K18 9236 L14
I13 9238 M16
J13 9252 L16
L 4 9254 K13
M17 9317 K10
M17 9327 G17
B21 9328 G17
G29 9372 N 8
H24 9375 B 1
H24 9380 H29
H21 9381 L 8
H22 9382 M 8
H22 9387 N 8
M29 9392 N23
M29 9393 N24
K28 9400 E21
J29 9403 K21
J29 9404 J21
I29 9440 D25
N22 9441 B23
N29 9452 I28
N29 9453 J28
M28 9454 K28
I21 9456 G26
L25 9457 H28
M25 9458 G26
M26
M27
M26
M19
M20
N19
N20
N25
J14
L15
M16
C13
B17
I11
I10
I 4
H 3
H10
H 2
H 1
D 5
N 7
N 6
N 6
K18
B15
J 5
N24
O18
C22
K29
B18
N24
N28
I21
D25
M26
B21
C14
K21
J21
J 7
H 3
C 6
D 4
B10
J28
J28
I28
L15
M15
M15
C 5
C 5
F13
C17
L26
D24
E25
M27
L26
N20
M21
H 6
K 8
H 4
J 4
J 5
J 3
I 9
L 3
F 2
E 4
N 4
C 7
I13
I15
G25
H22
L29
L28
M28
N21
N26

Synchronization / Synchronisation

B





REMARKS/REMARQUES/ANMERKUNGEN/VN
 PRESENT IN SETS:
 PRESENT SUR LES APPAREILS:
 ANWESEND IN GERÄTEN:
 PRESENTE SUI MODELLI:
 PRESENTE SOBRE MODELOS:
 1) NO ECO NICAM
 2) ONLY ECO NICAM
 4) ONLY AMBSBLATT
 6) NOT FOR 16:9, 33"ML AND PTV
 7) NOT FOR SAT BOX
 8) ONLY SAT BOX
 9) NO NICAM

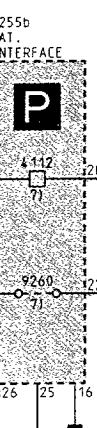
Source selection at
 Tonquellenwahl
 Selezione delle sor
 Sélection source sc

S1	S0	AUDIO SEL
0V	0V	EXT. 3
0V	5V	FE
5V	0V	EXT. 1
5V	5V	EXT. 2

S3	S2	REC SEL
0V	0V	EXT. 3
0V	5V	FE
5V	0V	EXT. 1
5V	5V	---

Stereo decoder
 Stereo decoder
 Decodificatore stereo
 Décodeur stéréo

Sound Ton P
 Procce
 Traif



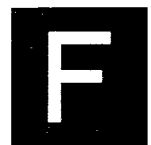
7635
 LM833K

7645
 15

7649

-13/-16

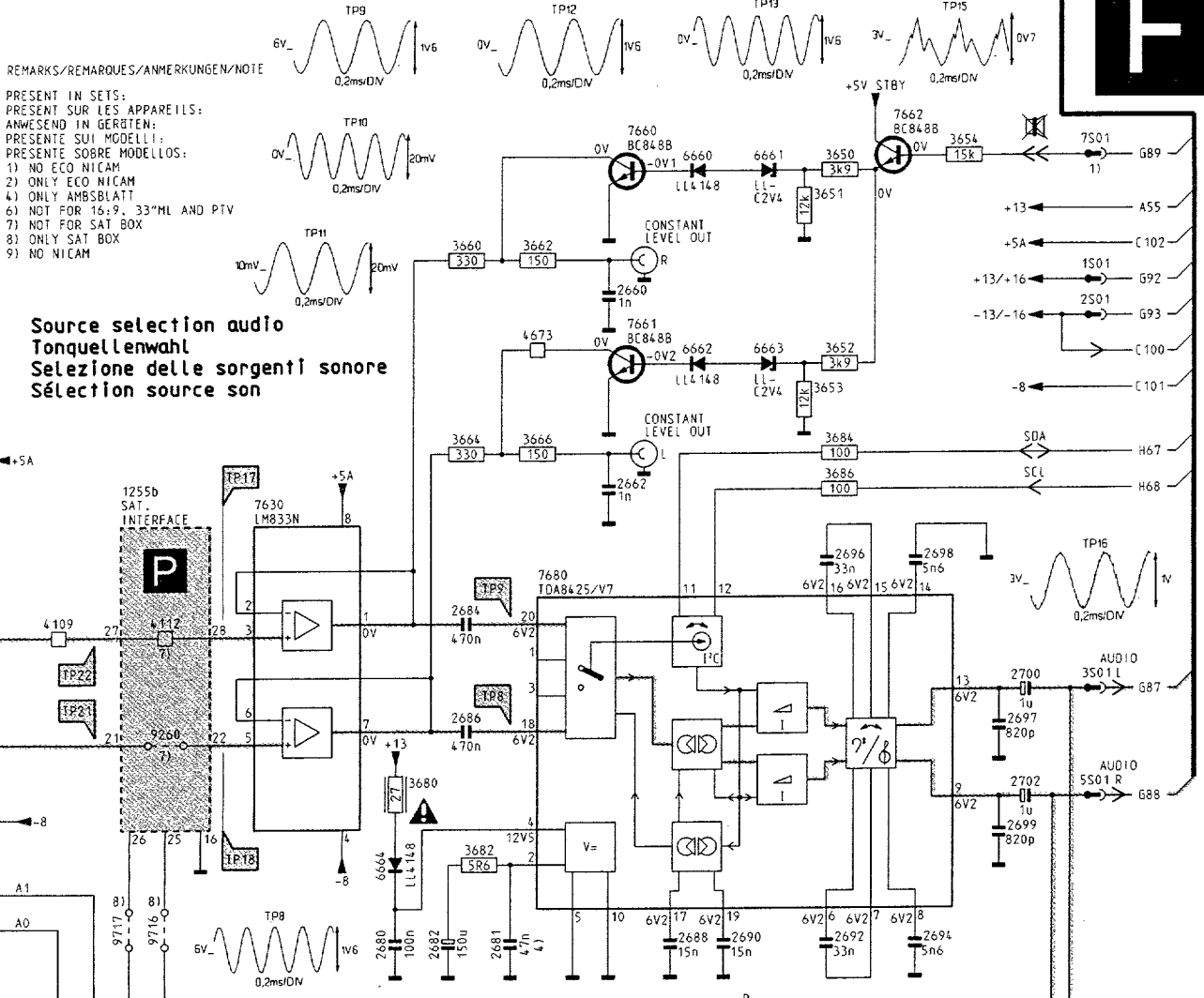
Traitement audio



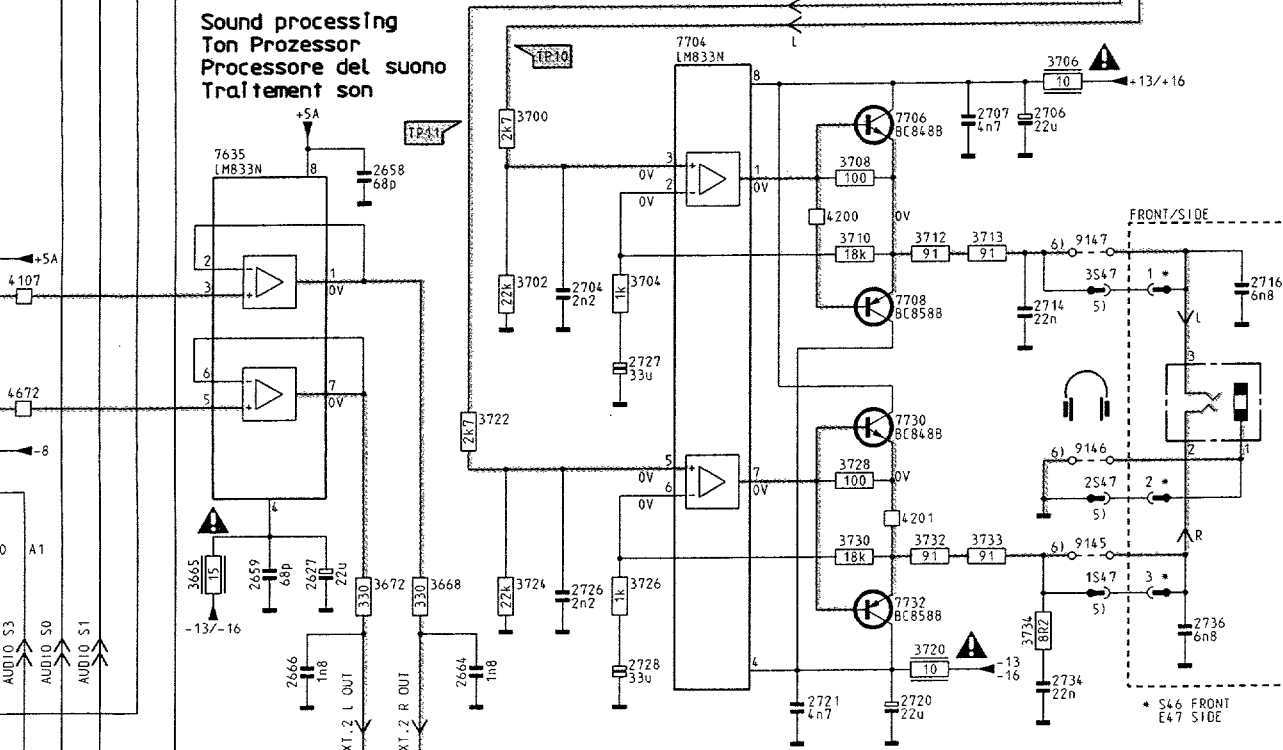
REMARKS/REMARQUES/ANMERKUNGEN/NOTE

PRESENT IN SETS:
 PRESENT SUR LES APPAREILS:
 ANWESEND IN GERÄTEN:
 PRESENTE SUI MODELLI:
 PRESENTE SOBRE MODELOS:
 1) NO ECO NICAM
 2) ONLY ECO NICAM
 4) ONLY AMBSBLATT
 6) NOT FOR 16-9, 33"HL AND PTV
 7) NOT FOR SAT BOX
 8) ONLY SAT BOX
 9) NO NICAM

Source selection audio Tonquellenwahl Selezione delle sorgenti sonore Sélection source son

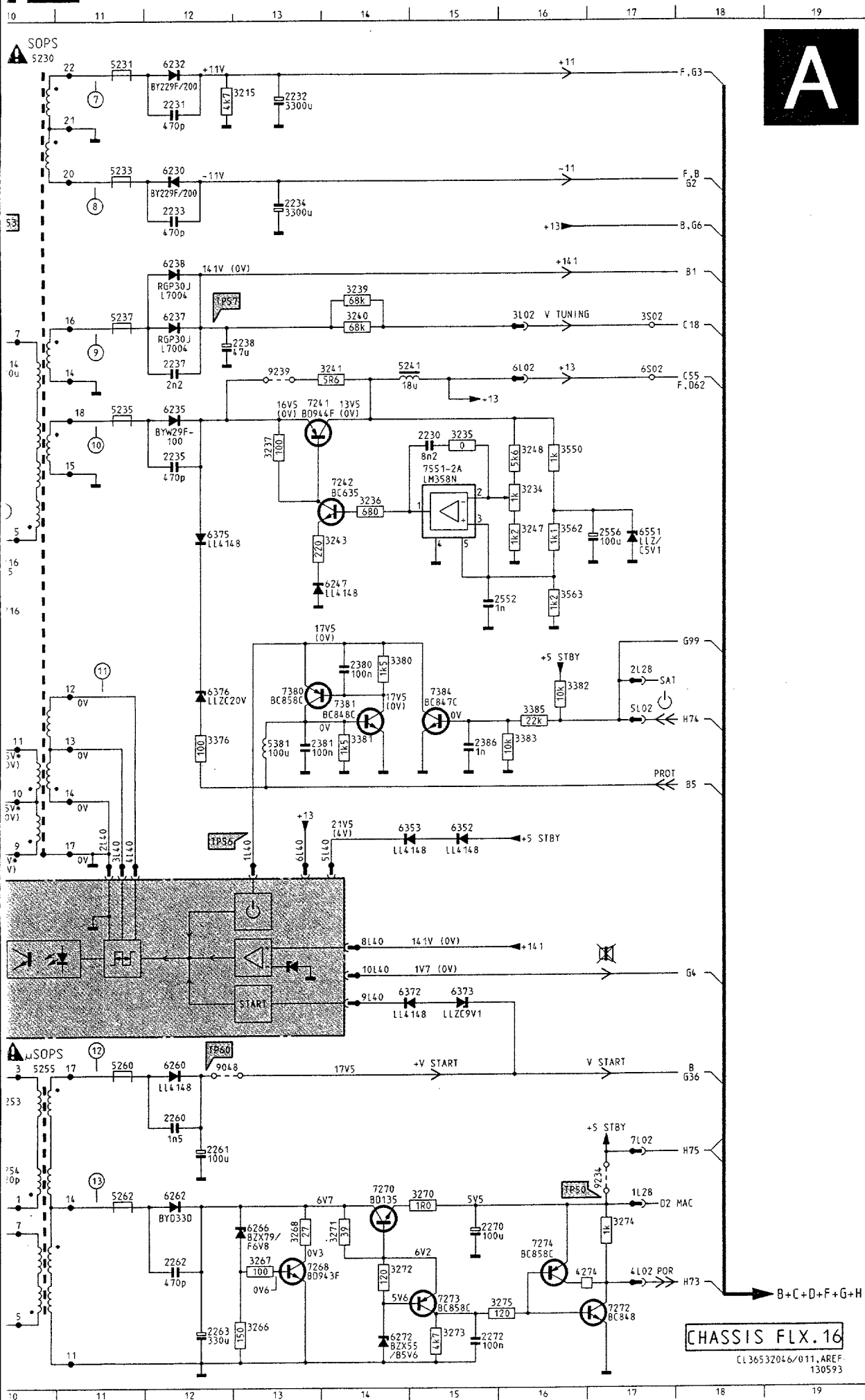


Sound processing Ton Processor Processore del suono Traitement son



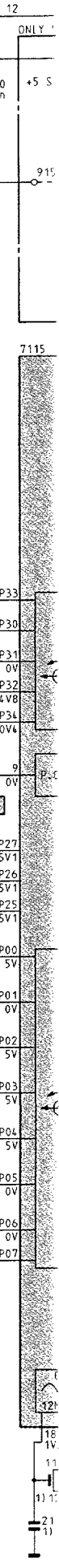
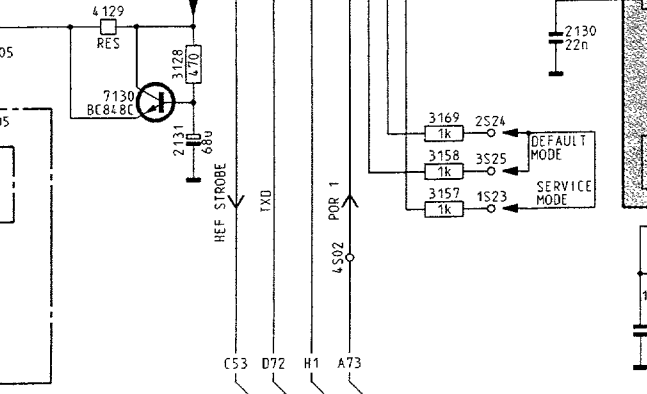
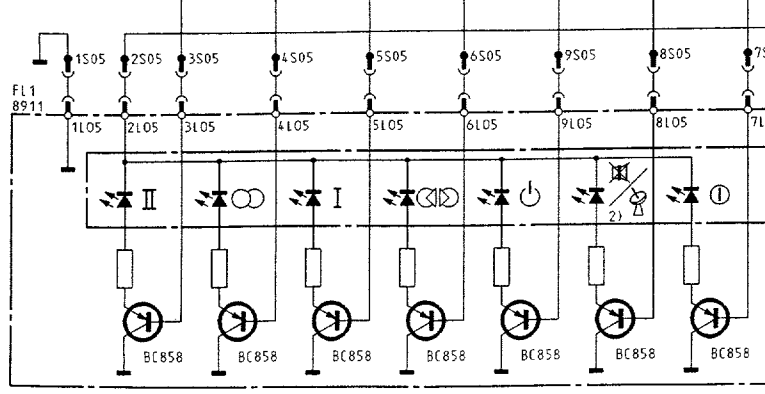
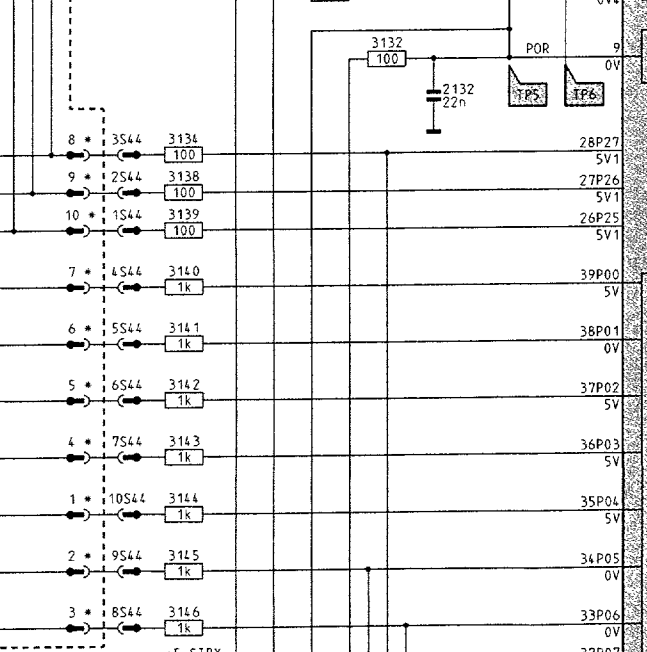
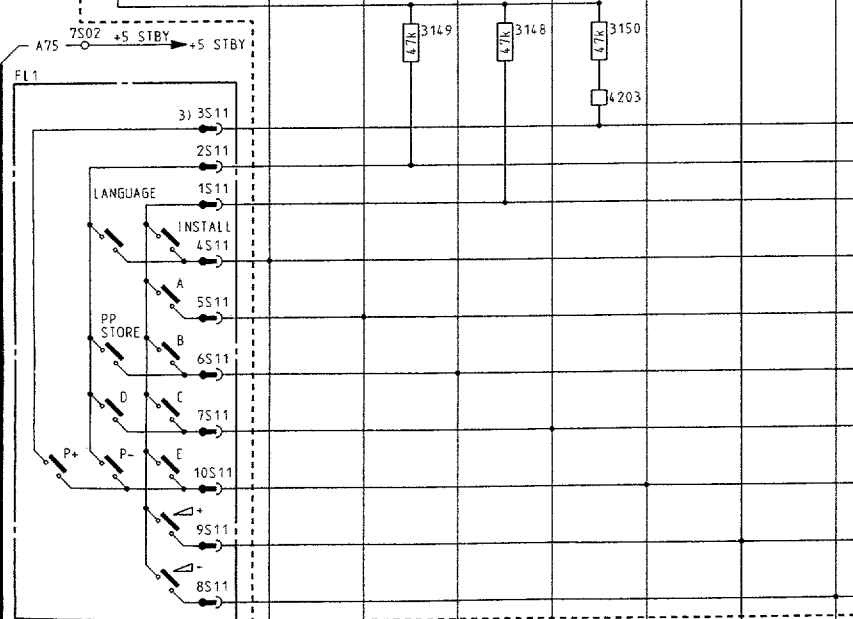
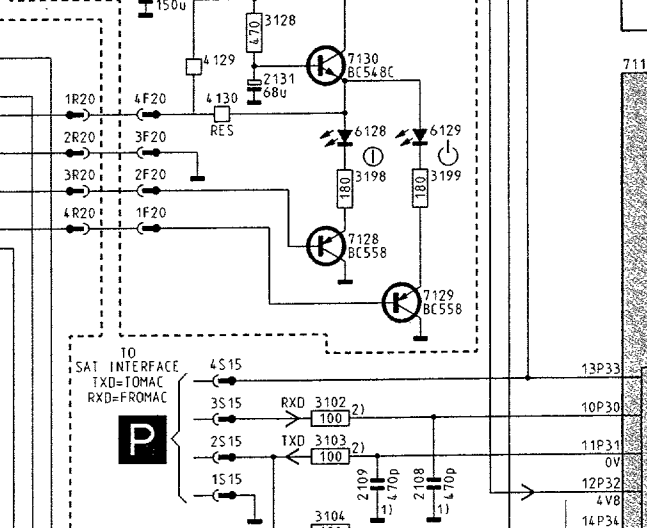
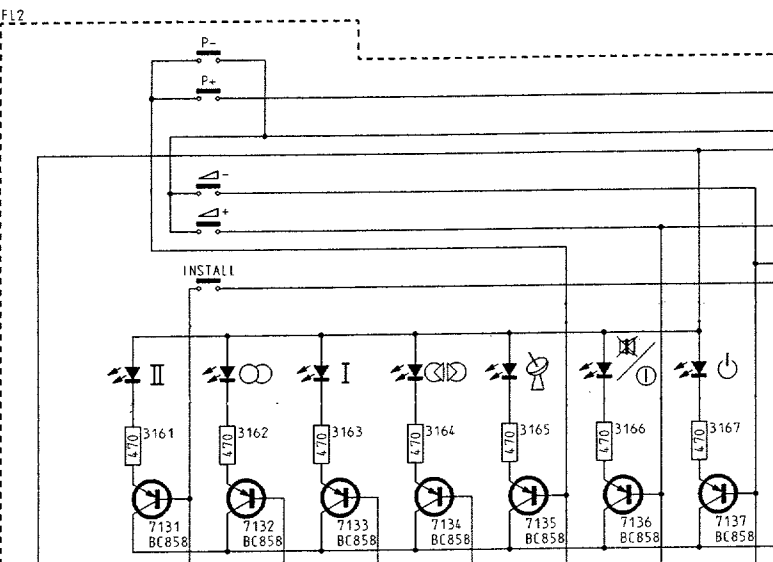
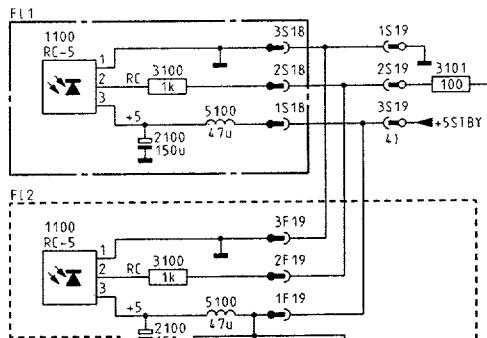
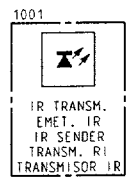
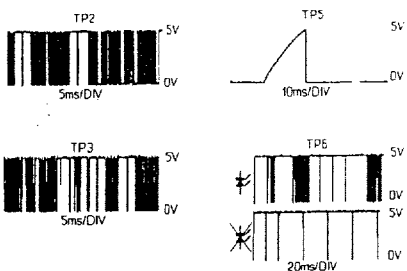
CHASSIS FL
 (L36532036/016, FREF 130593)

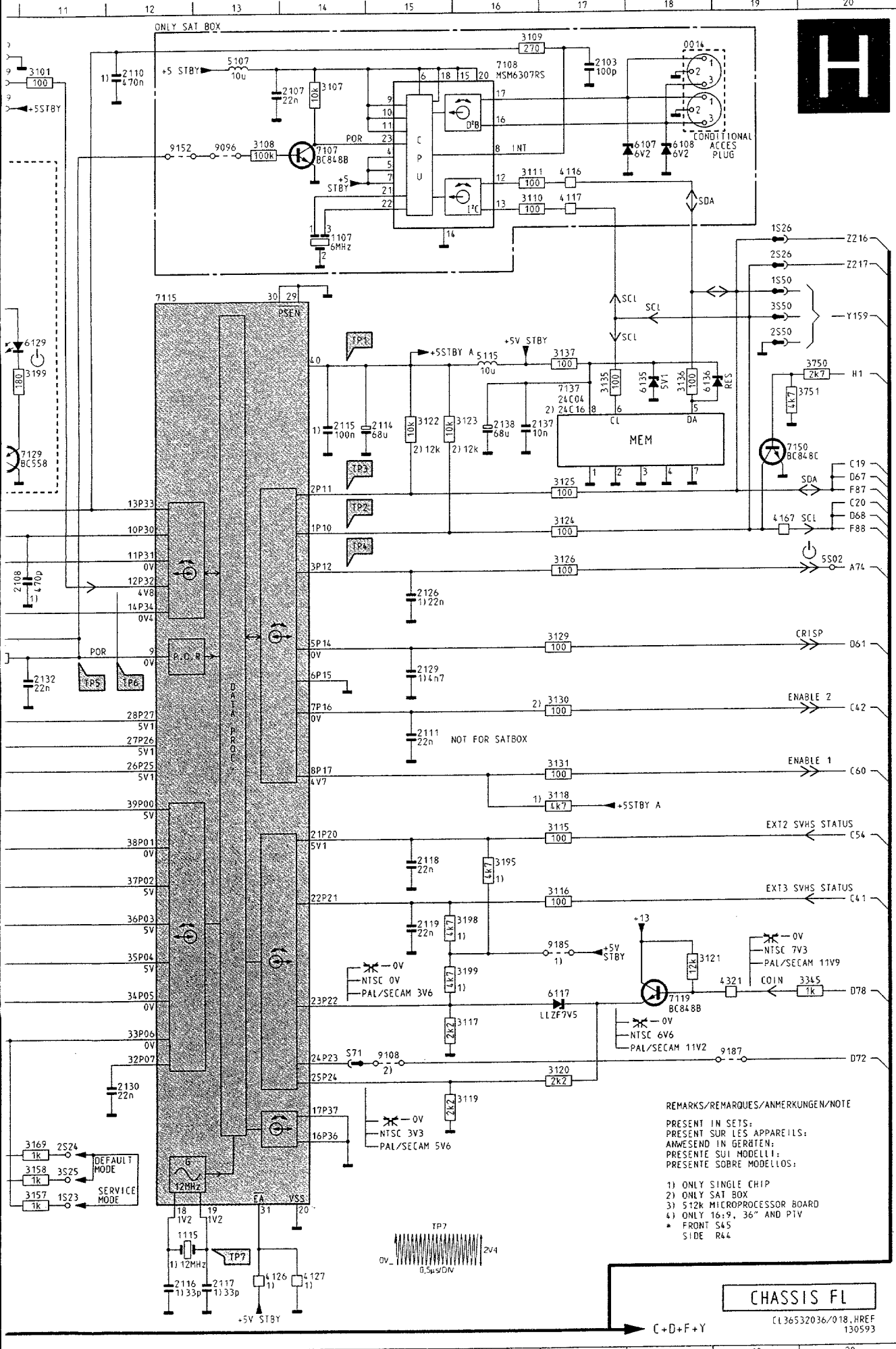
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1600	E 2	4112	F12
1602	M 1	4166	D 5
2600	G 2	4200	K17
2602	H 1	4201	M17
2604	E 2	4672	L11
2606	N 3	4673	C15
2608	M 2	6610	N 5
2620	H 5	6660	B16
2622	H 4	6661	B17
2624	B 6	6662	O16
2626	A 7	6663	D17
2628	H13	6664	H14
2629	C 6	6665	M 3
2630	B 7	7600	I 1
2632	D 6	7620	A 9
2634	C 7	7622	J 9
2636	D 6	7630	E12
2638	D 6	7635	J12
2640	E 6	7660	B16
2642	E 7	7661	C16
2644	F 6	7662	B18
2646	F 7	7680	E15
2658	J13	7704	L16
2659	M12	7706	J17
2660	C16	7708	K17
2662	E16	7730	L17
2664	N14	7732	N17
2666	N13	9145	M19
2680	H14	9146	M19
2681	H15	9147	K19
2682	H14	9260	G12
2684	F14	9641	G 2
2686	G14	9716	H12
2688	H16	9717	H11
2690	H16		
2692	H17		
2694	H18		
2696	E17		
2697	G19		
2698	E18		
2699	H19		
2700	F19		
2702	G19		
2704	K15		
2706	J18		
2707	J18		
2714	K18		
2716	K20		
2720	O17		
2721	O17		
2726	N15		
2727	L15		
2728	N15		
2734	N19		
2736	N20		
3600	E 2		
3602	F 1		
3603	H 1		
3604	G 1		
3605	H 1		
3606	M 3		
3608	M 4		
3610	M 4		
3612	M 6		
3620	H 5		
3622	H 3		
3624	A 6		
3626	B 7		
3628	B 6		
3630	C 7		
3632	C 6		
3634	C 7		
3636	D 6		
3638	D 7		
3640	E 6		
3642	E 7		
3644	F 6		
3646	F 7		
3650	B17		
3651	B17		
3652	D17		
3653	D17		
3654	B18		
3660	C14		
3662	C15		
3664	D14		
3665	H12		
3666	O15		
3668	N14		
3672	N13		
3680	G14		
3682	H14		
3684	D17		
3686	E17		
3700	J14		
3702	K14		
3704	K15		
3706	J19		
3708	J17		
3710	K17		
3712	K18		
3713	K18		
3720	N18		
3722	L14		
3724	N14		
3726	N15		
3728	M17		
3730	M17		
3732	M18		
3733	M18		
3734	N18		
4105	G 4		
4106	G 5		
4107	K11		
4109	F11		



1200	B 2	6352	I15
1200	E 3	6353	I14
1250	L 9	6372	K14
2200	F 3	6373	K15
2200	C 2	6375	F12
2203	E 4	6376	H12
2203	B 4	6551	F17
2210	B 9	7201	N 7
2211	C 9	7216	F 9
2214	D10	7241	E13
2215	I 9	7242	F14
2216	F10	7250	N 8
2230	E15	7251	N 9
2231	A12	7268	N13
2232	A13	7270	H14
2233	B12	7272	O17
2234	B13	7273	O15
2235	E12	7274	N16
2237	D12	7380	H13
2238	D12	7381	H14
2254	M10	7384	H15
2255	N 9	7551	E15
2258	O 6	9048	L12
2260	M12	9204	A 4
2261	M12	9204	E 4
2262	N12	9205	F 6
2263	O12	9206	C 5
2270	N15	9207	G 5
2272	O15	9223	H 8
2380	H14	9234	H17
2381	H13	9239	F13
2386	H15		
2552	G15		
2552	F17		
3201	G 1		
3202	I 9		
3203	G 5		
3204	B 5		
3204	E 5		
3204	F 6		
3209	F 6		
3210	C 8		
3211	B 8		
3212	N 6		
3213	O 6		
3215	A13		
3216	G10		
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3239	C14		
3240	D14		
3241	D14		
3243	F14		
3247	F16		
3248	E16		
3249	M 9		
3250	O 8		
3251	N 8		
3252	L 9		
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3255	N 9		
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3267	N13		
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3270	N15		
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3272	N14		
3273	O15		
3274	N17		
3275	O16		
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3381	H14		
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3550	E16		
3562	F16		
3563	G16		
4102	N17		
4274	N16		
5202	F 4		
5203	A 5		
5203	D 5		
5204	C 3		
5230	A10		
5231	A11		
5233	B11		
5235	E11		
5237	D11		
5241	D14		
5255	L10		
5260	L11		
5262	N11		
5381	H13		
6201	O 9		
6210	C 9		
6211	C 9		
6212	C 9		
6213	B 9		
6216	G 9		
6230	B12		
6232	A12		
6235	E12		
6237	O12		
6238	C12		
6247	G14		
6251	O 9		
6260	L12		
6262	N12		
6266	N13		
6272	O14		
6306	H 8		

CHASSIS FLX. 16
 CL36532046/011, AREF
 130593

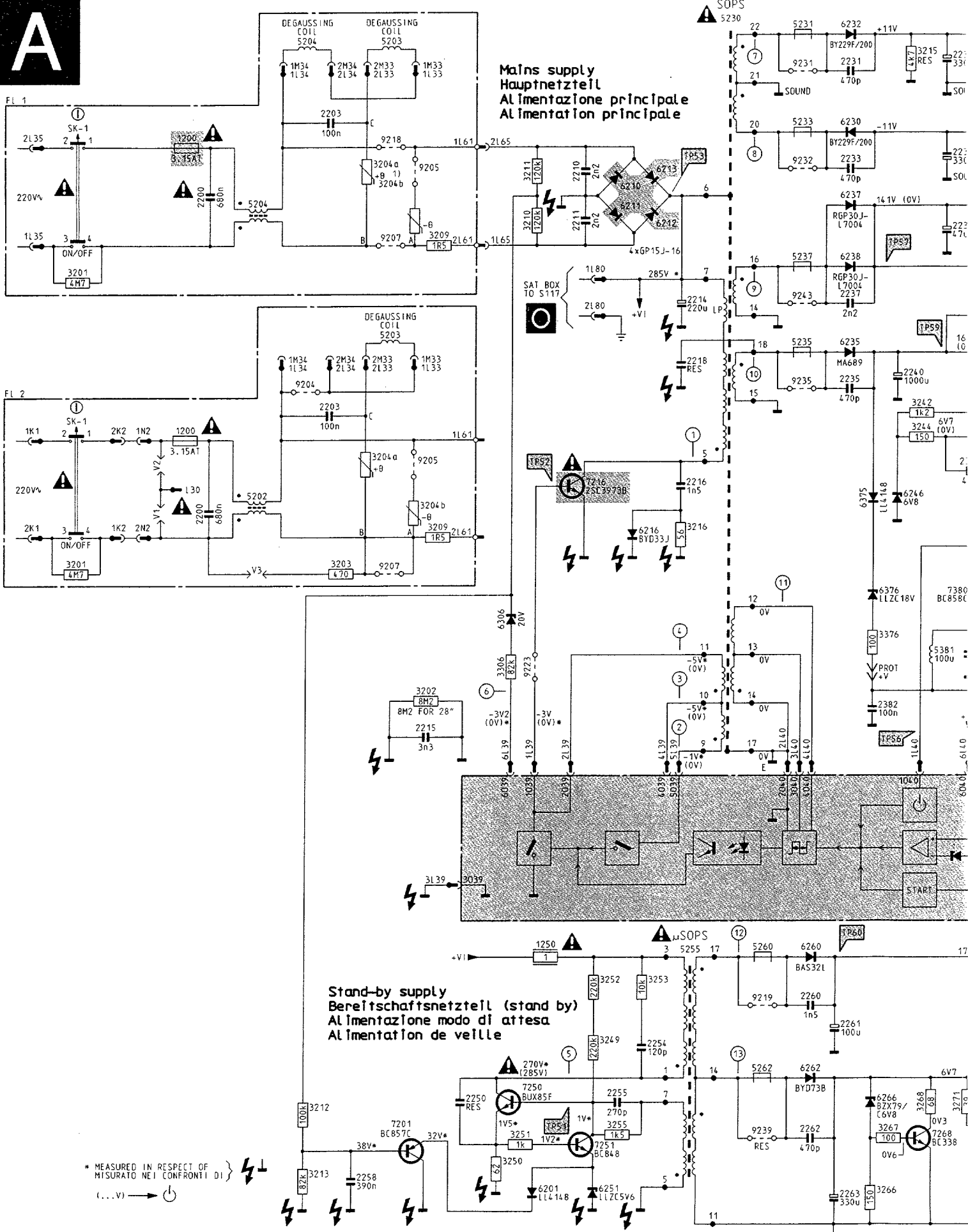




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1001	A 6	7129	E10
1100	A 8	7130	M 8
1100	B 8	7130	D10
1107	C14	7131	G 2
1115	N12	7132	G 3
2100	B 8	7133	G 4
2100	C 8	7134	G 4
2103	A17	7135	G 5
2107	A14	7136	G 6
2108	G11	7137	G 7
2109	G10	7137	E17
2110	A12	7150	E19
2111	I15	8911	M 1
2114	E15	9096	B13
2115	E14	9108	L15
2116	O12	9152	B12
2117	O13	9185	K17
2118	J15	9187	L19
2119	K15		
2126	G15		
2129	H15		
2130	M12		
2131	M 9		
2131	D 9		
2132	H11		
2137	E16		
2138	E16		
3100	A 9		
3100	B 9		
3101	A11		
3102	F10		
3103	F10		
3104	G10		
3107	A14		
3108	B13		
3109	A16		
3110	B16		
3111	B16		
3115	J17		
3116	J17		
3117	L16		
3118	L17		
3119	M16		
3120	M17		
3121	K18		
3122	E15		
3123	E16		
3124	F17		
3125	F17		
3126	G17		
3128	M 9		
3128	C 9		
3128	H17		
3130	H17		
3131	I17		
3132	H10		
3134	H 9		
3135	E17		
3136	E18		
3137	D17		
3138	I 9		
3139	I 9		
3140	I 9		
3141	J 9		
3142	J 9		
3143	K 9		
3144	K 9		
3145	L 9		
3146	L 9		
3148	H 4		
3149	H 4		
3150	H 5		
3157	M11		
3158	N11		
3161	F 2		
3162	F 3		
3163	F 4		
3164	F 4		
3165	F 5		
3166	F 6		
3167	F 7		
3169	M11		
3195	J16		
3198	D10		
3198	K15		
3199	D11		
3199	K16		
3345	L20		
3750	O20		
3751	E19		
4116	B17		
4117	B17		
4126	O13		
4127	O14		
4129	L 8		
4129	D 9		
4130	D 9		
4167	F19		
4203	H 5		
4321	L19		
5100	A 9		
5100	C 9		
5107	A13		
5115	D16		
6107	B18		
6108	B18		
6117	L17		
6128	D10		
6129	D11		
6135	E18		
6136	E18		
7107	A16		
7115	D12		
7119	L18		

REMARKS/REMARQUES/ANMERKUNGEN/NOTE
 PRESENT IN SETS;
 PRESENT SUR LES APPAREILS;
 ANWESEND IN GERÄTEN;
 PRESENTE SUI MODELLI;
 PRESENTE SOBRE MODELOS:
 1) ONLY SINGLE CHIP
 2) ONLY SAT BOX
 3) 512K MICROPROCESSOR BOARD
 4) ONLY 16:9, 36" AND PTV
 * FRONT S45
 SIDE R44

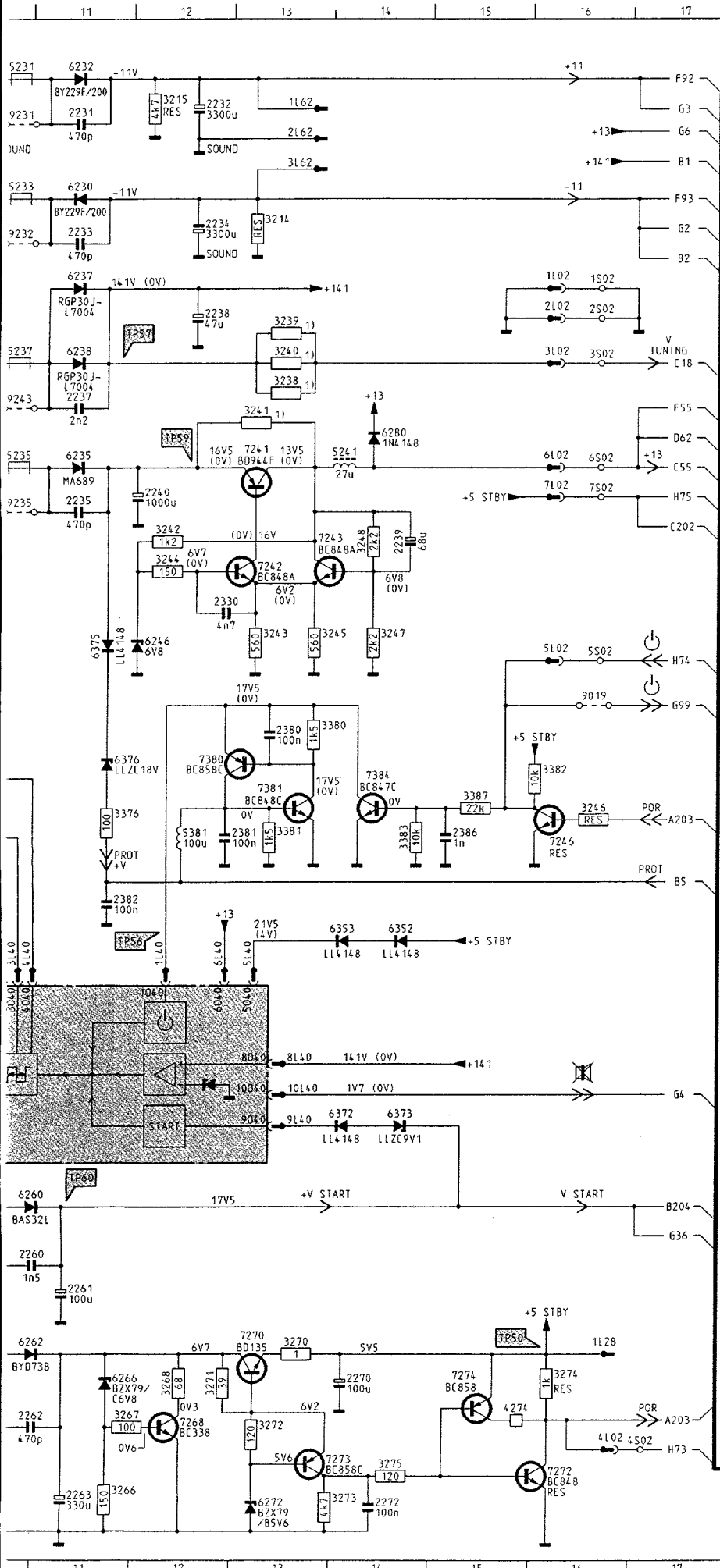
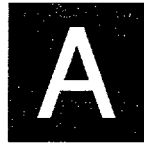
CHASSIS FL
 CL36532036/018_HREF
 130593



Mains supply
Hauptnetzteil
Alimentazione principale
Alimentation principale

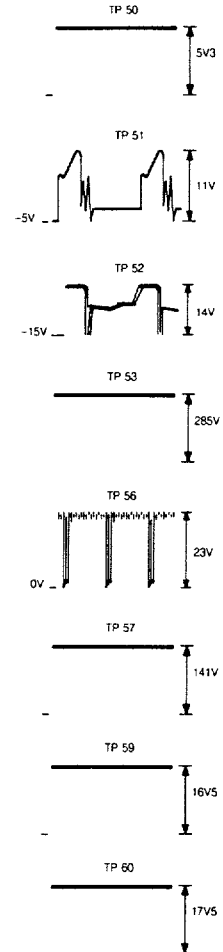
Stand-by supply
Bereitschaftsnetzteil (stand by)
Alimentazione modo di attesa
Alimentation de veille

* MEASURED IN RESPECT OF MISURATO NEI CONFRONTI DI (...V) →



1)

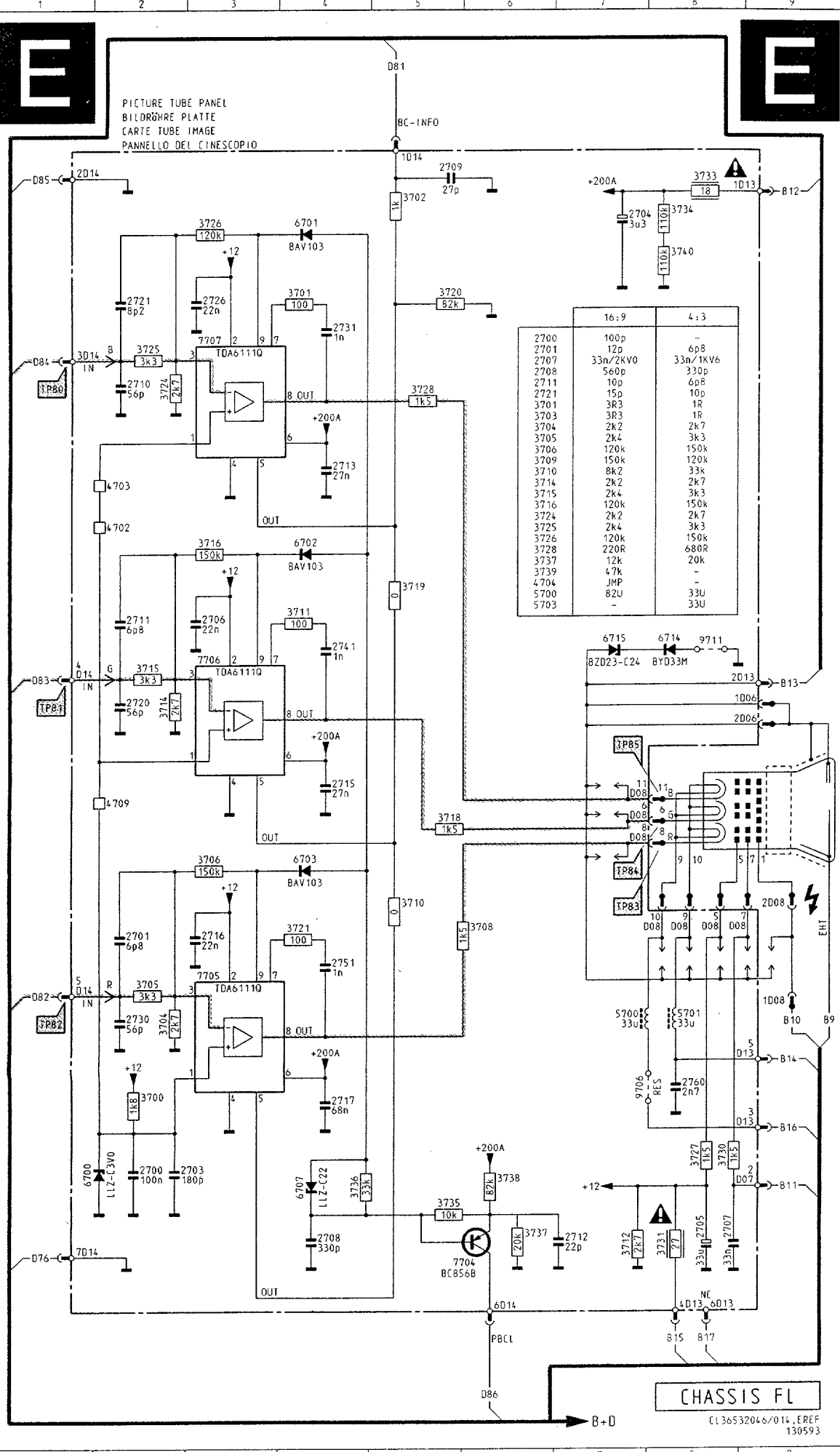
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3238	---	---	---	100k	300k	300k
3239	---	---	---	100k	300k	300k
3240	---	---	---	100k	300k	300k
3241	---	---	---	2R2	4R7	2R7



CHASSIS FLX. 14
 CL36532036/011,AREF
 130593

- 1200 B 2 6237 C11
- 1200 F 2 6238 D11
- 2200 C 2 6246 G12
- 2200 G 2 6251 O 8
- 2202 B 3 6260 L11
- 2203 B 4 6262 N11
- 2203 E 4 6266 M11
- 2210 C 8 6272 O13
- 2211 C 8 6280 D14
- 2214 D 9 6306 H 7
- 2215 I 6 6352 L14
- 2216 F 9 6353 L14
- 2218 E 9 6372 K14
- 2231 A11 6373 K14
- 2232 A12 6375 G11
- 2233 B11 6376 H11
- 2234 B12 7201 N 6
- 2235 E11 7216 F 8
- 2237 D11 7241 E13
- 2238 C12 7242 F13
- 2239 E14 7243 F13
- 2240 E12 7246 H16
- 2250 N 6 7250 N 7
- 2254 M 9 7251 N 8
- 2255 N 8 7268 N12
- 2258 O 5 7270 M13
- 2260 M11 7272 O16
- 2261 M11 7273 O13
- 2262 N11 7274 N15
- 2263 O11 7380 H12
- 2270 N14 7381 H13
- 2272 O14 7384 H14
- 2330 F12 9019 G16
- 2380 G13 9204 E 4
- 2381 H12 9205 C 5
- 2382 I11 9205 F 5
- 2386 H15 9206 C 5
- 3201 D 2 9206 G 5
- 3201 G 2 9207 D 5
- 3202 I 6 9207 G 5
- 3203 C 5 9218 B 5
- 3203 G 4 9219 M10
- 3204 B 5 9223 I 7
- 3204 C 5 9231 A10
- 3204 F 5 9232 B10
- 3209 C 5 9239 N10
- 3209 G 5 9242 B 5
- 3210 C 7 9242 E 5
- 3211 C 7 9243 D10
- 3212 N 4
- 3213 O 4
- 3214 B13
- 3215 A12
- 3216 G 9
- 3235 L 7
- 3238 D13
- 3239 C13
- 3240 O13
- 3241 D13
- 3242 E12
- 3243 F13
- 3244 F12
- 3245 F13
- 3246 H16
- 3247 F14
- 3248 E14
- 3249 H 8
- 3250 O 7
- 3251 N 7
- 3252 L 8
- 3253 L 9
- 3255 N 8
- 3266 O11
- 3267 N11
- 3268 N12
- 3270 N13
- 3271 N12
- 3272 N13
- 3273 O14
- 3274 N16
- 3275 O14
- 3275 N14
- 3275 N16
- 3306 I 7
- 3376 H11
- 3380 G13
- 3381 H13
- 3382 H16
- 3383 H14
- 3387 H15
- 4274 N15
- 5202 G 3
- 5203 A 5
- 5203 E 5
- 5204 C 3
- 5204 A 4
- 5230 A 9
- 5233 B10
- 5235 E10
- 5237 D10
- 5241 E14
- 5255 L 9
- 5260 L10
- 5262 N10
- 5381 O12
- 6201 O 7
- 6210 C 8
- 6211 C 8
- 6212 C 9
- 6213 C 9
- 6216 G 8
- 6230 B11
- 6232 A11
- 6235 E11

PICTURE TUBE PANEL
 BILDROHRE PLATTE
 CARTE TUBE IMAGE
 PANNELLO DEL CINESCOPIO



	16:9	4:3
2700	100p	-
2701	12p	6p8
2707	33n/2kV0	33n/1kV6
2708	560p	330p
2711	10p	6p8
2721	15p	10p
3701	3R3	1R
3703	3R3	1R
3704	2k2	2k7
3705	2k4	3k3
3706	120k	150k
3709	150k	120k
3710	8k2	33k
3714	2k2	2k7
3715	2k4	3k3
3716	120k	150k
3724	2k2	2k7
3725	2k4	3k3
3726	120k	150k
3728	220R	680R
3737	12k	20k
3739	47k	-
4704	JMP	-
5700	82U	33U
5703	-	33U

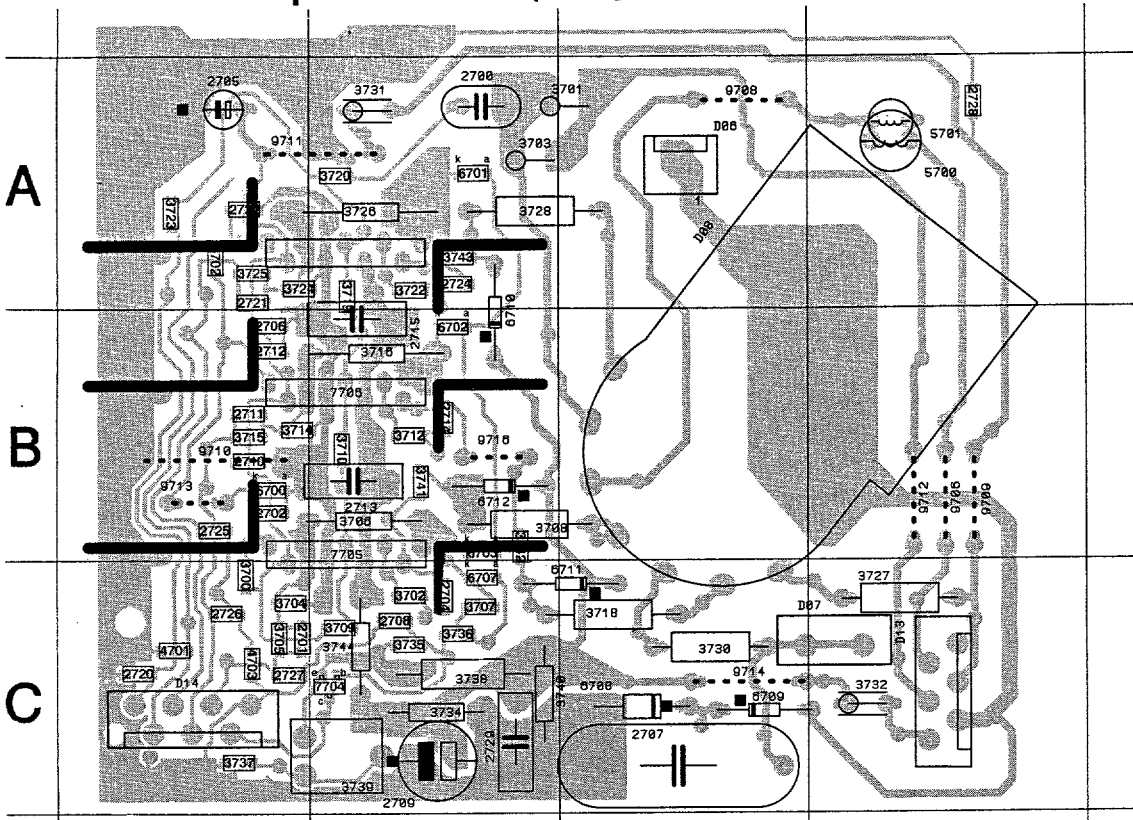
- 2700 M 2
- 2701 J 2
- 2703 M 2
- 2704 C 7
- 2705 M 8
- 2706 G 3
- 2707 M 4
- 2708 M 4
- 2709 B 5
- 2710 D 2
- 2711 G 2
- 2712 M 7
- 2713 E 4
- 2715 I 4
- 2716 J 3
- 2717 L 4
- 2720 H 2
- 2721 C 2
- 2726 C 3
- 2730 K 2
- 2731 D 4
- 2741 G 4
- 2751 K 4
- 2760 L 8
- 3700 L 2
- 3701 C 4
- 3702 B 5
- 3704 K 2
- 3705 K 2
- 3706 I 3
- 3708 J 6
- 3710 J 5
- 3711 G 4
- 3712 M 7
- 3714 H 2
- 3715 G 2
- 3716 F 3
- 3718 I 5
- 3719 F 5
- 3720 C 5
- 3721 J 4
- 3724 D 2
- 3726 C 3
- 3727 M 8
- 3730 M 8
- 3731 M 8
- 3733 B 8
- 3734 B 8
- 3735 M 5
- 3736 M 4
- 3737 M 6
- 3738 M 6
- 3740 C 8
- 4702 F 2
- 4703 E 2
- 4709 I 2
- 5700 K 7
- 5701 K 8
- 6700 M 1
- 6701 C 4
- 6702 F 4
- 6703 I 4
- 6707 M 4
- 6714 G 8
- 6715 G 7
- 7704 N 6
- 7705 K 3
- 7706 G 3
- 7707 D 3
- 9706 L 7
- 9711 G 8



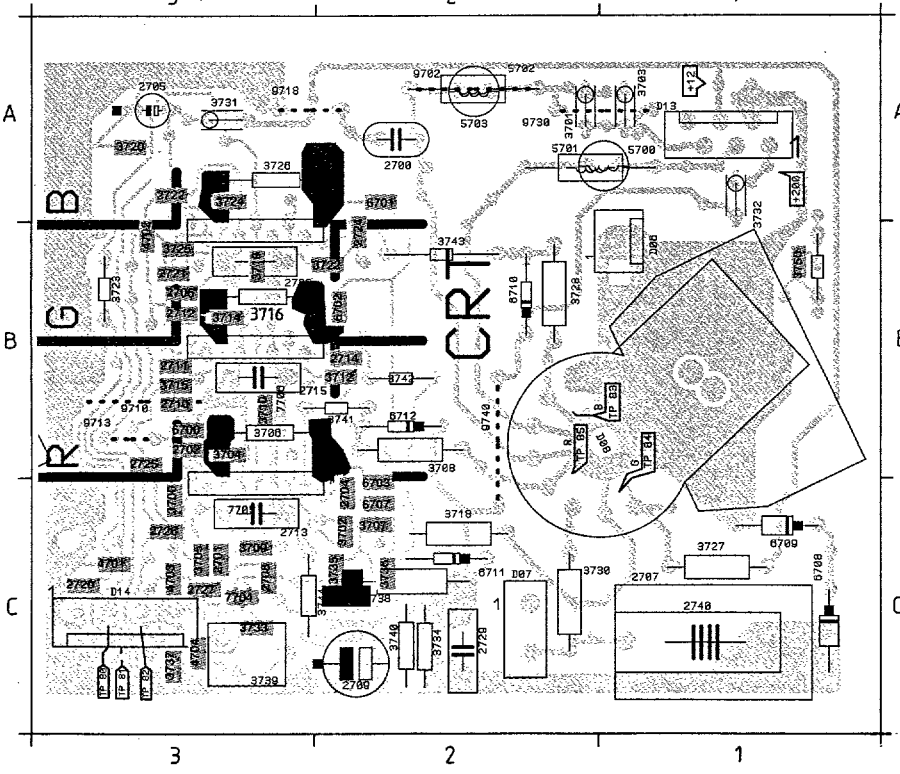
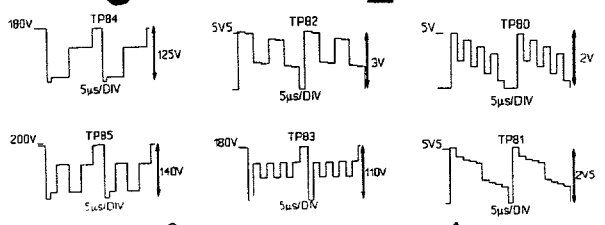
CHASSIS FL
 CL36532046/014, EREF
 130593

Platines Tube-image

Videocolor picture tube (36")

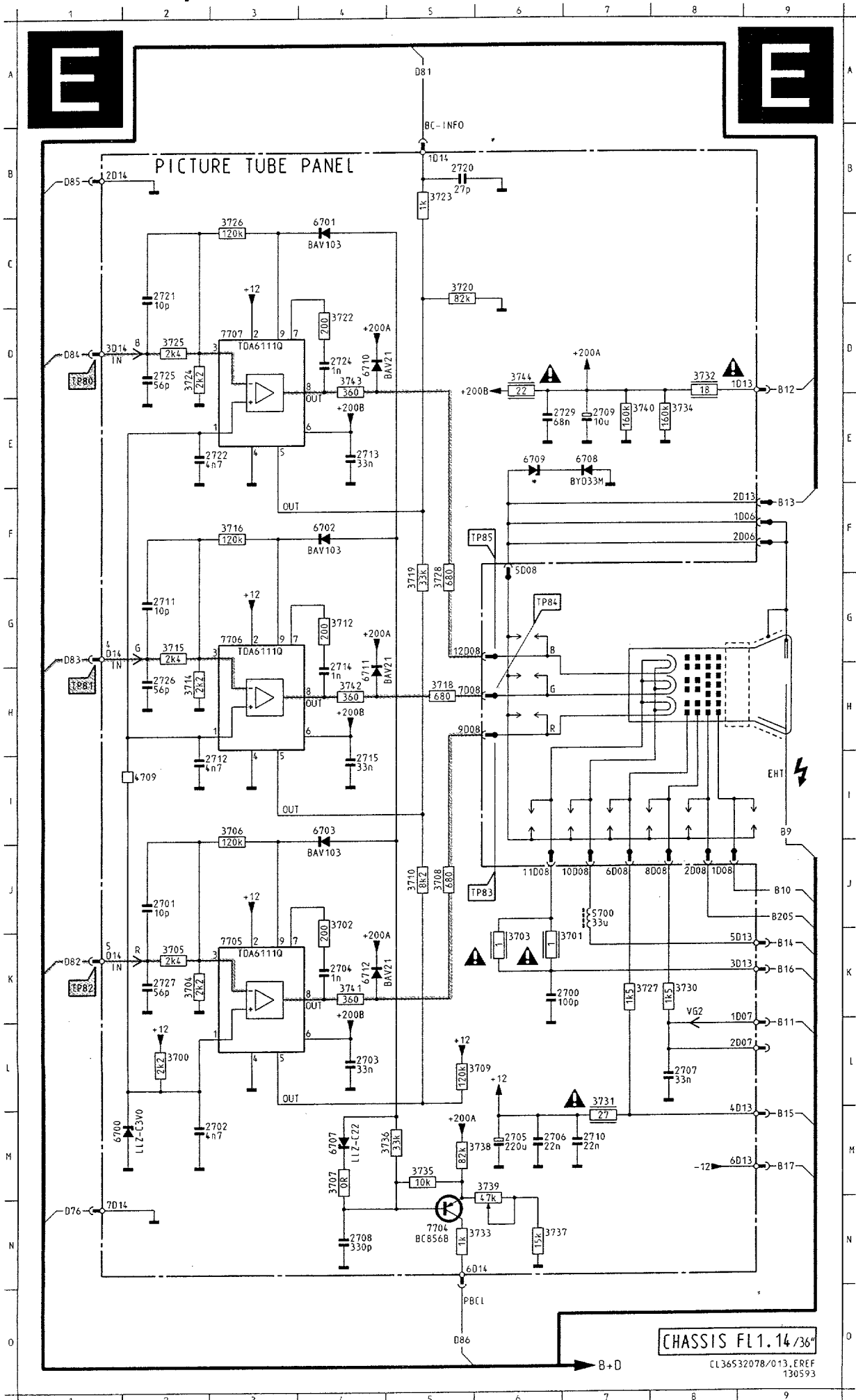


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D07 C1	3709 C3	6702 B3
D08 B2	3710 B3	6703 B3
D13 C1	3712 B3	6707 C3
D14 C4	3714 B4	6708 C2
2700 A3	3715 B4	6709 C2
2701 C4	3716 B3	6710 B3
2702 B4	3718 C2	6711 C3
2704 C3	3719 A3	6712 B3
2705 A4	3720 A3	7704 C4
2706 B4	3722 A3	7705 B3
2707 C3	3723 A4	7706 B3
2708 C3	3724 A4	7707 A3
2709 C3	3725 A4	8706 B1
2710 B4	3726 A3	8708 A2
2711 B4	3727 C1	8709 B1
2712 B4	3728 A3	8710 B4
2713 B3	3730 C2	8711 A4
2714 B3	3731 A3	8712 B1
2715 B3	3732 C1	8713 B4
2720 C4	3734 C3	8714 C2
2721 A4	3735 C3	9716 B3
2722 A4	3736 C3	
2724 A3	3737 C4	
2725 B4	3738 C3	
2726 C4	3739 C3	
2727 C4	3740 C3	
2728 A1	3741 B3	
2729 C3	3742 B3	
3700 C4	3743 A3	
3701 A3	3744 C3	
3702 C3	4701 C4	
3703 A3	4702 A4	
3704 C4	4703 C4	
3705 C4	6700 A1	
3706 B3	6701 A1	
3707 C3	6700 B4	



D06 B1	3708 B2	5701 A2
D07 C2	3709 C3	5702 A2
D08 B1	3710 B3	5703 A2
D13 A1	3712 B2	6700 B3
D14 C3	3714 B3	6701 A2
2700 A2	3715 B3	6702 B2
2701 C3	3716 B3	6703 C2
2702 B3	3718 C2	6707 C2
2703 B3	3719 B3	6708 C1
2704 C2	3720 A3	6709 C1
2705 A3	3722 B2	6710 B2
2706 B3	3723 B3	6711 C2
2707 C1	3724 A3	6712 B2
2708 C3	3725 B3	7704 C3
2709 C2	3726 A3	7705 C3
2710 B3	3727 C1	7706 B3
2711 B3	3728 B2	7707 B3
2712 B3	3730 C2	9702 A2
2713 C3	3731 A3	9710 B3
2714 B2	3732 A1	9713 B3
2715 B3	3733 C3	9718 A3
2720 C3	3734 C2	9730 A1
2721 B3	3735 C2	9740 B2
2722 A3	3736 C2	
2724 B2	3738 C2	
2725 B3	3739 C3	
2726 C3	3740 C2	
2727 C3	3741 B2	
2729 C2	3742 B2	
2740 C1	3743 B2	
3700 C3	3744 C3	
3701 A2	3750 B1	
3702 C2	3751 B1	
3703 A1	4701 C3	
3704 B3	4702 B3	
3705 C3	4703 C3	
3706 B3	4704 C3	
3707 C2	5700 A1	

Picture tube panel 36"



- 33 6701 A3
- 33 6702 B3
- 33 6703 B3
- 33 6707 C3
- 34 6708 C2
- 34 6709 C2
- 33 6710 B3
- 32 6711 C3
- A3 6712 B3
- A3 7704 C4
- A4 7706 B3
- A4 7708 B3
- A4 7707 A3
- A3 9708 B1
- A3 9708 A2
- C1 9708 B1
- A3 9710 B4
- C2 9711 A4
- A1 9712 B1
- C3 9713 B4
- C3 9714 C2
- C3 9716 B3

- 5701 A2
- 5702 A2
- 5703 A2
- 6700 B3
- 6701 A2
- 6702 B2
- 6703 C2
- 6707 C2
- 6708 C1
- 6709 C1
- 6710 B2
- 6711 C2
- 6712 B2
- 7704 C3
- 7705 C3
- 7706 B3
- 7707 B3
- 9702 A2
- 9710 B3
- 9713 B3
- 9718 A3
- 9730 A1
- 9740 B2

- 2700 K 6
- 2701 J 2
- 2702 M 2
- 2703 L 4
- 2704 K 4
- 2705 M 6
- 2706 M 6
- 2707 L 8
- 2708 N 4
- 2709 E 7
- 2710 M 7
- 2711 G 2
- 2712 I 2
- 2713 E 4
- 2714 H 4
- 2715 I 4
- 2720 B 5
- 2721 C 2
- 2722 E 2
- 2724 D 4
- 2725 D 2
- 2726 H 2
- 2727 K 2
- 2729 E 6
- 3700 L 2
- 3701 K 6
- 3702 J 4
- 3703 K 6
- 3704 K 2
- 3705 K 2
- 3706 I 3
- 3707 M 4
- 3708 J 5
- 3709 L 5
- 3710 J 5
- 3712 G 4
- 3714 H 2
- 3715 G 2
- 3716 F 3
- 3718 H 5
- 3719 G 5
- 3720 C 5
- 3722 D 4
- 3723 B 5
- 3724 D 2
- 3726 C 3
- 3727 K 7
- 3728 G 5
- 3730 K 8
- 3731 L 7
- 3732 D 8
- 3733 N 5
- 3734 E 8
- 3735 M 5
- 3736 M 5
- 3737 N 6
- 3738 M 5
- 3739 M 6
- 3740 E 7
- 3741 K 4
- 3742 H 4
- 3743 D 4
- 3744 D 6
- 4709 I 2
- 5700 J 7
- 6700 M 1
- 6701 C 4
- 6702 F 4
- 6703 I 4
- 6707 M 4
- 6708 E 7
- 6709 E 6
- 6710 D 4
- 6711 H 4
- 6712 K 4
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- 7705 K 3
- 7706 G 3
- 7707 D 3

CHASSIS FL1.14/36"
 CL36532078/013, EREF
 130593

Audi

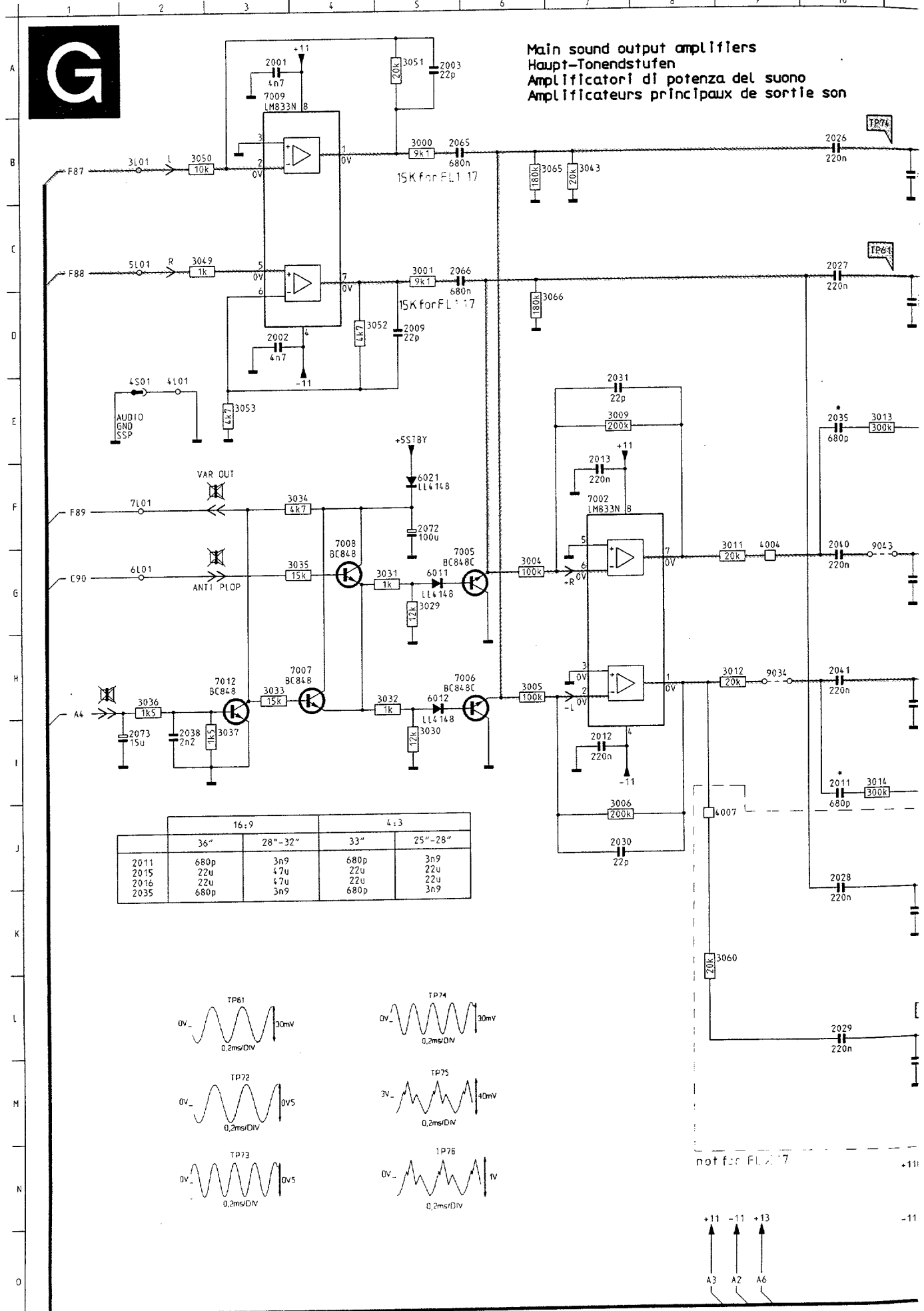


A
B
C
D
E
F
G
H
I
J
K
L
M
N
O

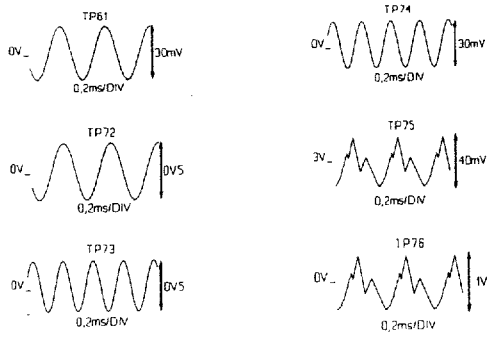




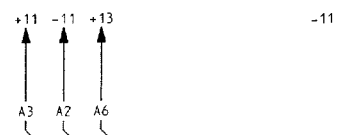
Main sound output amplifiers
 Haupt-Tonendstufen
 Amplificatori di potenza del suono
 Amplificateurs principaux de sortie son



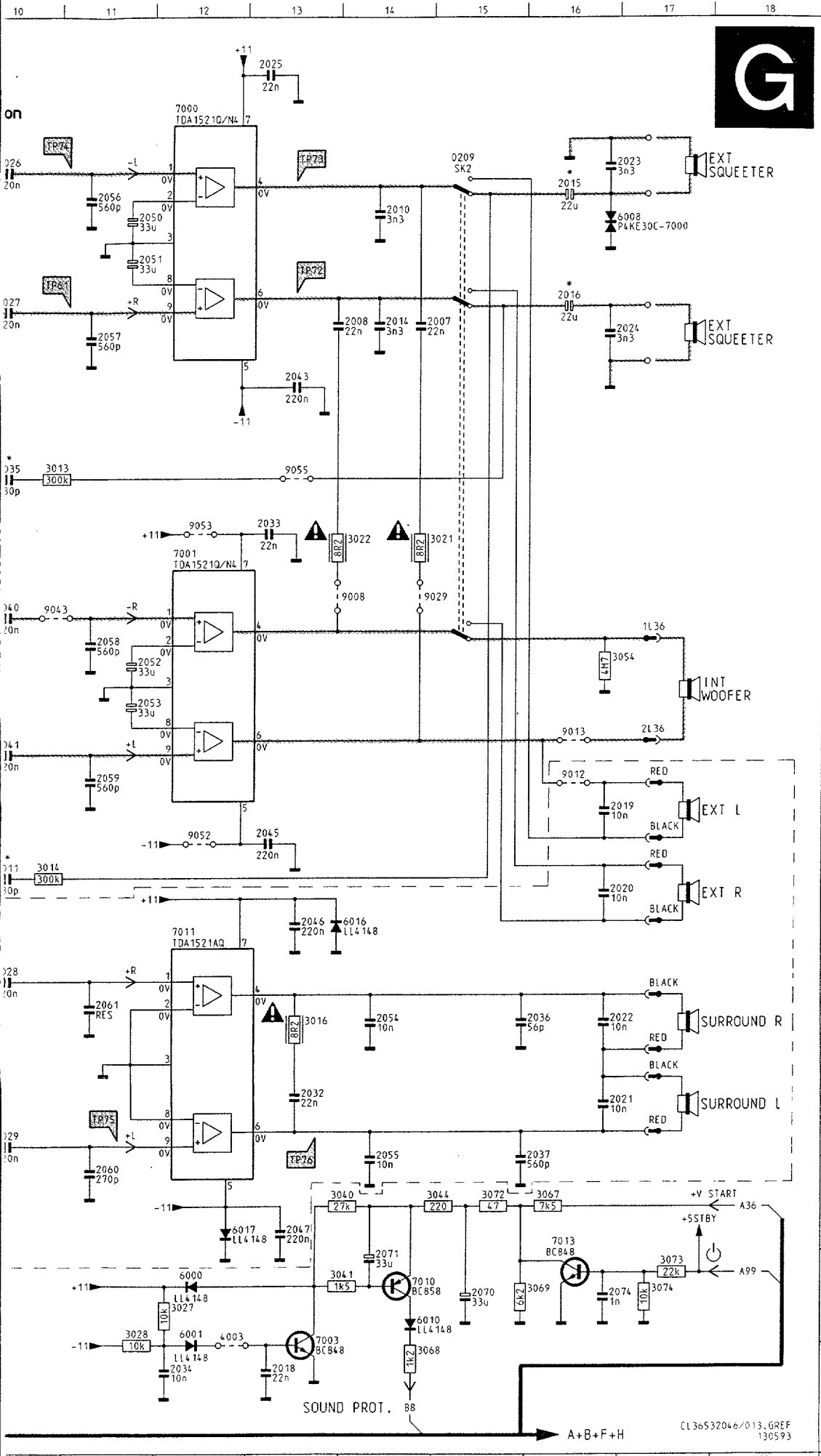
	16:9		4:3	
	36"	28"-32"	33"	25"-28"
2011	680p	3n9	680p	3n9
2015	22u	47u	22u	22u
2016	22u	47u	22u	22u
2035	680p	3n9	680p	3n9



not for FL 2:7



Amplificateur audio

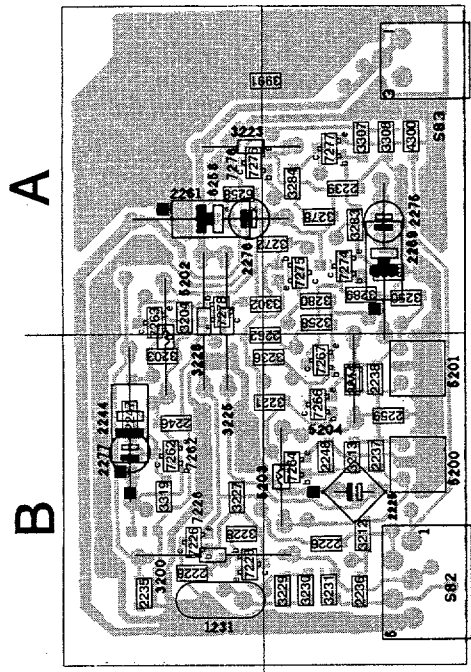


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2001	A 3	7002	F 7
2002	D 3	7003	O13
2003	A 5	7005	G 5
2007	D14	7006	H 5
2008	D14	7007	H 3
2009	D 5	7008	G 4
2010	B14	7009	A 3
2011	I10	7010	N14
2012	I 7	7011	J12
2013	F 7	7012	H 3
2014	D14	7013	M16
2015	B16	9008	F14
2016	C16	9012	H16
2018	O13	9013	H16
2019	I16	9029	F14
2020	J16	9034	H 9
2021	L16	9043	G10
2022	K16	9052	I12
2023	B16	9053	F12
2024	D16	9055	E13
2025	A13		
2026	B10		
2027	C10		
2028	K10		
2029	L10		
2030	J 7		
2031	E 7		
2032	L13		
2033	F13		
2034	O12		
2035	E10		
2036	K16		
2037	M16		
2038	I 2		
2040	G10		
2041	H10		
2043	D13		
2045	I13		
2046	J13		
2047	M13		
2050	B11		
2051	C11		
2052	G11		
2053	H11		
2054	K14		
2055	M14		
2056	B11		
2057	D11		
2058	G11		
2059	H11		
2060	M11		
2061	K11		
2065	B 5		
2066	C 5		
2070	N15		
2071	N14		
2072	F 5		
2073	I 2		
2074	N16		
3000	B 5		
3001	C 5		
3004	G 6		
3005	H 6		
3006	J 7		
3009	E 7		
3011	G 9		
3012	H 9		
3013	E10		
3014	I10		
3016	K13		
3021	F14		
3022	F14		
3027	N12		
3028	N11		
3029	G 5		
3029	G 5		
3030	I 5		
3031	G 5		
3032	H 5		
3033	H 3		
3034	F 4		
3035	G 4		
3036	H 2		
3037	I 3		
3040	M14		
3041	N14		
3043	B 7		
3044	M15		
3049	C 2		
3050	B 2		
3051	A 5		
3052	D 4		
3053	E 3		
3054	G16		
3060	K 8		
3065	B 6		
3066	D 6		
3067	M16		
3068	O14		
3069	N16		
3072	M15		
3073	N17		
3074	N17		
4003	N12		
4004	G 9		
4007	J 8		
6000	N12		
6001	N12		
6008	B16		
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6011	G 5		
6012	H 5		
6016	J14		
6017	M12		
6021	F 5		
7006	A12		

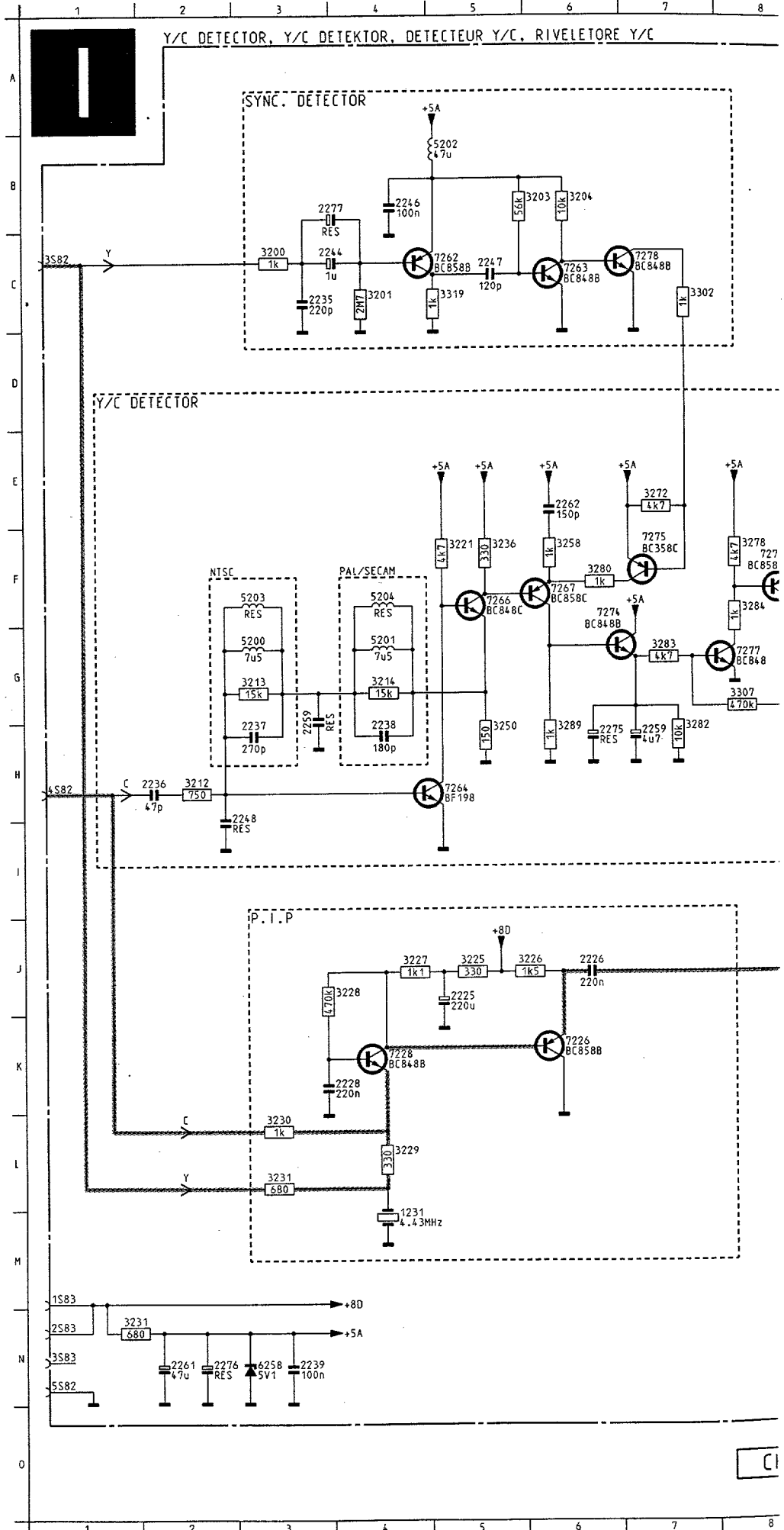
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L02	E1	2073	D4	2526	C1	3215	E5	3422	B3	3549	D2	4520	H2	6440	B3	7381	E3	9046	D4	9407	B2
L03	A1	2074	A5	2527	C1	3216	F4	3423	B3	3550	B4	4520	F4	6441	B3	7384	E3	9047	E5	9450	B1
L08	C4	2200	H3	2528	C1	3220	G4	3424	B2	3553	B4	4521	E5	6451	B1	7400	B3	9048	D4	9451	A1
L13	C4	2202	G2	2529	F1	3230	F3	3425	B3	3554	B4	4523	E4	6452	B1	7402	C3	9050	A3	9453	B2
L27	B3	2203	H2	2530	F1	3234	B4	3426	A2	3555	B3	4523	E4	6453	B1	7403	A1	9051	D4	9454	B2
L28	G1	2210	F4	2531	D3	3235	B4	3427	B3	3556	B3	4527	E3	6465	A1	7407	B3	9052	D4	9456	B2
L30	A1	2211	F4	2533	D3	3236	B4	3428	C3	3557	C4	4524	C4	6466	A1	7417	B3	9053	D5	9457	A1
L31	E2	2214	G4	2534	D3	3237	C4	3429	B3	3558	B3	4525	F3	6467	A1	7444	B2	9054	D4	9459	A3
L33	G2	2215	G4	2535	C4	3238	C4	3430	B3	3559	B4	4526	E3	6480	F1	7445	B2	9055	A4	9460	B2
L34	G2	2216	G5	2536	D3	3239	D3	3431	B3	3560	C3	4526	E3	6481	F1	7450	A1	9056	A4	9461	B3
L35	G3	2218	F5	2537	D3	3240	E3	3437	A1	3561	C3	4530	H5	6504	D1	7451	A1	9057	C5	9462	C4
L36	A2	2219	F5	2541	D4	3241	B4	3438	B2	3562	B4	4531	H5	6506	C1	7469	B2	9058	G2	9468	B3
L37	A3	2230	B4	2542	C4	3243	B4	3439	B3	3563	B4	4531	E3	6507	B4	7480	F2	9059	G1	9471	B2
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L61	G2	2234	E5	2547	C2	3248	B4	3443	C3	3603	B2	4551	D1	6519	E2	7506	D1	9065	B4	9501	D2
L62	E5	2235	D3	2552	B4	3249	F3	3444	B2	3604	B2	4511	D3	6520	E2	7512	C3	9066	B5	9504	D2
L65	G2	2236	D4	2553	B4	3250	F3	3446	B2	3605	C3	4514	F2	6526	C1	7513	C3	9067	A3	9505	C1
L67	D4	2237	E3	2554	D4	3251	F3	3450	A1	3606	B2	4520	E2	6527	F1	7530	F1	9068	G3	9506	D1
L68	C3	2238	D4	2555	B3	3252	F3	3451	A1	3607	B2	4521	E1	6529	F1	7540	C4	9200	E5	9507	C2
L69	A2	2240	D4	2556	B4	3253	F2	3452	B1	3608	F1	4522	E2	6535	D3	7541	C4	9201	F5	9508	B2
L80	G4	2241	B4	2600	F1	3255	F3	3455	A1	3609	F1	4524	C1	6536	C3	7542	C4	9202	D3	9510	D2
L87	B2	2242	B4	2601	B2	3266	F2	3456	A2	3610	F1	4525	C4	6538	B2	7543	D2	9203	D4	9511	C2
SK1	G3	2250	F3	2603	C2	3267	F2	3457	A2	3611	F1	4526	E1	6542	C4	7550	D3	9204	G2	9513	D1
SK2	B3	2254	F2	2604	B2	3268	G2	3458	A1	3612	E1	4527	C1	6546	C2	7551	B4	9205	H1	9521	E1
0207	A4	2255	F3	2605	F1	3270	F2	3459	A1	3614	F1	4528	C2	6547	D3	7552	B4	9206	H1	9522	E1
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040	H4	2260	E3	2609	F1	3273	G2	3462	A1	3617	F1	4543	D4	6629	B2	7603	F1	9217	G2	9533	C2
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2001	G1	2262	E3	2611	F1	3275	G2	3464	A1	3619	F1	4555	D3	7001	D5	7610	E1	9219	E3	9535	C3
2002	G1	2263	E2	2613	F1	3298	F5	3465	A2	3620	F1	6000	A5	7002	C5	7616	A1	9220	G4	9537	C3
2003	G1	2270	G1	2614	F1	3299	F5	3466	A1	3621	E1	6001	A5	7003	A5	7618	A2	9221	G3	9539	C3
2004	G1	2272	G2	2626	A2	3300	H5	3467	B2	3622	E1	6008	A3	7005	D5	9000	A4	9222	F3	9541	D2
2005	G1	2302	H5	3000	D4	3304	H5	3468	A1	3623	E1	6010	A5	7006	D5	9001	C5	9223	F4	9542	C2
2007	B5	2303	H5	3001	D5	3305	H5	3469	A1	3624	E1	6011	D5	7007	D5	9002	A4	9224	F5	9543	C2
2008	B5	2308	H5	3004	C5	3306	F3	3470	A1	3625	E1	6012	D5	7008	D5	9003	A4	9225	E3	9544	D1
2009	G1	2321	H5	3005	D5	3308	H5	3471	A1	3626	B2	6016	B5	7009	G1	9008	B5	9228	E4	9545	C1
2010	A4	2331	H4	3006	C5	3309	H5	3473	B1	3627	A1	6017	E4	7010	A5	9010	C5	9229	H5	9547	D1
2011	D5	2351	H4	3008	C5	3310	H5	3474	A2	3628	A1	6021	D4	7011	B5	9012	A4	9230	F3	9548	D1
2012	C5	2360	H4	3009	C5	3311	H5	3479	F2	3629	B2	6201	F3	7012	D4	9013	A4	9231	E5	9549	E1
2013	C5	2361	H4	3011	C5	3312	H5	3480	B1	3630	A2	6210	G3	7013	A5	9015	B4	9232	E4	9550	C1
2014	A3	2365	H4	3012	C5	3313	H5	3481	F2	3631	A2	6211	F3	7201	F3	9017	B5	9233	F2	9551	C1
2015	A3	2372	H4	3013	D4	3314	H5	3482	F2	3632	C3	6212	F4	7216	G5	9020	D5	9234	F1	9552	F1
2016	A3	2374	H4	3014	D4	3317	H5	3483	B3	3633	A2	6213	F4	7241	B4	9022	A3	9235	E4	9556	C1
2018	A5	2376	H4	3016	B5	3320	H5	3484	B3	3634	A1	6216	F5	7242	B4	9023	A4	9236	F1	9557	E2
2019	A4	2380	E3	3019	B5	3321	H5	3485	E2	4000	A5	6220	G4	7246	E1	9024	A4	9237	F1	9560	D3
2020	A4	2381	E3	3020	B5	3322	H5	3490	B3	4001	D5	6221	G5	7250	F3	9025	A5	9238	G3	9561	D3
2021	A4	2382	E3	3021	B5	3331	H4	3500	B2	4002	B5	6230	E4	7251	F3	9026	A4	9239	B4	9562	C3
2022	A4	2386	E3	3022	B5	3332	H4	3501	B2	4003	A5	6231	E4	7268	F2	9027	A5	9240	B4	9563	C3
2023	A3	2401	B3	3027	A5	3350	H4	3502	B1	4004	C5	6232	E4	7270	F2	9028	A5	9241	E3	9565	B4
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2025	C5	2403	A2	3029	D5	3356	H4	3504	D1	4006	D5	6235	D3	7273	F2	9031	C4	9243	E3	9567	D3
2026	B5	2404	A2	3030	D5	3357	H4	3505	D1	4007	C5	6237	E3	7274	G1	9032	C5	9244	B4	9601	E1
2027	C5	2405	A2	3031	D5	3358	H4	3506	C1	4010	A3	6238	E3	7305	H5	9033	C5	9246	E1	9614	E2
2028	B5	2406	B3	3032	D5	3360	H4	3507	D1	4011	B3	6247	B4	7311	H5	9034	C5	9250	F2	9615	B2
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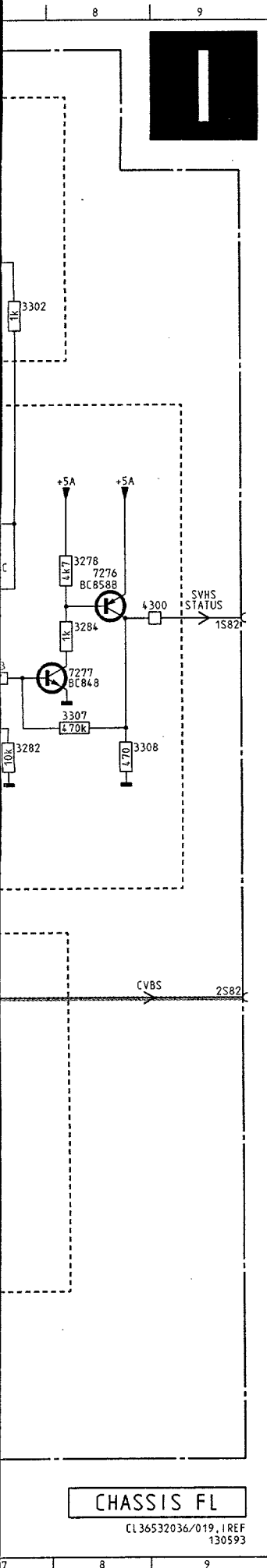


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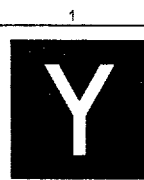


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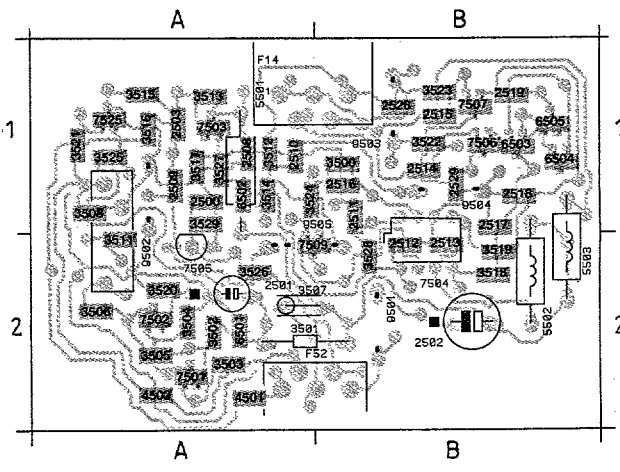
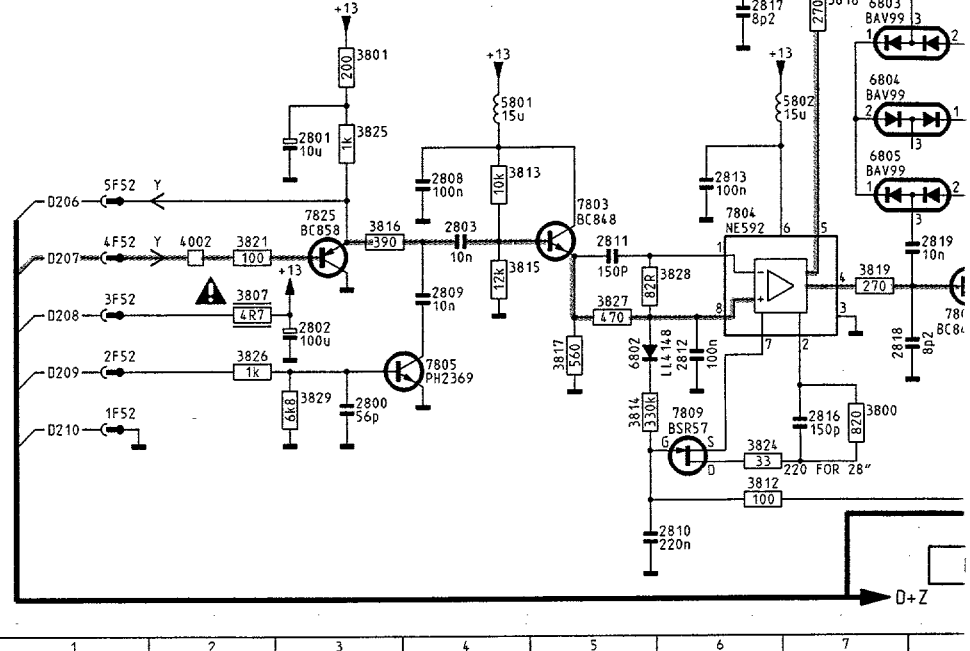


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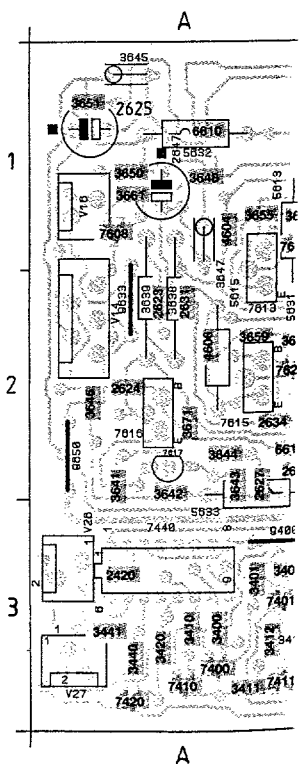


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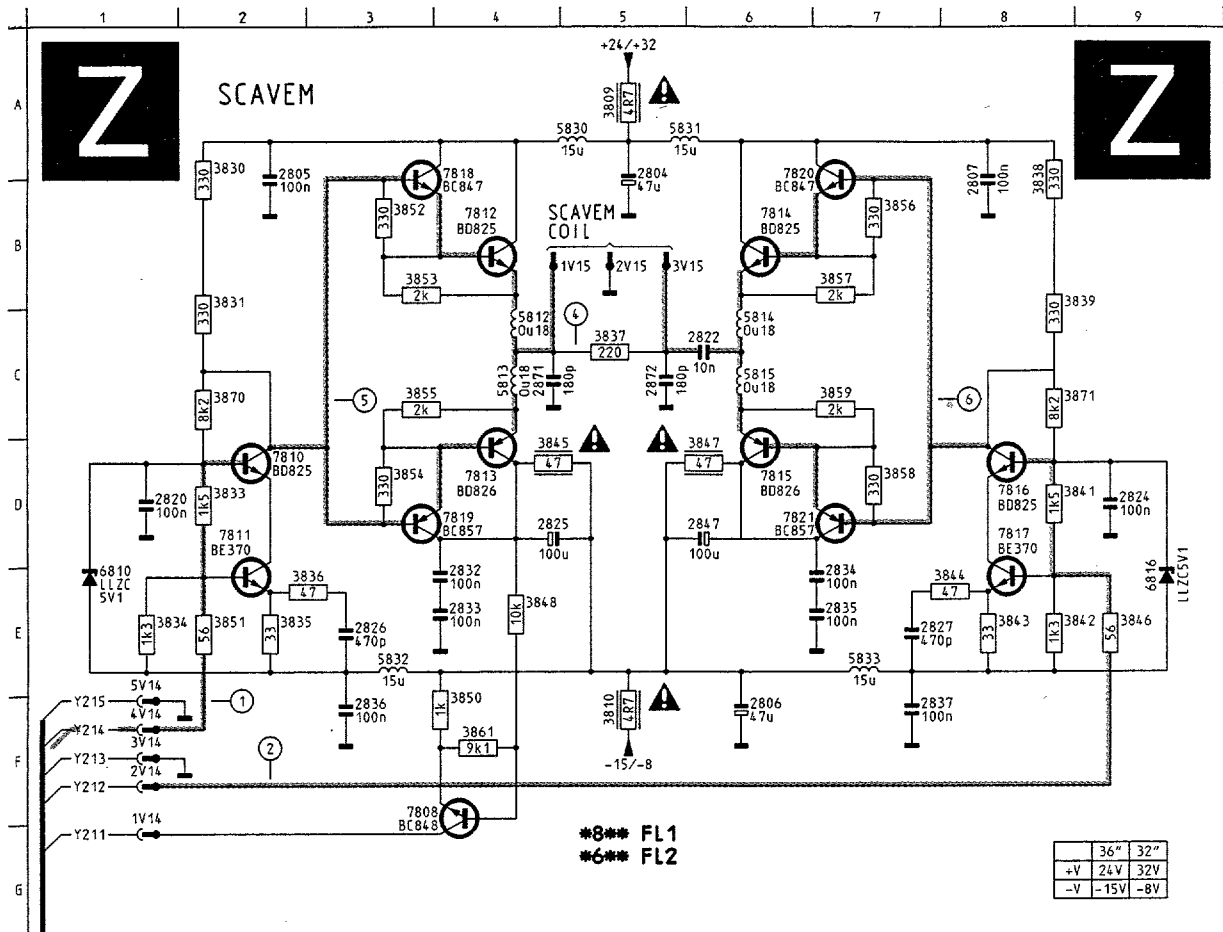


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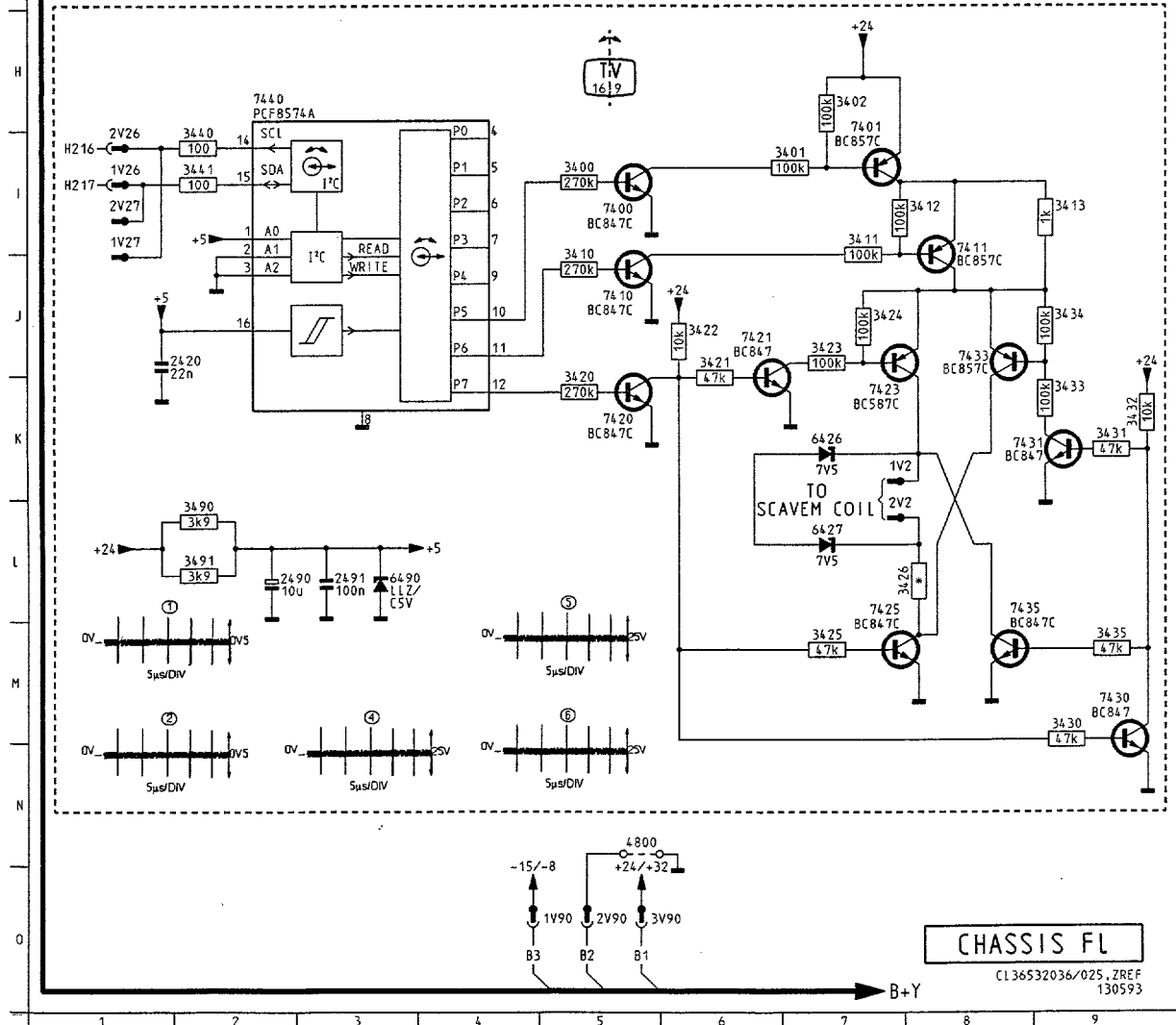


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 7817 D 8
 7818 B 4
 7819 D 4

*8** FL1
 *6** FL2

	36"	32"
+V	24V	32V
-V	-15V	-8V

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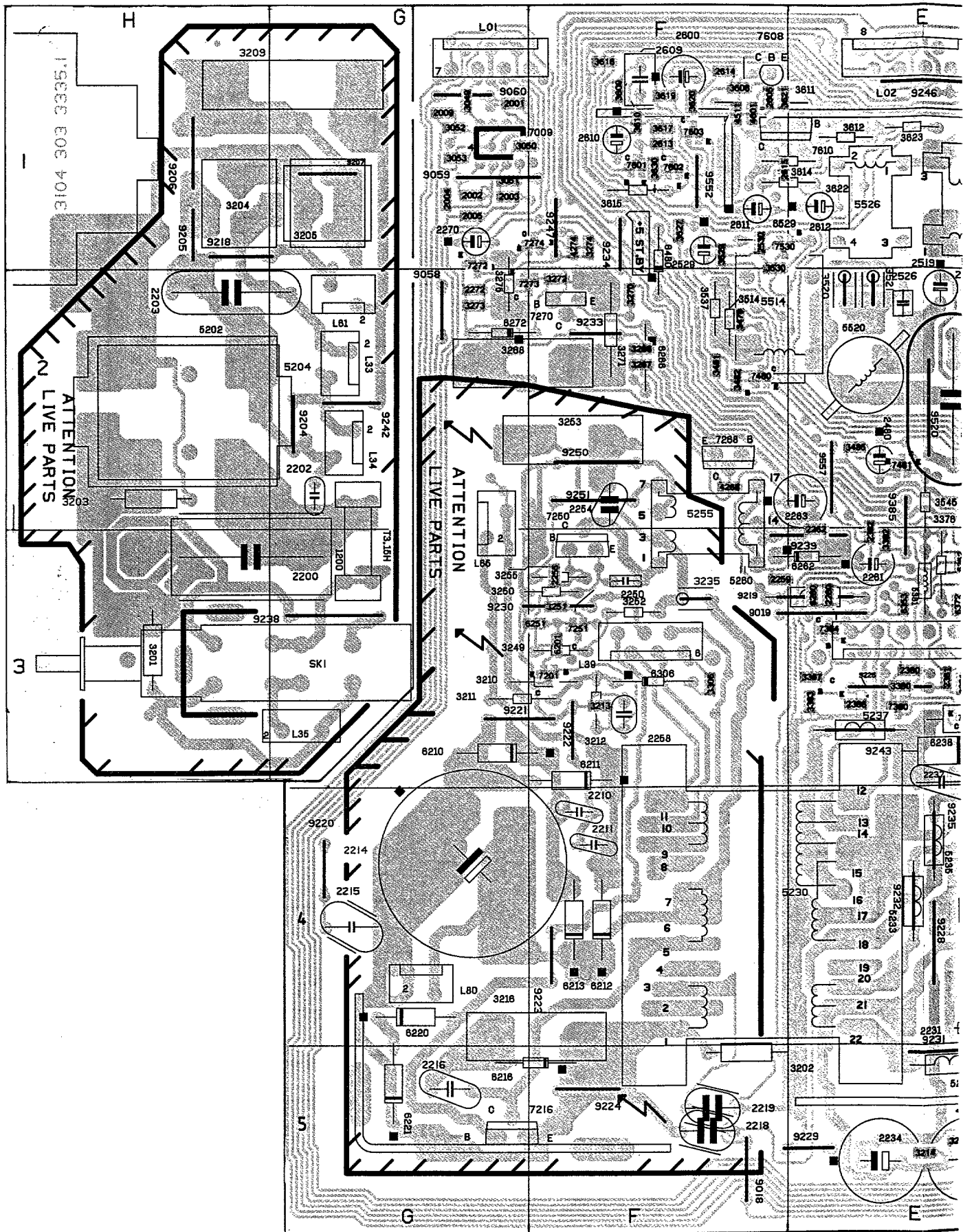
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CHASSIS FL

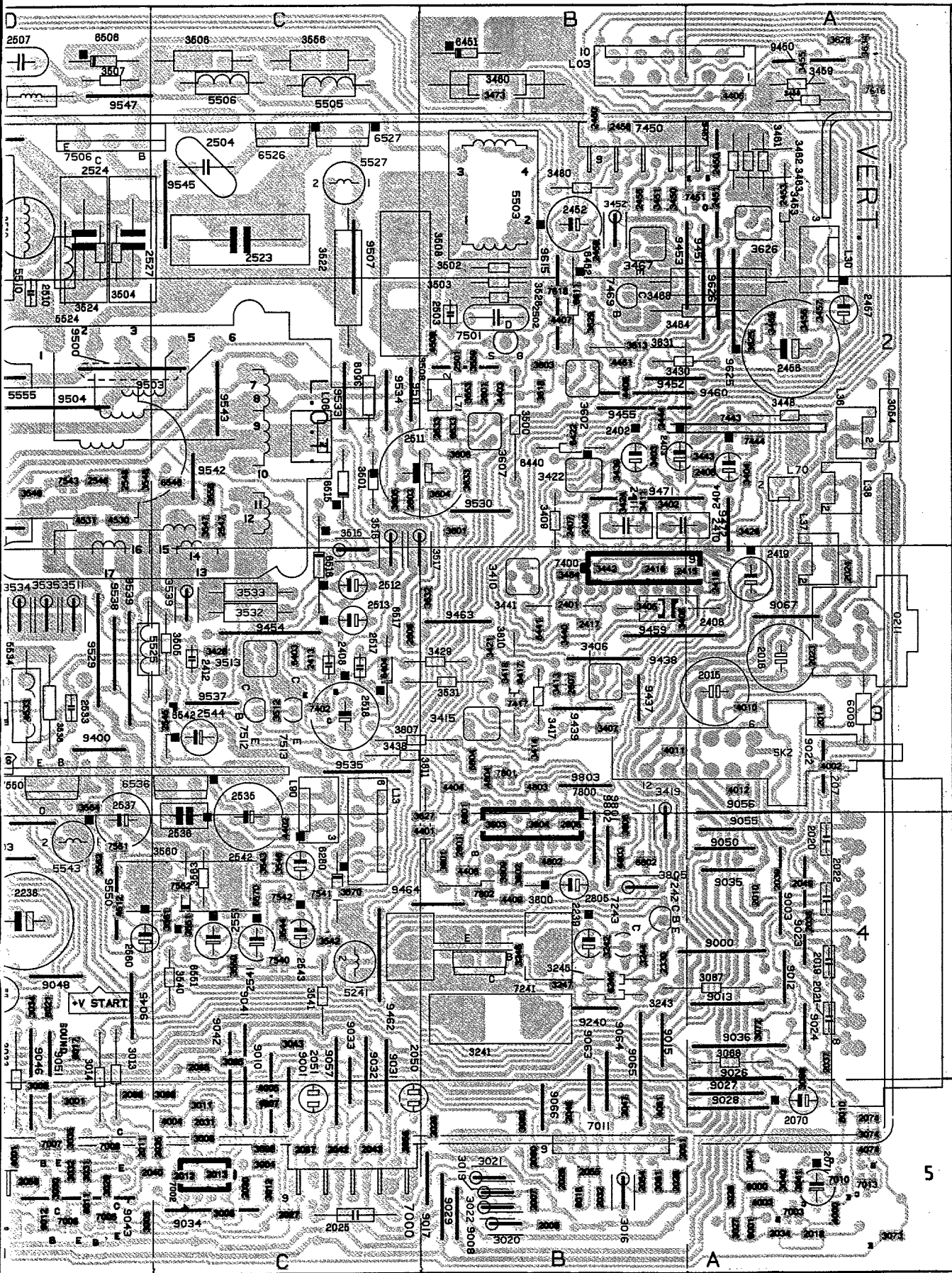
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L06	C2	2214	G4	2533	D3	3240	E3	3442	B3	3603	B2	5510	D1	6802	B4	7402	C3	9022	A3	9219	E3	9464	B4
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2013	C5	2372	H4	3005	D5	3313	H5	3507	D1	3803	B4	6251	F3	7360	H4	9010	C5	9067	A3	9453	A1	9625	A2
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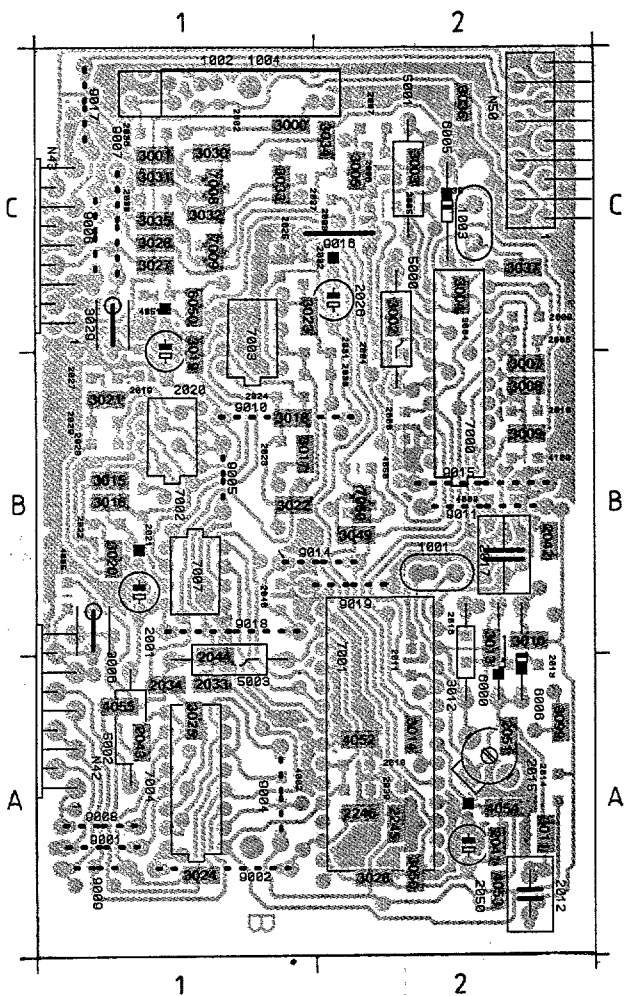
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Platine forts signaux FL X.14 /



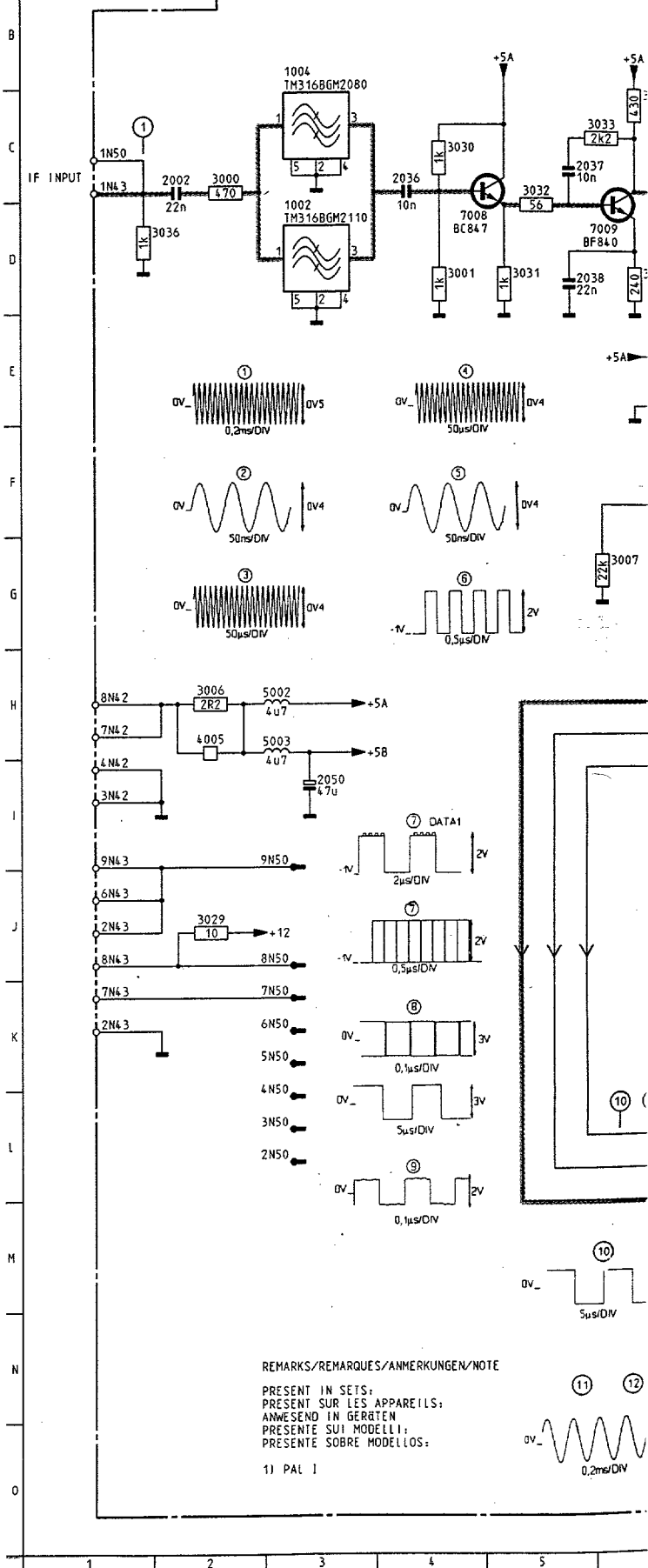
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1004	C1	2024	B1	3000	C1	3025	A1	4100	B2	9009	A1
2000	B2	2025	C1	3001	C1	3026	C1	5000	C2	9010	B1
2001	B1	2026	C2	3002	C2	3027	C1	5001	C2	9011	B2
2002	C1	2027	B1	3003	C2	3028	A2	5002	A1	9014	B2
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2013	A2	2038	C1	3014	A2	3050	A2	7007	B1		
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2016	A2	2041	A2	3017	B1	4003	B2	7050	B2		
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ECO NICAM

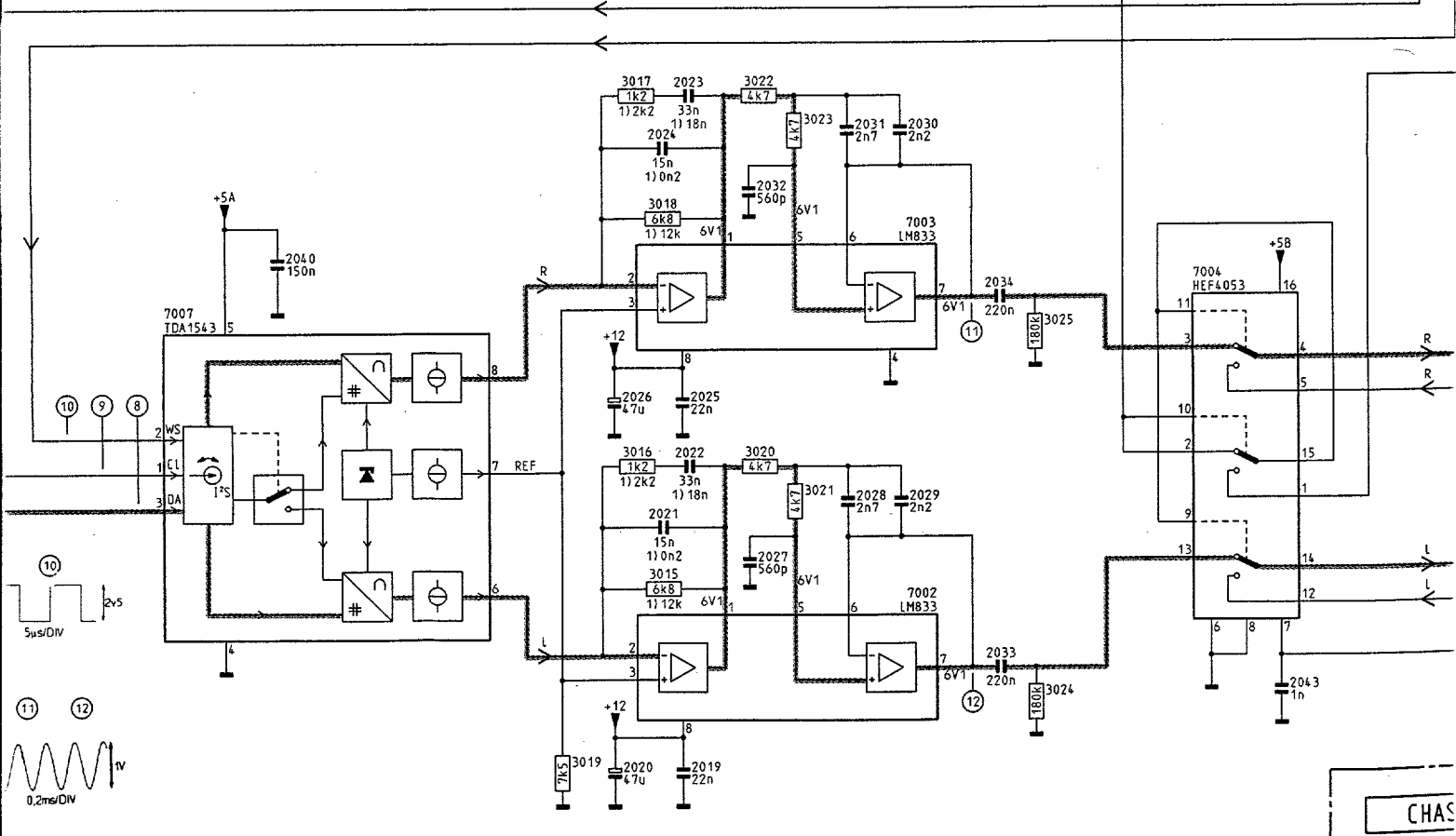
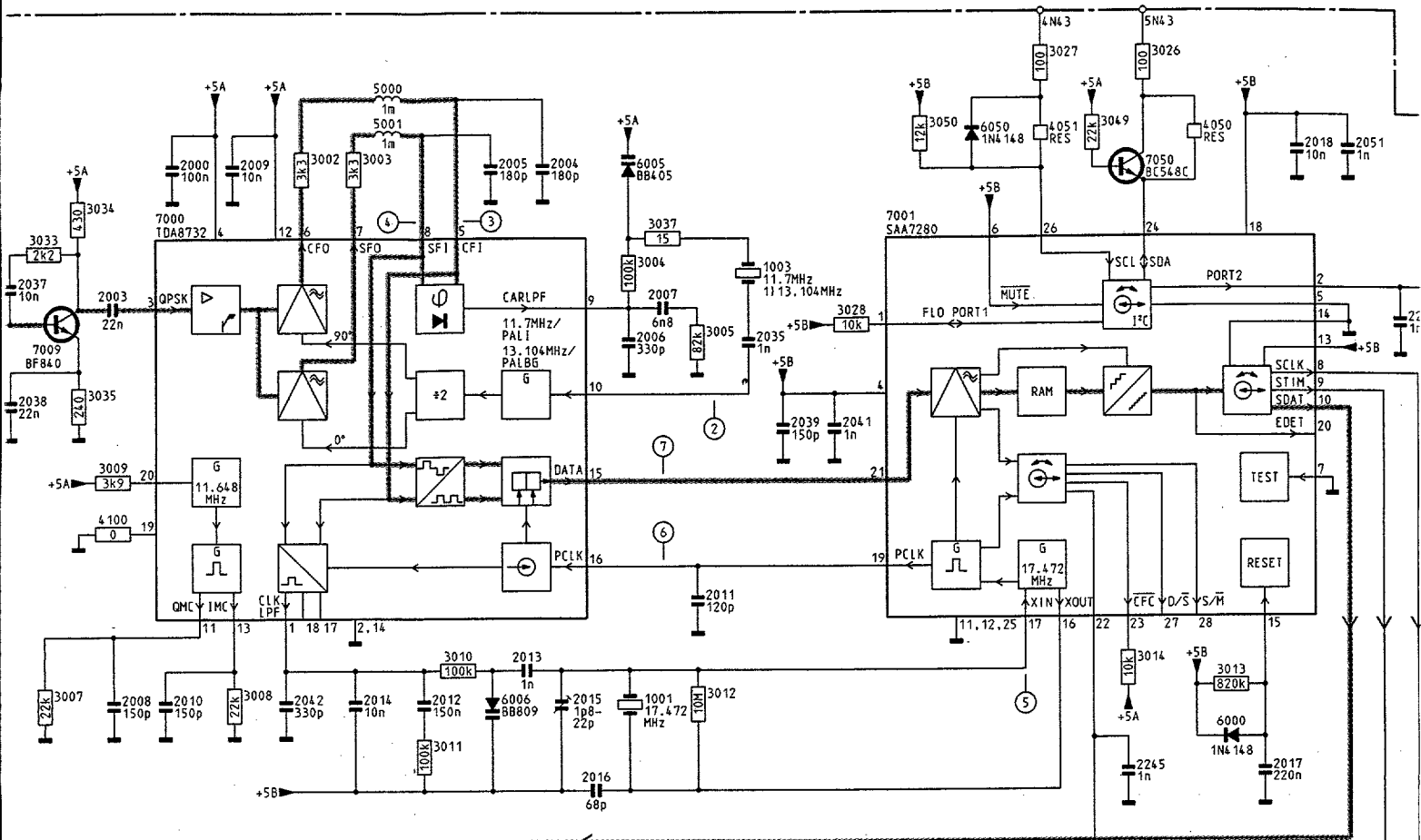


REMARKS/REMARQUES/ANMERKUNGEN/NOTE

PRESENT IN SETS;
PRESENT SUR LES APPAREILS;
ANWESEND IN GERÄTEN;
PRESENTE SUI MODELLI;
PRESENTE SOBRE MODELLOS;

1) PAL 1

6 7 8 9 10 11 12 13 14 15 16 17

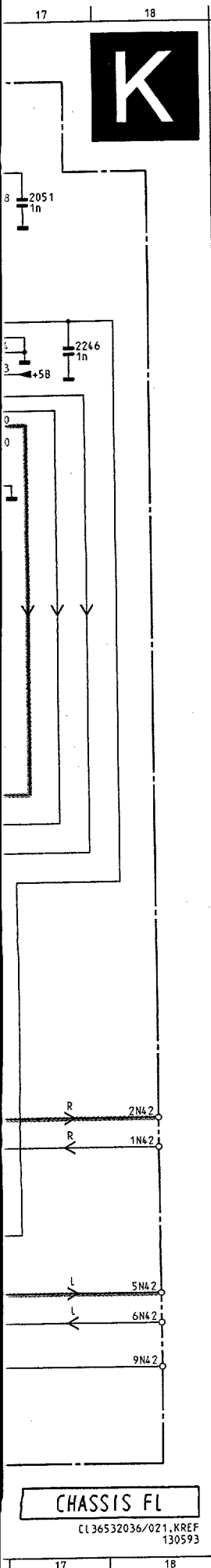


CHAS
CL:

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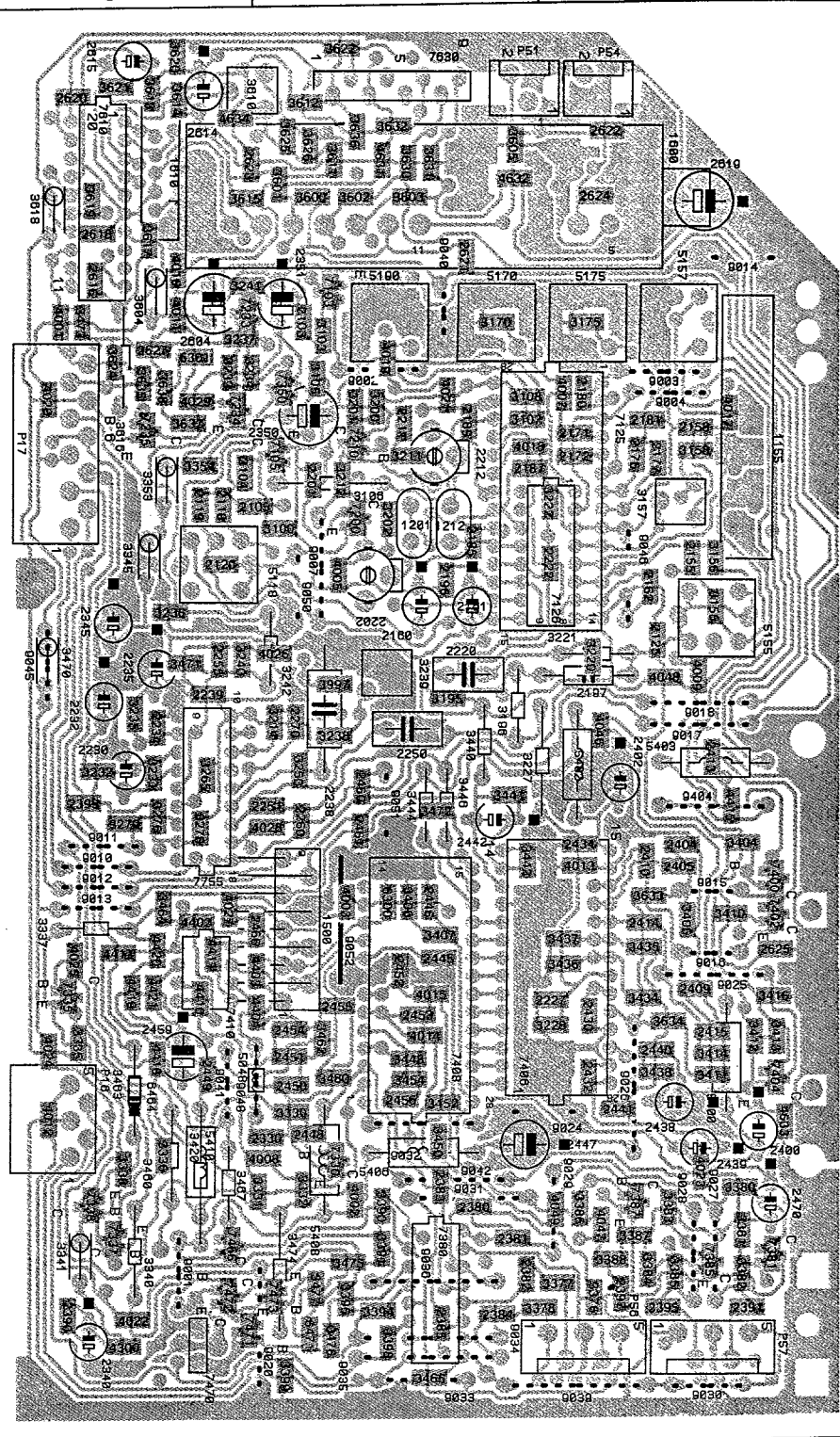
PIP panel

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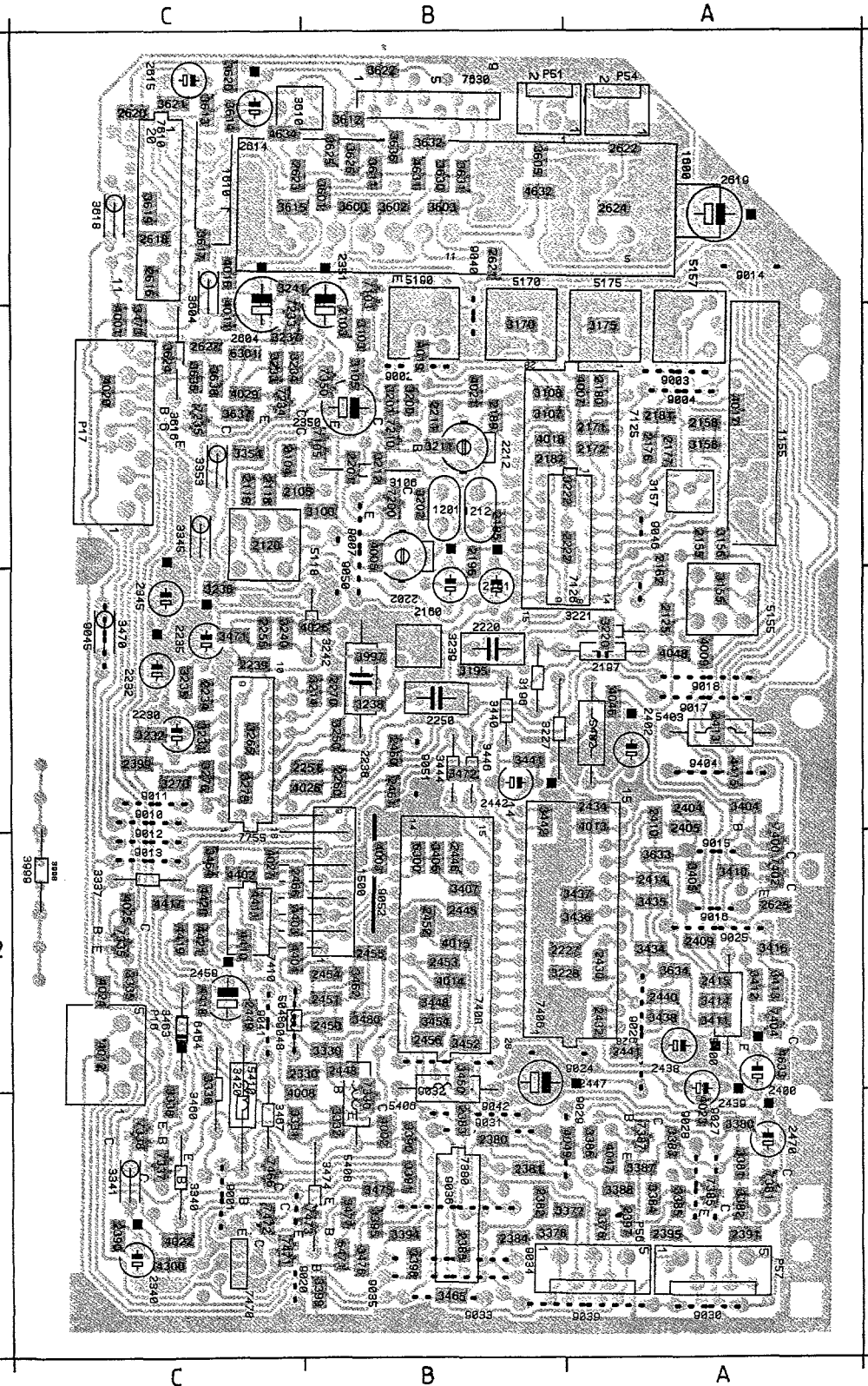
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- 2015 G10
- 2016 G10
- 2017 G16
- 2018 B16
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1500 B2	2176 A4	2230 C3	2380 B1	2410 A3	2449 C2	2616 C5	3108 B4	3221 A3	3250 B3
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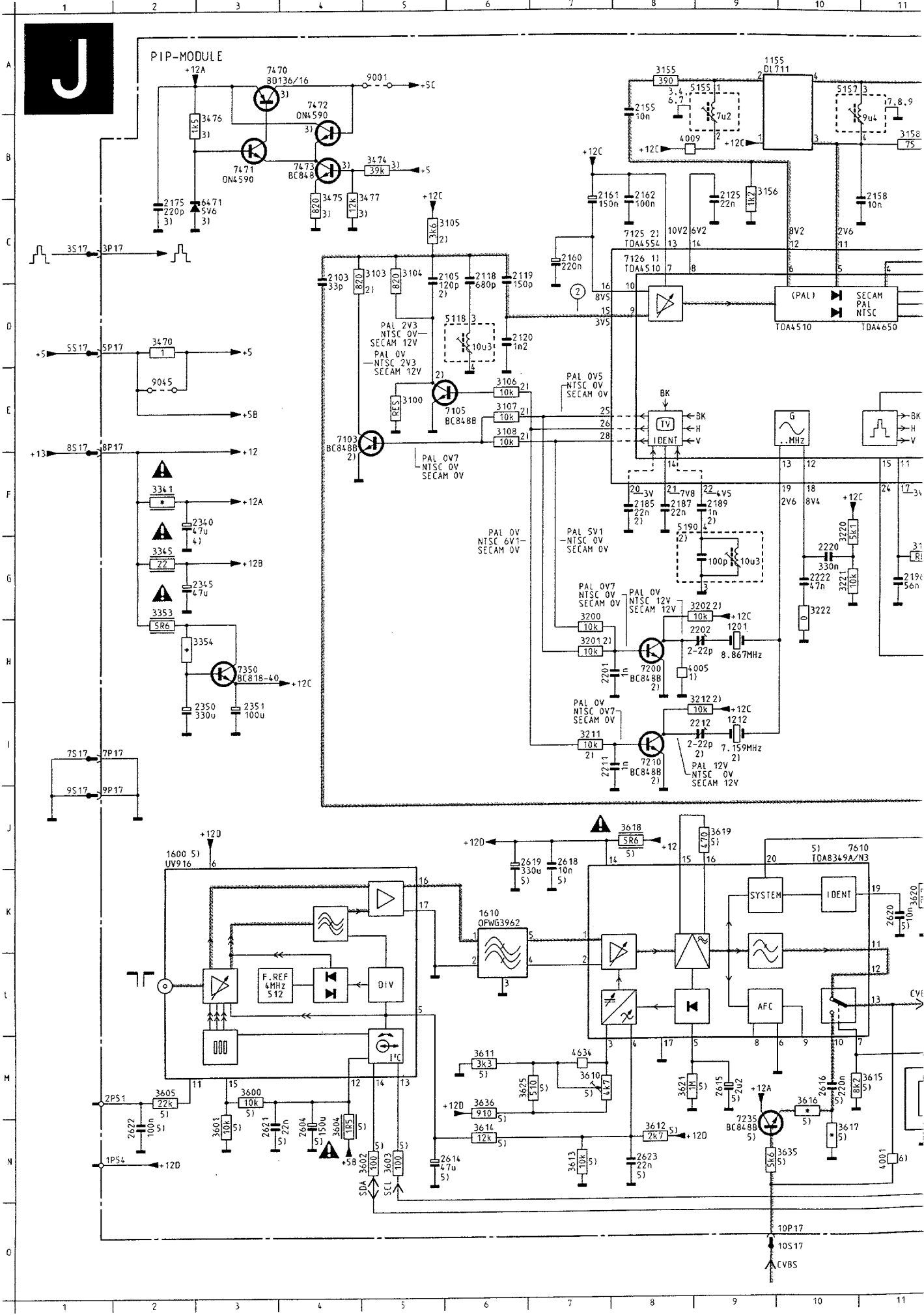
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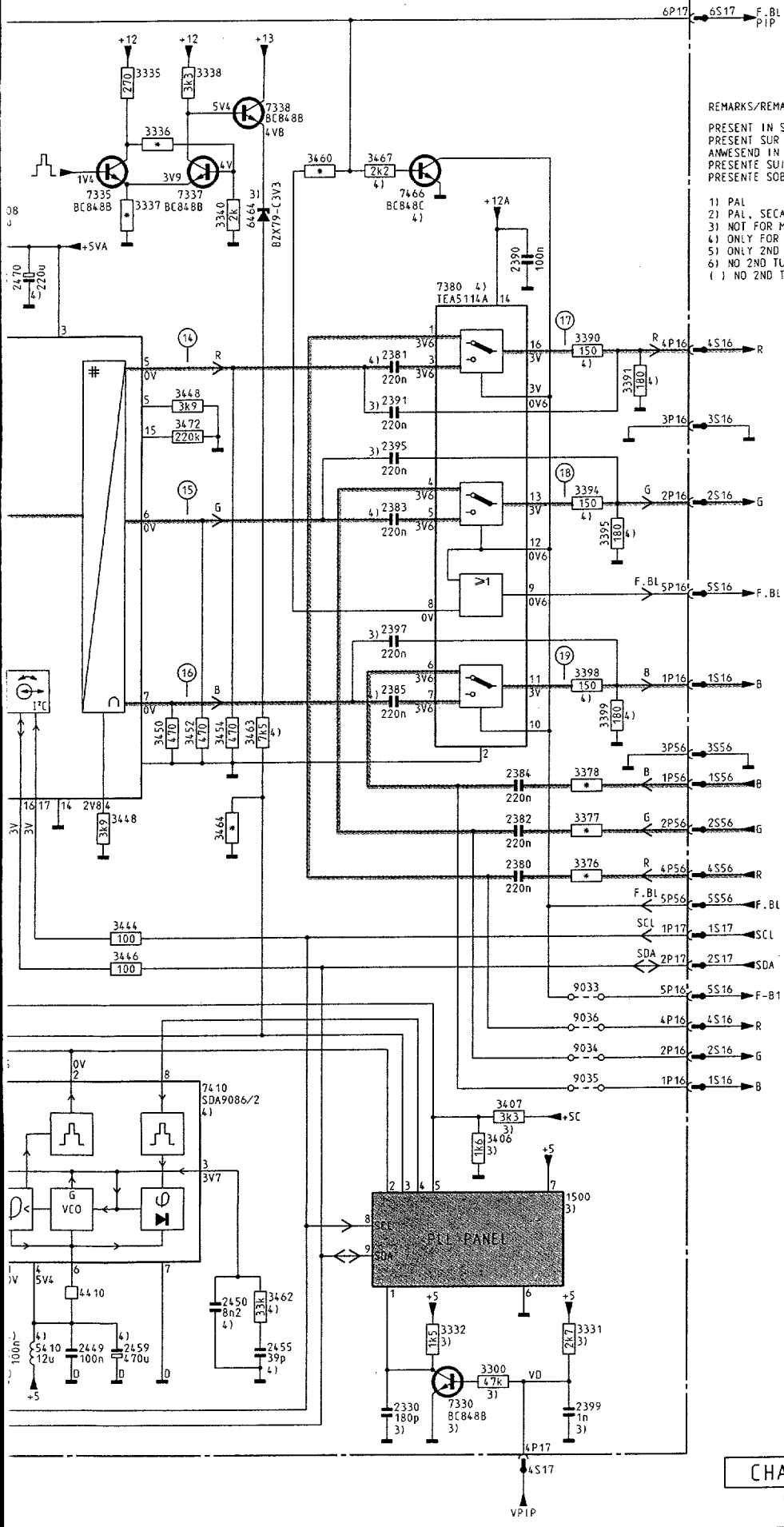
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2119 C4	2189 B4	2250 B3	2390 C1	2434 A3	2455 B2	2623 C5	3175 A4	3233 C4	3331 C1





REMARKS/REMARQUES/ANMERKUNGEN/NOTE

PRESENT IN SETS:
 PRESENT SUR LES APPAREILS:
 ANWESEND IN GERÄTEN:
 PRESENTE SUI MODELLI:
 PRESENTE SOBRE MODELIOS:

1) PAL
 2) PAL, SECAM, NTSC
 3) NOT FOR MULTI PIP
 4) ONLY FOR MULTI PIP
 5) ONLY 2ND TUNER
 6) NO 2ND TUNER
 () NO 2ND TUNER

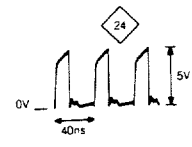
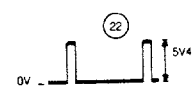
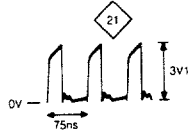
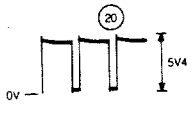
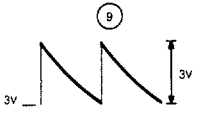
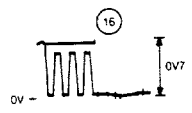
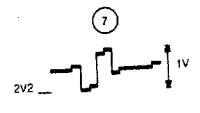
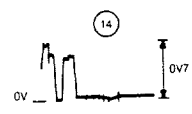
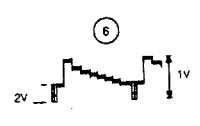
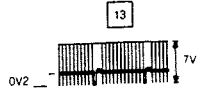
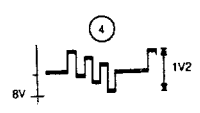
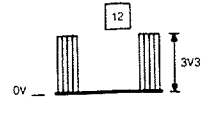
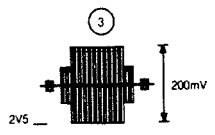
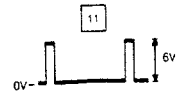
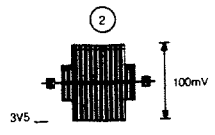
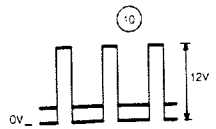
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2413	18p
2415	820p
3235	1k2
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3354	270
3376	1k
3377	1k
3378	1k
3412	390
3414	100
3460	470
3464	4k7
3471	10k
3516	750
3617	750
3633	100k
3634	100k
220p	100p
220p	2k0
2k0	6k8
1k0	1k0
12	330
0	0
0	0
750	750
180	180
100k	100k
120k	120k

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1600	J 2	3214	M20	4415	G12
1610	K 6	3220	G10	4634	M 7
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2255	L14	3391	D28	7466	C26
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2270	M17	3395	F27	7471	B 3
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CHASSIS FL

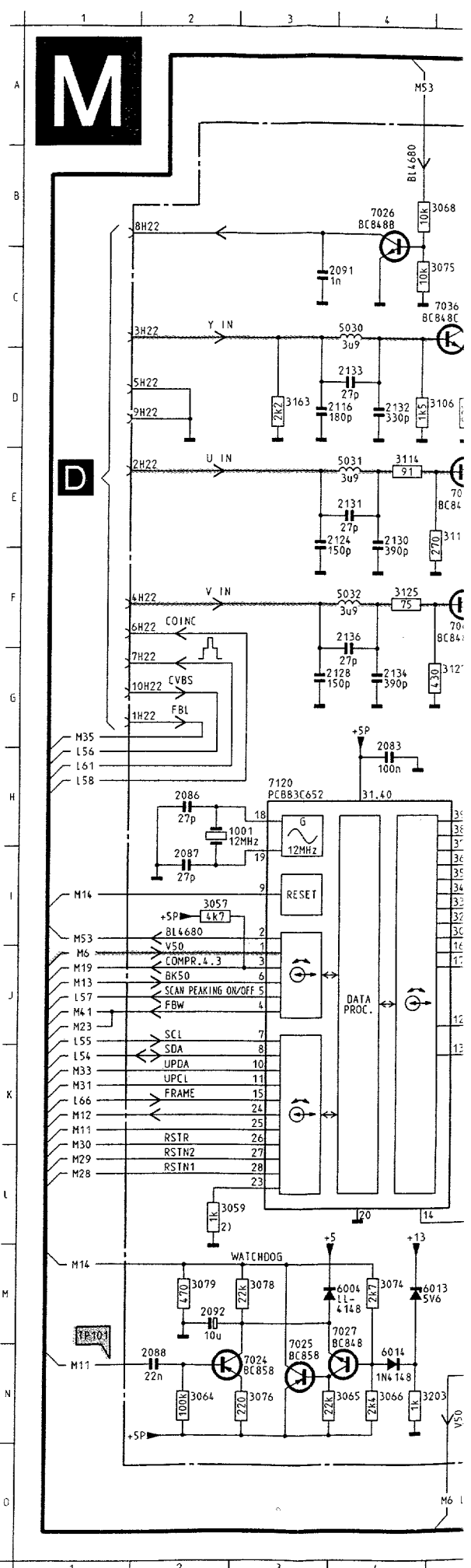
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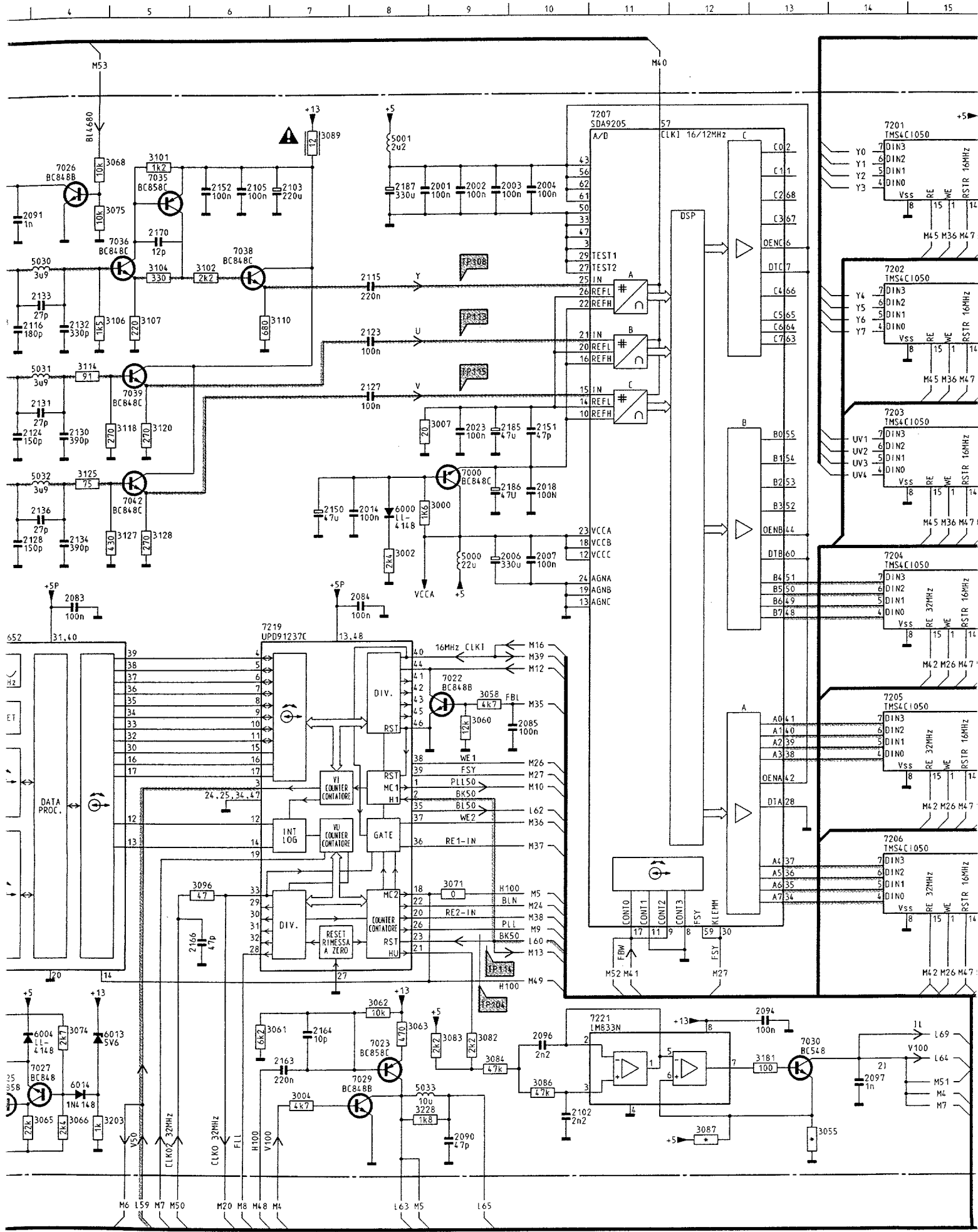
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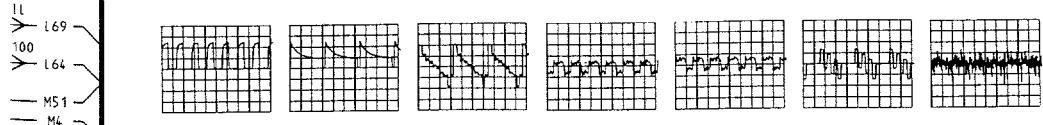
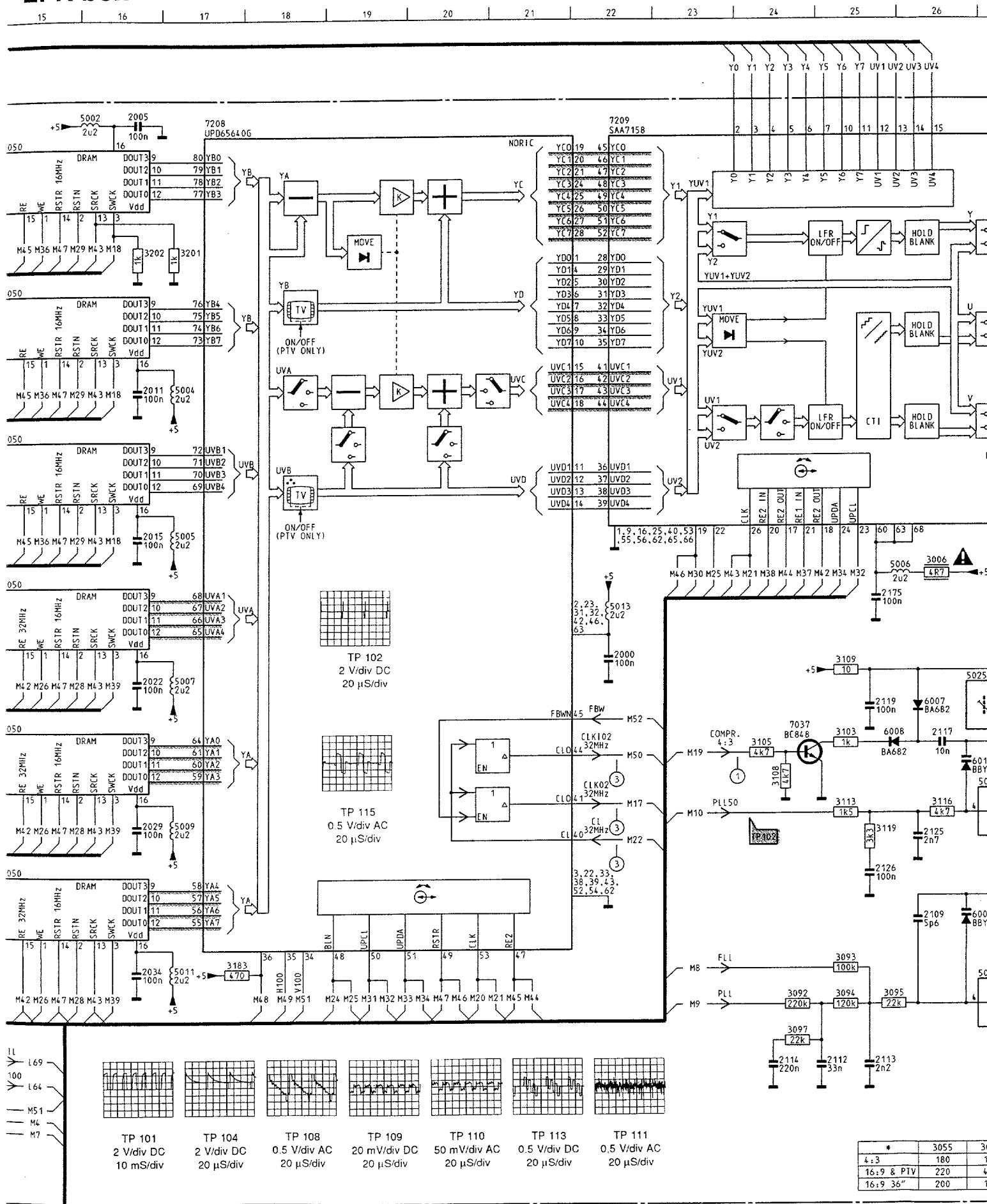


M

D



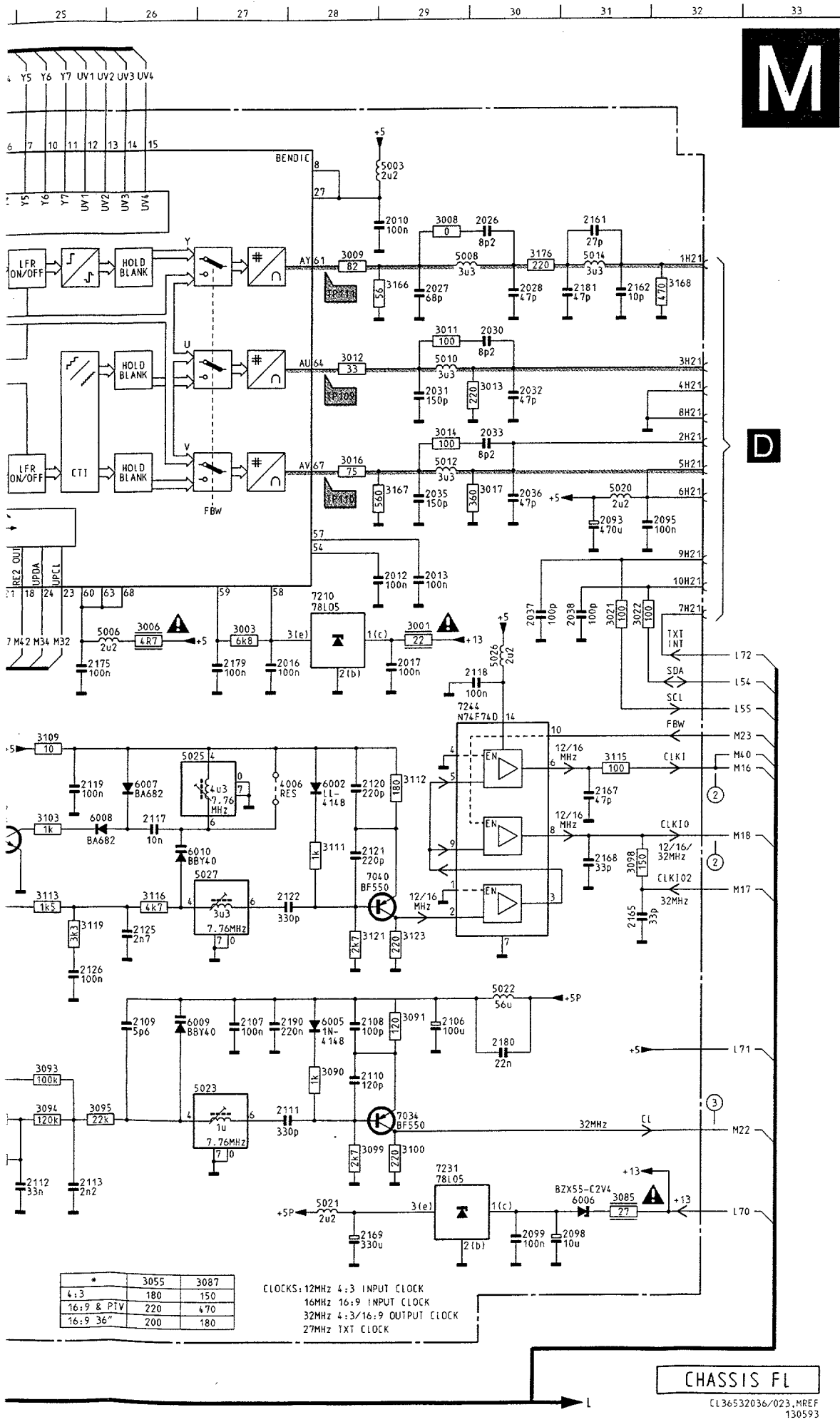




TP 101 2 V/div DC 10 mS/div
 TP 104 2 V/div DC 20 μS/div
 TP 108 0.5 V/div AC 20 μS/div
 TP 109 20 mV/div DC 20 μS/div
 TP 110 50 mV/div AC 20 μS/div
 TP 113 0.5 V/div DC 20 μS/div
 TP 111 0.5 V/div AC 20 μS/div

*	3055	308
4:3	180	150
16:9 & PIV	220	470
16:9 36"	200	180

LFR box



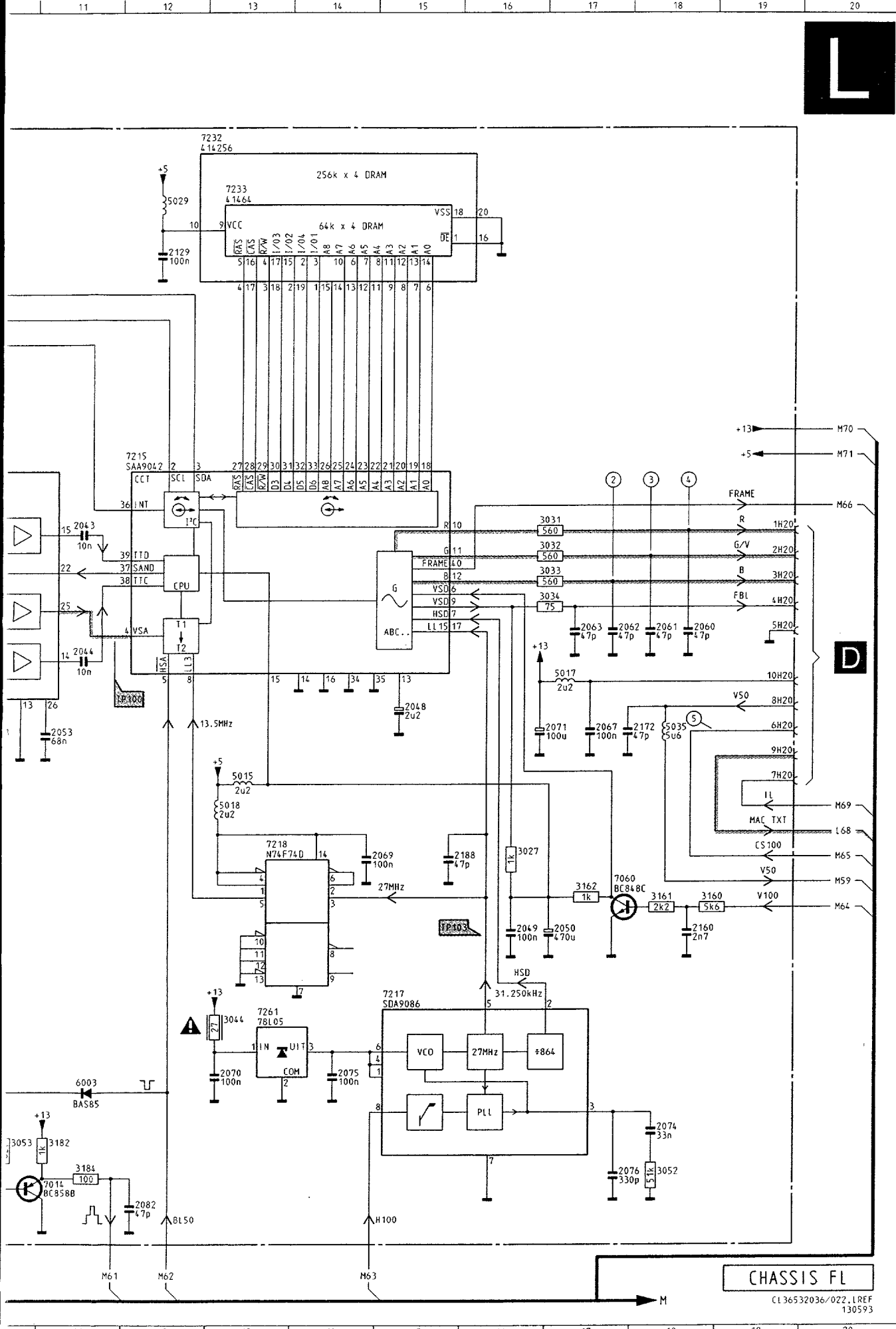
*	3055	3087
4:3	180	150
16:9 & PIV	220	470
16:9 36"	200	180

CLOCKS: 12MHz 4:3 INPUT CLOCK
 16MHz 16:9 INPUT CLOCK
 32MHz 4:3/16:9 OUTPUT CLOCK
 27MHz TXT CLOCK

CHASSIS FL
 CL36532036/023, MREF
 150593

A	2000	H 2	3021	G31	7027	M 4
	2001	H 22	3022	G31	7029	N 8
	2001	B 9	3055	N13	7030	M13
	2002	B 9	3057	I 2	7034	L29
	2003	B 9	3058	I 9	7035	B 5
	2004	B10	3059	I 2	7036	C 5
	2005	B16	3060	I 9	7037	I24
	2006	G 9	3061	M 6	7038	C 6
	2007	G10	3062	M 8	7039	E 5
	2010	C29	3063	M 8	7040	J29
	2011	E16	3064	N 2	7042	F 5
	2012	F29	3065	N 4	7120	H 3
	2013	F29	3066	N 4	7201	B14
	2014	F 8	3068	B 4	7202	D14
	2015	G16	3071	K 9	7203	E14
	2016	G27	3074	M 4	7204	G14
	2017	G29	3075	C 4	7205	I14
	2018	F10	3076	N 3	7206	K14
	2022	H16	3078	M 3	7207	B11
	2023	E 9	3079	M 2	7208	B17
	2026	C30	3082	M 9	7210	B22
	2027	C29	3083	M 9	7219	G28
	2028	C30	3084	M 9	7219	H 6
	2029	J16	3085	M31	7221	M11
	2030	D30	3086	N10	7231	M29
	2031	D29	3087	N12	7244	H29
	2032	D30	3089	B 7		
	2033	E30	3090	L28		
	2034	L16	3091	K29		
	2035	F29	3092	L24		
	2036	F30	3093	L25		
	2037	G30	3094	L25		
	2038	G31	3095	L25		
	2083	H 4	3096	K 4		
	2084	H 8	3097	M24		
	2085	I10	3098	I31		
	2086	H 2	3099	M28		
	2087	I 2	3100	M29		
	2088	N 2	3101	B 5		
	2090	N 9	3102	C 6		
	2091	C 3	3103	L25		
	2092	M 2	3104	C 5		
	2093	F31	3105	L24		
	2094	M13	3106	D 4		
	2095	F32	3107	D 5		
	2096	M10	3108	J24		
	2097	N14	3109	H25		
	2098	N31	3110	D 7		
	2099	N30	3111	L28		
	2102	N10	3112	I29		
	2103	B 7	3113	J25		
	2105	B 6	3114	E 4		
	2106	K29	3115	H31		
	2107	K27	3116	J26		
	2108	K28	3118	E 5		
	2109	K26	3119	J25		
	2110	L28	3120	E 5		
	2111	L28	3121	J28		
	2112	M25	3123	J29		
	2113	M25	3125	F 4		
	2114	M24	3127	G 5		
	2115	D 8	3128	G 5		
	2116	D 3	3163	D 3		
	2117	I26	3166	C29		
	2118	G30	3167	E29		
	2119	I25	3168	C32		
	2120	I28	3176	C30		
	2121	I28	3181	M13		
	2122	J28	3183	L17		
	2123	D 8	3201	C17		
	2124	E 3	3202	C16		
	2125	J26	3203	N 4		
	2126	K25	3228	N 8		
	2127	E 8	4006	I27		
	2128	G 3	5000	G 9		
	2130	E 4	5001	B 8		
	2131	E 4	5002	B16		
	2132	D 4	5003	B29		
	2133	D 4	5004	E17		
	2134	G 4	5005	G17		
	2136	F 4	5006	G26		
	2150	F 7	5007	H17		
	2151	E10	5008	C19		
	2152	B 6	5009	J17		
	2161	C31	5010	D29		
	2162	C31	5011	L17		
	2163	M 7	5012	E29		
	2164	M 7	5013	G22		
	2165	J31	5014	C31		
	2166	L 6	5020	E31		
	2167	I31	5021	M28		
	2169	N28	5022	K30		
	2170	C 5	5023	L27		
	2175	G25	5025	H26		
	2179	G27	5026	G30		
	2180	K30	5027	J27		
	2181	C31	5030	C 4		
	2185	E 9	5031	E 4		
	2186	F 9	5032	F 4		
	2187	B 8	5033	N 8		
	2190	K27	6000	F 8		
	3000	F 9	6002	I28		
	3001	G29	6004	M 4		
	3002	G 8	6006	M31		
	3003	G27	6007	I26		
	3004	N 7	6008	I25		
	3006	G26	6009	K26		
	3007	E 9	6010	I26		
	3008	C29	6013	M 4		
	3009	C28	6014	N 4		
	3011	D29	7000	F 9		
	3012	D28	7022	I 9		
	3013	D30	7023	M 8		
	3014	E29	7024	N 3		
	3016	E28	7025	N 3		
	3017	E30	7026	B 4		

LFR Box



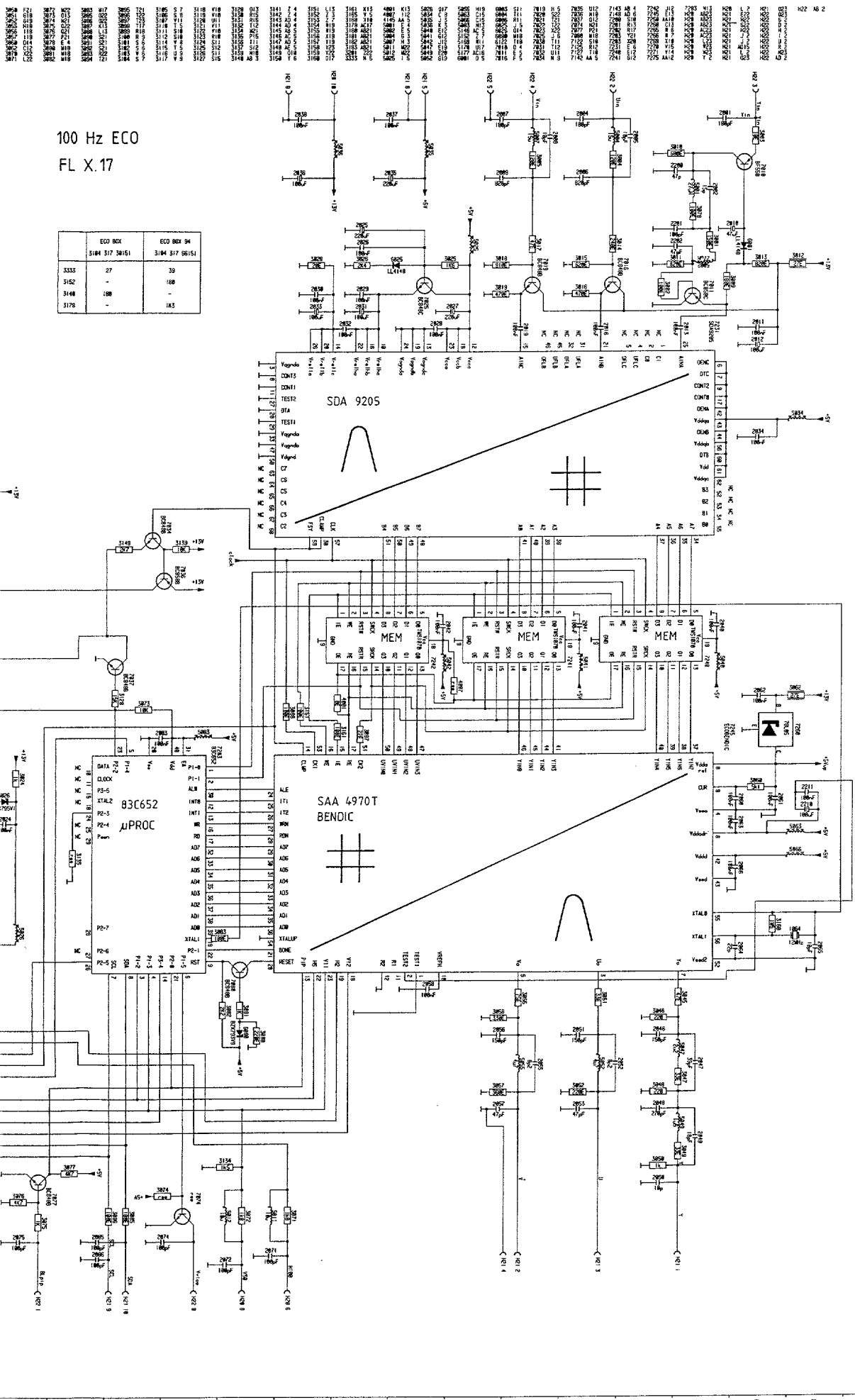
CHASSIS FL

CL 36532036/022.LREF
130593



100 Hz ECO
FL X.17

	ECO BOX	ECO BOX 94
3333	3184 317 30151	3184 317 30151
3152	27	39
3148	188	188
3178		183



H22 A8 2

7. Electrical adjustments

Setting conditions

Unless stated otherwise, the supply voltage used is:
 220 - 240V 10%; 50 - 60Hz 5%
 Voltages and oscillograms are measured in relation to tuner earth. **Never** use the cooling plates as earth.
 Warming-up time 10 minutes
 For all measurements it is true that:
 probe Ri > 1MΩ; Ci < 10pF

Electrical settings on the large signal panel

- .1 **+141V supply voltage**
 Supply the mains voltage; this must be isolated from the mains.
 Connect a voltmeter over C2238.
 Using R3371, on the SOPS DRIVE CIRCUIT (fig. 7.2) set the supply voltage to + 141V ±0.5V.
- .2 **+5V supply voltage (FL1/2.16)**
 Connect a voltmeter to pin 8 of L02
 Adjust the voltage to 5.4V using R3558
- .3 **+13V supply voltage (FL1/2.16)**
 Connect a voltmeter to pin 6 of connector L02
 Adjust the voltage to 14.2V using R3234.
- .4 **Focusing**
 This is set with the focus potentiometer (top one on the Line output transformer/DAF Unit).
- .5 **Dynamic 1) Astigmatic focus**
 This is set with the aid of the potentiometer on the bottom right of the DAF transformer. Repeat the adjustment of the Vg2 and focus.
- .6 **Vg2 setting**
 Supply an aerial signal.
 Set the contrast to maximum and the brightness and saturation to nominal.
 Using an oscilloscope set to field frequency, measure the direct voltage level of the measurement pulse (fig. 7.1) on pin 9 of IC7705, IC7706 and IC7707 in relation to earth.
 Now adjust the highest voltage level found with the aid of the Vg2 potentiometer (bottom left on the Line output transformer/DAF unit) to 150V ±2V.

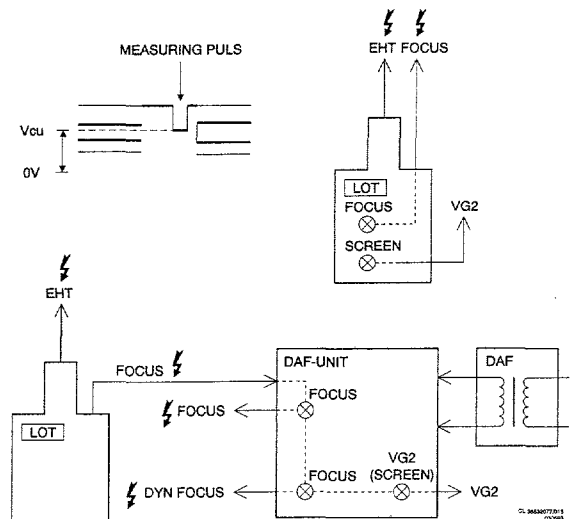


Fig. 7.1

- 1.7 **Stable OSD**
 Short circuit pin 11 IC7401 to pin 13 IC7401
 Short circuit pin 5 IC7755 to earth.
 Measure the frequency on pin 16-IC7401 and set this to 15,625 Hz ±25 Hz with R3434.
 Remove the short circuits.
- 1.8 **Horizontal synchronisation**
 Connect point 5-IC7400 to point 9-IC7400.
 Supply an aerial signal and set the receiver.
 Adjust potentiometer R3406 until the picture is straight.
 Break the through connection.
- 1.9 **Horizontal centring**
 Feed in a test pattern that makes the horizontal linearity visible (e.g. a symmetrical cross pattern or a test circle).
 Adjust the DC offset current through the horizontal deflection coil using R3513 so that the horizontal linearity is optimal (the distance between the two vertical lines should be equal on both the left and right hand sides of the picture). It is also possible to use a ruler for this purpose. The picture can then be centred using R3415.
- 1.10 **Picture width**
 Set using potentiometer R3607.
- 1.11 **Vertical centring**
 Set using potentiometer R3467.
- 1.12 **Picture height**
 Set using potentiometer R3410.
- 1.13 **Picture height**
 Movie expand off: set using potentiometer R3410.
 Movie expand on: set using potentiometer R3422.
- 1.14 **East/West correction**
 Set using potentiometer R3602.

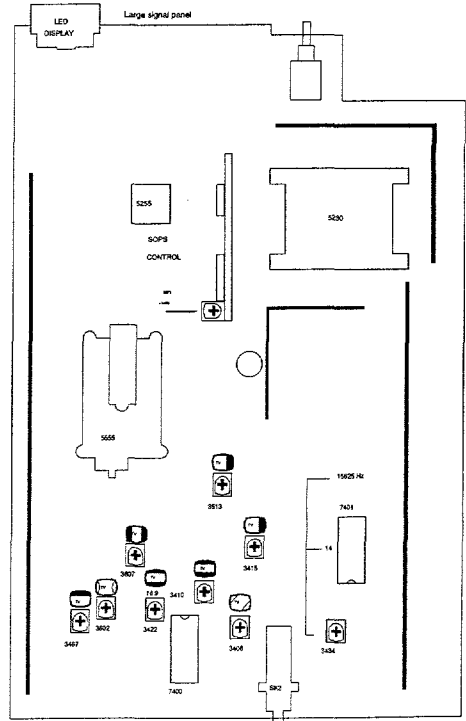


Fig. 7.2

2. E
 2.1 S
 C
 si
 S
 th
 C
 U
 ar
 2.2 4.
 S
 p
 ar
 2.3 E
 2.3.1 C
 C
 th
 4.
 pi
 os
 S
 R
 2.3.2 4.
 C
 wi
 C
 C
 S
 R
 2.3.3 6.
 C
 E
 2C
 C
 C
 S
 R
 2.3.4 C
 C
 be
 ee
 pr
 2.3.5 C
 C
 be
 ee
 pr
 2.3.6 S
 C
 bl
 3-
 C
 m

2. Electrical settings on the small signal panel

2.1 Stereo audio channel separation

Connect a signal generator with a 2 carrier stereo signal ("stereo" mode). Select 1kHz for the right-hand channel and switch off the sound for the left-hand channel. Connect an oscilloscope to pin 3 of Euroconnector EXT1 Using R3602 on the small signal panel, set the amplitude of the signal to minimum amplitude.

2.2 4.43 MHz chroma suppression circuit

Supply a colour bar signal. Connect an oscilloscope to point 17 of IC7324 and set L5305 to minimum amplitude of the chrominance signal.

2.3 Electrical settings IC7365 (TDA4650)

2.3.1 Chroma bandpassfilter

Connect a signal generator (e.g. PM 5326) to pin 20 of the euroconnector (EXT1) and set its frequency to 4.286 MHz/0.2 Vpp. Switch the unit to EXT1. Connect pin 27-IC7365 to pin 13-IC7365 (+12V). Connect an oscilloscope to pin 15-IC7365. Set L5345 to maximum amplitude. Remove the interconnection.

2.3.2 4.50 MHz NTSC sound suppression

Connect a generator to point 20 of Euroconnector EXT1 with a frequency of 4.50 MHz and 200mV_{rms}. Connect point 26-IC7365 to point 13-IC7365. Connect an oscilloscope to point 15 of IC7365. Set L5346 to minimum amplitude. Remove the short circuit.

2.3.3 6.50 MHz SECAM DK sound suppression

Connect a sine-wave generator to point 20 of Euroconnector EXT1 with a frequency of 6.50 MHz and 200mV_{rms}. Connect point 28-IC7365 to point 13-IC7365. Connect an oscilloscope to point 15 of IC7365. Set L5346 to minimum amplitude. Remove the short circuit.

2.3.4 Chroma 8,87 MHz auxiliary oscillator

Connect a pattern generator and supply a PAL colour bar pattern. Connect pin 17-IC7365 (TDA4650) to earth. Set C2380 so that the colour on the screen has practically stopped. Remove the interconnection.

2.3.5 Chroma 7,16 MHz auxiliary oscillator

Connect a pattern generator and supply a PAL colour bar pattern. Connect pin 17-IC7365 (TDA4650) to earth. Set R2379 so that the colour on the screen has practically stopped. Remove the interconnection.

2.3.6 SECAM demodulators

Connect a pattern generator and supply a SECAM black pattern. Connect an oscilloscope to pin 3-IC7365. Set L5370 to minimum amplitude. Connect the oscilloscope to pin 1-IC7365. Set R3370 to minimum amplitude.

SMALL SIGNAL PANEL

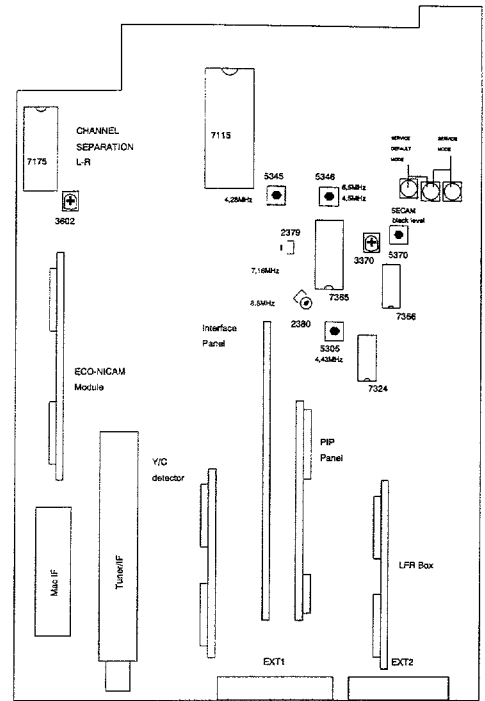


Fig. 7.3

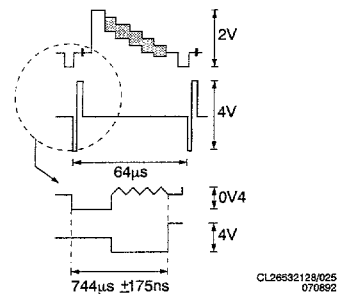


Fig. 7.4

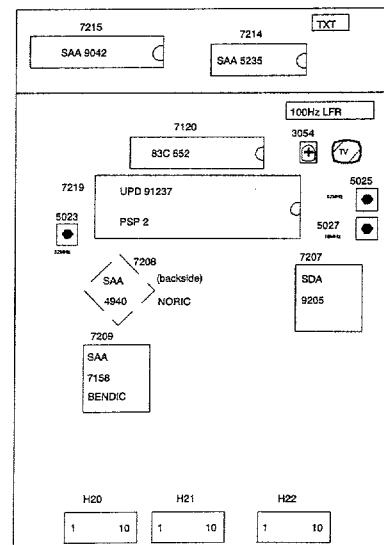


Fig. 7.5

Electrical adjustments

3. Electrical adjustments on the LFR box

3.1 Synchronisation

Connect point 5 of IC7216 to earth. Adjust R3054 until the picture is straight.
Remove the short circuit.

3.2 16MHz oscillator

Apply a PAL/SECAM signal. Measure the signals at point 1 of IC7219 and at point 5 of IC7216 simultaneously with an oscilloscope (fig. 7.9). Adjust coil L5027 so that the positive-going flank of the signal at point 1 of IC7219 comes 7.62 μsec after the negative-going flank of the sync pulse in the video signal (point 5 of IC7216).

3.3 32MHz oscillator

Force the STABLE OSD command to the microprocessor, by disconnecting the set from a possible antenna input signal. Measure the frequency at point 41 of IC7208. Using L5023 set the frequency to 32 MHz \pm 50 KHz.

3.4 12MHz oscillator

Switch on compress.
Measure the signals on point 1 of IC7219 and on point 5 of IC7216 simultaneously with an oscilloscope (fig. 7.9). Adjust coil L5025 so that the rising flank of the signal on point 1 of IC7219 comes 7.62 μsec after the negative flank of the sync pulse in the video signal (point 5 of IC7216).

4. Electrical settings on the ECO-NICAM decoder panel

4.1 Neutral frequency adjustment

Connect a frequency counter via a probe ($C_i \leq 15\text{pF}$) to pin 19 of IC7001 (SAA 7280) and pin 15 (GND).
Adjust C2015 in such a manner that the clock frequency is set at 728.025 kHz. ($\pm 5\text{Hz}$)

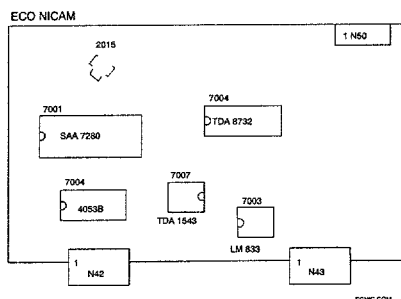


Fig. 7.6

5. Y/C detector adjustment

5.1 PAL/SECAM

Inject a chroma signal of 4.418 MHz/200mV on pin 15 of EXT2 SCART (PL05).
Connect an oscilloscope to the collector of T7266 (T7).
Using L5201 adjust the 4.418 MHz signal to maximum amplitude.

5.2 NTSC

As PAL/SECAM but with a signal of 3.582 MHz/200mV. Adjust with L5200.

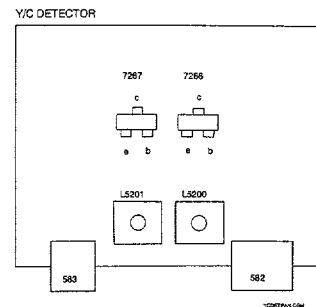


Fig. 7.7

6. Electrical settings on the PIP panel

Setting conditions

Before carrying out each setting, it should be ensured that a P.I.P. picture with colour bar is visible on the screen and the unit should have reached its operating temperature (after ≈ 20 min.).

6.1 Horizontal synchronisation

Supply an aerial or generator signal.
Connect pin 28-IC7125 to pin 13-IC7125.
Connect pin 5-IC7755 to earth.
Measure the frequency on pin 17-IC7755 and set this to 15,625 Hz \pm 25 Hz with R3239.
Remove the short circuits.

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If the picture from a strong local transmitter is distorted, adjust 3160 until the picture is not distorted.

6.3 Setting for PIP modules with TDA4554

6.3.1 Chroma bandpass filter

Connect a signal generator (e.g. PM 5326) to pin 10 of P17 and set its frequency to 4.286 MHz/0.2 Vpp.
Connect pin 27-IC7125 to 13-IC7125.
Connect an oscilloscope to pin 15-IC7125.
Set L5118 to maximum amplitude.
Remove the interconnection.

6.3.2 PAL chroma auxiliary oscillator

Connect a pattern generator and supply a PAL colour bar pattern. Connect pin 17-IC7125 (TDA4554) to earth.
Set C2202 so that the colour of the PIP picture is practically still.
Remove the interconnection.

6.3.3 NTSC chroma auxiliary oscillator

Connect a pattern generator and supply an NTSC M colour bar pattern. Connect pin 17-IC7125 to earth.
Set C2212 so that the colour of the PIP picture is practically still.
Remove the interconnection.

6.3.4 The delay line

Connect a pattern generator and supply a PAL colour bar signal. Connect the X-input of the oscilloscope to pin 1-IC7125 (TDA4554). Connect the Y-input of the oscilloscope to pin 3-IC7125 (TDA4554). Set the oscilloscope to the X-Y position.
Set L5155 and L5157 so that the vectors lie in one line (points which are furthest from the origin).
Set the pattern generator to the "DEM" mode.
Set R3157 so that the vectors lie on top of one another in the origin.

Electrical adjustments

6.3.5 SECAM identification

Connect a pattern generator and supply a SECAM colour bar signal.

Connect pin 27-IC7125 to pin 13-IC7125.

Connect an oscilloscope to pin 21-IC7125.

Adjust L5190 to maximum DC level.

Remove the interconnection.

6.3.6 SECAM demodulators

Connect a pattern generator and supply a SECAM signal without contents (black). Connect pin 27-IC7125 to pin 13-IC7125. Connect an oscilloscope to pin 1-IC7125. Using L5175, set the DC level during the scan equal to the DC level during the flyback.

In the same way set L5170, but now measure at pin 3-IC7125.

Remove the interconnection.

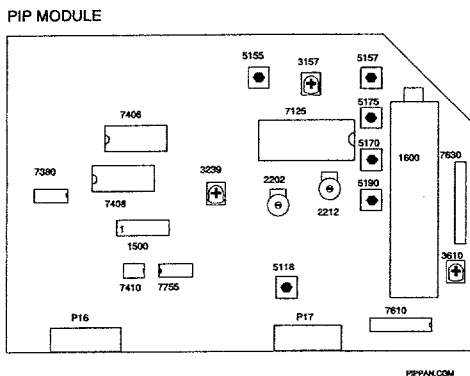


Fig. 7.8

6.4 Adjustment of PLL circuit (36", 16:9)

Connect a pattern generator and apply a PAL colour-bar pattern to the CVBS input.

6.4.1 Adjustment of the PLL oscillator

Movie expand off

Main picture 16:9

PIP-picture 16:9

With the aid of L5101 on the PLL PCB set the DC level on pin 5 of 1500 to 2.5V.

6.4.2 Adjustment of the duty cycle

Movie expand off

Main picture 16:9

PIP-picture 4:3

Connect an oscilloscope to pin 11 of IC7408 (SDA9088).

With the aid of R3130 on the PLL PCB set the time T to 13nsec (see fig. 7.9).

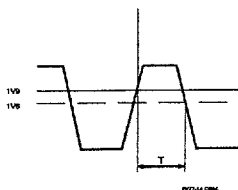


Fig. 7.9

7. Alignments in the Service Menu

7.1

Switch in the Service Menu by momentarily connecting together pins S23 and S24 on the small signal panel (diagram H). The Service Menu will then appear on the screen. The procedure is as follows:

- Select the required alignment with the coloured keys A to E.
- Change the values set using the "Menu +/-" key.
- Store the values set in the EAROM and leave the Service Menu by selecting STORE.

7.2

White Drive Alignment

Switch the set into 4:3 mode.

Switch out the DNR via the remote control.

Select a white picture. (A black picture (e.g. VCR1) set at maximum brightness is also suitable).

Switch the Service Menu in.

Select the required white drive alignment by adjusting the colours red and blue in relation to green (green is the reference colour).

Remarks: In the original factory settings "white" has a colour temperature of 7600K (White with a bluish tint). The point of departure is green with a value of 44. The factory setting for blue is then approx. 44. The factory setting for red is then approx. 21.

7.3

Cut-off Alignment

Switch the set into 4:3 mode.

Switch out the DNR via the remote control.

Select a black picture (e.g. VCR1).

Switch the service menu in.

Set the brightness level so that the picture just (but clearly) illuminates.

Using the Cut-off adjustments align the colour temperatures in such a manner that at minimum illumination of the picture they are the same as the colour temperatures at maximum brightness. (At minimum picture illumination it is possible that one colour may dominate. This is however normal and does not have to be (fully) compensated with the cut-off alignment).

Remarks: In the original factory settings "white" has a colour temperature of 7600K (White with a bluish tint). The point of departure is green with a value of 28. The factory setting for blue is then approx. 33. The factory setting for red is then approx. 25.

7.4

D2-MAC Alignment

These alignments are described in the section: FL1 SAT box chapter 7.

7.5

Option Alignment

The microprocessor communicates with a great number of components in the set. For correct communication the microprocessor has to know what IC's and modules are present in the set. This is done using option codes. An incorrectly set option code will give a communication problem and an accompanying error code. Every function has been allocated a value. The sum of 8 values forms an option code. This number can vary from 0 to 255. The option code tables are given at the end of this paragraph.

For example, a set has:

Option code 1	
<i>Function</i>	<i>Value</i>
Frontend FQ816/ME/IF	2
PIP Module	8
NTSC-M	16
NICAM module	64
2nd Frontend on PIP module	128 +

Option code 1 is now: 218

Option code 2	
<i>Function</i>	<i>Value</i>
IC7175 present on SSP	1
100 Hz	4
ECO NICAM	32
100 Hz LFR	64 +

Option code 2 is now: 101

Option code 3	
<i>Function</i>	<i>Value</i>
16:9	64 +

Option code 3 is now: 64

Option code 4:	
<i>Function</i>	<i>Value</i>
Multi-PIP	2
FL2 model	4 +

Option code 4 is now: 6

Optioncode 1	
Nbr.	Function
0	Front end = FQ916 A reception of PAL BG or PAL BG and SECAM BG is now possible
1	Front-End = FQ944 Only reception of the UHF band is now possible
2	Front end = FQ916/ME/IF Reception of SECAM L but not of SECAM L' is now possible (reception of NTSC-M is now usually also possible).
4	Front end =FQ916/MF/IF Reception of both SECAM L and SECAM L' is now possible (NTSC M reception is generally possible now via the Euroconnector).
8	PIP module present This makes it possible to show PIP (Picture in Picture) displays.
16	NTSC-M reception possible This is normally always in combination with front end FQ816/ME/IF or FQ816/MF/IF
32	SECAM DK module fitted In this case transmissions using the SECAM DK system can also be received.
64	NICAM module fitted In this case the digital sound with NICAM transmission can be received.
128	Second front end for PIP fitted If this second front end is fitted a second transmitter can be displayed in the PIP picture. The PIP function (number 8) still applies.

Optioncode 2	
Nbr.	Function
1	IC7175 present on SSP This is always the case.
2	Not in use
4	100Hz featuring present This is always the case (see also number 64).
8	Not in use
16	Not in use
32	ECO NICAM module present In this case the digital sound broadcast in NICAM transmissions can also be received (see further the number 64 of option code 1).
64	LFR box present This is always the case (see also number 4).
128	Not in use

Electrical adjustments

Optioncode 3	
Nbr.	Function
1	FSS reception only via SAT box This switches the D2-MAC decoder off.
2	Front-end on SAT box is: SF916 In this case it is possible to tune the SAT box to 2 GHz.
4	Satellite front-end SF914/SF916 present (SAT MAC reception) Switching on and off satellite reception via the satellite front-end. On switching off the front-end D2-MAC can only be received via cable-TV (CABLE MAC via MAC IF module).
8	MAC IF module present (CABLE MAC reception) This module makes it possible to decode a D2-MAC signal which is received via the cable front-end (FQ816/FQ844). In this case, besides satellite transmitters, MAC transmitters can also be received via the cable.
16	SECAM "Telecom Audio" reception possible This option generates an extra sound channel in the menu on FSS reception. This channel is necessary for the reception of the French "Telecom" satellite. The necessary hardware is present in all sets so that this option may be selected as desired.
32	Cable-MAC reception only in hyperband In this case the reception of MAC-transmitters via the cable is limited to the hyperband. 16:9 present
64	Not in use
128	"Videocolor 36" Picture tube

Optioncode 4	
Nbr.	Function
1	Teletext Peaking Filter on/off for LFR box (Scandinavia) In Scandinavia this number must be selected .
2	Multi-PIP When the PIP-module operates on a 50Hz basis the Multi-PIP function is present and this option is active. (Multi-PIP provides 9 or 16 small pictures on the screen simultaneously).
4	FL2 model When the operating buttons are located on the side of the set, the set is an FL2 model. (see chapter 4 also).
8-128	Not in use.

3. Repair tips

1. The Service Default Mode

The FL1/2 is equipped with a service default mode. The service default mode is a fixed, definite state to which the set can be switched.

1.1 Definition state

The definition of the fixed state in the service default mode is as follows:

- all sound and picture controls are in the central position (exception volume which is turned down)
- tuned to 475.25 MHz
- system:
 - * PAL/SECAM BG for Multi Europe
 - * PAL I for UK
 - * SECAM L for Multi French

1.2 Switch on and off

The service default mode is switched on by shorting pins S24 and S25 on the small signal panel.

The service default mode can only be switched off by switching the set to stand-by. If the set is switched off and then on again using the mains switch or the mains plug, the service default mode will remain on.

If the set switches to stand-by immediately after switching-on, the set cannot be operated and also cannot be switched to the service default mode. The child-proof lock has already been activated.

To deactivate the child-proof lock the following series of commands has to be given using the remote control (see also Section 9):

<MENU>-<BLUE>-<RED>-<MENU+>-<MENU OFF>

1.3 Fault signals

To indicate that the set is in the service default mode, the following is displayed on the screen:

SERVICE 00 00 05 06 05

The five numbers after the word "service" stand for the last five fault signals noted by the operator(s). The number on the extreme right represents the last fault signal, that on the extreme left the last fault signal but 4. Since this enables fault reports to be looked at afterward, it means that intermittent faults can be traced. When the set leaves the service default mode, the fault-report memory is cleared.

1.4 Operation

During the service default mode the set will accept all operating commands. When, however, the set is switched off and on, it will return to the state as defined above.

2. Error messages

In both FL1 and FL2 models the IC error messages are indicated by a combination of flashing LED's. In FL1 7 LED's on the front of the set are used. In FL2 only 2 LED's have been fitted to the front of the set: 'on' and 'stand-by'; for service purposes the 7 LED's have been fitted inside the set in an SMD version. These are located on the solder side of the panel with buttons for local control on the side of the set. The 2 LED's on the front of the set are connected in parallel with the corresponding service LED's.

Figure 8.1 illustrates the situation for FL1 and FL2. A table of error messages is provided at the end of this chapter.

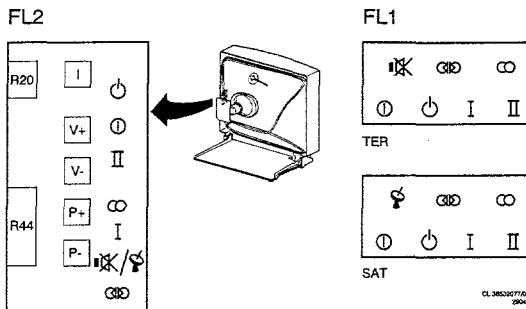


Fig. 8.1

3. Replacement of EEPROM IC7137

If, during a repair, the EEPROM has to be replaced, the microprocessor will detect that the EEPROM is empty. A fault signal (No. 21) will then be displayed.

If the service mode is now activated (see section 7), the microprocessor will load the EEPROM with a number of standard values for the white balance and the other linear settings. These values, however, must all be checked and, if necessary, re-adjusted.

All options have also to be set, the programs installed and the personal preference set.

4. Extension prints

To simplify the measurements ON the various modules extension prints are available for the modules fitted with BTB connectors. Modules can be placed in these connectors so that they stick out above the other prints when the chassis is in the service position.

The code numbers for the extension prints are:

5-fold	4822 395 30261
6-fold	4822 395 30259
8-fold	4822 214 31402
9-fold	4822 395 30258
10-fold	4822 395 30257

5. Removing the PIP module

The PIP module can be simply removed, leaving the set functioning normally (The LED display does however indicate an error condition). Following the removal of the PIP module the signal path is broken. The signal path can be restored by placing the 5-core flat cable with connector S56 in connector foot S16 (see diagram D). The error message can be removed through the application of the option codes (see chapter 7).

6. Removing the SAT box

The SAT box (excluding the interface panel (p)) can be simply removed, leaving the set functioning normally (The LED display does however indicate an error condition). The SAT box can also be partially removed: it is possible to remove both the D2-MAC(S) or FSS(T), leaving the SAT box functioning normally. The error message which remains following the total or partial removal of the SAT box can be removed through the application of the option codes (see chapter 7).

7.

8.

9

9.1

A:
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th
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D:
pa

E:
E:
ar
se
4:

S:

C:

F:
th
re
m
In
se
de
su
cc

1.
2.
3.
4.
5.

Ti
m
Ti

Li
10

D:

H:
lr
pi
sv
st
in
pe
A:
pe
cc
is

A:
st
pi
m
(S

A:
in
de

As all programs, including that for the SAT box, are stored in the main EAROM (IC7137), the settings for these programs will not be lost, even if the SAT box is replaced. The EAROM (IC7450) located on the D2-MAC panel stores all the settings for the D2-MAC panel.

7. Extension cables

Extension cables are available to lead the large signal and small signal panel signals (LSP and SSP) separately out of the set. These are made up as follows:

4822 320 20209	Set of 6 cables for LSP and SSP connections.
----------------	--

See chapter 4 also.

8. Central repair

For panels and modules which are difficult to repair there remains a possibility for central repair. Following receipt of a defective module a repaired and tested module is issued.

In order to guarantee the quality of the central repair service a certain amount of information regarding the defective panel is required. This information should be submitted together with the defective panel. This concerns the following information:

1. Clear description of the fault.
2. Indication of intermittent or continuous fault
3. Type/version number of the set
4. AG-production code and week/year number
5. Serial number

The defective modules should be complete and free of mechanical damage.

These facilities are offered for the modules below:

LFR box (L+M)	4822 212 30857
100Hz box [L']	4822 212 30887

9. Diagnosis and protection

9.1 Hardware and software protection

In case any serious fault occurs in the set, one of the protection circuits will activate. A protection circuit switches of the main power supply (SOPS) via the stand-by input (STBY) of the SOPS control panel. This input is located on pin 1 of connector pin L40 with test point number TP56, and is illustrated on diagram A. As the microprocessor is fed by a separate stand-by power supply (SOPS), the processor and the LED's will continue to operate, even when the main power supply is switched off.

A number of protection circuits can switch off the power supply independently and immediately (hardware protection). In two protection circuits the microprocessor itself switches off the power supply (software protection).

All protection circuits come together on the stand-by input (TP56 of the main power supply. A diagnosis determines which protection circuit is active.

9.2 Protection test point TP56 [diagram A]

The following voltages may be present on the stand-by input of the SOPS control panel (TP56): [see diagram A]

1. Approx. 17V during operation;
2. 0.5 - 1V during hardware protection; (this value is maintained by a thyristor circuit formed by TS7380/TS7381);
3. 0.5Vd during stand-by and software protection.

9.3 Hardware protection:

1. Power supply voltage +13 from the SOPS too high (+V) [diagram A].
This protection circuit activates if the voltage in +13V circuit of the SOPS becomes too high during operation.

2. SOPS and/or +11/-11V for the audio output amplifier defective (SOUND-PROT). [diagram G]

The protection circuit activates when the +11V and -11V voltages are no longer in balance, or when both voltages are absent. This protection circuit also operates when the SOPS does not function or is short-circuited.

This protection circuit is fed by the start-up voltage 'Vstart' from the SOPS.

3. Beam current too high (I-BEAM) [diagram B]
When the beam current becomes too high this protection circuit switches off the power supply. Before this protection circuit can activate the picture will first illuminate brightly. This fault occurs for example on the absence of the +200V power supply voltage on the picture tube panel.

4. Deviating LOT behaviour (EHT, LOT-PROT) [diagram B].
This protection circuit becomes active when a 'unusual' voltage forms appear on the LOT outputs (5555). This may indicate defective or loose components in the line deflection circuit. (LOT, switching transistors, capacitors).

5. East/west output stage defective [diagram B].
This protection circuit activates when the current through the east/west switching transistor T7610 exceeds a specific value. In this case transistor T7542 will conduct for a brief period. (the base-emitter voltage U_{be} from T7542 is then momentary greater than 0.6V).

6. Vertical deflection end stage (IC7450) defective [diagram B].
The frame output stage IC7450 has a protection output (pin 7, TP62). This output becomes momentarily high on any defect in this IC or during the absence of the power supply voltage.
During normal operation there are short pulses on this output.
The frame output stage is fed by a winding on the LOT (5555) (+28V or +32V).
During diagnosis a check should be made whether the +28/+32V power supply voltage continually drops before the protection circuit output is activated. If this is the case then one of the other protection circuits is responsible for switching out the power supply.

Repair tips

By measuring the timing pulses between the protection output (pin 7) and the power supply voltage (pin 6) in relation to earth (pin 2 or 4) it can be determined whether the protection is originating from the frame output stage. The protection circuit overview at the end of this chapter provides a schematic overview of the measurements.

9.4 Software protection

9.4.1 Error message 99

Error message 99 is displayed when software protection is generated by the microprocessor. Software protection becomes active when the +13V and or +5V power supply voltage is not present on the small signal panel (SSP). Due to the absence of the power supply the connected components are unable to provide an IC signal to the microprocessor. The processor then sets the SOPS in stand-by. If this is the case error message 99 is then displayed. Software protection can be switched out by activating the 'Service Default Mode' (see §1).

If the +13V or +5V are absent as a result of hardware protection switching out the power supply, error message 99 will be displayed by the LED's following a short period, as the microprocessor is no longer receiving any signal from the connected IC's. The processor now bridges the hardware protection via the STBY signal. Each hardware protection will therefore eventually result in software protection, resulting in error message 99 being displayed.

During hardware protection the microprocessor makes repeated attempts at communication with the connected IC's before making a decision for software protection.

During this period (up to approximately 5 minutes) the set will not react to any operational commands. Because none of the IC's responds in this period various error messages will be displayed by the LED's. If error message 99 does not eventually appear then the protection circuits are not operational and the cause of the fault can be sought elsewhere.

When the microprocessor generates a STBY signal for implementing software protection TP56 will be made lower than 0.5V by the STBY signal, through which any eventual hardware protection on TP56 will be bridged. In order to determine whether hardware protection is active via TP56 the voltage on TP56 should be measured with the set in the 'Service Default Mode' or measured before error message 99 appears on the LED display.

9.4.2 Software protection

7 +5V on the small signal panel (SSP) [diagram B and C]

To test whether the +5V power supply voltage, from the LOT winding (5555) [diagram B], is reaching the small signal panel without short-circuiting the front-end (1160 [diagram C]) must provide a signal to the microprocessor via IC within a specific time. If this signal does not arrive, the microprocessor switches the main power supply into stand-by, and the LED's will indicate error message 99 once more.

To test whether the front-end is defective the service default mode will have to be selected. If the power supply voltages on the front-end are correct and a front-end error message persists (error 11), then the front-end is defective.

8 +13V on the small signal panel (SSP) [diagrams A, D and F]).

To test whether the +13V power supply voltage from the main power supply (SOPS) [diagram A] is reaching the small signal panel without short-circuiting, IC7430 (TDA4680 video processor, [diagram D]) or IC7600 (TDA8417, stereo decoder, [diagram F]) or IC7680 (TDA8425, audio processor [diagram F]) must provide a signal via IC to the microprocessor within a specific time. If none of these three IC's provides any signal the microprocessor switches the main power supply into stand-by. The LED's indicate error code 99.

9 SAT box power supply defective (only for set with a SAT box (D2-MAC)).

When the SAT box microprocessor does not send a signal to the main processor in the set, the main processor, following error message 51 (SAT box processor), will switch the software protection in. The LED's now indicate error code 99.

To test whether the SAT box processor is defective the service default mode must be selected. If only the error message from the SAT box is now indicated (error 51), and all power supply voltages on the processor are correct, then the SAT box processor is defective.

The operation of the SAT box power supply [diagram O] can be checked as followed:

Disconnect the SAT box and chassis from one another by disconnecting the band cable between the interface panel [diagram P] and the SAT box [diagram O].

When after a short time the set can be started up from stand-by the SAT box will have an incorrect power supply and error message 99 does not appear.

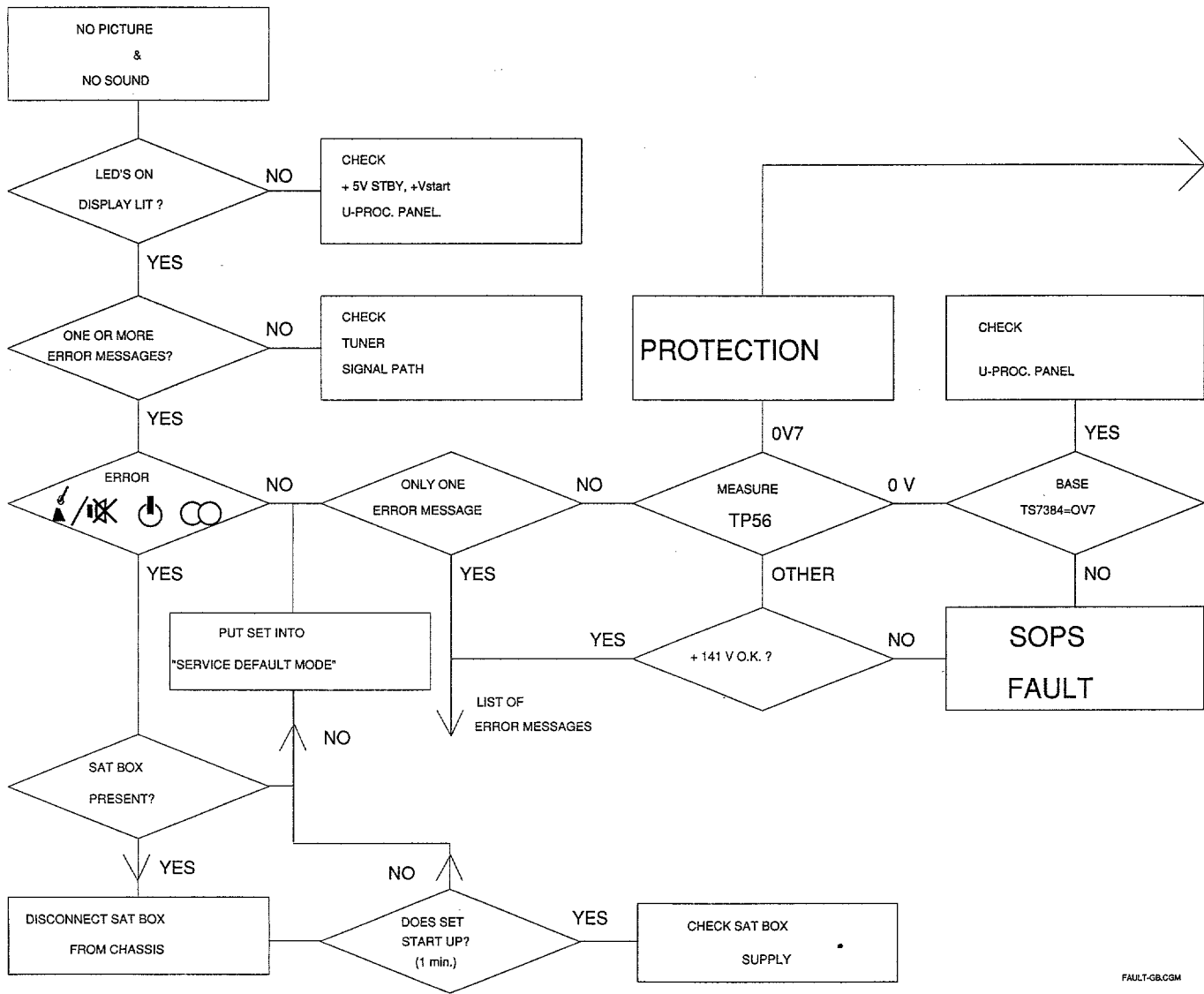
9.5 Measurements in the protection circuits.

All hardware circuits are illustrated in figure 8.2.

The oscillograms indicate the voltages on the relevant test points immediately after the set is switched on.

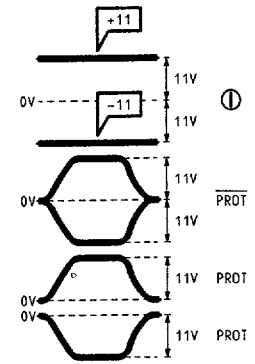
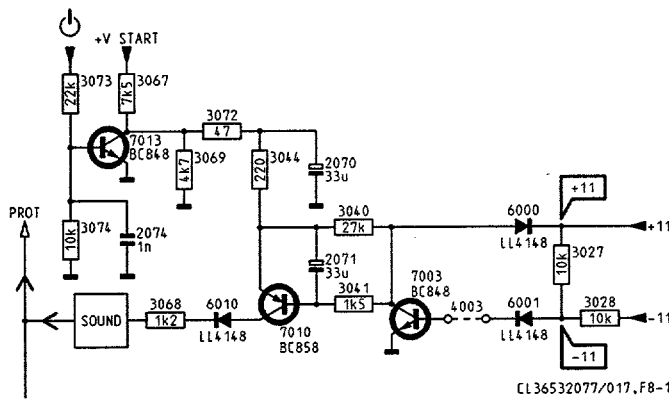
In this case the signals illustrated are for during:

- normal operation
- protection caused by this circuit (PROT);
- protection caused by a different protection circuit (N-PROT).



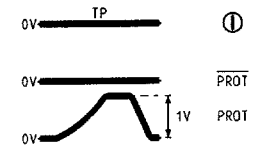
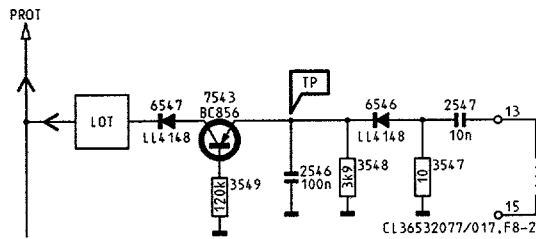
FAULT-GB/GM

+11V
-11V

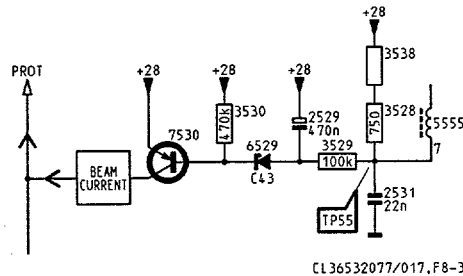


CL36532077/017, F8-1

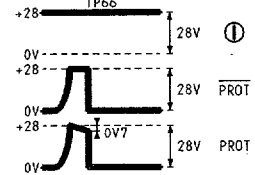
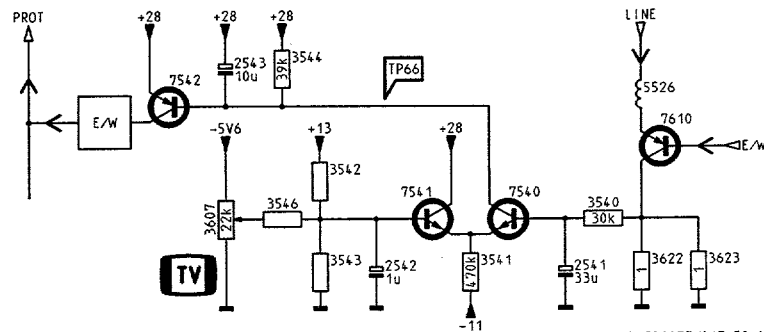
EHT



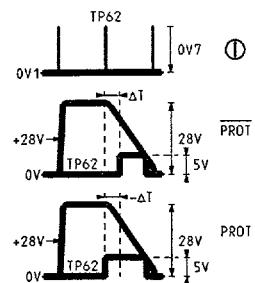
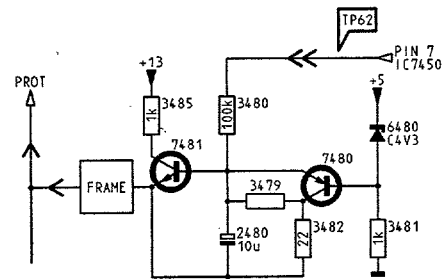
CL36532077/017, F8-2



CL36532077/017, F8-3

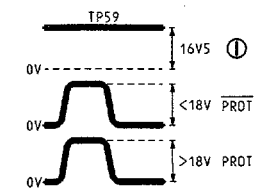
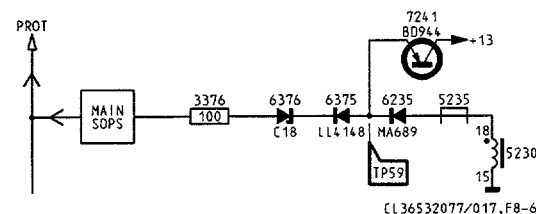


CL36532077/017, F8-4



CL36532077/017, F8-5

+V



CL36532077/017, F8-6

CL36532077/017, FREF 130593

Fig. 8.2

List of error messages

Error number on screen	Flashing LED							Description of error
1 ¹⁾			X		X	X		I ² C, IC7108, SSP [H] (MSM6307)
3					X	X	II	I ² C, IC7215, 100Hz [L] [L'] SAA9042
4				X			X	I ² C, IC7220, 100Hz [M] [L'] 83C652
5				X				I ² C, IC7408, PIP [J] (SDA9088)
6				X	X	X		I ² C, IC7600, SSP [F] (TDA8417)
7							X	I ² C, IC7680, SSP [F] (TDA8425)
8						X	X	IC7440, frame rotation [Z], PCF8574 (16:9)
9			X	X		X		I ² C, IC7430, SSP [D] (TDA4680)
10				X	X		X	I ² C, IC7395, SSP [D] (TDA8443)
11				X	X			I ² C, front-end, SSP [C] (FQ 9XX)
12						X		I ² C, IC7137, SSP [H] (X24C04)
13			X					I ² C, bus on chassis blocked
14			X	X				I ² C, IC7258, SSP [C] (HEF4094)
15			X	X	X			I ² C, IC7219, SSP [C] (TEA6414)
16			X			X		I ² C, IC7040, SAT Interface [P] (TEA6414)
17			X		X			IR-receiver on SSP [H] blocked (1100)
18				X		X	X	7115, SSP, μ proc. [H]
19			X	X	X	X		UART Bus blocked, 7115, SSP, μ proc. [H]
20				X	X	X	X	7115, SSP, μ proc. [H]
21				X				EAROM X24C04 empty, IC7137, SSP [H] (§ 8.3)
23	X				X			I ² C, IC7080, convergence panel [V] (TDA8444)
28		X						I ² C, PIP tuner [J]
29		X						I ² C, IC7638, PIP-modulo [J] (SAA1300)
30			X		X		X	I ² C, IC7175, SSP [C] (PCF8574)
31			X		X	X	X	I ² C, IC7001, NICAM-panel [K] (SAA7280)
33		X						I ² C, PLL (1500) PIP modulo [L]
34 ¹⁾	X		X				X	LNC supply on SAT box [Q,R] not correct
35 ¹⁾	X		X		X		X	IM-bus on SAT box [Q,S] blocked.
36 ¹⁾	X		X	X			X	I ² C, bus on SAT box blocked.
37 ¹⁾	X		X	X	X		X	I ² C, IC7450, D2-MAC [S] (X24C02)
38 ¹⁾	X		X			X	X	I ² C, SAT Tuner [Q] (SF914; SF916)
39 ¹⁾	X		X		X	X	X	HEF STROBE 1, IC7925, FSS [T] (HEF4094)
40 ¹⁾	X		X	X		X	X	D2-MAC [S]
41 ¹⁾	X		X	X	X	X	X	HEF STROBE 2, IC7475, D2-MAC [S] (HEF4094)
42 ¹⁾	X				X		X	IC7250, TUNER/CONTROL [Q]
43 ¹⁾	X			X			X	UART bus blocked IC7250, TUNER/CONTROL [Q].
44 ¹⁾	X			X	X		X	SAT Tuner [Q] (SF914/916)
45 ¹⁾	X					X	X	IC7250, TUNER/CONTROL [Q]
46 ¹⁾	X				X	X	X	IC7250, TUNER/CONTROL [Q]
47 ¹⁾	X			X		X	X	IC7262, TUNER/CONTROL [Q]
48 ¹⁾	X			X	X	X	X	D2-MAC [S]
49 ¹⁾	X			X		X		EAROM X24C02 empty, 7450, D2-MAC [S] (§17)
51 ¹⁾					X	X	X	IC7250, TUNER/CONTROL [Q]
52 ¹⁾			X				X	D2B Bus EXT, SSP [H] blocked.
53			X			X	X	IC7330, MAC TXT [S], TPU2735
55			X	X		X	X	IC7140, Panorama [B], PCF8574 (16:9)
99	X		X		X			Protection

¹⁾ This error is only possible on sets with built in SAT box.

In case an error indication on the set is not included in this table, then check the optional codes (see § 7).