Cassette auto radio 90DC668

Service
Service
Service

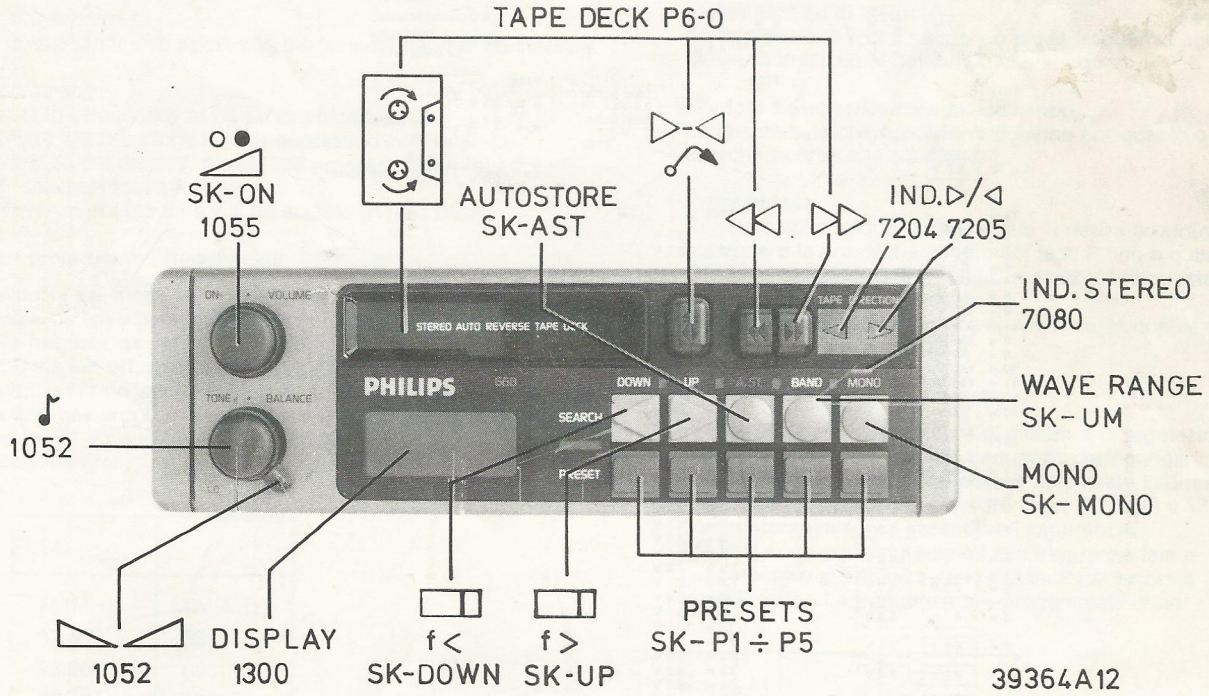
00/38/68T

BELT PART N° 358 - 30405.

For repair information of the tape-deck, see Service Manual of auto cassette deck P6-0

Service Manual

12 V



Documentation Technique Service Dokumentation Documentazione di Servizio Huolte-Ohje Manual de Servicio Manual de Serviço

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

Subject to modification

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(GB) TECHNICAL DATA

General

Power supply	: 14.4 V⎓
Memory battery	: 22EN9893
Dimensions (wxhxd)	: 180×51×149 mm

Radio

MW	: 531-1602 kHz
FM	: 87.5-108 MHz
IF-AM	: 468 kHz
IF-FM	: 10.7 MHz
Sensitivity for 26 dB (S/R)	: ⩽ 140 µV (MW)
	: ⩽ 5 µV (FM)
Limitation α -3 dB	: 12 µV
10 dB crosstalk	: 140 µV

Cassette player

Number of tracks	: 2×2
Tape speed	: 4.76 cm/sec
Wow and flutter	: ⩽ 0.3%
Crosstalk	: ⩾ 40 dB

Amplifier

Output power (D ⩽ 10%)	: 2×5.0 W ± 1 dB/4 Ω
	: 2×8.0 W ± 1 dB/4 Ω
Bass	: – 6 dB at 125 Hz
Treble	: –14 dB at 10 kHz

(I) DATI TECNICI

Generali

Alimentazione	: 14,4 V⎓
Batteria per la memoria	: 22EN9893
Dimensioni (wxhxd)	: 180×51×149 mm

Radio

MW	: 531-1602 kHz
FM	: 87,5-108 MHz
IF-AM	: 468 kHz
IF-FM	: 10,7 MHz
Sensibilità per 26 dB S/R	: ⩽ 140 µV (MW)
	: ⩽ 5 µV (FM)
Punto limite α -3 dB	: 12 µV
10 dB di diafonia	: 140 µV

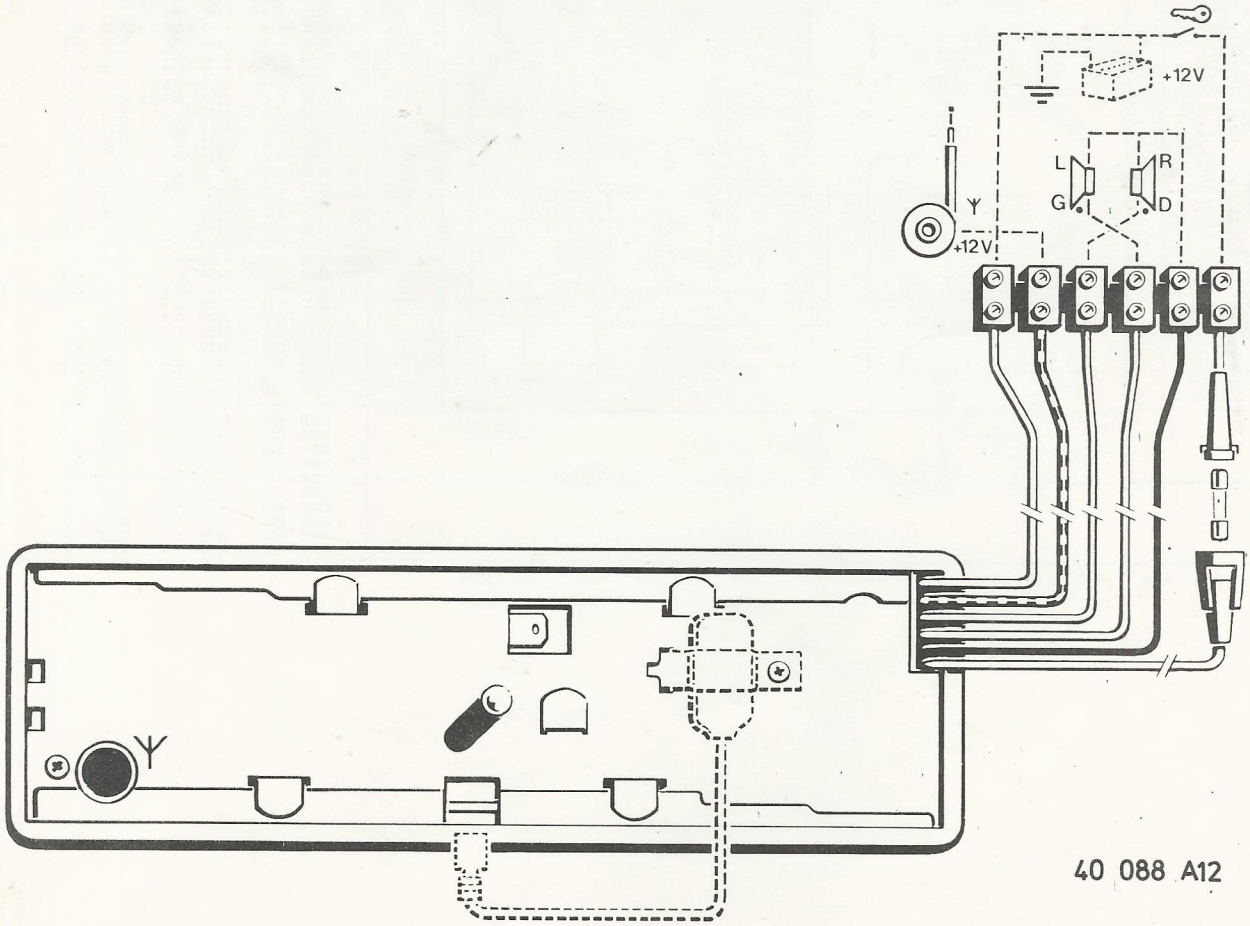
Riproduttore a cassetta

Numero di tracce	: 2×2
Velocità nastro	: 4,76 cm/sec
Wow e flutter	: ⩽ 0,3%
Diafonia	: ⩾ 40 dB

Amplificatore

Potenza d'uscita (D ⩽ 10%)	: 2×5,0 W ± 1 dB/4 Ω
	: 2×8,0 W ± 1 dB/4 Ω
Bassi	: – 6 dB a 125 Hz
Alti	: –14 dB a 10 kHz

white – CONST B+



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(GB) SERVICING HINTS

1. Repair

For repair to the radio section the mechanism need not be connected.

2. ESD

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

3. Service test programme

The test programme is called as follows:
Switch set off, depress keys △ ("up") and ▽ ("down") and switch the set on while keeping △ and ▽ depressed.
The µC now tests the RAM.
If P1 ... P5 are depressed, the set tunes to the preset frequency (see point 5).
The set functions normally.
The test programme can be ended by switching the set off.

4. Roger Bleep

If one of the push-buttons is depressed briefly, a Roger Bleep will be heard.

Tuning
If the "up" or "down" button is depressed briefly, the frequency will increase or decrease respectively.
If one of these buttons is depressed for approx 1 s, the µC will switch over to "search".
If one of these buttons is depressed longer than two seconds, the frequency will increase or decrease as long as depressing continues.

Remote search
The above story also applies to the "remote search" connection.

Programming
Tune to the frequency to be programmed.
If ONE of the P-buttons is kept depressed now until -5- appears on the display, the µC will program this frequency under the depressed P-button.
Moreover, a double tone will be audible (Roger Bleep).

5. Pre-programmed frequencies

To simplify the measurement and adjustment procedures, five frequencies have been pre-programmed on each wave range. These frequencies can be called as follows:
Switch the set off, depress keys △ ("up") and ▽ ("down") and switch the set on while keeping △ and ▽ depressed. The P keys are now programmed with test frequencies, the set is tuned to FM P1 and functions normally. The pre-programmed frequencies are:

	LCD	
P..	FM (MHz)	MW (kHz)
P1	87.50	531
P2	93.00	603
P3	98.00	999
P4	103.00	1449
P5	108.00	1602

The test programme ends when the set is switched off.

6. Decasing

Tape-deck
To prevent metal parts from bending through, the tape-deck should not be removed from the cabinet by the cassette lift.

(I) CONSIGLI PER LA RIPARAZIONE

1. Riparazioni

Per quanto è delle riparazioni alla sezione radio, il meccanismo non deve essere collegato.

2. ESD

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alle loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

3. Programma test di Servizio

Il programma test si ottiene in questo modo:
Spegnere l'apparecchio, premere i tasti △ ("up") e ▽ ("down") contemporaneamente accendere l'apparecchio.
Il µC ora controllerà la RAM.
Se si preme sui P1 ... P5, l'apparecchio sintonizza alla frequenza preprogrammata (vedi punto 5).
L'apparecchio funziona normalmente.
Il programma test si ferma spegnendo l'apparecchio.

4. Roger Bleep

Una pressione di uno dei tasti renderà audibile la tonalità del "Roger Bleep".

Sintonia
La pressione del tasto "up" o "down" provocherà sia una elevazione sia una diminuzione della frequenza.
Se uno mantene la pressione durante ± 1 secondo, il µC commuterà su di "search".
Se la pressione è di 2 secondi o più la frequenza aumenterà o diminurà in funzione del tempo che si preme.

Remote Search (ricerca a telecomando)
La descrizione che precede vale anche per quanto è del "remote search" (ricerca a telecomando).

Programmazione
Regolare sulla frequenza alla quale si desira programmare.
Mantenere la pressione su uno dei tasti P fino a quando la ciffra -5- apparisce, dopo di chè il µC memorizzerà questa frequenza sotto il tasto P corrispondente.
Mentre uno procede a questa operazione, la doppia tonalità del "Roger Bleep" sarà audibile.

5. Frequenze pre-programmate

Per semplificare le procedure di misure e di regolazione, sono state pre-programmate cien frequenze per ogni gamma.
Queste frequenze possono essere richiamate in questo mode:
Spegnere l'aaparecchio, premere i tasti △ ("up") e ▽ ("down") e contemporaneamente accendere l'aaparecchio.
I tasti P sono ora programmati alle frequenze test e l'aaparecchio è sintonizzato in FM su P1 e funziona normalmente. Le frequenze pre-progammate sono:

	LCD	
P..	FM (MHz)	MW (kHz)
P1	87.50	531
P2	93.00	603
P3	98.00	999
P4	103.00	1449
P5	108.00	1602

Il programma test si disinserisce spegnendo l'apparecchio.

6. Smontaggio

Tape-deck
Per evitare la piegatura di parti metalliche, il tape deck non deve essere tolto facendo sforzo sul sollevatore cassette.

7055

G = [0.1 V]
D = [7.8 V]
S = [1.9 V]

7056

G = 0 V
D = [4.6 V]
S = [0.3 V]

7057

e = ⊥
b = [0.7 V]
c = [0.2 V]

7059

e = ⊥
b = [0 V] [0.6 V | LO1]
c = 0 V

7070

e = ⊥
b = [0.6 V | St. switch on]
[0.0 V | St. switch off]
c = [0.0 V | St. switch on]
[2.6 V | St. switch off]

7071

e = ⊥
b = 0.7 V ▷◁, during search
c = 0.0 V

7074

e = 5.0 V
b = 5.6 V
c = 12.1 V

7075

e = 8.6 V
b = 9.3 V
c = 14.2 V

7076

e = ⊥
b = [0.7 V] [0 V]
c = [0 V] [8.4 V]

7077

e = ⊥
b = [0 V] [0.7 V]
c = [8.6 V] [0 V]

7078

e = 8.6 V
b = [8.0 V] [8.4 V]
c = [8.6 V] [0 V]

7079

e = 8.6 V
b = [8.6 V] [7.9 V]
c = [0 V] [8.6 V]

7084

e = [1.1 V | LO1]
b = [0.0 V] [1.8 V | LO1]
c = [8.6 V]

7088

e = [0.9 V]
b = [1.7 V]
c = [8.6 V]

7089

G = [0 V]
D = [5.8 V]
S = ⊥

7090

1 = [8.6 V]
2 = [4.1 V]
3 = [8.6 V]
4 = [0.7 V]
5 = ⊥
6 = [2.3 V]
7 = [1.6 V]
8 = [7.0 V]
9 = [5.5 V]

7122

e = [0.9 V]
b = [1.6 V]
c = [8.6 V]

7123

e = 5 V ┐└ Stop pulse 0.5 V
b = 5 V ┐└ Stop pulse 0 V
c = ⊥

7124

e = ⊥
b = [0.0 V] [0.7 V | LO2]
c = 0 V

7125

e = ⊥
b = [0 V] [0.6 V]
c = 0 V

7158

e = 4.8 V
b = 5.4 V
c = 5.0 V

7159

e = 0.6 V
b = 1.1 V
c = VC-AM, VC-FM

7160

e = ⊥
b = 0.6 V
c = VC-AM, VC-FM

7170

e = 0.0 V
b = 0.0 V
c = 0.0 V

7172

e = 0.0 V
b = 0.0 V
c = 0.0 V Stop signal MW

7180

e = 0.0 V
b = 0.0 V
c = 0.0 V

7182

e = 0.0 V Stop signal FM
b = 0.0 V
c = 0.0 V

7183

e = ⊥
b = 0 V ┐└ 0.7 V stop pulse
c = 4.9 V ┐└ stop pulse 0 V

7190

e = 5 V ┐└ Stop pulse 0.5 V
b = 4.9 V during search
c = 8.7 V ┐└ Stop pulse 0.0 V

7191

e = 8.6 V
b = 8.7 V ┐└ stop pulse 8.0 V
c = 0.0 V ┐└ 8.6 V 0.0 V stop pulse

7505

1 = 7.0 V
2 = 6.9 V
3 = 6.9 V
4 = N.C.
5 = 6.9 V
6 = 13.4 V
7 = ⊥
8 = 13.4 V
9 = 6.9 V
10 = 14.3 V
11 = 14.3 V
12 = 6.9 V
13 = 7.0 V

7811

1 = [6.7 V] [7.5 V]
2 = [6.9 V]
3 = [6.9 V]
4 = [1.0 V]
5 = [0.5 V] [1.7 V]
6 = [6.7 V] [7.4 V]
7 = [6.8 V] [7.4 V]
8 = [6.8 V] [7.4 V]
9 = [6.6 V] [7.4 V]
10 = [6.6 V] [7.2 V]
11 = ⊥
12 = [7.1 V] [7.9 V]
13 = [2.0 V]
14 = [7.1 V] [7.9 V]
15 = [1.2 V | ST] [0 V | MO]
16 = 1.6 V
17 = 1.5 V
18 = [6.9 V]

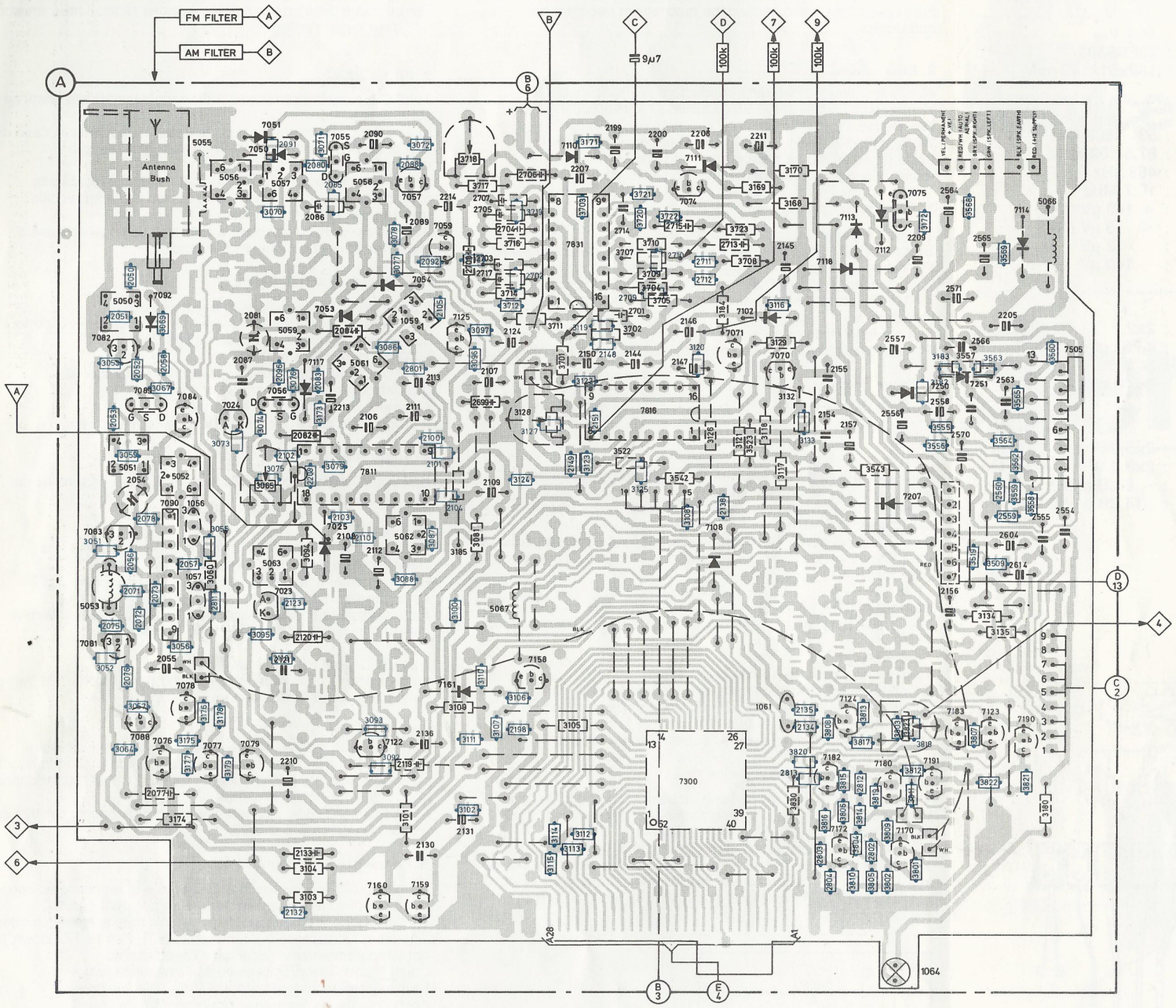
7816

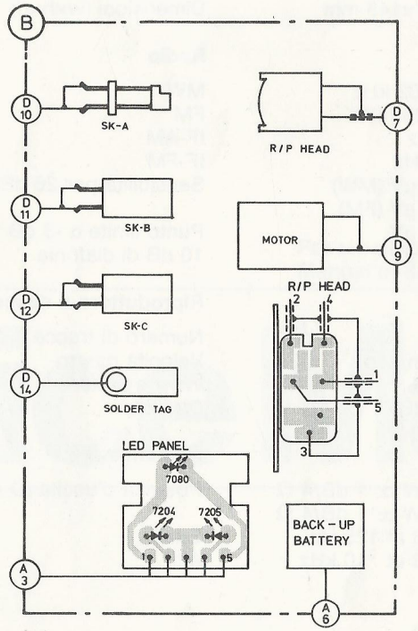
1 = 3.1 V
2 = 3.1 V
3 = [1.0 V | ST] [12 V | MO]
4 = [0.7 V | ST] [0 V | weak ST]
5 = ⊥
6 = [2.0 V | ST] [0.5 V | MO]
7 = 1.2 V (stereo switch on)
= 2.2 V (stereo switch off)
8 = 228 kHz
9 = 8.3 V
10 = 1.4 V

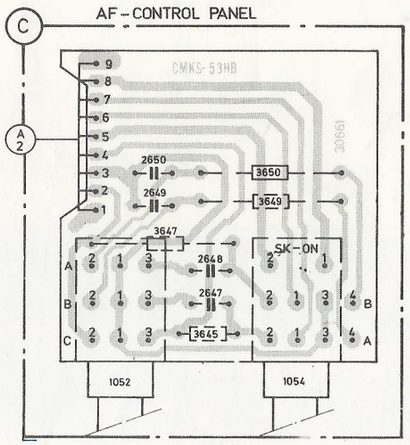
7831

1 = 3.9 V
2 = 3.2 V
3 = 3.1 V
4 = 3.5 V
5 = 3.5 V
6 = 2.2 V
7 = 2.7 V
8 = 0.8 V
9 = 13.1 V
10 = 13.1 V
11 = 0 V
12 = 13.0 V
13 = 3.5 V
14 = 3.5 V
15 = 2.5 V
16 = ⊥

[.... V] = FM
[.... V] = AM







39 902 E12

1052	J15	2648	I16	3180	I11	7081	G 1
1054	J16	2649	H15	3182	D10	7082	D 2
1056	F 3	2650	H15	3183	D10	7083	F 1
1057	G 2	2699	E 6	3184	D 8	7084	E 2
1059	D 5	2701	D 7	3185	F 5	7088	H 2
1061	H 8	2702	C 6	3509	F11	7089	E 2
1064	K10	2703	C 6	3519	F11	7090	F 2
2050	C 2	2704	C 6	3522	E 7	7092	D 2
2051	D 2	2705	C 6	3523	E 8	7102	D 8
2052	D 2	2706	B 6	3542	F 8	7108	F 8
2053	E 2	2707	C 6	3543	E10	7110	B 6
2054	F 2	2708	C 5	3555	E10	7111	B 8
2055	G 2	2709	D 7	3556	E10	7112	C10
2056	F 2	2710	C 8	3557	D11	7113	C 9
2057	F 2	2711	C 8	3558	F11	7114	C11
2058	D 2	2712	C 8	3559	F11	7117	D 4
2071	G 2	2713	C 8	3560	D11	7118	C 9
2072	G 2	2714	C 7	3562	E11	7122	H 5
2073	G 2	2715	C 8	3563	D11	7123	H11
2075	G 2	2717	C 6	3564	E11	7124	H 9
2076	H 2	2801	D 5	3565	E11	7125	D 5
2077	I 2	2802	I10	3568	C11	7158	G 6
2078	F 2	2803	I 9	3569	C11	7159	J 5
2080	B 4	2804	J 9	3645	J16	7160	J 4
2081	D 3	2811	G 3	3647	I15	7161	H 5
2082	E 4	2812	I 9	3649	I16	7170	I10
2083	D 4	2813	I 9	3650	H16	7172	I 9
2084	D 4	3051	F 1	3701	D 6	7180	I10
2085	B 4	3052	H 2	3702	D 7	7182	I 9
2086	C 4	3053	D 2	3703	C 7	7183	H11
2087	D 3	3055	F 3	3704	D 7	7190	H11
2088	B 5	3056	G 2	3705	D 7	7191	I10
2089	C 5	3057	H 2	3707	C 7	7204	E15
2090	B 4	3059	E 2	3706	C 8	7205	E16
2091	B 3	3060	G 3	3709	C 7	7207	F10
2092	C 5	3064	H 2	3710	C 7	7250	E10
2096	D 3	3065	F 3	3711	D 6	7251	E11
2100	E 5	3067	E 2	3712	D 6	7300	I 8
2101	E 5	3069	D 2	3713	C 5	7505	D12
2102	E 3	3070	C 3	3714	D 6	7811	E 4
2103	F 4	3071	B 4	3716	C 6	7816	E 7
2104	F 5	3072	B 5	3717	B 5	7831	C 6
2104	F 5	3073	E 3	3718	B 5	SK A	B15
2105	D 5	3074	E 3	3719	C 6	SK B	C15
2106	E 4	3075	E 3	3720	C 7	SK C	D15
2107	D 6	3076	D 4	3721	B 7		
2108	F 4	3077	C 5	3722	C 7		
2109	F 6	3078	C 5	3723	C 8		
2110	F 4	3079	E 4	3801	J10		
2111	E 5	3081	F 5	3802	J10		
2112	F 4	3086	D 4	3803	H10		
2113	D 5	3087	F 5	3804	I 9		
2118	G 3	3088	G 5	3805	J10		
2119	I 5	3088	G 5	3806	I 9		
2120	G 4	3092	H 5	3807	H11		
2121	G 3	3093	H 4	3808	H 9		
2123	G 4	3094	F 4	3809	I10		
2124	D 6	3095	G 3	3810	J 9		
2130	I 5	3096	D 5	3811	I10		
2131	I 5	3097	D 5	3812	I10		
2132	J 4	3100	G 5	3813	H10		
2133	J 4	3101	I 5	3814	I 9		
2134	H 9	3102	I 5	3815	I 9		
2135	H 9	3103	J 4	3816	I 9		
2136	H 5	3104	J 4	3817	H10		
2138	F 8	3105	H 6	3818	H10		
2144	D 7	3106	H 6	3819	I10		
2145	C 9	3107	H 6	3820	H 9		
2146	D 8	3108	F 8	3821	I11		
2147	D 8	3109	H 5	3822	I11		
2148	D 7	3110	H 6	3823	H10		
2149	E 6	3111	H 5	3830	I 9		
2150	D 7	3112	I 7	5050	D 2		
2151	E 7	3113	I 6	5051	E 2		
2154	E 9	3114	I 6	5052	F 2		
2155	D 9	3115	J 6	5053	G 1		
2156	G10	3116	D 9	5055	B 3		
2157	E 9	3117	E 9	5056	B 3		
2198	H 6	3118	E 9	5057	B 3		
2199	B 7	3119	D 7	5058	B 4		
2200	B 7	3120	D 8	5059	D 3		
2205	D11	3121	E 8	5061	D 4		
2206	B 8	3122	D 7	5062	F 5		
2207	B 7	3123	E 7	5063	F 3		
2208	E 4	3124	F 6	5066	C11		
2209	C10	3125	F 7	5067	G 6		
2210	I 4	3126	E 8	7023	G 3		
2211	B 8	3127	E 6	7024	E 3		
2213	E 4	3128	E 6	7025	F 4		
2214	C 5	3129	D 9	7050	B 3		
2554	F12	3132	E 9	7051	B 3		
2555	F11	3133	E 9	7053	D 4		
2556	E10	3134	G11	7054	C 5		
2557	D10	3135	G11	7055	B 4		
2558	E10	3168	C 9	7056	E 3		
2559	F11	3169	B 8	7057	C 5		
2560	F11	3170	B 9	7059	C 5		
2563	D11	3171	B 7	7070	D 9		
2564	B10	3172	C10	7071	D 8		
2565	C11	3173	E 4	7074	C 8		
2566	D11	3174	I 2	7075	B10		
2570	E11	3175	H 2	7076	H 2		
2571	D10	3176	H 3	7077	H 3		
2604	F11	3177	I 2	7078	H 2		
2614	F11	3178	H 3	7079	H 3		
2647	I16	3179	I 3	7080	E15		

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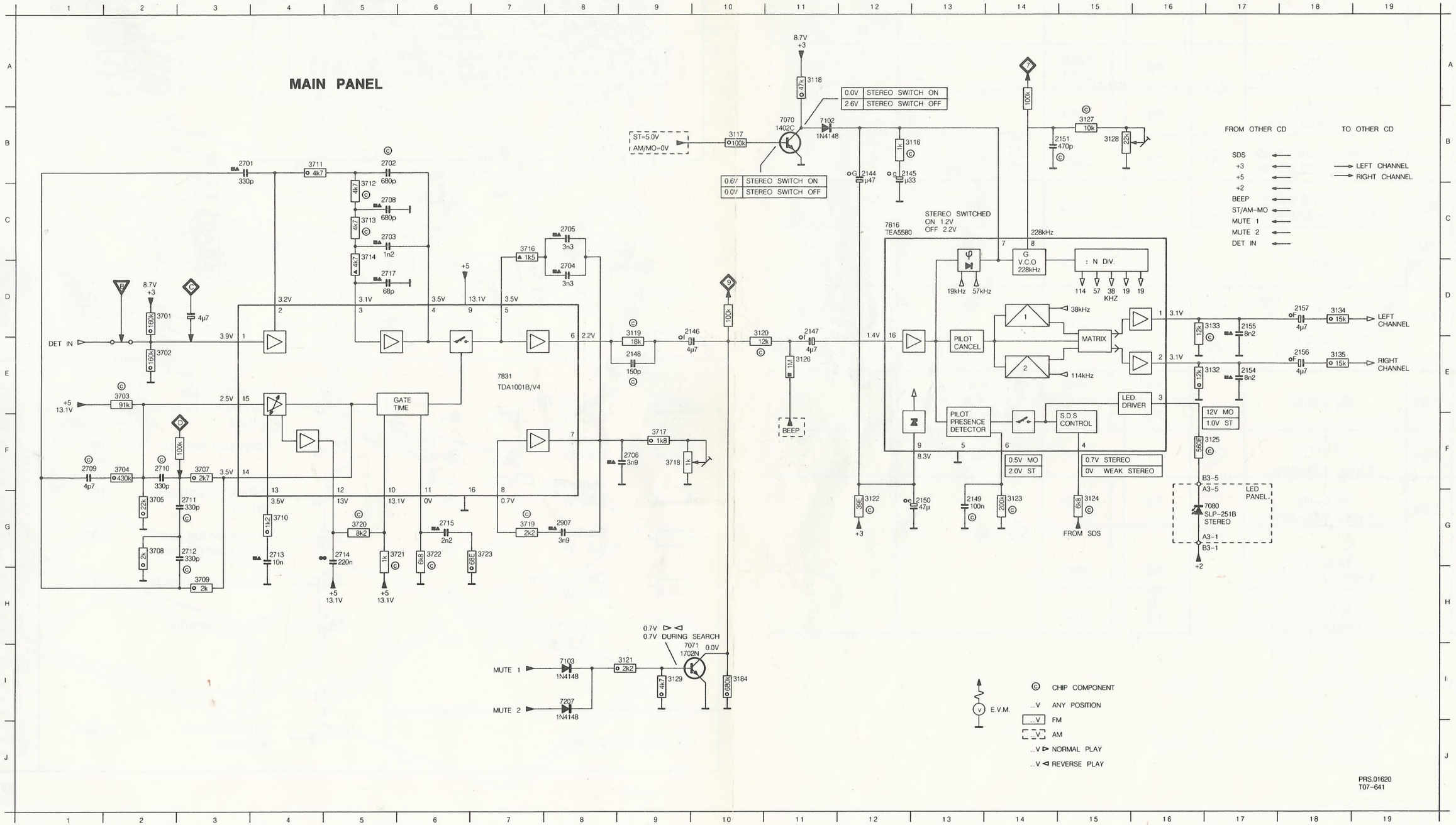
| | | |

2144 B12 2147 D11 2150 G13 2155 D17 2701 B 3 2704 D 8 2708 C 5 2711 G 3 2714 G 5 2907 G 8 3118 A11 3121 I 9 3124 G15 3127 B15 3132 E17 3135 E18 3702 E 2 3705 G 2 3709 H 3 3712 B 5 3716 C 7 3719 G 7 3722 G 6 7071 I 10 7103 I 8 7831 E 7
2145 B13 2148 E 9 2151 B15 2156 E18 2702 B 5 2705 C 8 2709 F 1 2712 G 3 2715 G 6 3116 B13 3119 D 9 3122 G12 3125 F17 3128 B15 3133 D17 3184 I 10 3703 E 2 3707 F 3 3710 G 4 3713 C 5 3717 F 9 3720 G 5 3723 G 7 7080 G17 7207 I 8
2146 D10 2149 G13 2154 E17 2157 D18 2703 C 5 2706 F 9 2710 F 2 2713 G 4 2717 D 5 3117 B10 3120 D10 3123 G14 3126 E11 3129 I 9 3134 D18 3701 D 2 3704 F 2 3708 G 2 3711 B 4 3714 C 5 3718 F 9 3721 G 6 7070 B11 7102 B11 7816 C12



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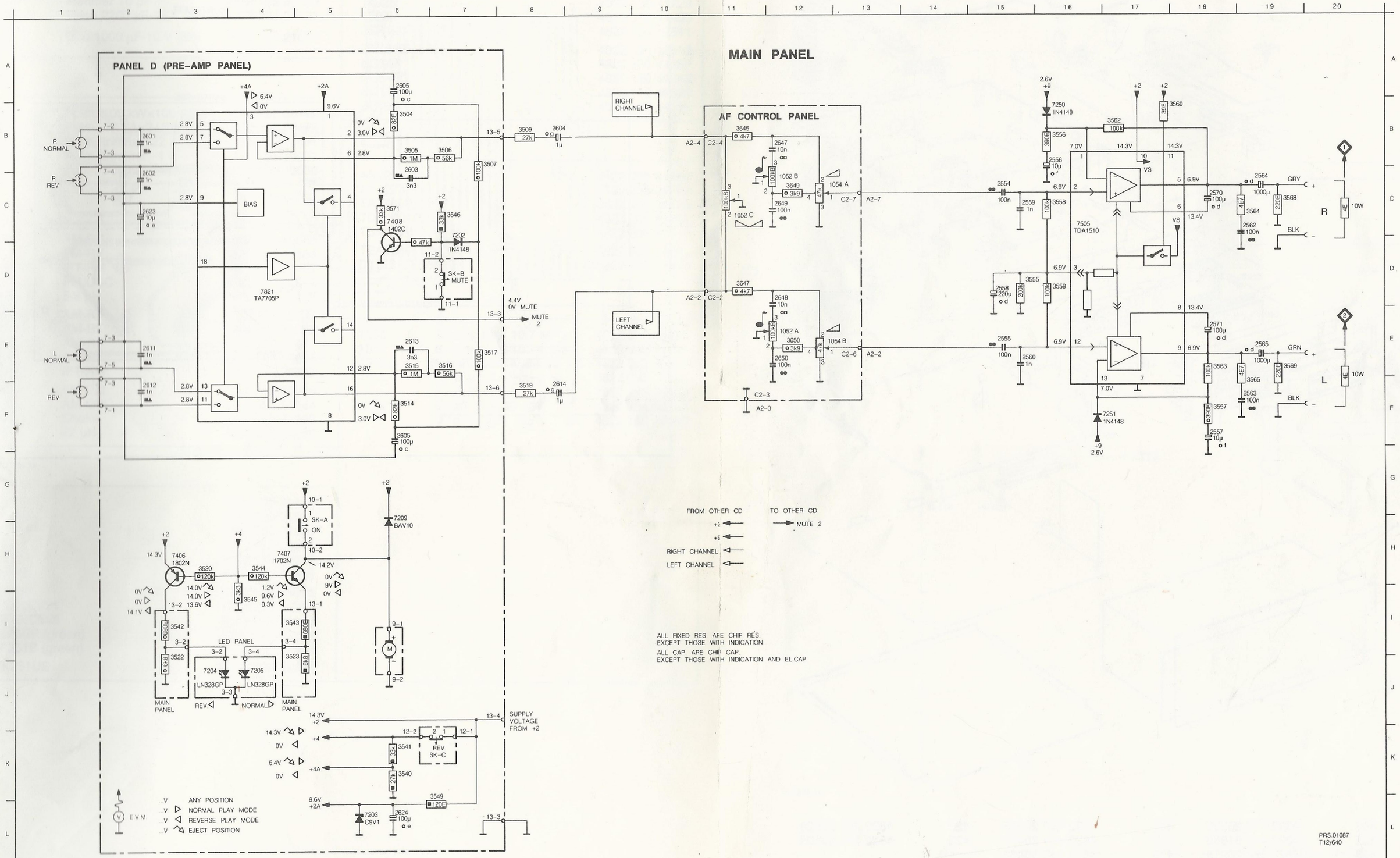
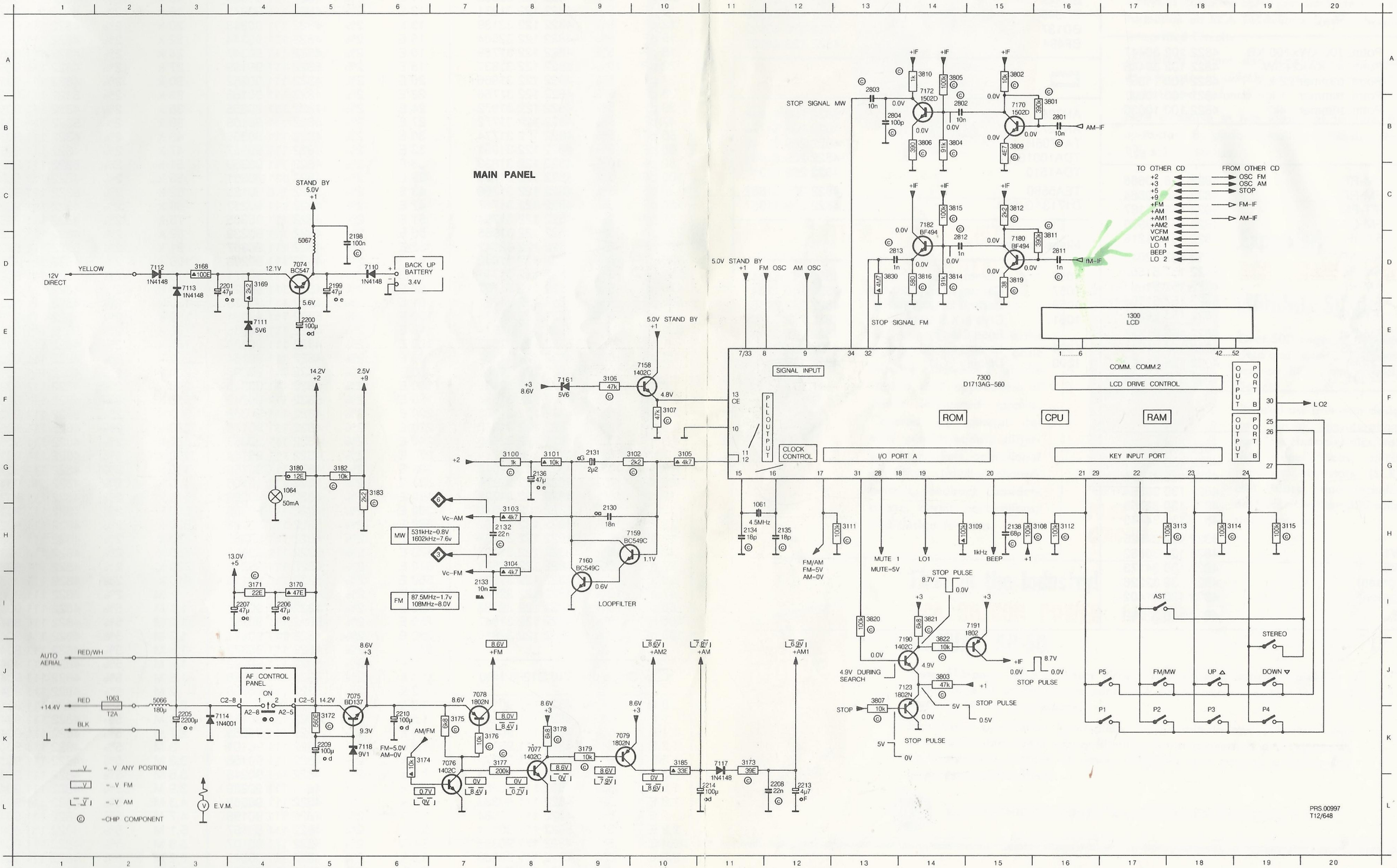
1052	C12	2555	E15	2560	E15	2570	C18	2604	B 8	2613	E 6	2648	D12	3506	B 7	3516	E 7	3523	I 4	3544	H 4	3556	B16	3562	B17	3569	E19	3650	E12	7209	G 6	7408	C 6
1052	C11	2556	B16	2562	C19	2571	E18	2605	A 6	2614	F 8	2649	C12	3507	B 7	3517	E 7	3540	K 6	3545	I 4	3557	F18	3563	E18	3571	C 6	7202	C 7	7250	B16	7505	C16
1054	C12	2557	F18	2563	F19	2601	B 2	2605	F 6	2623	C 2	2650	E12	3509	B 8	3519	F 8	3541	K 6	3546	C 7	3558	C16	3564	C19	3645	B11	7203	L 6	7251	F17	7821	D 4
1054	E12	2558	D15	2564	C19	2602	C 2	2611	E 2	2624	L 6	3504	B 6	3514	F 6	3520	H 3	3542	I 3	3549	K 7	3559	D16	3565	F19	3647	D11	7204	J 3	7406	H 3		

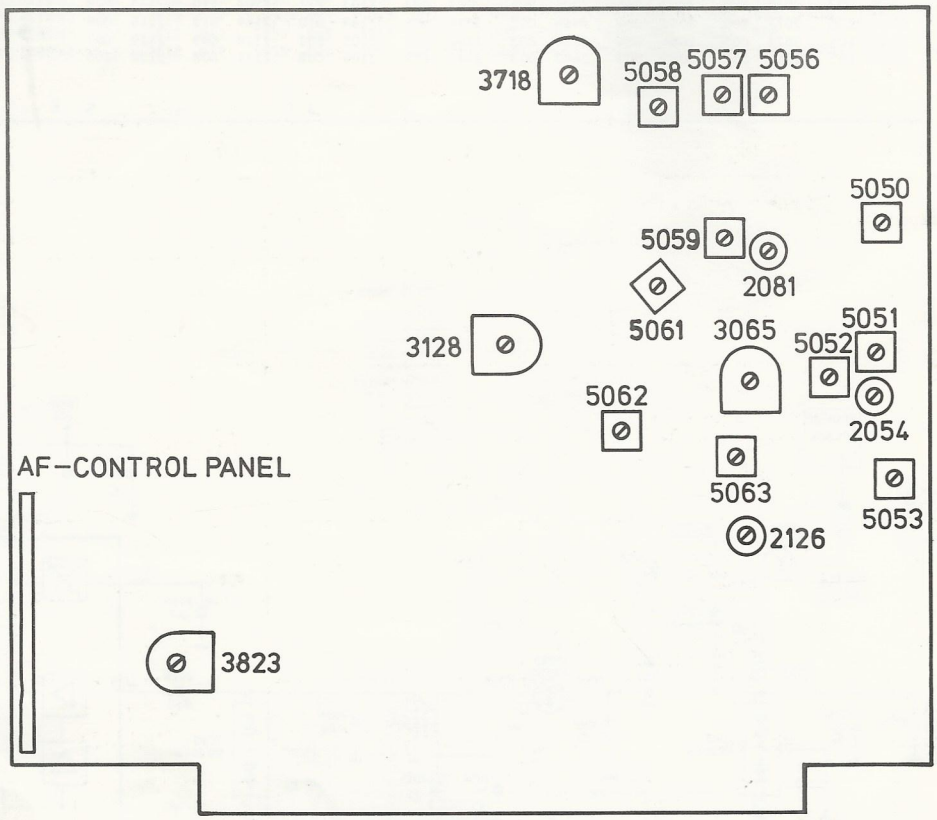


1061	H11	2131	G 9	2136	G 8	2201	D 4	2209	K 5	2802	B14	2813	D13	3104	H 8	3109	H15	3114	H19	3171	I 4	3176	K 7	3182	G 5	3803	J14	3809	B15	3816	D14	3830	D13	7076	K 7	7111	E 4	7118	K 6	7161	F 9	7190	J14
1063	J 2	2132	H 8	2138	H14	2205	K 3	2210	K 6	2803	A13	3100	G 8	3105	G10	3110	H13	3115	H19	3172	K 5	3177	K 8	3183	G 6	3804	B14	3811	D16	3819	D15	5066	J 2	7077	K 8	7112	D 2	7123	J14	7170	B15	7191	I 15
1064	G 4	2133	I 7	2198	D 5	2206	I 4	2213	L12	2804	B13	3101	G 8	3106	F 9	3111	H13	3168	D 3	3173	K11	3178	K 8	3185	K10	3805	A14	3812	C15	3820	I 13	5067	D 5	7078	J 7	7113	D 3	7158	E10	7172	A14	7300	F15
1300	E17	2134	H11	2199	D 5	2207	I 4	2214	L11	2811	D16	3102	G10	3107	F10	3112	H16	3169	D 4	3174	K 6	3179	K 9	3801	B16	3806	B14	3814	D14	3821	I 14	7074	D 5	7079	K 9	7114	K 3	7159	H10	7180	D15		
2130	H 9	2135	H12	2200	E 5	2208	L12	2801	B16	2812	D14	3103	H 8	3108	H16	3113	H18	3170	I 5	3175	K 7	3180	G 5	3802	A15	3807	J13	3815	C14	3822	J14	7075	J 5	7110	D 6	7117	K11	7160	H 9	7182	C14		

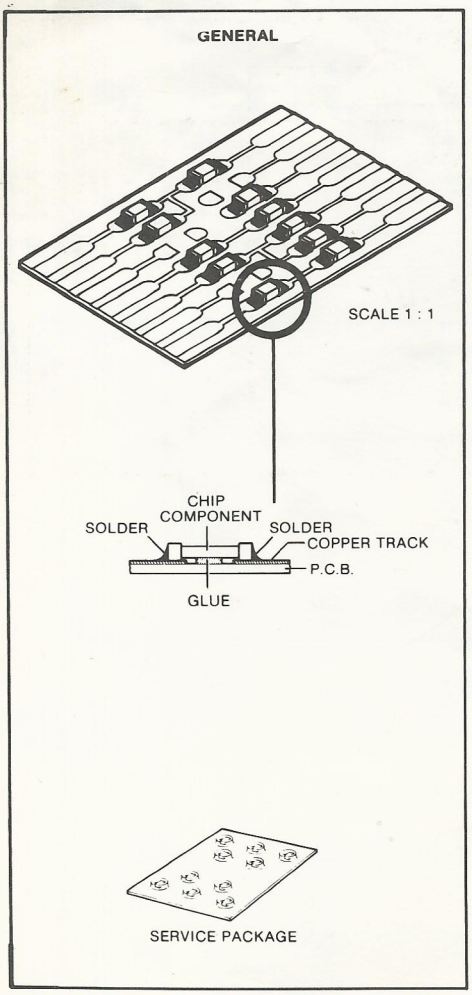


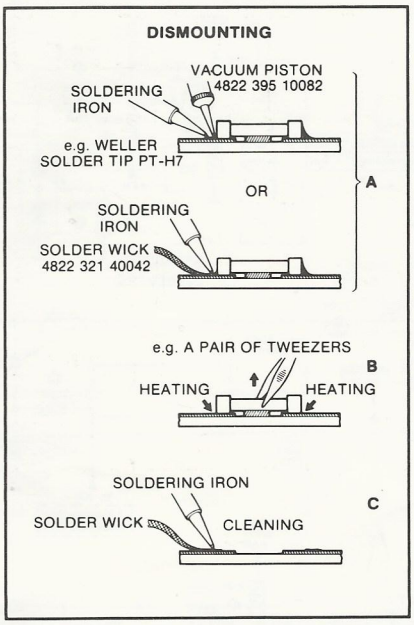
CHECKS (For more information we refer to general alignment procedures)

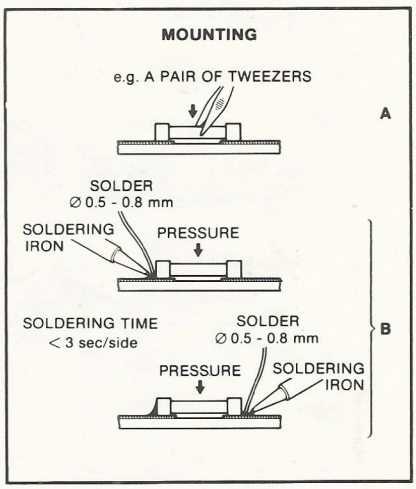
Check	SK				Setting of controls		
α -3 dB	FM	98 MHz : 1 mV 1 kHz, △f=22.5 kHz	A	P3		1 0 dB (=775 mV)	
		98 MHz : 8 μV 1 kHz, △f=22.5 kHz				1 -3 dB	
SDS	FM stereo	98 MHz : 1 mV stereo signal	A	P3	+	1 R: 0 dB 2 L: 0 dB	
		98 MHz : 70 μV stereo –R				2 L- 1 R = 10 dB ±2 dB	
Crosstalk	FM stereo	98 MHz : 1 mV stereo signal	A	P3	+	1 R: 0 dB 2 L: 0 dB	
		98 MHz : 1 mV stereo –R				2 L- 1 R: > 20 dB	
Search level FM	FM	93 MHz : 40 μV ± 5 μV	A	Pres search		display 93 MHz	
IAC	FM	τ, Vp, T B τ =10 μs T=300 μs Vp=50 mV	C				9 25-50 μs B
26 dB	FM	98 MHz : 8 μV 1 kHz, △f=22.5 kHz	A	P3		1 2 V~ (0 dB)	
		98 MHz : 8 μV without mod.				1 -26 dB	
	MW	999 kHz : 180 μV 1 kHz, AM=30%	B	P3		1 2 V~ (0 dB)	
		999 kHz : 180 μV without mod.				1 -26 dB	

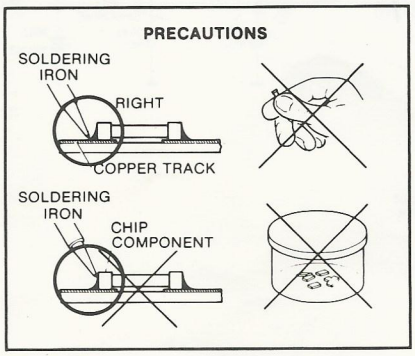


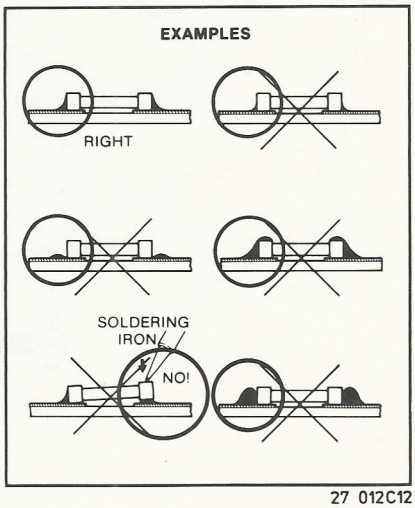
39 903 A12











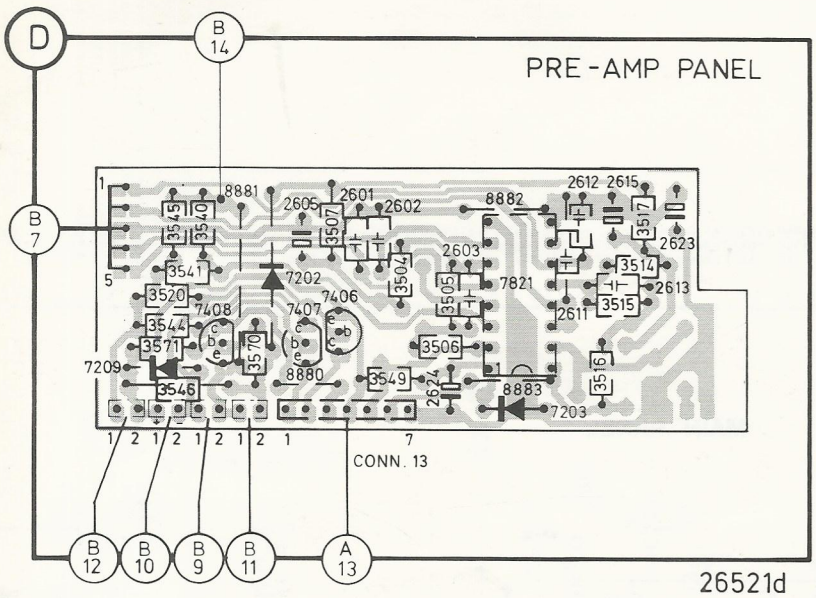
27 012C12

ADJUSTMENTS (For more information we refer to general alignment procedures)

Adjustment	SK						
FM oscillator	FM	No signal		P5	5053	3 8 V⎓	
FM-IF + detektor	FM	93 MHz wobbel 50 Hz, △f=300 kHz	A	P2	5052		5 MAX.
					5062		8 A
FM-RF	FM	93 MHz 1 kHz, △f=22.5 kHz	A	P2	5050 5051	1 max. ~	
		103 MHz 1 kHz, △f=22.5 kHz		P4	2054		
FM search level	FM	98 MHz, 40 µV ± 5 µV 1 kHz, △f=22.5 kHz	A	P3	3823	1 4 5V 0V	
α -3 dB	FM	98 MHz, 8 µV 1 kHz, △f=22.5 kHz	A	P3	3065	1 -3 dB	
VCO stereo decoder	FM stereo	No signal			3128	7 228 kHz ± 0.5 kHz	
IAC 19 kHz	FM	19 kHz : 250 mV B	C		3718		to X-input time base B 20 µs/cm 9
		f= 5 kHz V_0=1.5 V	D				
MW-oscillator	MW	No signal		P1	5063	6 0.8 V⎓	
				P5	2121	6 8.5 V⎓	
AM-IF	MW	531 kHz 1 kHz, AM=30%	B	P1	5061	1 max.~	
MW-RF	MW	603 kHz 1 kHz, AM=30%	B	P2	5059	1 max.~	
		1449 kHz 1 kHz, AM=30%		P4	2081		
		1602 kHz 1 kHz, AM=30%		P5	5057		

↕ Repeat

1 LO1 = 0 V, LO2 = 0 V



7821

1	=	9.6V	9	=	2.8V
2	=	3.0V	10	=	-
3	=	6.4V	11	=	2.8V
4	=	3.0V	12	=	2.8V
5	=	2.8V	13	=	2.8V
6	=	2.8V	14	=	3.0V
7	=	2.8V	15	=	3.4V
8	=	⊥	16	=	3.0V

7406

e	=	14.3V	-
b	=	14.0V ▷	13.6V ◁
c	=	0 V ▷	14.1V ◁

7407

e	=	9.2V ▷	0 V ◁
b	=	8.5V ▷	0.3V ◁
c	=	14.2V	-

7408

e	=	⊥
b	=	-
c	=	4.4V

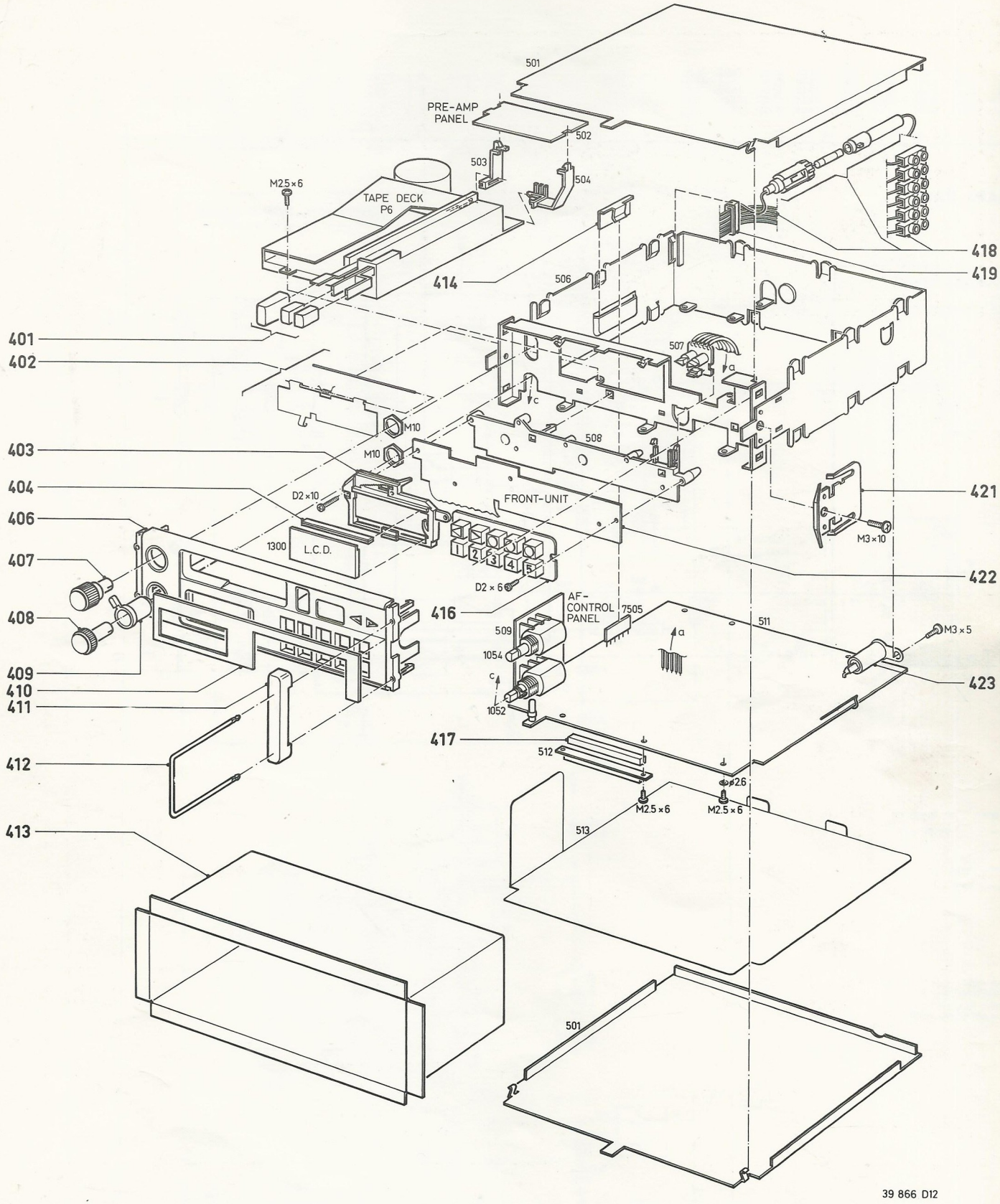
▲	Carbon film 0.2 W	70°C	5%
□	Carbon film 0.33 W	70°C	5%
■	Metal film 0.33 W	70°C	5%
●	Carbon film 0.5 W	70°C	5%
▨	Carbon film 0.67 W	70°C	5%
◪	Carbon film 1.15 W	70°C	5%

Ⓒ Chip component

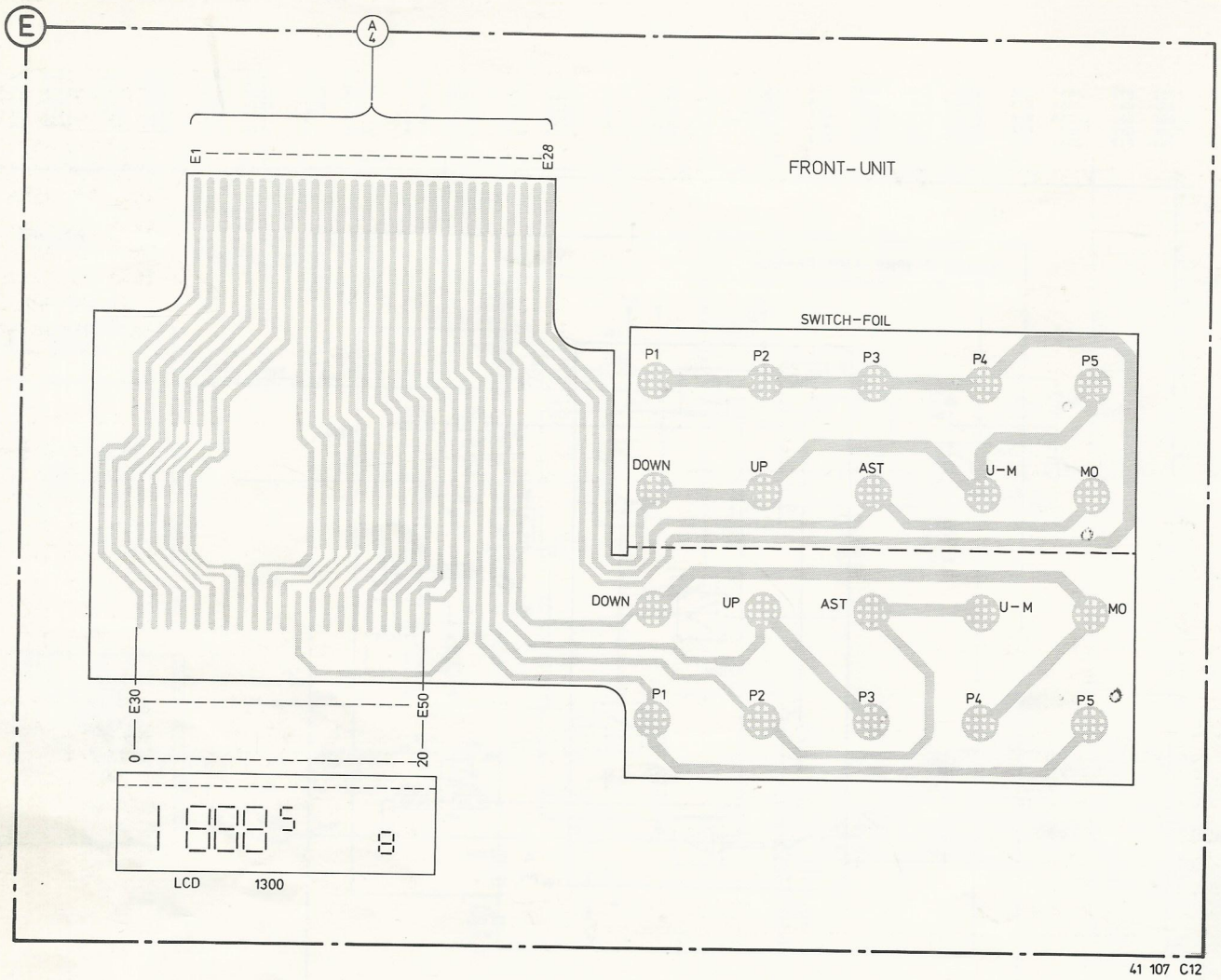
△△*	Ceramic plate Tuning ≤ 120 pF NP.0	2%
	Others	—20/+80%
●●*	Polyester flat foil	10%
□*	Metalized polyester flat film	10%
○□*	Polyester flat foil small size (Mylar)	10%
○△*	Polysterene film/foil	1%
■▲*	Tubular ceramic	
○*	Miniature single	
○○*	Subminiature tantalum	± 20%

*a	=	2,5 V
b	=	4 V
c	=	6,3 V
d	=	10 V
e	=	16 V
f	=	25 V
g	=	40 V
h	=	63 V
j	=	100 V
l	=	125 V
m	=	150 V
n	=	160 V
q	=	200 V
r	=	250 V
s	=	300 V
t	=	350 V
u	=	400 V
v	=	500 V
w	=	630 V
x	=	1000 V
A	=	1,6 V
B	=	6 V
C	=	12 V
D	=	15 V
E	=	20 V
F	=	35 V
G	=	50 V
H	=	75 V
I	=	80 V

27 037A/C



401	4822 410 25296	411	4822 460 20645	422	4822 466 10526
402	4822 443 61869	412	4822 404 20437	423	4822 266 20103
403	4822 380 20216	413	4822 443 30463		
404	4822 466 61174	414	4822 255 40528		
406	4822 460 20646	416	4822 410 90083		
407	4822 413 31408	417	4822 466 61173		
408	4822 413 31409	418 /00/38	4822 321 21783		
409	4822 413 31411	/68T	4822 321 22283		
410 /00/38	4822 460 20644	419	4822 403 52901		
/68T	4822 460 20678	421	4822 492 90087		


E
A
4
E1
E28
FRONT-UNIT
SWITCH-FOIL
P1
P2
P3
P4
P5
DOWN
UP
AST
U-M
MO
DOWN
UP
AST
U-M
MO
P1
P2
P3
P4
P5
E30
E50
0
20
LCD
1300

41 107 C12

2054	Trimmer 10 pF	4822 125 50199
2081	Trimmer 20 pF	4822 125 50201
2121	Trimmer 10 pF	4822 125 50199
2205	Eleco 2200 µF-16 V 20%	4822 124 21681
2564 } 2565 }	Elco 1000 µF-10 V 20%	4822 124 21694

1052	Potm. 100 kW×100 KB	4822 102 30447
1054	Potm. 47 KA×2+SW	4822 102 30446
3128	Potm. trimmer 22 k	4822 100 10051
3718	Potm. trimmer 1 k	4822 100 10037
3823	Potm. trimmer 4k7	4822 100 10036

5050	FM-RF	4822 156 10666
5051	FM-RF	4822 156 10664
5052	IFT-FM	4822 156 21167
5053	FM OSC	4822 157 50973
5055	5.6 µH	4822 157 51216
5056	AM-RF	4822 157 52047
5057	AM-RF	4822 157 51509
5058	AM-RF	4822 157 51061
5059	AM-RF	4822 157 51505
5061	IFT-AM	4822 153 20233
5062	FM-Det	4822 156 21328
5063	AM-OSC	4822 157 51844
5066	Choke	4822 156 21109
5067	22 µH	4822 157 52286

1N4001	4822 130 31438
1N4148	4822 130 30621
BA482	4822 130 34955
BAV10	4822 130 30594
BB112	4822 130 32159
BB204B	4822 130 34449
BB204G	5322 130 34825
BZX79/C9V1	4822 130 30862
BZX79/C5V6	4822 130 34173
LN328GP (green)	4822 130 32226
SLP251B (green)	4822 130 31402
2-1K261UE	4822 130 32299

1402C	4822 130 40937
1502D	4822 130 44195
1702N	4822 130 41729
1802N	4822 130 41456
2SK193	4822 130 42511
2SK519	4822 130 42512
BC547	4822 130 44257
BC549C	4822 130 44246
BD137	4822 130 40823
BF494	4822 130 44195

AN7254	4822 209 81944
AN7273	4822 209 81773
TA7705P	4822 209 82116
TDA1001B/V4	4822 209 81462
TDA1510	4822 209 81317
TEA5580	4822 209 81882
D1713AG-560	4822 209 11357

Miscellaneous

1056	Ceram. filter 10.7 MHz	4822 242 71341
1057	Ceram. filter 10.7 MHz	4822 242 71341
1059	Ceram. filter 468 kHz	4822 242 70763
1061	Crystal 4.5 MHz	4822 242 70761
	Fuse 2 A (T)	4822 253 30025
1064	Lamp 14 V 80 mA	4822 134 40757
1300	Display LCD	4822 130 90363

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1 pF	5%	4822 122 32479
1,5 pF	5%	4822 122 31792
1,8 pF	5%	4822 122 32087
2,2 pF	5%	4822 122 32425
3,3 pF	5%	4822 122 32079
3,9 pF	5%	4822 122 32081
4,7 pF	5%	4822 122 32082
5,6 pF	5%	4822 122 32506
6,8 pF	5%	4822 122 32507
8,2 pF	5%	4822 122 32083
10 pF	5%	4822 122 31971
12 pF	5%	4822 122 32139
15 pF	5%	4822 122 32504
18 pF	5%	4822 122 31769
22 pF	10%	4822 122 31837
27 pF	5%	4822 122 31966
33 pF	5%	4822 122 31756
39 pF	5%	4822 122 31972
47 pF	5%	4822 122 31772
56 pF	5%	4822 122 31774
68 pF	5%	4822 122 31961
82 pF	10%	4822 122 31839
100 pF	5%	4822 122 31765
120 pF	5%	4822 122 31766
150 pF	5%	4822 122 31767
180 pF	2%	4822 122 31794
220 pF	5%	4822 122 31965
270 pF	5%	4822 122 32142
330 pF	10%	4822 122 31642
390 pF	5%	4822 122 31771
470 pF	5%	4822 122 31727
560 pF	5%	4822 122 31773
680 pF	5%	4822 122 31775
820 pF	5%	4822 122 31974
1 nF	10%	5322 122 31647
1,2 nF	5%	4822 122 31807
1,5 nF	10%	4822 122 31781
1,8 nF	10%	4822 122 32153
2,2 nF	10%	4822 122 31644
2,7 nF	10%	4822 122 31783
3,3 nF	10%	4822 122 31969
3,9 nF	10%	4822 122 32566
4,7 nF	10%	4822 122 31784
5,6 nF	10%	4822 122 31916
6,8 nF	10%	4822 122 31976
10 nF	10%	4822 122 31728
12 nF	10%	5322 122 31648
15 nF	10%	4822 122 31782
18 nF	10%	4822 122 31759
22 nF	10%	4822 122 31797
27 nF	10%	4822 122 32541
33 nF	10%	4822 122 31981
47 nF	10%	4822 122 32542
56 nF	10%	4822 122 32183
100 nF	10%	4822 122 31947
180 nF	10%	4822 122 32915

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0 E	jumper	4822 111 90163
1 E	5%	4822 111 90184
1,1 E	5%	4822 111 90377
1,2 E	5%	4822 111 90378
1,3 E	5%	4822 111 90379
1,5 E	5%	4822 111 90381
1,6 E	5%	4822 111 90382
1,8 E	5%	4822 111 90383
2 E	5%	4822 111 90384
2,2 E	5%	5322 111 90104
2,4 E	5%	4822 111 90385
2,7 E	5%	4822 111 90386
3 E	5%	4822 111 90387
3,3 E	5%	4822 111 90388
3,6 E	5%	4822 111 90389
3,9 E	5%	4822 111 90391
4,3 E	5%	4822 111 90392

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4,7 E	5%	5322 111 90376
5,1 E	5%	4822 111 90393
5,6 E	5%	4822 111 90394
6,2 E	5%	4822 111 90395
6,8 E	5%	4822 111 90254
7,5 E	5%	4822 111 90396
8,2 E	5%	4822 111 90397
9,1 E	5%	4822 111 90398
10 E	2%	5322 111 90095
11 E	2%	4822 111 90338
12 E	2%	4822 111 90341
13 E	2%	4822 111 90343
15 E	2%	4822 111 90344
16 E	2%	4822 111 90347
18 E	2%	5322 111 90139
20 E	2%	4822 111 90352
22 E	2%	4822 111 90186
24 E	2%	4822 111 90355
27 E	2%	5322 111 90105
30 E	2%	4822 111 90356
33 E	2%	4822 111 90357
36 E	2%	4822 111 90359
39 E	2%	4822 111 90361
43 E	2%	5322 116 90125
47 E	2%	4822 111 90217
51 E	2%	4822 111 90365
56 E	2%	4822 111 90239
62 E	2%	4822 111 90367
68 E	2%	4822 111 90203
75 E	2%	4822 111 90371
82 E	2%	4822 111 90124
91 E	2%	4822 111 90375
100 E	2%	5322 111 90091
110 E	2%	4822 111 90335
120 E	2%	4822 111 90339
130 E	2%	4822 111 90164
150 E	2%	5322 111 90098
160 E	2%	4822 111 90345
180 E	2%	5322 111 90242
200 E	2%	4822 111 90348
220 E	2%	4822 111 90178
240 E	2%	4822 111 90353
270 E	2%	4822 111 90154
300 E	2%	4822 111 90156
330 E	2%	5322 111 90106
360 E	1%	4822 111 90288
360 E	2%	4822 111 90358
390 E	2%	5322 111 90138
430 E	2%	4822 111 90362
470 E	2%	5322 111 90109
510 E	2%	4822 111 90245
560 E	2%	5322 111 90113
620 E	2%	4822 111 90366
680 E	2%	4822 111 90162
750 E	2%	5322 111 90306
820 E	2%	4822 111 90171
910 E	2%	4822 111 90372
1 k	2%	5322 111 90092
1,1 k	2%	4822 111 90336
1,2 k	2%	5322 111 90096
1,3 k	2%	4822 111 90244
1,5 k	2%	4822 111 90151
1,6 k	2%	5322 111 90265
1,8 k	2%	5322 111 90101
2 k	2%	4822 111 90165
2,2 k	2%	4822 111 90248
2,4 k	2%	4822 111 90289
2,7 k	2%	4822 111 90569
3 k	2%	4822 111 90198
3,3 k	2%	4822 111 90157
3,6 k	2%	5322 111 90107
3,9 k	2%	4822 111 90571
4,3 k	2%	4822 111 90167
4,7 k	2%	5322 111 90111
5,1 k	2%	5322 111 90268
5,6 k	2%	4822 111 90572
6,2 k	2%	4822 111 90545

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6,8 k	2%	4822 111 90544
7,5 k	2%	4822 111 90276
8,2 k	2%	5322 111 90118
9,1 k	2%	4822 111 90373
10 k	2%	4822 111 90249
11 k	2%	4822 111 90337
12 k	2%	4822 111 90253
13 k	2%	4822 111 90509
15 k	2%	4822 111 90196
16 k	2%	4822 111 90346
18 k	2%	4822 111 90238
20 k	2%	4822 111 90349
22 k	2%	4822 111 90251
24 k	2%	4822 111 90512
27 k	2%	4822 111 90542
30 k	2%	4822 111 90216
33 k	2%	5322 111 90267
36 k	2%	4822 111 90514
39 k	2%	5322 111 90108
43 k	2%	4822 111 90363
47 k	2%	4822 111 90543
51 k	2%	5322 111 90274
56 k	2%	4822 111 90573
62 k	2%	5322 111 90275
68 k	2%	4822 111 90202
75 k	2%	4822 111 90574
82 k	2%	4822 111 90575
91 k	2%	5322 111 90277
100 k	2%	4822 111 90214
110 k	2%	5322 111 90269
120 k	2%	4822 111 90568
130 k	2%	4822 111 90511
150 k	2%	5322 111 90099
160 k	2%	5322 111 90264
180 k	2%	4822 111 90565
200 k	2%	4822 111 90351
220 k	2%	4822 111 90197
240 k	2%	4822 111 90215
270 k	2%	4822 111 90302
300 k	2%	5322 111 90266
330 k	2%	4822 111 90513
360 k	2%	4822 111 90515
390 k	2%	4822 111 90182
430 k	2%	4822 111 90168
470 k	2%	4822 111 90161
510 k	2%	4822 111 90364
560 k	2%	4822 111 90169
620 k	2%	4822 111 90213
680 k	2%	4822 111 90368
750 k	2%	4822 111 90369
820 k	2%	4822 111 90205
910 k	2%	4822 111 90374
1 M	2%	4822 111 90252
1,1 M	5%	4822 111 90408
1,2 M	5%	4822 111 90409
1,3 M	5%	4822 111 90411
1,5 M	5%	4822 111 90412
1,6 M	5%	4822 111 90413
1,8 M	5%	4822 111 90414
2 M	5%	4822 111 90415
2,2 M	5%	4822 111 90185
2,4 M	5%	4822 111 90416
2,7 M	5%	4822 111 90417
3 M	5%	4822 111 90418
3,3 M	5%	4822 111 90191
3,6 M	5%	4822 111 90419
3,9 M	5%	4822 111 90421
4,3 M	5%	4822 111 90422
4,7 M	5%	4822 111 90423
5,1 M	5%	4822 111 90424
5,6 M	5%	4822 111 90425
6,2 M	5%	4822 111 90426
6,8 M	5%	4822 111 90235
7,5 M	5%	4822 111 90427
8,2 M	5%	4822 111 90237
9,1 M	5%	4822 111 90428
10M	5%	5322 111 91141