

# Service Service Service

## RTV servis Horvat

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Croatia



39 545 A12

For Servicing Information as regard to the:

-Cassette mechanisms refer to Service Manual  
"Tape Transport RT76, "Tape Transports RT74".  
-Record Player refer to service Manual "Record player Q510AR".  
-Loudspeakers refer to 70FB152/11R for F1664/30/35  
70FB250/11R for F1664/32  
70FB360/11R for F1667/32/43

# Service Manual

(GB)

## TECHNICAL DATA

Power supply voltages

Power consumption

Dimensions

Wave ranges:

FM

MW

LW

Sensitivity:

$\Delta f$  75 kHz FM

600 kHz AM

IF: FM

IF: AM

Aerial input

Input CD/TV

Output power (at 4  $\Omega$  load)

Output impedance

Output impedance of  
headphones

Cassette deck

Speed

Wow and flutter

Record player

Speed

Wow and flutter

(NL)

## SPECIFICATIES

Voedingsspanningen

Opgenomen vermogen

Afmetingen

Golfbereiken:

FM

MW

LW

Gevoeligheid:

$\Delta f$  75 kHz FM

600 kHz AM

IF: FM

IF: AM

Antenne ingang

Ingang CD/TV

Uitgangsvermogen (4  $\Omega$ )

Uitgangsimpedantie

Uitgangsimpedantie  
hoofdtelefoon

Recorder

Snelheid

Wow and flutter

Platenspeler

Snelheid

Wow and flutter

(F)

## SPECIFICATIONS

Alimentation

Puissance absorbée

Dimensions

Gammes d'ondes:

FM

PO

GO

Sensibilité:

$\Delta f$  75 kHz FM

600 kHz AM

IF: FM

IF: AM

Impédance d'antenne

entrée CD/TV

Puissance de sortie (4  $\Omega$ )

Impédance de sortie

Impédance de sortie  
écouteurs

Magnétophone

Vitesse

Pleurage et scintillement

Tourne-disque

Vitesse

Pleurage et scintillement

(D)

## TECHNISCHE DATEN

Versorgungsspannungen

: 220 V, 110 V (127, 240 V  
Service solution)  
50/60 Hz~

Leistungsaufnahme

:  $\leq$  55 W (F1664)  
 $\leq$  65 W (F1667)

Abmessungen

: 340x360x320 (hxxwxd)

Wellenbereiche:

UKW

: 87.5 - 108 MHz

MW

: 513 - 1611 kHz

LW

: 146 - 263 kHz

Empfindlichkeit:

$\Delta f$  75 kHz FM

600 kHz AM

IF: FM

IF: AM

Antennen-Impedanz

Eingang CD/TV

Ausgangsleistung (4  $\Omega$ )

: ( 3  $\mu$ V mono, 26 dB SN)  
(60  $\mu$ V stereo, 46 dB SN)  
(1400  $\mu$ V/m for 26 dB SN)

: 10.7 MHz

: 450 kHz

: 300  $\Omega$

: 700 mV (47 k $\Omega$ )

: 2 x 7.5 W (1 kHz) D $\leq$  10% (F1664)  
: 2 x 9 W (1 kHz) D $\leq$  10% (F1667)

Ausgangsimpedanz

Kopfhörer-Ausgangs-  
impedanz

: 4  $\Omega$

: 4-1000  $\Omega$

Recorder

Geschwindigkeit

: 4.76 cm/sec  $\pm$  0.5%

Gleichlaufschwankungen

:  $\leq$  0.2 %

Plattenspieler

Geschwindigkeit

: 33 1/3 - 45 r.p.m.

Gleichlaufschwankungen

:  $\leq$  0.3 %

### Attention

This set is equipped with microprocessors having built-in test programmes.

For this test programme and the corresponding repair manual, see page CS 4 053 of this documentation.

### Attentie

Dit apparaat is uitgerust met microprocessors met een ingebouwd testprogramma.

Zie voor dit testprogramma en de bijbehorende reparatiehandleidingen pagina CS 4 053 van deze documentatie

### Attention

Cet appareil est équipé de microprocesseurs ayant un programme de test incorporé.

Se référer à la page CS 4 053 de cette Documentation pour ce qui concerne ce programme de test et la méthode de réparation qui s'y rapporte.

### Achtung!

Dieses Gerät ist mit Mikroprozessoren mit einem eingebauten Prüfprogramm ausgestattet.

Für dieses Prüfprogramm und die zugehörige Reparaturanleitung siehe Seite CS 4 053 dieser Dokumentation.



TOP VIEW

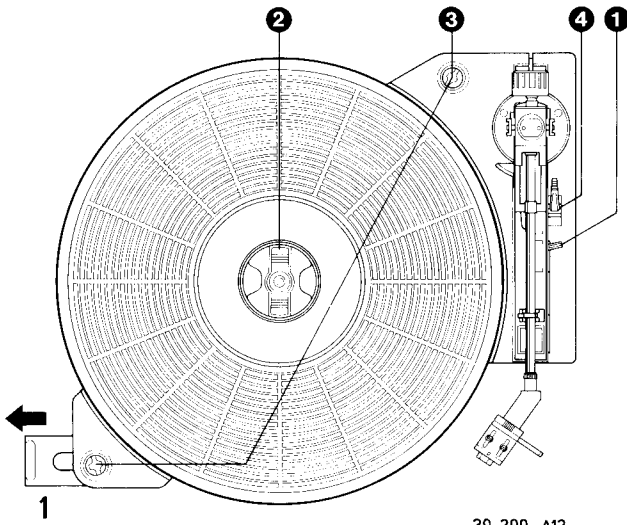


Fig. 1

39 299 A12

FRONT VIEW

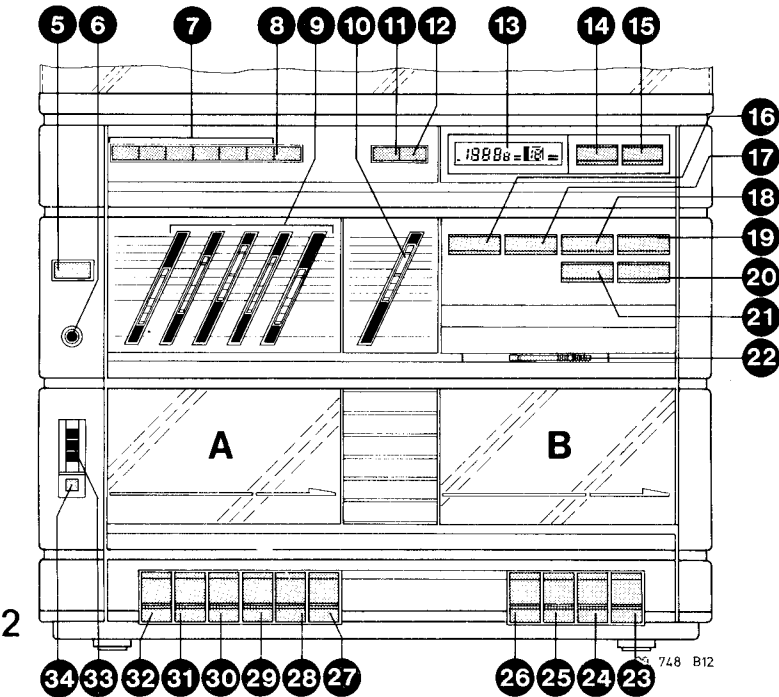


Fig. 2

748 B12

REAR VIEW

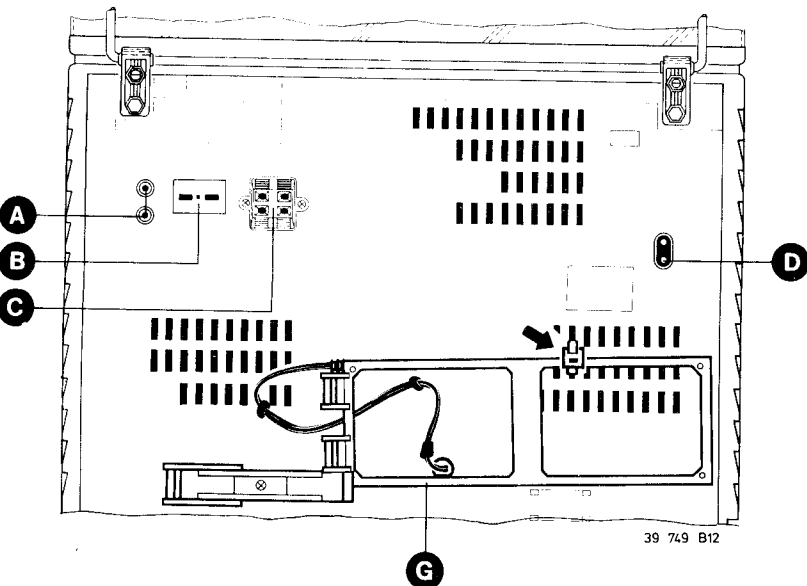


Fig. 3

39 749 B12

CONTROLS

- 1 Speed selector
- 2 Adapter for 45 rpm. records
- 3 Transit screws
- 4 Cue lever
- 5 'POWER' On/Off switch
- 6 Headphone socket BU-5
- 7 Pre-sets
- 8 Programming key 'MEMORY'
- 9 'GRAPHIC EQUALIZER'
- 10 'BALANCE'
- 11 AM/FM selection
- 12 LW/MW selection
- 13 Display
- 14 Key 'DOWN'
- 15 Key 'UP'
- 16 'MONO/RIF' mono stereo selection
- 17 Tape type selector (recorder A)
- 18 Tape type selector (recorder B)
- 19 'DUBBING'
- 20 'TAPE', 'TUNER', 'CD.TV'
- 21 'PHONO', 'TUNER', 'CD.TV'
- 22 'VOLUME'
- 23 'PLAY'
- 24 'STOP/EJECT'
- 25 'WIND'
- 26 'REWIND'
- 27 'PAUSE'
- 28 'PLAY'
- 29 'STOP/EJECT'
- 30 'WIND'
- 31 'REWIND'
- 32 'RECORD'
- 33 'COUNTER'
- 34 'RESET'

SOCKETS

- A 'AUX' terminal sockets
- B FM aerial, 300 Ohms
- C Loudspeaker terminals
- D Mains connection socket

**Servicing hints**

- 1 Demounting  
See Fig. 4
- 2 Replacing PU cartridge  
See Fig. 5
- 3 Remove Record player  
See Fig. 6
- 4 Chip handling  
See Fig. 7
- 5 Service position "RF panel"  
See Fig. 8
- 6 Microprocessor check  
See next page

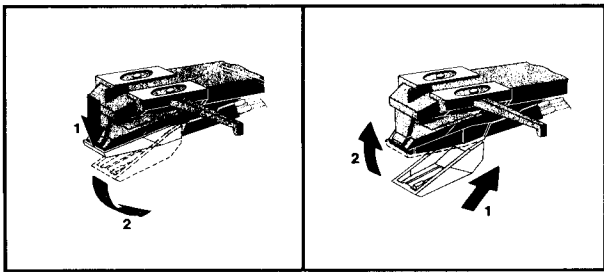


Fig. 5

38 217 A12

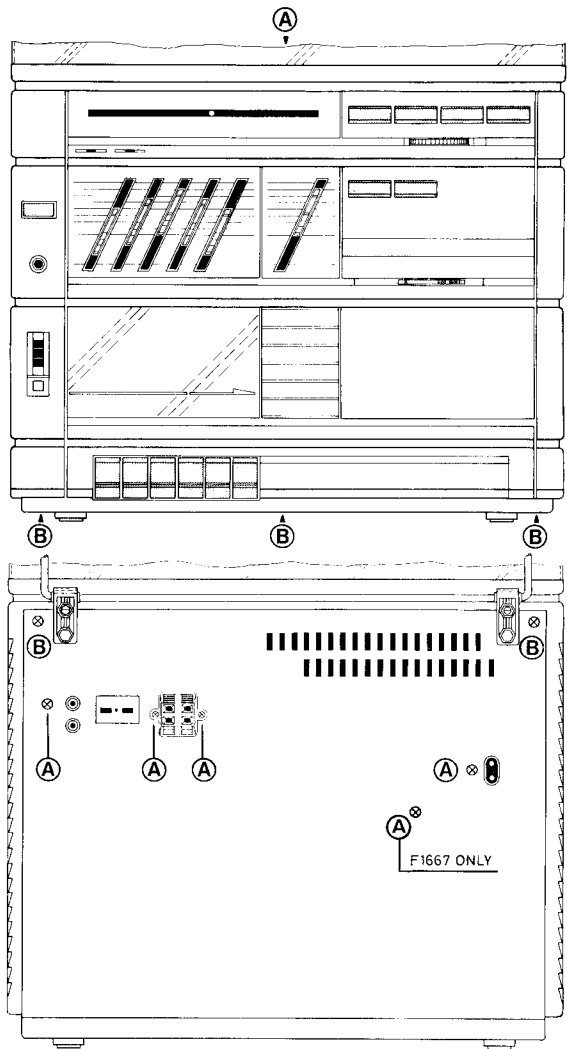


Fig. 4

40 018 B12

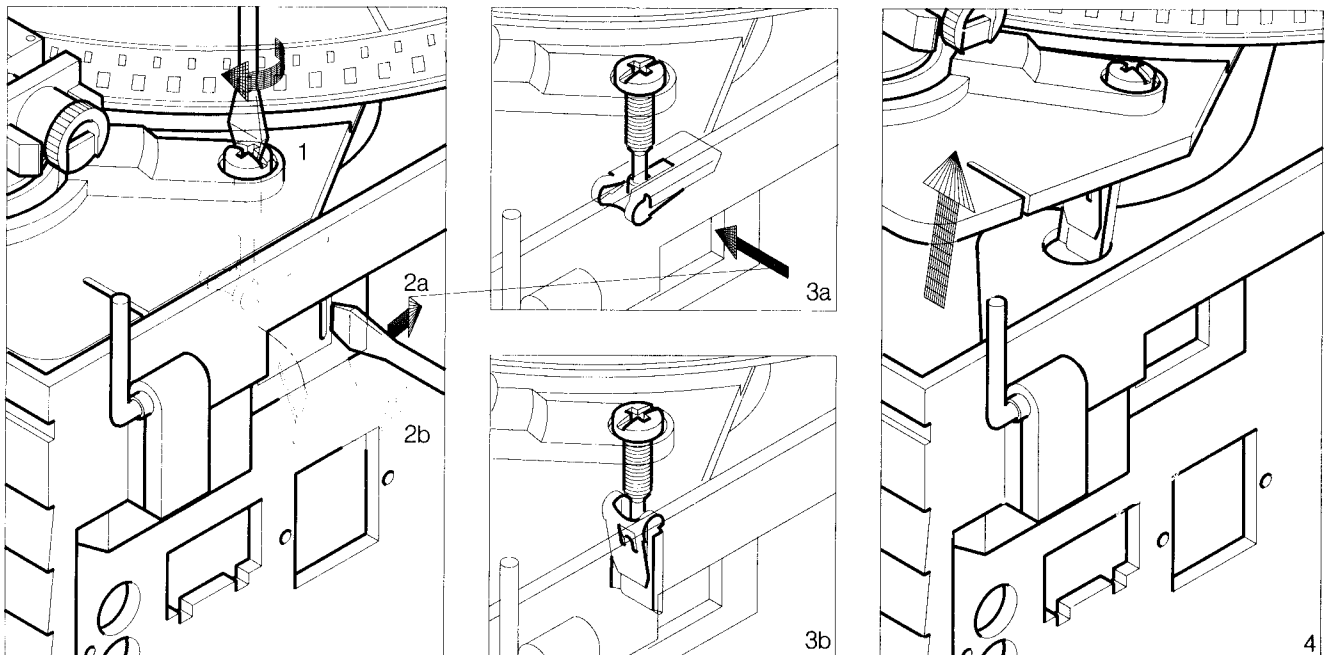
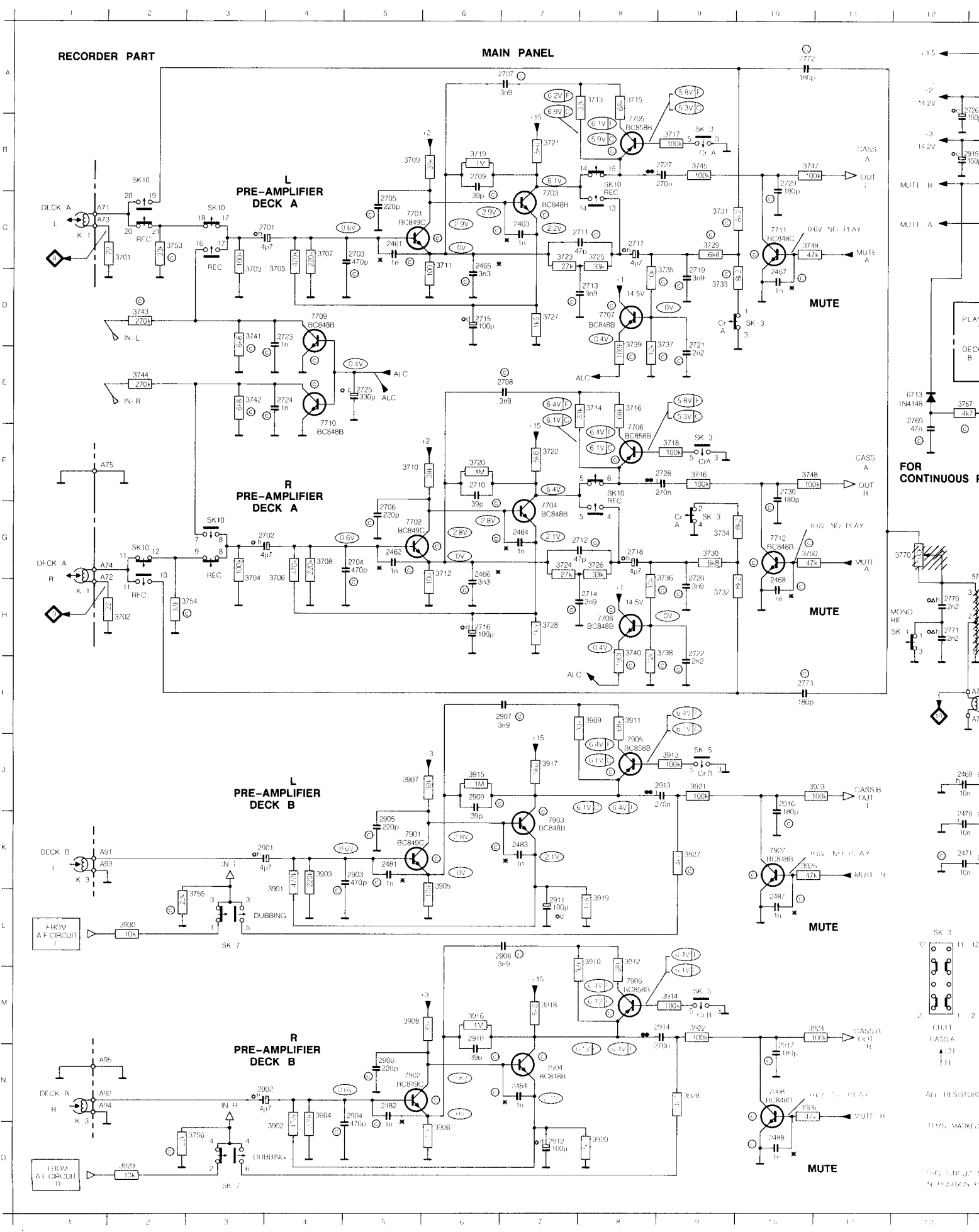
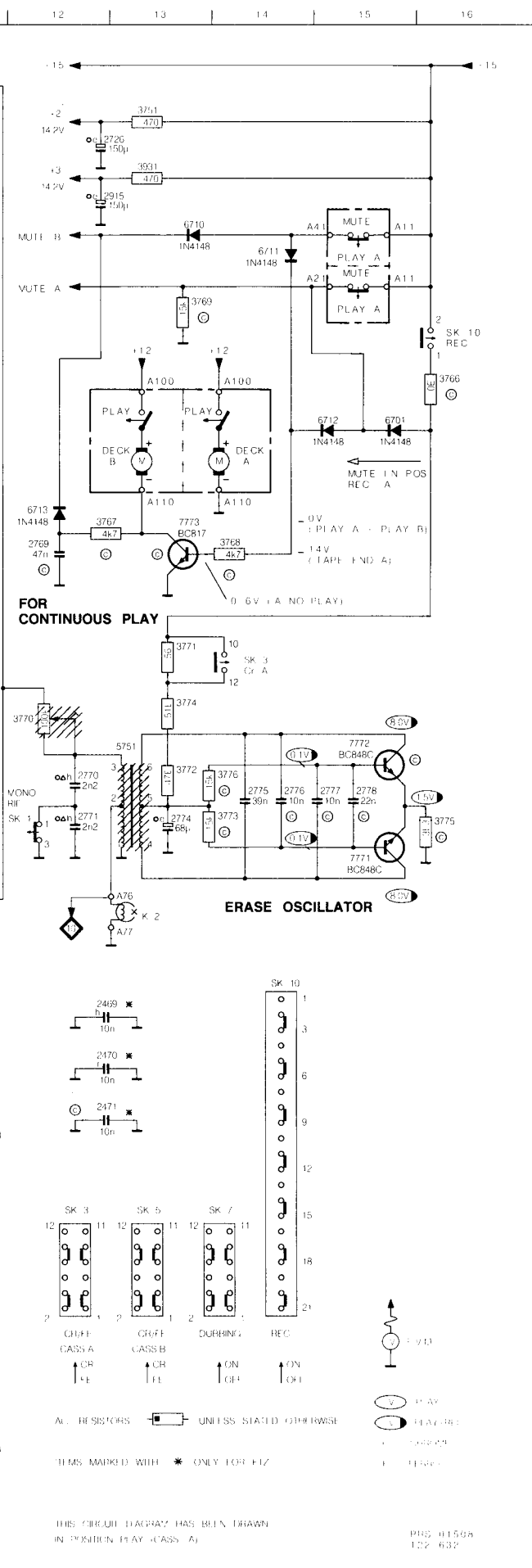
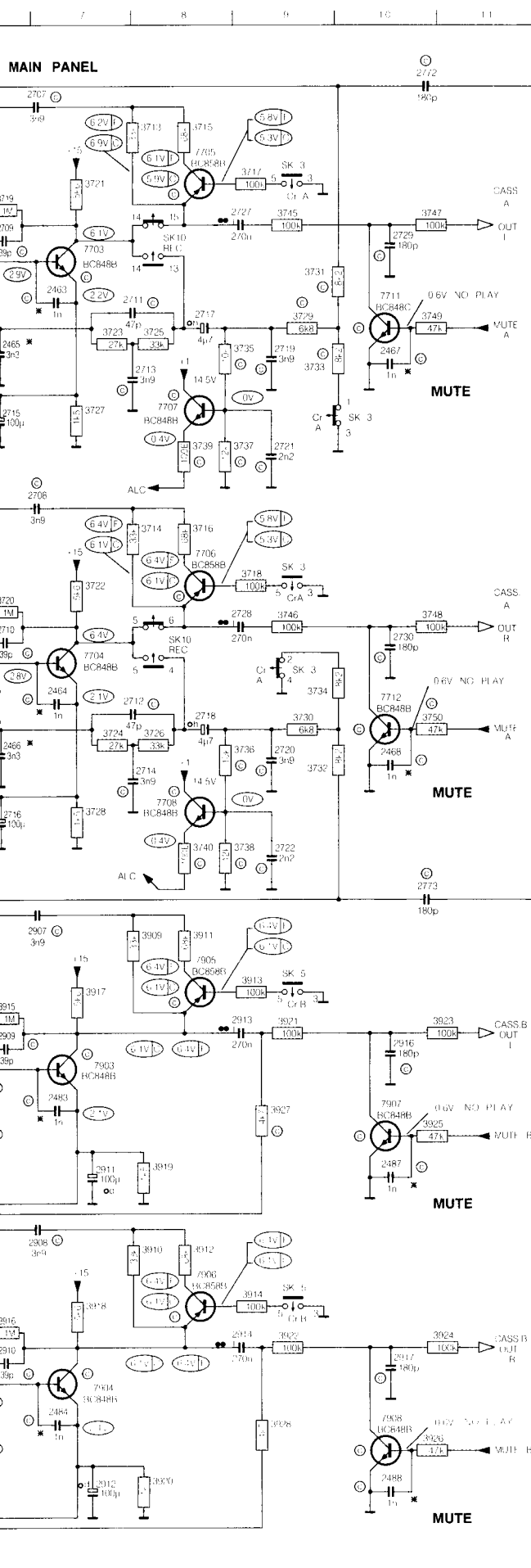


Fig. 6

MDA.00253

CS 4 051





2461	C 5	3907	J 5
2462	C 5	3908	M 5
2463	C 7	3909	I 8
2464	C 7	3910	I 8
2465	C 6	3911	I 8
2466	G 6	3912	I 8
2467	D10	3913	J 9
2468	H10	3914	M 9
2481	K 5	3915	J 6
2482	N 5	3916	V 6
2483	K 7	3917	J 7
2484	M 7	3918	M 7
2487	L10	3919	I 8
2488	O10	3920	O 8
2701	C 4	3921	J 9
2702	G 4	3922	M 9
2703	C 5	3923	J11
2704	G 5	3924	M11
2705	C 5	3925	K10
2706	G 5	3926	N10
2707	A 7	3927	K 9
2708	E 7	3928	N 9
2709	B 6	3929	O 2
2710	F 6	3930	L 2
2711	C 8	3931	B13
2712	G 8	3932	G13
2713	D 8	3933	D15
2714	H 8	3934	B13
2715	D 8	3935	C14
2716	H 8	3936	D15
2717	C 8	3937	E12
2718	G 8	3938	C 5
2719	D 9	3939	G 5
2720	G 9	3940	C 7
2721	D 9	3941	G 7
2722	H 9	3942	B 8
2723	D 4	3943	F 8
2724	F 4	3944	D 8
2725	F 5	3945	H 8
2726	A13	3946	D 4
2727	B 9	3947	G 7
2728	F 9	3948	C10
2729	H10	3949	G10
2730	F10	3950	L15
2731	E12	3951	G15
2732	H12	3952	F13
2733	H12	3953	G15
2734	A10	3954	N 5
2735	I10	3955	K 7
2736	H13	3956	N 7
2737	H14	3957	J 8
2738	H14	3958	M 8
2739	H15	3959	K10
2740	H15	3960	N10
2902	N 4		
2903	K 5		
2904	N 5		
2905	K 5		
2906	N 5		
2907	L 7		
2908	L 7		
2909	J 6		
2910	M 6		
2911	L 7		
2912	O 7		
2913	J 9		
2914	M13		
2915	B13		
2916	J10		
2917	N10		
2918	C 2		
3702	H 2		
3703	C 3		
3704	G 3		
3705	C 4		
3706	G 4		
3707	C 4		
3708	G 4		
3709	B 5		
3710	F 5		
3711	C 6		
3712	G 6		
3713	A 8		
3714	E 8		
3715	A 8		
3716	E 8		
3717	B 9		
3718	F 9		
3719	B 6		
3720	F 6		
3721	B 7		
3722	F 7		
3723	C 7		
3724	G 7		
3725	C 8		
3726	G 8		
3727	D 7		
3728	H 7		
3729	C 9		
3730	G 9		
3731	C 9		
3732	H 9		
3733	D 9		
3734	G 9		
3735	C 9		
3736	G 9		
3737	D 9		
3738	H 9		
3739	D 8		
3740	H 8		
3741	D 3		
3742	E 3		
3743	D 2		
3744	E 2		
3745	B 9		
3746	F 9		
3747	H10		
3748	F10		
3749	C10		
3750	G10		
3751	A13		
3752	C 3		
3753	G 3		
3754	H 3		
3755	E 3		
3756	O 3		
3757	D16		
3758	F12		
3759	F12		
3760	C13		
3761	G12		
3762	I12		
3763	L13		
3764	H13		
3765	I14		
3766	H14		
3767	I14		
3768	I14		
3769	K 4		
3770	K 4		
3771	K 4		
3772	K 4		
3773	K 4		
3774	K 4		
3775	K 4		
3776	K 4		
3777	K 4		
3778	K 4		
3779	K 4		
3780	K 4		

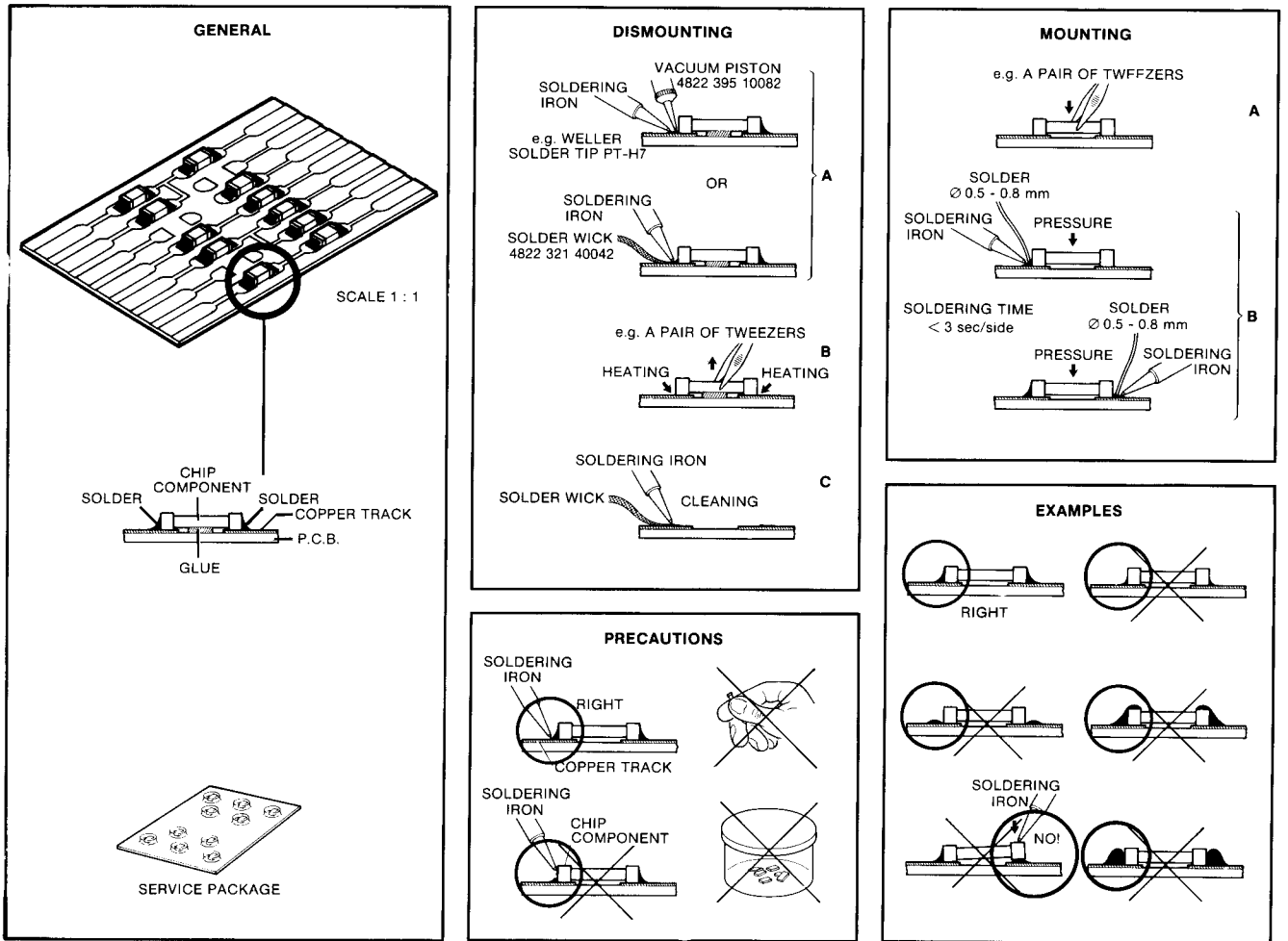
THIS CIRCUIT DIAGRAM HAS BEEN DRAWN IN POSITION PLAY (CASS A)

RESISTORS UNLESS STATED OTHERWISE

ITEMS MARKED WITH \* ONLY FOR F1Z

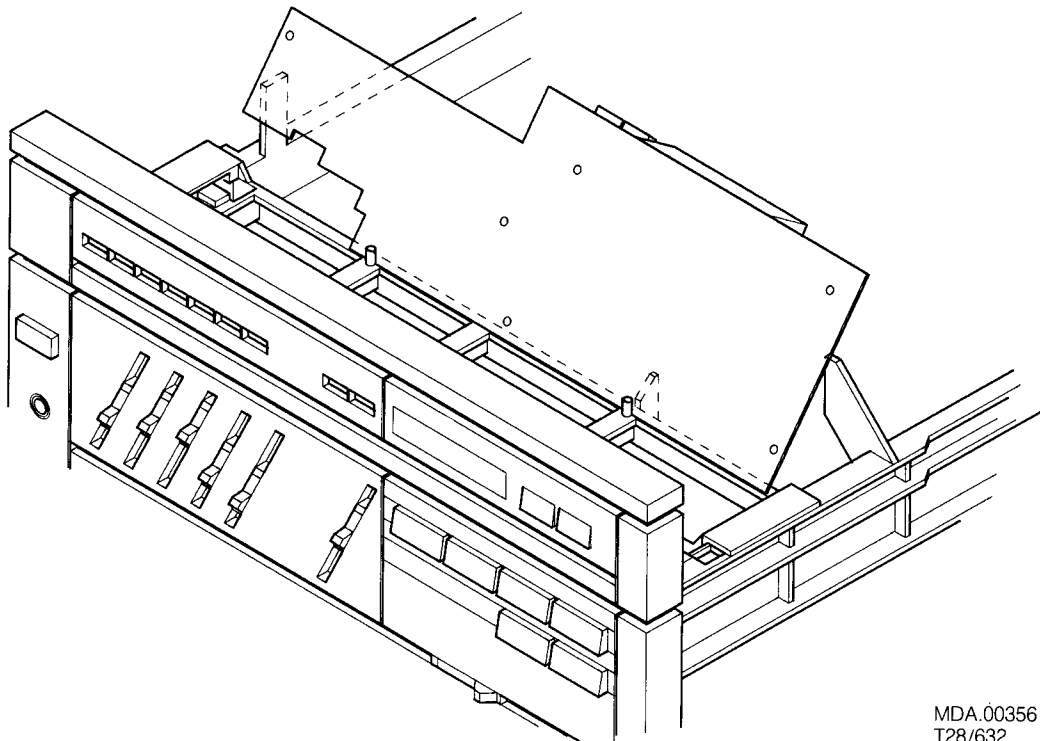
PRS 01508  
122 632

**HANDLING CHIP COMPONENTS**



27 012C12

Fig. 7

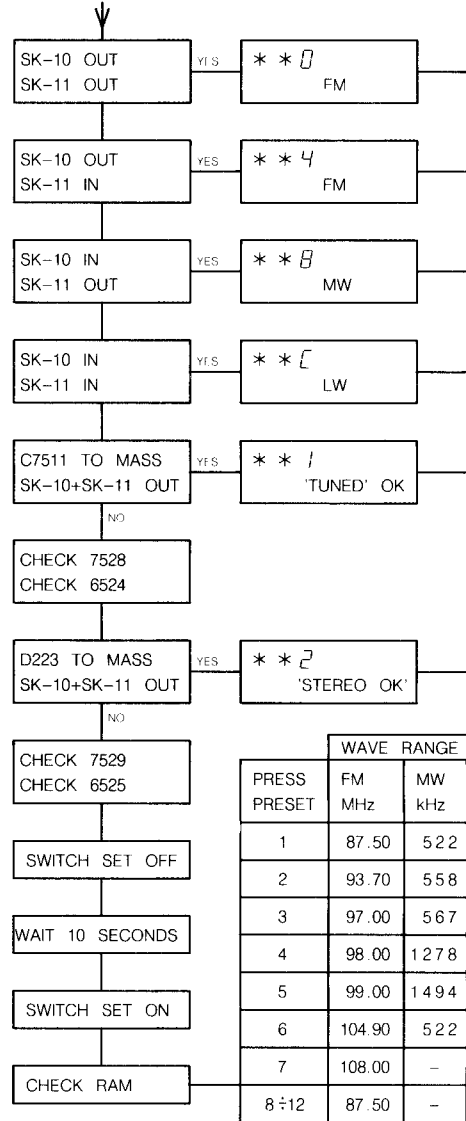
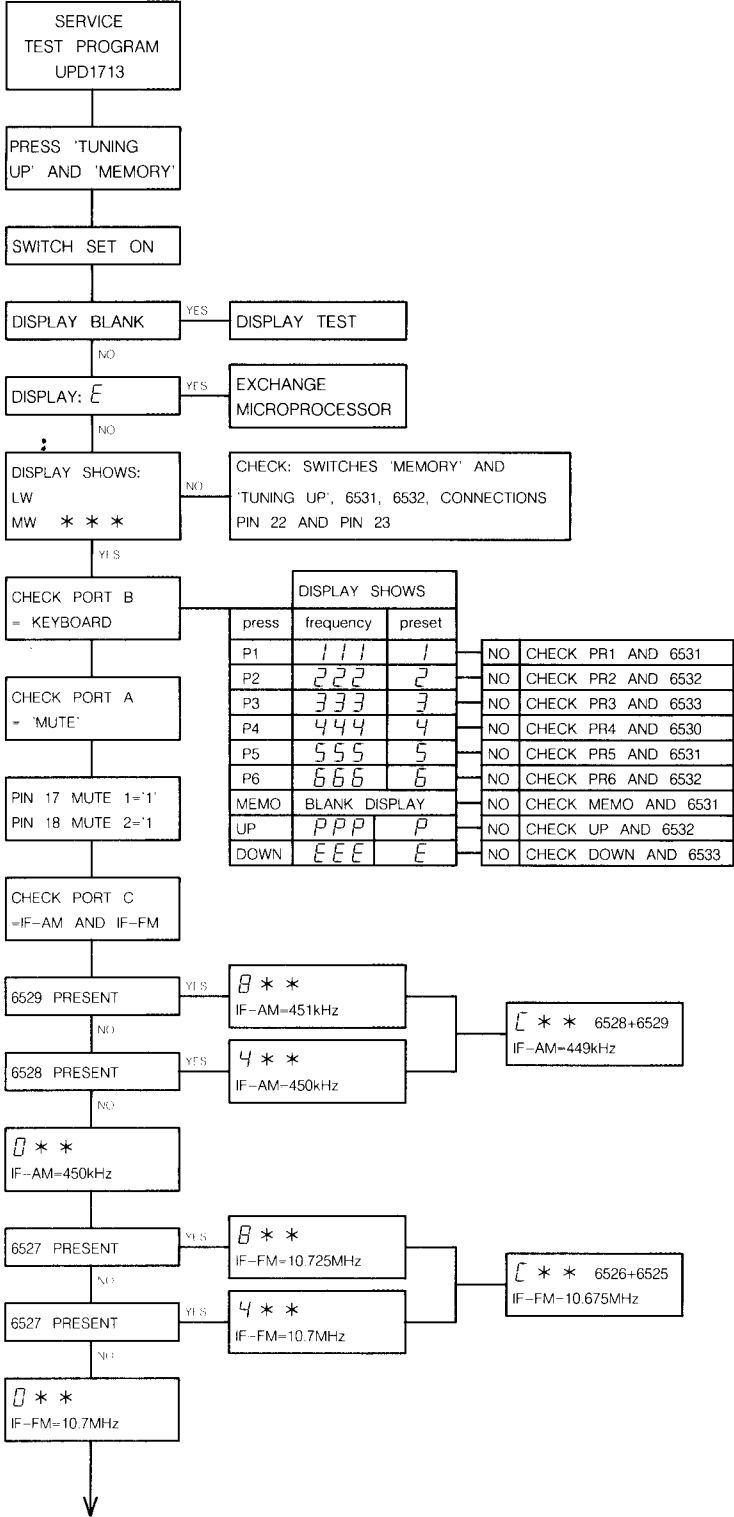


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T28/632

Fig. 8

# MICRO PROCESSOR CHECK

\* = IRRELEVANT  
DISPLAY DIGIT

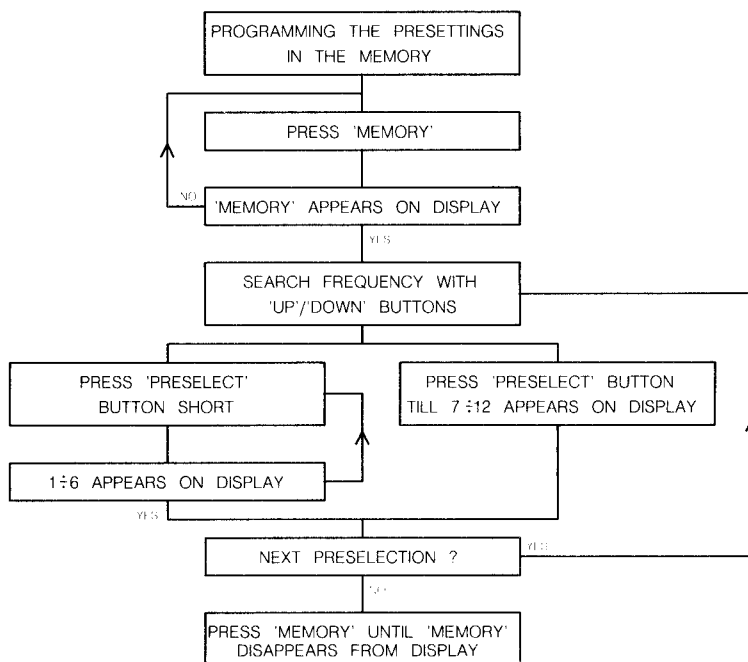
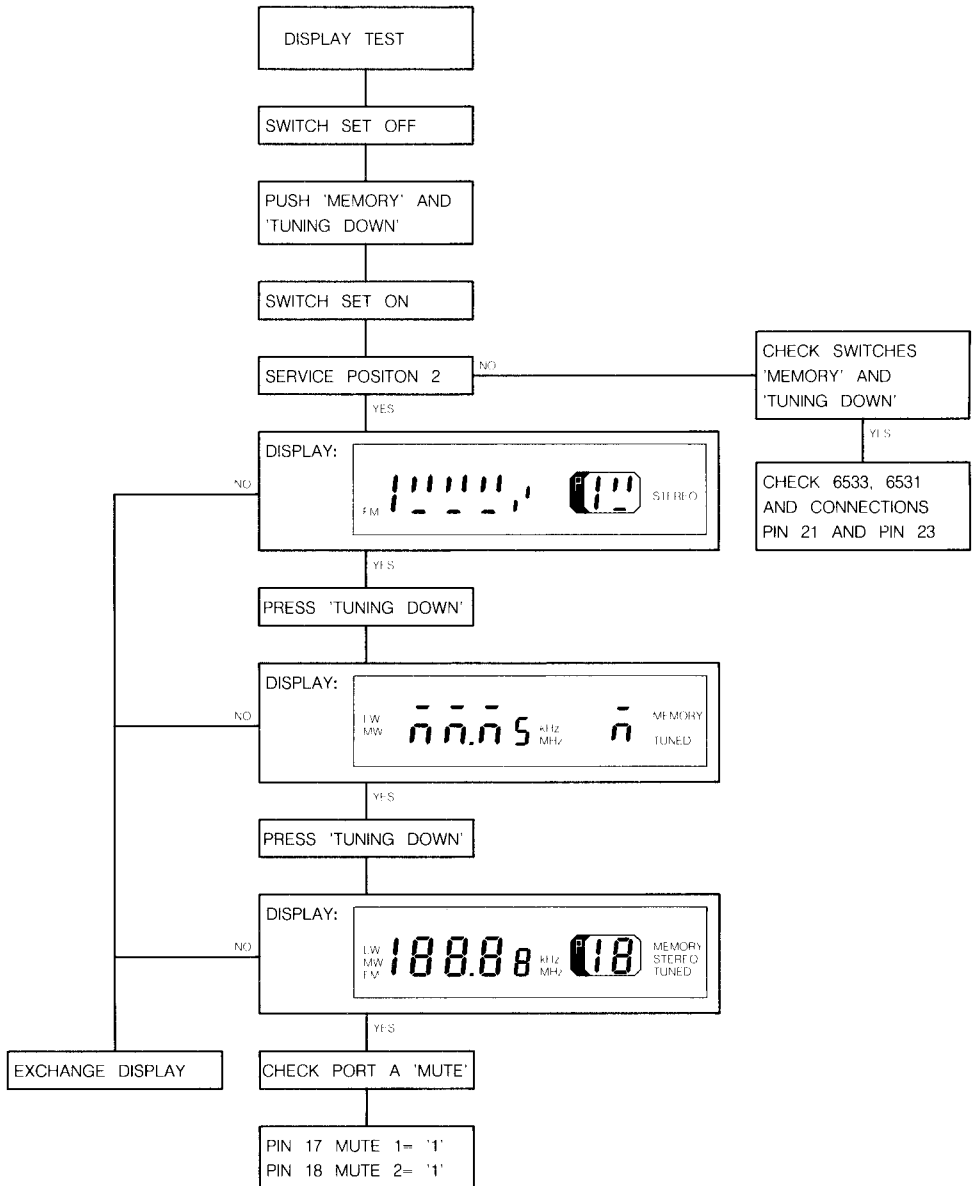


INPUT PORT K				DISPL SHOW
LSB		MSB		
1	2	3	4	*
0	0	0	0	*
1	0	0	0	*
0	1	0	0	*
1	1	0	0	*
0	0	1	0	*
1	0	1	0	*
0	1	1	0	*
1	1	1	0	*
0	0	0	1	*
1	0	0	1	*
0	1	0	1	*
1	1	0	1	*
0	0	1	1	*
1	0	1	1	BLA
0	1	1	1	*
1	1	1	1	*

PRESS PRESET	WAVE RANGE		
	FM MHz	MW kHz	LW kHz
1	87.50	522	150
2	93.70	558	155
3	97.00	567	254
4	98.00	1278	263
5	99.00	1494	150
6	104.90	522	150
7	108.00	-	-
8 ÷ 12	87.50	-	-

INPUT PORT K				DISPLAY SHOWS
LSB	2	3	MSB	
1	2	3	4	**0
0	0	0	0	**1
1	0	0	0	**2
0	1	0	0	**3
1	1	0	0	**4
0	0	1	0	**5
1	0	1	0	**6
0	1	1	0	**7
1	1	1	0	**8
0	0	0	1	**9
1	0	0	1	**A
0	1	0	1	**B
1	1	0	1	**C
0	0	1	1	**D
1	0	1	1	BLANK
0	1	1	1	**E
1	1	1	1	**F

FREQUENCY RANGE		
MHz	MW kHz	LW kHz
50	522	150
70	558	155
00	567	254
00	1278	263
00	1494	150
90	522	150
00	-	-
50	-	-





GB

**WARNING**

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.

NL

**WAARSCHUWING**

ESD



Alle IC's en vele andere halfgeleiders zijn gevoelig voor elektrostatische ontladingen (ESD). Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.  
Zorg ervoor, dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.  
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

F

**ATTENTION**

ESD



Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.  
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfile le bracelet serti d'une résistance de sécurité.  
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

D

**WARNUNG**

ESD



Alle IC's und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD). Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.  
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen potential wie die Masse des Gerätes.  
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

GB

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

NL

Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde worden toegepast.

D

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden für Reparaturen sind Original-Ersatzteile zu verwenden.

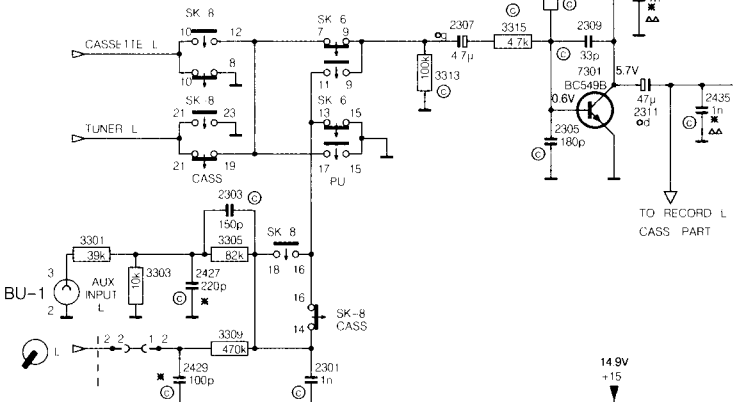
F

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

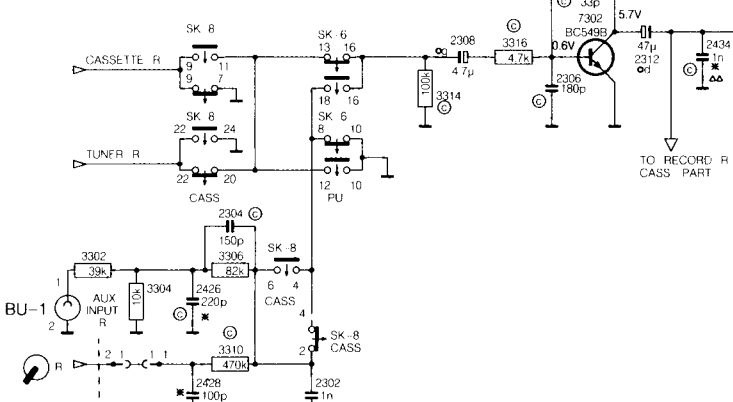
1301	K18	2304	L 2	2311	C 5	2318	E10	2325	B10	2332	G10	2339	C11	2346	A11	2357	D16	2364	-17	2382	L17	2391	L14	2432	F 6	2441	D12	3301	D 1	3310	J 2	3319	A 5	3325
1302	L15	2305	C 5	2312	C 5	2319	A10	2326	F10	2333	C10	2340	H11	2351	C15	2358	H16	2365	D18	2383	L18	2392	M14	2433	B 6	2444	A12	3302	I 1	3323	F 4	3326	F 5	3328
1303	J14	2306	H 5	2313	A 5	2320	F10	2327	B10	2334	H10	2341	B12	2352	G15	2359	E16	2366	H18	2384	J13	2393	M13	2434	C 6	2445	R20	3303	D 2	3314	H 4	3321	C 8	3326
1502	K20	2307	B 4	2314	F 5	2321	A10	2328	G10	2335	C 9	2342	D12	2353	C16	2360	J16	2367	C18	2385	F15	2426	I 2	2435	C 6	2446	E20	3304	I 2	3315	B 4	3322	H 8	3327
2301	I 3	2308	G 4	2315	C 7	2322	F10	2329	C10	2336	G 9	2343	D13	2354	H16	2361	B18	2368	G19	2386	M13	2427	D 2	2436	G11	2447	E20	3305	D 2	3316	G 4	3323	D 8	3327
2302	J 3	2309	B 5	2316	H 7	2323	B10	2330	G10	2337	D 9	2344	H13	2355	D16	2362	E18	2369	L16	2387	M13	2428	J 2	2437	B11	2448	F20	3306	I 2	3317	B 5	3324	G 8	3328
2303	D 2	2310	G 5	2317	A10	2324	F10	2331	C10	2338	H 9	2345	M11	2356	H16	2363	E17	2381	K16	2390	M15	2429	F 2	2440	I 12	3150	K16	3309	I 2	3318	F 5	3325	D 7	3328

MAIN PANEL AF PART

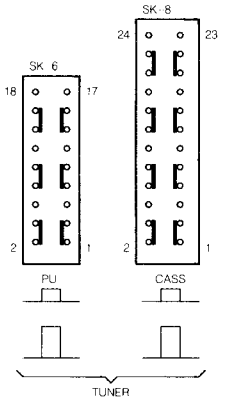
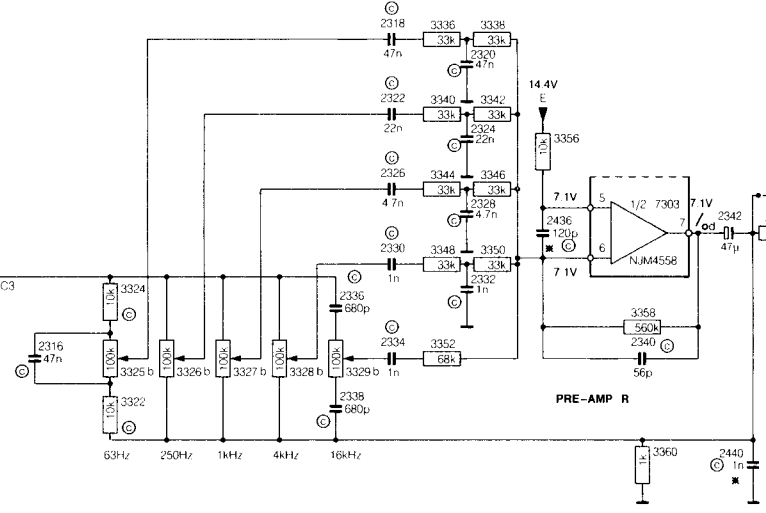
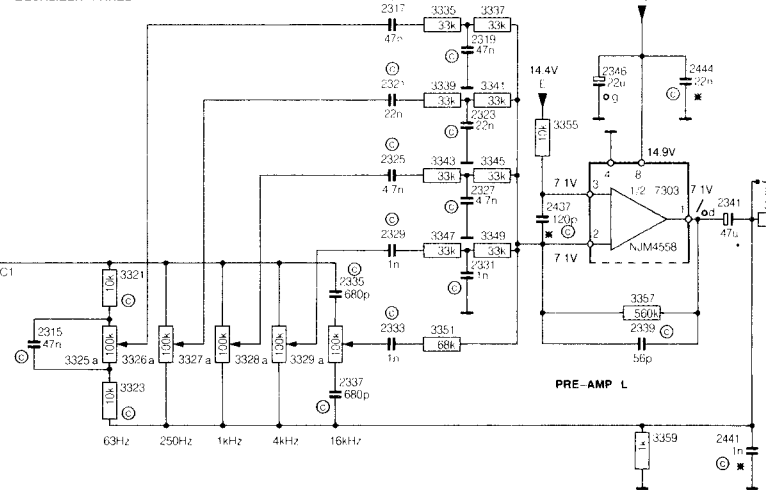
INPUTS



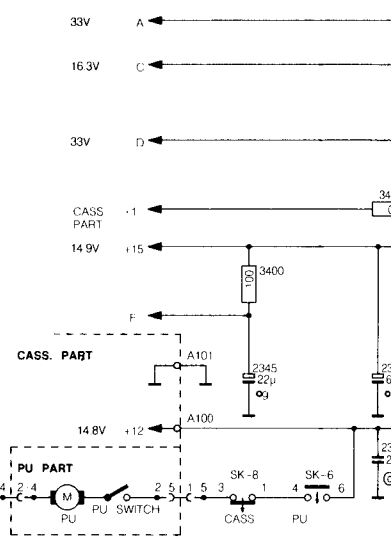
INPUTS



EQUALIZER PANEL

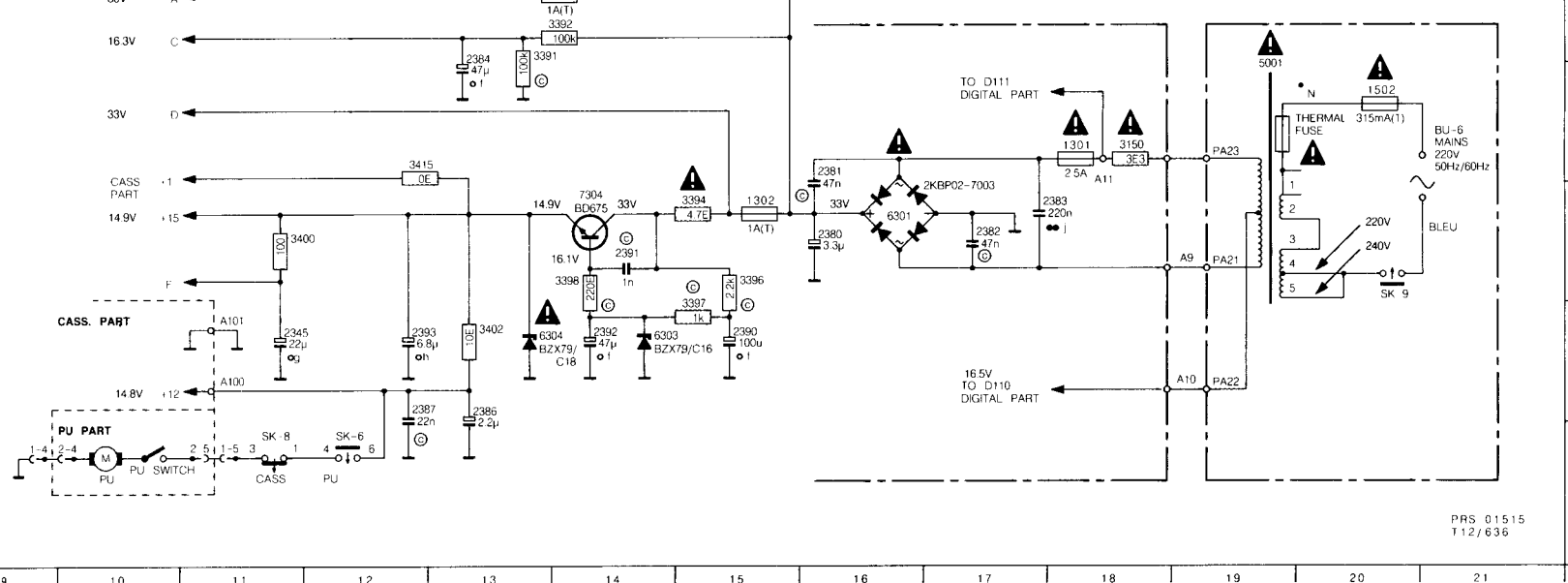
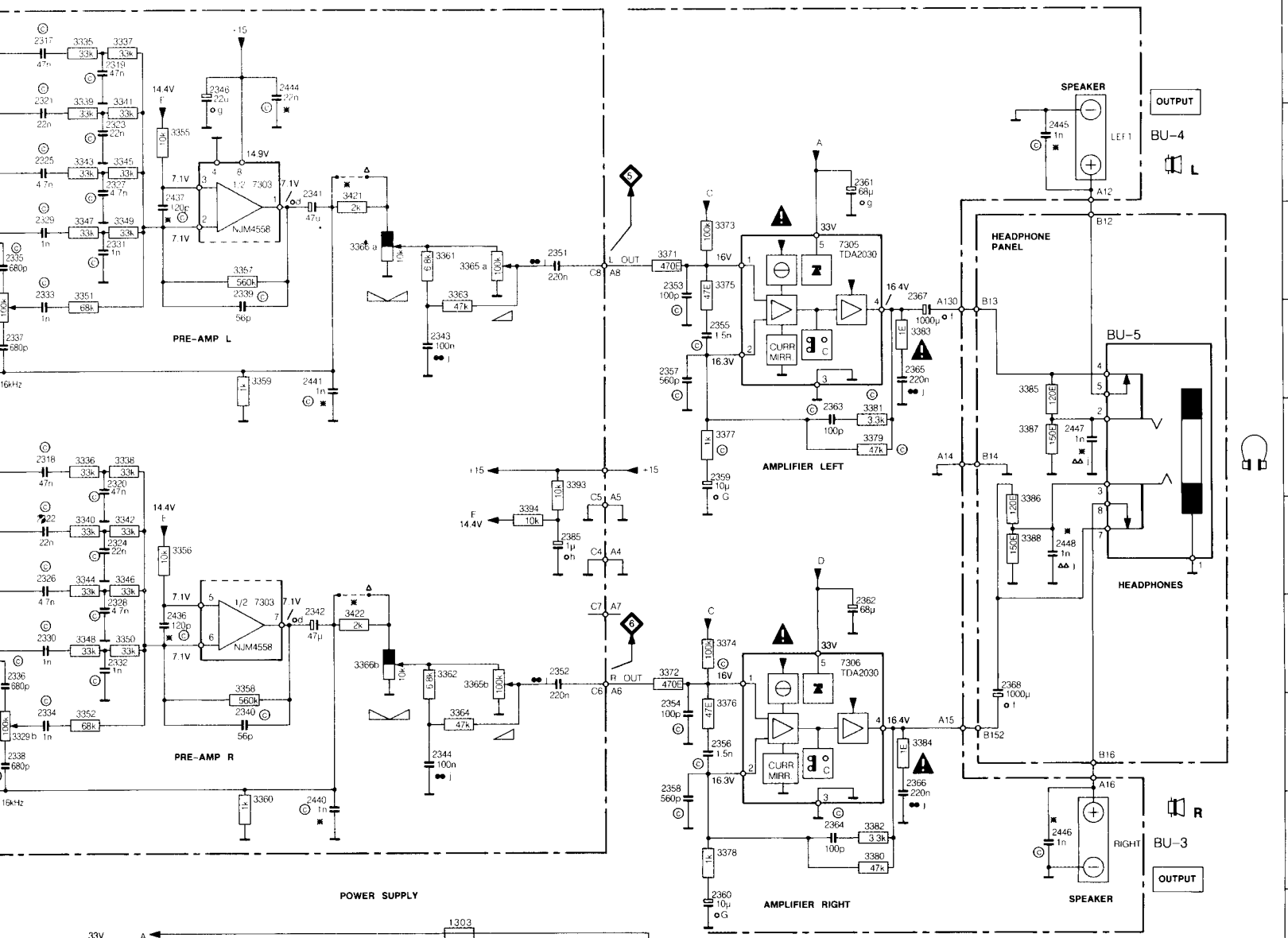
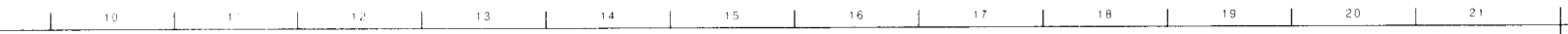


ALL RESISTORS UNLESS STATED OTHERWISE  
 ITEM MARKED WITH \* ONLY FOR FTZ  
 ITEM MARKED WITH Δ NOT FOR FTZ  
 =CONNECTOR 2 PIN 1



# F1667 ONLY

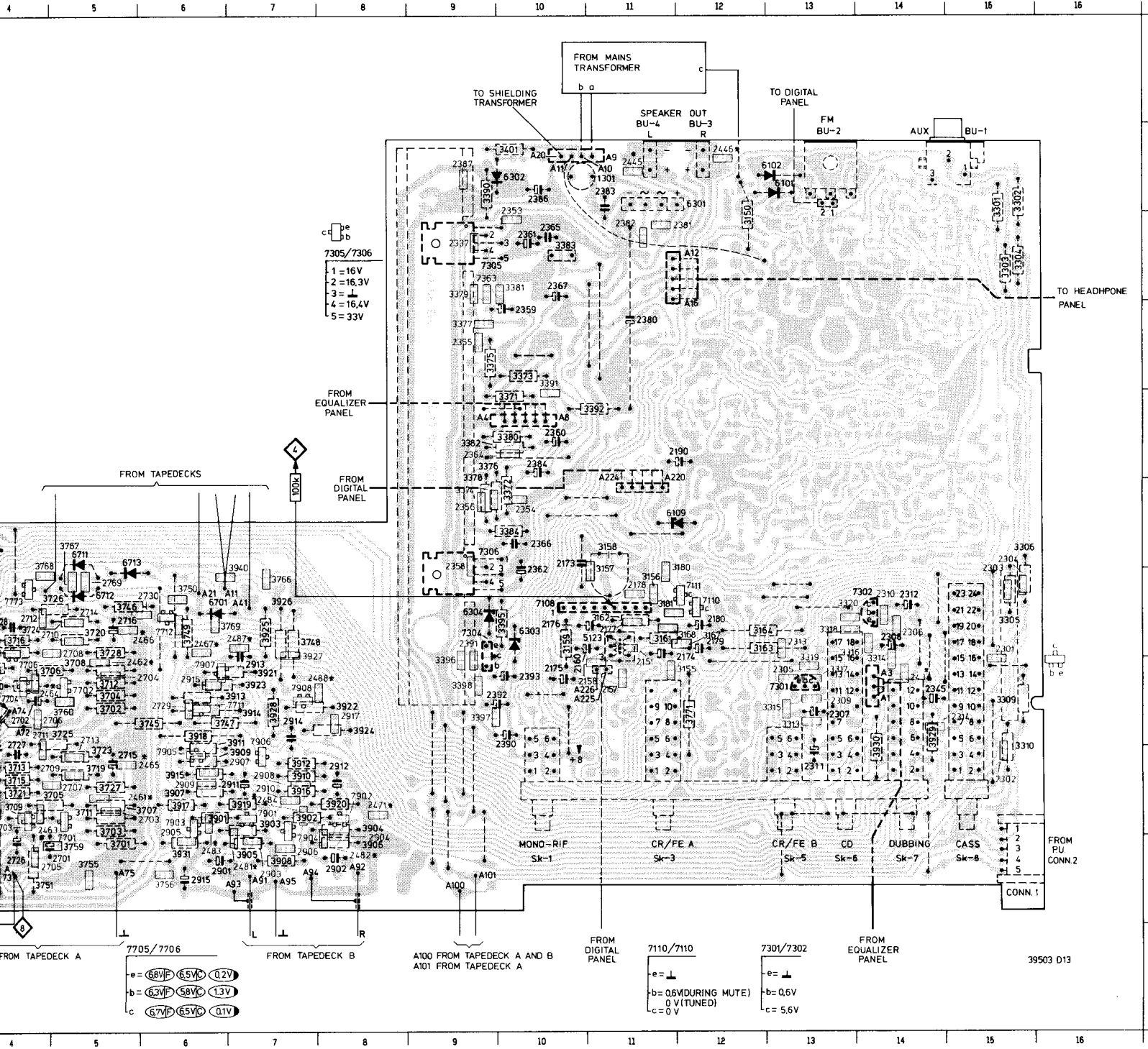
F 6	2441	D12	3301	D 1	3310	J 2	3319	A 5	3325	H 7	3329	D 9	3340	F10	3347	C10	3356	F11	3363	C14	3372	G16	3379	E18	3386	F19	3394	L15	3421	B13	7302	G 5
R 6	2444	A12	3302	-	3313	C 4	3320	F 5	3326	D 7	3329	H 9	3341	A10	3348	G10	3357	C11	3364	H14	3373	C16	3380	I 18	3387	E19	3396	L15	3422	G13	7304	L14
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G11	2447	L20	3305	D 2	3316	G 4	3323	D 8	3327	H 8	3337	A10	3344	F10	3351	C10	3359	I12	3366	C13	3376	H16	3383	D18	3392	J14	3400	L12	6303	M14		
B11	2448	L20	3306	F 2	3317	B 5	3324	D 8	3328	D 8	3338	E10	3345	B10	3352	H10	3361	C13	3366	C13	3377	E16	3384	H18	3393	E15	3402	M13	6304	M14		
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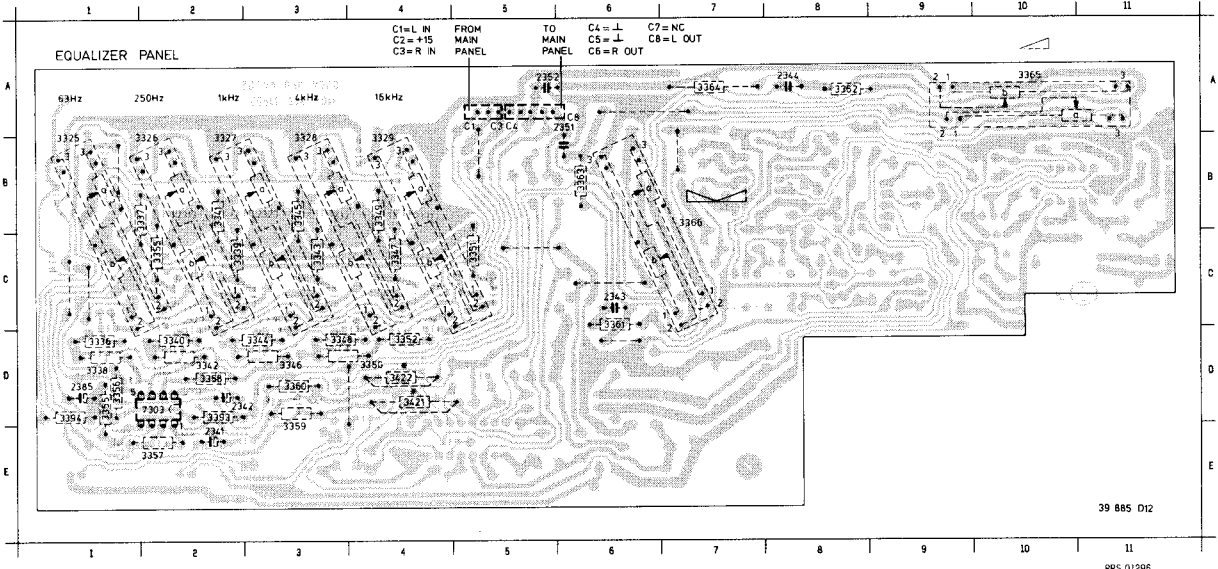
F1664 ONLY

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2704	H 6	2720	G 3	2774	G 2	2912	I 8	3168	G12	3318	G13	3390	B 9	3709	I 4	3725	H 5	3741	I 3	3760	H 5	3905	J 7	3921	H 7	6102	B13	7304	G 9	7772	F 3	SK10	J 3
2705	H 5	2722	G 3	2776	G 2	2913	H 7	3180	F12	3319	G13	3391	D10	3710	H 4	3726	G 5	3742	H 2	3766	G 7	3906	J 8	3922	H 8	6109	F12	7305	C 9	7773	G 4		
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2708	G 5	2724	H 2	2778	F 2	2916	H 6	3302	B15	3371	E10	3396	G 9	3713	I 4	3728	G 5	3744	H 3	3768	F 4	3908	J 7	3924	H 8	6302	B10	7701	I 5	7902	I 8		
2709	I 4	2725	H 3	2901	J 8	2917	H 8	3303	C15	3373	D10	3397	H 9	3714	G 4	3729	G 5	3746	G 5	3770	J 2	3909	I 7	3925	G 7	6303	G10	7702	H 5	7903	I 6		
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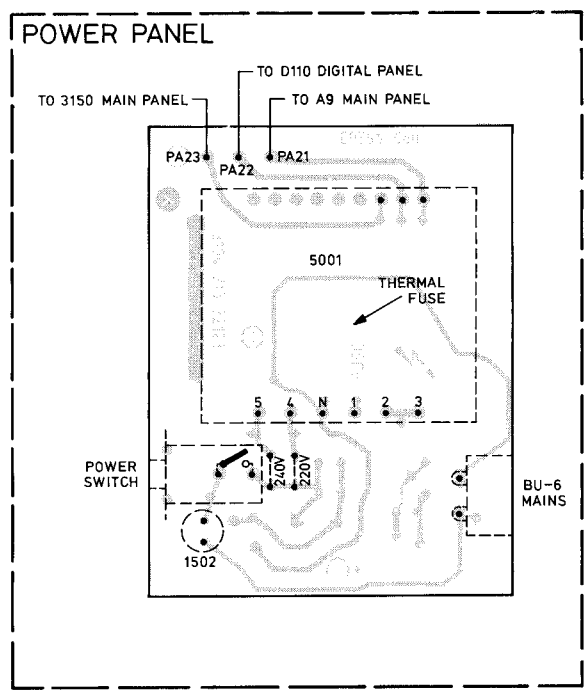
PRS.01574  
DRA AAD  
112/633

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2320	D 1	2325	C 3	2331	R 4	2338	R 4	2344	R 6	2440	D 3	3324	R 1	3330	C 2	3341	R 2	3347	C 4	3355	D 1	3361	C 6	3333	D 2	6310	E 1		

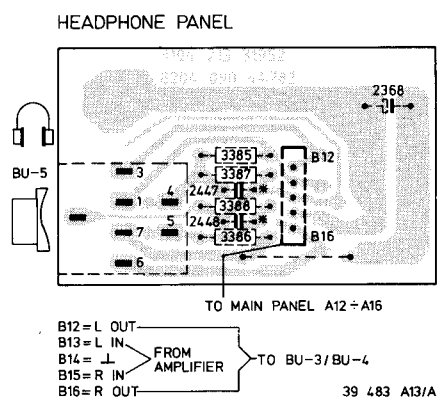


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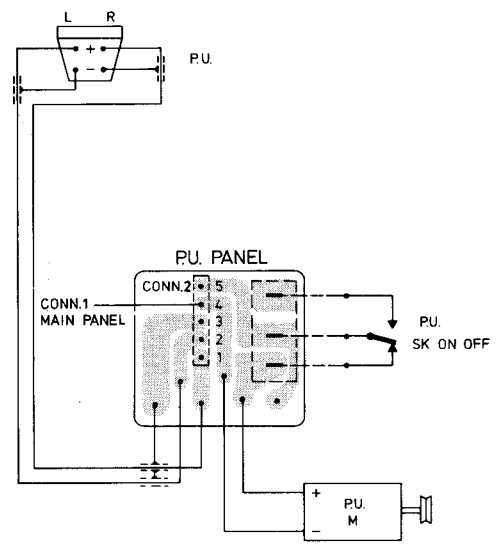
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112/623



39 841 B12



39 483 A13/A

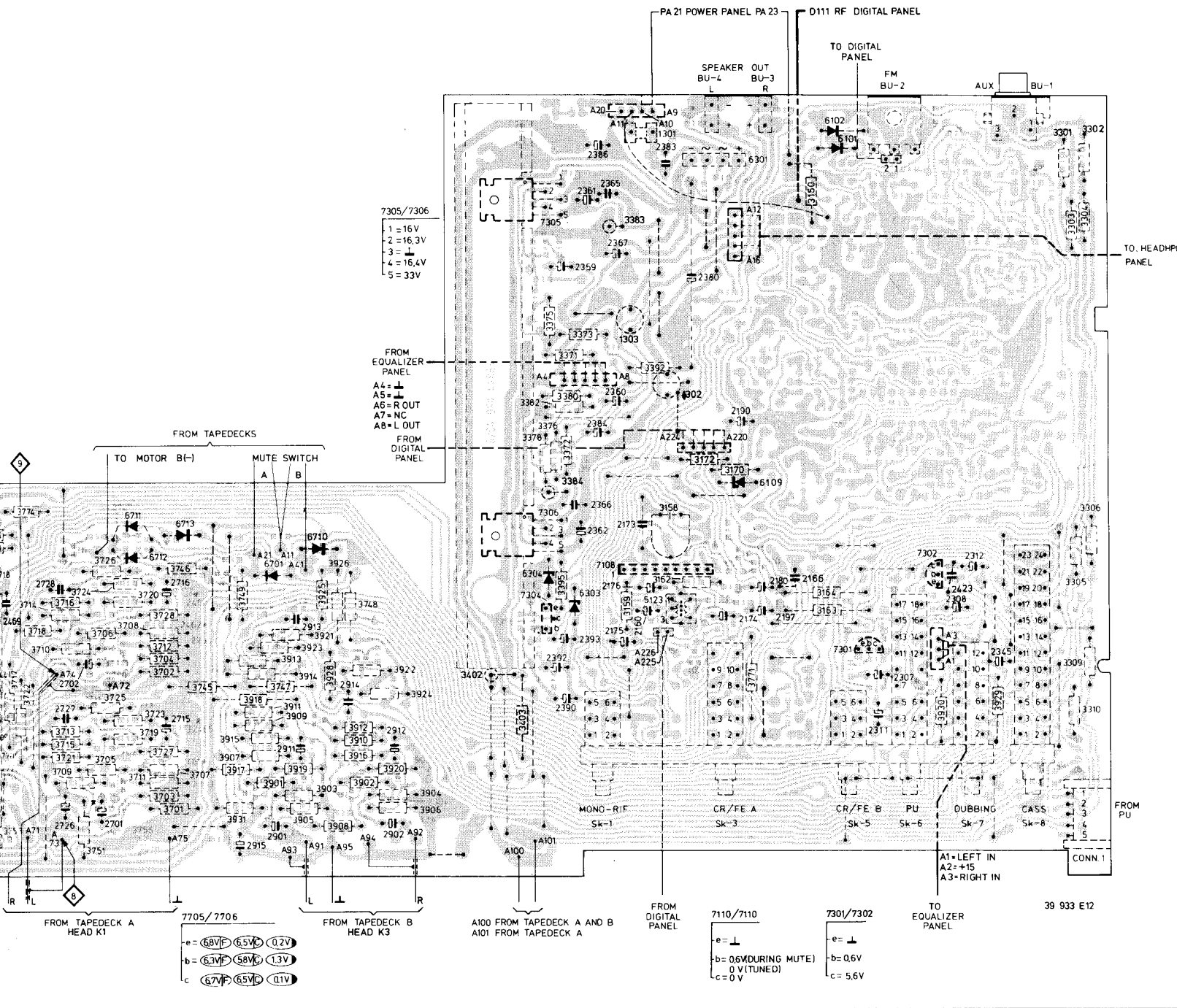


39484 A13/A



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62	G 5	2702	H 4	2717	H 3	2771	F 3	2909	I 6	3163	G12	3310	H15	3379	C 9	3703	I 4	3719	I 5	3735	I 2	3751	J 4	3775	F 2	3915	I 6	3931	J 6	7110	G12	7710	H 3	7911	H 3
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81	J 7	2710	G 5	2726	J 4	2902	J 8	2918	J 8	3150	C12	3301	H15	3371	D10	3712	H 5	3728	C 5	3744	H 3	3767	F 5	3908	J 7	3924	H 8	6701	G 6	7702	H 5	7904	I 7	7920	I 7
82	J 8	2711	H 4	2727	H 4	2903	J 7	2919	J 7	3155	G12	3302	H15	3372	F10	3713	I 4	3729	I 3	3745	H 6	3769	G 7	3909	H 7	3925	G 7	6710	F 7	7703	I 4	7905	H 6	7921	H 6
83	J 6	2712	G 4	2728	G 4	2904	I 8	2920	I 8	3157	F11	3303	C15	3373	D10	3714	G 4	3730	G 3	3746	G 5	3770	J 2	3910	I 7	3926	G 7	6711	F 5	7704	H 4	7906	H 7	7922	H 7
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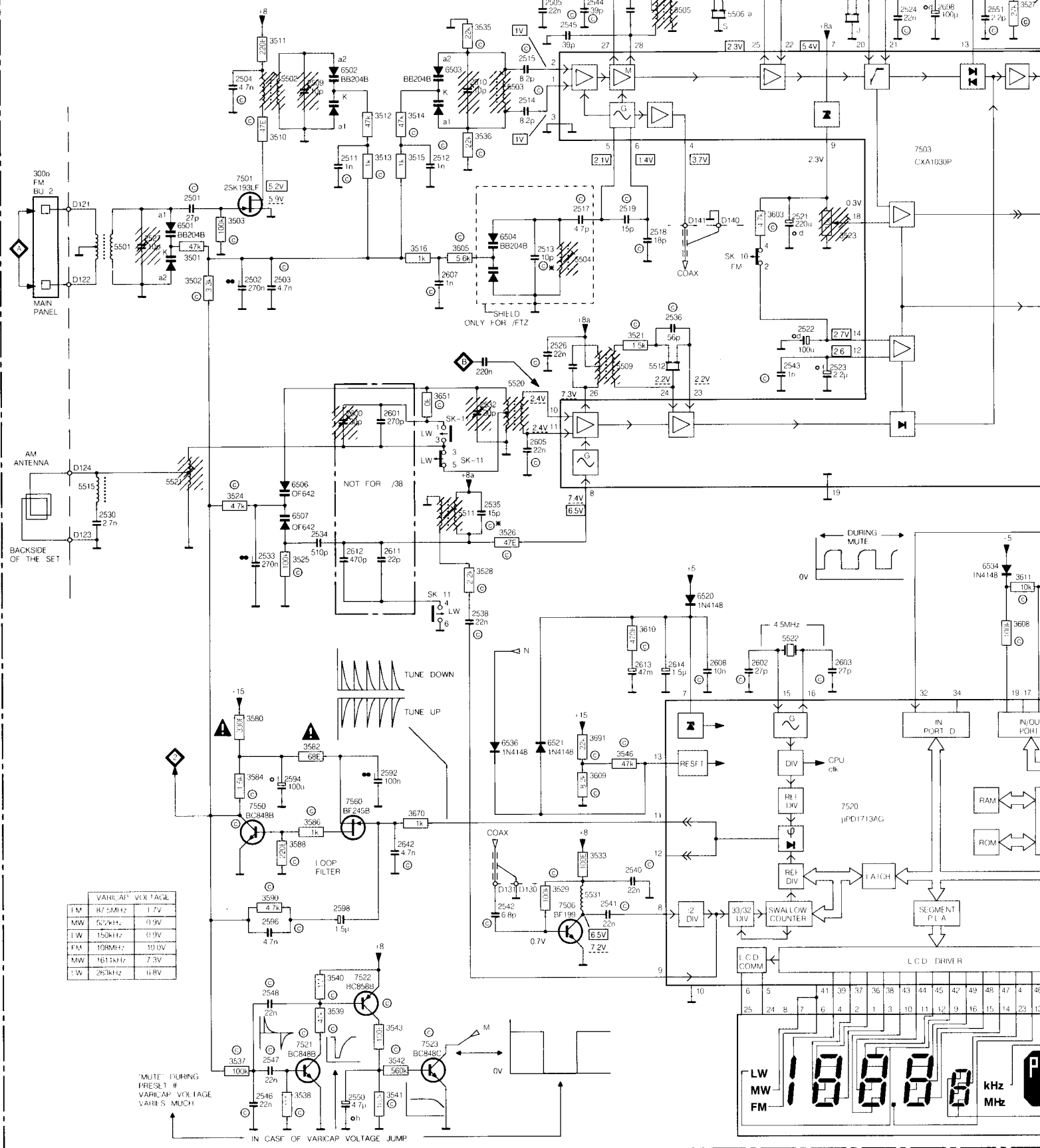


4 5 6 7 8 9 10 11 12 13 14 15 16



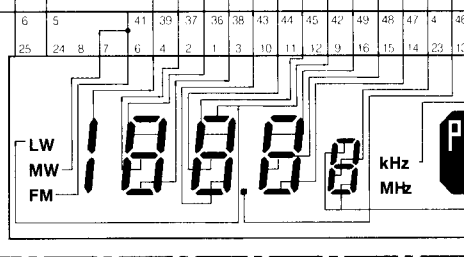
# RF DIGITAL PART

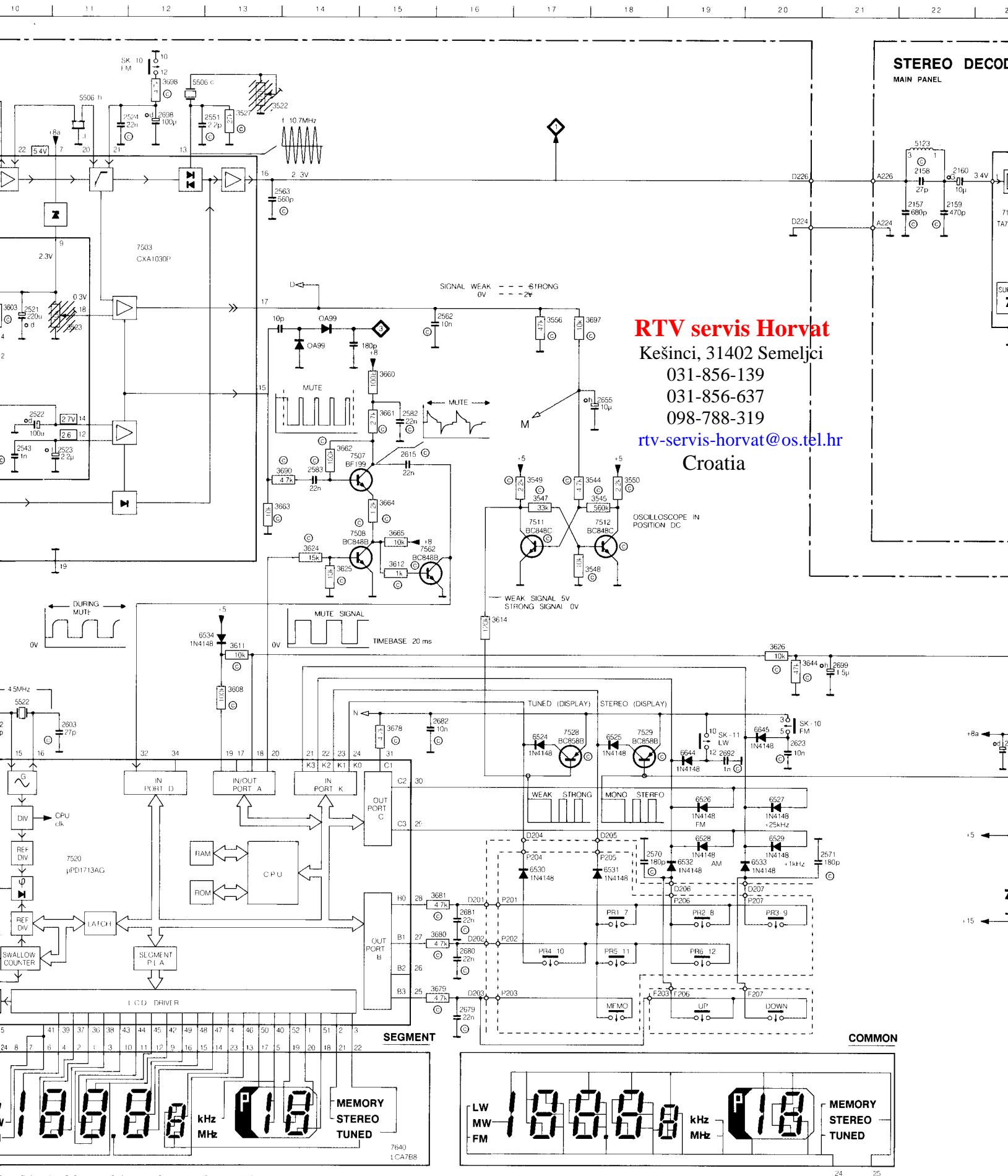
RF DIGITAL PANEL



	VARI-CAP VOLTAGE
FM	87.5MHz: 1.7V
MW	520kHz: 0.9V
LW	150kHz: 0.9V
FM	108MHz: 10.0V
MW	161kHz: 7.3V
LW	263kHz: 6.8V

MUTE DURING PRESET  
VARI-CAP VOLTAGE VARI'S MUCH  
IN CASE OF VARI-CAP VOLTAGE JUMP





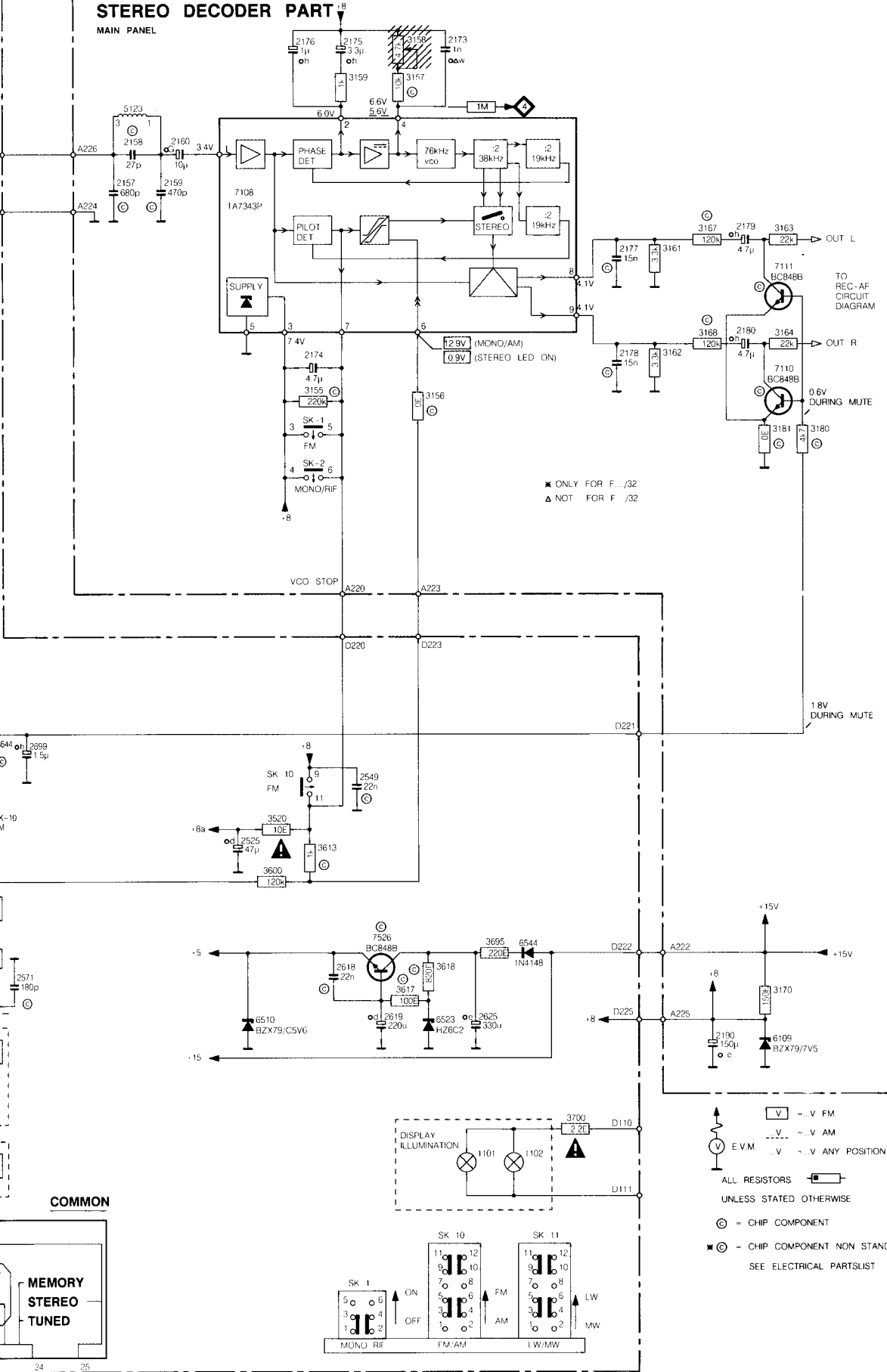
**RTV servis Horvat**  
 Kešinci, 31402 Semeljci  
 031-856-139  
 031-856-637  
 098-788-319  
[rtv-servis-horvat@os.tel.hr](mailto:rtv-servis-horvat@os.tel.hr)  
 Croatia

**STEREO DECODER**  
 MAIN PANEL

SEGMENT COMMON

# STEREO DECODER PART I

MAIN PANEL



▲ ONLY FOR F.../32  
 ▲ NOT FOR F /32

V ...V FM  
 ...V ...V AM  
 EV.M ...V ...V ANY POSITION

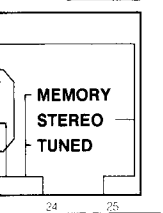
ALL RESISTORS UNLESS STATED OTHERWISE

⊙ = CHIP COMPONENT  
 ⊛ = CHIP COMPONENT NON STANDARD.  
 SEE ELECTRICAL PARTSLIST

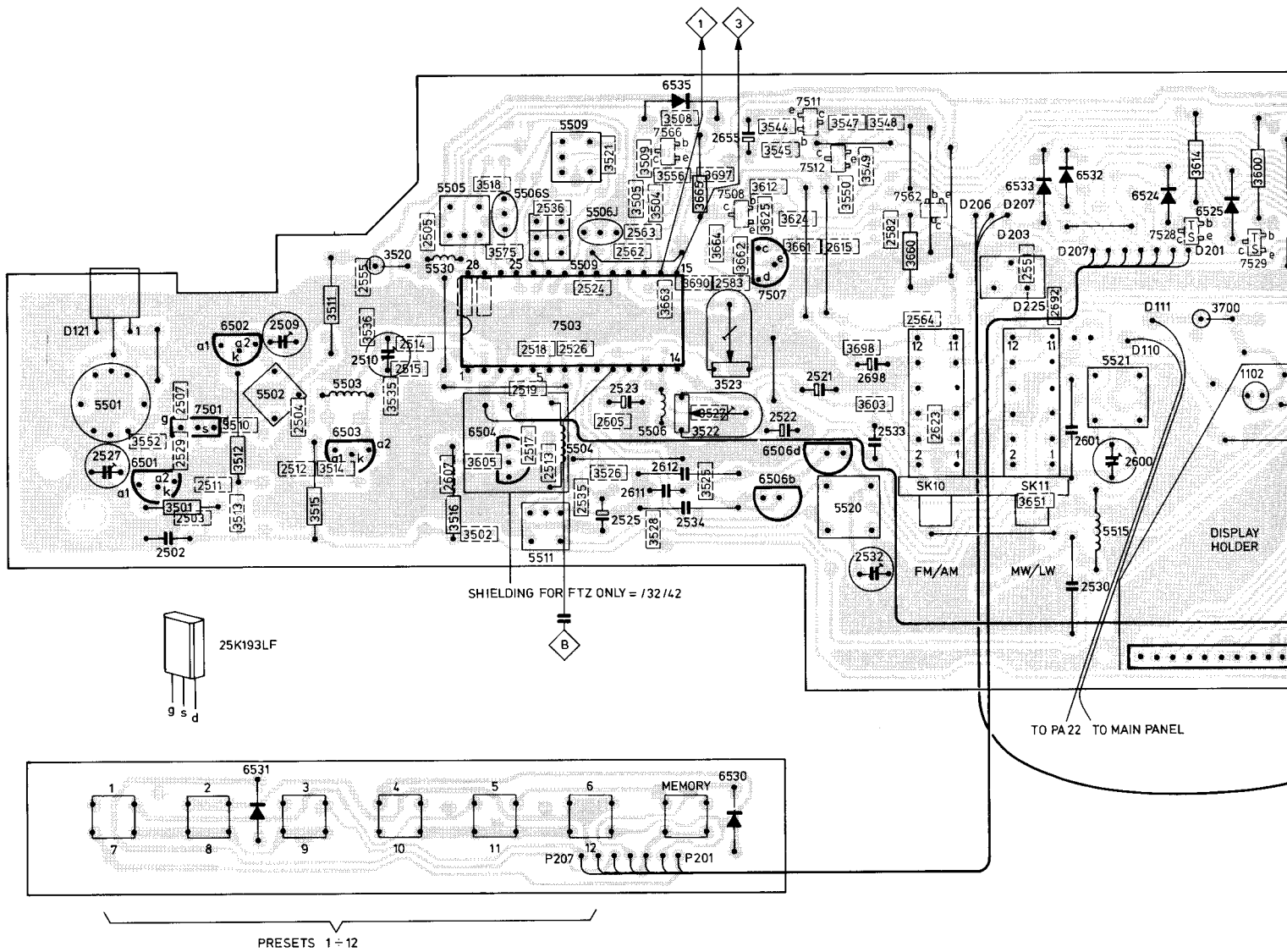
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1102	M26	3582	J 4
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2158	R22	3586	K 4
2159	C22	3588	L 4
2160	B22	3590	L 4
2173	A25	3600	J23
2174	E24	3603	E10
2175	A24	3605	D 6
2176	A24	3608	I 13
2177	C27	3609	K 8
2178	E27	3610	I 8
2179	C28	3611	H13
2180	D28	3612	G15
2190	L28	3613	J24
2501	D 3	3614	H16
2502	E 4	3617	K25
2503	E 4	3618	K25
2504	B 4	3624	G14
2505	B 7	3625	G14
2509	B 4	3626	H20
2510	B 6	3644	I 20
2511	C 5	3651	F 6
2512	C 6	3660	E15
2513	D 7	3661	E15
2514	C 7	3662	F14
2515	B 7	3663	J14
2517	D 9	3664	G15
2518	D 9	3665	G15
2519	D 8	3670	K 6
2521	E10	3678	J15
2522	E10	3679	M16
2523	F11	3680	L18
2524	B12	3681	L18
2525	J23	3690	I14
2526	F 7	3691	J 8
2527	D 2	3695	K26
2530	H 2	3697	E18
2532	F 6	3698	A12
2533	H 4	3700	M27
2534	H 4	5123	B22
2535	H 7	5501	D 2
2536	E 9	5502	B 4
2538	I 6	5503	C 7
2540	L 8	5504	E 8
2541	B 8	5505	B 9
2542	L 7	5509	H 8
2543	F10	5511	H 6
2544	B 8	5512	F 9
2545	B 7	5515	G 2
2546	O 4	5520	F 7
2547	N 4	5521	G 3
2548	M 4	5522	I10
2549	I24	5530	A 9
2550	O 5	5531	L 8
2551	B13	6109	L28
2552	E16	6501	D 3
2553	C14	6502	J20
2570	K18	6503	B 6
2571	K21	6504	D 7
2582	E15	6506	G 4
2583	F14	6507	H 4
2582	K 5	6510	L23
2594	K 9	6520	I 9
2596	M 4	6521	J 7
2598	L 5	6523	L25
2600	F 5	6524	J17
2601	F 5	6525	J18
2602	I10	6526	J20
2603	I11	6527	J20
2605	G 7	6528	K19
2607	E 6	6529	K20
2608	I 9	6530	K17
2611	H 5	6531	K18
2612	H 5	6532	K19
2613	J 8	6533	K20
2614	J 9	6534	H13
2615	F15	6536	J 7
2618	K24	6544	K26
2619	L25	6644	J19
2623	J20	6645	J20
2625	L26	7108	C23
2642	L 5	7110	E29
2655	E18	7111	D29
2679	M16	7501	D 4
2680	L16	7503	C12
2681	L16	7506	L 7
2682	I16	7507	F14
2692	J19	7508	G14
2698	B12	7511	G17
2699	I21	7512	G18
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3156	E25	7521	N 4
3157	B25	7522	M 5
3158	A25	7523	N 6
3159	B24	7526	K24
3161	C28	7528	J17
3162	E28	7529	J18
3163	C29	7550	K 4
3164	D29	7560	K 5
3167	C28	7562	G15
3168	D28	7640	O15
3170	K28	SK-1	E24
3180	E29	SK-10	I29
3181	E29	SK-10	A12
3501	F 3	SK-10	E 9
3502	E 3	SK-11	G 6
3503	D 3	SK-11	G 6
3510	C 4	SK-11	G 6
3511	B 4	SK-11	J19
3512	C 5	SK 2	F24
3513	C 5		
3514	C 6		
3515	C 6		
3516	D 6		
3518	A 9		
3520	I 23		
3521	I 8		
3522	A13		
3523	E11		
3524	G 3		
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3529	L 7		
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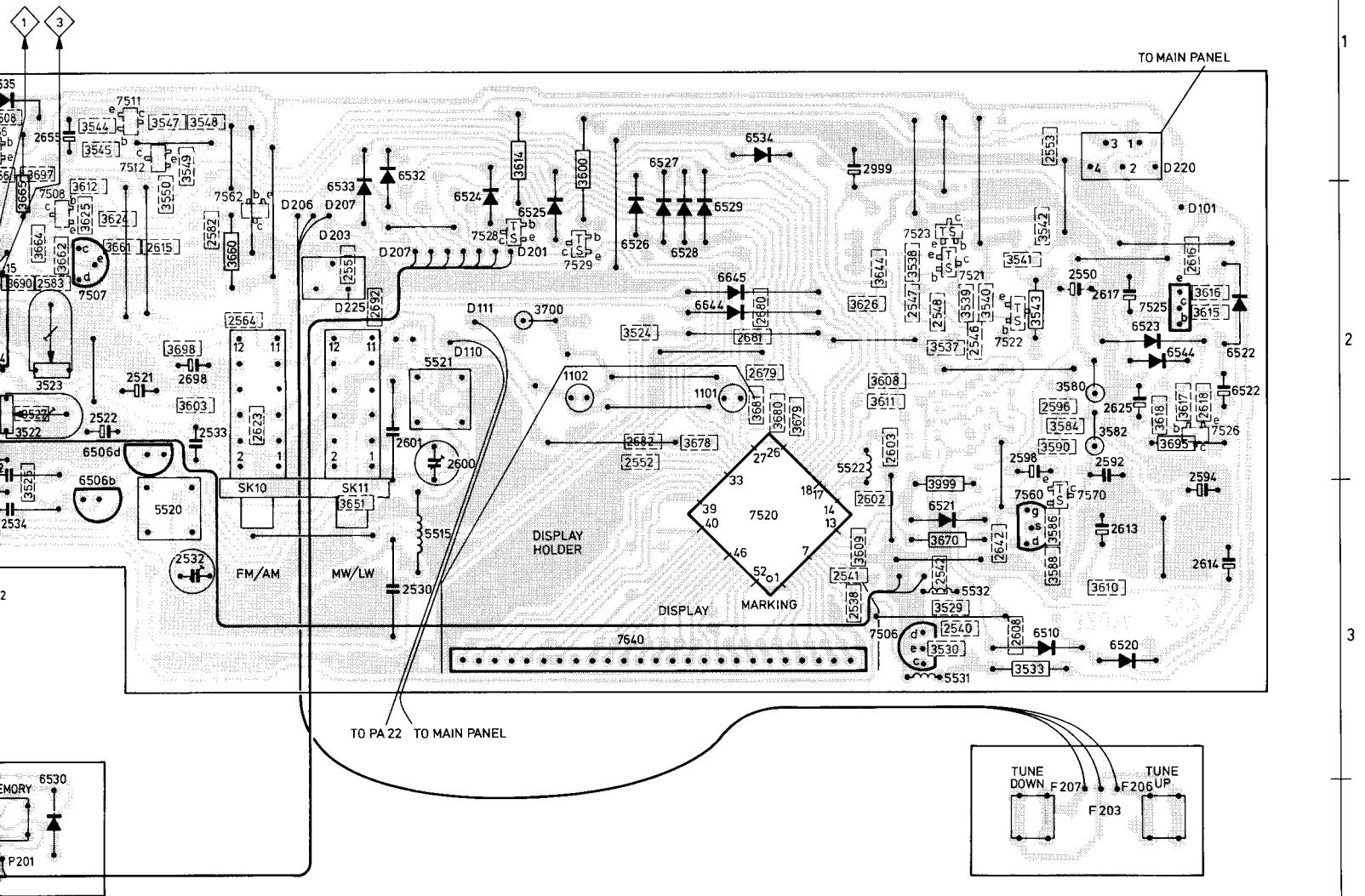
PRS 01290  
132 034

**COMMON**



A B C D E  
RF DIGITAL PANEL

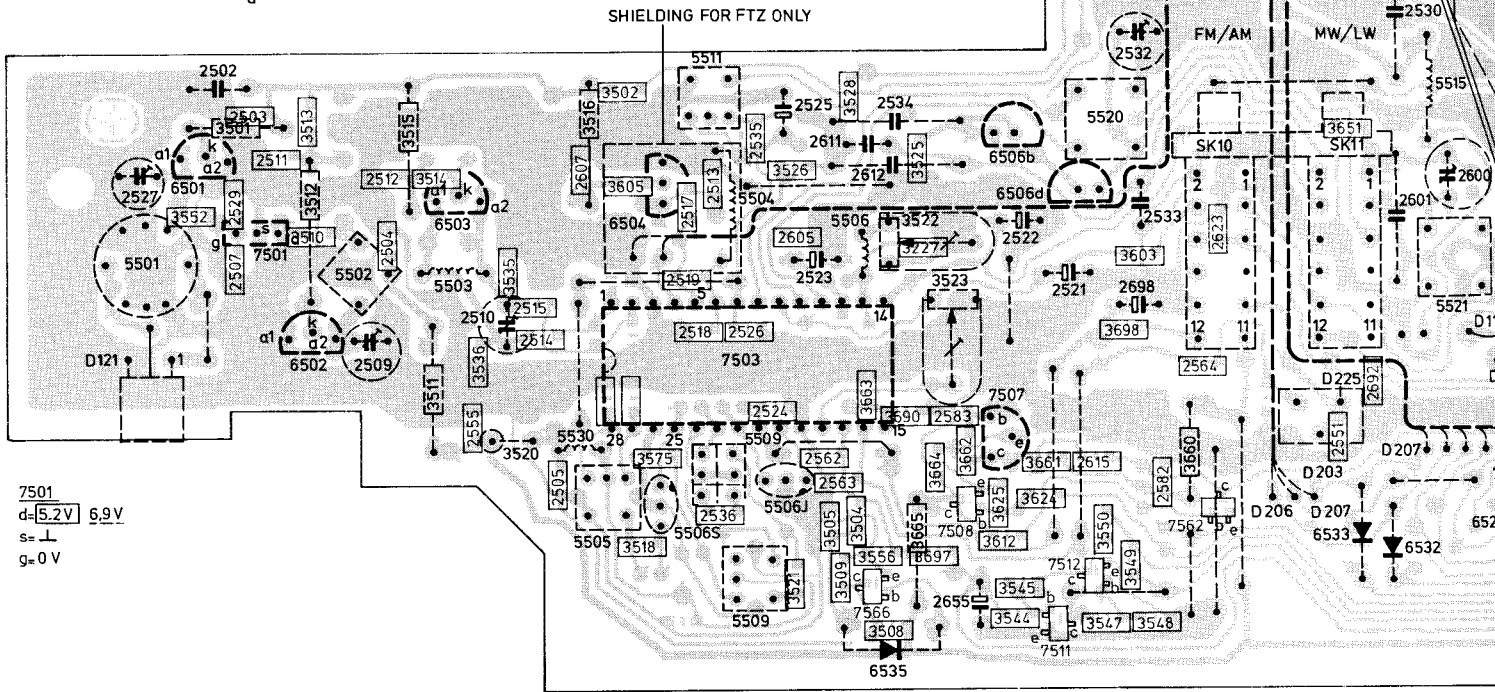
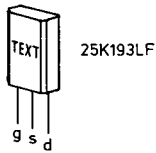
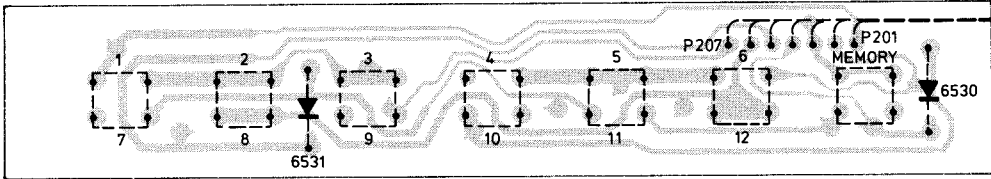




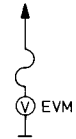
RF DIGITAL PANEL

A B C D

PRESETS 1 ÷ 12



7501  
d=5.2V 6.9V  
s=L  
g=0V



---V=FM  
---V=AM  
---V=ANY POSITION

DURING MUTE

7507  
e=2.7V  
b=3.4V  
c=4.9V  
7508  
e=L  
b=0V  
c=1.9V

7503	1 = 1V 0V	8 = 6.5V 7.3V	15 = 2.8V 2.2V	22 = 5.4V 6.8V
	2 = 1V 0V	9 = 2.3V	16 =	23 = 0V 2.2V
	3 = L	10 = 0V 2.4V	17 = 0V M 1.9V S 0V	24 = 0V 2.2V
	4 = 3.7V 0V	11 = 0V 2.4V	18 = 0.3V	25 = 2.3V 1.1V
	5 = 2.1V 0V	12 = 2.6V 0V	19 = L	26 = 6.6V 7.3V
	6 = 1.4V 0V	13 = 2.0V 0V	20 = 2.4V 1.1V	27 = 6.6V 7.3V
	7 = 1.4V 0V	14 = 2.7V 2.3V	21 = 2.4V 1.1V	28 = 6.6V 7.3V

7528  
e= 0.1V  
b= 51V  
c= 0.1V  
WEAK STR

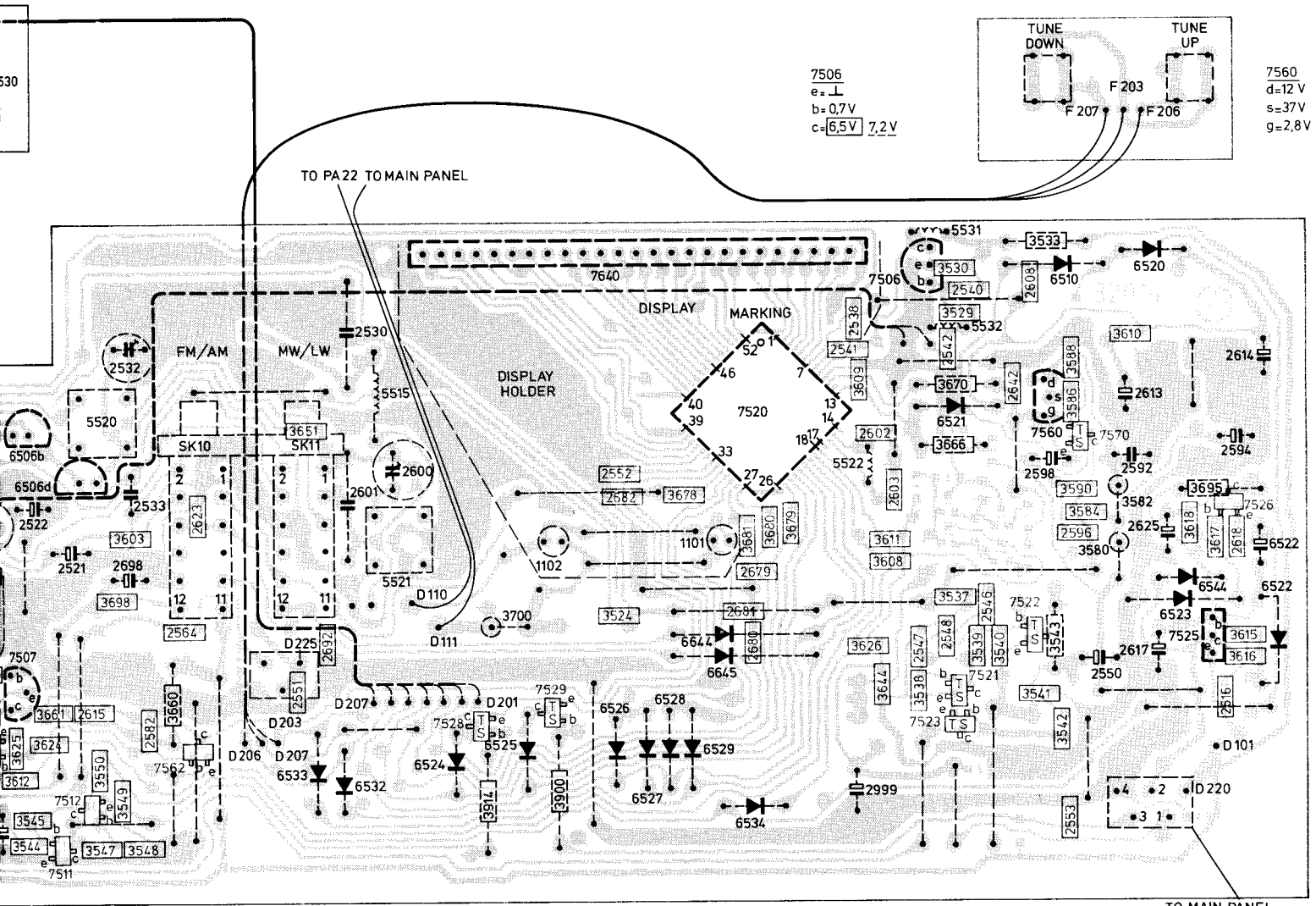
A B C D

D

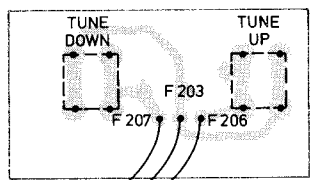
E

F

G



7506  
e =  $\perp$   
b = 0.7V  
c = 6.5V 7.2V

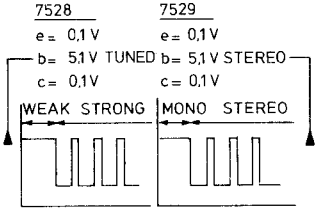


7560  
d = 12V  
s = 37V  
g = 2.8V

TO PA22 TO MAIN PANEL

TO MAIN PANEL

15 = 2.8V	2.2V	22 = 5.4V	6.8V
16 = 0.3V	0.0V	23 = 0.0V	2.2V
17 = 0.0V	1.9V	24 = 0.0V	2.2V
18 = 0.3V	0.0V	25 = 2.3V	1.1V
19 = 0.3V	0.0V	26 = 6.6V	7.3V
20 = 2.4V	1.1V	27 = 6.6V	7.3V
21 = 2.4V	1.1V	28 = 6.6V	7.3V



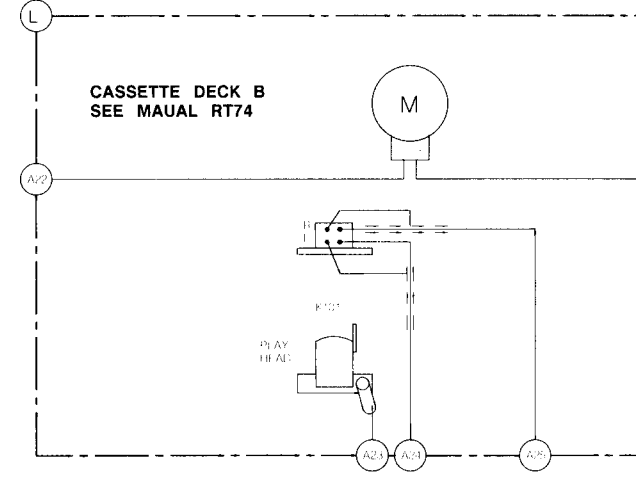
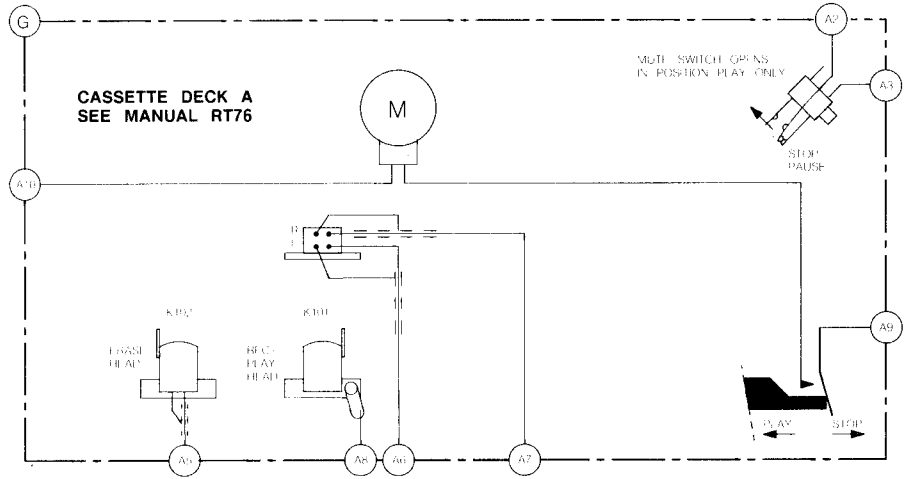
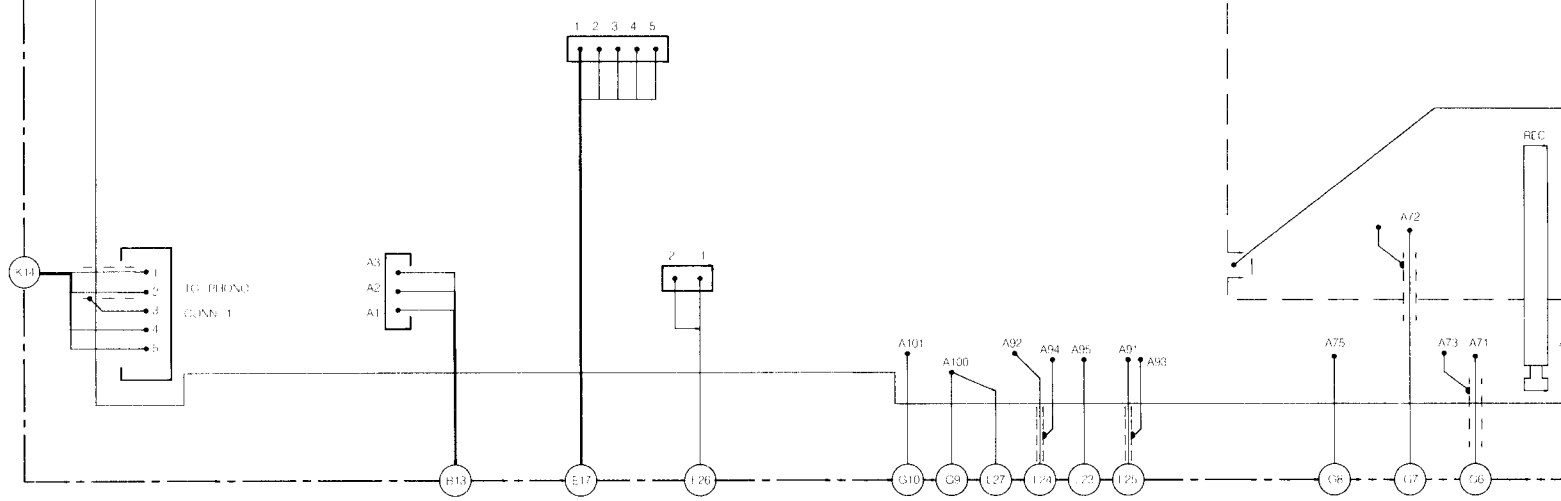
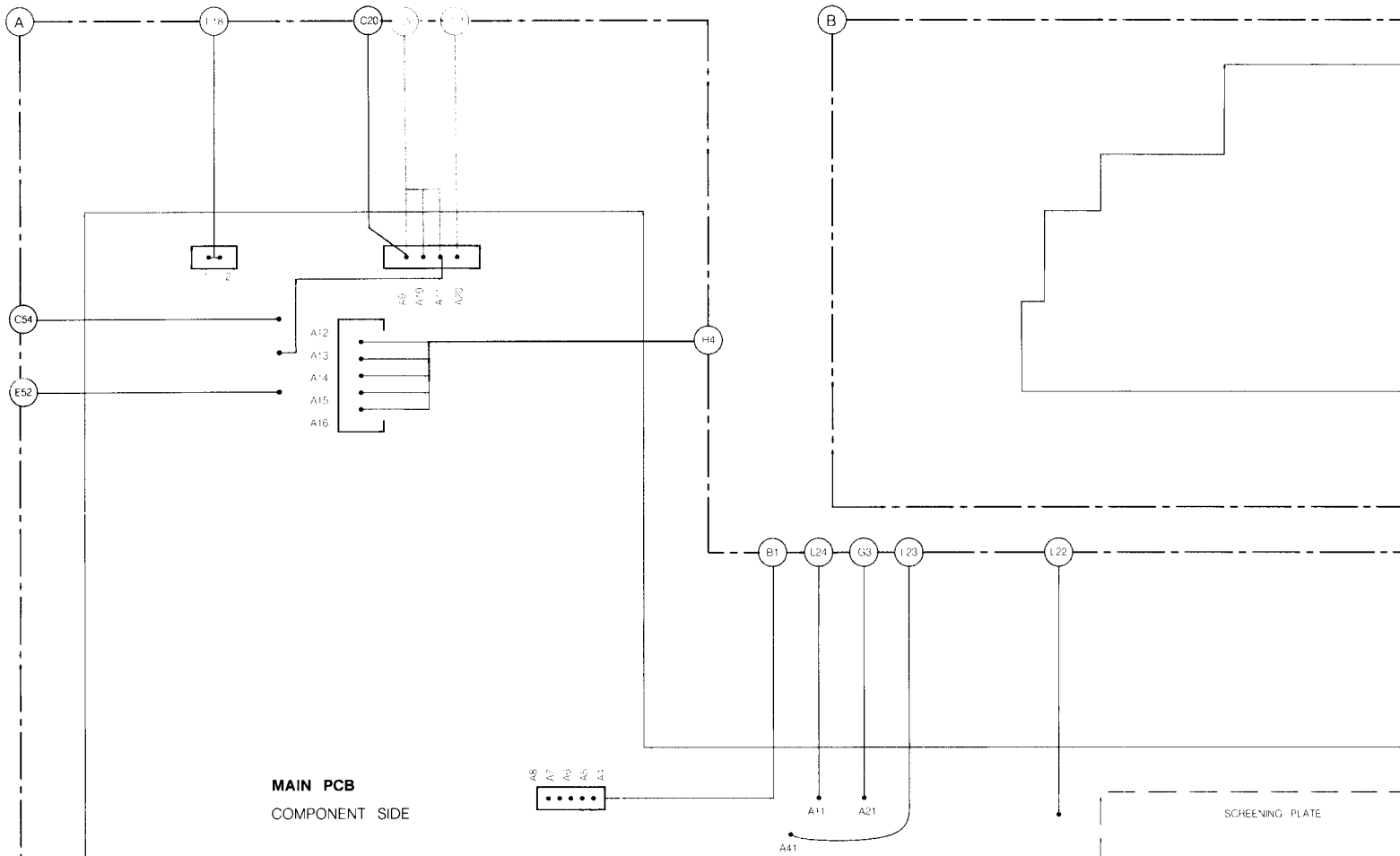
	VARICAP	VOLTAGE	TRANSISTOR 7550	COLLECTOR
FM	87.5 MHz	1.7 V	108 MHz	10.0 V
MW	522 kHz	0.9 V	1611 kHz	7.3 V
LW	150 kHz	0.9 V	263 kHz	6.8 V

D

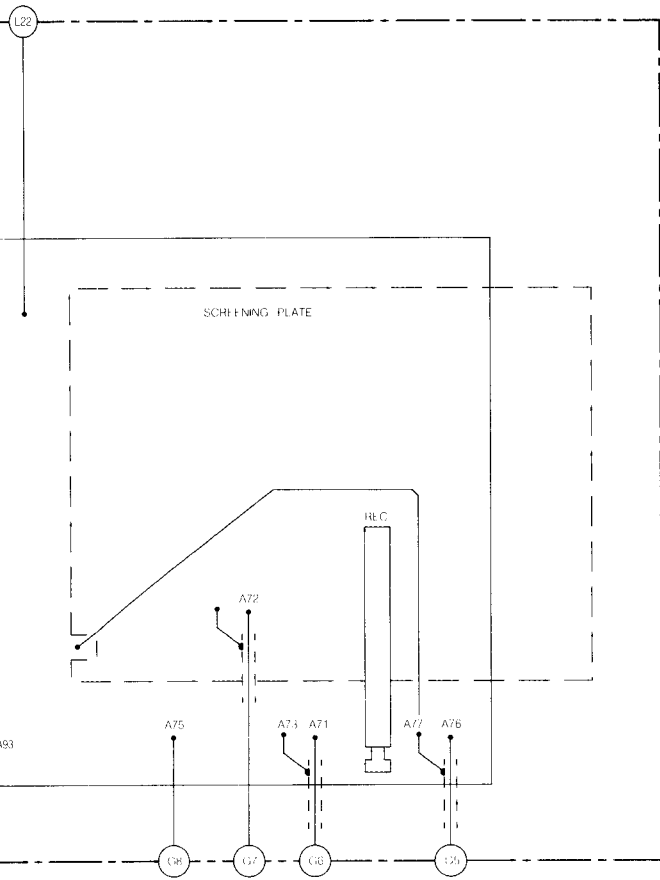
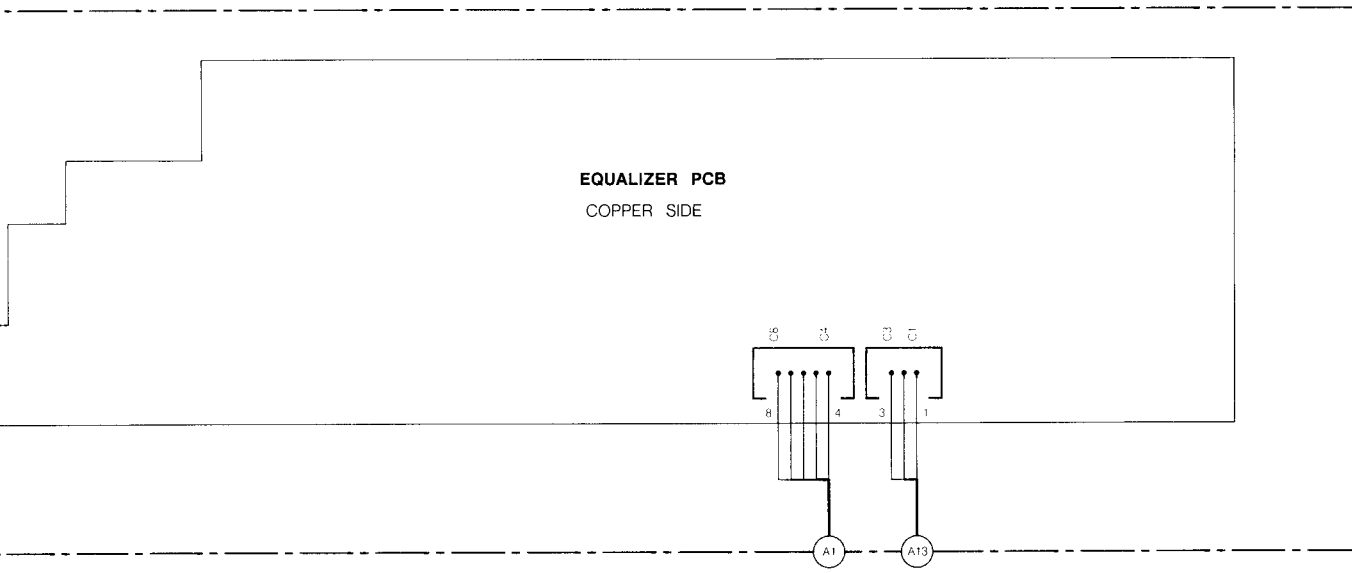
E

F

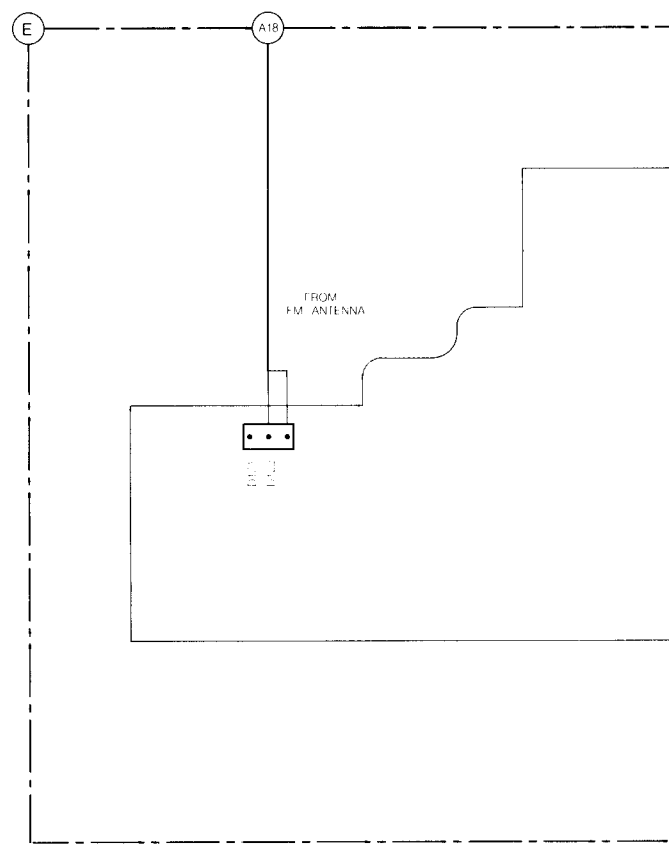
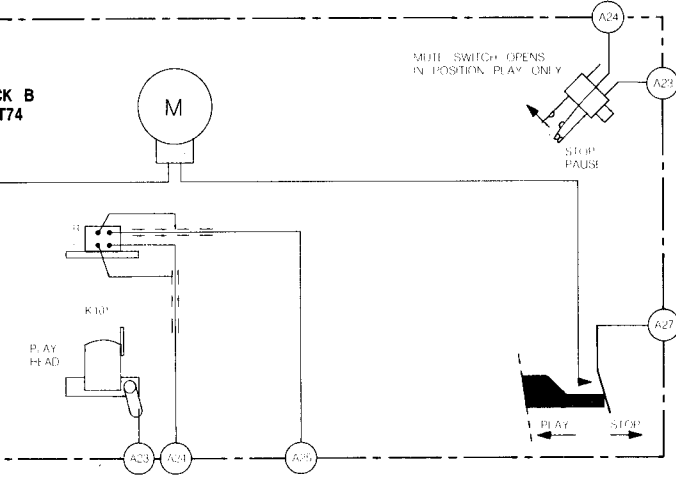
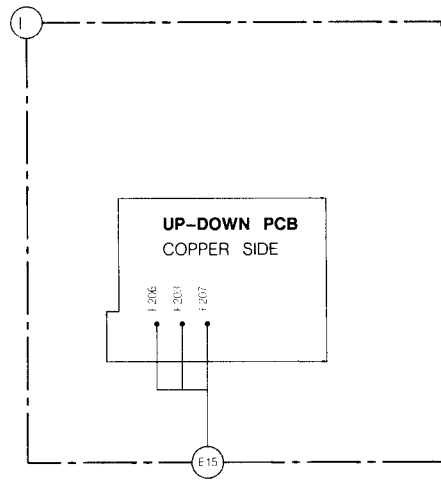
G

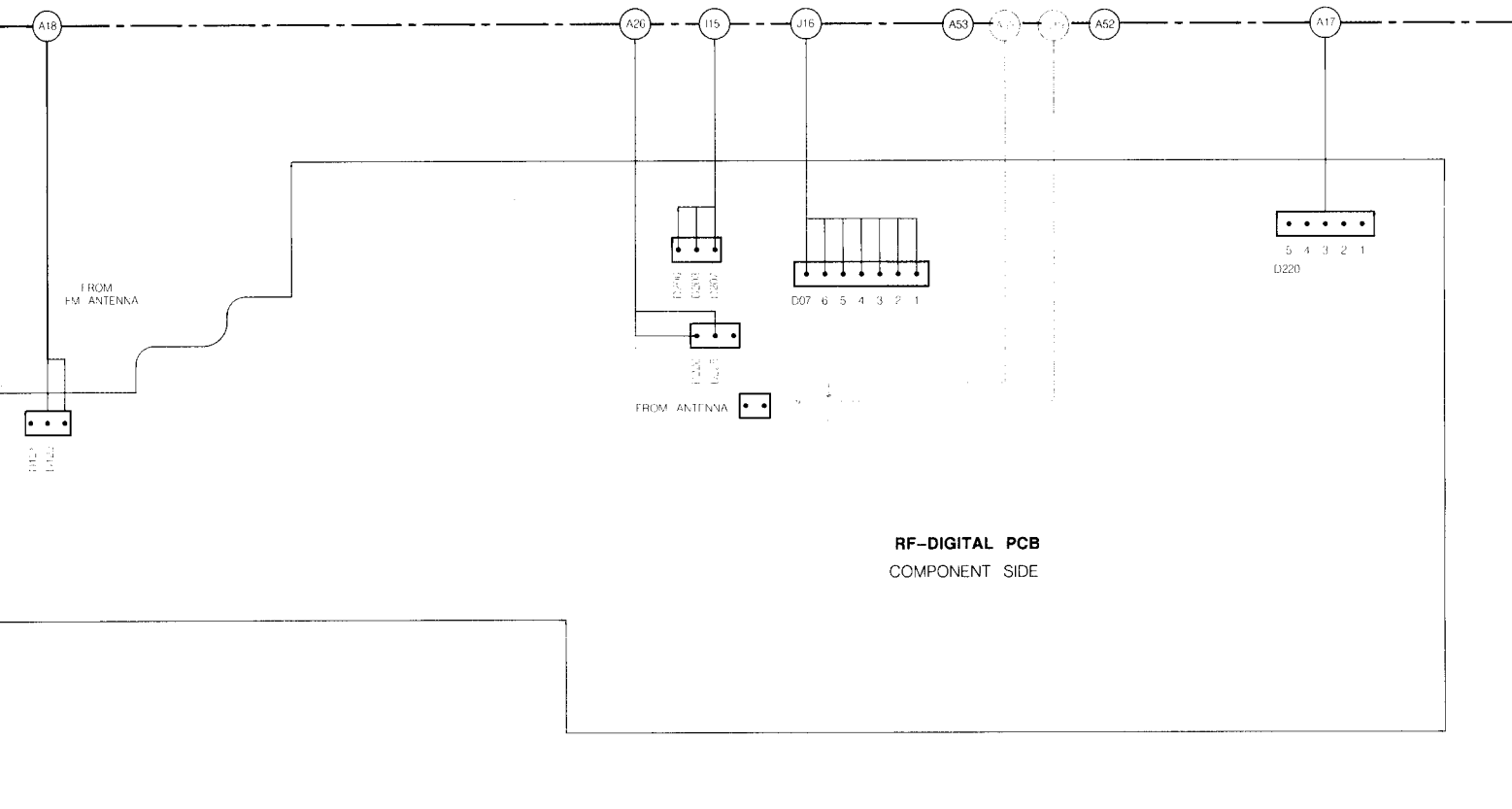
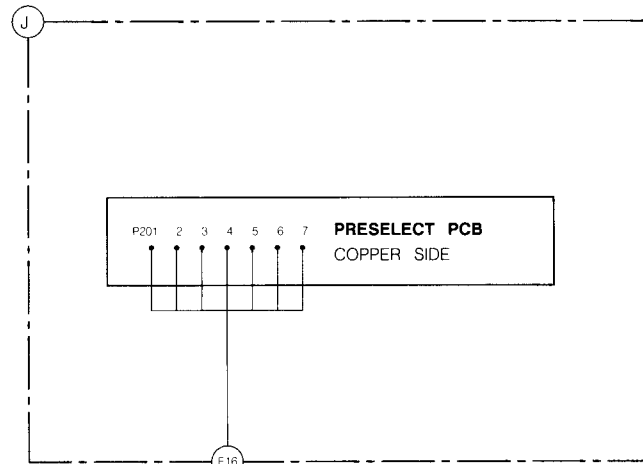
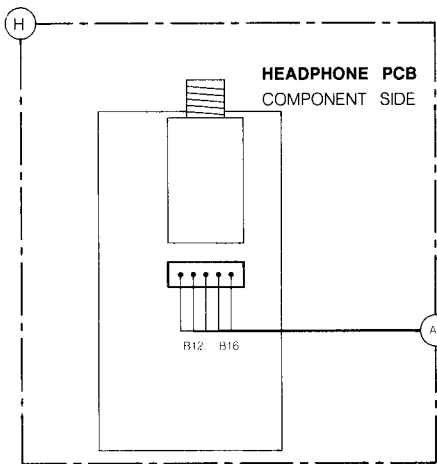
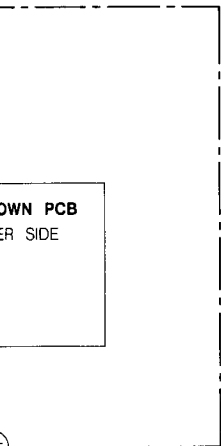
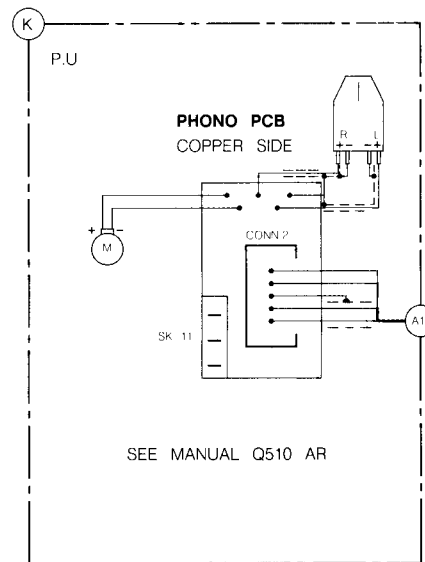
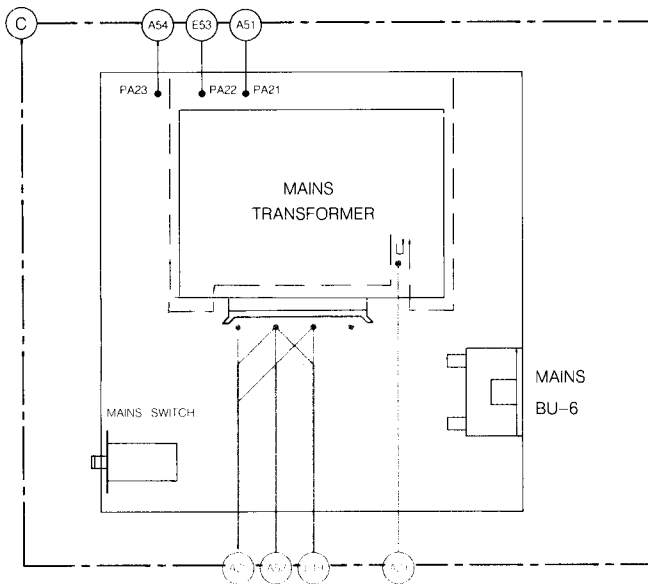
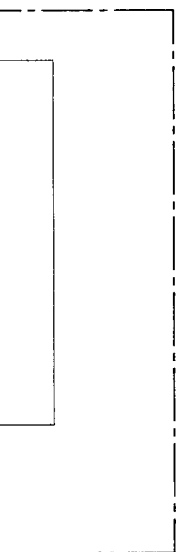






BLACK IS GENERAL  
BLACK IS GENERAL





## ELECTRICAL MEASUREMENTS AND ADJUSTMENTS RECORDER AND RECORD PLAYER

### General conditions recorder

- Prior to any measurement or adjustment with the tape running, heads and tape guides should be degaussed and cleaned.
- The measurements and adjustments are related to the left-hand channel.
- The corresponding test points and adjusting elements for the right-hand channel are given in brackets.
- The voltages have been measured relative to earth.

### Required test equipment and test cassettes

- LF generator
- AC mV meter
- Wow and flutter meter
- Frequency counter
- Cassette service set 801CSS 4822 395 30078
- Universal test cassette SBC420Fe 4822 397 30071

### RECORDER A + B

Recorder	Adjustment	Cassette	Recorder in position SK	Apply signal to	Measure on	Read on	Adjust with	Adjust to
A+B	Playback speed Method 1 or Method 2	3150 Hz part of SBC420Fe	PLAY	-	Loudspeaker output ⑤ (⑥)	Wow and flutter meter	Trimpotmeter R at the back of the motor	*A
		Test cassette set 801/CSS	PLAY	-	Loudspeaker output BU3-4	indicator on test set	Trimpotmeter R at the back of the motor	*B
A+B	Azimuth R/P head	8 kHz part of SBC420Fe	PLAY	-	⑤ (⑥)	AC mV meter or oscilloscope	Left screw on R/P head	Max. output L+R
A+B	Playback sensitivity	315 Hz-0 dB part of SBC420Fe	PLAY	-	⑤ (⑥)	AC mV meter	-	90 mV
A	BIAS	SBC420Fe side-2 °C	REC+PLAY	-	⑧ (⑨)	AC mV meter	3770	9 mV
A	Erase osc.	Empty cassette	REC PLAY Cr RIF OFF	-	⑩	Freq. counter	5751	53 kHz ± 5 kHz
			RIF ON	-	⑩	Freq. counter	5751	fosc. + 8 kHz ± 4 kHz
			RIF OFF Normal	-	⑩	DC mV meter	B -3 V ± 1 dBc	
			RIF OFF Cr	-	⑩	DC mV meter	19 V ± 1 dB =B	
A+B		Rewind recording made with deck A	PLAY	-	⑤ (⑥)	AC mV meter		See graph Fig. 11 if necessary repeat adjustment *D

### RECORD PLAYER

Recorder	Adjustment	Cassette	Recorder in position SK	Apply signal to	Measure on	Read on	Adjust with	Adjust to
	Speed		SK14 33 <sup>1</sup> / <sub>3</sub> rpm			Stroboscope	Trimpotmeter inside motor	33 <sup>1</sup> / <sub>3</sub> rpm

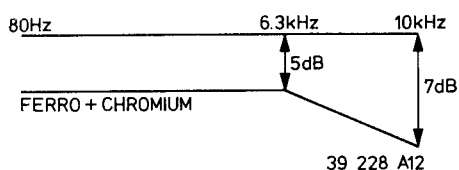


Fig. 11

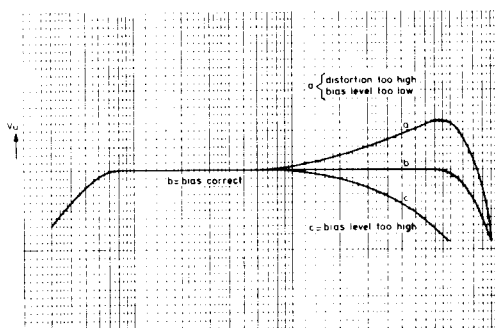


Fig. 12

**GB Electrical measurements and adjustments "Recorder"**

- \*A. – The maximum permissible speed deviation is  $\pm 0.5\%$ .  
Moreover, the wow and flutter value can be read.
  - This value should not exceed  $0.35\%$ .
- \*B. – Connect the Service cassette set to the apparatus via one of the loudspeaker connectors.
  - Set the apparatus to the play back position with the 50 Hz cassette service set.
  - With R at the back of the motor, adjust for minimum variation of the indicator reading.
- \*C. – If the accuracy requirements are less stringent a high quality ferro (normal) cassette may be used as an alternative.
- \*D. – If the adjustment is correct the frequency response curve will be similar to curve b in Fig. 12 (distortion  $\leq 5\%$ ).

**F Mesures électriques et réglages "Recorder"**

- \*A. – L'écart de vitesse maximum admissible est de  $\pm 0.5\%$ .  
La taux de pleurage pourra également être lu lors de cette mesure.
  - Cette valeur ne doit pas dépasser  $0.35\%$ .
- \*B. – Relier le jeu de cassette Service à travers un des haut-parleurs à l'appareil.
  - Positionner l'appareil en lecture et utiliser la cassette Service de 50 Hz.
  - À l'aide de R à l'arrière du moteur, ajuster pour un minimum de variation à l'indication.
- \*C. – Si de exigences du point de vue de la précision ne zont pas tellement hautes, une cassette ferro (normale) de bonne qualité suffira.
- \*D. – Si le réglage est correct, la courbe de réponse sera seuilable à la courbe b de la Fig. 12 (distorsion  $\leq 5\%$ ).

**I Misure e regolazione elettrica "Recorder"**

- \*A. – La deviazione massima di velocità è  $\pm 0.5\%$ .  
Inoltre, può essere rilevato il wow e flutter.
  - Questo valore non deve eccedere dello  $0.35\%$ .
- \*B. – Collegare lo strumento di servizio al connettore di uscita di una cassa acustica dell'apparecchio.
  - Posizionare l'apparecchio in riproduzione e usare la cassetta test a 50 Hz.
  - Regolare la velocità del motore (R), per la minima deviazione dello strumento.

**NL Elektrische metingen en instellingen "Recorder"**

- \*A. – De hoogst toelaatbare snelheidsafwijking bedraagt  $\pm 0.5\%$ .  
Tevens kan bij deze meting de jengelwaarde afgelezen worden.
  - Deze waarde mag niet hoger zijn dan  $0.35\%$ .
- \*B. – Via een van de luidsprekerconnectors het Service-cassettedeel met het apparaat verbinden.
  - Zet het apparaat in de weergeefstand met de 50 Hz cassette uit het Service-cassettedeel.
  - Met R aan de achterzijde van de motor op minimale variatie van de indicatoraflezing instellen.
- \*C. – Als de nauwkeurigheidseisen minder streng zijn, kan als alternatief een ferro-cassette (normal) van hoge kwaliteit gebruikt worden.
- \*D. – Als de instelling juist is, zal de frekwentiekromme gelijk zijn aan kromme b in Fig. 12 (vervorming  $\leq 5\%$ ).

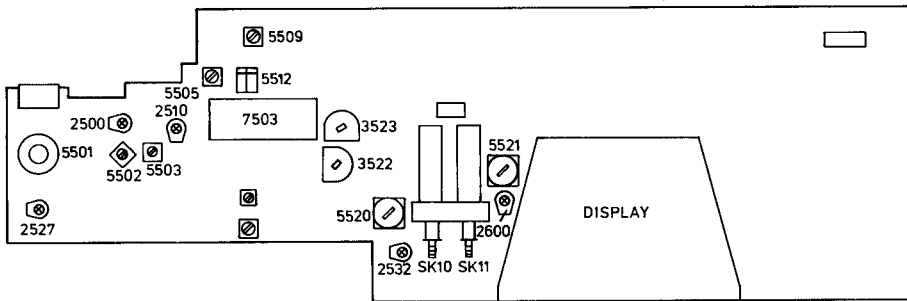
**D Elektrische Messungen und Einstellungen "Recorder"**

- \*A. – Die höchstzulässige Geschwindigkeitsabweichung beträgt  $\pm 0.5\%$ .  
Auch lässt sich bei dieser Messung der Jaulwert ablesen.
  - Dieser Wert darf  $0.35\%$  nicht überschreiten.
- \*B. – Über einen der Lautsprecherkonnektoren den Service-Cassettenteil mit dem Gerät verbinden.
  - Mit dem 50-Hz-Cassette aus dem Service-Cassettenteil das Gerät in die Wiedergabestellung bringen.
  - Mit R auf der Rückseite des Motors auf mindest-Schwankungen der Anzeigerablesung einstellen.
- \*C. – Wenn die Genauigkeitsanforderungen weniger streng sind, kann als Alternative eine Hochleistungs-ferrocassette (Normal) benutzt werden.
- \*D. – Wenn die Einstellung richtig ist, wird der Frequenzgang gleich der Kurve b in Bild 12 (Verzerrung  $\leq 5\%$ ) sein.

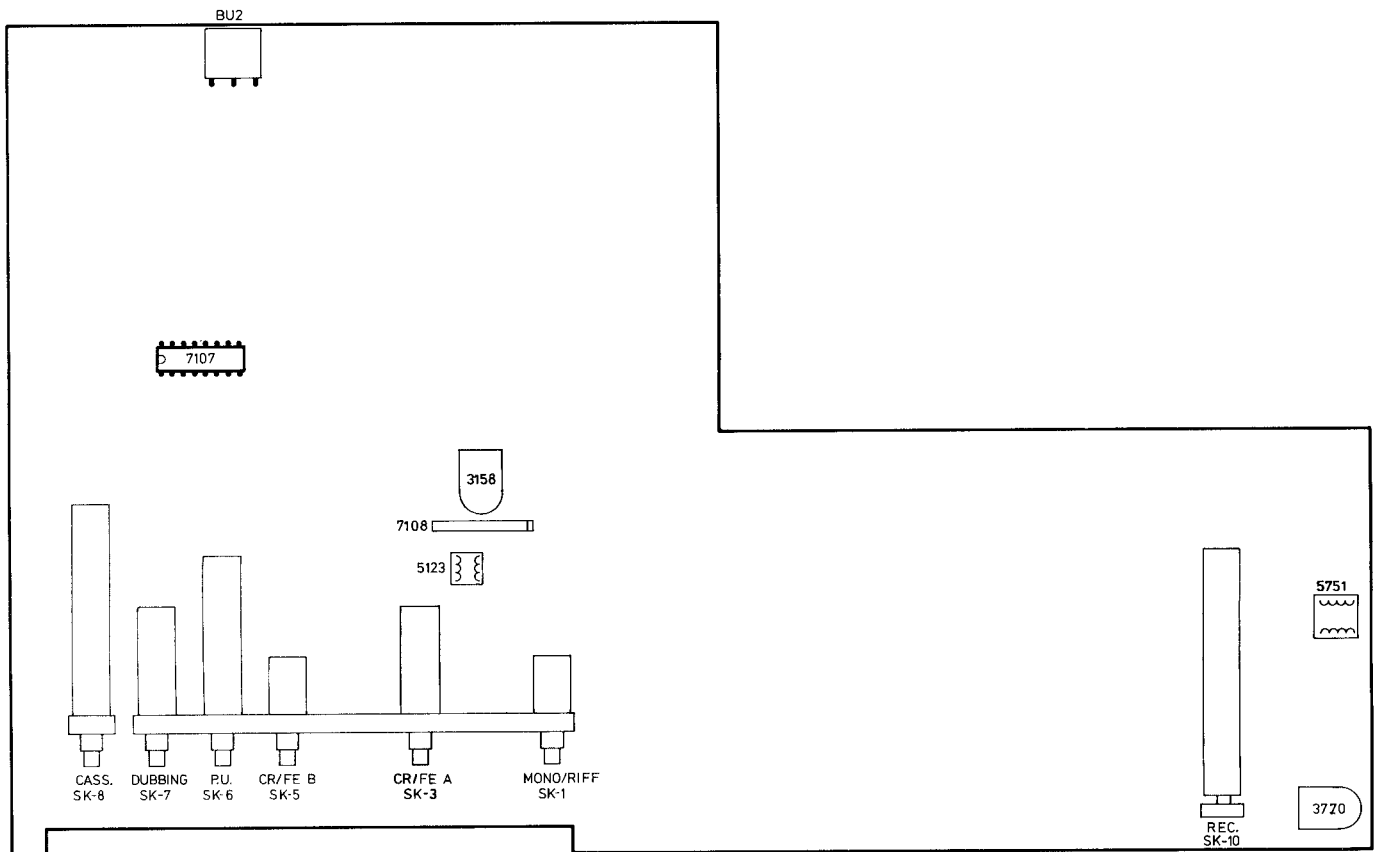
- \*C. – Se le esigenze de precisione sone meno alte può essere una cassetta du alta qualità al ferro (normale).
- \*D. – Se la regolazione è corretta la curva di risposta in frequenza sarà simile alla curva b in Fig. 12 (distorsione  $\leq 5\%$ ).

**Achtung**

**"Bei notwendigem Abgleich ist das Gerät auf die gesetzlich vorgeschriebenen Eckfrequenzen abzugleichen".**  
**>87.2 MHz <108.5 MHz.**



39 988 B12



39 987 C12





**ALIGNMENT**

**General**

- During the alignment, keep the levels of the injected signals as low as possible.
- Alignment of IF stages requires a sweep signal.  
For FM: Apply a 10.7 MHz signal with a sweep of 300 kHz at a frequency of 50 Hz.  
For AM: Apply a 450 kHz (468 kHz) signal with a sweep of 10 kHz at a frequency of 50 Hz.
- Place the peak of the band-pass curve in the middle of the picture by shifting the sweep frequency.

**Equipment required**

- RF generator
- Oscilloscope
- DC-millivoltmeter
- AC-millivoltmeter
- Frequency counter

**FM-IF**

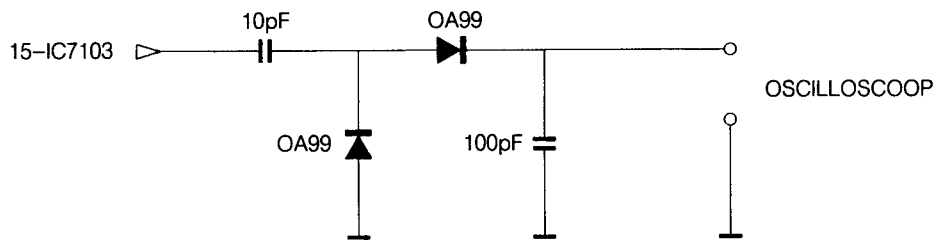
SK Position	Insert Signal	Tune in	Measure on	Adjust	Meter displays (oscilloscope)
SK-10 FM	10.7 MHz f (sw) = 75 kHz f (m) = 1 kHz to point A	108 MHz	Testp. 2 Testp. 1	5505	10 V (DC) S-curve symm.

sw=sweep m=modulated

**FM-RF**

SK-10 FM	108 MHz f (sw) = 75 kHz f (m) = 1 kHz to point A	108 MHz	Testp. 3	5504	Bandpass curve in the middle *
	87.5 MHz f (sw) = 75 kHz f (m) = 1 kHz to point A	87.5 MHz	Testp. 3  Testp. 2	5501 5502 5503	Bandpass curve maximum * (repeat) 1.7 V (DC)
	108 MHz f (sw) = 75 kHz f (m) = 1 kHz to point A	108 MHz	Testp. 3  Testp. 2	2527 2509 2510	

\* Measure bandpass curve with circuit below:





**T.H.D. (total harmonic distortion)**

SK-10 FM	98 Hz f (sw) = 75 kHz f (m) = 1 kHz to point A	98 MHz	Testp. 1	3522	S-curve min. THD
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**Stereo-decoder**

SK-10 FM	No signal		Testp. 4	3158	Counter: 76 kHz
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**Tuned indication**

SK-10 FM	98 MHz 90 % L-R 9 % pilot 8 μV	98 MHz		3523	Display: tuned on stereo on
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**AM-IF**

SK-10 AM SK-11 MW	450 kHz f (sw) = 10 kHz via 22 nF to point B	Short circuit 5511	Testp. 3	5509	Band pass curve max. symm.
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**AM-RF**

SK-10 AM SK-11 MW	To point C: 522 kHz f (m) = 1 kHz	522 kHz (8 V) * overbridge 6507 with 470 pF	Testp. 3	5511	Bandpass curve in the middle
	567 kHz f (m) = 1 kHz	567 kHz (1.4 V)	Testp. 3	5521	Bandpass curve maximum (repeat)
	1494 kHz f (m) = 1 kHz	1494 kHz (6.9 V)	Testp. 3	2532	
SK-10 AM SK-11 MW	155 kHz f (m) = 1 kHz	155 kHz (1.1 V)	Testp. 3	5520	
	255 kHz f (m) = 1 kHz	255 kHz (6.2 V)	Testp. 3	2600	







\* Varicap tuning voltages





sw=sweep

m=modulated

	Carbon film 0.2 W 70°C 5%		Ceramic plate Tuning ≤ 120 pF NP.0 2% Others -20/+80%	*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
	Carbon film 0.33 W 70°C 5%		Polyester flat foil 10%	
	Metal film 0.33 W 70°C 5%		Metalized polyester flat film 10%	
	Carbon film 0.5 W 70°C 5%		Polyester flat foil small size (Mylar) 10%	
	Carbon film 0.67 W 70°C 5%		Polyesterene film/foil 1%	
	Carbon film 1.15 W 70°C 5%		Tubular ceramic	
	© Chip component		Miniature single	
			Subminiature tantalum ± 20%	

## ELECTRICAL PARTS

					
BAX14		4822 130 34193	2109	27 pF 50 V N220 5%	4822 122 32564
BA220		4822 130 34221	2158	27 pF ceramic N220	4822 122 32706
BB204B		4822 130 34449	2173	1 nF PS cap. 630 V 1%	4822 121 50591
BZX79/C4V7		4822 130 34174	2380	Elco 3300 µF 40 V 20%	4822 124 21744
BZX79/C5V6		4822 130 34173	2386	Elco 2200 µF 16 V 20%	4822 124 40723
BZX79/C7V5		4822 130 30861	2509	Trimmer 10 pF N450	4822 125 60101
BZX79/C8V2		4822 130 34382	2510	Trimmer 10 pF N450	4822 125 60101
BZX79/C16		4822 130 34268	2513	10 pF ceramic 2%	4822 122 32185
BZX79/C18		4822 130 31024	2527	Trimmer 10 pF N450	4822 125 60101
HZ6C2		4822 130 32698	2532	Trimmer 30 pF N750	4822 125 60102
OA99		4822 130 31482	2534	510 pF PS. cap. 630 V 1%	5322 121 54055
OF642 varicap		4822 130 32159	2535	27 pF cer. N1500 2%	4822 122 32848
1N4148		4822 130 30621	2600	Trimmer 30 pF N750	4822 125 60102
2KBP02-7001		4822 130 50363	2601	270 pF PS. cap 630 V 1%	5322 121 54047
LCA7B8061A (display)		4822 130 90348	2612	470 pF PS. cap 630 V 1%	5322 121 54078
					
3158	Trimmer 4k7 lin.	4822 100 10036	5001	Transformer mains F1664	4822 146 21053
3325	Slide potm. 100k	4822 105 10649	5001	Transformer mains F1667	4822 145 60088
3326	Slide potm. 100k	4822 105 10649	5123		4822 157 51842
3327	Slide potm. 100k	4822 105 10649	5501	Aerial coil	4822 157 51465
3328	Slide potm. 100k	4822 105 10649	5502	RF coil	4822 157 51065
3329	Slide potm. 100k	4822 105 10649	5503	RF coil	4822 156 21339
3365	Slide potm. 100k	4822 105 10651	5504	RF coil	4822 156 21339
3366	Slide potm. 10k	4822 105 10652	5505	FM 10.7 MHz	4822 153 50102
3383	1E NFR25 5%	4822 116 53074	5506	Cer. filter pack.	4822 242 71558
3384	1E NFR25 5%	4822 116 53074	5509	AM IF coil	4822 158 60511
3395	4.7E NFR30 5%	4822 116 52448	5511	AM osc. coil	4822 157 51844
3522	Trimmer 220E	4822 100 10019	5512	Ceramic resonator	4822 142 70484
3523	Trimmer 10k lin.	4822 100 10035	5515	Choke	4822 157 50964
3770	Trimmer 100k lin.	4822 100 10052	5520	LW aerial coil	4822 156 10922
			5521	MW aerial coil	4822 158 60507
2SK193LF		4822 130 41813	5522	Crystal 4.5 MHz	4822 242 71506
BB204B		4822 130 34449	5530	Absorb. coil	4822 156 10641
BC549B		4822 130 40936	5751	Osc. coil 100 kHz	4822 156 20946
BC817		4822 130 42133	<b>Miscellaneous</b>		
BC848B	(1K marked)	5322 130 41982	BU-1		4822 267 30631
BC849C		4822 130 42614	BU-2		4822 267 20153
BC858B	(3K marked)	5322 130 41983	BU-3/4		4822 290 80609
BC858C	(31 marked)	4822 130 42513	BU-5		4822 267 30558
BD135		4822 130 40823	BU-6		4822 265 20262
BD675		5322 130 44786	1301	2.5A (T)	4822 253 10082
BF199		4822 130 44154	1302	1A (T)	4822 253 10052
BF245A		5322 130 44499	1303	1A (T)	4822 253 10052
BF245B		4822 130 41024	1502	315 mA (T)	4822 253 10074
BF494B		4822 130 41376	SK 1-7	Select sw. assy	4822 276 50338
			SK 8	Cass. sw.	4822 276 40346
CXA1030P		4822 209 70243	SK 9	Power sw.	4822 276 11567
NJM4558DD		4822 209 81054	SK 10	Record sw.	4822 277 60232
TA7343P		4822 209 81245	SK 9-10	AM/FM sw. assy	4822 276 20423
TDA2030HL		4822 209 80674	SK P	Print sw. frontp.	4822 276 11896
UPC1238H		4822 209 81964		Thermal fuse (mains transf)	4822 252 20146
UPD1713AG		4822 209 70244	1101	Lamp 12 V/ 110 mA	4822 134 40634
			1102	Lamp 12 V/ 110 mA	4822 134 40634

Ⓢ  Chips 50 V NP0 S1206			Ⓢ  Chips 0,125 W S1206			Ⓢ  Chips 0,125 W S1206			1S
1 pF	5%	4822 122 32479	4,7 E	5%	5322 111 90376	6,8 k	2%	4822 111 90544	
1,5 pF	5%	4822 122 31792	5,1 E	5%	4822 111 90393	7,5 k	2%	4822 111 90276	
1,8 pF	5%	4822 122 32087	5,6 E	5%	4822 111 90394	8,2 k	2%	5322 111 90118	
2,2 pF	5%	4822 122 32425	6,2 E	5%	4822 111 90395	9,1 k	2%	4822 111 90373	
3,3 pF	5%	4822 122 32079	6,8 E	5%	4822 111 90254	10 k	2%	4822 111 90249	
3,9 pF	5%	4822 122 32081	7,5 E	5%	4822 111 90396	11 k	2%	4822 111 90337	
4,7 pF	5%	4822 122 32082	8,2 E	5%	4822 111 90397	12 k	2%	4822 111 90253	
5,6 pF	5%	4822 122 32506	9,1 E	5%	4822 111 90398	13 k	2%	4822 111 90509	
6,8 pF	5%	4822 122 32507	10 E	2%	5322 111 90095	15 k	2%	4822 111 90196	
8,2 pF	5%	4822 122 32083	11 E	2%	4822 111 90338	16 k	2%	4822 111 90346	
10 pF	5%	4822 122 31971	12 E	2%	4822 111 90341	18 k	2%	4822 111 90238	
12 pF	5%	4822 122 32139	13 E	2%	4822 111 90343	20 k	2%	4822 111 90349	
15 pF	5%	4822 122 32504	15 E	2%	4822 111 90344	22 k	2%	4822 111 90251	
18 pF	5%	4822 122 31769	16 E	2%	4822 111 90347	24 k	2%	4822 111 90512	
22 pF	10%	4822 122 31837	18 E	2%	5322 111 90139	27 k	2%	4822 111 90542	
27 pF	5%	4822 122 31966	20 E	2%	4822 111 90352	30 k	2%	4822 111 90216	
33 pF	5%	4822 122 31756	22 E	2%	4822 111 90186	33 k	2%	5322 111 90267	
39 pF	5%	4822 122 31972	24 E	2%	4822 111 90355	36 k	2%	4822 111 90514	
47 pF	5%	4822 122 31772	27 E	2%	5322 111 90105	39 k	2%	5322 111 90108	
56 pF	5%	4822 122 31774	30 E	2%	4822 111 90356	43 k	2%	4822 111 90363	
68 pF	5%	4822 122 31961	33 E	2%	4822 111 90357	47 k	2%	4822 111 90543	
82 pF	10%	4822 122 31839	36 E	2%	4822 111 90359	51 k	2%	5322 111 90274	
100 pF	5%	4822 122 31765	39 E	2%	4822 111 90361	56 k	2%	4822 111 90573	
120 pF	5%	4822 122 31766	43 E	2%	5322 116 90125	62 k	2%	5322 111 90275	
150 pF	5%	4822 122 31767	47 E	2%	4822 111 90217	68 k	2%	4822 111 90202	
180 pF	2%	4822 122 31794	51 E	2%	4822 111 90365	75 k	2%	4822 111 90574	
220 pF	5%	4822 122 31965	56 E	2%	4822 111 90239	82 k	2%	4822 111 90575	
270 pF	5%	4822 122 32142	62 E	2%	4822 111 90367	91 k	2%	5322 111 90277	
330 pF	10%	4822 122 31642	68 E	2%	4822 111 90203	100 k	2%	4822 111 90214	
390 pF	5%	4822 122 31771	75 E	2%	4822 111 90371	110 k	2%	5322 111 90269	
470 pF	5%	4822 122 31727	82 E	2%	4822 111 90124	120 k	2%	4822 111 90568	
560 pF	5%	4822 122 31773	91 E	2%	4822 111 90375	130 k	2%	4822 111 90511	
680 pF	5%	4822 122 31775	100 E	2%	5322 111 90091	150 k	2%	5322 111 90099	
820 pF	5%	4822 122 31974	110 E	2%	4822 111 90335	160 k	2%	5322 111 90264	
1 nF	10%	5322 122 31647	120 E	2%	4822 111 90339	180 k	2%	4822 111 90565	
1,2 nF	5%	4822 122 31807	130 E	2%	4822 111 90164	200 k	2%	4822 111 90351	
1,5 nF	10%	4822 122 31781	150 E	2%	5322 111 90098	220 k	2%	4822 111 90197	
1,8 nF	10%	4822 122 32153	160 E	2%	4822 111 90345	240 k	2%	4822 111 90215	
2,2 nF	10%	4822 122 31644	180 E	2%	5322 111 90242	270 k	2%	4822 111 90302	
2,7 nF	10%	4822 122 31783	200 E	2%	4822 111 90348	300 k	2%	5322 111 90266	
3,3 nF	10%	4822 122 31969	220 E	2%	4822 111 90178	330 k	2%	4822 111 90513	
3,9 nF	10%	4822 122 32566	240 E	2%	4822 111 90353	360 k	2%	4822 111 90515	
4,7 nF	10%	4822 122 31784	270 E	2%	4822 111 90154	390 k	2%	4822 111 90182	
5,6 nF	10%	4822 122 31916	300 E	2%	4822 111 90156	430 k	2%	4822 111 90168	
6,8 nF	10%	4822 122 31976	330 E	2%	5322 111 90106	470 k	2%	4822 111 90161	
10 nF	10%	4822 122 31728	360 E	1%	4822 111 90288	510 k	2%	4822 111 90364	
12 nF	10%	5322 122 31648	360 E	2%	4822 111 90358	560 k	2%	4822 111 90169	
15 nF	10%	4822 122 31782	390 E	2%	5322 111 90138	620 k	2%	4822 111 90213	
18 nF	10%	4822 122 31759	430 E	2%	4822 111 90362	680 k	2%	4822 111 90368	
22 nF	10%	4822 122 31797	470 E	2%	5322 111 90109	750 k	2%	4822 111 90369	
27 nF	10%	4822 122 32541	510 E	2%	4822 111 90245	820 k	2%	4822 111 90205	
33 nF	10%	4822 122 31981	560 E	2%	5322 111 90113	910 k	2%	4822 111 90374	
47 nF	10%	4822 122 32542	620 E	2%	4822 111 90366	1 M	2%	4822 111 90252	
56 nF	10%	4822 122 32183	680 E	2%	4822 111 90162	1,1 M	5%	4822 111 90408	
100 nF	10%	4822 122 31947	750 E	2%	5322 111 90306	1,2 M	5%	4822 111 90409	
180 nF	10%	4822 122 32915	820 E	2%	4822 111 90171	1,3 M	5%	4822 111 90411	
			910 E	2%	4822 111 90372	1,5 M	5%	4822 111 90412	
			1 k	2%	5322 111 90092	1,6 M	5%	4822 111 90413	
			1,1 k	2%	4822 111 90336	1,8 M	5%	4822 111 90414	
			1,2 k	2%	5322 111 90096	2 M	5%	4822 111 90415	
			1,3 k	2%	4822 111 90244	2,2 M	5%	4822 111 90185	
			1,5 k	2%	4822 111 90151	2,4 M	5%	4822 111 90416	
			1,6 k	2%	5322 111 90265	2,7 M	5%	4822 111 90417	
			1,8 k	2%	5322 111 90101	3 M	5%	4822 111 90418	
			2 k	2%	4822 111 90165	3,3 M	5%	4822 111 90191	
			2,2 k	2%	4822 111 90248	3,6 M	5%	4822 111 90419	
			2,4 k	2%	4822 111 90289	3,9 M	5%	4822 111 90421	
			2,7 k	2%	4822 111 90569	4,3 M	5%	4822 111 90422	
			3 k	2%	4822 111 90198	4,7 M	5%	4822 111 90423	
			3,3 k	2%	4822 111 90157	5,1 M	5%	4822 111 90424	
			3,6 k	2%	5322 111 90107	5,6 M	5%	4822 111 90425	
			3,9 k	2%	4822 111 90571	6,2 M	5%	4822 111 90426	
			4,3 k	2%	4822 111 90167	6,8 M	5%	4822 111 90235	
			4,7 k	2%	5322 111 90111	7,5 M	5%	4822 111 90427	
			5,1 k	2%	5322 111 90268	8,2 M	5%	4822 111 90237	
			5,6 k	2%	4822 111 90572	9,1 M	5%	4822 111 90428	
			6,2 k	2%	4822 111 90545	10M	5%	5322 111 91141	
Ⓢ  Chips 0,125 W S1206 NP0									
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							



