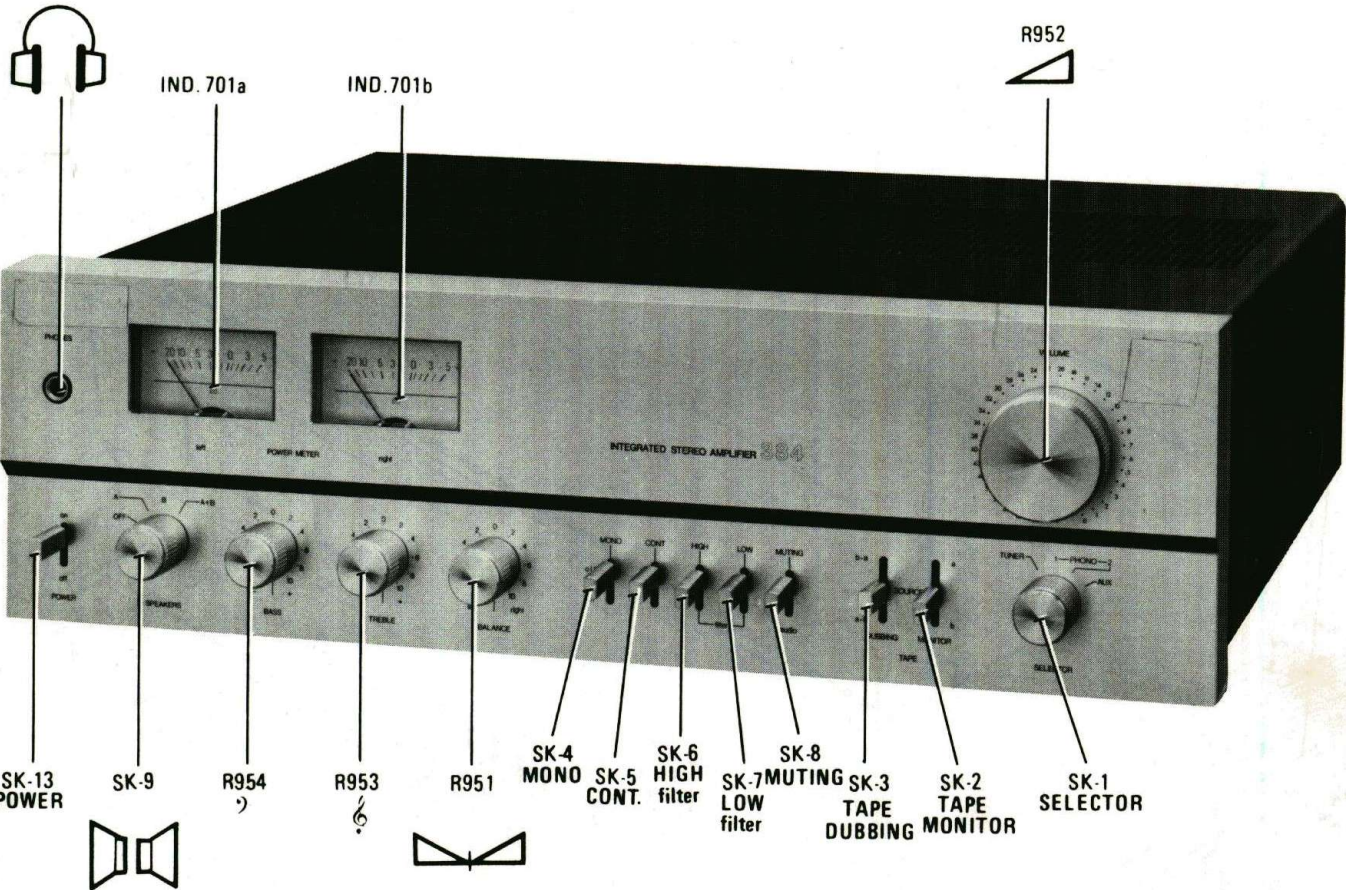
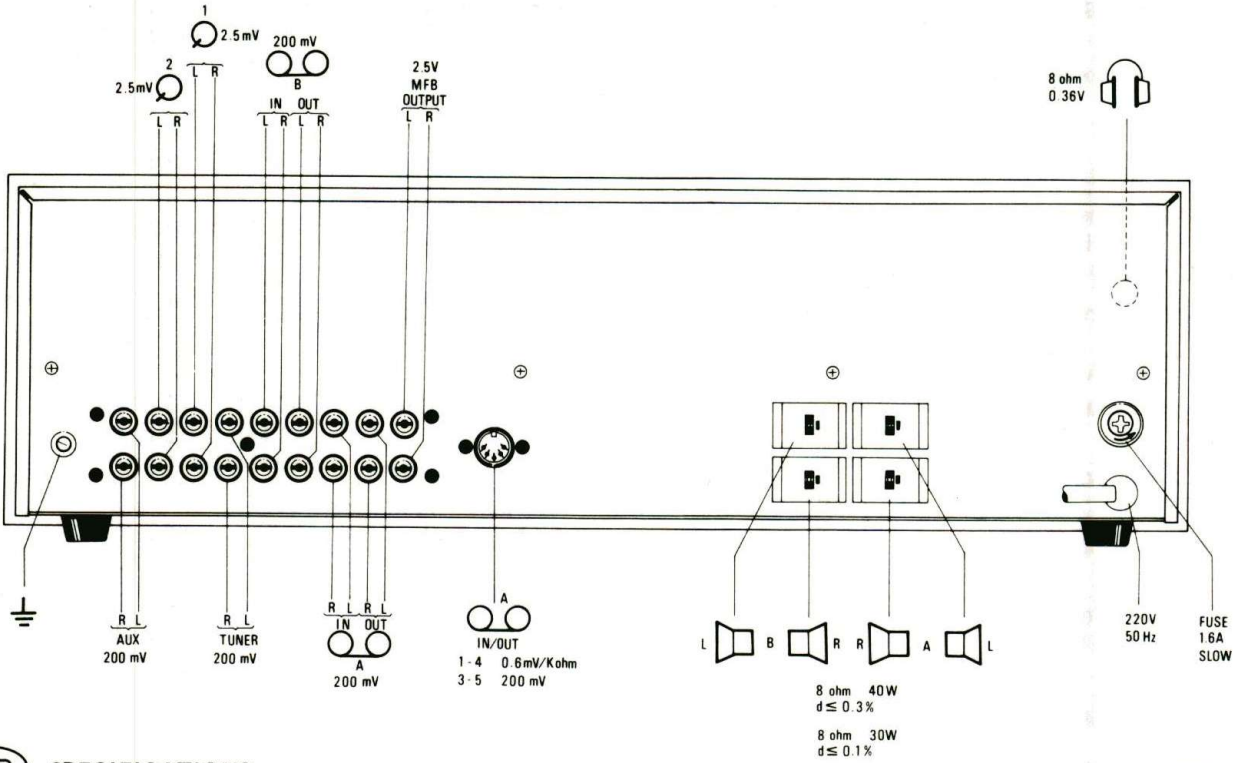


Service
Service
Service

Service Manual



15017A12



GB SPECIFICATIONS

Power output	: 2x45 W (4 Ω) d ≤ 0.3 %
Power band width d ≤ 0.3 %	: 10 - 40.000 Hz
Harmonic distortion at 30 W (8 Ω)	: 0.1 %
Intermodulation distortion (acc. to IHF 60-7000 Hz 4:1) at 20 W (8 Ω)	: 0.1 %
Frequency response	: 20 - 20.000 Hz

Stereo separation 100 Hz	: 45 dB
1 kHz	: 50 dB
10 kHz	: 40 dB
Signal-to-noise ratio Phono 1,2	: 60 dB
Aux./Tuner	: 80 dB
Output impedance Loudspeaker	: 4-16 Ω
Headphone	: 8 Ω
Dimensions	: 480x150x380 mm

NL SPECIFICATIES

Uitgangsvermogen	: 2x45 W (4 Ω) v ≤ 0,3 %
Vermogensbandbreedte v ≤ 0,3 %	: 10 - 40.000 Hz
Harmonische vervorming bij 30 W (8 Ω)	: 0,1 %
Intermodulatie (acc. IHF 60-7000 Hz 4:1) bij 20 W (8 Ω)	: 0,1 %
Frequentiebereik	: 20 - 20.000 Hz

Kanaalscheiding 100 Hz	: 45 dB
1 kHz	: 50 dB
10 kHz	: 40 dB
Signaal/ruisverhouding Phono 1, 2	: 60 dB
Aux, Tuner	: 80 dB
Uitgangsimpedantie Luidspreker	: 4-16 Ω
Hoofdtelefoon	: 8 Ω
Afmetingen	: 480x150x380 mm

F CARACTERISTIQUES TECHNIQUES

Puissance de sortie	: 2x45 W (4Ω) d ≤ 0,3 %
Bande passante en puissance d ≤ 0,3 %	: 10 - 40.000 Hz
Distorsion harmonique à 30 W (8 Ω)	: 0,1 %
Distorsion intermodulatoire (IHF 60-7000 Hz 4:1) à 20 W (8 Ω)	: 0,1 %
Courbe amplitude/fréquence	: 20 - 20.000 Hz

Séparation en stéréo 100 Hz	: 45 dB
1 kHz	: 50 dB
10 kHz	: 40 dB
Rapport signal/bruit Phono 1, 2	: 60 dB
Aux, Tuner	: 80 dB
Impédance de sortie Haut-parleur	: 4-16 Ω
Casque d'écoute	: 8 Ω
Dimensions	: 480x150x380 mm



D TECHNISCHE DATEN

Ausgangsleistung	: 2x45 W (4 Ω) k ≤ 0,3 %
Leistungsbandbreite	: 10 - 40.000 Hz k ≤ 0,3 %
Klirrgrad	: 0,1 % bei 30 W (8 Ω)
Intermodulationsgrad	: 0,1 % (IHF 60-7000 Hz 4:1) bei 20 W (8 Ω)
Übertragungsbereich	: 20 - 20.000 Hz

I DATA TECNICI

Potenza d'uscita	: 2x45 W (4 Ω) d ≤ 0,3 %
Banda di potenza	: 10 - 40.000 Hz d ≤ 0,3 %
Distorsione armonica	: 0,1 % a 30 W (8 Ω)
Intermodulazione	: 0,1 % (IHF 60-7000 Hz 4:1) a 20 W (8 Ω)
Risposta in frequenza	: 20 - 20.000 Hz

S TEKNISKA DATA

Uteffekt	: 2x45 W (4 Ω) d ≤ 0,3 %
Effekt bandbredd	: 10 - 40.000 Hz d ≤ 0,3 %
Harmonisk distorsion	: 0,1 % vid 30 W (8 Ω)
Intermodulation	: 0,1 % (IHF 60-7000 Hz 4:1) vid 20 W (8 Ω)
Frekvensomfång	: 20 - 20.000 Hz

DK TEKNISKE DATA

Udgangseffekt	: 2x45 W (4 Ω) f ≤ 0,3 %
Effektbåndbredde	: 10 - 40.000 Hz f ≤ 0,3 %
Harmonisk forvrængning	: 0,1 % ved 30 W (8 Ω)
Intermodulation	: 0,1 % (IHF 60-7000 Hz 4:1) ved 20 W (8 Ω)
Frekvens område	: 20 - 20.000 Hz

N TEKNISKE DATA

Utgangseffekt	: 2x45 W (4 Ω) f ≤ 0,3 %
Effektbåndbredde	: 10 - 40.000 Hz f ≤ 0,3 %
Harmonisk forvrengning	: 0,1 % ved 30 W (8 Ω)
Intermodulasjon	: 0,1 % (IHF 60-7000 Hz 4:1) ved 20 W (8 Ω)
Frekvensområde	: 20 - 20.000 Hz

Überspechdämpfung	100 Hz : 45 dB 1 kHz : 50 dB 10 kHz : 40 dB
S/R-Verhältnis	Phono 1, 2 : 60 dB Aux, Tuner : 80 dB
Ausgangsimpedanz	Lautsprecher : 4-16 Ω Kopfhörer : 8 Ω
Abmessungen	: 480x150x380 mm

Separazione stereo	100 Hz : 45 dB 1 kHz : 50 dB 10 kHz : 40 dB
Rapporto segnale/disturbo	Phono 1, 2 : 60 dB Aux, Tuner : 80 dB
Impedenza d'uscita	Altoparlante : 4-16 Ω Cuffia : 8 Ω
Dimensioni	: 480x150x380 mm

Kanalseparation	100 Hz : 45 dB 1 kHz : 50 dB 10 kHz : 40 dB
Signal/brusför hållande	Phono 1, 2 : 60 dB Aux, Tuner : 80 dB
Impedans	Högtalare : 4-16 Ω Hörtelefon : 8 Ω
Dimensioner	: 480x150x380 mm

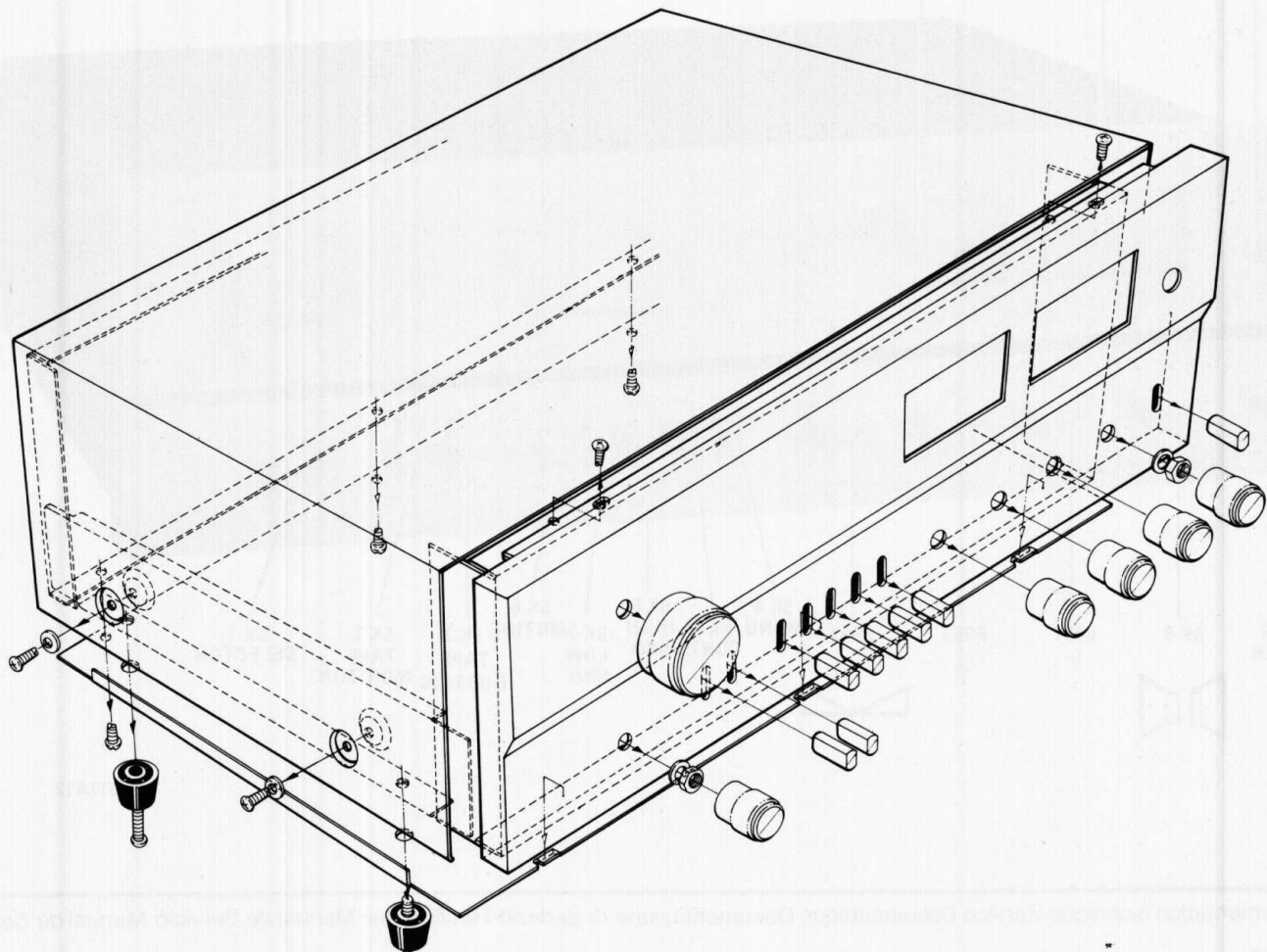
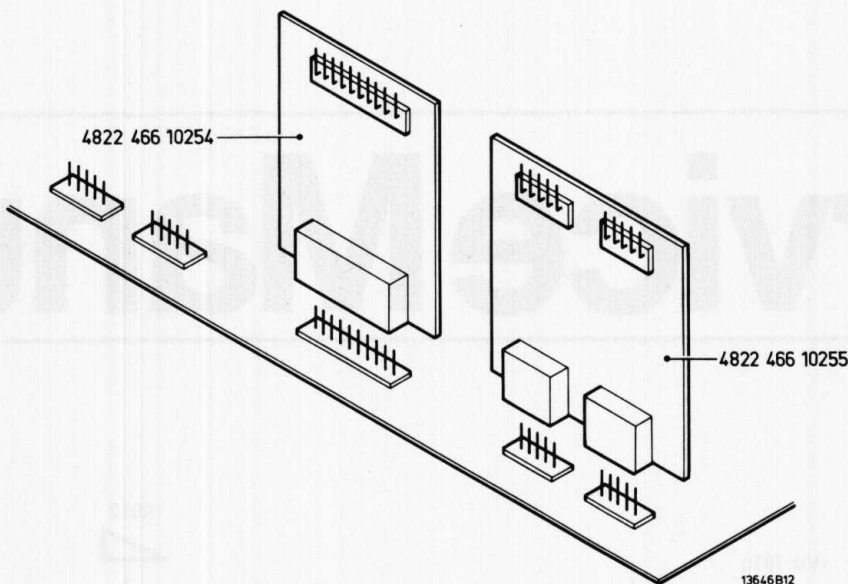
Stereo separation	100 Hz : 45 dB 1 kHz : 50 dB 10 kHz : 40 dB
Signal/støjforhold	Phono 1, 2 : 60 dB Aux, Tuner : 80 dB
Udgangsimpedans	Højttaler : 4-16 Ω Hovedtelefoner : 8 Ω
Dimensioner	: 480x150x380 mm

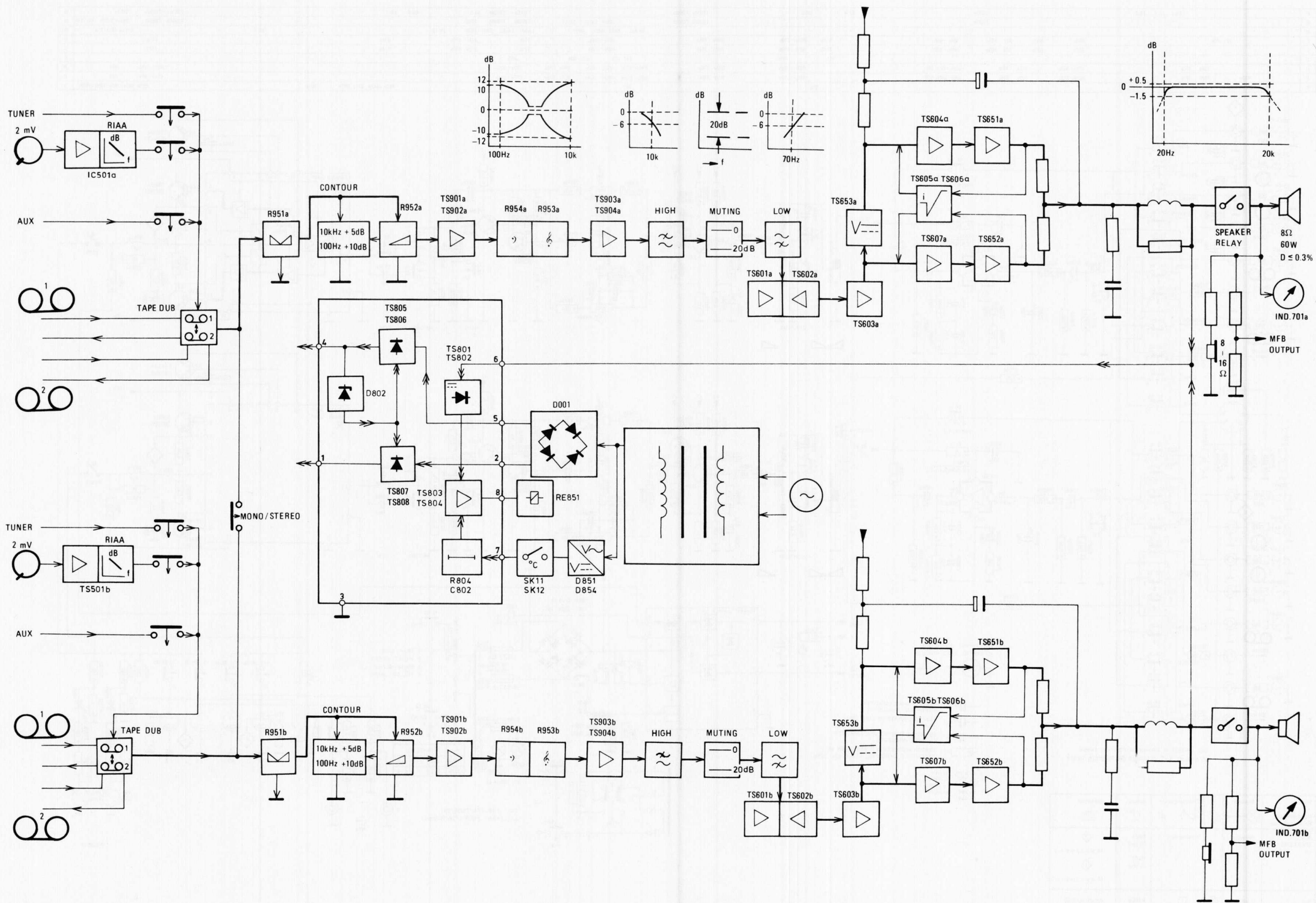
Stereoseparasjon	100 Hz : 45 dB 1 kHz : 50 dB 10 kHz : 40 dB
Signal/støy-forhold	Phono 1, 2 : 60 dB Aux, Tuner : 80 dB
Utgangsimpedans	Høyttaler : 4-16 Ω Hodetelefoner : 8 Ω
Dimensjoner	: 480x150x380 mm

SF TEKNISET TIEDOT

Lähtöteho	: 2x45 W (4 Ω) s ≤ 0,3 %
Tehokaista	: 10 - 40.000 Hz s ≤ 0,3 %
Harmoninen särö	: 0,1 % 30 W (8 Ω)
Keskeismodulaatio	: 0,1 % (IHF 60-7000 Hz 4:1) 20 W (8 Ω)
Toistoalue	: 20 - 20.000 Hz

Kanavaerotus	100 Hz : 45 dB 1 kHz : 50 dB 10 kHz : 40 dB
Signaalikohinasuhde	Phono 1, 2 : 60 dB Aux, Tuner : 80 dB
Lähtöimpedanssi	Kaiutin : 4-16 Ω Kuulokkeet : 8 Ω
Mitat	: 480x150x380 mm

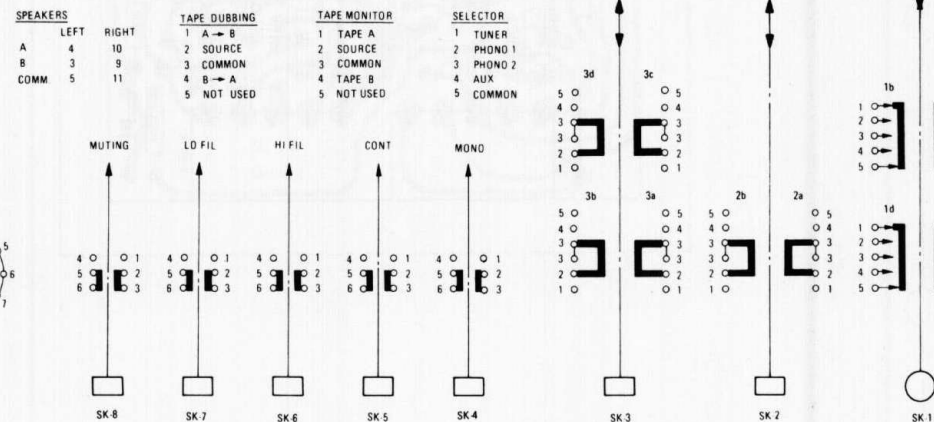
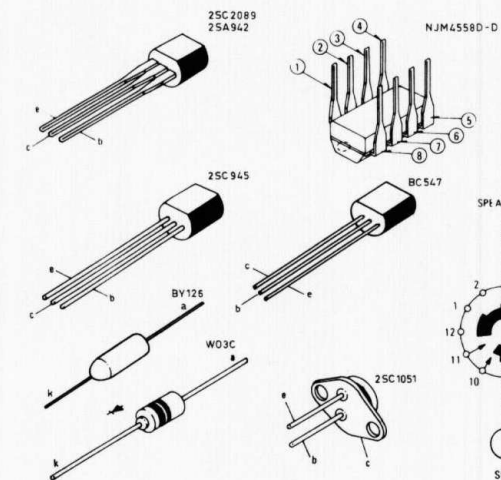
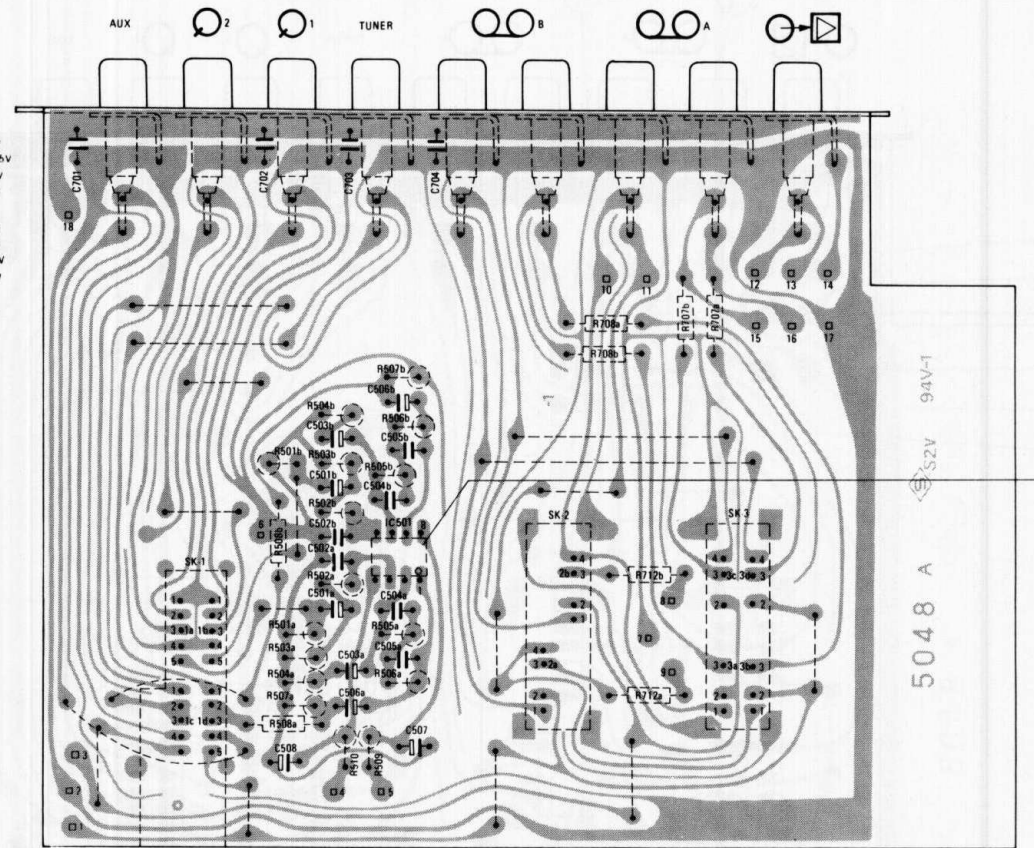
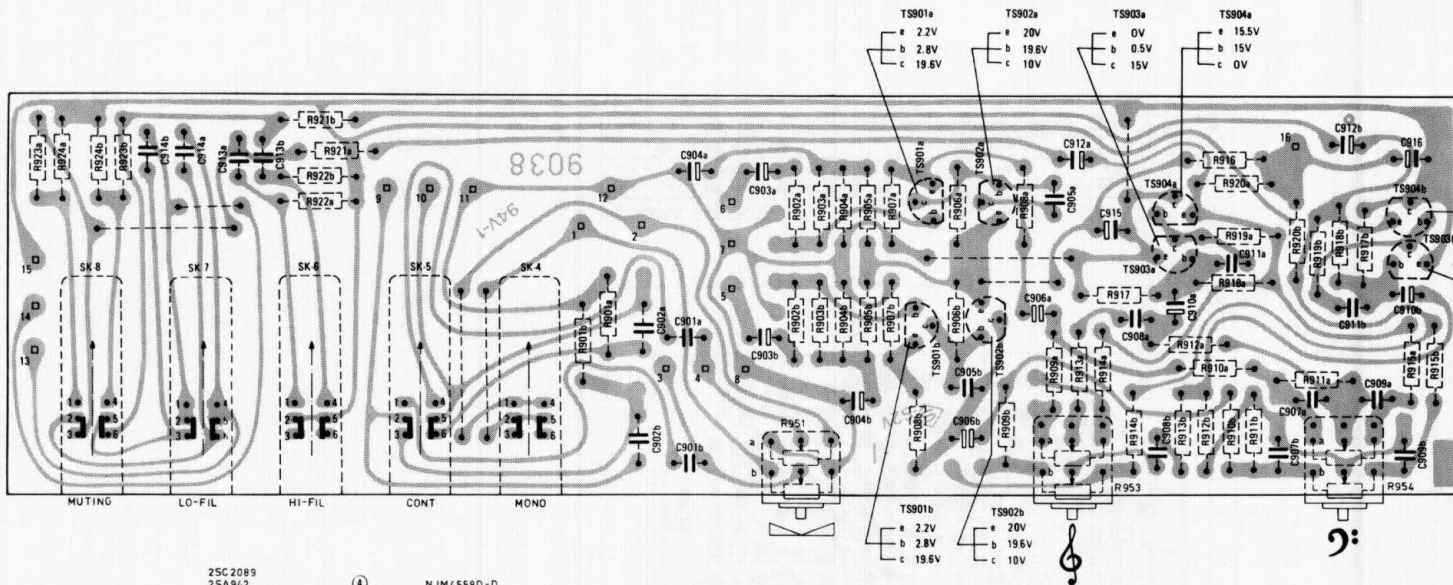




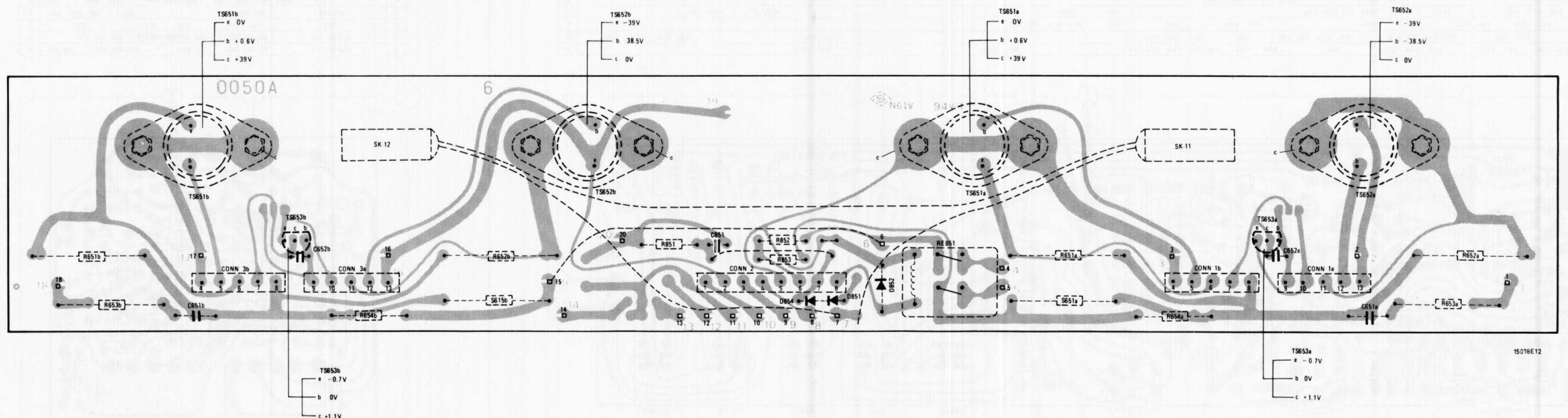
15021D12

M	SK-8	SK-7	SK-6	SK-5	SK-4	TS901b TS901a TS902b TS902a	TS903a TS904a	TS903b TS904b	M
C	914b 914a	913a 913b				904a 903a	905a 912a 915 908a 910a 911a	912b 911b 910b 91b	C
C									C
R	923a 924a 924b 923b		921b 921a			902a-905a 907a 906a 908a 909a 913a 914a 917	912a 916 918a-920a	917b-920b	R
R		922a 922b			901b 901a	951 902b-905b 907b 908b 906b 905b 953	910b-914b 910a	911a 954 915a 915b	R

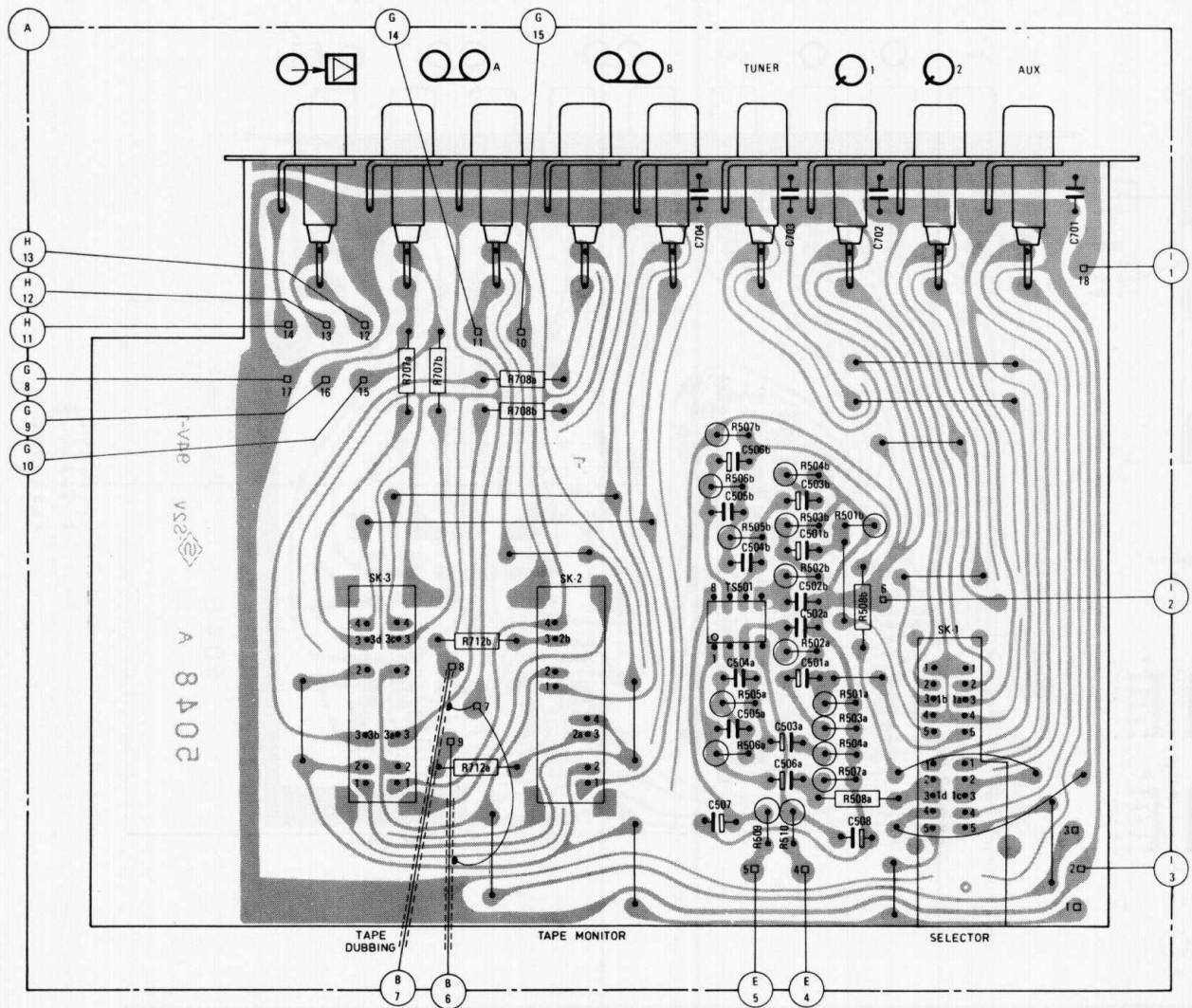
M	SK-1	TS501	SK-2	SK-3	M
C	701	702 501b-503b 703 504b-506b 704			C
C		508 501a-503a 504a-506a 507			C
R		508b 501b-504b 505b-507b	708b 708a 707b 707a		R
R		508a 507a 501a-504a 510 509 505a 506a	712a 712b		R



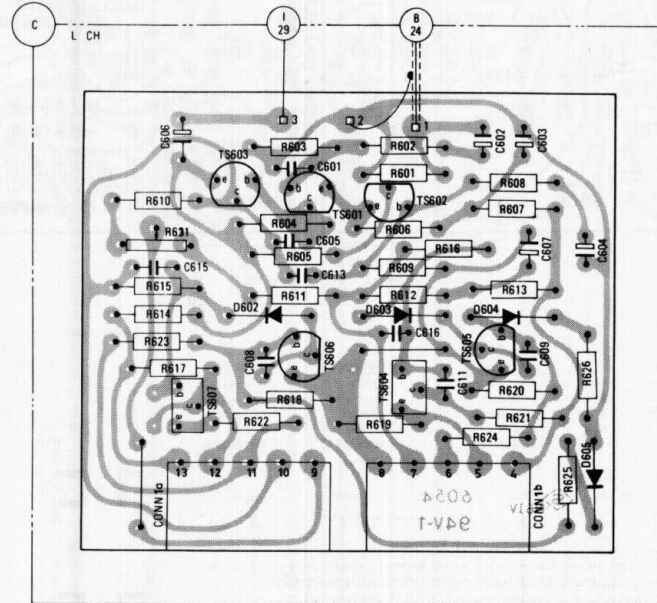
M	TS651b	TS653b	SK-12	TS651b	TS652b	D854 D851 D852	RE851 TS651a	TS651a	SK-11	TS653a	652a	M
C	651b	652b				851 852 853				652a	651a	C
R	651b 653b		654b	652b			651a		654a		653a 652a	R



M	SK 3	SK 2	TS501	SK 1	M
C			704 504b 506b 703 501b 503b 702	701	C
C			507 504a 506a 501a 503a 508		C
R	707a 707b	708a 708b	505b 507b R501b 504b 508b		R
R		712b 712a	506a 505a 509 510 501a 504a 507a 508a		R

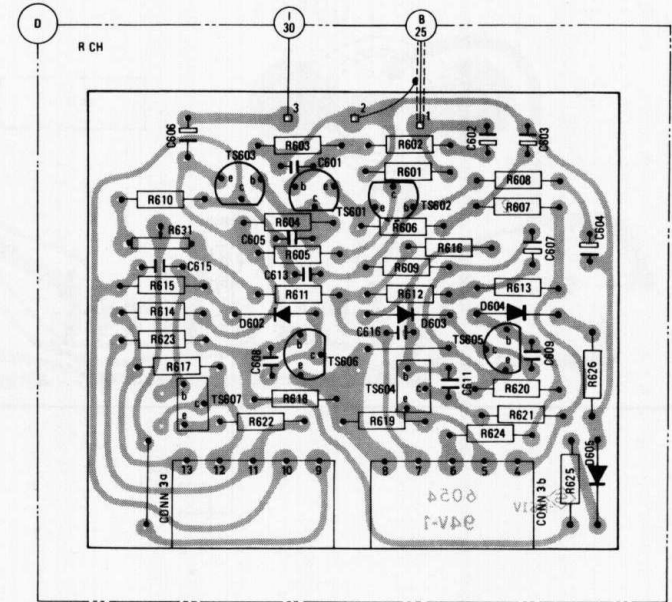
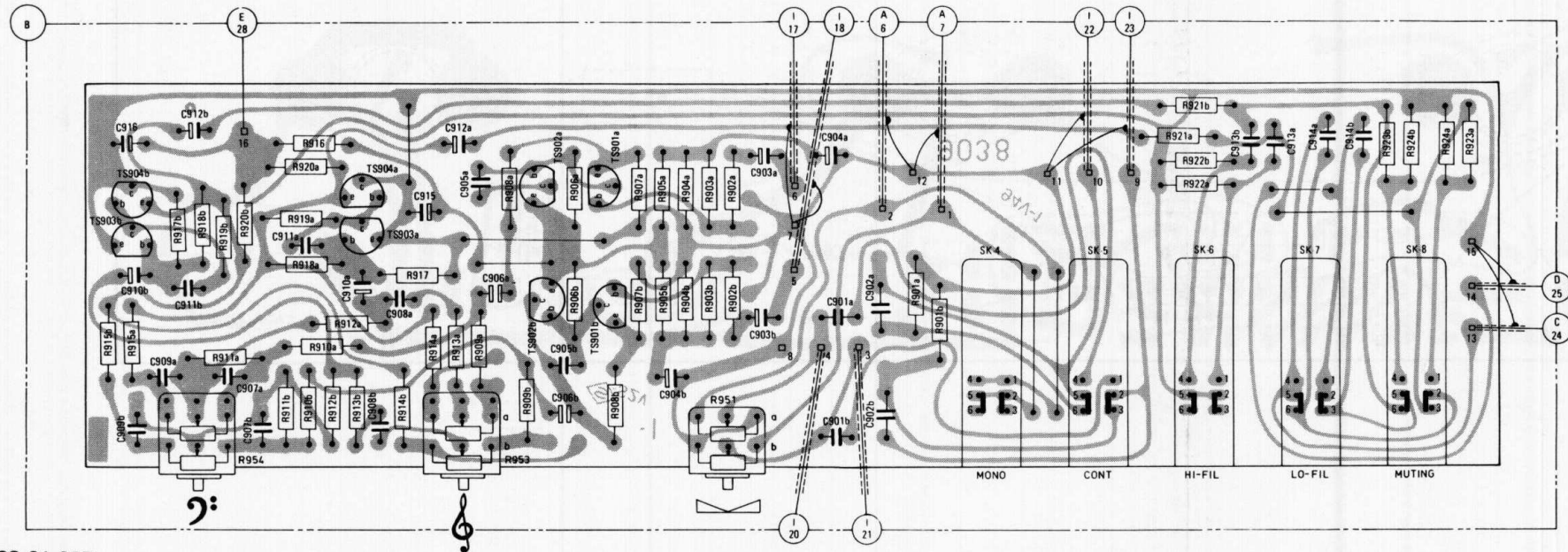


M	TS607	TS603	D602	TS601	TS606	TS602	D603	TS604	D604	TS605	D605	M
C	615 606		605 601				602 603 607 604					C
C	610		608 613			616 611		609				C
R	610 681 615		604 603 605			602 601 606 609 616		608 607 613				R
R	614 623 617		622 612 618			619 611		624 620 621 626 625				R

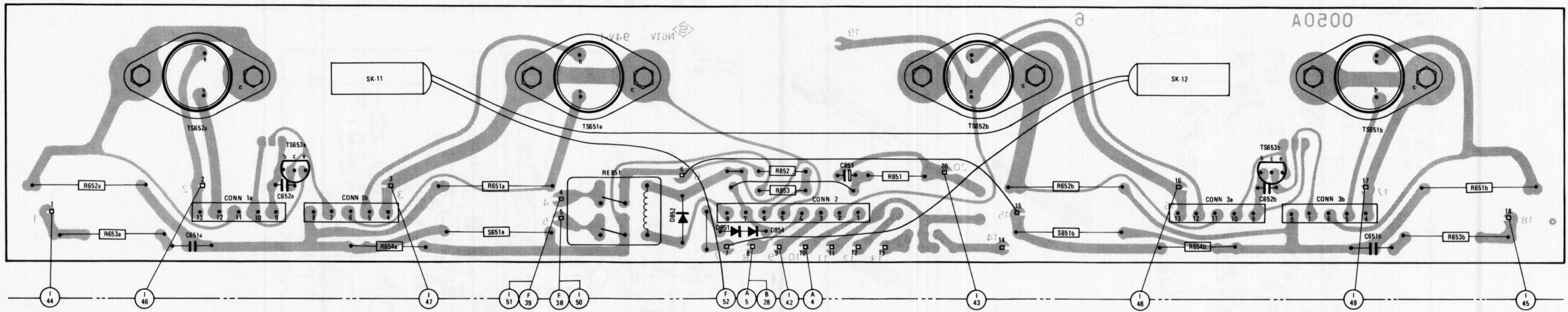


M	TS904b	TS903b	TS904a	TS903a	TS902a	TS902b	TS901a	TS901b	SK 4	SK 5	SK 6	SK 7	SK 8	M
C	916 910b 911b 912b		911a 910a 908a 915 912a 905a						903a 904a			913b 913a 914a 914b		C
C	909b 909a 907a 907b		908b			905b 906b			903b 901a 901b 902a 902b					C
R	917b 920b		918a 920a 916 912a 917 914a 913a 909a 908a 906a 907a 902a 905a						921a 921b			923b 924b 924a 923a		R
R	915b 915a 954a 911a		910a 910b 914b 953			909b 906b 908b 907b 902b 905b 951			901a 901b			922b 922a		R

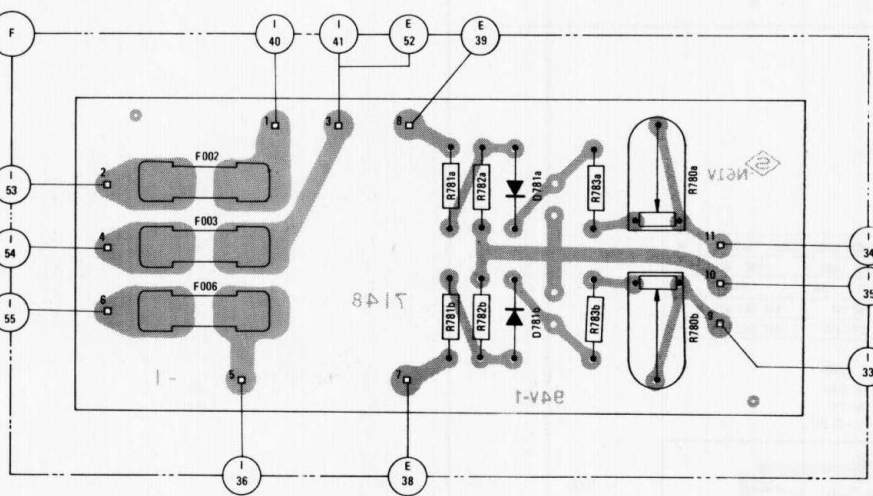
M	TS607	TS603	D602	TS601	TS606	TS602	D603	TS604	D604	TS605	D605	M
C	615 606		605 601				602 603 607 604					C
C	610		608 613			616 611		609				C
R	610 681 615		604 603 605			602 601 606 609 616		608 607 613				R
R	614 623 617		622 612 618			619 611		624 620 621 626 625				R



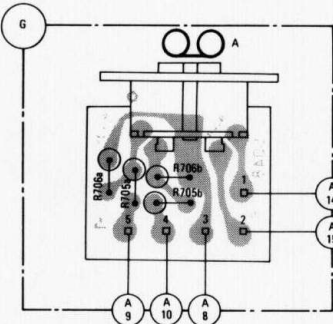
M	TS652a		TS653a	SK-11	S651a	TS651a	RE 851	D852	D851	D854	TS652b		S651b	SK-12	TS653b	TS651b	M		
C	651a		652a								851	853	854	852	652b	651b	C		
R	652a	653a		654a	651a					852	853		851		652b	654b	653b	651b	R



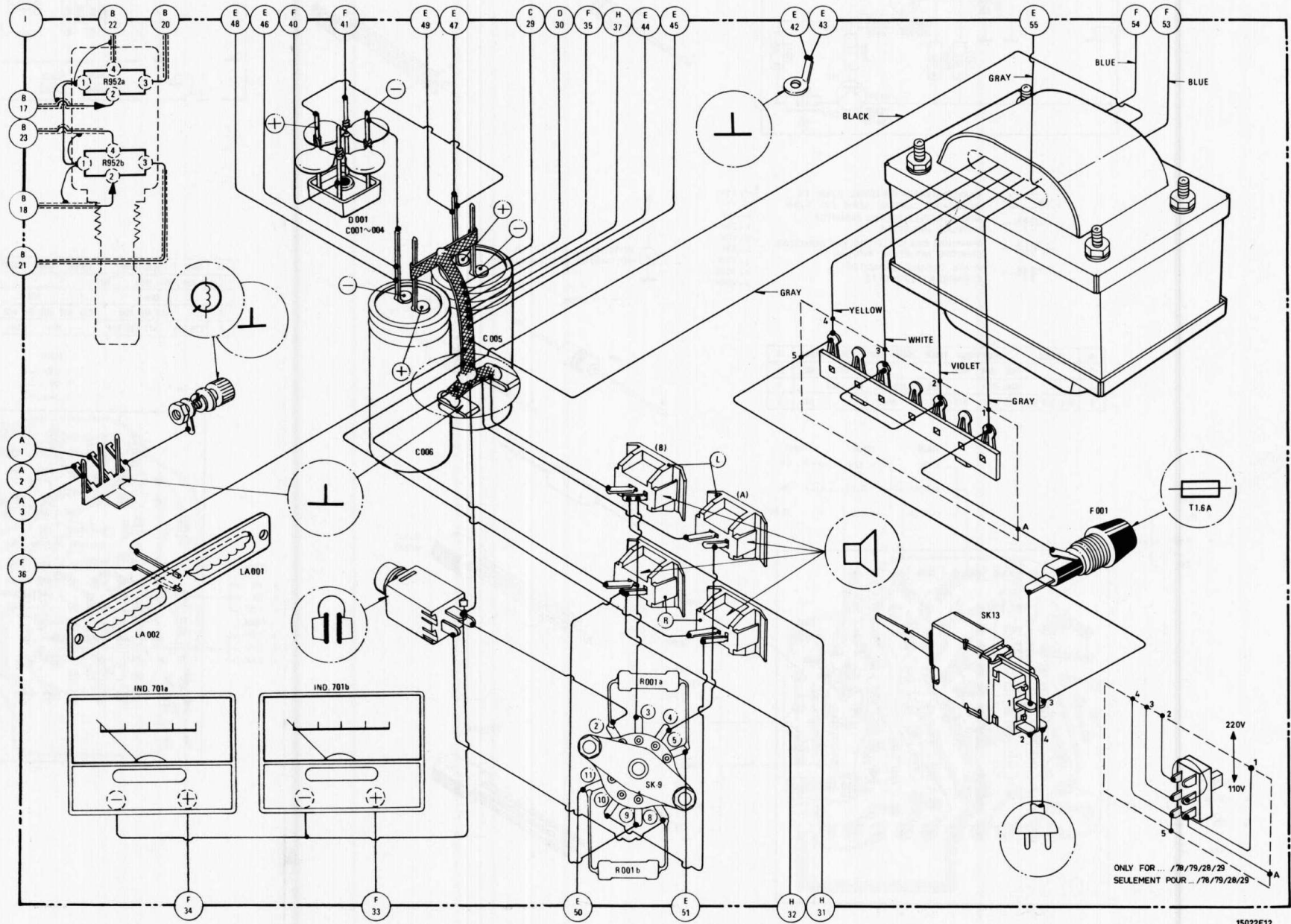
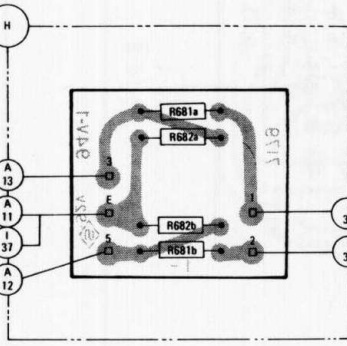
M	F002 F003 F006		D781a D781b	M
R	781a 781b 782a 782b 783a 783b 780a 780b			R



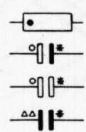
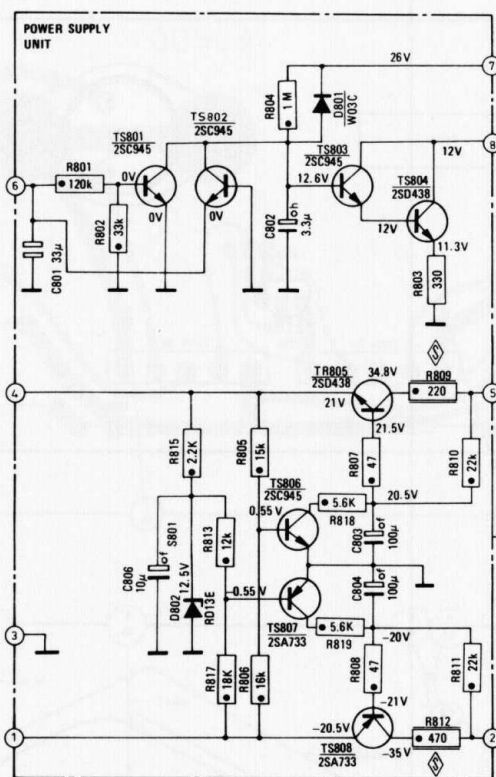
R	706a 705a 705b 706b	R
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R	681a 682a 682b 681b	R
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M	TS801	TS802	D801	TS803	TS804	M
M	D802		TS805 - TS808			M
C	801	806	802	803	804	C
R	801	802	805	804	803	R
R	815 813 817 806			818 819 807 - 812		R



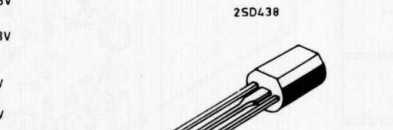
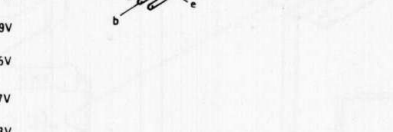
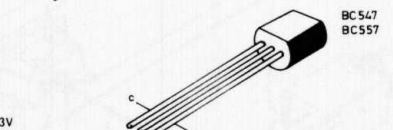
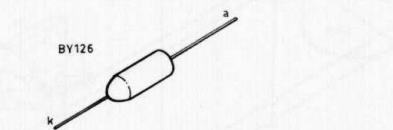
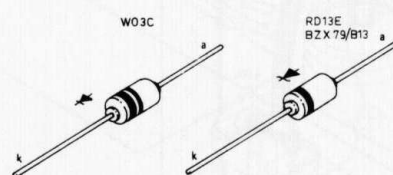
CARBON RESISTOR E24 SERIES 0.25W 5%
RÉSISTANCE CARBONE SÉRIE E24 0.25W
MINIATURE ELECTROLYTIC CAPACITOR
CHIMIQUE MINIATURE
MINIATURE BIPOlar ELECTROLYTIC CAPACITOR
CHIMIQUE MINIATURE BIPOlar
PLATE CERAMIC CAPACITOR
CERAMIQUE PLAQUETTE

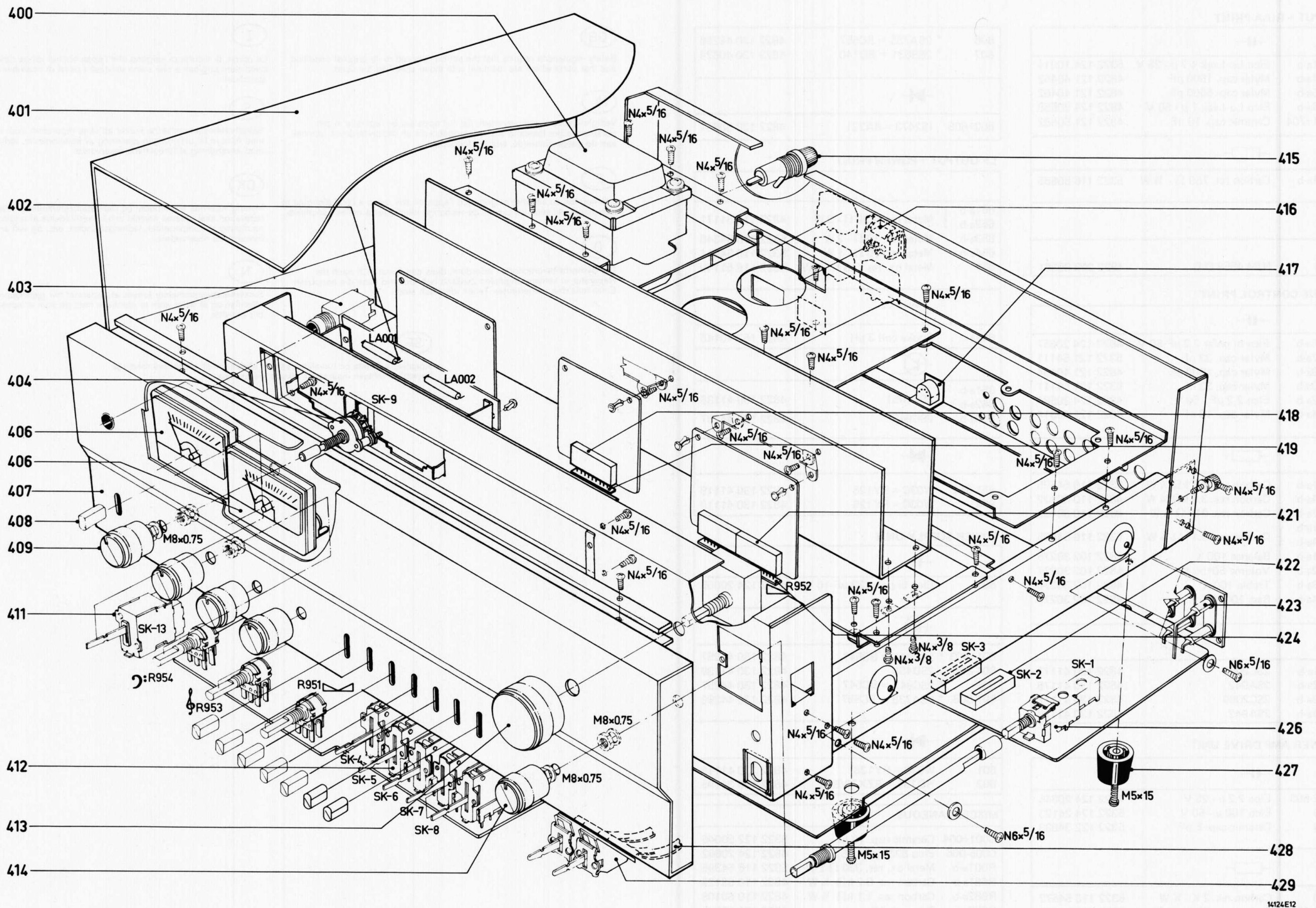
* c = 6.3V
d = 10V
e = 16V
f = 25V
g = 40V
h = 63V
j = 100V
r = 250V
u = 400V



ELECTRONIC VOLTMETER
VOLTMÈTRE ÉLECTRONIQUE

M	TS808		D802 TS807		TS806	TS805	D801	TS801-TS804		M	
C	806		804	803				801	802	C	
R	806		813	805 818		807	815	801	802	R	
R	814	817	806	812	811	819	810	809	804	803	R





14124E12

400 4822 146 30317
 401 4822 425 50108
 402 4822 134 90007
 403 4822 267 30283
 404 4822 273 60107

406 4822 347 20086
 407 4822 426 50306
 408 4822 410 22008
 409 4822 413 40783
 411 4822 276 10665

412 4822 277 10431
 413 4822 413 50974
 414 4822 413 40783
 415 4822 256 30162
 416 4822 267 30284

417 4822 267 40209
 418 4822 265 40134
 419 4822 265 40131
 421 4822 267 40262
 422 4822 277 10433

423 4822 267 50257
 424 4822 267 40259
 426 4822 273 80172
 427 4822 462 71088
 428 4822 277 10432

429 4822 277 10449

INPUT + RIAA PRINT

		
501a-b	Elco Lo-Leak 4.7 μ - 25 V	5322 124 10014
504a-b	Mylar cap. 1500 pF	4822 121 40452
505a-b	Mylar cap. 5600 pF	4822 121 40462
506a-b	Elco Lo-Leak 1 μ - 50 V	4822 124 20658
701÷704	Ceramic cap. 10 nF	4822 121 50582
		
504a-b	Carbon res. 750 Ω - ¼ W	5322 116 50685
I.C.		
501	NJM 4558 D-D	4822 209 80381

TONE CONTROL PRINT

		
906a-b	Elco bi-polar 2.2 μ F-50 V	4822 124 20657
907a-b	Mylar cap. 33 nF	5322 121 54111
908a-b	Mylar cap. 1800 pF	4822 121 40454
909a-b	Mylar cap. 33 nF	5322 121 54111
912a-b	Elco 2.2 μ F - 50 V	4822 124 20584
914a-b	Mylar cap. 18 nF	4822 121 40314
		
901a-b	Carbon res. 5.1 k Ω -¼ W	5322 116 54595
904a-b	Carbon res. 3.6 k Ω -¼ W	4822 110 60122
907a-b	Carbon res. 910 Ω -¼ W	4822 110 60106
921a-b	Carbon res. 5.1 k Ω -¼ W	5322 116 54595
924a-b		
951a-b	Balance 100 K	4822 102 30278
952a-b	Volume 50+50 K	4822 102 30277
953a-b	Treble 100 K	4822 102 30276
954a-b	Bass 100 K	4822 102 30276
		
901a-b	2SC2089	4822 130 41177
902a-b	2SA942	4822 130 41176
903a-b	2SC2089	4822 130 41177
904a-b	2SA942	4822 130 41176

POWER AMP DRIVE UNIT

		
602-603	Elco 2.2 μ - 25 V	4822 124 20845
606	Elco 100 μ - 50 V	5322 124 24123
613	Ceramic cap. 5 pF	5322 122 34033
		
610	Carbon res. 2 K - ¼ W	5322 116 54572
625-626	Carbon res. 20 K - ¼ W	5322 116 54642
631	Trimpot. 1 K	4822 100 10208
		
601-602	2SA942	4822 130 41176
603	2SC2363	4822 130 41208
604	* 2SD600 = BD139	4822 130 40823
605	* 2SC945 = BC547	4822 130 44257

606	* 2SA733 = BC557	4822 130 44256
607	* 2SB631 = BD140	4822 130 40824
		
602÷605	IS2473 = BA221	4822 130 30831

LF OUTPUT + POWER PRINT

		
651a-b	Metal res. 0.39 Ω - 3 W	4822 116 51171
652a-b		
653a-b	Metal res. 10 Ω - 2 W	5322 116 54348
654a-b	Metal res. 10 Ω - 1 W	5322 116 54214
851	Metal ox. res. 3.3 K - 1 W	4822 116 51149
		
651a-b	Choke coil 3 μ H	4822 157 40148
		
651a-b	2SC1051	4822 130 41138
652a-b	2SC945	4822 130 44257
653a-b	2SC945	4822 130 44257
		
851-852	W03C = BY126	4822 130 41119
854	W03C = BY126	4822 130 41119

POWER SUPPLY UNIT

		
801	Elco bi-polar 33 μ F-16 V	4822 124 20665
		
801÷803	* 2SC945 = BC547	4822 130 44257
804-805	2SD438	4822 130 41139
806	* 2SC945 = BC547	4822 130 44257
807-808	* 2SA733 = BC557	4822 130 44256
		
801	W03C = BY126	4822 130 41119
802	RD13E = BZX79/B13	4822 130 34195

MISCELLANEOUS

C001÷004	Ceramic cap. 10 nF	5322 122 50046
C005-006	Elco 8200 μ F - 45 V	4822 124 20662
R001a-b	Metal ox. res. 330 Ω -2 W	5322 116 54395
R681a-b	Carbon res. 6.2 k Ω - ¼ W	4822 110 63129
R682a-b	Carbon res. 1.1 k Ω - ¼ W	4822 110 60108
R780a-b	Trimpot. 1K	4822 100 10225
D001	S4VB-10	4822 130 30977
D781a-b	IN60 = AA119	4822 130 31012
F001	Fuse 1.6 A slow	4822 253 30024
F002-003	Fuse 4 A slow	4822 253 30038
F006	Fuse 1.6 A slow	4822 253 30024
SK11-12	Thermal switch	4822 282 40158
	Fuse holder for PCB	4822 256 30154
RE851	Relay	4822 280 20072

* Watch the connections of E-B-C
Voir les connexions de E-B-C

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 bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

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.

D

Die Sicherheitsvorschriften erfordern, dass das Gerät sich nach der Reparatur in seinem originalen Zustand befindet und dass die benutzten Einzelteile den aufgeführten Teilen identisch sind.

SF

Korjatesa laitetta on turvallisuussyistä ehdottomasti eneteltävä oikein ja käytettävä tehtaan määäämiä alkuperäisvaraosia.

I

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

S

Säkerhetsbestämmelserna kräver att varje reparation skall utföras korrekt med hänsyn till ursprunglig placering av komponenter, ledningar etc. och med användning af föreskrivna reservdelar.

DK

Myndighedernes sikkerheds- og radiostøjbestemmelser kræver, at enhver reparation skal udføres korrekt m.h.t. overholdelse af originalplacering og montering af komponenter, ledningsbundter, etc., og ved anvendelse af de foreskrevne reservedele.

N

Sikkerhetsbestemmelser kreves at apparatet blir gjenopprettet til original utførelse og at deler som er identiske med de som er spesifisert, blir benyttet.