

TUBE AND TRANSISTOR HANDBOOK



TENTH REVISED EDITION

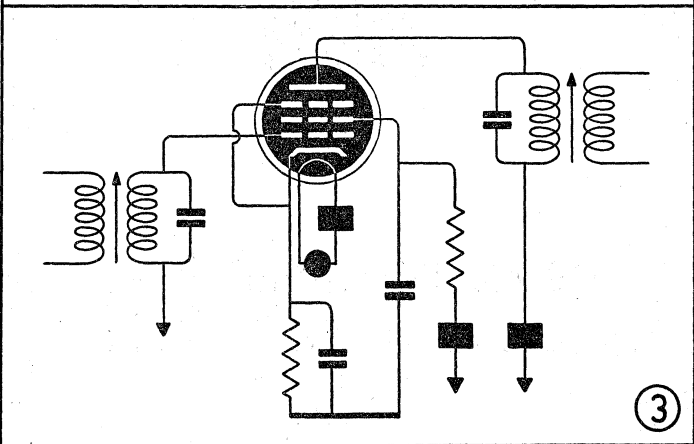
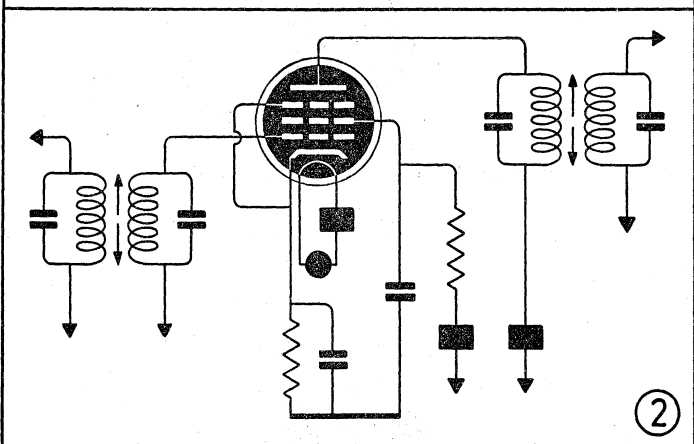
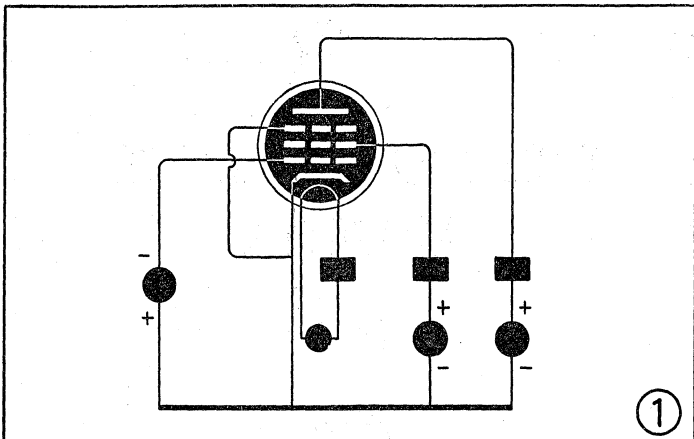
PUBLISHED FOR



BY

DE MUIDERKRING N.V.

NIJVERHEIDSWERF 17- 21 - BUSSUM - NETHERLANDS



INTRODUCTION

The data contained in this book have been arranged in such a way that everybody dealing in practice with electronic tubes or valves may readily find all necessary particulars of any type.

The book covers the principal data of a large number of European and American types of receiver and amplifier tubes as well as on cathode ray tubes for TV-sets and oscilloscopes, arranged in such a manner that all relevant characteristic data and electrode connections of a given tube can be read off immediately.

This has been achieved by the insertion of a circuit diagram for each tube type, giving clearly indicated, currents and voltages, the figures printed near the electrodes corresponding with those of the base diagram, which is shown as well.

Moreover, the diagrams have been so designed that it can be ascertained at a glance for which application the tube in question is intended.

In addition to the characteristic data mentioned above, at the end of each section various operation details are tabulated for a number of tubes especially eligible for use as RC-coupled amplifiers.

Furthermore a comparative table has been included after each section, showing first of all the tube types which are either completely identical or which differ only in filament voltage, filament current or have a different tube base.

In addition, the tube designations used by military authorities are given in this table, so far as they are identical with the commercial types shown. The types placed between " - - " have been included only for comparison purposes and are not listed separately in the respective sections.

The letter codes G, GT, GTA etc. placed behind some of the tube types refer almost exclusively to the mechanical construction of the tubes in question and are therefore not listed separately either.

Finally, a table is included giving data on thyratrons, cathode ray tubes and a large number of transistors.

The various types of tubes are arranged under 9 main headings, marked in the book with a coloured band, as follows:

- I (Orange) **Diodes** (rectifiers and detectors)
- II (Green) **Triodes** (comprising double triodes and (double) diode-triodes).
- III (Yellow) **Tetrodes and pentodes** (comprising (double) diode-pentodes)
- IV (Red) **Output Tubes** (triodes, tetrodes, pentodes)
- V (Grey) **Frequency Converters** (so-called mixer tubes, such as hexodes, heptodes, octodes, whether or not combined with oscillator triode)
- VI (Brown) **Combination Tubes** (triode-pentodes, etc; triode-heptodes, in as far as suitable for a.f., i.f. and r.f. applications)
- VII (Purple) **Cathode Ray Tubes** (Indicator tubes and picture tubes for TV and oscilloscope)
- VIII **Transistors** (a.f. amplifiers green, output stages red, r.f. and i.f. amplifiers and frequency converters grey, tables blue).
- IX (White) **Thyratrons** (gas-filled triodes and tetrodes)

Directions for Use

The classification used in this book enables the user to find quick-

ly data on any given tube type, or to find a suitable tube — e.g. a triode, a rectifier or an output pentode — for any given purpose.

In the first instance the alphabetic index will refer the user to the page on which the characteristic data are to be found.

In the second instance the type of tube having the sought-for characteristic data is to be looked up under the heading concerned while, in addition, the relevant comparative table may be consulted to find out whether an equivalent tube possibly occurs under a different designation. As a general rule, only those characteristic data are mentioned, which correspond with the more generally employed anode voltages, i.e. 250 volts for tubes commonly used in A.C. sets and 90 volts for battery powered tubes.

This rule does not apply when:

- (a) the max. permissible anode voltage is smaller than 250 V or 90 V, respectively.
- (b) the manufacturer of the tube type concerned has only stated the data for deviating voltages.

In addition and wherever these seem to be called for, data for two or more different anode voltages are given, using a complete connection diagram for each case.

Rectifiers

In the case of rectifiers, a combination of maximum A.C. voltage and maximum direct current is specified for each individual item, the combination being generally based on the maximum permissible direct current. However, in a few isolated cases on the absolute permissible maximum A.C. voltage has been used as the basis.

Pentodes

The manner in which the circuit diagram is drawn indicates, whether a pentode may be used as an a.f. or an i.f. and r.f. amplifier, viz. (see page 4):

- (1) If the tube is mainly or exclusively suitable for a.f. amplification, a diagram as shown in fig. 1 is used, in which static characteristics are specified.
- (2) For tubes finding application in i.f. and r.f. stages of standard type broadcast receivers, the circuit diagram of fig. 2 is applicable.
- (3) Pentodes especially designed for amplifying broad bands or very high frequencies (TV and FM sets), which cannot be used to advantage unless associated with better than standard i.f. amplifiers for intermediate frequencies from 100 to 500 kc/s, are indicated by a circuit diagram according to fig. 3.
If a tube is suitable for application of automatic volume control, the letters AVR have been printed at the point to which the control voltage is to be supplied.
The control range is then additionally indicated by two values behind „V_{G1}”.

Output tubes

Of triode, tetrode and pentode output tubes, the usual Class A operation data are given. Data for push-pull operation are also included for a number of types.

EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED

	Supply voltage, in volts
	a. filament current, in amperes b. anode and screen grid current in milliamperes
	signal voltage, in volts. (R.M.S. value) or A.C. voltage to be rectified
	Load resistance in kilohms and output power in watts
	the same tube with different designation
	the same tube, but with different filament voltage and/or current
	the same tube, but with different base.

A	voltage amplification	R _t	total internal resistance of the power supply
AVR	Automatic volume control	S	Mutual conductance
BOOSTER	booster diode in television deflection generators	S _c	Conversion conductance
d ₁	total distortion at the specified value of V _o	S _H	Mutual conductance of heptode
EHT	very high voltage for picture tube in TV-connections	S _P	Mutual conductance of pentode
I _a	anode current	S _T	Mutual conductance of triode
I _{ap}	peak value of the anode current	S _{Te}	Mutual conductance of tetrode
I _d	direct current to be supplied by diode	V	Volts
I _{g2}	screen grid current	V _a	anode voltage
I _k	cathode current	V _{a inv. p}	peak value of the inverse anode voltage
k	kilohm (= 1000 ohms)	V _g	grid voltage
M	megohm (1,000,000 ohms)	V _b	supply voltage
mA	milliampere (= 0.001 ampere)	V _d	effective value of A.C. voltage to be rectified
P _a (W _a)	anode dissipation	V _{g1}	control grid voltage
P _o	output power	V _{g2}	screen grid voltage
R _a	Anode load resistance	V _{g3}	voltage at third grid
R _{aa}	anode load resistance (between plates) in push-pull stages	V _{g4}	voltage at fourth grid
R _{eq}	equivalent noise-resistance at control grid	V _i	input voltage
R _{g1}	control grid resistor	V _o	output voltage
R' _{g1}	control grid resistor of next tube	V _{o max}	output voltage at the start of grid current
R _{g2}	screen grid resistor	W	watt
R _i	plate resistance	W _a (P _a)	Anode dissipation
R _k	cathode resistor	μ	1. amplification factor 2. at condensor: microfarad
		μA	micro-ampere
		μ _{g2g1}	Amplification factor against screen grid
		Ω	ohm

INLEIDING

Dit handboek is zodanig ingericht dat een ieder, die in de praktijk met elektronenbuizen heeft te maken, gemakkelijk en snel de noodzakelijke bijzonderheden van elk buistype kan vinden.

Het bevat de belangrijkste gegevens van een groot aantal Europese en Amerikaanse buistypen voor ontvangtoestellen en versterkers, alsmede van katodestraalbuizen voor TV toestellen en oscilloscopen en wel in zodanige vorm dat men in één oogopslag de karakteristieke eigenschappen en de elektrode-aansluitingen van iedere radiobuis kan aflezen.

Dit is mogelijk omdat van elk buistype een schematisch schakelbeeld is gegeven waarin de optredende stromen en spanningen duidelijk zijn aangegeven, terwijl cijfers bij de elektroden corresponderen met de nummering van de eveneens afgebeelde buisvoet. Bovendien is het schakelschema zo getekend, dat men onmiddellijk kan zien voor welke toepassing het betreffende buistype is bestemd.

Ter aanvulling van de volgens dit systeem vastgelegde karakteristieke eigenschappen zijn achter de betreffende groep nog tabellen opgenomen met verschillende instelgegevens voor een aantal buizen die zich bij uitstek lenen voor toepassing als RC-gekoppelde spanningsversterker.

Voorts is achter elke groep een vergelijkingstabel opgenomen, waarin op de eerste plaats buistypen voorkomen, welke volkomen aan elkaar gelijk zijn, dan wel alleen van elkaar verschillen voor zover het de gloeispanning, gloeistroom of buisvoet betreft. Ook werden in deze tabel de door militaire instanties gebruikte type-aanduidingen verwerkt, voor zover deze indientiek zijn aan de opgenomen commerciële typen. De hier tussen „- -” vermelde typen zijn slechts ter vergelijking opgenomen en zijn dus niet afzonderlijk in de betreffende groep vermeld.

De letteraanduidingen G, GT, GTA, enz. achter sommige buistypen hebben vrijwel uitsluitend betrekking op de mechanische uitvoering van de buis en dergelijke buizen zijn dus evenmin afzonderlijk vermeld.

Ook de gegevens van thyratrons, katodestraalbuizen en een groot aantal transistoren zijn — deels in tabelvorm — gegeven.

De verschillende soorten buizen zijn gerangschikt volgens 9 hoofdgroepen, welke ieder door een kleurband zijn gekenmerkt en wel als volgt:

- | | |
|--------------|---|
| I (oranje) | Dioden (gelijkrichters en detectoren) |
| II (groen) | Trioden (waaronder dubbeltrioden en (duo)diode-trioden) |
| III (geel) | Tetroden en pentoden (waaronder ook (duo)diode-pentoden) |
| IV (rood) | Eindbuizen (trioden, tetroden, pentoden) |
| V (grijs) | Frequentie omvormers (z.g. mengbuizen zoals hexoden, heptoden, octoden, al of niet gecombineerd met oscillator-triode) |
| VI (bruin) | Combinatie-buizen (triode-pentoden e.d.; triode-heptoden voorzover die zich lenen voor a.f.; m.f. en r.f. toepassingen) |
| VII (violet) | Katodestraalbuizen (indicatorbuizen en beeldbuizen voor TV en oscilloscoop). |
| VIII | Transistoren (a.f. versterkers groen, eindtrappen rood, r.f. en m.f. versterkers en frequentie-omvormers grijs, tabellen blauw). |
| IX (wit) | Thyratrons (gasgevulde trioden en tetroden) |

Regels voor gebruik

De indeling van dit boek maakt het mogelijk, dat men zowel de gegevens van een willekeurig buistype kan vinden, als ook een geschikte buis — bv. een triode, een gelijkrichter dan wel een pentode eindbuis — voor een bepaald doel gemakkelijk kan opzoeken.

In het eerstgenoemde geval verwijst het alfabetisch register naar de bladzijde waar men de eigenschappen kan vinden. In het tweede geval zoekt men het buistype met de gewenste eigenschappen in de betreffende groep, waarna men nog de bij deze groep behorende vergelijkingstabel kan raadplegen om na te gaan of er eventueel een overeenkomstige buis onder een andere type-aanduiding bestaat.

In het algemeen zijn die karakteristieke gegevens vermeld, welke gelden voor de meest gebruikelijke anodespanningen, d.w.z. 250 V voor buizen, welke gewoonlijk in wisselstroomtoestellen worden toegepast en 90 V in het geval van buizen voor batterij-voeding.

Hiervan is afgeweken indien:

- a. de maximaal toelaatbare anodespanning kleiner is dan 250 V, resp. 90 V;
- b. de fabrikant van het betreffende buistype alleen de gegevens voor afwijkende spanningen heeft opgegeven.

Daarnaast zijn voor buizen, waarvoor dit van bijzonder belang kan zijn, de gegevens voor twee of meer verschillende anodespanningen gegeven, in welk geval dan telkens een volledig schakelbeeld is opgenomen.

Gelijkrichters

Bij gelijkrichtbuizen is telkens een combinatie van maximale wisselspanning en maximale gelijkstroom aangegeven, in 't algemeen gebaseerd op het absolute maximum van de toelaatbare gelijkstroom. In enkele gevallen werd het absolute maximum van de wisselspanning als uitgangspunt genomen.

Pentoden

Of een pentode bruikbaar is voor a.f.- of m.f. en r.f. versterking is aangegeven door de tekenwijze van de schakeling en wel als volgt (zie blz. 4):

1. Is de buis voornamelijk of uitsluitend geschikt voor a.f. versterking, dan is een schakelbeeld volgens fig. 1 gebruikt, vermeldende de statische karakteristieken.
2. Voor buizen welke toepassing vinden in m.f. en r.f. trappen van normale omroep ontvangers geldt het schakelbeeld van fig. 2.
3. Pentoden welke speciaal zijn ontworpen voor het versterken van grote bandbreedte of zeer hoge frequenties (TV en FM toestellen) en welke niet zonder meer in normale m.f. versterkers voor middelfrequenties van 100 .. 500 kHz kunnen worden toegepast, zijn gekenmerkt door een schakelingsbeeld volgens fig. 3.

Is een buis geschikt voor toepassing van automatische versterkingsregeling dan zijn de letters AVR geplaatst bij het punt waaraan de regelspanning kan worden toegevoerd. Bovendien is dan het regelgebied aangegeven door twee getallen achter „V_{G1}”.

Eindbuizen

Van triode-, tetrode- en pentode-eindbuizen zijn de gebruikelijke klasse A instellingen gegeven. Voor een aantal typen zijn bovendien in tabelvorm achter de betreffende groep instelgegevens voor balanstrappen opgenomen.

VERKLARING VAN GEBRUIKTE SYMBOLEN EN AFKORTINGEN

6.3

voedingsspanning in volt

0.3

a. gloeistroom in ampere

b. anode- en schermroosterstroom in milliampere

10

signaalspanning in volt (effectieve waarde)

resp. gelijk te richten wisselspanning.



$4W$ belastingweerstand in kilohm en uitgangsenergie in watt.

=

dezelfde buis met andere type aanduiding



dezelfde buis, maar andere gloeispanning en/of gloeistroom



dezelfde buis, maar andere voet.

A spanningsversterking
AVR automatische versterkingsregeling

BOOSTER = spaardiode in televisie afbuiggeneratoren
d totale vervorming bij de aangegeven waarde van V_o

EHT zeer hoge spanning voor weergeefbuis in TV-schakelingen

I_a anodestroom

I_{ap} topwaarde van de anodestroom

I_d door diode te leveren gelijkstroom

I_{g2} schermroosterstroom

I_k katodestroom ($I_a + I_{g2}$)

k kilohm (= 1000 ohm)

M megohm (= 1000.000 ohm)

mA milliampere (= 0,001 ampere)

P_a anode-dissipatie

P_o uitgangsvermogen

R_a anode belastingweerstand

R_{aa} idem (van plaat tot plaat) in balanstrappen

R_{eq} equivalente ruisweerstand aan het stuurrooster

R_{g1} stuurroosterweerstand

R'_{g1} stuurroosterweerstand van volgende buis

R_{g2} schermroosterweerstand

R_i inwendige weerstand

R_k katodeweerstand

R_t totale inw. weerstand van de voedingsbron

S steilheid

S_c conversiesteilheid

S_H steilheid van heptode

S_P steilheid van pentode

S_T steilheid van triode

V volt

V_a anodespanning

$V_{a \text{ inv.p.}}$ topwaarde van de anodespanning in de sperrichting

V_b voedingsspanning

V_d effectieve waarde van de gelijk te richten wisselspanning

V_g roosterspanning

V_{g1} stuurroosterspanning

V_{g2} schermroosterspanning

V_{g3} spanning van 3e rooster

V_{g4} spanning van 4e rooster

V_i ingangsspanning

V_o uitgangsspanning

$V_{o \text{ max}}$ uitgangsspanning bij het inzetten van roosterstroom

W watt

W_a anode-dissipatie

μ 1. versterkingsfactor

2. microfarad

μA micro-ampere

μ_{g2g1} versterkingsfactor van stuurrooster t.o.v. schermrooster

Ω ohm.

INTRODUCTION

Le présent manuel est conçu de telle manière que tous ceux qui ont à s'occuper de l'emploi de tubes électroniques puissent y trouver facilement et rapidement les renseignements dont ils ont besoin.

Il donne les principales caractéristiques techniques d'un grand nombre de tubes européens et américains (réception et amplification) ainsi que des tubes à rayons cathodiques pour télévision et oscillographes, sous une forme qui permet d'embrasser d'un seul coup d'oeil les propriétés et le branchement de chaque tube.

A cette fin, un schéma de connexion qui laisse clairement apparaître les valeurs des tensions et des intensités dans les circuits, a été établi pour chaque tube et a été dessiné de manière à montrer immédiatement l'application pour laquelle le tube envisagé est destiné.

Pour compléter les propriétés techniques données par ce système, chaque groupe est suivi de tableaux donnant des caractéristiques de réglage pour un certain nombre de tubes particulièrement indiqués comme amplificateurs de tension à couplage par résistance et capacité.

En outre, chaque groupe est suivi d'un tableau comparatif donnant en premier lieu les types de tubes entièrement identiques ou dont l'unique différence réside dans la tension de chauffage, le courant de chauffage ou le culot. Ces tableaux donnent également les indications de type utilisés par les services militaires dans la mesure où ces types sont identiques aux types commerciaux mentionnés. Les types indiqués entre tirets sont uniquement cités à titre comparatif; ils ne figurent donc pas séparément dans le groupe correspondant.

Les caractères G, GT, GTA, etc. qui suivent l'indication de certains types de tubes se rapportent presque uniquement à l'exécution mécanique du tube; ces tubes n'ont par suite pas fait l'objet d'une mention séparée.

Les caractéristiques des thyratrons, des tubes à rayons cathodiques et des transistors sont également reprises dans un tableau.

Les différents types de tubes sont classés en 9 chapitres principaux margés en couleur distinctive suivant l'index ci-dessous:

- | | |
|--------------|--|
| I (Orange) | Diodes (redresseurs et détecteurs) |
| II (Vert) | Triodes (parmi lesquelles les doubles triodes et les (duo-) diodes-triodes) |
| III (Jaune) | Tétrapodes et pentodes (parmi lesquelles les (duo-) diodes-pentodes) |
| IV (Rouge) | Tubes de puissance (triodes, tétrapodes, pentodes) |
| V (Gris) | Changeurs de fréquence (tubes hétérodynes tels que hexodes, heptodes, octodes, combinées ou non à une triode oscillatrice) |
| VI (Brun) | Tubes combinés (triodes-pentodes, etc., triodes-heptodes dans la mesure où celles-ci sont applicables en BF, MF et HF) |
| VII (Violet) | Tubes à rayons cathodiques (indicateurs visuels d'accord et tubes-images pour la télévision et les oscillographes). |
| VIII | Transistors (amplificateurs BF vert, amplificateurs de puissance rouge, amplificateurs HF et MF et changeurs de fréquence gris, tableaux bleu). |
| IX (Blanc) | Thyratrons (triodes et tétrapodes à remplissage gazeux) |

Mode d'emploi

Les marges en couleur de ce livre permettent, non seulement de trouver rapidement les renseignements recherchés concernant un type de tube déterminé, mais aussi de repérer facilement un tube approprié — par exemple une triode, une valve ou une pentode de puissance — pour une application envisagée.

Dans le premier cas, l'index alphabétique renvoie à la page où se trouvent les propriétés recherchées. Dans le second cas on cherche le type de tube possédant les propriétés requises dans l'un des groupes.

On peut encore consulter le tableau comparatif correspondant à ce groupe, ce tableau indique s'il existe éventuellement un tube analogue portant un autre numéro signalétique.

En général, nous avons indiqué les caractéristiques en fonction des tensions anodiques les plus courantes, c'est-à-dire 250 V pour les tubes ordinaires employés dans les appareils alimentés par le réseau à courant alternatif et 90 V pour les tubes conçus pour l'alimentation par piles.

Nous avons fait exception à cette règle dans les cas où:

- a. la tension anodique maximum admissible est inférieure à 250 V ou à 90 V;
- b. le fabricant du tube envisagé ne fournit que les spécifications pour des tensions différentes.

En ce qui concerne les tubes pour lesquels ces renseignements peuvent être d'importance spéciale, nous indiquons les valeurs caractéristiques pour deux tensions ou plus; dans ce cas, le schéma de connexion complet est toujours indiqué.

Redresseurs

Pour les valves, le répertoire indique une combinaison de tensions alternatives et de courants continus maxima, valeurs qui sont généralement basées sur le maximum absolu du courant continu admissible.

Dans quelques cas, le maximum absolu de la tension alternative est pris comme point de départ.

Pentodes

Pour distinguer si la pentode a été prévue pour l'amplification BF, MF ou HF, la représentation schématique sera (voir p. 4).

1. du genre de la fig. 1, indiquant les caractéristiques statiques, si le tube est principalement ou exclusivement prévu pour l'amplification BF;
2. du genre de la fig. 2 pour les tubes trouvant leur application dans les étages HF et MF des récepteurs normaux de radiodiffusion;
3. du genre de la fig. 3 s'il s'agit de pentodes spécialement conçues pour l'amplification de bandes larges ou de fréquences très élevées (téléviseurs et récepteurs FM) et qui ne peuvent être employées sans adaptation dans les amplificateurs MF normaux (100 à 500 kc/s).

Lorsqu'un tube permet l'application de la commande automatique de volume, le point auquel la tension régulatrice peut être appliquée est marqué AVR.

En outre la plage de régulation est alors indiquée par deux valeurs pour Vg 1.

Tubes de puissance

Pour les tubes de puissance: triodes, tétrodes et pentodes nous avons indiqué les régimes classe A usuels. Pour certains types nous indiquons en outre les valeurs pour l'emploi en push-pull.

TABLE DES SYMBOLES ET DES ABRÉVIATIONS EMPLOYÉS DANS CE RÉPERTOIRE

	tension d'alimentation en volts
	a. courant de chauffage en ampères b. courant anodique et de grille-écran en milliampères
	tension d'un signal en volts efficaces, ou tension alternative à redresser
	résistance de charge en k.ohms et puissance de sortie en watts
	le même tube mais à désignation différente
	le même tube mais conçu pour une tension et/ou un courant de chauffage différents
	le même tube mais muni d'un culot différent

A	amplification de tension	R_i	résistance interne
A	commande automatique de volume	R_k	résistance cathodique
BOOS	ER diode survolteuse des générateurs de déflexion pour la télévision	R_t	résistance intérieure totale de la source d'alimentation
d	distorsion totale à la valeur indiquée de V_o	S	pente
EHT	très haute tension pour le tube écran des montages de télévision	S_c	pente de conversion
I_a	courant anodique	S_H	pente de la heptode
I_{ap}	valeur de crête du courant anodique	SP	pente de la pentode
I_d	courant continu à débiter par une diode	ST	pente de la triode
I_{g2}	courant de grille-écran	ST_e	pente de la tétrode
I_k	courant cathodique ($I_a + I_{g2}$)	V	volt
k	kilo-ohm (= 1.000 ohms)	V_a	tension anodique
M	mégohm (= 1.000.000 ohms)	V_{ainv}	p. valeur de crête de la tension anodique dans le sens arrêté
mA	milliampère (= 0,001 ampère)	V_b	tension d'alimentation
$P_a(W_a)$	dissipation anodique	V_d	valeur efficace de la tension alternative à redresser
P_o	puissance de sortie	V_g	tension de grille
R_a	résistance de charge anodique	V_{g1}	tension de grille de commande
R_{aa}	résistance de charge anodique (entre plaques) dans les étages en push-pull	V_{g2}	tension de grille-écran
R_{eq}	résistance équivalente de souffle à la grille de commande	V_{g3}	tension sur la 3e grille
R_{g1}	résistance de grille de commande	V_{g4}	tension sur la 4e grille
R'_{g1}	résistance de grille de commande du tube suivant	V_i	tension d'entrée
R_{g2}	résistance de grille-écran	V_o	tension de sortie
		$V_{o max}$	tension de sortie à la naissance du courant de grille
		W	watt
		$W_a(P_a)$	dissipation anodique
		μ	1. facteur d'amplification 2. pour un condensateur: microfarad
		μA	microampère
		μ_{g2g1}	facteur d'amplification de la grille de commande à la grille-écran
		Ω	ohm

EINFÜHRUNG

In diesem Handbuch findet jeder, der sich in der Praxis mit Elektronenröhren beschäftigt, leicht und schnell sämtliche erforderlichen Röhrendaten.

Das Röhrenhandbuch enthält die wichtigsten Angaben über eine grosse Anzahl europäischer und amerikanischer Röhren für Rundfunkempfänger und Verstärker, sowie von Kathodenstrahlröhren für Fernsehgeräte und Oszillographen. Die charakteristischen Eigenschaften sämtlicher Röhren lassen sich infolge der besonderen Anordnung mit einem Blick übersehen, und zwar wurde für jede Röhrentype ein Schaltbild gezeichnet, in dem Spannungen und Ströme eindeutig angegeben sind. Die Bezeichnung der Elektroden stimmen mit denen der ebenfalls abgebildeten Röhrensockel überein.

Ausserdem kann dem Schaltbild der Verwendungszweck der betreffenden Röhre entnommen werden.

In Ergänzung der nach diesem System angeordneten Röhreneigenschaften wurden am Ende jedes Abschnittes noch Tabellen mit verschiedenen Einstellwerten für eine Anzahl Röhren aufgenommen, die sich ganz besonders für die Verwendung in RC-gekoppelten Spannungsverstärkern eignen.

Ferner ist hinter jeder Gruppe eine Vergleichstabelle aufgenommen, in der in erster Linie die Röhrentypen aufgeführt sind, die sich vollständig gleichen bzw. sich lediglich hinsichtlich der Glühspannung, des Glühstroms oder des Röhrensockels unterscheiden. Auch wurden in diese Tabelle die von den Militärbehörden verwendeten Typenbezeichnungen aufgenommen, soweit diese mit den aufgenommenen handelsüblichen Typen identisch sind. Die hier zwischen Anführungsstrichen genannten Typen wurden lediglich zum Vergleich aufgenommen und sind also nicht gesondert in der betreffenden Gruppe aufgeführt.

Die Buchstaben G. GT. GTA usw. hinter einigen Röhrentypen beziehen sich praktisch ausschliesslich auf die mechanische Ausführung der Röhre, und derartige Röhren sind also ebenfalls nicht gesondert aufgeführt.

Ebenfalls sind Daten von Thyatronen, Kathodenstrahlröhren und einer grossen Anzahl Transistoren in Tabellenform wiedergegeben.

Die Einteilung der verschiedenen Röhrentypen in 9 Hauptgruppen, die sich jeweils durch eine andere Farbe unterscheiden, erfolgt nach untenstehender Tabelle.

- | | |
|---------------|---|
| I (Orange) | Dioden (Gleichrichter und Detektoren) |
| II (Grün) | Trioden (ausserdem Doppeltrioden und (Doppel-)dioden Trioden) |
| III (Gelb) | Tetroden und Pentoden (Doppel-)dioden-Pentoden) |
| IV (Rot) | Endröhren (Trioden, Tetroden, Pentoden) |
| V (Grau) | Frequenzwandler (Mischröhren wie Hexoden, Heptoden, Oktoden, kombiniert oder nicht kombiniert mit Oszillator-Trioden) |
| VI (Braun) | Kombinations-Röhren (Trioden-Pentoden u.a.m.; Trioden-Heptoden, soweit sie sich für Anwendung auf den Gebieten der Hoch-, Zwischen- und Niederfrequenz eignen) |
| VII (Violett) | Kathodenstrahlröhren (Abstimmanzeiger und Bildröhren für Fernsehgeräte und Oszillographen) |
| VIII | Transistoren (NF Verstärker grün, Endstufen rot, HF und ZF Verstärker, sowie Frequenzwandler grau, Tabellen blau). |
| IX (Weiss) | Thyatronen (Gasgefüllte Trioden und Tetroden) |

Gebrauchsanweisung

Die Einteilung des vorliegenden Röhrenhandbuches ermöglicht sowohl ein schnelles Aufsuchen der Röhrendaten einer beliebigen Röhrentype als auch das Auffinden einer geeigneten Röhre, z.B. einer Triode, einer Gleichrichterröhre oder einer Pentoden-Endröhre für einen bestimmten Verwendungszweck.

Im ersteren Fall weist das alphabetische Register auf die Seite hin, auf der die Eigenschaften zu finden sind. Im anderen Fall sucht man die Röhrentype mit den gewünschten Eigenschaften in der betreffenden Gruppe, wobei die zu dieser Gruppe gehörende Vergleichstabelle benutzt werden kann, um festzustellen, ob möglicherweise eine ähnliche Röhre noch unter einer anderen Typenbezeichnung vorhanden ist.

Im allgemeinen sind die kennzeichnenden Daten für normale Anodenspannungen angegeben, d.h. 250 V für Röhren in Wechselstromgeräten und 90 V für Röhren mit Batteriespeisung.

Eine Abweichung tritt ein, wenn:

- a) die maximal zulässige Anodenspannung kleiner als 250 V bzw. 90 V ist.
- b) der Fabrikant der betreffenden Röhre nur Angaben für abweichende Spannungen angegeben hat.

Daneben sind für Röhren, bei denen dies besonders wichtig sein kann, die Daten für 2 oder mehrere verschiedene Anodenspannungen angegeben; in solchen Fällen ist dann jeweils ein vollständiges Schaltbild abgebildet.

Gleichrichter

Bei Gleichrichterröhren sind höchste Wechselspannung mit höchstem Gleichstrom im Zusammenhang gebracht, und zwar unter Zugrundelegung des höchst zulässigen Gleichstroms. In einigen Fällen jedoch wird die höchste Wechselspannung als Ausgangspunkt gewählt.

Pentoden

Ob eine Pentode für Nieder- Zwischen- oder Hochfrequenzverstärkung geeignet ist, wird durch die Art des Schaltbildes, wie folgt, dargestellt (siehe Seite 4):

- 1) Eignet sich die Röhre hauptsächlich oder ausschliesslich für Niederfrequenzverstärkung, so ist das Schaltbild nach Abbildung 1 mit den statischen Kennlinien massgebend.
- 2) Für Röhren, die in Zwischen- oder Hochfrequenzstufen normaler Rundfunkempfänger Verwendung finden, gilt das Schaltbild nach Abbildung 2.
- 3) Pentoden, die besonders zur Verstärkung grosser Bandbreiten oder sehr hoher Frequenzen dienen (Fernseh- und UKW-Empfänger) und die nicht ohne weiteres in normalen ZF-Verstärkern für Zwischenfrequenzen von 100-500 kHz verwendet werden können, sind durch ein Schaltbild, wie Abbildung 3 gekennzeichnet.

Eignet sich eine Röhre für selbsttätigen Schwundausgleich, so ist der Punkt, der an die Regelspannung gelegt werden kann, mit den Buchstaben AVR versehen. Das Regelgebiet ist durch 2 Werte hinter „Vgl“ angegeben.

Endröhren

Für Trioden-, Tetroden- und Pentoden-Endröhren sind die üblichen Klasse-A-Einstellungen vermerkt. Eine Anzahl von Röhrentypen haben ausserdem Einstellwerte für Gegentaktendstufen erhalten.

BEDEUTUNG DER VERWENDETEN SYMBOLE UND ABKÜRZUNGEN

	Spannung in Volt (Heizspannung usw.)		Gesamtinnenwiderstand der Speisequelle
	a. Heizstrom in Ampere b. Anoden- und Schirmgitterstrom in Milliampere		Steilheit
	Signalspannung in Volt (Effektivwert) bzw. gleichzurichtende Wechselspannung		Misch-Steilheit
	Anodenbelastungswiderstand in kOhm und Ausgangsleistung in Watt		Steilheit der Heptode
	dieselbe Röhre mit anderer Typenbezeichnung		Steilheit der Pentode
	dieselbe Röhre, aber andere Heizspannung und/oder Heizstrom		Steilheit der Triode
	dieselbe Röhre mit anderem Sockel		Tetrodensteilheit
A	Spannungsverstärkung		Volt
AVR	selbsttätiger Schwun- ausgleich		Anodenspannung
BOOSTER	Spardiode in Fern- seh-Ablenkgeneratoren		Spitzenwert der Ano- denspannung in der Sperrichtung
d	Gesamtverzerrung beim angegebenen Wert von V _c		Speisespannung
EHT	sehr hohe Spannung für Wiedergaberöhre in Fernschaltungen		effektiver Wert der gleichzurichtenden Wechselspannung
I _a	Anodenstrom		Gitterspannung
I _{a p}	Spitzenwert des Ano- denstroms		Steuergitterspannung
I _d	von der Diode zu lie- fernder Gleichstrom		Schirmgitterspannung
I _{g2}	Schirmgitterstrom		Spannung am 3. Gitter
I _k	Kathodenstrom (I _a + I _{g2})		Spannung am 4. Gitter
k	kOhm (= 1000 Ohm)		Eingangsspannung
M	Megohm (= 1 000 000 Ohm)		Ausgangsspannung
mA	Milliampere (= 0,001 Ampere)		Ausgangsspannung am Gitterstromeinsatz
P _a (W _a)	Anodenverlustleistung		Watt
R _o	Ausgangsleistung		Anodenverlustleistung
R _a	Anodenbelastungs-Wi- derstand		1.) Verstärkungsfaktor ($\frac{1}{\mu} \times 100\% =$ Durch- griff)
R _{aa}	Anodenbelastungswider- stand (von Platte zu Platte) in Gegentakt- stufen		Mikroampere
R _{eq}	äquivalenter Rauschi- widerstand am Steuergitter		Verstärkungsfaktor Steuergitter gegen Schirmgitter
R _{g1}	Steuergitter-Widerstand		Ohm
R _{g1}	Steuergitter-Widerstand der folgenden Röhre		
R _{g2}	Schirmgitter-Wider- stand		
R _i	Innenwiderstand		
R _k	Kathodenwiderstand		

MUKADAMAT

Pembimbing ini disusun dengan tjara sedemikian hingga segala orang jang mengurus lampu² elektron dalam praktek dapat memperoleh ketentuan² jang perlu tentang setiap matjam lampu radio dengan mudah dan tjepat. Buku ini memuat keterangan² jang paling penting tentang banjak matjam² lampu radio dari Eropah dan Amerika untuk penerima² dan penguat², dan tentang lampu² sinar katoda untuk pesawat² televisi dan osiloskop². Keterangan² itu disusun sedemikian hingga orang dapat membatja sifat² tjiri dan hubungan² elektroda tentang tiap² lampu radio dalam sekedjap mata.

Hal itu dimungkinkan oleh karena dari tiap² matjam lampu radio diberikan suatu bagan hubungan pada mana arus² dan tegangan² jang berlaku ditandakan dengan terang, sedangkan angka² pada elektroda² sesuai dengan nomor² kaki lampu radio jang digambarkan djuga.

Lagi pula bagan hubungan digambarkan sedemikian sehingga orang dapat melihat dengan selang pandang untuk penglaksanaan mana matjam lampu radio jang bersangkutan diperuntukkan.

Untuk melengkapkan sifat² tjiri jang ditetapkan menurut sistim ini dibelakang tiap² golongan dimuatkan beberapa daftar lagi dengan berbagai-bagai keterangan² penetapan untuk beberapa lampu² radio jang baik benar untuk dipakai seperti penguat tegangan jang dihubungkan -RC. Selandjutnja dibelakang tiap² golongan dipasang sebuah daftar perbandingan. Daftar itu pertama-tama memberikan tjorak² tabung jang betul² sama atau jang hanja perbedaan sekadar mengenai tegangan-pidjar, arus-pidjar atau kaki-tabingnja. Dalam daftar ini dimasukkan djuga keterangan-tjorak sebagaimana dipergunakan oleh instansi² militer, sekadar bersamaan dengan tjorak² komersil jang termuat dalam daftar. Tjorak² jang dinjatakan disini dengan memakai tanda penarik perhatian („— —”) hanja dimuat untuk perbandingan sadja, djadi tidak dinjatakan tersendiri dalam golongan jang bersangkutan.

Keterangan² berupa huruf G., GT., GTA., dst. dibelakang beberapa tjoraktabung hampir semata-mata mengenai pembuatan tabung itu setjara mekanik dan tabung jang sematjam itu djuga tidak dinjatakan tersendiri.

Keterangan² tentang tiratron², lampu² sinar katoda dan transistora² jang banjak terdapat diberikan djuga dalam beberapa daftar.

Rupa² lampu radio disusun menurut 9 golongan utama jang masing² ditandai dengan sebuah ban berwarna sebagai berikut:

- | | |
|------------------|---|
| I (pinang masak) | Dioda² (perata ² arus dan detektor ²) |
| II (hidjau) | Trioda² (antara lain trioda ² berganda, trioda ² -dioda dan trioda ² -dioda berganda) |
| III (kuning) | Tetroda² dan pentoda² (antara lain djuga pentoda ² -dioda dan pentoda ² -dioda berganda) |
| IV (mérah) | Lampu² terachir (trioda ² , tetroda ² pentoda ²) |
| V (kelabu) | Pengubah frekuensi (jang dimaksudkan lampu ² tjampur sebagai heksoda ² , heptoda ² , oktoda ² , digabungkan atau tidak dengan trioda-osilator) |
| VI (mera toewa) | Lampu²-kombinasi (pentoda ² -trioda, dsb.: heptoda ² -trioda sekedar lampu ² itu dapat dipakai untuk frekuensi rendah, atau frekuensi tengah dan tinggi) |
| VII (lembajung) | Lampu² sinar katoda (lampu ² indikator dan televisi dan osiloskop) |
| VIII | Transistora² (frékuensi rendah hidjau, transistora ² terachir mérah, frékuensi tengah dan tinggi, dan penguba frékuensi kelabu). |
| IX (putih) | Tiratron² (trioda ² dan tetroda ² jang diisi dengan gas) |

Petunjuk Pemakaian

Pembagian buku ini memungkinkan orang baik untuk lekas dapat menemui keterangan² tentang sebarang lampu radio maupun untuk dengan mudah mentjari sesuatu lampu yang serasih untuk maksud tertentu — ump. sebuah trioda, sebuah perata-arus atau sebuah lampu terachir pentoda.

Dalam hal pertama daftar menurut abjad menunjukkan halamannya dimana orang dapat mengetahui sifat² itu. Dalam hal kedua orang mentjari matjam lampu dengan sifat² yang dikehendaki dalam golongan yang bersangkutan setelah mana orang masih dapat membatja daftar perbandingan yang turut golongan ini untuk menjelidiki apakah mungkin sesuatu lampu sesuai dibawah penundjukan matjam yang lain.

Pada umumnja yang diberitahukan, ialah keterangan² tjiri yang berlaku jika lampu yang bersangkutan diisi pada tegangan² anoda yang paling lazim, jaitu 250 V untuk lampu² yang biasanja dipakai dalam pesawat arus bolak-balik, dan 90 V kalau dipakai seperti lampu² untuk pengisian baterai. Dalam pada itu adahali yang menjimpang, yakni djikalau:

- a. tegangan anoda tertinggi yang dapat diizinkan lebih ketjil daripada 250 V, masing² 90 V;
- b. paberik yang membuat matjam lampu yang bersangkutan tjuma memberikan keterangan² yang berlaku untuk tegangan² anoda yang menjimpang.

Lain daripada itu buat lampu² diberikan keterangan² untuk tegangan² dua atau lebih anoda yang berbeda dimana keterangan² itu penting sekali, maka tiap² kali dimuatkan suatu bagan hubungan yang lengkap.

Perata² arus.

Pada lampu² perata arus tiap² kali diberitahukan suatu gabungan tekanan bolak-balik tertinggi dan arus searah tertinggi, gabungan itu pada umumnja berdasarkan maksimum mutlak dari arus searah yang dapat diizinkan. Dalam beberapa hal maksimum mutlak dari tekanan bolak-balik dipilih sebagai dasar.

Pentoda²

Apakah sebuah pentoda dapat dipakai untuk penguatan frékuénsi rendah atau frékuénsi tengah dan tinggi diberitahukan oleh tjara menggambarkan hubungan, jaitu sebagai berikut:

1. Djikalau lampu radio terutama atau melulu untuk penguatan frékuénsi rendah, maka dipakai suatu bagan hubungan menurut luk. 1, yang menjebutkan sifat² tjiri statis.
2. Untuk lampu² yang dilaksanakan dalam tingkatan² frékuénsi tengah dan tinggi dari penerima² penjar yang biasa berlaku bagan hubungan pada luk. 2.
3. Pentoda² yang pada chususnja dirantjanakan untuk menguatkan ban lebar atau frékuénsi² yang sangat tinggi (pesawat² televisi dan modulasi frekuénsi), dan yang tidak dapat dilaksanakan demikian sadja dalem penguat² frékuénsi tengah dari 100...500 kiloperioda tiap detik, ditanda-tjirikan oleh bagan hubungan menurut luk. 3.

Djikalau sebuah lampu radio serasih untuk dipakai buat pengatur kekuatan otomatis, maka huruf² "A V R" dibubuhi pada titik dimana tekanan pengatur dapat dihantarkan. Lagi pula dalam nal itu daerah pengatur diberitahukan dengan dua bilangan dibelakang "Vg₁".

Lampu² terachir

Tentang lampu² terachir trioda, tetroda dan pentoda diberikan penetapan kelas A yang lazim. Lain daripada itu untuk beberapa matiam dimuatkan keterangan² penetapan buat tingkat² timbangan.

KETERANGAN TENTANG TANDA² DAN KEPENDEKAN² JANG DIPAKAI

	Tegangan pengisian dalam Volt.
	Arus pidjar dalam Ampere. Arus anoda dan arus kisi-lindung dalam miliampere.
	Tegangan sinjal dalam Volt (nilai berguna) masing ² tegangan bolak-balik jang harus diratakan.
	Tahanan beban dalam kilo-ohm dan tenaga dasar dalam Watt.
	Lampu radio jang sama, tetapi matjamnja ditandakan tjara lain.
	Lampu radio jang sama, tetapi tegangan pidjar-dan/atau arus pidjarnja lain.
	Lampu radio jang sama, tetapi kakinja lain.

A	Penguatan tegangan.	R _t	tahanan-dalam selu- ruhnja dari sumber pengisian.
AVR	P.K.O.	S	Tjuramnja.
BOOSTER	diada-hemat dalam generator-pembias dari televisi.	S _c	Tjuramnja konversi.
d	Djumlah perubahan bentuk pada nilai jang diberitahukan pada V _o .	SH	Tjuramnja heptoda.
EHT	tegangan jang amat tinggi buat tabung- gaung dalam hubungan T.V.	SP	Tjuramnja pentoda.
I _a	Arus anoda.	ST	Tjuramnja trioda.
I _{ap}	nilai-puntjak arus ano- da.	ST _e	Tjuramnja tetroda.
I _d	arus searah diberikan oleh diada.	V	Volt.
I ₂	Arus kisi-lindung.	V _a	Tegangan anoda.
I _k	Arus katoda. (I _a + I _{a2})	V _{ainv.p.}	nilai-puntjak dari tegangan anoda dalam djurusan tjegah.
k	Kilo-ohm (= 1000 ohm).	V _b	Tegangan pengisian
M	Megohm (= 1.000.000 ohm).	V _d	nilai efektif dari teka- nan bolak-balik jang dirata-anuskan.
mA	Miliampere (= 0,001 Ampere).	V _g	Tegangan kisi.
P _a (W _a)	disipasi anoda.	V _{g1}	Tegangan kisi-kemudi.
P _o	Tenaga keluar.	V _{g2}	Tegangan kisi-lindung.
R _a	Tahanan beban anoda.	V _{g3}	tegangan kepada kisi ketiga
R _{aa}	Tahanan-beban-anoda (dari pelat kepelat) dalam djendjang nera- tja.	V _{g4}	tegangan kepada kisi keempat.
R _{eq}	Tahanan desah tara pada kisi-kemudi.	V _i	tegangan djalan masuk.
R _{g1}	Tahanan kisi-kemudi.	V _o	Tegangan keluar
R'g1	Tahanan kisi-kemudi dari lampu jang berikut	V _{o max}	Tegangan keluar bila arus kisi bermula.
R'g2	Tahanan kisi-lindung.	W	Watt.
R _i	Tahanan dalam.	W _a (P _a)	Disipasi anoda.
R _k	Tahanan katoda.	μ	1. Faktor penguat. 2. Mikro (pada konden- sator: mikrofarad).
		μA	Mikroampere.
		μg21	Faktor penguat kisi-ke- mudi terhadap kisi-lin- dung
		Ω	Ohm.

INLEDNING

Denna handbok är uppställd på sådant sätt, att var och en, som i praktiken har att göra med elektronrör, lätt och fort kan finna erforderliga upplysningar om olika rörtyper.

Den innehåller de viktigaste uppgifterna om ett stort antal europeiska och amerikanska rör för mottagare och förstärkare samt katodstrålerör för TV-mottagare och oscilloskop. Uppställningen är gjord så att man snabbt kan få reda på de karakteristiska egenskaperna och elektrodanslutningarna för varje rörtyp.

För varje rörtyp finns nämligen ett kopplingsschema med värden för strömmar och spänningar tydligt angivna och siffror vid elektroderna svarande mot den avbildade rörsockelns stiftnumrering. Dessutom är kopplingsschemat ritat så att man genast kan se för vilket ändamål rörtypen är avsedd.

Som komplettering till de karakteristiska egenskaperna finnas även tabeller med olika driftsdata för en del rör, som äro särskilt lämpliga för RC-kopplade spänningsförstärkare. Efter varje grupp har dessutom upptagits en jämförelsetabell, i vilken i första rummet förekomma rörtyper som helt och hållet motsvara varandra eller endast skilja sig från varandra såvitt det gäller glödspänning, glödström eller rörfot. I denna tabell ha även upptagits de av militärmyndigheterna använda typbeteckningar, såvitt dessa äro identiska med de upptagna kommersiella typerna. De här mellan „—“ angivna typerna ha endast upptagits som jämförelse och ha sålunda icke angivits särskilt i ifrågavarande grupp.

Bokstavsbeteckningarna G, GT, GTA o.s.v. bakom vissa rörtyper syfta nästan uteslutande på rörets mekaniska utförande och dylika rör ha därför icke heller angivits särskilt.

Det finnes även tabeller med uppgifter om tyratroner, katodstrålerör och transistorer.

De olika rörtyperna äro uppdelade i följande 9 huvudgrupper som var och en har sin särskilda färg:

- | | |
|---------------|---|
| I (orange) | Dioder (likriktare och detektorer) |
| II (grön) | Trioder (inkl. dubbeltrioder och (duo) diodtrioder) |
| III (gul) | Tetroder och pentoder (inkl. även (duo) diodpentoder) |
| IV (röd) | Slutrör (trioder, tetroder, pentoder) |
| V (grå) | Frekvensomformare (s.k. blandarrör, såsom hexoder, heptoder, oktoder, kombinerade med eller utan oscil-latortriöd) |
| VI (brun) | Kombinationsrör (triöd-pentoder, o. dyl., triödheptoder försåvida de äro användbara till hög-, mellan- och lågfrekvens) |
| VII (violett) | Katodstrålerör (indikatorrör och bildrör för TV och oscilloskop) |
| VIII | Transistorer (lågfrekvensförstärkning grön, slutstegen röd, mellan- och högfrekvensförstärkning, och frekvensomformare grå, tabeller blå). |
| IX (vit) | Tyratroner (gasfyllda trioder och tetroder) |

Anvisningar

Man kan på grund av den uppställningen boken har lätt finna erforderliga uppgifter för vilken rörtyp som helst, men också ett passande rör, t.ex. en triod, en likriktare eller ett pentodslutrör. Det alfabetiska registret hänvisar till sidan där man finner rörets egenskaper och söker man en rörtyp med vissa egenskaper går man till ifrågavarande huvudgrupp. Därefter kan man även rådfråga jämförelsetabellen, som hör till denna grupp, för att se om det eventuellt finnes ett överensstämmande rör under en annan typbeteckning.

I allmänhet hänför sig de karakteristiska uppgifterna till de mest använda anodspänningarna, dvs. 250 V för rör, som vanligtvis användas i växelströmsapparater och 90 V för batterirör. Detta gäller dock inte i följande fall:

- a. om den maximalt tillåtna anodspänningen är mindre än 250 V, resp. 90 V.
- b. om den ifrågavarande rörtypens fabrikant endast har lämnat uppgifter om avvikande spänningar.

Dessutom lämnas för rör, där detta är av särskild betydelse, uppgifter för två eller flera anodspänningar; därvid finnes för varje anodspänning ett fullständigt kopplingsschema.

Likriktare

För likriktarrör finnes alltid angivet en kombination av maximal spänning och maximal ström, i allmänhet baserad på den tillåtna likströmmens absoluta maximum. I några enskilda fall har som utgångspunkt tagits växelspänningens absoluta maximum.

Pentoder

Pentodernas användningsområde beträffande låg- eller högfrekvensförstärkning har angivits på kopplingsschemat enligt följande (se sid. 4):

1. Om röret huvudsakligen eller uteslutande lämpar sig för lågfrekvensförstärkning, användes kopplingsschema enligt fig. 1, som anger de statiska egenskaperna.
2. För rör, som användas för mellan- och högfrekvensstegen i normala radiomottagare, gäller kopplingsschema enligt fig. 2.
3. För pentoder, speciellt gjorda för bredbandsförstärkning eller mycket höga frekvenser (TV och FM-apparater) och vilka icke utan vidare kunna användas i normala mellanfrekvensförstärkare med en mellanfrekvens av 100—500 kHz, användas kopplingsschema enligt fig. 3.

Lämpar sig ett rör för automatisk förstärkningsreglering placeras bokstäverna AVR vid den punkt, där regleringsspänningen kan anslutas. Dessutom är regleringsområdet angivet genom två tal bakom "V_{G1}".

Slutrör

För triod-, tetrod- och pentodslutrör angivas de vanliga inställningarna, klass A. För en del typer finnas dessutom inställningsuppgifter för balanssteg.

FÖRKLARING PÅ ANVANDA TECKEN OCH FÖRKORTNINGAR

6.3

driftspänning i volt

0.3

a. glödström i ampere

b. anod- och skärmgallerström i milliampere

10

signalspänning i volt (effektiva värdet) resp. växelspänningen, som skall likriktas



4w belastningsmotstånd i kiloohm och utgångsenergi i watt

=

samma rör, men annan typbeteckning



samma rör, men annan glödspänning och/eller glödström



samma rör, men annan sockel

A spänningsförstärkning
 AVR automatisk förstärkningsreglering
 BOOSTER spardiod i televisionsavböjningsgeneratorer
 d total distorsion vid det angivna värdet av V_o
 EHT mycket hög spänning för återgivningsrör i TV-kopplingar
 I_a anodström
 I_{ap} toppvärde för anodströmmen
 I_d likström att levereras av dioden
 I_{g2} skärmgallerström
 I_k katodström ($I_a + I_{g2}$)
 k kiloohm (= 1.000 ohm)
 M megohm (= 1.000.000 ohm)
 mA milliampere (= 0,001 ampere)
 $P_a(W_a)$ anoddissipation
 P_o utgångsenergi
 R_a anodbelastningsmodstånd
 R_{aa} anodbelastningsmotstånd (från plåt till plåt) i balanstrappor
 R_{eq} ekvivalent brusmodstånd vid styrgallret
 R_{g1} styrgallermodstånd
 R_{g1} styrgallerresistans av efterföljande rör
 R_{g2} skärmgallermodstånd
 R_i invändig modstånd

R_k katodmodstånd
 R_t totalt invändigt motstånd vid näringskällan
 S branthet
 S_c blandningsbranthet
 S_H brandhet för heptod
 S_P branthet för pentod
 ST branthet för triod
 ST_e branthet för tetrod
 V volt
 V_a anodspänning
 $V_{a\text{ inv.}}$ p. toppvärde för anodspänningen i spärriktningen
 V_b driftspänning
 V_d effektivt värde för växelspänningen som skall likriktas
 V_g gällerspänning
 V_{g1} styrgällerspänning
 V_{g2} skärmgällerspänning
 V_{g3} spänning vid 3de skärm
 V_{g4} spänning vid 4de skärm
 V_i ingångsspänning
 V_o utgångsspänning
 $V_{o\text{ max}}$ utgångsspänning vid gallerströmmens början
 W watt
 $W_a(P_a)$ anodförlust
 μ 1. förstärkningsfaktor;
 2. vid kondensator: mikrofara
 μA mikroampere
 μ_{g2g1} förstärkningsfaktor av styrgaller med avseende på skärmgallret
 Ω ohm

INTRODUCCION

Este Manual está concebido para todos los que, usando las válvulas electrónicas en la práctica, necesiten encontrar los detalles de cada tipo con rapidez y facilidad.

Contiene los datos principales de un considerable número de tipos de válvulas americanas y europeas, para receptores y amplificadores, así como los de los tubos de rayos catódicos empleados en Televisión y aplicaciones oscilográficas, todo ello en forma que permita la lectura a primera vista de las propiedades, características y conexionado de electrodos para cada válvula.

Esto es posible porque, para cada tipo de válvula, figura un esquema de conexión, en el cual se han indicado las corrientes y tensiones con suma claridad, estando marcados los electrodos con números que corresponden a los de los soportes, que también están dibujados.

Además, el esquema correspondiente, muestra, enseguida, la debida aplicación del tipo de válvula en cuestión.

Así, las principales características reproducidas, tienen su complemento en las tablas de la parte final del libro, las cuales contienen varios datos de ajuste para válvulas destinadas, principalmente, a su uso como amplificadoras a resistencia-capacidad. Además se ha incluido al fin de cada grupo un cuadro comparativo que comprende sobre todo los tipos de válvulas completamente iguales o diferentes tan sólo por lo que toca a la tensión de filamento, la corriente de filamento o al pie de válvula. Este cuadro contiene también aquellas indicaciones de tipos empleadas por las organizaciones militares que son idénticas a los tipos comerciales incluidos. Los tipos puestos entre comillas quedan incluidos solamente a título de comparación, pues no se hallan indicados separadamente en el grupo comprometido.

Las letras G, GT, GTA, etc., que siguen a determinadas indicaciones de tipos, se refieren únicamente al acabado mecánico de la válvula, pues tales válvulas ni tampoco tienen mención aparte.

Los datos acerca de tiratrones, tubos de rayos catódicos, y transistores quedan también incluidos.

Los diferentes tipos de válvulas, están divididos en 9 grupos principales diferenciados por medio de franjas coloreadas de la siguiente manera:

I (anaranjado)	Diodos (Rectificadoras y detectoras)
II (verde)	Triodos (triodos doble y (duo)diodos-triodos incluidos)
III (amarillo)	Tetrodos y pentodos ((duo-)diodos-pentodos incluidos)
IV (rojo)	Valvulas finales (triodos, tetrodos, pentodos)
V (gris)	Conversores de frecuencia (las llamadas mezcladoras, tales como hexodos, heptodos, octodos, estén o no combinados con triodo oscilador)
VI (castaña)	Valvulas combinadas (triodos-pentodos y aquellos triodos-heptodos que sean apropiados para la amplificación de B.F., F.I. y A.F.)
VII (violeta)	Tubos de rayos catódicos (tubos indicadores y de imagen para televisión y aplicaciones oscilográficas)
VIII	Transistores (amplificación de B.F. verde, etapas finales rojo, amplificación de F.I. y A.F. y conversores de frecuencia gris, tablas azul).
IX (blanco)	Tiratrones (triodos y tetrodos a atmósfera gaseosa)

Modo de empleo

El sistema empleado en el presente Manual permite tanto encontrar rápidamente los datos de cualquier tipo de válvula, como hallar fácilmente el tubo apropiado para un fin determinado, por ejemplo, un triodo, un conversor o un pentodo final.

En el primer caso, el registro alfabético indica la página donde se puede encontrar los datos deseados. En el último caso, se busca la válvula en cuestión, con las propiedades deseadas, en el grupo correspondiente, consultando eventualmente la tabla comparativa, para ver si existe otro tubo semejante con diferente indicación de tipo.

Por lo general, se indican los datos característicos para las tensiones anódicas más corrientes, es decir, 250 voltios para las válvulas empleadas en los aparatos llamados de corriente alterna y 90 voltios para las válvulas alimentadas por pilas.

La excepción de esta regla, es para:

- a) La tensión anódica máxima tolerada es menor de 250 voltios. La misma condición para las de 90 voltios.
- b) El fabricante del tipo de válvula en cuestión sólo ha suministrado los datos para otras tensiones.

Para las válvulas en las que puede ser importante, se han indicado los datos para dos o más tensiones anódicas diferentes. En tal caso, figura un esquema de conexión completo.

Rectificadoras.

Para todas las válvulas rectificadoras, se han indicado la tensión alterna y la corriente continua máximas. Por lo general, el punto de partida para ello, ha sido el máximo absoluto de la corriente continua tolerable; en algunos casos se ha partido del dato de máxima tensión alterna.

Pentodos.

Examinando el esquema de conexión, puede verse si un pentodo es apropiado para amplificación de B.F., F.I. o A.F.

- 1). Si una válvula es apropiada única y principalmente para amplificación de B.F., se ha empleado el esquema de conexión según la fig. 1, con indicación de las características estáticas.
- 2). El esquema de conexión de la fig. 2 es de aplicación a las etapas de F.I. y A.F. en los receptores normales.
- 3). El esquema de conexión de la fig. 3 conviene para los pentodos diseñados especialmente para la amplificación de banda-ancha o de frecuencias muy elevadas (aparatos de televisión o de modulación de frecuencia) y cuyo empleo no es indicado en los amplificadores normales de F.I. a 50 ó 100 kilociclos.

Si una válvula es apta para la aplicación de control automático de volumen, esta condición queda marcada con las iniciales AVR, en el punto donde puede aplicarse la tensión reguladora. El margen de regulación se indica por medio de dos números detrás de la indicación „V_{g1}”

Valvulas finales.

Para los triodos, tetrodos y pentodos finales, están indicados los ajuste corrientes en clase A., figurando, para algunos tipos, los datos de ajuste de etapas en contrafase.

SIGNIFICADO DE LAS ABREVIATURAS EMPLEADAS

6.3

tensión de alimentación en voltios

0.3

a. corriente de filamento en amperios

b. corriente de ánodo y de rejilla pantalla en miliamperios

10

tensión de entrada en voltios (valor eficaz), respectivamente tensión alterna a rectificar



resistencia de carga en kilohmios y potencia de salida en vatios

=

misma válvula con indicación diferente



misma válvula con otra tensión o corriente de filamento



misma válvula con pie diferente

A **amplificación de tensión**
AVR **regulación automática del volumen**

BOOSTER **diodo reforzador en circuitos de desviación, de televisión**

d **distorsión total al valor indicado de V_o**

EHT **muy alta tensión para tubo de imagen en circuitos de TV**

I_a **corriente de ánodo**

I_{ap} **valor máximo de la corriente**

I_d **corriente continua a suministrar por el diodo**

I_{g2} **corriente de rejilla pantalla**

I_k **corriente de cátodo ($I_a + I_{g2}$)**

k **kilohmio (= 1000 ohmios)**

M **megohmio (= 1.000.000 de ohmios)**

mA **miliamperio (= 0,001 amperio)**

$P_a(W_a)$ **disipación de placa**

P_o **potencia de salida**

R_a **resistencia de carga de ánodo**

R_{aa} **resistencia de carga de ánodo (de placa a placa) en etapas push-pull**

R_{eq} **resistencia equivalente de ruidos a la rejilla de mando**

R_{g1} **resistencia de rejilla de mando**

R'_{g1} **resistencia de rejilla de mando de la válvula siguiente**

R_{g2} **resistencia de rejilla pantalla**

R_i **resistencia interna**

R_k **resistencia de cátodo**

R_t **resistencia total interna de la fuente de alimentación**

S **pendiente**

S_c **pendiente de conversión**

SH **pendiente de heptodo**

SP **pendiente de pentodo**

ST **pendiente de triodo**

STe **pendiente de tetrodo**

V **voltio**

V_a **tensión de ánodo**

$V_{a\text{ inv. p}}$ **valor máximo de la tensión anódica inversa**

V_b **tensión de alimentación**

V_d **valor eficaz de la tensión de c.a. a rectificar**

V_g **tensión de rejilla**

V_{g1} **tensión de rejilla de mando**

V_{g2} **tensión de rejilla pantalla**

V_{g3} **tensión de rejilla tercera**

V_{g4} **tensión de rejilla cuarta**

V_i **tensión de entrada**

V_o **tensión de salida**

$V_{o\text{ max}}$ **tensión de salida al comienzo de la corriente de rejilla**

W **vatio**

$W_a(P_a)$ **disipación de placa**

μ **1. factor de amplificación**

2. (condensadores) microfaradio

μA **microamperio**

μg_{2g1} **factor de amplificación de rejilla de mando con relación a la rejilla pantalla**

Ω **ohmio**

INTRODUÇÃO

O presente manual de válvulas foi redigido especialmente para facilitar a qualquer pessoa que, na prática, precise tratar com válvulas eletrônicas, possa encontrar, rapidamente, as particularidades especiais de cada tipo de válvula.

Nesta edição encontram-se os dados técnicos mais importantes de diversos tipos de válvulas européias e americanas, tanto para receptores a amplificadores, como também, de tubos de raios catódicos, para aparelhos de televisão e osciloscópios.

Este manual permite que, à primeira vista, se possa encontrar as características e as ligações dos eletrodos de cada válvula.

Para cada tipo de válvula foi desenhado o esquema de um circuito, no qual se pode logo ver a aplicação para a qual determinada válvula é destinada.

Neste circuito são indicados, bem claras, as correntes e tensões reinantes; os números dos electrodos correspondem com a numeração da base ou soquete da válvula, sendo esta última, também, reproduzida.

Para completar os dados característicos apresentados conforme este sistema, foi acrescentado, no fim de cada grupo de válvulas, algumas tabelas com dados para um certo número de válvulas que são, particularmente, indicadas para amplificação de audio em circuitos ligados por resistência e capacidade.

Além desta tabela, uma outra comparativa mostra, em primeiro lugar, as válvulas inteiramente idênticas ou que difira, apenas, pelo que diz respeito à tensão de filamento, à corrente de filamento, ou à base de válvula. Esta tabela indica, também, os tipos de válvulas usados pelos serviços militares que são idênticos aos tipos comerciais relacionados.

Os tipos postos entre aspas estão incluídos, apenas a título comparativo, de maneira que estes não são mencionados, separadamente, no grupo correspondente.

As letras G, GT, GTA, etc., que seguem alguns tipos de válvulas referem-se, somente, à execução mecânica da válvula, razão pela qual tais válvulas tão pouco se mencionam separadamente.

Da mesma forma os dados de tiratrons, tubos de raios catódicos e transistores estão relacionados em forma de tabela.

Os diversos tipos de válvulas estão classificados em 9 grupos principais, cada um marcado por uma fita colorida diferente, como segue:

- | | |
|-----------------|---|
| I (Côr laranja) | Diodes (Retificadores e detetores) |
| II (Verde) | Triodos (entre os quais triodos duplos e diodos duplos-triodo) |
| III (Amarela) | Tetrodos e pentodos (entre os quais, também, duplo diodos-pentodos) |
| IV (Vermelha) | Válvulas de potência (triodos, tetrodos, pentodos) |
| V (Cinza) | Válvulas conversoras , as chamadas válvulas de mistura, tais como hexodos, heptodos, octodos, sim ou não combinadas com triodo oscilador |
| VI (Castanha) | Tubos de combinação (triodos-pentodos e semelhantes; triodos-heptodos enquanto estes servem para a amplificação de b.f. (baixa frequência), ou m.f. (média frequência) e r.f. (radiofrequência)) |
| VII (Roxa) | Tubos de raios catódicos (válvulas olhos mágicos, tubos de imagem para televisão e osciloscópios) |
| VIII | Transistores (amplificação de sinais de b.f. verde, estágios de saída vermelha, amplificação de sinais de m.f. ou r.f. e conversores de frequência cinza, tabelas azul) |
| IX (Branca) | Tiratrons (triodos e tetrodos) |

Modo de usar

O sistema de classificação empregado neste manual permite encontrar, de uma maneira rápida, tanto os dados de um tipo de válvula arbitrário, como, também, os de um tipo próprio para um fim determinado — por exemplo um triodo, um retificador ou uma válvula pentodo de potência.

No primeiro caso o índice alfabético indica as páginas nas quais podem ser encontradas as qualidades. No segundo caso procura-se o tipo de válvula com as qualidades exigidas no grupo concernente. Depois pode-se consultar a tabela de comparação, pertencente a este grupo, para verificar se há, talvez, ainda uma válvula semelhante sob outra indicação de tipo.

Em geral estão mencionados, somente, os dados característicos que correspondem às tensões anódicas mais comuns, quer dizer 250 volts para as válvulas que se aplicam, geralmente, nos aparelhos alimentados de redes de corrente alternada, e 90 volts para as de alimentação de pilhas.

Desta regra se desvia quando:

- a. a tensão anódica máxima permitida é inferior à tensão 250 volts ou respectivamente 90 volts;
- b. se o fabricante de válvula concernente somente forneceu especificações para tensões diferentes.

Por outro lado, são fornecidos dados para duas ou mais tensões anódicas diferentes para as válvulas de importância especial. Para estes casos encontra-se neste livro um esquema do circuito completo.

Retificadores

Para válvulas retificadoras sempre é indicada uma combinação de tensão alternada máxima e de corrente contínua máxima, geralmente baseada no máximo absoluto da corrente contínua permitida. Em alguns casos tomou-se como ponto de partida o máximo absoluto da tensão alternada.

Pentodos

Para distinguir se um pentodo é previsto para amplificação de sinais de baixa frequência (b.f.) de média (m.f.) ou de radio-frequência (r.f.) a representação esquemática do circuito será como segue (veja pag. 4):

1. Conforme a figura 1, quando a válvula é principalmente ou exclusivamente destinada para amplificação de b.f.;
2. Conforme a figura 2, para as válvulas usadas em estágios m.f. e r.f. de receptores de radiodifusão comuns;
3. Conforme a figura 3, quando se trata de pentodos especialmente previstos para a amplificação de grande largura de faixa ou de frequências muito elevadas (aparelhos de TV e F.M.) e que não podem ser aplicados, normalmente, em amplificadores normais para as frequências médias entre 100—500 Kc/S.

Numa válvula onde se pode aplicar controle automático de ganho, as letras AVR estão colocadas no ponto onde a tensão de controle pode ser aplicada. Além disso a margem de controle está indicada por dois números atrás „Vg1”.

Válvulas de saída

Das válvulas de potência, triodos, tetrodos e pentodos estão dados os ajustes comuns de classe A. Para um certo número de tipos, também, estão acrescentados dados para os estágios balanceados (push-pull).

EXEMPLIFICAÇÃO DOS SIMBOLOS E ABREVIACOES USADOS

6.3

Tensão de alimentação em volts;

0.3

a. corrente de filamento em amperes;

b. corrente de anodo e de grade de blindagem em mili-amperes;

10

tensão de sinal em volts (valor eficaz), respectivamente tensão alternativa a retificar;



resistência de carga em kilo ohms e potência de saída em watts;

=

a mesma válvula com outra indicação do tipo;



a mesma válvula com outra tensão e/ou corrente de filamento;



a mesma válvula com outra base.

A amplificador de tensão
AVR controle automático de ganho

BOOSTER diodo de poupança nos geradores de deflexão de televisão

d distorção total para o valor indicado de V_o

EHT tensão muito elevada para válvulas de imagem em circuitos de TV

Ia corrente de anodo

IaP valor de pico da corrente de anodo

Id corrente contínua a ser produzida pelo anodo

Ig₂ corrente de grade de blindagem

Ik corrente de catodo

k kilo ohms

M megachms

mA miliamperes

Pa(Wa) dissipação anódica

Po potência de saída

Ra resistência de carga de a anodo

Raa resistência de carga de anodo (de placa a placa)

Req resistência de ruído equivalente à grade de controle

Rg₁ resistência de grade de controle

R'g₁ resistência de grade de controle da válvula seguinte

Rg₂ resistência de grade de blindagem

Ri resistência interna

Rk resistência de catodo

Rt resistência interna total

S da alimentação
Sc transcondutância de conversão

Sh transcondutância do heptodo

Sp transcondutância do pentodo

ST transcondutância do triodo

STe transcondutância do tetrodo

V volts

Va tensão de anodo

Va inv. p. valor de pico da tensão anódica inversa

Vb tensão de alimentação

Vd valor efetivo da tensão de c.a. a ser retificada

Vg tensão de grade de controle

Vg₁ tensão de grade de comando

Vg₂ tensão de grade de blindagem

Vg₃ tensão a terceira grade

Vg₄ tensão a quarta grade

Vi tensão de entrada

Vo tensão de saída

Vo max tensão de saída no início de corrente de grade

W watts

Wa(Pa) dissipação anódica

μ 1. fator de amplificação
2. tratando-se de um capacitor: microfarad

μA microamperes

μg₂g₁ fator de amplificação de grade controle com relação a grade de blindagem

Ω ohms

USO DEL MANUALE

Questo manuale è compilato in maniera tale che chiunque abbia a che fare, in pratica, con le valvole elettroniche, possa trovare facilmente e rapidamente tutti i dati di un qualsiasi tipo di valvola.

Esso contiene i dati più importanti e le caratteristiche tecniche principali di un grandissimo numero di valvole a caratteristica europea e a caratteristica americana, per radioricevitori ed amplificatori; sono riportati anche i dati riguardanti i tubi a raggi catodici per televisori e per oscillografi, il tutto presentato in una forma che permette di rilevare le caratteristiche ed i collegamenti agli elettrodi, a prima vista.

Quanto sopra è stato reso possibile con la pubblicazione, per ogni valvola, di uno schemino riprodotto l'impiego della valvola stessa: sullo schema sono chiaramente indicati i valori delle correnti e delle tensioni e, accanto agli elettrodi, si trovano i numeri indicativi reperibili poi sulla zoccolatura anch'essa disegnata.

Oltre a questo, lo schema è stato redatto in modo da rendere immediatamente evidente per quale applicazione quel dato tipo di valvola è stato progettato.

Per completare le caratteristiche tecniche esposte con questo sistema, dietro di ogni gruppo si trovano diverse tabelle contenenti ulteriori dati d'impiego per un certo numero di valvole che si prestano in modo particolare al montaggio come amplificatrici di tensione con accoppiamento a resistenzacapacità. Inoltre dietro ogni gruppo è riprodotta una tabella comparativa nella quale figurano in primo luogo tipi di valvole del tutto uguali fra loro, o differenti fra loro soltanto rispetto alla tensione o corrente di accensione o alla zoccolatura. In questa tabella sono pure inclusa le indicazioni di tipi adoperate dagli uffici militari in quanto detti tipi sono identici ai tipi commerciali riprodotti. I tipi qui menzionati fra virgolette („—“) sono soltanto riprodotti a titolo di confronto e pertanto non sono menzionati separatamente nel rispettivo gruppo.

Le indicazioni in lettere G, GT, GTA, ecc. messe dietro alcuni tipi di valvole si riferiscono quasi esclusivamente all'esecuzione meccanica della valvola e valvole di tal genere non vengono pertanto neppure menzionate separatamente. Sempre sotto forma di tabella sono riportati i dati di tyatron, di tubi a raggi catodici e di un certo numero di transistori, tra quelli più usati.

I vari tipi di valvola sono suddivisi in 9 gruppi principali, ognuno dei quali è contraddistinto, nel libro, da una propria striscia colorata come segue:

- I°) (arancio) **Diodi** (raddrizzatori e rivelatori)
 - II°) (verde) **Triodi** (tra i quali i doppi triodi ed i doppi diodotriodi)
 - III°) (giallo) **Tetrodi e pentodi** (tra i quali i doppi diodipentodi)
 - IV°) (rosso) **Valvole di potenza** (triodi, tetrodi, pentodi)
 - V°) (grigio) **Convertitori di frequenza** (valvole mescolatrici quali gli exodi, eptodi, octodi, con o senza triodo oscillatore)
 - VI°) (bruno) **Valvole multiple** (triodi-pentodi ecc.; triodi-eptodi in quanto impiegabili per applicazioni di B. F., Media Frequenza e A. F.).
 - VII°) (viola) **Tubi a raggi catodici** (indicatori di sintonia e tubi per visione TV ed oscillografia).
 - VIII°) **Transistori** (amplificazione in B.F. verde, stadi di potenza rosso, amplificazione in M.F. o in A.F. e convertitori di frequenza grigio, tabella bleu).
 - IX°) (bianco) **Tyatron** (triodi e tetrodi in atmosfera gassosa)
- Impiego:**

La classificazione seguita per questo libro rende possibile il reperire, come si è detto, rapidamente i dati concernenti un determinato

tipo di valvola, ma permette altresì di individuare la valvola più indicata — per esempio un triodo, una raddrizzatrice o un pentodo di potenza — per un determinato impiego.

Nel primo caso, l'indice alfabetico rinvia alla pagina dove si trovano i dati che interessano. Nel secondo caso si cerca la valvola che risponde alle necessità, scorrendo il gruppo di classificazione (vedi colore). In seguito si può consultare anche la tabella comparativa che si riferisce a quel dato gruppo e accertare se esiste eventualmente un'altra valvola analoga con diversa indicazione di tipo.

Le caratteristiche riportate sono quelle ricavate, in generale, sulla base delle tensioni anodiche più correnti e cioè 250 volt per le valvole correntemente impiegate nelle apparecchiature a corrente alternata e 90 volt per quanto si riferisce alle valvole previste per l'alimentazione con batterie. Abbiamo fatto però eccezione a questa regola nel caso specifico in cui:

- a) la tensione anodica massima ammissibile è inferiore ai citati 250 e 90 volt;
- b) la casa costruttrice della valvola in questione indica solamente i dati riferiti ad una particolare tensione diversa.

Inoltre, per determinate valvole per le quali tali dati risultano di una particolare importanza, sono riprodotte le caratteristiche riferite a due o più tensioni anodiche e, in questi casi, è sempre riprodotto lo schema completo dei collegamenti.

Raddrizzatrici

Per le valvole raddrizzatrici viene indicata la tensione alternata massima e la corrente continua massima; tali valori sono basati generalmente sul massimo assoluto della corrente continua ammissibile.

In qualche caso viene preso come punto di partenza il massimo assoluto della tensione alternata.

Pentodi

Il sistema adottato per il disegno delle connessioni permette, secondo il sistema che ora spieghiamo, di rilevare se un pentodo è previsto per l'amplificazione in B. F. o in Media Frequenza o in A. F. (Vedi pag. 4).

- 1). Se la valvola è principalmente ed esclusivamente prevista per l'impiego di amplificazione B. F., lo schema è del tipo di cui alla figura 1, che indica le caratteristiche statiche.
- 2). Lo schema di figura 2 invece è seguito per le valvole che trovano applicazione negli stadi di A. F. e di Media Frequenza dei ricevitori normali per radiodiffusione.
- 3). I Pentodi previsti per il particolare impiego di amplificazione a banda larga o di frequenze molto elevate (televisori e ricevitori a modulazione di frequenza) e che comunque non possono essere adottati negli amplificatori per frequenze abituali dai 100 ai 500 kHz, sono rappresentati secondo lo schema di connessione di cui alla figura 3.

Quando una valvola è adatta all'applicazione della regolazione automatica di amplificazione, il punto al quale può essere applicata la tensione regolatrice viene indicato con la sigla AVR. In più, viene riportato il campo di regolazione indicandolo nei due valori dopo la dicitura „ V_{g1} ”.

Valvole di potenza

Per le valvole di potenza, sia per i triodi che per i tetrodi che per i pentodi, viene preso in esame il regime di funzionamento abituale in classe A. Per certi tipi sono riportati anche i valori per l'impiego in „push-pull”.

SPIEGAZIONE DEI SIMBOLI E DELLE ABBREVIAZIONI USATE

6.3

tensione di alimentazione in Volt.

0.3

a. corrente di riscaldamento in Ampere.

b. corrente anodica e di griglia schermo in milli Ampere.

10

tensione di segnale in Volt (valore effettivo) resp.
tensione alternata da raddrizzare.



4W resistenza di carico in Kohm e potenza d'uscita in Watt.

=

la stessa valvola con un'altra indicazione del tipo.



la stessa valvola ma altra tensione e/o corrente di riscaldamento.



la stessa valvola ma con altra zoccolatura

A amplificazione di tensione
AVR regolazione automatica di volume
BOOSTER diodo economico in generatori a deviazione per TV
d distorsione totale con valore dato di V_o .
EHT tensione molto elevata per tubo di riproduzione in connessioni TV
 I_a corrente anodica
 I_{ap} valore picco della corrente anodica
 I_d corrente continua da fornirsi dal diodo
 I_g corrente di griglia schermo
 I_k corrente catodica ($I_a + I_{g2}$)
k Kohm (1000 ohm)
M Mohm (1000.000 ohm)
mA milliampere (0,001 ampere)
 $P_a(W_a)$ dissipazione anodica
 P_o potenza d'uscita
 R_a resistenza di carica anodica
 R_{aa} resistenza di carico anodico (da placca a placca) per l'impiego in „push-pull”
 R_{eq} resistenza equivalente di rumore alla griglia di comando
 R_{g1} resistenza di griglia di comando
 R'_{g1} resistenza di griglia di comando della prossima valvola
 R_{g2} resistenza di griglia schermo

R_i resistenza interna
 R_k resistenza catodica
 R_t resistenza totale interna della fonte di alimentazione
 p pendenza
 S_c pendenza di conversione
SH pendenza di heptodo
SP pendenza di pentodo
ST pendenza di triodo
 ST_e pendenza di tetrodo
SV volt
 V_a tensione anodica
 $V_{a\text{ inv. p.}}$ valore massimo della tensione anodica nella direzione di blocco
 V_b tensione di alimentazione
 V_d valore effettivo della tensione alternata da raddrizzare
 V_g tensione di griglia
 V_{g1} tensione di griglia di comando
 V_{g3} tensione alla 3a griglia
 V_{g4} tensione alla 4a griglia
 V tensione di entrata
 V_o tensione di uscita
 $V_{o\text{ max}}$ tensione di uscita al cominciamento della corrente di griglia
W watt
 $W_a(P_a)$ dissipazione anodica
 μ 1. coefficiente d'amplificazione
2. con condensatore: microfarad
 μA micro-ampere
 μ_{g2g1} coefficiente d'amplificazione della griglia di comando a riguardo alla griglia schermo
 Ω ohm

مقدمة

قد رتب هذا الدليل ترتيبا واضحا حتى ييسر على كل من يشتغل بالصمامات الكهربية اشتغالا عمليا ان يستعمله بسهولة عن التفاصيل الخاصة باى واحد من انواعها .

يحتوى الكتاب على التفاصيل الرئيسية لعدد كبير من الصمامات الأوروبية والأمريكية لاجهزة الالتقاط والمقويات وكذلك لصمامات اشعة المهبط لاجهزة التلفزة واللاسلكويات . ونظم كل هذا تنظيما يمكن به ان تستطلع في لمح البصر المميزات المناسبة لاي صمام والتوصيلات لاقطابه .

وحصل ذلك من ادخال رسم بياني لكل نوع من الصمامات تجد فيه الاشارة الى التيارات والجهود المختصة بالصمام ، واما الارقام المطبوعة عند الاقطاب فتوافر ارقام الرسم البياني لقاعدة الصمام الذى تجد بجانبه . وقد خطط هذه الرسوم تخطيطا بسيطا ينظر به لحظة واحدة ما هي امكانيات الاستعمال الخاصة بالصمام المشار اليه .

ويلاحق كل قسم جدول نسبي يوجد فيه اولا بيان للانواع المتساوية للصمامات اى الانواع التي لا اختلاف بينها والانواع غير المتفاوتة سوى من ناحية فلتية السلك الحرارى او تيار السلك الحرارى او قاعدة الصمام . ثم يوجد في هذا الجدول ايضا الاشارات الى الانواع على اختلافها حسب تسميتها المختصة بالسلطات العسكرية ومن حيث انها متماثلة هي والانواع التجارية . اما الانواع المذكورة هناك بعلامة (—) فانما ذكرها للمقارنة بحيث انه لا يوجد لها الذكر المنفصل في القسم المنسوب .

اما اشارات الحروف اللاتينية (G و GT و GTA الخ) الصماء عند بعض انواع الصمامات ، فهي تختص بتركيب الصمام ميكانيكيا ، حيث انه لا يوجد لتلك الصمامات الذكر المنفصل ايضا .

واخيرا يدرج جدول يشتمل على تفاصيل عن الثيراترونات اى الصمامات الثلاثية الاقطاب او الرباعية المملوءة بالغاز وعن صمامات اشعة المهبط وعن عدد الصمامات الثنائية الاقطاب اى الديودات البلورية وعن الترانسيستورات الشائعة الاستعمال .

وقد رتب الانواع المختلفة من الصمامات ٩ ابواب رئيسية وهي لكل واحد منها شريطة ملونة مميزة كما يلي —

(ا) (نارنج) الصمامات الثنائية الاقطاب (الديودات من المقومات)

- ٢ (أخضر) الصمامات الثلاثية الاقطاب (التربونات ومنها التربونات العزودوجة والديونات المختلطة بالتربونات)
 - ٣ (أصفر) الصمامات الرباعية والخماسية الاقطاب (التربونات والبنونات ومنها الديونات المختلطة بالبنونات)
 - ٤ (أحمر) الصمامات المخرجة (منها الثلاثية والرباعية والخماسية الاقطاب)
 - ٥ (رمادي) محولات الذبذبة (المسماة الصمامات المخلطة ومنها السداسية الاقطاب والسباعية والثمانية سواء كان مركبا فيه تربون مذبذب او غير مركب)
 - ٦ (بنفي) الصمامات المركبة (الثلاثية الاقطاب المختلطة بالخماسية وغير ذلك والثلاثية المختلطة بالسباعية بقدر موافقتها التطبيق في الذبذبة المنخفضة والمتوسطة والمرتفعة)
 - ٧ (بنفسجي) صمامات أشعة المهبط (الصمامات الاشارية والصمامات المصورة للتلفزة والاولوسكوب)
 - ٨ (أزرق) صمامات الترانزستور
 - ٩ (أبيض) الثيراتونات (الصمامات الثلاثية الاقطاب والرباعية المملوءة بالغاز) والثنائية البلورية والترانسيستورات
- ارشادات لاستعمال الكتاب
- اقدر ترتيب الكتاب على ان تجد فورا اي صمام محتاجا اليه او ان تجد صماما موافقا - صماما ثلاثي الاقطاب مثلا او صماما خماسيا مخرجا مد لاى غرض من الاغراض . وفي الحالة الاولى فيشير الفهرس الى الصفحة التي تجد فيه التفاصيل الخاصة . وفي الحالة الاخرى فتجد نوع الصمام الذى له الخواص المطلوبة في الباب المناسب، كما يمكن ان تستشير ايضا الجدول المقارن المناسب لتكشف عما مذكور من الصمامات المتكاثفة في باب آخر . وموجه العموم فلا يذكر من التفاصيل الا ما يوافق الجهود الصعدية الشائعة الاستعمال اي ٢٥٠ ولطا للصمامات المستعملة في الاجهزة بالتيار المتناوب و ٩٠ ولطا للصمامات ذوات التغذية بالتيار من البطاريات .
- وانما لا يطبق هذا القانون اذا

- ١ - يكون غاية جهد الصعد اقل من ٢٥٠ ولطا او اقل من ١٠ ولطا .
 - ب - صنع الصمام ما ذكرت من التفاصيل الا لولطيات غير عادية .
- وبالاضافة الى ذلك فقد ذكر ولطات الصعد المختلفة كلما تحتاج الحالة اليه وادرج ايضا رسوم بيانية كاملة .

العقومات

فى الرسوم الايضاحية للعقومات قد خصص لكل منها التركيب من غاية جهد التيار المتناوب وغاية جهد التيار المباشر فاسس هذا التركيب بوجه عام على اساس غاية التيار المباشر ، وانما اخذنا غاية التيار المتناوب اساسا لحساب التيار المركب والغاية القابلة له فى بعض الاحوال فقط .

الصمامات الخماسية الاقطاب

اما هذه الصمامات فيشير طريقة تخطيط توصيلاتها فى رسومها البيانية الى استعمالها مقويا لذبذبة منخفضة او لذبذبة متوسطة او لذبذبة مرتفعة (انظر الصفحة ٤) وهذه الطرائق المختلفة كما يلى

- ١ - اذا كان الصمام قابلا للاستعمال مقويا لذبذبة منخفضة على وجه خاص فتجد له رسما مثل الرسم (١) الذى خصص فيه الخواص الساكنة .
 - ٢ - اذا كان للصمام تطبيق مقو لذبذبة متوسطة ولذبذبة مرتفعة اى فى اجهزة الالتقاط من النوع القياسى فتجد له رسما ايضاحيا لتياراته مثل الرسم (٢) .
 - ٣ - اذا كان الصمام خماسيا خاصا بتقوية مجار عريضة او ذبذبات غاية الارتفاع (فى اجهزة التلفزة واجهزة طباعة الذبذبية) الذى لا يمكن استعماله الا مركبا بمقوى طاقة فوق طاقة المقوى القياسى للذبذبات المتوسطة من ١٠٠ الى ٥٠٠ كيلوسيكلات فى الثانية فتجد لذلك الصمام رسما بيانيا مثل الرسم (٣) .
- واذا كان الصمام قابلا للاستعمال فى رقابة اوتوماتيكية لضخامة الصوت فتجد الحروف AVR فى رسمه البيانى عند نقطة الدخول لولطية الرقابة ، حيث يشير الحروف Vg1 الى قيمتى مجال الرقابة .

الصمامات المخرجة

اما الصمامات الثلاثية والرابعة والخماسية فتجد لها تفاصيل القسم A العادية لعمليتها ، وتجد ايضا لبعض هذه الصمامات التفاصيل المحتاجة اليها لضبط ميزانيتها

بيان العلامات الرمزية والاختلالات

جهد تيار التغذية (فلط)

6,3

أ - تيار السلك الحرارى (امبير)
ب - تيار الصعد وتيار السلك المتحكم المستر (مليامبير)

0,3

الجهد الاشارى (فلط ، حسب قيمته الفاعلية)



المقاومة الاحتمالية (كيلومية) وقوة المخرج (واط)



ذات الصمام ، ولكن تختلف الاشارة اليه

=

ذات الصمام ، ولكن تختلف فلطية سلكه الحرارى اويختلف تياره الحرارى



ذات الصمام ، ولكن تختلف قاعدته



تقوية الفلظية A

رقابة اوتوماتيكية لضخامة الصوت AVR

صمام ثنائى مذخر فى مولدات الانحراف للتلفزيون Booster

انحراف تام عند القيمة المختصة بفلظية المخرج d

فلظية عالية جدا لصمام الاصدار فى المحولات للتلفزيون EHT

تيار الصعد Ia

القدر الاقصى لتيار الصعد Ia p

التيار المستريولد ، الصمام الثنائى Id

تيار السلك المتحكم المستر Ig2

تيار المهبط Ik (Ia + Ig2)

كيلومية (الف اومية) k

ميجومية (مليون اومية) M

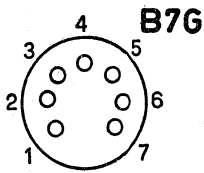
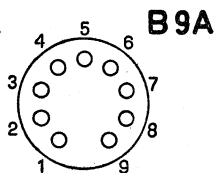
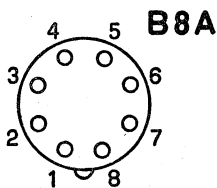
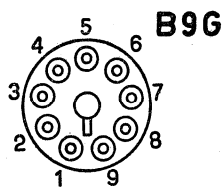
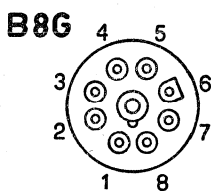
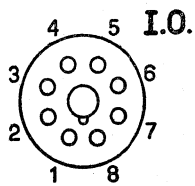
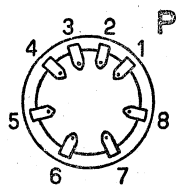
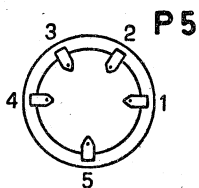
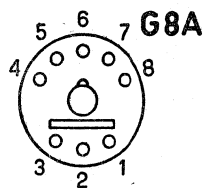
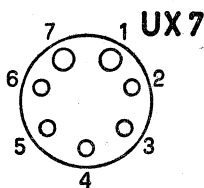
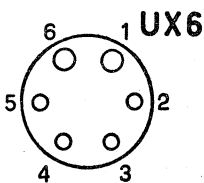
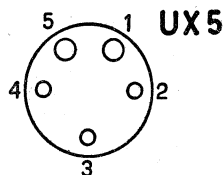
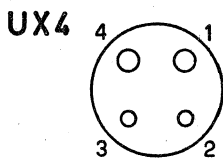
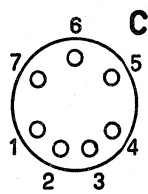
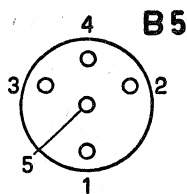
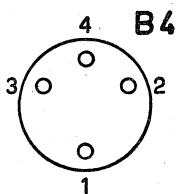
مليامبير (الالف من الامبير) mA

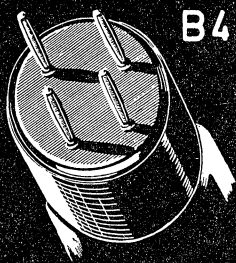
انقشاع الصعد Pa(Wa)

قوة المخرج Po

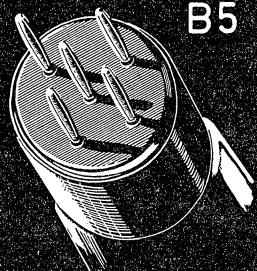
المقاومة الاحتمالية للصعد Ra

Raeq	مقاومة السلك المتحكم على الاضطراب
Rgl	مقاومة السلك المتحكم
R'gl	مقاومة السلك المتحكم للصمام التالى
Rg2	مقاومة السلك المتحكم المستر
Ri	المقاومة الداخلية
Rk	مقاومة المهبط
Rt	حاصل المقاومة الداخلية للجهاز الغذائى
S	الاىصال المتبادل
Sc	الاىصال المتبادل للتحويل
SH	الاىصال المتبادل للصمام السداسى
Sp	الاىصال المتبادل للصمام الخماسى
ST	الاىصال المتبادل للصمام الثلاثى
STe	الاىصال المتبادل للصمام الرباعى
V	فلط
Va	جهد فلطية الصعد
Va inv.p	القدر الاقصى لفلطية الصعد نحو الستار
Vb	جهد فلطية التغذية
Vd	القدر الفعال للفلطية المتناوبة القابلة للتقويم
Vg	جهد فلطية السلك المتحكم
Vgl	جهد فلطية السلك المتحكم الموجه
Vg3	الفلطية عند السلك المتحكم الثالث
Vg4	الفلطية عند السلك المتحكم الرابع
Vi	الفلطية عند المدخل
Vg2	جهد فلطية السلك المتحكم المستر
Vo	جهد فلطية المخرج
Vo max	جهد فلطية المخرج عند ابتدأ تيار السلك المتحكم
W	واط
Wa(Pa)	انتشاع الصعد
μ	عامل التقوية ٢ - ميكروفردي (عند المكثف)
μA	ميكروامبير
$\mu g2g1$	عامل تقوية السلك المتحكم الموجه تلقاء السلك المتحكم المستر
Ω	اومية

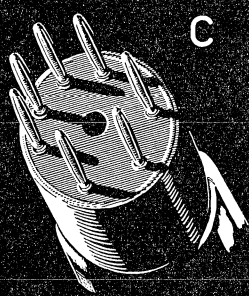




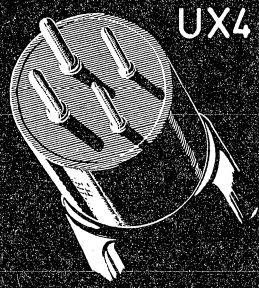
B4



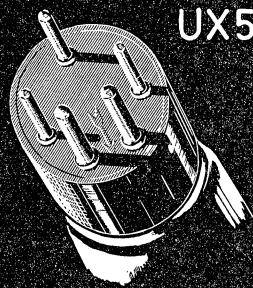
B5



C



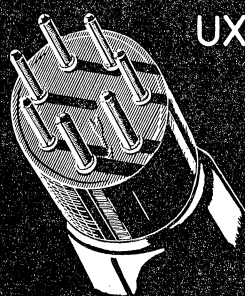
UX4



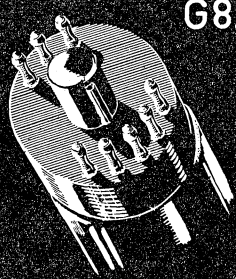
UX5



UX6



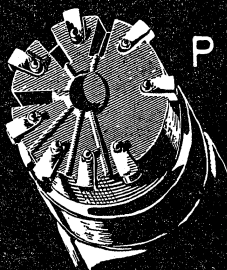
UX7



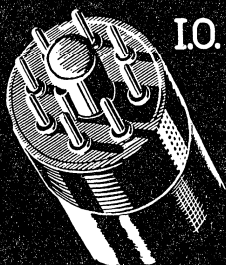
G8A



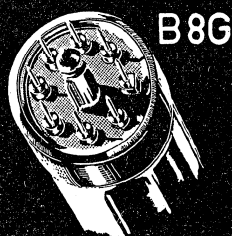
P5



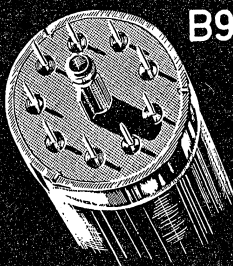
P



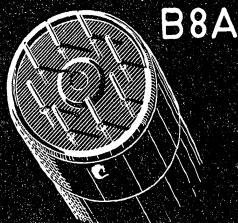
IO.



B8G



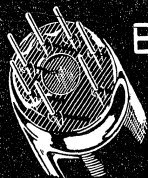
B9G



B8A

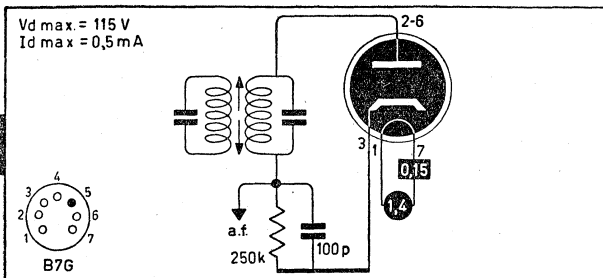


B9A

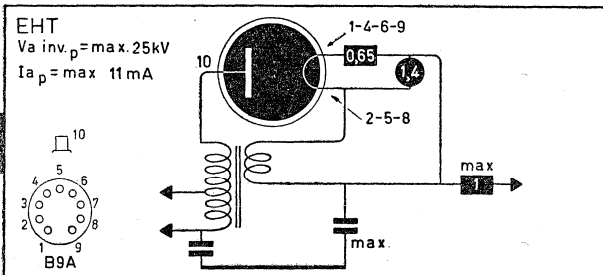


B7G

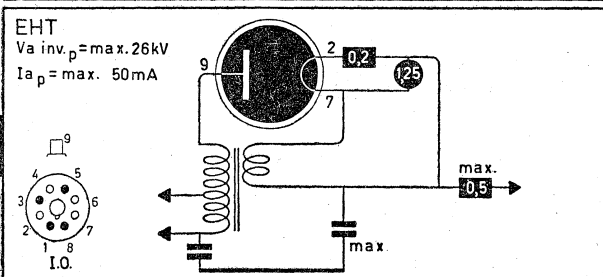
1A3



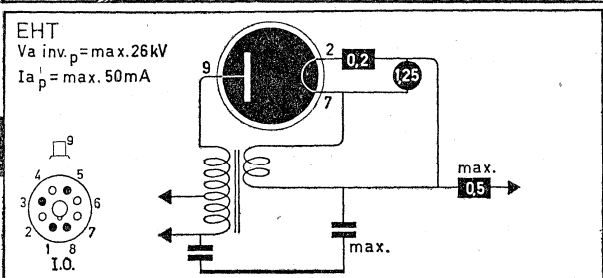
1AX2



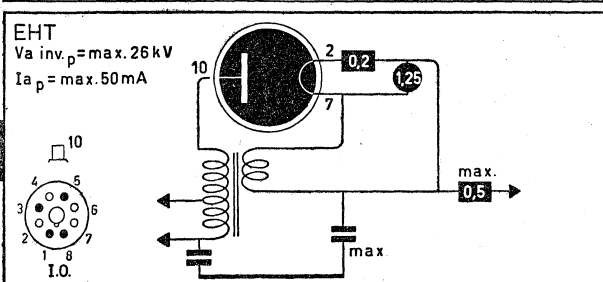
1B3

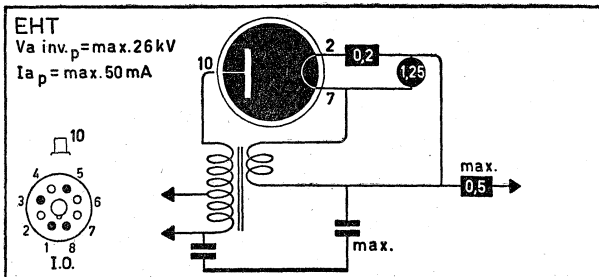


1G3

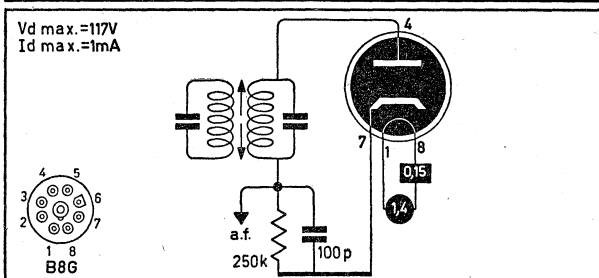


1J3

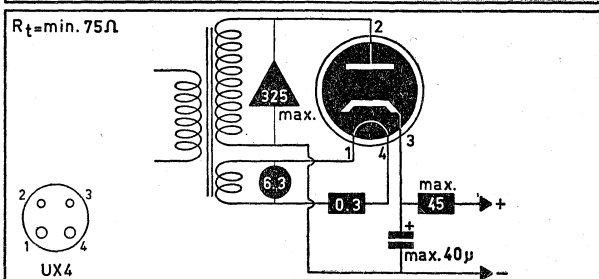




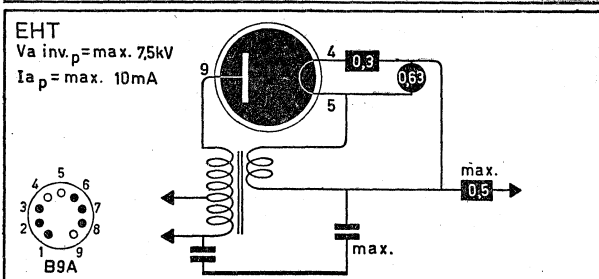
1K3



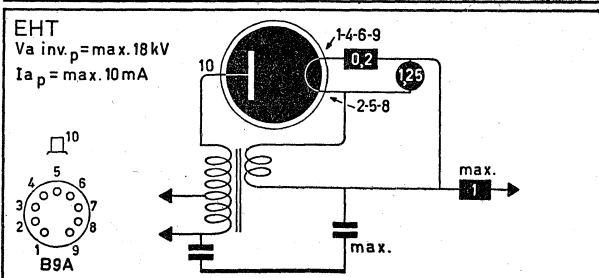
1R4



1V



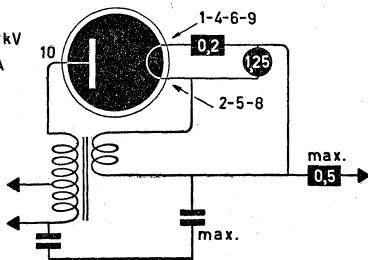
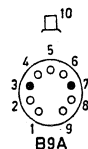
1V2



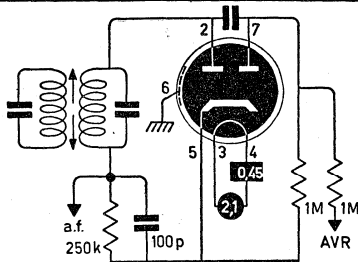
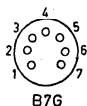
1X2A

1X2B

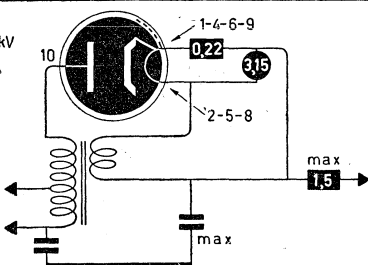
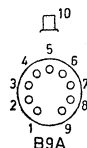
EHT
 $V_{a \text{ inv. } p} = \text{max. } 22 \text{ kV}$
 $I_{a \text{ } p} = \text{max. } 45 \text{ mA}$

**2EN5**

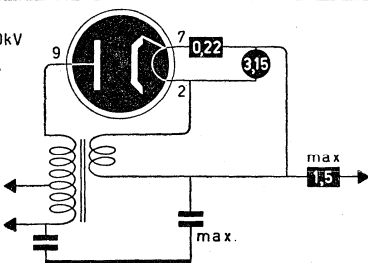
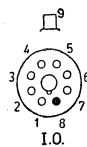
$V_d \text{ max.} =$
 $I_d \text{ max.} = 5 \text{ mA}$

**3A2**

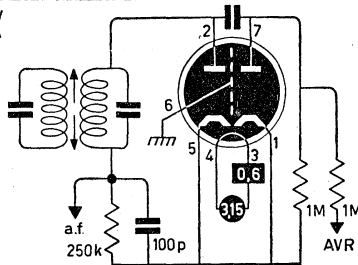
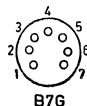
EHT
 $V_{a \text{ inv. } p} = \text{max. } 18 \text{ kV}$
 $I_{a \text{ } p} = \text{max. } 80 \text{ mA}$

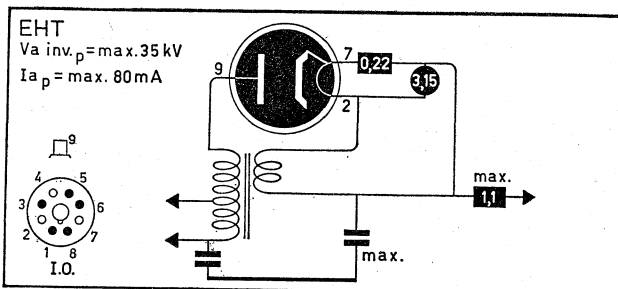
**3A3**

EHT
 $V_{a \text{ inv. } p} = \text{max. } 30 \text{ kV}$
 $I_{a \text{ } p} = \text{max. } 80 \text{ mA}$

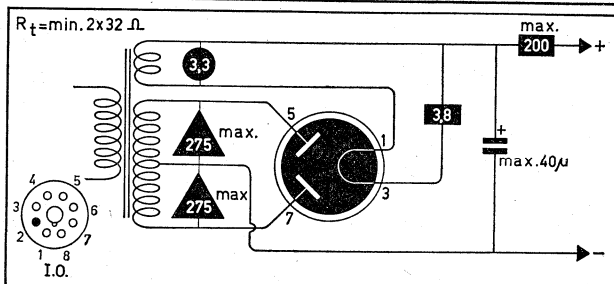
**3AL5**

$V_d \text{ max.} = 150 \text{ V}$
 $I_d \text{ max.} = 9 \text{ mA}$

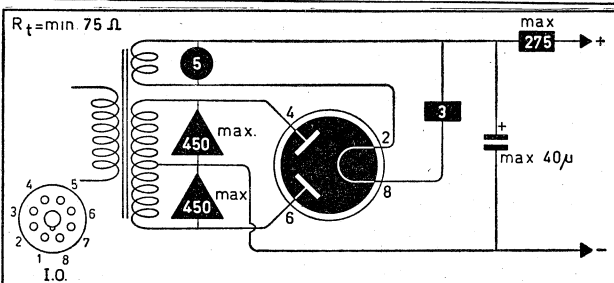




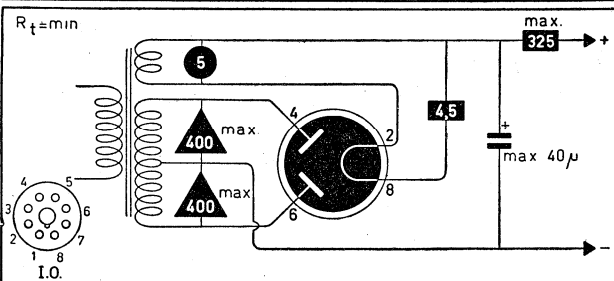
3B2



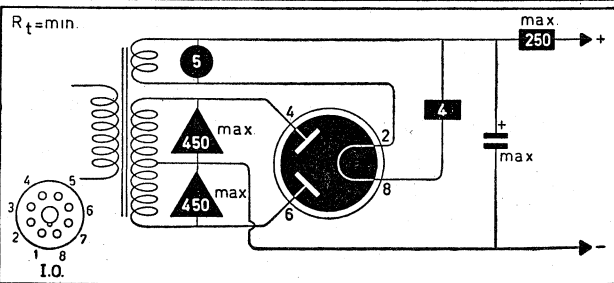
3DG4



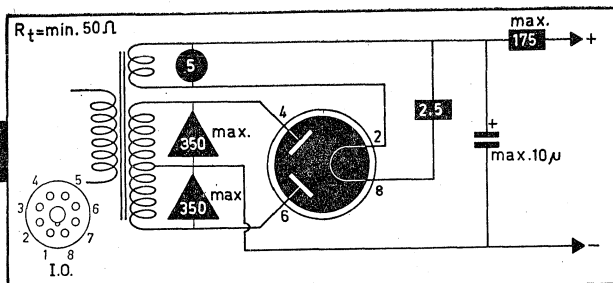
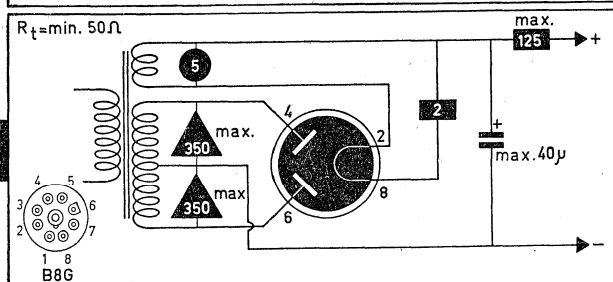
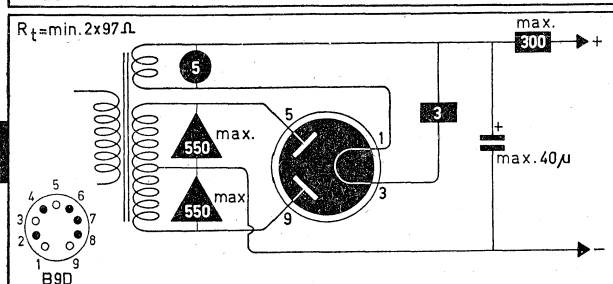
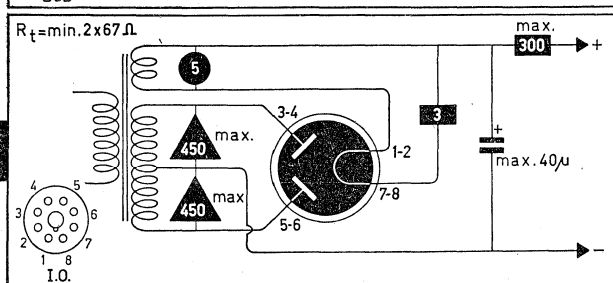
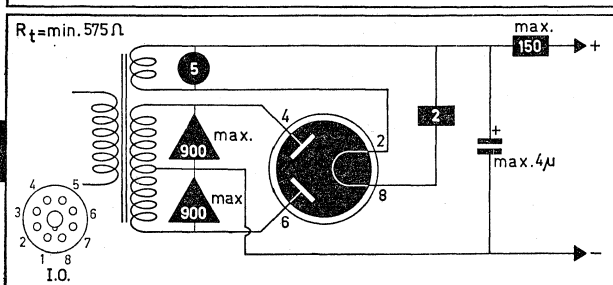
5AS4

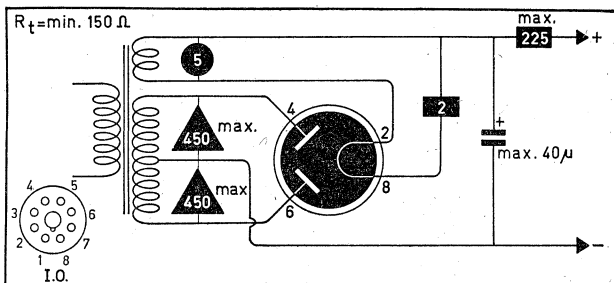


5AU4

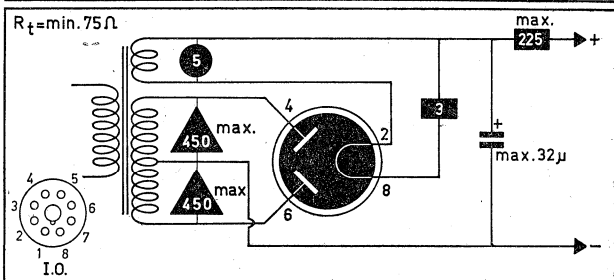


5AW4

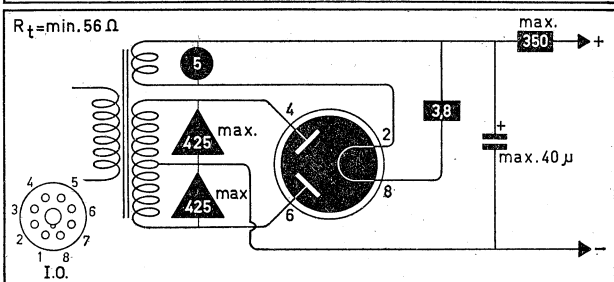
5AX4**5AZ4****5BC3****5DJ4****5R4/GY**



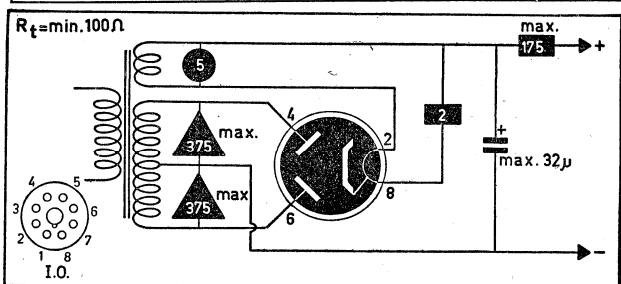
5T4



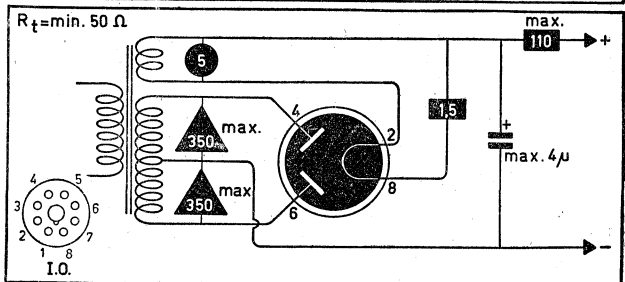
5U4



5V3

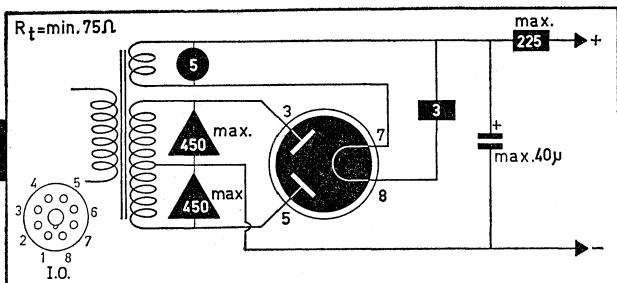


5V4

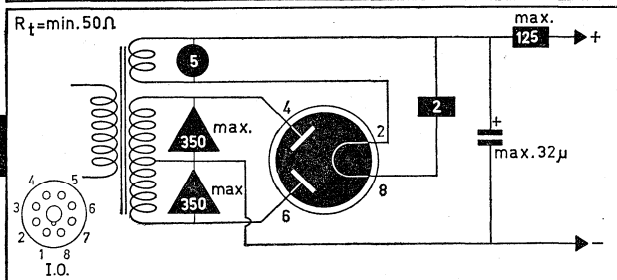


5W4

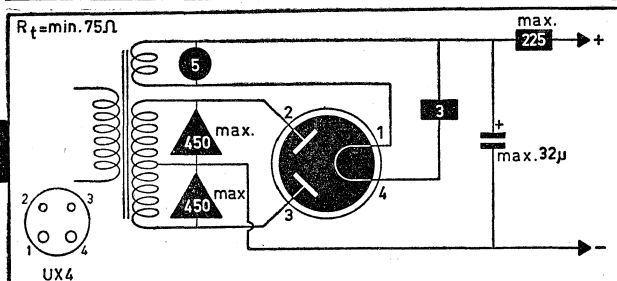
5X4



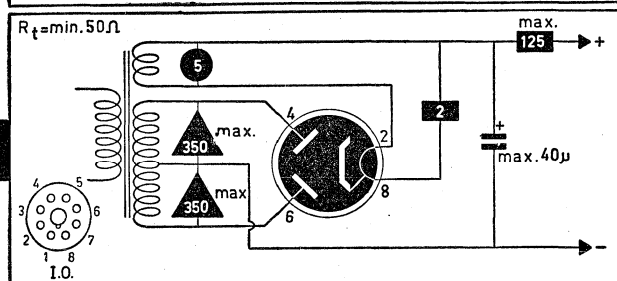
5Y3



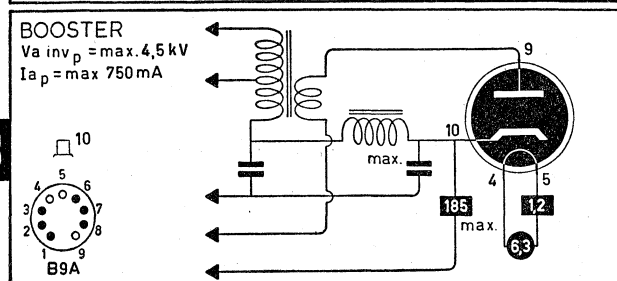
5Z3

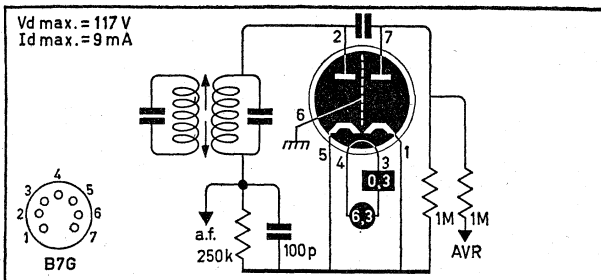


5Z4

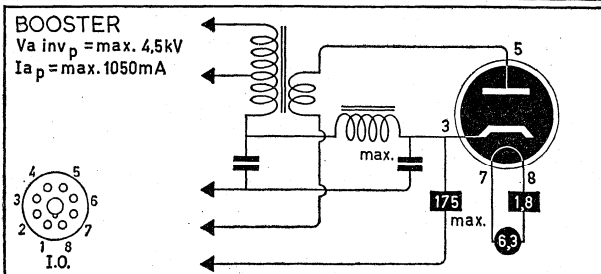


6AF3

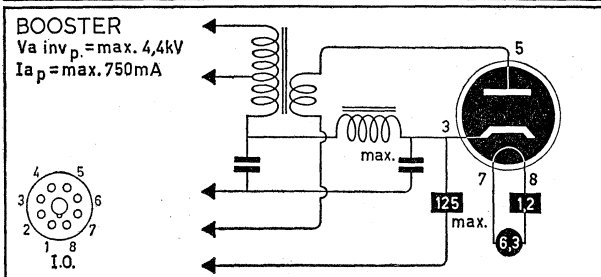




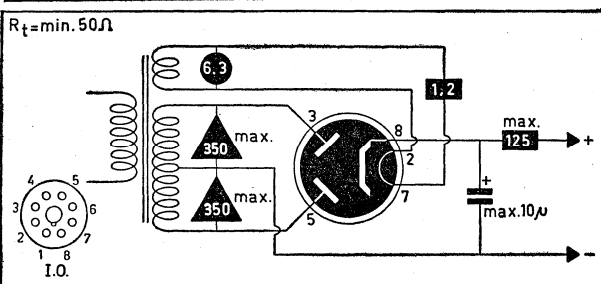
6AL5



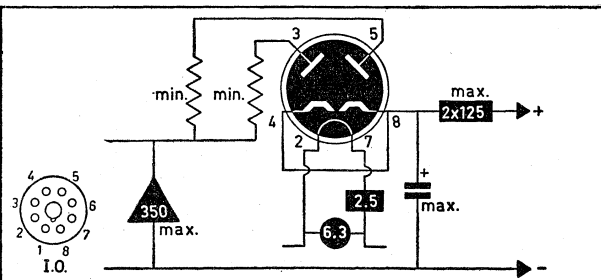
6AU4



6AX4



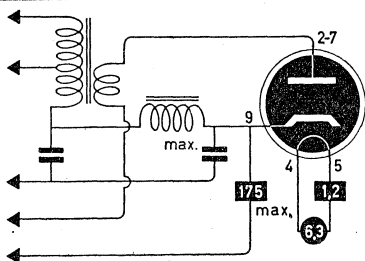
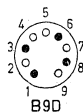
6AX5



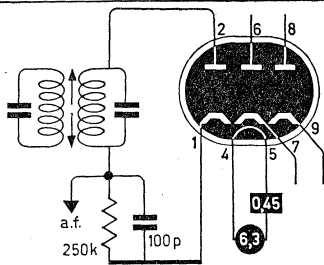
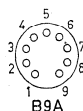
6AX6

6AY3

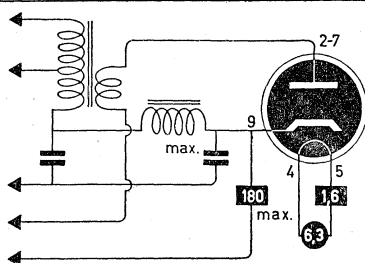
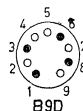
BOOSTER
 $V_{a \text{ inv } p} = \text{max. } 5\text{kV}$
 $I_{a p} = \text{max. } 1100\text{mA}$

**6BC7**

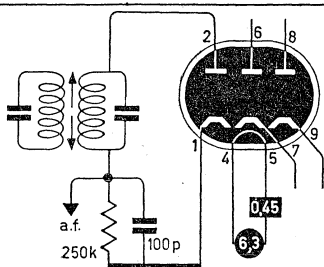
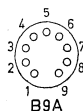
$V_d \text{ max.} = 117\text{V}$
 $I_d \text{ max.} = 12\text{mA}$

**6BH3**

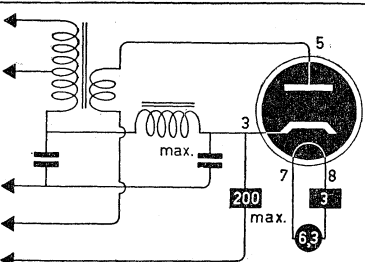
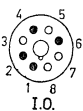
BOOSTER
 $V_{a \text{ inv } p} = \text{max. } 5.5\text{kV}$
 $I_{a p} = \text{max. } 1100\text{mA}$

**6BJ7**

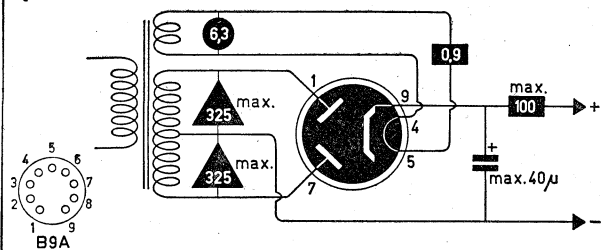
$V_d \text{ max.} = 117\text{V}$
 $I_d \text{ max.} = 9\text{mA}$

**6BL4**

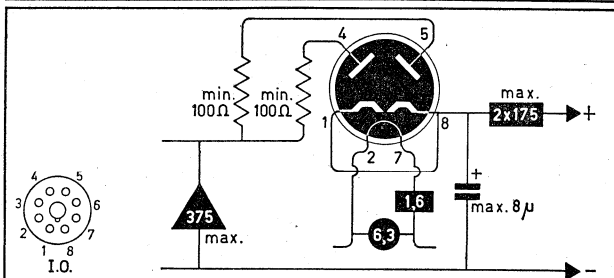
BOOSTER
 $V_{a \text{ inv } p} = \text{max. } 4.5\text{kV}$
 $I_{a p} = \text{max. } 1.2\text{A}$



$R_t = \min. 2 \times 82 \Omega$



6BW4

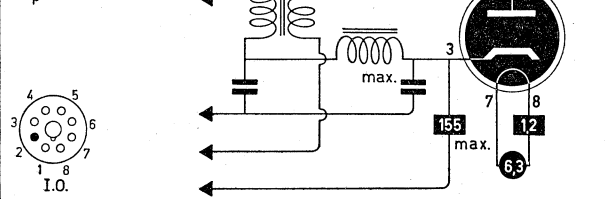


6BY5

BOOSTER

$V_{a \text{ inv } p} = \max. 4.4 \text{ kV}$

$I_{a p} = \max. 900 \text{ mA}$

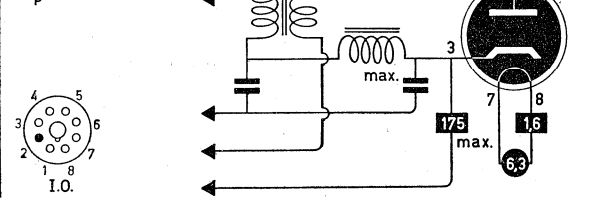


6DA4

BOOSTER

$V_{a \text{ inv } p} = \max. 5 \text{ kV}$

$I_{a p} = \max. 1100 \text{ mA}$

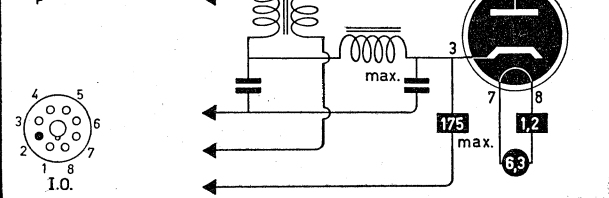


6DE4

BOOSTER

$V_{a \text{ inv } p} = \max. 5 \text{ kV}$

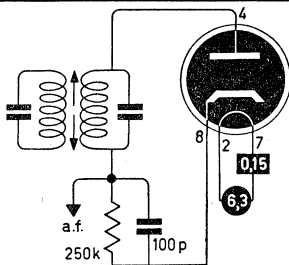
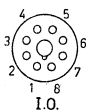
$I_{a p} = \max. 1100 \text{ mA}$



6DM4

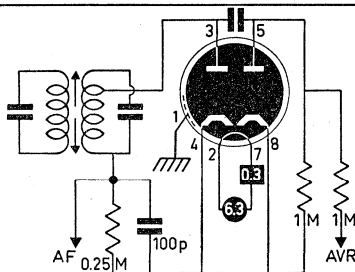
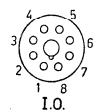
6H4

Vd max. = 100V
Id max. = 4 mA



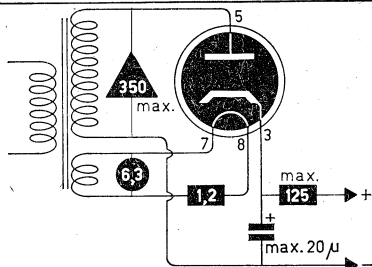
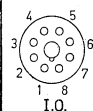
6H6

Vd max. = 150V
Id max. = 8 mA



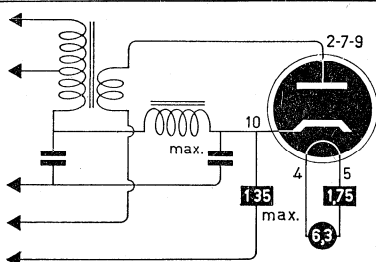
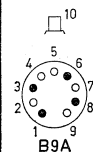
6U4

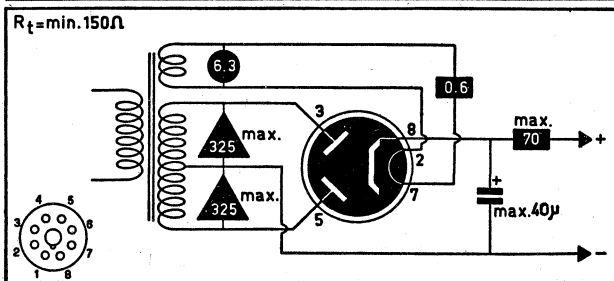
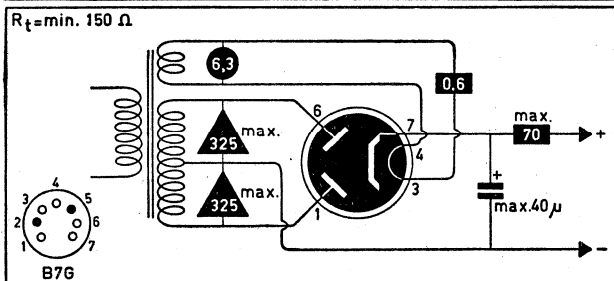
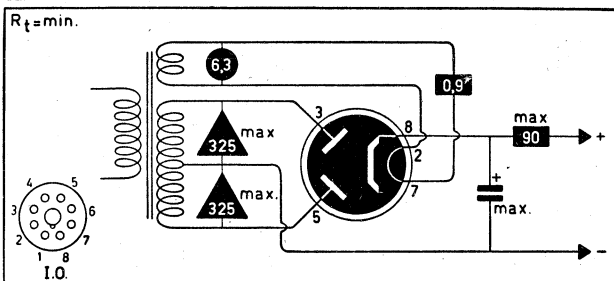
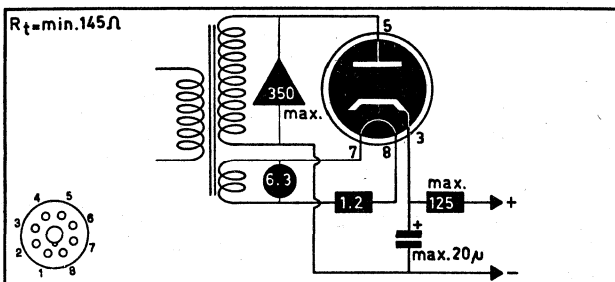
R_t = min.



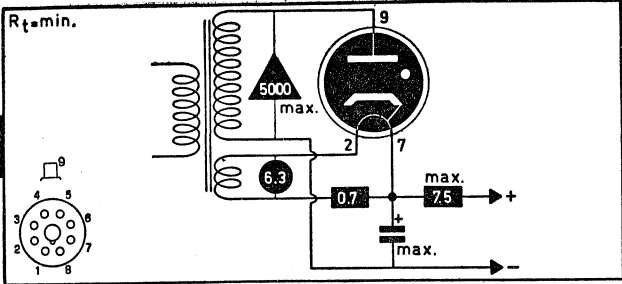
6V3A

BOOSTER
Va inv_p = max. 6 kV
Ia_p = max. 800 mA

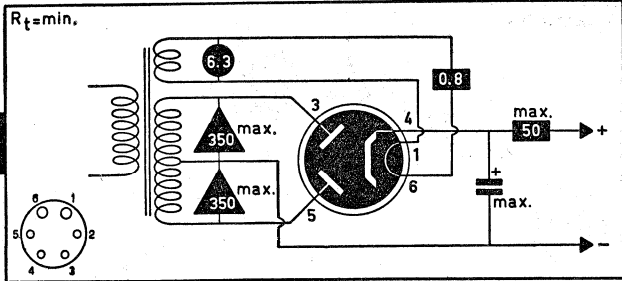




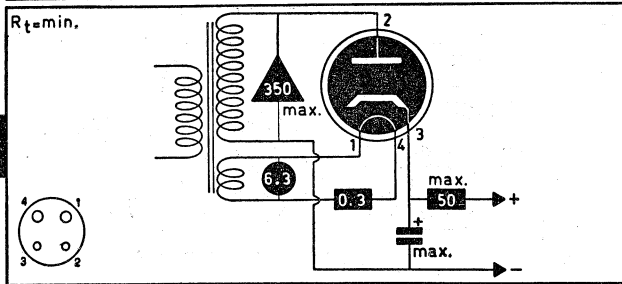
6Y3



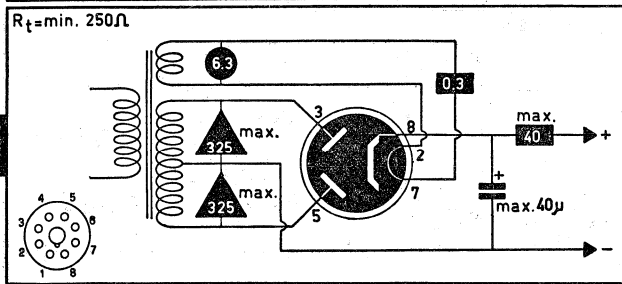
6Y5



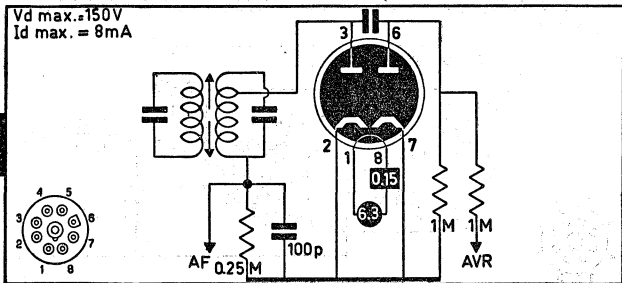
6Z3

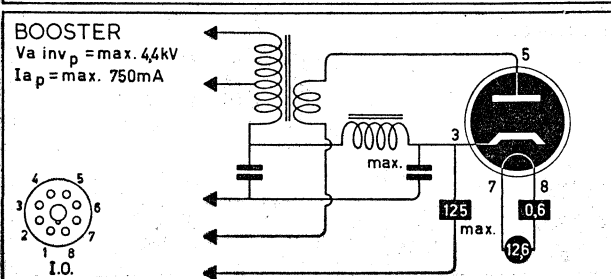
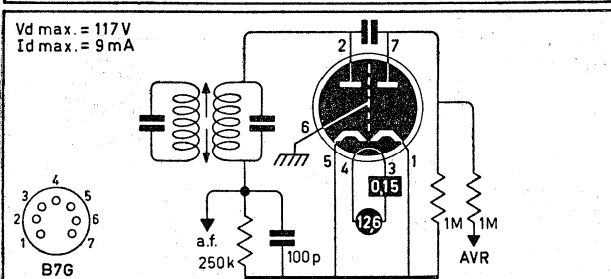
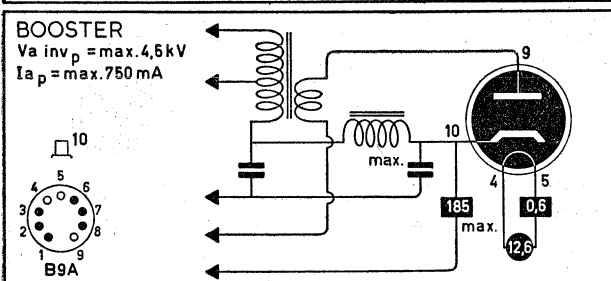
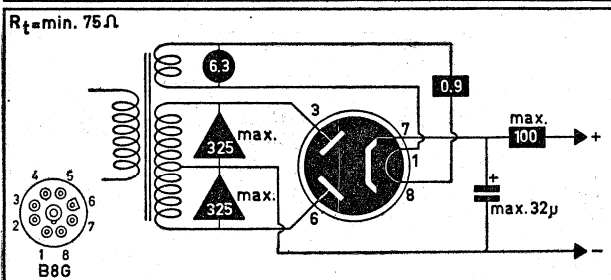
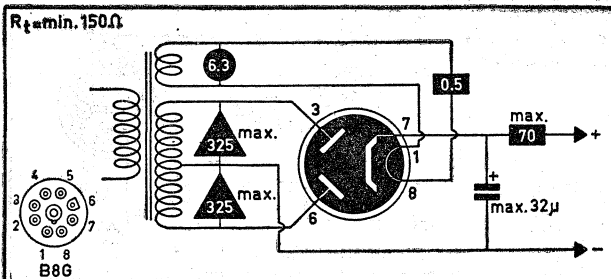


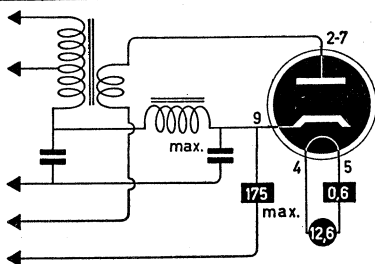
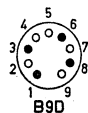
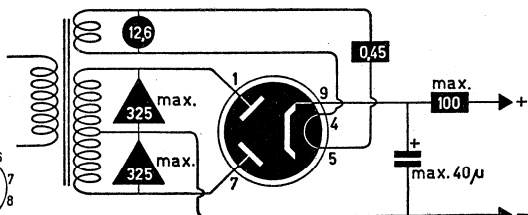
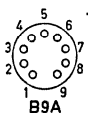
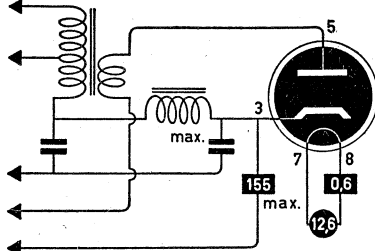
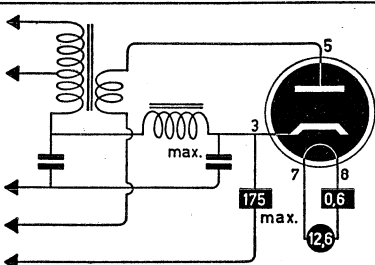
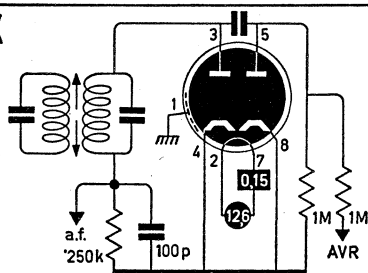
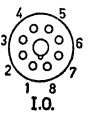
6ZY5

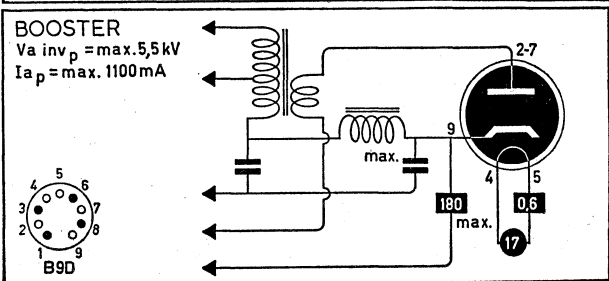
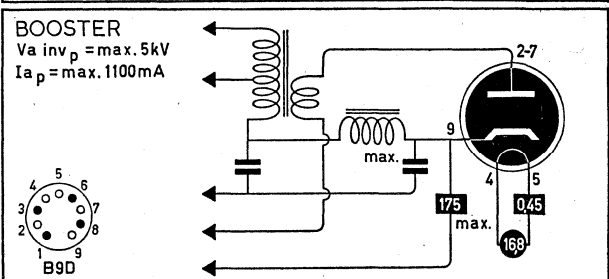
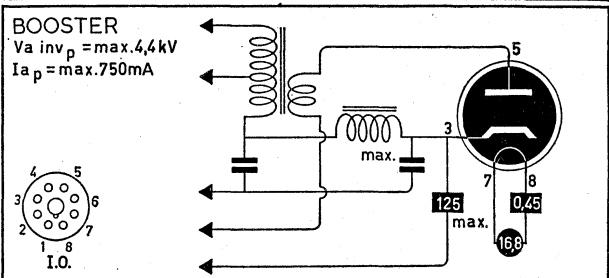
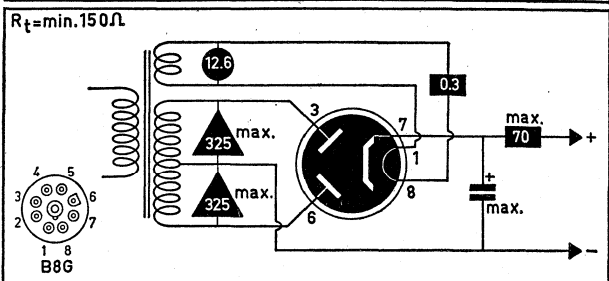
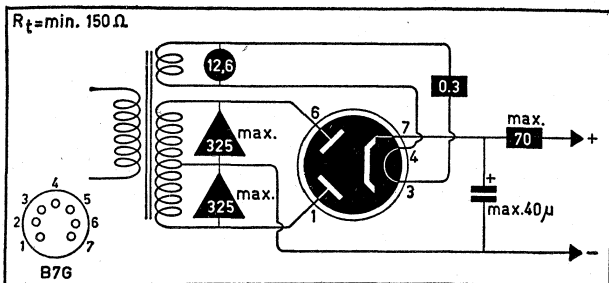


7A6





12AY3**BOOSTER** $V_{a\text{ inv } p} = \text{max. } 5\text{kV}$ $I_{a p} = \text{max. } 1100\text{mA}$ **12BW4** $R_t = \text{min. } 2 \times 82 \Omega$ **12D4****BOOSTER** $V_{a\text{ inv } p} = \text{max. } 4.4\text{kV}$ $I_{a p} = \text{max. } 900\text{mA}$ **12DM4****BOOSTER** $V_{a\text{ inv } p} = \text{max. } 5\text{kV}$ $I_{a p} = \text{max. } 1100\text{mA}$ **12H6** $V_d \text{ max. } = 150\text{V}$ $I_d \text{ max. } = 8\text{mA}$ 

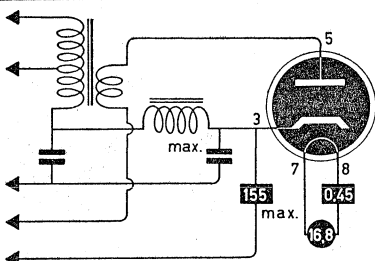
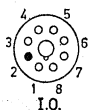


17D4

BOOSTER

$V_{a \text{ inv } p} = \text{max. } 4.4 \text{ kV}$

$I_{a p} = \text{max. } 900 \text{ mA}$

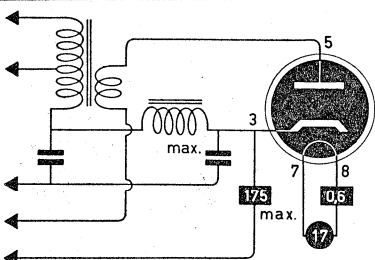
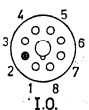


17DE4

BOOSTER

$V_{a \text{ inv } p} = \text{max. } 5 \text{ kV}$

$I_{a p} = \text{max. } 1100 \text{ mA}$

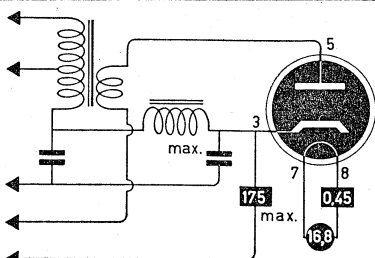
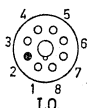


17DM4

BOOSTER

$V_{a \text{ inv } p} = \text{max. } 5 \text{ kV}$

$I_{a p} = \text{max. } 1100 \text{ mA}$

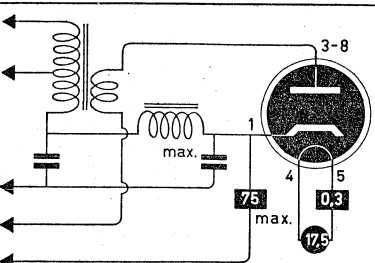
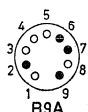


17H3

BOOSTER

$V_{a \text{ inv } p} = \text{max. } 2 \text{ kV}$

$I_{a p} = \text{max. } 450 \text{ mA}$

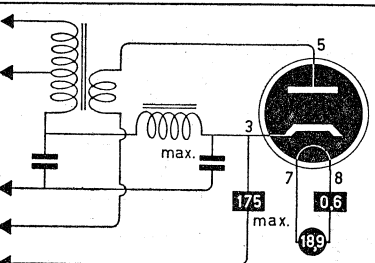
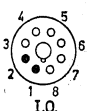


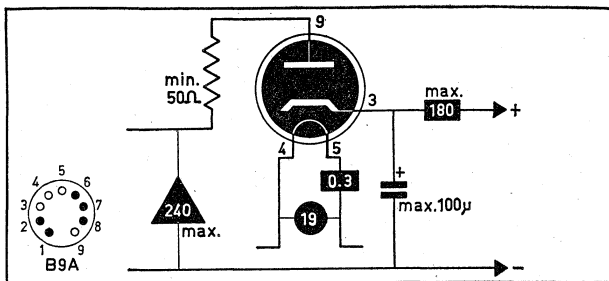
19AU4

BOOSTER

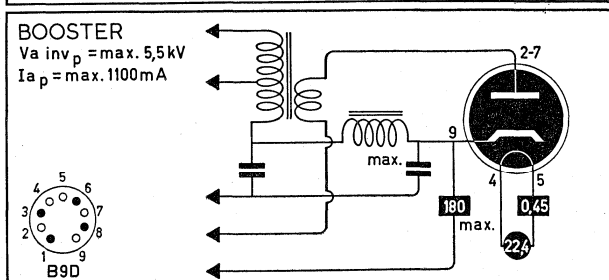
$V_{a \text{ inv } p} = \text{max. } 4.5 \text{ kV}$

$I_{a p} = \text{max. } 1.05 \text{ A}$

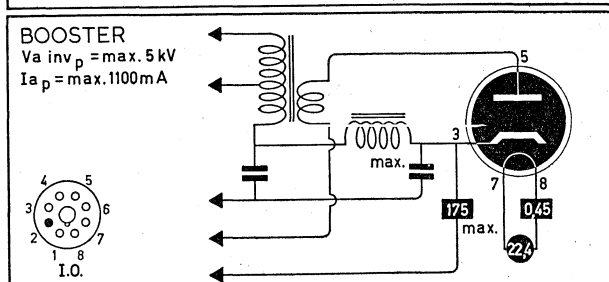




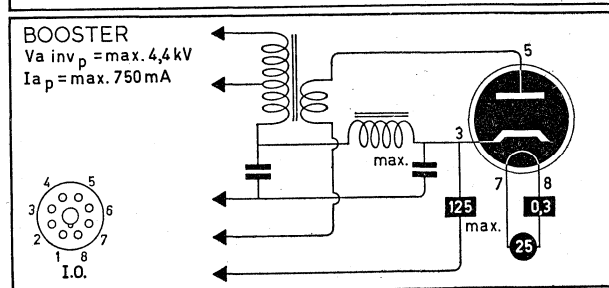
19W3



22BH3

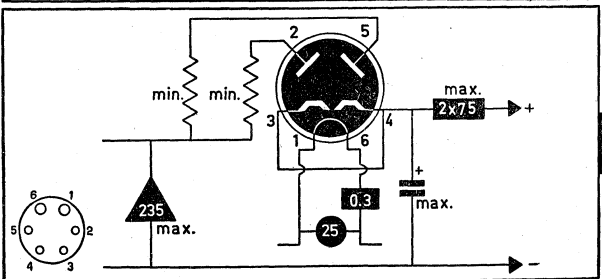
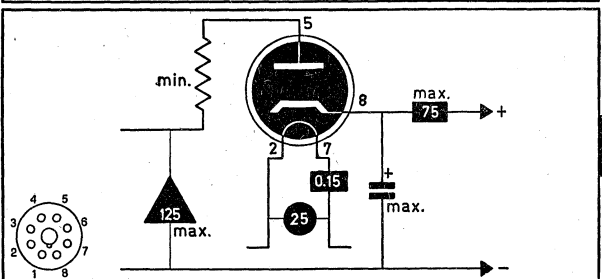
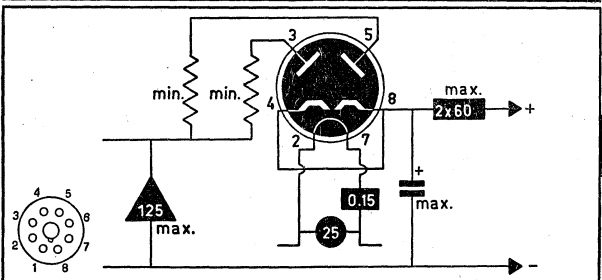
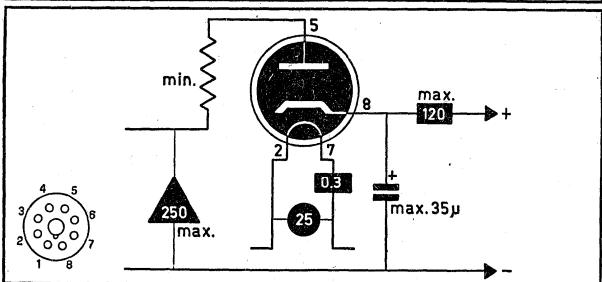
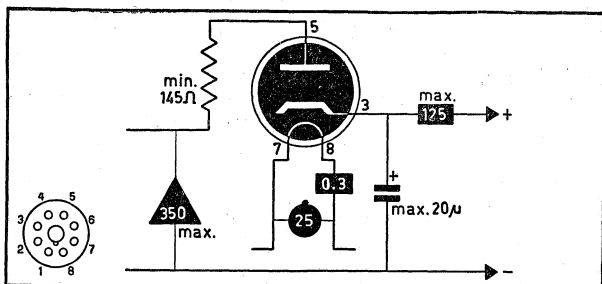


22DE4

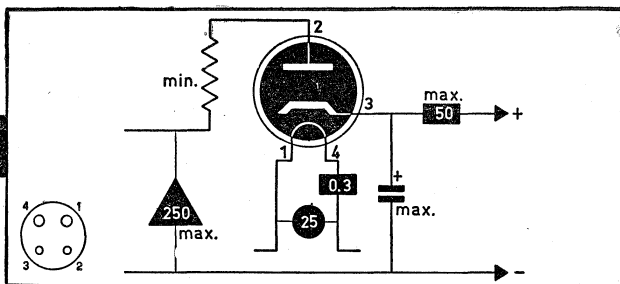


25AX4

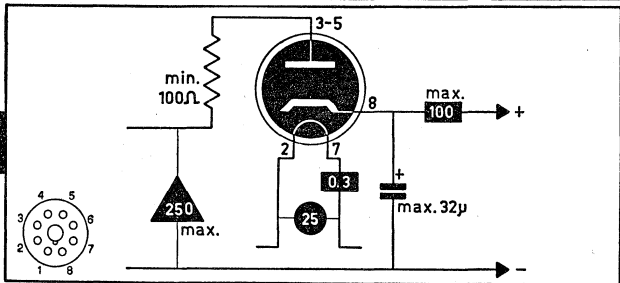
This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no text or other markings on the paper.



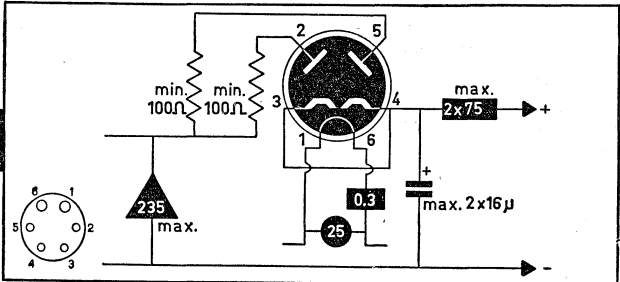
25Z3



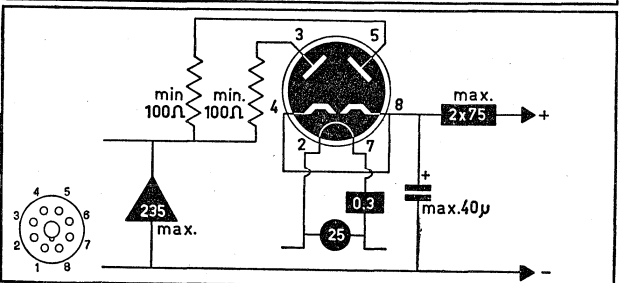
25Z4



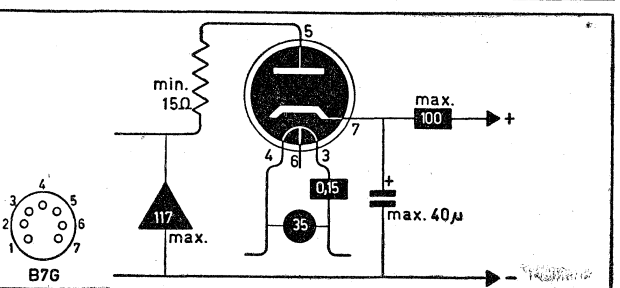
25Z5

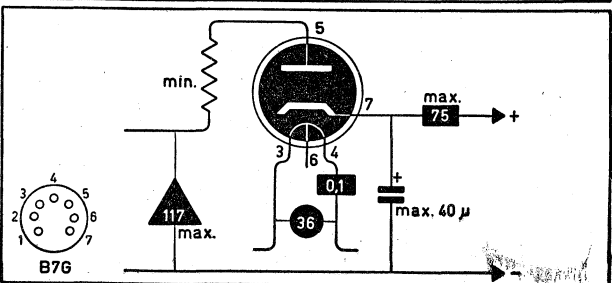
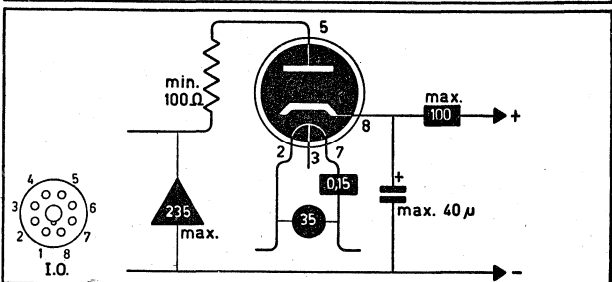
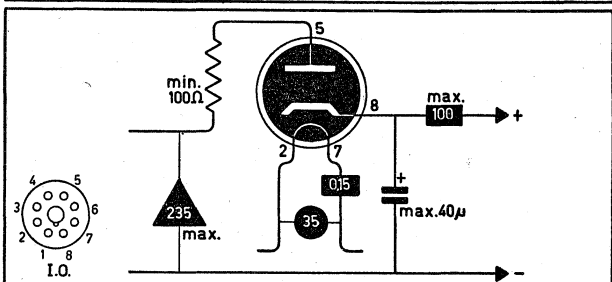
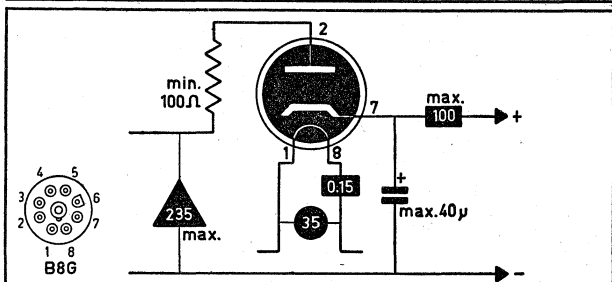
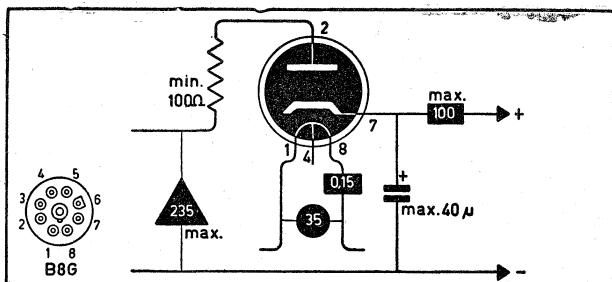


25Z6

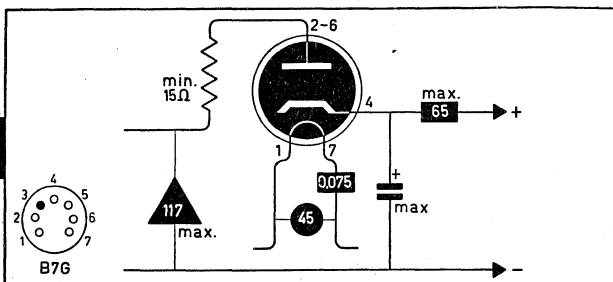


35W4

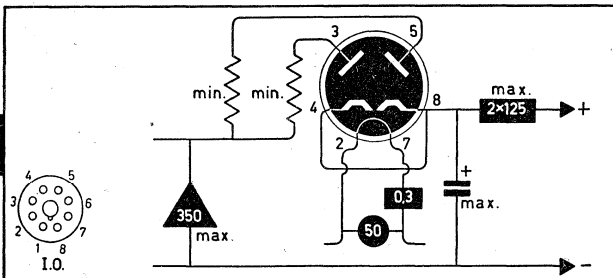




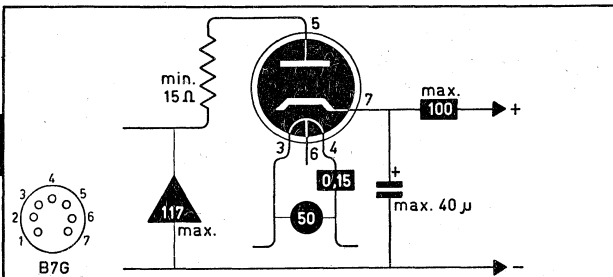
45Z3



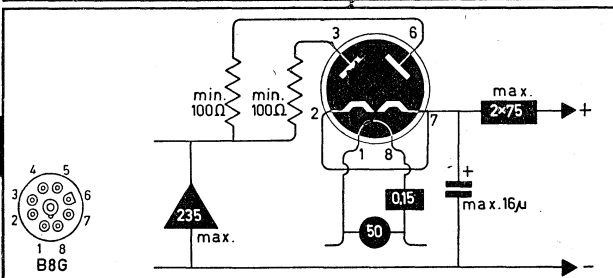
50AX6



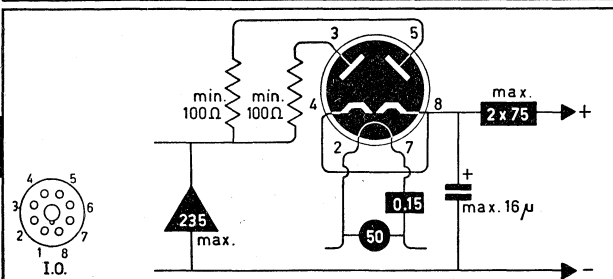
50DC4

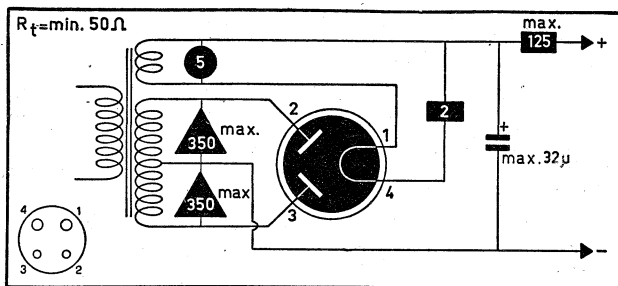


50X6

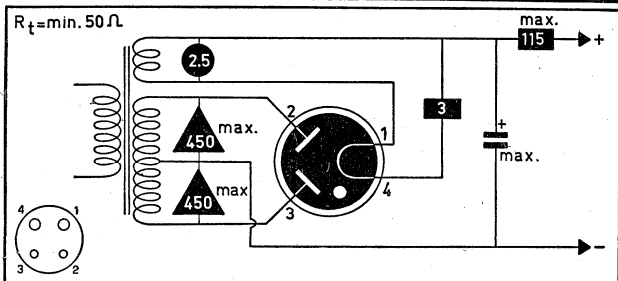


50Y6

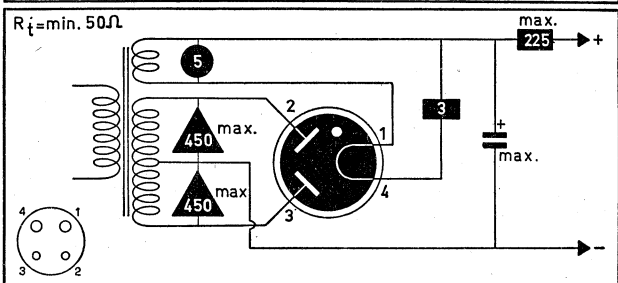




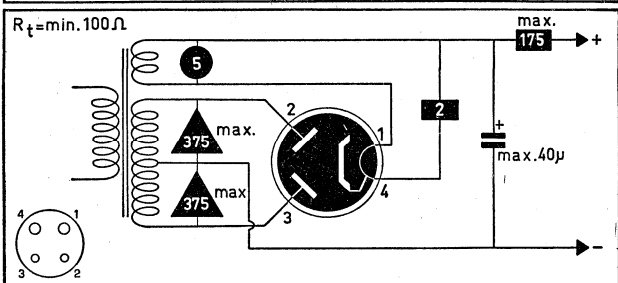
80



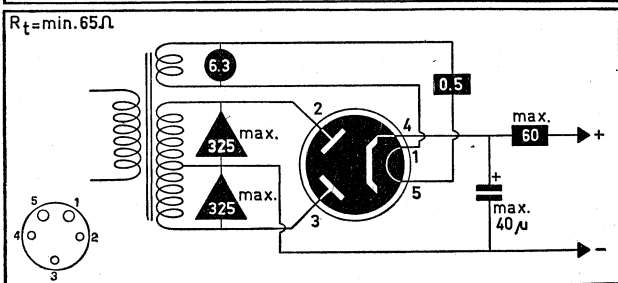
82



83

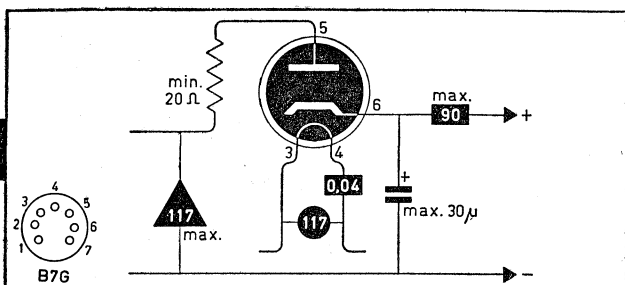


83V

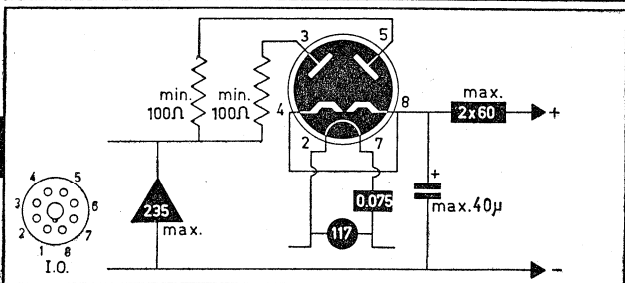


84/6Z4

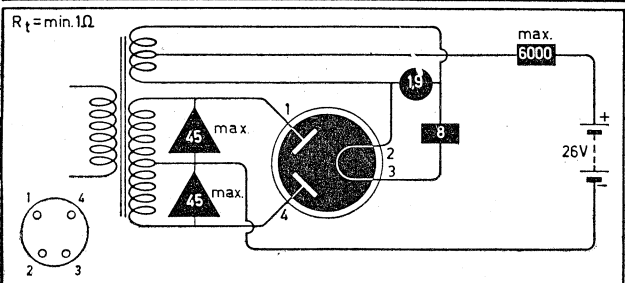
11723



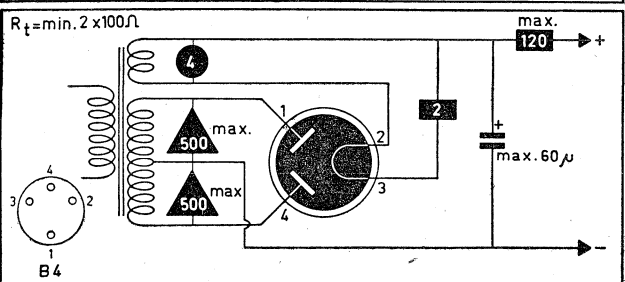
11726



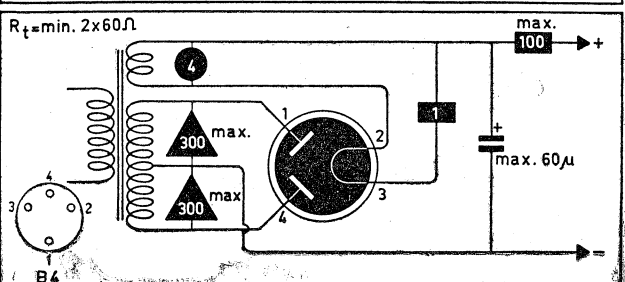
367

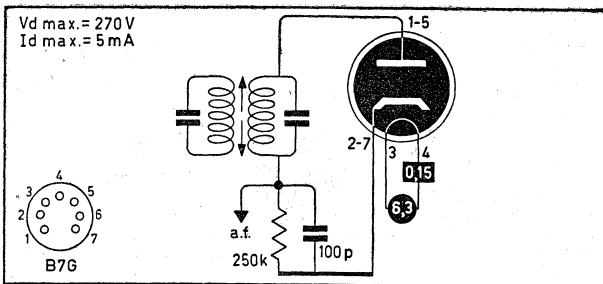


1561

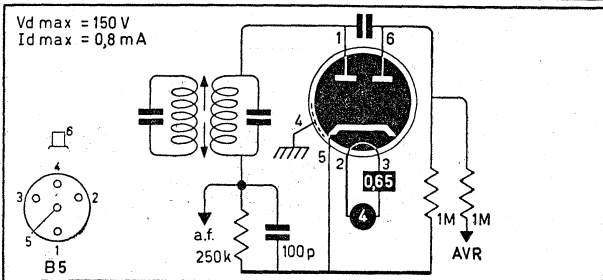


1805

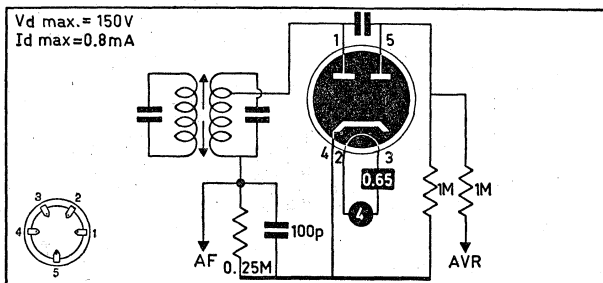




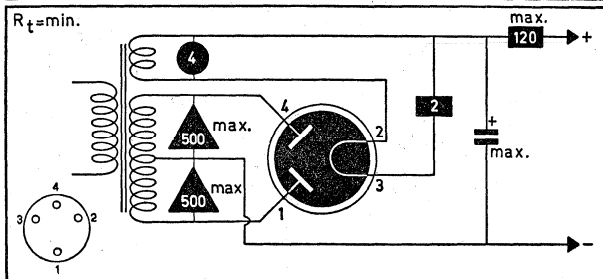
9006



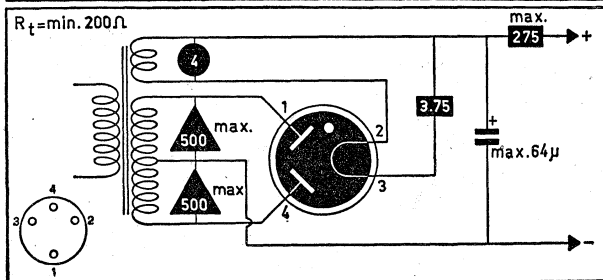
AB1



AB2



APV4100



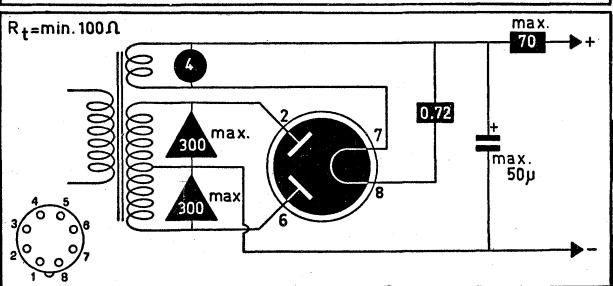
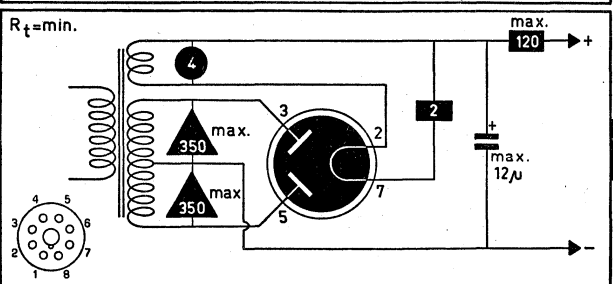
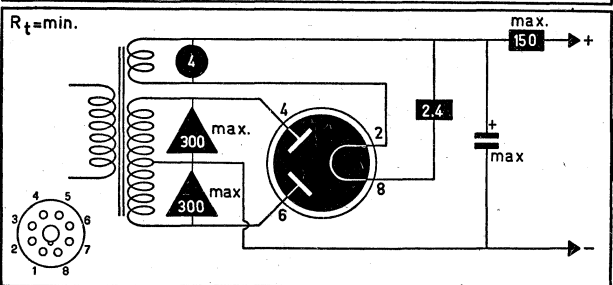
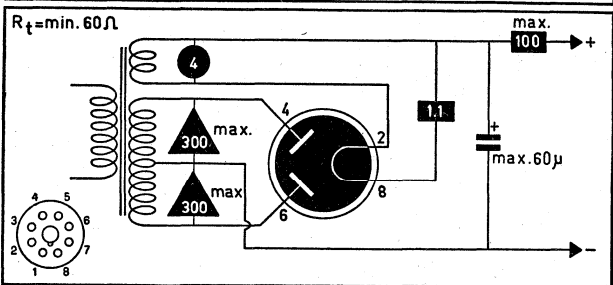
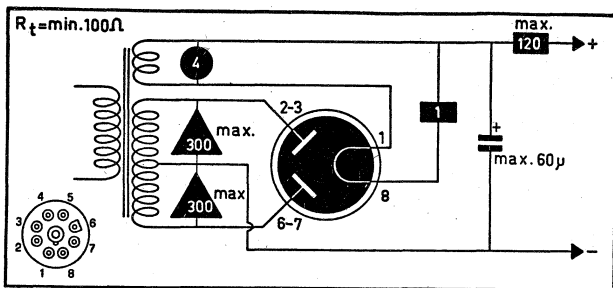
AX50

$R_t = \min.$

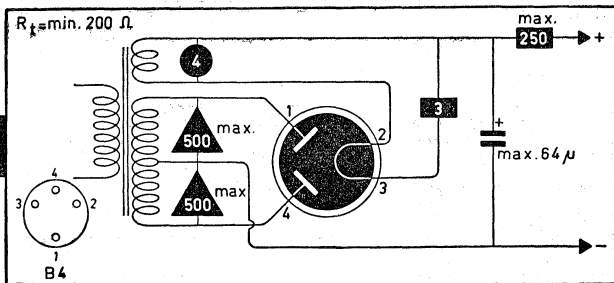
max. 120

max. 12 μ

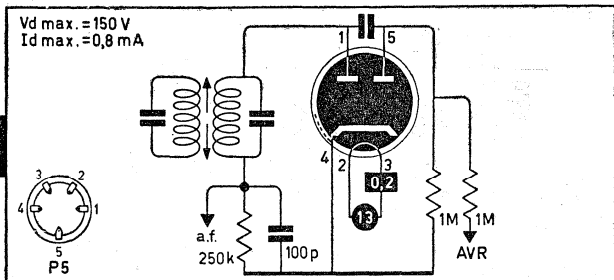
The diagram shows a power supply circuit. A transformer's primary is connected to a 230V AC source. The secondary has several taps. A selector switch (1, 5, 6, 8) selects the output voltage. Two 300V fuses protect the secondary circuit. A 1.1 ohm resistor and a 60 microfarad capacitor are connected in parallel with the output. The output is labeled 'max. 100V' and 'max. 60μ'.



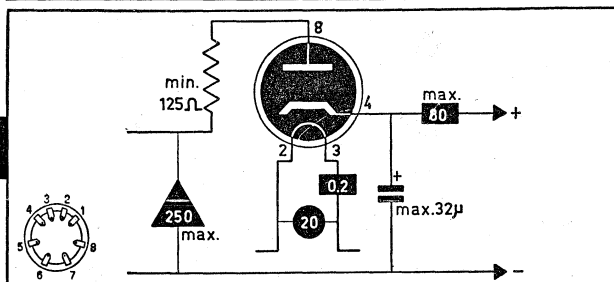
AZ50



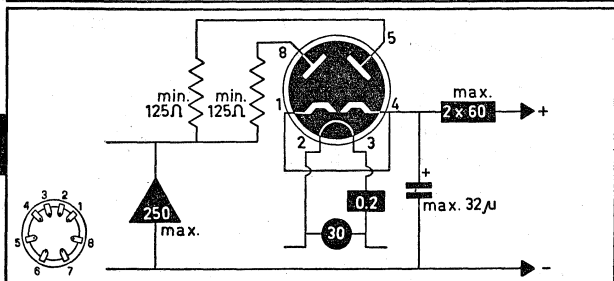
CB2



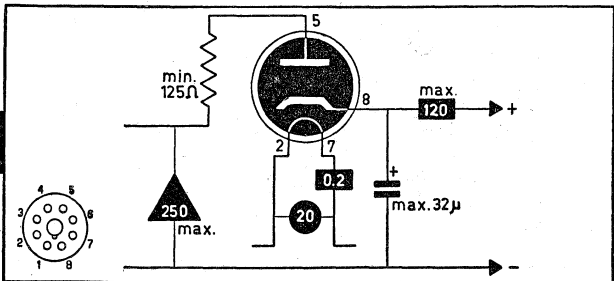
CY1

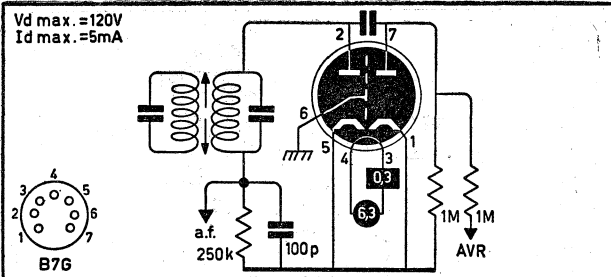


CY2

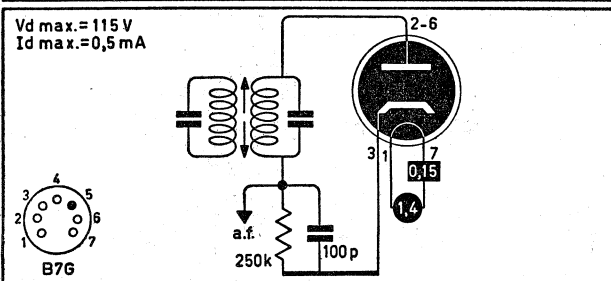


CY31

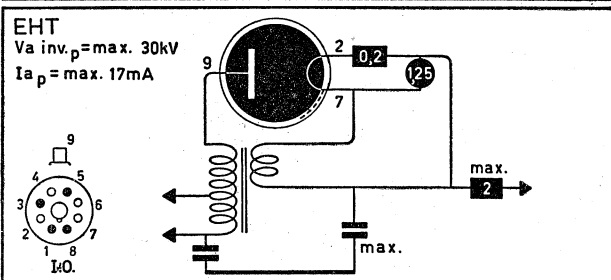




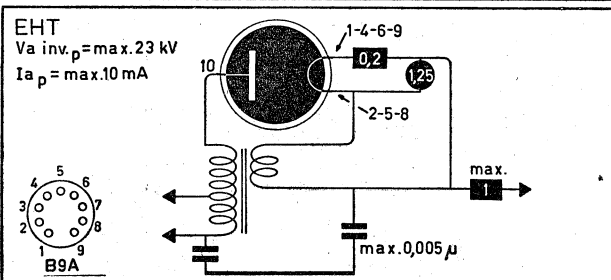
077



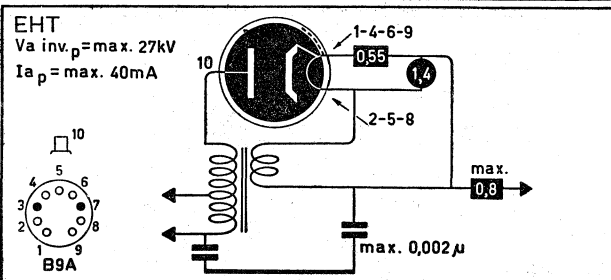
DA90



DY30



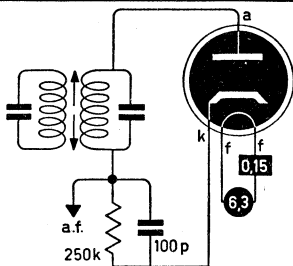
DY80



DY86
DY87

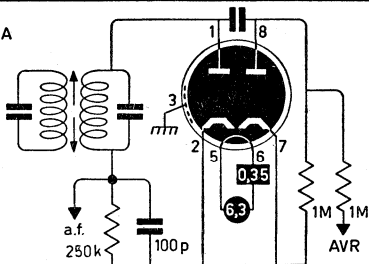
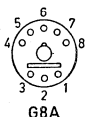
EA50

Vd max. = 200V
Id max. = 5mA



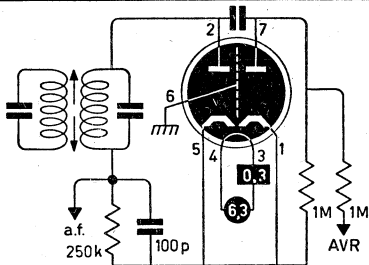
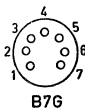
EAA11

Vd max. = 100V
Id max. = 0,8 mA



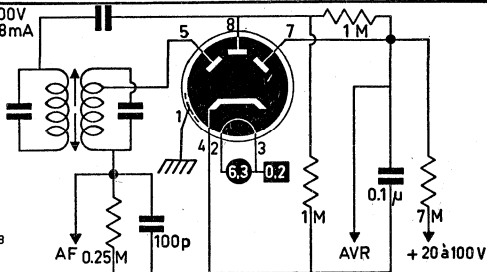
EAA91

Vd max. = 117V
Id max. = 9mA



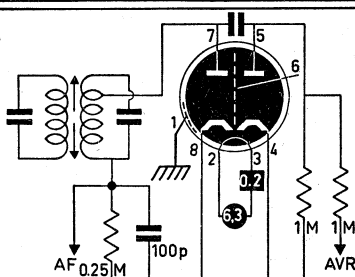
EAB1

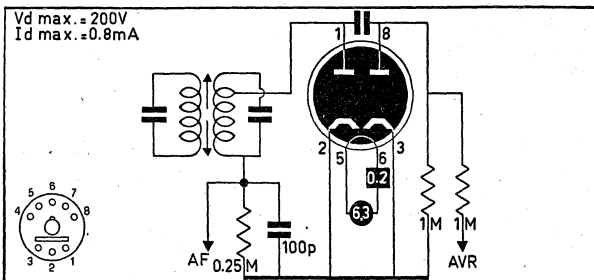
Vd max. = 200V
Id max. = 0,8mA



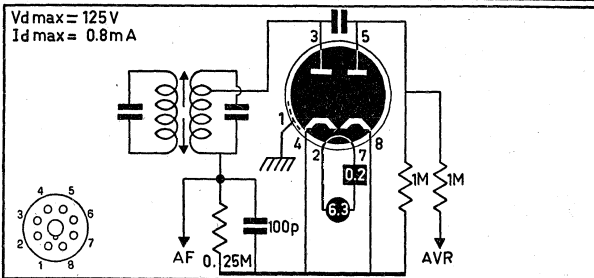
EB4

Vd max. = 125V
Id max. = 0,8 mA

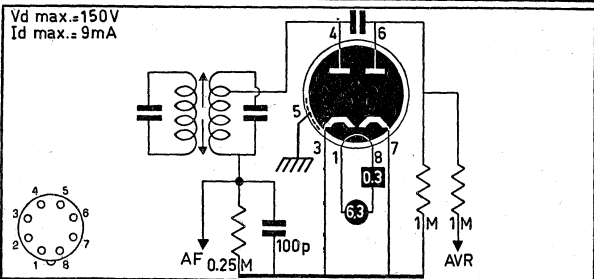




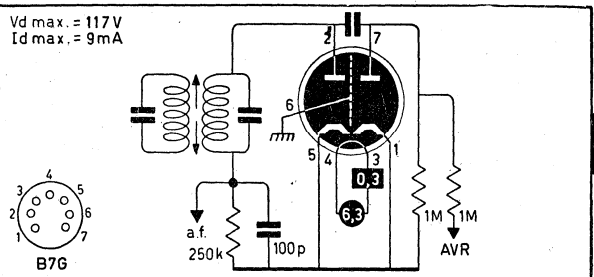
EB11



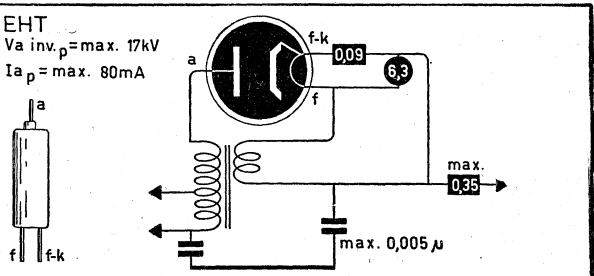
EB34



EB41



EB91

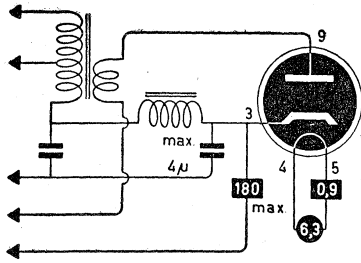
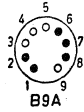


EY51

EY80

BOOSTER

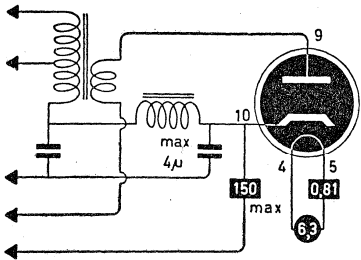
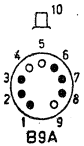
$V_{a \text{ inv } p} = \text{max. } 4\text{kV}$
 $I_{a p} = \text{max. } 400\text{mA}$



EY81

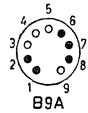
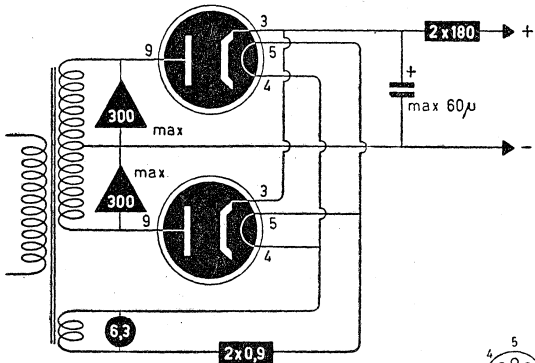
BOOSTER

$V_{a \text{ inv } p} = \text{max. } 5,6\text{kV}$
 $I_{a p} = \text{max. } 450\text{mA}$



$R_t = \text{min. } 2 \times 110 \Omega$

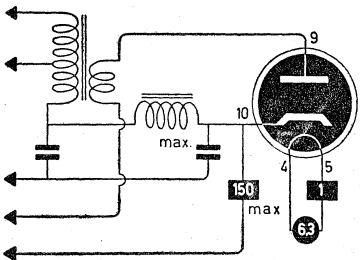
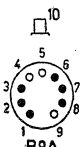
EY82



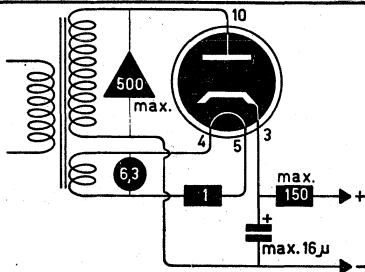
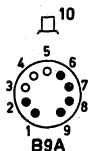
EY83

BOOSTER

$V_{a \text{ inv } p} = \text{max. } 5\text{kV}$
 $I_{a p} = \text{max. } 450\text{mA}$



$R_t = \text{min. } 150 \Omega$

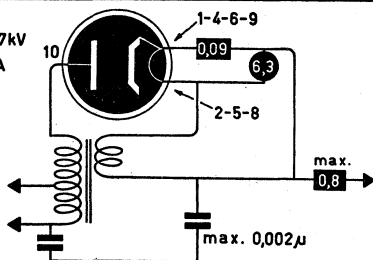
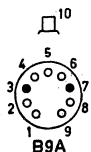


EY84

EHT

$V_{a \text{ inv. } p} = \text{max. } 27 \text{ kV}$

$I_{a p} = \text{max. } 40 \text{ mA}$

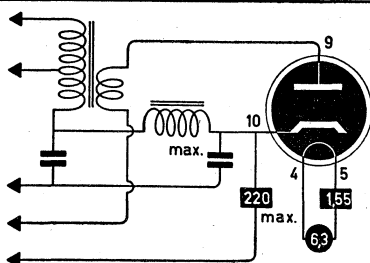
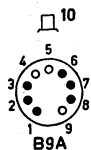


EY86
EY87

BOOSTER

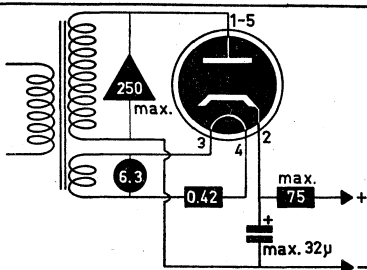
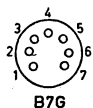
$V_{a \text{ inv. } p} = \text{max. } 6 \text{ kV}$

$I_{a p} = \text{max. } 550 \text{ mA}$



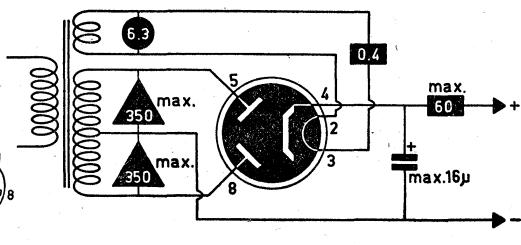
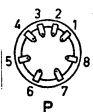
EY88

$R_t = \text{min. } 100 \Omega$



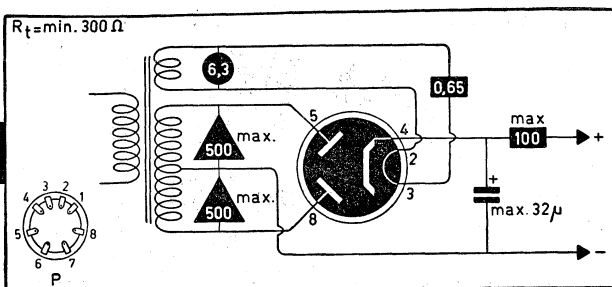
EY91

$R_t = \text{min. } 500 \Omega$

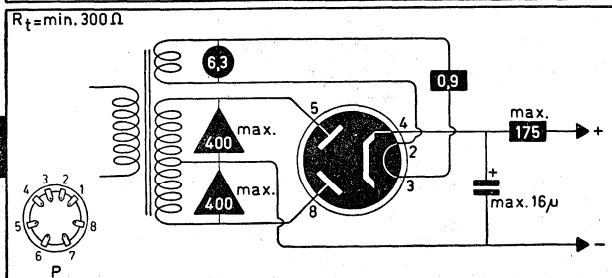


EZZ

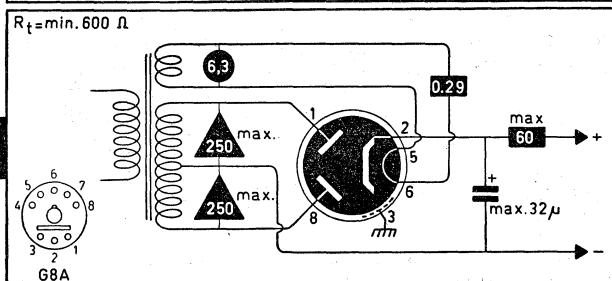
EZ3



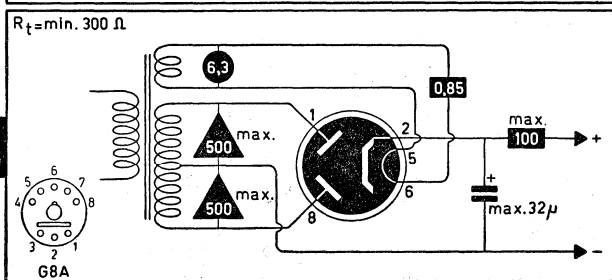
EZ4



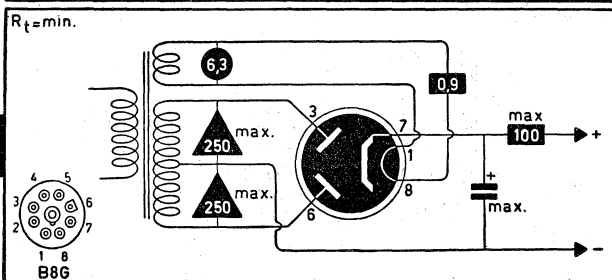
EZ11

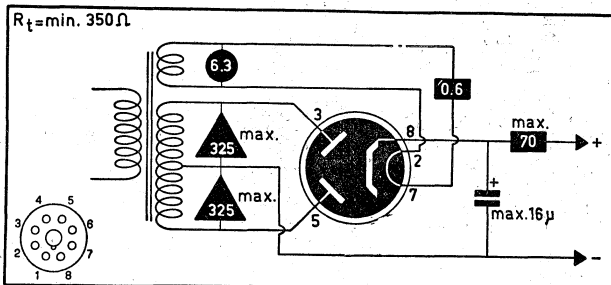


EZ12

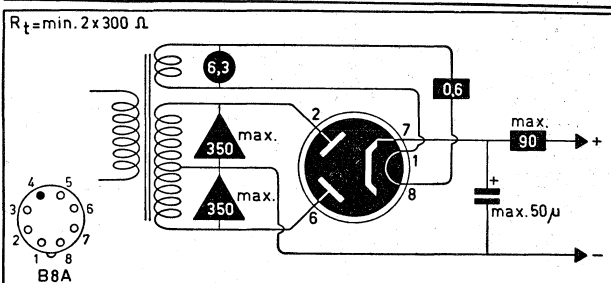


EZ22

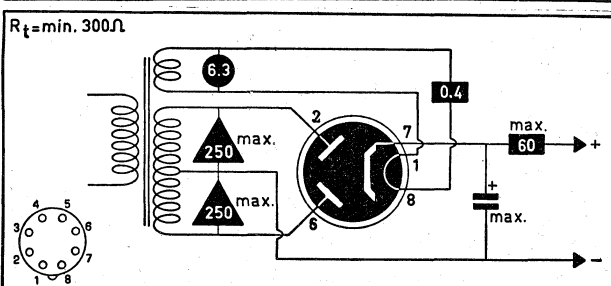




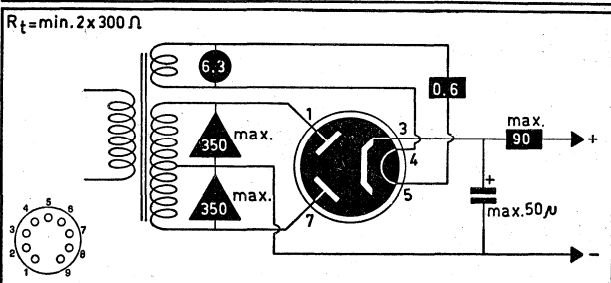
EZ35



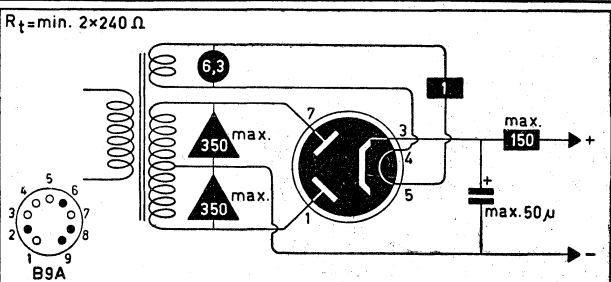
EZ40



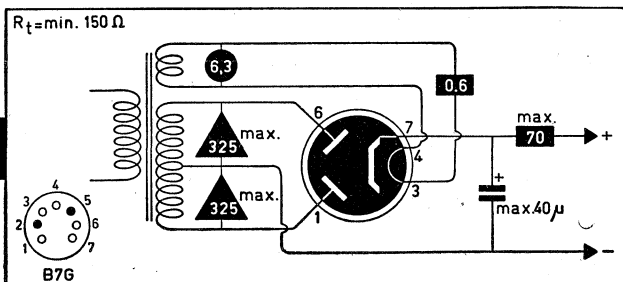
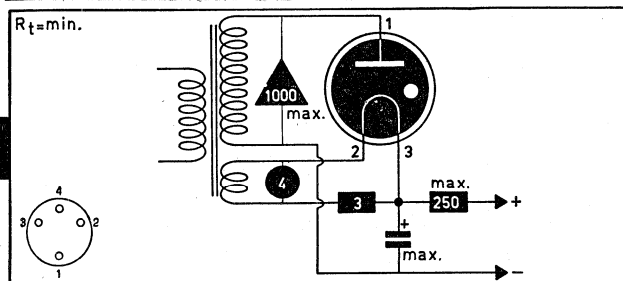
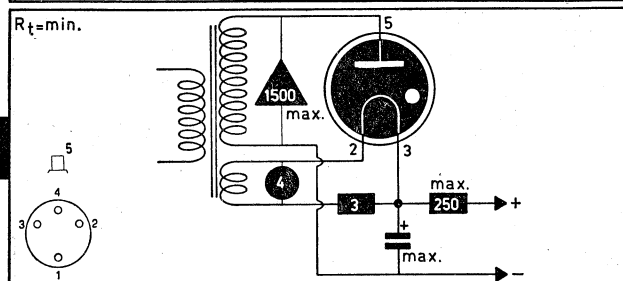
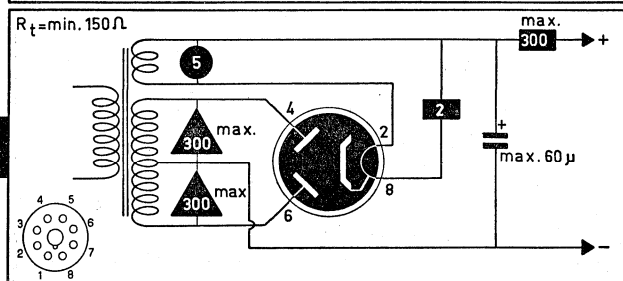
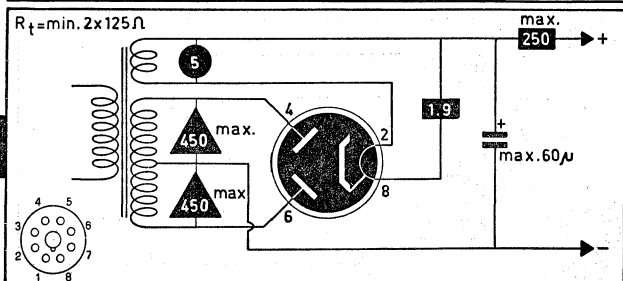
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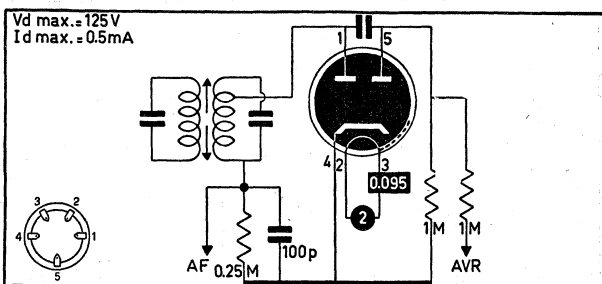


EZ80

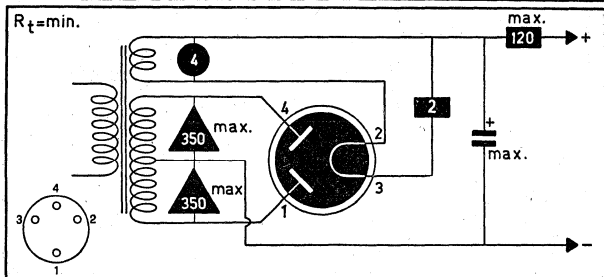


EZ81

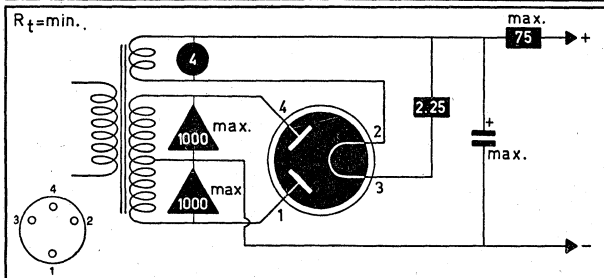
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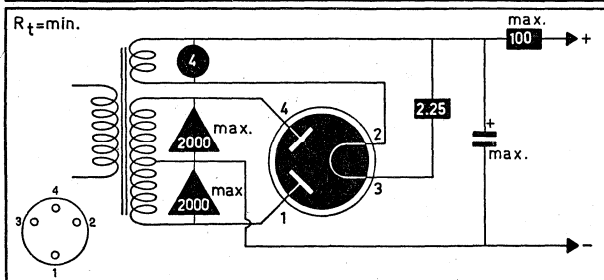
KB2



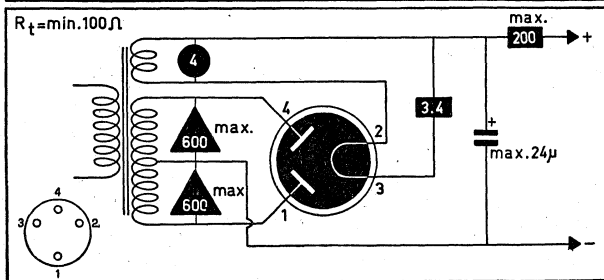
PV4



PV75/1000

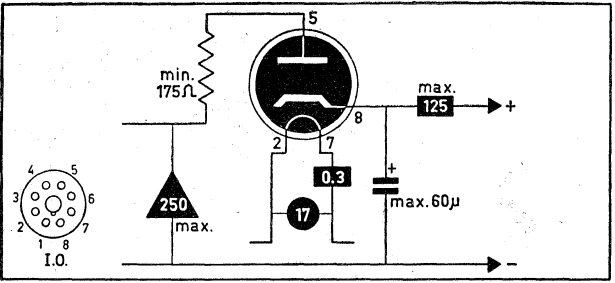


PV100/2000

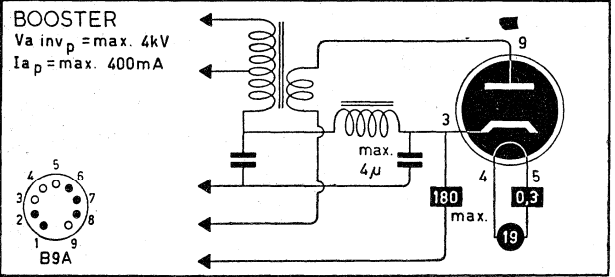


PV200/600

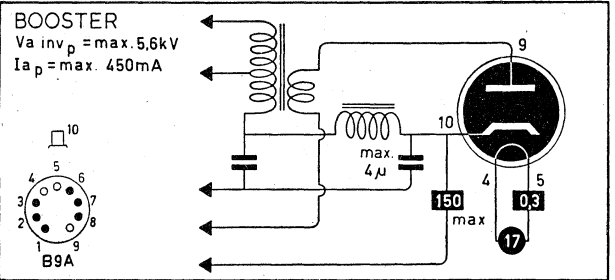
PY31



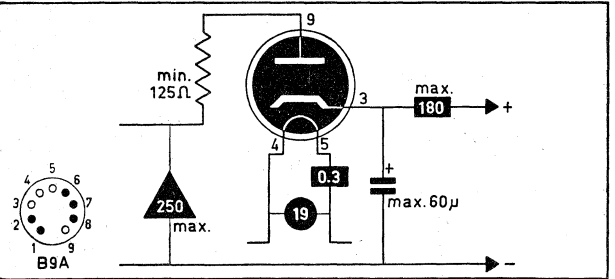
PY80



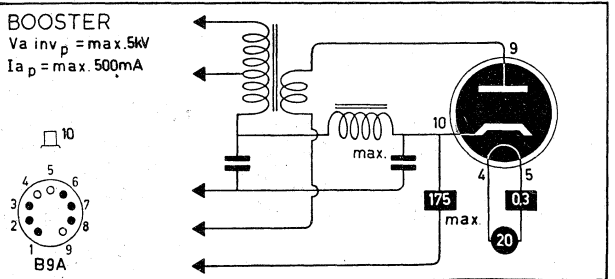
PY81

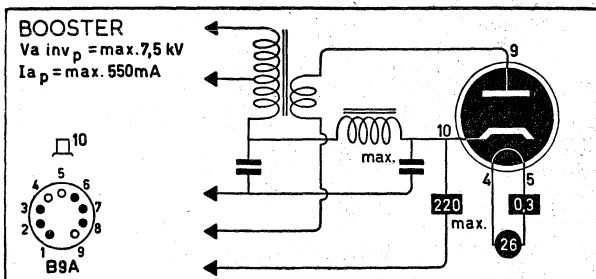


PY82

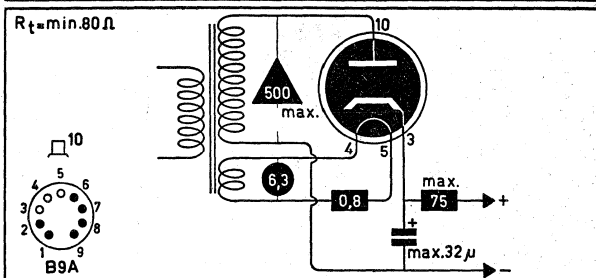


PY83

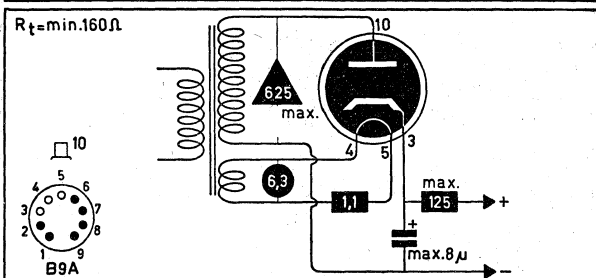




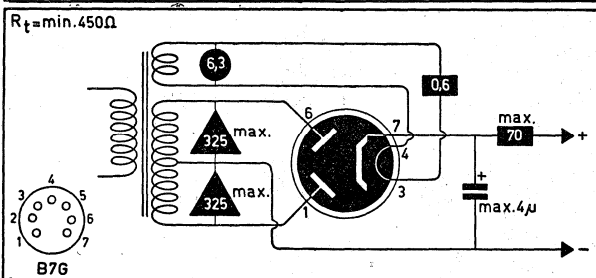
PY88



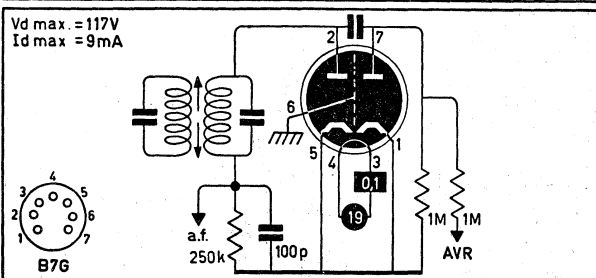
R17



R18

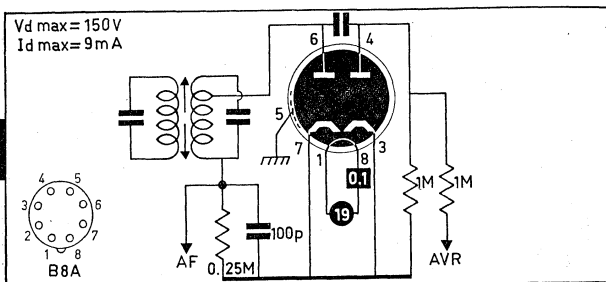


U78

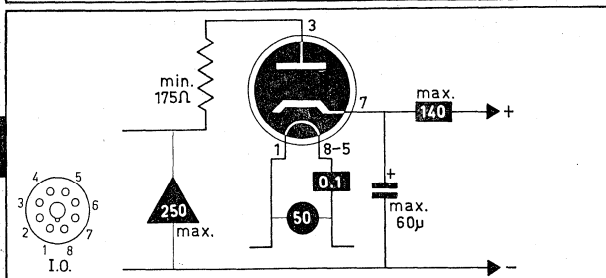


UAA91

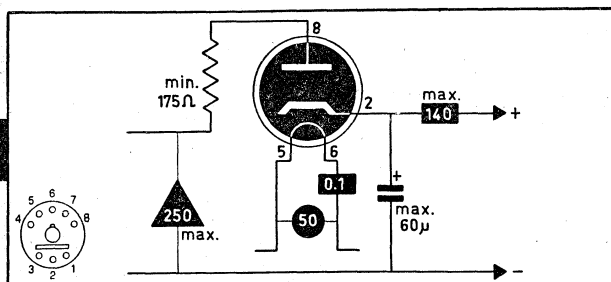
UB41



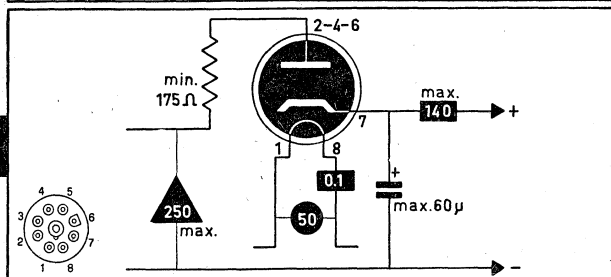
UY1(N)



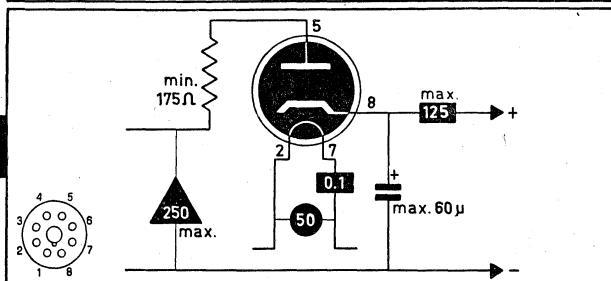
UY11

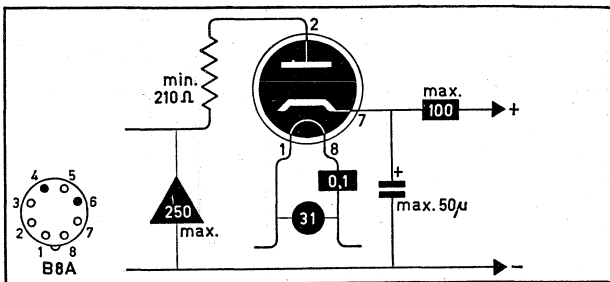


UY21



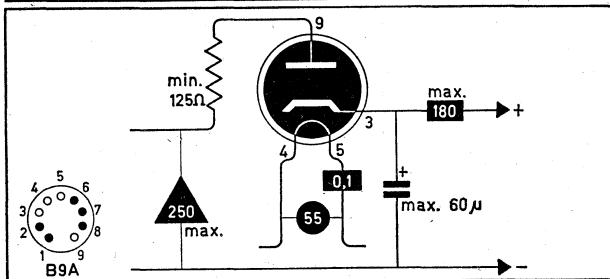
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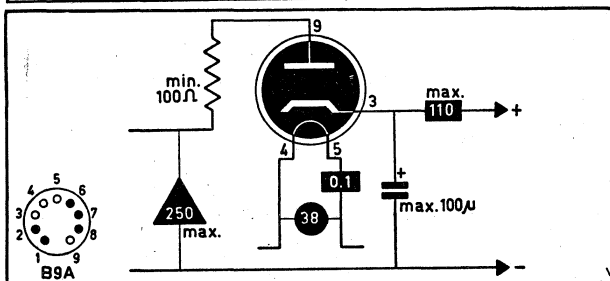


UY41

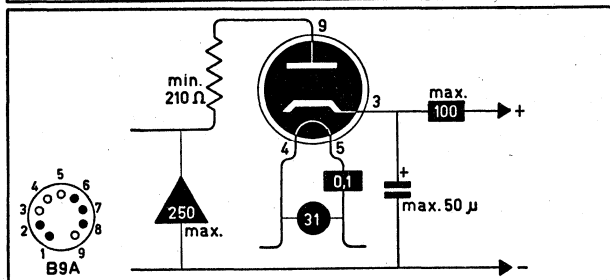
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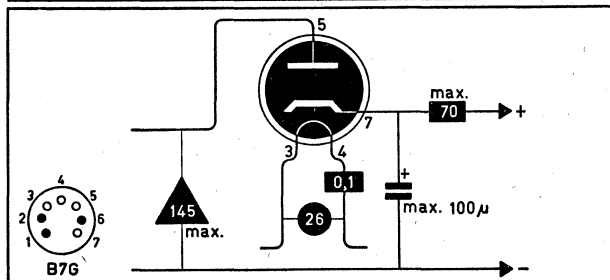
UY82



UY85



UY89



UY92

	=			
1A3	DA90	CV753	-	-
1B3GT	DY30	CV1830	-	-
1R4	-	CV2709	-	-
1S2	DY86/87	-	-	-
1V	-	CV1999	-	-
-1X2A-	DY80	-	-	-
-2B35-	EA50	-	-	-
2X2A	-	CV597	-	-
3AL5	-	-	6AL5 12AL5 EAA91 EB91	-
5A24	-	-	-	5Y3 5Y4 80
5R4	-	CV2835	-	-
5R4GY	-	CV717	-	-
5R4WGA	-	CV4026	-	-
5T4	-	CV1846	-	-
5U4	-	CV1071	-	5X4 5Z3
5U4G	-	CV575 CV1575 VT244 x)	-	-
5U4GT	-	CV841	-	-
5V4	-	-	-	83V
5V4G	-	CV729 VT206 x)	-	-
5W4	-	CV503 CV1849 VT97 x)	-	-
5W4G	-	CV842	-	-
5X4	-	-	-	5U4 5Z3
5X4G	-	CV1851	-	-
5Y3	-	CV1854	-	5A24 5Y4 80
5Y3G	-	CV1268	-	-
5Y3GT	-	CV1856 VT197A x)	-	-
5Y3WGTA	-	CV4027	-	-
5Y4	-	-	-	5A24 5Y3 80
5Y4G	-	CV1857	-	-
5Z3	-	CV1861 VT145 x)	-	5U4 5X4
5Z4	-	CV1864 VT74 x)	-	-
5Z4G	-	CV1863	-	-
5Z4GT	-	CV2748	-	-
6AF3	-	-	12AF3	-
6AL5	EAA91 EB91	CV140 CV283 CV2004 CV2005 CV2882	3AL5 12AL5	-
6AU4	-	-	19AU4	-
6AX4	-	-	12AX4 17AX4 25AX4	-

x) American VT

				
6AX6	-	-	50AX6	-
6AY3	-	-	12AY3 17AY3	-
6BH3	-	-	17BH3 22BH3	-
6BW4	-	-	12BW4	-
-6CA4-	EZ81	-	-	-
6DE4	-	-	17DE4 22DE4	-
6DM4	-	-	12DM4 17DM4	-
6H6	-	CV1301 CV1930 VT90 x)	7A6 12H6	7A6
6H6G	-	AR003 VT90A x)	-	-
6H6GT	-	CV1929 CV1931	-	-
-6R3-	EY81	CV1931	PY81	-
-6S2-	EY86/87	-	-	-
-6U3-	EY80	-	-	-
-6V4-	EZ80	-	-	EZ40
6W4	-	CV732 x)	25W4	-
6W5G	-	VT196 x)	-	-
-6X2-	EY51	-	-	-
6X4	EZ90	CV493	12X4	-
6X4W	-	CV2844	-	-
6X5	-	CV573 VT126 x)	-	-
6X5G	-	CV572 VT126A x)	-	-
6X5GT	-	CV574 VT126B x)	-	-
6Y3GT	-	CV1816	-	-
6Z4	84	-	-	-
6ZY5G	-	CV873	-	-
7A6	-	CV876	6H6 12H6	6H6 12H6
7Y4	-	CV901	14Y4	-
7Z4	-	CV1790 VT181 x)	-	-
1001	-	CV1300	-	-
12AF3	-	-	6AF3	-
12AL5	-	-	3AL5 6AL5 EAA91 EB91	-
12AX4	-	-	6AX4 17AX4 25AX4	-
12AY3	-	-	6AY3 17AY3	-
12BW4	-	-	6BW4	-
12D4	-	-	17D4	-
12DM4	-	-	6DM4 17DM4	-
12H6	-	CV916 VT124 x)	6H6 7A6	- 7A6
12X4	-	-	6X4 EZ90	-
14Y4	-	-	7Y4	-

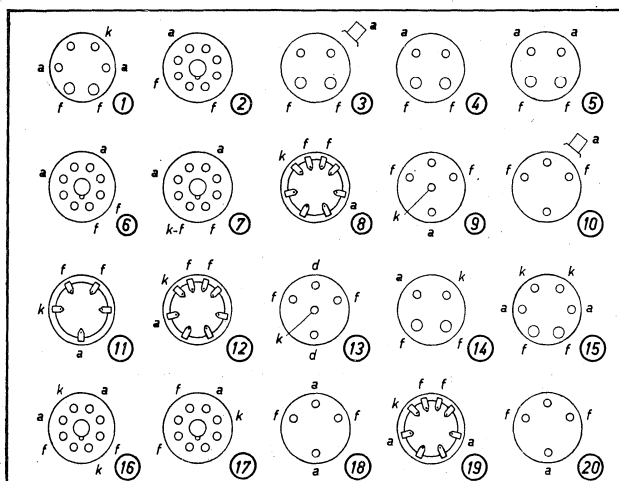
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17AY3	-	-	6AY3 12AY3	-
17BH3	-	-	6BH3 22BH3	-
17D4	-	-	12D4	-
17DE4	-	-	6DE4 22DE4	-
17DM4	-	-	6DM4 12DM4	-
-17Z3-	PY81	-	-	-
19AU4	-	-	6AU4	-
-19X3-	PY80	-	-	-
-19Y3-	PY82	-	-	-
22BH3	-	-	6BH3 17BH3	-
22DE4	-	-	6DE4 17DE4	-
25AX4	-	-	6AX4 12AX4 17AX4	-
25W4	-	-	6W4	-
25Y5	-	CV942	-	-
25Z5	-	CV555	-	25Z6
25Z6	-	CV558	50Y6	25Z6
25Z6GT	-	CV559	-	-
35Y4	-	-	-	35Z5
35Z3	-	CV564 CV565 CV726	-	-
35Z5	-	CV567	-	35Y4
35Z5GT	-	CV568	-	-
50AX6	-	-	6AX6	-
50Y6	-	CV805	25Z6	-
72	-	CV709 CV2542	-	-
80	-	CV617 VT80 x)	-	5AZ4 5Y4
82	-	CV1773	-	-
83	-	CV618	-	-
83V	-	CV2547 VT83 x)	-	5V4
84	6Z4	CV619 CV2548	-	-
117Z6GT	-	CV2558	-	-
1561	-	CV1289 CV2644	-	-
1805	-	-	AZ1 AZ11 AZ31	AZ1 AZ11 AZ31
9006	-	CV2769	-	-
AB2	-	-	CB2	-
AZ1	-	CV2860	1805	1805 AZ11 AZ31
-AZ2-	-	CV2861	-	-
AZ3	-	-	-	AZ33
AZ4	-	-	-	AZ12
AZ11	-	-	1805	1805 AZ1 AZ31
AZ12	-	-	-	AZ4

x) American VT

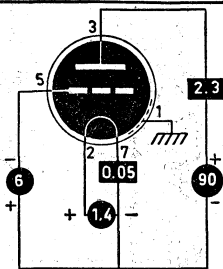
				
AZ31	-	CV2862	1805	1805 AZ1 AZ11
AZ33	-	-	-	AZ3
AZ41	-	CV3892	-	-
AZ50	-	CV1264	-	-
CB2	-	-	A82	-
CY1	-	-	-	CY31
CY31	-	CV1402	-	CY1
DA90	1A3	-	-	-
OY30	183	-	-	-
OY80	-1X2A-	-	-	-
OY86/87	152	-	-	-
EA50	-2B35-	CV375 CV1092 VR92	-	-
EEA91	EB91 6AL5	-	3AL5 12AL5	- -
EB4	-	-	-	EB34
EB34	-	ARDD5 CV1054 VR54	-	EB4
EB41	-	CV3881	UB41	-
EB91	EEA91 6AL5	-	3AL5 12AL5	- -
EY51	-6X2-	CV426	-	-
EY80	-6U3-	-	PY80	-
EY81	-6R3-	-	PY81	-
EY84	-	CV2235	-	-
EY86/87	-6S2-	-	-	-
EY91	-	CV135	-	-
EZ3	-	-	EZ12	EZ12
EZ11	-	-	-	EZ41
EZ12	-	-	EZ3	EZ3
EZ22	-	CV346	-	-
EZ40	-	CV3891	-	-6V4- EZ80
EZ41	-	-	EZ11	EZ11
EZ80	-6V4-	-	-	EZ40
EZ81	-6CA4-	-	-	-
EZ90	6X4	-	12X4	-
GZ32	-	CV378 CV593	-	-
KB2	-	CV3515	-	-
PY80	-19X3-	-	-	-
PY81	-17Z3-	-	-	-
PY82	-19Y3-	-	-	-
UB41	-	-	EB41	-
UY1N	-	-	-	UY11 UY21
UY11	-	-	-	UY1N UY21
UY21	-	-	-	UY1N UY11
UY82	-	-	PY82 -19Y3-	-

OBSELETE TYPES

Type	V_f	I_f	$V_{t \max}$	$R_{t \min}$	$C_L \max$	$I_{\max}$	Base
	V	A	V	Ω	μF	mA	nr.
106	25	0,3	250	50	16	100	1
2w3	2,5	1,5	350			55	2
2X2A	2,5	1,75	4500			7,5	3
2Z2	2,5	1,5	350			50	4
5X3	5	2	2x 1275			30	5
5Y4	5	2	2 x 350	50	32	125	6
1001	13	0,2	50	(duo-diode)		8	13
12Z3	12,6	0,3	235	75	40	55	14
14Z3	12,6	0,3	250			60	14
25RE	25	0,3	250			2 x 85	15
35Z6	35	0,3	125			2 x 55	16
50Z6	50	0,3	250			2 x 150	16
72	2,5	3	7000			30	3
117Z4	117	0,04	117	15	40	90	17
506	4	1	2 x 300	100	16	75	18
CY32	30	0,2	250	125	32	2 x 60	16
EZ1	6,3	0,4	2 x 250			60	19
GR4	4	3	2 x 350			350	18
PV400	4	1	225			40	20
PV430	4	0,3	2 x 250			25	18
PV475	4	0,8	2 x 250			45	18
PV480	4	1	225			40	20
PV495	4	1,1	2 x 300			70	18
PV4100	4	1	2 x 300			100	18
PV4200	4	2,4	2 x 500			120	18
PV4201	4	2	2 x 600			180	18
PV4300	4	2	2 x 500			120	18
UU6	4	1,4	2 x 350		8	120	7
UY4	35	0,1	250	175	60	55	8
V20	20	0,2	250			80	9
V30	30	0,2	275			120	9
V2018	20	0,18	250			60	9
V2118	20	0,18	250			80	9
VU111	4	1,1	5000			50	10
VU113	4	1	2500			30	10
VY1	55	0,05	250			60	8
VY2	30	0,05	250			35	11
VY2(N)	30	0,05	250			30	12

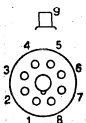


$S=0.825\text{mA/V}$
 $\mu=8.8$
 $R_i=$
 $W_a=$

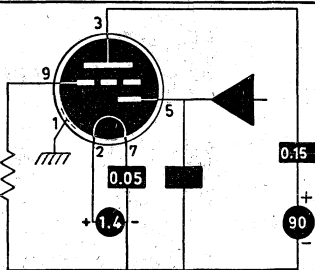


1G4

$S=0.275\text{mA/V}$
 $\mu=65$
 $R_i=240\text{k}$
 $W_a=$

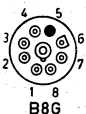


min. 1M

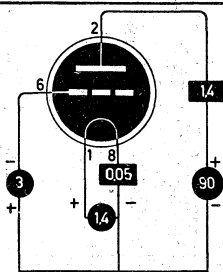


1H5

$S=0.76\text{mA/V}$
 $\mu=14.5$
 $R_i=19\text{k}$
 $P_a=\text{max } 0.1\text{W}$
 $R_{eq}=$

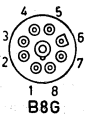


B8G

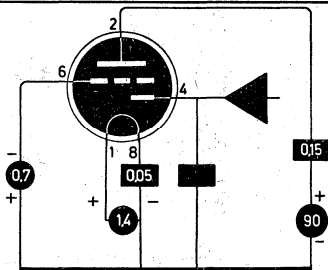


1LE3

$S=0.275\text{mA/V}$
 $\mu=65$
 $R_i=240\text{k}$
 $P_a=\text{max } 13\text{mW}$
 $R_{eq}=$

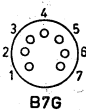


B8G

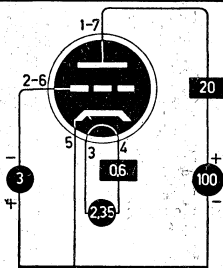


1LH4

$S=75\text{mA/V}$
 $\mu=16$
 $R_i=2.13\text{k}$
 $P_a=\text{max } 2\text{W}$
 $R_{eq}=$



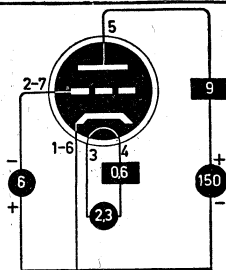
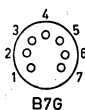
B7G



2AF4

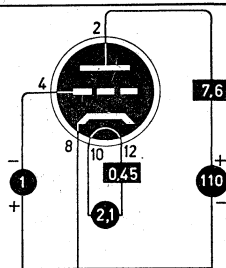
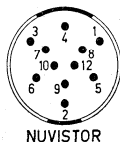
2BN4

$S = 6,8 \text{ mA/V}$
 $\mu = 43$
 $R_i = 6,3 \text{ k}$
 $P_a = \text{max. } 2 \text{ W}$
 $R_{eq} =$



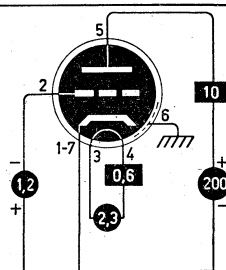
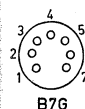
2CW4

$S = 9,8 \text{ mA/V}$
 $\mu = 62$
 $R_i = 6,3 \text{ k}$
 $P_a = \text{max. } 1 \text{ W}$
 $R_{eq} =$



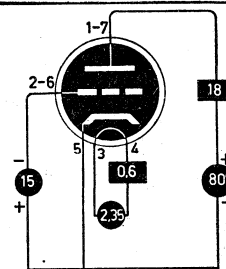
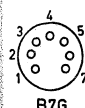
2ER5

$S = 10,5 \text{ mA/V}$
 $\mu = 80$
 $R_i = 8 \text{ k}$
 $P_a = \text{max. } 2,2 \text{ W}$
 $R_{eq} =$



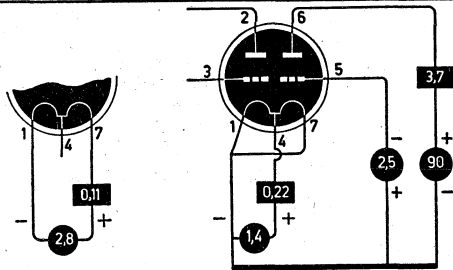
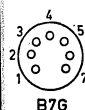
2T4

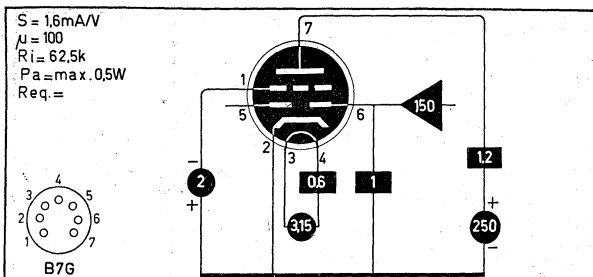
$S = 7 \text{ mA/V}$
 $\mu = 13$
 $R_i = 1,85 \text{ k}$
 $P_a = \text{max. } 3,5 \text{ W}$
 $R_{eq} =$



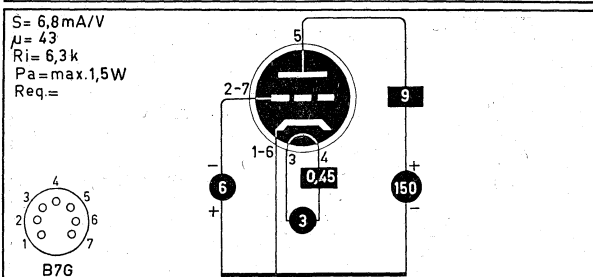
3A5

$S = 1,8 \text{ mA/V}$
 $\mu = 15$
 $R_i = 8,3 \text{ k}$
 $P_a = \text{max. } 2 \times 0,5 \text{ W}$
 $R_{eq} =$

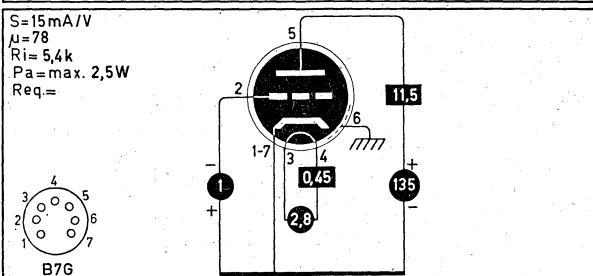




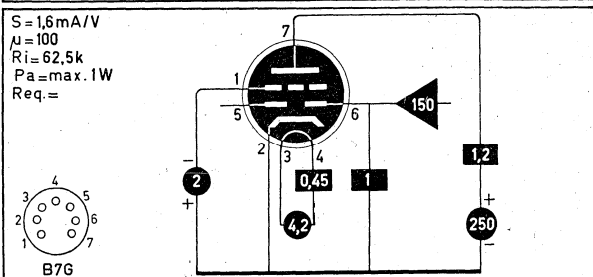
3AV6



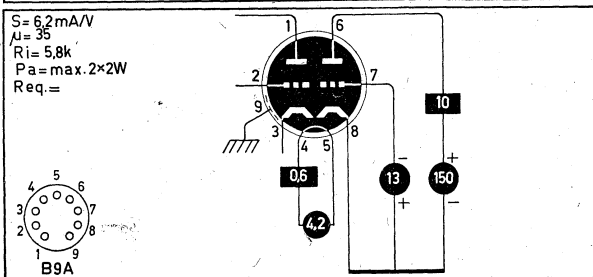
3BN4



3GK5



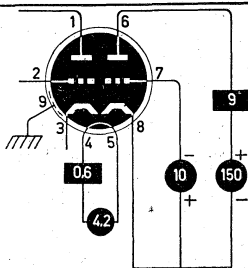
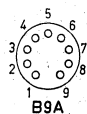
4AV6



4BC8

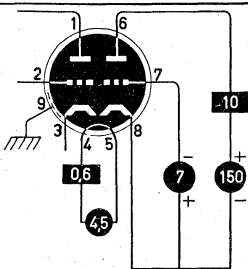
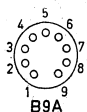
4BQ7A

$S = 6,4 \text{ mA/V}$
 $\mu = 39$
 $R_i = 6,1 \text{ k}$
 $P_a = \text{max. } 2 \times 2 \text{ W}$
 $R_{eq} =$



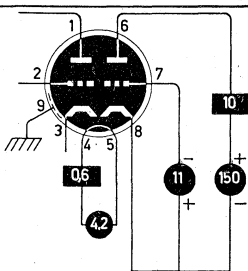
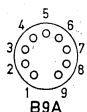
4BS8

$S = 7,2 \text{ mA/V}$
 $\mu = 36$
 $R_i = 5 \text{ k}$
 $P_a = \text{max. } 2 \times 2 \text{ W}$
 $R_{eq} =$



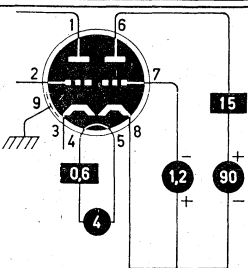
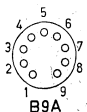
4BZ7

$S = 6,8 \text{ mA/V}$
 $\mu = 38$
 $R_i = 5,6 \text{ k}$
 $P_a = \text{max. } 2 \times 2 \text{ W}$
 $R_{eq} =$



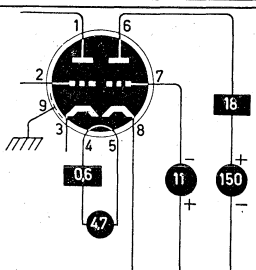
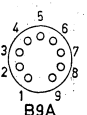
4ES8

$S = 12,5 \text{ mA/V}$
 $\mu =$
 $R_i = 2,5 \text{ k}$
 $P_a = \text{max. } 2 \times 1,8 \text{ W}$
 $R_{eq} =$

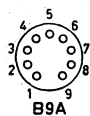


5BK7A

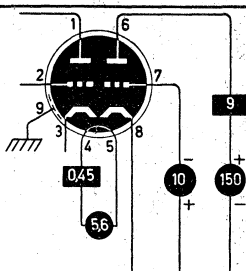
$S = 9,3 \text{ mA/V}$
 $\mu = 43$
 $R_i = 4,6 \text{ k}$
 $P_a = \text{max. } 2 \times 2,7 \text{ W}$
 $R_{eq} =$



$S = 6,4 \text{ mA/V}$
 $\mu = 39$
 $R_i = 6,1 \text{ k}$
 $P_a = \max. 2 \times 2 \text{ W}$
 $R_{eq} =$



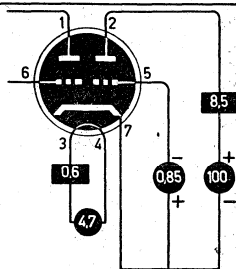
B9A



$S = 5,3 \text{ mA/V}$
 $\mu = 38$
 $R_i = 7,1 \text{ k}$
 $P_a = \max. 2 \times 1,5 \text{ W}$
 $R_{eq} =$



B7G

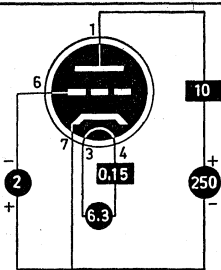
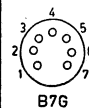


5BQ7A

5J6

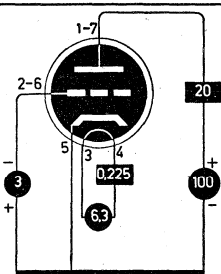
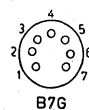
6AB4

$S=5.5\text{mA/V}$
 $\mu=60$
 $R_i=10.9\text{k}$
 $W_a=\text{max } 2.5\text{W}$



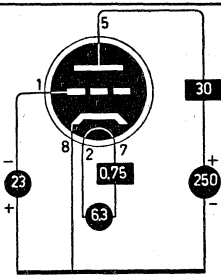
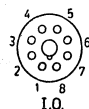
6AF4

$S=7.5\text{mA/V}$
 $\mu=16$
 $R_i=2.13\text{k}$
 $P_a=\text{max } 2\text{W}$
 $R_{eq}=\text{=}$



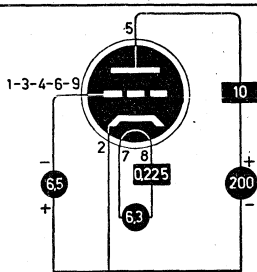
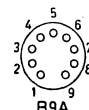
6AH4

$S=4.5\text{mA/V}$
 $\mu=8$
 $R_i=1.78\text{k}$
 $P_a=\text{max } 7.5\text{W}$
 $R_{eq}=\text{=}$



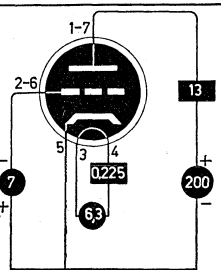
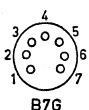
6AM4

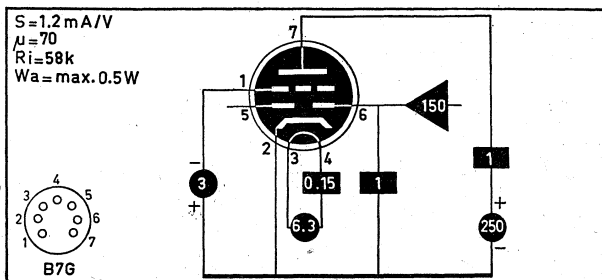
$S=9.8\text{mA/V}$
 $\mu=85$
 $R_i=8.7\text{k}$
 $P_a=\text{max } 2\text{W}$
 $R_{eq}=\text{=}$



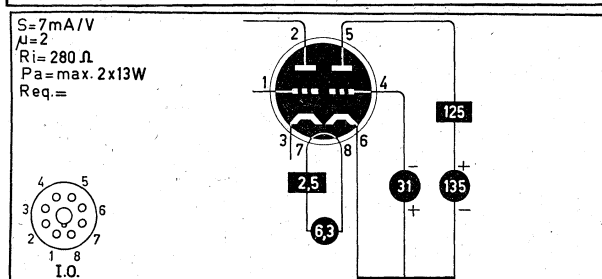
6AN4

$S=10\text{mA/V}$
 $\mu=70$
 $R_i=7\text{k}$
 $P_a=\text{max } 4\text{W}$
 $R_{eq}=\text{=}$

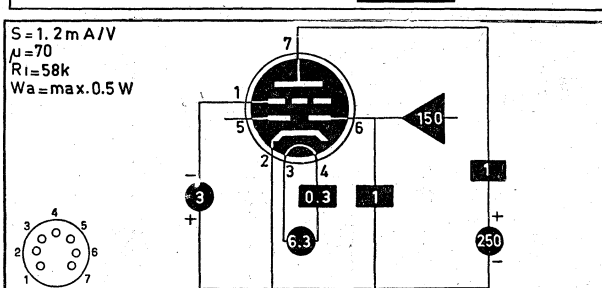




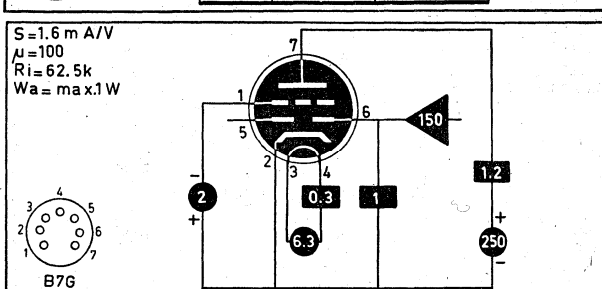
6AQ6



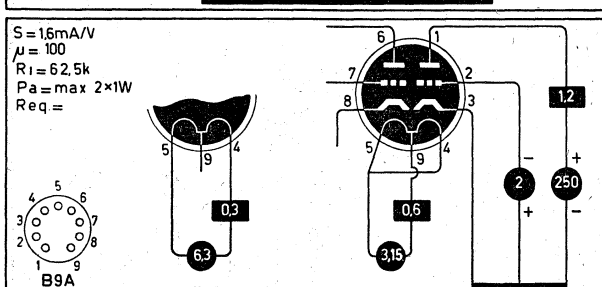
6AS7



6AT6



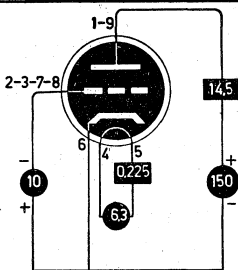
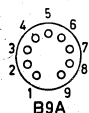
6AV6



6AX7

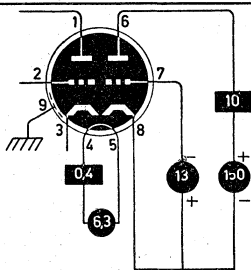
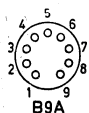
6BC4

$S=10\text{mA/V}$
 $\mu=48$
 $R_i=4,8\text{k}$
 $P_a=\text{max. } 2,5\text{W}$
 $R_{eq}=$



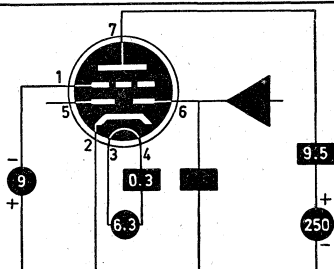
6BC8

$S=6,2\text{mA/V}$
 $\mu=35$
 $R_i=5,8\text{k}$
 $P_a=\text{max. } 2\text{W}$
 $R_{eq}=$



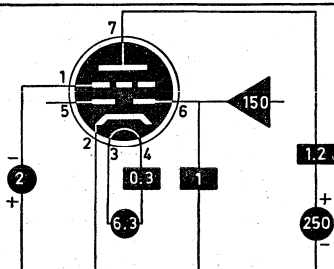
6BF6

$S=1,9\text{mA/V}$
 $\mu=16$
 $R_i=8,5\text{k}$
 $W_a=\text{max. } 2,5\text{W}$



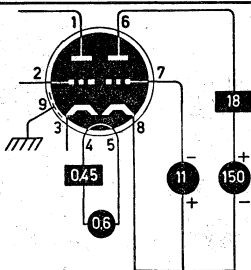
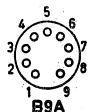
6BK6

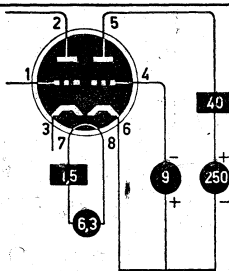
$S=1,6\text{mA/V}$
 $\mu=100$
 $R_i=62,5\text{k}$
 $W_a=\text{max. } 1\text{W}$



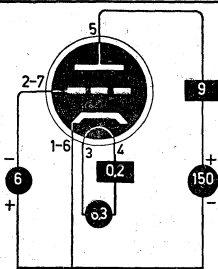
6BK7A

$S=9,3\text{mA/V}$
 $\mu=43$
 $R_i=4,6\text{k}$
 $P_a=\text{max. } 2,7\text{W}$
 $R_{eq}=$

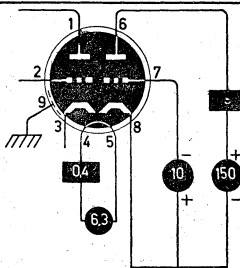




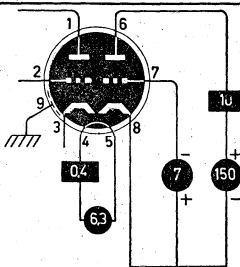
A diagram showing a circle with 7 points inside, labeled 1 through 7. The points are arranged in a circular pattern. Below the circle is the label B7G.



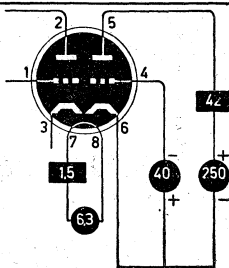
B9A



A diagram showing a circle with 9 points arranged in a ring. The points are labeled 1 through 9, starting from the bottom and moving clockwise. Below the circle is the label 'B9A'.



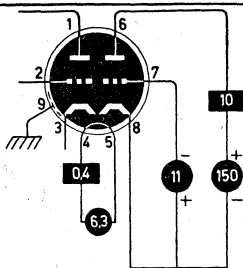
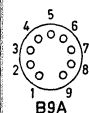
I.O.



95

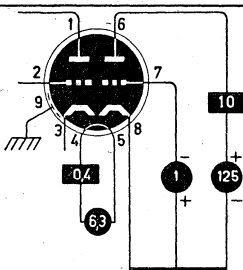
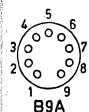
6BZ7

$S=6.8\text{mA/V}$
 $\mu=38$
 $R_i=5.6\text{k}$
 $P_a=\text{max. } 2 \times 2\text{W}$
 $R_{eq}=$



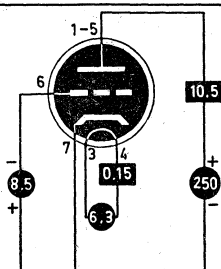
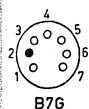
6BZ8

$S=8\text{mA/V}$
 $\mu=45$
 $R_i=5.6\text{k}$
 $P_a=\text{max. } 2 \times 2.2\text{W}$
 $R_{eq}=$



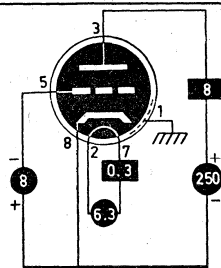
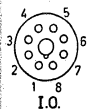
6C4

$S=2.2\text{mA/V}$
 $\mu=17$
 $R_i=7.7\text{k}$
 $W_a=\text{max. } 3.5\text{W}$



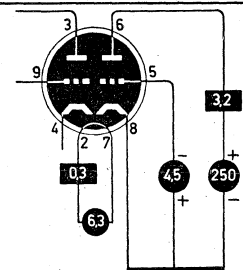
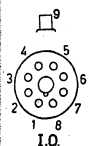
6C5

$S=2\text{mA/V}$
 $\mu=20$
 $R_i=10\text{k}$
 $W_a=\text{max. } 2.5\text{W}$

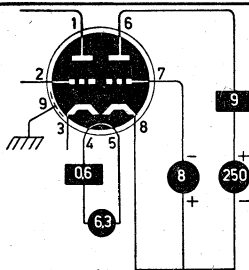
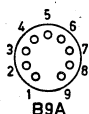


6C8

$S=16\text{mA/V}$
 $\mu=36$
 $R_i=22.5\text{k}$
 $P_a=\text{max. } 2 \times 1\text{W}$
 $R_{eq}=$

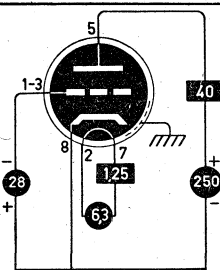
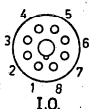


$S=2,6\text{mA/V}$
 $\mu=20$
 $R_i=7,7\text{k}$
 $P_a=\text{max.}2\times3,5\text{W}$
 $R_{eq}=$



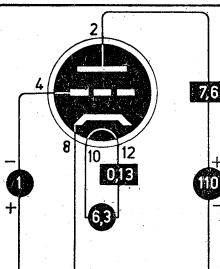
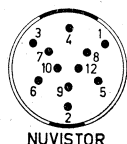
6CG7

$S=5,5\text{mA/V}$
 $\mu=6,6$
 $R_i=1,2\text{k}$
 $P_a=\text{max}$
 $R_{eq}=$



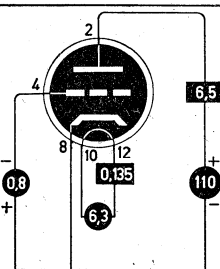
6CK4

$S=9,8\text{mA/V}$
 $\mu=62$
 $R_i=6,3\text{k}$
 $P_a=\text{max.}1\text{W}$
 $R_{eq}=$



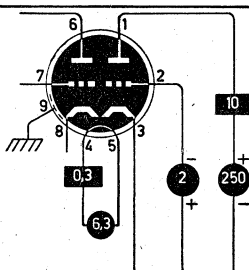
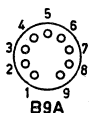
6CW4

$S=9\text{mA/V}$
 $\mu=62$
 $R_i=6,9\text{k}$
 $P_a=\text{max.}1\text{W}$
 $R_{eq}=$



6DS4

$S=5,5\text{mA/V}$
 $\mu=60$
 $R_i=10,9\text{k}$
 $P_a=\text{max.}2\times2,5\text{W}$
 $R_{eq}=$



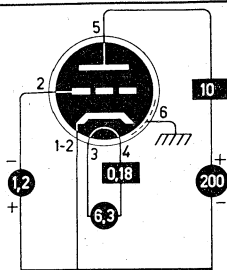
6DT8

6ER5

$S=10,5\text{mA/V}$
 $\mu=80$
 $R_i=8\text{k}$
 $P_a=\text{max. } 2,2\text{W}$
 $R_{eq}=$



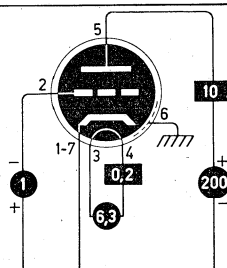
B7G

**6ES5**

$S=9\text{mA/V}$
 $\mu=75$
 $R_i=8\text{k}$
 $P_a=\text{max. } 2,2\text{W}$
 $R_{eq}=$



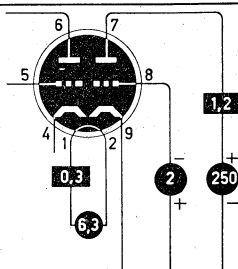
B7G

**6EU7**

$S=1,6\text{mA/V}$
 $\mu=100$
 $R_i=62,5\text{k}$
 $P_a=\text{max. } 2 \times 1,2\text{W}$
 $R_{eq}=$



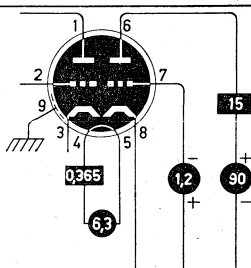
B9A

**6ES8**

$S=12,5\text{mA/V}$
 $\mu=$
 $R_i=2,5\text{k}$
 $P_a=\text{max. } 2 \times 1,8\text{W}$
 $R_{eq}=$



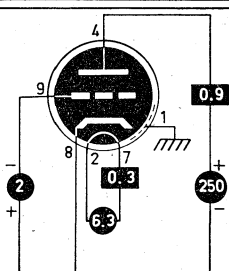
B9A

**6F5**

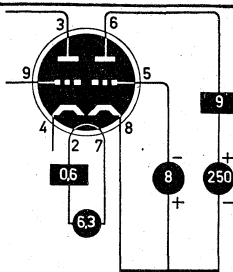
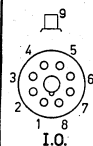
$S=1,5\text{mA/V}$
 $\mu=100$
 $R_i=66\text{k}$
 $W_a=$



I.O.

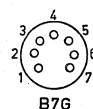


$S=26\text{mA/V}$
 $\mu=20$
 $R_i=7,7\text{k}$
 $P_a=\text{max. } 2 \times 2,5\text{W}$
 $R_{eq}=$

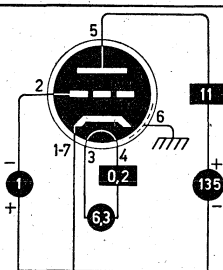


6F8

$S=9\text{mA/V}$
 $\mu=50$
 $R_i=5,6\text{k}$
 $P_a=\text{max. } 2,2\text{W}$
 $R_{eq}=$

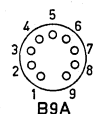


B7G

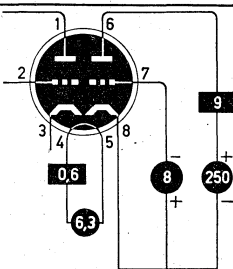


6FH5

$S=2,6\text{mA/V}$
 $\mu=20$
 $R_i=7,7\text{k}$
 $P_a=\text{max. } 2 \times 4\text{W}$
 $R_{eq}=$

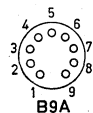


B9A

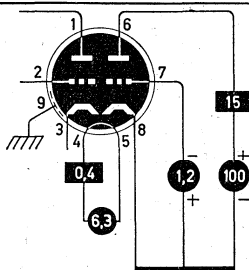


6FQ7

$S=13\text{mA/V}$
 $\mu=33$
 $R_i=2,5\text{k}$
 $P_a=\text{max. } 2 \times 2,2\text{W}$
 $R_{eq}=$

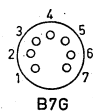


B9A

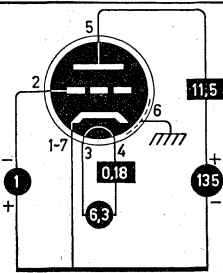


6FW8

$S=15\text{mA/V}$
 $\mu=78$
 $R_i=5,4\text{k}$
 $P_a=\text{max. } 2,5\text{W}$
 $R_{eq}=$



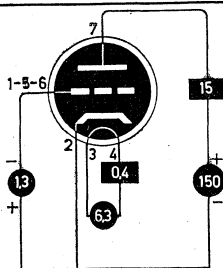
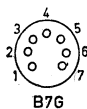
B7G



6GK5

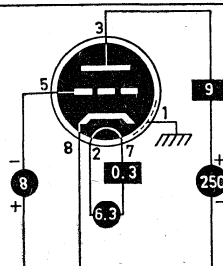
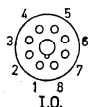
6J4

$S = 12.2 \text{ mA/V}$
 $\mu = 55$
 $R_i = 4.5 \text{ k}$
 $P_a = \text{max. } 2.25 \text{ W}$
 $R_{eq} =$



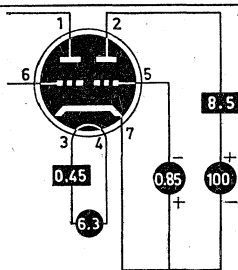
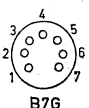
6J5

$S = 2.6 \text{ mA/V}$
 $\mu = 20$
 $R_i = 7.7 \text{ k}$
 $W_a = \text{max. } 2.5 \text{ W}$



6J6

$S = 5.3 \text{ mA/V}$
 $\mu = 38$
 $R_i = 7.1 \text{ k}$
 $W_a = \text{max. } 1.5 \text{ W}$



dr Blan

helpt U verder....

WIJ MENEN, DAT U RECHT HEEFT OP DE ALLERBESTE OPLEIDING OP ELEKTRONISCH GEBIED ALS HET OM NIET MINDER DAN UW TOEKOMST GAAT. BESEF DAAROM TERDEGE, DAT DEGENEN, DIE UW OPLEIDING IN HANDEN HEBBEN, IN FEITE OVER DEZE TOEKOMST BESLISSEN.

STUDEER BIJ DE BRON

STANDAARDCURSUS RADIO

DEZE CURSUS BESTAAT UIT 12 LESSEN, DIE PRECIES OP DE 1E VAN IEDERE MAAND WORDEN TOEGEZONDEN. DE CURSUS IS IN EEN ZO BEVATTELIJKE TRANT GESCHREVEN, DAT IEDER, DIE LEZEN KAN EN ENIG GEVOEL VOOR TECHNIEK HEEFT, ZONDER MEER DE CURSUS TOT HET EINDE TOE KAN VOLGEN.

STANDAARDCURSUS TELEVISIE

EEN IEDER, DIE ZICH GEVORDERD RADIO-AMATEUR KAN NOEMEN ZAL DEZE, UIT 12 LESSEN BESTAANDE CURSUS, ZONDER MEER KUNNEN VOLGEN.

VERVOLGCURSUS MEETTECHNIEK

VOOR HET VOLGEN VAN DEZE CURSUS IS DE KENNIS VEREIST VAN DE DR. BLAN RADIO-CURSUS OF MINSTENS EEN GELIJKWAARDIGE OPLEIDING. DE CURSUS BESTAAT UIT MINIMAAL 6 LESSEN.

VERVOLGCURSUS KG ZENDAMATEUR

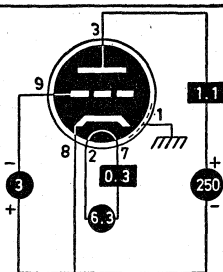
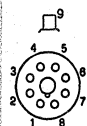
HET ZENDAMATEURISME IS TE BESCHOUWEN ALS DE ROMANTIEK DER ELEKTRONICA. DE KENNIS VAN DE RADIOCURSUS IS VEREIST. DE CURSUS BESTAAT UIT MINIMAAL 6 LESSEN.

VRAAGT UITVOERIGE PROSPECTUS AAN!

DE MUIDERKRING N.V. BUSSUM

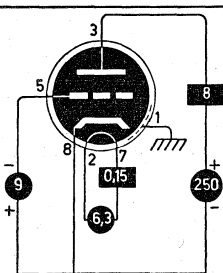
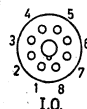
6K5

$S=1.4 \text{ mA/V}$
 $\mu=70$
 $R_i=50\text{k}$
 $W_a=$



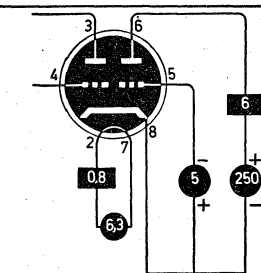
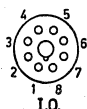
6L5

$S=1.9\text{mA/V}$
 $\mu=17$
 $R_i=9\text{k}$
 $P_a=\text{max } 2\text{W}$
 $\text{Req.} =$



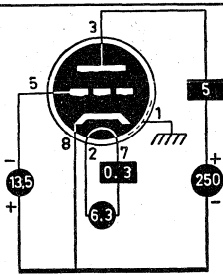
6N7

$S=31\text{mA/V}$
 $\mu=35$
 $R_i=11.3\text{k}$
 $P_a=\text{max } 1\text{W}$
 $\text{Req.} =$



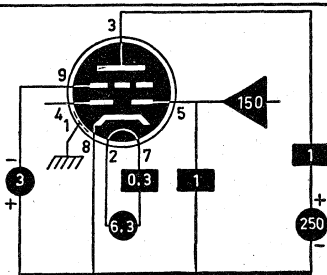
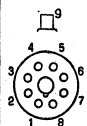
6P5

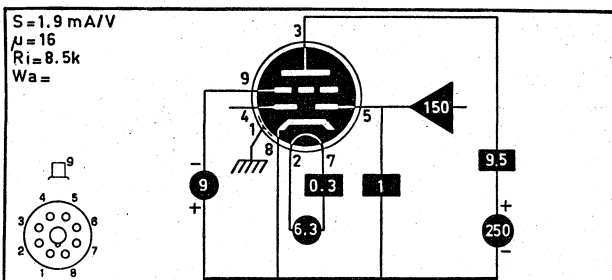
$S=1.4 \text{ mA/V}$
 $\mu=13.8$
 $R_i=9.5\text{k}$
 $W_a=$



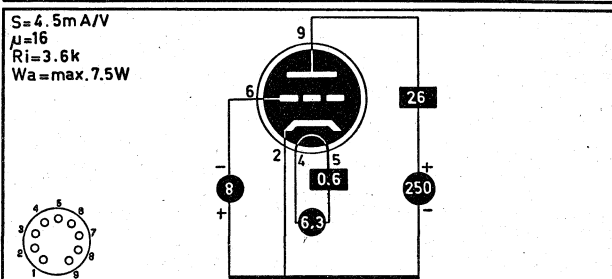
6Q7

$S=1.2\text{mA/V}$
 $\mu=70$
 $R_i=58\text{k}$
 $W_a=\text{max } 1\text{W}$

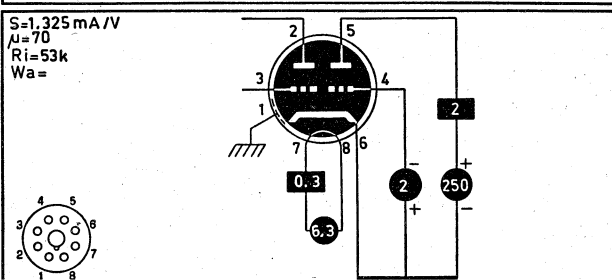




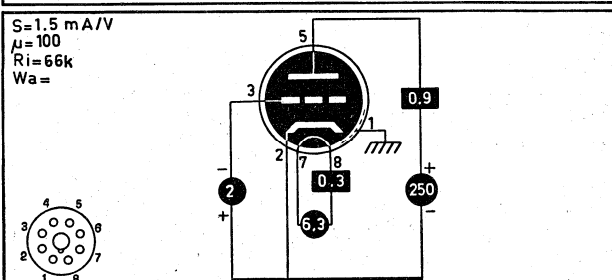
6R7



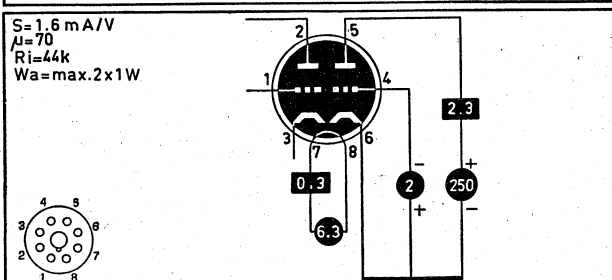
6S4



6SC7



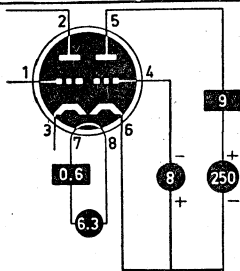
6SF5



6SL7

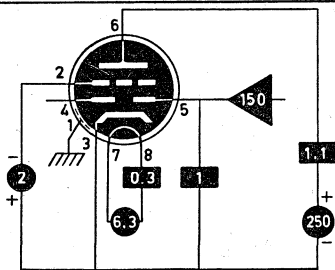
6SN7

$S=2.6 \text{ mA/V}$
 $\mu=20$
 $R_i=7.7 \text{ k}$
 $W_a=\text{max. } 2 \times 2.5 \text{ W}$



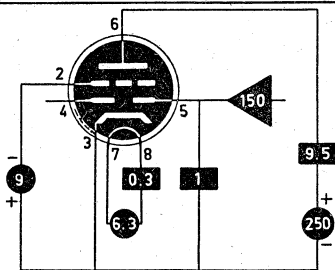
6SQ7

$S=1.18 \text{ mA/V}$
 $\mu=100$
 $R_i=85 \text{ k}$
 $W_a=\text{max. } .1 \text{ W}$



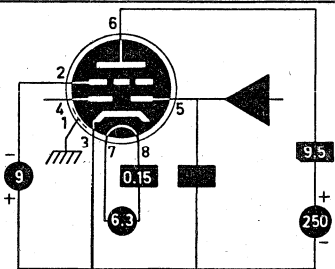
6SR7

$S=1.9 \text{ mA/V}$
 $\mu=16$
 $R_i=8.5 \text{ k}$
 $W_a=\text{max. } 2.5 \text{ W}$



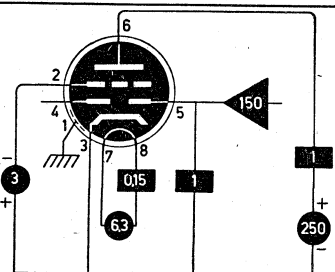
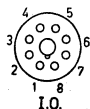
6ST7

$S=1.88 \text{ mA/V}$
 $\mu=16$
 $R_i=8.5 \text{ k}$
 $W_a=\text{max. } 2.5 \text{ W}$

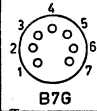


6SZ7

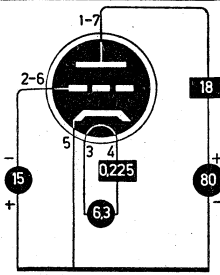
$S=1.2 \text{ mA/V}$
 $\mu=70$
 $R_i=58.7 \text{ k}$
 $P_a=\text{max. } 2.5 \text{ W}$
 $R_{eq} =$



$S = 7 \text{ mA/V}$
 $\mu = 13$
 $R_i = 1.85 \text{ k}$
 $P_a = \text{max } 3.5 \text{ W}$
 $R_{eq} =$

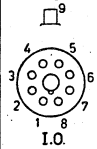


B7G

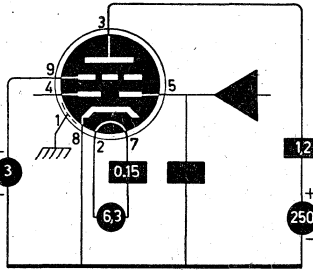


6T4

$S = 1.05 \text{ mA/V}$
 $\mu = 65$
 $R_i = 62 \text{ k}$
 $P_a = \text{max } 0.5 \text{ W}$
 $R_{eq} =$

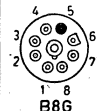


I.O.

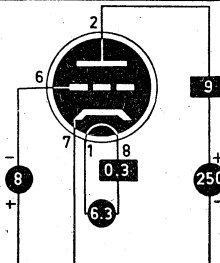


6T7

$S = 2.6 \text{ mA/V}$
 $\mu = 20$
 $R_i = 7.7 \text{ k}$
 $P_a = \text{max } 2.5 \text{ W}$

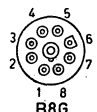


B8G

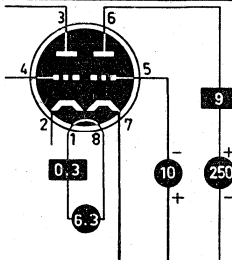


7A4

$S = 2.1 \text{ mA/V}$
 $\mu = 16$
 $R_i = 7.6 \text{ k}$
 $P_a = \text{max } 2 \times 1.5 \text{ W}$

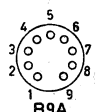


B8G

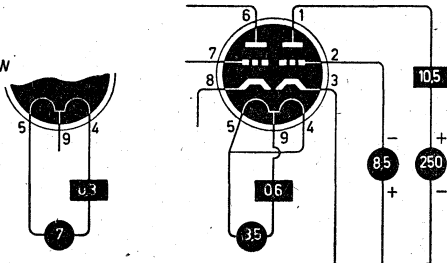


7AF7

$S = 2.2 \text{ mA/V}$
 $\mu = 17$
 $R_i = 7.7 \text{ k}$
 $P_a = \text{max } 2 \times 2.75 \text{ W}$
 $R_{eq} =$



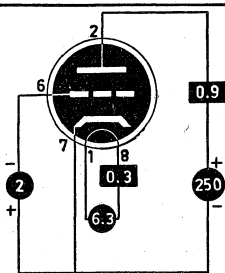
B9A



7AU7

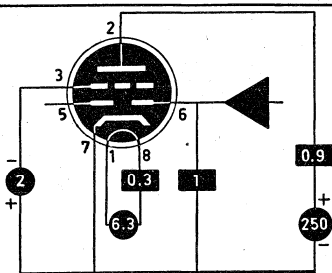
7B4

$S=1.5 \text{ mA/V}$
 $\mu=100$
 $R_i=66 \text{ k}$
 $W_a=$



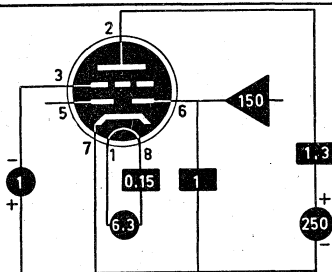
7B6

$S=1.1 \text{ mA/V}$
 $\mu=100$
 $R_i=91 \text{ k}$
 $W_a=$



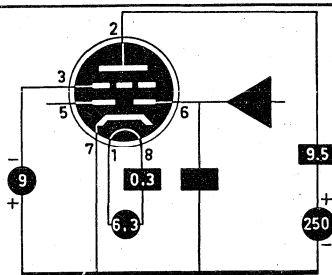
7C6

$S=1 \text{ mA/V}$
 $\mu=100$
 $R_i=100 \text{ k}$
 $W_a=$



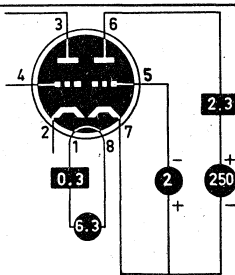
7E6

$S=1.88 \text{ mA/V}$
 $\mu=16$
 $R_i=8.5 \text{ k}$
 $W_a=\text{max. } 2.5 \text{ W}$

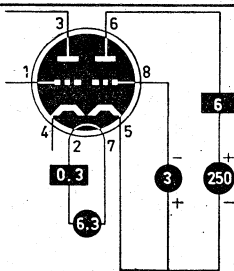
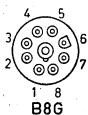


7F7

$S=1.6 \text{ mA/V}$
 $\mu=70$
 $R_i=44 \text{ k}$
 $W_a=\text{max. } 2 \times 1 \text{ W}$

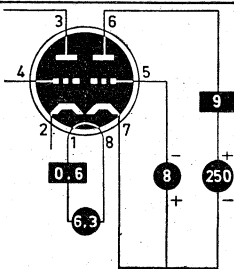
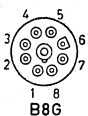


$S = 3.3 \text{ mA/V}$
 $\mu = 48$
 $R_i = 14.5 \text{ k}$
 $W_a = \text{max. } 3.5 \text{ W}$



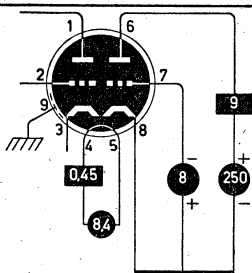
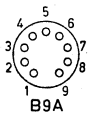
7F8

$S = 2.6 \text{ mA/V}$
 $\mu = 20$
 $R_i = 7.7 \text{ k}$
 $W_a = \text{max. } 2 \times 2.5 \text{ W}$



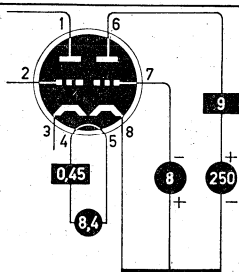
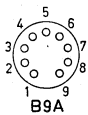
7N7

$S = 2.6 \text{ mA/V}$
 $\mu = 20$
 $R_i = 7.7 \text{ k}$
 $P_a = \text{max. } 2 \times 3.5 \text{ W}$
 $\text{Req.} =$



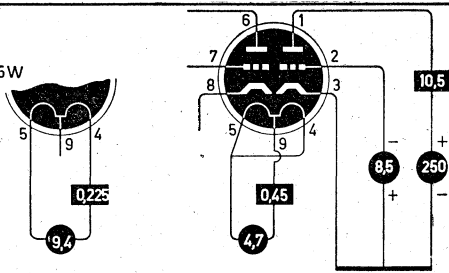
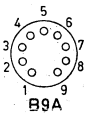
8CG7

$S = 2.6 \text{ mA/V}$
 $\mu = 20$
 $R_i = 7.7 \text{ k}$
 $P_a = \text{max. } 2 \times 4 \text{ W}$
 $\text{Req.} =$



8FQ7

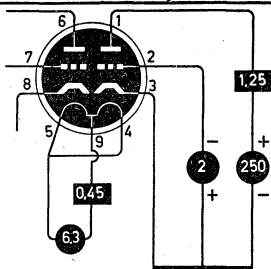
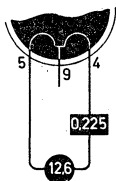
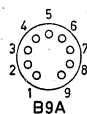
$S = 2.2 \text{ mA/V}$
 $\mu = 17$
 $R_i = 7.7 \text{ k}$
 $P_a = \text{max. } 2 \times 2.75 \text{ W}$
 $\text{Req.} =$



9AU7

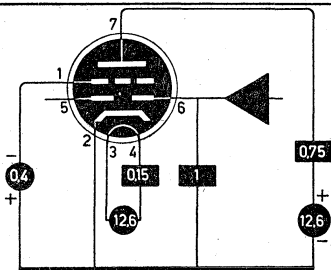
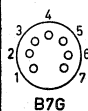
12AD7

$S = 1,6 \text{ mA/V}$
 $\mu = 100$
 $R_i = 62,5 \text{ k}$
 $P_a = \text{max. } 2 \times 1 \text{ W}$
 $R_{eq} =$



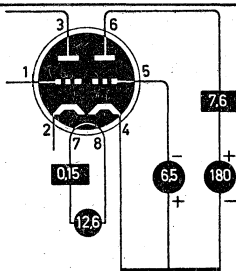
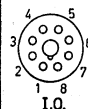
12AE6

$S = 1 \text{ mA/V}$
 $\mu = 15$
 $R_i = 15 \text{ k}$
 $P_a = \text{max. } 90 \text{ mW}$
 $R_{eq} =$



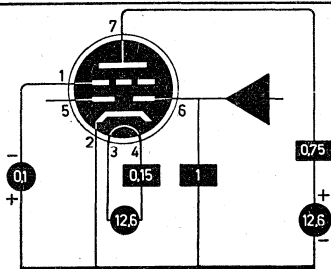
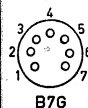
12AH7

$S = 1,9 \text{ mA/V}$
 $\mu = 16$
 $R_i = 8,4 \text{ k}$
 $P_a = \text{max. } 2 \times 1,5 \text{ W}$
 $R_{eq} =$



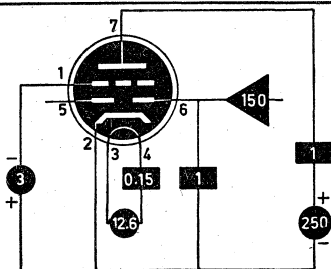
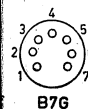
12AJ6

$S = 12 \text{ mA/V}$
 $\mu = 55$
 $R_i = 45 \text{ k}$
 $P_a = \text{max. } 90 \text{ mW}$
 $R_{eq} =$

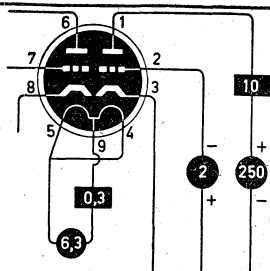
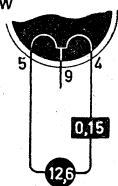
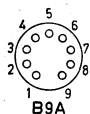


12AT6

$S = 1,2 \text{ mA/V}$
 $\mu = 70$
 $R_i = 58 \text{ k}$
 $W_a = \text{max. } 0,5 \text{ W}$

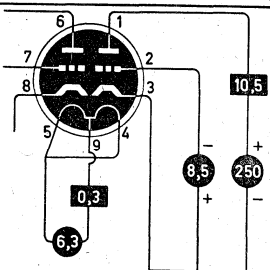
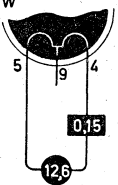
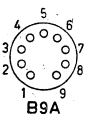


$S = 5,5 \text{ mA/V}$
 $\mu = 60$
 $R_i = 11 \text{ k}$
 $P_a = \text{max. } 2 \times 2,5 \text{ W}$
 $R_{eq} =$



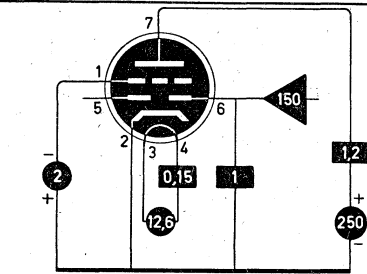
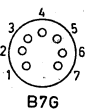
12AT7

$S = 2,2 \text{ mA/V}$
 $\mu = 17$
 $R_i = 7,7 \text{ k}$
 $P_a = \text{max. } 2 \times 2,75 \text{ W}$
 $R_{eq} =$



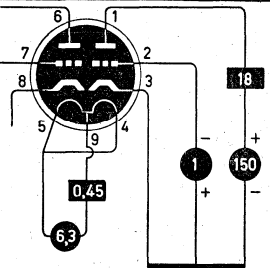
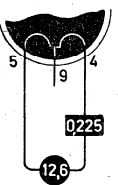
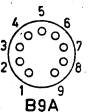
12AU7

$S = 1,6 \text{ mA/V}$
 $\mu = 100$
 $R_i = 62,5 \text{ k}$
 $P_a = \text{max. } 1 \text{ W}$
 $R_{eq} =$



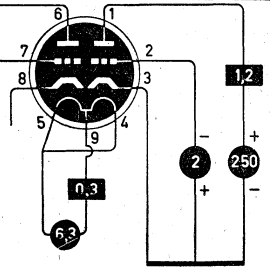
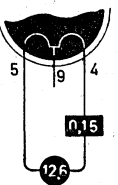
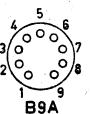
12AV6

$S = 8,5 \text{ mA/V}$
 $\mu = 41$
 $R_i = 4,8 \text{ k}$
 $P_a = \text{max. } 2 \times 2,7 \text{ W}$
 $R_{eq} =$



12AV7

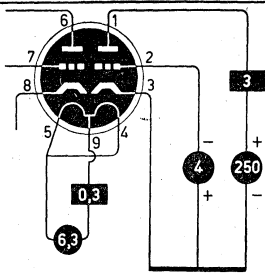
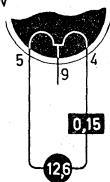
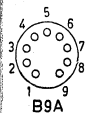
$S = 1,6 \text{ mA/V}$
 $\mu = 100$
 $R_i = 62,5 \text{ k}$
 $P_a = \text{max. } 2 \times 1 \text{ W}$
 $R_{eq} =$



12AX7

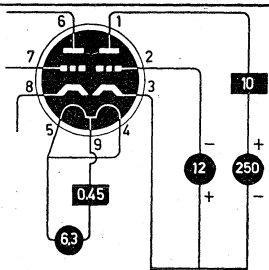
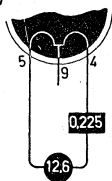
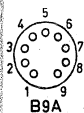
12AY7

$S = 1,75 \text{ mA/V}$
 $\mu = 40$
 $R_i = 22,8 \text{ k}$
 $P_a = \text{max } 2 \times 1,5 \text{ W}$
 $R_{eq} =$



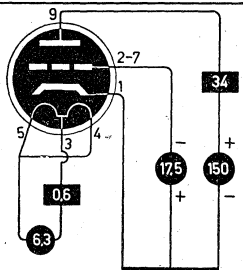
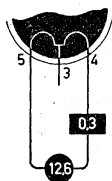
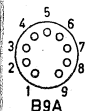
12AZ7

$S = 5,5 \text{ mA/V}$
 $\mu = 60$
 $R_i = 10,9 \text{ k}$
 $P_a = \text{max } 2 \times 2,5 \text{ W}$
 $R_{eq} =$



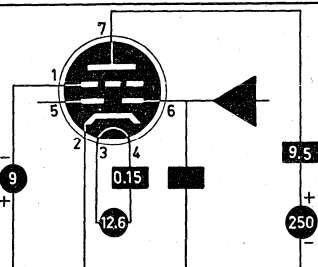
12B4A

$S = 6,3 \text{ mA/V}$
 $\mu = 6,5$
 $R_i = 1 \text{ k}$
 $P_a = \text{max } 5,5 \text{ W}$
 $R_{eq} =$



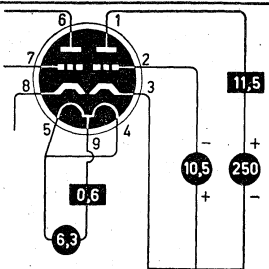
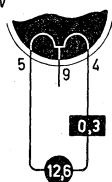
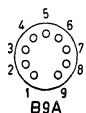
12BF6

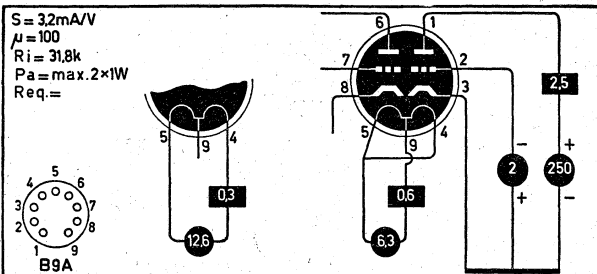
$S = 1,9 \text{ mA/V}$
 $\mu = 16$
 $R_i = 8,5 \text{ k}$
 $W_a = \text{max } 2,5 \text{ W}$



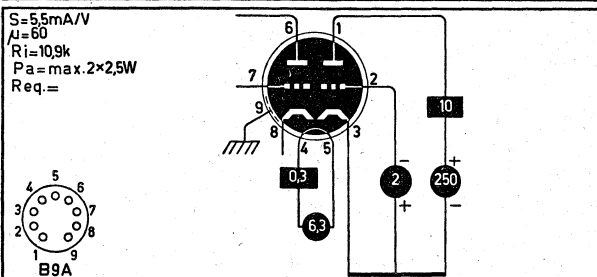
12BH7

$S = 3,1 \text{ mA/V}$
 $\mu = 16,5$
 $R_i = 5,3 \text{ k}$
 $P_a = \text{max } 2 \times 3,5 \text{ W}$
 $R_{eq} =$

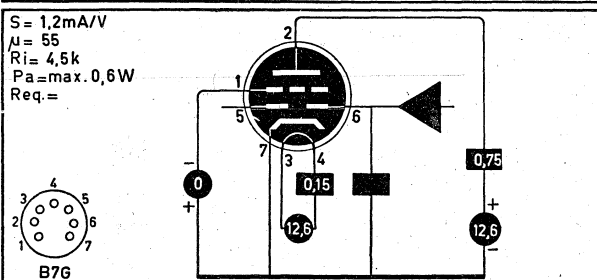




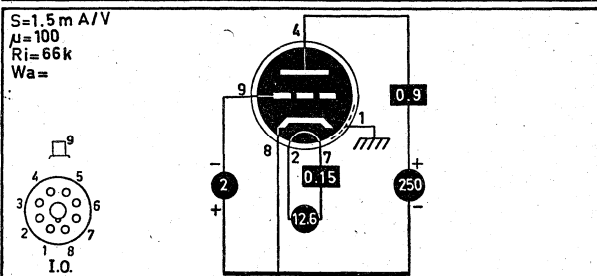
12BZ7



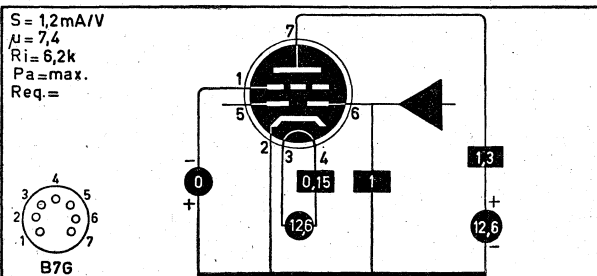
12DT8



12EL6



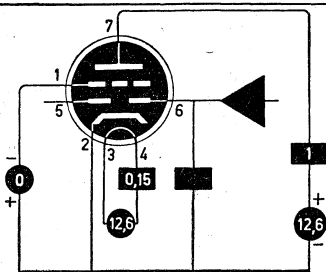
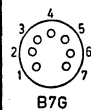
12F5



12FK6

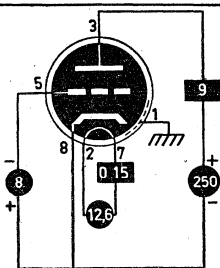
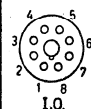
12FM6

$S = 2,4 \text{ mA/V}$
 $\mu = 13,5$
 $R_i = 5,6 \text{ k}$
 $P_a = \text{max } 0,6 \text{ W}$
 $R_{eq} =$



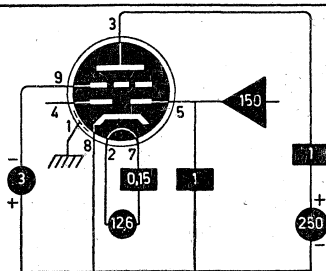
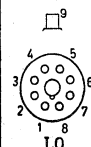
12J5

$S = 2,6 \text{ mA/V}$
 $\mu = 20$
 $R_i = 7,7 \text{ k}$
 $W_a = \text{max } 2,5 \text{ W}$



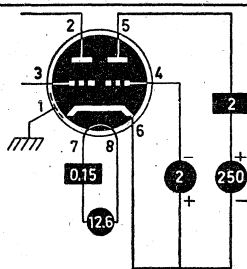
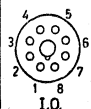
12Q7

$S = 1,2 \text{ mA/V}$
 $\mu = 70$
 $R_i = 58 \text{ k}$
 $P_a = \text{max } 0,5 \text{ W}$
 $R_{eq} =$



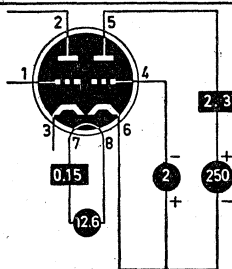
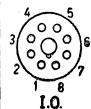
12SC7

$S = 1,325 \text{ mA/V}$
 $\mu = 70$
 $R_i = 53 \text{ k}$
 $W_a =$

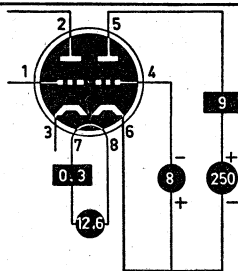
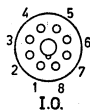


12SL7

$S = 1,6 \text{ mA/V}$
 $\mu = 70$
 $R_i = 44 \text{ k}$
 $W_a =$

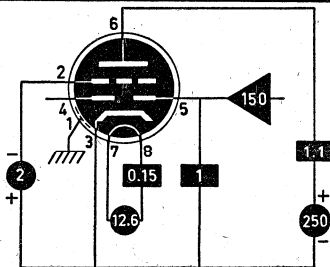
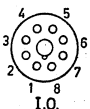


$S=2.6 \text{ mA/V}$
 $\mu=20$
 $R_i=7.7k$
 $W_a=\text{max. } 2 \times 2.5W$



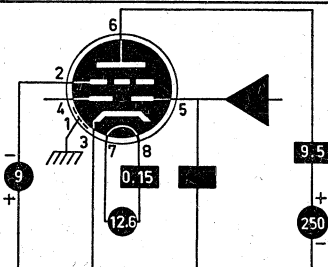
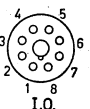
12SN7

$S=1.18 \text{ mA/V}$
 $\mu=100$
 $R_i=85k$
 $W_a=$



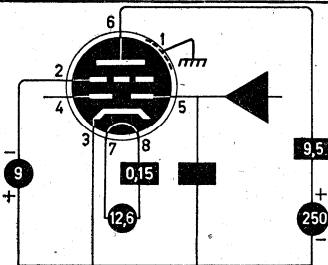
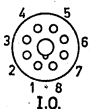
12SQ7

$S=1.9 \text{ mA/V}$
 $\mu=16$
 $R_i=8.5k$
 $W_a=\text{max. } 2.5W$



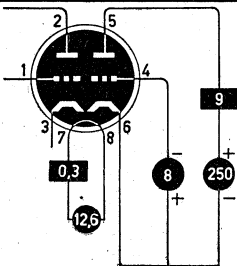
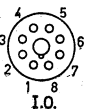
12SR7

$S=1.9 \text{ mA/V}$
 $\mu=16$
 $R_i=8.5k$
 $P_a=\text{max. } 2.5W$
 $Req.=$



12SW7

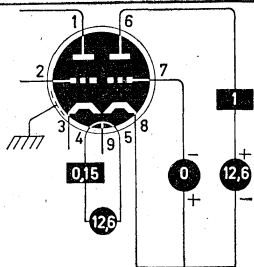
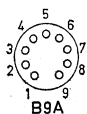
$S=2.6 \text{ mA/V}$
 $\mu=20$
 $R_i=7.7k$
 $P_a=\text{max. } 2 \times 2.5W$
 $Req.=$



12SX7

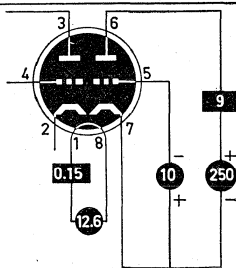
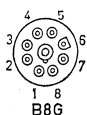
12U7

$S=1.6\text{mA/V}$
 $\mu=20$
 $R_i=12.5\text{k}$
 $P_a=\text{max.}0.45\text{W}$
 $R_{eq}=$



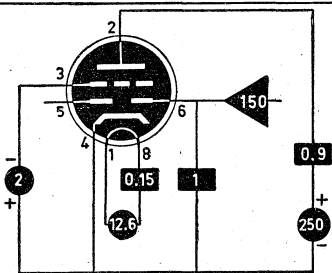
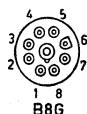
14AF7

$S=2.1\text{mA/V}$
 $\mu=16$
 $R_i=7.6\text{k}$
 $W_a=\text{max.}2 \times 2.5\text{W}$



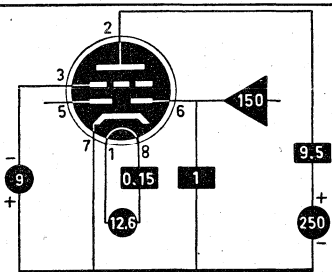
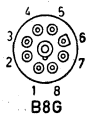
14B6

$S=1.1\text{mA/V}$
 $\mu=100$
 $R_i=91\text{k}$
 $W_a=\text{max.}0.5\text{W}$



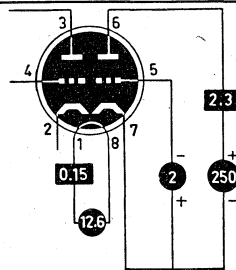
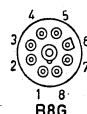
14E6

$S=1.9\text{mA/V}$
 $\mu=16$
 $R_i=8.5\text{k}$
 $W_a=\text{max.}2.5\text{W}$

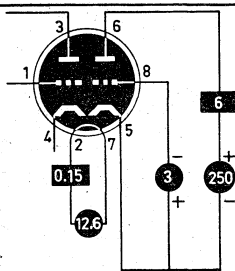
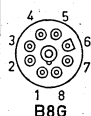


14F7

$S=1.6\text{mA/V}$
 $\mu=70$
 $R_i=44\text{k}$
 $W_a=\text{max.}2 \times 1\text{W}$

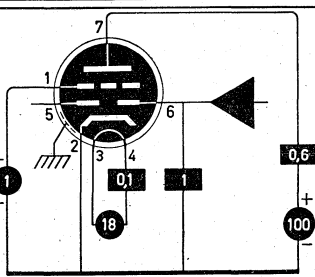
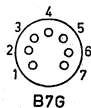


$S = 3.3 \text{ mA/V}$
 $\mu = 48$
 $R_i = 14.5 \text{ k}$
 $W_a = \text{max. } 3.5 \text{ W}$



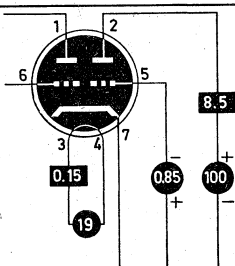
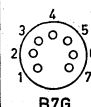
14F8

$S = 1.3 \text{ mA/V}$
 $\mu = 100$
 $R_i = 77 \text{ k}$
 $P_a = \text{max. } 0.5 \text{ W}$
 $R_{eq} =$



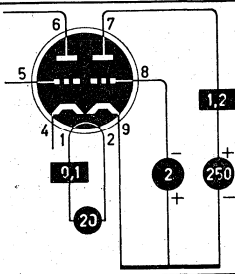
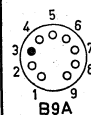
18FY6

$S = 5.3 \text{ mA/V}$
 $\mu = 38$
 $R_i = 7.1 \text{ k}$
 $W_a = \text{max. } 2 \times 1.5 \text{ W}$



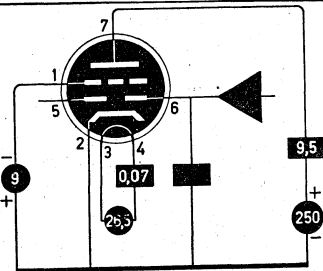
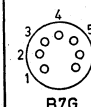
19J6

$S = 1.6 \text{ mA/V}$
 $\mu = 100$
 $R_i = 62.5 \text{ k}$
 $P_a = \text{max. } 2 \times 1.2 \text{ W}$
 $R_{eq} =$



20EZ7

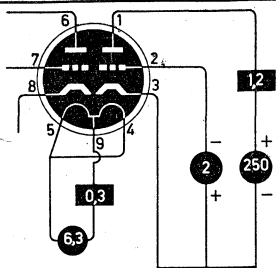
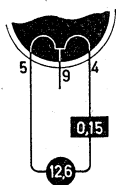
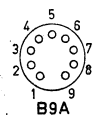
$S = 1.9 \text{ mA/V}$
 $\mu = 16$
 $R_i = 8.5 \text{ k}$
 $P_a = \text{max. } 2.5 \text{ W}$
 $R_{eq} =$



26C6

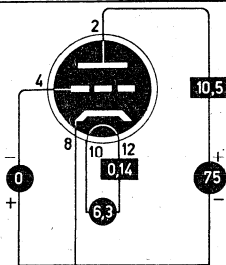
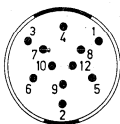
7025

$S=1,6\text{mA/V}$
 $\mu=100$
 $R_i=62,5\text{k}$
 $P_a=\text{max. } 2 \times 1\text{W}$
 $R_{eq}=$



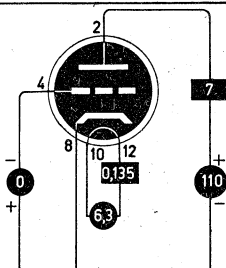
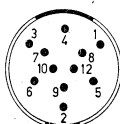
7586

$S=11,5\text{mA/V}$
 $\mu=33$
 $R_i=2,9\text{k}$
 $P_a=\text{max. } 1\text{W}$
 $R_{eq}=$



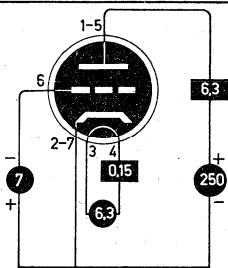
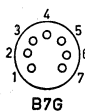
7895

$S=9,4\text{mA/V}$
 $\mu=64$
 $R_i=6,8\text{k}$
 $P_a=\text{max. } 1\text{W}$
 $R_{eq}=$



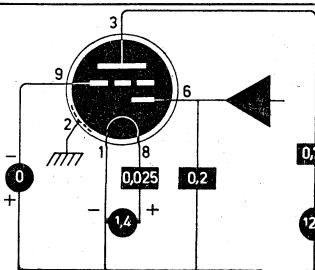
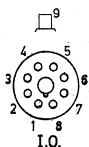
9002

$S=2,2\text{mA/V}$
 $\mu=25$
 $R_i=11,4\text{k}$
 $P_a=\text{max. } 1,6\text{W}$
 $R_{eq}=$

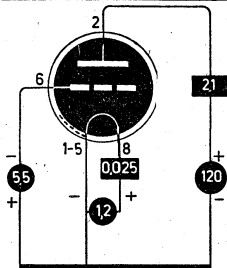
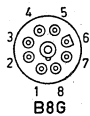


DAC21

$S=0,4\text{mA/V}$
 $\mu=40$
 $R_i=100\text{k}$
 $P_a=\text{max. } 0,1\text{W}$
 $R_{eq}=$

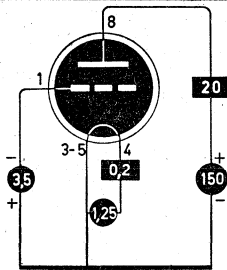
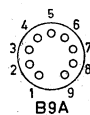


$S=0,89\text{mA/V}$
 $\mu=13$
 $R_i=15\text{k}$
 $P_a=\text{max.}0,4\text{W}$
 $R_{eq}=$



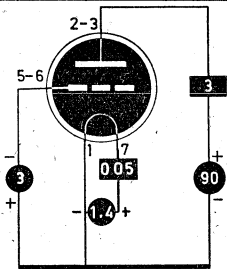
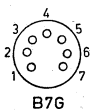
DC25

$S=3,5\text{mA/V}$
 $\mu=40$
 $R_i=$
 $P_a=\text{max.}3\text{W}$
 $R_{eq}=$



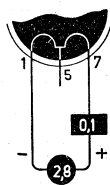
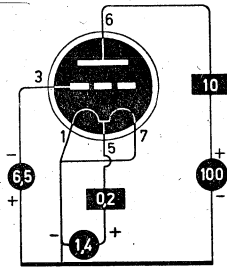
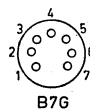
DC80

$S=1,1\text{mA/W}$
 $\mu=11,5$
 $R_i=10,4\text{k}$
 $W_a=\text{max}0,6\text{W}$



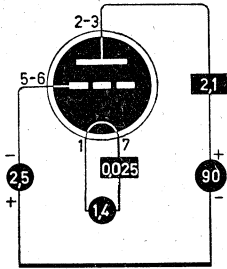
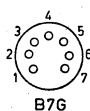
DC90

$S=2,5\text{mA/V}$
 $\mu=15$
 $R_i=3,3\text{k}$
 $P_a=\text{max.}1,8\text{W}$
 $R_{eq}=$



DC93

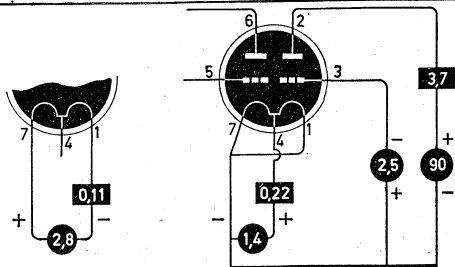
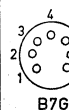
$S=1\text{mA/V}$
 $\mu=14$
 $R_i=$
 $P_a=\text{max.}0,25\text{W}$
 $R_{eq}=$



DC96

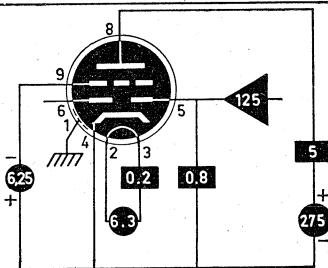
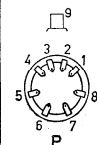
DCC90

$S=1.8\text{mA/V}$
 $\mu=15$
 $R_i=8.3\text{k}$
 $P_a=\text{max.}2\times1\text{W}$
 $R_{eq}=$



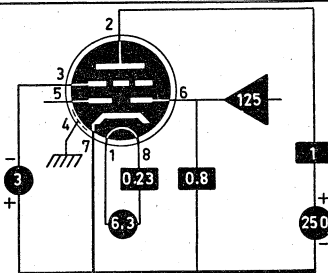
EBC3

$S=2\text{mA/V}$
 $\mu=30$
 $R_i=15\text{k}$
 $W_a=\text{max.}1.5\text{W}$



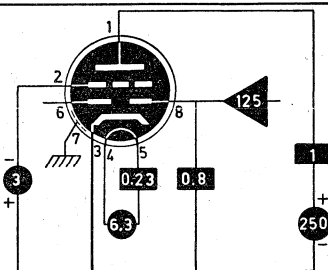
EBC41

$S=1.2\text{mA/V}$
 $\mu=70$
 $R_i=58\text{k}$
 $W_a=\text{max.}0.5\text{W}$



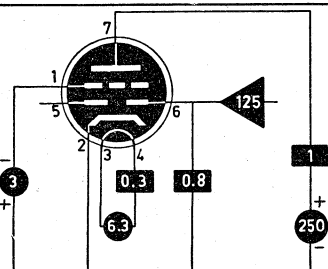
EBC81

$S=1.2\text{mA/V}$
 $\mu=70$
 $R_i=58\text{k}$
 $W_a=\text{max.}0.5\text{W}$

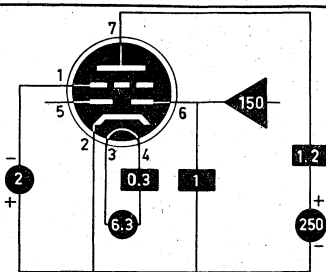
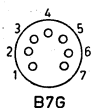


EBC90

$S=1.2\text{mA/V}$
 $\mu=70$
 $R_i=58\text{k}$
 $W_a=\text{max.}0.5\text{W}$

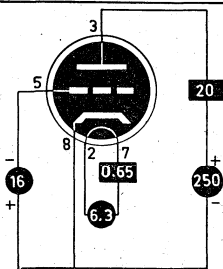
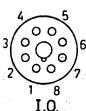


$S = 1.6 \text{ m A/V}$
 $\mu = 100$
 $R_i = 62.5 \text{ k}$
 $W_a = \text{max. } 1 \text{ W}$



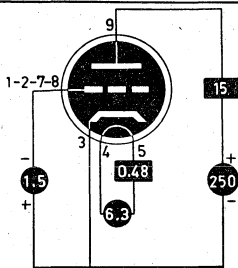
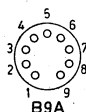
EBC9

$S = 3.2 \text{ m A/V}$
 $\mu = 10.5$
 $R_i = 3.3 \text{ k}$
 $W_a = \text{max. } 5 \text{ W}$



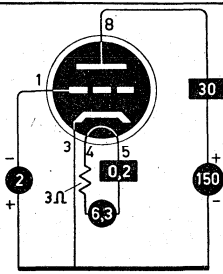
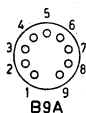
EC31

$S = 12 \text{ m A/V}$
 $\mu = 80$
 $R_i = 6.6 \text{ k}$
 $W_a = \text{max. } 4 \text{ W}$



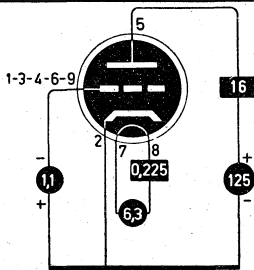
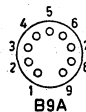
EC80

$S = 5.5 \text{ mA/V}$
 $\mu = 16$
 $R_i = 3 \text{ k}$
 $P_a = \text{max. } 3.5 \text{ W}$
 $R_{eq} =$



EC81

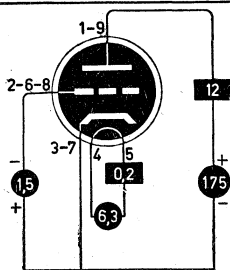
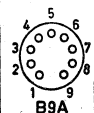
$S = 10 \text{ mA/V}$
 $\mu = 110$
 $R_i = 4.2 \text{ k}$
 $P_a = \text{max. } 2.5 \text{ W}$
 $R_{eq} =$



EC84

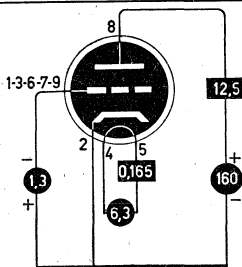
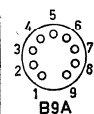
EC86

$S = 14 \text{ mA/V}$
 $\mu = 68$
 $R_i =$
 $P_a = \text{max. } 2.2 \text{ W}$
 $R_{eq} = 230 \Omega$



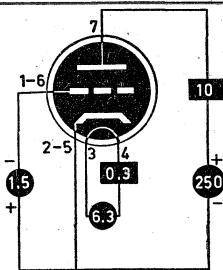
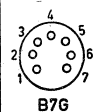
EC88

$S = 13.5 \text{ mA/V}$
 $\mu = 65$
 $R_i =$
 $P_a = \text{max. } 2 \text{ W}$
 $R_{eq} = 240 \Omega$



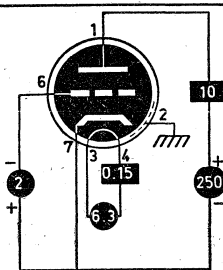
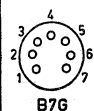
EC91

$S = 8.5 \text{ mA/V}$
 $\mu = 100$
 $R_i = 12 \text{ k}$
 $W_a = \text{max. } 2.5 \text{ W}$



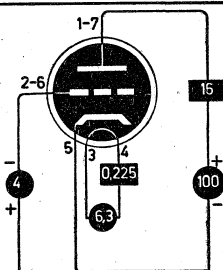
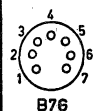
EC92

$S = 5 \text{ mA/V}$
 $\mu = 60$
 $R_i = 12 \text{ k}$
 $W_a = \text{max. } 2.5 \text{ W}$

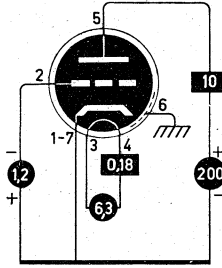
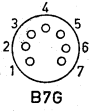


EC93

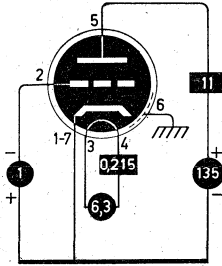
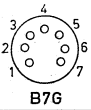
$S = 8 \text{ mA/V}$
 $\mu = 15$
 $R_i = 1.9 \text{ k}$
 $P_a = \text{max. } 2.25 \text{ W}$
 $R_{eq} =$



$S = 10,5 \text{ mA/V}$
 $\mu = 80$
 $R_i =$
 $P_a = \text{max. } 2,2 \text{ W}$
 $R_{eq} =$



$S = 13 \text{ mA/V}$
 $\mu = 65$
 $R_i = 5 \text{ k}$
 $P_a = \text{max. } 2,2 \text{ W}$
 $R_{eq} =$

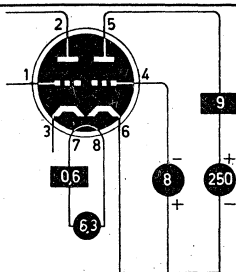
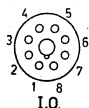


EC95

EC97

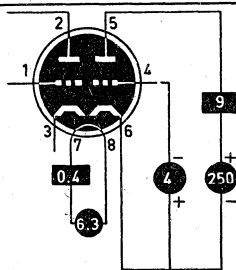
ECC32

$S=2.6\text{mA/V}$
 $\mu=20$
 $R_i=7.7\text{k}$
 $P_a=\text{max. } 2 \times 2.5\text{W}$
 $R_{eq}=$



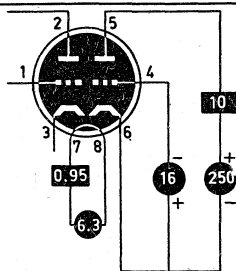
ECC33

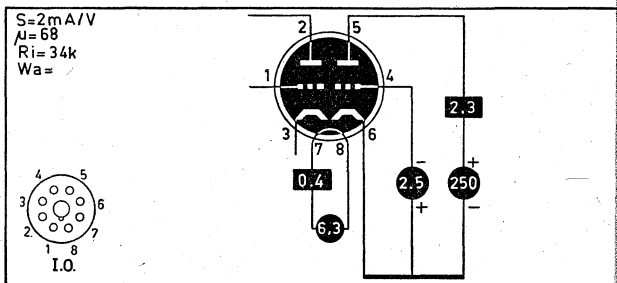
$S=3.6\text{mA/V}$
 $\mu=35$
 $R_i=9.7\text{k}$
 $W_a=$



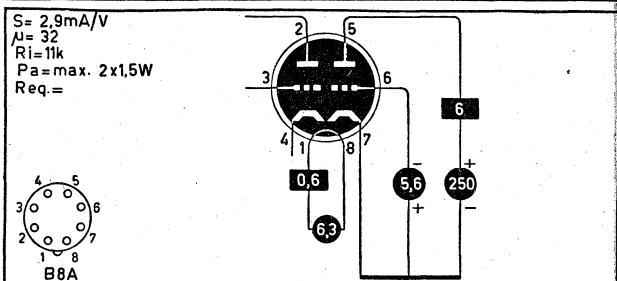
ECC34

$S=2.2\text{mA/V}$
 $\mu=11.5$
 $R_i=5.2\text{k}$
 $W_a=$

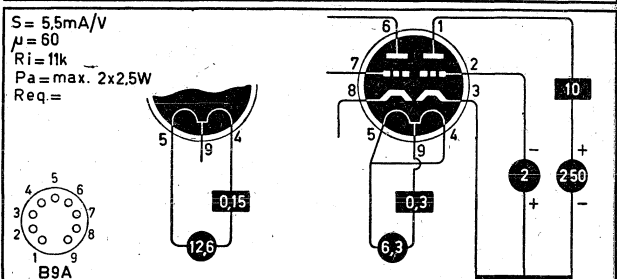




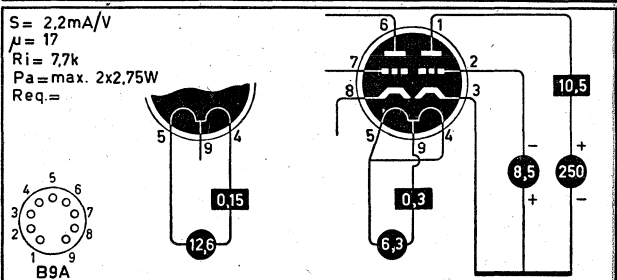
ECC35



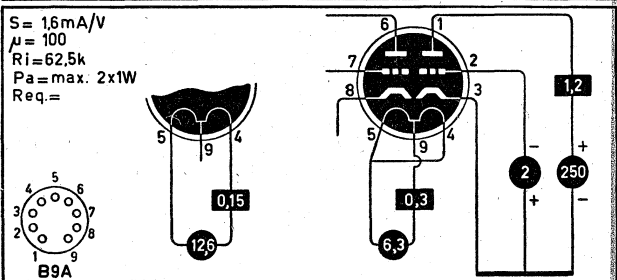
ECC40



ECC81



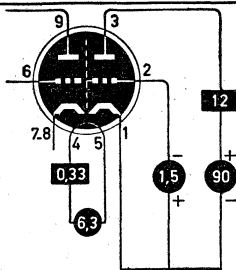
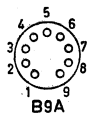
ECC82



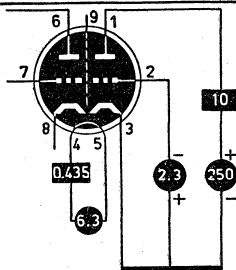
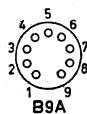
ECC83

ECC84

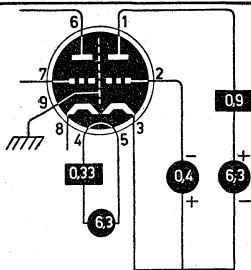
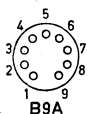
$S = 6 \text{ mA/V}$
 $\mu = 24$
 $R_i = 4 \text{ k}$
 $P_a = \text{max. } 2 \times 2 \text{ W}$
 $R_{eq} =$

**ECC85**

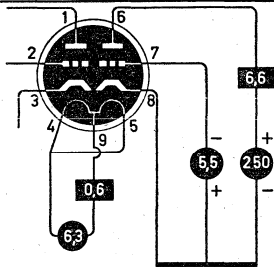
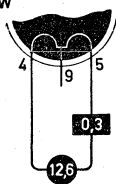
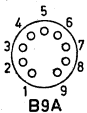
$S = 5.9 \text{ mA/V}$
 $\mu = 57$
 $R_i = 9.7 \text{ k}$
 $W_a = \text{max. } 2 \times 2.5 \text{ W}$

**ECC86**

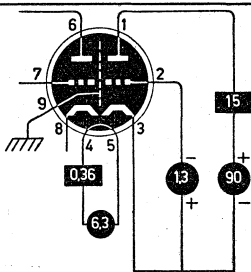
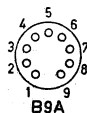
$S = 26 \text{ mA/V}$
 $\mu = 14$
 $R_i = 5 \text{ k}$
 $P_a = \text{max.}$
 $R_{eq} =$

**ECC87**

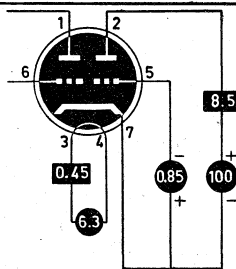
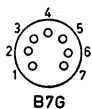
$S = 2.8 \text{ mA/V}$
 $\mu = 45$
 $R_i = 11.5 \text{ k}$
 $P_a = \text{max. } 2 \times 1.5 \text{ W}$
 $R_{eq} =$

**ECC88**

$S = 12.5 \text{ mA/V}$
 $\mu = 33$
 $R_i = 2.64 \text{ k}$
 $P_a = \text{max. } 2 \times 1.8 \text{ W}$
 $R_{eq} = 300 \Omega$

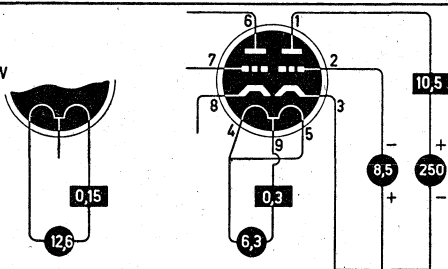
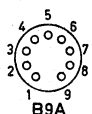


$S = 5.3 \text{ mA/V}$
 $\mu = 38$
 $R_i = 7.1 \text{ k}$
 $W_a = \max. 2 \times 1.5 \text{ W}$



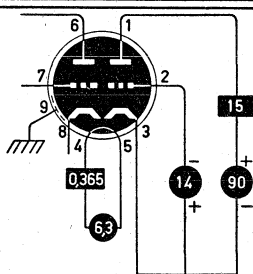
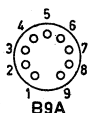
ECC91

$S = 2.2 \text{ mA/V}$
 $\mu = 17$
 $R_i = 7.7 \text{ k}$
 $P_a = \max. 2 \times 275 \text{ W}$
 $R_{eq} =$



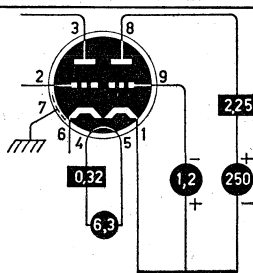
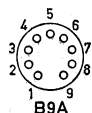
ECC186

$S = 12.5 \text{ mA/V}$
 $\mu = 65$
 $R_i = 2.5 \text{ k}$
 $P_a = \max. 2 \times 1.8 \text{ W}$
 $R_{eq} =$



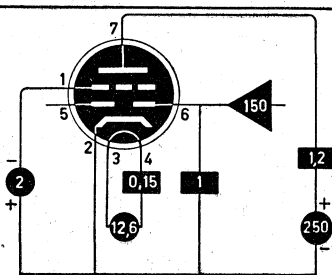
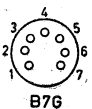
ECC189

$S = 3.3 \text{ mA/V}$
 $\mu = 140$
 $R_i = 42 \text{ k}$
 $P_a = \max. 2 \times 1 \text{ W}$
 $R_{eq} =$



ECC807

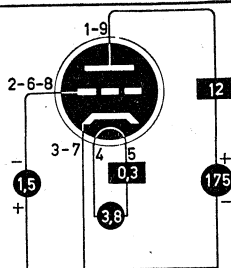
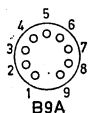
$S = 1.6 \text{ mA/V}$
 $\mu = 100$
 $R_i = 62.5 \text{ k}$
 $P_a = \max. 1 \text{ W}$
 $R_{eq} =$



HBC91

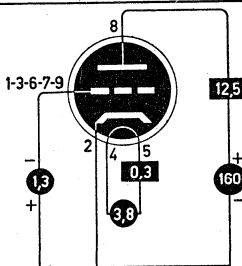
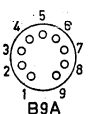
PC86

$S=14\text{mA/V}$
 $\mu=68$
 $R_i=$
 $P_a=\text{max. } 2,2\text{W}$
 $R_{eq}=230\Omega$



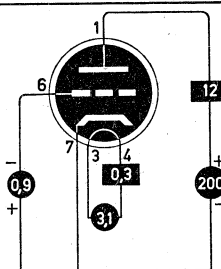
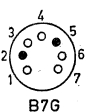
PC88

$S=13,5\text{mA/V}$
 $\mu=65$
 $R_i=$
 $P_a=\text{max. } 2\text{W}$
 $R_{eq}=240\Omega$



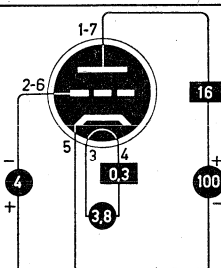
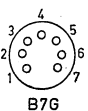
PC92

$S=7,2\text{mA/V}$
 $\mu=67$
 $R_i=$
 $P_a=\text{max. } 2,5\text{W}$
 $R_{eq}=400\Omega$



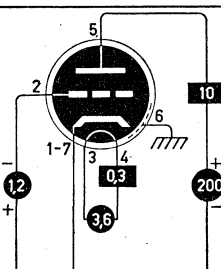
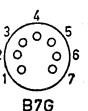
PC93

$S=8\text{mA/V}$
 $\mu=15$
 $R_i=1,9\text{k}$
 $P_a=\text{max. } 2,25\text{W}$
 $R_{eq}=$



PC95

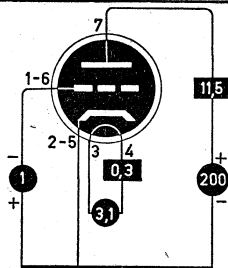
$S=10,5\text{mA/V}$
 $\mu=80$
 $R_i=$
 $P_a=\text{max. } 2,2\text{W}$
 $R_{eq}=$



$S = 6,7 \text{ mA/V}$
 $\mu = 200$
 $R_i = 10 \text{ k}$
 $P_a = \text{max. } 2,5 \text{ W}$
 $R_{eq} = 400 \Omega$



B7G

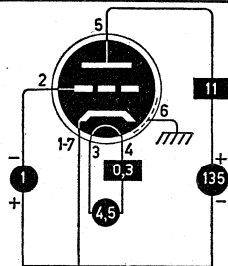


PC96

$S = 13 \text{ mA/V}$
 $\mu = 65$
 $R_i = 5 \text{ k}$
 $P_a = \text{max. } 2,2 \text{ W}$
 $R_{eq} =$



B7G

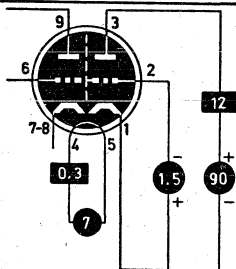


PC97

$S = 6 \text{ mA/V}$
 $\mu = 24$
 $R_i = 4 \text{ k}$
 $W_a = \text{max. } 2 \times 2 \text{ W}$



B9A

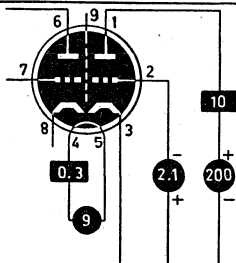


PCC84

$S = 5,8 \text{ mA/V}$
 $\mu = 48$
 $R_i = 8,3 \text{ k}$
 $W_a = \text{max. } 2 \times 2,5 \text{ W}$



B9A

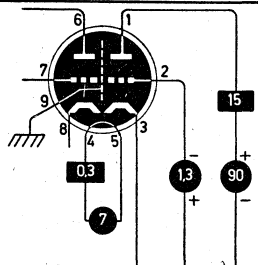


PCC85

$S = 12,5 \text{ mA/V}$
 $\mu = 33$
 $R_i = 2,64 \text{ k}$
 $P_a = \text{max. } 2 \times 1,8 \text{ W}$
 $R_{eq} = 300 \Omega$



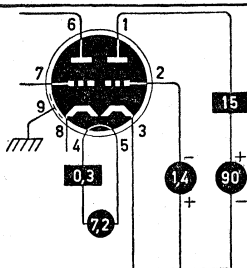
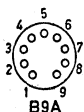
B9A



PCC88

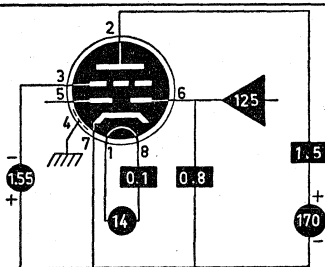
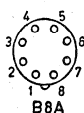
PCC189

$S = 12.5 \text{ mA/V}$
 $\mu = 65$
 $R_i = 2.5 \text{ k}$
 $P_a = \text{max. } 2 \times 1.8 \text{ W}$
 $R_{eq} =$



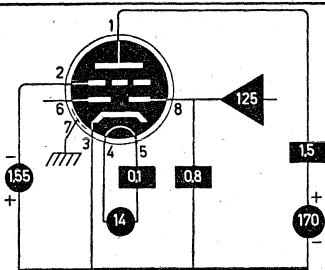
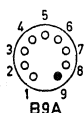
UBC41

$S = 1.65 \text{ mA/V}$
 $\mu = 70$
 $R_i = 42 \text{ k}$
 $P_a = \text{max. } 0.5 \text{ W}$



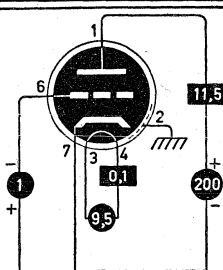
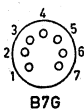
UBC81

$S = 1.65 \text{ mA/V}$
 $\mu = 70$
 $R_i = 42 \text{ k}$
 $P_a = \text{max. } 0.5 \text{ W}$
 $R_{eq} =$



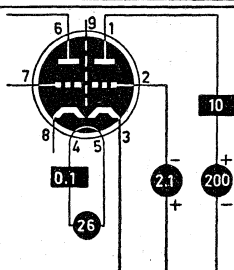
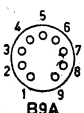
UC92

$S = 6.7 \text{ mA/V}$
 $\mu = 70$
 $R_i = 10.5 \text{ k}$
 $P_a = \text{max. } 2.5 \text{ W}$
 $R_{eq} =$



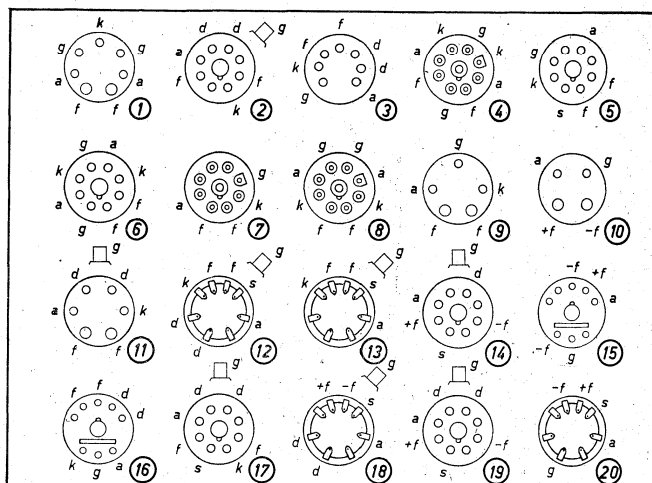
UCC85

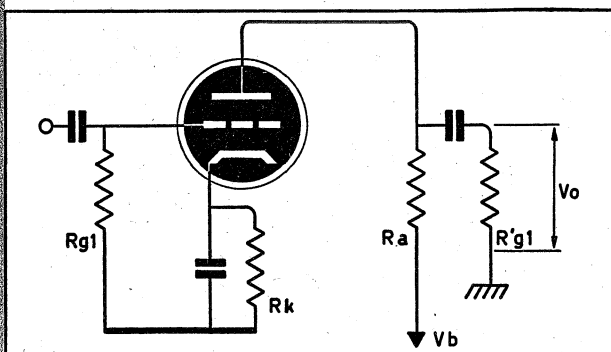
$S = 5.8 \text{ mA/V}$
 $\mu = 48$
 $R_i = 8.3 \text{ k}$
 $P_a = \text{max. } 2 \times 2.5 \text{ W}$



OBSOLETE TYPES

V_f	I_f	V_a	I_a	$-V_g$	S	μ	Base	Type
V	A	V	mA	V	mA/V		nr.	
6,3	0,8	250	6	5	3,1	35	1	6A6
6,3	0,3	250	0,9	2	1,1	100	2	6A6
6,3	0,3	250	9,5	9	1,9	16	3	6A6
6,3	0,15	180	5,5	3	3	36	4	7E5
12,6	0,15	250	0,9	2	1,5	100	5	12S65
25	0,15	250	9	8	2,6	20	6	13D1
12,6	0,15	250	9	8	2,6	20	7	14A4
12,6	0,3	250	9	8	2,6	20	8	14M7
2,5	1,75	250	5,2	21	0,9	9	9	27
2	0,06	180	3,1	13,5	0,9	9,3	10	30
2,5	2	250	6	5	3,1	35	1	53
2,5	1	250	5	13,5	1,5	13,8	9	56
6,3	0,3	250	0,9	2	1,1	100	11	75
6,3	0,3	250	5	13,5	1,5	13,8	9	76
4	0,65	250	4	7	2	27	12	ABO1
4	0,65	250	6	5,5	2,5	30	13	OC2
13	0,2	250	4	7	2	27	12	OBG1
13	0,2	250	6	5,5	2,5	30	13	OC2
1,4	0,05	90	0,2	0	0,3	65	14	DAC32
1,2	0,02	90	2	3	0,9	16	15	OC11
6,3	0,2	250	5	8	2,2	25	16	BBG11
6,3	0,2	250	5	5,5	2	30	17	BBG33
2	0,12	90	1	3,4	0,7	16	18	KBC1
2	0,05	120	1,3	1,5	1,2	25	19	KBC32
2	0,06	90	0,3	1,5	0,4	24	20	KC1
2	0,21	90	2	1,6	2,2	25	20	KC3
2	0,1	90	0,5	1,5	0,8	30	20	KC4





		Vb: 90V					
Ra	k	470			1000		
R'g1	M	1	4,7	10	2,2	4,7	10
Rk	k	-	-	-	-	-	-
Ia	mA	0,05	0,05	0,05	0,03	0,03	0,03
Vo max	Veff	4,89	6,2	6,65	5,66	6,8	7,45
A	—	28,7	32,6	33,2	35,4	37,8	39,2
d	%	4,5	4,5	4,7	4,5	4,65	4,7
		Rg1: 270 k					

		Vb: 100V					
Ra	k	100		270		470	
R'g1	k	270	470	270	470	470	1000
Rk	k	4,7	5,6	8,2	10	12	15
Ia	mA	0,23	0,21	0,13	0,12	0,09	0,08
Vo max	Veff	5	5,2	4,6	6	6,1	8,5
A	—	35,7	37,2	41,8	42,9	46,9	50
d	%	5	5,1	4,1	4,9	4,4	5

		Vb: 250V					
Ra	k	100		270		470	
R'g1	k	270	470	270	470	470	1000
Rk	k	1,8	1,8	3,3	3,3	4,7	5,6
Ia	mA	0,84	0,84	0,45	0,45	0,3	0,28
Vo max	Veff	26,5	28,5	24,5	29	25	33,5
A	—	53	52	59,8	64,4	65,8	69,8
d	%	5	4,4	4,95	4,4	4,1	4,2
		Rg1: 270 k					

1H5

6AX7
6BK6
12AX7

		V _b : 100V					
R _a	k	47		100		270	
R' _{gl}	k	100	270	100	470	270	470
R _k	k	1,8	2,2	2,7	3,9	6,8	8,2
I _a	mA	1,07	1	0,62	0,56	0,26	0,24
V _{o max}	V _{eff}	10,6	13,2	9,5	14,2	11	12,8
A	—	10,4	10,6	10,9	11,5	11,3	11,6
d	%	4,5	4,9	4,7	4,8	4,9	4,3

		V _b : 250V					
R _a	k	47		100		270	
R' _{gl}	k	100	270	100	470	270	470
R _k	k	1,5	1,8	2,2	3,3	5,6	8,2
I _a	mA	2,85	2,69	1,63	1,46	0,66	0,6
V _{o max}	V _{eff}	31,2	38	26	40,4	28,5	40,6
A	—	11,1	11,7	11,7	12,3	12,1	12,2
d	%	4,5	4,6	4,4	4,5	4,5	4,9

		R _{g1} : 270k					
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		V _b : 100V					
R _a	k	47		100		270	
R' _{gl}	k	100	270	100	470	270	470
R _k	k	1,2	1,2	2,2	2,7	6,8	8,2
I _a	mA	1,22	1,22	0,66	0,63	0,26	0,25
V _{o max}	V _{eff}	8,1	8,6	7,2	10,4	8,9	12,4
A	—	12,5	13,2	12,6	13,5	12,5	12,6
d	%	4,8	4,4	4,8	4,6	4,6	5

		V _b : 250V					
R _a	k	47		100		270	
R' _{gl}	k	100	270	100	470	270	470
R _k	k	1	1	1,5	1,8	4,7	6,8
I _a	mA	3,2	3,2	1,78	1,72	0,68	0,63
V _{o max}	V _{eff}	23	24	18,5	24,5	24,1	33,1
A	—	13,5	14,1	13,8	14,3	13,4	13,1
d	%	4,9	4,6	5	5	4,9	5

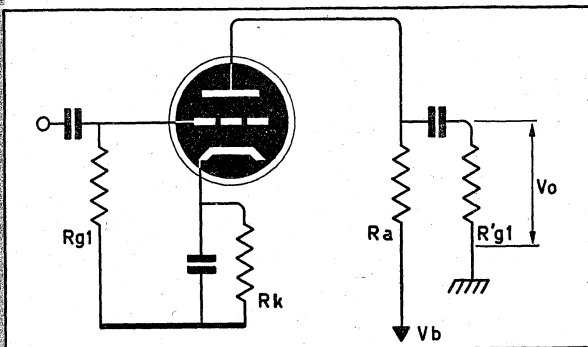
		R _{g1} : 270k					
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		V _b : 100V		V _b : 200V		V _b : 250V	
R _a	k	47	180	47	180	47	180
R' _{gl}	k	680	680	680	680	680	680
R _k	k	5,6	12	5,6	12	1,8	3,9
I _a	mA	0,4	0,2	0,8	0,35	1,8	0,75
V _o	V _{eff}	10	10	10	10	10	10
A	—	17	19	19	22	22	26
d	%	7	4,6	3,2	1,8	1	1

6BF6
6BU6
6R7
6SR7
6ST7
7E6
12BF6
12SR7
14E6

7AU7
6C4
12AU7
9AU7

EBC3



		Vb: 100V					
Ra	k	47		100		270	
R'g1	k	100	270	100	470	270	470
Rk	k	1,8	2,2	2,7	3,9	6,8	8,2
Ia	mA	0,98	0,9	0,58	0,51	0,24	0,23
Vo max	Veff	10,5	13,2	9,8	14,6	11,1	13,3
A	—	11,5	12	12,3	13,3	12,9	13,3
d	%	4	4	4,1	4,1	4,5	4,1

6C5

		Vb: 250V					
Ra	k	47		100		270	
R'g1	k	100	270	100	470	270	470
Rk	k	1,8	1,8	2,7	3,9	6,8	8,2
Ia	mA	2,5	2,5	1,45	1,28	0,6	0,57
Vo max	Veff	38,4	41,2	32,6	46,8	35	42
A	—	12,5	13,4	13,1	14,2	13,6	14
d	%	5	4	5	4,8	5	5

Rg1: 270k

6L5

		Vb: 250V					
Ra	k	47		100		270	
R'g1	k	100	270	100	470	270	470
Rk	k	1,8	2,2	2,7	4,7	8,2	10
Ia	mA	2,7	2,49	1,54	1,27	0,6	0,56
Vo max	Veff	39,2	46,5	33,4	53,5	41,6	48,5
A	—	12,3	12,8	12,8	13,4	13,4	13,9
d	%	4,5	4,5	4,4	5	5,1	4,6

Rg1: 270k

		V _b : 100V					
R _a	k	100		270		470	
R _{g1}	k	270	470	270	470	470	1000
R _k	k	3,3	3,3	5,6	5,6	8,2	10
I _a	mA	0,29	0,29	0,16	0,16	0,11	0,1
V _{o max}	V _{eff}	8	8,9	7,75	8,93	8,7	12,2
A	—	34,8	37,1	40,8	44,6	45,8	48,8
d	%	3,6	3,4	3,95	3,4	3,9	4,6
		V _b : 250V					
R _a	k	100		270		470	
R _{g1}	k	270	470	270	470	470	1000
R _k	k	1,8	2,2	3,3	3,9	5,6	6,8
I _a	mA	0,95	0,88	0,48	0,46	0,31	0,29
V _{o max}	V _{eff}	33,3	38,5	30,8	39,6	37,5	48,6
A	—	42,2	43,3	48,9	51,4	52,8	56,6
d	%	3,67	4,28	3,4	4,3	4,8	4,95
		R _{g1} : 270 k					

		V _b : 100V					
R _a	k	47		100		270	
R _{g1}	k	100	270	100	470	270	470
R _k	k	1,8	2,2	3,3	4,7	8,2	10
I _a	mA	1,05	0,97	0,57	0,5	0,24	0,22
V _{o max}	V _{eff}	12,5	15,5	12,9	19,2	13,7	17,7
A	—	13,1	13,9	13,6	14,7	14,4	14,7
d	%	3,9	4,2	4,9	4,7	4,4	4,5
		V _b : 250V					
R _a	k	47		100		270	
R _{g1}	k	100	270	100	470	270	470
R _k	k	1,5	2,2	2,7	3,9	6,8	8,2
I _a	mA	2,79	2,4	1,49	1,31	0,61	0,58
V _{o max}	V _{eff}	39,9	52,5	38,4	53	42	49,4
A	—	14,7	15	15	16,1	15,9	16,2
d	%	4,1	4,9	4,9	4,6	4,7	4,5
		R _{g1} : 270 k					

		V _b : 100V					
R _a	k	47		100		270	
R _{g1}	k	100	270	100	470	270	470
R _k	k	2,2	2,7	3,3	5,6	10	12
I _a	mA	1	0,92	0,59	0,48	0,23	0,21
V _{o max}	V _{eff}	13,7	17	12	19,5	13,7	19,1
A	—	11,4	12,2	12	12,6	12,5	13,2
d	%	4,6	5	4,5	5,1	5	4,9
		R _{g1} : 270 k					

6AQ6

6AT6

6K5

6Q7

6SZ7

12AT6

12Q7

6F8

6J5

6SN7

7A4

7N7

12J5

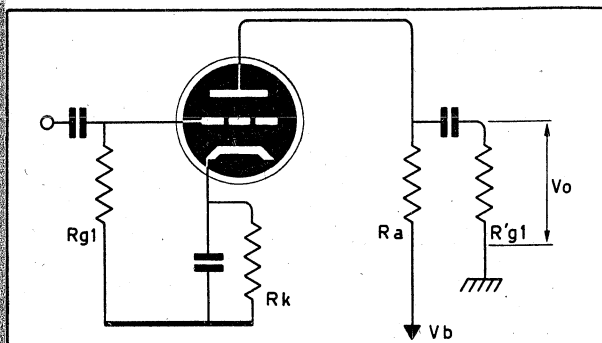
12SN7

13D1

14A4

14N7

6L5



3AV6
 6AV6
 6B6
 6F5
 6SF5
 6SQ7
 7B4
 7B6
 12AV6
 12F5
 12SF5
 12SQ7
 14B6
 75

		Vb: 100V					
Ra	k	100		270		470	
R'g1	k	270	470	270	470	470	1000
Rk	k	3,9	3,9	5,6	5,6	8,2	10
Ia	mA	0,22	0,22	0,14	0,14	0,1	0,09
Vo max	Veff	5,1	5,15	4,8	5,35	5,4	9
A	—	42,5	43	48	53,5	54	60
d	%	5,1	5	4,3	3,7	4,1	5

		Vb: 250V					
Ra	k	100		270		470	
R'g1	k	270	470	270	470	470	1000
Rk	k	1,5	1,8	2,7	2,7	3,9	4,7
Ia	mA	0,84	0,76	0,44	0,44	0,3	0,27
Vo max	Veff	26,5	30,5	24,5	27,5	23,5	34
A	—	56,4	56,5	63	70,5	71,3	75,5
d	%	4,5	5,3	5,1	4,2	5,2	5,3
		Rg1: 270 k					

		Vb: 250V					
Ra	k	100		270		470	
R'g1	k	270	470	270	470	470	1000
Rk	k	1,8	1,8	2,7	3,3	3,9	4,7
Ia	mA	0,6	0,6	0,38	0,34	0,26	0,24
Vo max	Veff	19,8	22	19,4	28	22,8	32,3
A	—	36	40	47,5	52,9	57	64,6
d	%	5	4,5	3,7	4,8	3,6	3,6
		Rg1: 270 k					

7C6

		Vb:100V					
Ra	k	47		100		270	
R'g1	k	100	270	100	470	270	470
Rk	k	1	1,2	1,8	2,2	4,7	4,7
Ia	mA	1,06	1	0,59	0,56	0,25	0,25
Vo max	Veff	6,25	8,65	4,25	9,3	8,55	8,95
A	—	21,5	22,2	21,2	23,2	21,9	23
d	%	4,3	4,9	3	4,4	4,8	4

		Vb:250V					
Ra	k	47		100		270	
R'g1	k	100	270	100	470	270	470
Rk	k	0,56	0,68	0,82	1,2	2,7	2,7
Ia	mA	3,05	2,95	1,74	1,6	0,67	0,67
Vo max	Veff	21	25,5	16,6	25,8	19,3	20,2
A	—	25,6	25,5	26	26,9	24,8	25,9
d	%	5	5	4,7	4,9	5	4,8

		Rg1:270k					
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		Vb:100V					
Ra	k	100		270		470	
R'g1	k	270	470	270	470	470	1000
Rk	k	3,3	3,3	5,6	5,6	6,8	8,2
Ia	mA	0,3	0,3	0,17	0,17	0,12	0,11
Vo max	Veff	10,3	10,4	7,7	8,6	8,5	13,5
A	—	31,2	31,5	36,6	41	42,5	45
d	%	4,9	4,8	4	3,1	3,4	4,4

		Vb:250V					
Ra	k	100		270		470	
R'g1	k	270	470	270	470	470	1000
Rk	k	1,8	2,2	3,3	3,9	4,7	5,6
Ia	mA	0,92	0,83	0,48	0,44	0,31	0,29
Vo max	Veff	33,6	41,5	36,3	46,6	38,8	48,5
A	—	38,6	40,2	43,7	48	50,4	54
d	%	4	4,8	4,5	4,8	3,9	3,7

		Rg1:270k					
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		Vb:100V					
Ra	k	100		270		470	
R'g1	k	270	470	270	470	470	1000
Rk	k	4,7	4,7	6,8	6,8	10	10
Ia	mA	0,16	0,16	0,1	0,1	0,07	0,07
Vo max	Veff	3,95	4,3	4,16	4,9	6	7,15
A	—	26,4	28,6	34,7	40,7	43	51
d	%	5	4,7	4,3	3,7	5	4

		Rg1:270k					
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7E5

6SC7

6SL7

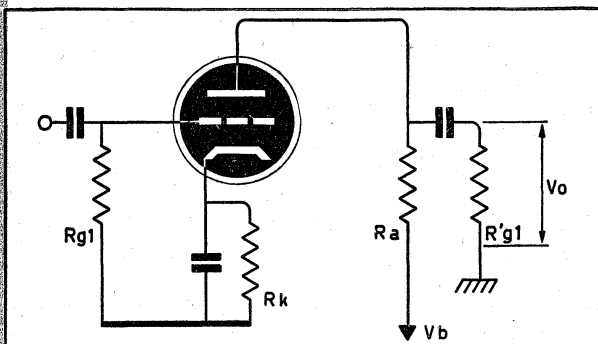
7F7

12SC7

12SL7

14F7

7C6



		Vb:100V					
Ra	k	47		100		270	
R'g1	k	100	270	100	470	270	470
Rk	k	1	1,2	1,8	2,2	4,7	4,7
Ia	mA	0,9	0,84	0,51	0,48	0,22	0,22
Vo max	Veff	4,74	6,8	4,45	8,8	6,7	7,1
A	—	26,3	26,2	26,2	29,4	28	29,6
d	%	3,7	4,8	3,6	4,7	4,3	3,7

		Vb:250V					
Ra	k	47		100		270	
R'g1	k	100	270	100	470	270	470
Rk	k	0,39	0,47	0,82	1	2,2	2,2
Ia	mA	3	2,86	1,58	1,5	0,66	0,66
Vo max	Veff	13,5	21	17,8	25,5	20,4	21,6
A	—	33,8	38,2	35,6	36,4	34	36
d	%	4	4,6	4,6	4,9	4,5	4,2

		Rg1:270 k					
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		Vb:250V			
Ra	k	100	220	100	220
R'g1	k	330	680	330	680
Rk	k	1,2	1,8	—	—
Ia	mA	1,15	0,7	1,4	0,76
Vo	Veff	10	10	10	10
A	—	43	51	44	52
d	%	1,1	0,9	0,9	0,8

		Rg1:1M		Rg1:10M	
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7F8
14F8

EBC41
EBC81

		V _b : 200V			V _b : 250V		
R _a	k	47	100	220	47	100	220
R' _{g1}	k	150	330	680	150	330	680
R _k	k	1,2	2,2	3,9	1,2	2,2	3,9
I _a	mA	2	1,1	0,58	2,6	1,4	0,72
V _{o max}	V _{eff}	30	33	32	40	44	44
A	—	20	24	24	20	24	25
d	%	3,4	3,6	3,5	3,8	3,7	3,6

		V _b : 300V			V _b : 350V		
R _a	k	47	100	220	47	100	220
R' _{g1}	k	150	330	680	150	330	680
R _k	k	1,2	2,2	3,9	1,2	2,2	3,9
I _a	mA	3,1	1,6	0,87	3,6	1,9	1
V _{o max}	V _{eff}	50	54	53	60	65	63
A	—	20	24	25	20	24	25
d	%	4	3,8	3,7	4,1	3,9	3,7

R_{g1}: 1M

ECC40

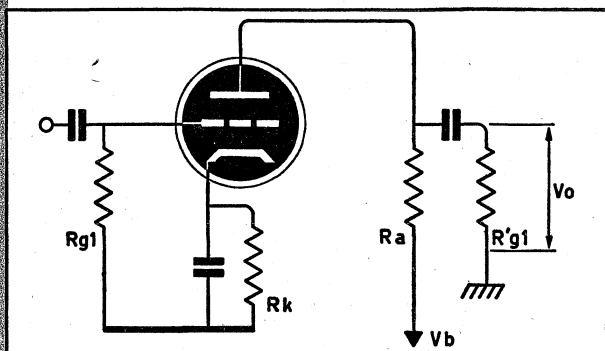
		V _b : 100V			V _b : 200V		
R _a	k	47	100	220	47	100	220
R' _{g1}	k	150	330	680	150	330	680
R _k	k	1,2	2,2	3,9	1,2	2,2	3,9
I _a	mA	1,2	0,66	0,33	2,41	1,3	0,66
V _{o max}	V _{eff}	11	10	8	26	25	22
A	—	13,5	14	14,5	13,5	14	14,5
d	%	5,6	4,8	4	6,3	5,8	4,7

		V _b : 250V			V _b : 300V		
R _a	k	47	100	220	47	100	220
R' _{g1}	k	150	330	680	150	330	680
R _k	k	1,2	2,2	3,9	1,2	2,2	3,9
I _a	mA	3,02	1,63	0,82	3,65	1,97	0,98
V _{o max}	V _{eff}	34	32	28	43	41	36
A	—	13,5	14	14,5	13,5	14	14,5
d	%	6,4	5,9	4,8	6,5	6	4,9

		V _b : 350V			V _b : 400V		
R _a	k	47	100	220	47	100	220
R' _{g1}	k	150	330	680	150	330	680
R _k	k	1,2	2,2	3,9	1,2	2,2	3,9
I _a	mA	4,3	2,3	1,16	5	2,62	1,31
V _{o max}	V _{eff}	51	49	43	59	57	50
A	—	13,5	14	14,5	13,5	14	14,5
d	%	6,6	6,1	5	6,7	6,2	5,1

R_{g1}: 1M

ECC82



		Vb: 200V			Vb: 250V		
Ra	k	47	100	220	47	100	220
R'g1	k	150	330	680	150	330	680
Rk	k	1,5	1,8	3,3	1,2	1,5	2,7
la	mA	0,86	0,65	0,36	1,18	0,86	0,48
Vo max	Veff	18	20	24	23	26	28
A	—	34	50	56	37,5	54,5	66,5
d	%	8,5	4,8	4,6	7	3,9	3,4

ECC83

		Vb: 300V			Vb: 400V		
Ra	k	47	100	220	47	100	220
R'g1	k	150	330	680	150	330	680
Rk	k	1	1,2	2,2	0,68	0,82	1,2
la	mA	1,55	1,11	0,63	2,45	1,72	1,02
Vo max	Veff	26	30	36	37	38	38
A	—	40	57	72	44	63	76,5
d	%	5	2,7	2,6	3,6	1,7	1,1
		Rg1: 1M					

UBC41
UBC81

		Vb: 100V			Vb: 170V		
Ra	k	100	220	220	100	220	220
R'g1	k	330	680	680	330	680	680
Rk	k	3,9	5,6	—	3,9	5,6	—
la	mA	0,28	0,18	0,21	0,45	0,28	0,46
Vo	Veff	5	5	5	5	5	5
A	—	34	41	41	37	44	48
d	%	3,5	1,9	2	1,7	1,3	1,1
		Rg1: 1M		10M	Rg1: 1M		10M

		$V_b = 100V$					
R_a	k	47		100		270	
R_{g1}	k	100	270	100	470	270	470
R_k	k	1,8	1,8	2,7	3,3	6,8	6,8
I_a	mA	0,81	0,81	0,51	0,47	0,23	0,23
$V_o \text{ max}$	V_{eff}	6,8	7,6	5,7	10,9	9,3	10
A	—	17,1	19,1	19,2	21,8	22	23,8
d	%	4,7	3,7	3,7	4,8	5	4,2
		$V_b = 250V$					
R_a	k	47		100		270	
R_{g1}	k	100	270	100	470	270	470
R_k	k	1	1,2	1,5	1,8	3,3	3,9
I_a	mA	2,36	2,21	1,45	1,36	0,64	0,61
$V_o \text{ max}$	V_{eff}	23,8	30,4	21,8	30,5	23	28,8
A	—	19,8	21,7	21,8	25	25,6	26,2
d	%	4,5	4,9	4,8	4,7	4,7	5
		$R_{g1} = 270k$					

6A6
6N7
53

	=		Y	
-1E3-	DC80	-	-	-
1G4	-	CV1817	-	-
1H5G	-	CV1818	-	-
1H5GT	-	CV1820	-	-
1LH4	-	CV780	-	-
2AF4	-	-	6AF4	-
2BN4	-	-	3BN4 6BN4	-
2CW4	-	-	6CW4	-
2ER5	-	-	6ER5	-
2T4	-	-	6T4	-
3A5	DCC90	CV808	-	-
3AV6	-	-	4AV6 6AV6 6BK6 12AV6 EBC91 HBC91	-
3BN4	-	-	2BN4 6BN4	-
3GK5	-	-	6GK5	-
4AV6	-	-	6AV6 12AV6	-
4BC8	-	-	6BC8	-
4BQ7A	-	-	6BQ7A	-
4BS8	-	-	6BS8	-
4BZ7	-	-	6BZ7	-
4ES8	-	-	6ES8	-
5BK7A	-	-	6BK7A	-
5BQ7A	-	-	6BQ7A	-
5J6	-	-	6J6 19J6 ECC91	-
6A6	-	CV1867	53	6N7
6AB4	EC92	-	-	-
6AF4	-	-	2AF4	-
-6AJ4-	EC84	-	-	-
-6AQ4-	EC91	-	-	-
6AQ6	-	-	6AT6 12AT6 EBC90	-
-6AQ8-	ECC85	-	-	-
6AT6	EBC90	CV452	6AQ6 12AT6 EBC90	-
6AV6	EBC91	CV2525 CV2526	3AV6 6BK6 12AV6 HBC91	-
6AX7	-	-	12AX7 ECC83	-
6B6	-	ARP29	-	7B6
6B6G	-	CV1887	-	-
6BC8	-	-	4BC8	-
-6BD7A-	EBC81	-	-	-
6BF6	-	-	12BF6	7E6
6BK6	-	-	3AV6 6AV6 12AV6 EBC91	-
6BK7A	-	-	5BK7A	-

				
6BN4	-	-	2BN4 3BN4	-
6BQ7A	-	-	5BQ7A	-
-6BS4-	EC93	-	-	-
6BS8	-	-	4BS8	-
6BU6	6BF6	-	-	-
6BZ7	-	-	4BZ7	-
6C4	-	CV133 CV852	-	-
6C5	-	CV582 CV583	-	-
6C5G	-	CV581 VT65A x)	-	-
6CW4	-	-	2CW4	-
-6CW7-	ECC84	-	-	-
6ER5	-	-	2ER5	-
6ES8	-	-	4ES8	-
6F5	-	CV1908 CV1909 CV1910	-	6SF5
6F8	-	CV1917 CV1918	-	6SN7
6FQ7	-	-	8FQ7	-
6GK5	-	-	3GK5	-
6J4	-	CV1763	-	-
6J5	-	CV1067 CV1933 VT94 x)	12J5	7A4
6J5G	-	CV1932 NR78A VR67 VT94A x)	-	-
6J5GT	-	CV1934 VT94D x)	-	-
6J6	ECC91	CV858 CV2010 CV2843	5J6 19J6	-
6J6WA	-	CV4031	-	-
6K5	-	CV861	-	-
6K5G	-	CV860	-	-
6L5	-	CV862	-	-
6N7	-	CV1957	6A7	53
6N7G	-	CV1285 CV1956	-	-
6N7GT	-	CV1958	-	-
6P5	-	CV1819	-	-
-6Q4-	EC80	-	-	-
6Q7	-	CV588 VT92 x)	12Q7	-
6Q7G	-	CV587 AR18 NR68 VT92A x)	-	-
6Q7GT	-	CV589	-	-
-6R4-	EC81	-	-	-
6R7	-	CV1963 CV1964 VT88 x)	-	6SR7
6R7G	-	CV1962 VT88A x)	-	-
6R7GT	-	VT88B x)	-	-

x) American VT

		==		
6SC7	-	CV1969 CV2716 VT105 x)	12SC7	-
6SC7GT	-	CV1970	-	-
6SF5	-	CV1972 CV1973	12SF5	6F5 7B4
6SL7	-	CV1984	12SL7	-
6SL7GT	-	CV1985 VT229 x)	-	-
6SN7	-	-	12SN7	7N7
6SN7G	-	CV1986	-	-
6SN7GT	-	CV1988 VT231 x)	-	-
6SQ7	-	CV1990 CV1991 VT103 x)	12SQ7	-
6SR7	-	CV867 VT233 x)	12SR7	-
6ST7	-	CV1995 CV1996 VT205 x)	7E6	7E6
6T4	-	-	2T4	-
6T7G	-	CV500	-	-
7A4	-	CV1770 VT192 x)	14A4	6J5
7AF7	-	-	14AF7	-
-7AN7-	PCC84	-	-	-
7AU7	-	-	9AU7 12AU7 ECC82	-
7B4	-	CV879	-	6SF5
7B6	-	CV882	14B6	6B6
7C6	-	CV887	-	-
7E5	-	CV890 CV2704	-	-
7E6	-	CV891 VT188 x)	14E6	6BF6
7F7	-	CV893 VT189 x)	14F7	6SL7
7F8	-	-	14F8	-
7N7	-	CV898	14N7	6SN7
8FQ7	-	-	6FQ7	-
-9AQ8-	PCC85	-	-	-
9AU7	-	-	7AU7 12AU7 ECC82	-
12AH7G	-	VT207 x)	-	-
12AH7GT	-	CV529	-	-
12AT6	-	-	6AQ6 6AT6 EBC90	-
12AT7	ECC81	CV455	-	-
12AU7	ECC82	CV491 CV2007 CV2011	7AU7 9AU7	-
12AV6	HBC91	-	3AV6 4AV6 6AV6 6BK6 EBC91	-
12AX7	ECC83	CV492	6AX7	-
12AY7	-	CV3650	-	-

x) American VT

	=		Y	
12BF6	-	-	6BF6	-
12F5	-	-	6F5	-
12J5	-	CV534 VT135A x)	6J5	-
12J5GT	-	CV535 VT135 x)	-	-
12Q7	-	-	6Q7	-
12SC7	-	CV540 VT268 x)	6SC7	-
12SF5	-	CV919 CV920	6SF5	12F5
12SL7	-	VT289 x)	6SL7	-
12SL7GT	-	CV924	-	-
12SN7	-	-	6SN7	14N7
12SN7GT	-	CV925	-	-
12SQ7	-	CV546 CV547 VT104 x)	6SQ7	-
12SR7	-	CV700	6SR7	-
13D1	-	CV423	6SN7	-
13D3	-	CV2212	-	-
14A4	-	-	7A4	12J5
14AF7	-	-	7AF7	-
14B6	-	-	7B6	6B6
14E6	-	-	6BF6 7E6	6BF6
14F7	-	CV930	7F7	12SL7
14F8	-	-	7F8	-
-14L7-	USC41	-	-	-
14N7	-	-	7N7	12SN7
19J6	-	-	5J6 6J6 ECC91	-
30	-	CV604	-	-
53	-	CV2535	6A6	6N7
56	-	CV611	-	-
75	-	CV614	-	-
76	-	CV615	-	-
9002	-	CV664	-	-
ABC1	-	-	CBC1	-
AC2	-	-	CC2	-
CBC1	-	-	ABC1	-
CC2	-	-	AC2	-
DAC21	-	CV2887	-	-
DC80	-1E3-	-	-	-
DCC90	3A5	-	-	-
EBC3	-	CV1428 CV1715	-	EBC33
EBC33	-	CV352 CV1055 VR55	-	EBC3
EBC41	-	CV3882	EBC90 6AQ6 6AT6 12AT6	EBC81 EBC90
EBC81	-6B07A-	-	EBC90 6AQ6 6AT6 12AT6	EBC41 EBC90
EBC90	6AT6	-	12AT6	EBC41 EBC81
EBC91	6AV6	-	12AV6	-

x) American VT

				
EC31	-	CV1433	-	-
EC80	-6Q4-	-	-	-
EC81	-6R4-	-	-	-
EC84	-6A34-	-	-	-
EC86	-	-	PC86	-
EC88	-	-	PC88	-
EC91	-6AQ4-	CV139 CV417 CV419	-	-
EC92	6AB4	-	-	-
EC93	-6BS4-	-	PC93	-
EC95	-	-	PC95	-
EC97	-	-	PC97	-
ECC32	6SN7	CV181	12SN7	-
ECC33	-	CV2821	-	-
ECC35	-	CV569	-	-
ECC40	-	CV3884	-	-
ECC81	12AT7	-	-	-
ECC82	12AU7	-	7AU7 9AU7	-
ECC83	12AX7	-	6AX7	-
ECC84	-6CW7-	-	PCC84	-
ECC85	-6AQ8-	-	-	-
ECC88	-	-	PCC88	-
ECC91	6J6	-	5J6 19J6	-
ECC189	-	-	PCC189	-
HBC91	12AV6	-	3AV6 4AV6 6AV6 EBC91	-
PC86	-	-	EC86	-
PC88	-	-	EC88	-
PC93	-	-	EC93	-
PC95	-	-	EC95	-
PC97	-	-	EC97	-
PCC84	-7AN7-	-	ECC84	-
PCC85	-9AQ8-	-	UCC85	-
PCC88	-	-	ECC88	-
PCC189	-	-	ECC189	-
UBC41	-14L7-	-	-	UBC81
UBC81	-	-	-	UBC41
UCC85	-	-	PCC85	-

RADIO Bulletin ★

HET MEEST GELEZEN RADIO TIJDSCHRIFT
IN HET NEDERLANDSE TAALGEBIED

- INTERESSANTE NIEUWTJES
- SCHAKELINGEN
- ONTWERPEN MET BOUWTEKENINGEN
- RECORDER TIPS
- SERVICE PROBLEMEN
- AUDIO
- MEETTECHNIEK

EN VELE ANDERE BELANGWEKKENDE ONDERWER-
PEN WORDEN WETENSCHAPPELIJK EN BEGRIJPelijk
BEHANDELD DOOR EEN STAF VAN DESKUNDGEN.

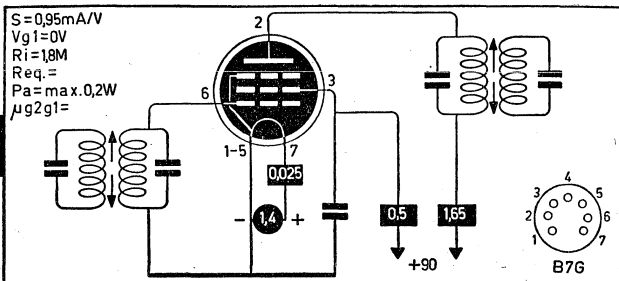
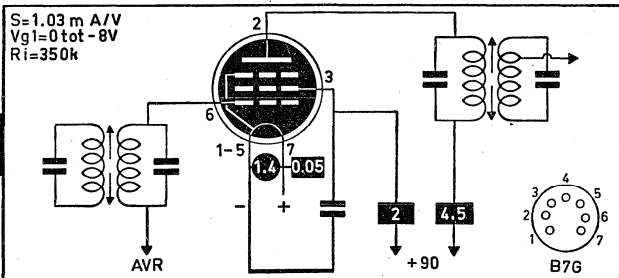
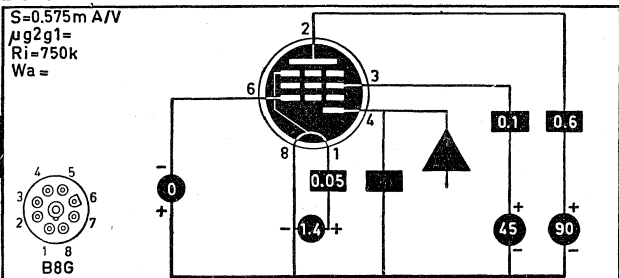
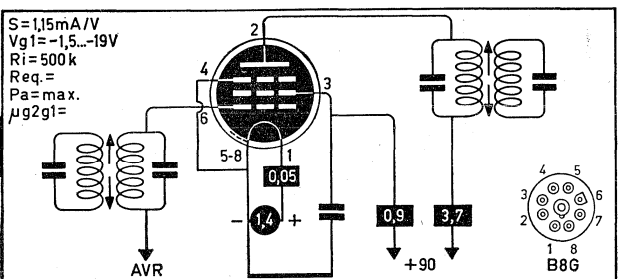
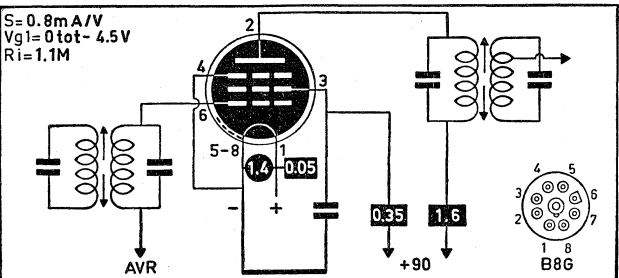
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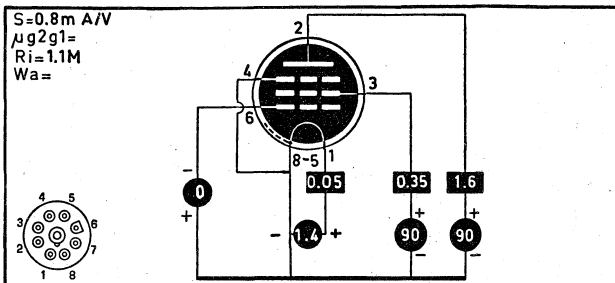
EEN PROEFNUMMER WORDT U OP
AANVRAAG GRATIS TOEGEZONDEN

●

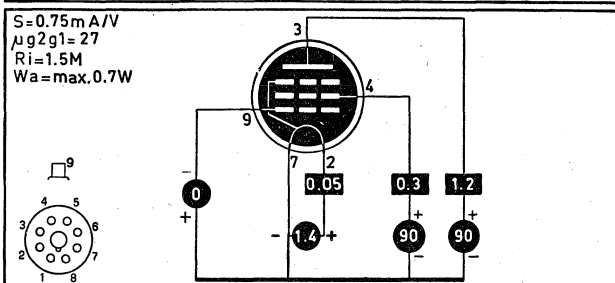
JAARABONNEMENT (12 NUMMERS) f 8,50
BELGISCHE EDITIE (12 NUMMERS) 120,- FR.
OVERIG BUITENLAND f 9,50

D E M U I D E R K R I N G N.V.
BUSSUM - NEDERLAND

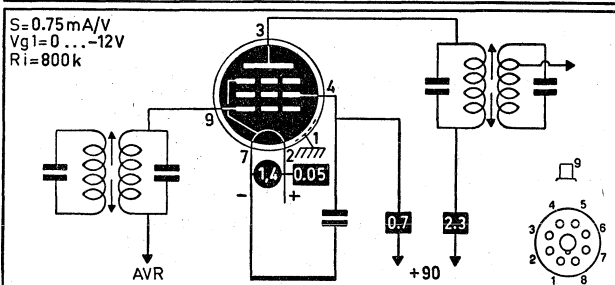
1AF4**1L4****1LD5****1LG5****1LN5**



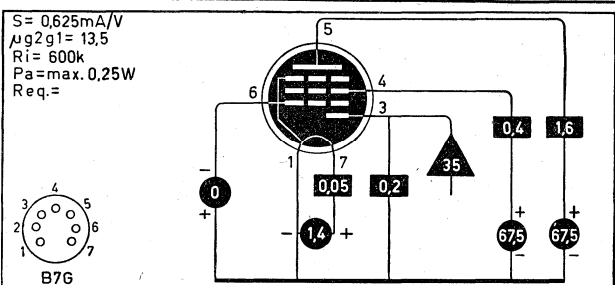
1LN5



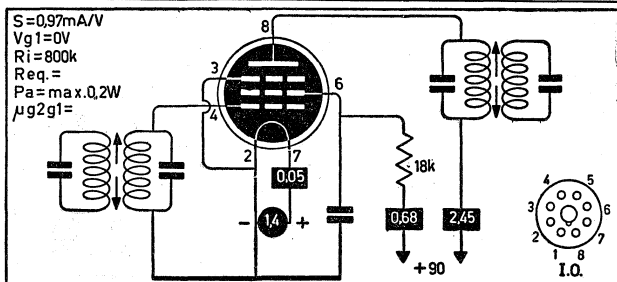
1N5



1P5



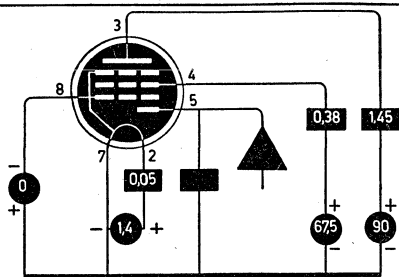
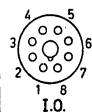
1S5



1SA6

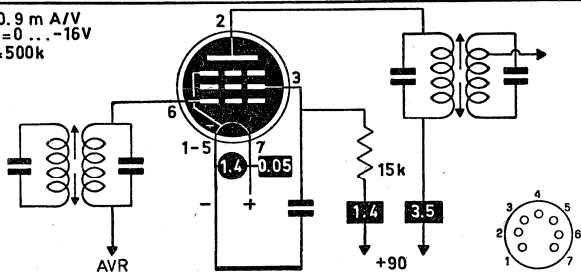
1S86

$S=0.66\text{mA/V}$
 $\mu g_{2g1}=$
 $R_i=700\text{k}$
 $P_a=\text{max. } 0.15\text{W}$
 $R_{eq}=$



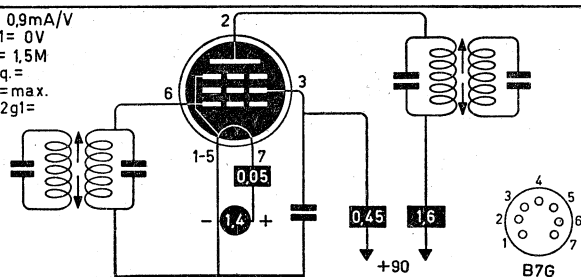
1T4

$S=0.9\text{ mA/V}$
 $V_{g1}=0 \dots -16\text{V}$
 $R_i=500\text{k}$



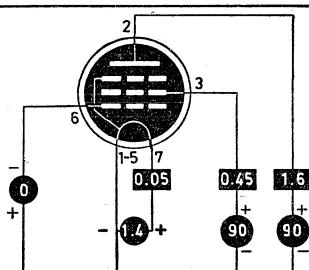
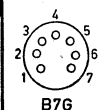
1U4

$S=0.9\text{mA/V}$
 $V_{g1}=0\text{V}$
 $R_i=1.5\text{M}$
 $R_{eq}=$
 $P_a=\text{max.}$
 $\mu g_{2g1}=$



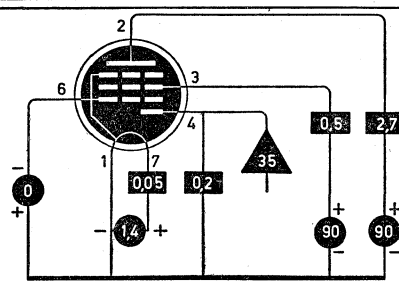
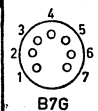
1U4

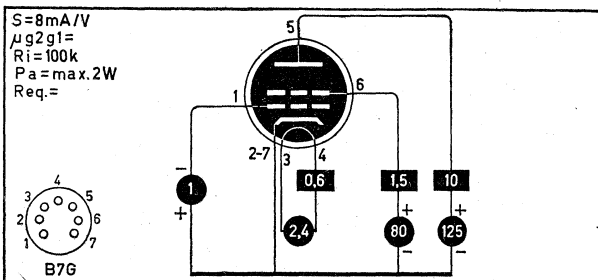
$S=0.9\text{mA/V}$
 $\mu g_{2g1}=$
 $R_i=1.5\text{M}$
 $W_a=\text{max. } 0.7\text{W}$



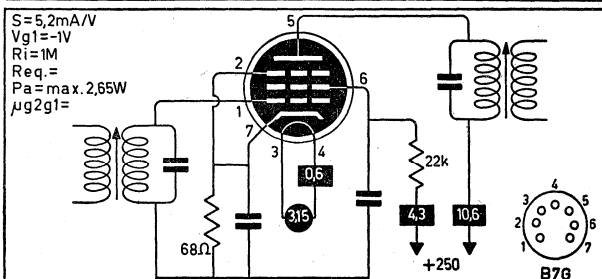
1U5

$S=0.72\text{mA/V}$
 $\mu g_{2g1}=13.5$
 $R_i=500\text{k}$
 $P_a=\text{max. } 0.25\text{W}$
 $R_{eq}=$

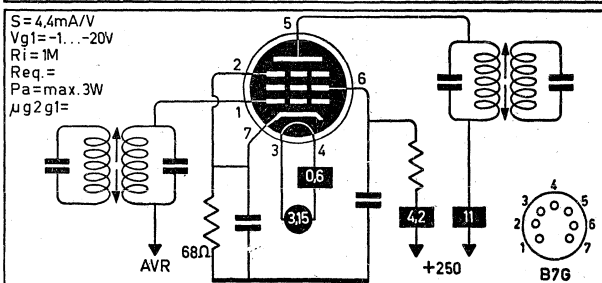




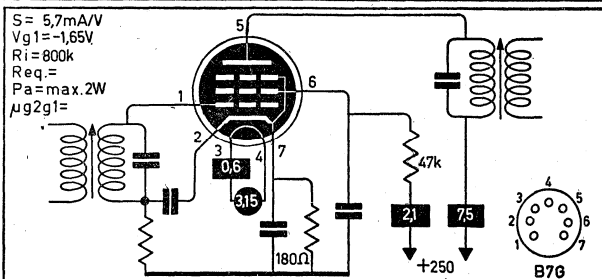
2CY5



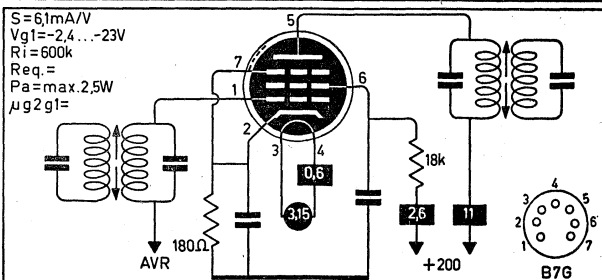
3AU6



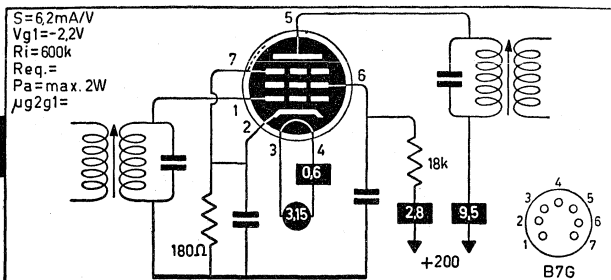
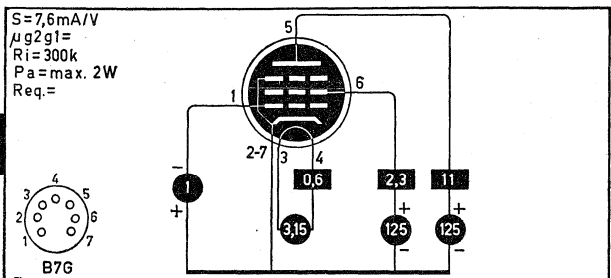
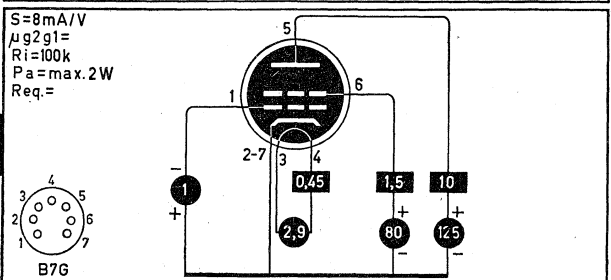
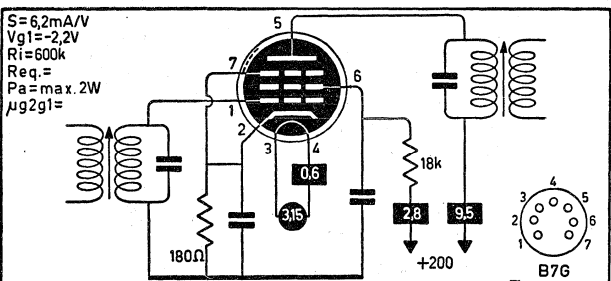
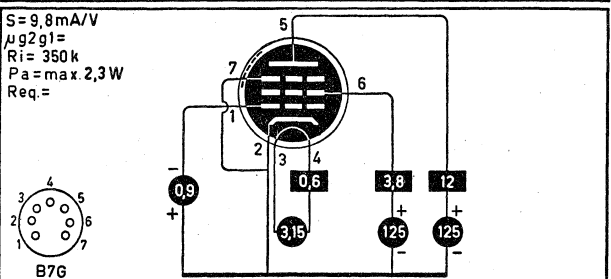
3BA6

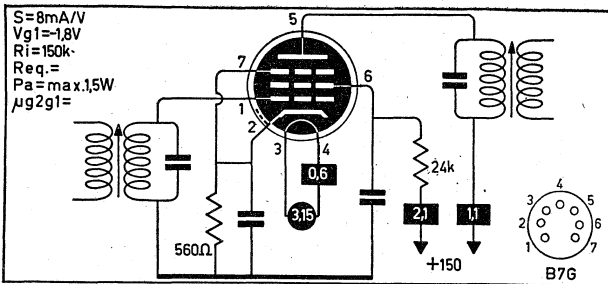


3BC5

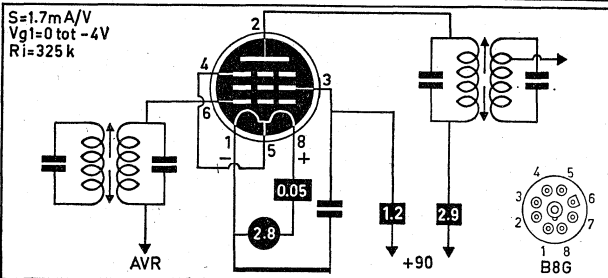


3BZ6

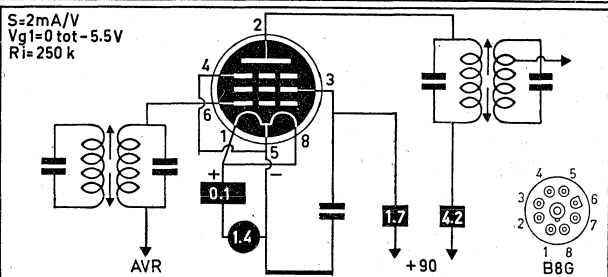
3CB6**3CE5****3CY5****3CF6****3DK6**



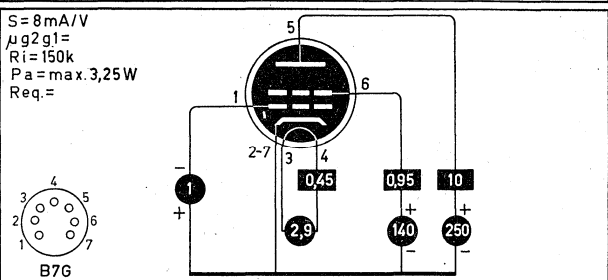
3DT6



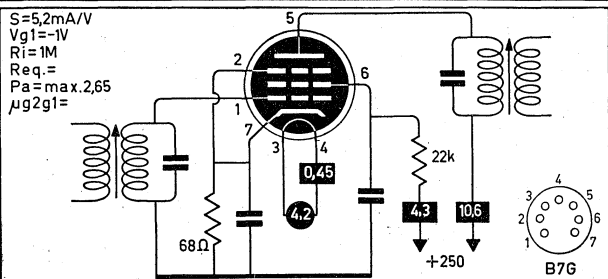
3E6



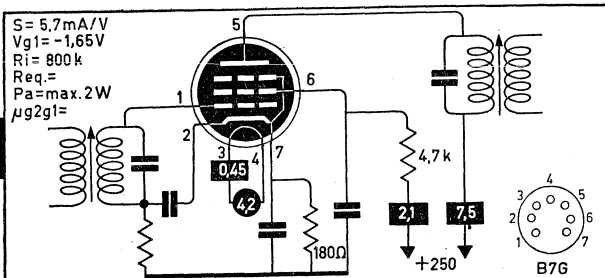
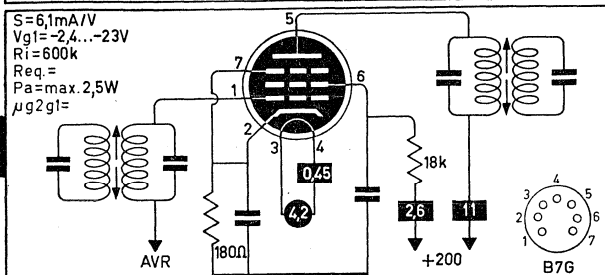
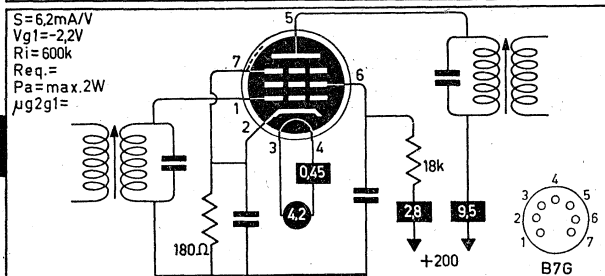
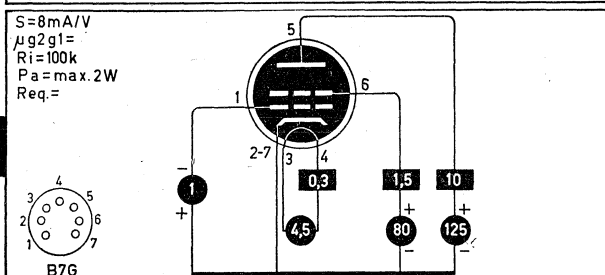
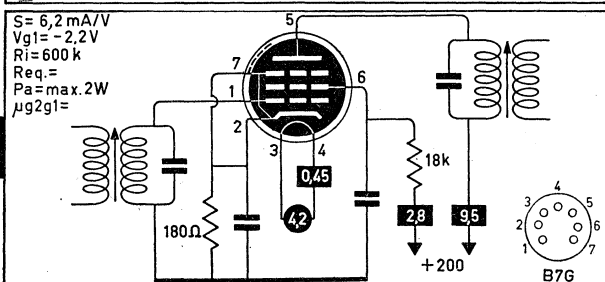
3E6

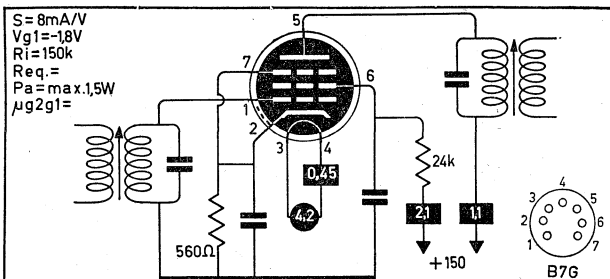


3EA5

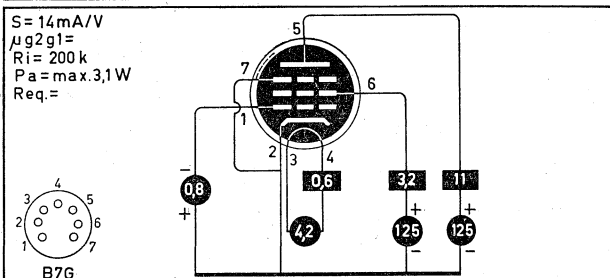


4AU6

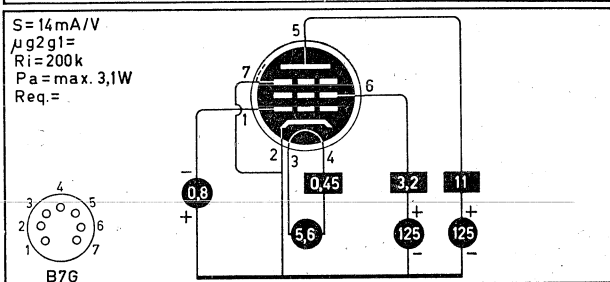
4BC5**4BZ6****4CB6****4CY5****4DE6**



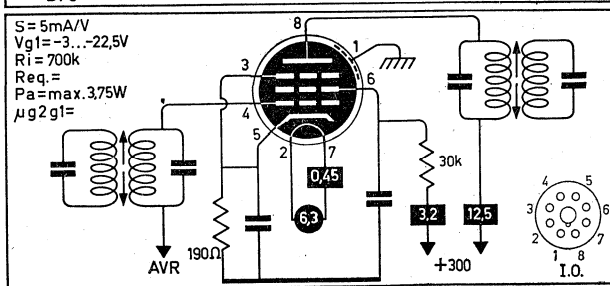
4DT6



4EW6

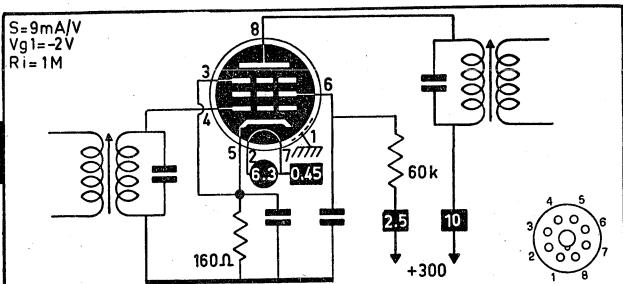


5EW6

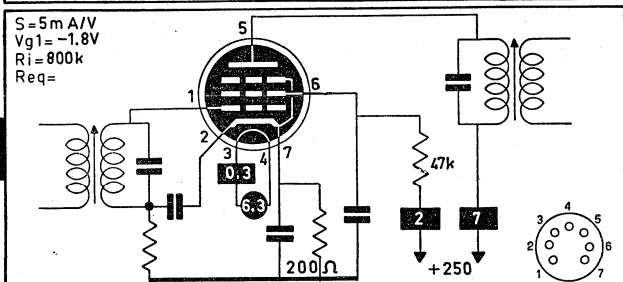


6AB7

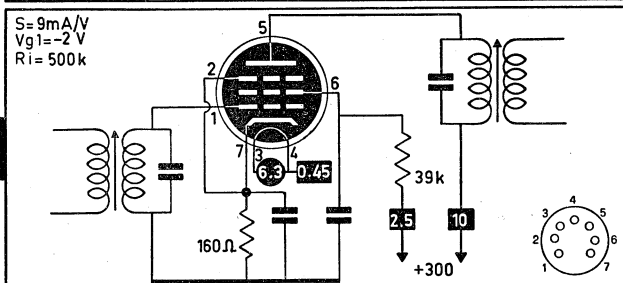
6AC7



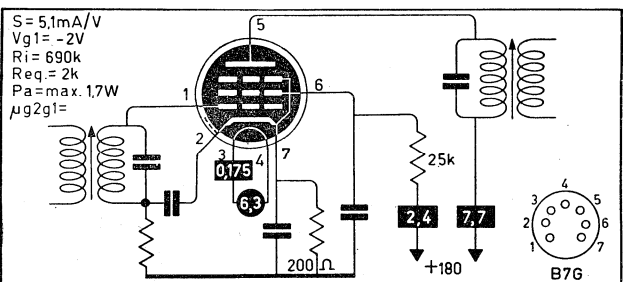
6AG5



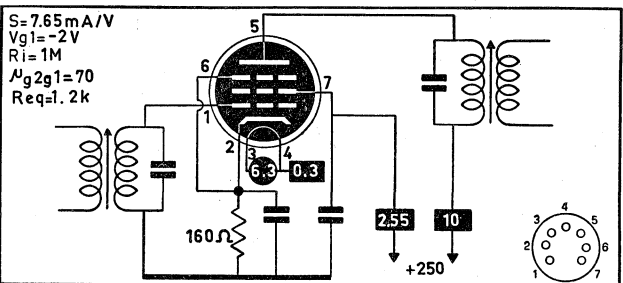
6AH6

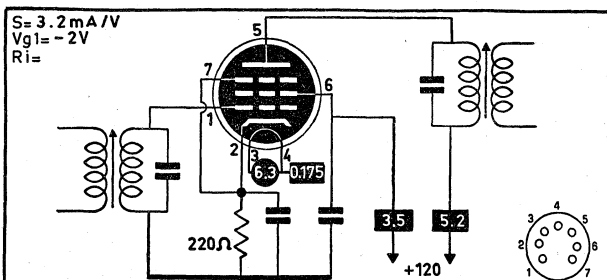


6AK5

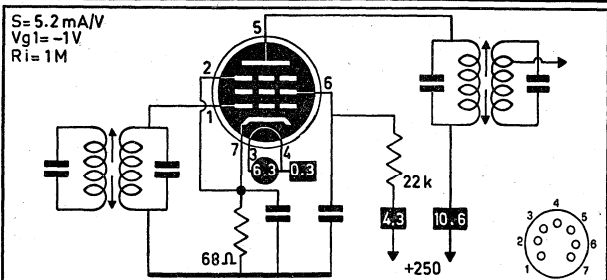


6AM6

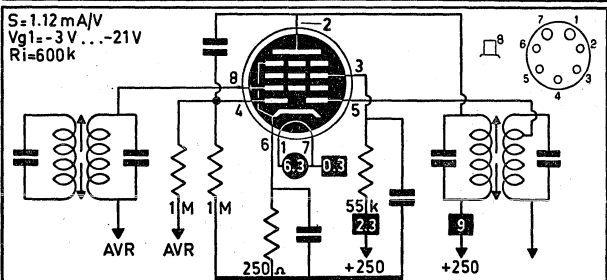




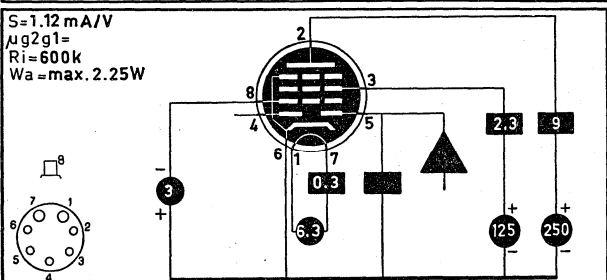
6AS6



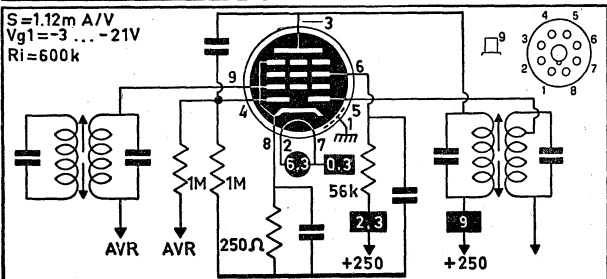
6AU6



6B7



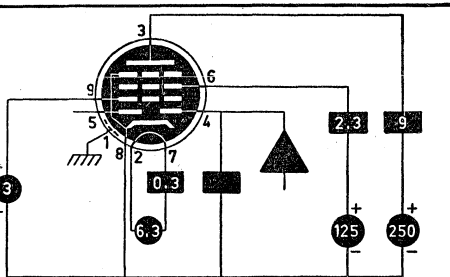
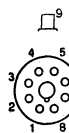
6B7



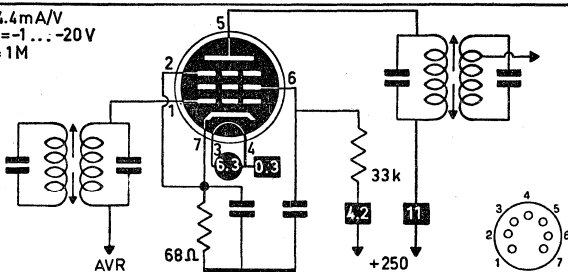
6B8

6B8

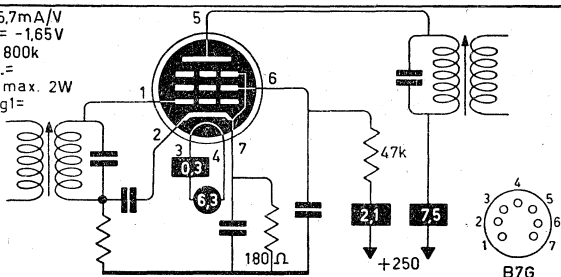
$S = 1.12 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 600 \text{ k}$
 $W_a = \text{max. } 2.25 \text{ W}$

**6BA6**

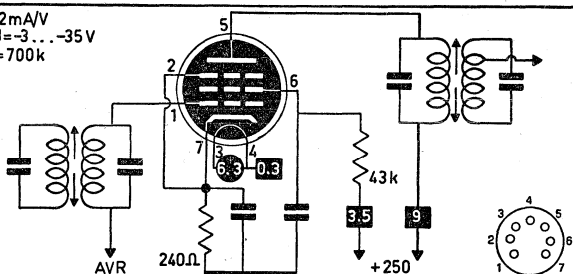
$S = 4.4 \text{ mA/V}$
 $V_{g1} = -1 \dots -20 \text{ V}$
 $R_i = 1 \text{ M}$

**6BC5**

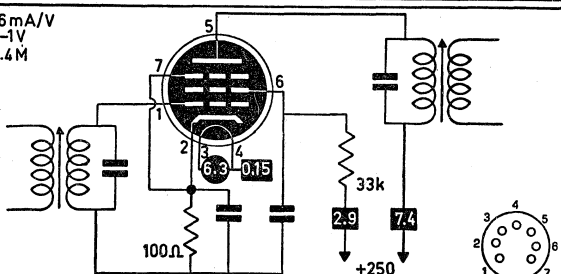
$S = 5.7 \text{ mA/V}$
 $V_{g1} = -1.65 \text{ V}$
 $R_i = 800 \text{ k}$
 $R_{eq} =$
 $P_a = \text{max. } 2 \text{ W}$
 $\mu g_{2g1} =$

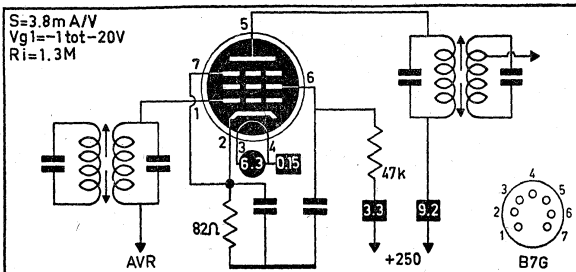
**6BD6**

$S = 2 \text{ mA/V}$
 $V_{g1} = -3 \dots -35 \text{ V}$
 $R_i = 700 \text{ k}$

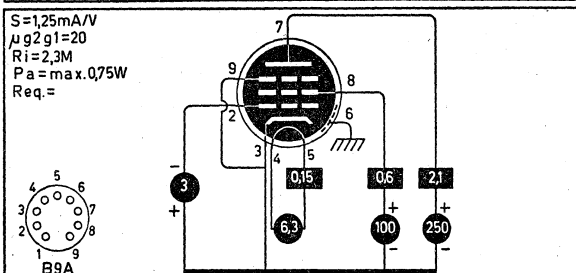
**6BH6**

$S = 4.6 \text{ mA/V}$
 $V_{g1} = -1 \text{ V}$
 $R_i = 1.4 \text{ M}$

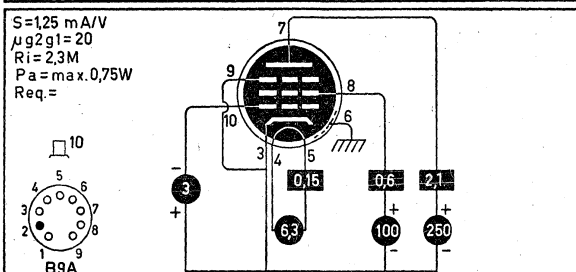




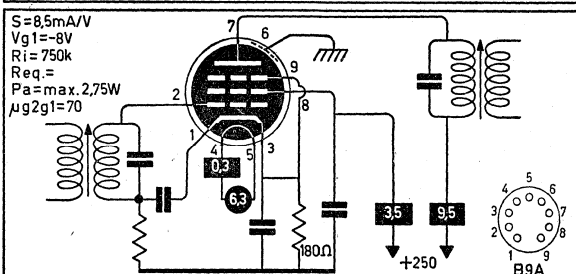
6BJ6



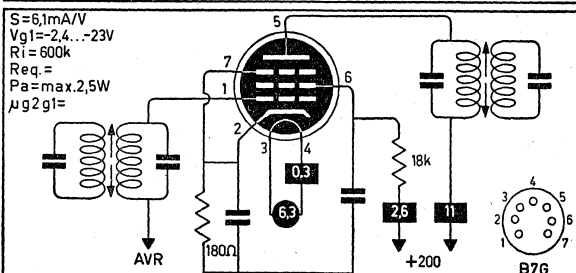
6BR7



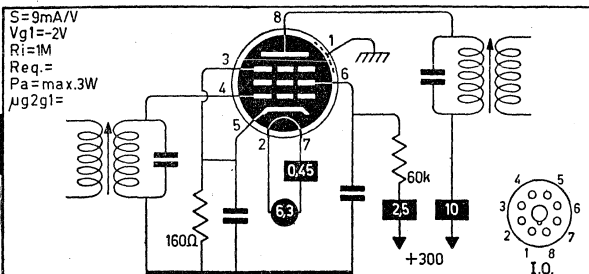
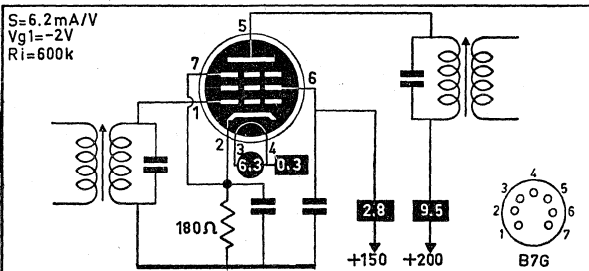
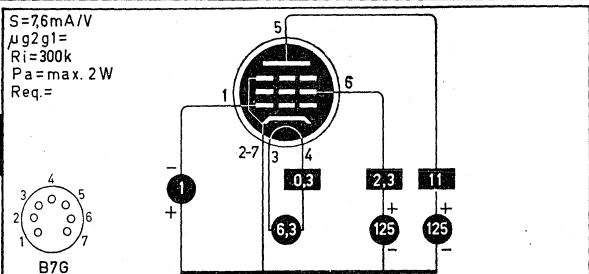
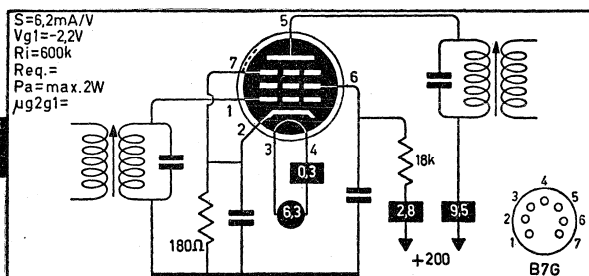
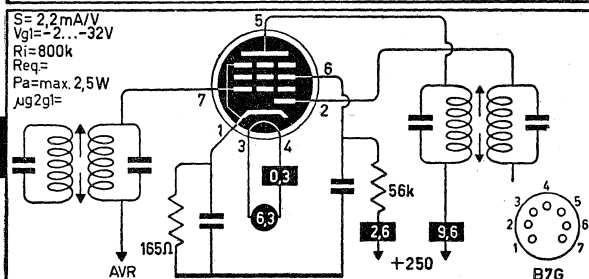
6BS7



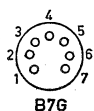
6BW7



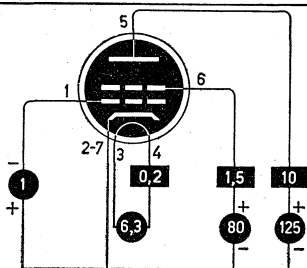
6BZ6

6C9**6CB6****6CE5****6CF6****6CR6**

$S=8\text{mA/V}$
 $\mu g_{2g1}=$
 $R_i=100\text{k}$
 $P_a=\text{max. } 2\text{W}$
 $\text{Req.}=$



B7G

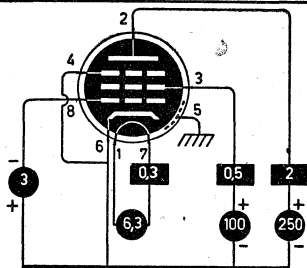


6CY5

$S=1,225\text{mA/V}$
 $\mu g_{2g1}=$
 $R_i=1\text{M}$
 $P_a=\text{max. } 0,75\text{W}$
 $\text{Req.}=$

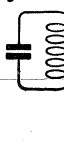


UX7

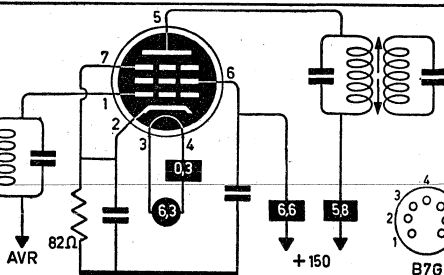


6D7

$S=2,05\text{mA/V}$
 $V_{g1}=-1\text{V}$
 $R_i=50\text{k}$
 $\text{Req.}=$
 $P_a=\text{max. } 0,9\text{W}$
 $\mu g_{2g1}=$



B7G

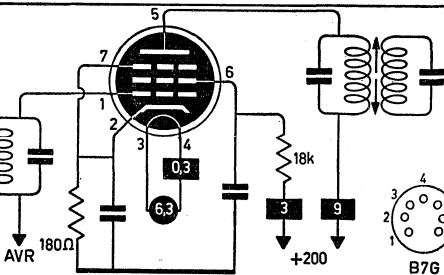


6DB6

$S=5,5\text{mA/V}$
 $V_{g1}=-2,1\text{...}-125\text{V}$
 $R_i=500\text{k}$
 $\text{Req.}=$
 $P_a=\text{max. } 2\text{W}$
 $\mu g_{2g1}=$

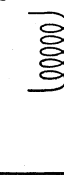


B7G

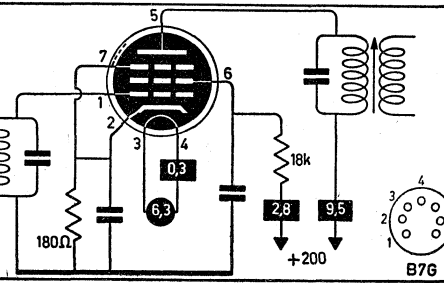


6DC6

$S=6,2\text{mA/V}$
 $V_{g1}=-2,2\text{V}$
 $R_i=600\text{k}$
 $\text{Req.}=$
 $P_a=\text{max. } 2\text{W}$
 $\mu g_{2g1}=$

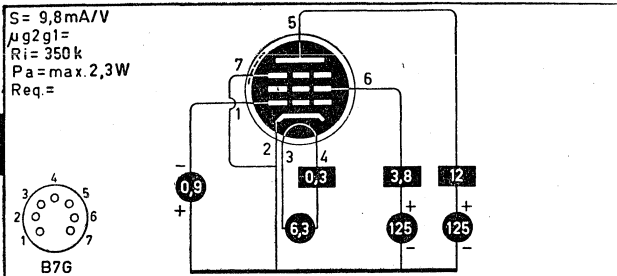


B7G

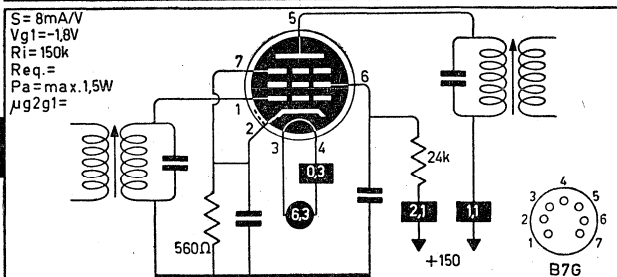


6DE6

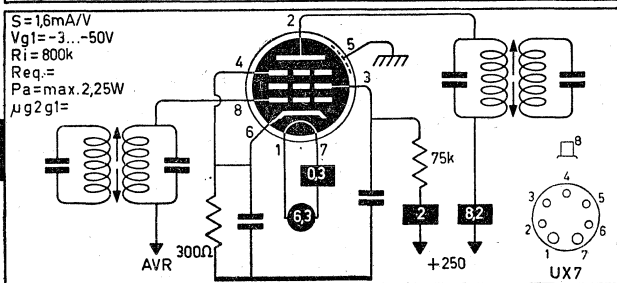
6DK6

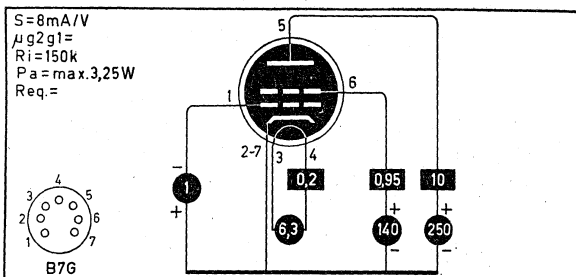


6DT6

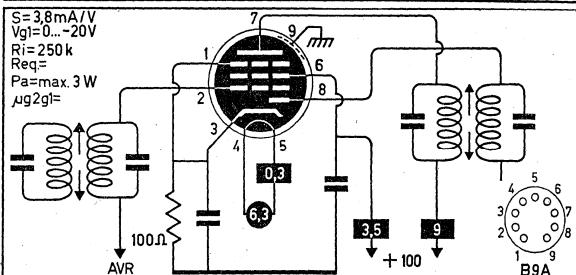


6E7

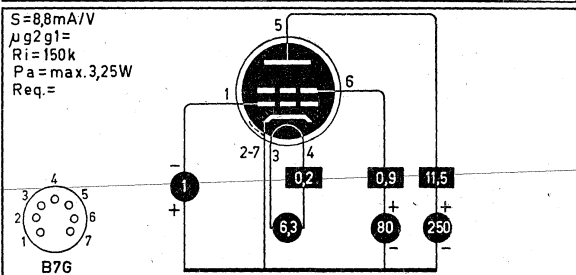




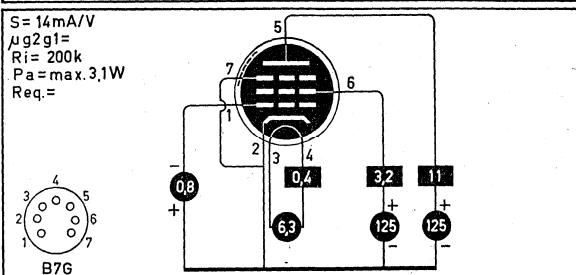
6EA5



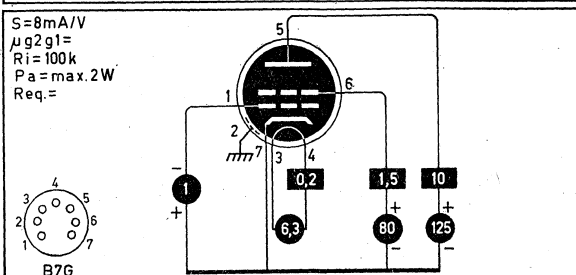
6EQ7



6EV5



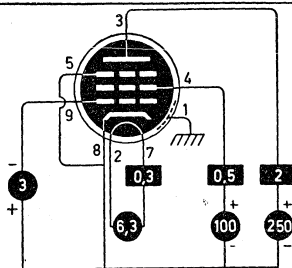
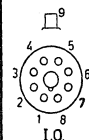
6EW6



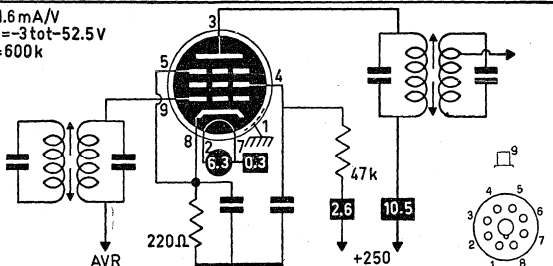
6FV6

6J7

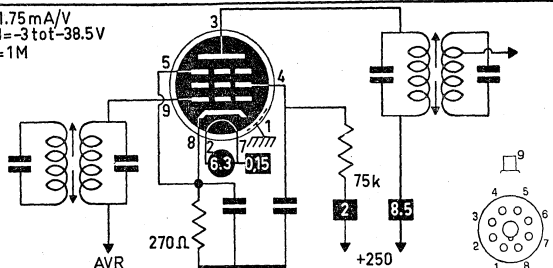
$S = 1.225 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 1 \text{ M}$
 $P_a = \text{max.}$
 $\text{Req.} =$

**6K7**

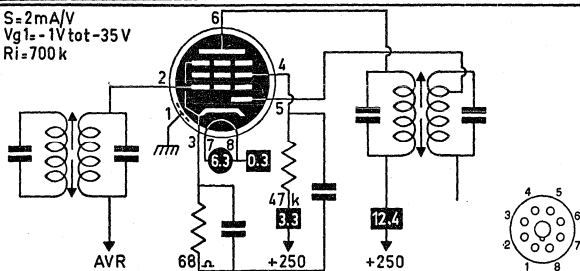
$S = 1.6 \text{ mA/V}$
 $V_{g1} = -3 \text{ tot} -52.5 \text{ V}$
 $R_i = 600 \text{ k}$

**6S7**

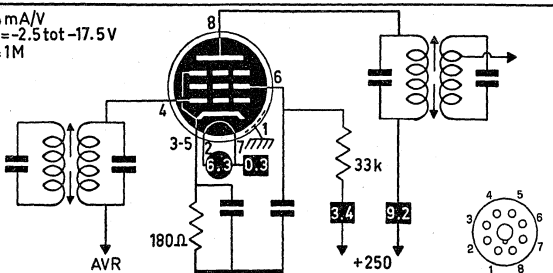
$S = 1.75 \text{ mA/V}$
 $V_{g1} = -3 \text{ tot} -38.5 \text{ V}$
 $R_i = 1 \text{ M}$

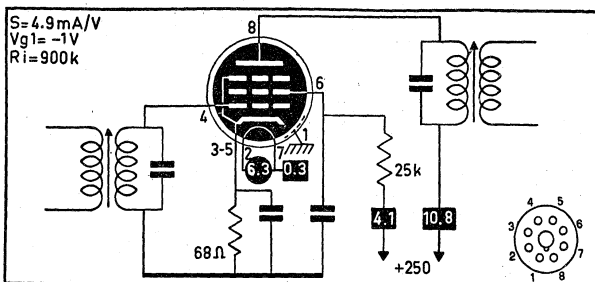
**6SF7**

$S = 2 \text{ mA/V}$
 $V_{g1} = -1 \text{V tot} -35 \text{ V}$
 $R_i = 700 \text{ k}$

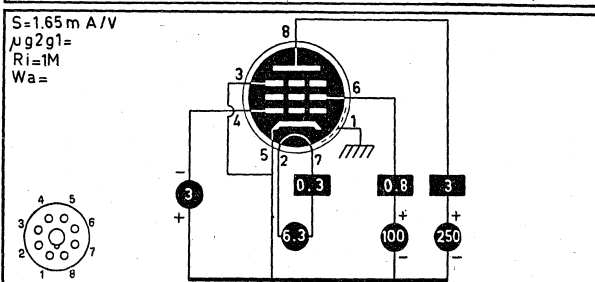
**6SG7**

$S = 4 \text{ mA/V}$
 $V_{g1} = -2.5 \text{ tot} -17.5 \text{ V}$
 $R_i = 1 \text{ M}$

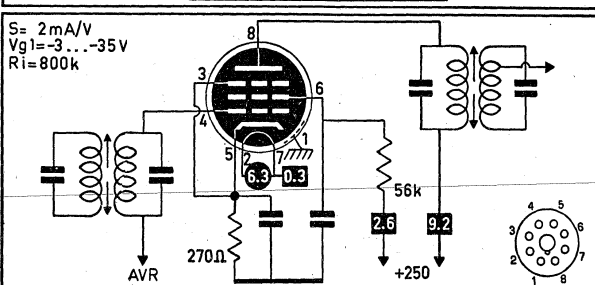




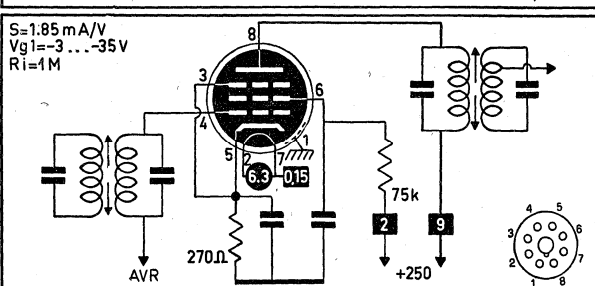
6SH7



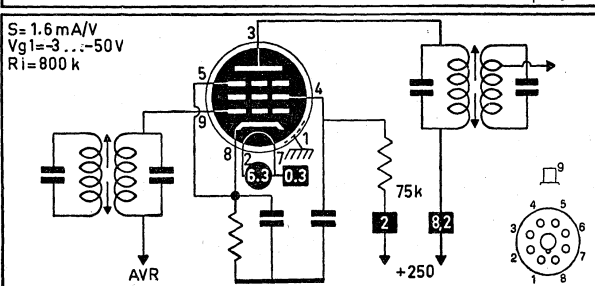
6SJ7



6SK7



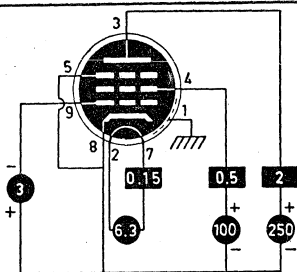
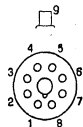
6SS7



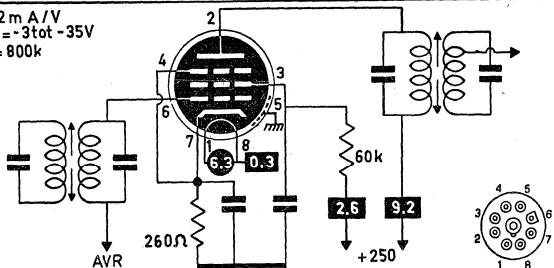
6U7

6W7

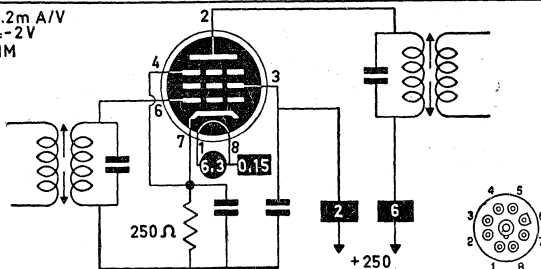
$S = 1.23 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 1 \text{ M}$
 $W_a = 1 \text{ W}$

**7A7**

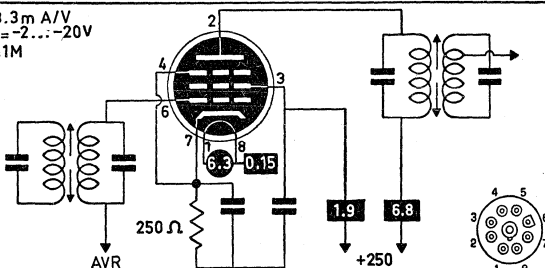
$S = 2 \text{ mA/V}$
 $V_{g1} = -3 \text{ tot } -35 \text{ V}$
 $R_i = 800 \text{ k}$

**7AG7**

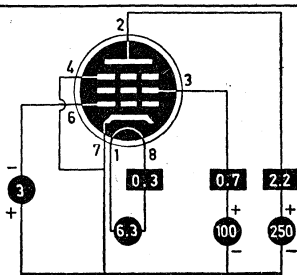
$S = 4.2 \text{ mA/V}$
 $V_{g1} = -2 \text{ V}$
 $R_i = 1 \text{ M}$

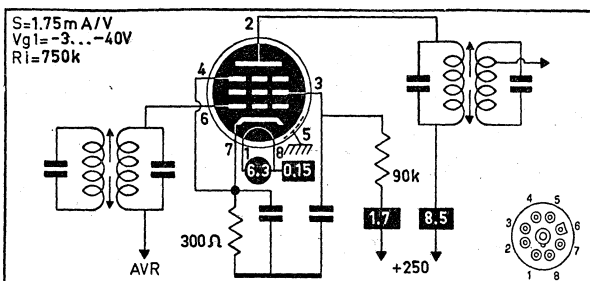
**7AH7**

$S = 3.3 \text{ mA/V}$
 $V_{g1} = -2 \dots -20 \text{ V}$
 $R_i = 1 \text{ M}$

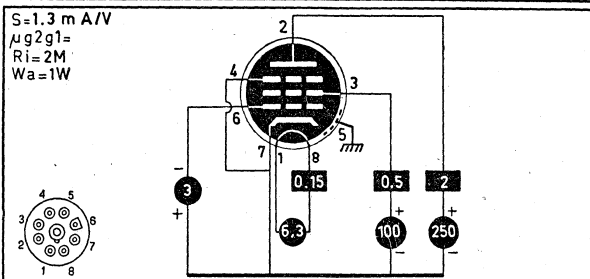
**7AJ7**

$S = 1.57 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 1 \text{ M}$
 $W_a =$

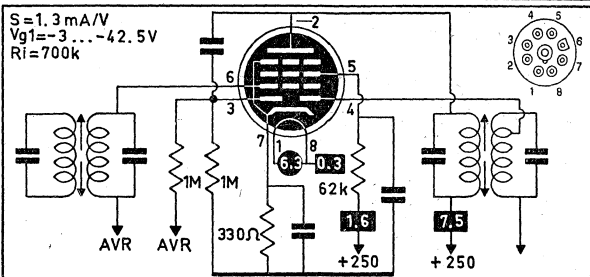




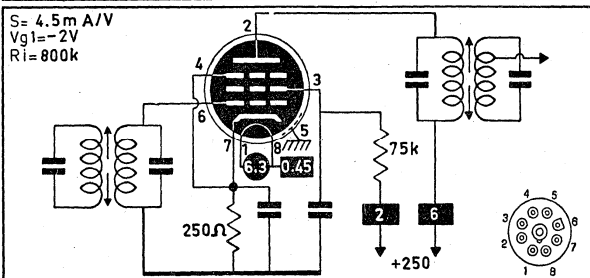
7B7



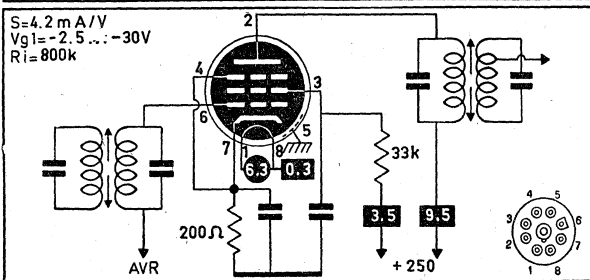
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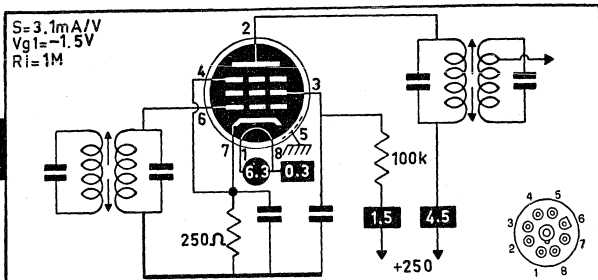
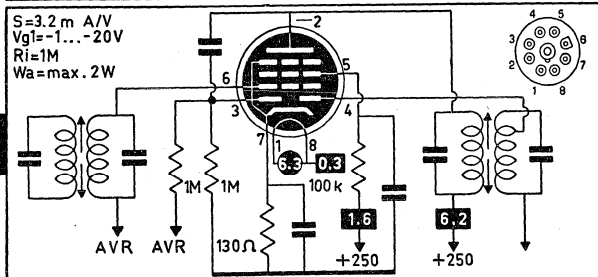
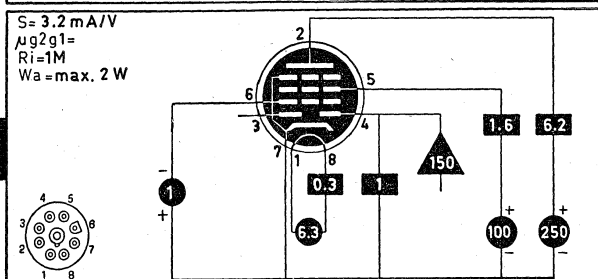
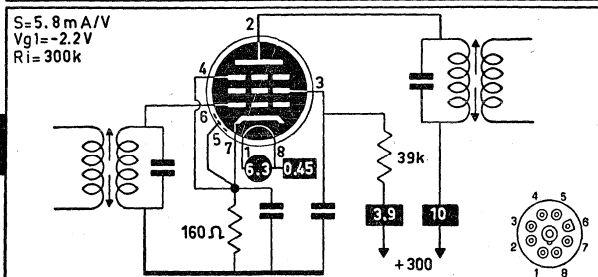
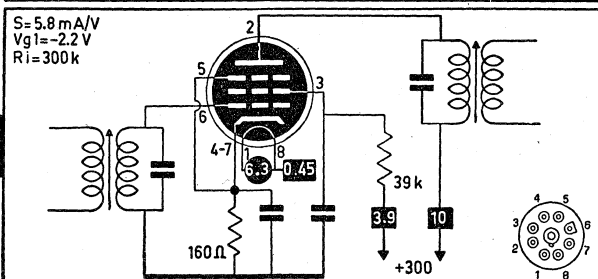
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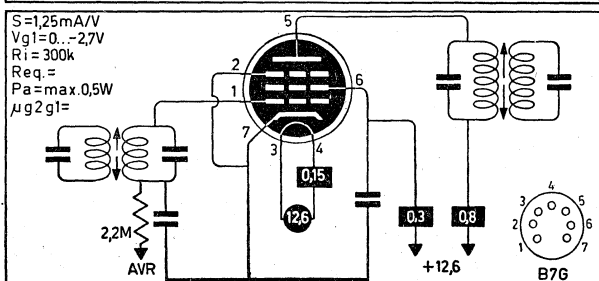
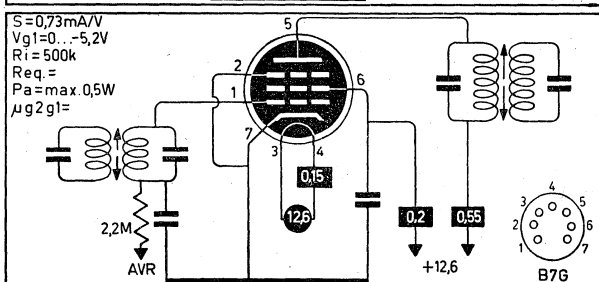
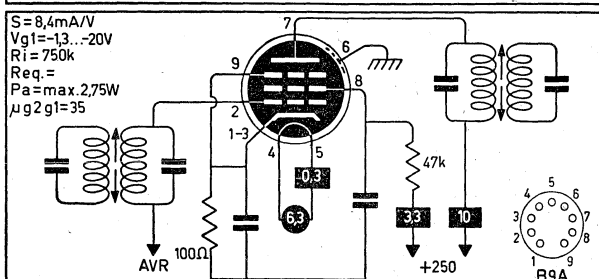
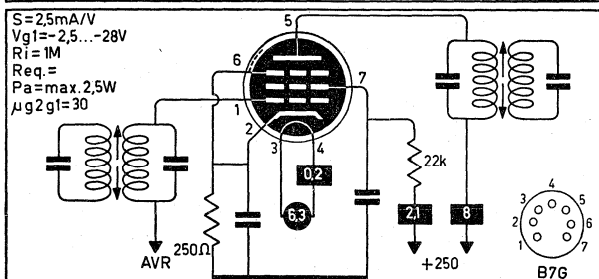
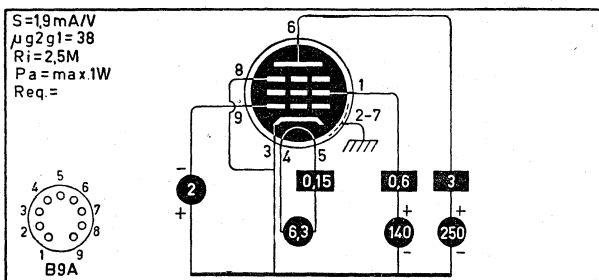


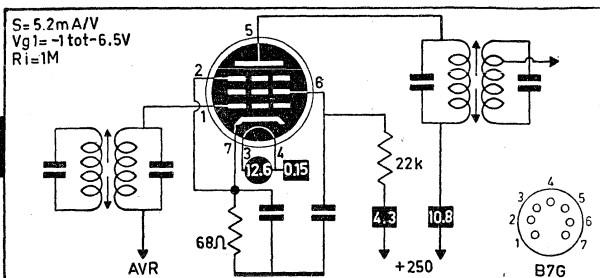
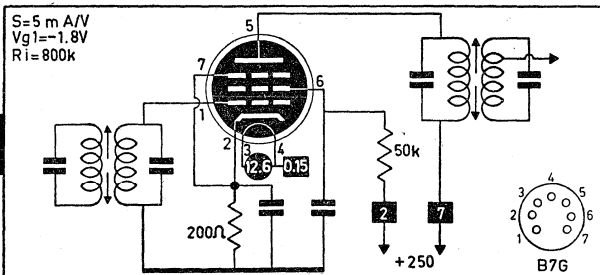
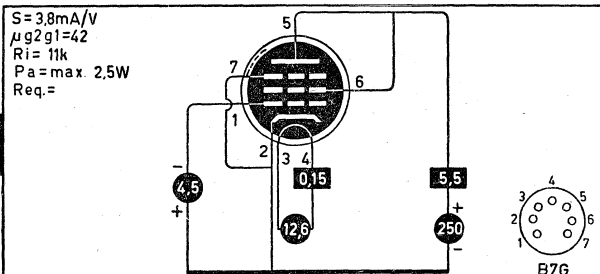
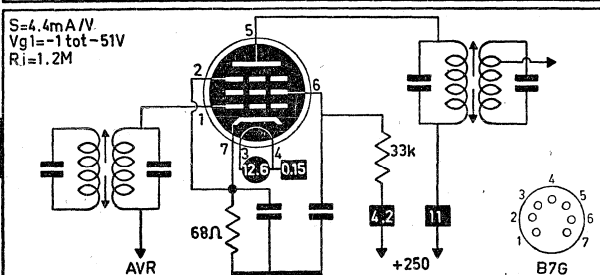
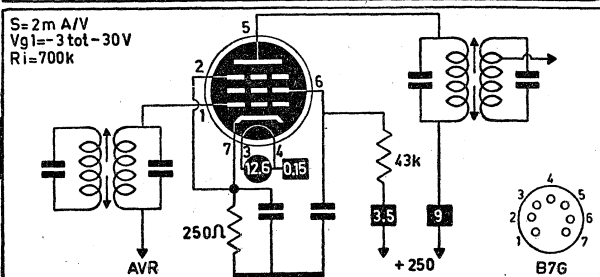
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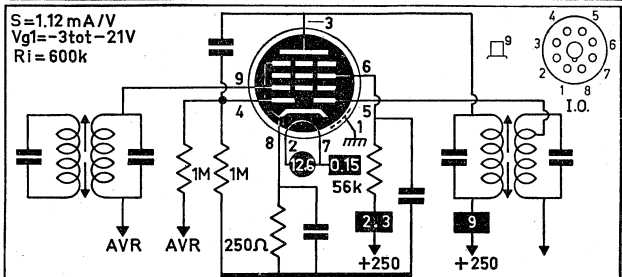
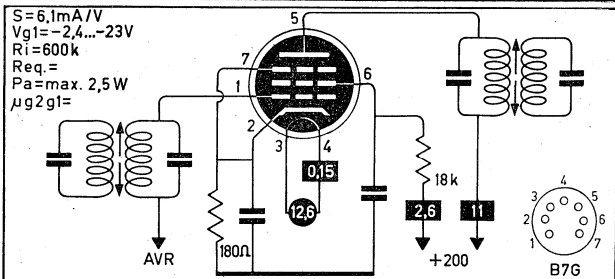
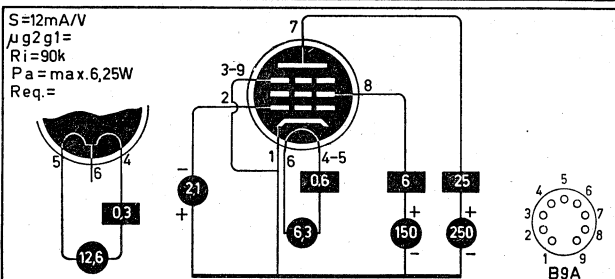
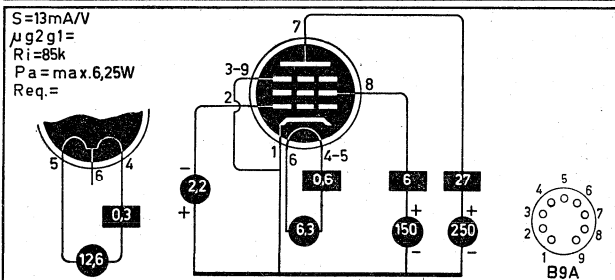
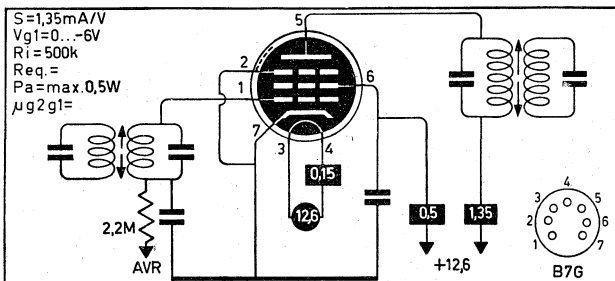


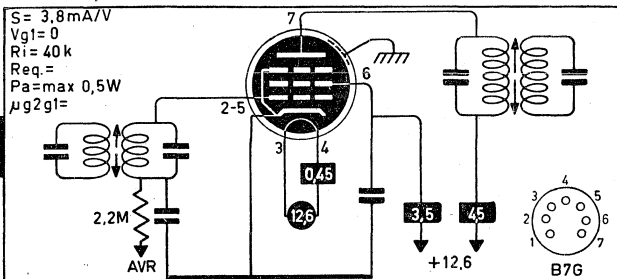
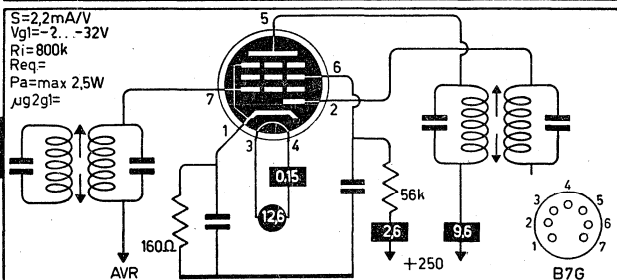
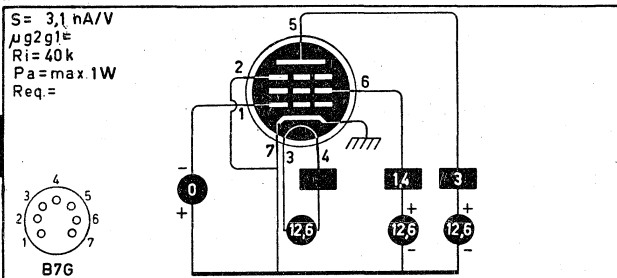
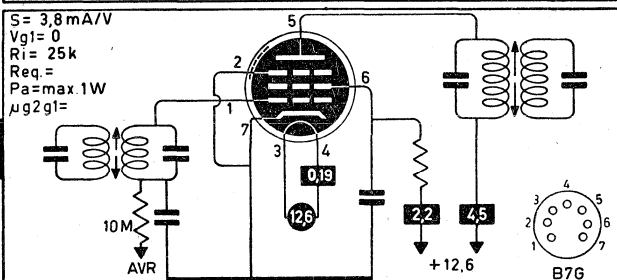
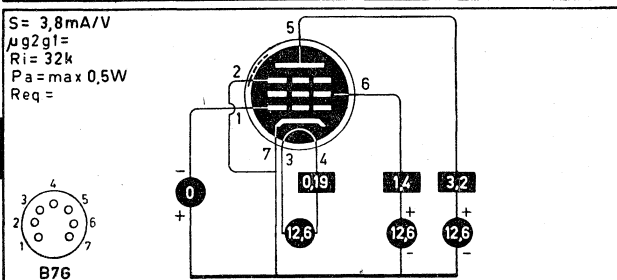
7H7

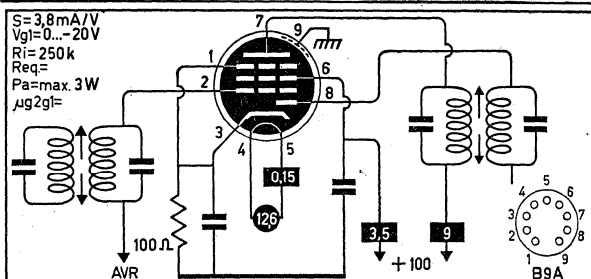
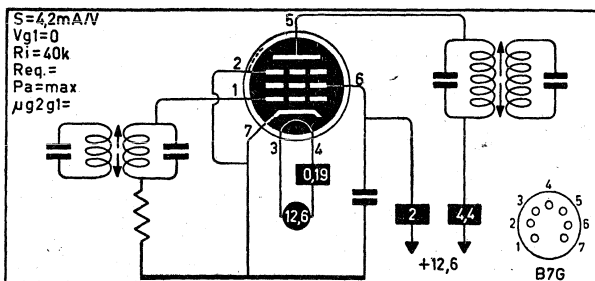
7L7**7R7****7R7****7V7****7W7**



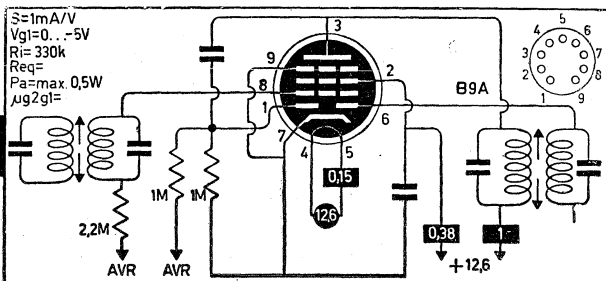
12AU6**12AW6****12AW6****12BA6****12BD6**



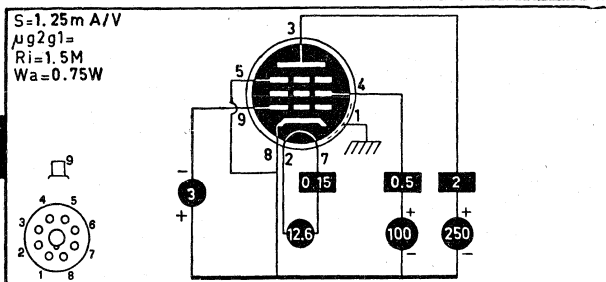
12CN5**12CR6****12CX6****12DZ6****12EA6**



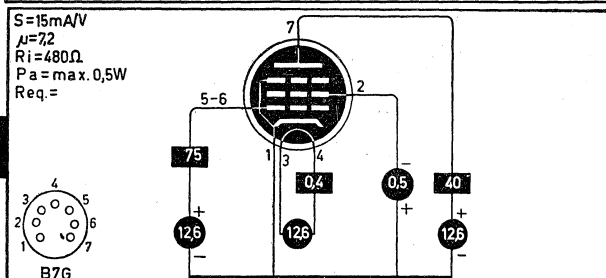
12F8



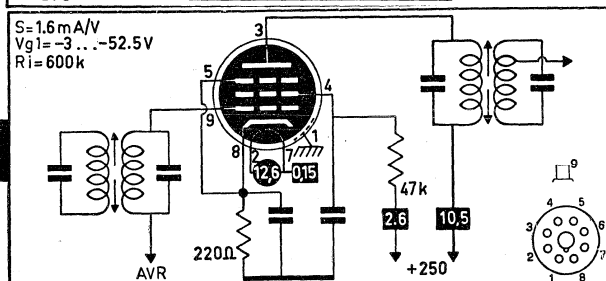
12J7



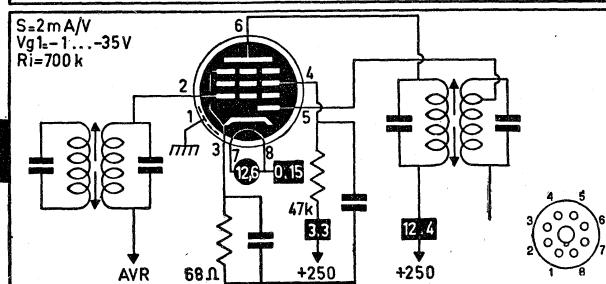
12K5

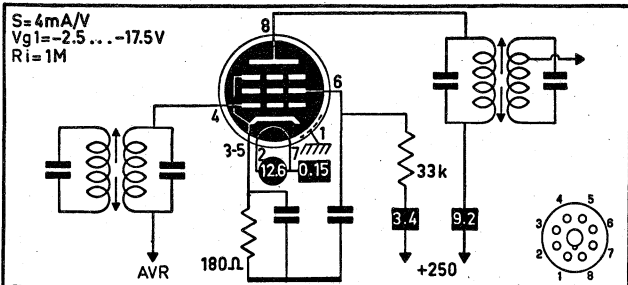


12K7

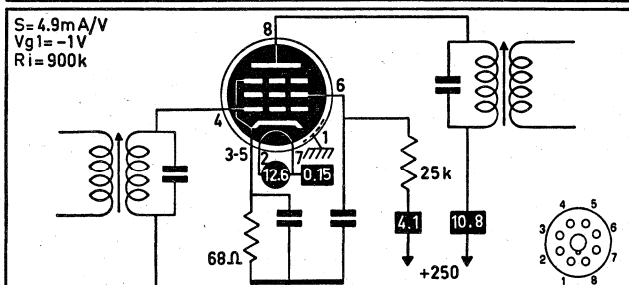


12SF7

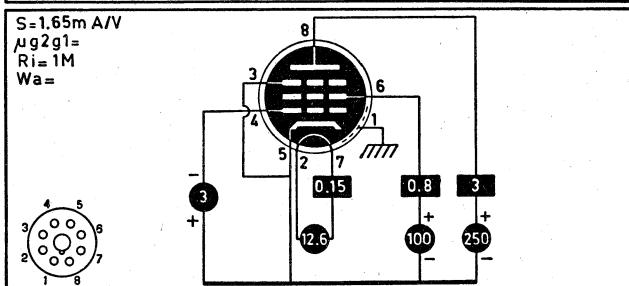




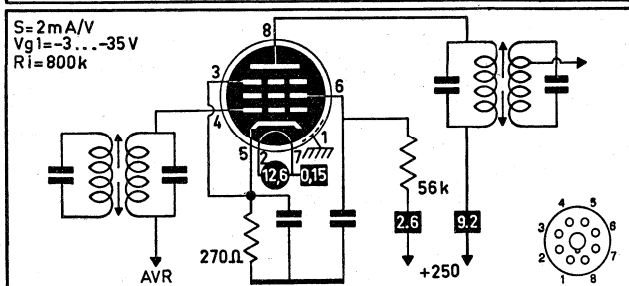
12SG7



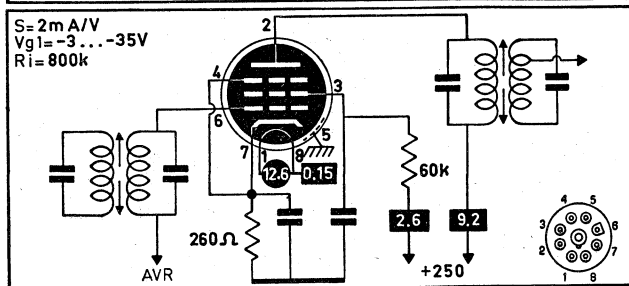
12SH7



12SJ7



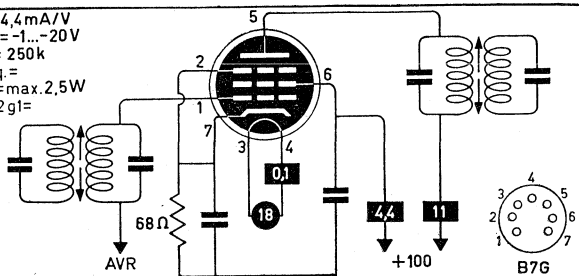
12SK7



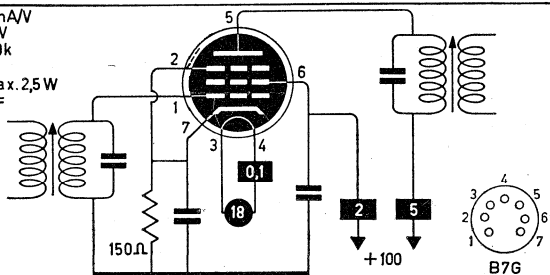
14A7

18FW6

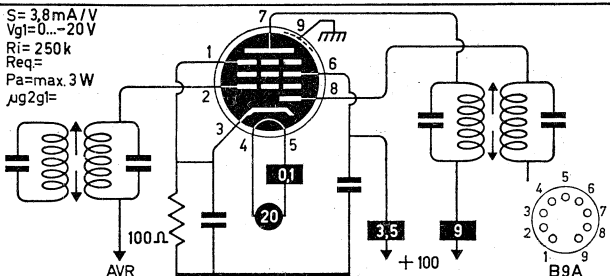
$S = 4,4 \text{ mA/V}$
 $V_{g1} = -1 \dots -20 \text{ V}$
 $R_i = 250 \text{ k}$
 $R_{eq} =$
 $P_a = \text{max. } 2,5 \text{ W}$
 $\mu g_{2g1} =$

**18GD6A**

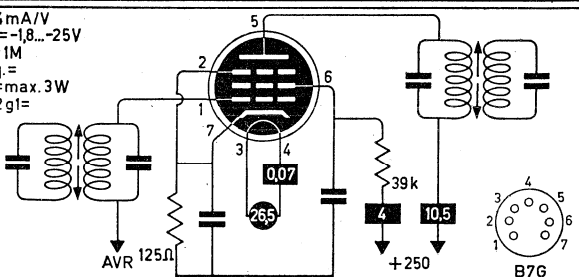
$S = 4,3 \text{ mA/V}$
 $V_{g1} = -1 \text{ V}$
 $R_i = 500 \text{ k}$
 $R_{eq} =$
 $P_a = \text{max. } 2,5 \text{ W}$
 $\mu g_{2g1} =$

**20EQ7**

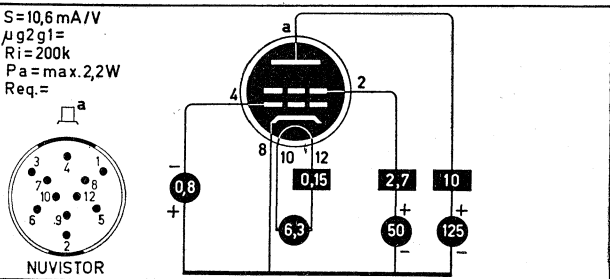
$S = 3,8 \text{ mA/V}$
 $V_{g1} = 0 \dots -20 \text{ V}$
 $R_i = 250 \text{ k}$
 $R_{eq} =$
 $P_a = \text{max. } 3 \text{ W}$
 $\mu g_{2g1} =$

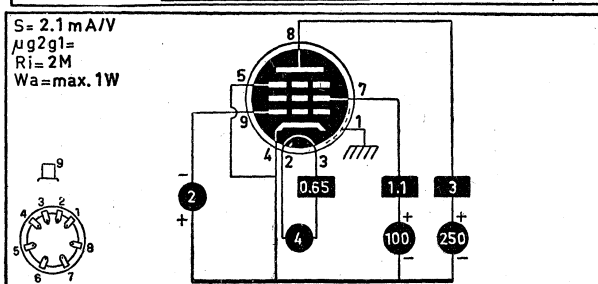
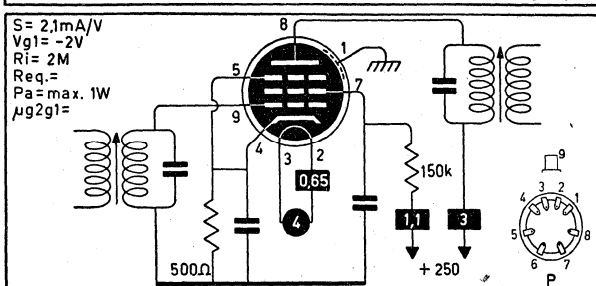
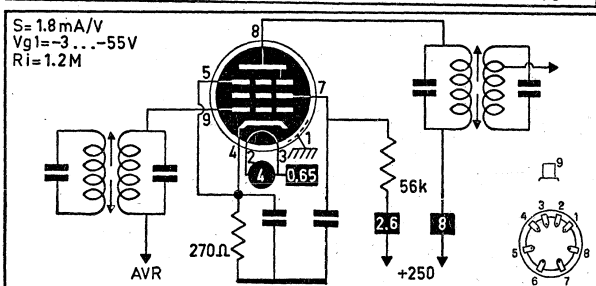
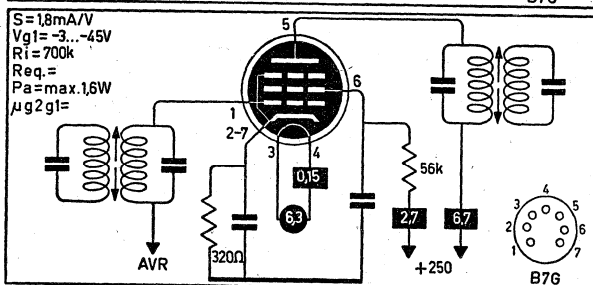
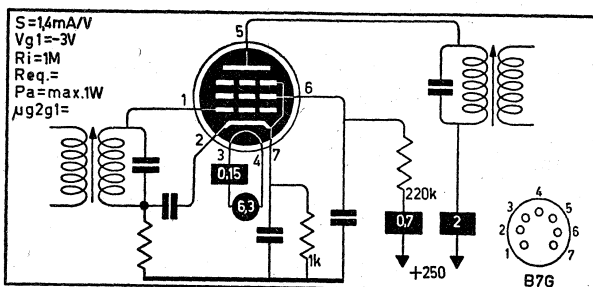
**26A6**

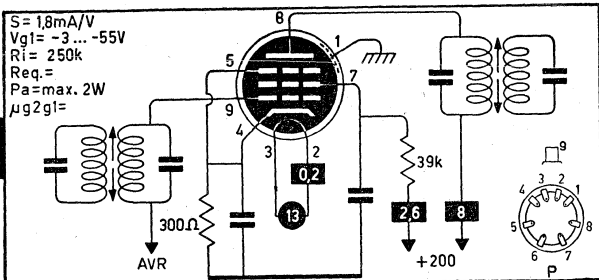
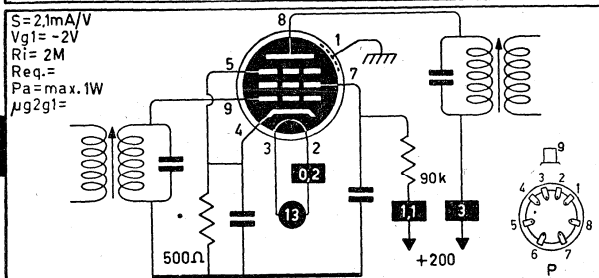
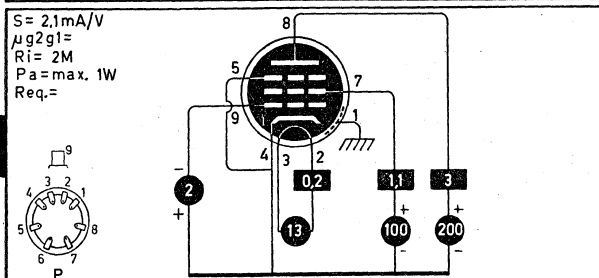
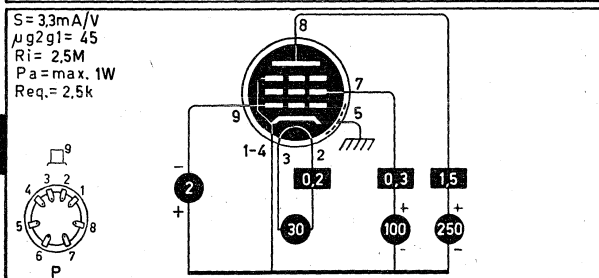
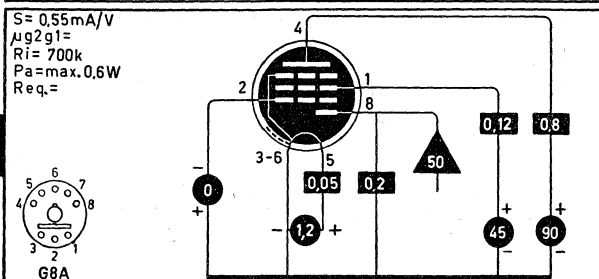
$S = 4 \text{ mA/V}$
 $V_{g1} = -1,8 \dots -25 \text{ V}$
 $R_i = 1 \text{ M}$
 $R_{eq} =$
 $P_a = \text{max. } 3 \text{ W}$
 $\mu g_{2g1} =$

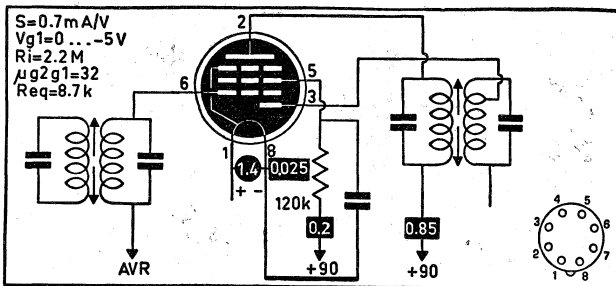
**7587**

$S = 10,6 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 200 \text{ k}$
 $P_a = \text{max. } 2,2 \text{ W}$
 $R_{eq} =$

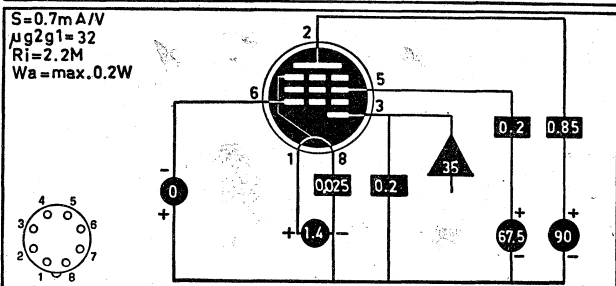




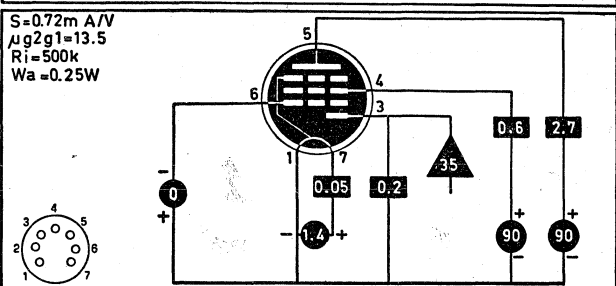
CF3**CF7****CF7****CF50****DAF 11**



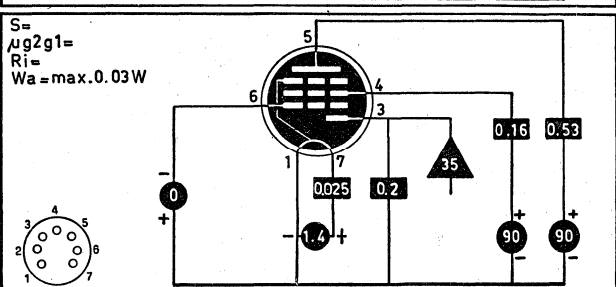
DAF40



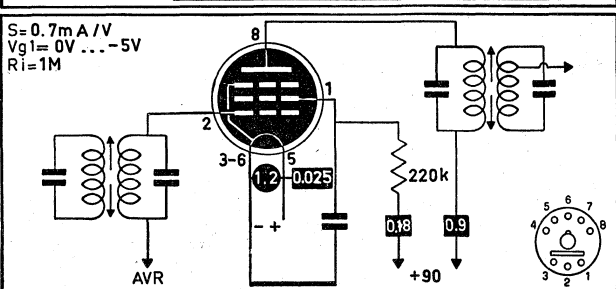
DAF41



DAF91



DAF96



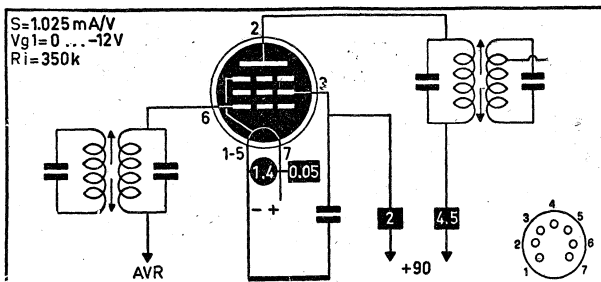
DF11

$S=0.7\text{m A/V}$
 $V_{g1}=0\ldots-3.5\text{V}$
 $R_i=2\text{M}$
 $\mu_{g2g1}=30$

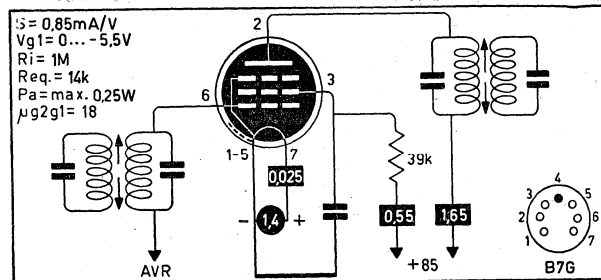
$S = 0.7 \text{ m A/V}$
 $\mu_g 2g_1 = 30$
 $R_i = 2 \text{ M}$
 $W_a = \text{max. } 0.2 \text{ W}$

[illegible][illegible]

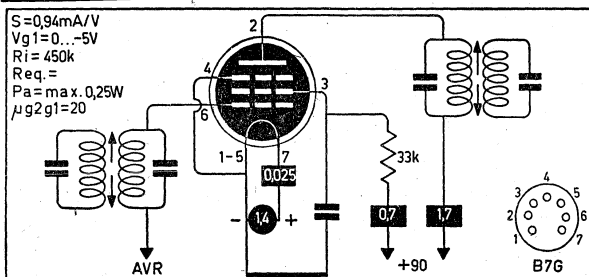
$S = 0.75 \text{ mA/V}$
 $V_{g1} = 0 \dots -10 \text{ V}$
 $R_i = 800 \text{ k}$
 $\mu g_{2g1} = 11$
 $R_{eq} = 16$



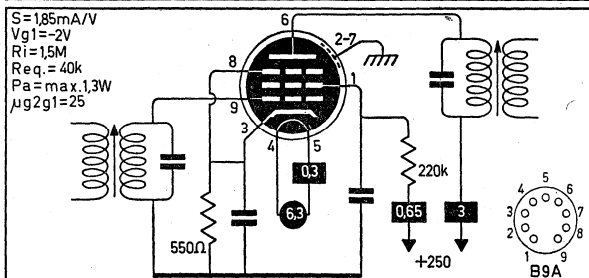
DF92



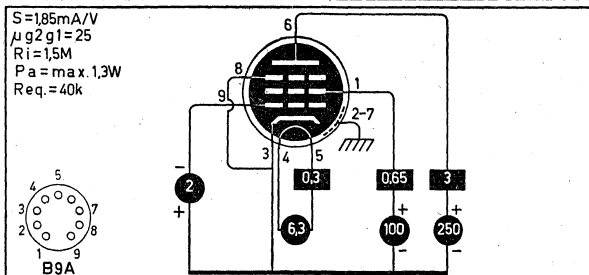
DF96



DF97



E80F



E80F

$S = 9\text{mA/V}$
 $V_{g1} = -2\text{V}$
 $R_i = 500\text{k}$
 $R_{eq} = 750\Omega$
 $P_a = \text{max } 2.1\text{W}$
 $\mu g 2g1 = 34$

$S=4,6\text{mA/V}$
 $V_{g1}=-7,7\text{V}$
 $R_i=1,3\text{M}$
 $R_{eq}=2,5\text{k}$
 $P_a=\text{max.}2,6\text{W}$
 $\mu_{2g1}=50$

100Ω
 33k
 +250
 6BQ6

$S = 1.8 \text{ mA/V}$
 $V_{g1} = -2 \text{ V} \dots -40 \text{ V}$
 $R_i = 1.2 \text{ M}\Omega$
 $R_{eq} = 9 \text{ k}\Omega$

$S = 1.8 \text{ mA/V}$
 $\mu g 2 g_1 = 19$
 $R_i = 1.2 \text{ M}$
 $W_a = \max. 2 \text{ W}$

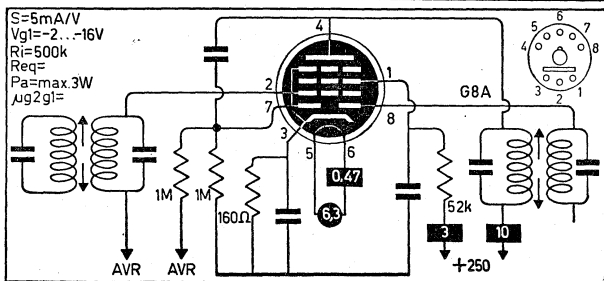
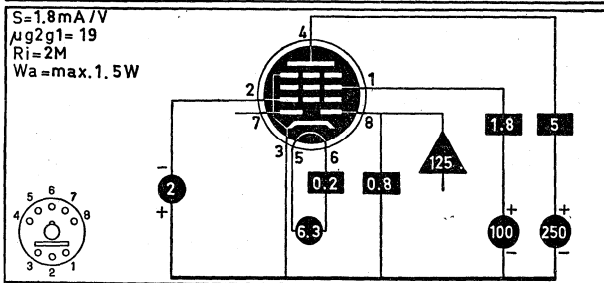
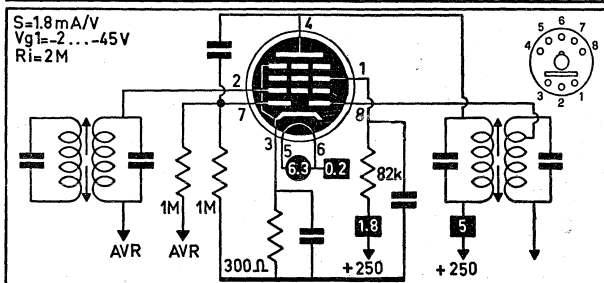
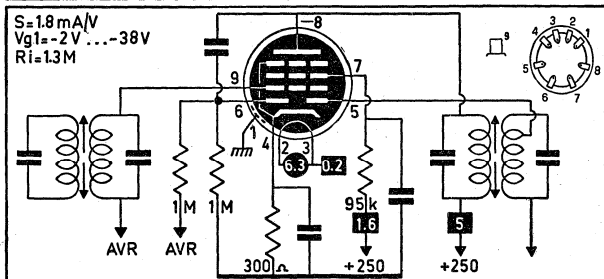
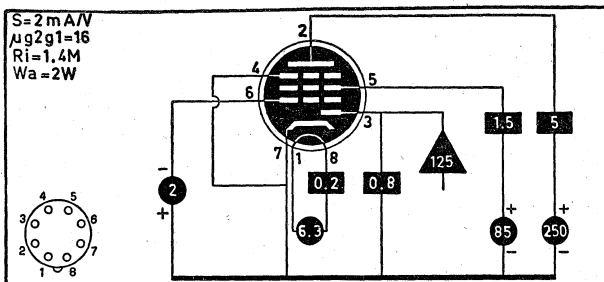
$S = 2\text{ mA/V}$
 $V_{g1} = -2 \dots -43\text{ V}$
 $R_i = 1.4\text{ M}$
 $R_{eq} = 7.5\text{ k}$

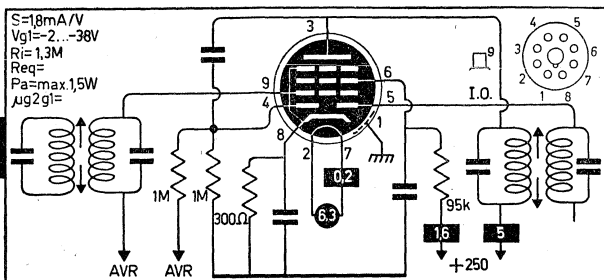
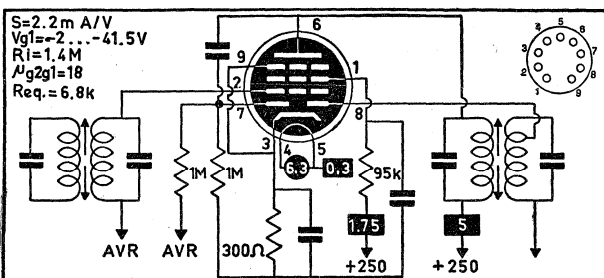
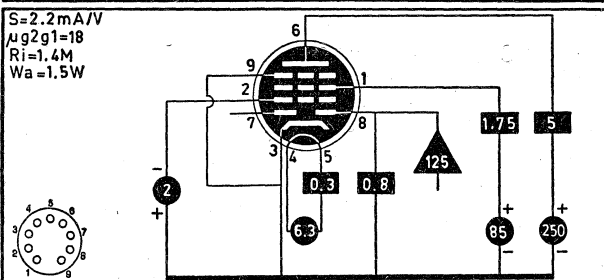
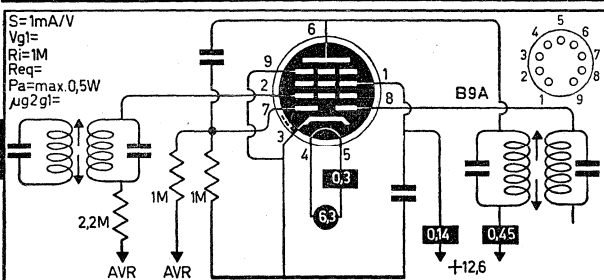
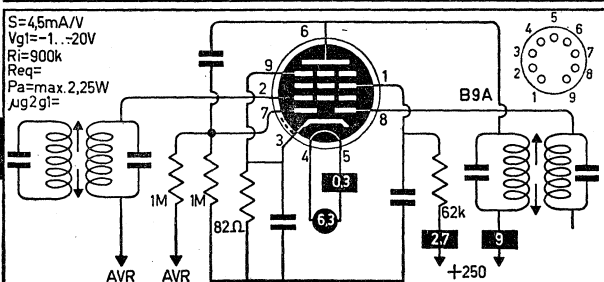
The diagram shows a vacuum tube circuit with the following components and connections:

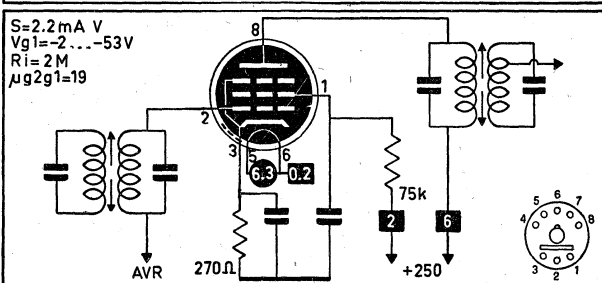
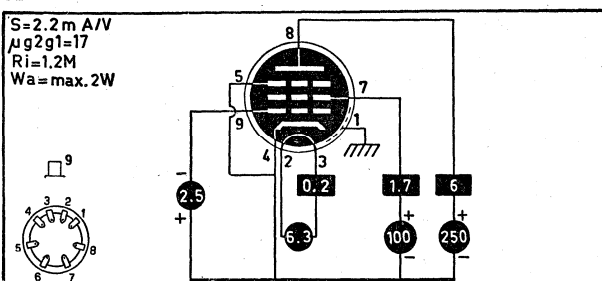
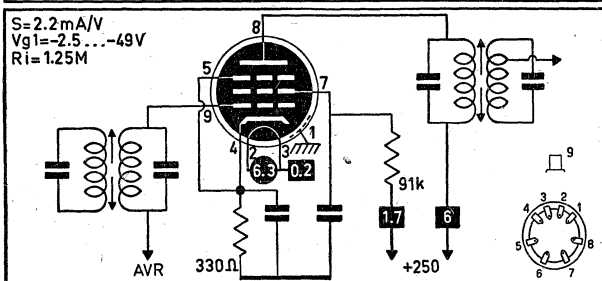
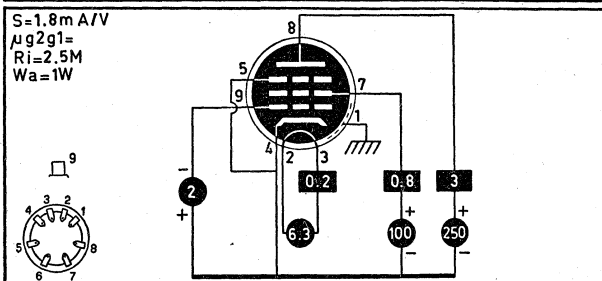
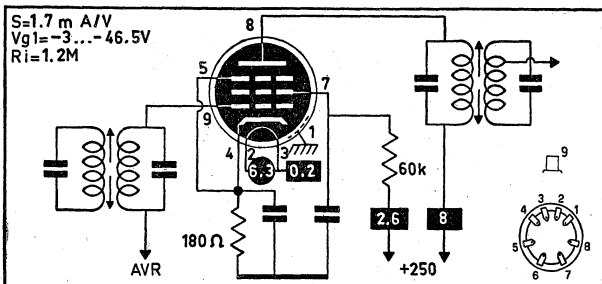
- Tube:** 6X4P, with pins 1, 2, 3, 4, 5, 6, 7, and 8 labeled.
- AVX Section:** A transformer with a center tap connected to pin 1. The secondary is connected to pin 2. A 310Ω resistor is connected between pin 1 and ground.
- Main Amplifier Section:** A transformer with a center tap connected to pin 3. The secondary is connected to pin 4. A 110kΩ resistor is connected between pin 3 and ground. A 1.5V source is connected between pin 3 and ground.
- Output Section:** A transformer with a center tap connected to pin 5. The secondary is connected to pin 6. A 5V source is connected between pin 5 and ground.

Pinout diagram for the 6X4P tube:

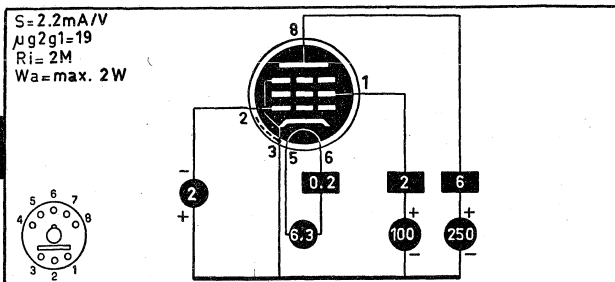
- Pin 1: Bottom center
- Pin 2: Top center
- Pin 3: Bottom left
- Pin 4: Top left
- Pin 5: Bottom right
- Pin 6: Top right
- Pin 7: Middle left
- Pin 8: Middle right



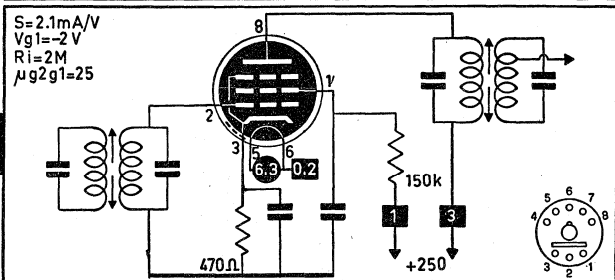
EBF32**EBF80****EBF80****EBF83****EBF89**



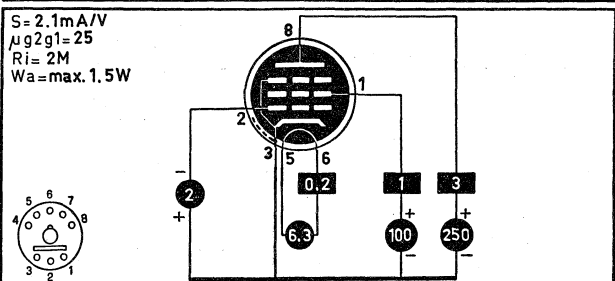
EF11



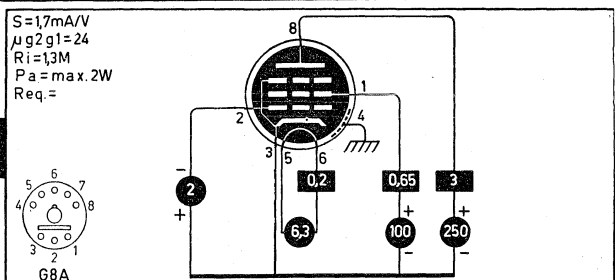
EF12



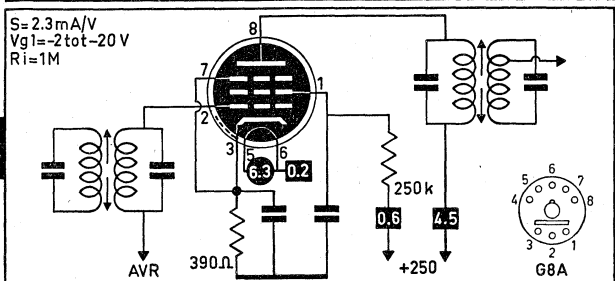
EF12



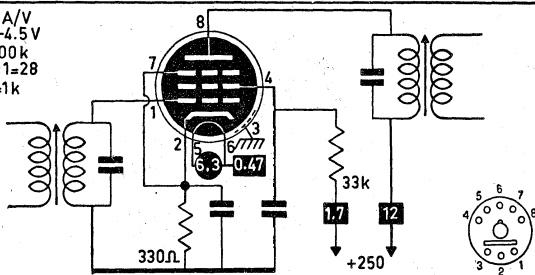
EF12s



EF13

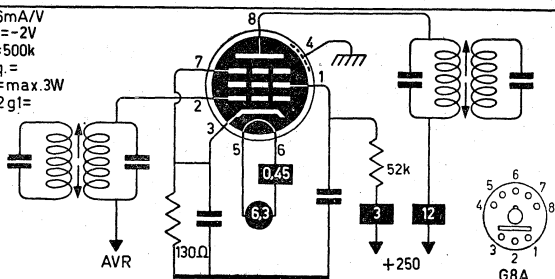


$S=7\text{mA/V}$
 $V_{g1}=-4.5\text{V}$
 $R_i=200\text{k}$
 $\mu g_{2g1}=28$
 $R_{eq}=1\text{k}$



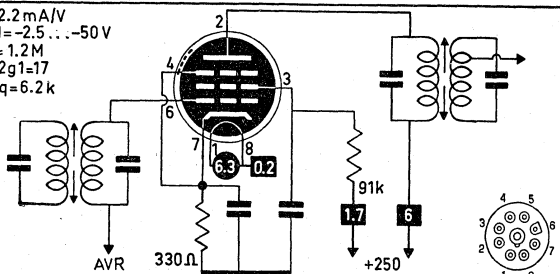
EF14

$S=6\text{mA/V}$
 $V_{g1}=-2\text{V}$
 $R_i=500\text{k}$
 $R_{eq}=$
 $P_a=\text{max.}3\text{W}$
 $\mu g_{2g1}=$



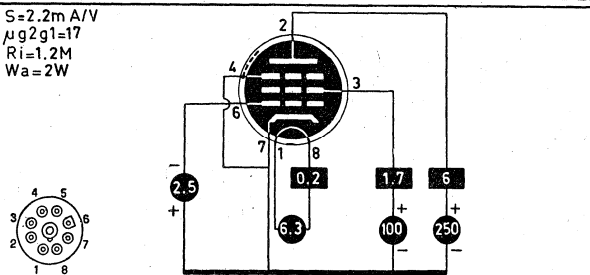
EF15

$S=2.2\text{mA/V}$
 $V_{g1}=-2.5\ldots-50\text{V}$
 $R_i=1.2\text{M}$
 $\mu g_{2g1}=17$
 $R_{eq}=6.2\text{k}$



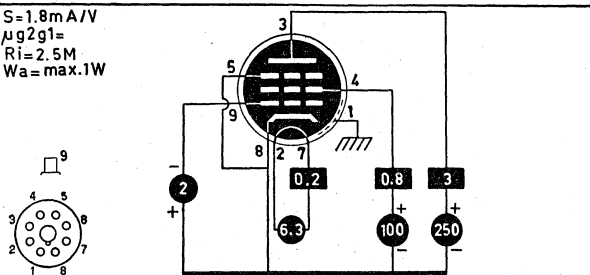
EF22

$S=2.2\text{mA/V}$
 $\mu g_{2g1}=17$
 $R_i=1.2\text{M}$
 $W_a=2\text{W}$



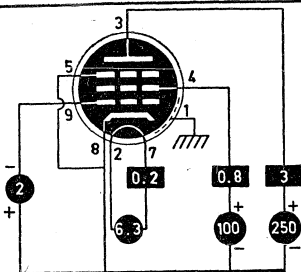
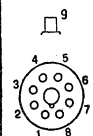
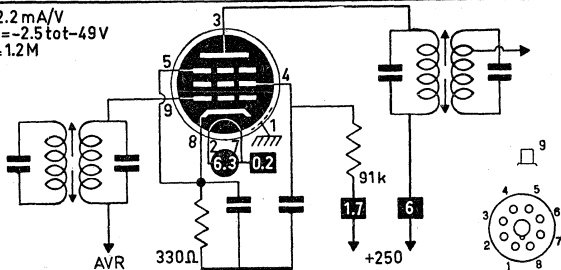
EF22

$S=1.8\text{mA/V}$
 $\mu g_{2g1}=$
 $R_i=2.5\text{M}$
 $W_a=\text{max.}1\text{W}$

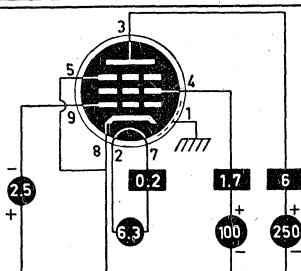
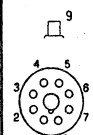


EF36

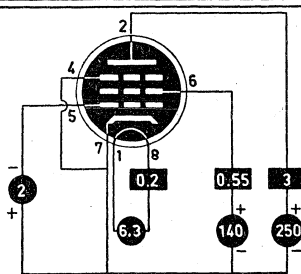
$S = 1.8 \text{ m A/V}$
 $\mu g_2 g_1 =$
 $R_i = 2.5 \text{ M}$
 $W_a = \text{max. } iW$


$$\begin{aligned} S &= 2.2 \text{ mA/V} \\ V_{G1} &= -2.5 \text{ tot} - 49 \text{ V} \\ R_i &= 1.2 \text{ M} \end{aligned}$$


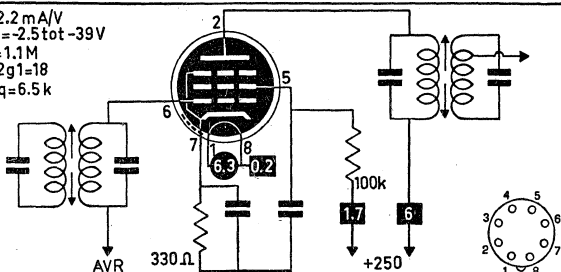
S=2.2mA/V
 $\mu_{g2g1}=$
 $R_i=1.2M$
 $W_a=$



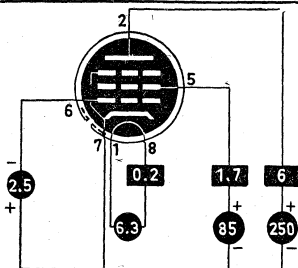
$S = 1.85 \text{ mA/V}$
 $\mu_{g2} g_1 = 38$
 $R_i = 2.5 \text{ M}$
 $W_a = 1 \text{ W}$



$S = 2.2 \text{ mA/V}$
 $V_{g1} = -2.5 \text{ tot } -39 \text{ V}$
 $R_i = 1.1 \text{ M}$
 $\mu_{g2} g_1 = 18$
 $R_{eq} = 6.5 \text{ k}$

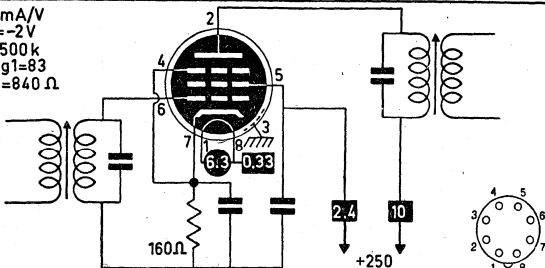


$S=2.2\text{mA/V}$
 $\mu g_{2g1}=18$
 $R_i=1.1\text{M}$
 $W_a=\text{max. } 2\text{W}$



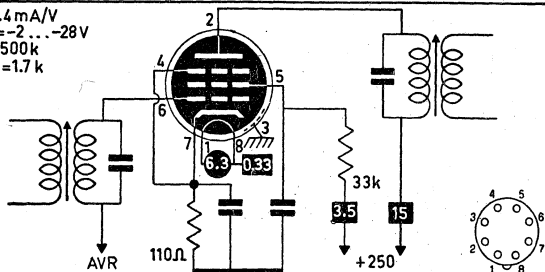
EF41

$S=9\text{mA/V}$
 $V_{g1}=-2\text{V}$
 $R_i=500\text{k}$
 $\mu g_{2g1}=83$
 $\text{Req}=840\Omega$



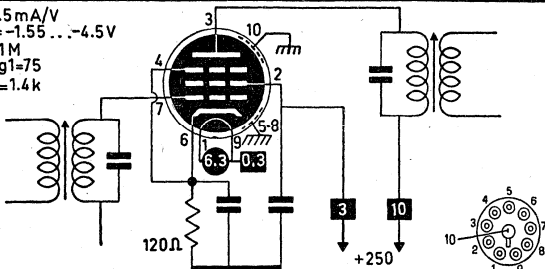
EF42

$S=6.4\text{mA/V}$
 $V_{g1}=-2\ldots-28\text{V}$
 $R_i=500\text{k}$
 $\text{Req}=1.7\text{k}$



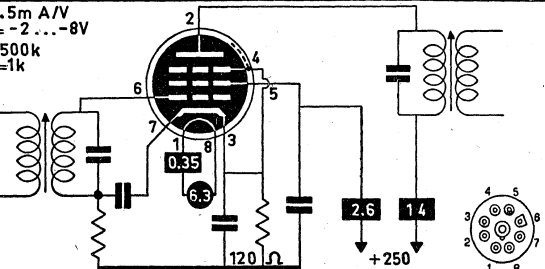
EF43

$S=6.5\text{mA/V}$
 $V_{g1}=-1.55\ldots-4.5\text{V}$
 $R_i=1\text{M}$
 $\mu g_{2g1}=75$
 $\text{Req}=1.4\text{k}$

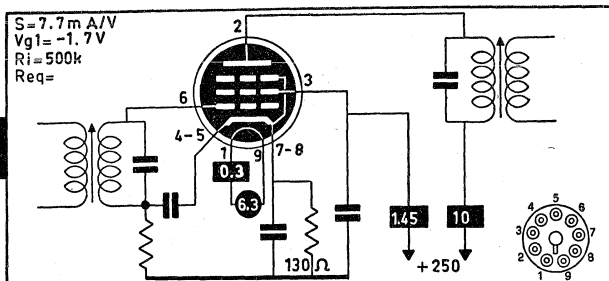
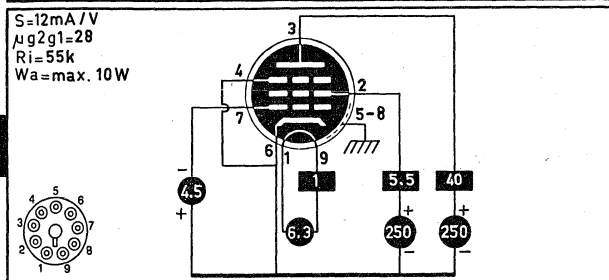
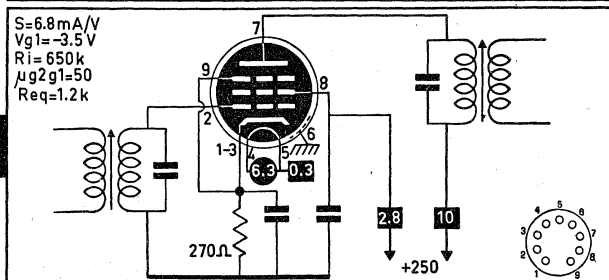
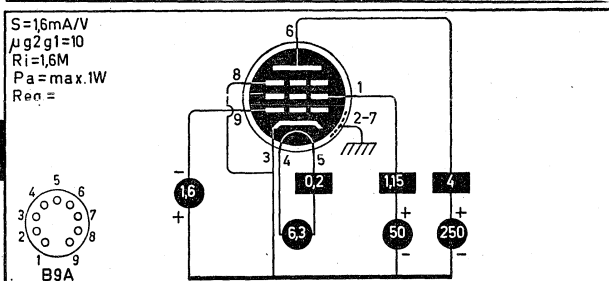
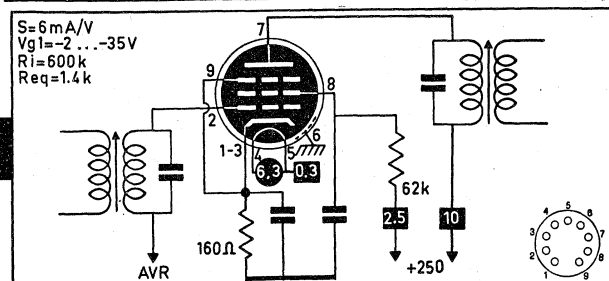


EF50

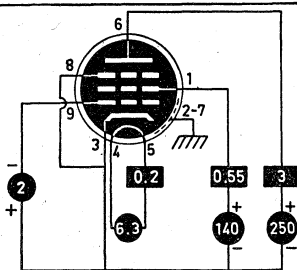
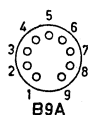
$S=9.5\text{mA/V}$
 $V_{g1}=-2\ldots-8\text{V}$
 $R_i=500\text{k}$
 $\text{Req}=1\text{k}$



EF51

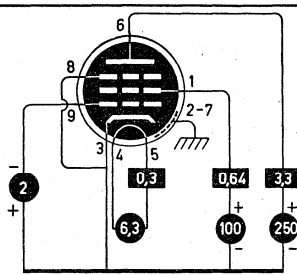
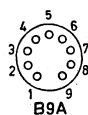
EF54**EF55****EF80****EF83****EF85**

$S=1.85 \text{ mA/V}$
 $\mu g_{2g1}=38$
 $R_i=2.5 \text{ M}$
 $W_a=1 \text{ W}$



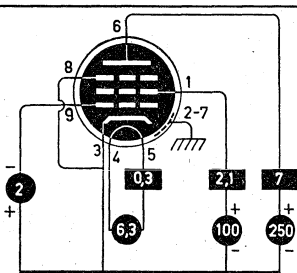
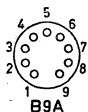
EF86

$S=1.9 \text{ mA/V}$
 $\mu g_{2g1}=$
 $R_i=1.5 \text{ M}$
 $P_a=\text{max. } 1.5 \text{ W}$
 $R_{eq}=$



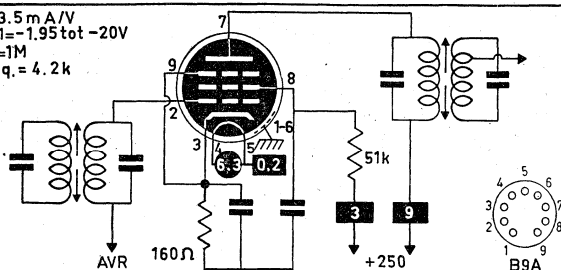
EF87

$S=2.1 \text{ mA/V}$
 $\mu g_{2g1}=$
 $R_i=900 \text{ k}$
 $P_a=\text{max. } 2 \text{ W}$
 $R_{eq}=$



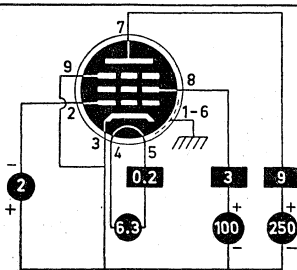
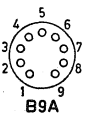
EF88

$S=3.5 \text{ mA/V}$
 $V_{g1}=-1.95 \text{ tot } -20 \text{ V}$
 $R_i=1 \text{ M}$
 $R_{eq}=4.2 \text{ k}$



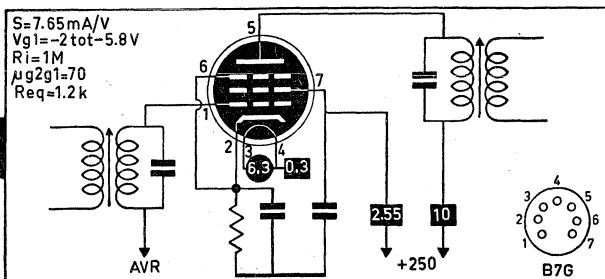
EF89

$S=3.6 \text{ mA/V}$
 $\mu g_{2g1}=19$
 $R_i=1 \text{ M}$
 $W_a=\text{max. } 2.25 \text{ W}$

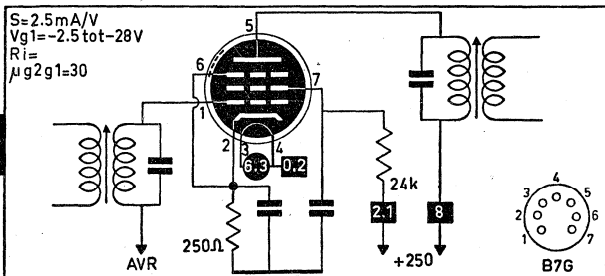


EF89

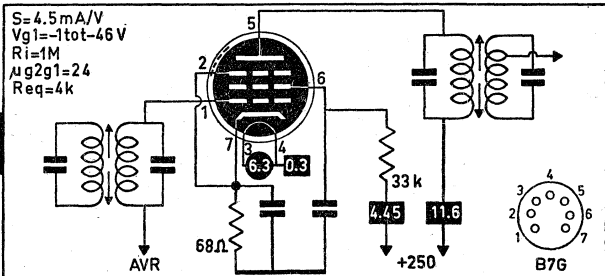
EF91



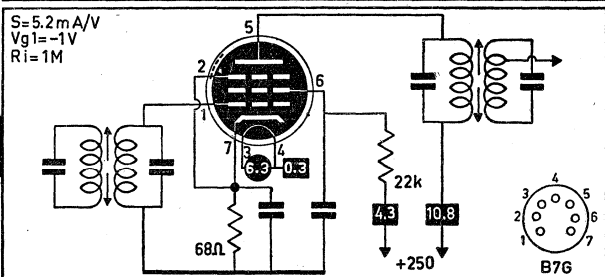
EF92



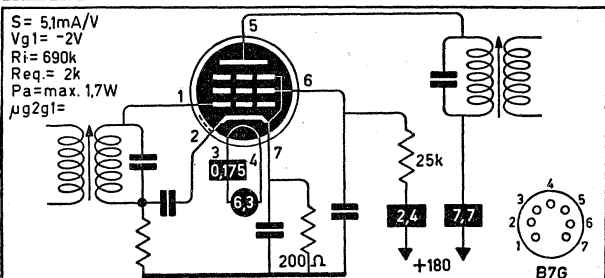
EF93

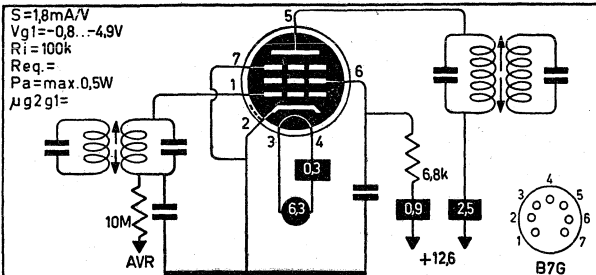


EF94

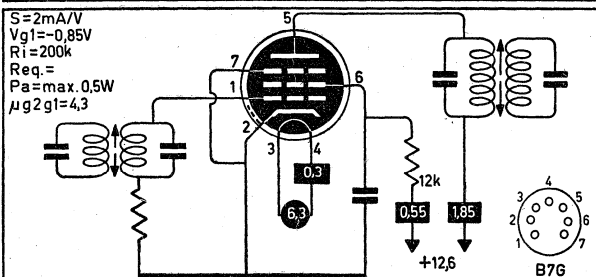


EF95

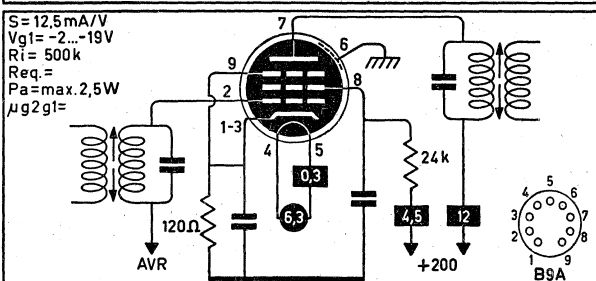




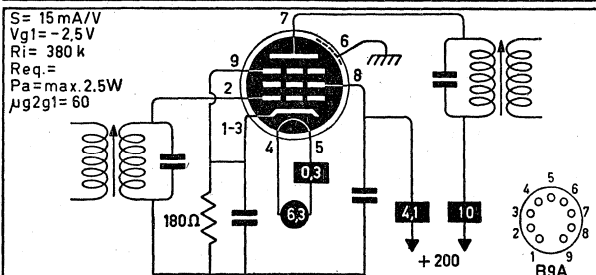
EF97



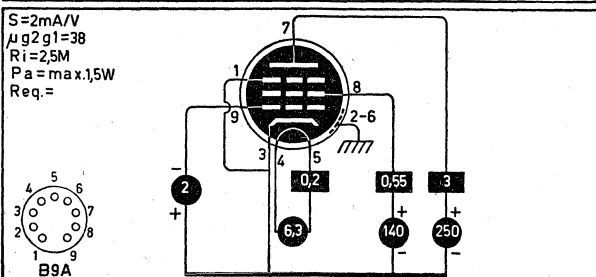
EF98



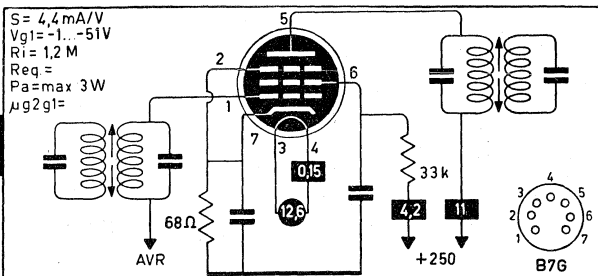
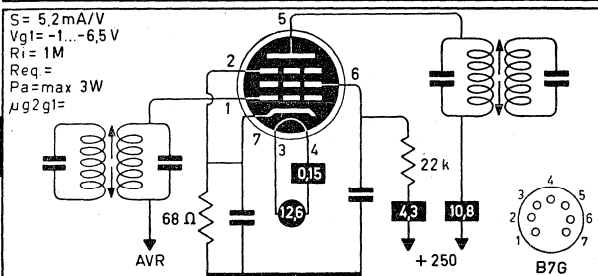
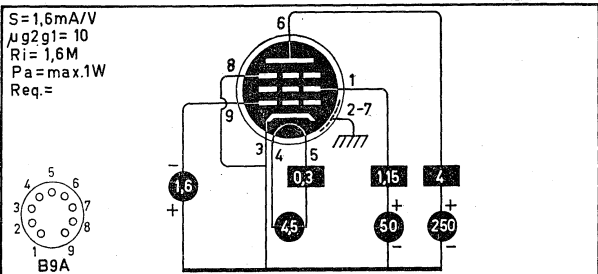
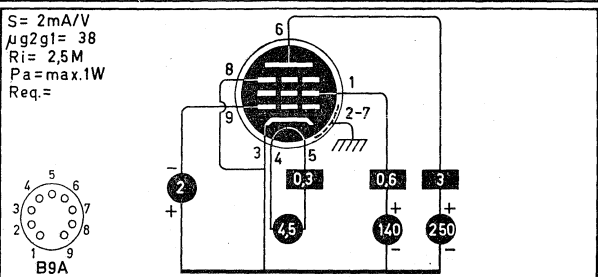
EF183

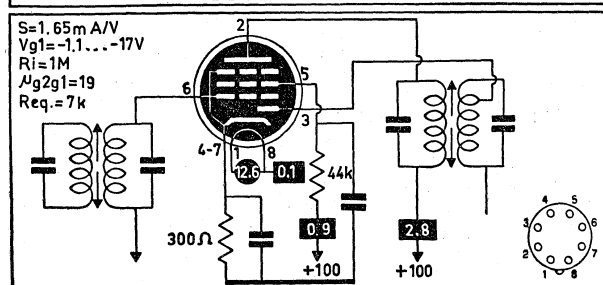
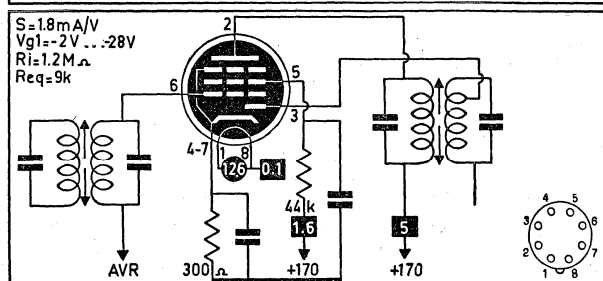
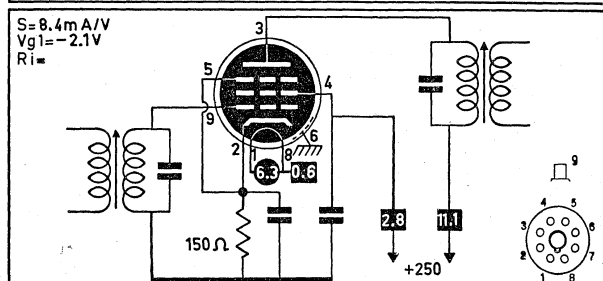
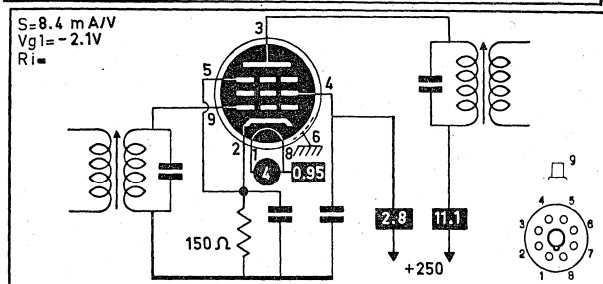
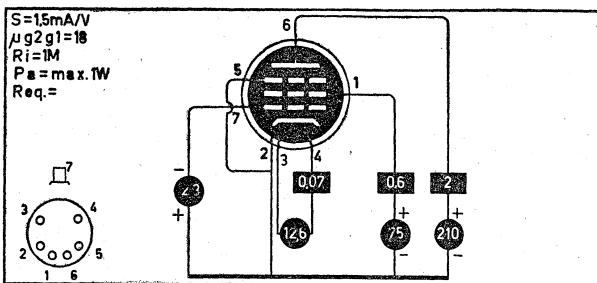


EF184

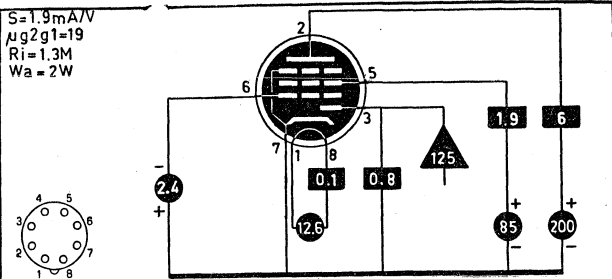


EF804

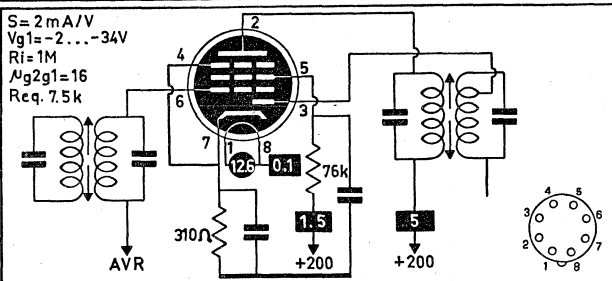
HF93**HF94****PF83****PF86**



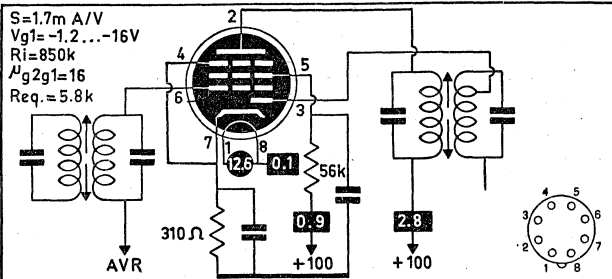
UAF41



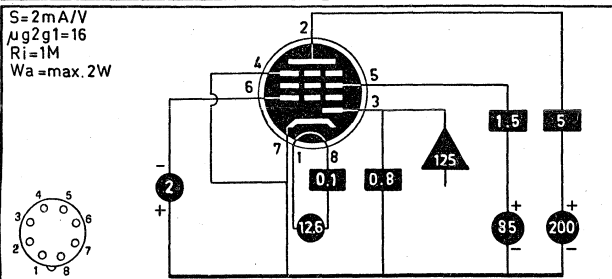
UAF42



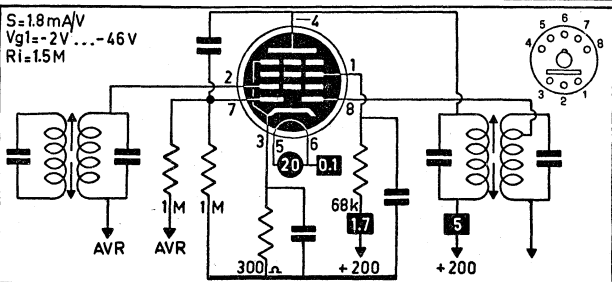
UAF42

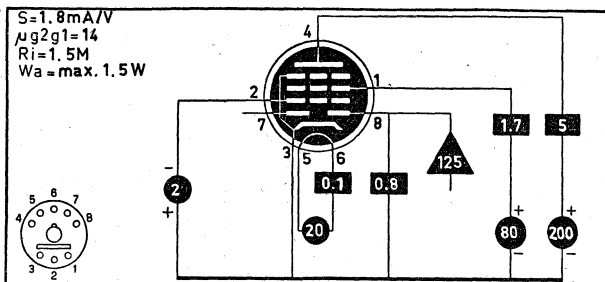


UAF42

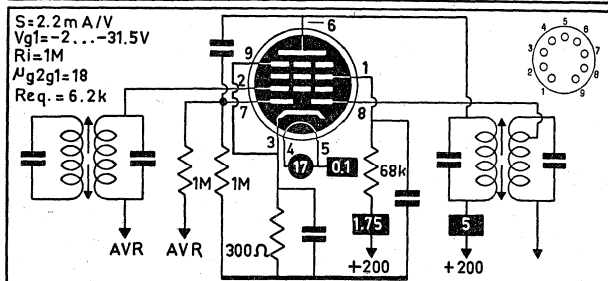


UBF 11

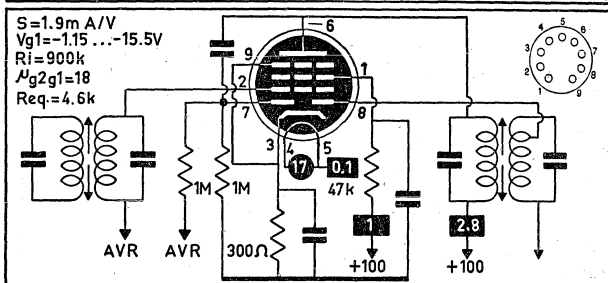




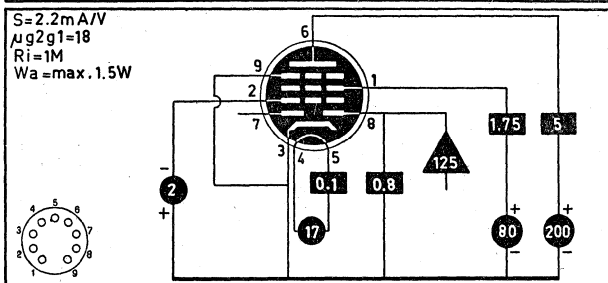
UBF11



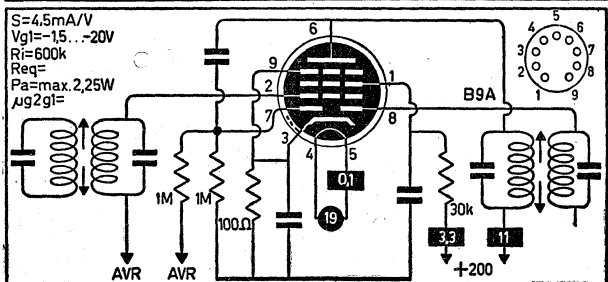
UBF80



UBF80

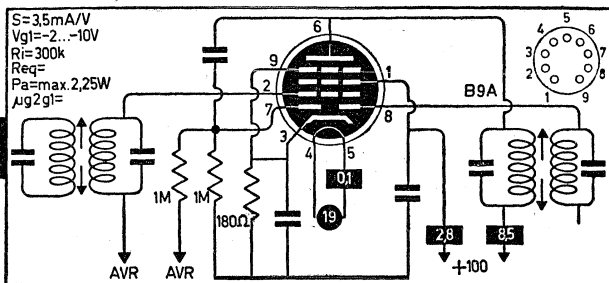


UBF80

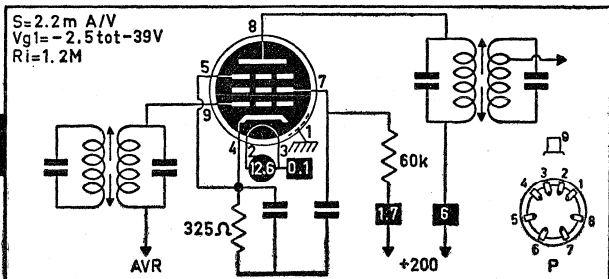


UBF89

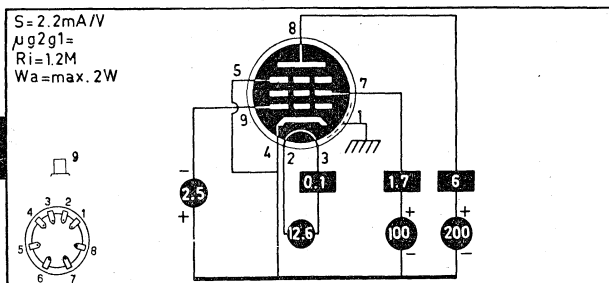
UBF89



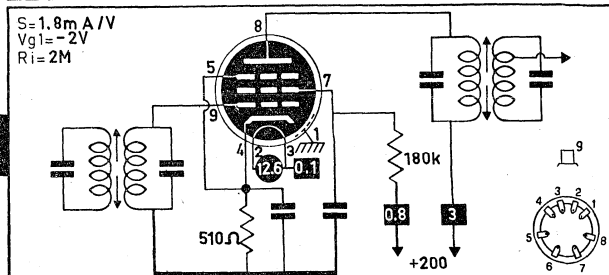
UF5



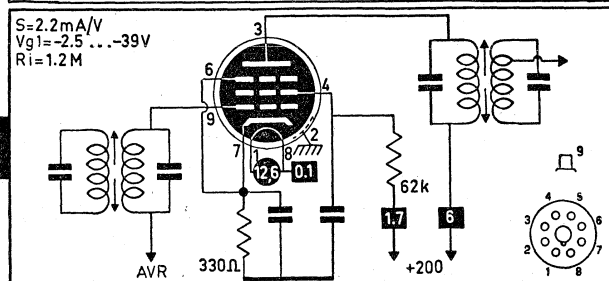
UF5

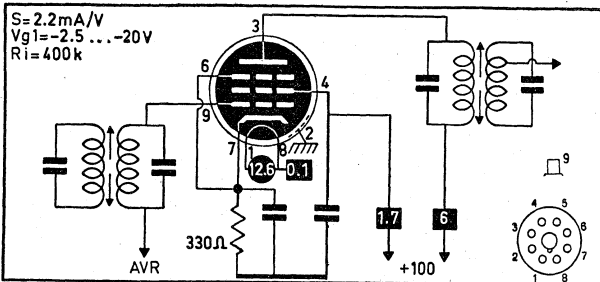


UF6

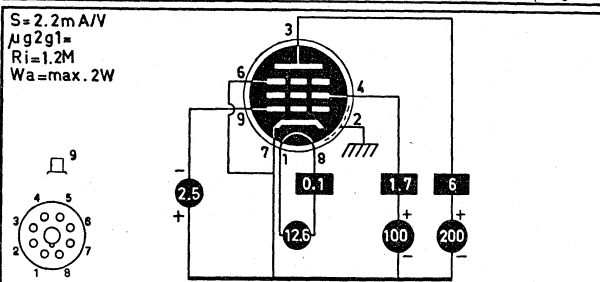


UF9

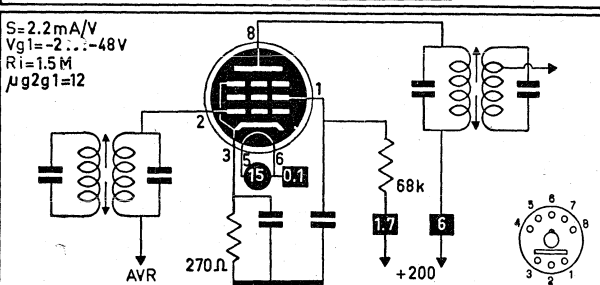




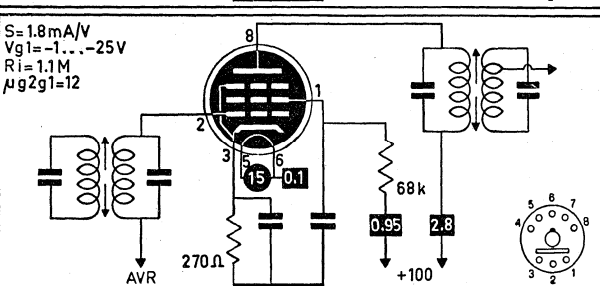
UF9



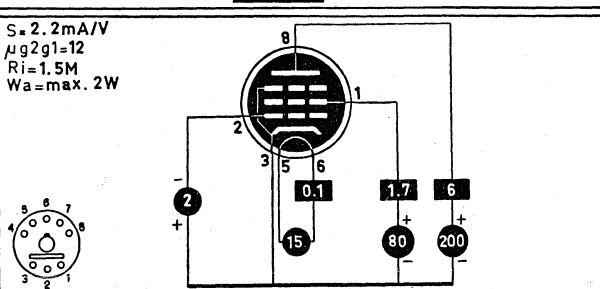
UF9



UF11

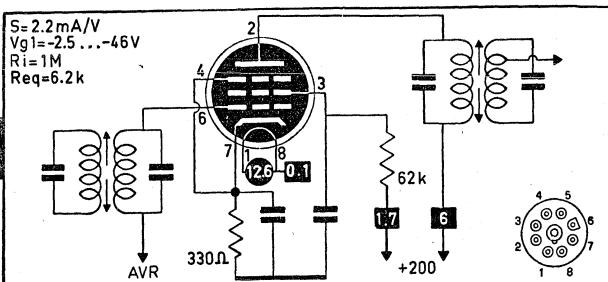


UF11

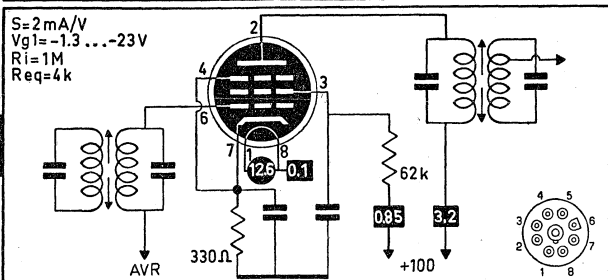


UF11

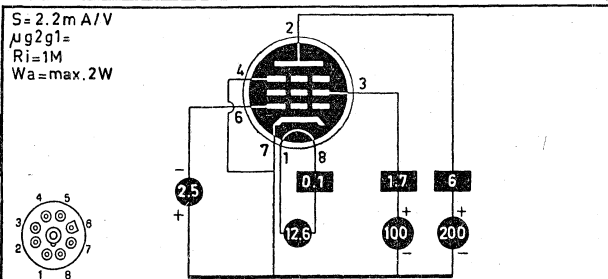
UF21



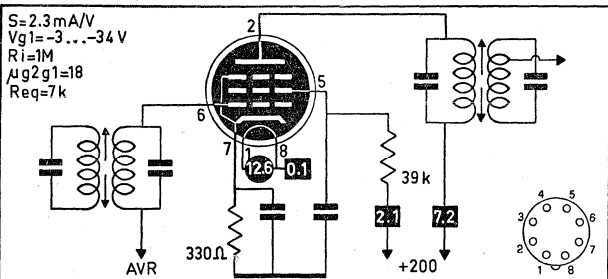
UF21



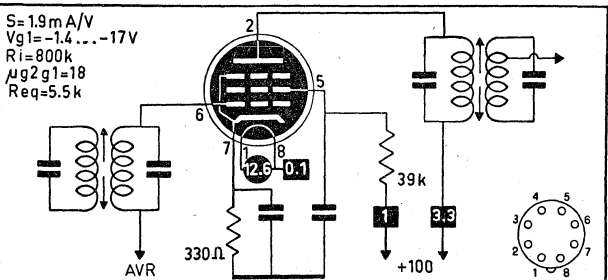
UF21

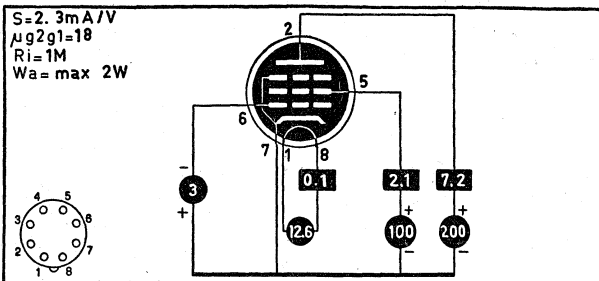


UF41

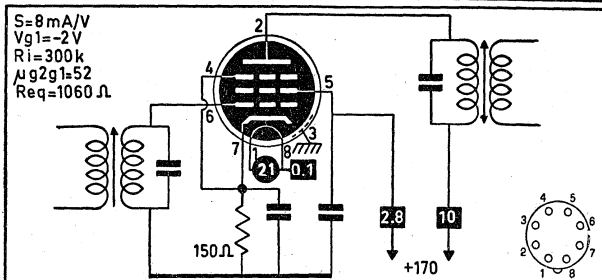


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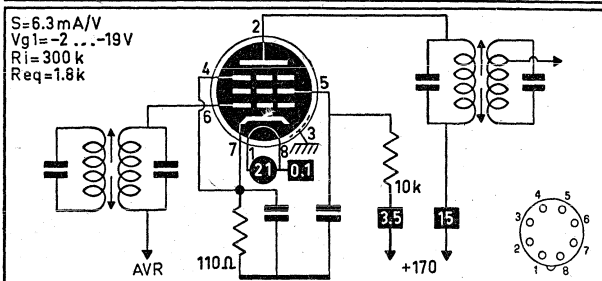




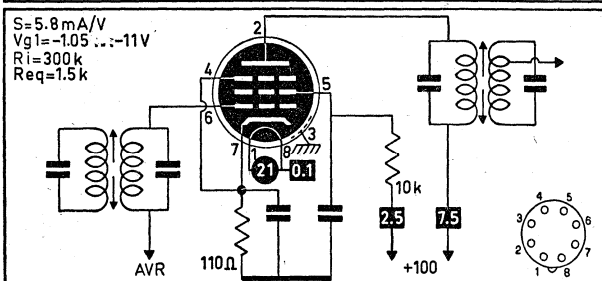
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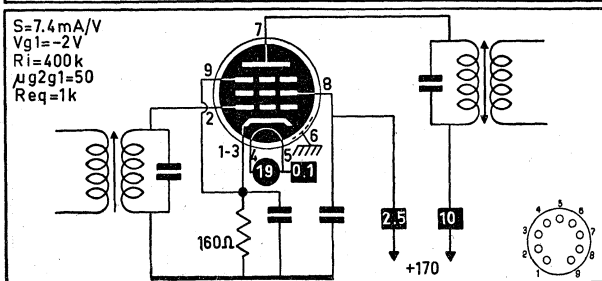
UF42



UF43

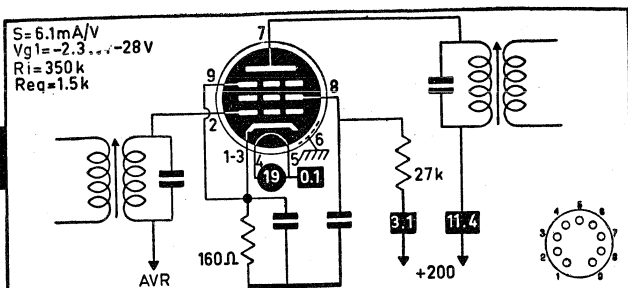


UF43

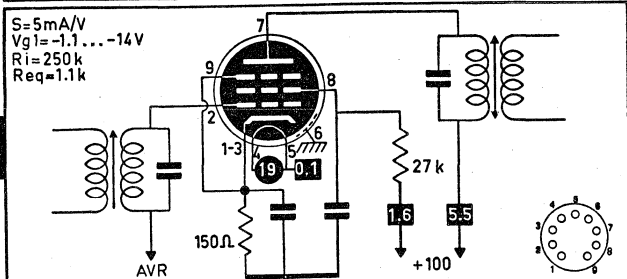


UF80

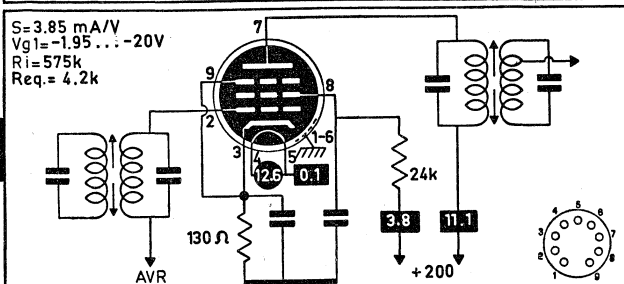
UF85



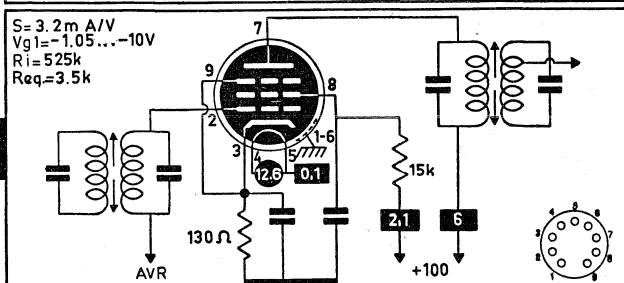
UF85



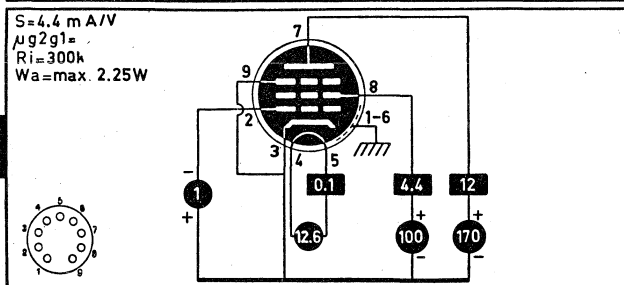
UF89

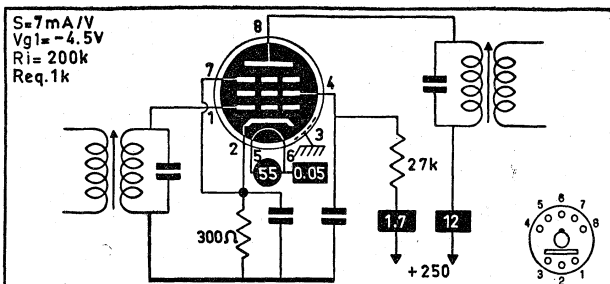


UF89

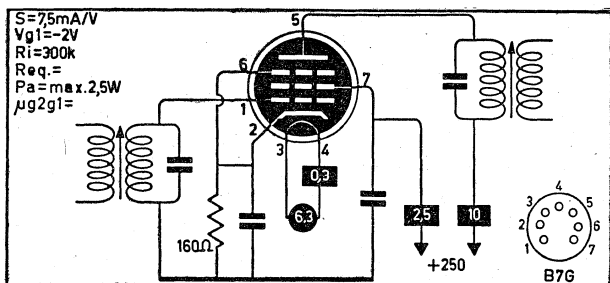


UF89





VF 14



277

E80F

Vb	V	100	200	250	300	400
Ra	k	220	220	220	220	220
Rg2	M	1	1,2	1,2	1,2	1,2
R'g1	k	680	680	680	680	680
Rk	k	3,3	1,8	1,5	1,2	1
Ia	mA	0,29	0,61	0,8	0,98	1,37
Ig2	mA	0,07	0,13	0,17	0,2	0,28
Vo max	Veff	8	20	25	30	40
A	—	120	165	175	190	200
d	%	1,7	1,6	1,4	1,1	0,9
		Rg1 = 1M				

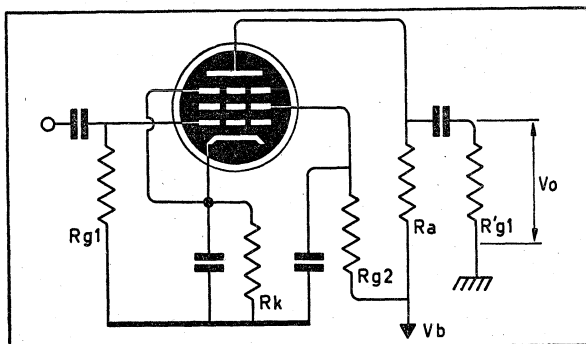
EF804

		Vb = 100V			Vb = 250V		
Ra	k	220	220	330	220	220	330
Rg2	M	1,2	1	1,2	1,2	1	1,5
R'g1	k	680	1000	1000	680	1000	1000
Rk	k	—	3,3	4,7	—	1,5	2,2
Ia	mA	0,3	0,29	0,21	0,9	0,87	0,61
Ig2	mA	0,06	0,05	0,04	0,17	0,16	0,11
Vo	Veff	12	12	12	12	12	12
A	—	120	120	125	190	175	210
d	%	3	2,5	2,6	1	1	1,2
Rg1	M	10	1	1	10	1	1

EF804

TRIODE

		Vb = 100V		Vb = 250V	
Ra	k	100	220	100	220
Rg2	k	—	—	—	—
R'g1	k	1000	1000	1000	1000
Rk	k	2,7	4,7	1,2	1,5
Ia	mA	0,48	0,28	1,5	0,85
Ig2	mA	—	—	—	—
Vo	Veff	12	12	12	12
A	—	26	27	29	31
d	%	2,2	1,8	1	1,1
		Rg1 = 1M			



		Vb: 90V					
Ra	k	470			1000		
Rg2	M	1,8			3,9		
R'g1	M	1	4,7	10	2,2	4,7	10
Rk	k	-	-	-	-	-	-
Ia	mA	0,13	0,13	0,13	0,07	0,07	0,07
Ig2	mA	0,04	0,04	0,04	0,02	0,02	0,02
Vo max	Veff	16,5	20,3	21	15,1	17,4	17,6
A	—	59	72,5	75	84	96,8	104
d	%	4,6	4,5	4,8	4,7	4,9	4,8
		Rg1: 10M					

1LC5
1S5
1U5

		Vb: 90V					
Ra	k	470			1000		
Rg2	M	2,7			5,6		
R'g1	M	1	4,7	10	2,2	4,7	10
Rk	k	-	-	-	-	-	-
Ia	mA	0,11	0,11	0,11	0,06	0,06	0,06
Ig2	mA	0,02	0,02	0,02	0,01	0,01	0,01
Vo max	Veff	11,9	16,9	17,5	12,4	16,3	18,2
A	—	62,7	77	79,6	82,8	96	101
d	%	4,7	4,8	4,7	4,9	4,8	5
		Rg1: 10M					

1LD5

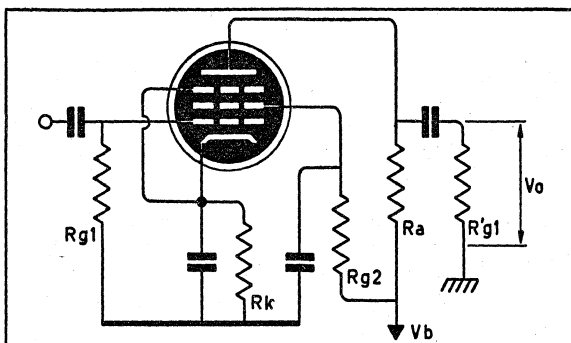
		Vb: 90V					
Ra	k	470			1000		
Rg2	M	2,2			4,7		
R'g1	M	1	4,7	10	2,2	4,7	10
Rk	k	-	-	-	-	-	-
Ia	mA	0,11	0,11	0,11	0,06	0,06	0,06
Ig2	mA	0,03	0,03	0,03	0,01	0,01	0,01
Vo max	Veff	12,5	17,2	17,9	12,9	16,1	17
A	—	73,5	90,5	94,2	99	115	121
d	%	4,9	4,7	4,6	4,9	4,9	4,9
		Rg1: 10M					

1LN5
1N5

		Vb: 100V					
Ra	k	100		270		470	
Rg2	M	0,39		1,2		1,8	
R'g1	k	270	470	270	470	470	1000
Rk	k	1,2	1,2	2,7	2,7	4,7	4,7
Ia	mA	0,65	0,65	0,26	0,26	0,17	0,17
Ig2	mA	0,18	0,18	0,07	0,07	0,05	0,05
Vo max	Veff	13,2	14,9	11,1	13,9	12,8	16,6
A	—	65,8	74,5	79,4	99,5	98,5	128
d	%	3	2,9	5,1	4,3	4,6	5

		Vb: 250V					
Ra	k	100		270		470	
Rg2	M	0,39		1,2		2,2	
R'g1	k	270	470	270	470	470	1000
Rk	k	0,56	0,56	1,2	1,2	1,8	1,8
Ia	mA	1,77	1,77	0,68	0,68	0,4	0,4
Ig2	mA	0,5	0,5	0,18	0,18	0,1	0,1
Vo max	Veff	47	54	33	41,8	28	37
A	—	94	108	132	168	187	247
d	%	4,2	5	5,2	4,4	4,5	3,7
		Rg1: 270k					

		Vb: 100V					
Ra	k	100		270		470	
Rg2	M	0,47		1,2		1,8	
R'g1	k	270	470	270	470	470	1000
Rk	k	1	1	2,2	2,2	3,9	3,9
Ia	mA	0,62	0,62	0,27	0,27	0,17	0,17
Ig2	mA	0,15	0,15	0,06	0,06	0,47	0,47
Vo max	Veff	12,3	13,9	10,8	13,8	13,2	17
A	—	68,5	77,2	77,2	98,7	94,5	122
d	%	4,7	4,1	5,5	4,6	4,9	5
		Vb: 250V					
Ra	k	100		270		470	
Rg2	M	0,47		1,2		2,2	
R'g1	k	270	470	270	470	470	1000
Rk	k	0,47	0,47	1	1	1,5	1,5
Ia	mA	1,76	1,76	0,75	0,75	0,44	0,44
Ig2	mA	0,41	0,41	0,18	0,18	0,1	0,1
Vo max	Veff	40,3	45,2	33	41,6	32	41,5
A	—	101	113	122	154	178	230
d	%	4,3	4,4	5	5	4,3	4,9
		Rg1: 270k					



		Vb: 90V					
Ra	k	470			1000		
Rg2	M		1,5		3,3		
R'g1	M	1	4,7	10	2,2	4,7	10
Rk	k	-	-	-	-	-	-
Ia	mA	0,11	0,11	0,11	0,06	0,06	0,06
Ig2	mA	0,04	0,04	0,04	0,02	0,02	0,02
Vo max	Veff	10,4	15	16,5	10	11,8	15,1
A	—	80	100	103	111	131	138
d	%	4,8	4,9	4,5	4,9	4,4	4,6
		Rg1: 10M					

1SA6
1U4

		Vb: 100V					
Ra	k	100		270		470	
Rg2	M	0,39		1		1,8	
R'g1	k	270	470	270	470	470	1000
Rk	k	1,2	1,2	2,7	2,7	4,7	4,7
Ia	mA	0,61	0,61	0,27	0,27	0,16	0,16
Ig2	mA	0,17	0,17	0,08	0,08	0,04	0,04
Vo max	Veff	8,55	9,8	8	10,2	9,6	12,5
A	—	77,8	89	80	102	96	129
d	%	5,1	4,6	5	3,8	5,2	3,9
		Vb: 250V					
Ra	k	100		270		470	
Rg2	M	0,39		1		1,8	
R'g1	k	270	470	270	470	470	1000
Rk	k	0,47	0,47	1	1	1,8	1,8
Ia	mA	1,75	1,75	0,75	0,75	0,44	0,44
Ig2	mA	0,49	0,49	0,21	0,21	0,12	0,12
Vo max	Veff	29	33	22,5	28	26,4	34,5
A	—	132	150	150	187	189	247
d	%	4,8	4,3	4,5	3,8	4,7	4,4
		Rg1: 270k					

7R7
14R7

CF50

		Vb:100V			Vb:250V		
Ra	k	100	220	330	100	220	330
Rg2	k	270	330	390	680	680	820
R'g1	M	1	1	1	1	1	1
Rk	k	4,7	4,7	6,8	1,8	1,8	2,2
Ia	mA	0,3	0,3	0,2	0,9	0,9	0,7
Ig2	mA	0,09	0,09	0,07	0,22	0,22	0,18
Vo	Veff	3	3	3	3	3	3
A	—	140	145	150	280	295	315
d	%	1	1	1	1	1	1
		Rg1:470k					

DAF41

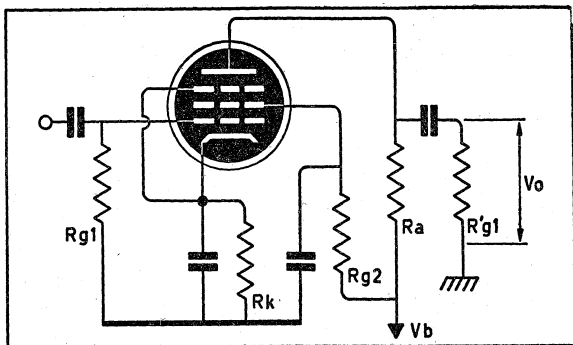
		Vb:67,5V	Vb:90V		Vb:120V
Ra	k	220	220	470	470
Rg2	M	0,82	0,82	2,2	2,2
R'g1	M	1	1	1	1
Rk	k	—	—	—	—
Ia	mA	0,17	0,25	0,13	0,18
Ig2	mA	0,04	0,06	0,03	0,04
Vo	Veff	5	5	5	5
A	—	60	70	83	100
d	%	1,7	0,9	1,4	1
		Rg1:3M			

DAF91

		Vb:45V		Vb:67,5V		Vb:90V	
Ra	k	470	1000	470	1000	470	1000
Rg2	M	1,8	3,9	1,8	3,9	1,8	3,9
R'g1	M	1	1	1	1	1	1
Rk	k	—	—	—	—	—	—
Ia	mA	0,07	0,04	0,13	0,06	0,17	0,09
Vo	Veff	5	5	5	5	5	5
A	—	38	42	50	55	56	60
d	%	4	5	1	3	1	2
		Rg1:10M					

DAF96

		Vb:67,5V •		Vb:90V		
Ra	M	1		1	1	
Rg2	M	2,2		2,7	—	
R'g1	M	1	2,2	1	2,2	2,2
Rk	k	—	—	—	—	—
Ia	mA	0,04	0,04	0,06	0,06	0,06
Ig2	mA	0,01	0,01	0,02	0,02	—
Vo	Veff	5	5	5	5	5
A	—	50	63	55	70	13,5
d	%	3,5	1,8	1,4	2,4	1,2
		Rg1:10M				



		Vb:90V		Vb:120V	
Ra	k	220	470	220	470
Rg2	M	1	2,2	1	2,2
R'g1	k	1	1	1	1
Rk	k	-	-	-	-
Ia	mA	0,17	0,1	0,28	0,15
Ig2	mA	0,03	0,02	0,06	0,03
Vo	Veff	3	3	3	3
A	—	53	69	68	85
d	%	1,6	1,2	0,75	0,8
		Rg1:1,5M			

DF21

		Vb:250V			
Ra	k	100	220	47	100
Rg2	k	390	820	-	-
R'g1	k	680	680	680	680
Rk	k	0,68	1,5	0,39	0,68
Ia	mA	1,52	0,8	3,8	2
Ig2	mA	0,53	0,26	-	-
Vo	Veff	8	8	8	8
A	—	100	120	14	15
d	%	1	1,2	1,1	1,2

EAF42

		Vb:250V	
Ra	k	100	220
Rg2	k	390	820
R'g1	k	680	680
Rk	k	1	2,2
Ia	mA	1,5	0,8
Ig2	mA	0,46	0,24
Vo	Veff	5	5
A	—	83	98
d	%	1,15	1,3
		Rg1:1M	

EBF11

EBF80

		Vb:250V		Vb:250V	
Ra	k	100	220	47	100
Rg2	k	390	820	-	-
R'g1	k	330	680	150	330
Rk	k	1	1,8	0,56	0,82
Ia	mA	1,5	0,75	4,1	2,08
Ig2	mA	0,53	0,3	-	-
Vo	Veff	8	8	8	8
A	—	80	110	13	14
d	%	2,2	2	2,9	4,3
		Rg1:1M			

**EF6
EF36**

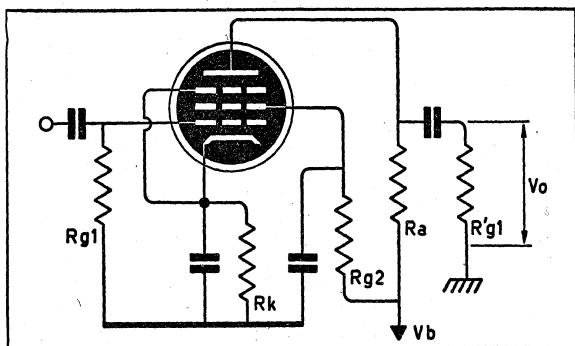
		Vb:100V			Vb:250V		
Ra	k	100	220	330	100	220	330
Rg2	k	220	390	560	270	390	820
R'g1	k	680	680	680	680	680	680
Rk	k	3,3	4,7	6,8	1,5	3,3	3,9
Ia	mA	0,6	0,3	0,22	1,6	0,9	0,6
Ig2	mA	0,2	0,12	0,08	0,5	0,35	0,2
Vo	Veff	2,4	2,4	2,4	3,7	3,7	3,7
A	—	85	100	105	110	140	165
d	%	1	0,9	1	1	1	1
		Rg1:1,5M					

**EF9
EF22
EF39**

		Vb:250V	
Ra	k	100	220
Rg2	k	390	820
R'g1	k	680	680
Rk	k	1	1,8
Ia	mA	1,6	0,87
Ig2	mA	0,45	0,26
Vo	Veff	10	10
A	—	85	106
d	%	2,5	2,7
		Rg1:1M	

EF11

		Vb:100V	Vb:200V	Vb:250V
Ra	k	220	220	220
Rg2	k	680	680	680
R'g1	k	680	680	680
Rk	k	2,2	2,2	1,5
Ia	mA	0,37	0,76	1
Ig2	mA	0,12	0,26	0,35
Vo	Veff	5	5	5
A	—	66	77	98
d	%	4	1,7	1,4
		Rg1:1M		



		V _b :100V			V _b :250V		
R _a	k	47	100	220	47	100	220
R _{g2}	k	150	270	470	220	270	470
R'g1	k	680	680	680	680	680	680
R _k	k	0,82	1,2	2,2	0,68	0,82	1,5
I _a	mA	0,92	0,6	0,32	2,15	1,7	0,9
I _{g2}	mA	0,48	0,25	0,14	0,82	0,68	0,37
V _o	V _{eff}	5	5	5	5	5	5
A	—	70	100	128	90	137	181
d	%	0,7	0,4	0,7	0,45	0,15	0,2
		R _{g1} :1M					

EF12

		V _b :250V			V _b :300V		
R _a	k	47	100	220	47	100	220
R _{g2}	k	—	—	—	—	—	—
R'g1	k	150	330	680	150	330	680
R _k	k	1,2	2,2	3,9	1,2	2,2	3,9
I _a	mA	2,3	1,25	0,65	2,7	1,5	0,8
I _{g2}	mA	—	—	—	—	—	—
V _o max	V _{eff}	32	39	39	43	50	51
A	—	23,5	28	30,5	24	28,5	31
d	%	3,5	3,7	3,5	3,8	3,8	3,7
		V _b :350V			V _b :400V		
R _a	k	47	100	220	47	100	220
R _{g2}	k	—	—	—	—	—	—
R'g1	k	150	330	680	150	330	680
R _k	k	1,2	2,2	3,9	1,2	2,2	3,9
I _a	mA	3,2	1,7	0,9	3,7	2	1,05
I _{g2}	mA	—	—	—	—	—	—
V _o max	V _{eff}	53	62	62	64	73	74
A	—	24,5	28,5	31,5	24,5	28,5	32
d	%	4	4	3,7	4,5	4	3,8
		R _{g1} :1M					

**EF40
EF86
PF86**

TRIODE

EF40
EF86
PF86

		Vb:250V			Vb:100V
Ra	k	100	220	220	220
Rg2	M	0,39	1	1,2	1,2
R'g1	k	330	680	680	680
Rk	k	1	2,2	-	-
Ik	mA	2,05	0,95	1,07	0,36
Vo	Veff	12	12	12	12
A	—	112	180	200	130
d	%	0,8	1,4	1	3
		Rg1:1M		Rg1:10M	

EF89

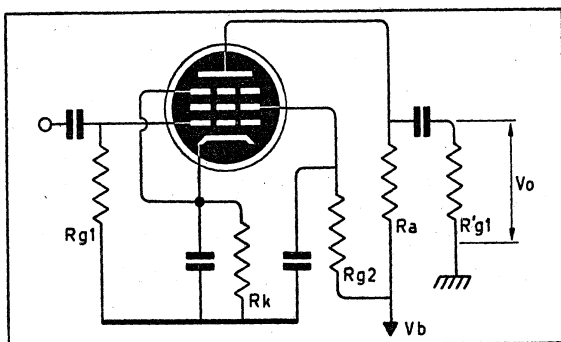
		Vb:250V			
Ra	k	100	220	100	220
Rg2	k	270	680	470	1000
R'g1	M	1	1	1	1
Rk	k	0,56	1,2	-	-
Ia	mA	2,05	0,92	1,5	0,79
Ig2	mA	0,7	0,3	0,49	0,24
Vo	Veff	8	8	8	8
A	—	115	135	170	240
d	%	0,5	1,05	1,9	1,3
		Rg1:1M		Rg1:10M	

UAF42

		Vb:100V			Vb:170V		
Ra	k	100	220	100	100	220	100
Rg2	k	330	820	-	330	820	-
R'g1	k	680	680	680	680	680	680
Rk	k	1,5	2,7	1,8	1,5	2,7	1,8
Ia	mA	0,58	0,29	0,7	1,05	0,5	1,2
Ig2	mA	0,21	0,09	-	0,37	0,17	-
Vo	Veff	5	5	5	8	8	8
A	—	60	75	12	68	80	12
d	%	1	1,1	2,2	1,1	1,2	3,2
		Rg1:1M					

UBF11

		Vb:100V	Vb:200V
Ra	k	220	220
Rg2	k	680	680
R'g1	k	680	680
Rk	k	2,2	2,2
Ia	mA	0,33	0,66
Ig2	mA	0,12	0,24
Vo	Veff	5	5
A	—	76	82
d	%	1,2	1,2
		Rg1:1M	



		Vb:100V		Vb:170V		Vb:170V	
Ra	k	100	220	100	220	47	100
Rg2	k	270	680	270	680	-	-
R'g1	k	330	680	330	680	150	330
Rk	k	1	2,7	1	2,7	1	1,8
Ia	mA	0,73	0,32	1,25	0,56	2,4	1,25
Ig2	mA	0,29	0,12	0,5	0,2	-	-
Vo	Veff	5	5	8	8	8	8
A	—	67	82	70	85	11	11
d	%	1,8	1,9	2	1,8	4,6	4,8
		Rg1:1M					

UBF80

		Vb:100V		Vb:200V	
Ra	k	220	100	220	
Rg2	k	820	390	820	
R'g1	k	680	680	680	
Rk	k	2,7	1,2	2,7	
Ia	mA	0,33	1,22	0,65	
Ig2	mA	0,08	0,35	0,17	
Vo	Veff	3	8	8	
A	—	82	78	88	
d	%	0,85	2	2	
		Rg1:1M			

**UF5
UF9
UF21**

		Vb:100V		Vb:200V	
Ra	k	220	100	220	
Rg2	k	560	390	560	
R'g1	k	680	680	680	
Rk	k	2,2	1,5	2,2	
Ia	mA	0,37	1,18	0,76	
Ig2	mA	0,12	0,37	0,26	
Vo	Veff	5	5	5	
A	—	66	69	77	
d	%	4	1,5	1,7	
		Rg1:1M			

UF11

				
-1AH5-	DAF96	-	-	-
-1AJ4-	DF96	-	-	-
1L4	DF92	CV1758 CV2795	-	-
1LC5	-	CV777	-	-
1LD5	-	CV779	-	-
1LN5	-	CV781 VT179 x)	-	-
1N5	DF33	CV1821	-	-
1N5GT	-	CV1823 VT146 x)	-	-
1P5GT	-	CV728	-	-
1S5	DAF91	CV784 VT172 x)	-	1U5
1T4	DF91	CV785 CV1971 VT173 x)	-	-
1U4	-	CV2507	-	-
1U5-	-	-	-	1S5 DAF91
2B7	-	-	6B7 6B8	6B8
2CY5	-	-	3CY5 4CY5 6CY5	-
3AU6	-	-	4AU6 6AU6 12AU6 EF94 HF94	-
3BA6	-	-	6BA6 12BA6 EF93 HF93	-
3BC5	-	-	4BC5 6BC5	-
3BZ6	-	-	4BZ6 6BZ6 12BZ6	-
3CB6	-	-	4CB6 6CB6	-
3CE5	-	-	6CE5	-
3CF6	-	-	6CF6	-
3CY5	-	-	2CY5 4CY5 6CY5	-
3DK6	-	-	6DK6	-
3DT6	-	-	6DT6	-
3EA5	-	-	6EA5	-
4AU6	-	-	3AU6 6AU6 12AU6 EF94 HF94	-
4BC5	-	-	3BC5 6BC5	-
4BZ6	-	-	3BZ6 6BZ6 12BZ6	-
4CB6	-	-	3CB6 6CB6	-

*) American VT

	==			
4CY5	-	-	2CY5 3CY5 6CY5	-
4DE6	-	-	6DE6	-
4DT6	-	-	3DT6 6DT6	-
4EW6	-	-	5EW6 6EW6	-
6AB7	-	CV661 CV1873	-	-
6AC7	-	CV660 CV747 CV846 CV849	-	-
6AG5	EF96	CV848	-	-
6AH6	-	CV2521	-	-
6AK5	EF95	CV850 CV2877	-	-
6AM6	EF91	CV138	-	-
6AS6	-	CV2522 CV2884	-	-
6AU6	EF94	CV2524	3AU6 4AU6 12AU6 HF94	-
6AU6WA	-	CV4023	-	-
6B7	-	CV1711 VT68 ^x)	2B7	6B8
6B7G	-	CV1890	-	-
6B8	-	CV1894 VT93 ^x)	2B7	2B7 6B7
6B8G	-	CV1893 VT93A ^x)	-	-
6BA6	EF93	CV454	3BA6 12BA6	-
6BC5	-	-	3BC5 4BC5	-
6B06	-	-	12B06	-
6BR7	-	CV2135	-	-
-6BX6-	EF80	-	-	-
-6BY7-	EF85	-	-	-
6BZ6	-	-	3BZ6 4BZ6 12BZ6	-
6C6	-	CV585	-	6D7 6J7
6CB6	-	-	3CB6 4CB6	-
6CE5	-	-	3CE5	-
6CF6	-	-	3CF6	-
-6CJ5-	EF41	-	-	-
-6CQ6-	EF92	-	-	-
-6CT7-	EAF42	-	-	-
6CY5	-	-	2CY5 3CY5 4CY5	-
6D6	-	CV1900	-	6C6 6U7
6D7	-	CV1776	-	6C6 6J7
-6DA6-	EF89	-	-	-
6DE6	-	-	4DE6	-

* American VT

				
6DK6	-	-	3DK6	-
6DT6	-	-	3DT6	-
6E7	-	-	-	6D6 6U7
6EA5	-	-	3EA5	-
6EQ7	-	-	12EQ7 20EQ7	-
6EW6	-	-	4EW6 5EW6	-
6J7	-	CV1074 CV1936 VT74 ^{xx} VT91 ^x	6W7 12J7	6C6 6D7
6J7G	-	ARP16 NR83	-	-
6J7GT	-	CV1935 CV1937 VT91A ^x	-	-
6K7	-	CV1942 ^x VT86 ^x	12K7	-
6K7G	-	ARP15 CV1941 ^x VT86A ^x	-	-
6K7GT	-	CV1943 ^x VT86B ^x	-	-
-6N8-	EBF80	-	-	-
6S7	-	CV1974 CV1975	-	-
6SD7	-	CV865	-	-
6SF7	-	-	12SF7	-
6SG7	-	CV1978 ^x VT211 ^x	12SG7	-
6SH7	-	CV594 CV595	12SH7	-
6SJ7	-	CV590 CV591 CV592 VT116 ^x	12SJ7	-
6SJ7GT	-	VT116A ^x	-	-
6SJ7WGT	-	CV3619	-	-
6SJ7Y	-	CV866 VT116B ^x	-	-
6SK7	-	CV1981 CV1982 VT117 ^x	12SK7	-
6SK7GT	-	VT117A ^x	-	-
6SS7	-	CV1993 ^x VT199 ^x	-	-
6U7	-	-	-	6D6 6E7
6U7G	-	CV706	-	-
6W7	-	-	6J7	-
6W7G	-	CV512	-	-
7A7	-	CV877	12SK7 14A7	6SK7 12SK7
7B7	-	CV522 CV1891	-	-
7C7	-	CV1777 VT193 ^x	14C7	-
7E7	-	CV892	14E7	-
7G7	-	CV894	-	-
7H7	-	CV895	14H7	-

*) American VT

**) American VT

	=			
7R7	-	CV900	14R7	-
7V7	-	-	-	7W7 14W7
7W7	-	CV902	14W7	7V7
-12AC5-	UF41	-	-	-
12AU6	HF94	CV1961	3AU6 4AU6 6AU6 EF94	-
12AW6	-	-	6AG5 EF96	6AG5 EF96
12BA6	HF93	CV1928	3BA6 6BA6 EF93	-
12BD6	-	-	6BD6	-
12BZ6	-	-	3BZ6 4BZ6 6BZ6	-
12C8	-	CV531 CV837 VT169	6B8	6B7
12C8Y	-	VT153	-	-
12EQ7	-	-	6EQ7	-
			20EQ7	
12J8	-	-	6J7	6C6 6D7
12J7GT	-	CV917	-	-
12K7	-	-	6K7	-
12K7GT	-	CV918	-	-
12SF7	-	CV921	6SF7	-
12SG7	-	CV694 VT209	6SG7	-
12SH7	-	CV922 VT288	6SH7	-
12SH7GT	-	CV3651	-	-
12SJ7	-	CV697 CV698 CV923 VT162	6SJ7	-
12SK7	-	CV543 CV544 VT131	6SK7	-
14A7	-	-	7A7 12SK7	6SK7 12SK7
14C7	-	-	7C7	-
14E7	-	-	7E7	-
14H7	-	-	7H7	-
14R7	-	-	7R7	-
14W7	-	-	7W7	-
-17N8-	UBF80	-	-	-
-19BY7-	UF85	-	-	-
20EQ7	-	-	6EQ7 12EQ7	-
57	-	CV612	-	-
58	-	CV613	-	-
77	-	CV616	-	-
78	-	CV2544	-	-
-6267-	EF86	-	PF86	-
9001	-	CV1757	-	-
9003	-	CV665	-	-
AF3	-	CV2833	CF3	-
AF7	-	-	CF7	-

*) American VT

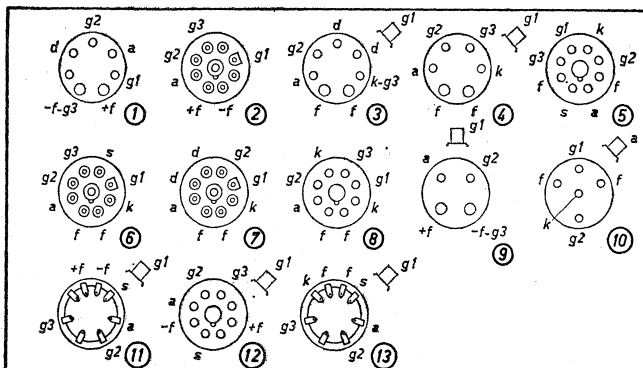
	=		Y	
CF3	-	-	AF3	-
CF7	NF2	-	AF7	-
DAF91	1S5	-	-	1U5
DAF96	-1AH5-	-	-	-
DF33	1N5	-	-	-
DF91	1T4	-	-	-
DF92	1L4	-	-	-
DF96	-1AJ4-	-	-	-
E8DF	-	CV2729	-	-
EAF42	-6CT7-	CV3883	-	-
EBF2	-	CV2925	-	EBF32
EBF32	-	CV501	-	EBF2
EBF80	-6N8-	-	-	-
EF6	-	-	-	EF36
EF9	-	CV1427	-	EF22
				EF39
EF22	-	CV303	-	EF9
				EF39
EF36	EF37 -EF37A-	CV1056 CV1404 NR49 VR56	-	EF6
EF37	EF36 -EF37A-	-	-	EF6
-EF37A-	EF36 EF37	CV358	-	EF6
EF39	-	ARP34 CV1053 CV1464	-	EF9
EF40	-	CV3885	-	EF86 -6267-
EF41	-6CJ5-	CV3886	-	-
EF42	-	CV3887	-	-
EF50	-	ARP35 CV1091 CV1578 VR87 VR87A VT250 x)	-	-
EF51	-	CV305	-	-
EF54	-	CV380 CV1136	-	-
EF55	-	CV173	-	-
EF80	-6BX6-	-	-	-
EF83	-	-	PF83	-
EF85	-6BY7-	CV1375	-	-
EF86	-6267-	CV2901	PF86	-
EF89	-6DA6-	-	-	-
EF91	6AM6	CV1955 CV2001	-	-
EF92	-6CQ6-	CV131	-	-
EF93	6BA6	-	3BA6 12BA6 HF93	-
EF94	6AU6	-	3AU6 4AU6 12AU6 HF94	-
EF95	6AK5	-	-	-
EF96	6AG5	-	-	-
EF804	-	-	-	EF40 EF86

x) American VT

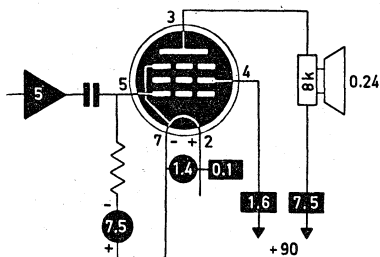
[illegible]

OBSOLETE TYPES

Type	V_F	I_F	V_a	I_a	V_{g2}/R_{g2}	I_{g2}	$-V_{g1}$	R_k	S	Base
	V	A	V	mA	V kΩ	mA	V	Ω	mA/V	nr.
1AF5	1,4	0,02	90	1,1	90	0,4	0	-	0,6	1
1LC5	1,4	0,05	90	1,1	45	0,3	0	-	0,8	2
2B7	2,5	0,8	250	6	100	1,5	3	-	1	3
6C6	6,3	0,3	250	2	100	0,5	3	-	1,2	4
606	6,3	0,3	250	8,2	75 k	2	3	300	1,6	4
6SD7	6,3	0,3	250	6	82 k	1,9	2	250	3,6	5
6SE7	6,3	0,3	250	4,5	100 k	1,5	1,5	250	3,1	5
14C7	12,6	0,15	250	2,2	100	0,7	3	-	1,6	6
14E7	12,6	0,15	250	7,5	100 k	1,6	3	330	1,3	7
14H7	12,6	0,15	250	10	33 k	3,2	2	180	4	6
14R7	12,6	0,15	250	6,2	100 k	1,6	1	130	3,2	7
14W7	12,6	0,22	250	10	39 k	3,9	2,2	160	5,8	8
34	2	0,06	135	2,8	68 k	1	3	-	0,6	9
57	2,5	0,1	250	2	100	0,5	3	-	1,2	4
58	2,5	0,1	250	8,2	75 k	2	3	300	1,6	4
77	6,3	0,3	250	2,3	100	0,5	3	-	1,3	4
78	6,3	0,3	250	10,5	47 k	2,6	3	220	1,6	4
AF2	4	1,1	200	4,3	56 k	1,8	2	390	2,5	10
KF3	2	0,04	90	1	90	0,2	0,5	-	0,5	11
KF4	2	0,06	90	1,2	90	0,4	0,5	-	0,7	11
KF35	2	0,05	120	1,4	1,2 M	0,5	1,5	-	1	12
NF2	13	0,2	200	3	90 k	1,1	2	500	2,1	13

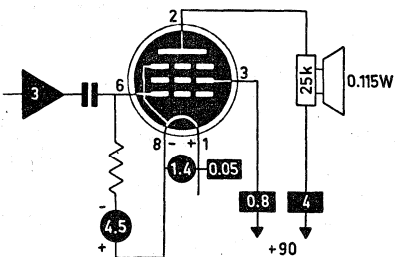


$S = 1.55 \text{ mA/V}$
 $V_{g1} = -7.5 \text{ V}$
 $R_i = 115 \text{ k}$



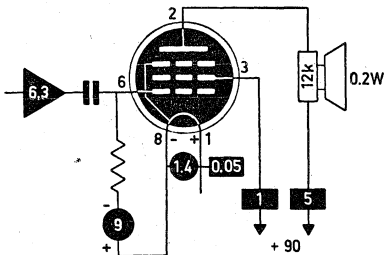
1C5

$S = 0.85 \text{ mA/V}$
 $V_{g1} = -4.5 \text{ V}$
 $R_i = 300 \text{ k}$



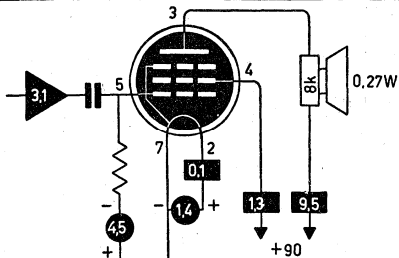
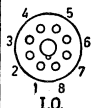
1LA4

$S = 0.92 \text{ mA/V}$
 $V_{g1} = -9 \text{ V}$
 $R_i = 250 \text{ k}$



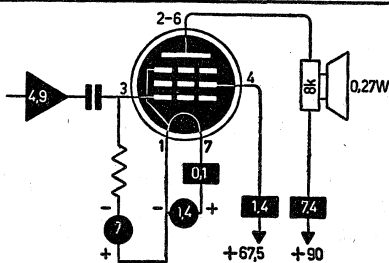
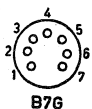
1LB4

$S = 2.2 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 90 \text{ k}$
 $P_a = \text{max.}$



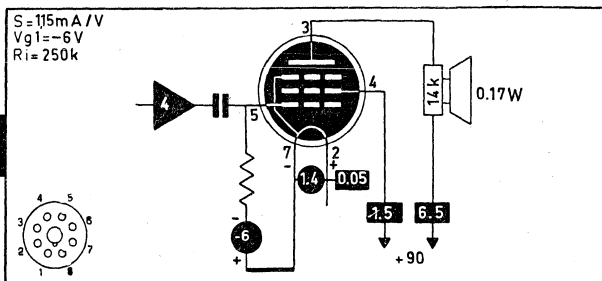
1Q5

$S = 1.57 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 100 \text{ k}$
 $P_a = \text{max. } 0.7 \text{ W}$

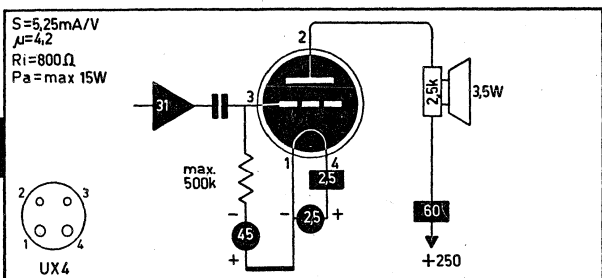


1S4

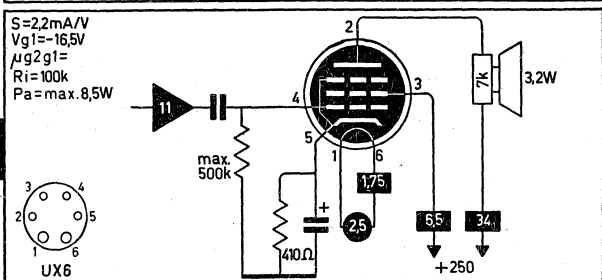
1T5



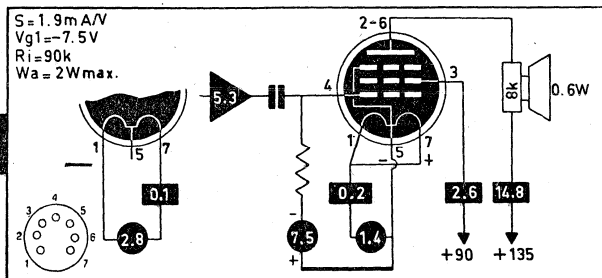
2A3



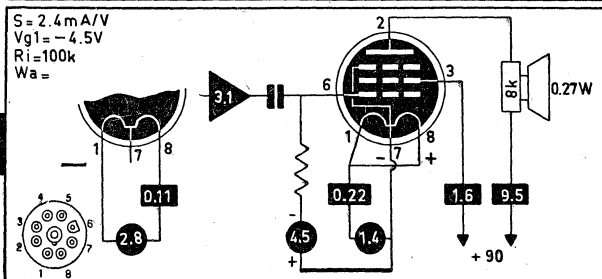
2A5

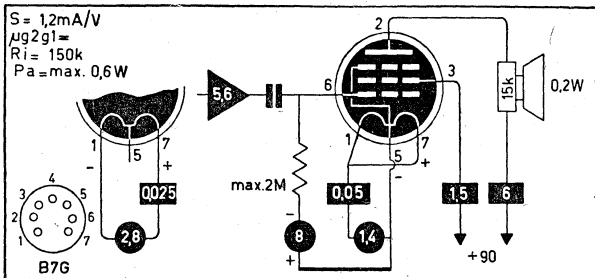


3A4

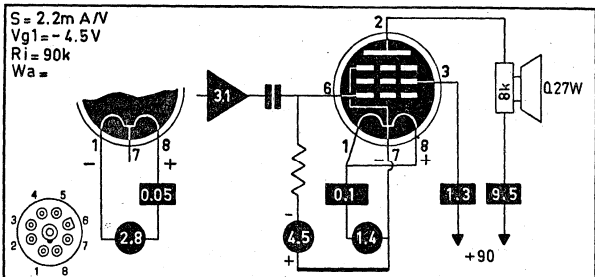


3D6

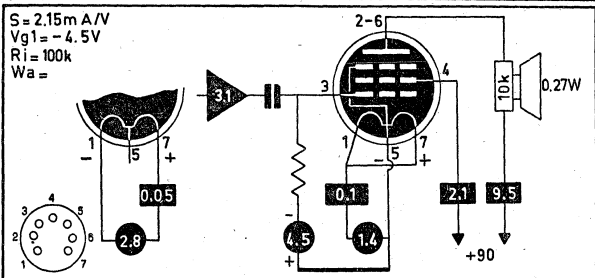




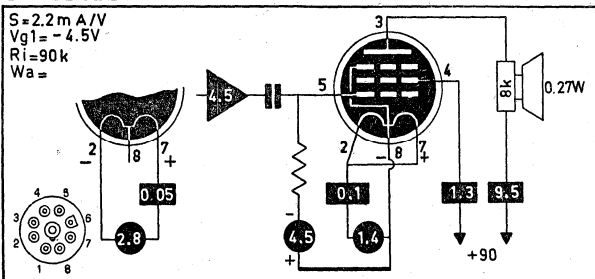
3E5



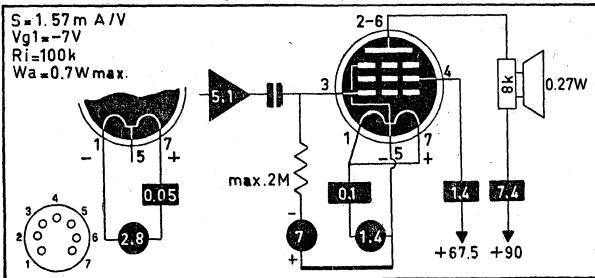
3LF4



3Q4



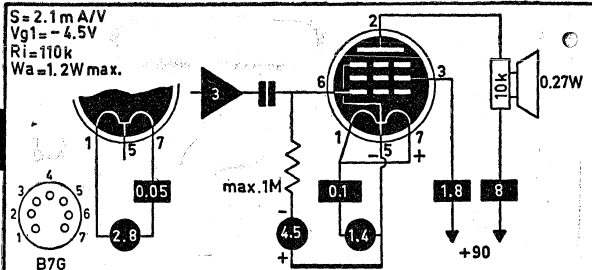
3Q5



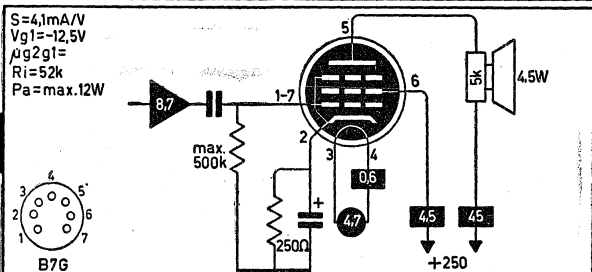
3S4

3V4

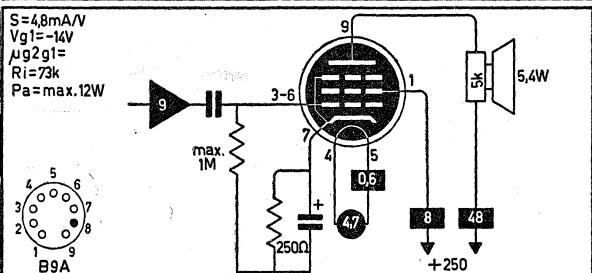
$S = 2.1 \text{ mA/V}$
 $V_{g1} = -4.5 \text{ V}$
 $R_i = 110 \text{ k}$
 $W_a = 1.2 \text{ W max.}$

**5AQ5**

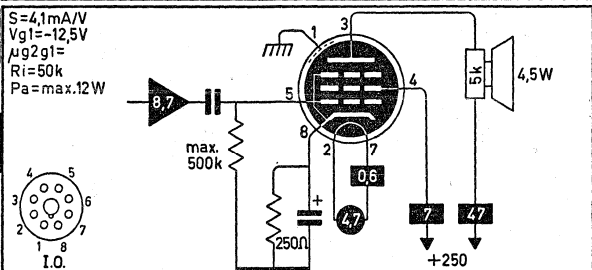
$S = 4.1 \text{ mA/V}$
 $V_{g1} = -12.5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 52 \text{ k}$
 $P_a = \text{max. } 12 \text{ W}$

**5CZ5**

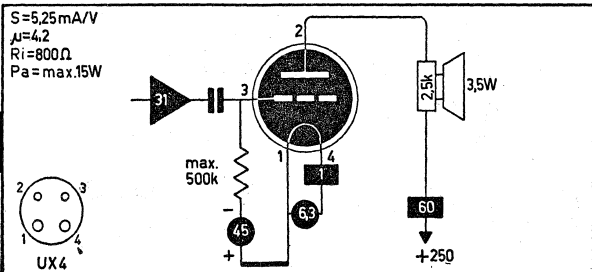
$S = 4.8 \text{ mA/V}$
 $V_{g1} = -14 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 73 \text{ k}$
 $P_a = \text{max. } 12 \text{ W}$

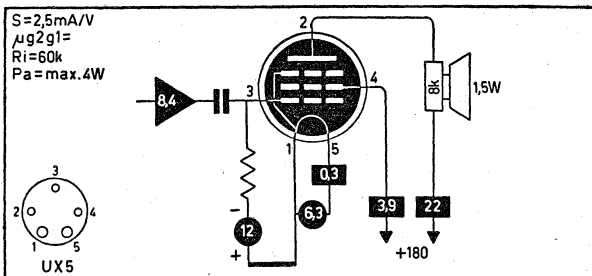
**5V6**

$S = 4.1 \text{ mA/V}$
 $V_{g1} = -12.5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 50 \text{ k}$
 $P_a = \text{max. } 12 \text{ W}$

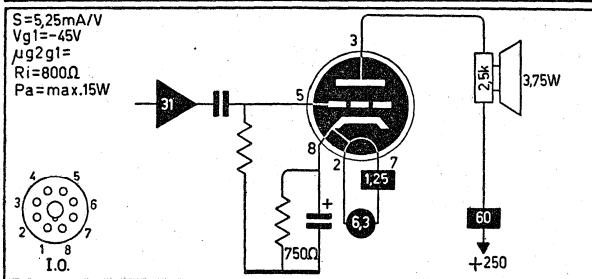
**6A3**

$S = 5.25 \text{ mA/V}$
 $\mu = 4.2$
 $R_i = 800 \Omega$
 $P_a = \text{max. } 15 \text{ W}$

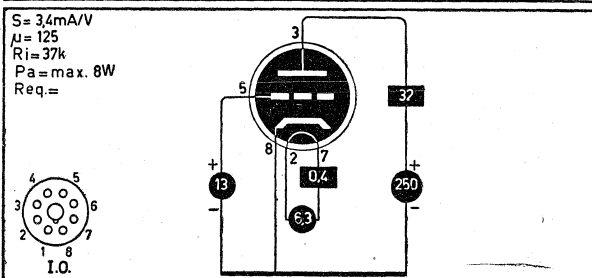




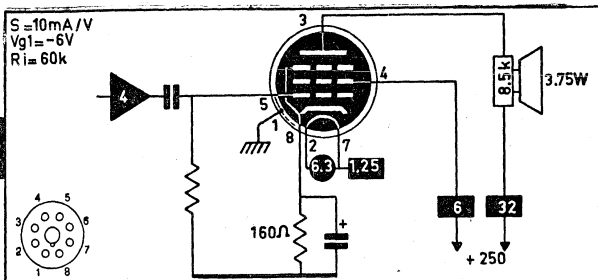
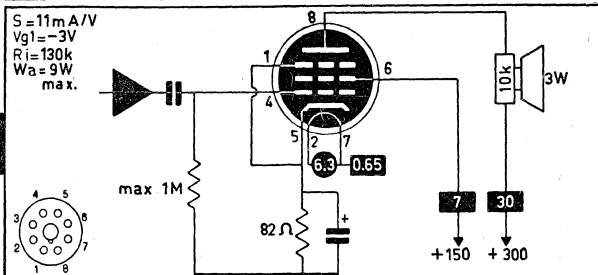
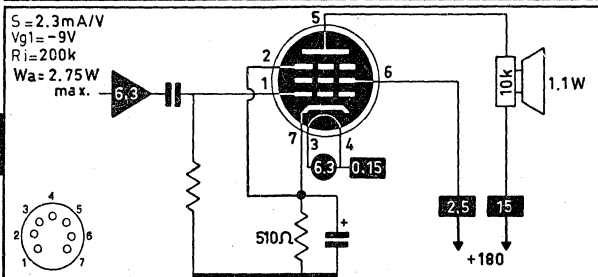
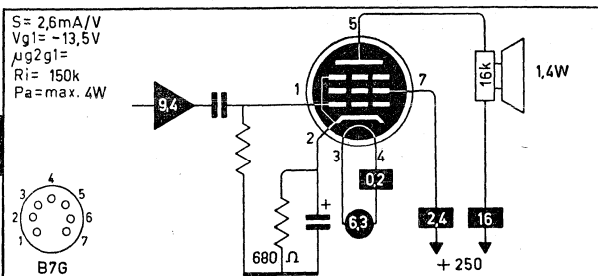
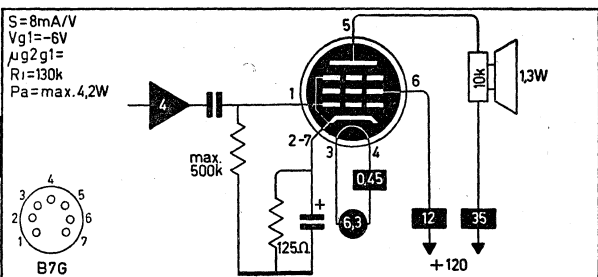
6A4

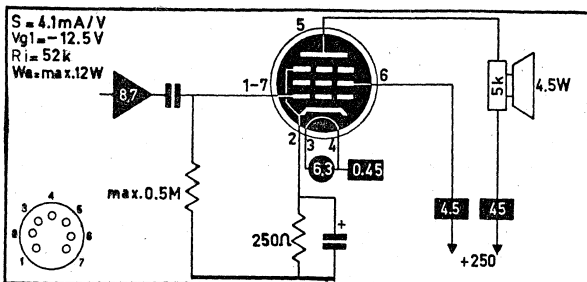


6A5

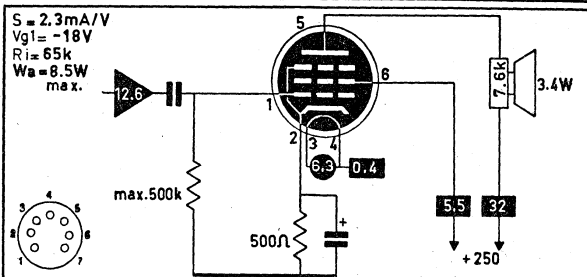


6AC5

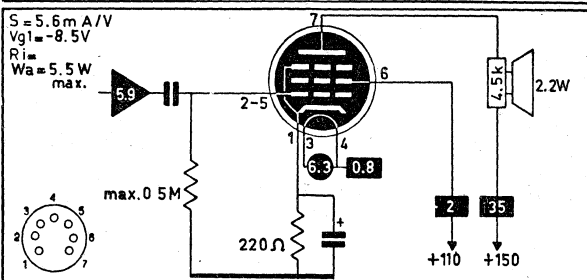
6AG6**6AG7****6AK6****6AM5****6AN5**



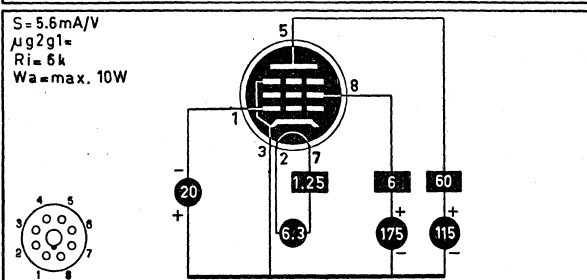
6AQ5



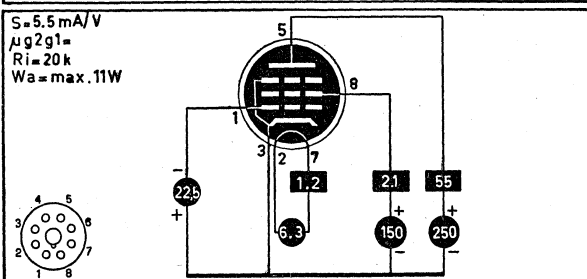
6AR5



6AS5



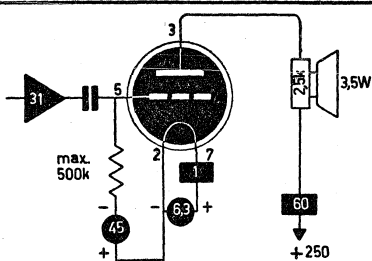
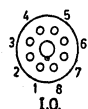
6AU5



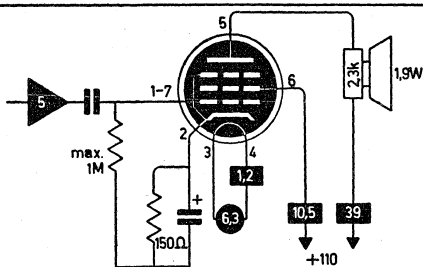
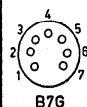
6AV5

6B4

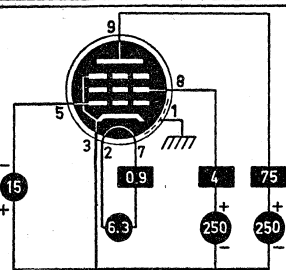
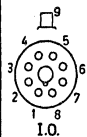
$S=5,25\text{mA/V}$
 $\mu=4,2$
 $R_i=800\Omega$
 $P_a=\text{max } 15\text{W}$

**6BF5**

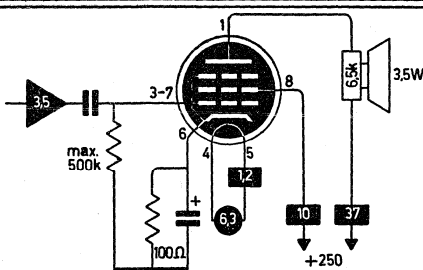
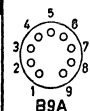
$S=7,5\text{mA/V}$
 $V_{g1}=-7,5\text{V}$
 $\mu_{g2g1}=12\text{k}$
 $P_a=\text{max } 5,5\text{W}$

**6BG6**

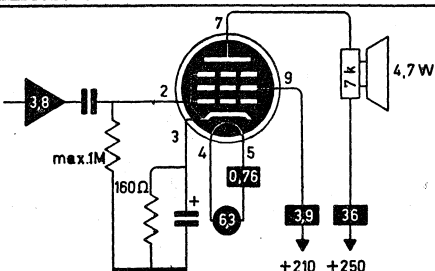
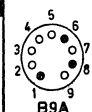
$S=6\text{mA/V}$
 $\mu_{g2g1}=8$
 $R_i=25\text{k}$
 $W_a=\text{max } 20\text{W}$

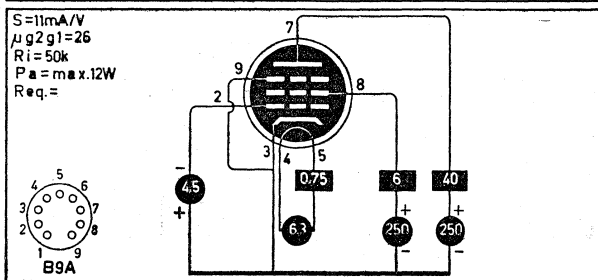
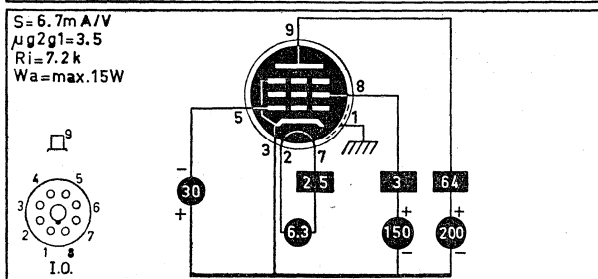
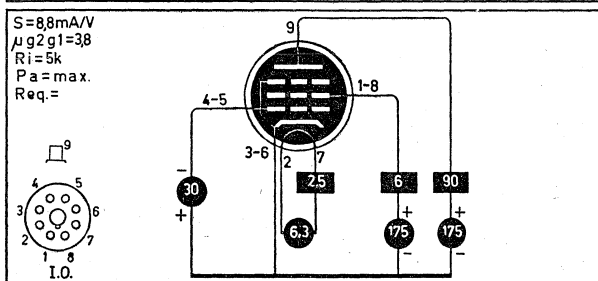
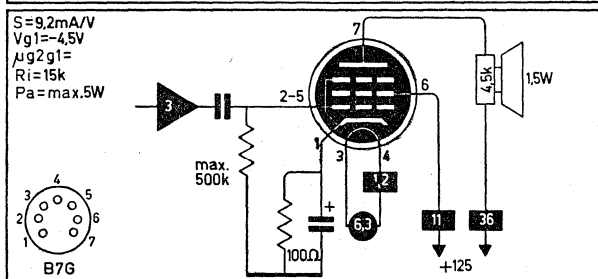
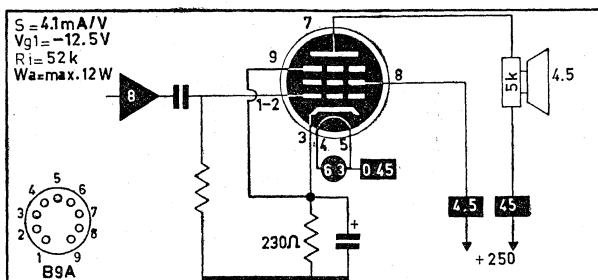
**6BK5**

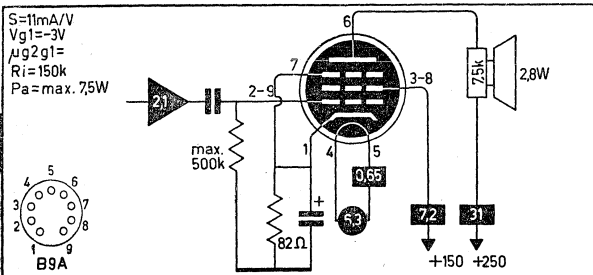
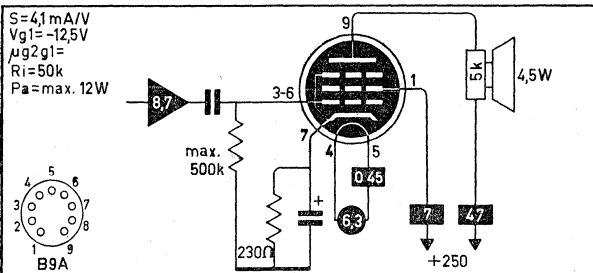
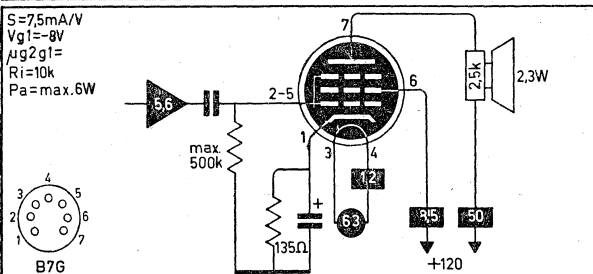
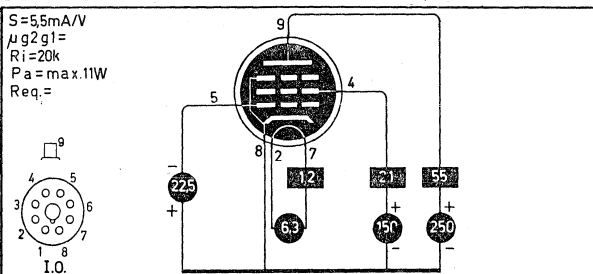
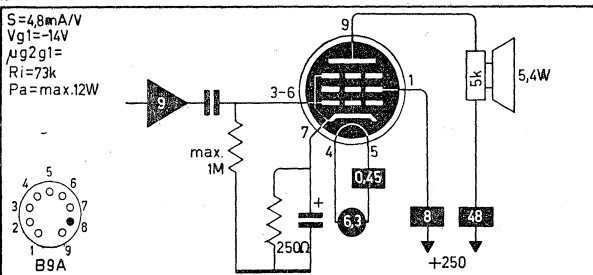
$S=8,5\text{mA/V}$
 $V_{g1}=-5\text{V}$
 $\mu_{g2g1}=100\text{k}$
 $P_a=\text{max } 9\text{W}$

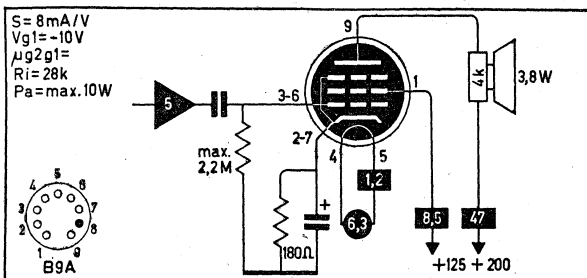
**6BQ5**

$S=10,4\text{mA/V}$
 $V_{g1}=-6,4\text{V}$
 $\mu_{g2g1}=19$
 $R_i=40\text{k}$
 $P_a=\text{max } 12\text{W}$

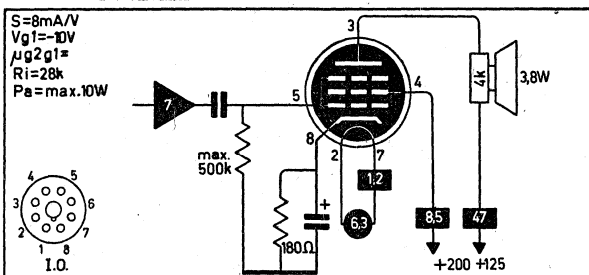




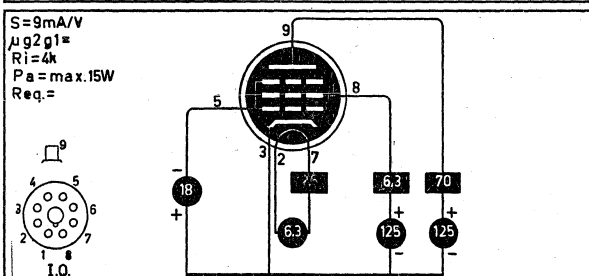
6CL6**6CM6****6CU5****6CU6****6CZ5**



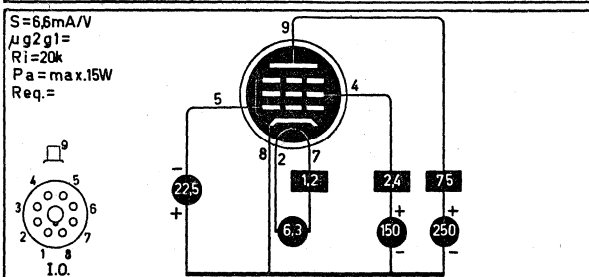
6DB5



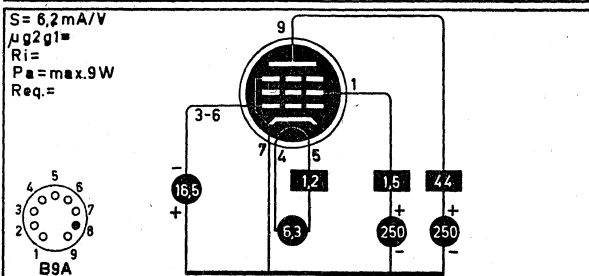
6DG6



6DN6



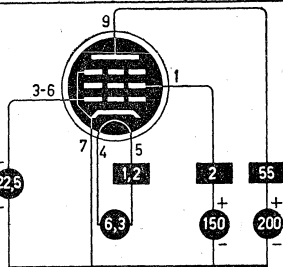
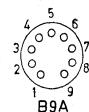
6DQ6A



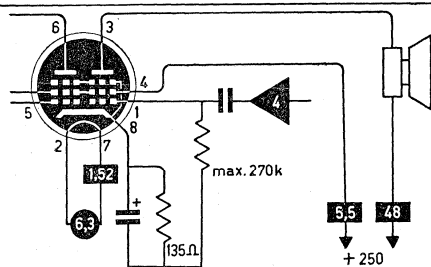
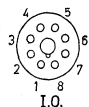
6DT5

6DW5

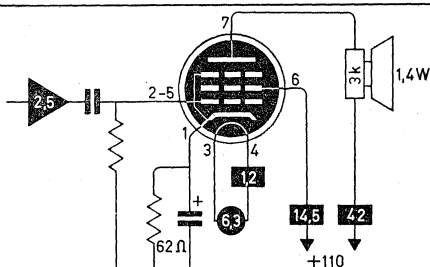
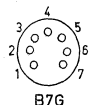
$S = 5,5 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 15 \text{ k}$
 $P_a = \text{max. } 11 \text{ W}$
 $\text{Req.} =$

**6DZ7**

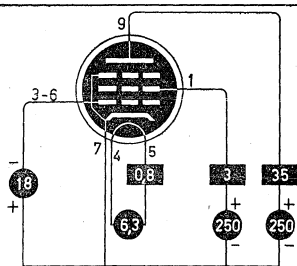
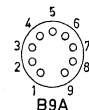
$S = 11,3 \text{ mA/V}$
 $V_{g1} = -7,3 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 38 \text{ k}$
 $P_a = \text{max.}$

**6EH5**

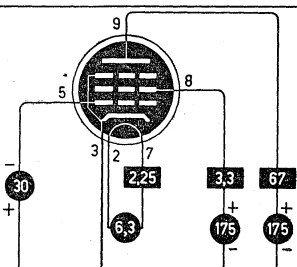
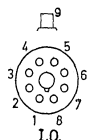
$S = 14,6 \text{ mA/V}$
 $V_{g1} = -3,5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 11 \text{ k}$
 $P_a = \text{max. } 5 \text{ W}$

**6EM5**

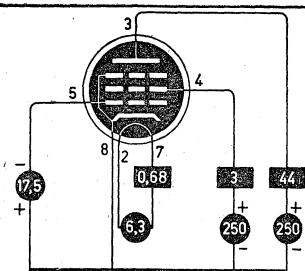
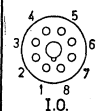
$S = 5,1 \text{ mA/V}$
 $\mu g_{2g1} = 8,7$
 $R_i =$
 $P_a = \text{max. } 10 \text{ W}$
 $\text{Req.} =$

**6EX6**

$S = 7,7 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 8,5 \text{ k}$
 $P_a = \text{max. } 22 \text{ W}$
 $\text{Req.} =$

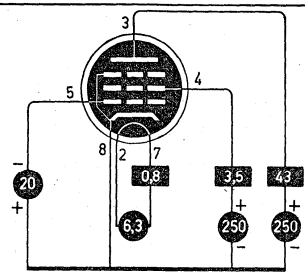
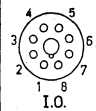


$S=4,4\text{mA/V}$
 $\mu g_{2g1}=$
 $R_i=60\text{k}$
 $P_a=\text{max.}11\text{W}$
 $R_{eq}=$



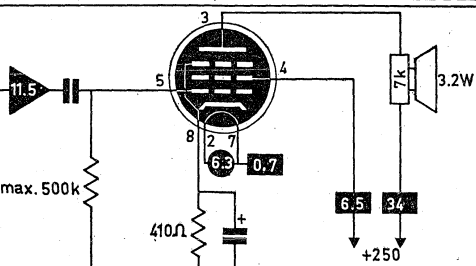
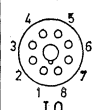
6EY6

$S=4,1\text{mA/V}$
 $\mu g_{2g1}=$
 $R_i=50\text{k}$
 $P_a=\text{max.}12\text{W}$
 $R_{eq}=$



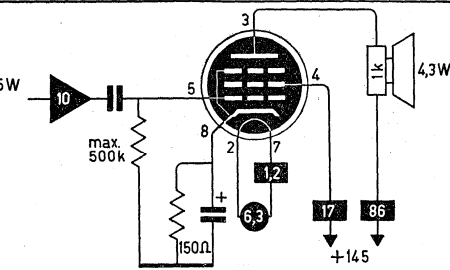
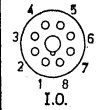
6EZ5

$S=2,5\text{mA/V}$
 $V_{g1}=-16,5\text{V}$
 $R_i=80\text{k}$
 $W_a=12\text{W}$
 max.



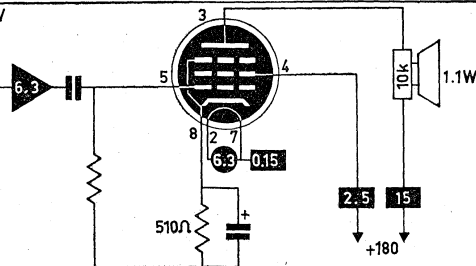
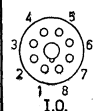
6F6

$S=9,5\text{mA/V}$
 $V_{g1}=-15\text{V}$
 $\mu g_{2g1}=$
 $R_i=8\text{k}$
 $P_a=\text{max.}14,5\text{W}$



6FE5

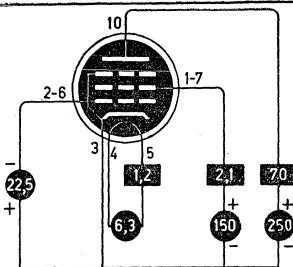
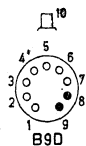
$S=2,3\text{mA/V}$
 $V_{g1}=-9\text{V}$
 $R_i=175\text{k}$
 $W_a=\text{max.}2,75\text{W}$



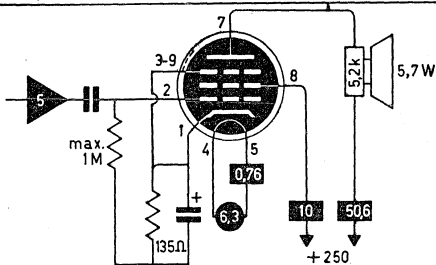
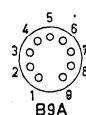
6G6

6GJ5

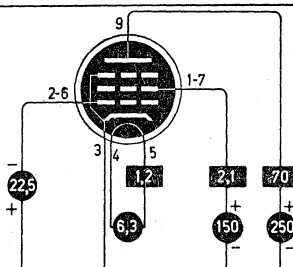
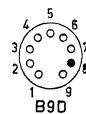
$S = 7,1 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 15 \text{ k}$
 $P_a = \text{max. } 17,5 \text{ W}$
 $R_{eq} =$

**6GK6**

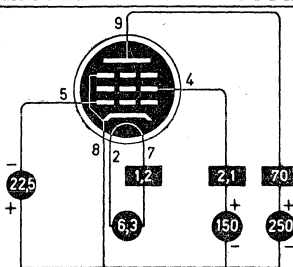
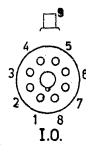
$S = 11,3 \text{ mA/V}$
 $V_{g1} = 8 \text{ V}$
 $\mu g_{2g1} = 19$
 $R_i = 38 \text{ k}$
 $P_a = \text{max. } 13,2 \text{ W}$

**6GT5**

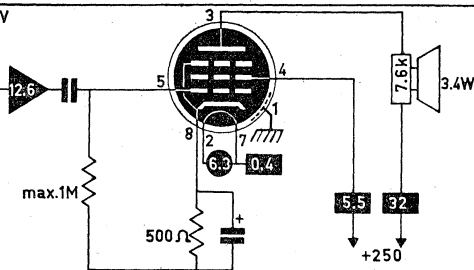
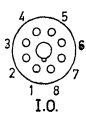
$S = 7,1 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 15 \text{ k}$
 $P_a = \text{max. } 17,5 \text{ W}$
 $R_{eq} =$

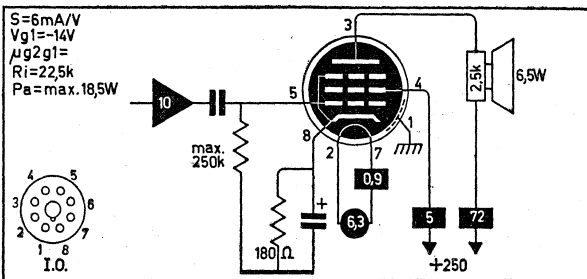
**6GW6**

$S = 7,1 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 15 \text{ k}$
 $P_a = \text{max. } 17,5 \text{ W}$
 $R_{eq} =$

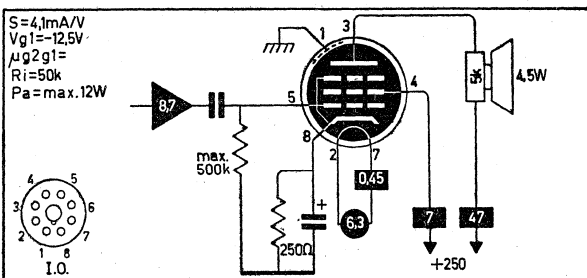
**6K6**

$S = 2,3 \text{ mA/V}$
 $V_{g1} = -18 \text{ V}$
 $R_i = 68 \text{ k}$
 $W_a = 8,5 \text{ W}$
 max.

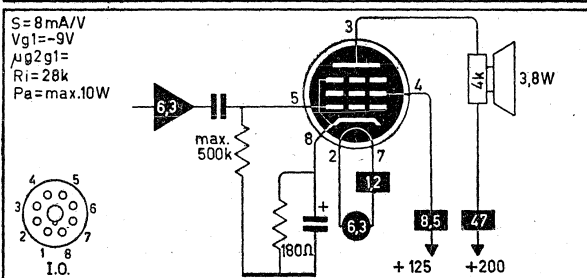




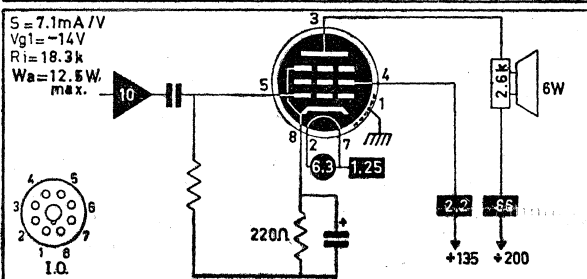
6L6



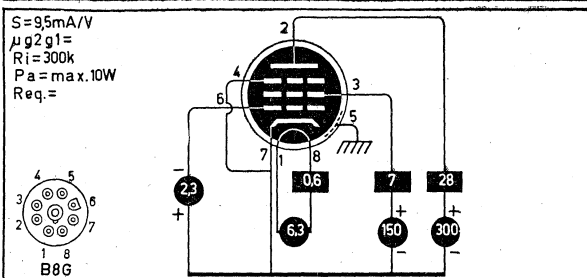
6V6



6W6



6Y6



7AD7

$S = 2.3 \text{ mA/V}$
 $V_{g1} = -18 \text{ V}$
 $R_i = 68 \text{ k}\Omega$
 $W_a = 8.5 \text{ W max.}$

max. 0.5M

500Ω

6.3 0.4

12.6

96 3.4W

5.5 32 +250

B8G

[illegible]

$S = 2,6 \text{ mA/V}$
 $V_{g1} = -13,5 \text{ V}$
 $\mu_{g2g1} =$
 $R_i = 150 \text{ k}$
 $P_a = \text{max. } 4 \text{ W}$

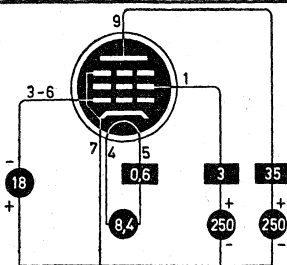
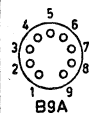
9.4
 1
 2
 3
 4
 5
 6
 7
 0.2
 6.3
 6800
 14W
 2.4
 16
 +250
 B7G

$S = 4,4 \text{ mA/V}$
 $\mu_{g2} = 1 =$
 $R_i = 60 \text{ k}$
 $P_a = \text{max. } 11 \text{ W}$
 $R_{eq} =$

$S = 10,4 \text{ mA/V}$
 $V_{g1} = -6,4 \text{ V}$
 $\mu g_{2g1} = 19$
 $R_i = 40 \text{ k}$
 $P_a = \text{max. } 12 \text{ W}$

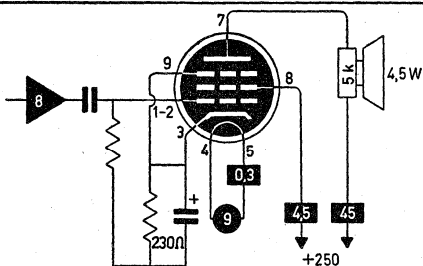
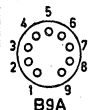
The diagram shows a vacuum tube (6B9A) with its internal structure and pin connections. The circuit includes a 3.8V input, a 3.8k resistor, a 160Ω resistor, a 0.6V bias source, and a 7k load resistor connected to a 4.7W speaker. The tube is labeled 6B9A.

$S = 5,1 \text{ mA/V}$
 $\mu g_{2g1} = 8,7$
 $R_i =$
 $P_a = \text{max. } 10 \text{ W}$
 $R_{eq} =$



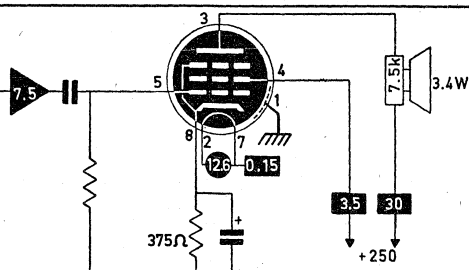
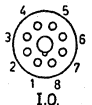
8EM5

$S = 4,1 \text{ mA/V}$
 $V_{g1} = -12,5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 52 \text{ k}$
 $P_a = \text{max. } 12 \text{ W}$



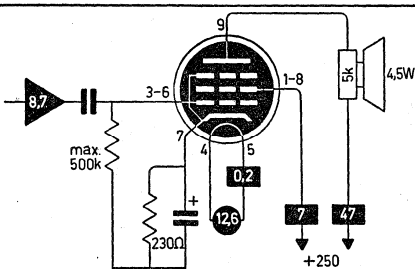
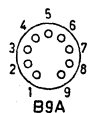
9BW6

$S = 3 \text{ mA/V}$
 $V_{g1} = -12,5 \text{ V}$
 $R_i = 70 \text{ k}$
 $W_a = 7,5 \text{ W max.}$



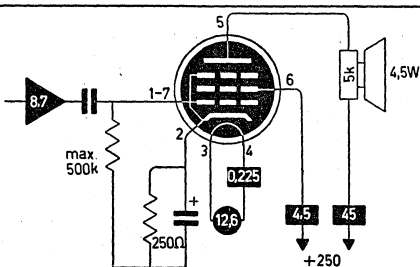
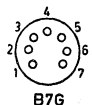
12A6

$S = 4,1 \text{ mA/V}$
 $V_{g1} = -12,5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 50 \text{ k}$
 $P_a = \text{max. } 12 \text{ W}$



12AB5

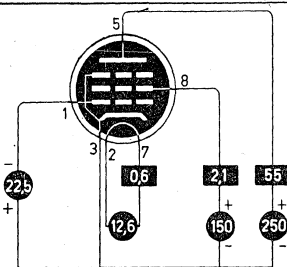
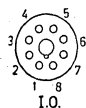
$S = 4,1 \text{ mA/V}$
 $V_{g1} = -12,5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 52 \text{ k}$
 $P_a = \text{max. } 12 \text{ W}$



12AQ5

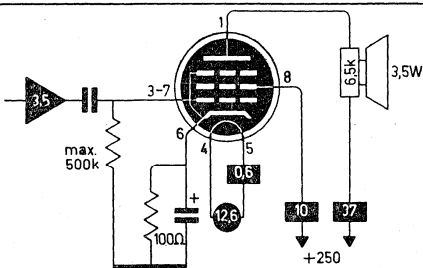
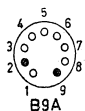
12AV5

$S = 5,5 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 20 \text{ k}$
 $P_a = \text{max } 11 \text{ W}$
 $R_{eq} =$



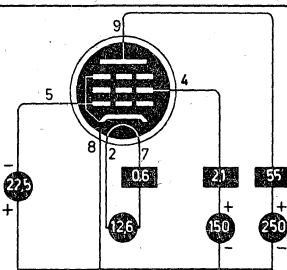
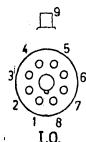
12BK5

$S = 8,5 \text{ mA/V}$
 $V_{g1} = -5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 100 \text{ k}$
 $P_a = \text{max } 9 \text{ W}$



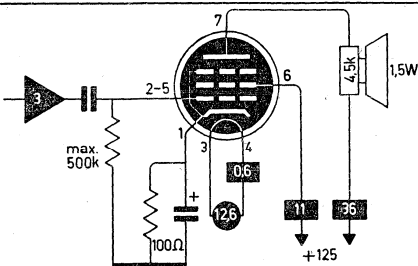
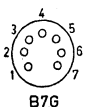
12BQ6

$S = 5,5 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 20 \text{ k}$
 $P_a = \text{max } 11 \text{ W}$
 $R_{eq} =$



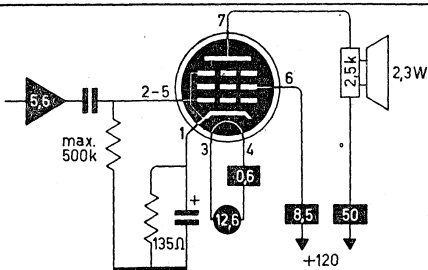
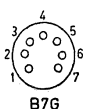
12CA5

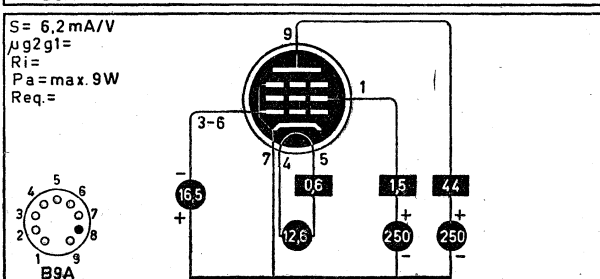
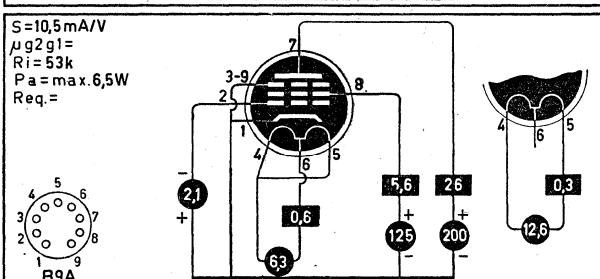
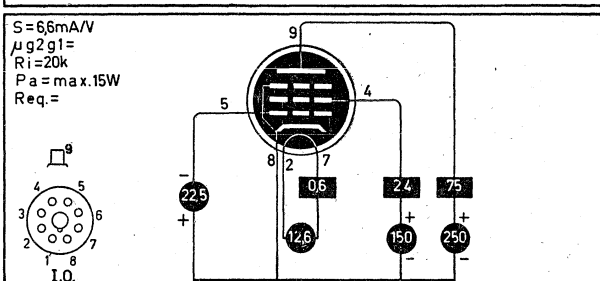
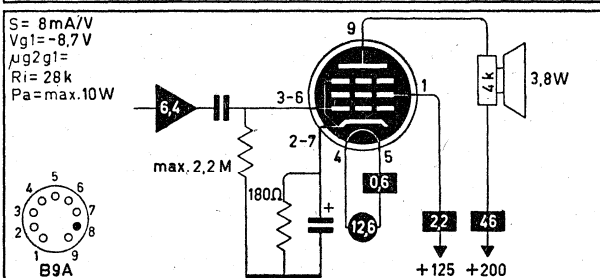
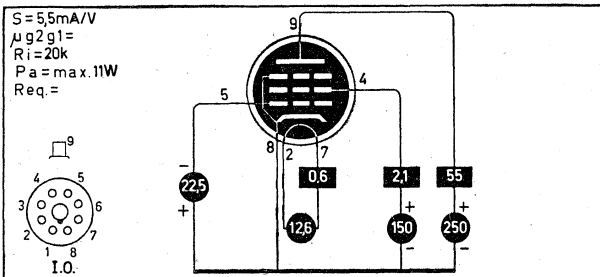
$S = 9,2 \text{ mA/V}$
 $V_{g1} = -4,5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 15 \text{ k}$
 $P_a = \text{max } 5 \text{ W}$



12CU5

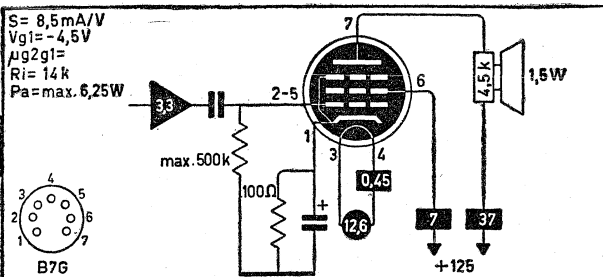
$S = 7,5 \text{ mA/V}$
 $V_{g1} = -8 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 10 \text{ k}$
 $P_a = \text{max } 6 \text{ W}$



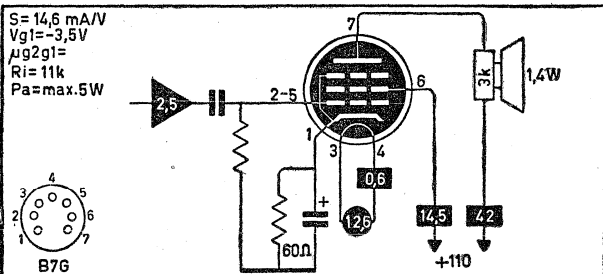


12ED5

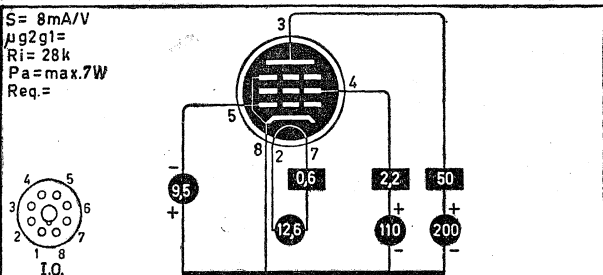
$S = 8,5 \text{ mA/V}$
 $V_{g1} = -4,5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 14 \text{ k}$
 $P_a = \text{max. } 6,25 \text{ W}$

**12EH5**

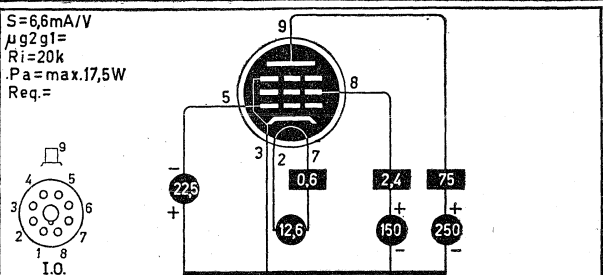
$S = 14,6 \text{ mA/V}$
 $V_{g1} = -3,5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 11 \text{ k}$
 $P_a = \text{max. } 5 \text{ W}$

**12EN6**

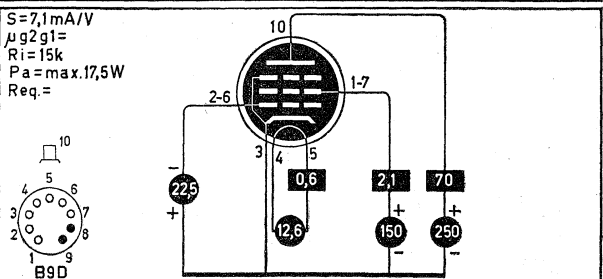
$S = 8 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 28 \text{ k}$
 $P_a = \text{max. } 7 \text{ W}$
 $R_{eq} =$

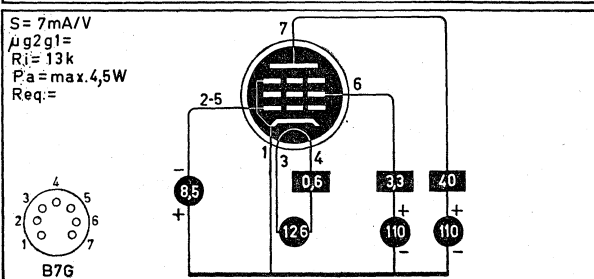
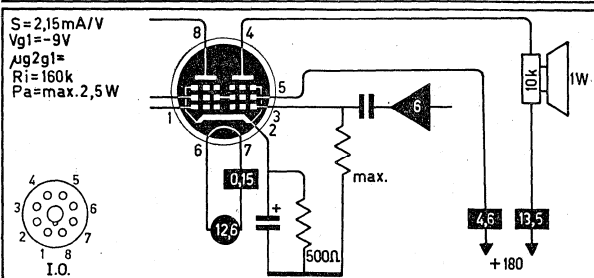
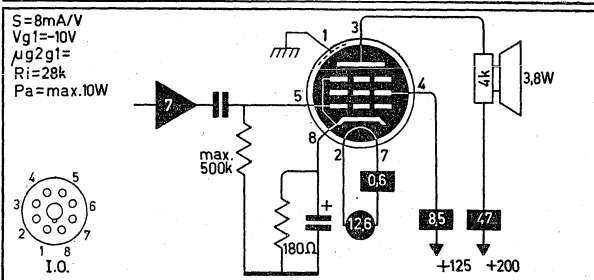
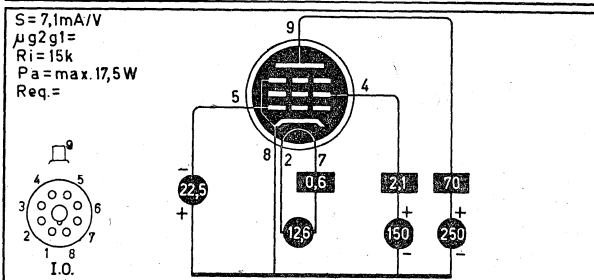
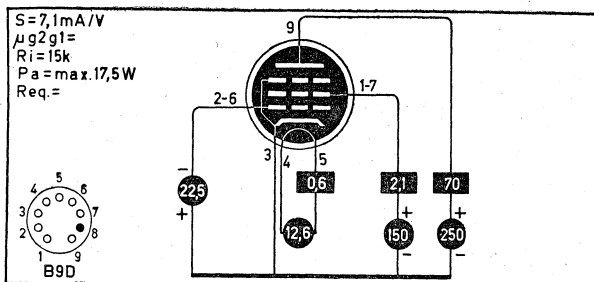
**12GC6**

$S = 6,6 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 20 \text{ k}$
 $P_a = \text{max. } 17,5 \text{ W}$
 $R_{eq} =$

**12GJ5**

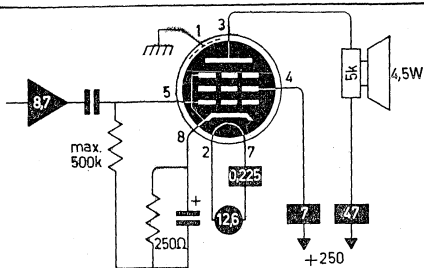
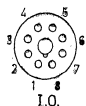
$S = 7,1 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 15 \text{ k}$
 $P_a = \text{max. } 17,5 \text{ W}$
 $R_{eq} =$



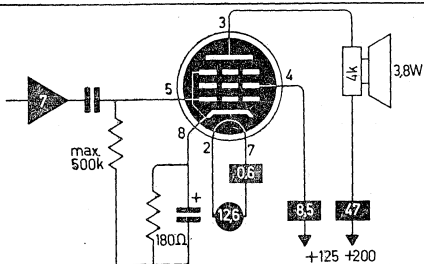
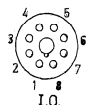


12V6

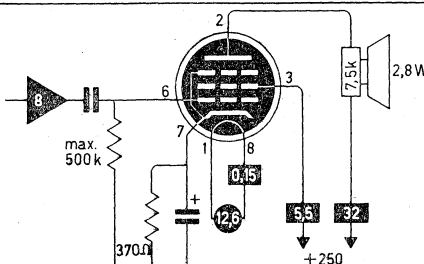
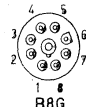
$S=4,1\text{mA/V}$
 $V_{g1}=-12,5\text{V}$
 $\mu g_{2g1}=$
 $R_i=50\text{k}$
 $P_a=\text{max. } 12\text{W}$

**12W6**

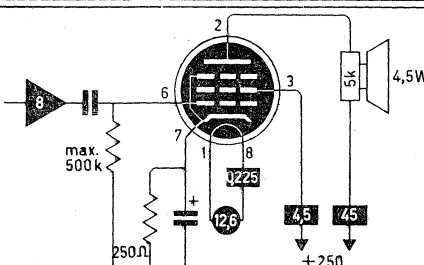
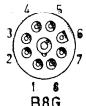
$S=8\text{mA/V}$
 $V_{g1}=-10\text{V}$
 $\mu g_{2g1}=$
 $R_i=28\text{k}$
 $P_a=\text{max. } 10\text{W}$

**14A5**

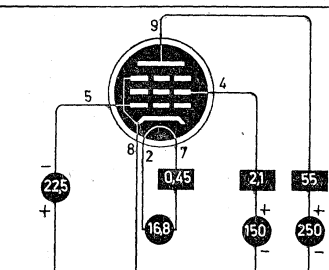
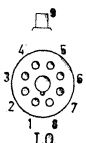
$S=3\text{mA/V}$
 $V_{g1}=-12,5\text{V}$
 $\mu g_{2g1}=$
 $R_i=70\text{k}$
 $P_a=\text{max. } 7,5\text{W}$

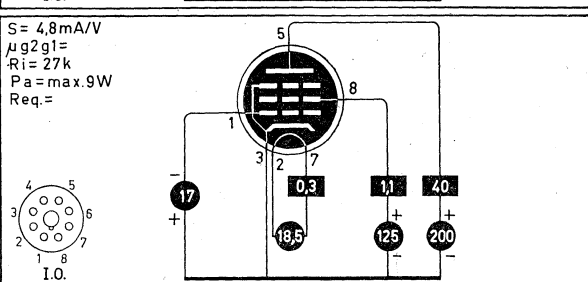
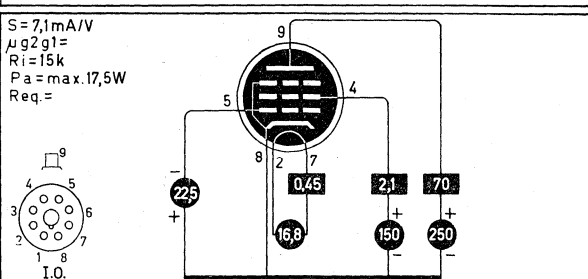
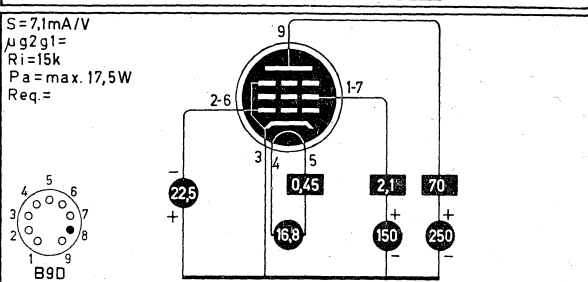
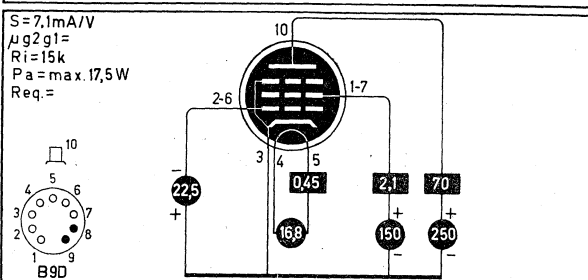
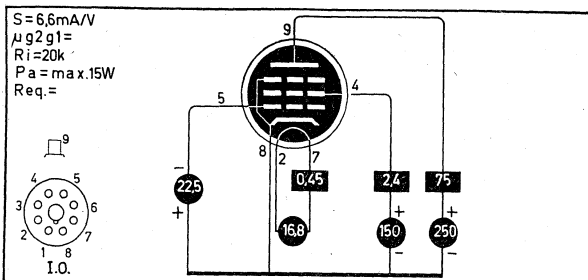
**14C5**

$S=4,1\text{mA/V}$
 $V_{g1}=-12,5\text{V}$
 $\mu g_{2g1}=$
 $R_i=52\text{k}$
 $P_a=\text{max. } 12\text{W}$

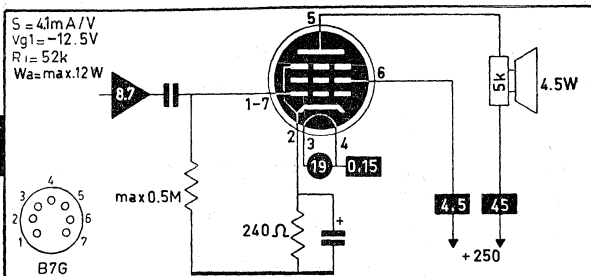
**17BQ6**

$S=5,5\text{mA/V}$
 $\mu g_{2g1}=$
 $R_i=20\text{k}$
 $P_a=\text{max. } 11\text{W}$
 $R_{eq}=$

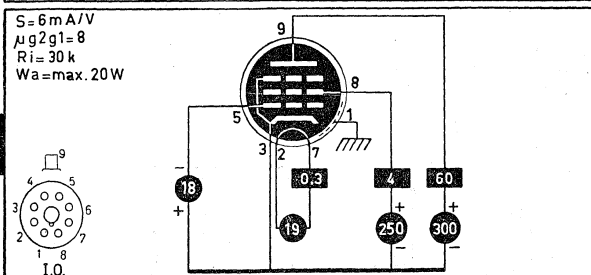




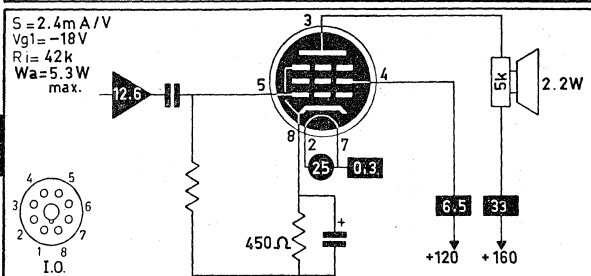
19AQ5



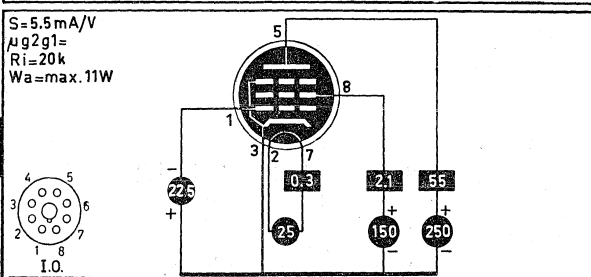
19B6G



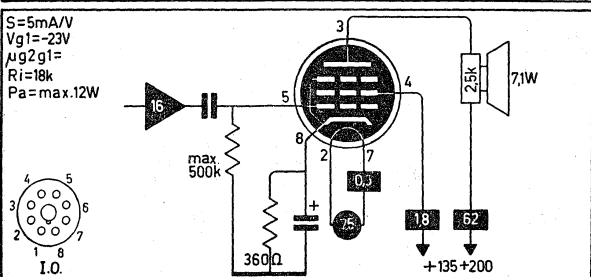
25A6



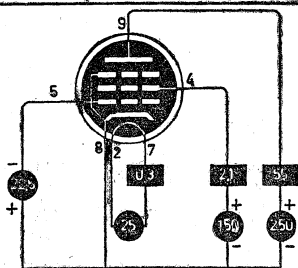
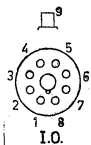
25AV5



25B6

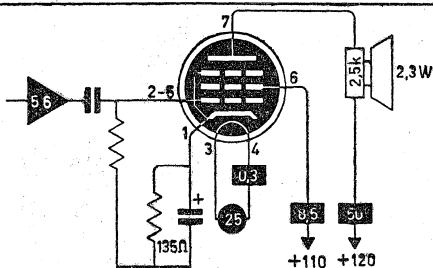
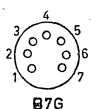


$S = 5,5 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 20 \text{ k}$
 $P_a = \text{max. } 1 \text{ W}$
 $R_{eq} =$



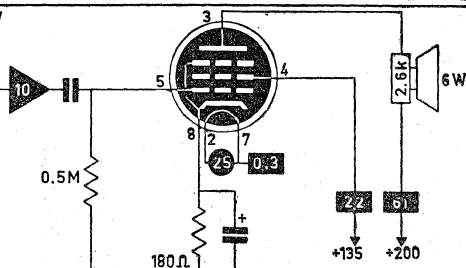
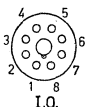
25BQ6

$S = 7,5 \text{ mA/V}$
 $V_{g1} = -8 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 10 \text{ k}$
 $P_a = \text{max. } 6 \text{ W}$



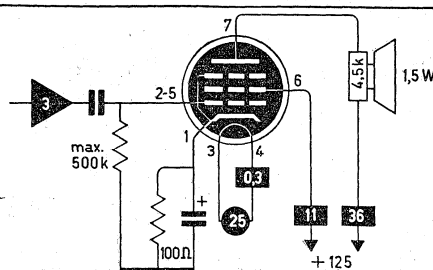
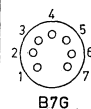
25C5

$S = 7,1 \text{ mA/V}$
 $V_{g1} = -14 \text{ V}$
 $R_i = 18,3 \text{ k}$
 $W_a = 12,5 \text{ W}$
 max.



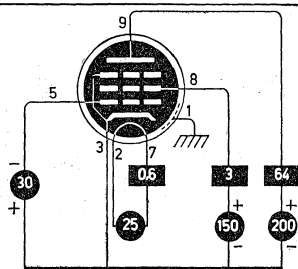
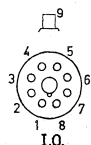
25C6

$S = 9,2 \text{ mA/V}$
 $V_{g1} = -4,5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 15 \text{ k}$
 $P_a = \text{max. } 5 \text{ W}$



25CA5

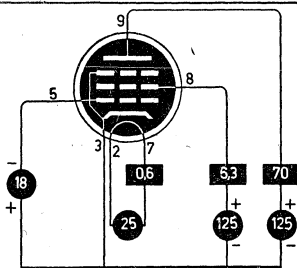
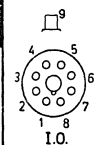
$S = 6,7 \text{ mA/V}$
 $\mu g_{2g1} = 3,5$
 $R_i = 7,2 \text{ k}$
 $P_a = \text{max. } 15 \text{ W}$
 $R_{eq} =$



25CD6

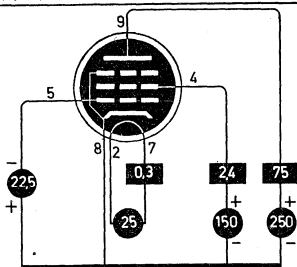
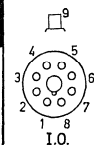
25DN6

$S=9\text{mA/V}$
 $\mu g_{2g1}=$
 $R_i=4k$
 $P_a=\text{max. } 15\text{W}$
 $R_{eq}=$



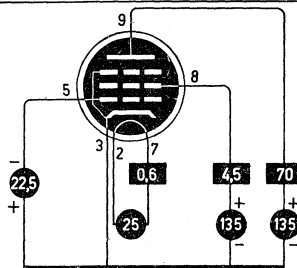
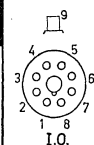
25DQ6A

$S=66\text{mA/V}$
 $\mu g_{2g1}=$
 $R_i=20k$
 $P_a=\text{max. } 15\text{W}$
 $R_{eq}=$



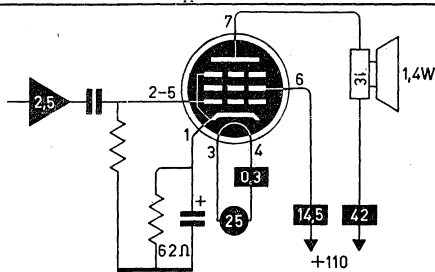
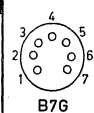
25EC6

$S=7,5\text{mA/V}$
 $\mu g_{2g1}=$
 $R_i=4,7k$
 $P_a=\text{max. } 10\text{W}$
 $R_{eq}=$



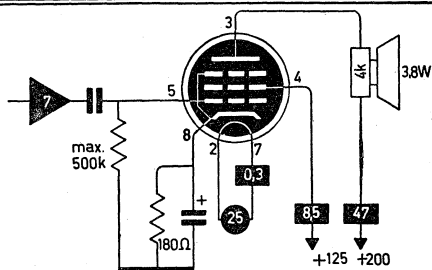
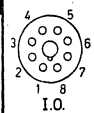
25EH5

$S=14,6\text{mA/V}$
 $V_{g1}=-3,5\text{V}$
 $\mu g_{2g1}=$
 $R_i=11k$
 $P_a=\text{max. } 5\text{W}$

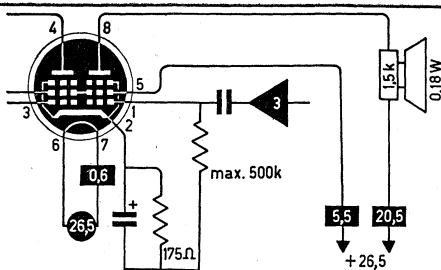
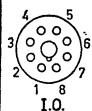


25L6

$S=8\text{mA/V}$
 $V_{g1}=-10\text{V}$
 $\mu g_{2g1}=$
 $R_i=28k$
 $P_a=\text{max. } 10\text{W}$

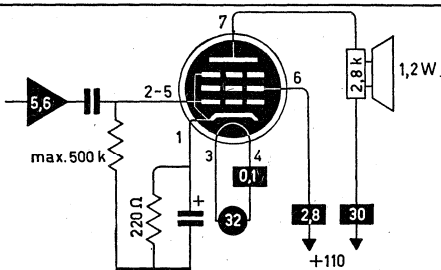
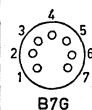


$S = 5,7 \text{ mA/V}$
 $V_{g1} = -4,5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i =$
 $P_a = \text{max. } 2 \text{ W}$



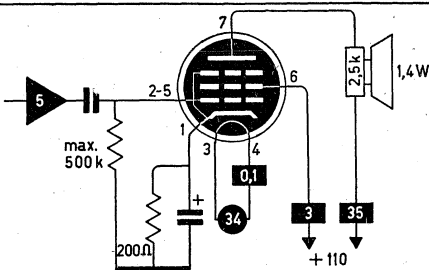
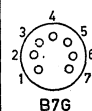
26A7

$S = 5,5 \text{ mA/V}$
 $V_{g1} = -7,5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 21,5 \text{ k}$
 $P_a = \text{max. } 5,4 \text{ W}$



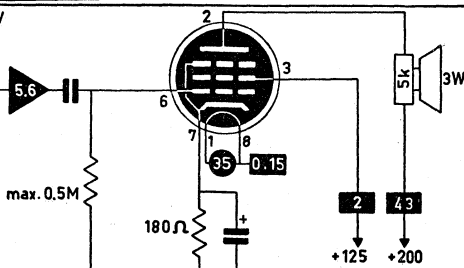
32ET5

$S = 5,7 \text{ mA/V}$
 $V_{g1} = -7,5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 13 \text{ k}$
 $P_a = \text{max. } 5 \text{ W}$



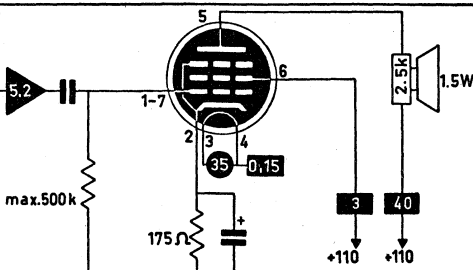
34GD5

$S = 6,1 \text{ mA/V}$
 $V_{g1} = -8,5 \text{ V}$
 $R_i = 34 \text{ k}$
 $W_a = \text{max. } 4,5 \text{ W}$

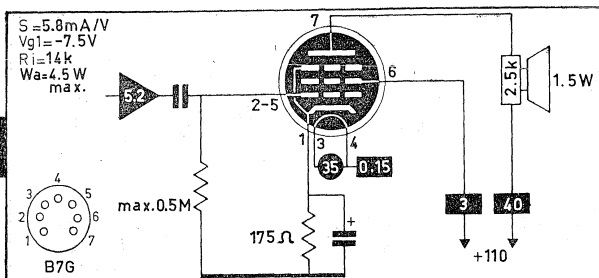
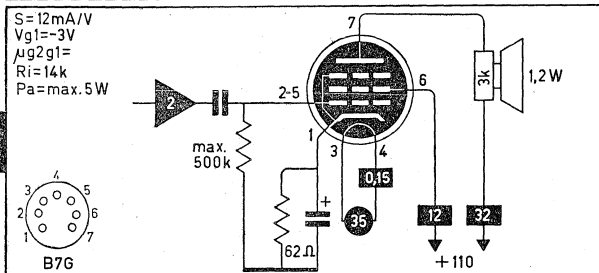
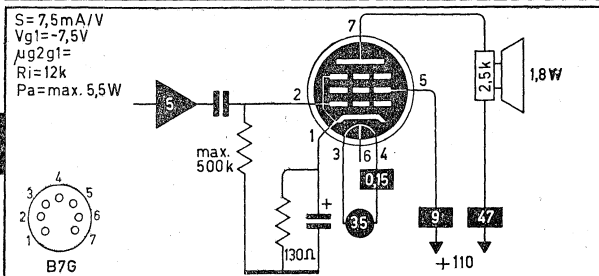
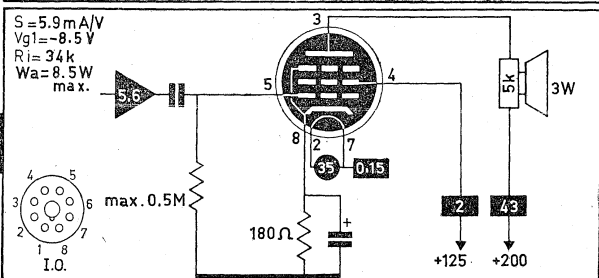


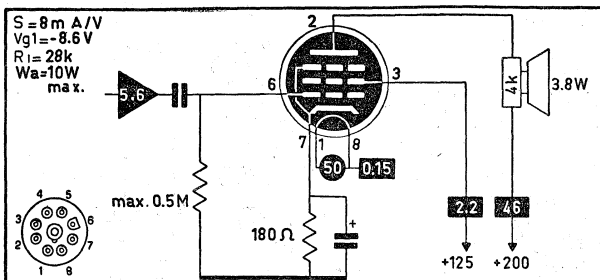
35A5

$S = 5,8 \text{ mA/V}$
 $V_{g1} = -7,5 \text{ V}$
 $R_i = 14 \text{ k}$
 $W_a = 4,5 \text{ W max.}$

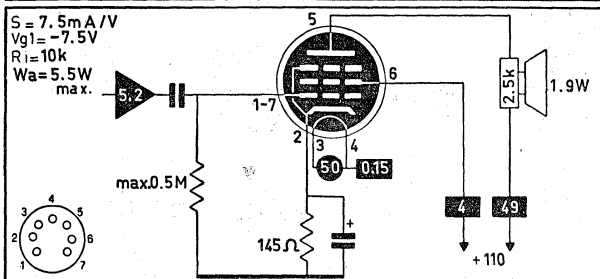


35B5

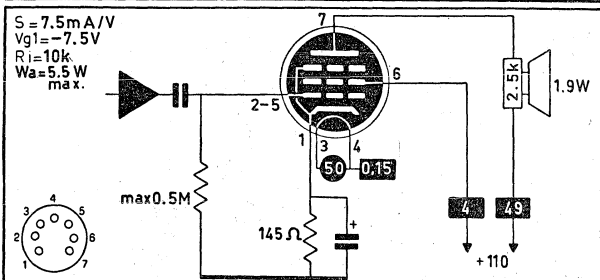
35C5**35EH5****35GL6****35L6**



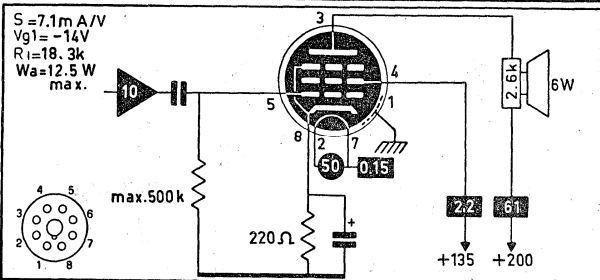
50A5



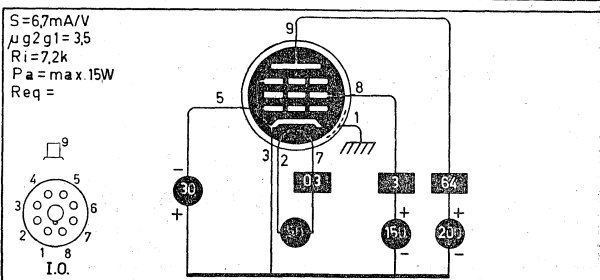
50B5



50C5



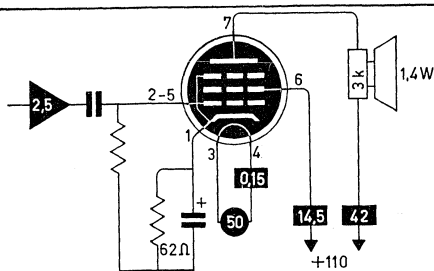
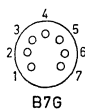
50C6



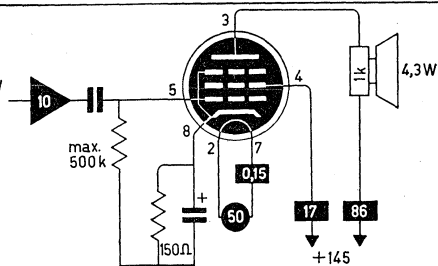
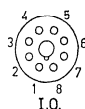
50CD6

50EH5

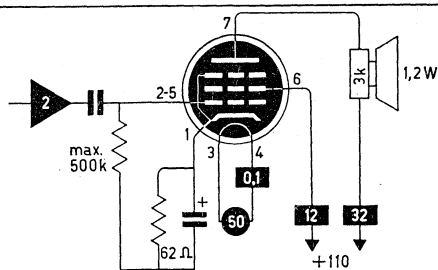
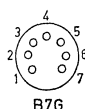
$S=14,6\text{mA/V}$
 $V_{g1}=-3,5\text{V}$
 $\mu g_{2g1}=$
 $R_i=11\text{k}$
 $P_a=\text{max.}5\text{W}$

**50FE5**

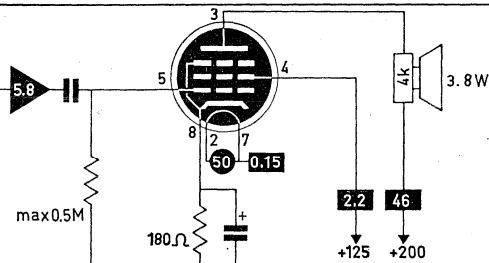
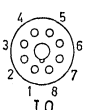
$S=9,5\text{mA/V}$
 $V_{g1}=15\text{V}$
 $\mu g_{2g1}=$
 $R_i=8\text{k}$
 $P_a=\text{max.}14,5\text{W}$

**50FK5**

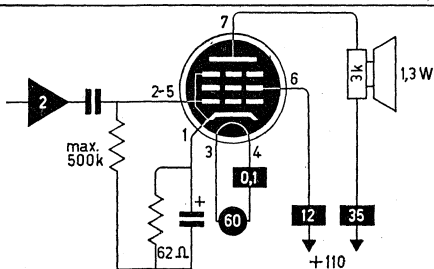
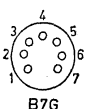
$S=12,8\text{mA/V}$
 $V_{g1}=-3\text{V}$
 $\mu g_{2g1}=$
 $R_i=14\text{k}$
 $P_a=\text{max.}5\text{W}$

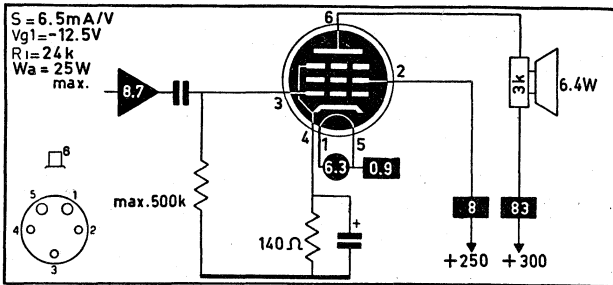
**50L6**

$S=8\text{mA/V}$
 $V_{g1}=-8,6\text{V}$
 $R_i=28\text{k}$
 $W_a=10\text{W}$
 max.

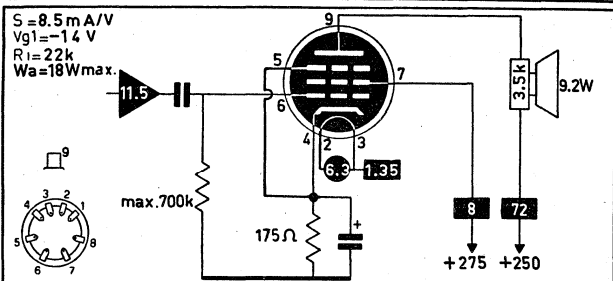
**60FX5**

$S=13,5\text{mA/V}$
 $V_{g1}=-3\text{V}$
 $\mu g_{2g1}=$
 $R_i=17,5\text{k}$
 $P_a=\text{max.}5,5\text{W}$

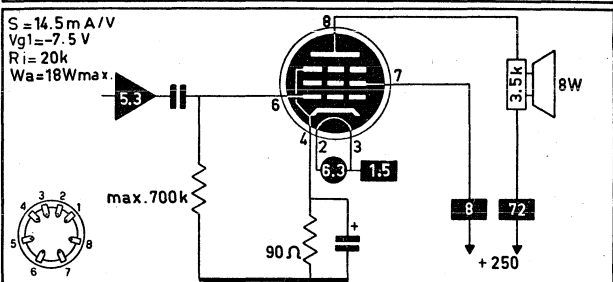




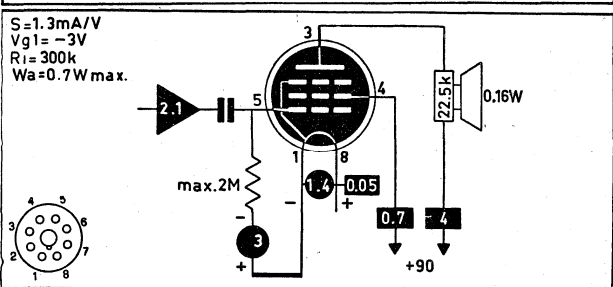
807



4654

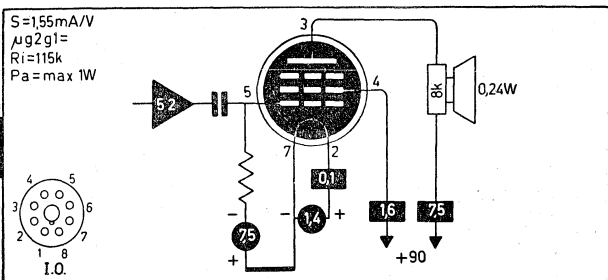


4699

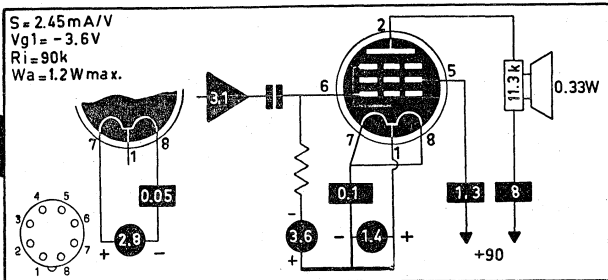


DL21

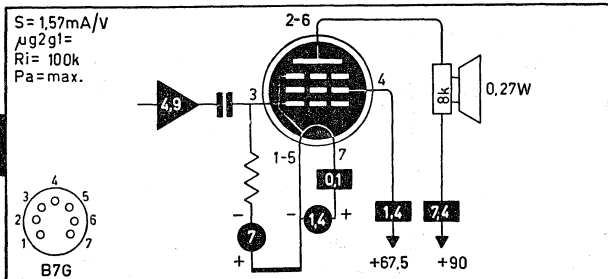
DL35



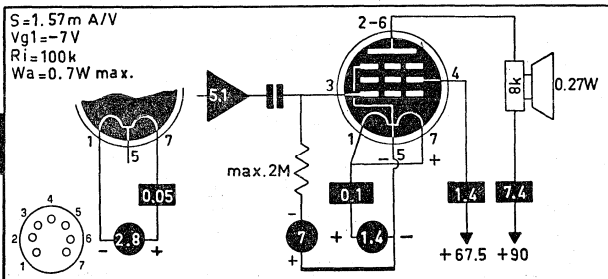
DL41



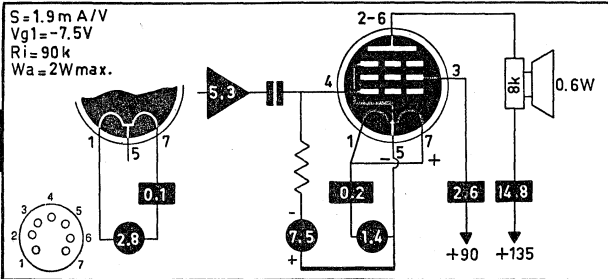
DL91

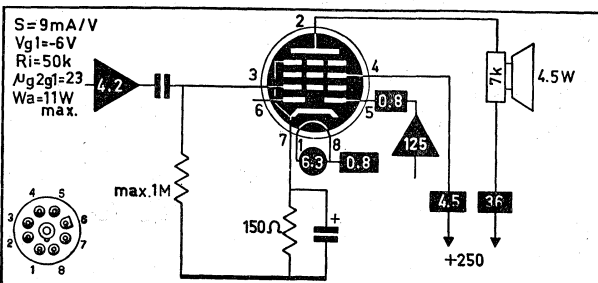
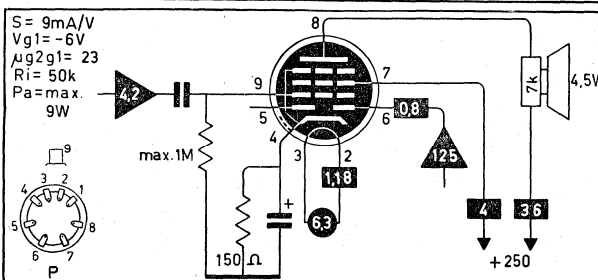
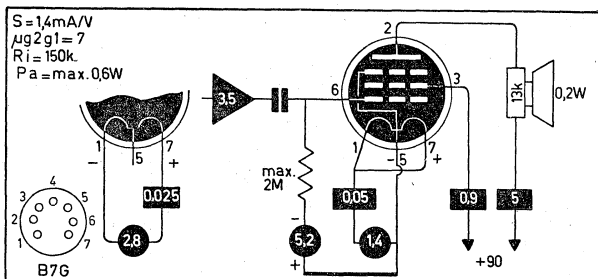
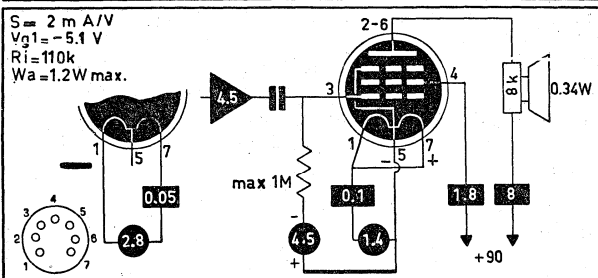
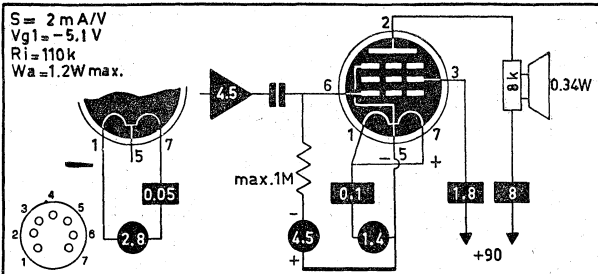


DL92

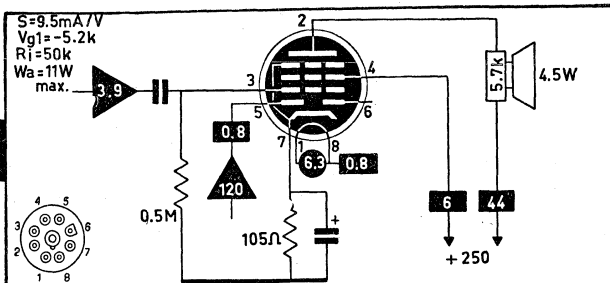


DL93

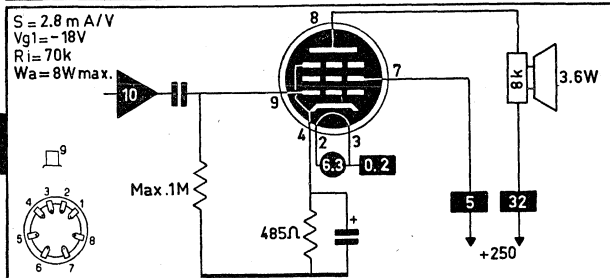




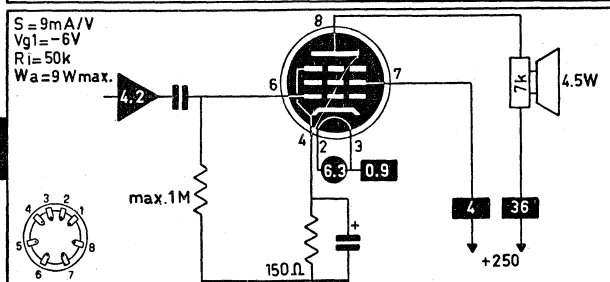
EBL71



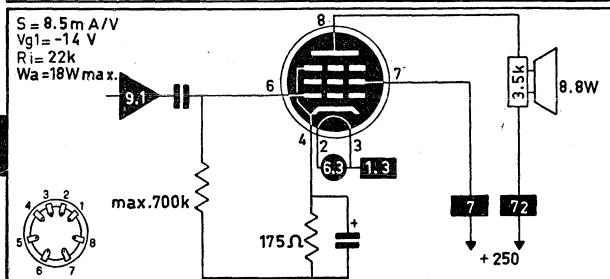
EL2



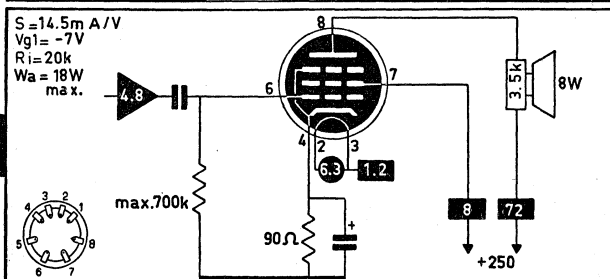
EL3

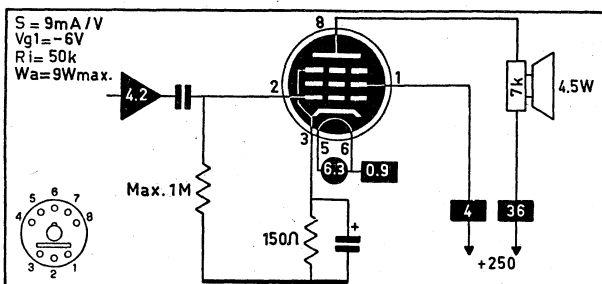


EL5

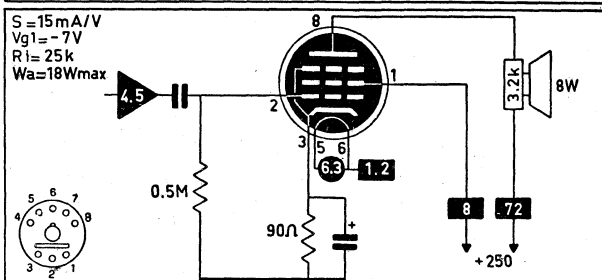


EL6

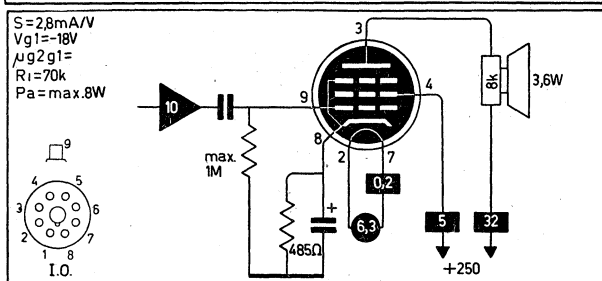




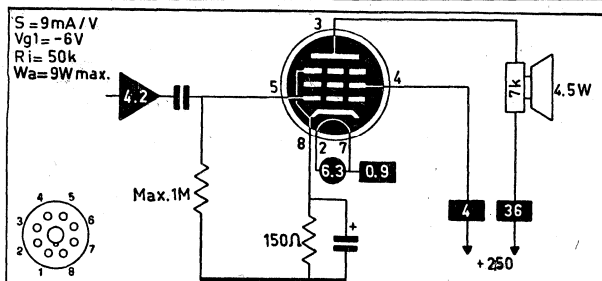
EL11



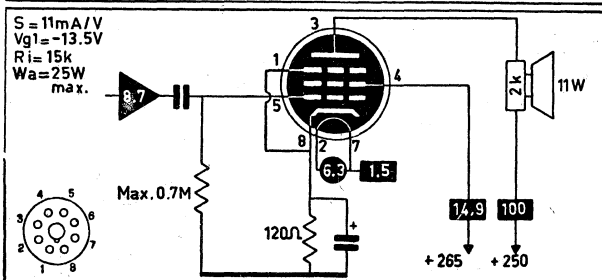
EL12



EL32



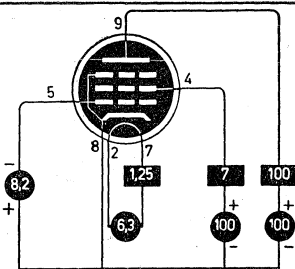
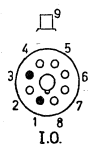
EL33



EL34

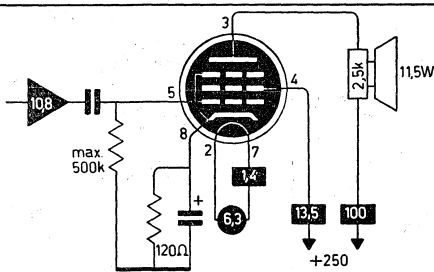
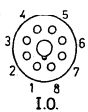
EL36

$S=14\text{mA/V}$
 $\mu g_{2g1}=5,6$
 $R_i=5k$
 $P_a=\text{max.}10\text{W}$
 $R_{eq}=$



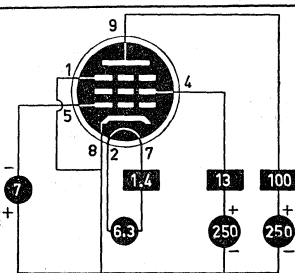
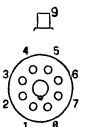
EL37

$S=11\text{mA/V}$
 $V_{g1}=-13,5\text{V}$
 $\mu g_{2g1}=$
 $R_i=13,5k$
 $P_a=\text{max.}25\text{W}$



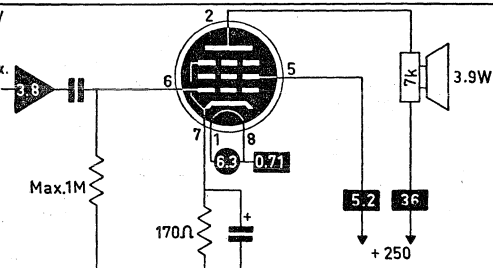
EL38

$S=14.3\text{mA/V}$
 $\mu g_{2g1}=16.5$
 $R_i=21k$
 $W_a=\text{max.}25\text{W}$



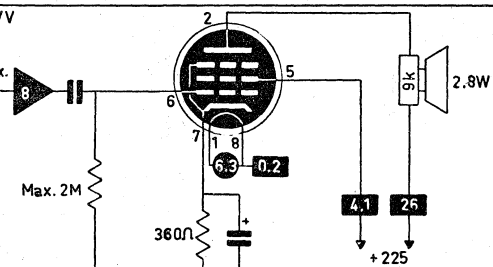
EL41

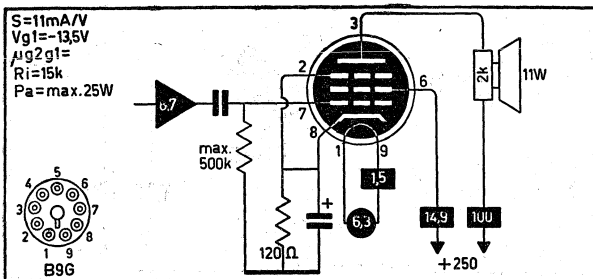
$S=10\text{mA/V}$
 $V_{g1}=-7\text{V}$
 $R_i=40k$
 $W_a=9\text{Wmax.}$



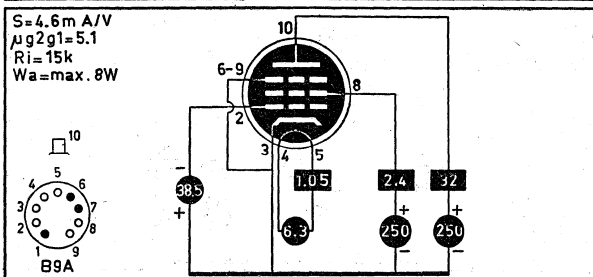
EL42

$S=3.2\text{mA/V}$
 $V_{g1}=-11\text{V}$
 $R_i=90k$
 $W_a=6\text{Wmax.}$

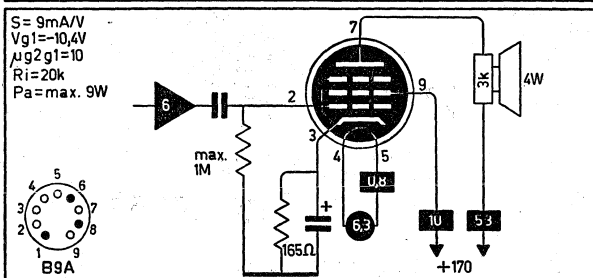




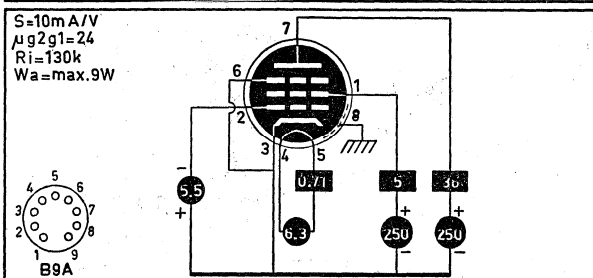
EL60



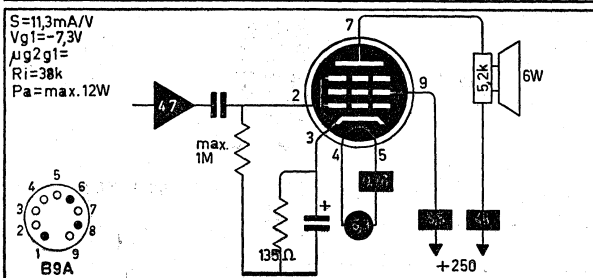
EL81



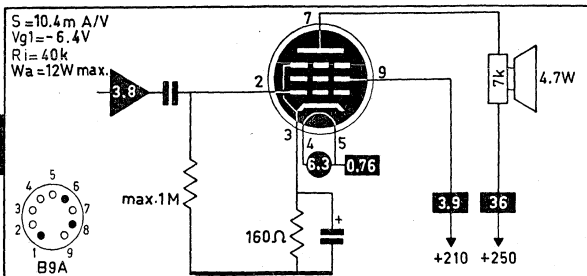
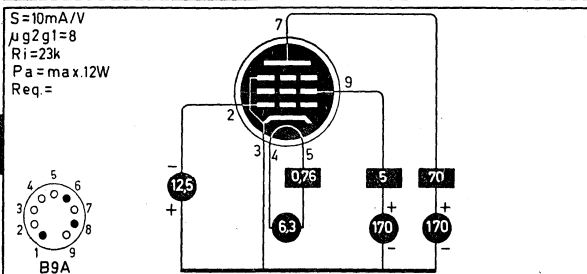
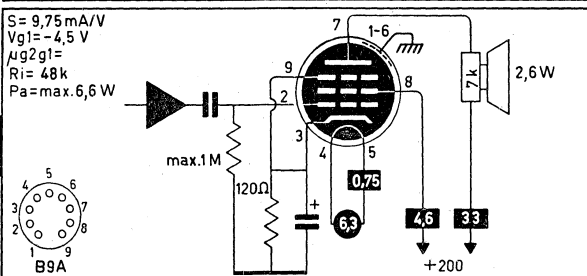
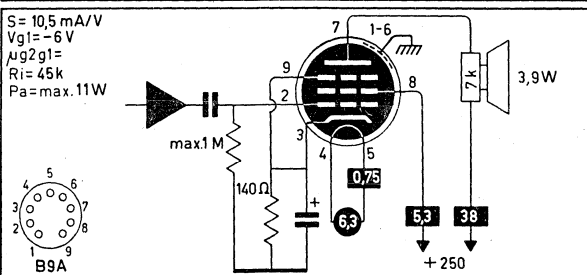
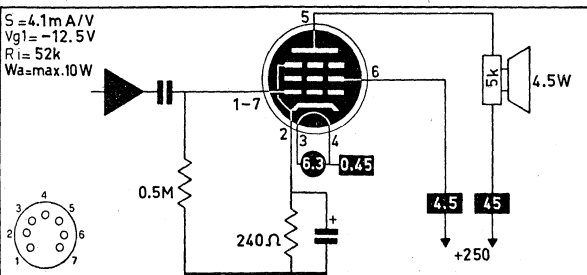
EL82



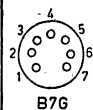
EL83



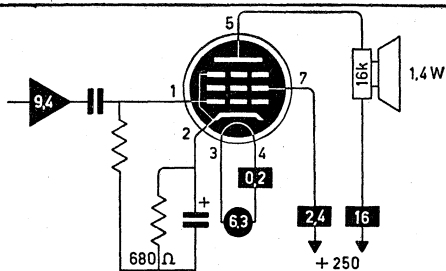
EL84

EL84**EL86****EL88****EL89****EL90**

$S = 2,6 \text{ mA/V}$
 $V_{g1} = -13,5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 150 \text{ k}$
 $P_a = \text{max. } 4 \text{ W}$

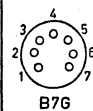


B7G

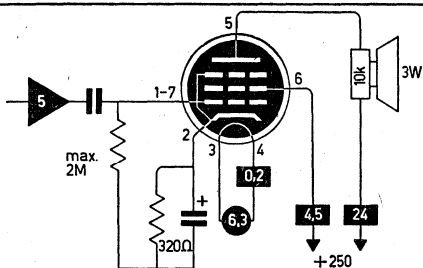


EL91

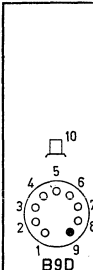
$S = 5 \text{ mA/V}$
 $V_{g1} = -9,1 \text{ V}$
 $\mu g_{2g1} = 17$
 $R_i = 80 \text{ k}$
 $P_a = \text{max. } 6 \text{ W}$



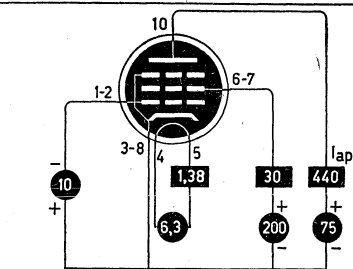
B7G



EL95

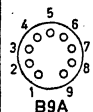


B9D

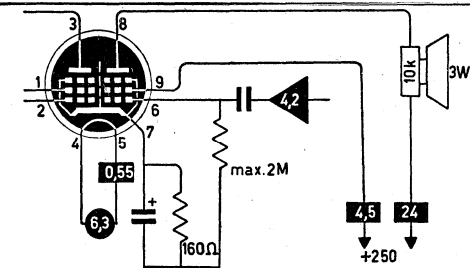


EL500

$S = 6 \text{ mA/V}$
 $V_{g1} = -9 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 80 \text{ k}$
 $P_a = \text{max. } 2 \times 6 \text{ W}$

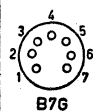


B9A

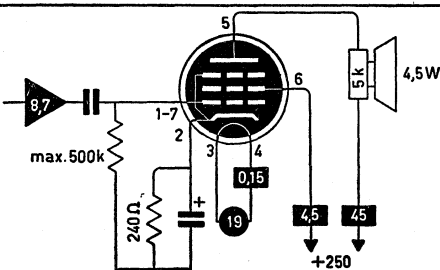


ELL80

$S = 4,1 \text{ mA/V}$
 $V_{g1} = -12,5 \text{ V}$
 $\mu g_{2g1} =$
 $R_i = 52 \text{ k}$
 $P_a = \text{max. } 12 \text{ W}$



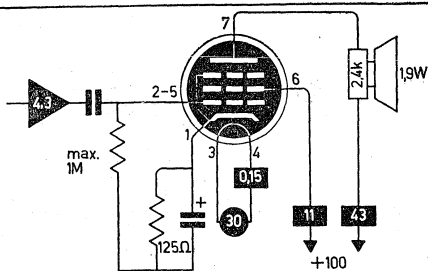
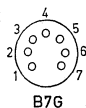
B7G



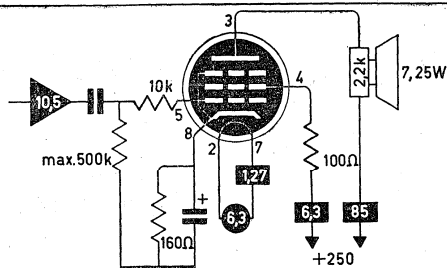
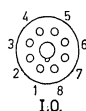
HL90

HL94

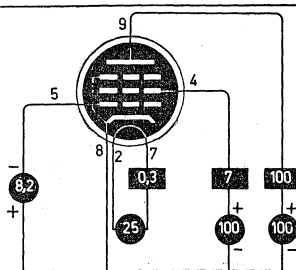
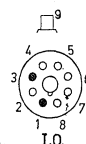
$S=9.2\text{mA/V}$
 $V_{g1}=-6.7\text{V}$
 $\mu g_{2g1}=7.8$
 $R_i=22\text{k}$
 $P_a=\text{max.}7.5\text{W}$

**KT66**

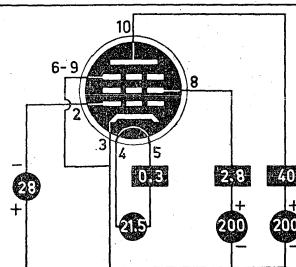
$S=6.3\text{mA/V}$
 $V_{g1}=-15\text{V}$
 $\mu g_{2g1}=$
 $R_i=22.5\text{k}$
 $P_a=\text{max.}25\text{W}$

**PL36**

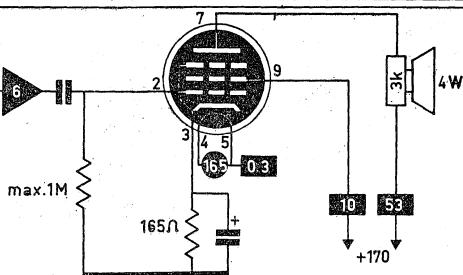
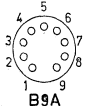
$S=14\text{mA/V}$
 $\mu g_{2g1}=5.6$
 $R_i=5\text{k}$
 $P_a=\text{max.}10\text{W}$
 $R_{eq}=$

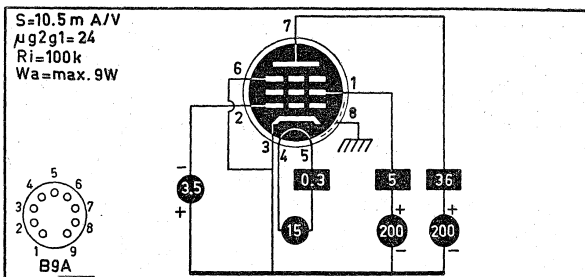
**PL81**

$S=6\text{mA/V}$
 $\mu g_{2g1}=5.5$
 $R_i=11\text{k}$
 $W_a=\text{max.}8\text{W}$

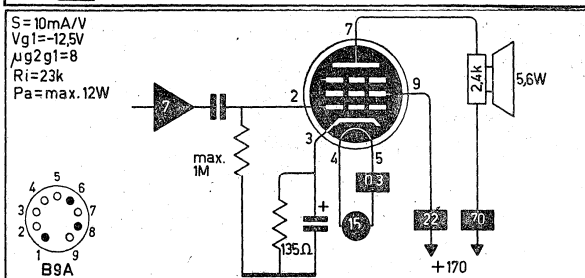
**PL82**

$S=9\text{mA/V}$
 $V_{g1}=-10.4\text{V}$
 $R_i=20\text{k}$
 $\mu g_{2g1}=10$
 $W_a=9\text{Wmax.}$

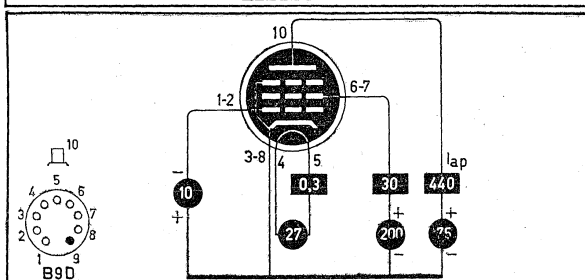




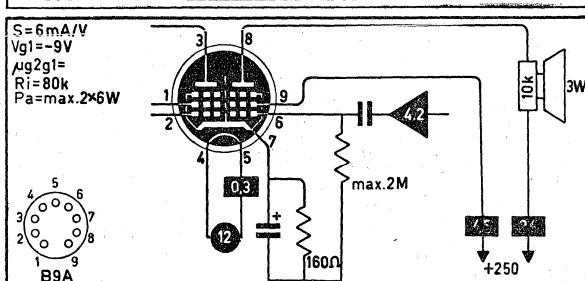
PL83



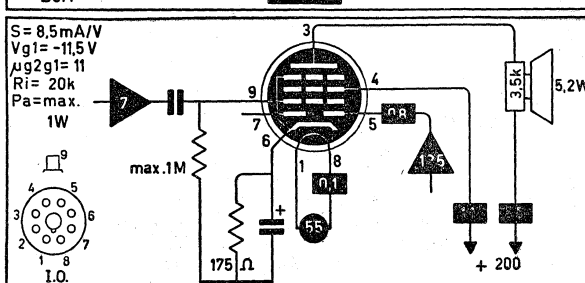
PL84



PL500

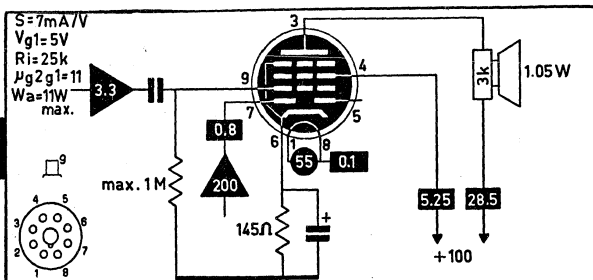


PLL80

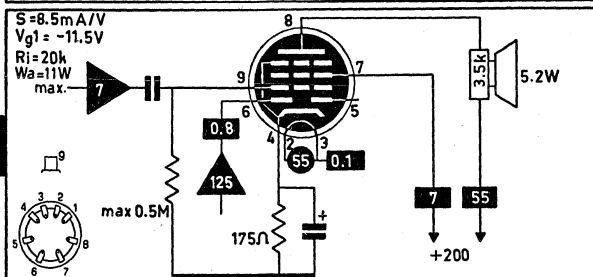


UBL1

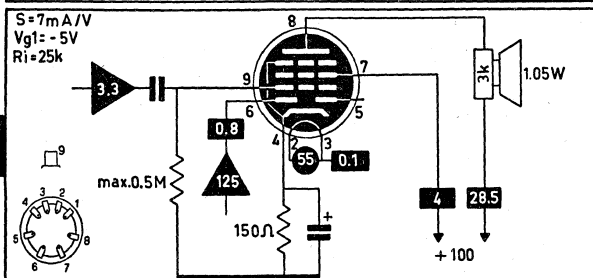
UBL1



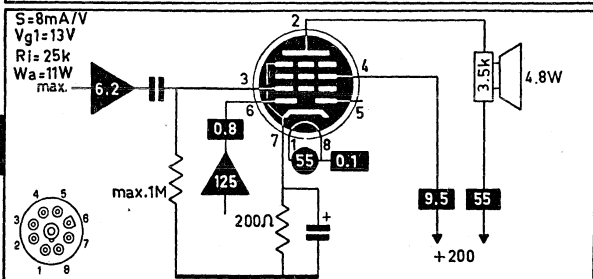
UBL3



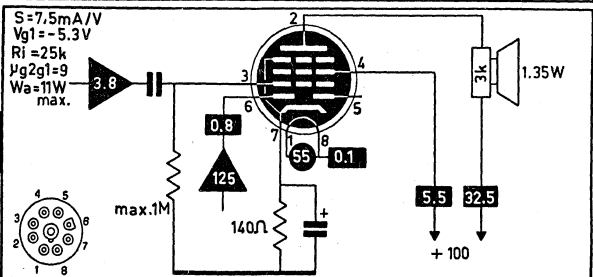
UBL3

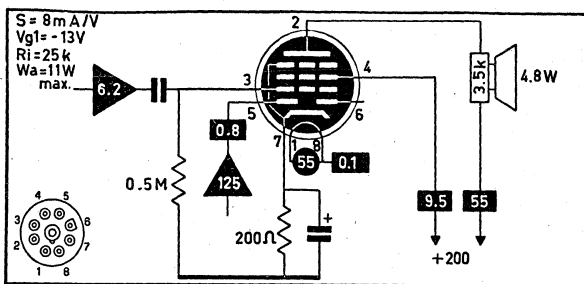


UBL21

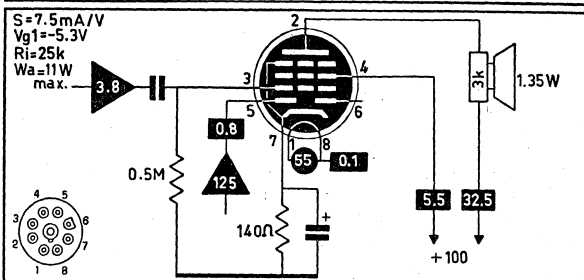


UBL21

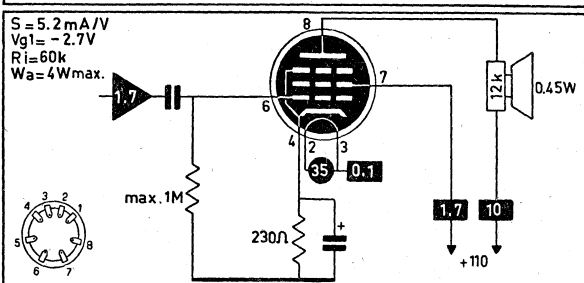




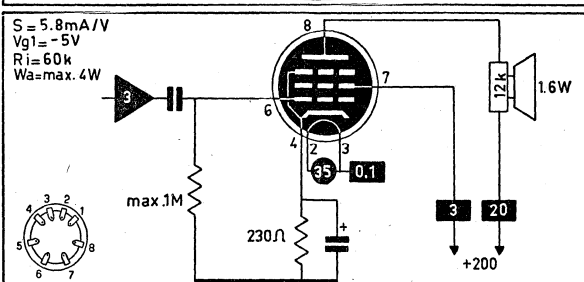
UBL7



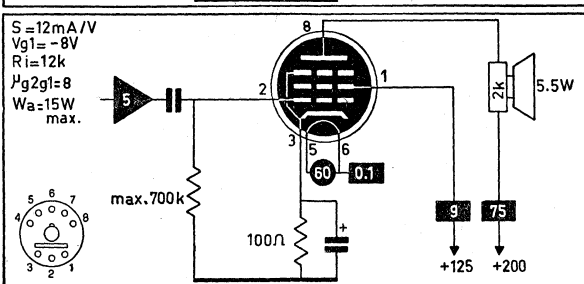
UBL71



UL2

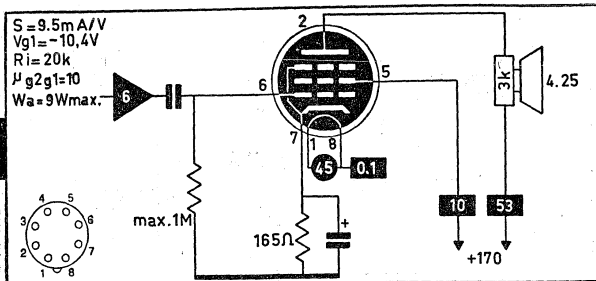


UL2

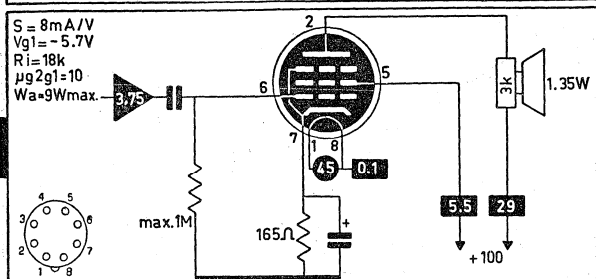


UL12

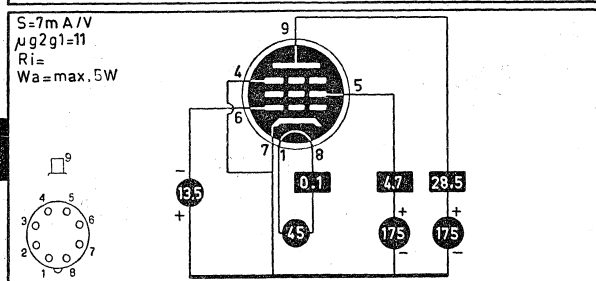
UL41



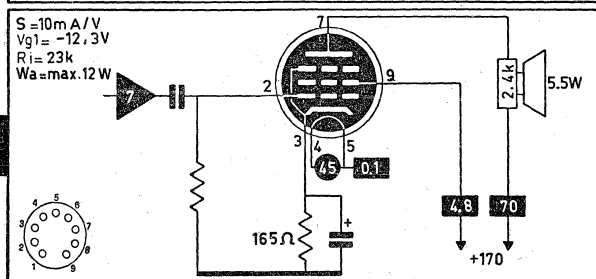
UL41



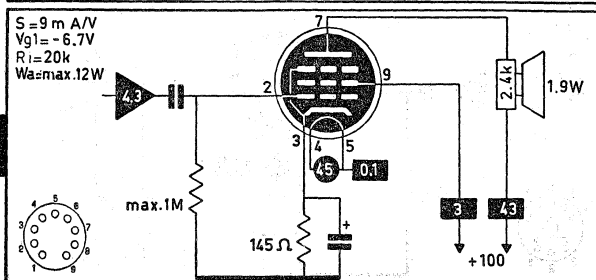
UL44

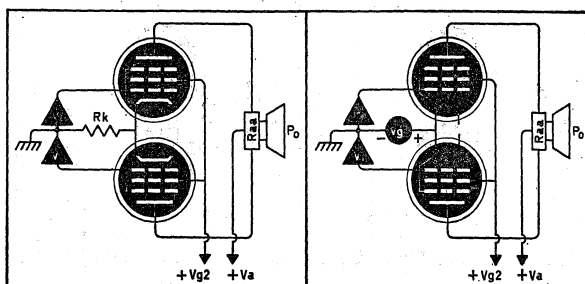


UL84

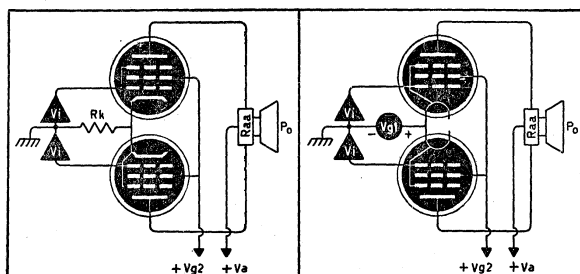


UL84





V_a	V_{g2}	V_i	I_a	I_{g2}	R_k	R_{aa}	P_o	d	
V	V	V	mA	mA	Ω	k Ω	W	%	
		(max)	$(V_i = 0)$						
300	-	2 x 78	2 x 40	-	780	5	10	5	2A3
90	90	2 x 7,9	2 x 3,25	2 x 0,6	560	20	0,42	4	3E5
120	120	2 x 9,9	2 x 5,7	2 x 1,25	470	14	0,9	5	3Q4
120	120	2 x 9,9	2 x 5,7	2 x 1,25	470	14	0,9	5	3V4
250	250	2 x 15	2 x 35	2 x 2,5	200	10	10	5	5AQ5
350	280	2 x 23	2 x 23	2 x 1,5	1)	7,5	21,5	1	5CZ5
300	-	2 x 78	2 x 40	-	780		10	5	6A3
250	250	2 x 12	2 x 11	2 x 1,6	600	24	4	3,2	6AM5
250	250	2 x 15	2 x 35	2 x 2,5	200	10	10	5	6AQ5
300	-	2 x 78	2 x 40	-	780	5	10	5	6B4
300	300	2 x 10	2 x 36	2 x 4	130	8	17	4	6BQ5
350	280	2 x 23	2 x 23	2 x 1,5	1)	7,5	21,5	1	6CZ5
300	250	2 x 11	2 x 33	2 x 3,5	120	9	12	3,5	6DZ7
140	120	2 x 9,4	2 x 47	2 x 11	68	6	3,8	5	6EH5
315	285	2 x 24	2 x 31	2 x 6	320	10	11	4	6F6
145	145	2 x 14,4	2 x 80	2 x 4	75	1,6	8,5	6	6FE5
300	300	2 x 14	2 x 36	2 x 4	130	8	17	4	6GK6
360	270	2 x 20	2 x 44	2 x 2,5	250	9	24,5	4	6L6
285	285	2 x 19	2 x 35	2 x 2	260	8	14	3,5	6V6
250	250	2 x 15	2 x 35	2 x 2,5	200	10	10	5	7C5
250	250	2 x 12	2 x 11	2 x 1,6	600	24	4	3,2	7D9
300	300	2 x 10	2 x 36	2 x 4	130	8	17	4	8BQ5
250	250	2 x 15	2 x 35	2 x 2,5	2)	10	10	5	12AB5
250	250	2 x 15	2 x 35	2 x 2,5	200	10	10	5	12AQ5
140	120	2 x 9,4	2 x 47	2 x 11	68	6	3,8	5	12EH5
285	285	2 x 19	2 x 35	2 x 2	260	8	14	3,5	12V6
250	250	2 x 15	2 x 35	2 x 2,5	200	10	10	5	14C5
250	250	2 x 15	2 x 35	2 x 2,5	200	10	10	5	19AQ5
140	120	2 x 9,4	2 x 47	2 x 11	68	6	3,8	5	25EH5
26	26	2 x 7	2 x 19	2 x 2	2)	2,5	0,5	5	26A7
315	285	2 x 24	2 x 31	2 x 6	320	10	11	4	42
140	120	2 x 9,4	2 x 47	2 x 11	68	6	3,8	5	50EH5
500	300	2 x 25	2 x 50	2 x 1,5	270	9	32,5	2,7	807
425	425	2 x 27	2 x 46,5	2 x 5,4	265	6,5	27,5	5	4654
375	375	2 x 14	2 x 52	2 x 6,5	125	6	27,5	4	4699
250	250	2 x 6,7	2 x 24	2 x 2,8	140	10	8,2	3,1	AL4
375	275	2 x 16	2 x 48	2 x 5	165	6,5	28,5	2,3	AL5
200	200	2 x 14	2 x 33	2 x 3,5	135	4,5	8	2,5	CL4
200	125	2 x 11	2 x 45	2 x 5	250	4,5	12,1	1,8	CL6
90	90	2 x 5	2 x 1,5	2 x 0,25	3)	18	0,48	5	DL41



	V_a	V_{g2}	V_i	I_a	I_{g2}	R_k	R_{aa}	P_o	d
	V	V	V	mA	mA	Ω	k Ω	W	%
			(max)	$(V_i = 0)$					
DL94	120	120	2 x 9,9	2 x 5,7	2 x 1,25	470	14	0,9	5
DL95	120	120	2 x 9,9	2 x 5,7	2 x 1,25	470	14	0,9	5
DL96	90	90	2 x 7,9	2 x 3,25	2 x 0,6	560	20	0,42	4
EBL21	300	300	2 x 7	2 x 30	2 x 3,8	130	9	13,2	1,8
EBL71	300	300	2 x 7	2 x 30	2 x 3,8	130	9	13,2	1,8
EL2	250	250	2 x 17	2 x 27,5	2 x 4,5	300	8	8	1,4
EL3	250	250	2 x 6,7	2 x 24	2 x 2,8	140	10	8,2	3,1
EL5	250	275	2 x 13	2 x 58	2 x 6,25	120	4,5	19,5	5,1
EL6	250	250	2 x 7,3	2 x 45	2 x 5,1	90	5	14,5	2,2
EL12	250	250	2 x 7,3	2 x 45	2 x 5,1	90	5	14,5	2,2
EL32	250	250	2 x 17	2 x 27,5	2 x 4,5	300	8	8	1,4
EL33	250	250	2 x 6,7	2 x 24	2 x 2,8	140	10	8,2	3,1
EL34	350	350	2 x 21	2 x 75	2 x 11,5	130	3,4	35	5
EL41	250	250	2 x 5,6	2 x 36	2 x 5,2	85	7	9,4	4,6
EL42	250	250	2 x 13	2 x 20	2 x 3,2	310	15	7	5,5
EL60	350	350	2 x 21	2 x 75	2 x 11,5	130	3,4	35	5
EL84	300	300	2 x 10	2 x 36	2 x 4	130	8	17	4
EL90	250	250	2 x 15	2 x 35	2 x 2,5	200	10	10	5
EL91	250	250	2 x 12	2 x 11	2 x 1,6	600	24	4	3,2
EL95	250	250	2 x 9	2 x 22	2 x 4	360	10	7	5
ELL80	250	250	2 x 8	2 x 21	2 x 4,2	180	10	8,5	5
KL4	135	135	2 x 6,2	2 x 1,5	2 x 0,3	4)	35	0,8	7,8
KL5	135	135	2 x 8,7	2 x 2	2 x 0,35	1)	25	1,05	7
KT66	390	275	2 x 24	2 x 52	2 x 2,5	250	8	30	6
PL82	200	200	2 x 14	2 x 45	2 x 8,5	135	4	12	5
PL84	170	170	2 x 13	2 x 56,5	2 x 3	120	3,5	13	4,5
PLL80	250	250	2 x 8	2 x 21	2 x 4,2	180	10	8,5	5
UBL21	200	200	2 x 12	2 x 50	2 x 7,8	120	4	12,5	3,9
UBL71	200	200	2 x 12	2 x 50	2 x 7,8	120	4	12,5	3,9
UL41	170	170	2 x 9,3	2 x 44	2 x 8,8	100	4	9	4
UL84	170	170	2 x 13	2 x 56,5	2 x 3	120	3,5	13	4,5
1) $V_{g1} = -12$ V				2) $V_{g1} = -7,5$ V		3) $V_{g1} = -6,4$ V			
4) $V_{g1} = -8$ V									

			
1C5	DL35	-	-
1C5G	-	CV1803	-
1C5GT	-	CV1805 VT125 *)	-
1L84	-	CV776	-
1Q5	-	CV1824	-
1Q5GT	-	CV1826	-
1S4	DL91	CV783 VT210 *)	-
1T5	-	CV786 CV1829	-
2A3	-	CV1831	6A3
2A5	-	CV1834	-
3A4	DL93	CV807 CV2300	-
-3C4-	DL96	-	-
3D6	-	CV2710	-
3LF4	-	VT180 *)	3Q5
3Q4	DL95	CV818	-
3Q5	-	CV819	3LF4
3Q5GT	-	VT221 *)	-
3S4	DL92	CV820 VT174 *)	-
3V4	DL94	CV2983	-
5AQ5	-	-	6AQ5 12AQ5 19AQ5 EL90 HL90
5CZ5	-	-	6CZ5
5V6	-	-	6V6 12V6
6A3	-	CV730	2A3
6AC5	-	CV844 CV845	-
6AG7	-	CV1882 VT247 *)	-
6AK6	-	CV1762	6G6
6AM5	EL91	CV136	-
6AN5	-	CV2854	-
6AQ5	EL90	CV1862 CV2883 CV2937 CV4019	5AQ5 12AQ5 19AQ5 HL90
6AR5	-	-	6K6
6AV5	-	-	12AV5 25AV5
6B4	-	-	6A3
6B4G	-	CV851	-
6BG6	-	-	19BG6
6BK5	-	-	12BK5 25BK5
6BQ5	EL84	-	-
6BQ6	6CU6	-	12BQ6 17BQ6 25BQ6
6CA5	-	-	12CA5
-6CA7-	EL34	-	-
6CD6	-	-	25CD6 50CD6
-6CJ6-	EL81	-	-
-6CK5-	EL41	-	-

*) American VT

				
-6CK6-	EL83	-	-	-
-6CM6-	-	-	-	6V6
-6CN6-	EL38	-	-	-
6CU6	6BQ6	-	12CU6	-
-6CW5-	EL86	-	-	-
6CZ5	-	-	5CZ5	-
6DB5	-	-	12DB5	6DG6
6DG6	-	-	12DB5	6DB5
-6DL5-	EL95	-	-	-
6DQ6A	-	-	12DQ6A 17DQ6A 25DQ6A	-
6DT5	-	-	12DT5	-
6EH5	-	-	12EH5 25EH5 35EH5 50EH5	-
6EM5	-	-	8EM5	-
6F6	-	CV731 CV1186 CV1912 VT66 x)	-	-
6F6G	-	ARP17 CV1911 NR85 VT66A x)	-	-
6G6	-	CV1926	-	6AK6
6G6G	-	VT198A x)	-	-
6FE5	-	-	50FE5	-
6GJ5	-	-	12GJ5	-
6GT5	-	-	12GT5 17GT5	-
6GW6	-	-	12GW6 17GW6	-
6K6	-	CV1940 VT52 x)	-	7B5
6K6G	-	CV1938 VT152A x)	-	-
6K6GT	-	VT152 x)	-	-
6L6	-	CV1948 CV2817 VT115 x)	25L6	-
6L6G	-	CV1286 CV1947 VT115A x)	-	-
6L6WGA	-	CV3618	-	-
6L6WGB	-	CV2796	-	-
6P25	-	CV1853	-	-
6V6	-	CV510 VT107 x)	5V6 12V6	6CM6 7C5
6V6G	-	ARP32 CV509 VT1078 x)	-	-
6V6GT	-	CV511 VT107A x)	-	-
6Y6	-	CV515	25C6	-
7B5	-	CV880 CV881	-	6K6
7C5	-	CV885 CV886	14C5	6V6
7D9	6AM5 EL91	CV2002 CV2003	-	-

*) American VT

				
8EM5	-	-	6EM5	-
9BW6	-	-	6BW6	-
12A6	-	CV525 VT134 x)	-	-
12AQ5	-	-	5AQ5 6AQ5 19AQ5 EL90 HL90	-
12AV5	-	-	6AV5	-
12BK5	-	-	6BK5 25BK5	-
12BQ6	-	-	6BQ6 17BQ6 25BQ6	-
12CA5	-	-	6CA5 25CA5	-
12CU6	-	-	6CU6	-
12DB5	-	-	6DB5	-
12DQ6A	-	-	6DQ6A 17DQ6A 25DQ6A	-
12DT5	-	-	6DT5	-
12EH5	-	-	6EH5 25EH5 35EH5 50EH5	-
12GJ5	-	-	6GJ5 17GJ5	-
12GT5	-	-	6GT5 17GT5	-
12GW6	-	-	6GW6 17GW6	-
12L6	-	-	25L6	-
12V6	-	-	5V6 6V6	-
14C5	-	-	7C5	-
-15A6-	PL83	-	-	-
-15CW5-	PL84	-	-	-
-16A5-	PL82	-	-	-
17BQ6	-	-	6BQ6 12BQ6 25BQ6	-
17DQ6A	-	-	6DQ6A 12DQ6A 25DQ6A	-
17GJ5	-	-	6GJ5 12GJ5	-
17GT5	-	-	6GT5 12GT5	-
17GW6	-	-	6GW6 12GW6	-
19AQ5	HL90	-	5AQ5 6AQ5 12AQ5 EL90	-
19BG6	-	-	6BG6	-
-21A6-	PL81	-	-	-
25A6	-	CV549	-	-
25A6G	-	CV550	-	-
25AV5	-	-	6AV5	-
25B6	-	CV939	-	-

*) American VT

				
25BK5	-	-	6BK5 12BK5	-
25BQ6	-	-	6BQ6 12BQ6 17BQ6	-
25C6	-	-	6Y6	-
25CA5	-	-	6CA5 12CA5	-
25CD6	-	-	6CD6	-
25DQ6A	-	-	6DQ6A 12DQ6A 17DQ6A	-
-25E5-	PL36	-	-	-
25EH5	-	-	6EH5 12EH5 35EH5 50EH5	-
25L6	-	CV551 CV552 VT201 x)	50L6	-
25L6G	-	VT201C	-	-
25L6GT	-	CV553	-	-
-30A5-	HL94	-	-	-
35A5	-	CV1753	-	35L6
35B5	-	-	-	35C5
35C5	-	-	-	35B5
35EH5	-	-	6EH5 12EH5 25EH5 50EH5	-
35L6	-	CV561	-	35A5
35L6GT	-	CV562	-	-
41	-	CV608	-	-
42	-	CV609 CV1712	-	-
43	-	CV2514	-	-
45	-	CV610	-	-
-45A5-	HL41	-	-	-
50A5	-	-	-	50L6
50B5	-	-	-	50C5
50C5	-	CV1959	-	50B5
50CD6	-	-	6CD6 25CD6	-
50EH5	-	-	6EH5 12EH5 25EH5 35EH5	-
50FE5	-	-	6FE5	-
50L6	-	CV2534	25L6	50A5
50L6GT	-	CV571	-	-
59	-	CV2538	-	-
89	-	CV833	-	-
8D7	-	CV124 CV1364 CV1572 VT60 x) VT100 x)	-	-
4699	-	-	EL6	-
ABL1	-	-	EBL1	-
AL1	-	CV159	-	-
AL4	-	-	EL3	-
AL5	-	-	EL5	-

*) American VT

**) British VT

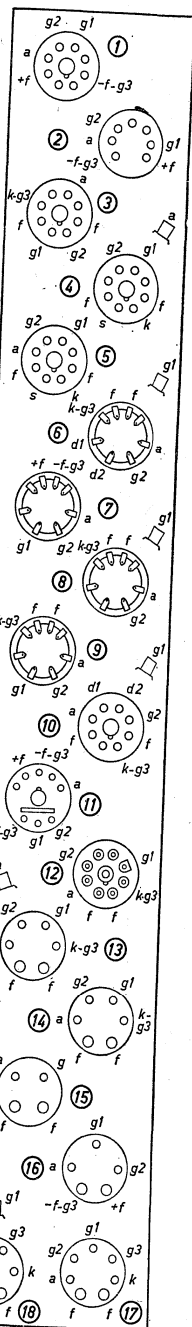
				
CBL1	-	-	-	CBL31
CBL31	-	CV1463	-	CBL1
CL4	-	CV2875	-	-
DL35	1C5	-	-	-
DL91	1S4	-	-	-
DL92	3S4	CV2370	-	-
DL93	3A4	-	-	-
DL94	3V4	-	-	-
DL95	3Q4	-	-	-
DL96	-3C4-	-	-	-
EBL1	-	-	ABL1	-
EBL21	EBL71	-	-	-
EBL71	EBL21	-	-	-
EL2	-	CV1429	-	EL32
EL3	-	-	AL4	EL11
				EL33
EL5	-	-	AL5	-
EL6	-	-	4699	EL12
EL11	-	-	-	EL3
				EL33
EL12	-	-	-	EL6
EL32	-	CV996 VT52 xx)	-	EL2
EL33	-	CV2938	-	EL3
				EL11
EL34	-6CA7-	CV1741	-	EL60
EL36	-	-	PL36	-
EL38	-6CN6-	CV450	-	-
EL41	-6CK5-	CV3889	-	-
EL42	-	CV3890	-	-
EL60	-	-	-	EL34
EL81	-6CJ6-	-	-	-
EL83	-6CK6-	-	-	-
EL84	6BQ5	CV2975	-	-
EL86	-6CW5-	-	-	-
EL90	6AQ5	-	5AQ5 12AQ5 19AQ5 HL90	-
EL91	6AM5 7D9	-	-	-
EL95	-6DL5-	-	-	-
EL500	-	-	PL500	-
ELL80	-	-	PLL80	-
HL90	19AQ5	-	5AQ5 6AQ5 12AQ5	-
HL94	-30A5-	-	EL90	-
KT66	-	CV321 CV1075 VT75 xx)	-	-
PL36	-25E5-	-	EL36	-
PL81	-21A6-	-	-	-
PL82	-16A5-	-	-	-
PL83	-15A6-	-	-	-
PL84	-15CW5-	-	UL84	-
PL500	-	-	EL500	-
PLL80	-	-	ELL80	-
UBL21	UBL71	-	-	-
UBL71	UBL21	-	-	-
UL41	-45A5-	CV1977	-	-
UL84	-	-	PL84	-

**) British VT

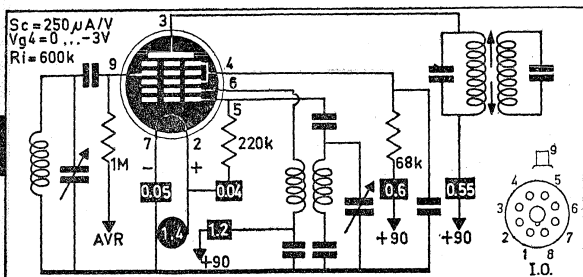
OBSELETE TYPES

Type	V_f	I_f	V_a	I_a	V_{g2}	I_{g2}	$-V_{g1}$	R_k
	V	A	V	mA	V	mA	V	Ω
1A5	1,4	0,05	90	4	90	0,8	4,5	-
1W4	1,4	0,05	90	5	90	1	9	-
6BD5	6,3	0,9	200	48	200	2,5	12	-
6BQ6	6,3	1,2	250	55	150	2,1	22,5	-
6P25	6,3	1,1	250	40	250	8	8,5	180
6TP	6,3	0,9	250	72	250	5	14,5	180
6U6	6,3	0,75	200	55	135	3	14	250
7A5	6,3	0,75	135	45	125	9,5	10,4	190
41	6,3	0,4	250	33	250	10	18	420
42	6,3	0,7	250	36	250	10,5	16,5	410
43	25	0,3	160	36	120	12	18	375
45	2,5	1,5	250	34	-	-	50	-
47	2,5	1,75	250	31	250	6	16,5	-
59	2,5	2	250	35	250	9	18	400
89	6,3	0,4	250	32	250	5,5	25	660
ABL1	4	2,4	250	36	250	4	6	150
AL1	4	1,1	250	36	250	6,8	15	-
AL2	4	1	250	36	250	5	25	625
AL4	4	1,75	250	36	250	4	6	150
AL5	4	2	250	72	275	7	14	175
CBL1	44	0,2	200	45	200	6	8,5	170
CBL6	44	0,2	200	40	100	9	9,2	190
CBL31	44	0,2	200	45	200	6	8,5	170
CL4	33	0,2	200	45	200	6	8,5	170
CL6	35	0,2	200	45	100	5,5	9,5	190
DL11	1,2	0,05	90	3,2	90	0,6	4,5	-
EBL31	6,3	1,2	250	36	250	5	6	145
EL8	6,3	0,5	250	20	250	3,2	7,5	320
KL1	2	0,15	135	8	100	1,2	6	-
KL2	2	0,26	135	18	135	2	12	-
KL4	2	0,15	90	4,7	90	0,8	2,6	-
KL5	2	0,1	90	4,8	90	0,9	4	-
KL35	2	0,15	135	5,6	135	0,9	4,5	-
N78	6,3	0,64	250	35	250	5,5	5	120

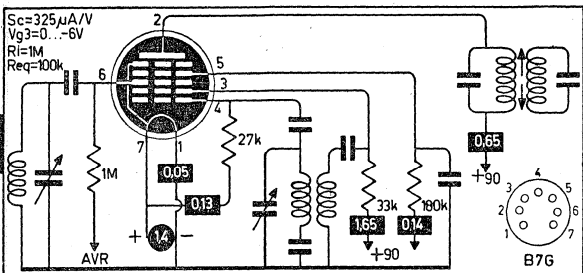
S	V_i max	R_a	P_o	Base
mA/V	V	k Ω	W	nr.
0,85	3	25	0,11	1
0,92	6,3	12	0,2	2
5	-	-	-	3
5,5	-	-	-	4
8,8	6	5	4,5	5
6	10	2,5	6,5	13
6,2	10	3	5,5	5
6	7,2	2,7	2,2	12
2,3	12	7,6	3,4	14
2,5	11	7	3,2	14
2,4	12	5	2,2	14
2,1	35	3,9	1,6	15
2,5	11	7	2,7	16
2,5	12	6	3	17
1,8	12	7	1,5	18
9	3,6	7	4,3	6
2,8	9,7	7	3,1	7
2,6	14	7	3,8	8
9	3,6	7	4,3	9
8,5	9	3,5	8,8	9
8	5	4,5	4	6
6,2	7,3	5	3,8	6
8	5	4,5	4	10
8	5	4,5	4	8
8	5,6	4,5	4	8
1	3	22	0,17	11
9,5	3,6	7	4,3	10
5,5	3,8	12,5	2	9
1,7	3,6	14	0,36	7
2	8	6	0,8	7
1,8	1,9	19	0,16	7
1,4	2,6	19	0,2	7
2,2	3,1	19	0,34	1
10,5	3,5	7	4	19



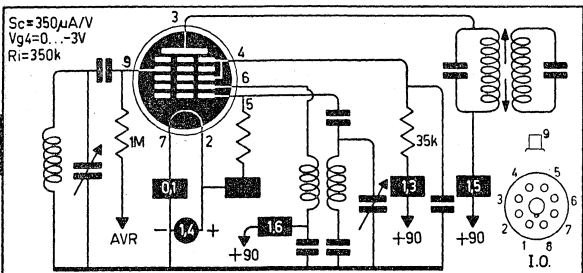
1A7



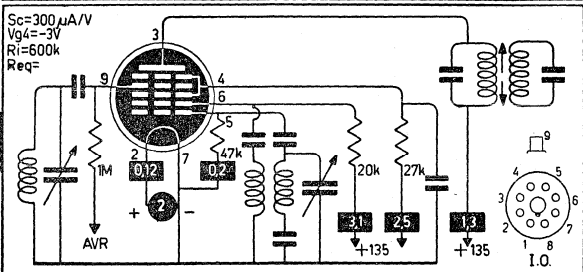
1AC6



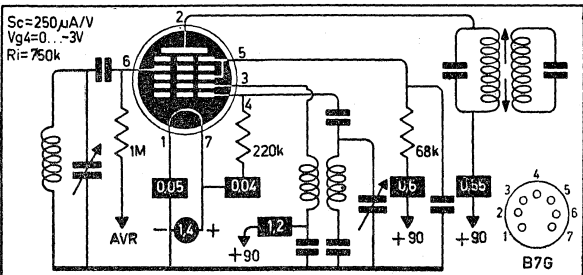
1B7

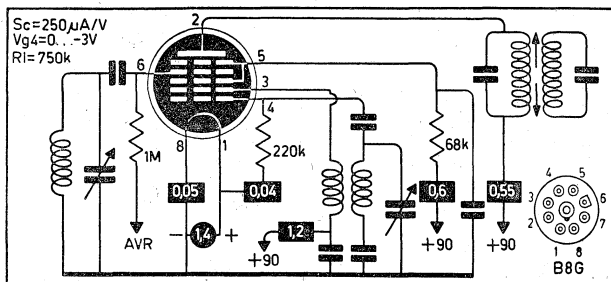


1C7

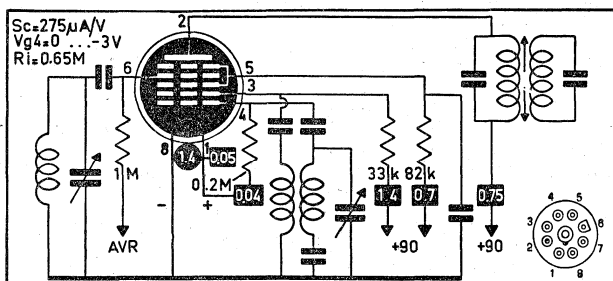


1L6

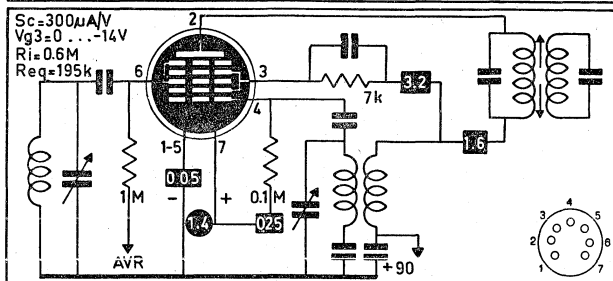




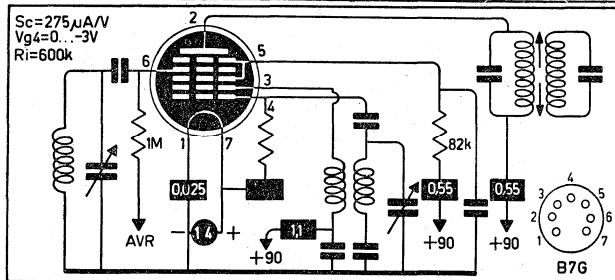
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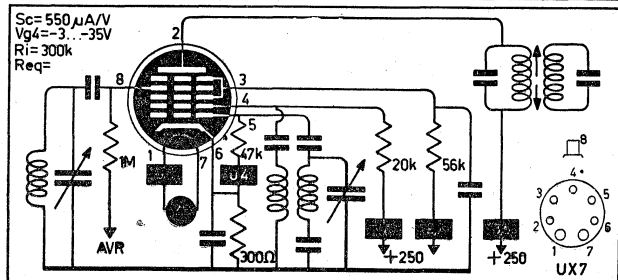
1LC6



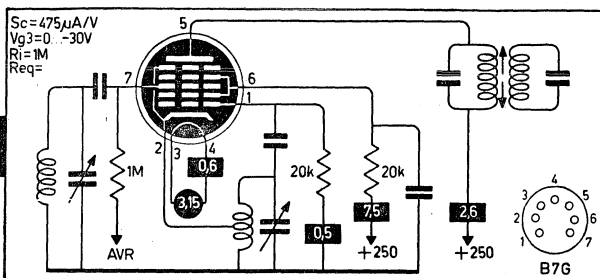
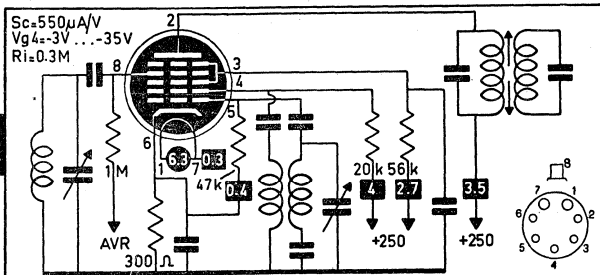
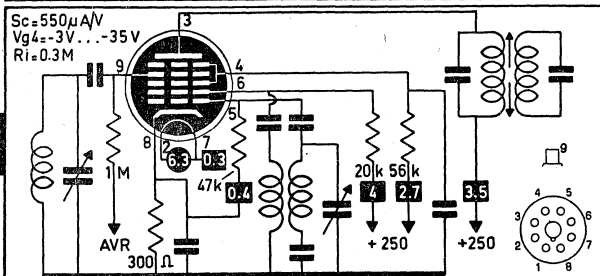
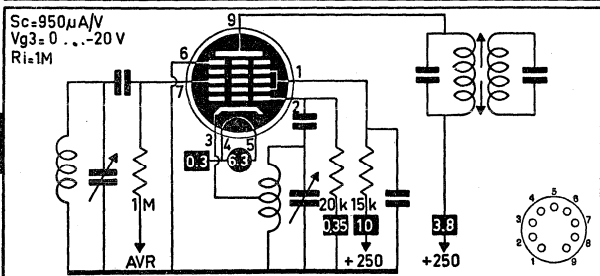
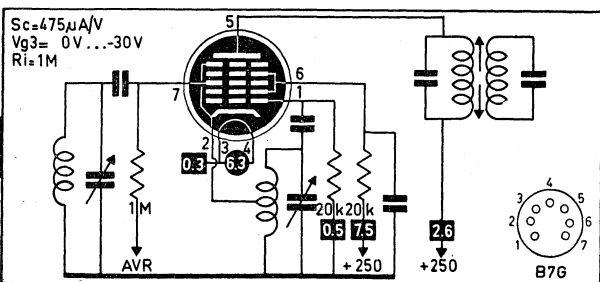
1R5

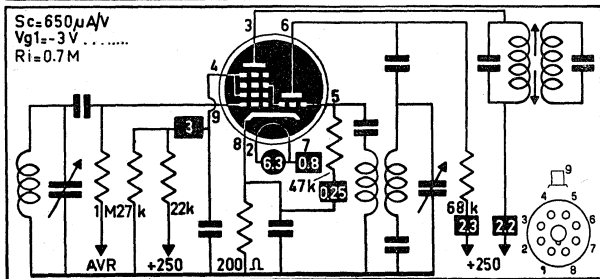
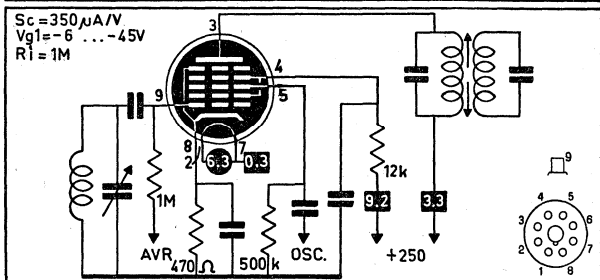
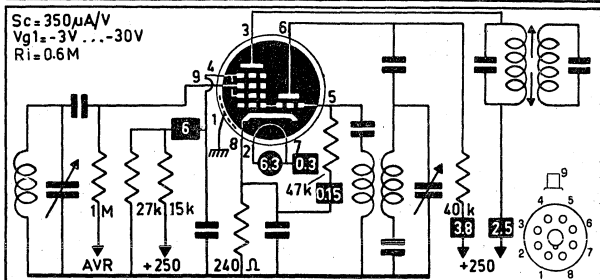
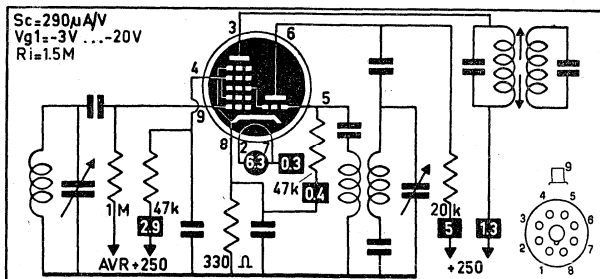
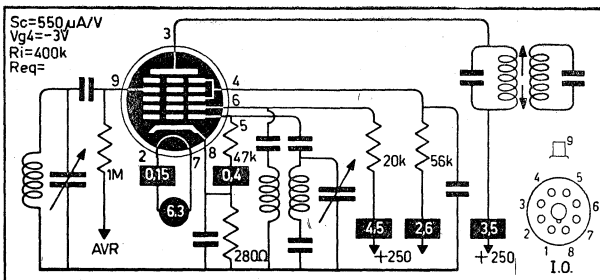


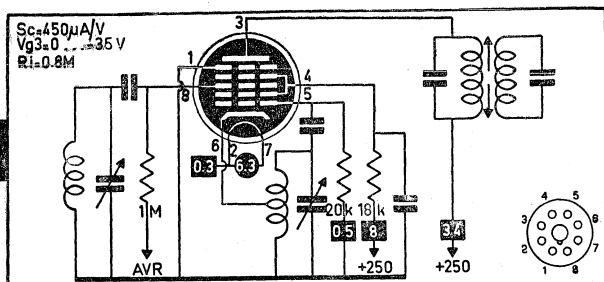
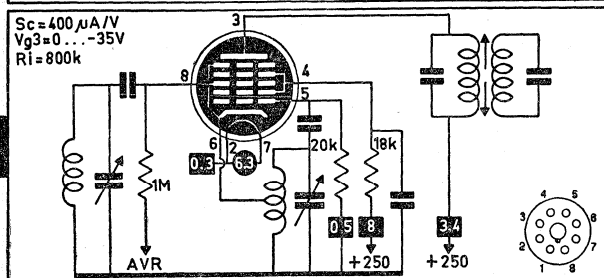
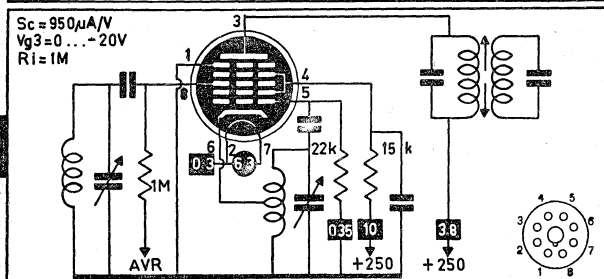
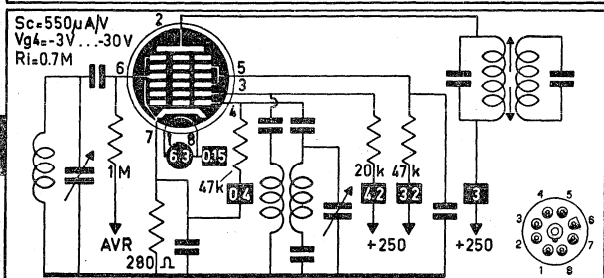
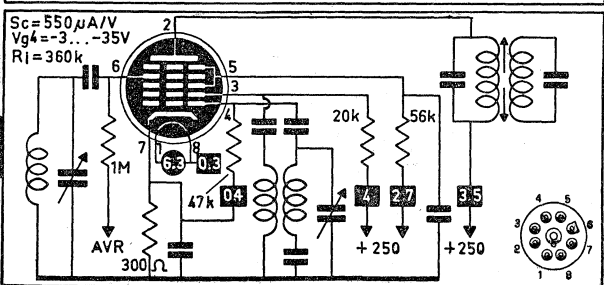
1U6

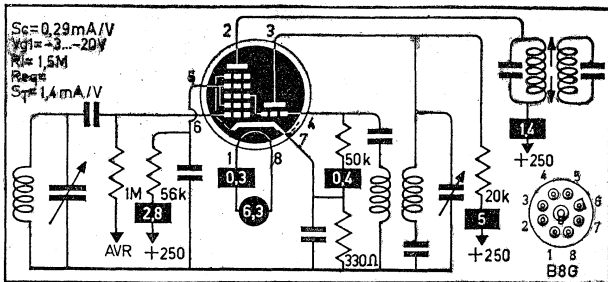


2A7

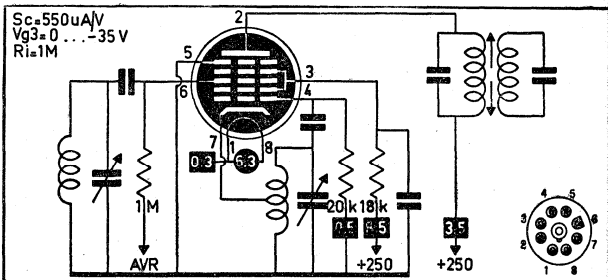
3BE6**6A7****6A8****6BA7****6BE6**



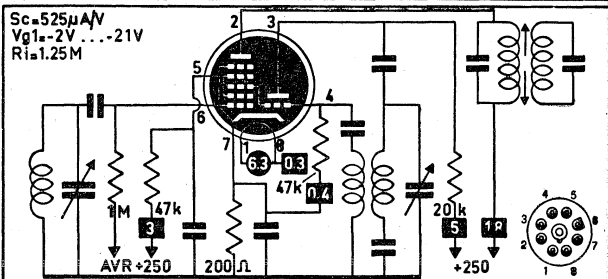
6SA7**6SA7GT****6SB7Y****7A8****7B8**



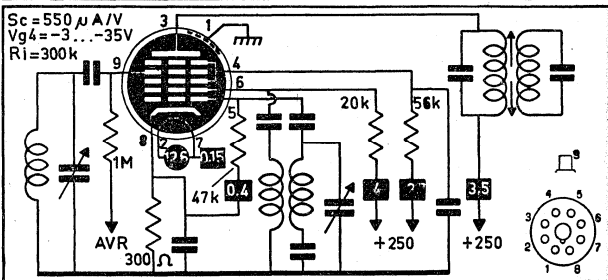
7J7



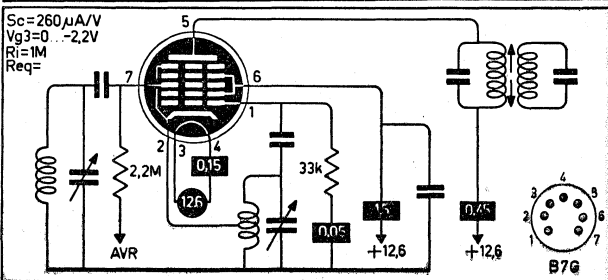
7Q7



7S7

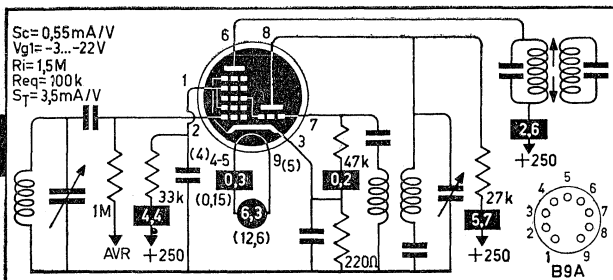


12A8

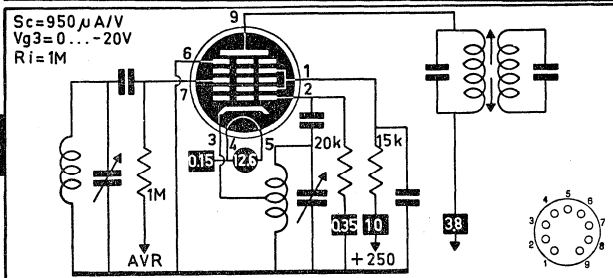


12AD6

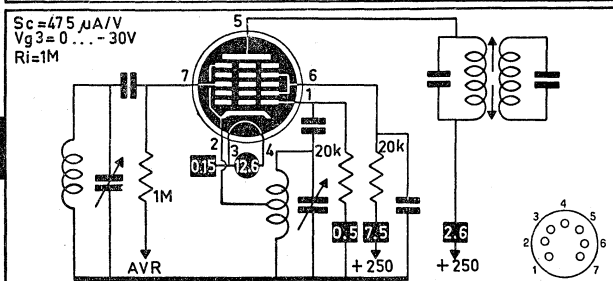
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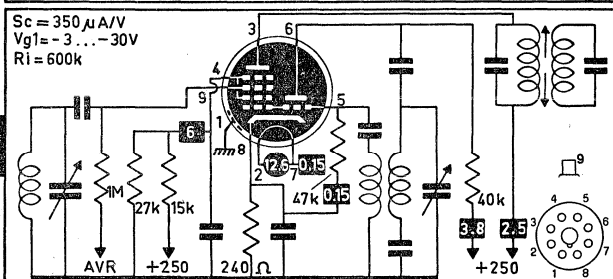
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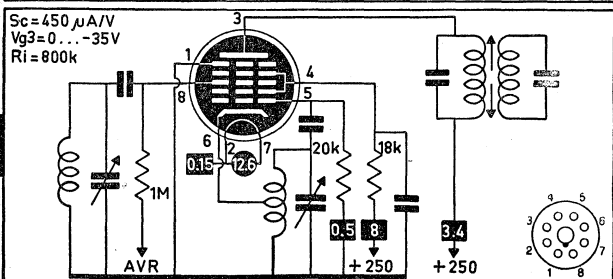
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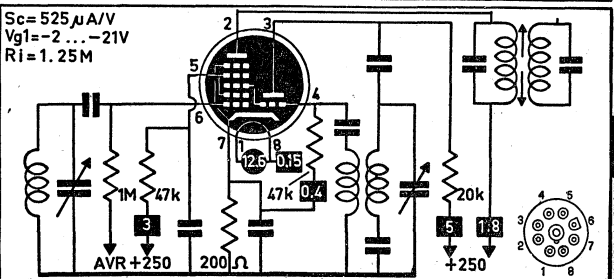
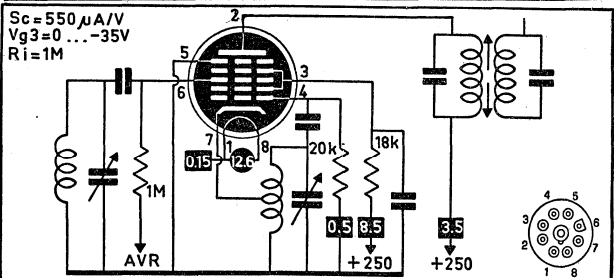
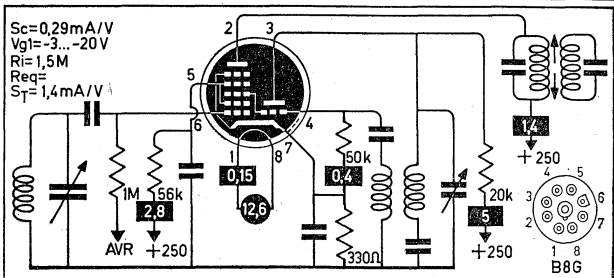
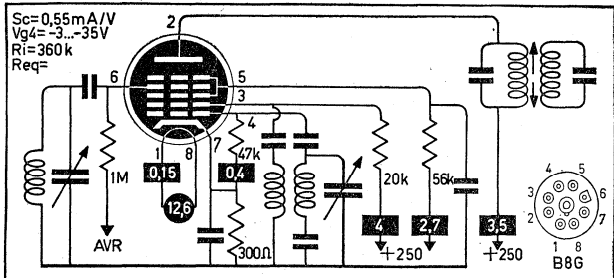
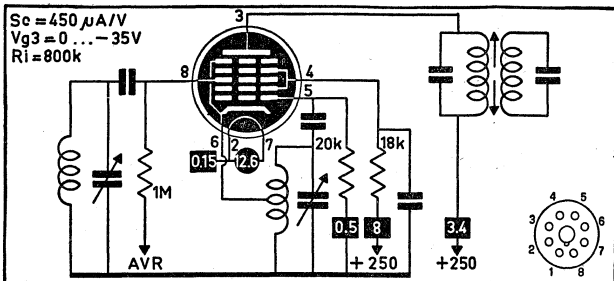


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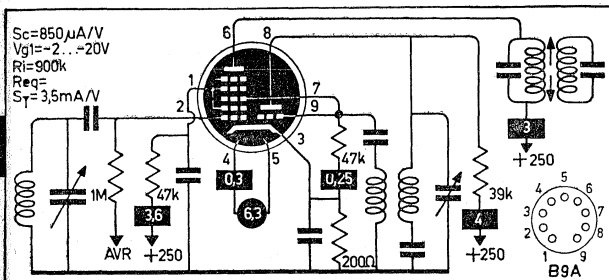


12SA7

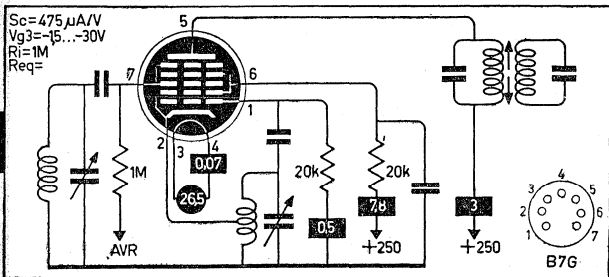




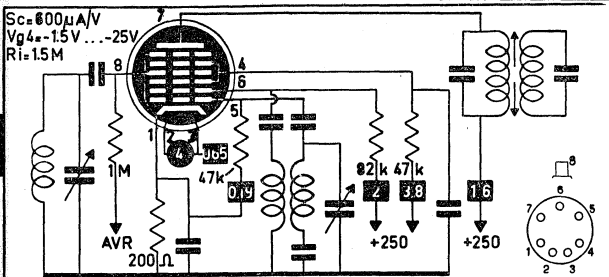
2004



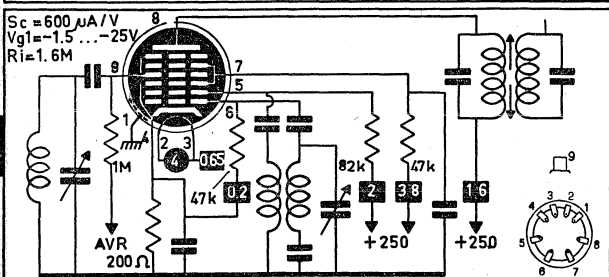
2606



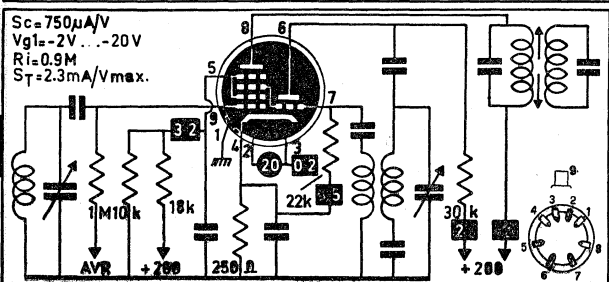
AK1

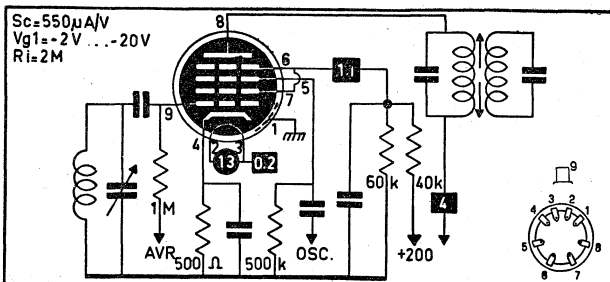


AK2

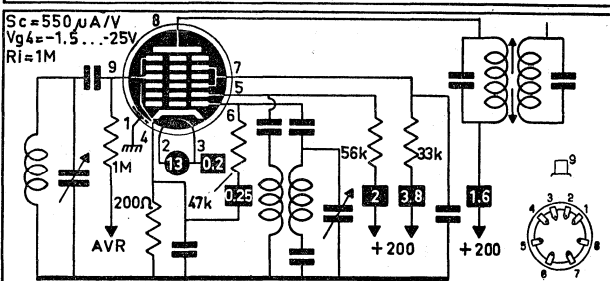


CCH1

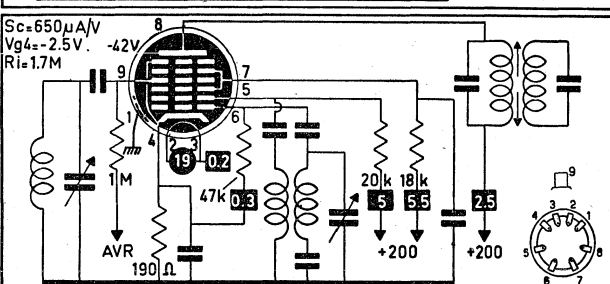




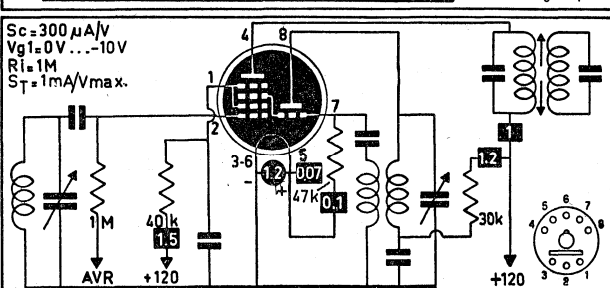
CH1



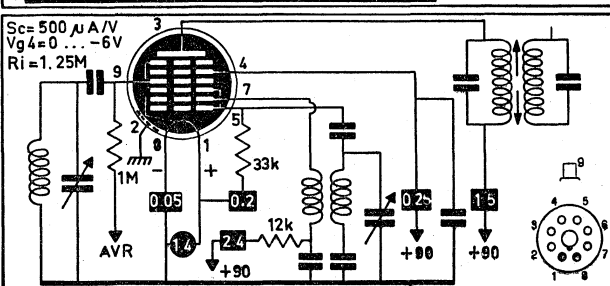
CK1



CK3



DCH 11



DK21

[illegible]

$S_c = 300 \mu A/V$
 $V_{g3} = 0V \dots -14V$
 $R_i = 0.6M$
 $R_{eq} = 195k$

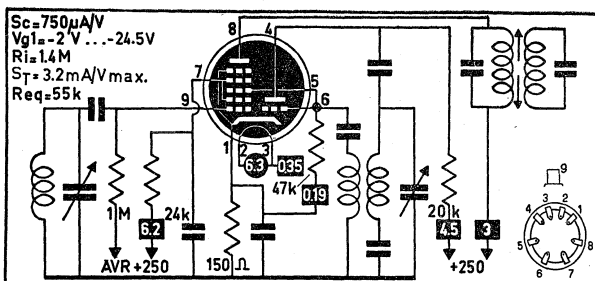
The schematic diagram shows a 6X4 vacuum tube oscillator circuit. The tube is connected to a 1M resistor and a 0.05 capacitor. The output is connected to a 90V source. The diagram also shows a 6X4 tube symbol and a 7-pin connector.

[illegible]

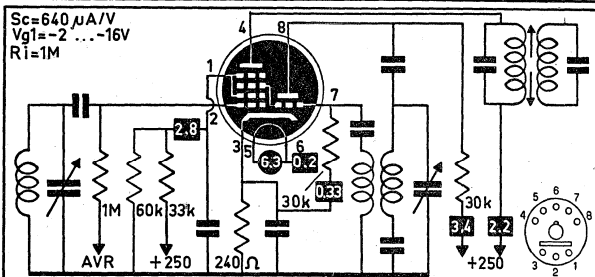
$S_c = 300 \mu A/V$
 $V_{g3} = 0 \dots -6V$
 $R_i = 800k$

The diagram shows a vacuum tube circuit for a 6X4 tube. The tube is represented by a circle with internal connections. The pins are numbered 1 through 7. The circuit includes a 1M resistor, a 0.025 capacitor, a 27k resistor, a 0.09 capacitor, a 33k resistor, a 120k resistor, and a 1.4 capacitor. The output is connected to a transformer with a 120k secondary. The circuit is powered by a 6V battery and a 300 μA/V source. The diagram is labeled with 'AVR' and '1.4'.

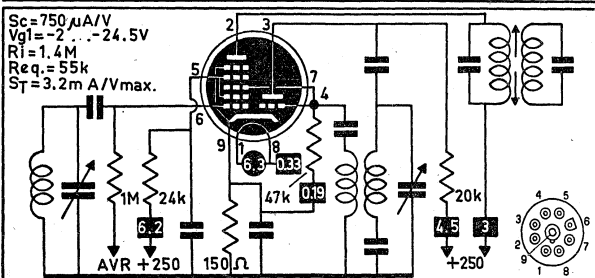
$S_C = 650 \mu A/V$
 $V_{g1} = -2V \dots -31V$
 $R_i = 1.3M$
 $S_T = 2.8 mA/Vmax.$



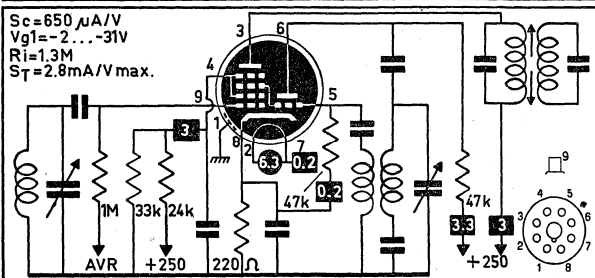
ECH4



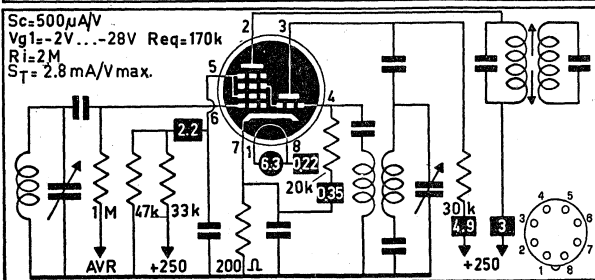
ECH11



ECH21

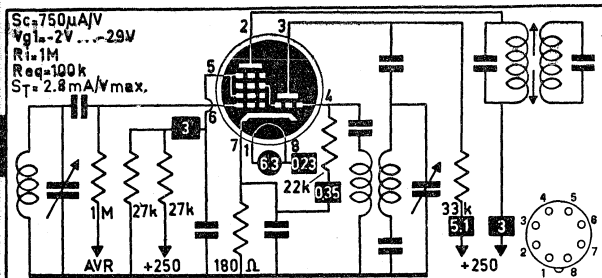


ECH35

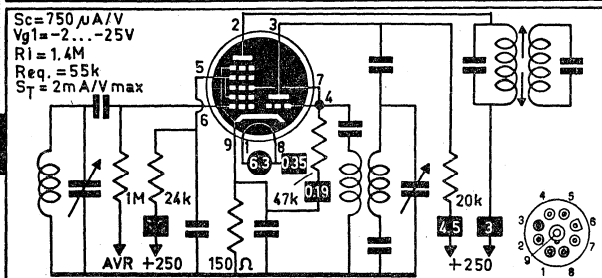


ECH41

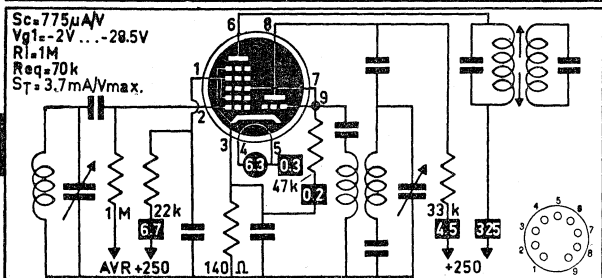
ECH42



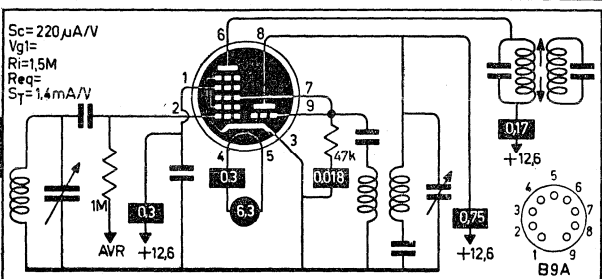
ECH71



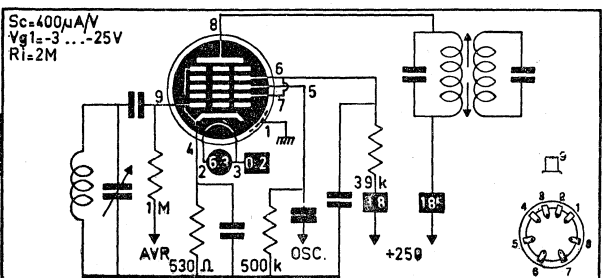
ECH81

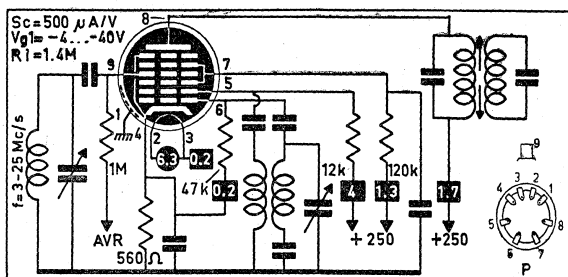


ECH83

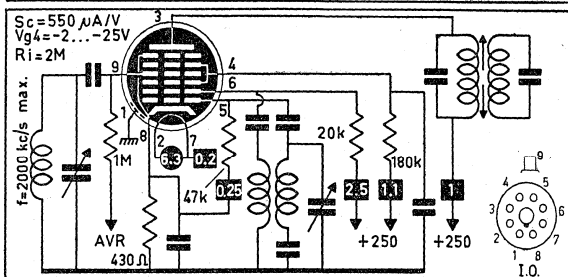


EH2

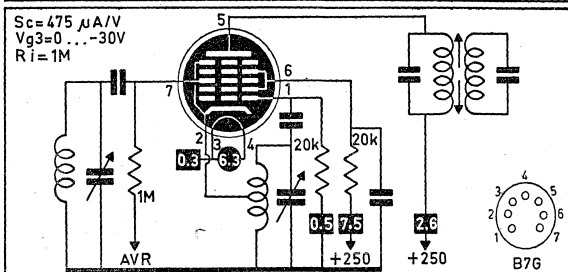




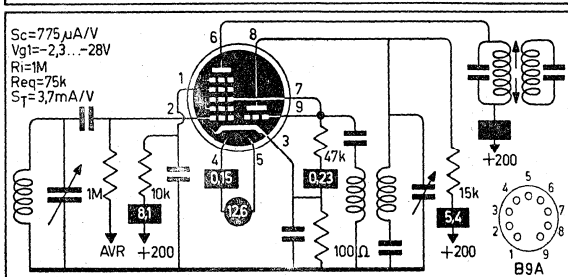
EK2



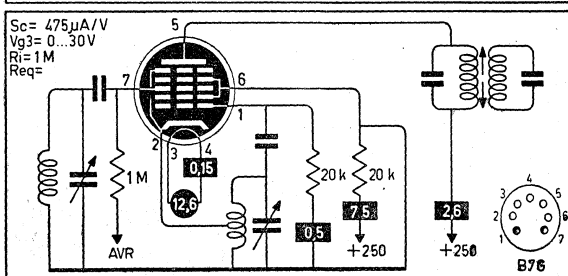
EK32



EK90

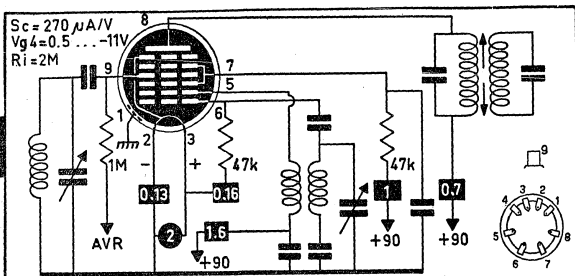


HCH81

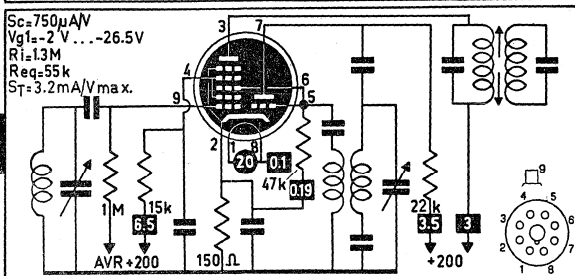


HK90

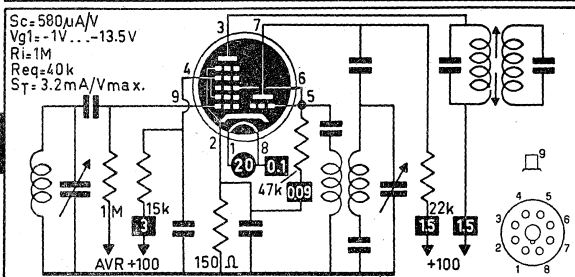
KK2



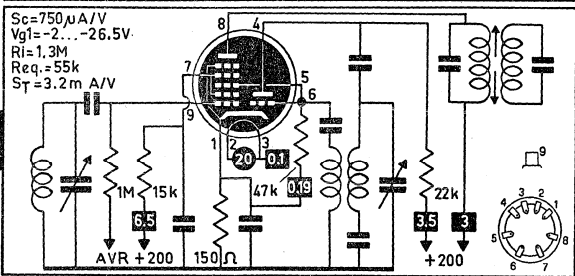
UCH4



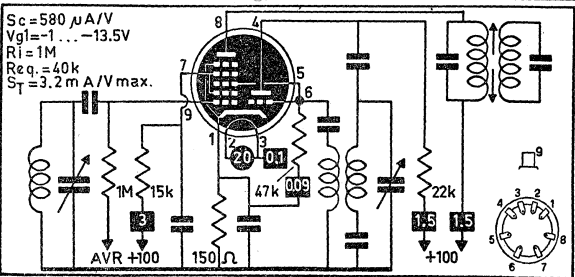
UCH4

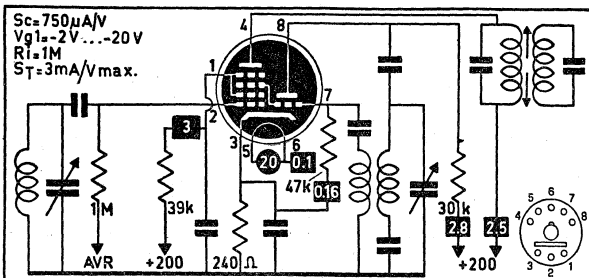


UCH5

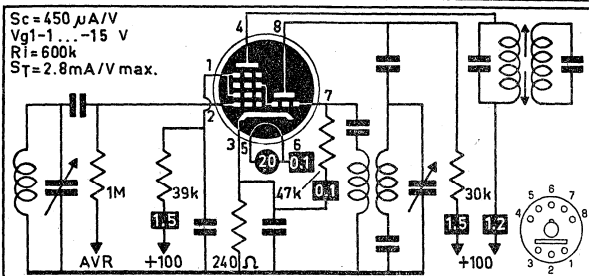


UCH5

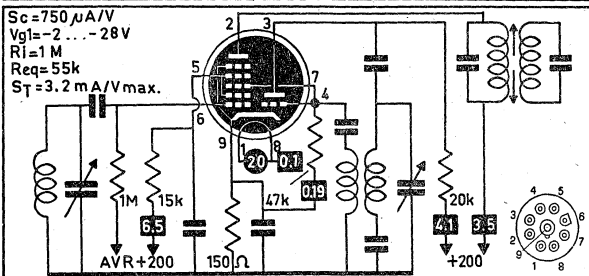




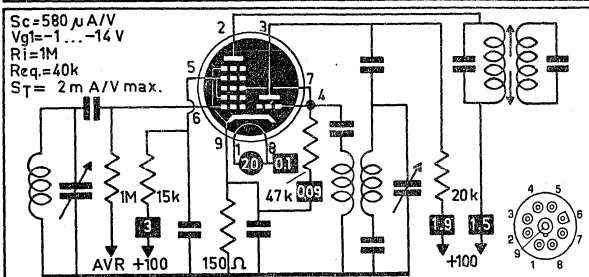
UCH11



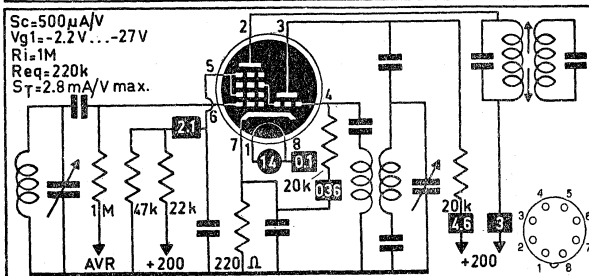
UCH11



UCH21

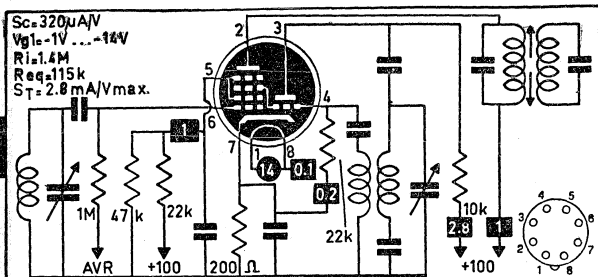


UCH21

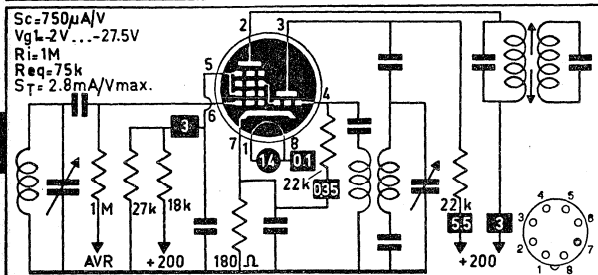


UCH41

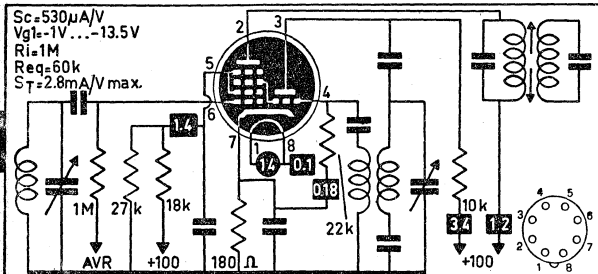
UCH41



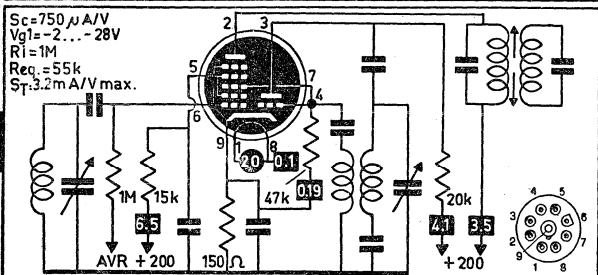
UCH42



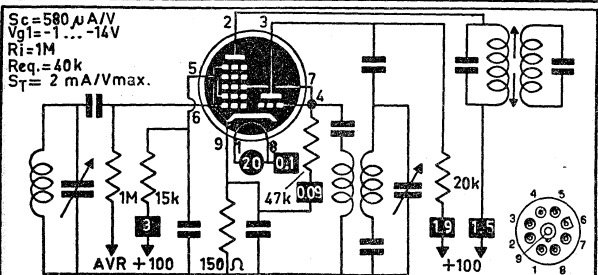
UCH42

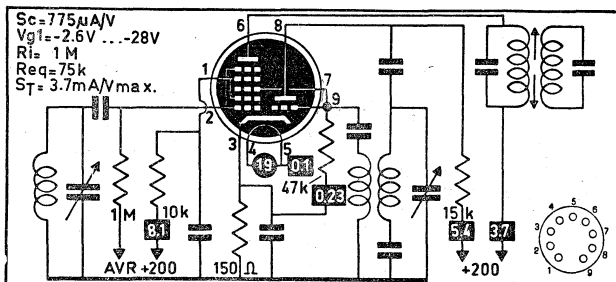


UCH71

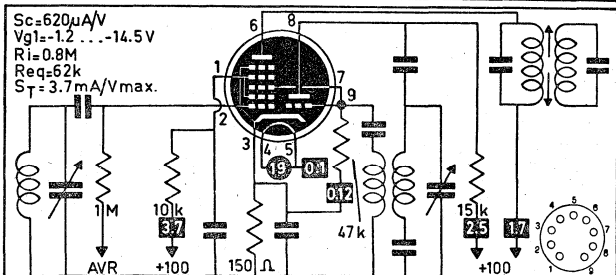


UCH71

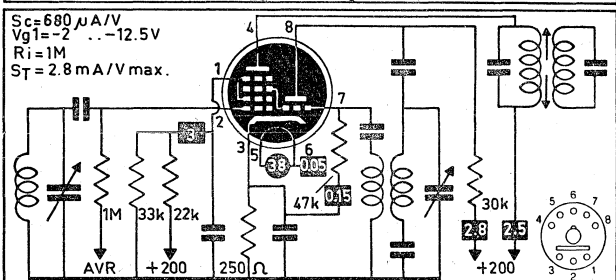




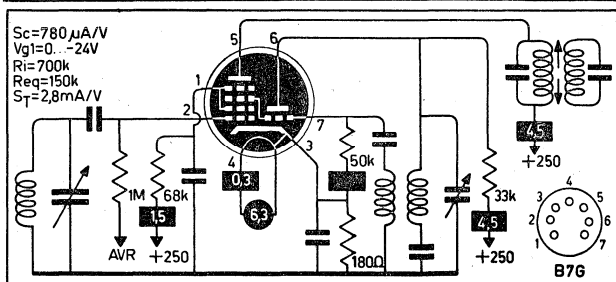
UCH81



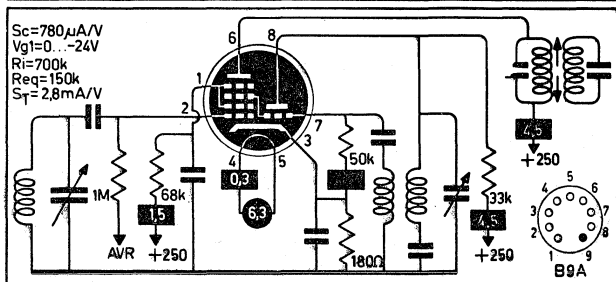
UCH81



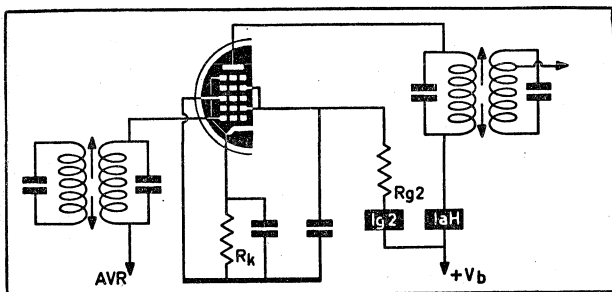
VCH11



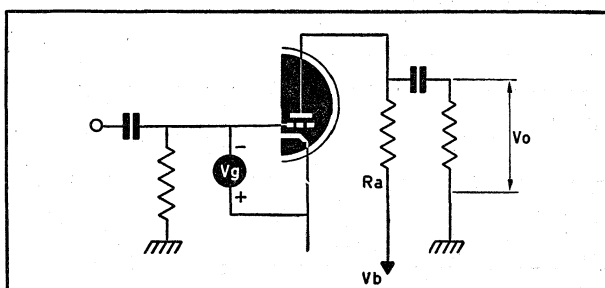
X78



X79



	Va	Vg1	Rg2	Vg2	Ig2	Ia	Rk	S
	V	V	k	V	mA	mA	Ω	mA/V
ECH4	250	-2 ... -44	47	90	3,5	5,3	220	2,2
ECH21	250	-2 ... -44	47	90	3,5	5,3	220	2,2
ECH71	250	-2 ... -44	47	90	3,5	5,3	220	2,2
ECH81	250	-2 ... -42	39	100	3,8	6,5	220	2,4
HCH81	200	-2,3 ... -33	18	117	4,6	7,4	200	2,4
HCH81	100	-1,1 ... -16,5	18	60	2,2	3,4	200	2
UCH4	200	-2 ... -36	33	94	3,5	5,2	220	2,2
UCH4	100	-1 ... -20	33	50	1,9	2,6	220	2
UCH21	200	-2 ... -36	33	94	3,5	5,2	220	2,2
UCH21	100	-1 ... -20	33	50	1,9	2,6	220	2
UCH71	200	-2 ... -36	33	94	3,5	5,2	220	2,2
UCH71	100	-1 ... -20	33	50	1,9	2,6	220	2
UCH81	200	-2,6 ... -33	18	123	4,3	7,6	220	2,4
UCH81	170	-2,2 ... -28	18	102	3,8	6,2	220	2,3
UCH81	100	-1,2 ... -17	18	60	2,2	3,4	220	2



		Vb: 250V					
Ra	k	47		100		220	
Vg	V	-2	-4	-2	-4	-2	-4
la	mA	3,5	3	2	1,7	1	0,9
Vo	Veff	7,5	7,5	7,5	7,5	7,5	7,5
A	—	14	13	14	13	13	12
d	%	2,1	1,5	2,1	1,6	2,5	2

ECH4
ECH21
ECH71

		Vb: 100V			Vb: 200V		
Ra	k	47	100	220	47	100	220
Vg	V	-1	-1	-1	-2	-2	-2
la	mA	1,3	0,68	0,37	2,8	1,5	0,8
Vo	Veff	7,5	7,5	7,5	7,5	7,5	7,5
A	—	11	10,5	10	11	10,5	10
d	%	5,4	5,8	6	2,2	2,8	2,8

UCH4
UCH21
UCH71

	=			
1A6	-	CV757	-	-
1A7	-	CV1800	-	1LA6
1A7GT	-	CV1802 VT147 x)	-	-
-1AB6-	DK96	-	-	-
1AC6	DK92	-	-	-
1B7GT	-	CV760	-	-
1LA6	-	CV775	-	1A7
1LC6	-	CV778 VT178 x)	-	-
1R5	DK91	CV782 VT171 x)	-	-
2A7	-	CV787	6A7	-
3BE6	-	-	6BE6 12BE6 EK90	-
6A7	-	CV1870	2A7	6A8
6A8	-	CV579	12A8	6A7 7B8
6A8G	-	CV578 VT151 x)	-	-
6A8GT	-	CV580 VT151B x)	-	-
-6AJ8-	ECH81	-	-12AJ8- HCH81	-
6BA7	-	CV2527	12BA7	6SB7Y
6BE6	EK90	CV453	3BE6 12BE6	-
-6C10-	ECH42	-	-	-
-6DS8-	ECH83	-	-	-
6J8	-	CV859	-	-
6K8	-	CV1945 VT167 x)	12K8	-
6K8G	-	ARTH1 CV1944 VT167A x)	-	-
6K8GT	-	CV1946	-	-
6L7	-	CV1280 CV1951 VT87 x)	-	-
6L7G	-	ARH1 CV1950 VT87A x)	-	-
6SA7	-	CV1966 CV1967 VT150 x)	12SA7	6SA7GT
6SA7GT	-	VT150A x)	12SA7GT	6SA7
6SB7Y	-	-	-	6BA7
7A8	-	CV878	-	-
7B8	-	CV883 VT208 x)	14B8	6A8
7J7	-	-	14J7	-
7Q7	-	CV899	14Q7	-
7S7	-	-	14S7	-
12A8	-	CV910	6A8	-
-12AJ8-	HCH81	-	-6AJ8- ECH81	-
12BA7	-	-	6BA7	-
12BE6	-	-	3BE6 6BE6 EK90	-
12K8	-	CV703	6K8	-

*) American VT

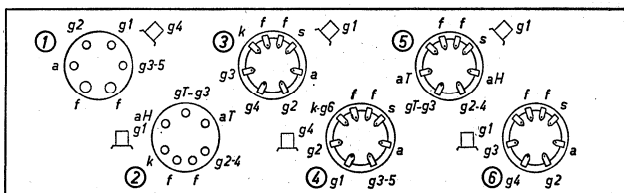
	=		W	
12SA7	-	CV537 VT161 x)	6SA7	12SA7GT
12SA7GT	-	CV538	6SA7GT	12SA7
14B8	-	-	7B8	-
14J7	-	-	7J7	-
-14K7-	UCH42	-	-	-
14Q7	-	-	7Q7	-
14S7	-	-	7S7	-
-19D8-	UCH81	-	-	-
AK1	-	-	-	AK2
AK2	-	-	-	AK1
OK91	1R5	-	-	-
OK92	1AC6	-	-	-
OK96	-1AB6-	-	-	-
ECH3	-	CV2929	-	ECH35
ECH4	-	-	-	ECH21
				ECH71
ECH21	ECH71	-	-	ECH4
ECH35	-	ARTH2 CV1347 CV1581	-	ECH3
ECH42	-6C1Q-	CV3888	-	-
ECH71	ECH21	-	-	ECH4
ECH81	-6AJ8-	-	-12AJ8- HCH81	-
ECH83	-6DS8-	-	-	-
EK2	-	CV1426	-	-
EK32	-	CV1057 CV1570 VR57	-	-
EK90	6BE6	-	3BE6 12BE6	-
HCH81	-12AJ8-	-	-6AJ8- ECH81	-
KK2	-	CV3516	-	-
UCH4	-	-	-	UCH5 UCH21 UCH71
UCH5	-	-	-	UCH4 UCH21 UCH71
UCH21	UCH71	-	-	UCH4 UCH5
UCH42	-14K7-	-	-	-
UCH71	UCH21	-	-	UCH4 UCH5
UCH81	-19D8-	-	-	-

*) American VT

OBSOLETE TYPES

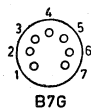
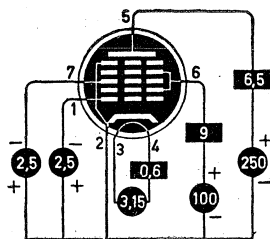
Type	V_f	I_f	V_a	I_a	V_{g2-4}	I_{g2-4}	$-V_{g1}$	V_{aT}
	V	A	V	mA	V	mA	V	V
1A6	2	0,06	135	1,8	135	2,1	3	135
1C6	2	0,12	135	1,3	135	2,5	3	135
ACH1	4	1	300	2,5	300	3,5	2	300
AH1	4	0,65	250	1,7	250	2,6	2	-
EK3	6,3	0,6	250	2,5	250	5,5	2,5	250
KCH1	2	0,18	135	1	135	1,2	0,5	135
KH1	2	0,14	135	1	135	1,1	1,5	-

I_{aT}	S_c	S_T	R_k	Base
mA	$\mu A/V$	mA/V	Ω	nr.
2	275	-	-	1
3,1	300	-	-	1
5	750	2	220	2
-	550	-	500	3
5	650	-	190	4
3	325	1,3	-	5
-	450	-	-	6



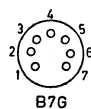
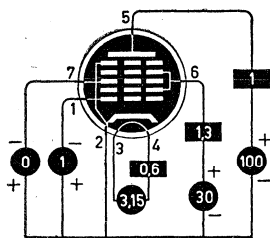
3BY6

$S_{g1-a} = 1,9 \text{ mA/V}$
 $S_{g3-a} = 0,5 \text{ mA/V}$
 $R_i =$
 $P_a = \text{max. } 2 \text{ W}$



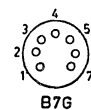
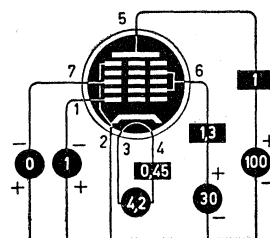
3CS6

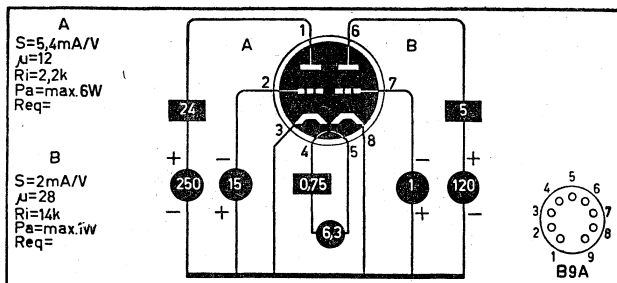
$S_{g1-a} = 1,1 \text{ mA/V}$
 $S_{g3-a} =$
 $R_i = 1 \text{ M}$
 $P_a = \text{max. } 1 \text{ W}$



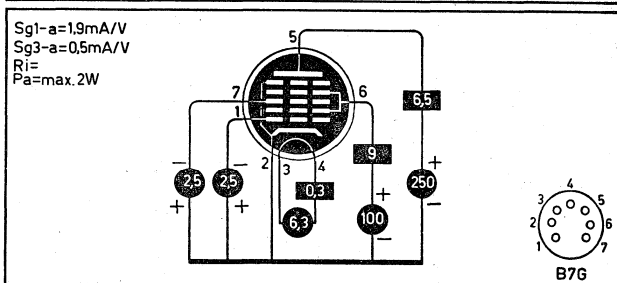
4CS6

$S_{g1-a} = 1,1 \text{ mA/V}$
 $S_{g3-a} =$
 $R_i = 1 \text{ M}$
 $P_a = \text{max. } 1 \text{ W}$

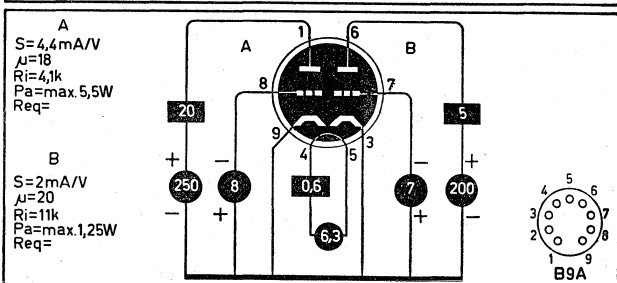




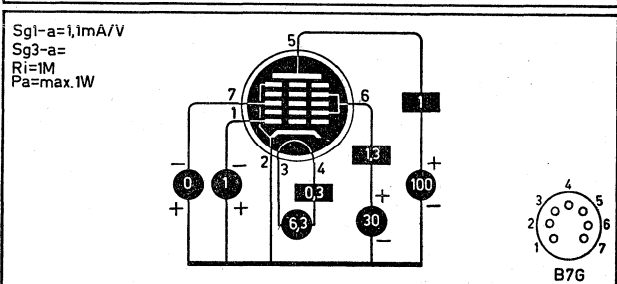
6BN7



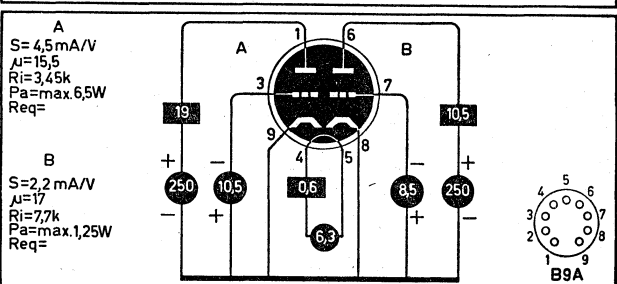
6BY6



6CM7



6CS6

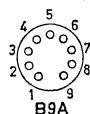
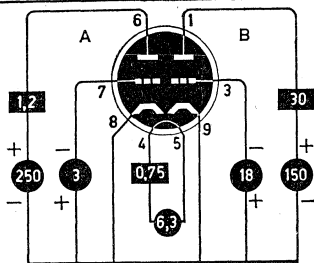


6CS7

6CY7

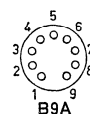
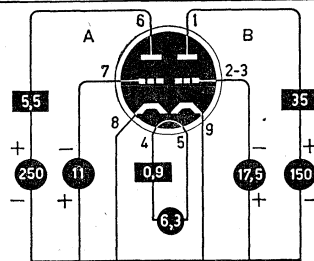
A
 $S=1,3\text{mA/V}$
 $\mu=68$
 $R_i=52\text{k}$
 $P_a=\text{max. } 1\text{W}$
 $R_{eq}=\text{---}$

B
 $S=5,4\text{mA/V}$
 $\mu=\text{---}$
 $R_i=920\Omega$
 $P_a=\text{max. } 5,5\text{W}$
 $R_{eq}=\text{---}$

**6DE7**

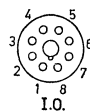
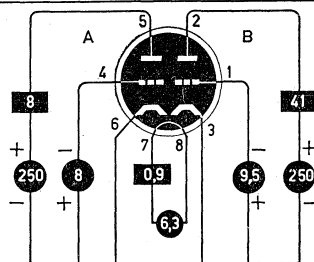
A
 $S=2\text{mA/V}$
 $\mu=17,5$
 $R_i=8,75\text{k}$
 $P_a=\text{max. } 7\text{W}$
 $R_{eq}=\text{---}$

B
 $S=6,5\text{mA/V}$
 $\mu=6$
 $R_i=925\Omega$
 $P_a=\text{max. } 7\text{W}$
 $R_{eq}=\text{---}$

**6DN7**

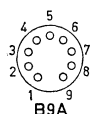
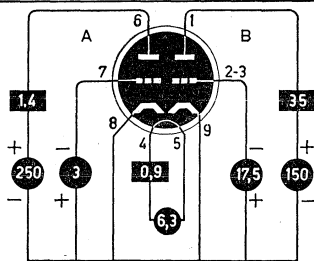
A
 $S=2,5\text{mA/V}$
 $\mu=22,5$
 $R_i=9\text{k}$
 $P_a=\text{max. } 1\text{W}$
 $R_{eq}=\text{---}$

B
 $S=7,7\text{mA/V}$
 $\mu=15,4$
 $R_i=2\text{k}$
 $P_a=\text{max. } 10\text{W}$
 $R_{eq}=\text{---}$

**6DR7**

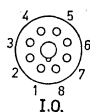
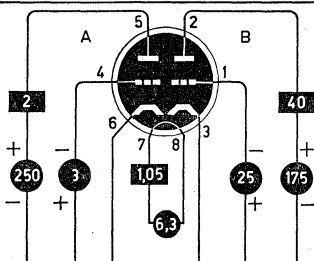
A
 $S=1,6\text{mA/V}$
 $\mu=68$
 $R_i=40\text{k}$
 $P_a=\text{max. } 1\text{W}$
 $R_{eq}=\text{---}$

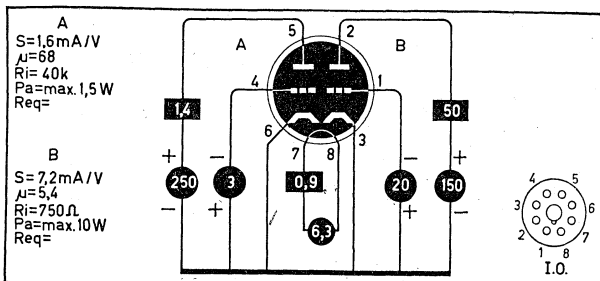
B
 $S=6,5\text{mA/V}$
 $\mu=6$
 $R_i=925\Omega$
 $P_a=\text{max. } 7\text{W}$
 $R_{eq}=\text{---}$

**6EA7**

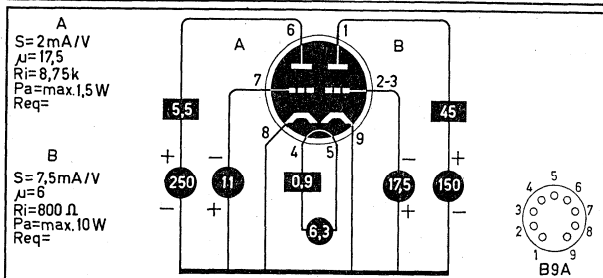
A
 $S=2,2\text{mA/V}$
 $\mu=66$
 $R_i=30\text{k}$
 $P_a=\text{max. } 1\text{W}$
 $R_{eq}=\text{---}$

B
 $S=6\text{mA/V}$
 $\mu=5,5$
 $R_i=920\Omega$
 $P_a=\text{max. } 10\text{W}$
 $R_{eq}=\text{---}$

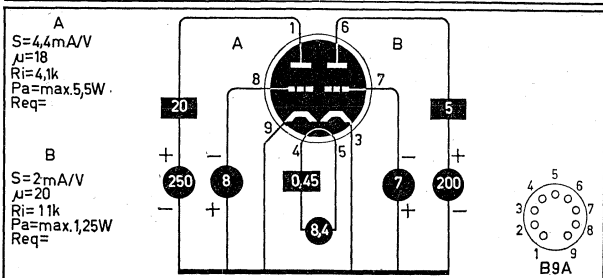




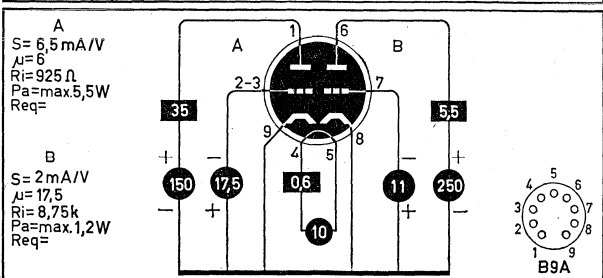
6EM7



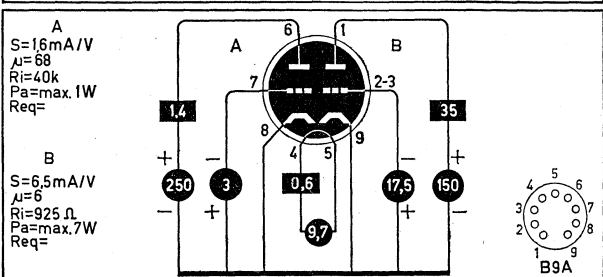
6EW7



8CM7



10DE7

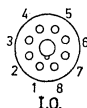
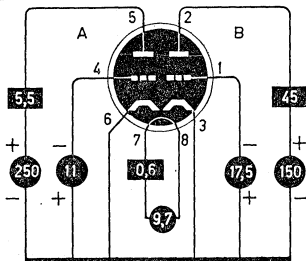


10DR7

10EG7

A
 $S=2\text{mA/V}$
 $\mu=17,5$
 $R_i=8,75\text{k}$
 $P_a=\text{max. } 1,5\text{W}$
 $R_{eq}=\text{---}$

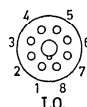
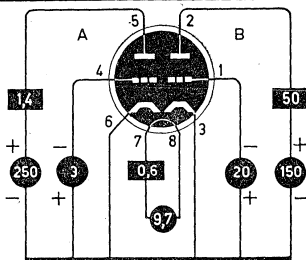
B
 $S=7,5\text{mA/V}$
 $\mu=6$
 $R_i=800\Omega$
 $P_a=\text{max. } 10\text{W}$
 $R_{eq}=\text{---}$



10EM7

A
 $S=1,6\text{mA/V}$
 $\mu=68$
 $R_i=40\text{k}$
 $P_a=\text{max. } 1,5\text{W}$
 $R_{eq}=\text{---}$

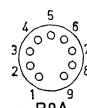
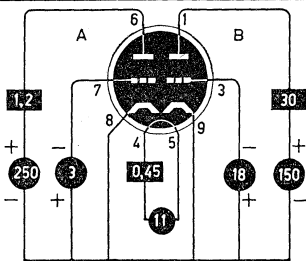
B
 $S=7,2\text{mA/V}$
 $\mu=5,4$
 $R_i=750\Omega$
 $P_a=\text{max. } 10\text{W}$
 $R_{eq}=\text{---}$



11CY7

A
 $S=1,3\text{mA/V}$
 $\mu=68$
 $R_i=52\text{k}$
 $P_a=\text{max. } 1\text{W}$
 $R_{eq}=\text{---}$

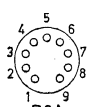
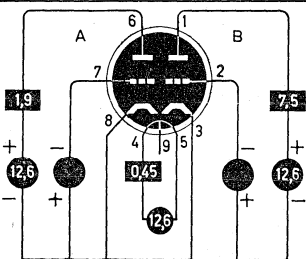
B
 $S=5,4\text{mA/V}$
 $\mu=\text{---}$
 $R_i=920\Omega$
 $P_a=\text{max. } 5,5\text{W}$
 $R_{eq}=\text{---}$



12AE7

A
 $S=4\text{mA/V}$
 $\mu=13$
 $R_i=3,15\text{k}$
 $P_a=\text{max. } 1\text{W}$
 $R_{eq}=\text{---}$

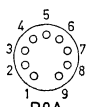
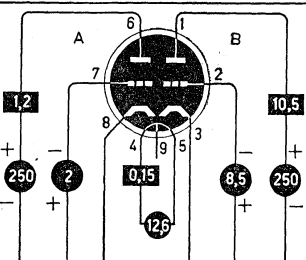
B
 $S=6,5\text{mA/V}$
 $\mu=6,4$
 $R_i=985\Omega$
 $P_a=\text{max. } 1\text{W}$
 $R_{eq}=\text{---}$



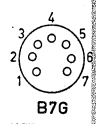
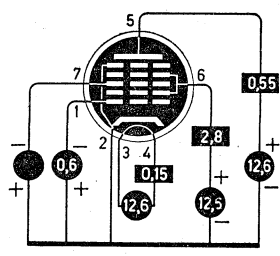
12DW7

A
 $S=1,6\text{mA/V}$
 $\mu=100$
 $R_i=62,5\text{k}$
 $P_a=\text{max. } 1,2\text{W}$
 $R_{eq}=\text{---}$

B
 $S=2,2\text{mA/V}$
 $\mu=17$
 $R_i=7,7\text{k}$
 $P_a=\text{max. } 3,3\text{W}$
 $R_{eq}=\text{---}$

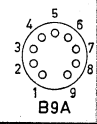
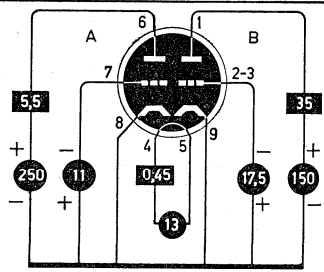


Sg1-a=
Sg3-a=0,8mA/V
Ri=150k
Pa=max.



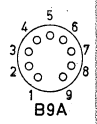
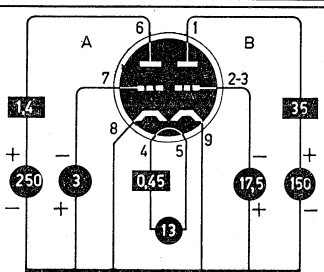
12EG6

A
S=2mA/V
 μ =17,5
Ri=8,75k
Pa=max.7W
Req=



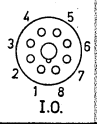
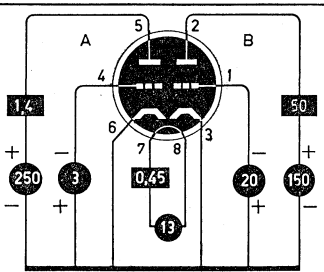
13DE7

B
S=6,5mA/V
 μ =6
Ri=925 Ω
Pa=max.7W
Req=



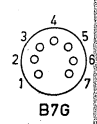
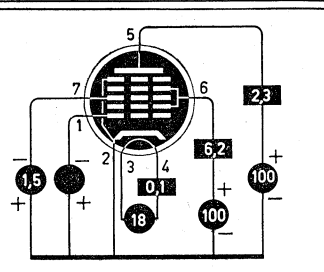
13DR7

A
S=1,6mA/V
 μ =68
Ri=40k
Pa=max.1W
Req=



13EM7

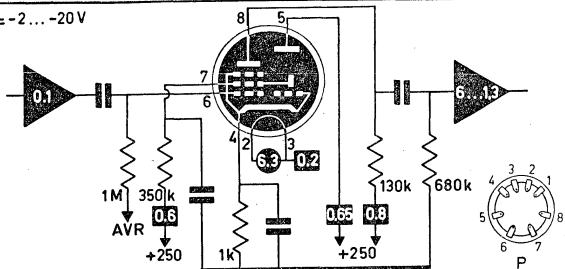
A
S=1,6mA/V
 μ =68
Ri=40k
Pa=max.1,5W
Req=



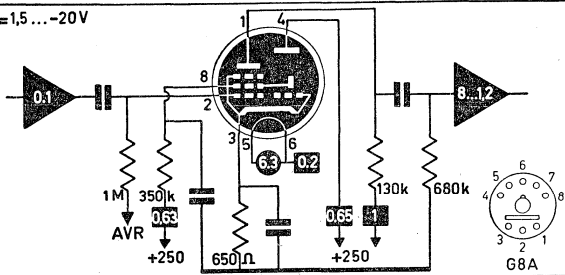
18FX6

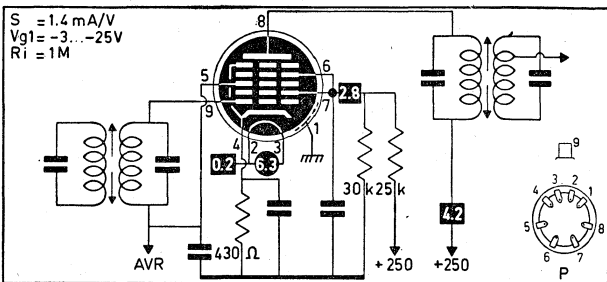
EFM1

$V_{g1} = -2 \dots -20 \text{ V}$

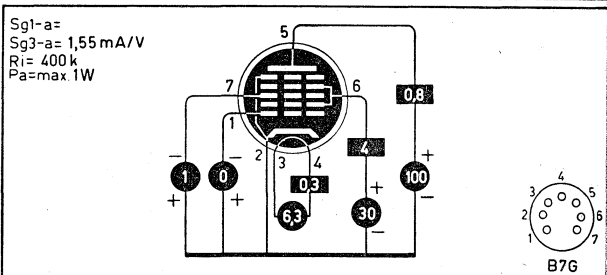


$V_{g1} = 1,5 \dots -20 \text{ V}$

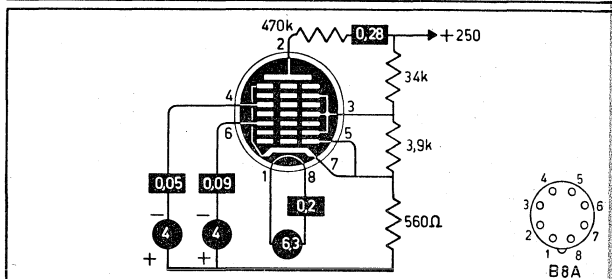




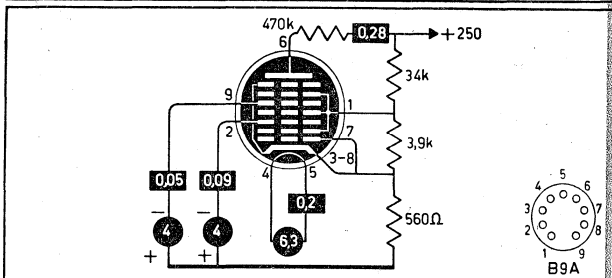
EH2



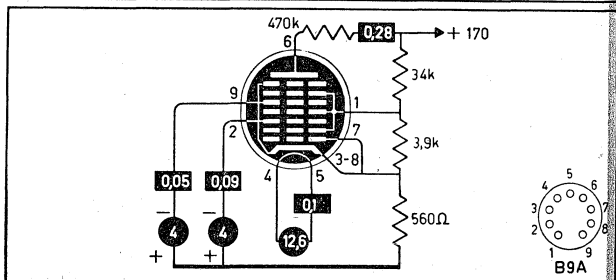
EH90



EQ40

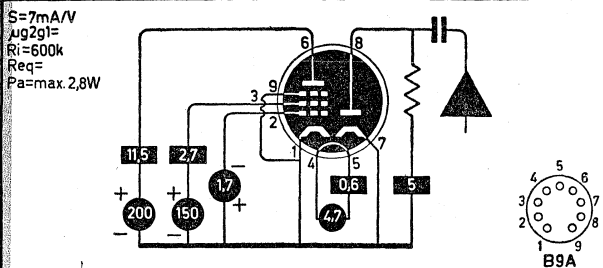


EQ80

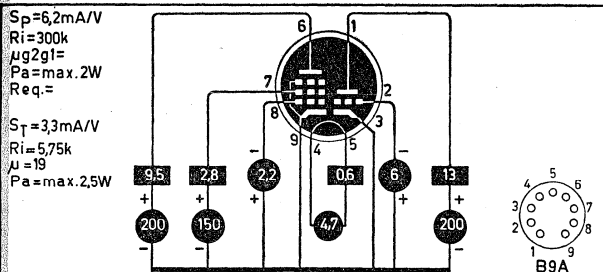


UQ80

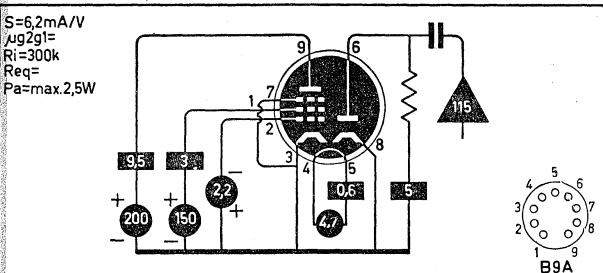
5AM8



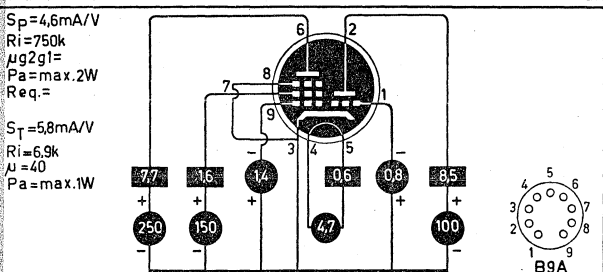
5A8



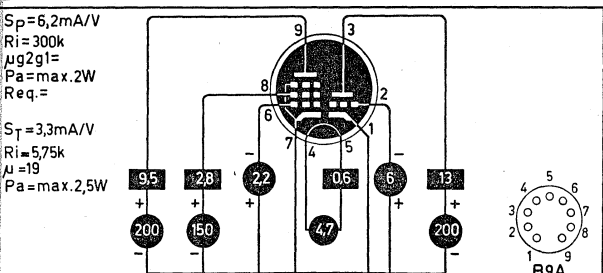
5A58



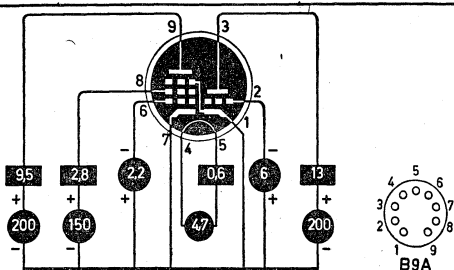
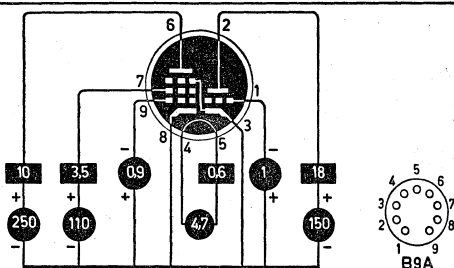
5AT8



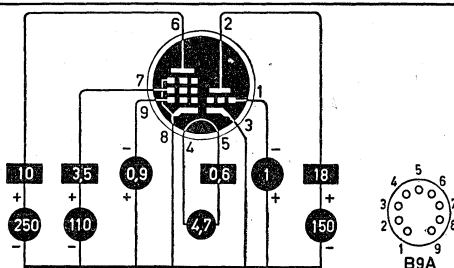
5AV8



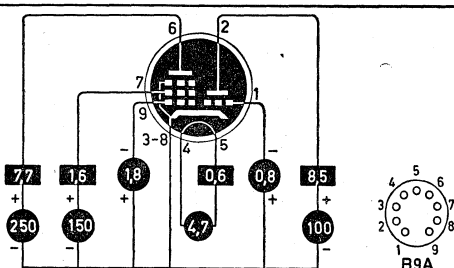
$S_T = 3,3 \text{ mA/V}$
 $R_i = 5,75 \text{ k}$
 $\mu = 19$
 $P_a = \text{max. } 2,5 \text{ W}$


$$\begin{aligned} S_T &= 8,5 \text{ mA/V} \\ R_i &= 5 \text{ k} \\ \mu &= 40 \\ P_a &= \text{max. } 2,5 \text{ W} \end{aligned}$$


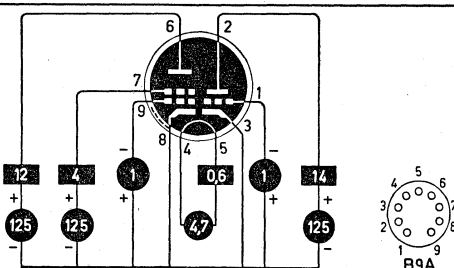
$S_T = 8,5 \text{ mA/V}$
 $R_i = 5 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 2,7 \text{ W}$



$S_T = 5,8 \text{ mA/V}$
 $R_i = 6,9 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 1,5 \text{ W}$



$S_T = 8 \text{ mA/V}$
 $R_i = 5 \text{ k}$
 $\mu = 40$
 $P_a = \max. 2.5 \text{ W}$



588

5BE8

5BR8

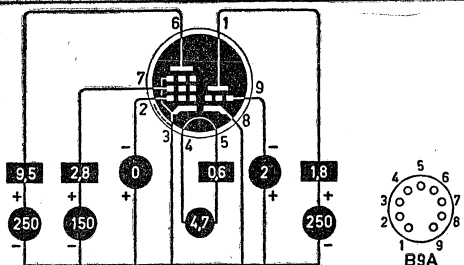
5068

5CL8A

5CM8

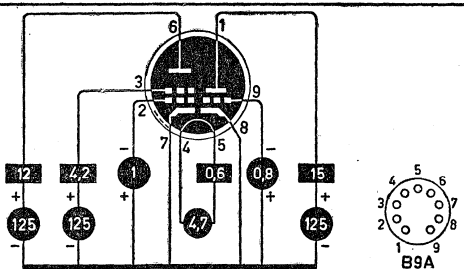
$S_p = 6,2 \text{ mA/V}$
 $R_i = 600 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 2 \text{ W}$
 $R_{eq} =$

$S_T = 2 \text{ mA/V}$
 $R_i = 50 \text{ k}$
 $\mu = 100$
 $P_a = \text{max. } 1 \text{ W}$

**5CQ8**

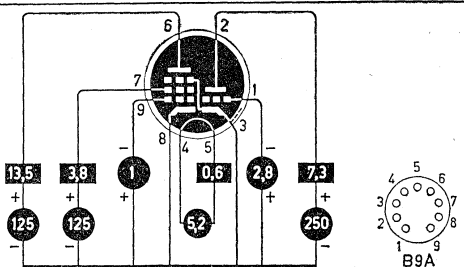
$S_{Te} = 5,8 \text{ mA/V}$
 $R_i = 140 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 2,8 \text{ W}$
 $R_{eq} =$

$S_T = 8 \text{ mA/V}$
 $R_i = 5 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 2,7 \text{ W}$

**5DH8**

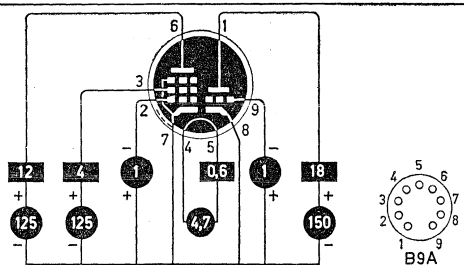
$S_p = 8,6 \text{ mA/V}$
 $R_i = 150 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 2,2 \text{ W}$
 $R_{eq} =$

$S_T = 4,4 \text{ mA/V}$
 $R_i = 12 \text{ k}$
 $\mu = 53$
 $P_a = \text{max. } 2 \text{ W}$

**5EA8**

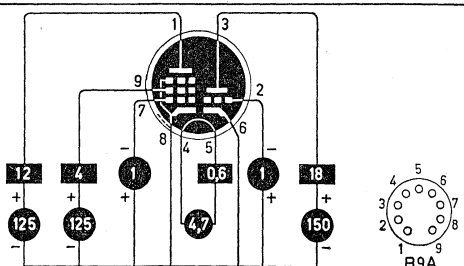
$S_p = 6,4 \text{ mA/V}$
 $R_i = 80 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 3,1 \text{ W}$
 $R_{eq} =$

$S_T = 8,5 \text{ mA/V}$
 $R_i = 5 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 3 \text{ W}$

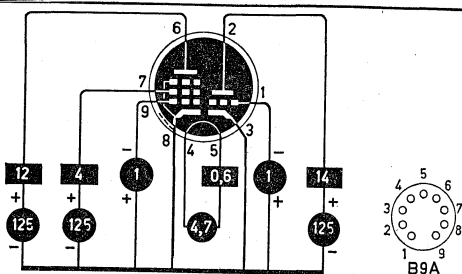
**5EU8**

$S_p = 6,4 \text{ mA/V}$
 $R_i = 80 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 3,1 \text{ W}$
 $R_{eq} =$

$S_T = 8,5 \text{ mA/V}$
 $R_i = 5 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 3 \text{ W}$



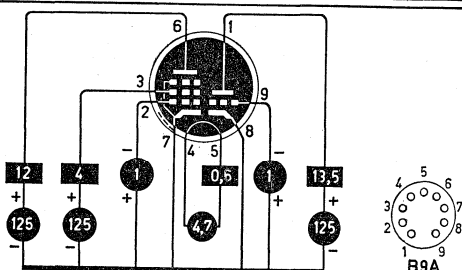
$S_T = 8 \text{ mA/V}$
 $R_i = 5 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 2 \text{ W}$



5FV8

$S_p = 7,5 \text{ mA/V}$
 $R_i = 200 \text{ k}$
 $\mu_{g2g1} =$
 $P_a = \text{max. } 2,5 \text{ W}$
 $R_{eq} =$

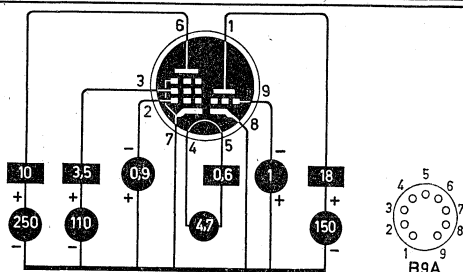
$S_T = 8,5 \text{ mA/V}$
 $R_i = 5,4 \text{ k}$
 $\mu = 46$
 $P_a = \text{max. } 2,5 \text{ W}$



56H8

$S_p = 5,2 \text{ mA/V}$
 $R_i = 400 \text{ k}$
 $\mu_{g2g1} =$
 $P_a = \text{max. } 2,8 \text{ W}$
 $R_{eq} =$

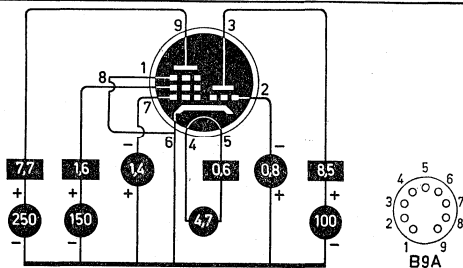
$S_T = 8,5 \text{ mA/V}$
 $R_i = 5 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 2,7 \text{ W}$



508

$S_p = 4,6 \text{ mA/V}$
 $R_i = 750 \text{ k}$
 $\mu_{g2g1} =$
 $P_a = \text{max. } 2 \text{ W}$
 $R_{eq} =$

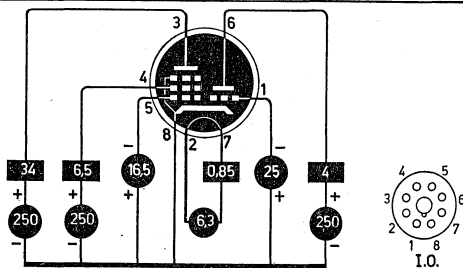
$S_T = 5,8 \text{ mA/V}$
 $R_i = 6,9 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 1 \text{ W}$



5x8

$S_p = 2,5 \text{ mA/V}$
 $R_i = 80 \text{ k}$
 $\mu_{g2g1} =$
 $P_a = \max. 8,5 \text{ W}$
 $R_{eq} =$

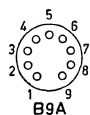
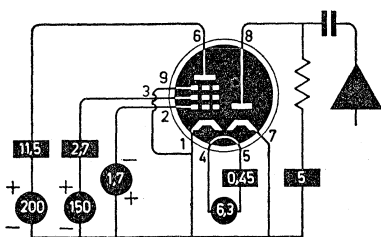
$S_T = 0,3 \text{ mA/V}$
 $R_i = 19 \text{ k}$
 $\mu = 6$
 $P_a = \text{max. } 1 \text{ W}$



6AD7

6AM8

$S=7\text{mA/V}$
 $\mu g_{2g1}=$
 $R_i=600\text{k}$
 $R_{eq}=$
 $P_a=\text{max.}2,8\text{W}$

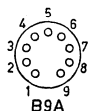
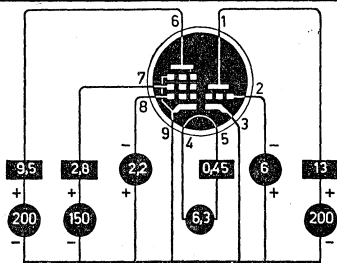


B9A

6AN8

$S_p=6,2\text{mA/V}$
 $R_i=300\text{k}$
 $\mu g_{2g1}=$
 $P_a=\text{max.}2\text{W}$
 $R_{eq}=$

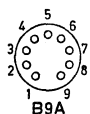
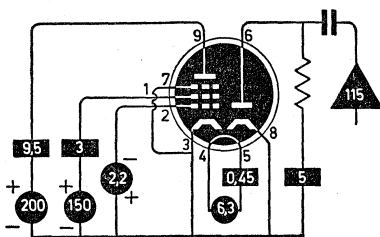
$S_T=3,3\text{mA/V}$
 $R_i=5,75\text{k}$
 $\mu=19$
 $P_a=\text{max.}2,5\text{W}$



B9A

6AS8

$S=6,2\text{mA/V}$
 $\mu g_{2g1}=$
 $R_i=300\text{k}$
 $R_{eq}=$
 $P_a=\text{max.}2,5\text{W}$

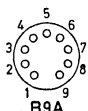
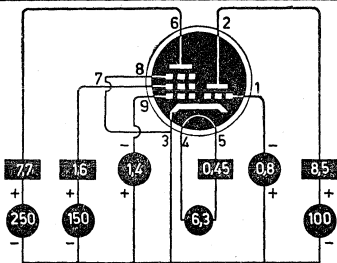


B9A

6AT8

$S_p=4,6\text{mA/V}$
 $R_i=750\text{k}$
 $\mu g_{2g1}=$
 $P_a=\text{max.}2\text{W}$
 $R_{eq}=$

$S_T=5,8\text{mA/V}$
 $R_i=6,9\text{k}$
 $\mu=40$
 $P_a=\text{max.}1\text{W}$

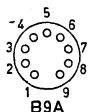
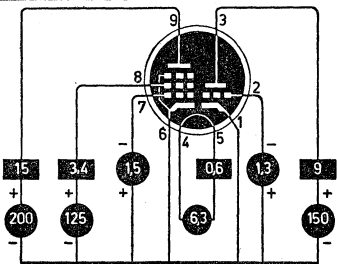


B9A

6AU8

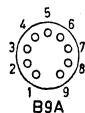
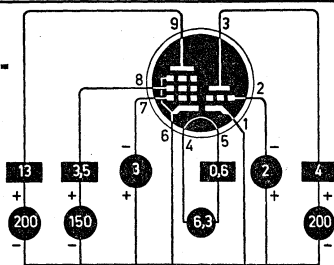
$S_p=7\text{mA/V}$
 $R_i=150\text{k}$
 $\mu g_{2g1}=$
 $P_a=\text{max.}3\text{W}$
 $R_{eq}=$

$S_T=4,9\text{mA/V}$
 $R_i=8,2\text{k}$
 $\mu=40$
 $P_a=\text{max.}2,5\text{W}$



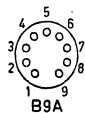
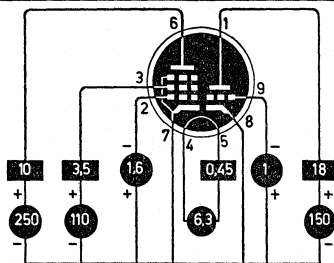
B9A

Req.=



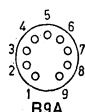
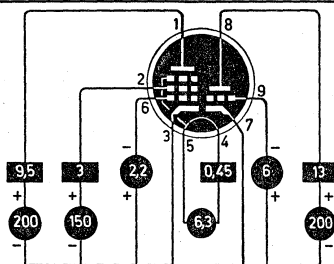
B9A

Req.=



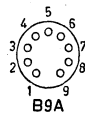
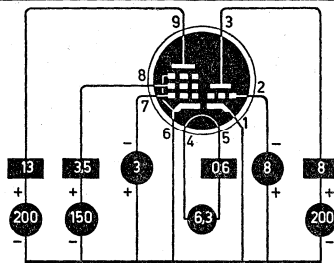
B9A

Req. =



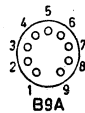
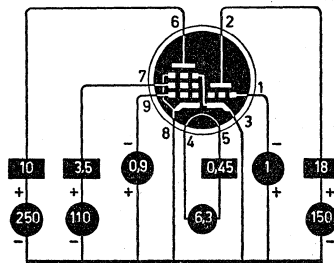
B9A

Req.=

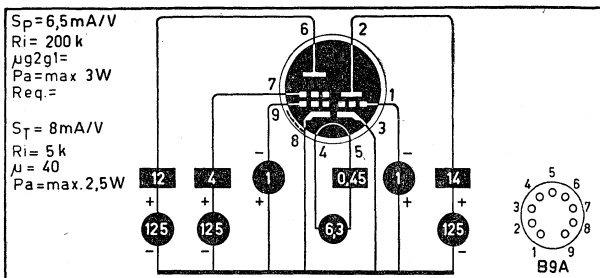


B9A

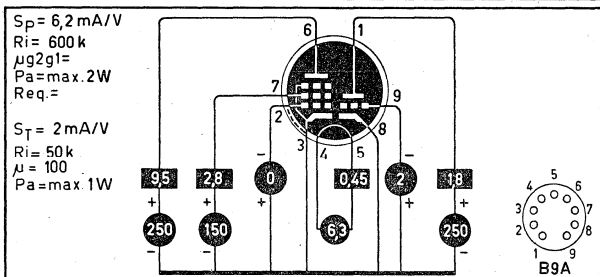
Req. =



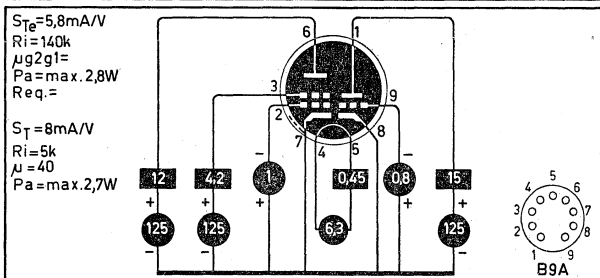
B9A



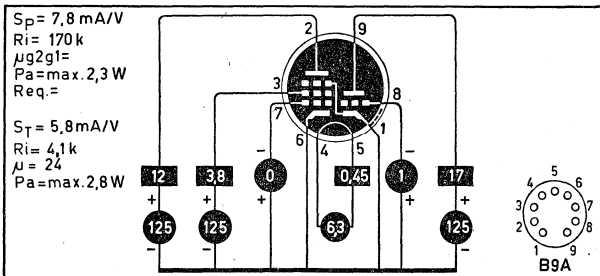
6CL8A



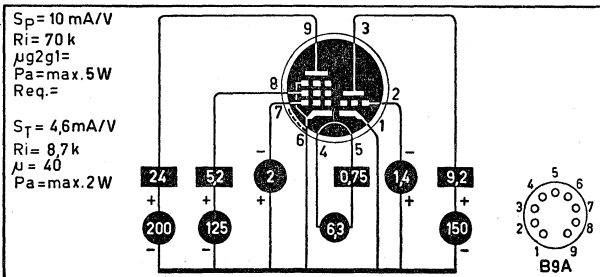
6CM8



6CQ8



6CU8

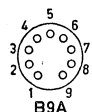
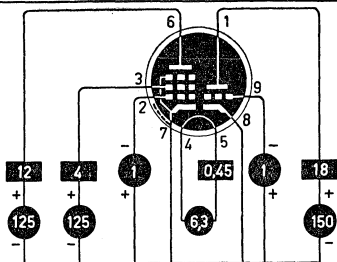


6CX8

6EA8

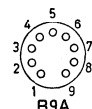
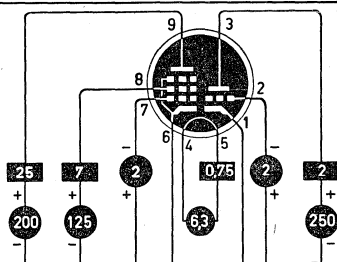
$S_p = 6,4 \text{ mA/V}$
 $R_i = 80 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max } 3,1 \text{ W}$
 $R_{eq} =$

$S_T = 8,5 \text{ mA/V}$
 $R_i = 5 \text{ k}$
 $\mu = 40$
 $P_a = \text{max } 3 \text{ W}$

**6EB8**

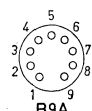
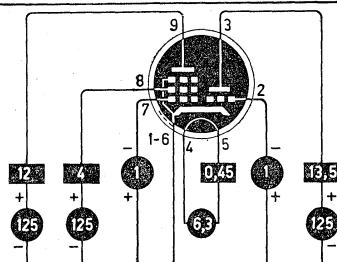
$S_p = 12,5 \text{ mA/V}$
 $R_i = 75 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max } 5 \text{ W}$
 $R_{eq} =$

$S_T = 2,7 \text{ mA/V}$
 $R_i = 37 \text{ k}$
 $\mu = 100$
 $P_a = \text{max } 1 \text{ W}$

**6EH8**

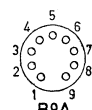
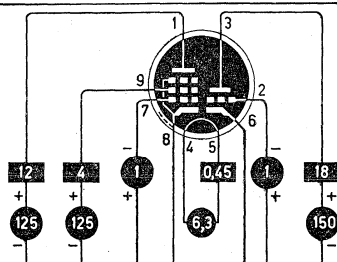
$S_p = 6 \text{ mA/V}$
 $R_i = 170 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max } 2,8 \text{ W}$
 $R_{eq} =$

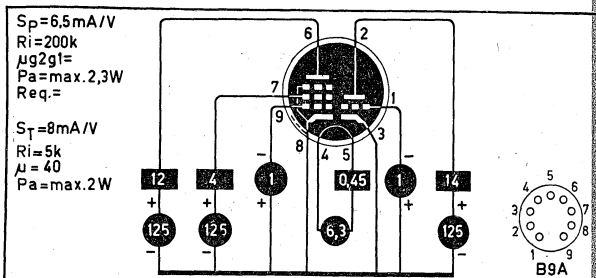
$S_T = 7,5 \text{ mA/V}$
 $R_i =$
 $\mu = 40$
 $P_a = \text{max } 2,5 \text{ W}$

**6EU8**

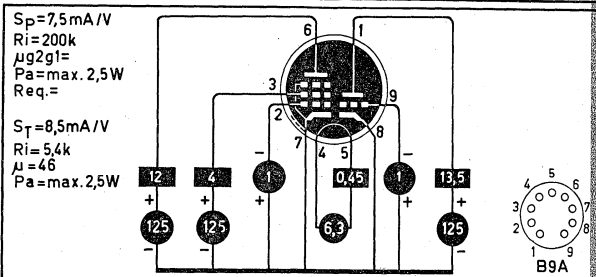
$S_p = 6,4 \text{ mA/V}$
 $R_i = 80 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max } 3,1 \text{ W}$
 $R_{eq} =$

$S_T = 8,5 \text{ mA/V}$
 $R_i = 5 \text{ k}$
 $\mu = 40$
 $P_a = \text{max } 3 \text{ W}$

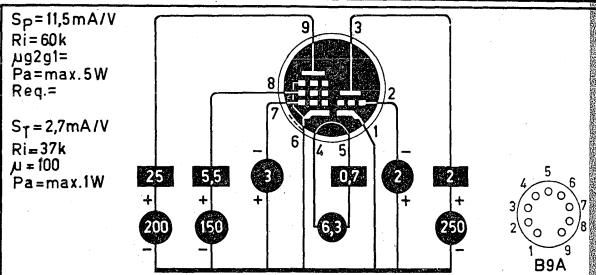




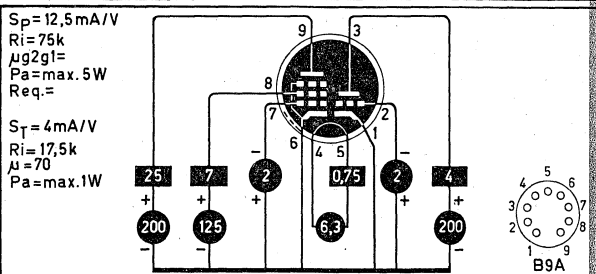
6FV8



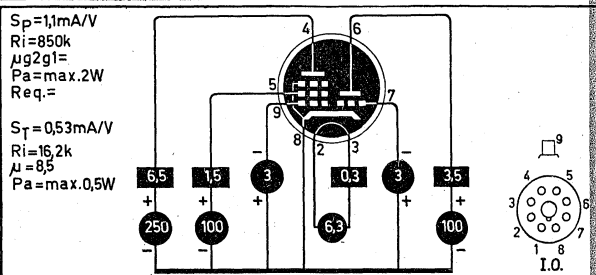
6GH8



6GN8



6HF8

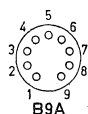
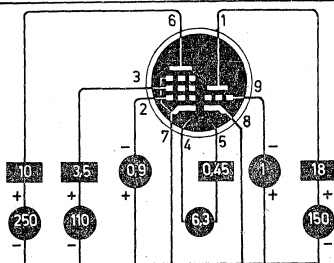


6P7

6U8

$S_p = 5,2 \text{ mA/V}$
 $R_i = 400 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 2,8 \text{ W}$
 $R_{eq} =$

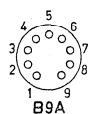
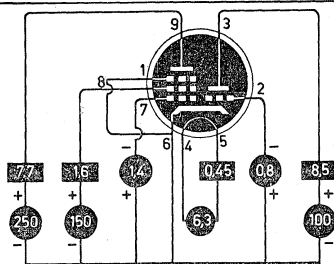
$S_T = 8,5 \text{ mA/V}$
 $R_i = 5 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 2,7 \text{ W}$



6X8

$S_p = 4,6 \text{ mA/V}$
 $R_i = 750 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 2 \text{ W}$
 $R_{eq} =$

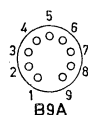
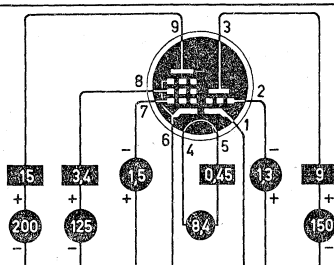
$S_T = 5,8 \text{ mA/V}$
 $R_i = 6,9 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 1 \text{ W}$



8AU8

$S_p = 7 \text{ mA/V}$
 $R_i = 150 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 3 \text{ W}$
 $R_{eq} =$

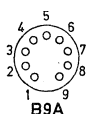
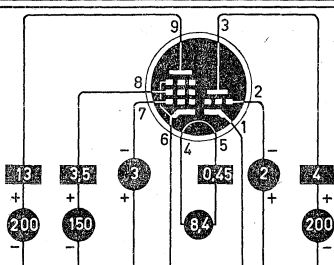
$S_T = 4,9 \text{ mA/V}$
 $R_i = 8,2 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 2,5 \text{ W}$



8AW8

$S_p = 9 \text{ mA/V}$
 $R_i = 400 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 3,25 \text{ W}$
 $R_{eq} =$

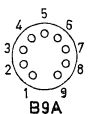
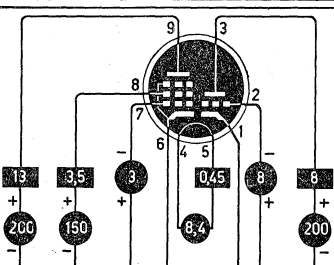
$S_T = 4 \text{ mA/V}$
 $R_i = 17,5 \text{ k}$
 $\mu = 70$
 $P_a = \text{max. } 1 \text{ W}$

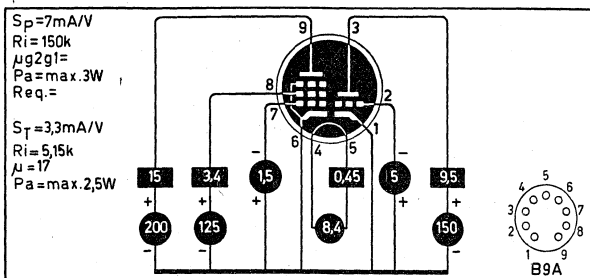


8BA8

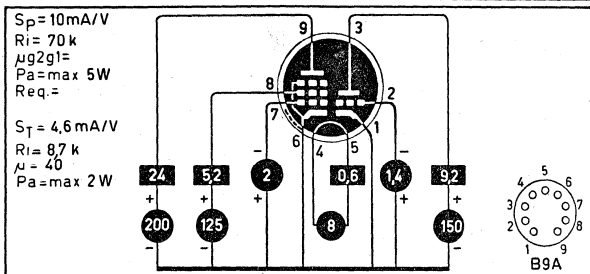
$S_p = 9 \text{ mA/V}$
 $R_i = 400 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 3,25 \text{ W}$
 $R_{eq} =$

$S_T = 2,7 \text{ mA/V}$
 $R_i = 6,7 \text{ k}$
 $\mu = 18$
 $P_a = \text{max. } 2 \text{ W}$

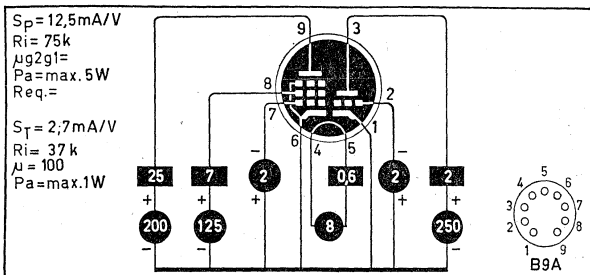




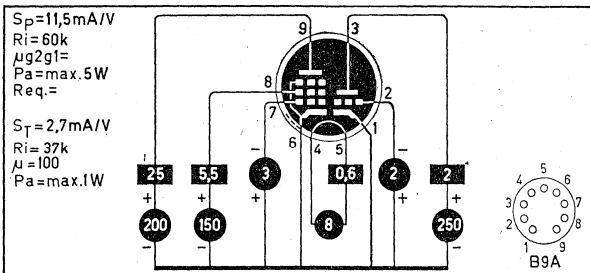
8BH8



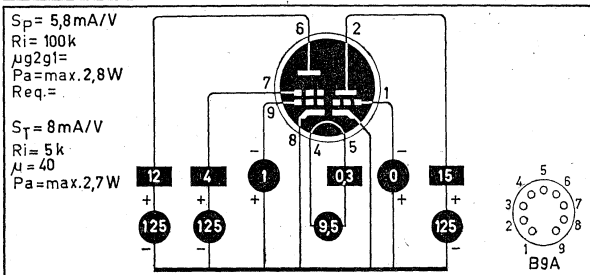
8CX8



8EB8



8GN8

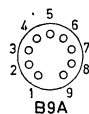
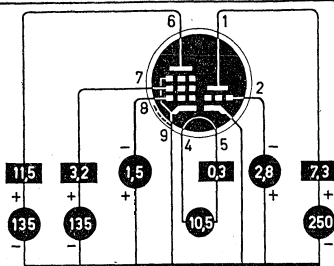


9CL8

10C8

$S_p = 8 \text{ mA/V}$
 $R_i = 190 \text{ k}$
 $\mu g_{2g1} = 40$
 $P_a = \text{max. } 2.2 \text{ W}$
 $R_{eq} =$

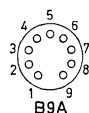
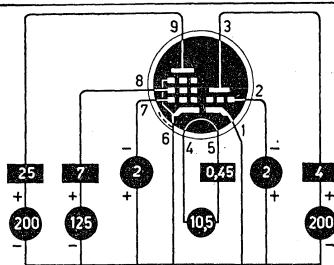
$S_T = 4.4 \text{ mA/V}$
 $R_i = 12 \text{ k}$
 $\mu = 53$
 $P_a = \text{max. } 2 \text{ W}$



10HF8

$S_p = 12.5 \text{ mA/V}$
 $R_i = 75 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 5 \text{ W}$
 $R_{eq} =$

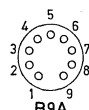
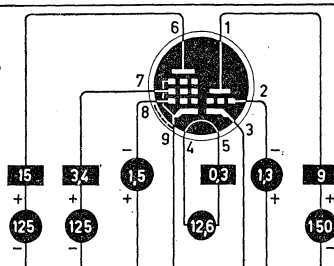
$S_T = 4 \text{ mA/V}$
 $R_i = 17.5 \text{ k}$
 $\mu = 70$
 $P_a = \text{max. } 1 \text{ W}$



12CT8

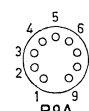
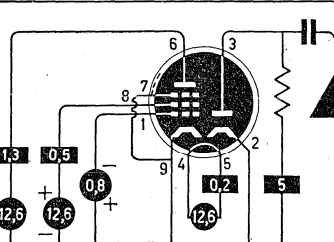
$S_p = 7 \text{ mA/V}$
 $R_i = 150 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 2.75 \text{ W}$
 $R_{eq} =$

$S_T = 4.9 \text{ mA/V}$
 $R_i = 8.2 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 2.5 \text{ W}$



12DE8

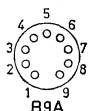
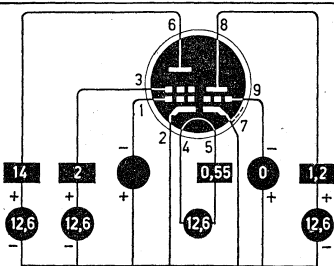
$S = 1.5 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 300 \text{ k}$
 $R_{eq} =$
 $P_a = \text{max.}$



12DY8

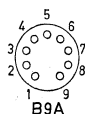
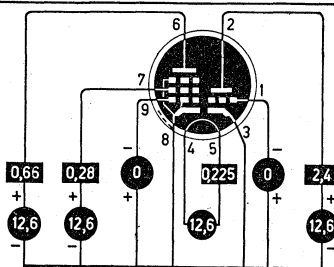
$S_p = 6 \text{ mA/V}$
 $R_i = 5 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max.}$
 $R_{eq} =$

$S_T = 2 \text{ mA/V}$
 $R_i = 10 \text{ k}$
 $\mu = 20$
 $P_a = \text{max.}$



$S_p = 2 \text{ mA/V}$
 $R_i = 750 \text{ k}$
 $\mu_{g2g1} =$
 $P_a = \text{max.}$
 $R_{eq} =$

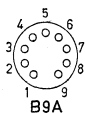
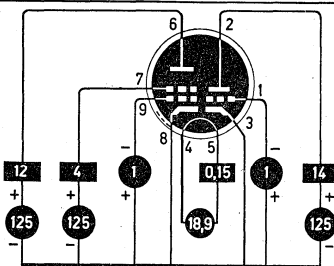
$S_T = 4,7 \text{ mA/V}$
 $R_i = 6 \text{ k}$
 $\mu = 25$
 $P_a = \text{max.}$



12EC8

$S_p = 6,5 \text{ mA/V}$
 $R_i = 200 \text{ k}$
 $\mu_{g2g1} =$
 $P_a = \text{max. } 3 \text{ W}$
 $R_{eq} =$

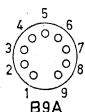
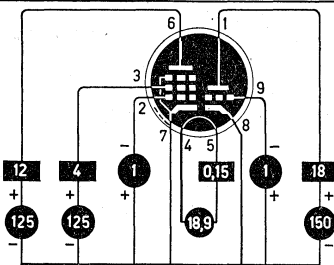
$S_T = 8 \text{ mA/V}$
 $R_i = 5 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 2,5 \text{ W}$



19CL8

$S_p = 6,4 \text{ mA/V}$
 $R_i = 80 \text{ k}$
 $\mu_{g2g1} =$
 $P_a = \text{max. } 3,1 \text{ W}$
 $R_{eq} =$

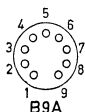
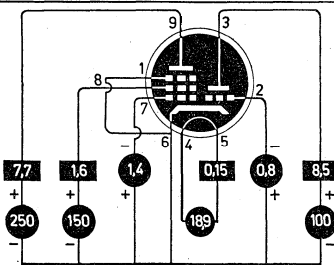
$S_T = 8,5 \text{ mA/V}$
 $R_i = 5 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 3 \text{ W}$



19EA8

$S_p = 4,6 \text{ mA/V}$
 $R_i = 750 \text{ k}$
 $\mu_{g2g1} =$
 $P_a = \text{max. } 2 \text{ W}$
 $R_{eq} =$

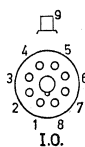
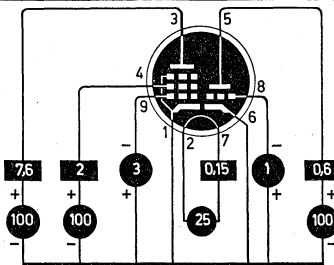
$S_T = 5,8 \text{ mA}$
 $R_i = 6,9 \text{ k}$
 $\mu = 40$
 $P_a = \text{max. } 1 \text{ W}$



19X8

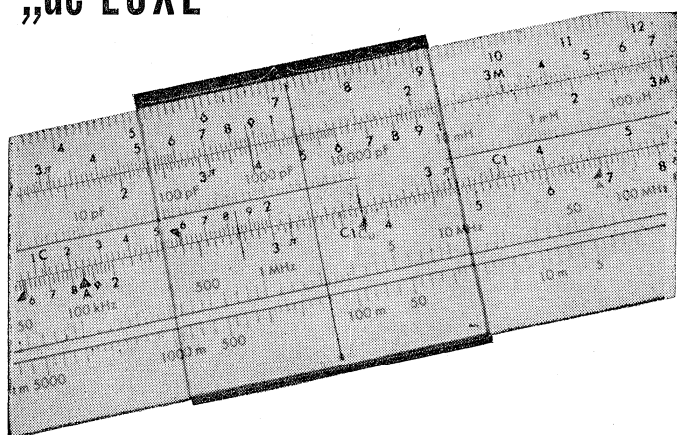
$S_p = 0,37 \text{ mA/V}$
 $R_i = 185 \text{ k}$
 $\mu_{g2g1} =$
 $P_a = \text{max. } 1 \text{ W}$
 $R_{eq} =$

$S_T = 0,11 \text{ mA/V}$
 $R_i = 75 \text{ k}$
 $\mu = 8,2$
 $P_a = \text{max. } 0,5 \text{ W}$



25B8

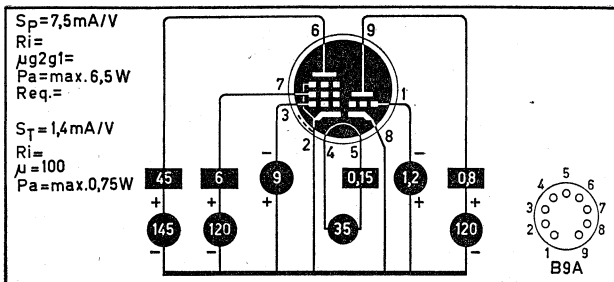
„de LUXE“



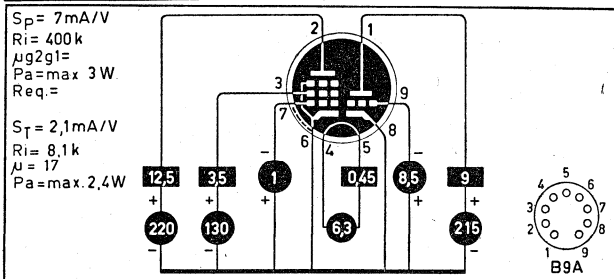
- Vermenigvuldigen en delen
- Kwadrateren en worteltrekken
- Oppervlakte- en inhoud-berekeningen
- Weerstand en gewicht van koper- en aluminiumdraad
- Omrekenen van pk in kW en omgekeerd
- Berekenen van afstemkringen
- Golflengte en frequentie
- Onbekende zelfinductie of capaciteit
- Berekenen aantal dB
- Bepaling van de versterking
- Bepaling van logaritmen
- Bepaling van de sinus en tangens van hoeken
- inch- en cm-schaal

DE MUIDERKRING N.V.

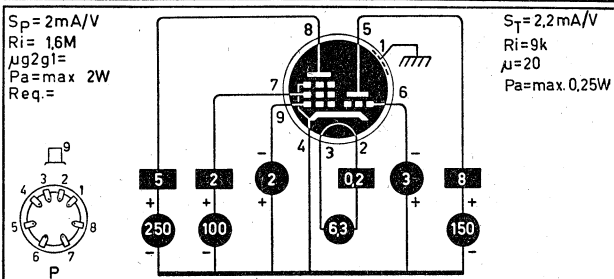
BUSSUM — NEDERLAND



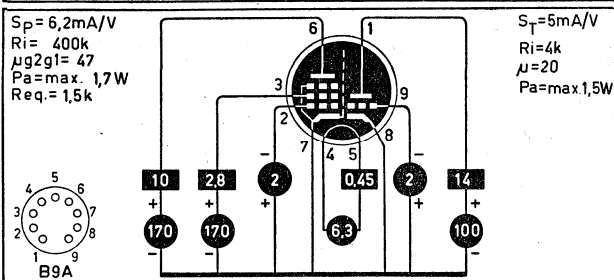
350Z8



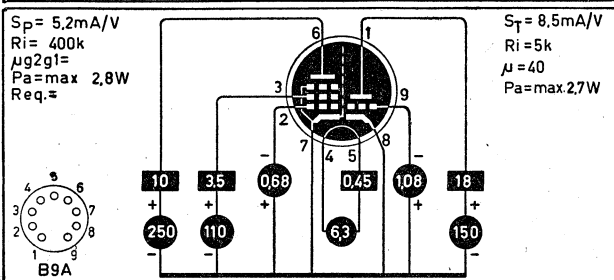
7199



ECF1



ECF80

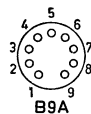
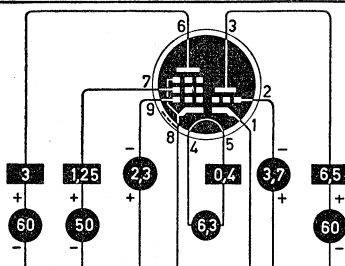


ECF82

ECF83

$S_p = 1,3 \text{ mA/V}$
 $R_i = 600 \text{ k}$
 $\mu g_{2g1} = 10$
 $P_a = \text{max. } 1 \text{ W}$
 $R_{eq.} =$

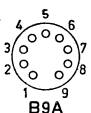
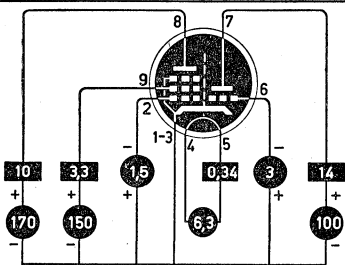
$S_T = 3,6 \text{ mA/V}$
 $R_i = 3 \text{ k}$
 $\mu = 11$
 $P_a = \text{max. } 1 \text{ W}$



ECF86

$S_p = 12 \text{ mA/V}$
 $R_i = 350 \text{ k}$
 $\mu g_{2g1} = 60$
 $P_a = \text{max. } 2 \text{ W}$
 $R_{eq.} = 1 \text{ k}$

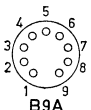
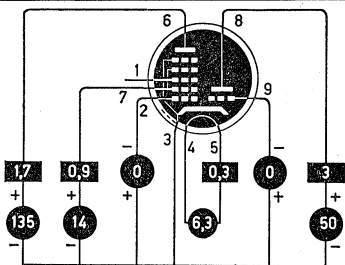
$S_T = 6 \text{ mA/V}$
 $R_i =$
 $\mu = 17$
 $P_a = \text{max. } 1,5 \text{ W}$



ECH84

$S_p = 2,2 \text{ mA/V}$
 $R_i =$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 1,7 \text{ W}$
 $R_{eq.} =$

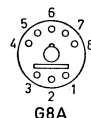
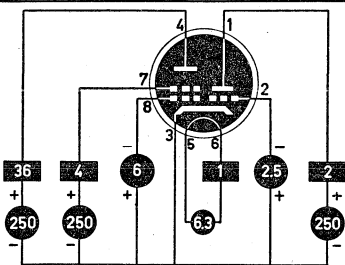
$S_T = 3,7 \text{ mA/V}$
 $R_i =$
 $\mu = 50$
 $P_a = \text{max. } 1,3 \text{ W}$



ECL11

$S_p = 9 \text{ mA/V}$
 $R_i = 25 \text{ k}$
 $\mu g_{2g1} = 25$
 $P_a = \text{max. } 9 \text{ W}$

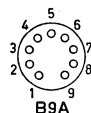
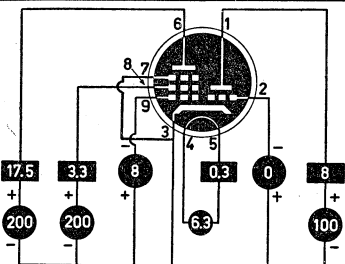
$S_T = 2 \text{ mA/V}$
 $R_i = 35 \text{ k}$
 $P_a = \text{max. } 0,5 \text{ W}$

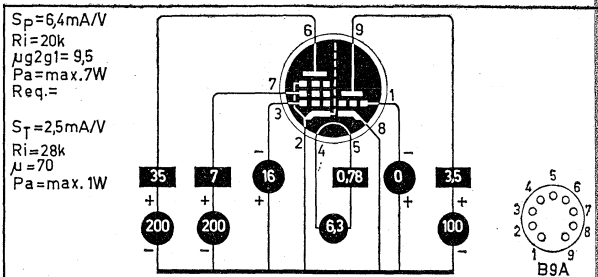


ECL80

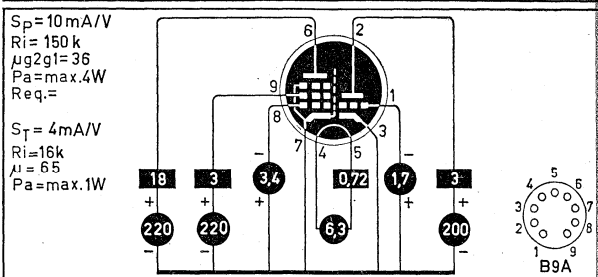
$S_p = 3,3 \text{ mA/V}$
 $R_i = 150 \text{ k}$
 $\mu g_{2g1} = 14$
 $P_a = \text{max. } 3,5 \text{ W}$

$S_T = 1,9 \text{ mA/V}$
 $R_i = 11 \text{ k}$
 $\mu = 20$
 $P_a = \text{max. } 1 \text{ W}$

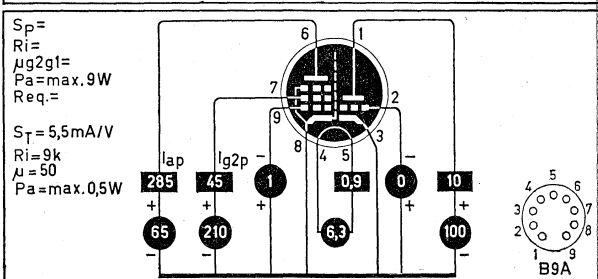




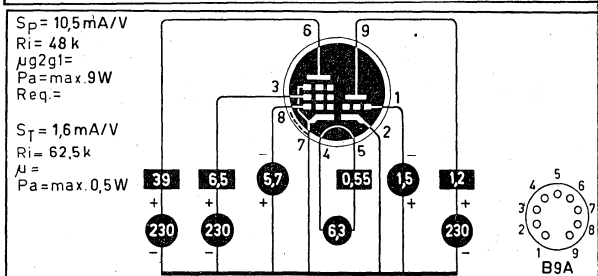
ECL82



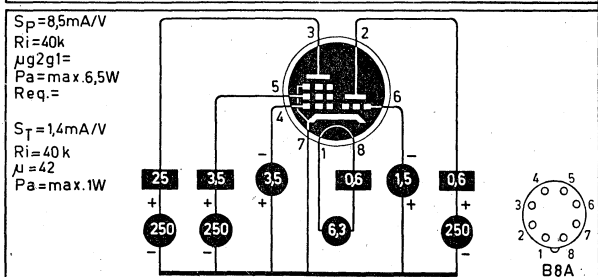
ECL84



ECL85



ECL86



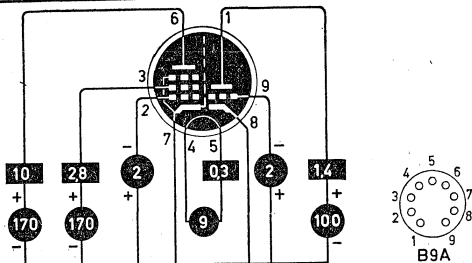
ECL113

PCF80

$S_p = 6.2 \text{ mA/V}$
 $R_i = 400 \text{ k}$
 $\mu g_{2g1} = 47$
 $P_a = \text{max. } 1.7 \text{ W}$
 $R_{eq} = 1.5 \text{ k}$

$S_T = 5 \text{ mA/V}$

$R_i = 4 \text{ k}$
 $\mu = 20$
 $P_a = \text{max. } 1.5 \text{ W}$

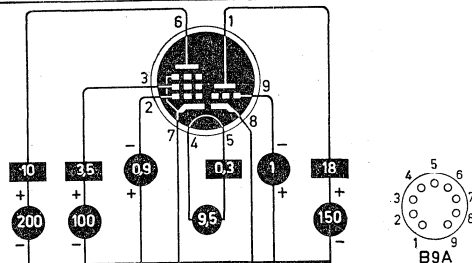


PCF82

$S_p = 5.2 \text{ mA/V}$
 $R_i = 400 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 2.8 \text{ W}$
 $R_{eq} =$

$S_T = 8.5 \text{ mA/V}$

$R_i = 5 \text{ k}$
 $\mu = 42$
 $P_a = \text{max. } 2.7 \text{ W}$

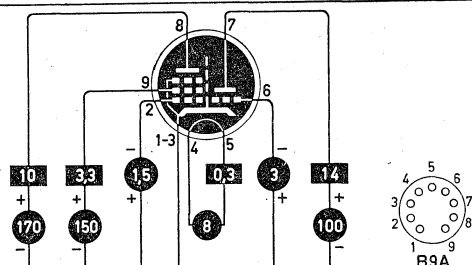


PCF86

$S_p = 12 \text{ mA/V}$
 $R_i = 350 \text{ k}$
 $\mu g_{2g1} = 60$
 $P_a = \text{max. } 2 \text{ W}$
 $R_{eq} = 1 \text{ k}$

$S_T = 6 \text{ mA/V}$

$R_i =$
 $\mu = 17$
 $P_a = \text{max. } 1.5 \text{ W}$

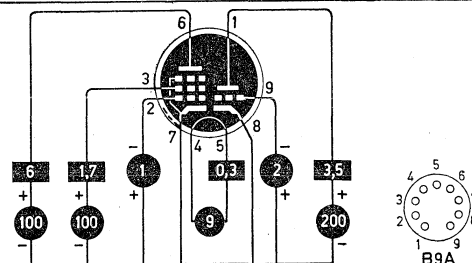


PCF802

$S_p = 5.5 \text{ mA/V}$
 $R_i = 400 \text{ k}$
 $\mu g_{2g1} = 47$
 $P_a = \text{max. } 1.2 \text{ W}$
 $R_{eq} =$

$S_T = 3.5 \text{ mA/V}$

$R_i = 20 \text{ k}$
 $\mu = 70$
 $P_a = \text{max. } 1.4 \text{ W}$

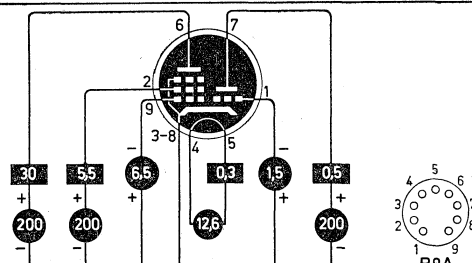


PCL81

$S_p = 8.75 \text{ mA/V}$
 $R_i = 22 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 6.5 \text{ W}$
 $R_{eq} =$

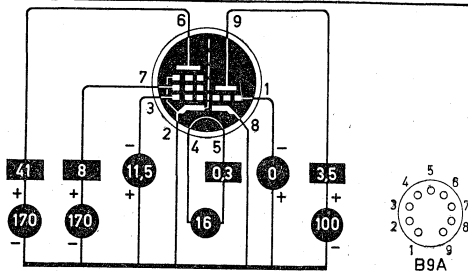
$S_T = 2 \text{ mA/V}$

$R_i = 22 \text{ k}$
 $\mu = 43$
 $P_a = \text{max. } 1 \text{ W}$



$S_p = 7,5 \text{ mA/V}$
 $R_i = 16 \text{ k}$
 $\mu g_{2g1} = 9,5 \text{ k}$
 $P_a = \text{max. } 7 \text{ W}$
 $\text{Req.} =$

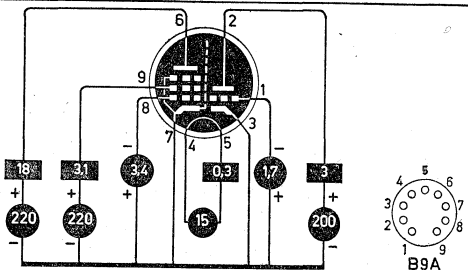
$S_T = 2,5 \text{ mA/V}$
 $R_i = 32 \text{ k}$
 $\mu = 70$
 $P_a = \text{max. } 4 \text{ W}$



PCL82

$S_p = 10 \text{ mA/V}$
 $R_i = 150 \text{ k}$
 $\mu g_{2g1} = 36$
 $P_a = \text{max. } 4 \text{ W}$
 $\text{Req.} =$

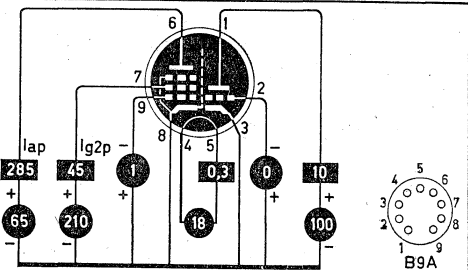
$S_T = 4 \text{ mA/V}$
 $R_i = 16 \text{ k}$
 $\mu = 65$
 $P_a = \text{max. } 1 \text{ W}$



PCL84

$S_p =$
 $R_i =$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 9 \text{ W}$
 $\text{Req.} =$

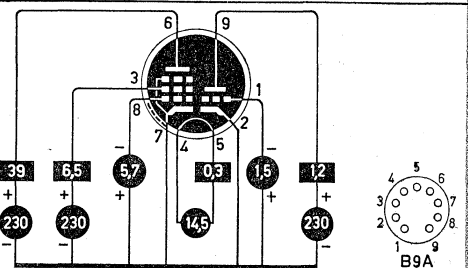
$S_T = 5,5 \text{ mA/V}$
 $R_i = 9 \text{ k}$
 $\mu = 50$
 $P_a = \text{max. } 0,5 \text{ W}$



PCL85

$S_p = 10,5 \text{ mA/V}$
 $R_i = 48 \text{ k}$
 $\mu g_{2g1} =$
 $P_a = \text{max. } 9 \text{ W}$
 $\text{Req.} =$

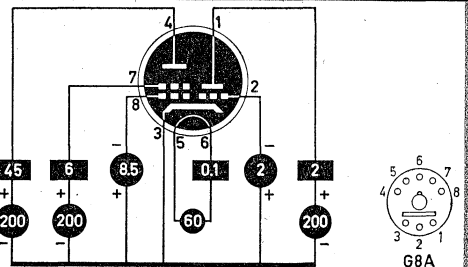
$S_T = 1,6 \text{ mA/V}$
 $R_i = 62,5 \text{ k}$
 $\mu =$
 $P_a = \text{max. } 0,5 \text{ W}$



PCL86

$S_p = 9 \text{ mA/V}$
 $R_i = 18 \text{ k}$
 $\mu g_{2g1} = 14$
 $P_a = \text{max } 9 \text{ W}$

$S_T = 2,1 \text{ mA/V}$
 $R_i = 30 \text{ k}$
 $\mu = 65$
 $P_a = \text{max } 0,6 \text{ W}$

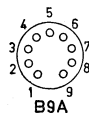
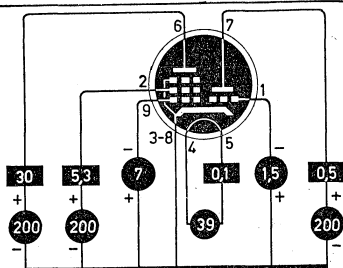


UCL11

UCL81

$S_p = 8,75 \text{ mA/V}$
 $R_i = 22 \text{ k}$
 $\mu_{g2g1} =$
 $P_a = \text{max. } 6,5 \text{ W}$
 $R_{eq} =$

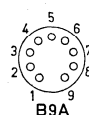
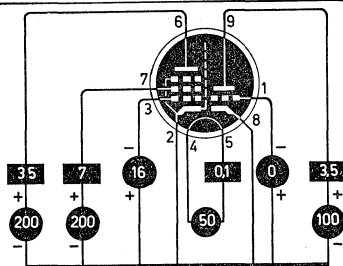
$S_T =$
 $R_i =$
 $\mu = 55$
 $P_a = \text{max. } 1 \text{ W}$



UCL82

$S_p = 6,4 \text{ mA/V}$
 $R_i = 20 \text{ k}$
 $\mu_{g2g1} = 9,5$
 $P_a = \text{max. } 7 \text{ W}$
 $R_{eq} =$

$S_T = 2,5 \text{ mA/V}$
 $R_i = 28 \text{ k}$
 $\mu = 70$
 $P_a = \text{max. } 1 \text{ W}$



$S = 5,2 \text{ mA/V}$
 $\mu g_{2g1} =$
 $R_i = 250 \text{ k}$
 $R_{eq} =$
 $P_a = \text{max. } 3 \text{ W}$

5T8

$S=1,2\text{mA/V}$
 $\mu=70$
 $R_i=58\text{k}$
 $P_a=\text{max.}1\text{W}$

1 2 3 4 5 6 7 8 9
 B9A

6AQ7

$S=16\text{mA/V}$
 $\mu=70$
 $R_i=44\text{k}$
 $P_a=\text{max.}1\text{W}$

6B18

$S = 2,8 \text{ mA/V}$
 $\mu = 20$
 $R_i = 7 \text{ k}$
 $P_a = \text{max. } 3,5 \text{ W}$

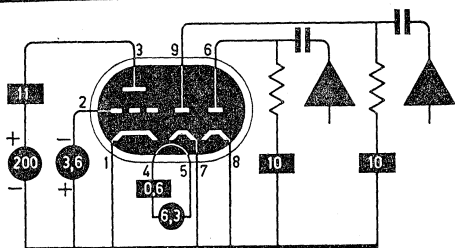
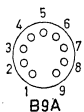
The diagram shows a vacuum tube amplifier circuit using a 6B9A tube. The tube is shown with its internal structure and pin connections. The circuit includes a 250V AC source connected to pins 8 and 9. A 0.6M resistor is connected between pins 4 and 5. A 6.3V heater supply is connected to pins 3 and 2. The output is taken from pin 1, which is connected to a load resistor and a 9V battery. The input is connected to pin 6, which is also connected to a 9V battery and a load resistor. The diagram is labeled '6B9A' and includes a pinout diagram for the 9-pin tube.

6BN8

$S=2,5\text{mA/V}$
 $\mu=70$
 $R_i=28\text{k}$
 $P_a=\text{max. } 1,5\text{W}$

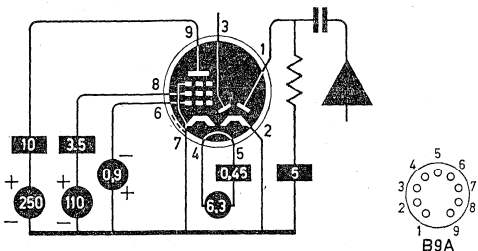
6BV8

$S=5,6\text{mA/V}$
 $\mu=33$
 $R_i=5,9\text{k}$
 $P_a=\text{max. } 2,7\text{W}$



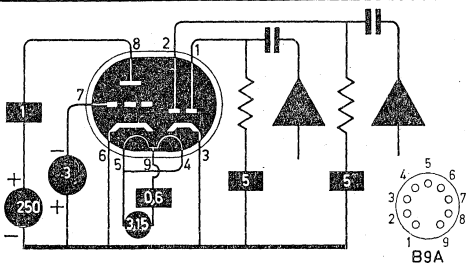
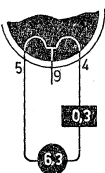
6BW8

$S=5,2\text{mA/V}$
 $\mu_{g2g1}=$
 $R_i=250\text{k}$
 $R_{eq}=$
 $P_a=\text{max. } 3\text{W}$



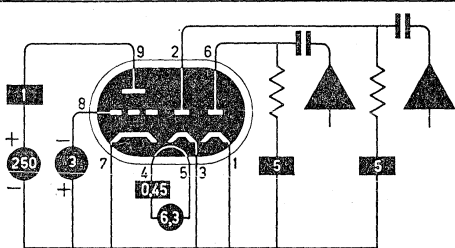
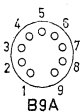
6CN7

$S=1,2\text{mA/V}$
 $\mu=70$
 $R_i=58\text{k}$
 $P_a=\text{max. } 1\text{W}$



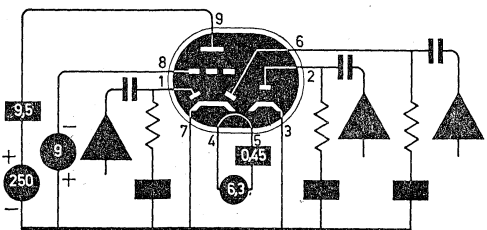
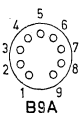
6FM8

$S=1,2\text{mA/V}$
 $\mu=70$
 $R_i=58\text{k}$
 $P_a=\text{max. } 1,1\text{W}$

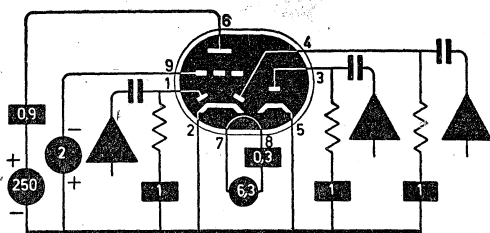
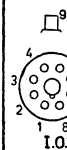


6R8

$S=2\text{mA/V}$
 $\mu=16$
 $R_i=8,5\text{k}$
 $P_a=\text{max. } 2,5\text{W}$

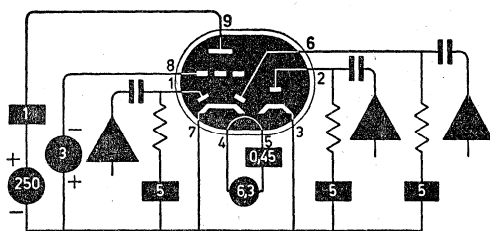
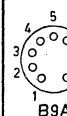


$S=11\text{mA/V}$
 $\mu=100$
 $R_i=91\text{k}$
 $P_a=\text{max. } 0,5\text{W}$



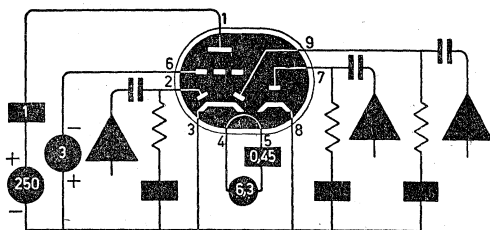
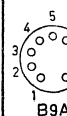
6S8

$S=1,2\text{mA/V}$
 $\mu=70$
 $R_i=58\text{k}$
 $P_a=\text{max. } 1\text{W}$



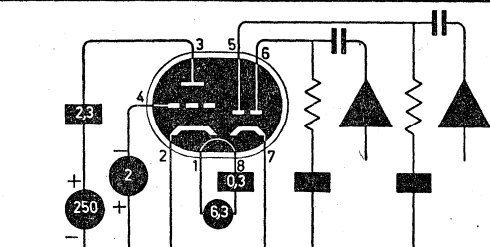
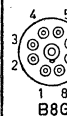
6T8

$S=1,2\text{mA/V}$
 $\mu=70$
 $R_i=58\text{k}$
 $P_a=\text{max. } 0,5\text{W}$



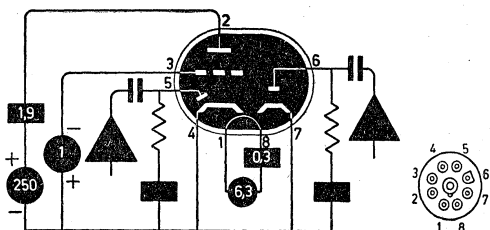
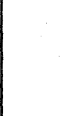
6V8

$S=1,6\text{mA/V}$
 $\mu=70$
 $R_i=44\text{k}$
 $P_a=\text{max. } 1\text{W}$



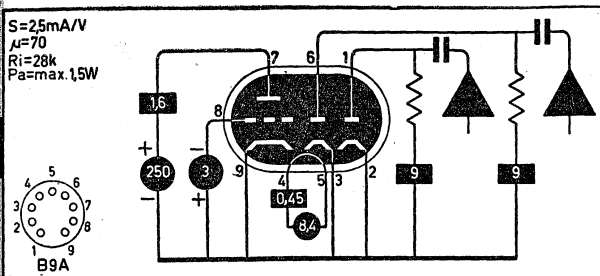
7K7

$S=1,5\text{mA/V}$
 $\mu=100$
 $R_i=67\text{k}$
 $P_a=\text{max. } 0,5\text{W}$

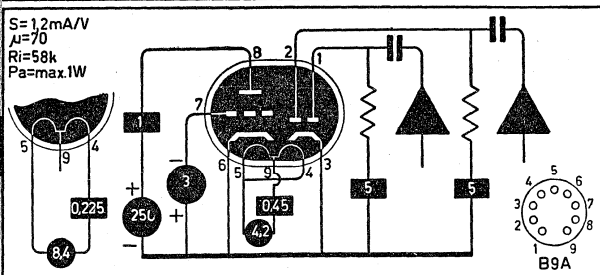


7X7

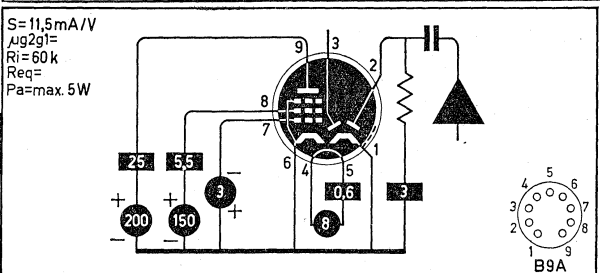
8BN8



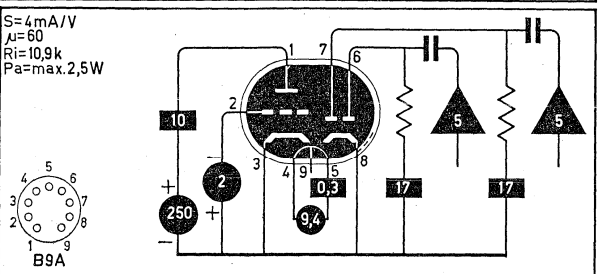
8CN7



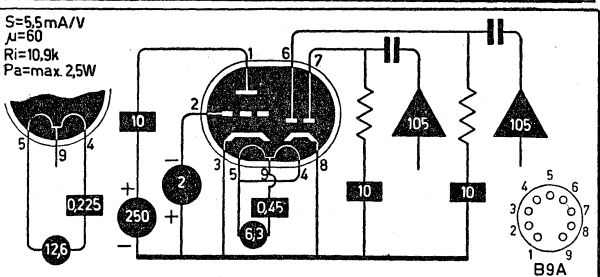
8ET7



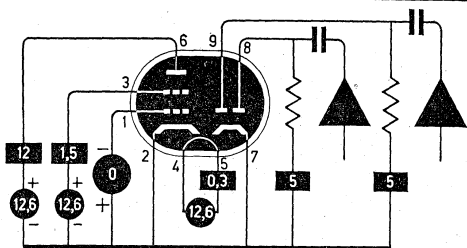
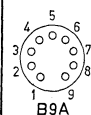
9BR7



12BR7

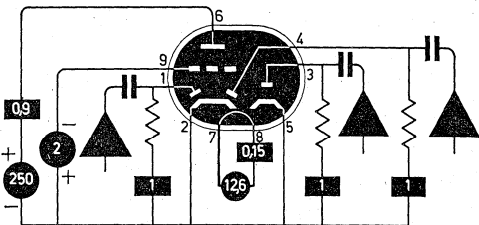
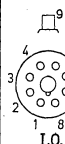


S=5,5mA/V
 $\mu=$
 $R_i=6k$
 $P_a=\max.$



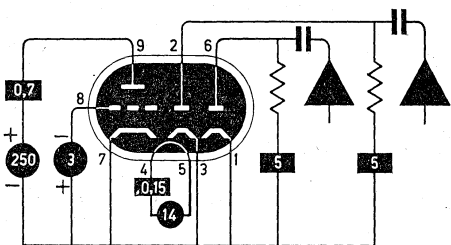
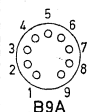
12J8

S=1,1mA/V
 $\mu=100$
 $R_i=91k$
 $P_a=\max, 0,5W$



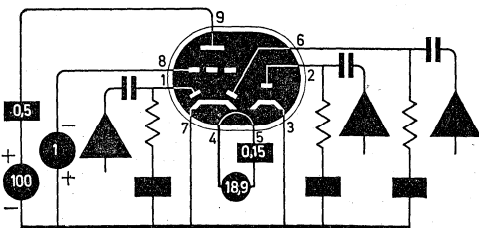
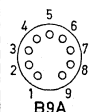
12S8

S=1mA/V
 $\mu=72$
 $R_i=72k$
 $P_a=\max, 1,1W$



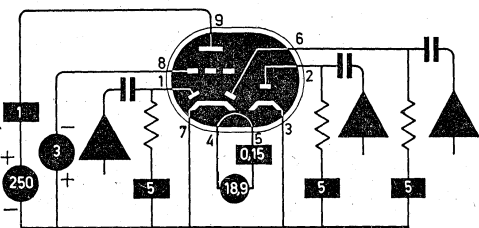
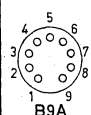
14GT8

S=1,25mA/V
 $\mu=100$
 $R_i=80k$
 $P_a=\max, 0,5W$

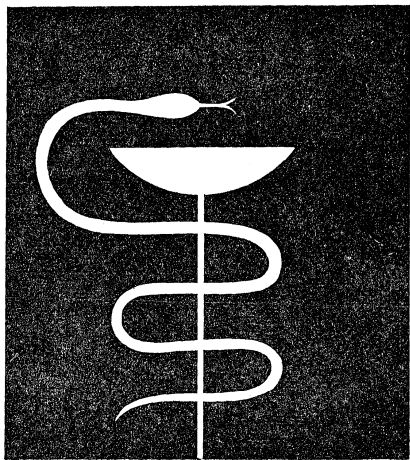


19C8

S=1,2mA/V
 $\mu=70$
 $R_i=58k$
 $P_a=\max, 1W$



19T8

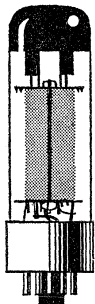


*een merk
is als
een
esculaap*

BETROUWBAAR

DE VAKMAN WEET WAT DAT WAARD IS

Een symbool dat vertrouwen wekt. Een merk dat betrouwbaar is. POPE! De vakman weet wat dat waard is. Daarom zal hij altijd verlangen dat op elke verpakking het kenmerk voor kwaliteit staat. Een goede verpakking houdt immers de belofte voor een goed produkt in. En Pope buizen zijn goed. Kenmerkend hiervoor zijn de constante kwaliteit, de functionele toepassing, de ruime keus en last but not least, de geweldige service. De radiohandelaar weet achter zich een organisatie die hem met raad en daad wil en kan steunen. Dat is Pope.

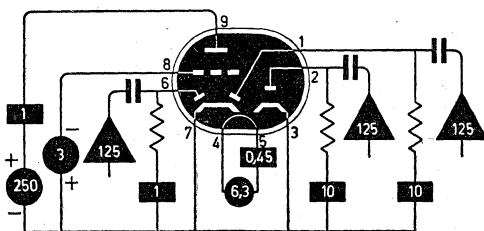
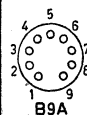


ALS HET ER OP AAN KOMT



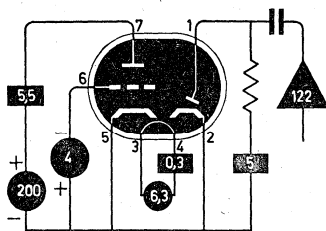
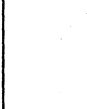
**elektronenbuizen
en half-geleiders**

$S=1,4\text{mA/V}$
 $\mu=70$
 $R_i=50\text{k}$
 $P_a=\text{max.}1\text{W}$



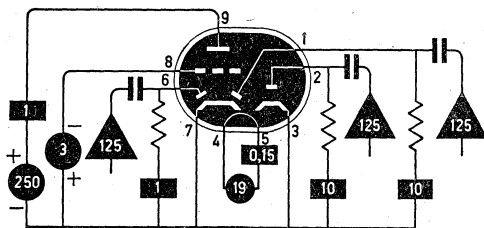
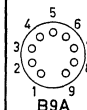
EABC80

$S=2,5\text{mA/V}$
 $\mu=31$
 $R_i=12,4\text{k}$
 $P_a=\text{max.}2\text{W}$



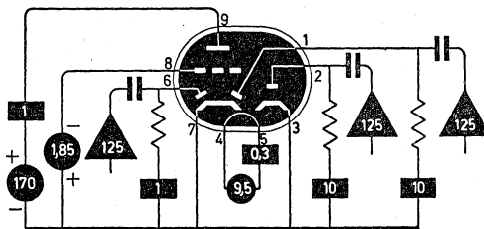
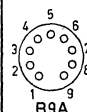
EAC91

$S=1,4\text{mA/V}$
 $\mu=70$
 $R_i=50\text{k}$
 $P_a=\text{max.}1\text{W}$



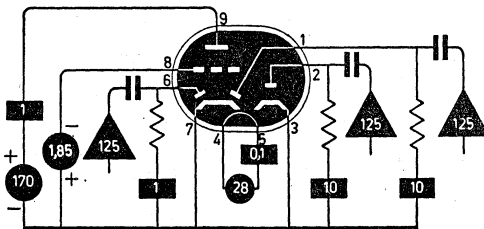
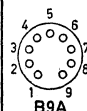
HABC80

$S=1,45\text{mA/V}$
 $\mu=70$
 $R_i=48\text{k}$
 $P_a=\text{max.}1\text{W}$



PABC80

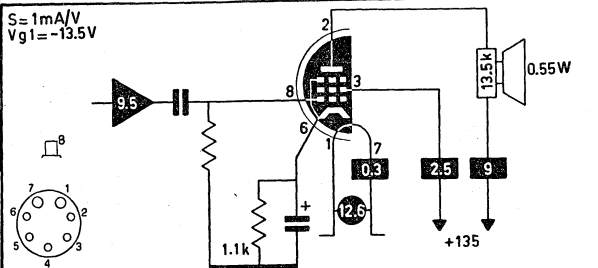
$S=1,45\text{mA/V}$
 $\mu=70$
 $R_i=48\text{k}$
 $P_a=\text{max.}1\text{W}$



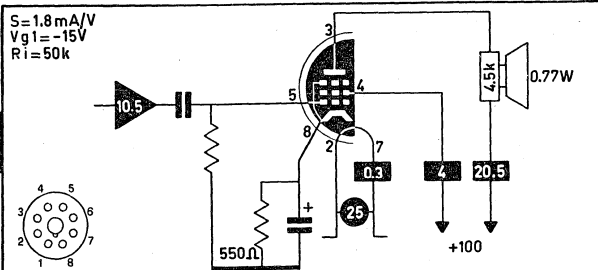
UABC80

12A7

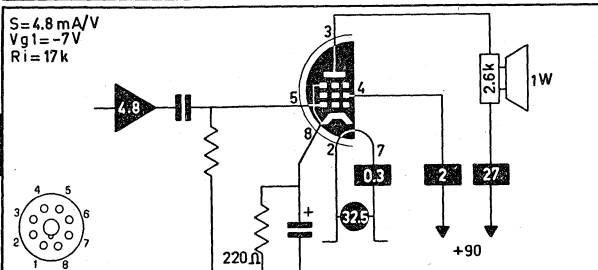
$S = 1 \text{ mA/V}$
 $V_{g1} = -13.5 \text{ V}$

**25A7**

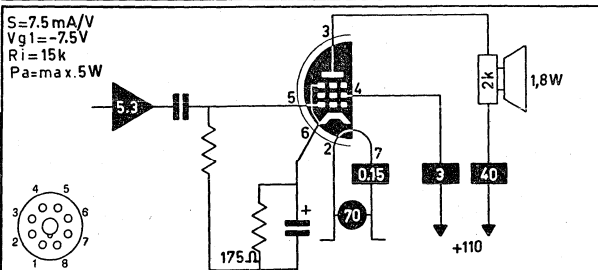
$S = 1.8 \text{ mA/V}$
 $V_{g1} = -15 \text{ V}$
 $R_i = 50 \text{ k}$

**32L7**

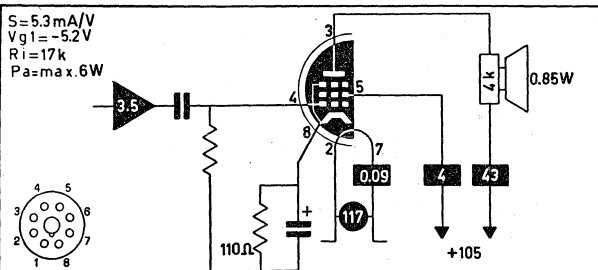
$S = 4.8 \text{ mA/V}$
 $V_{g1} = -7 \text{ V}$
 $R_i = 17 \text{ k}$

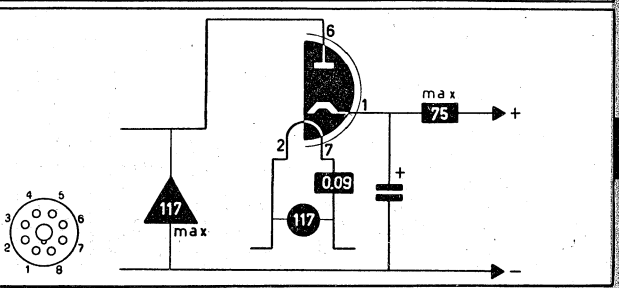
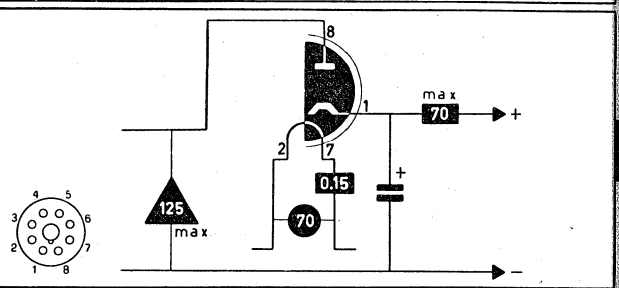
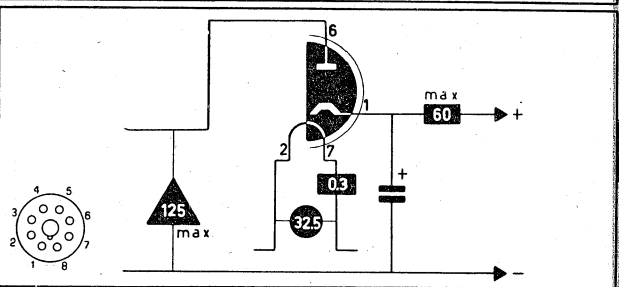
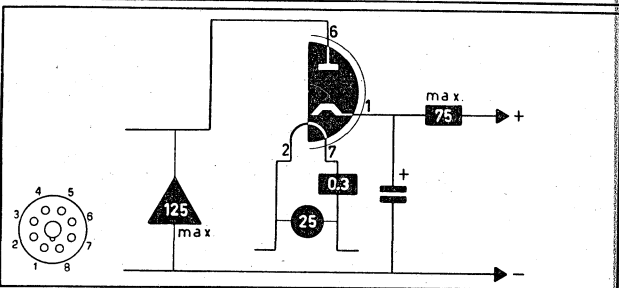
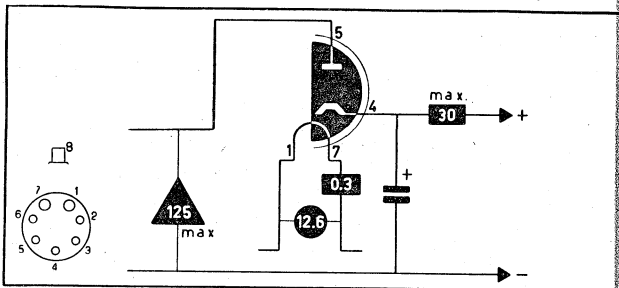
**70L7**

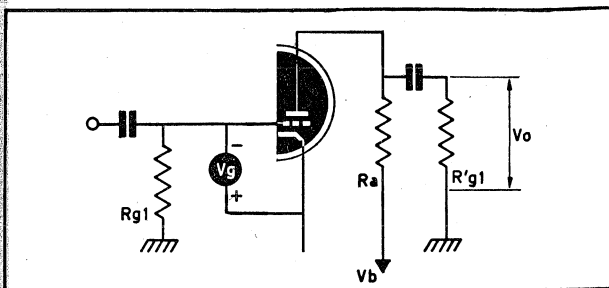
$S = 7.5 \text{ mA/V}$
 $V_{g1} = -7.5 \text{ V}$
 $R_i = 15 \text{ k}$
 $P_a = \text{max. } 5 \text{ W}$

**117L/M7**

$S = 5.3 \text{ mA/V}$
 $V_{g1} = -5.2 \text{ V}$
 $R_i = 17 \text{ k}$
 $P_a = \text{max. } 6 \text{ W}$







		Vb:100V			Vb:170V		
Ra	k	47	100	220	47	100	220
R'g1	k	150	330	680	150	330	680
Ia	mA	0,52	0,35	0,21	1,25	0,82	0,46
Vo	Veff	5	5	5	8	8	8
A	—	26	35	44	32	42	51
d	%	4,3	2,3	1,7	2	1,3	1,1
		Vb:200V			Vb:250V		
Ra	k	47	100	220	47	100	220
R'g1	k	150	330	680	150	330	680
Ia	mA	1,6	1	0,56	2,2	1,4	0,76
Vo	Veff	8	8	8	8	8	8
A	—	34	44	53	36	47	54
d	%	1,5	1	0,9	1	0,8	0,6
Rg1:10M							

		Vb = 170 V			Vb = 200 V			Vb = 250 V		
Ra	k	47	100	220	47	100	220	47	100	220
R'g1	k	150	330	680	150	330	680	150	330	680
-Vg	V	3,5	3,5	3,5	4,2	4,2	4,2	5,5	5,5	5,5
Ia	mA	1,8	1	0,5	2,2	1,2	0,6	2,8	1,5	0,8
Vo max	Veff	22	24	24	27	29	30	36	39	40
A	—	9,5	10	11	9,5	10	11	9,5	10	11
d	%	8,7	7,6	6,5	9	8	6,5	9,2	8,3	7

		Vb = 170 V			Vb = 200 V		
Ra	k	100	220	220	100	220	220
R'g1	k	680	680	680	680	680	680
Rk	k	—	2,7	—	—	2,2	—
Ia	mA	0,86	0,43	0,5	1,05	0,52	0,61
Vo max	Veff	19	25	20	24	26	25
A	—	49	51	53	50	52	55
d	%	1,4	2,3	1,4	1,5	1,6	1,4
Rg1	M	22	3	22	22	3	22

		Vb = 200 V		Vb = 250 V		Vb=300V			
Ra	k	220	220	220	220	220	220	220	220
R'g1	M	0,68	0,68	0,68	10	0,68	10	10	10
Rk	k	-	2,6	-	-	1,8	1,8	-	1,2
Ia	mA	0,42	0,42	0,42	0,6	0,6	1,8	-	1,2
Vo max	Veff	3,2	3,2	3,2	5	3,2	5	9	9
A	-	66	66	70	75	70	75	80	80
d	%	0,6	0,6	0,4	0,4	0,4	0,4	0,4	0,4
Rg1	M	10	-	10	10	-	-	10	-

ECL86

		Vb = 200 V		Vb = 230 V	
Ra	k	220	220	220	220
R'g1	k	680	680	680	680
Rk	k	-	2,6	-	2,1
Ia	mA	0,42	0,42	0,52	0,52
Vo max	V eff	3,2	3,2	3,2	3,2
A	-	66	66	68	68
d	%	0,6	0,6	0,5	0,5
Rg1	M	10	-	10	-

PCL86

		Vb = 100 V			Vb = 170 V		
Ra	k	100	220	220	100	220	220
R'g1	k	680	680	680	680	680	680
Rk	k	-	-	2,7	-	-	2,7
Ia	mA	0,37	0,22	0,23	0,86	0,5	0,43
Vo max	Veff	8	9	15	19	20	25
A	-	42	46	47	49	53	51
d	%	1,3	1,5	4	1,4	1,4	2,3
Rg1	M	22	22	3	22	22	3

UCL82

CLASS A OPERATING DATA PENTODE SECTION

V _a	V _{g2}	V _{g1}	I _a	I _{g2}	R _k	R _a	R _{g2}	P _o
V	V	V	mA	mA	Ω	kΩ	kΩ	W
250	250	- 6	36	4	-	7	-	4
170	170	- 6,7	15	2,8	-	11	-	1
200	200	- 8	17,5	3,3	-	11	-	1,4
250	-	-12,2	14	2,6	-	17,5	4,7	1,55
200	200	-	37	13,3	330	4,5	0,47	3,3
272	272	-	27	10,8	650	8	2,2	3,5
230	230	- 5,7	39	6,5	125	5,6	-	3,8
250	250	- 3,5	25	3,5	-	12,5	-	2,25
200	200	- 6,5	30	5,5	-	6,7	-	2,4
170	170	-	44	15,5	200	3,25	-	3,2
200	200	-	37	13,3	330	4,5	0,47	3,3
230	230	-	31	11	490	6	1,2	3,25
230	230	- 5,7	39	6,5	125	5,6	-	3,8
200	200	- 8,5	45	6	-	4,5	-	4
200	200	- 6,5	30	5,5	-	6,7	-	2,4
100	100	-	27	8,6	170	3	-	1
170	170	-	44	15,5	200	3,25	-	3,2

ECL11

ECL80

ECL82

ECL86

ECL113

PCL81

PCL82

PCL86

UCL11

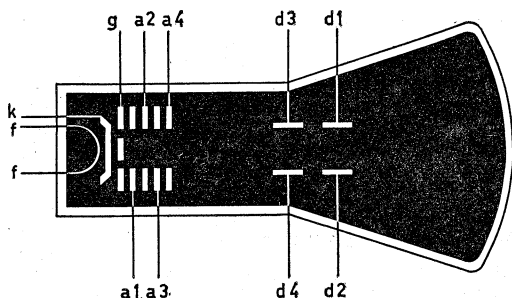
UCL81

UCL82

				
3BY6	-	-	6BY6	-
3CS6	-	-	4CS6	-
			6CS6	-
4CS6	-	-	3CS6	-
			6CS6	-
6BY6	-	-	3BY6	-
6CM7	-	-	8CM7	-
6CS6	-	-	3CS6	-
			4CS6	-
6CY7	-	-	11CY7	-
6DE7	-	-	10DE7	-
			13DE7	-
6DR7	-	-	10DR7	-
			13DR7	-
6EM7	-	-	10EM7	-
			13EM7	-
8CM7	-	-	6CM7	-
10DE7	-	-	6DE7	-
10DR7	-	-	6DR7	-
			13DR7	-
10EM7	-	-	6EM7	-
			13EM7	-
11CY7	-	-	6CY7	-
13DE7	-	-	6DE7	-
			10DE7	-
13DR7	-	-	6DR7	-
			10DR7	-
13EM7	-	-	6EM7	-
			10EM7	-
EQ40	-	-	-	EQ80
EQ80	-6BE7-	-	UQ80	EQ40
UQ80	-	-	EQ80	-
5AM8	-	-	6AM8	-
5AN8	-	-	6AN8	-
5AS8	-	-	6AS8	-
5AT8	-	-	6AT8	-
5AV8	-	-	6AN8	6AN8
5BE8	-	-	6BE8	-
5CL8A	-	-	6CL8A	-
			19CL8A	-
5CM8	-	-	6CM8	-
5EA8	-	-	6EA8	-
			19EA8	-
5EU8	-	-	6EU8	-
5FV8	-	-	6FV8	-
5GH8	-	-	6GH8	-
5U8	-	-	6U8	-
			ECF82	-
5X8	-	-	6X8	-
			19X8	-
-6AB8-	ECL80	-	-	-
6AD7	-	CV1878	-	-
6AM8	-	-	5AM8	-
6AN8	-	-	5AN8	5AV8
			5AV8	-
6AS8	-	-	5AS8	-
6AT8	-	-	5AT8	-
6BA8	-	-	8BA8	-
6BH8	-	-	8BH8	-
-6BL8-	ECF80	-	-	-
-6BM8-	ECL82	-	-	-

				
6CL8A	-	-	5CL8A 19CL8A	-
6CM8	-	-	5CM8	-
6CX8	-	-	8CX8	-
6EA8	-	-	5EA8 19EA8	-
6EB8	-	-	8EB8	-
6EU8	-	-	5EU8	-
6F7	-	CV1915	-	-
6FV8	-	-	5FV8	-
6GH8	-	-	5GH8	-
6GN8	-	-	8GN8	-
6HF8	-	-	10HF8	-
6P7G	-	CV864	-	-
6U8	ECF82	-	5U8	-
6X8	-	-	5X8 19X8	-
8AU8	-	-	6AU8	-
8AW8	-	-	6AW8	-
8BA8	-	-	6BA8	-
8BH8	-	-	6BH8	-
8CX8	-	-	6CX8	-
8EB8	-	-	6EB8	-
8GN8	-	-	6GN8	-
-9A8-	PCF80	-	-	-
-9U8-	PCF82	-	-	-
10HF8	-	-	6HF8	-
-16A8-	PCL82	-	-	-
19CL8A	-	-	5CL8A 6CL8A	-
19EA8	-	-	5EA8 6EA8	-
19X8	-	-	5X8 6X8	-
25B8GT	-	CV940	-	-
ECF80	-6BL8-	-	-	-
ECF82	6U8	-	5U8	-
ECF86	-	-	PCF86	-
ECL80	-6AB8-	-	-	-
ECL82	-6BM8-	-	UCL82	-
ECL84	-	-	PCL84	-
ECL86	-	-	PCL86	-
PCF80	-9A8-	-	-	-
PCF82	-9U8-	-	-	-
PCF86	-	-	ECF86	-
PCL82	-16A8-	-	-	-
PCL84	-150Q8-	-	ECL84	-
PCL86	-	-	ECL86	-
UCL82	-	-	-6BM8- ECL82	-
5BW8	-	-	6BW8	-
5T8	-	-	6T8 19T8	-
-6AK8-	EABC80	-	-	-
6BN8	-	-	8BN8	-
6BW8	-	-	5BW8	-
6CN7	-	-	8CN7	-
6S8	-	-	12S8	-
6T8	-	-	5T8 19T8	-
7K7	-	CV896	-	-

[illegible]



CATHODE-RAY TUBES

KATODESTRAAL BUIZEN

1	diam	scherm diameter
2	length	buis lengte
3	CM	centimeter
4	base	voet
5	defl. angle degr.	afbuigingshoek in graden
6	defl. and foc. method	wijze van afbuiging en focussering
7	E	elektrostatisch
8	M	(elektro) magnetisch
9	color	kleur
10	green	groen
11	white	wit
12	blue	blauw
13	accelerator grid	versnellingselektrode
14	cutoff voltage	negatieve roosterspanning voor straalonderdrukking
15	defl. sens.	afbuigingsgevoeligheid

TUBES À RAYONS CATHODIQUES

1	diamètre de l'écran
2	longueur du tube
3	centimètres
4	culot
5	angle de déflection
6	mode de déflection et de focalisation
7	électrostatique
8	(electro)magnétique
9	couleur
10	vert
11	blanc
12	bleu
13	électrode d'accélération
14	polarisation négative de suppression
15	sensibilidad de deflexión

KATHODENSTRAHLRÖHREN

1	Schirmdurchmesser
2	Röhrenlänge
3	Zentimeter
4	Sockel
5	Ablenkwinkel in Graden
6	Ablenk- und Fokussierungsmethode
7	elektrostatisch
8	elektromagnetisch

- 9 Farbe
- 10 grün
- 11 weiß
- 12 blau
- 13 Beschleunigungs-Elektrode
- 14 negative Gitterspannung (zur Unterdrückung des Elektronenstrahles)
- 15 Ablenkempfindlichkeit

LAMPU² SINAR KATODA

- 1 diameter
- 2 ukuran pandjang
- 3 centimeter
- 4 kaki lampu
- 5 sudut defleksi (dalam deradjat)
- 6 tjara defleksi dan fokus
- 7 tjara defleksi elektrostatis
- 8 tjara defleksi maknit listrik
- 9 warna
- 10 hidjau
- 11 putih
- 12 biru
- 13 elektroda pertjepat
- 14 tegangan kisi negatif akan „blanking”
- 15 kepékaan defleksi

KATODSTRALRÖR

- 1 skärmdiameter
- 2 rörlängd
- 3 centimeter
- 4 fot
- 5 avböjningsvinkel i grader
- 6 avböjningssätt och fokussering
- 7 elektrostatisk
- 8 (elektro) magnetisk
- 9 färg
- 10 grön
- 11 vit
- 12 blå
- 13 växelektrod
- 14 negativ skärmspänning för undertryckande av strålar
- 15 avböjningskänslighet

TUBOS DE RAYOS CATODICOS

- 1 Diámetro de la pantalla
- 2 Largo de tubo
- 3 centímetros
- 4 base
- 5 ángulo de desviación en grados
- 6 modo de desviación y enfoque
- 7 electrostático
- 8 electromagnético
- 9 color
- 10 verde
- 11 blanco
- 12 azul
- 13 electrodo acelerador
- 14 tensión de corte
- 15 sensibilidad de desviación

TUBOS DE RAIOS CATODICOS

- 1 diâmetro da grelha
- 2 longitude do tubo
- 3 centímetros
- 4 pé
- 5 ângulo de deflexão em graus
- 6 método de deflexão e focagem
- 7 electrostático
- 8 electromagnético
- 9 cor
- 10 verde
- 11 branco
- 12 azul
- 13 grelha aceleradora
- 14 voltagem de fechamento
- 15 sensibilidade de deflexão

TUBI A RAGGI CATODICI

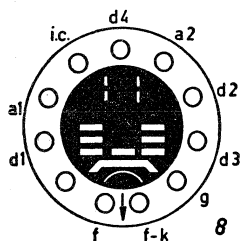
- 1 diametro dello schermo
- 2 lunghezza
- 3 centimetri
- 4 zoccolo
- 5 angolo di deviazioni in gradi
- 6 sistema di deviazione e messa a fuoco
- 7 elettrostatico
- 8 elettromagnetico
- 9 colore
- 10 verde
- 11 bianco
- 12 blu
- 13 griglia accelatrice (elettrode acceleratore)
- 14 tensione griglia negative per spegnimento della traccia
di ritorno
- 15 sensibilità di deviazione

صمامات اشعة المهبط

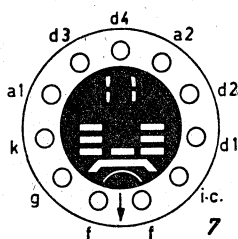
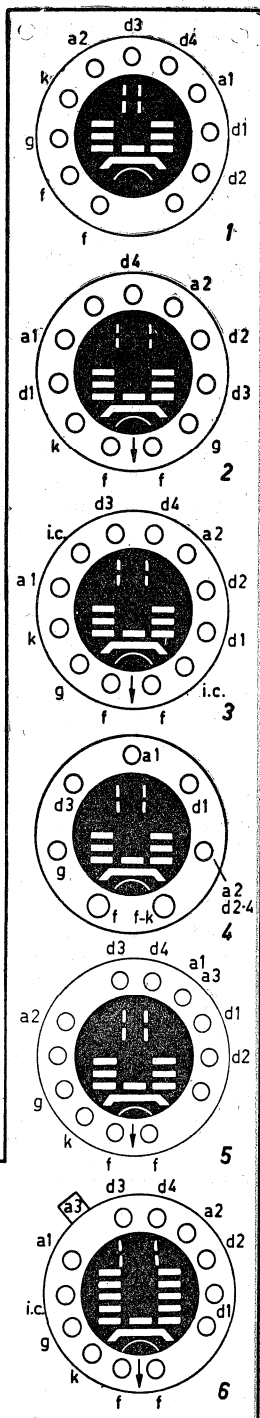
- 1 قطر الستار
- 2 طول الصمام
- 3 سنتيمتر
- 4 القاعدة
- 5 زاوية الانحراف (درجات)
- 6 طريقة الانحراف وضبط البؤرة
- 7 كهربائيا ساكنا
- 8 (كهربائيا) مغنطيسيا
- 9 اللون
- 10 اخضر
- 11 ابيض
- 12 ازرق
- 13 السلك المتحكم المسرع
- 14 فلطية السلك المتحكم السلبية لكبح الشعاع
- 15 حساسية الانحراف

OSCILLOGRAPH TUBES

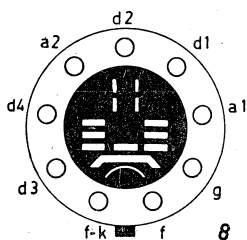
	DIAM.	LENGTH	BASE	COLOR	V _f	I _f	V _{a1}	V _{a2}
	CM	CM			V	A	V	V
1EP1	3,2	10,3	1	GREEN	6,3	0,6	100-300	1000
2AP1A	5	19	2	GREEN	6,3	0,6	250	1000
2BP1	5,2	19,3	3	GREEN	6,3	0,6	300-560	2000
2BP11 ELECTRICALLY SAME AS 2BP1								
3AP1A	7,5	29	4	GREEN	2,5	2,1	430	1500
3BP1A	7,5	25,4	5	GREEN	6,3	0,6	575	2000
3JP1	7,5	25,4	6	GREEN	6,3	0,6	400-690	2000
3JP7 ELECTRICALLY SAME AS 3JP1								
3KP1	7,5	29	7	GREEN	6,3	0,6	160-300	1000
3KP4	7,5	29	7	WHITE	6,3	0,6	320-600	2000
3KP7	7,5	29	7	BLUE	6,3	0,6	16-300	1000
3KP11	7,5	29	7	BLUE	6,3	0,6	160-300	1000
3KP16	7,5	29	7	VIOL	6,3	0,6	160-300	1000
3RP1	7,5	23,1	3	GREEN	6,3	0,6	330-620	2000
3RP1A ELECTRICALLY SAME AS 3RP1								
5ABP1	13,3	43	6	GREEN	6,3	0,6	400-690	2000
5ABP7	13,3	43	6	BLUE	6,3	0,6	400-690	2000
5ABP11	13,3	43	6	BLUE	6,3	0,6	400-690	2000
5ADP1	13,3	43	6	GREEN	6,3	0,6	400-690	2000
5BP1A	13,3	42,5	8	GREEN	6,3	0,6	450	2000
5CP1A	13,3	42,5	6	GREEN	6,3	0,6	575	2000
5CP7A	13,3	42,5	6	GR/YE	6,3	0,6	575	2000
5CP11A	13,3	42,5	6	BLUE	6,3	0,6	575	2000
5CP12	13,3	42,5	6	OR	6,3	0,6	575	2000



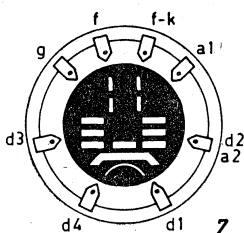
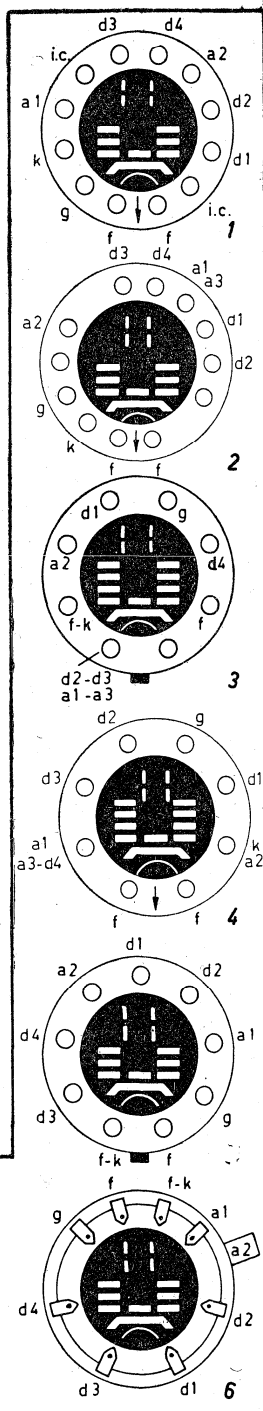
Va3	CUTOFF VOLTAGE	DEFL. SENS. IN V/CM	
		D1-D2	D3-D4
V	V		
-	42	116	102
-	30-90	92	78
-	135	108	70
-	25-75	46	43
-	60	80	59
4000	30-90	81	79
-	0-45	20-27	15-21
-	0-90	40-54	30-42
-	0-45	20-27	15-21
-	0-45	20-27	15-21
-	0-45	20-27	15-21
-	135	58-79	42-56
4000	87	24,8	16,5
4000	87	24,8	16,5
4000	87	24,8	16,5
4000	75	23,2	17,7
-	20-60	34	30
4000	30-90	37	31
4000	30-90	37	30
4000	30-90	37	30
4000	30-90	37	30



DIAM.	LENGTH	BASE	COLOR	V _f	I _f	V _{a1}	V _{a2}
CM	CM			V	A	V	V
13,3	37,4	1	GREEN	6,3	0,6	340-640	2000
SUP7 AND							
SUP11 ELECTRICALLY SAME AS SUP1							
18	36	2	GREEN	6,3	0,6	1200	3000
5	18,8	3	GREEN	6,3	0,6	150	600
3	9	4	BLUE	6,3	0,55	500	-
DH3-91 ELECTRICALLY SAME AS DB3-91							
4,4	16	5	BLUE	6,3	0,31	200-300	800
DG4-1 AND							
DP4-1 ELECTRICALLY SAME AS DB4-1							
4,4	16	5	BLUE	6,3	0,31	200-300	800
DG4-2 AND							
DP4-2 ELECTRICALLY SAME AS DB4-2							
7,1	16	6	BLUE	4	1	150-350	800
DG7-1 ELECTRICALLY SAME AS DB7-1							
7,1	16	7	BLUE	4	1	150-350	800
DG7-2 AND							
DN7-2 ELECTRICALLY SAME AS DB7-2							
7,1	16	8	BLUE	6,3	0,4	200-300	800
DG7-3,							
DN7-3 AND							
DR7-3 ELECTRICALLY SAME AS DB7-3							
7,1	16	8	BLUE	6,3	0,4	200-300	800
DG7-4,							
DN7-4 AND							
DR7-4 ELECTRICALLY SAME AS DB7-4							
7,1	16	5	BLUE	6,3	0,31	200-300	800
DG7-5,							
DP7-5 AND							
DR7-5 ELECTRICALLY SAME AS DB7-5							
7,1	16	5	BLUE	6,3	0,31	200-300	800
DG7-6 AND							
DN7-6 ELECTRICALLY SAME AS DB7-6							



Va3	CUTOFF VOLTAGE	DEFL. SENS. IN V/CM	
V	V	D1-D2	D3-D4
-	90	22-31	18-25
-	84	37-49	30-40
-	30-90	56	47
-	27	52,6	45,4
-	50	62,5	40
-	50	62,5	40
-	30	71,4	45,4
-	30	71,4	45,4
-	50	62,5	38,5
-	50	62,5	38,5
-	50	62,5	38,5
-	50	62,5	40



DP7-6

DG7-12C

DG7-14

DG7-31

DG7-31/01

DG7-32

DG7-32/01

DB7-36

DG7-52A

DG7-74A

DH7-78

DH7-91

DB9-3

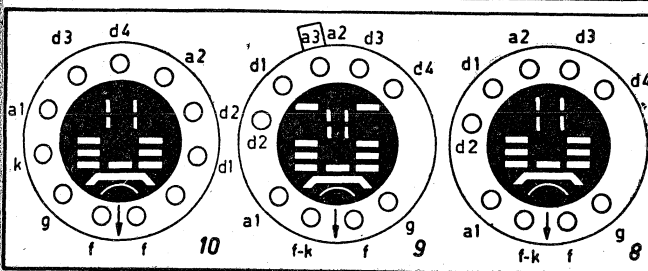
DB9-4

DB9-5

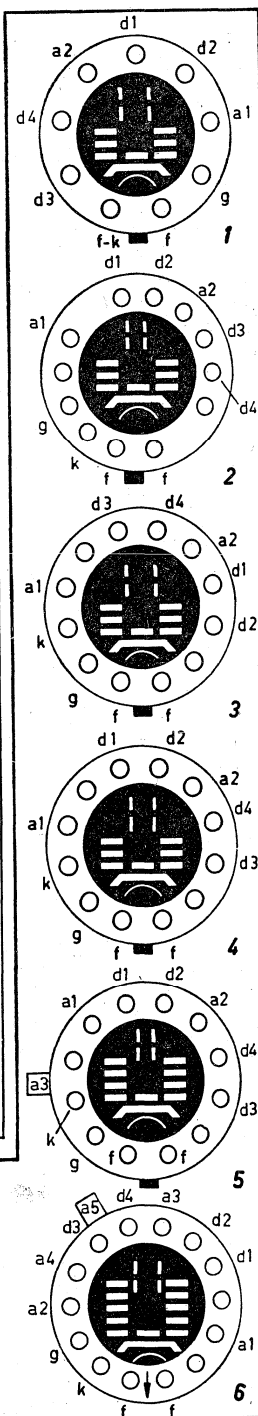
DB10-2

DB10-3

DIAM.	LENGTH	BASE	COLOR	Vf	If	Va 1	Va 2
CM	CM			V	A	V	V
7,1	16	1	BLUE	6,3	0,31	200-300	800
DR7-6 ELECTRICALLY SAME AS DP7-6 (DB7-6)							
7,6	17,5	2	GREEN	6,3	0,3	100-250	2000
7,6	25,4	2	GREEN	6,3	0,3	400-700	2000
7	17	3	GREEN	6,3	0,3	0-120	500
7	17	3	GREEN	6,3	0,3	0-120	500
7,1	17	3	GREEN	6,3	0,3	0-120	500
7,1	17	3	GREEN	6,3	0,3	0-120	500
7,7	29	4	BLUE	6,3	0,3	247-397	1500
DG7-36 ELECTRICALLY SAME AS DB7-36							
7,6	17,5	2	GREEN	6,3	0,3	25-125	800
7,6	30	5	GREEN	6,3	0,3	15-150	5000
7		6	GREEN	6,3	0,3	200-350	4000
7	25,7	7	GREEN	6,3	0,55	210-320	1000
9,7	34	8	BLUE	4	1	200-400	1000
DG9-3 AND DN9-3 ELECTRICALLY SAME AS DB9-3							
9,7	34	8	BLUE	4	1	200-400	1000
DG9-4 AND DN9-4 ELECTRICALLY SAME AS DB9-4							
9,7	34	9	BLUE	4	1	230-430	1000
DG9-5 AND DN9-5 ELECTRICALLY SAME AS DB9-5							
9,7	34	10	BLUE	6,3	0,3	400-720	2000
DG10-2, DP10-2 AND DR10-2 ELECTRICALLY SAME AS DB10-2							
9,7	34	8	BLUE	4	0,56	200-340	1000
DG10-3 AND DR10-3 ELECTRICALLY SAME AS DB10-3							



V _{a3}	CUTOFF VOLTAGE	DEFL. SENS. / CM	
		D1-D2	D3-D4
-	50	62,5	40
-	100	111	91
4000	75	62,5	45,5
-	100	35,7	23,3
-	50	37	20,8
-	90	40	25
-	100	37	20,8
-	80	30	20
-	100	50	22,2
1000	47	15	8
1000	60	33	11,7
-	65	20	11,5
-	40	32	25
-	40	32	25
5000	40	66,6	55,5
-	100	37	28,5
-	46	18,2	15,4



DB10-5**DG10-5 AND****DR10-5 ELECTRICALLY SAME AS DB10-5****DB10-6**

9, 7 | 34 | 2 | BLUE | 6, 3 | 0, 3 | 400-720 | 2000

DG10-6,**DP10-6 AND****DR10-6 ELECTRICALLY SAME AS DB10-6****DG10-14**

10 | 30 | 3 | GREEN | 6, 3 | 0, 3 | 400-700 | 2000

DG10-18

10 | 37 | 4 | GREEN | 6, 3 | 0, 3 | 100-160 | 500

DG10-54

10 | 30 | 3 | GREEN | 6, 3 | 0, 3 | 400-700 | 2000

DG10-74

9, 6 | 34 | 2 | GREEN | 6, 3 | 0, 3 | 400-720 | 2000

DB10-78

10 | 30 | 5 | BLUE | 6, 3 | 0, 3 | 200-350 | 1000

DH10-78 AND**DP10-78 ELECTRICALLY SAME AS DB10-78****DH10-94**

10, 6 | 38 | 6 | GREEN | 6, 3 | 0, 55 | 350-460 | 2000

DB13-2

13, 5 | 43, 5 | 7 | BLUE | 6, 3 | 0, 3 | 400-720 | 2000

DG13-2,**DP13-2 AND****DR13-2 ELECTRICALLY SAME AS DB13-2****DB13-12**

13 | 43 | 8 | BLUE | 4 | 0, 5 | 2300 | 8000

DG13-14

13 | 37 | 7 | GREEN | 6, 3 | 0, 3 | 360-620 | 2000

DG13-18

13 | 42 | 9 | GREEN | 6, 3 | 0, 3 | 400-590 | 2000

DG13-32

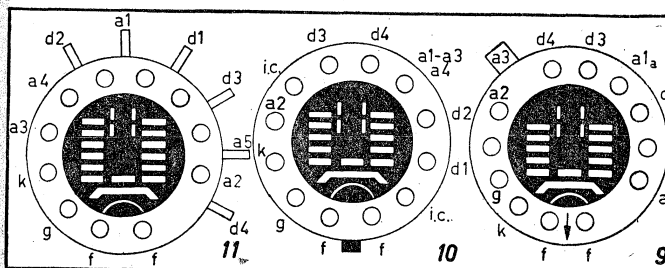
13, 3 | 37, 5 | 10 | GREEN | 6, 3 | 0, 6 | 340-640 | 2000

DB13-34

13, 3 | 42, 5 | 3 | BLUE | 6, 3 | 0, 6 | 400-690 | 2000

DG13-34 AND**DP13-34 ELECTRICALLY SAME AS DB13-34****DG13-38**

13, 3 | 49 | 11 | GREEN | 6, 3 | 0, 3 | 850 | 1000



DG13-54

DG13-58

DH13-76

DH13-78

DH13-97

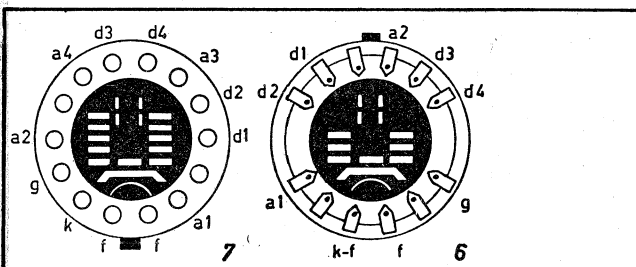
DG16-1

DG16-2

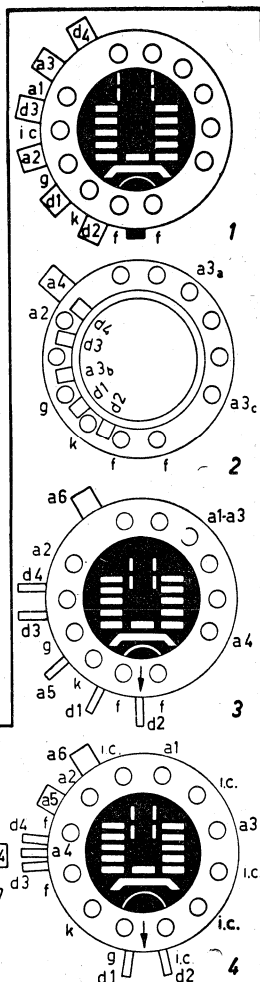
DG16-12

DB16-22

DIAM.	LENGTH	BASE	COLOR	V _f	I _f	V _{a1}	V _{a2}
CM	CM			V	A	V	V
13,3	45	1	GREEN	6,3	0,3	360-700	2000
13	46	2	GREEN	6,3	0,3	204-315	1670
13	46	3	GREEN	6,3	0,3	165-540	1500
DN13-76 ELECTRICALLY SAME AS DH13-76							
13	46	3	GREEN	6,3	0,3	220-710	2000
DN13-78 ELECTRICALLY SAME AS DH13-78							
13,7	44	4	GREEN	6,3	0,55	440-560	1800
16,7	45,7	5	GREEN	4	1	340-500	2000
16,7	45,7	6	GREEN	4	1	340-500	2000
16,7	45,7	6	GREEN	4	1	340-500	2000
15 X 6	42	7	BLUE	6,3	0,3	600-700	1800
DG16-22 AND							
DP16-22 ELECTRICALLY SAME AS DB16-22							



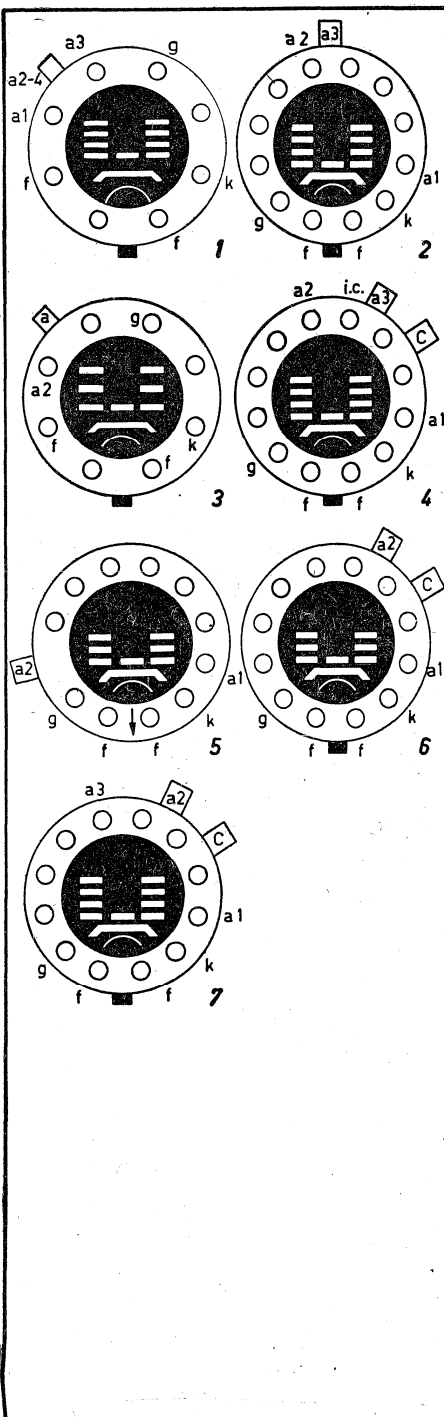
V _{a3}	CUTOFF VOLTAGE	DEFL. SENS. IN V/CM	
		D1-D2	D3-D4
V	V		
4000	90	18,6	12,5
10000	80	33,5	7,2
6000	72	20,8	5,2
12000	96	37	7,8
10000	90	26,3	12,5
-	40	59	40
-	40	59	40
-	40	59	40
5000	70	52,6	47,6



PICTURE TUBES

DIAM.	LENGTH	BASE	DEFL. ANGLE DEGREES.	DEFL. AND FOC. METHOD		V _f	I _f	V _a
				F	D			
CM	CM					V	A	V
5AHP7	10,5	28	1	53	E M	6,3	0,6	7000
5AHP7A ELECTRICALLY SAME AS 5AHP7								
5AZP4	12,5	31	2	50	E M	6,3	0,6	8100
5FP4A	12,5	28	3	53	M M	6,3	0,6	6000
5FP7A	12,5	28	3	53	M M	6,3	0,6	7000
5FP14A	10,5	28	3	53	M M	6,3	0,6	5000
5FP15A	10,5	28	3	53	M M	6,3	0,6	5000
5TP4	12,5	30	4	50	E M	6,3	0,6	27000
5WP11	12,5	29	4	50	E M	6,3	0,6	27000
5WP15	12,5	29	4	50	E M	6,3	0,6	27000
5ZP16	12,5	36	4	40	E M	6,3	0,6	27000
7BP7A	17,5	33	3	53	M M	6,3	0,6	7000
7MP7	18	32	5	50	M M	6,3	0,6	7000
10BP4A	26	44	6	50	M M	6,3	0,6	9000
10FP4A	26	44	6	54	M M	6,3	0,6	11000
10KP7	26	44	5	50	M M	6,3	0,6	9000
12DP7A	30	49	3	50	M M	6,3	0,6	7000
12KP4A	31	44	6	54	M M	6,3	0,6	11000
12LP4A	31	47	6	54	M M	6,3	0,6	11000
14EP4	32 X 25	42	6	70	M M	6,3	0,6	12000
14QP4A	31 X 24	42	7	70	E M	6,3	0,6	9000
14RP4A	32 X 26	35	7	90	E M	6,3	0,6	14000
14WP4	32 X 26	33	7	90	E M	6,3	0,6	12000
14ZP4 ELECTRICALLY SAME AS 14WP4								
16ADP7	40	55	5	53	M M	6,3	0,6	12000
16AP4A	40	58	5	53	M M	6,3	0,6	12000
16DP4A	40	52	5	60	M M	6,3	0,6	12000
16GP4B	40	45	5	70	M M	6,3	0,6	12000
16LP4A	40	56	6	52	M M	6,3	0,6	12000

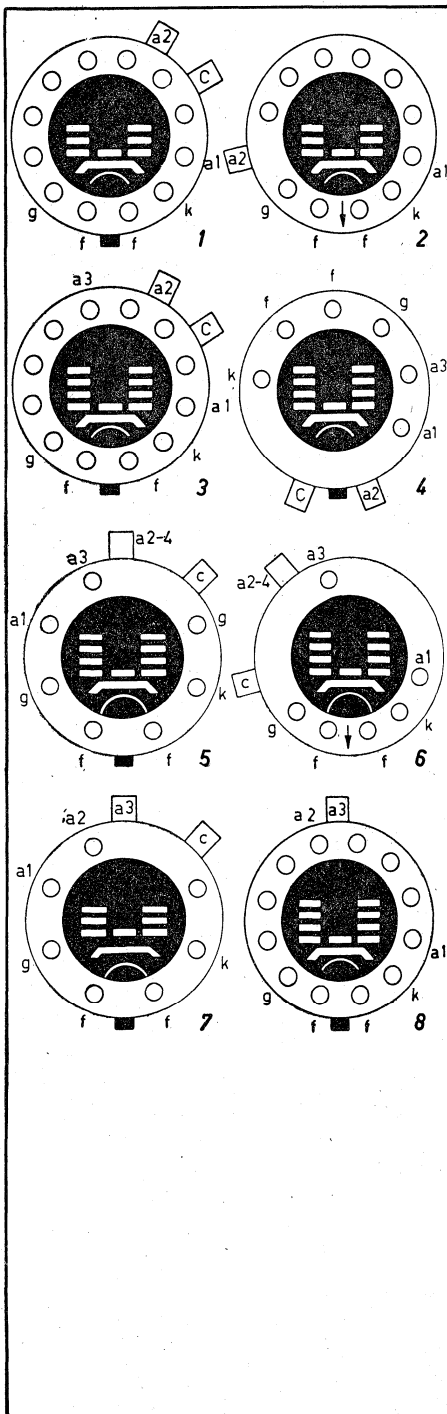
ACC. GRID	CUTOFF VOLTAGE
V	V
300	33-77
350	37-93
250	25-70
250	25-70
250	25-70
250	25-70
200	42-98
200	42-98
350	40-99
350	40-99
250	25-70
250	27-63
250	27-63
250	27-63
250	27-63
250	25-70
250	27-63
250	27-63
300	33-77
250	24-64
300	26-70
300	28-72
250	27-63
300	33-77
250	27-63
300	33-77
300	33-77



16RP4**16TP4****16WP4A****17ATP4A****17BJP4****17BP4A****17BVP4****17BZP4****17CFP4****17CP4****17CYP4****17DKP4****17DSP4****17GP4****17HP4**

DIAM.	LENGTH	BASE	DEFL. ANGLE DEGREES	DEFL. AND FOC. METHOD		Vf	If	Va
CM	CM			F	D	V	A	V
37 X 29	47	1	70	M	M	6,3	0,6	12000
16RP4A ELECTRICALLY SAME AS 16RP4								
37 X 29	46	1	70	M	M	6,3	0,6	12000
40	45	2	70	M	M	6,3	0,6	12000
39 X 31	40	3	90	E	M	6,3	0,6	14000
17AVP4A ELECTRICALLY SAME AS 17ATP4A								
39 X 31	35	3	90	E	M	6,3	0,6	14000
39 X 31	48	2	70	M	M	6,3	0,6	12000
17BP4B ELECTRICALLY SAME AS 17BP4A								
39 X 31	33	4	110	E	M	6,3	0,6	14000
39 X 31	31	5	110	E	M	6,3	0,6	16000
39 X 31	38	6	90	E	M	6,3	0,6	16000
40 X 31	48	2	70	M	M	6,3	0,6	14000
39 X 32	35	6	90	E	M	6,3	0,6	16000
39 X 32	27	7	110	E	M	6,3	0,6	16000
39 X 32	30	5	110	E	M	6,3	0,6	16000
40 X 31	49	8	70	E	M	6,3	0,6	14000
39 X 31	49	3	70	E	M	6,3	0,6	14000
17HP4B, 17RP4 AND 17RP4C ELECTRICALLY SAME AS 17HP4								
39 X 31	48	3	70	E	M	6,3	0,6	14000
17LP4A, 17VP4 AND 17VP4B ELECTRICALLY SAME AS 17LP4								
39 X 31	48	1	70	M	M	6,3	0,6	14000
17QP4A ELECTRICALLY SAME AS 17QP4								
40 X 31	49	8	70	E	M	6,3	0,6	16000
47	54	2	70	M	M	6,3	0,6	13000
20CP4A, 20CP4D, 20DP4A AND 20DP4C ELECTRICALLY SAME AS 19AP4B								
47 X 38	55	3	70	E	M	6,3	0,6	14000
20HP4D AND 20MP4 ELECTRICALLY SAME AS 20HP4A								

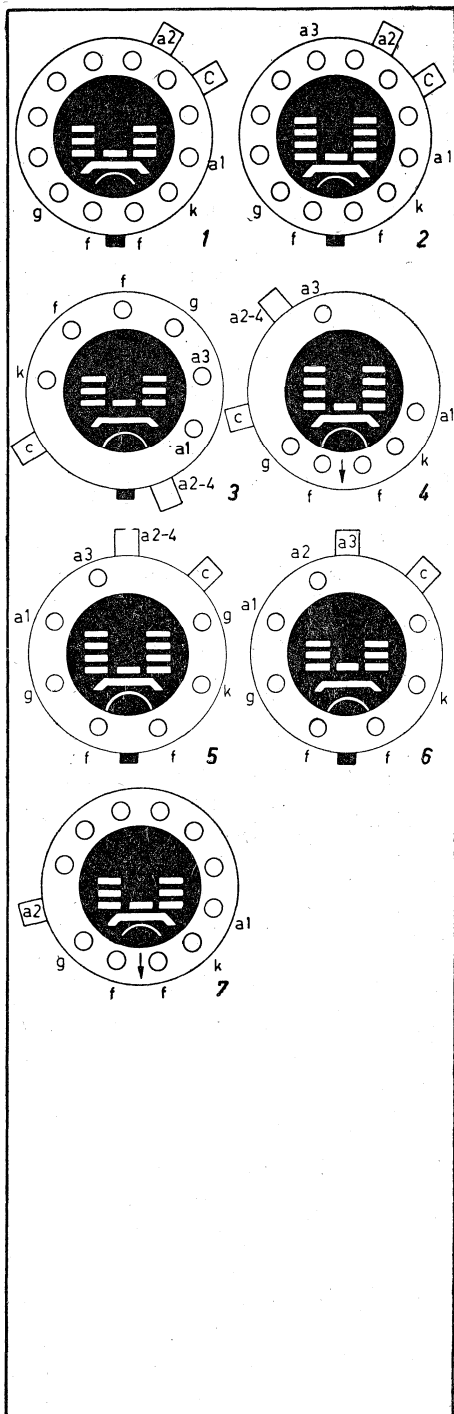
ACC. GRID	CUTOFF VOLTAGE
V	V
300	33-77
300	33-77
250	27-63
300	28-72
300	28-72
300	33-77
300	35-72
400	36-78
300	28-60
300	33-77
300	28-60
500	41-69
400	43-78
300	33-77
300	33-77
300	33-77
300	33-77
250	27-63
300	33-77



21ACP4A**21ALP4A****21AUP4A****21BTP4****21CBP4A****21CQP4****21CXP4****21DAP4****21DEP4A****21DFP4****21DLP4****21DSP4****21EP4A****21EQP4****21FP4A****21WP4****21ZP4A****24AEP4****24AUP4****24BAP4****24DP4A****27EP4**

DIAM.	LENGTH	BASE	DEFL. ANGLE DEGREES	DEFL. AND FOC. METHOD		V _f	I _f	V _a
CM	CM			F	D	V	A	V
52 X 42	51	1	90	M	M	6,3	0,6	16000
21AMP4A AND								
21BSP4 ELECTRICALLY SAME AS 21ACP4A								
52 X 42	51	2	90	E	M	6,3	0,6	16000
21ALP4B,								
21ATP4 AND								
21ATP4A ELECTRICALLY SAME AS 21ALP4A								
52 X 42	59	2	72	E	M	6,3	0,6	16000
21AUP4B,								
21AVP4A AND								
21AVP4B ELECTRICALLY SAME AS 21AUP4A								
52 X 42	51	2	90	E	M	6,3	0,6	16000
52 X 42	46	2	90	E	M	6,3	0,6	18000
52 X 42	36	3	110	E	M	6,3	0,6	16000
52 X 42	46	4	90	E	M	6,3	0,6	18000
52 X 42	36	5	110	E	M	6,3	0,6	16000
52 X 42	36	5	110	E	M	6,3	0,6	16000
52 X 42	36	5	110	E	M	6,3	0,6	16000
52 X 42	43	4	90	E	M	6,3	0,6	16000
52 X 42	45	4	90	E	M	6,3	0,6	18000
51 X 40	58	1	70	M	M	6,3	0,6	16000
21EP4B ELECTRICALLY SAME AS 21EP4A								
52 X 42	32	6	110	E	M	6,3	0,6	18000
51 X 40	58	2	70	E	M	6,3	0,6	16000
21FP4C ELECTRICALLY SAME AS 21FP4A								
47 X 38	56	1	70	M	M	6,3	0,6	16000
21WP4A ELECTRICALLY SAME AS 21WP4								
51 X 40	58	1	70	M	M	6,3	0,6	16000
21ZP4B ELECTRICALLY SAME AS 21ZP4A								
56 X 46	48	4	90	E	M	6,3	0,6	18000
56 X 46	46	4	90	E	M	6,3	0,6	18000
56 X 46	41	5	110	E	M	6,3	0,6	20000
56 X 46	54	2	90	E	M	6,3	0,6	18000
24YP4 ELECTRICALLY SAME AS 24DP4A								
64 X 51	58	7	90	M	M	6,3	0,6	16000

ACC. GRID -V	CUTOFF VOLTAGE V
300	28-72
300	28-72
300	28-72
300	28-72
300	28-72
400	36-78
300	35-72
350	32-47
400	36-78
400	36-78
400	36-78
300	28-60
350	32-47
300	33-77
500	41-69
300	33-77
300	33-77
300	33-77
400	36-78
300	33-60
400	42-58
300	28-72
300	33-77



DIAM.	LENGTH	BASE	DEFL. ANGLE DEGREES	DEFL. AND FOC. METHOD		V _f	I _f	V _a
				F	D	V	A	V
CM	CM							
33 X 27	36	1	90	E	M	6,3	0,3	12000
36 X 27	46	1	70	E	M	6,3	0,3	14000
39 X 31	40	1	90	E	M	6,3	0,3	16000
39 X 31	32	2	110	E	M	6,3	0,3	16000
39 X 31	28	3	110	E	M	6,3	0,3	16000
51 X 41	48	1	90	E	M	6,3	0,3	16000
51 X 41	38	2	110	E	M	6,3	0,3	16000
51 X 41	33	3	110	E	M	6,3	0,3	16000
58 X 47	41	2	110	E	M	6,3	0,3	16000
6,5	27	4	67	M	M	6,3	0,3	25000
12,5	29	5	53	M	M	6,3	0,3	7000
23	37	6	64	M	M	6,3	0,6	9000
23	37	6	64	M	M	6,3	0,3	9000
23	37	7	64	M	M	6,3	0,3	9000
MW22-17 AND								
MW22-18 ELECTRICALLY SAME AS MW22-16								
31	46	6	63	M	M	6,3	0,6	9000
31	46	6	63	M	M	6,3	0,3	9000
31	46	7	63	M	M	6,3	0,3	9000
MW31-17,								
MW31-18 AND								
MW31-74 ELECTRICALLY SAME AS MW31-16								
32 X 25	42	8	65	M	M	6,3	0,3	10000
32 X 25	42	8	65	M	M	6,3	0,3	10000
32 X 25	42	9	65	M	M	6,3	0,3	12000
32 X 25	45	8	65	M	M	6,3	0,3	14000
40	46	10	70	M	M	6,3	0,3	12000
41 X 31	48	11	66	M	M	6,3	0,3	14000
41 X 31	48	12	66	M	M	6,3	0,6	14000
36 X 27	48	8	70	M	M	6,3	0,3	14000
39 X 31	48	9	65	M	M	6,3	0,3	14000

AW 36-80

AW 43-20

AW 43-80

AW 43-88

AW 43-89

AW 53-80

AW 53-88

AW 53-89

AW 61-88

MW 6-2

MW 13-35

MW 22-7

MW 22-14

MW 22-16

MW 31-7

MW 31-14

MW 31-16

MW 36-24

MW 36-29

MW 36-44

MW 36-67

MW 41-1

MW 43-43

MW 43-43/02

MW 43-61

MW 43-64

MW 43-69**MW 53-20****MW 53-80****MW 61-80**

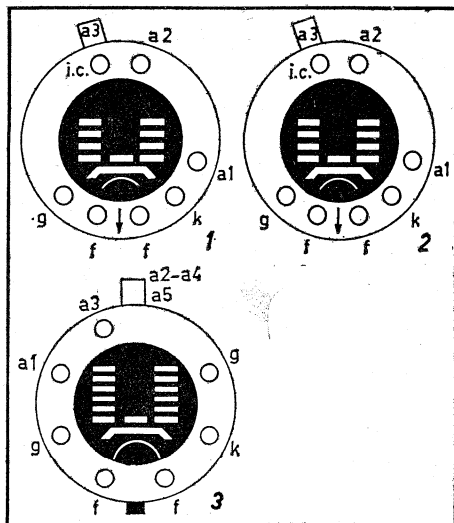
DIAM.	LENGTH	BASE	DEFL. ANGLE DEGREES	DEFL. AND FOC. METHOD		V _f	I _f	V _a
CM	CM			F	D	V	A	V
39 x 31	48	1	65	M	M	6,3	0,3	14000
52 x 40	58	2	65	M	M	6,3	0,3	16000
51 x 41	50	1	85	M	M	6,3	0,3	16000
58 x 47	53	1	85	M	M	6,3	0,3	16000

SUPPLEMENT**AW 47-91****AW 59-90****AW 59-91**

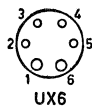
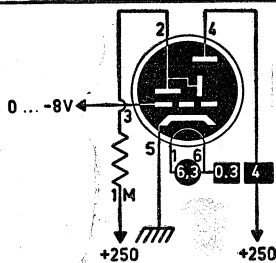
41 x 34	30	3	110	E	M	6,3	0,3	18000
52 x 42	38	3	110	E	M	6,3	0,3	16000
52 x 42	36	3	110	E	M	6,3	0,3	18000

ACC. GRID	CUTOFF VOLTAGE
V	V
300	40-86
300	40-80
300	40-80
300	40-80

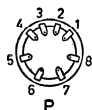
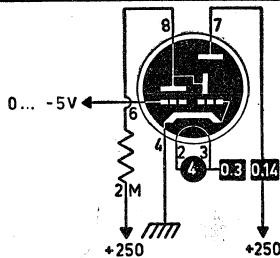
500	50-93
400	38-94
500	50-93



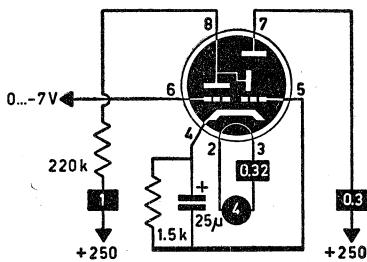
6E5



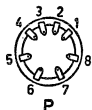
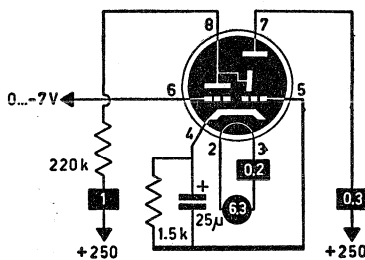
AM1



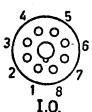
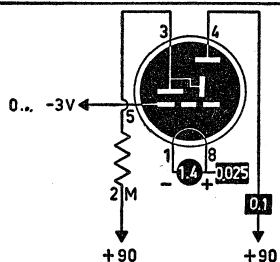
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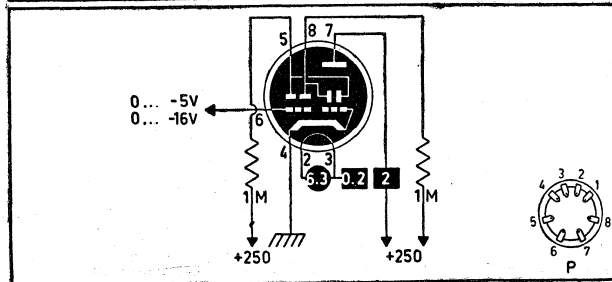
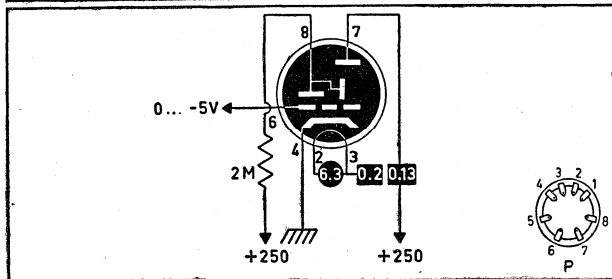
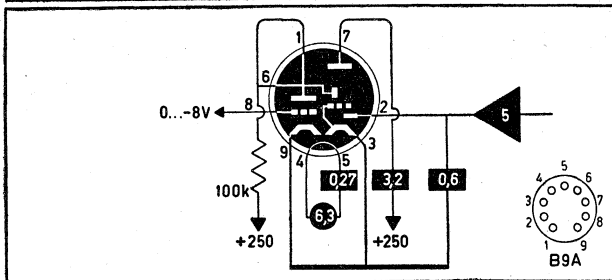
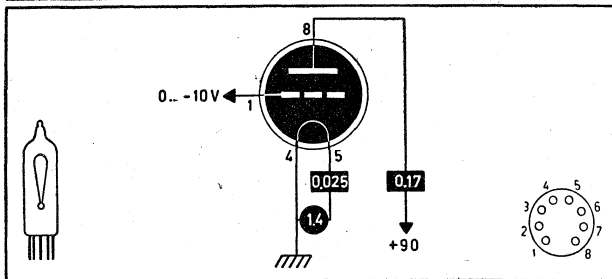
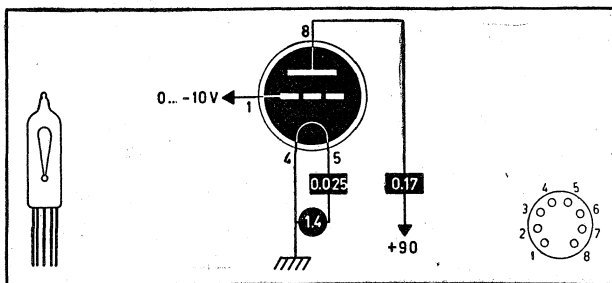


C/EM2

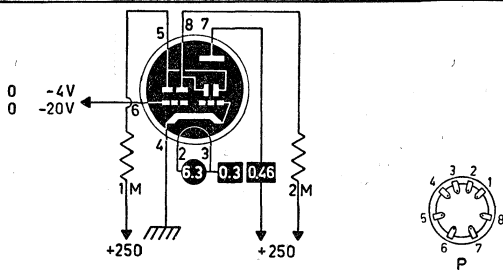


DM21

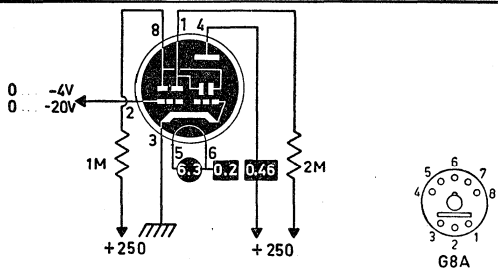




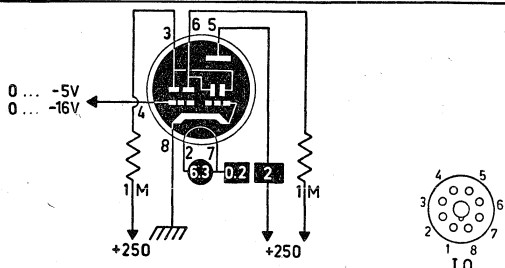
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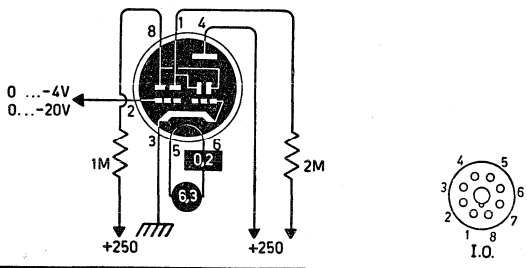
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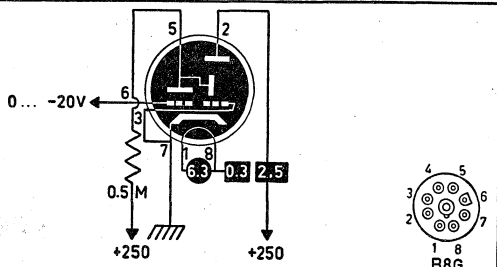
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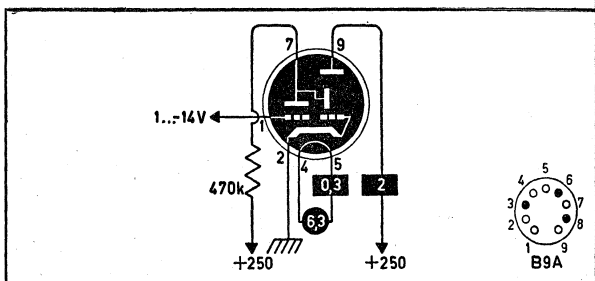


EM35

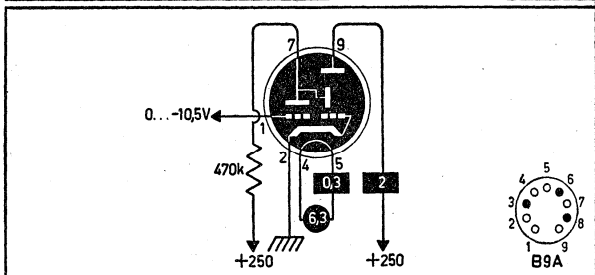


EM71

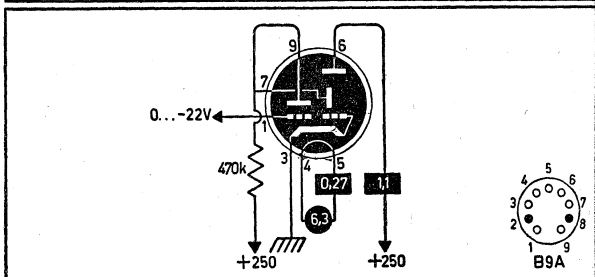




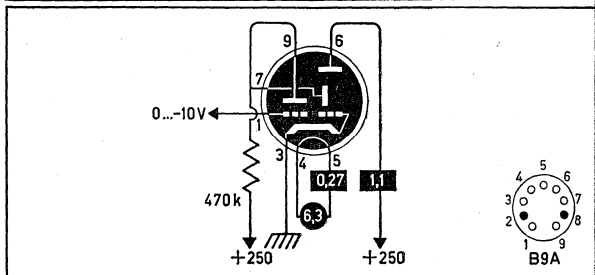
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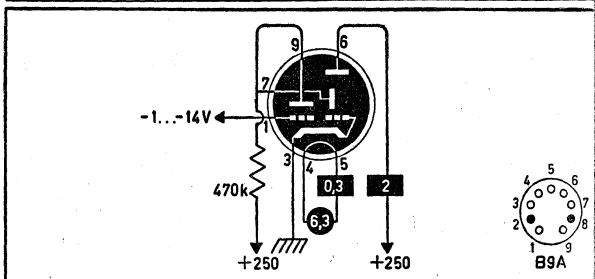
EM81



EM84

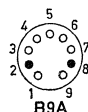
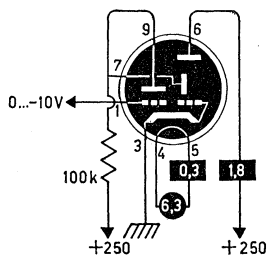


EM84a

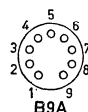
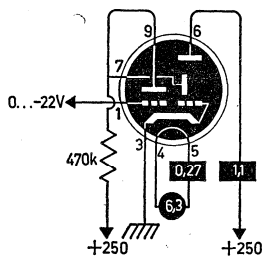


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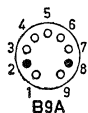
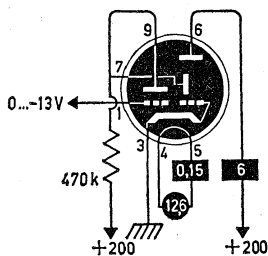
EM87



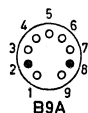
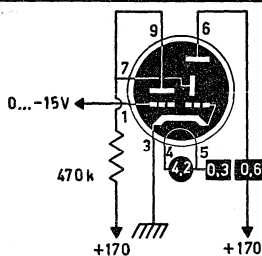
EM840



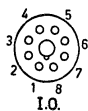
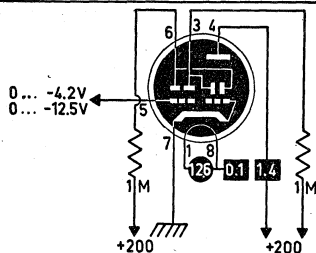
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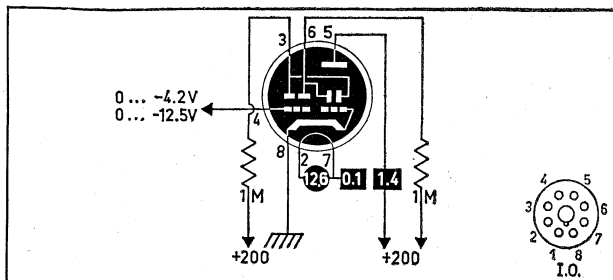


PM84

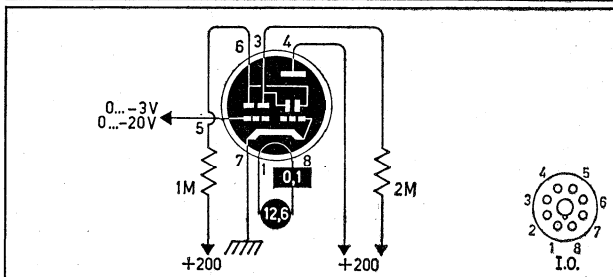


UM4

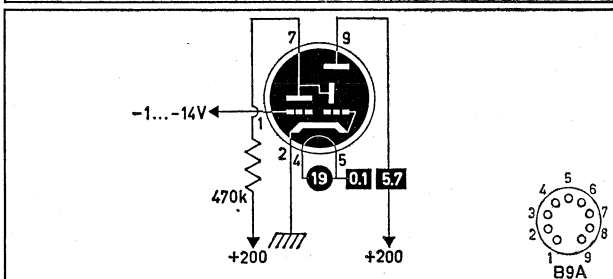




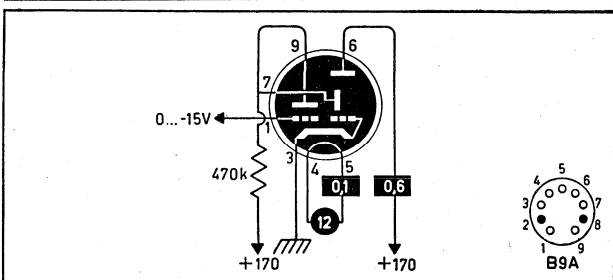
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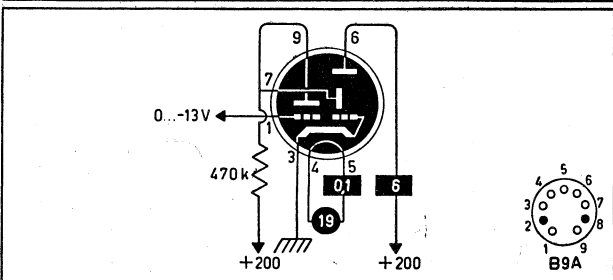
UM35



UM80

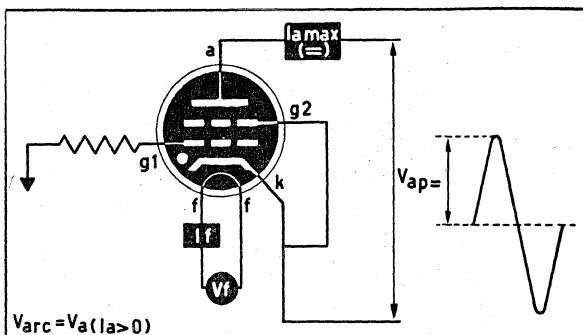


UM84

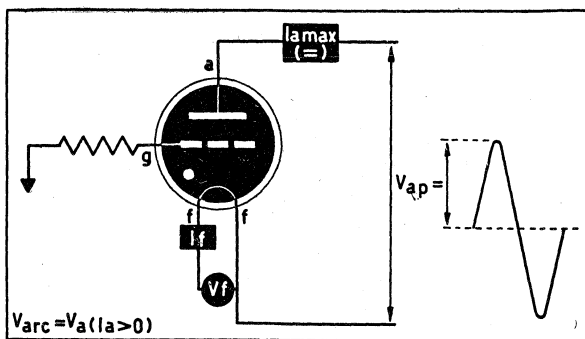


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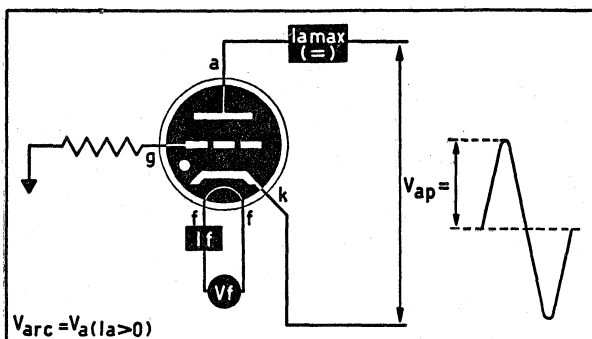
				
6AB5/6N5	-	CV843	-	-
6AF6G	-	CV847	-	-
6E5	-	CV1906	1629	1629
6G5G	6U5G	-	-	-
6U5G	6G5G	CV2747	-	-
1629	-	CV1756	6E5	6E5
AM2	-	-	C/EM2	-
C/EM2	-	-	AM2	-
DM70	-1M3-	CV2980	-	DM71
DM71	-	-	-	DM70
EM1	-	CV2942	-	-
EM4	-	CV1434	-	EM34
EM5	-	-	EM11	EM11
EM11	-	-	EM5	EM5
EM34	-6CD7-	CV394	-	EM4
EM80	-6BR5-	CV1352	-	EM85
EM84	EM840	-	PM84	-
EM85	-	-	-	EM80
EM840	EM84	-	-	-
PM84	-	-	EM84	-
UM4	-	-	-	UM34
UM34	-	-	-	UM4



V_f	I_f	V_{ap}	$I_{a\max}$	V_{arc}	Base	
V	A	V	A	V	nr.	
6,3	0,6	650	0,1	8	4	2D21
6,3	2,6	650	0,8	10	9	3D22A
6,3	0,6	650	0,1	8	8	502A
6,3	0,6	650	0,1	8	8	2050
6,3	0,6	650	0,1	8	8	2050A
5	4,5	1000	2,5	16	10	5560
6,3	0,15	500	0,025	10	4	5696
6,3	0,6	650	0,1	8	4	5727
6,3	2,6	650	0,5	10	3	6012
6,3	0,6	650	0,1	8	4	PL2D2
6,3	0,6	650	0,01	8	4	PL572
6,3	0,95	650	0,3	10	1	PL657



	V_f	I_f	V_{ap}	$I_{a \max}$	V_{arc}	Base
	V	A	V	A	V	nr.
3C23	2,5	7	1250	1,5	15	5
627	2,5	6	1250	0,64	12	5
5557	2,5	5	5000	0,25	16	5
PL3C23	2,5	7	1500	1,6	12	5
PL5544	2,5	12	1500	3,2	12	5
PL5557	2,5	5	2500	0,5	12	5
PL5632	2,5	9	900	2,5	10	6
PL5684	2,5	9	1000	2,5	10	6
PL6755	2,5	11	1500	3,2	12	5



V_f	I_f	V_{ap}	$I_{a \max}$	V_{arc}	Base
V	A	V	A	V	nr.
2,5	2,6	350	0,04	15	2
6,3	0,6	350	0,075	16	7
2,5	1,5	350	0,075	16	2
5	4	1000	2,5	16	11
5	4,5	1000	2,5	12	11

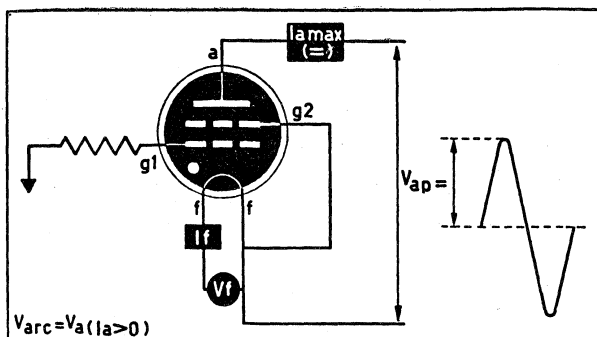
629

884

885

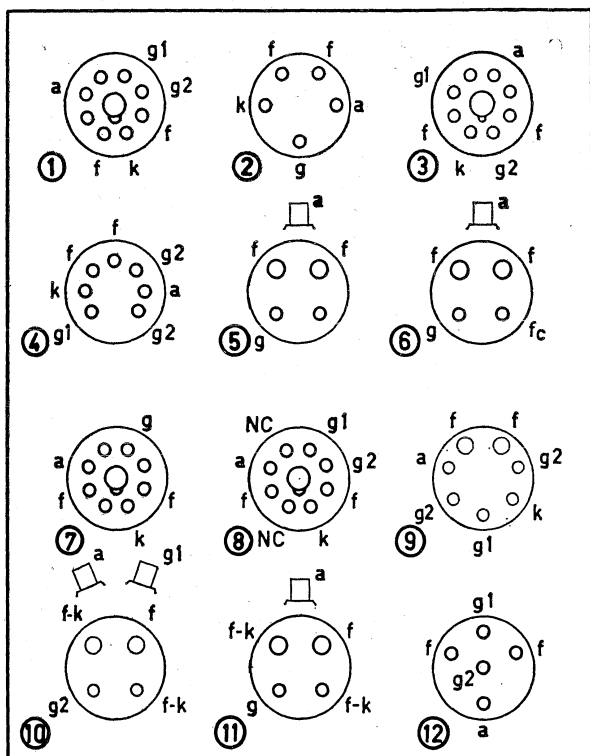
5559

PL5559



V_f	I_f	V_{ap}	$I_{a \max}$	V_{arc}	Base
V	A	V	A	V	nr.
2	2,6	650	0,5	15	12

PL1607



TRANSISTOR HANDBOOK

1st EDITION	JANUARY 1961
2nd EDITION	OCTOBER 1961
3rd EDITION	SEPTEMBER 1962
4th EDITION	JULY 1963



DE MUIDERKRING N.V.
BUSSUM NETHERLANDS

- 9 - Fréquence-limite en MHz. La lettre „k” derrière la valeur signifie qu'il s'agit de f_{ae} en kHz. Entre parenthèses, la fréquence maxima (MHz) en montage oscillateur. Le signe " signifie: produit de l'amplification et de la largeur de bande.
- 10 - I_{cho} en microampères à la tension maxima et à la température ambiante de 25 centigrades. Entre parenthèses la valeur en milliampères.
- 11 - Les chiffres dans cette colonne renvoient aux croquis des mesures des transistors.
- 12 - Les numéros renvoient à la liste des fabricants.

Application

- | | |
|---------------------------------------|--|
| 1 - universel | 8 - commutateur de puissance |
| 2 - préamplificateur à faible souffle | 9 - oscillateur |
| 3 - amplificateur BF | 10 - changeur de fréquence |
| 4 - étage d'attaque | 11 - amplificateur HF et MF |
| 5 - ampli classe B | 12 - amplificateur pour fréquences élevées |
| 6 - ampli de puissance | 13 - disponible en type militaire |
| 7 - calculateurs électroniques | |

- 1 - Typen-Nummer des Transistors. Das Zeichen + bedeutet, daß diese Type nicht mehr erhältlich ist.
- 2 - X bedeutet PNP-Transistor, O bedeutet NPN-Transistor.
- 3 - X bedeutet: Es handelt sich um einen Germanium-Transistor, O bedeutet: Silicium-Transistor.
- 4 - Herstellungsart (siehe Seite II).
- 5 - Anwendung (siehe unten).
- 6 - Maximale Verlustleistung in Milliwatt bei einer Umgebungstemperatur von 25° C. In Klammern Wert in Watt.
- 7 - Maximale Kollektor-Emitter-Spannung. In Klammern höchste Spannung zwischen Kollektor und Basis (gewöhnlich viel höher als V_{ce}).
- 8 - Verstärkungsfaktor bei Gleichstrom. In Klammern Verstärkungsfaktor für kleine Wechselfspannungen. Das Zeichen " bedeutet, daß der angegebene Wert für die Stromverstärkung in Basisschaltung gilt (α).
- 9 - Grenzfrequenz in MHz. Der Buchstabe „k” hinter dem Wert bedeutet f_{ae} in kHz. In Klammern Grenzfrequenz in MHz in Oszillatorschaltung. Das Zeichen " bedeutet: Produkt aus Verstärkung und Bandbreite.
- 10 - I_{cho} in μA bei maximaler Spannung und Umgebungstemperatur von 25° C. In Klammern Wert in mA.
- 11 - Die Zahlen in dieser Spalte verweisen auf die Abmessungen der Transistoren.
- 12 - Die Zahlen beziehen sich auf die Herstellerliste.

Anwendung

- | | |
|----------------------------------|----------------------------------|
| 1 - Allgemein | 8 - Leistungsschalttransistor |
| 2 - Rauscharmer Vorverstärker | 9 - Transistor für Schwingstufen |
| 3 - NF-Verstärker | 10 - Transistor für Mischstufen |
| 4 - Treiberstufe | 11 - HF- und ZF-Verstärker |
| 5 - Klasse B Verstärker | 12 - Transistor für VHF-Stufen |
| 6 - Leistungsverstärker | 13 - Für militärische Zwecke. |
| 7 - Anwendung in Rechenmaschinen | |

Type Nr.	p-n-p x	n-p-n o	Germ. x	Silic. o	Construction	Use	Dissipation in mW (...) in W	V _{ce} in V (...) V _{cb} in V	HFE (...) H _{fe} ... H _{fb}	f _{ab} in Mc/s (...) f _{osc} max in Mc/s	I _{co} in μ A (...) in mA	Diagram	Manufacturers
1	2	3	4	5	6	7	8	9	10	11	12		

- 1 - Number by which the transistor is identified. An asterisk means that the type is no longer available.
- 2 - X means the transistor is p-n-p; O implies n-p-n.
- 3 - X means germanium; O means silicon.
- 4 - Type of construction (see page II).
- 5 - Classes of service (see below).
- 6 - Maximum transistor dissipation in milliwatts at a case temperature of 25° C. Between brackets figure is given in watts.
- 7 - Maximum collector-to-emitter voltage. Between brackets maximum collector-to-base voltage (usually greater than V_{ce}).
- 8 - Typical d.c. common-emitter forward current gain. Between brackets small-signal a.c. forward current gain. A" means that the figure is common-base forward current gain (alpha).
- 9 - Typical alpha cut-off frequency in Mc/s. A "k" following the number means f_{ae} and that the figure is in kc/s. Between brackets the figure is maximum frequency of oscillation in Mc/s. A" indicates that the figure is gain-band-width product.
- 10 - I_{co} in μ A at maximum voltage and a case temperature of 25° C. Between brackets the figure is given in mA.
- 11 - Approximate case dimensions according to outlines.
- 12 - Manufacturers currently supplying the type.

Classes of service

- | | |
|----------------------------|---------------------------------|
| 1 - General purpose | 8 - Power convertor/switch |
| 2 - Low noise preamplifier | 9 - Oscillator |
| 3 - Audio amplifier | 10 - Mixer |
| 4 - Driver | 11 - HF/IF amplifier |
| 5 - Class B amplifier | 12 - VHF amplifier |
| 6 - Power amplifier | 13 - Military version available |
| 7 - Computer purpose | |

- 1 - Numéro du type de transistor. Le signe + signifie que ce type n'est plus disponible.
- 2 - X signifie transistor PNP; O signifie transistor NPN.
- 3 - X signifie qu'il s'agit d'un transistor au germanium; O signifie qu'il s'agit d'un transistor au silicium.
- 4 - Méthode de fabrication (voir page II).
- 5 - Application (voir page IV).
- 6 - Dissipation maxima en milliwatts à la température ambiante de 25 centigrades. Entre parenthèses, la valeur en watts.
- 7 - Potentiel maximum collecteur-émetteur. Entre parenthèses, le potentiel maximum entre collecteur et base (généralement plus élevé que V_{ce}).
- 8 - Facteur caractéristique d'amplification de courant continu. Entre parenthèses, le facteur d'amplification pour signaux de faible tension alternative. Le signe " signifie que la valeur donnée constitue le facteur d'amplification de courant en cas de montage à base commune (α).

Type Nr.	p-n-p		n-p-n		Use	Dissipation in mW (...) in W	V_{ce} in V (...) V_{cb} in V	H_{FE} (...) H_{fe} ... H_{fb}	f_{ab} in Mc/s (...) f_{osc} max in Mc/s	I_{co} in μA (...) in mA	Diagram	Manufacturers
	x	o	x	o								
1	2	3	4	5	6	7	8	9	10	11	12	

- 1 - Typenummer van de transistor. Een kruisje betekent dat het type niet meer beschikbaar is.
- 2 - X betekent p-n-p transistor; O is n-p-n.
- 3 - X is een germanium transistor; O een silicium type.
- 4 - Fabricage methode (zie hieronder).
- 5 - Toepassingen (zie hieronder).
- 6 - Maximum dissipatie in mW bij een omgevingstemperatuur van 25° C. Tussen haakjes de waarde in W.
- 7 - Maximum collector-emissor spanning. Tussen haakjes de maximum collector-basis spanning (meestal groter dan V_{ce}).
- 8 - Karakteristieke gelijkstroom versterkingsfactor. Tussen haakjes de stroomversterkingsfactor voor kleine wisselspanningssignalen. Een " betekent dat de gegeven waarde de stroomversterkingsfactor voor de gemeenschappelijke basisschakeling is (α).
- 9 - Grensfrequentie in MHz. Een „k" achter de waarde betekent f_{ae} in kHz. Tussen haakjes de maximum frequentie als oscillator in MHz. Een " betekent produkt van versterking en bandbreedte.
- 10 - I_{cbo} in μA bij maximum spanning en een omgevingstemperatuur van 25° C. Tussen haakjes de waarde in mA.
- 11 - De getallen in deze kolom verwijzen naar de maatschetsen van de transistoren.
- 12 - De nummers verwijzen naar de fabrikantenlijst.

Toepassingen

- | | |
|---------------------------------|---------------------------------------|
| 1 - Algemene toepassing | 8 - Schakeltransistor |
| 2 - Ruisarme voorversterker | 9 - Oscillator |
| 3 - l.f. versterker | 10 - Mengtransistor |
| 4 - Drijver | 11 - h.f./m.f. versterker |
| 5 - Klasse B versterker | 12 - r.f. (v.h.f.) versterker |
| 6 - Vermogensversterker | 13 - Militaire uitvoering beschikbaar |
| 7 - Toepassing in rekenmachines | |

Fabricage methode

Type of construction

Méthode de fabrication

Herstellungsart

- | | |
|---------------------------|---------------------------|
| AD - Alloy Diffused | MD - Micro-Diffused |
| AJ - Alloy Junction | ME - Mesa |
| DJ - Diffused Junction | PC - Point Contact Type |
| DD - Double Diffused Mesa | PL - Planar |
| DM - Diffused Mesa | SA - Surface Alloy |
| DR - Drift Type | SB - Surface Barrier |
| GJ - Grown Junction | TD - Triple-Diffused-Mesa |
| | MA - Micro-Alloy |

TRANSISTORS

Basic circuit diagrams are given for a number of transistor types, which are divided into three groups, each group being marked by a different colour band, thus:

Small signal a.f. amplifiers (green);

a.f. power amplifiers (red);

r.f. and i.f. amplifiers, frequency changers (grey).

As transistor parameters depend largely on the working point chosen and on the source- and load-impedances, the values shown in the diagrams are valid only for that specified combination.

In many instances two sets of values are given for different supply voltages, the values pertaining to the alternative supply voltage being written in brackets. All circuit diagrams are so designed that no risk of damage could arise from normal variations in transistor characteristics, not even if near-equivalent types are used. Additional characteristics, not listed in the circuit diagrams, are to be found in the tables at the end of this section. In the circuit diagrams the following abbreviations are used:

A.G.C.	automatic gain control
Ampl.	amplifier
Ant.	aerial, antenna
Cath.pict.tube	cathode of picture tube
Chan.	channel
C_n	neutralising capacitor
Conv.	converter
C_p	padding capacitor
d_t	total harmonic distortion
I_c	collector current
I_{cm}	maximum collector current
I_{cr}	quiescent collector current
I_e	emitter current
I_{in}	signal input current
IF	intermediate frequency
IFT	IF transformer
Mix	mixer (frequency changer)
Omitted	omitted
Osc	oscillator
P_{in}	signal input power
R_L	total load resistance in ohms
R_s	DC resistance of secondary winding
R_{sp}	DC resistance of loudspeaker
V_{in}	signal input voltage
Z_c	collector impedance
Z_{ce}	collector-to-collector impedance
Z_{in}	input impedance
Z_m	microphone impedance

The transistors in the tables are listed in numerical/alphabetical order. An asterisk (+) behind the type number means that the type is no longer available. The code in column 4 describes the method of manufacture. The numbers in column 5 indicate the class of service. Typical performance figures are usually given; a + following the number means that the value given is a minimum quantity, a — means that it is a maximum value.

Because of the very large number of transistor design parameters, only the most important ones needed for rough location are given in tables. For complete information it is advisable to consult the data

sheets, which are available from the manufacturers mentioned in column 12. The given quantities are valid at an ambient temperature of 25 degrees Centigrade.

In the tables, the maximum transistor dissipation as given in column 6 is valid only at a case temperature of 25° C and under the best possible cooling conditions as recommended by the manufacturers. To calculate the permissible dissipation at $T_{amb} = 45^{\circ} \text{C}$, multiply the value in column 6 by 0,6 for germanium transistors, and by 0,83 for silicon items.

Maximum permissible collector to emitter voltage V_{ce} , given in column 7, apply to circuits with a sufficiently low external base-to-emitter impedance and cut-off base-emitter diode as prescribed by the manufacturer.

In column 8, the minimum value of the d.c. common emitter forward current gain H_{FE} ; the small-signal a.c. forward current gain H_{fe} ; or the common-base forward gain H_{fb} is given.

Column 9 gives the minimum value of the typical alpha cut-off frequency $f_{\alpha h}$ (common base) in Megacycles. Some manufacturers, however, only give the maximum frequency of oscillation $f_{osc, max}$ (roughly twice $f_{\alpha h}$). Others give the gain figure as a gainbandwidth product f_T .

In column 11 the approximate case dimensions according to outlines are given, and the numbers in column 12 refer to the names of the manufacturers.

TRANSISTOREN

Voor een aantal transistor typen zijn representatieve basis schakelingen opgenomen, ingedeeld in drie groepen, onderscheiden d.m.v. kleurranden, n.l.

a.f. versterkers voor kleine signalen (groen);

a.f. eindtrappen (rood);

r.f. en m.f. versterkers, alsmede frequentie omvormers (grijs).

De karakteristieke grootheden van transistoren zijn sterk afhankelijk van de instelling en de signaalbron- resp. belastingimpedantie. De bij de schematische schakelvoorbeelden vermelde gegevens gelden dan ook uitsluitend voor die bepaalde instelwaarden.

Zoveel mogelijk zijn de waarden voor twee verschillende voedingsspanningen verstrekt; de waarden voor de tweede spanning zijn tussen haakjes gezet.

De schakelvoorbeelden zijn zo gekozen, dat, ook indien hierin nage-noeg equivalente typen worden toegepast, geen gevaar voor beschadiging van de transistoren ontstaat als gevolg van geringe afwijkingen in de eigenschappen.

Ter aanvulling van de volgens bovenstaand systeem vastgelegde eigenschappen zijn verdere gegevens verwerkt in de tabellen. Voorts geldt het volgende:

A.G.C.	Automatische versterkingsregeling
Ampl.	Versterker
Ant.	Antenne
Cath.pict.tube	Katode van beeldbuis
Chan.	Kanaal
C_n	Neutraliseringscondensator

Conv.	Frequentie omvormer
C_p	Padder condensator
d_t	Totale vervorming
I_c	Collectorstroom
I_{cm}	Max. collectorstroom
I_{cr}	Collector ruststroom
I_e	Emissorstroom
I_{in}	Ingangsstroom voor uitsturing
IF	m.f.
IFT	m.f. transformator
Mix	Frequentie omvormer
Omitted	Niet aanwezig
Osc	Oscillator
P_{in}	Ingangsvermogen voor uitsturing
R_L	Totale belasting in ohm
R_s	Gelijkstroomweerstand van de secundaire
R_{sp}	Luidspreker weerstand
Tuner	Afstemmer
V_{in}	Ingangsspanning voor uitsturing
Z_c	Collector impedantie
Z_{ce}	Impedantie collector-collector
Z_{in}	Ingangsimpedantie
Z_m	Microfoon impedantie
Z_t	Telefoon impedantie

De transistoren in de tabellen zijn gerangschikt in numeriek/alfabetische volgorde. Een kruisje (+) achter het typenummer betekent, dat het type niet meer beschikbaar is. De lettercode in kolom 4 verwijst naar de fabricagemethode en de getallen in kolom 5 verwijzen naar de toepassing.

Over het algemeen zijn de karakteristieke waarden vermeld; een + achter de gegeven waarde betekent, dat deze een minimum is dat te allen tijde wordt bereikt (dus of meer); een — wil zeggen maximum te bereiken waarde (.... of minder).

Omdat elke transistor een groot aantal parameters bezit zijn in de tabellen slechts de belangrijkste gegevens vermeld, nodig voor toepassing in een bepaalde schakeling. Voor volledige documentatie raadplege men de gegevens zoals die door de fabrikanten, genoemd in kolom 12, worden verstrekt.

De in de tabellen gegeven waarden gelden bij een omgevingstemperatuur van 25° C. Zo geldt ook de maximum collectordissipatie (kolom 6) slechts bij een omgevingstemperatuur van 25° C en met koeling zoals deze door de fabrikant is voorgeschreven. Berekening van de toegestane dissipatie bij $T_{omg} = 45^\circ \text{C}$ geschiedt door de in kolom 6 gegeven waarde te vermenigvuldigen met 0,6 voor zover het germanium transistoren betreft en met 0,83 voor silicium typen.

De maximum toegestane collector-emissorspanning V_{ce} (kolom 7) geldt voor schakelingen met een voldoende lage uitwendige basis-emissor impedantie en afgeknepen basis-emissor diode, zoals voorgeschreven door de fabrikant.

In kolom 8 zijn gegeven: de minimum waarde van de gelijkstroom versterkingsfactor H_{FE} voor de gemeenschappelijke emissorschakeling; de stroomversterkingsfactor voor kleine wisselspanningssignalen H_{fe} , of de stroomversterkingsfactor voor de gemeenschappelijke basis-schakeling H_{fb} .

Kolom 9 geeft de minimum waarde van de karakteristieke grensfrequentie f_{ab} (gemeenschappelijke basis) in MHz. Sommige fabrikanten echter geven alleen de maximum frequentie als oscillator (ruwweg $2 \times f_{ab}$), anderen geven de versterkingsfactor als een versterkings-bandbreedte product f_T .

De nummers in kolom 11 verwijzen naar de maatschetsen van de transistoren, de nummers in kolom 12 naar de namen van de fabrikanten.

TRANSISTORS

Des schémas de principe sont représentés pour un certain nombre de types de transistors, répartis en trois groupes, que l'on distingue au moyen de bandes de couleur, savoir:

amplificateurs pour faibles signaux B.F. (vert)

étages finaux B.F. (rouge)

amplificateurs H.F. et M.F. et changeurs de fréquence (gris).

Les grandeurs caractéristiques de transistors dépendent largement des valeurs de couplage et des impédances d'entrée et de charge.

Les données figurant sur les schémas de principe valent dès lors exclusivement pour ces valeurs de couplage déterminées.

Les valeurs sont indiquées autant que possible pour deux différentes tensions d'alimentation; les valeurs pour la seconde tension sont mises entre parenthèses.

Les exemples de couplages ont été choisis de telle sorte que, s'il est fait application de types de transistors à peu près équivalents, il n'y a aucun danger de détérioration des transistors par suite de faibles différences de caractéristiques.

D'autres données reprises dans les tableaux complètent les caractéristiques établies selon le système susmentionné. Pour le surplus, il y a lieu de tenir compte des symboles ci-après:

A.G.C.	Commande automatique de gain
Ampl.	Amplificateur
Ant.	Antenne
Cath.pict.tube	Cathode du tube image
Chan.	Canal
C _n	Condensateur de neutralisation
Conv.	Changeur de fréquence (convertisseur)
C _p	Condensateur padding
d _t	Distorsion totale
I _c	Courant du collecteur
I _{cr}	Courant maximum du collecteur
I _{cm}	Courant de repos
I _e	Courant de l'émetteur
I _{in}	Courant d'entrée pour ampl. max.
IF	M.F.
IFT	Transfo M.F.
Mix	Changeur de fréquence (mélangeur)
Omitted	Non prévu (manque)
Osc	Oscillateur
P _{in}	Puissance d'entrée pour ampl. max.
R _t	Charge totale en ohms
R _s	Résistance au c.c. du secondaire
R _{sp}	Résistance haut-parleur
Tuner	Adaptateur (accord)
V _{in}	Tension d'entrée pour ampl. max.
Z _c	Impédance collecteur
Z _{cc}	Impédance de collecteur à collecteur
Z _{in}	Impédance d'entrée
Z _m	Impédance microphone
Z _t	Impédance de l'écouteur (casque)

Les transistors repris dans les listes sont rangés par ordre numérique/alphabétique.

Le signe + à la suite du numéro du type signifie que ce type n'est plus disponible. Le code dans la colonne 4 renvoie à la méthode de fabrication et les nombres dans la colonne 5 à l'application.

Généralement les valeurs caractéristiques sont mentionnées; le signe + derrière la valeur donnée signifie qu'il s'agit d'un minimum obtenu en toutes circonstances (donc... ou davantage); le signe — signifie: valeur maxima (donc... ou moins).

Etant donné que tout transistor possède une plage de paramètres, seules les données principales nécessaires pour une application déterminée sont reprises. Pour une documentation complète il y aura lieu de se référer aux données fournies par les fabricants indiqués dans la colonne 12.

Les valeurs reprises dans les tableaux sont valables pour une température ambiante de 25° centigrades.

La dissipation maxima du collecteur (colonne 6) n'est également valable que pour la température ambiante de 25° centigrades et moyennant le refroidissement prescrit par le fabricant. Pour le calcul de la dissipation admissible pour une température ambiante (T_{amb}) de 45° centigrades, la valeur figurant dans la colonne 6 doit être multipliée par 0,6 pour les transistors au germanium et par 0,83 pour ceux au silicium.

La tension maxima admissible entre collecteur et émetteur V_{ce} (colonne 7) concerne les montages à impédance externe base-émetteur suffisamment faible et la diode base-émetteur en „cut-off”, comme prescrit par le fabricant.

La colonne 8 indique la valeur minima du facteur H_{FE} d'amplification de courant continu pour le montage en émetteur commun; le facteur d'amplification de courant pour signaux à faible tension alternative H_{fe} ou le facteur d'amplification de courant pour le montage en base commune H_{fb} .

La colonne 9 donne la valeur minima de la fréquence-limite caractéristique f_{ah} (base commune) en MHz. Certains fabricants indiquent uniquement la fréquence maxima en oscillateur (environ $2 \times f_{ah}$), d'autres le facteur d'amplification sous la forme du produit f_T de l'amplification et de la largeur de bande. Les numéros repris dans la colonne 11 renvoient aux croquis des mesures des transistors et ceux de la colonne 12 aux fabricants.

TRANSISTOREN

Für eine Anzahl von Transistor-Typen sind 3 Gruppen von Grundschaltungen aufgeführt, die sich durch farbige Umrandungen unterscheiden.

NF Kleinsignalverstärker (grün)

NF Leistungsverstärker (rot)

HF und ZF-Verstärker sowie Frequenzwandler (grau).

Die Transistor-Parameter hängen weitgehend vom gewählten Arbeitspunkt, dem Ein- und Ausgangswiderstand ab. Die in den Schaltbildern angegebenen Werte gelten daher lediglich für diese spezielle Anordnung.

Soweit möglich sind die Werte für 2 verschiedene Speisespannungen angegeben. Die Werte für die zweite Spannung sind in Klammern gesetzt. Sämtliche Schaltbilder sind so ausgelegt, daß auch bei Verwendung ähnlicher Typen keine Beschädigung der Transistoren infolge geringfügiger Abweichung derselben erfolgt. Weitere Einzelheiten, die in den Schaltbildern nicht aufgeführt sind, können den Tabellen am Schluß dieses Abschnittes entnommen werden.

Folgende Abkürzungen werden in den Schaltbildern angewandt:

A.G.C.	Automatische Verstärkungsregelung
Ampl.	Verstärker
Ant.	Antenne
Cath.pict.tube	Kathode Bildröhre
Chan.	Kanal
C_n	Neutralisierungskondensator
Conv.	Frequenzumformer
C_p	Parallelkondensator
d_t	Gesamtverzerrung
I_c	Kollektorstrom
$I_{c,m}$	Max. Kollektorstrom
I_{cr}	Kollektorreststrom
I_e	Emitterstrom
I_{in}	Steuerstrom
IF	Zwischenfrequenz
IFT	Zwischenfrequenztransformator
Mix	Frequenzwandler
Omitted	Nicht vorhanden
Osc	Oscillator
P_{in}	Eingangsleistung
R_l	Lastwiderstand in Ohm
R_s	Gleichstromwiderstand der Sekundärwicklung
R_{sp}	Lautsprecherwiderstand
V_{in}	Eingangsspannung
Z_c	Kollektorimpedanz
Z_{ce}	Kollektor-Kollektorimpedanz
Z_{in}	Eingangsimpedanz
Z_m	Mikrofonimpedanz
Z_t	Hörerimpedanz

Die Transistoren in den Tabellen sind nach Zahlen und alphabetisch geordnet. Ein Kreuz (+) hinter der Typennummer bedeutet, daß diese Type nicht mehr erhältlich ist. Die Code-Nummer in der Spalte 4 weist auf die Herstellungsart hin. Die Zahlen in Spalte 5 bedeuten die Anwendungsarten.

Normalerweise sind die charakteristischen Merkmale angegeben. Ein „+“ nach der Zahl bedeutet Kleinstwert, ein „—“ GrößtWert.

Da jeder Transistor eine große Anzahl von Parametern besitzt, sind in den Tabellen lediglich die hauptsächlichsten angegeben, die für eine Schaltung erforderlich sind. Für weitere Informationen ist es empfehlenswert, die Angaben in den Datenblättern der Hersteller zu verwenden. Die Hersteller sind in der Spalte 12 angegeben. Die in den Tabellen aufgeführten Werte gelten bei einer Umgebungstemperatur von 25° C. Dies gilt ebenfalls für die max. Kollektorverlustleistung (Spalte 6) und unter den vom Hersteller empfohlenen Kühlungsbedingungen. Um die zulässige Verlustleistung bei $T_{amb} = 45^{\circ} \text{C}$ zu errechnen, ist der Wert in der Spalte 6 mit 0,6 für Germaniumtransistoren und 0,83 für Siliciumtransistoren zu multiplizieren. Die maximal zulässige Kollektoremitterspannung V_{ce} (Spalte 7) gilt für Schaltungen, bei denen eine genügend niedrige Abschlußimpedanz zwischen Basis und Emitter besteht.

In Spalte 8 sind angegeben der Kleinstwert des Gleichstromverstärkungsfaktors H_{FE} in Emitterschaltung; der Stromverstärkungsfaktor für kleine Wechselspannungen H_{fe} oder der Stromverstärkungsfaktor in Basisschaltung H_{fb} .

In Spalte 9 ist die niedrigste Grenzfrequenz f_{ab} (Basisschaltung) in MHz angegeben. Einige Hersteller geben jedoch die höchste Oszillatorfrequenz (ungefähr $2 \times f_{ab}$), andere dagegen den Verstärkungsfaktor als Produkt der Verstärkungsbandbreite f_T an.

In Spalte 11 sind die Abmessungen der Transistoren und in Spalte 12 die Herstellernamen angegeben.

TRANSISTORER

För ett antal transistor-typer har bifogats tre grupper av grundkopplingar som skiljer sig åt genom olika färgmarkeringar:

L.F. småsignalförstärkare (grön)

L.F. effektförstärkare (röd)

R.F. och M.F. förstärkare samt frekvensomvandlare (grå)

Transistorns parametrar är starkt beroende på inställningen och in- och utgångsimpedansen. Värden angivna i schemakopplingarna gäller därför bara för den här speciella kombinationen. I många fall har angivits två olika batterispänningar, inom parentes värdet för den andra batterispänningen.

Alla schemakopplingar har valts så att ingen risk för skada kan uppträda genom normala variationer i transistorns karakteristika, även om nästan ekvivalenta typer används.

Vidare karakteristika, som inte finns med i schemakopplingarna har angivits i tabeller i slutet av detta avsnitt.

Följande förkortningar används i schemakopplingarna:

A.G.C.	automatisk förstärkningsreglering
Ampl.	förstärkare
Ant.	antenn
Cath.pict.tube	katod av bildrör
Chan.	kanal
C _n	neutraliseringskondensator
Conv.	frekvensomvandlare
C _p	parallel kondensator
d _t	total distorsion
I _c	kollektorström
I _{cm}	maximum kollektorström
I _{er}	vilokollektorström
I _e	emitterström
I _{in}	signalingångsström
IF	mellanfrekvens
IFT	mellanfrekvenstransformator
Mix	frekvensomvandlare
Omitted	ej ansluten
Osc	oscillator
P _{in}	ingångseffekt
R _L	total utgångsimpedans i ohm
R _s	likströmsmotstånd av sekundär lindning
R _{sp}	likströmsmotstånd av högtalare
V _{in}	signalingångsspänning
Z _c	kollektorimpedans
Z _{ce}	kollektor-kollektorimpedans
Z _{in}	ingångsimpedans
Z _m	mikrofonimpedans
Z _t	telefonimpedans

Transistorerna i tabellerna är uppställda i alfanumerisk ordning. Tecknet "+" efter tynumret betyder att typen inte längre är tillgänglig. Koden i kolumn 4 hänvisar till tillverkningsmetoden och siffrorna i kolumn 5 hänvisar till användningsområdet.

Karakteristiska värden har vanligtvis angivits, ett "+" efter siffran betyder att uppgivna värdet är ett minimum värde, ett "-" betyder att det är ett maximum värde.

På grund av det stora antal transistor-parametrarna har endast de viktigaste värdena angivits, vilka är nödvändiga för en viss koppling. För vidare information hänvisas till uppgifter, vilka erhållas av fabrikanter, angivna i kolumn 12.

De i tabellerna angivna värdena gäller vid en omgivningstemperatur av 25° C. Maximum kollektorförlusteffekten (kolumn 6) gäller

endast vid en omgivningstemperatur av 25°C och med kylning som fabrikanten har föreskrivit.

För att räkna ut förlusteffekten vid $T_{\text{amb}} = 45^{\circ}\text{C}$ multipliceras det i kolumn 6 givna värdet med 0,6 i fall det gäller germanium-transistorer och med 0,83 för kisel-transistorer.

Maximum tillåtna kollektor-emitterspänningen V_{ee} (kolumn 7) gäller för kopplingar med en tillräckligt låg utvändig bas-emitter-impedans och strypt bas-emitter-diod, som föreskrivits av fabrikanten.

I kolumn 8 är angivet: minimum värdet av likströmförstärkningsfaktorn H_{FE} för jordad emitterkoppling; strömförstärkningsfaktorn för små växelspänningssignaler H_{fe} , eller strömförstärkningsfaktorn för jordad baskoppling H_{fb} .

Kolumn 9 ger minimum värdet av den karakteristiska gränsfrekvensen f_{ab} (jordad bas) i MHz. Några fabrikanter däremot ger endast maximum frekvensen som oscillator (ungefär $2 \times f_{\text{ab}}$), andra ger förstärkningsfaktorn som en förstärkningbandbredd-produkt f_{T} . I kolumn 11 har angivits transistormått och i kolumn 12 fabrikantnamn.

TRANSISTORES

Para cierto número de transistores se dan los circuitos de principio, clasificados en tres grupos, cada uno de los cuales está señalado una franja de diferente color:

amplificadores para señales débiles de B.F. (verde)

amplificadores de potencia B.F. (rojo)

amplificadores de R.F. y F.I., conversores de frecuencia (gris)

Como los parámetros de los transistores dependen en gran medida del punto de trabajo elegido y de las impedancias de entrada y de carga, los valores indicados en los circuitos de principio son válidos únicamente para las condiciones especificadas en cada caso.

En muchos circuitos se indican valores para dos tensiones de alimentación diferentes, poniendo entre paréntesis todos los valores que corresponden a una de ellas.

Los circuitos han sido diseñados de tal forma que no existe ningún riesgo de deterioro a consecuencia de una variación normal en las características de los transistores especificados o por el empleo de transistores casi equivalentes. Las características adicionales que no se indican en los circuitos de principio, se encuentran en las tablas de características.

En los circuitos de principio se utilizan las siguientes abreviaturas:

A.G.C.	Control automático de ganancia
Ampl	Amplificador
Ant	Antena
Cath.pict.tube	Cátodo de un tubo de imagen
Chan	Canal
C_n	Condensador de neutralización
Conv	Conversor de frecuencia
C_p	Condensador padding
d_t	Distorsión total
I_c	Corriente de colector
I_{cm}	Corriente máxima de colector
I_{cr}	Corriente de reposo de colector
I_e	Corriente de emisor
I_{in}	Corriente de la señal de entrada
IF	Frecuencia intermedia
IFT	Transformador de F.I.
Mix	Conversor de frecuencia (mezclador)

Omitted	No previsto (falta)
Osc	Oscilador
P_{in}	Potencia de la señal de entrada para ampl. máx.
R_L	Carga total en ohmios
R_s	Resistencia a la c.c. del secundario
R_{sp}	Resistencia del altavoz
Tuner	Sintonizador
V_{in}	Tension de la señal de entrada para ampl. máx.
Z_c	Impedancia de colector
Z_{cc}	Impedancia de colector a colector
Z_{in}	Impedancia de entrada
Z_m	Impedancia del micrófono
Z_t	Impedancia del auricular

Los transistores están dispuestos en las tablas siguientes en orden numérico/alfabético. El signo (+) detrás del número de tipo indica que este tipo ya no está disponible. Las letras de la columna 4 indican el metodo de fabricación y los números de la columna 5 la aplicación

En general se dan los valores típicos de funcionamiento; el signo + detrás de un número indica que se trata de un valor mínimo; el signo — indica que se trata de un valor máximo.

Debido al gran número de parámetros de los transistores, únicamente pueden darse en las tablas los más importantes y necesarios para el diseño. Para una información completa, se recomienda consultar las hojas de características, las cuales pueden ser obtenidas de los fabricantes mencionados en la columna 12.

Los valores indicados son válidos para una temperatura ambiente de 25 grados centígrados. La máxima disipación del transistor dada en la columna 6 de las tablas es válida únicamente para una temperatura de 25° C y las condiciones de refrigeración prescritas por el fabricante. Para hallar la disipación admisible a $T_{amb} = 45^\circ C$, multiplíquese el valor indicado en la columna 6 por 0,6 para los transistores de germanio, y por 0,83 para los de silicio.

La máxima tensión admisible entre colector y emisor V_{ce} , dada en la columna 7, se aplica a circuitos con una impedancia base-emisor suficientemente pequeña y el diodo base-emisor en corte (cut-off), como prescribe el fabricante.

En la columna 8 se dan los valores mínimos del factor de ganancia de corriente continua (H_{FE}) en circuito emisor común (H_{fe}), o en circuito base común (H_{fb}).

La columna 9 da el valor mínimo de la frecuencia de corte en circuito base común, en megaciclos por segundo. Algunos fabricantes dan únicamente la máxima frecuencia de oscilación (aproximadamente $2 \times f_{ab}$). Otros dan el factor de ganancia en forma de producto f_T de la ganancia por la anchura de banda.

Los numeros de la columna 11 corresponden a las ejecuciones y dimensiones, y los de la columna 12 a los nombres de los fabricantes.

TRANSISTORES

Para um número de tipos de transistores são apresentados circuitos básicos, devididos em três grupos, distinguidos por meio de bordas coloridas, a saber:

amplificadores de B.F. para sinais pequenos (verde);

estágios de B.F. (vermelho);

amplificadores de R.F. e F.I., bem assim conversores de frequência (cinza).

As grandezas características dos transistores dependem muito dos ajustes das tensões e das impedâncias da fonte de sinal de entrada resp. da carga de saída.

Por estes razões que valham somente os dados indicados nos circuitos esquemáticos apresentados.

Tanto que possível são fornecidos os valores para duas tensões de alimentação diferentes; os valores alternativos de tensão são colocados entre parênteses.

Os exemplos dos circuitos são arranjados de tal maneira que em caso sejam empregados tipos equivalentes, não haver perigo de danificar os transistores em virtude das pequenas deviações nas características.

Nas tabelas são fornecidos mais dados, completando as qualidades definidas conforme o sistema acima. São usados os seguintes símbolos:

A.G.C.	Controle de ganho automático
Ampl	Amplificador
Ant	Antena
Cath.pict.tube	Catodo do tubo d'imagem
Chan	Canal
C_n	Capacitor de neutralização
Conv	Conversor de frequência
C_p	Capacitor padder
d_t	Distorção total
I_c	Corrente do coletor
I_{cm}	Corrente máxima do coletor
I_{cr}	Corrente de repouso do coletor
I_e	Corrente do emissor
I_{in}	Corrente de entrada para saturação
IF	Frequência intermediária (F.I.)
IFT	Transformador de F.I.
Mix	Conversor de frequência
Omitted	Omitido
Osc	Oscilador
P_{in}	Energia de entrada para saturação
R_L	Carga total em ohms
R_s	Resistência C.C. do secundário
R_{sp}	Resistência do alto falante
Tuner	Sintonizador
V_{in}	Tensão de entrada para saturação
Z_c	Impedância do coletor
Z_{cc}	Impedância coletor-coletor
Z_{in}	Impedância de entrada
Z_m	Impedância do microfone
Z_t	Impedância do telefone

Os transistores são classificados nas tabelas por ordem numérico/alfabético. Um sinal (+) atrás a indicação do tipo significa que

este tipo não possa ser mais obtido. O código em letras na coluna 4 referem-se aos métodos de fabricação e os números na coluna 5 referem-se às aplicações.

Em geral são mencionados os valores característicos; um sinal (+) atrás o valor dado significa que este valor seja o mínimo que sempre possa ser conseguido (pois ...ou mais); um sinal (—) quer dizer o valor máximo conseguido (...ou menos).

Em virtude que os transistores possuam um grande número de parâmetros, são apenas mencionados nas tabelas os dados mais importantes para o emprego num certo circuito. Para uma documentação mais completa consulta-se os dados fornecidos pelos fabricantes, indicados em coluna 12.

Os valores dados nas tabelas valem para uma temperatura ambiente de 25° C. Assim também vale a dissipação máxima do coletor (coluna 6) apenas para uma temperatura de 25° C e com resfriamento como é prescrito pelo fabricante. O cálculo da dissipação com $T_{amb} = 45^{\circ} C$ se efetua multiplicando o valor dado em coluna 6 por 0,6 em caso de tratar-se de transistores de germânio, e por 0,83 para os tipos de silício.

A tensão máxima permitida entre coletor-emissor, V_{ce} (coluna 7) vale para circuitos com uma impedância externa base-emissor suficientemente baixa, e a corrente do diodo base-emissor cortada, conforme prescrição do fabricante.

Em coluna 8 encontra-se os valores mínimos do fator de amplificação corrente contínua H_{FE} para o circuito emissor comum; o fator de amplificação de corrente para sinais de corrente alternada pequenas H_{fe} , ou o fator de amplificação de corrente para um circuito base-comum H_{fb} .

A coluna 9 fornece o valor mínimo da frequência limite característica f_{ah} (base-comum) em Mc/s. Alguns fabricantes porém fornecem somente a frequência máxima como oscilador (global $2 \times f_{ah}$), outros indicam o fator como produto de amplificação vez faixa passante, f_T .

Os números na coluna 11 referem-se às diagramas dos transistores, os números na coluna 12 referem-se aos nomes dos fabricantes.

TRANSISTORI

Per un certo numero di transistori sono dati gli schemi dei circuiti fondamentali, divisi in 3 gruppi, ognuno dei quali è marcato con una diversa banda colorata:

- Amplificatori per piccoli segnali A.F. (verde)
- Amplificatori di potenza A.F. (rosso)
- Amplificatori R.F. e I.F., convertitori (grigio)

Poichè i parametri dei transistori dipendono largamente dal punto di lavoro scelto e dalle impedenze di entrata e di carico i valori mostrati nei diagramma sono validi solamente per tale combinazione specificata.

In molti casi sono dati due gruppi di valori per differenti tensioni di alimentazione, i valori pertinenti alle tensioni di alimentazione alternative essendo scritti fra parentesi.

Tutti gli schemi dei circuiti sono progettati in modo che ogni rischio di danno che potrebbe risultare da normali variazioni nelle caratteristiche dei transistori, è inesistente anche se sono impiegati tipi circa equivalenti.

Ulteriori caratteristiche, benchè non elencate negli schemi del circuito, si possono trovare nelle tavole in fondo di tale sezione. Negli schemi dei circuiti sono usate le seguenti abbreviazioni:

A.G.C.	guadagno automatico di controllo
Ampl.	amplificatore
Ant.	antenna aerea
Cath. pict.	tubo catodico
Chan.	Canale
C_n	condensatore di neutralizzazione
Conv.	Convertitore
C_p	Condensatore di padding
d_t	distorsione totale armonica
I_c	corrente di collettore
I_{cm}	massima corrente di collettore
I_{cr}	corrente di collettore di riposo
I_e	corrente di emettitore
I_{in}	corrente del segnale di entrata
IF	media frequenza
IFT	trasformatore I.F.
Mix.	miscelatore
Omitted	omissis
Osc.	oscillatore
P_{in}	potenza del segnale di entrata
R_l	resistenza totale di carico in ohms
R_s	resistenza D.c. dell'avvolgimento secondario
R_{sp}	resistenza D.c. dell'altoparlante
V_{in}	tensione del segnale d'entrata
Z_c	impedenza del collettore
Z_{ce}	Impedenza collettore-collettore
Z_{in}	Impedenza d'entrata
Z_m	Impedenza del microfono

I transistori elencati nelle tavole sono in ordine numerico/alphabetico. Un asterisco (+) accanto al numero del tipo significa che tale tipo non è più ottenibile sul mercato. Il codice in colonna 4 descrive il metodo di fabbricazione. Il numero in colonna 5 indica la classe di servizio. Normalmente sono date prestazioni tipiche; un + che segue il numero significa che il valore dato è quello minimo, mentre un — significa che è quello massimo.

A causa dell'amplissimo numero di parametri di progetto del transistor solo i più importanti che occorrono per una definizione approssimata, sono reperibili nelle tavole.

Per un'informazione più completa, si raccomanda di consultare i fogli tecnici forniti dai costruttori menzionati nella colonna 12. I valori dati sono validi ad una temperatura ambiente di 25°C.

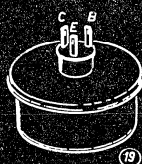
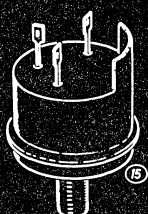
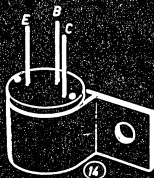
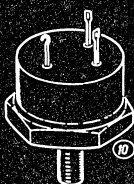
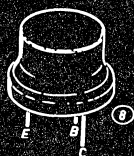
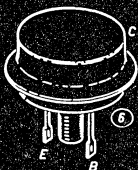
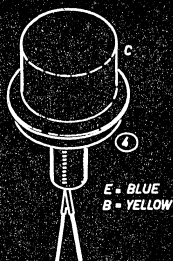
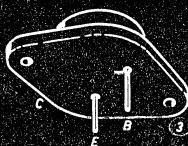
Nelle tavole la massima dissipazioni data nella colonna 6 è valida solo a una temperatura di 25°C del contenitore e sotto condizioni di raffreddamento le migliori possibili come raccomandato dai costruttori. Per calcolare la dissipazione ammissibile alla temperatura ambiente di 45°C, occorre moltiplicare il valore dato in colonna 6 per 0,6 per i transistori al Germanio, e per 0,83 per quelli al Silicio.

La massima tensione ammissibile collettore-emettitore V_{ce} , data in colonna 7, deve essere applicata ai circuiti con una sufficientemente bassa impedenza esterna base-emettitore e al ginocchio della curva del diodo base-emettitore come prescritto dai fabbricanti.

In colonna 8 è dato il valore minimo del guadagno di corrente diretta continua ad emettitore commune H_{fe} ; o il guadagno diretto a base commune H_{fb} .

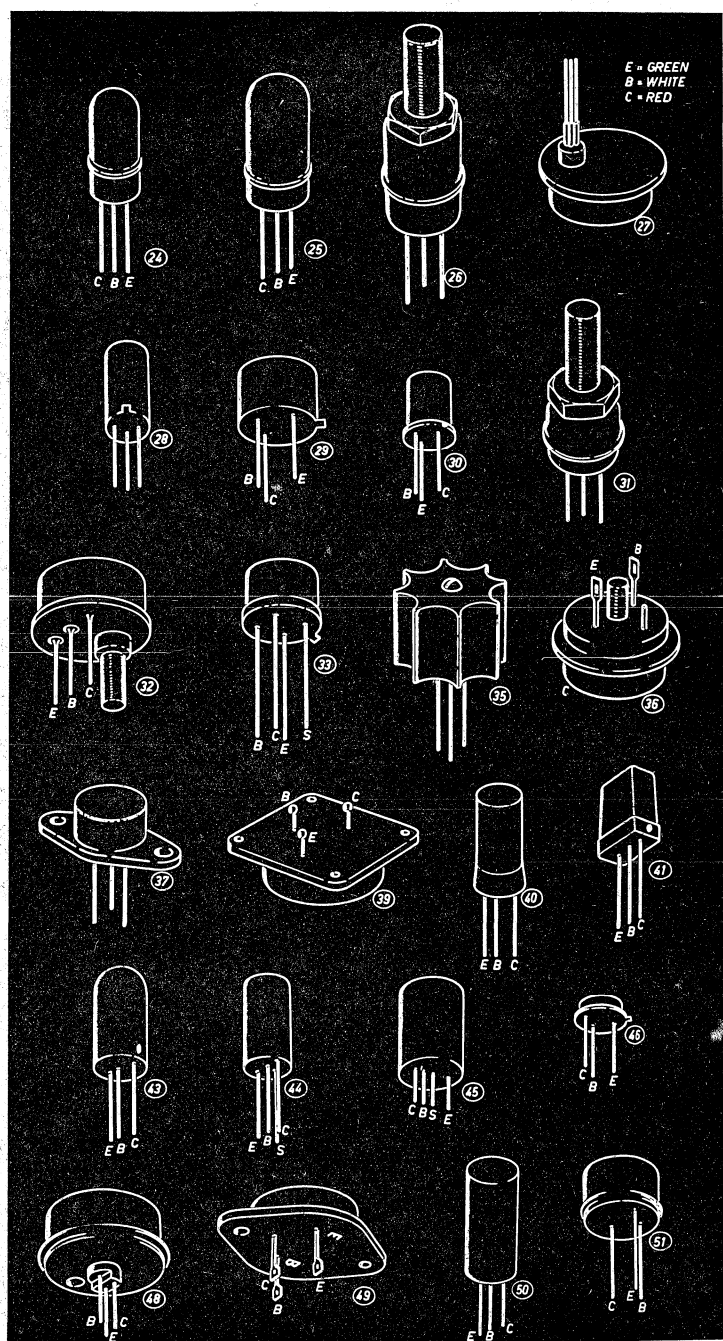
La colonna 9 dà il valore minimo della frequenza di tagliotipica f_{ab} (a base commune) in Megacicli. Alcuni costruttori, tuttavia, danno solamente la massima frequenza di oscillazione $f_{osc\ max}$ (circa il doppio di f_{ab}). Altri danno la cifra di guadagno come prodotto banda-guadagno f_T .

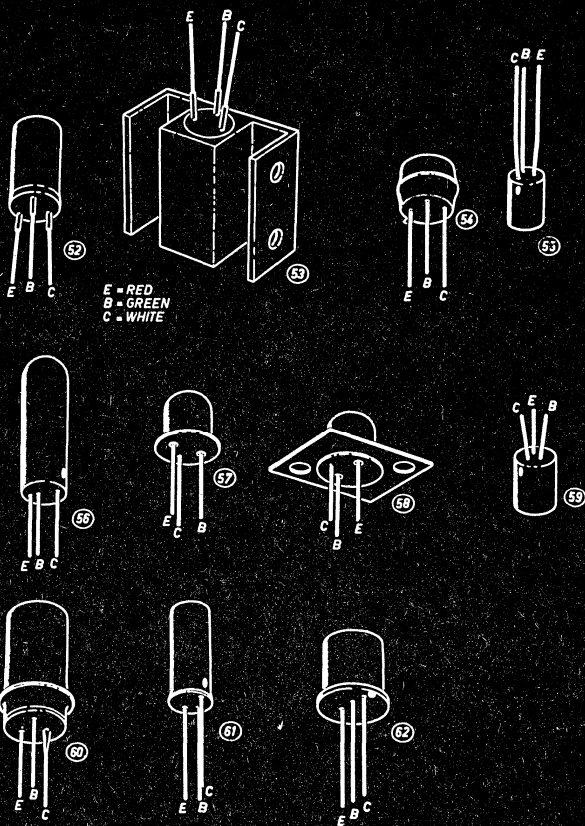
In colonna 11 sono date le dimensioni approssimative dei contenitori e i numeri in colonna 12 riportano i nomi dei costruttori.

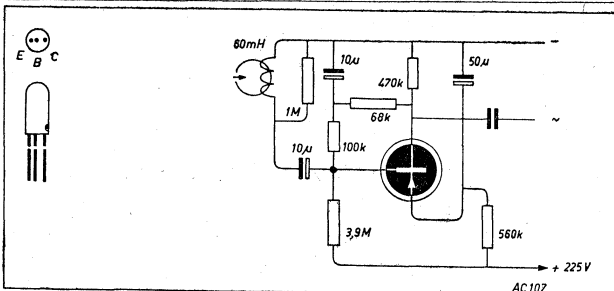
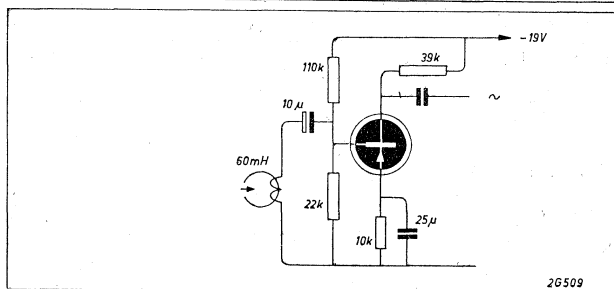
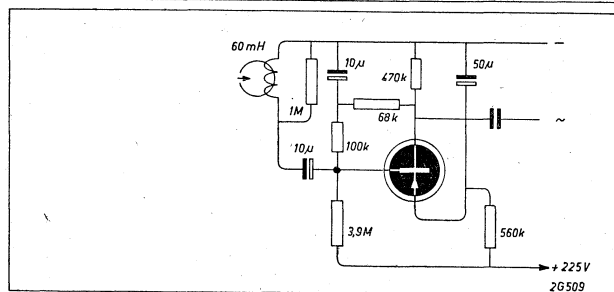
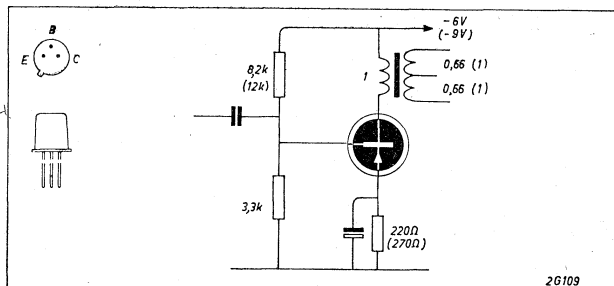
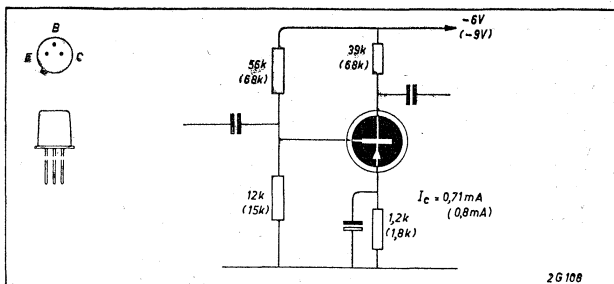


E = GREEN
B = BLACK
C = RED

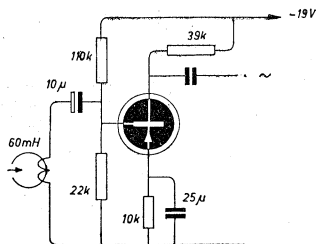






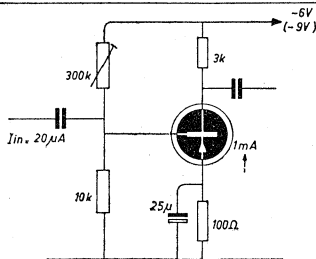


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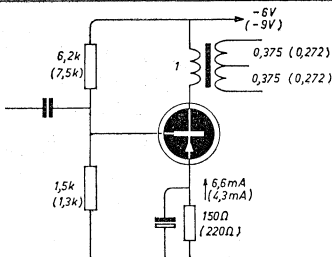
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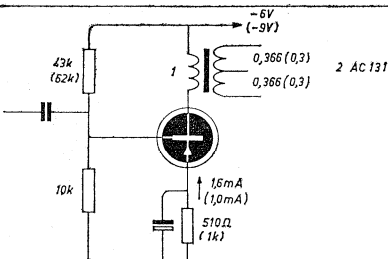
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AC116



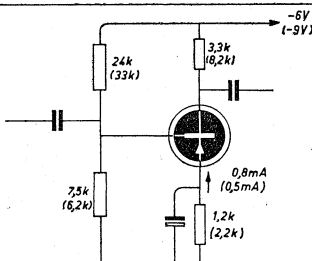
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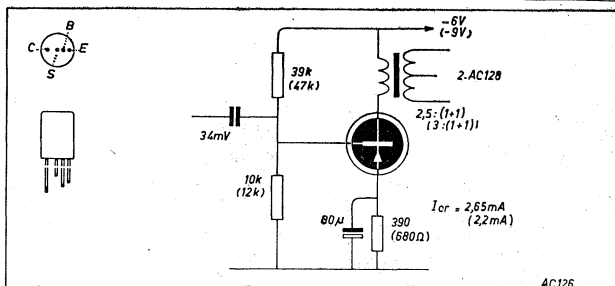
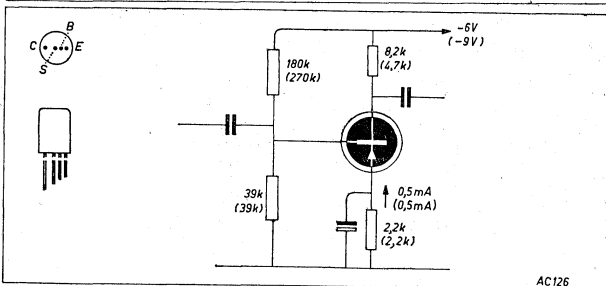
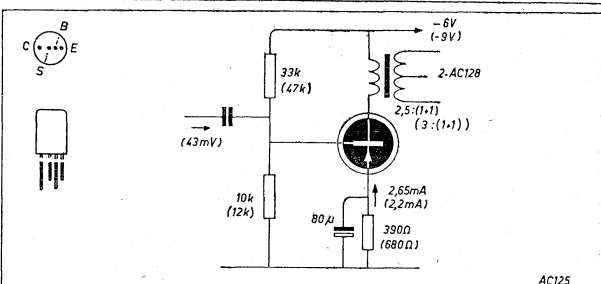
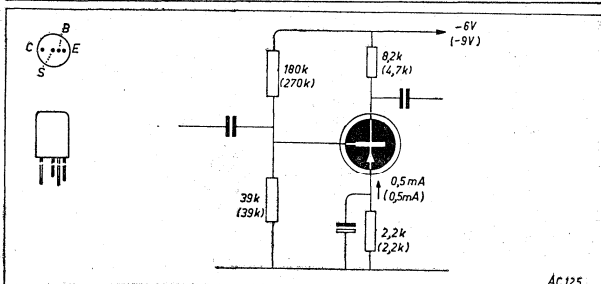
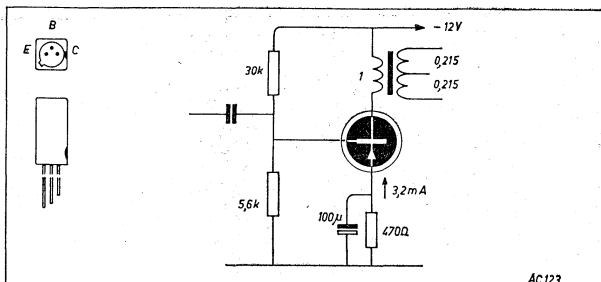


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AC122



AC122



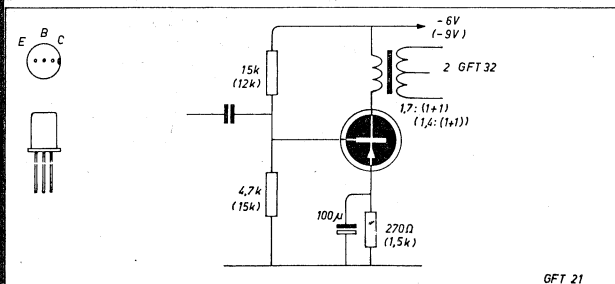
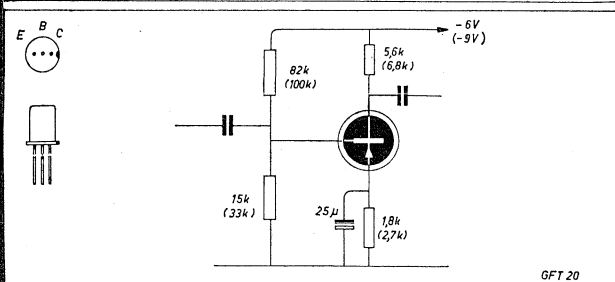
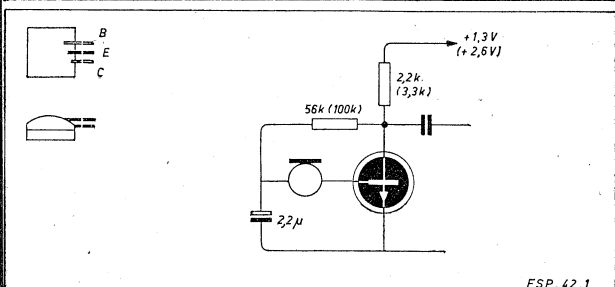
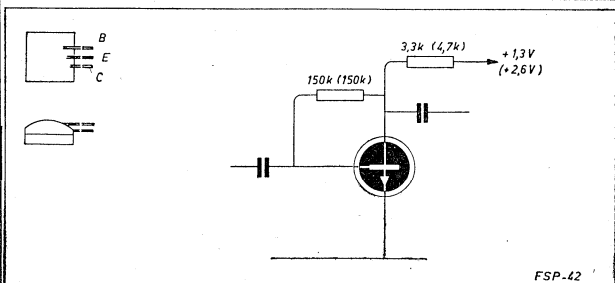
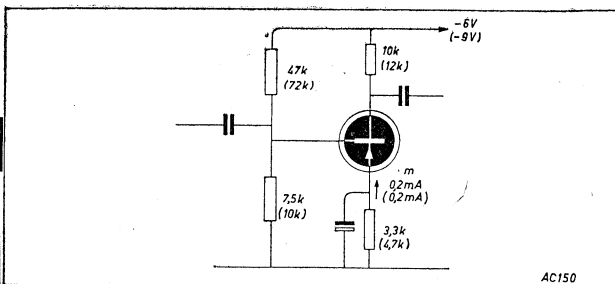
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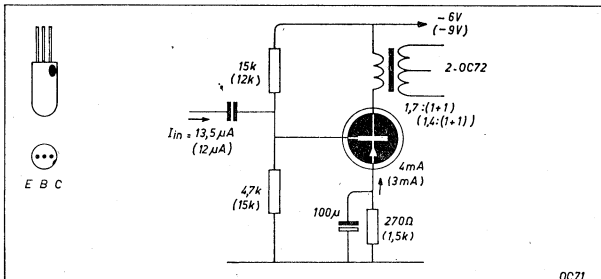
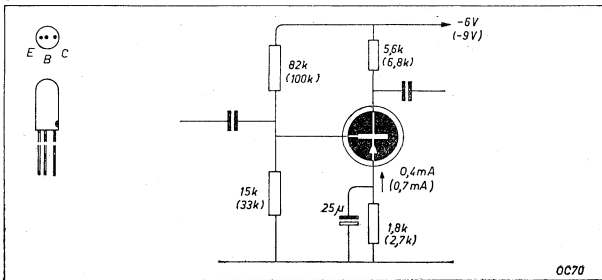
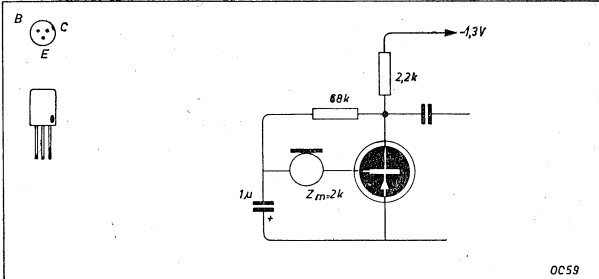
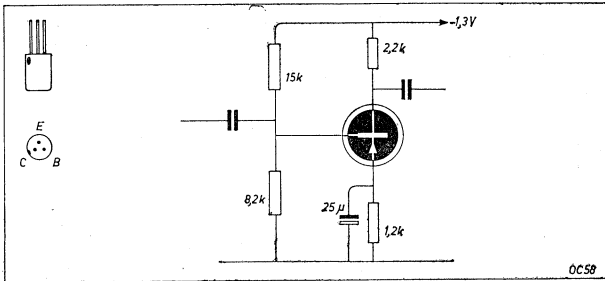
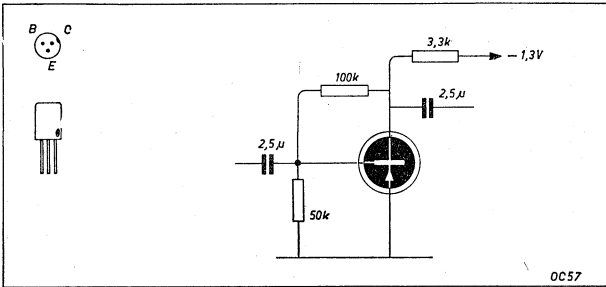
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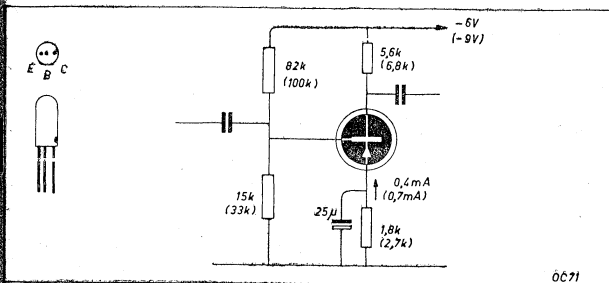
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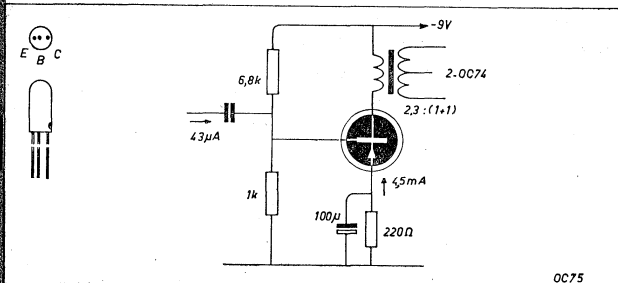




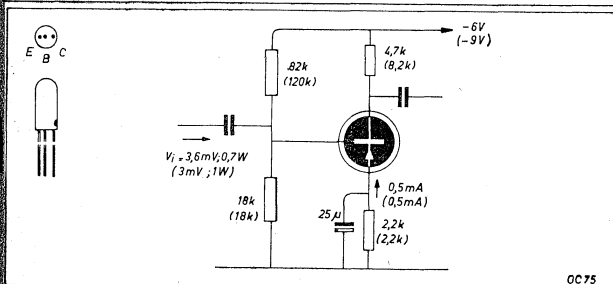
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OC75



OC75

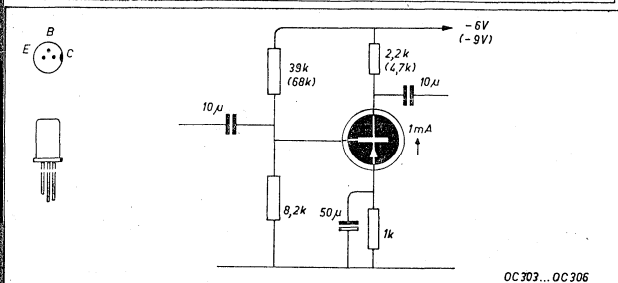


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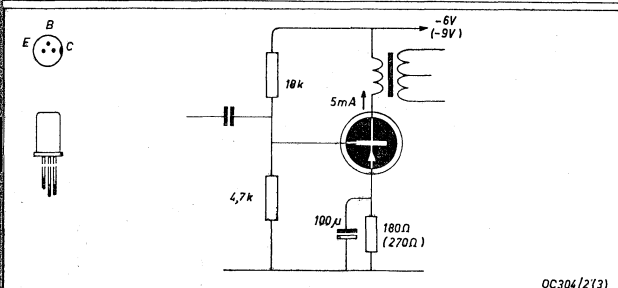
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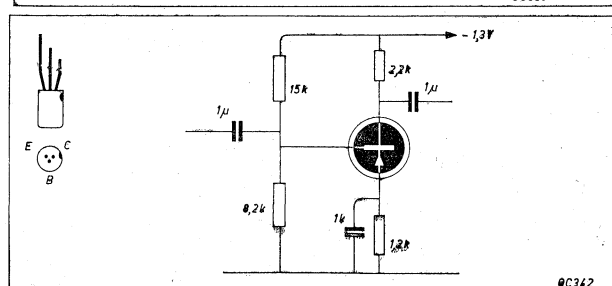
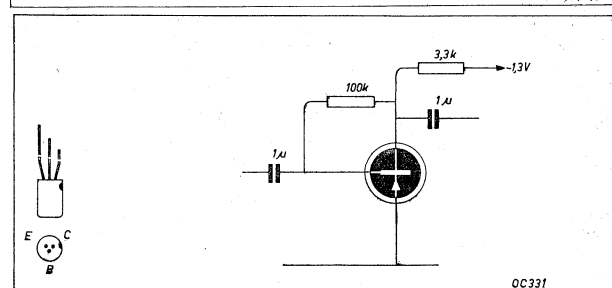
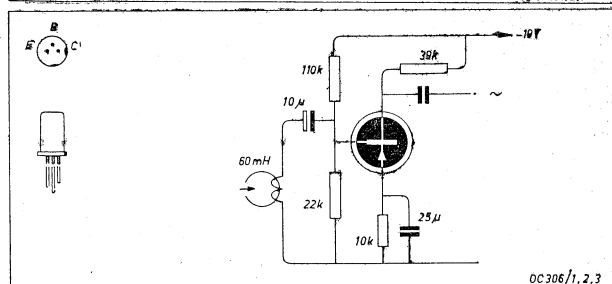
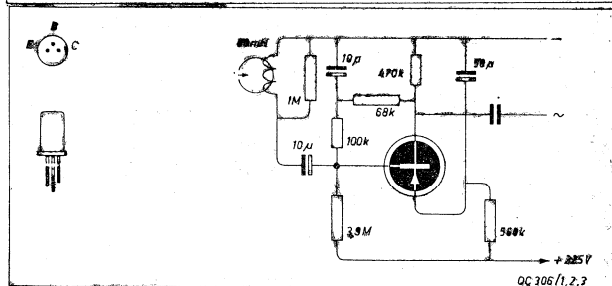
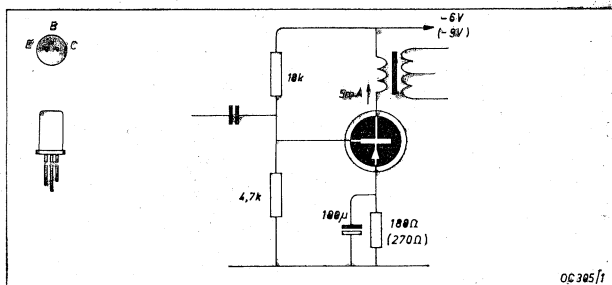
OC305

OC306



OC304





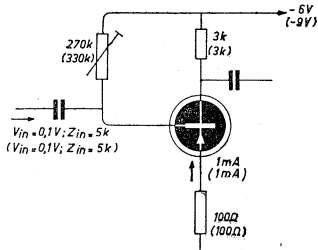
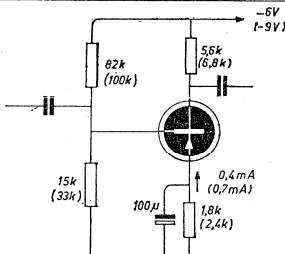
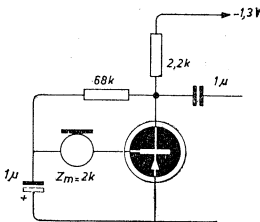
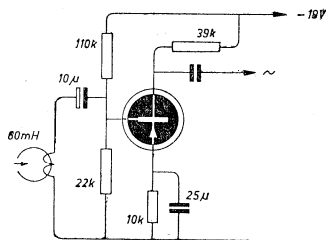
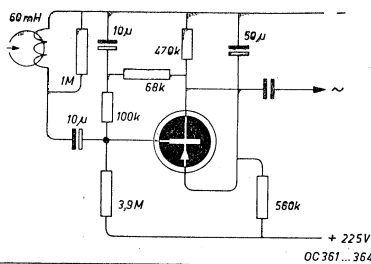
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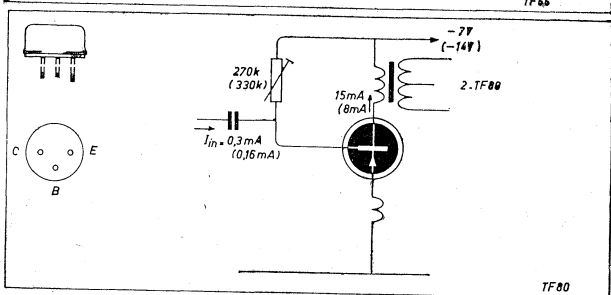
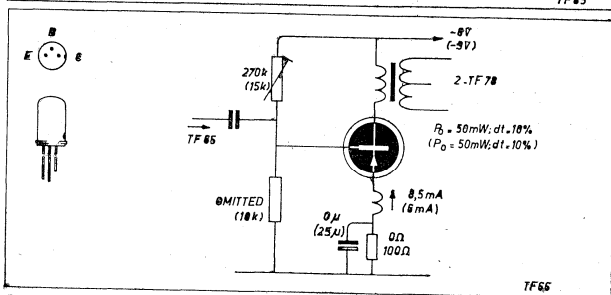
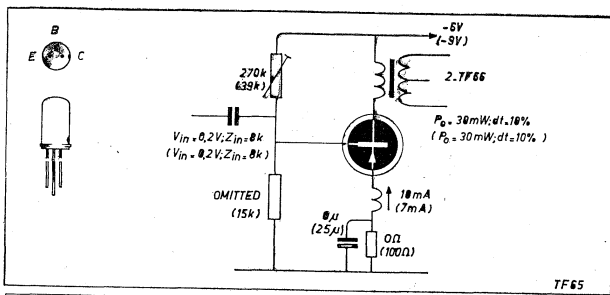
OC306

OC331

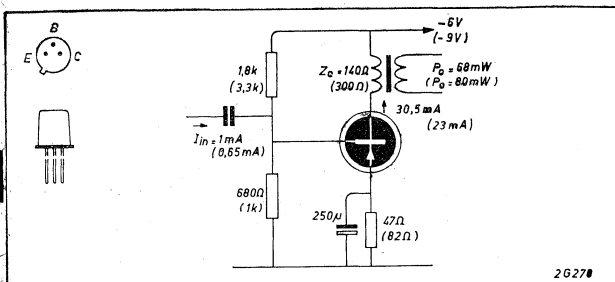
OC342



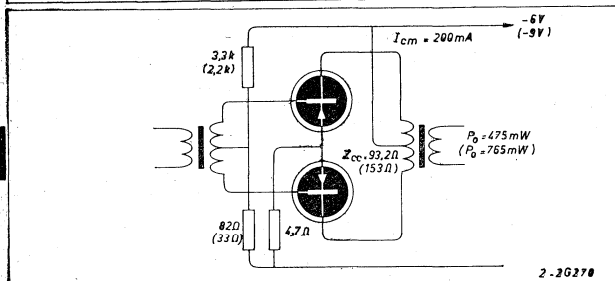
TF65



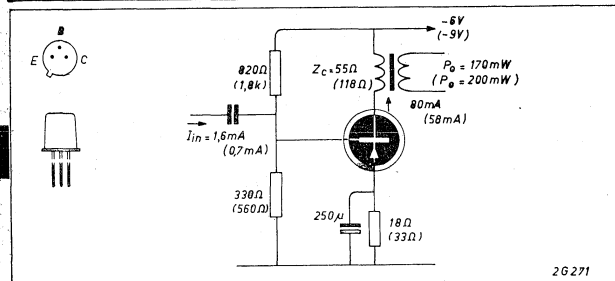
2G270



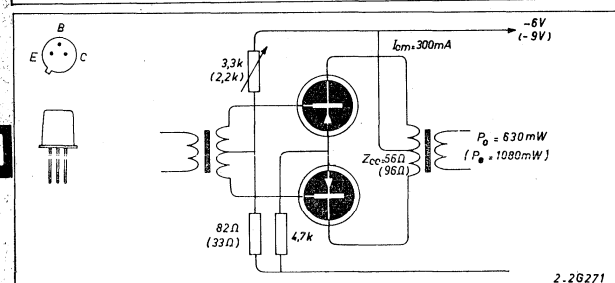
2 2G270



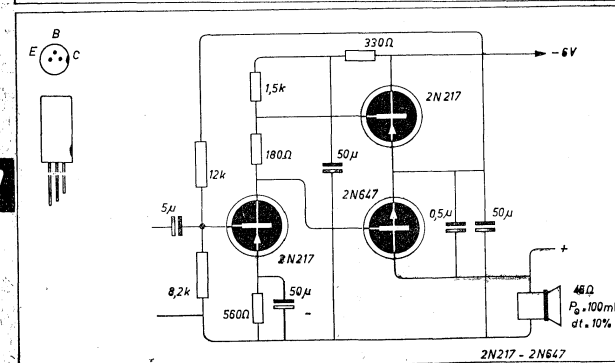
2G271



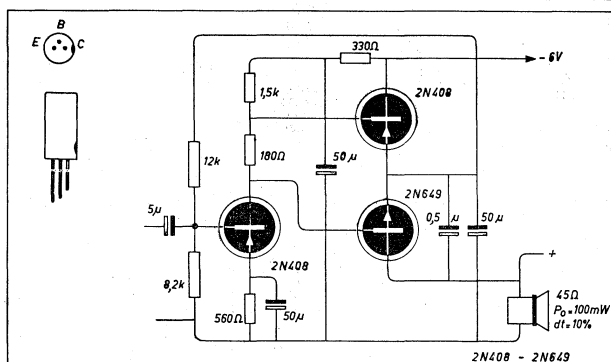
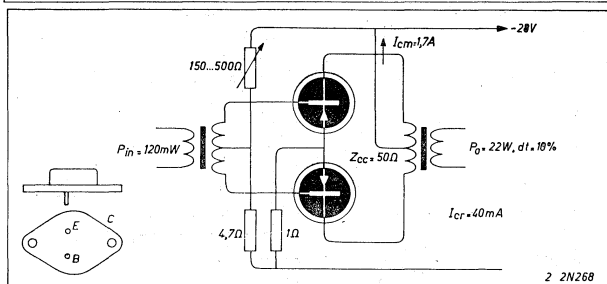
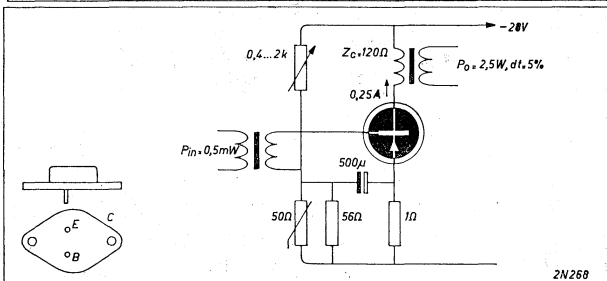
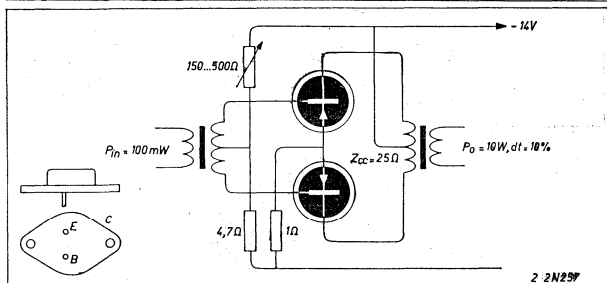
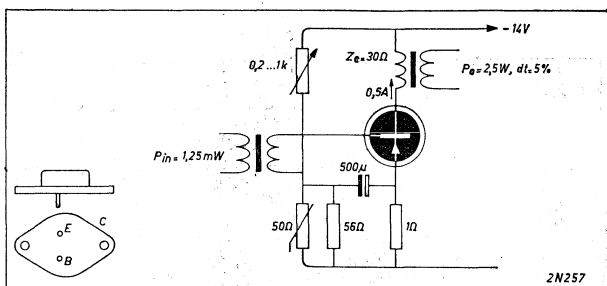
2 2G271



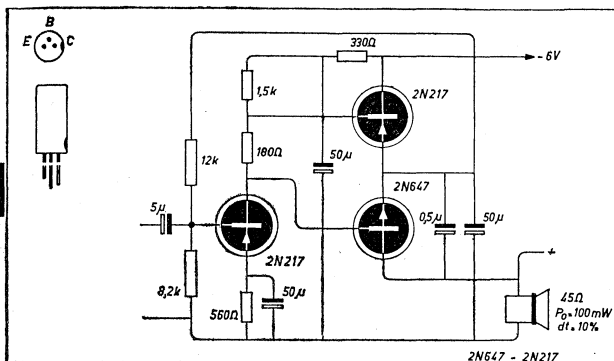
2N217



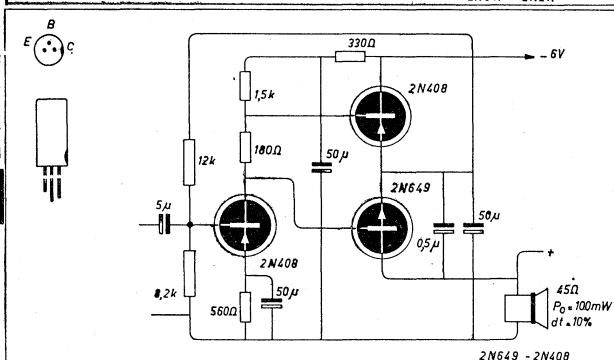
398



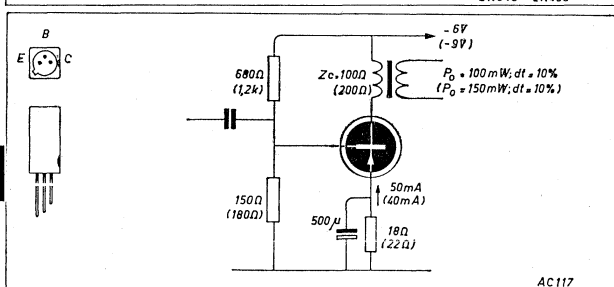
2N647



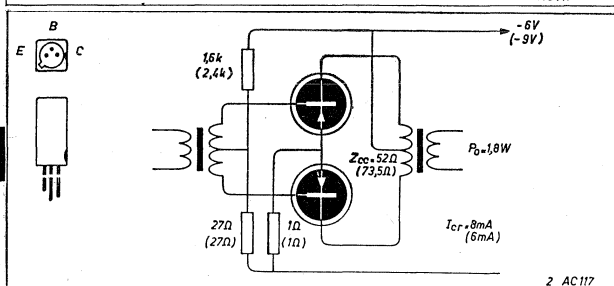
2N649

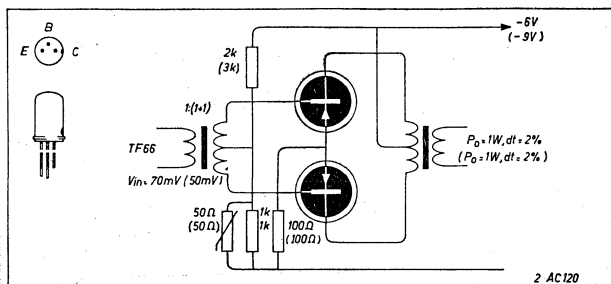


AC117

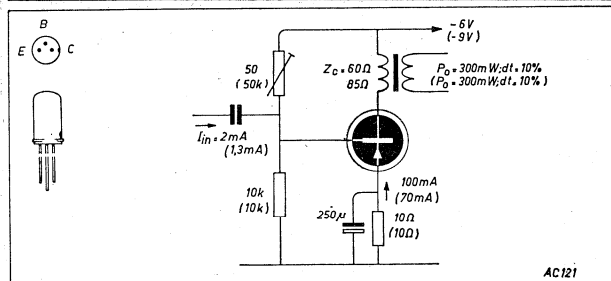


2 AC117

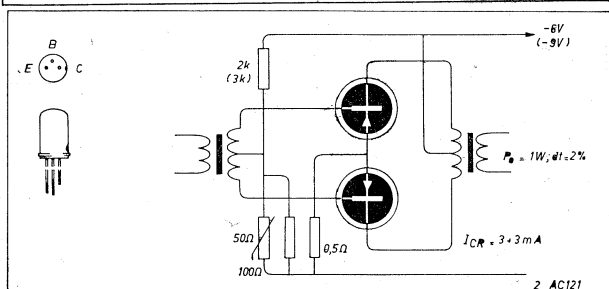




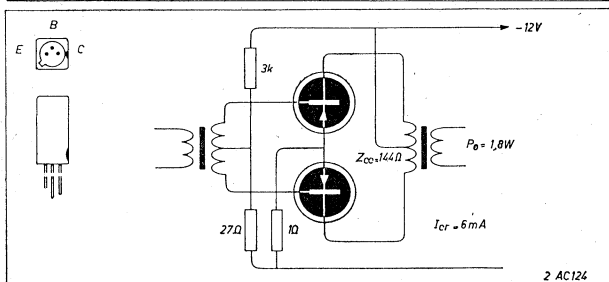
2 AC120



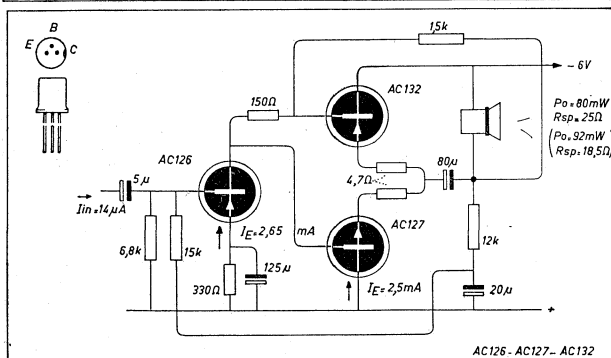
AC121



2 AC121

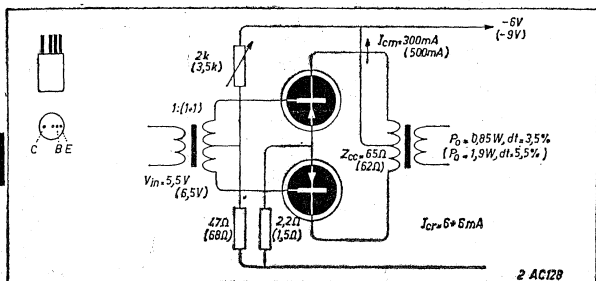


2 AC124

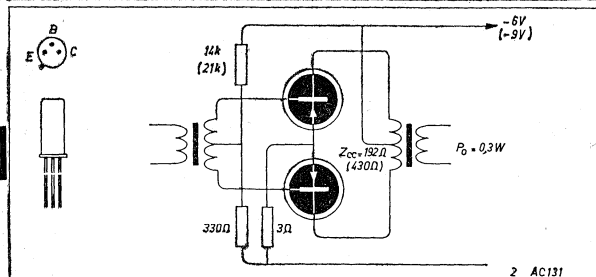


AC126

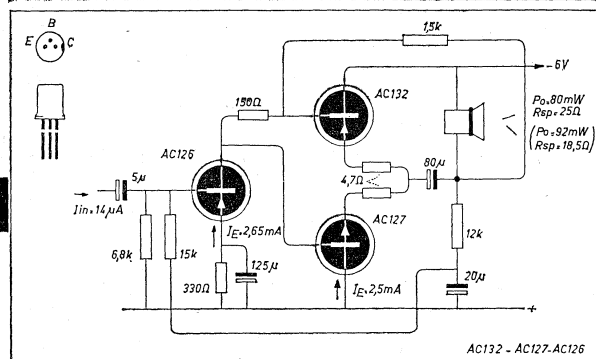
2 AC128



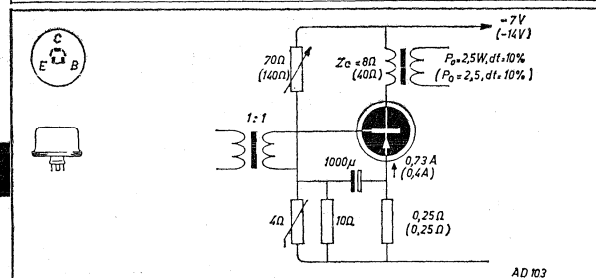
2 AC131



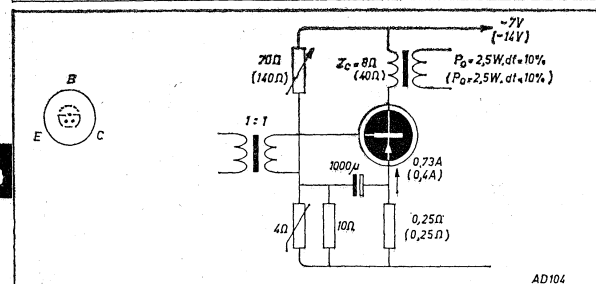
AC132

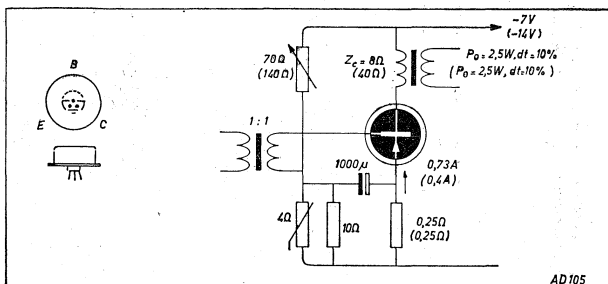


AD103

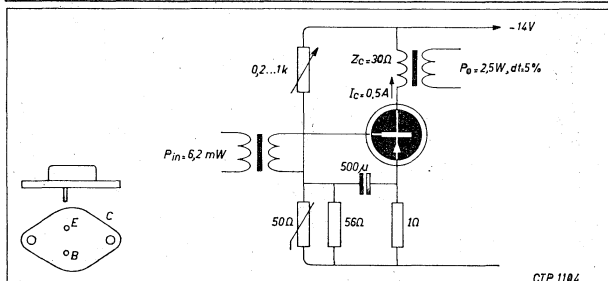


AD104

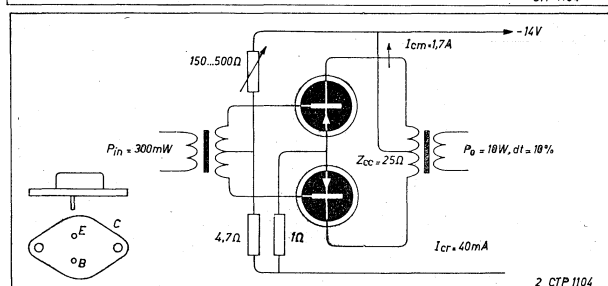




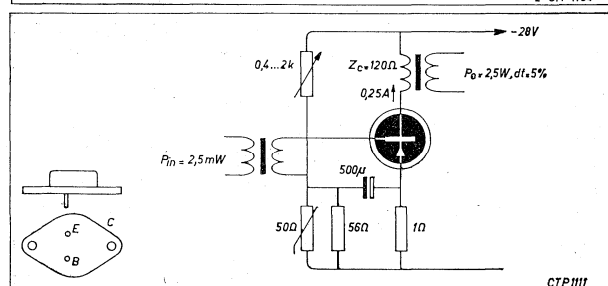
AD105



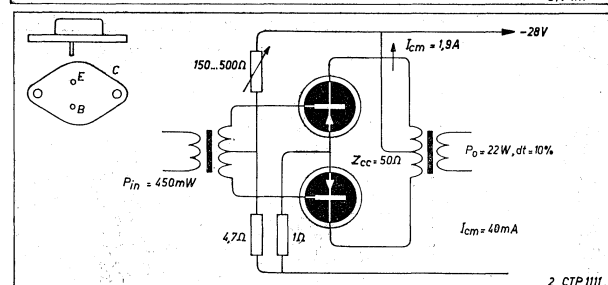
CTP1104



2 CTP1104

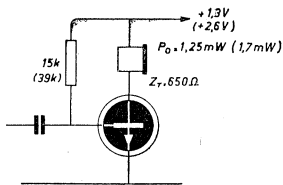


CTP1111



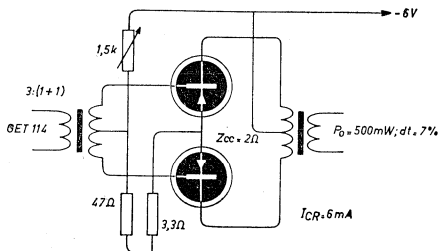
2 CTP1111

FSP 42



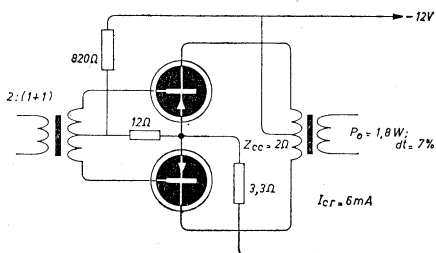
FSP-42

GET114



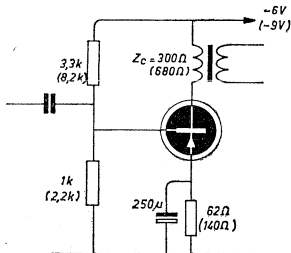
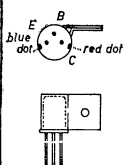
GET 114

GET116



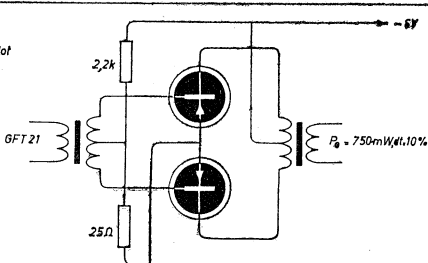
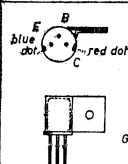
GET 116

GFT32

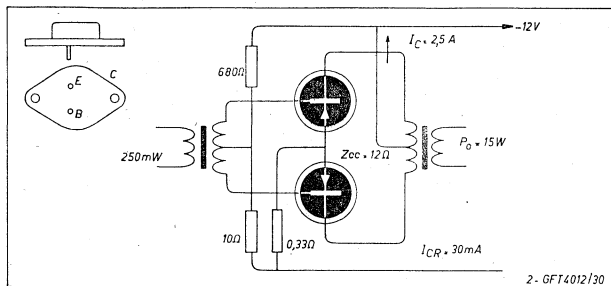


GFT 32

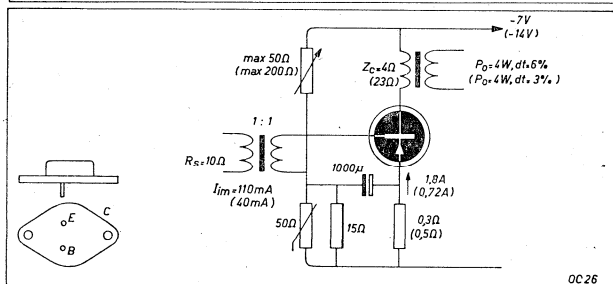
2 GFT32



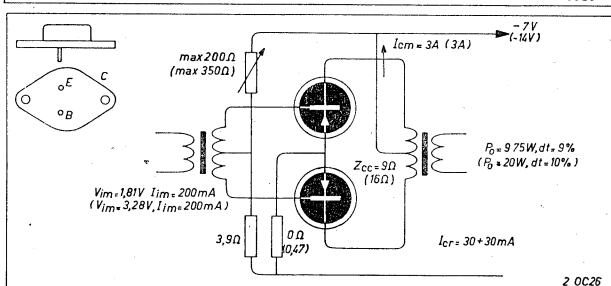
2 GFT 32



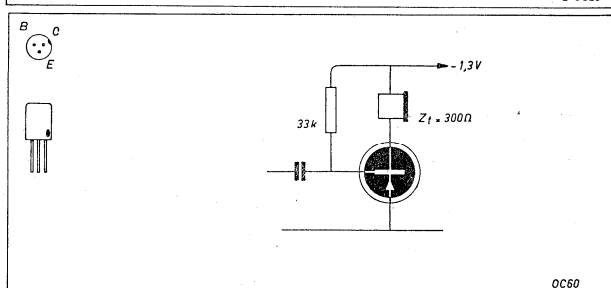
2 GFT4012
/30



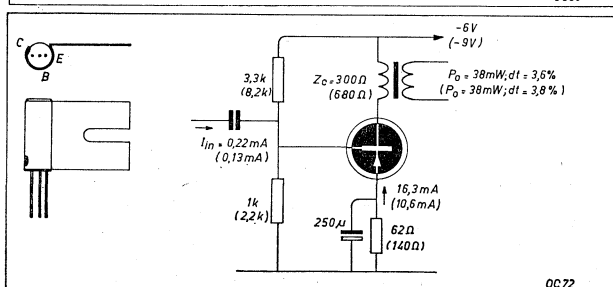
OC26



2 OC26

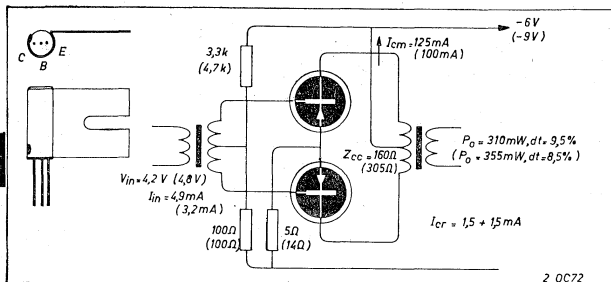


OC60

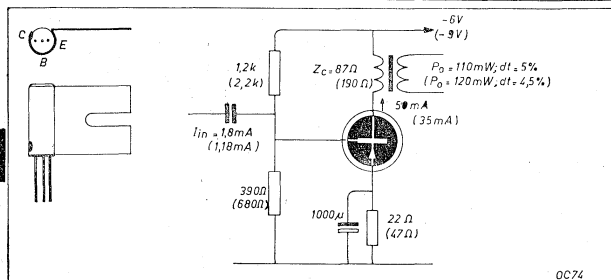


OC72

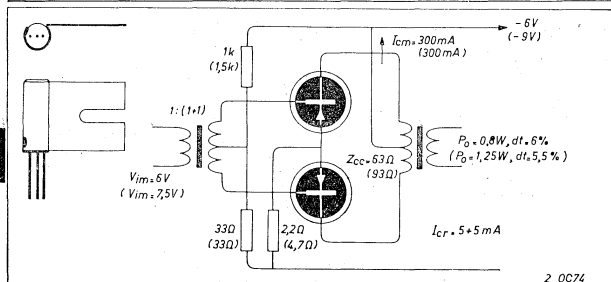
2 OC72



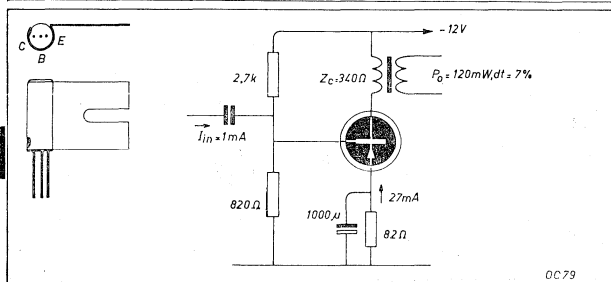
OC74



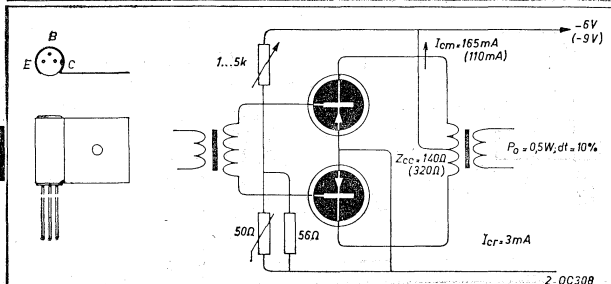
2 OC74

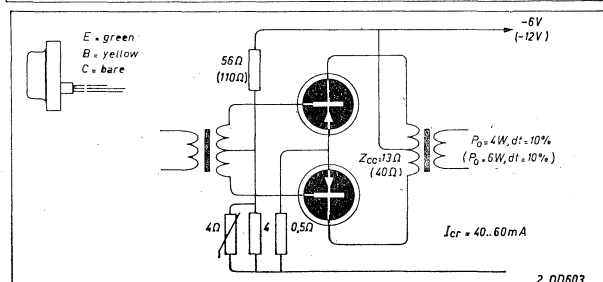
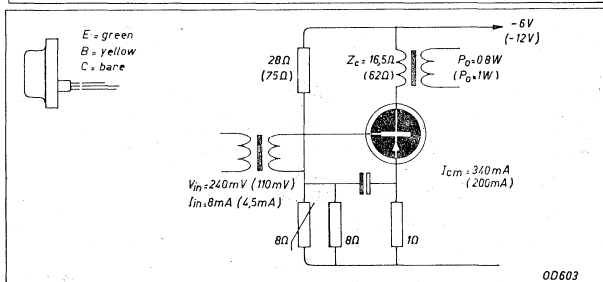
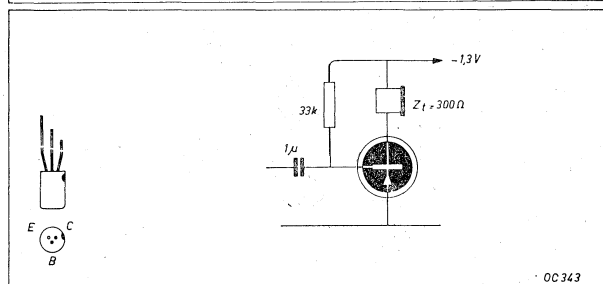
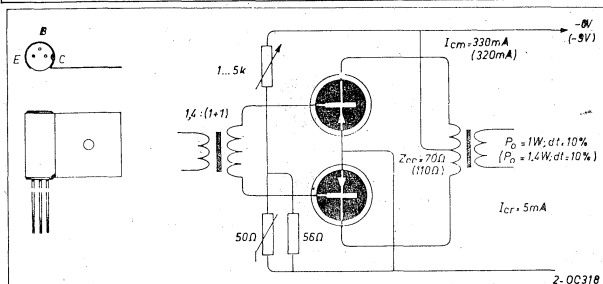
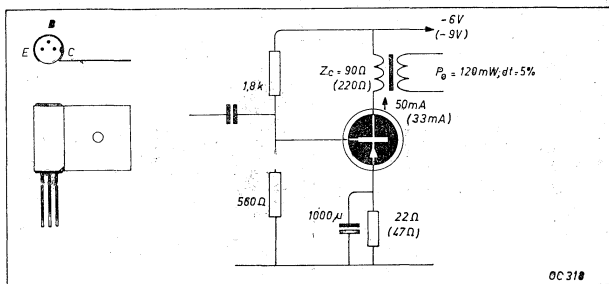


OC79

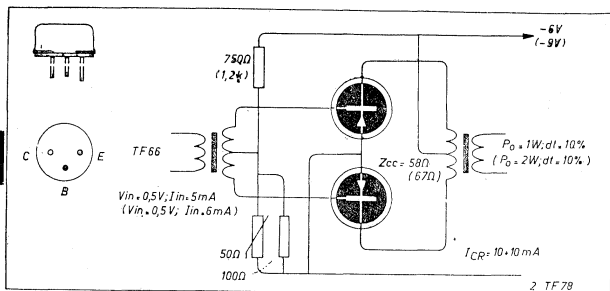


2 OC308

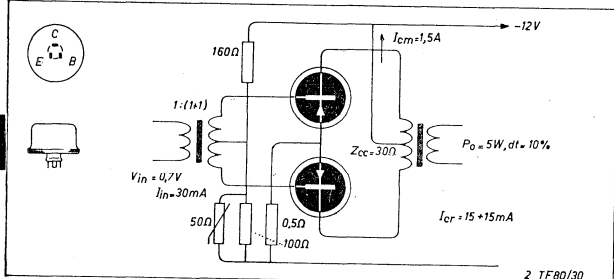




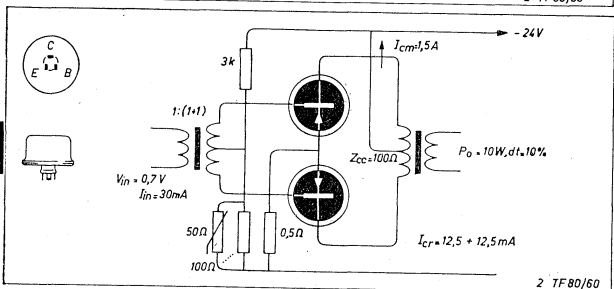
2 TF78



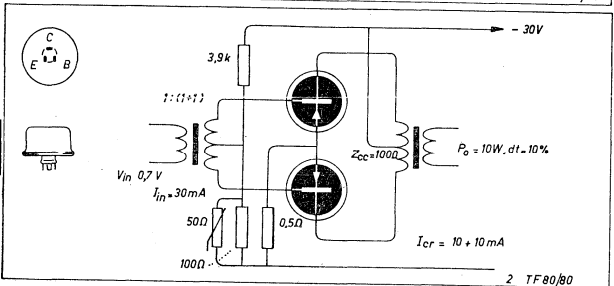
2 TF80/30

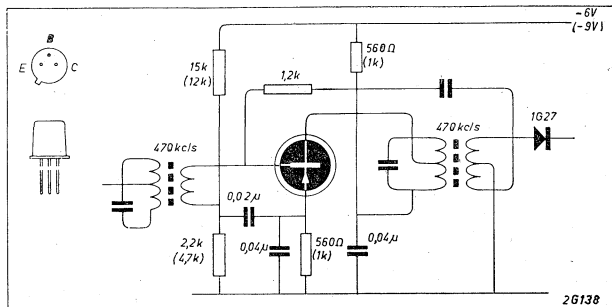


2 TF80/60

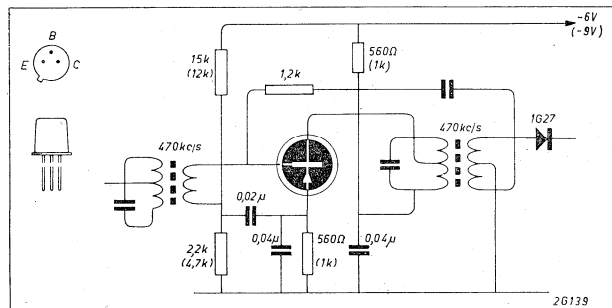


2 TF80/80

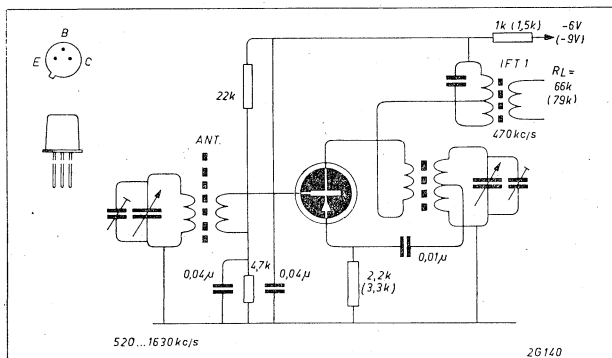




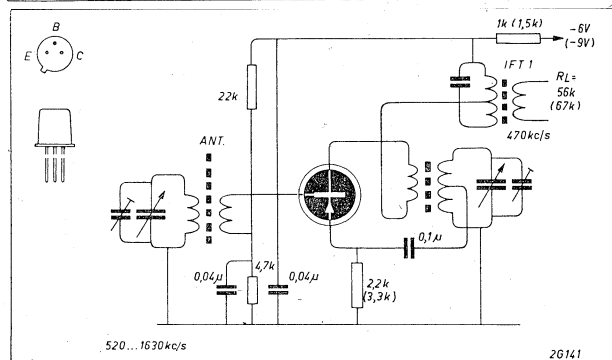
2G138



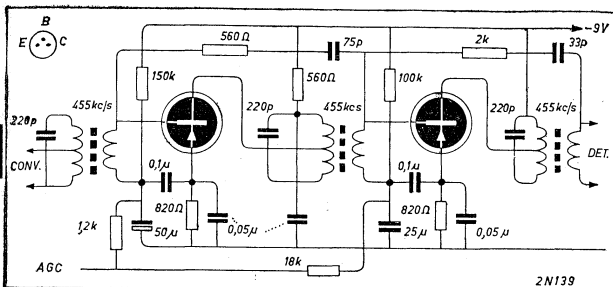
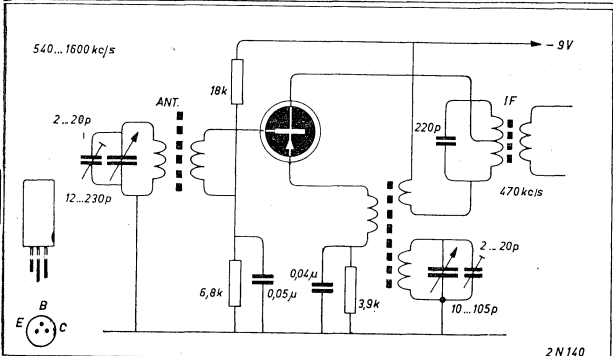
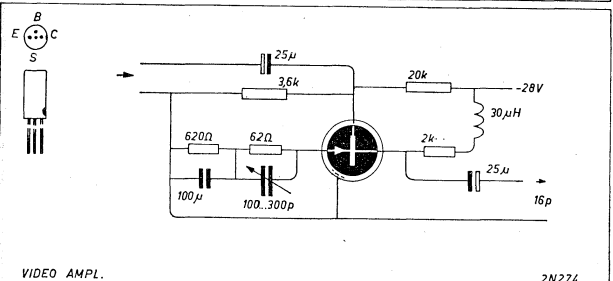
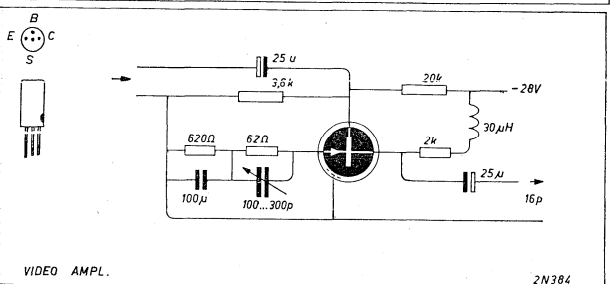
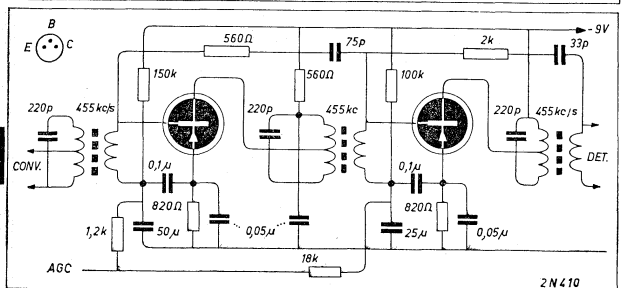
2G139

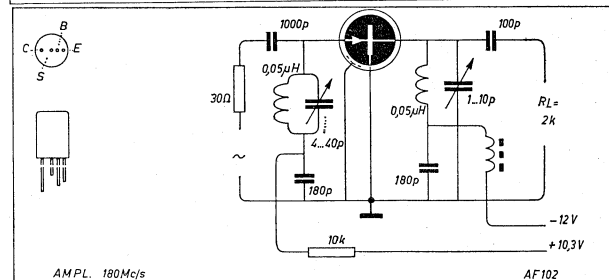
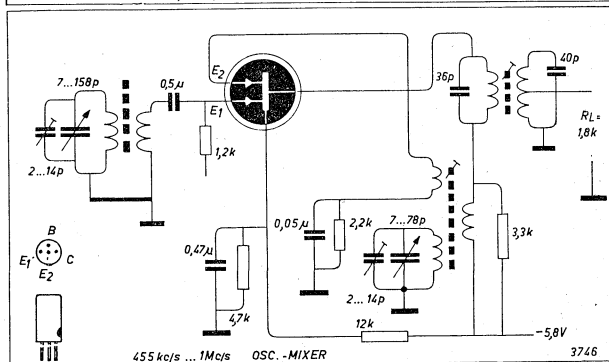
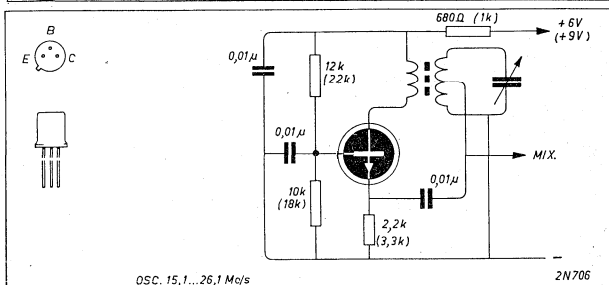
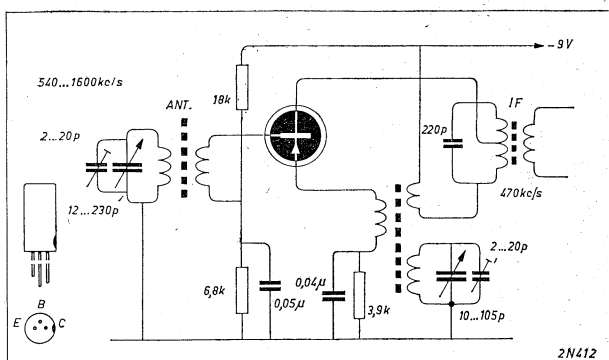


2G140

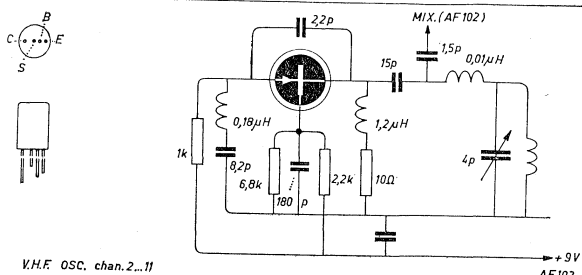


2G141

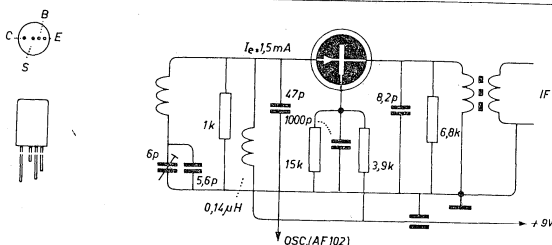
2N139**2N140****2N274****2N384****2N410**



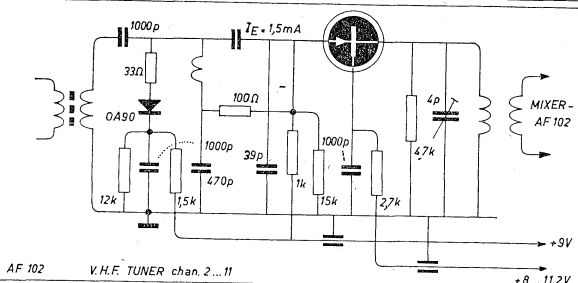
AF102



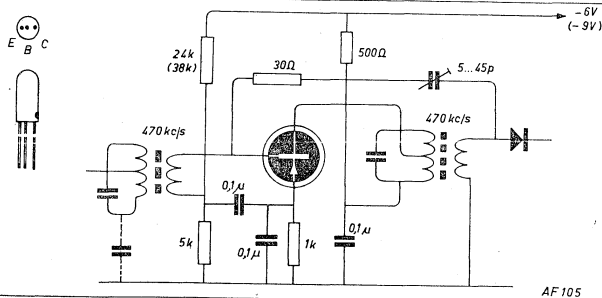
AF102



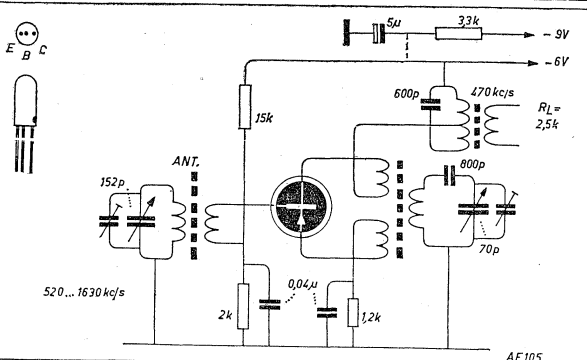
AF102

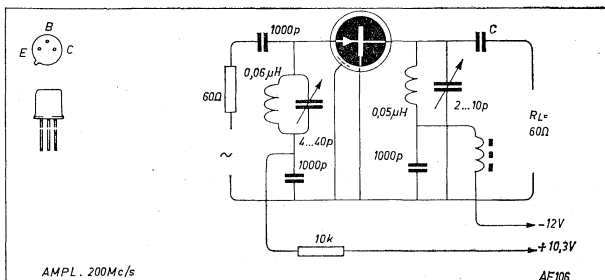


AF105

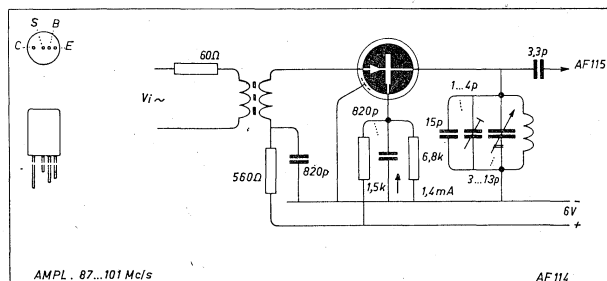


AF105

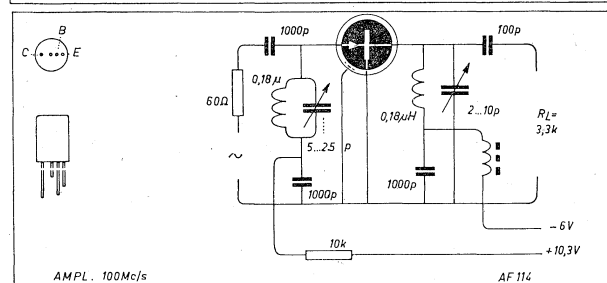




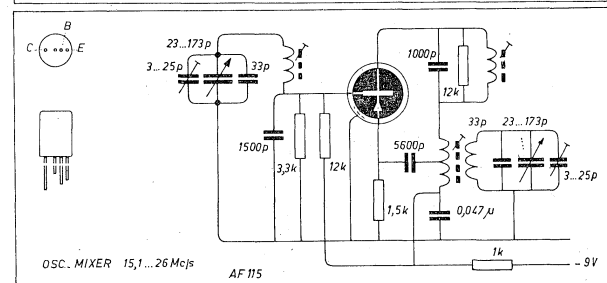
AF106



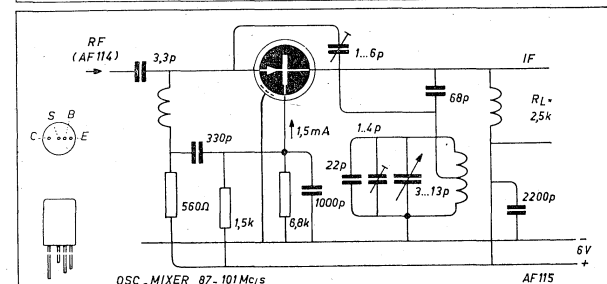
AF114



AF114

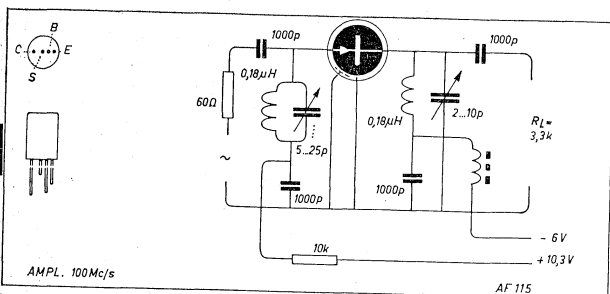


AF115

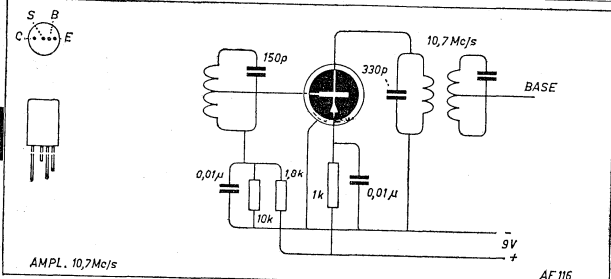


AF115

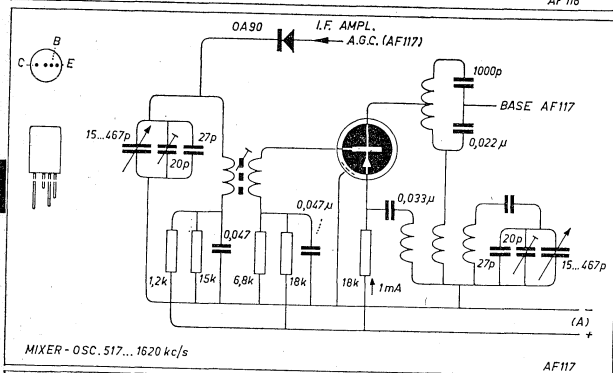
AF115



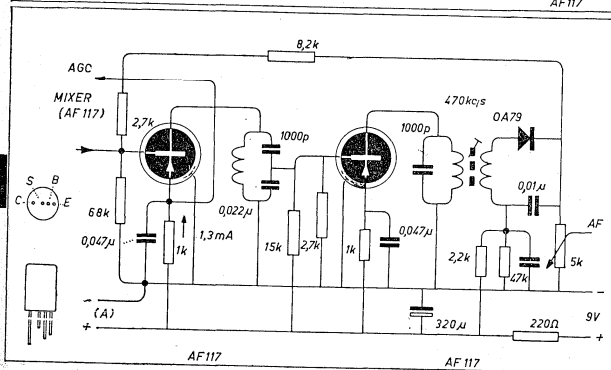
AF116

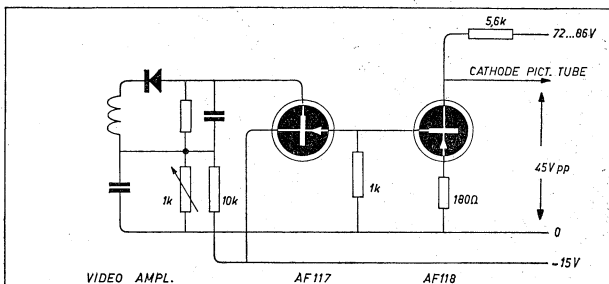


AF117

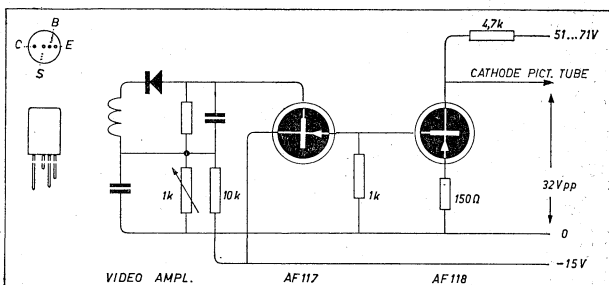


AF117

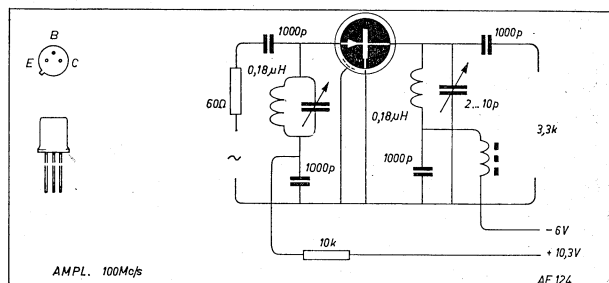




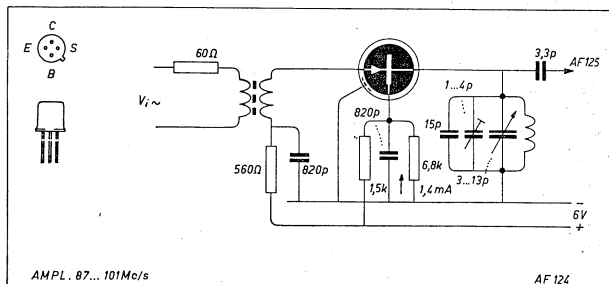
**AF117
AF118**



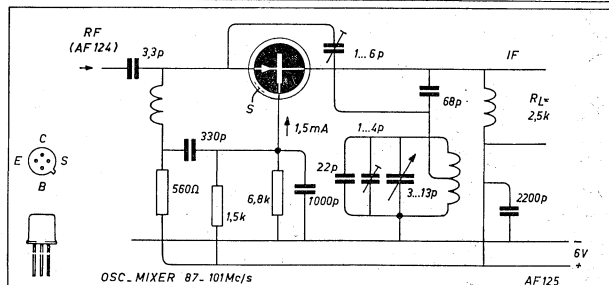
**AF117
AF118**



AF124

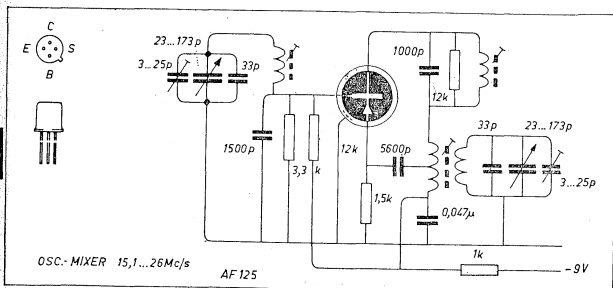


AF124

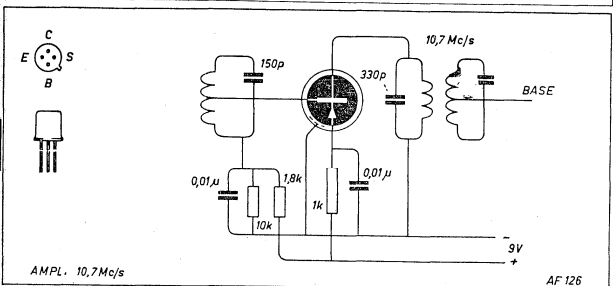


AF125

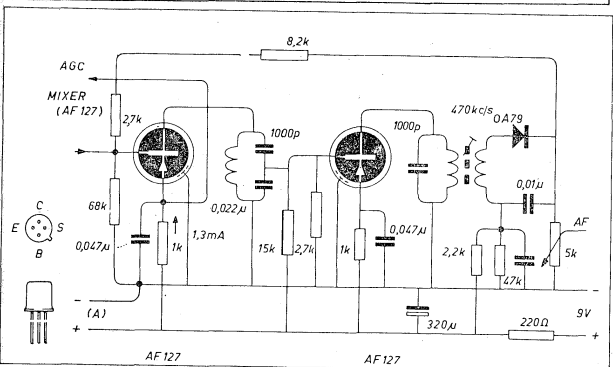
AF125



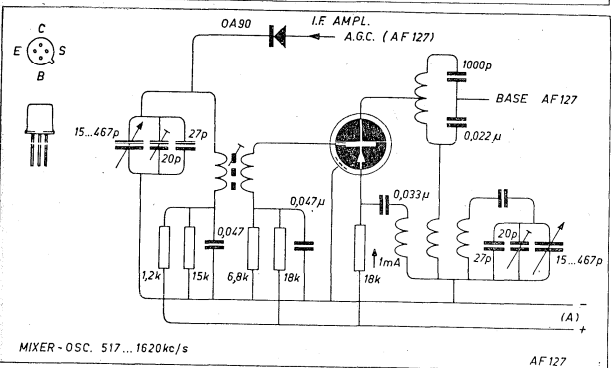
AF 126

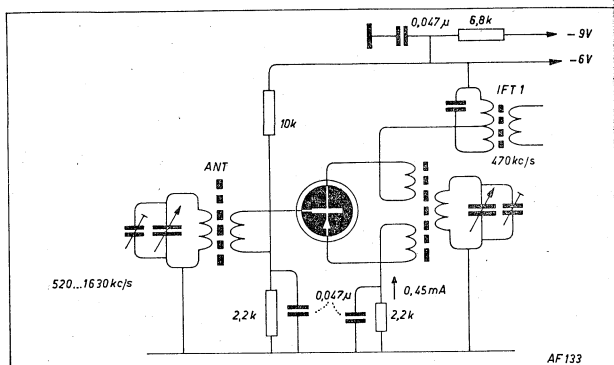


AF127

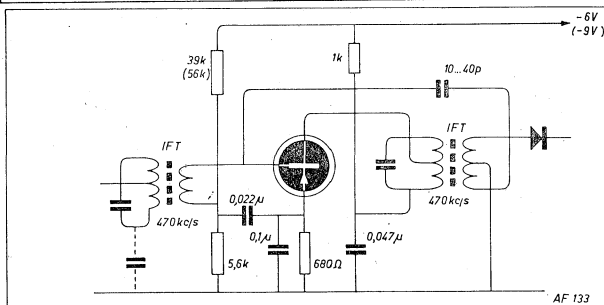


AF127

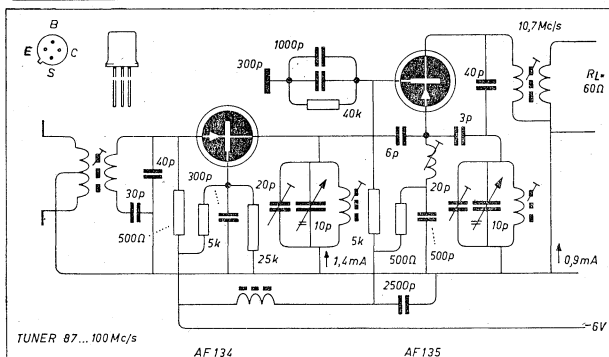




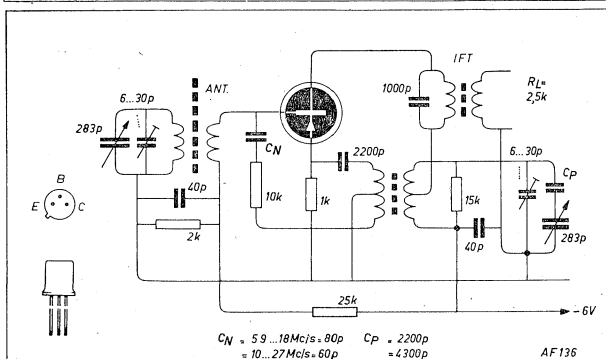
AF133



AF133

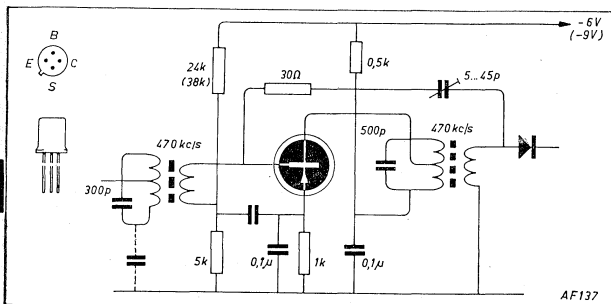


AF134
AF135

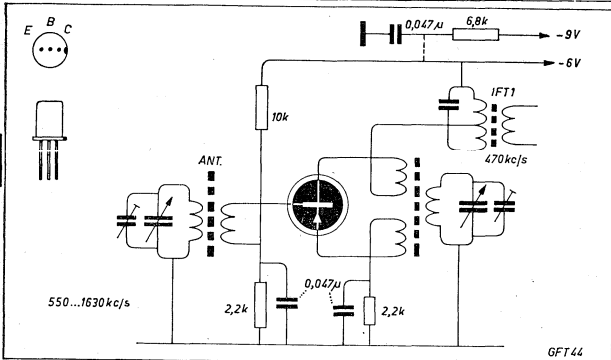


AF136

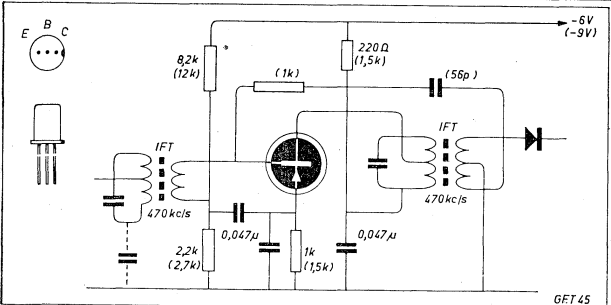
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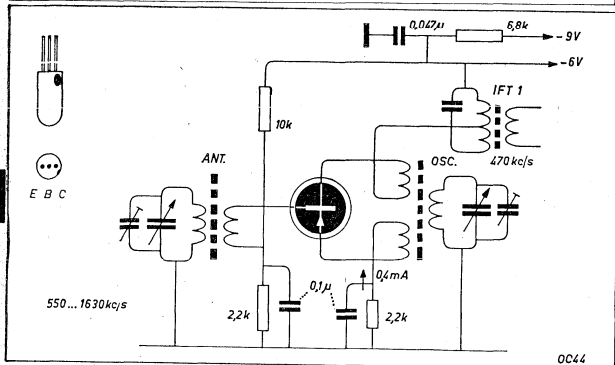
GFT44

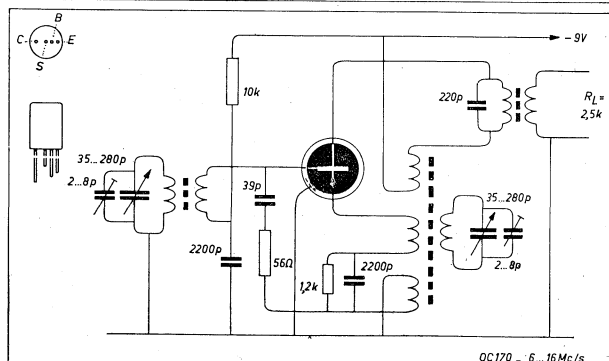
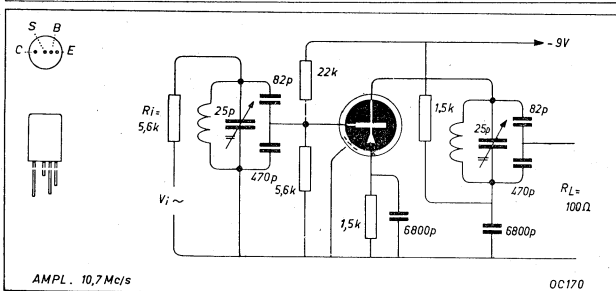
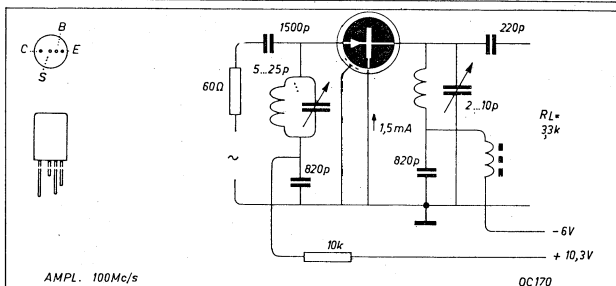
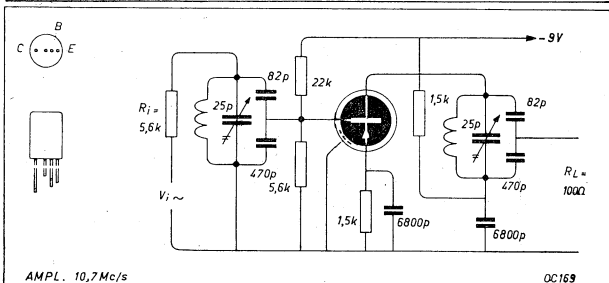
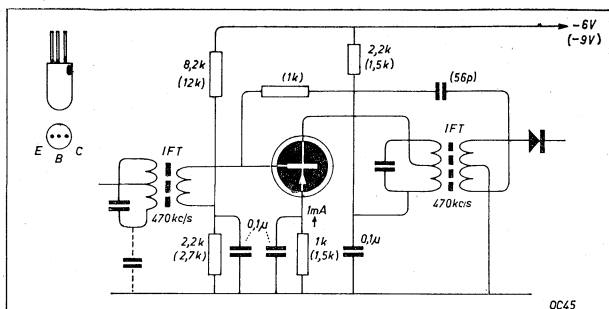


GFT45



OC44





OC45

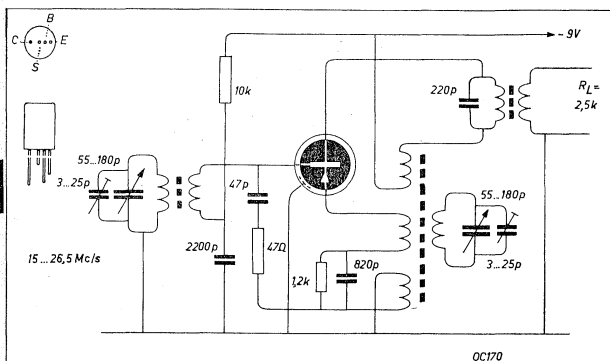
OC169

OC170

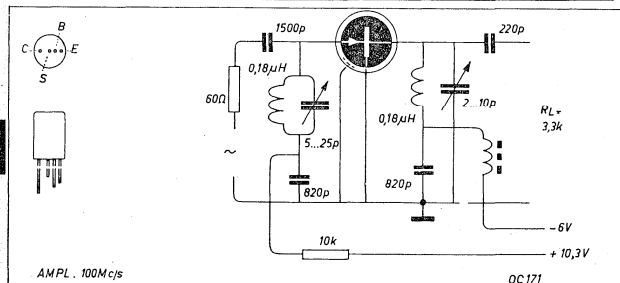
OC170

OC170

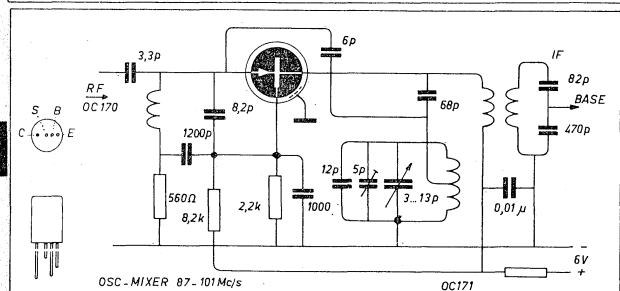
OC170



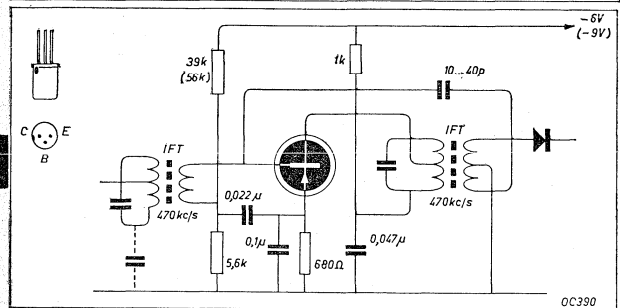
OC171

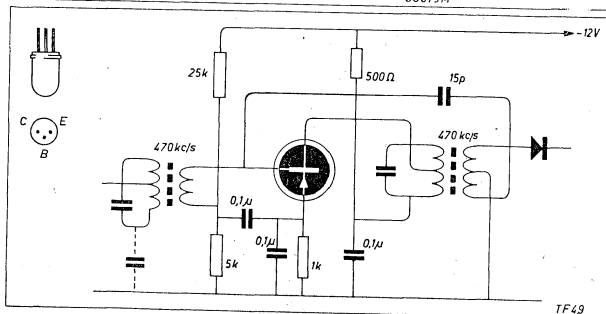
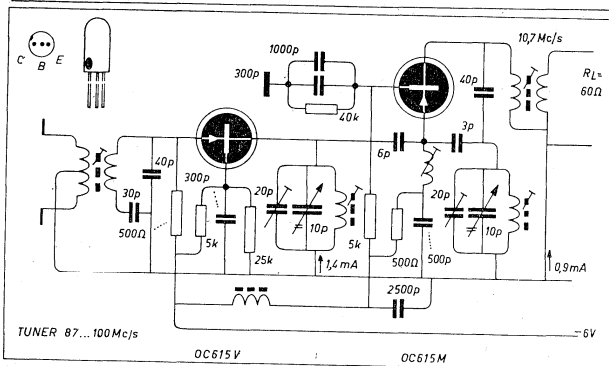
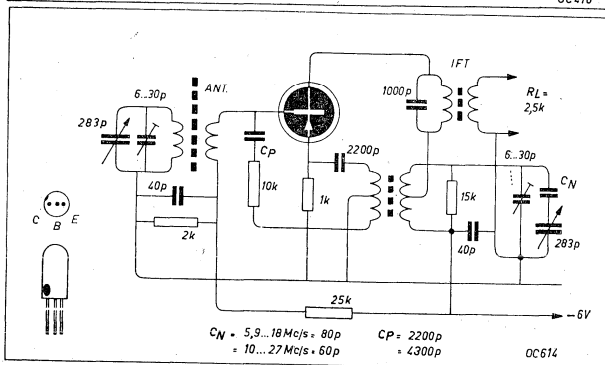
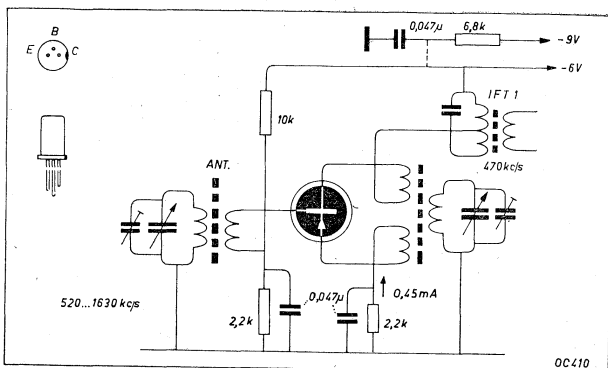


OC171



OC390





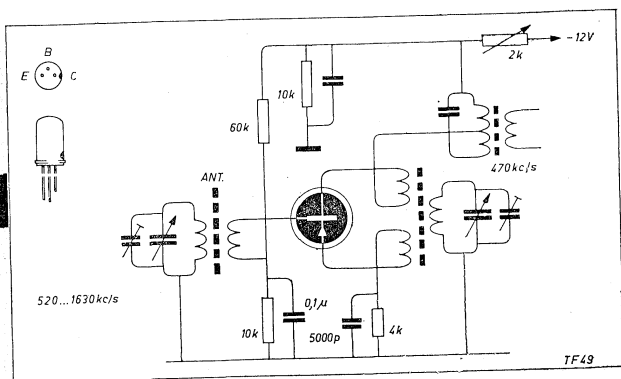
OC410

OC614

OC615M

OC615V

TF49



**MANUFACTURERS LIST
LIJST VAN FABRIKANTEN
LISTE DES FABRICANTS
HERSTELLER LISTE**

- 1 - Amperex, Mullard, Philips, Valvo
- 2 - Advanced Research Associates
- 3 - American Semiconductor Corporation
- 4 - Bendix Corporation
- 5 - Bogue Electric Manufacturing Company
- 6 - Bradley Semiconductor Corporation
- 7 - CBS-Electronics
- 8 - Continental Device Corporation
- 9 - Clevite Transistor Products
- 10 - Columbus Electronics Corporation
- 11 - C. P. Clare Transistor Corporation
- 12 - Delco Radio Division GMC
- 13 - Fansteel Metallurgical Corporation
- 14 - Fairchild Semiconductor Corporation
- 15 - Finney Company
- 16 - General Electric Company
- 17 - General Instrument Corporation
- 18 - General Transistor Corporation
- 19 - Hoffman Electronics Corporation
- 20 - Hughes Semiconductor Division
- 21 - Industro Transistor Corporation
- 22 - International Rectifier Corporation
- 23 - ITT Components Division
- 24 - Kemtron Electron Products
- 25 - Microwave Associates Incorporated
- 26 - Minneapolis-Honeywell
- 27 - Motorola Semiconductor Division
- 28 - North American Electronics
- 29 - Nucleonic Products Company
- 30 - National Semiconductor Corporation
- 31 - Lansdale Tube Division of Philco
- 32 - Pacific Semiconductors Incorporated
- 33 - Raytheon Semiconductor Division
- 34 - Radio Corporation of America
- 35 - Radio Development and Research (Bogue Electric)
- 36 - Rheem Semiconductor Corporation
- 37 - Semicon Incorporated
- 38 - U.S. Semiconductor Products
- 39 - Shockley Transistors
- 40 - Sprague Electric Company
- 41 - Sperry-Rand Semiconductor Division
- 42 - Solid-State Products Incorporated
- 43 - Sarkes-Tarzian Incorporated
- 44 - Silicon Transistor Corporation
- 45 - Sylvania Electric Products
- 46 - Synttron Company
- 47 - Texas Instruments
- 48 - Transitron Electronic Corporation
- 49 - Tung-Sol Electric Company
- 50 - Trans-Sil Corporation
- 51 - U.S. Transistor Corporation
- 52 - Vickers Incorporated
- 53 - Western Electric Company
- 54 - Westinghouse Electric Corporation
- 55 - Western Transistor Corporation
- 56 - Germany
- 57 - Mallory and Company Incorporated
- 58 - National Air
- 59 - Mullard
- 60 - Intermetall GmbH
- 61 - Telefunken GmbH
- 62 - TE-KA-DE
- 63 - Siemens & Halske AG
- 64 - Amroh NV
- 65 - Standard Electric
- 66 - Tungsram
- 67 - Compagnie générale des Semiconducteurs OSEM
- 68 - Società generale semiconduttori s.p.a. SGS

Part	Symbol	Material	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{fe}	(...) H _{fb}	f _{ab} in Mc/s	(...) fosc max in Mc/s	I _{co} in μA	(...) in mA	Diagram	Manufacturers
x	x	PC	8		145		40		1,9"					400+		1	53
x	x	PC	8		105		40		1,9"					400+		1	53
x	x	PC	3		145		20		2,2"					(1)		1	53
x	x	PC	3		200		20		2,5"			3				1	53
x	x	PC			90		40							700-		1	53
x	x		3		50		35		(100)			1					53
x	x		3		50		30		(100)			0,5					53
x	x	GJ	1-3		100		(35)		0,98"			1	15		40		53
x	x	PC			100		(30)		2,2"			2				1	16
x	x	PC			100		(30)		2"			3	800			1	16
x	x	PC			50		40		2,2"			2,7				40	
x	x	PC	9		30		(8,5)									22	
x	x	AJ	3-4		150		40		25-125			5k	50			40	45
x	x	AJ	3-4		150		40		25-125			10k	50			22	45
x	x		3		50		(20)		45							1	7
x	x		3		50		(20)		30							1	7
x	x		3		50		(20)		15							1	7
x	x				50		(25)		40							1	
x	x	AJ	3		240		30		34-65			1,3	16			9	16
x	x	AJ	1-2-1		240		30		34-65			1,3	16			9	16
x	x	AJ	3		240		30		31			1	16			9	16
x	x	AJ	1-3-1		240		30		18-43			1	16			9	16
x	x	AJ	1-3-1				45		(9-25)			1	15			9	18
x	x		3		50		(35)		0,975"			8	5			1	
x	x		3		50		(35)		0,975"			8	5			1	
x	x		3		50		(35)		0,975"			8	5			1	
x	x	PC			50		(15)		2"			3				1	9
x	x	PC	8		100		(50)		2,2+							1	9
x	x	PC	11		120		(50)					1+				1	9
x	x	PC	11		100		(50)		2+			5+				1	9
x	x		3		200		(45)		0,97"			0,5					54
x	x		3		200		(45)		0,95"			0,5					54
x	x		3		200		(45)		0,92"			0,5					54
x	x		6		(20)		(30)		60							8	
x	x	AJ	3-4-5		180		20		(100)			1,2	10			9	54
x	x	AJ	3-4		180		(40)		(100)			1,2	10			9	54
x	x	AJ	3-4		180		(50)		(100)			1,2	10			9	54
x	x	AJ	3-4		180		(60)		(100)			1,2	10			9	54
x	x	AJ	3-4		180		20		(70)			1,1	10			9	54
x	x	AJ	3-4		180		(40)		(70)			1,1	10			9	54
x	x	AJ	3-4		180		(50)		(70)			1,1	10			9	54
x	x	AJ	3-4		180		(60)		(70)			1,1	10			9	54
x	x	AJ	3-4		180		20		(45)			1,1	10			9	54
x	x	AJ	3-4		180		(40)		(45)			1	10			9	54
x	x	AJ	3-4		180		(50)		(45)			1	10			9	54
x	x	AJ	3-4		180		(60)		(45)			1	10			9	54
x	x				50		35		0,975"							1	
x	x		3		100		22		22			8	6			22	33
x	x		3		100		15		45			8	6			22	33
x	x		3		100		12		90			1,2	6			22	33
x	x	AJ	3-6		(2)		30		10,5+			0,4	5			35	45
x	x		6		(1)		50					0,25				36	54
x	x	PC			50		40					2,5					
x	x		3-8		200		50										54
x	x		3-8		200		50										54
x	x		3-8		200		20										54
x	x				50		20		(20)			1					16
x	x		3		35		(25)		55			0,7	10			1	
x	x		11		65		15		45-135			9	3			11	16
x	x		3		35		30		46			0,8	10			1	

p-n-p	x	o	n-p-n	o	Germ. x	Silic. o	Construction	Use	Disipation in mW	(. . .) in W	V _{ce} in V	(. . .) V _{cb} in V	HFE	(. . .) H _{fe}	. . . H _{ib}	f _{ab} in Mc/s	. . . f _r	(...) _{osc} max in Mc/s	I _{co} in μA	(. . .) in mA	Diagram	Manufacturers	
x	x	x					3		50		25		80						300-	1	7		
x	x	x					3		50		20		20+						16-	9	16		
x	x	x					3		35		20		20+						16-	1	7		
o	x	x	AJ				11		50		20		10-80			2		e 50	22	45			
o	x	x	AJ				11		50		20		19+			5		e 50	22	45			
o	x	x	AJ				3-6	(2,5)			30		10,5+			0,4		5					45
o	x	x					9-11		50		(30)		0,93"			1		2		22		56	
o	x	x					9-11		50		(40)		0,975"			2,5		2		22		56	
o	x	x					9-11		50		(40)		0,975"			3,5		2		22		56	
o	x	x					9-11		25		(25)		0,993			5		2		22		56	
x	x	x	AJ				3-6	(4)			30		10,5+			0,4	(e 5)	13		45			
o	x	x	AJ				3-6	(4)			30		10,5+			0,4	(e 5)	13		45			
o	x	x					11		50		(35)		0,8"			0,75		5		22		56	
x	x	x	AJ				3		150		(30)		(44)			0,7		10		1		34	
x	x	x	AJ				3		60		(25)		(55)			0,75		7		2		34	
x	x	x					3		100		(6)		25			0,8		12		22		33	
x	x	x	AJ				1-3		50		12		0,95"			1		10		9		16	
x	x	x					3-4		50		(20)		(matched pair)							1		7	
x	x	x	AJ				3-4-8		150		(25)		75					14		1		34-35	
x	x	x	PC				8		200		(50)					5				22		53	
x	x	x					11		150		15		25			3		1		22		33	
x	x	x					11		150		15		30			5		1		22		33	
x	x	x					11		100		(6)		45			10		1		22		33	
x	x	x					8-11		100		(6)		65			20		1		22		33	
x	x	x									32		40			200k		20		15		1	
o	o	o	GJ				1-3-1		150		(45)		0,925"			4		0,1		22		47-48	
o	o	o	GJ				1-3-1		150		(45)		0,96"			5		0,1		22		47-48	
o	o	o	GJ				1-3-9-11		150		(45)		0,968"			8+		0,1		22		47-48	
o	o	o	GJ				1-3-1		150		(45)		0,98"			6		0,1		22		47-48	
o	o	o	GJ				1-3		150		(45)		0,992"			7		2-		22		47	
o	o	o	GJ				6	(8,75)			(120)		3+			1						47	
x	x	x					7-8-11-13		100		15		30-150			5		6		5		16-45	
x	x	x					7-8-13		150		15					8		6		9		16	
o	x	x					8-11		50		(10)		24-			3+		2-		22		47	
o	x	x					8-11		50		(10)		48-			5+		2-		22		47	
o	x	x					8-11		50		(10)		100-			5+		2-		22		47	
o	x	x					8-11		50		(10)		200-			5+		2-		22		47	
x	x	x	SB				9-13		25		4,5		(19-66)			(60)		15		24		31-40	
x	x	x	SB				9		30		4,5		0,955"			(60)		3		1			
x	x	x	AJ				1-3		100		40		22					6		24		33	
x	x	x	AJ				1-3		100		30		45					6		24		33	
x	x	x	AJ				1-3		100		20		90					6		24		33	
x	x	x	AJ				1-2-3-4		100		20		25+					12-		24		33	
x	x	x					11		100		12		20			4,5		5-		9		16	
x	x	x					11		100		12		40			6,5		5-		9		16	
x	x	x					11		100		6		60			10		5-		9		16	
x	x	x					3-4		50		(12)		140					6		22		33	
x	x	x	AJ				8-9-11		80		(16)		(48)			6,8		5		1		34-35	
x	x	x	AJ				8-9-10		80		(16)		(75)			10				1		34-35	
x	x	x					6	(1,5)			30		40			0,4		100		36		45	
o	x	x					6	(1,5)			30		40			0,4		100		36		45	
x	x	x					6	(4)			60		10,5+			0,4	(e 5)	13		45			
o	x	x					6	(4)			60		10,5+			0,4	(e 5)	13		45			
o	x	x					11		65		20		PG = 33 db					0,2		22		47	
o	x	x					11		65		20		PG = 36 db					0,2		22		47	
o	x	x					9		65		20		PG = 39 db					0,2		22		47	
o	x	x					11		65		16		PG = 35 db					0,2		22		47	
o	x	x					11		65		16		PG = 38 db					0,2		22		47	
o	x	x					11		65		16		PG = 41 db					0,2		22		47	
x	x	x	AJ				3-6-8	(20)			(30)		45			0,5		180		3		4-7-45	

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{FE}	(...) H _{fs}	f _{ab} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μA	(...) in mA	Diagram	Manufacturers
x	x	AJ	3-6-8	(20)	30	23	4k	(1)	13	7-45										
x	x	AJ	3-6-8	(20)	30	20+	4k	(1)	3	7										
x	x	AJ	3-6-8-13	(20)	60	20	4k	(1)	13	7										
x	x	AJ	3-5-6-8	(20)	60	20	4k	(1)	13	7										
x	x	PC	8	80	(50)		5	(5)	22	40										
o	o		1-3-8	150	(40)	9-19	4	0,5	22	5										
o	o		1-3-8	150	(40)	9-19	4	0,5	22	5										
o	o		1-3-7-8-11	150	(40)	19-39	5	0,5	22	5										
o	o		1-3-7-8-11	150	(40)	19-39	5	0,5	22	5										
o	o		11	150	40	0,975"	8+	1	22	56										
o	o		1-3-7-8-11	150	(40)	39+	6	0,5	22	5										
o	o		1-3-7-8-11	150	(40)	39+	6	0,5	22	5										
o	x			65	15	72	5		9	16										
o	x			25	6	32	5	5-	9	16										
o	x		7-8-13	75	30	17-90	9	3	11	16										
o	x		7-8-13	75	30	17-90	9	29	11	16										
o	x		9	65	15	(23-135)	5	5	22	7-45										
o	x		11	65	25	(34-200)	9	5	11	16-45										
o	x		11	25	6	32	5	5-	11	16										
o	x		11	65	16	PG = 28 db		0,2	22	47										
x	x	AJ	3-4-5-6-8	(70)	45	35-70	0,1	(8)	6	12-49										
x	x	AJ	5-6-8-13	(70)	55	25-50	0,1	(8)	6	12-49										
x	x	AJ	3-4-6-8-13	(70)	40	25-50	0,1+	(8)	6	12-49										
x	x	AJ	2-3	50	(10)	(65)	0,85	12	1	34										
x	x	AJ	3-4-5-6	(10)	30	(25-90)	7k	(3)	3	34-45										
x	x		6	(10)	(12)	(30)			3	27										
x	x		6	(10)	(20)	PG = 32 db			3	27										
x	x		3	150	(30)	60	0,7		1	7										
x	x		3	250	(30)	60	0,7		31	7										
o	x		11	100	(25)	20	2,5+		1	7										
o	x		8	100	(25)	35	5+		1	7										
o	x		8	100	(25)	60	10+		1	7										
x	x	AJ	3	150	25	70		8	22	47										
x	x		3	200	25	24	0,8	16-	9	16										
x	x		3	200	25	36	1	16-	9	16										
x	x		3	200	25	54	1,2	16-	9	16										
x	x		3	75	25	24	0,8	16-	9	16										
x	x	AJ	1-2-3	75	25	(36)	1	16	9	16										
x	x	AJ	1-2-3	75	25	(54)	1,2	16	9	16										
x	x	AJ	1-2-3	75	25	(75)	1,5	16	9	16										
o	x	AJ	9-10	50	18	(4-15)	2+	e 50	22	45										
o	x	AJ	9-10	50	18	(5-15)	2+	e 50	22	45										
o	x	AJ	9-10	50	18	(5-15)	2+	e 50	22	45										
x	x		3	75	(30)	47	0,8	10	1											
x	x	AJ	3-8	50	12	(100)	2	15	23	31										
x	x	AJ	2-3-8	50	12	(100)	2	10	23	31										
x	x	AJ	2-3-8	50	12	(100)	2	10	23	31										
o	x	AJ	9	50	10	(5-15)	2	e 20	22	45										
o	x	AJ	9-10	50	18	(10-30)	4	e 50	22	45										
o	x	AJ	3-4	150	25	(70-250)	10k	50	22	45										
o	x	AJ	3-4	150	25	(100-250)	10k	50	22	45										
o	x	AJ	3-5-6	180	25	50-100	10k	50	22	45										
x	x	AJ	3	150	(30)	(44)	0,7	10	1	34										
o	x	AJ	11	50	18	5-15	2	e 50	22	45										
x	x	AJ	3-4-8	150	(25)	65	0,4	14	1	34-45										
x	x	AJ	8-9-11	80	(16)	(45)	6,8	6	1	34-45										
x	x	AJ	8-9-10	80	(16)	(75)	10	6	1	34										
x	x	AJ	2-3-13	50	(10)	(65)	0,85	12	1	34										
x	x	AJ	3-4	250	18	(70-150)	0,6	20	25	31										
x	x	AJ	3-6-8	250	(25)	60-120	0,5	25	25	31										

n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{fe}	... H _{fb}	f _{ab} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μA	(...) in mA	Diagram	Manufacturers
x	x	AJ			same as 2N224 - matched pair	250	(30)	35-105	0,4	25	25	31						
x	x	AJ			3-6-8	250	(30)	35-105	0,4	25	25	31						
x	x	AJ			same as 2N226 - matched pair	50	15	50-100	10k	100	22	45						
o	x	AJ			3-4-6	50	15	50-100	10k	100	22	45						
o	x	AJ			1-3-4-6	50	10	(25+)	0,6	100	22	45						
x	x				6	(15)	30	83	14k	100	8	57						
x	x	SB			9-10	9	4,5	(19-66)	(30)	3	24	31-40						
x	x	SB			11	9	4,5	(9-39)	(20)	6	24	31-40						
o	x	AJ			11	50	10	(10+)	e 50	22	45							
o	x	AJ			11	50	18	10-50	e 50	22	45							
x	x	AJ			1-3-6-8	(25)	30	(25)	0,5	0,42	3	4						
x	x	AJ			1-3-6-8	(25)	40	(40)	0,5	0,42	3	4-45						
x	x	AJ			1-3-6-8	(25)	40	(40)	0,5	0,42	3	4-45						
x	x	AJ			1-3-6-8	(25)	40	(40)	0,5	0,76	3	4						
x	x	AJ			1-3-6-8	(25)	40	(60)	0,5	0,76	3	4-45						
x	x				3	150	(45)	70	1	10	1	58						
x	x	AJ			3-4	50	20	(50)	20	22	47							
x	x	SB			7-8	30	6	(30)	50*	3	24	31-40						
x	x	AJ			3-5-6	100	25	73	1,3	16	9	16						
x	x	AJ			3-5-6	200	25	73	1,3	16	9	16-45						
x	x	AJ			3-6	(50)	45	50	7k	3	3	1)						
o	o	GJ			1-6-11	750	60	0,934	7	22	47							
o	o	GJ			1-6-11	750	60	0,975	8	22	47							
x	x	DR			7-11	80	(35)	(60)	30	16	7	34-45						
x	x				11-12	30	25	(20)	50	10	22	47						
x	x				3-6	350	(25)	45	10	11	47							
x	x	AJ			3-4-6-8	(25)	30	30	12k	(1)	3	45-47						
x	x	AJ			3-4-6-8	(25)	(60)	30	12k	(2)	3	47						
x	x				30	(16)			5	22	47							
x	x				11	65	12		0,2	22	47							
x	x				11	65	20		0,2	22	47							
x	x	AJ			3-5-6	(20)	(15)	15	0,1	(3)	3	4-7-4						
x	x	AJ			3-5-6-8	(20)	(15)	PG = 25 db	0,1	(3)	3	7						
x	x	AJ			3-5-6	(20)	(30)	15	0,1	(3)	3	4-7-4						
x	x	AJ			3-5-6-8	(20)	(30)	PG = 25 db	0,1	(3)	3	7						
x	x	AJ			3-5-6	(42)	25	(50)	7k+	(2)	3	2)						
x	x	AJ			3-6	(42)	25	PG=36db	5k	5	3	9						
x	x	AJ			3-6	(42)	25	PG=38db	5k	5	3	9						
x	x	AJ			3-6	(42)	25	PG=34db	5k	5	3	9						
x	o				250	(10)	16		1,8	0,001	1	9						
x	o				250	(75)	10		1,8	0,001	1	9						
x	o				250	(10)	20		6	0,001	1	9						
x	x	AJ			3-4	75	25	(110)	1,5	16	9	16						
x	x				75	(18)	24		0,8	16	9	16						
x	x	DR			11	35	(35)	60	30	10	1							
x	x	AJ			1-3-4-6-8	(30)	60	35	6k	(2)	3	3)						
x	x	AJ			6-8	(10)	60	40	0,5	2	3	4						
x	x	AJ			7-8	120	(25)	35	12	5	1	34						
x	x	AJ			3-4-6	250	(25)	70	16	7	34-45							
x	x	AJ			9	(30)	45		1	22	33							
x	x	AJ			3	150	(20)	60-120	1	22	33							
x	x	AJ			3-11	150	12	140	6	22	33							
x	x	DR			9-10-11-13	120	35	(60)	30	16	1	34						
x	x	AJ			3-4-5-6-8	(70)	25	35-70	0,1	(8)	6	12-49						
x	x	AJ			3-4-5-6-8	(70)	30	35-70	0,1	(8)	6	12-49						
x	x	AJ			1-2-3-4-8	125	30	(20-40)	0,3	12	33	1						
x	x	AJ			1-3-4-6-8	125	30	(30-75)	0,3	12	33	1						
x	x				3	16	70		0,35	50	33	1						
x	x				3	167	70		0,35	(mp)	33	1						
x	x				8	125	20	40	0,5	3,5	33	1						

	p-n-p	n-p-n	o	Silic.	o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	V _{cb} in V	HFE	(...) H _{FE}	H _{fb}	f _{ab} in Mc/s	f _{osc} max in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
	x	x	AJ	1-8	125	32	45	0,9	4,5	33	1									
	x	x	AJ	1-8	125	60	52	0,9	4,5	33	1									
	x	x	AJ	1-3-6-8	(25)	40	(150)	0,5	0,42	3	4-7-45									
	x	x			(55)	(70)	72	0,4	(1)	6	12									
	x	x		3-6	300	25	30-45+		25	22	47									
	o	x	GJ	11	65	(15)	(6-44)	5	5	22	16-45									
	o	x	GJ	11	65	15	8-51	8	5	11	16									
	x	x	AJ	3-4-6	(25)	60	20+	4k	(2)	3	45									
	x	x	AJ	1-6-8-13	(15)	50	25-100	0,5	3	3	4									
	x	x	AJ	1-3-+6-8-13	(35)	40	40-100	0,5	3	3	1)									
	x	x	SB	11	20	4,5		90+	3	26										
	x	x	SB	11	20	4,5	(11-33)	85+	3	26										
	x	x	AJ	3-4-6	(11)	(40)	70	5k	100	3	2)									
	x	x	AJ	3-4-6	(11)	(60)	70	5k	100	3	2)									
	o	x	AJ	3-4	50	15	25-125	0,6	50	22	7-45									
	x	x	AJ	3-6	(10)	35	21	4k	e 15	3	4-45									
	x	x	AJ	3-6	(17)	35	25+	5k	e 5	3	4-45									
	x	x		11		(20)	PG = 41	db	5	22	47									
	x	x		11	30	(20)	PG = 43	db	5	22	47									
	x	x		3-11	30	(30)	PG = 37	db		22	47									
	x	x	AJ	7-8	150	15	25-75		2	9	27									
	o	x	AJ	7-8-13	100	15	25-75		15	5	7-45									
	x	x	AJ	7-8	150	20	15-30	5	1	5	18-21									
	x	x		7-8	150	15	20-50	12	1	5	18-21									
	x	x		7-8	150	10	20-60	20	1	5	18-21									
	x	x	AJ	7-8	150	25	20-50	5	1	5	3)									
	x	x		7-8	150	20	20-50	12	1	5	3)									
	x	x		7-8	150	14	20-60	20	1	5	3)									
	x	x			50	(12)	photo transistor				18									
	x	x	AJ	3-4-5-6	200	20	33	2	16	5	16									
	x	x	AJ	3-4-5-6	200	20	48	2,5	16	5	16									
	x	x	AJ	3-4-5-6	200	25	50-100	10k	16	5	45									
	x	x	AJ	3-4	140	16	48	2,5	16	5	16									
	x	x	AJ	3-4	140	16	50-150	0,8	16	5	45									
	x	x	AJ	3-4	140	16	95	3,4	16	5	45									
	x	x		6	(12)	35	40	0,2												
	o	x		3-6	(7)	35	15-60	0,15	(3)	3	7-45									
	x	o	AJ	1-3-8	150	40	9-22	0,1	0,005	5	4)									
	x	o	AJ	1-3-8	150	35	18-44	0,2	0,005	5	4)									
	x	o	AJ	3-8	150	30	40-80	0,25	0,005	5	4)									
	x	o	AJ	3	385	30	(25)	0,5	0,1	9	41									
	x	x	AJ	1-3-4-6-13	200	30	50	1,2	16	9	5)									
	o	o	GJ	1-3-5-6-8-9-11-13	150	(45)	(9-20)	6	2	5	6)									
	o	o	GJ	1-3-7-8	500	(45)	19-22	10	20	5	16-30									
	o	o	GJ	1-3-6-8-11-13	150	(45)	(18-40)	8	2	5	6)									
	o	o	GJ	1-3-7-8	500	(45)	27	11	20	5	16-30									
	o	o	GJ	1-3-5-6-7-8-11-13	150	(45)	(18-90)	10	2	5	7)									
	o	o	GJ	1-3-7-8	500	(45)	36	12	20	5	16-30									
	o	o	GJ	1-3-5-6-7-8-11-13	150	(45)	(36-90)	11	2	5	6)									
	o	o	GJ	1-3-7-8	500	(45)	45	13	20	5	16-30									
	o	o	GJ	1-3-7-8	500	(45)	75	15	20	5	16-30									
	o	o	GJ	1-3-5-6-7-8-11	150	(45)	(76-333)	13	2	5	7)									
	o	o	GJ	5-6-8-11-B	125	(45)	55	20	1	5	8)									
	o	o	GJ	5-6-8-11-B	125	(45)	99	30	1	5	8)									
	o	o	GJ	1-6	(1)	(55)	15	6	1	11	47									

¹⁾ 4-7-12-27 ²⁾ 4-7-34-45 ³⁾ 11-18-21-51 ⁴⁾ 20-30-33-41-55
⁵⁾ 4-18-21-27-34 ⁶⁾ 5-16-30-47-48 ⁷⁾ 16-30-47-48
⁸⁾ 16-30-33-47-48

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{fe}	(...) H _{ib}	f _{ab} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
o	o	o	o	GJ	1-6	(1,2)		60		20									11	48
o	o	o	o	GJ	1-6	(1)		(85)		15					6		1		11	47-48
o	o	o	o	GJ	1-6	(1,2)		85		20									11	48
o	o	o	o	GJ	1-6	(1)		(125)		20					6		1		11	47-48
o	o	o	o	GJ	1-6	(1,2)		125		20									11	48
o	o	o	o	GJ	1-6	(1)		(60)		14					6		1		11	47-48
o	o	o	o	GJ	1-6	(1)		(85)		14					6		1		11	47
o	o	o	o	GJ	1-6	(1)		(60)		30					8		1		11	47-48
x	x	SB	7- +11	20	5	(11-33)		50		3					50		3		24	31-40
x	x	SB	7- +11	20	5	(25-110)		50		3					50		3		24	31-40
x	x	SB	7- +11	20	5	(20)		75		3					75		3		24	31-40
o	o	GJ	1-3-6	750	60	9+		3		5					3		5			5
o	o	GJ	1-3-6	750	60	9+		3		5					3		5			5
o	o	GJ	1-3-6	750	90	9+		3		6					3		6			5
o	o	GJ	1-3-6	750	90	9+		3							3					5
o	o	GJ	1-3-6	750	125	9+		3		8					3		8			5
x	x	AJ	3-6	(10)	(40)	20-60		5k+		3					5k+		3		3	27-45
x	x	AJ	3-5-6-8	(25)	40	20-60		5k+		(3)					5k+		(3)		3	27
x	x	AJ	3-6	(10)	(40)	25-90		5k+		(3)					5k+		(3)		3	1)
x	x	AJ	3-5-6-8	(25)	40	25-90		5k+		(3)					5k+		(3)		3	27
x	x		6	(25)	40	30-140		16k		(1)					16k		(1)		27	
x	x		6	(30)	40	40-150		16k		(1)					16k		(1)		27	
x	o		9	150	25	18		(15)		0,001					0,001		1		1	
x	o		8	150	10	18		(25)		0,001					0,001		1		1	
o	x	AJ	7-8	100	23	20-50		3		3					3		3		5	2)
o	x	AJ	7-8	150	28	20-50		3		3					3		3		5	3)
o	x		6-7-8	150	20	20-50		6		3					6		3		5	2)
o	x		7-8	150	25	25-75		6		3					6		3		5	3)
o	x		6-7-8	150	18	20-50		9		3					9		3		5	2)
o	x		7-8	150	23	25-75		9		3					9		3		5	4)
x	x	AJ	3-5-6	150	20	(150)		1		10					1		10		5	5)
x	x	AJ	3-5-6	150	20	(100)		1		10					1		10		5	5)
x	x	AJ	3-5-6	150	20	(70)		1		10					1		10		5	5)
x	x	AJ	3-4	150	12	(100)		1		10					1		10		5	5)
x	x	AJ	3-4	150	12	(50)		1		10					1		10		5	5)
o	x	GJ	1	150	30	9-19		2,5		10					2,5		10		22	47
o	x	GJ	1	150	30	19-49		3		10					3		10		22	47
o	x	GJ	1	150	30	49-142		3,5		10					3,5		10		22	47
x	x	AJ	1	150	30	19-49		1		20					1		20		22	47
x	x	AJ	1	150	30	49-142		1,3		20					1,3		20		22	47
x	x	DR	9	80	20	(60)		30		10					30		10		7	34-35
x	x	DR	8	80	20	(60)		30		10					30		10		7	34-35
x	x	DR	9	80	20	(60)		30		10					30		10		7	34-35
x	x	DR	11	80	25	(60)		30		8					30		8		7	34-35
x	x	DR	9	80	25	(60)		30		8					30		8		7	34-35
x	x	AJ	3-6-8	(90)	60	35-90		7k+		3					7k+		3		3	27
x	x	AJ	3-4-5-6	(10)	30	35-120		5k+		3					5k+		3		3	27-34
x	x	AJ	3-4-5-6-8	(25)	40	35-120		5k+		3					5k+		3		3	27
o	x	AJ	7-8-11	150	20	20-60		6		10					6		10		5	6)
o	x	AJ	7-8	150	20	20-60				40							40		5	45
x	x	AJ	3-6	(50)	20	30		0,3		(0,5)					0,3		(0,5)		3	49
x	x	AJ	3-6	(50)	40	30		0,3		(0,5)					0,3		(0,5)		3	49
x	x	AJ	3-6	(50)	30	50		0,4		(0,5)					0,4		(0,5)		3	49
x	x	AJ	3-5-6-8	200	50	35-65		3		10-					3		10-		5	45-49
x	x	AJ	3-5-6-8	200	50	60-90		4		10-					4		10-		5	45-49
x	x	AJ	3-5-6-8	200	50	75-120		5		10-					5		10-		5	45-49
x	x	DR	9- +13	120	40	60		100		12					100		12		1	34
o	x	AJ	7-8	150	25	30-110		4		10					4		10		5	7)
o	x	AJ	7-8	150	25	30-110		4		40					4		40		5	45
x	x	AJ	6-8	(12,5)	60	60		14k		(5)					14k		(5)		27	31

p-n-p	x	n-p-n	o	Germ. x	o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) Hfe	(...) H _{fb}	f _{ab} in Mc/s	(...) f _{osc} max in Mc/s	f _{co} in μA	(...) in mA	Diagram	Manufacturers
x	x	x	x	x	x	DM	6-8	(12,5)	80	35	20	60-180	12k	(5-)	27	31				
x	x	x	x	x	x		7-8-13	150	20	60	60-180	8	10	5	1)					
x	x	x	x	x	x		7-8-13	150	20	60	60-180	8	40	5	7-45					
x	x	x	x	x	x		1-6	(85)	60	12-60	7	(10)	39	2)						
x	x	x	x	x	x	AJ	3- 46-8-13	(35)	50	60-150	0,06	(8)	3	12						
x	x	x	x	x	x	MA	7-8-13	25	6	95	(40)	5	24	31-40						
x	x	x	x	x	x	AJ	7-8	150	10	70	9	2,5	9	11-29						
x	x	x	x	x	x	AJ	7-8	200	15	20-150	4,5	6	5	3)						
x	x	x	x	x	x	AJ	7-8	200	20	30-150	8	6	5	4)						
x	x	x	x	x	x	AJ	7-8-13	150	20	30-150	8	6	5	16-45						
x	x	x	x	x	x	AJ	7-8	200	15	40-150	12	6	5	3)						
x	x	x	x	x	x	AJ	8	50	105	60	14	9	34							
x	x	x	x	x	x		3-5-6	(25)	35	(40)	0,5	1	3	4-7-45						
x	x	x	x	x	x		3-6-8	(25)	35	(50)	0,5	2	3	4						
x	x	x	x	x	x		1-3-6	(25)	35	(40)	0,5	1	3	4-45						
x	x	x	x	x	x	AJ	3-4	180	20	25	0,6	10	9	54						
x	x	x	x	x	x	AJ	3-6	180	20	33	0,85	10	9	54						
x	x	x	x	x	x		7-8-13	150	(25)	40+	12	5	9	5)						
x	x	x	x	x	x	AJ	3-4	150	20	35		14	1	34-45						
x	x	x	x	x	x	AJ	3-4	150	20	35		14	1	34-45						
x	x	x	x	x	x	AJ	3-4-5-6	150	20	65		14	1	34-45						
x	x	x	x	x	x	AJ	3-4-5-6	150	20	65		14	1	34-45						
x	x	x	x	x	x	AJ	9-11	80	13	48	6,8	10	1	34-45						
x	x	x	x	x	x	AJ	9-11	80	13	48	6,8	10	1	34-45						
x	x	x	x	x	x	AJ	9-10	80	13	75	10	10	1	34-45						
x	x	x	x	x	x	AJ	9-10	80	13	75	10	10	1	34-45						
x	x	x	x	x	x	AJ	1-11	150	18	(30)	2,5	5	5	21-33						
x	x	x	x	x	x	AJ	1-8-11-13	150	15	(60)	7	5	9	6)						
x	x	x	x	x	x	AJ	11	150	15	PG=32db	2	10	9	7)						
x	x	x	x	x	x	AJ	11	150	15	PG=35db	4	20	9	45						
x	x	x	x	x	x	AJ	11	200	16	(60)	7	6	5	21						
x	x	x	x	x	x		11	150	10	80	10	2	9	11						
x	x	x	x	x	x	AJ	1-11-13	150	12	(80)	10	5	5	6)						
x	x	x	x	x	x	AJ	1-11-13	150	10	(140)	20	5	5	6)						
x	x	x	x	x	x	AJ	6-8	(25)	80	50	0,5	2	3	4-45						
x	x	x	x	x	x		1-6	(25)	45	(60)	0,5	1	3	4-45						
x	x	x	x	x	x		1-6-8	(25)	45	50	0,5	2	3	4						
x	x	x	x	x	x		6-8	(25)	70	50	0,5	2	3	4						
x	x	x	x	x	x	AJ	1-2-3	150	20	(50)	0,8	6	5	33						
x	x	x	x	x	x	DM	6	(85)	80	12-60	6	10	8	2)						
x	x	x	x	x	x	AJ	7-8-13	120	20	20-40	4	25	5	8)						
x	x	x	x	x	x	AJ	7-8-13	120	18	30-60	6	25	5	8)						
x	x	x	x	x	x	AJ	7-8-13	150	15	40-80	11	25	5	8)						
x	x	x	x	x	x	AJ	7-8-13	150	15	60+	17	25	5	8)						
x	x	x	x	x	x	AJ	7-8-13	100	25	20+	2,5+	10	5	9)						
x	x	x	x	x	x	AJ	7-8-13	100	20	30+	5+	10	5	9)						
x	x	x	x	x	x	AJ	7-8-13	100	15	40+	10+	10	5	9)						
x	x	x	x	x	x	AJ	7-8	150	25	20+	2,5+	10	5	10)						
x	x	x	x	x	x	AJ	7-8	150	20	30+	5+	10	9	10)						
x	x	x	x	x	x	AJ	7-8	150	15	40+	10+	10	9	10)						
x	x	x	x	x	x	AJ	3-4-5-6-8	(70)	25	20-40	0,1	(8)	6	12-49						
x	x	x	x	x	x	AJ	3-4-5-6-8	(70)	30	20-40	0,1	(8)	6	12-49						
x	x	x	x	x	x	AJ	3-4-5-6-8	(70)	45	20-40	0,1	(8)	6	12-49						
x	x	x	x	x	x	AJ	3-7-8	100	15	(10)	0,5+	6	9	7						
x	x	x	x	x	x	AJ	1-3-7-8-11	150	25+	20-40	0,5+	2	5	11-18						
x	x	x	x	x	x	AJ	3-7-8	100	12	(20)	2+	6	9	7						
x	x	x	x	x	x	AJ	1-7-8-11-13	150	18+	40-160	2+	2	5	11-18						
x	x	x	x	x	x	AJ	3-7-8	100	10	(30)	5+	6	9	7						
x	x	x	x	x	x	AJ	1-7-8-11-13	150	15+	60-250	5+	2	5	11-18						
x	x	x	x	x	x	AJ	3-7-8	100	6	(50)	9+	6	9	7						

1) 7-11-16-18-45 2) 33-44-47-48 3) 11-16-29-33-47-67

4) 11-16-18-29-33-45-47-51-67 5) 11-16-18-21-27-33-34-45-49-51-67

6) 11-18-21-33-49-51 7) 11-18-45 8) 11-18-21-27-33-45-49-51-67

9) 7-18-33-45 10) 7-11-45

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) Hf _o	(...) Hf _b	f _{ab} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μA	(...) in mA	Diagram	Manufacturers
o	x	AJ	1-7-8-11-13					150		12+		80-300		9+	2		5	11-18		
o	x	GJ	11					65		15		8-51		5	5		11	16		
o	x	GJ	11					65		15		34+		8	5		11	16		
x	x	AJ	7-8					150		12		30+		5+	6		9	16		
x	x	AJ	3-4-6-8					(50)		(40)		52					3	34		
x	x	AJ	3-4-6-8					(50)		(40)		30-90		0,43"	(2)		3	47		
x	x	AJ	3-4-6-8					(50)		(60)		52					3	34		
x	x	AJ	3-4-6-8					(50)		(60)		30-90		0,43"	(2)		3	47		
x	x	AJ	3-4-6					(50)		(80)		30-90		0,43"	(2)		3	47		
x	x	AJ	3-6-8					(50)		60		30		0,3	0,5		3	49		
x	x	AJ	1-3					200		(45)		25		1,2	15		5	49		
x	x	AJ	1-3-13					200		(45)		50		1,2	15		5	27-49		
x	x	AJ	7-8					150		(40)		20-45		0,5	35		25			
x	x	AJ	3-4-6-8					(37,5)		60		20-60		0,5	100			53		
x	x	AJ	1-3-13					150		40				0,7	6		5	1)		
x	x	AJ	1-3-13					150		30				0,8	6		5	1)		
x	x	AJ	1-3-13					150		20				1	6		5	1)		
x	x	AJ	1-3-13					150		15		180		1,2	6		5	1)		
x	x	AJ	photo tr.					50		(20)		(70)		1,8	8-			18		
o	o		1-11					200		30		10-25		1	0,5					
o	o	GJ	1-11					200		(15)		(30)		10	0,1			48		
o	o	GJ	1-11					200		(30)		30		10	0,01			48		
o	o	GJ	1-11					200		30		20-50		1	0,5					
o	o	GJ	1-11					200		45		(30)		10	0,5		5	48		
o	o	GJ	1-11					200		45		(30)		10	0,5		5	48		
o	o	GJ	1-11					200		(30)		(60)		11	0,01			48		
o	o	GJ	1-11					200		30		40-100		10	0,5		5	48		
o	o	GJ	1-11					200		45		(60)		11	0,5		5	48		
o	o	GJ	1-11					200		45		40+		10	0,5		5	48		
x	x	AJ	3-9					150		12		(50)		3	10		9	33		
x	x	AJ	11					150		10		(50)		3,5	10		5	21-33		
x	x	AJ	11					150		10		(60)		5,5	10		5	21-33		
x	x	AJ	11					150		10		(90)		10	10		5	21-33		
x	x	AJ	9-10					150		10		(50)		7,5	10		5	21-33		
x	x	AJ	9-10					150		10		(100)		12	10		5	21-33		
x	o		8-13					450		uni-junction				(0,9)			5	16		
x	o		8-13					450		uni-junction				(0,7)			5	16		
x	o		8-13					450		uni-junction				(0,8)			5	16		
x	o		8-13					450		uni-junction				(0,7)			5	16		
x	o		8-13					450		uni-junction				(0,7)			5	16		
x	o		8-13					450		uni-junction				(0,6)			5	16		
x	o	SA	9-11-13					150		25		(20)		(21)	1		1	31		
x	o	SA	7-8-13					150		10		16		20"	0,1		1	31		
o	o	DM	6					(4)		60		12-36		6	0,01		5	36-47		
o	o	DM	6					(4)		100		12-36		6	0,01		5	2)		
x	x	MD	11-13					30		18		(8,5)		120"	100		1	31-40		
x	x	MD	7-8					25		12		35		120"	100		1	31-40		
x	x	MD	7-8					60		15		35		120"	25		1	31-40		
x	x	MD	11-12					25		20		(45)		220"	5		9	31		
x	x	MD	11-12					75		30		(45)		220"	5		9	31		
x	x	MD	11-12					25		20		(45)		(330)	5		9	31		
x	x	MD	8-11					30		35		(16+)		(50+)	10		1	40		
x	x		8					200		20		(40)		8	2		9	21		
x	x							50		(40)		25-50		0,6+	15		22	45		
o	x							50		(40)		25-50		0,6+	15		22	45		
x	x	AJ	3-4					140		16		(112)		3,5	16		5	16		
replaced by 2N1195																				
x	x	AJ	6					(80)		(40)		20-60		0,26"	(2)		3	47		
x	x	AJ	6					(80)		(60)		20-60		0,26"	(2)		3	47		
x	x	AJ	6					(80)		(80)		20-60		0,26"	(2)		3	47		

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{FE}	... H _{ib}	f _{ab} in Mc/s	... f _{osc} max in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
x	x	AJ	6					(80)		(40)		20-60			0,28"	(2)		3	47	
x	x	AJ	6					(80)		(60)		20-60			0,28"	(2)		3	47	
x	x	AJ	6					(80)		(80)		20-60			0,28"	(2)		3	47	
x	x	AJ	6					(80)		(40)		20-60			0,3"	(2)		3	47	
x	x	AJ	6					(80)		(60)		20-60			0,3"	(2)		3	47	
x	x	AJ	6					(80)		(80)		20-60			0,3"	(2)		3	47	
x	x	AJ	6					(80)		(40)		20-60			0,35"	(2)		3	47	
x	x	AJ	6					(80)		(60)		20-60			0,35"	(2)		3	47	
x	x	AJ	6					(80)		(80)		20-60			0,35"	(2)		3	47	
o	x	AJ	11					50		18		25-50			2	e 50	22	45		
o	x	AJ	11					50		18		10-60			2	e 50	22	45		
o	x	AJ	11					50		18		(5-15)			2	16	22	45		
x	x	AJ	7-8					150		12		60+			10+	6	9	16		
x	x	AJ	1-3-7-8-11					150		15		(25)			0,5+	25	9	1)		
x	x	AJ	1-3-7-8-11					150		18+		20-50			0,5+	2-	5	2)		
x	x	AJ	7-8-11					150		12		(40)			3+	25	9	1)		
x	x	AJ	7-8-11-13					150		15+		40-170			3+	2-	5	2)		
x	x	AJ	7-8-11					150		10		(70)			8+	25	9	21-51		
x	x	AJ	7-8-11-13					150		12+		60-250			8+	2-	5	2)		
x	x	AJ	7-8-11					150		8		(120)			15+	25	9	21-51		
x	x	AJ	7-8-11-13					150		10+		80-320			15+	2-	5	2)		
x	x	AJ	7-8-11					150		6		(200)			21+	25	9	21-51		
x	x	AJ	7-8-11-13					150		6+		100-400			21+	2-	5	2)		
x	x	AJ	1-3-6-8					225		30		19-42			2	10	5	3)		
x	x	AJ	1-3-6-8					225		30		34-65			2,5	10	5	3)		
x	x	AJ	1-3-6-8-13					225		30		53-90			3	10	5	3)		
x	x	AJ	1-3-6-8					225		30		72-121			3,3	10	5	3)		
x	x	AJ	3-4-6-7-8				(2,5)	40		40		20+			4	10	8	53		
x	x	AJ	1-3					100		15		15-20			1	5	9	53		
x	x	AJ	1-3-8					25		(50)		(100)				8	23	31		
x	x	matched	1-3					100		15		20-25			1,3	5	9	53		
x	x	pairs	1-3					100		15		25-30			1,5	5	9	53		
x	x	1 n-p-n	1-3					100		15		30-35			1,8	5	9	53		
x	x	1 p-n-p	1-3					100		15		35-40			2	5	9	53		
x	x	AJ	1-2-3-8					50		20		(35-200)			2	3	23	31		
x	x	AJ	1-2-3-8					50		20		(35-200)			2	3	23	31		
x	x	AJ	8					50		20		150			1	4	23	31		
x	x	OM	3-6-9-11-13					250		4,5		(10)			750	5	29	53		
x	x	AJ	1-3-6-8					(32)		60		20-50			0,2"	(2)	10	26		
x	x	AJ	1-3-6-8					(32)		60		20-50			0,2"	(2)	10	26		
x	x	AJ	1-3-6-8-13					(32)		60		30-75			0,2"	(2)	10	26		
x	x	AJ	1-3-6-8					(32)		60		30-75			0,2"	(2)	10	26		
x	x	AJ	1-3-6-8					(32)		60		45-113			0,2"	(2)	10	26		
x	x	AJ	1-3-6-8					(32)		60		45-113			0,2"	(2)	10	26		
o	o	GJ	1-11-13					200		15		80+			15	0,5	5	48		
o	o	GJ	1-11-13					200		30		80+			15	0,5	5	48		
o	o	GJ	1-11					200		45		80+			15	0,5	5	48		
o	o	GJ	1-11					200		45		80+			15	0,5	5	48		
x	x	DR	11					80		24		60			30	16	7	34-45		
x	x	DR	11					80		(18)		(20-175)				16	7	45		
o	o	DJ	6-7-8					(5)		60		15+			8	70	5	48		
o	o	DJ	6-8					(5)		30		15+			8	50	5	48		
o	o	DJ	1-3-5-6-11					(5)		60		20+			6	15	5	48		
o	o	DJ	1-3-5-6-11					(5)		30		20-80			6	15	48			
o	o	DJ	1-3-5-6-11					(5)		60		20+			6	3	5	48		
o	o	DJ	1-3-5-6-11					(5)		30		20-80			6	3	5	48		
o	o	DJ	1-3-5-6-11					(5)		30		20-80			6	15	48			
x	x	AJ	3-4-5-6-8					(35)		40+		40-80			0,2	(2)	3	12		

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{fe}	... H _{fb}	f _{ab} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
x	x	x	x			6	(10)	28	(30)	8k	e 100	3	45							
x	x	x	x			6	(10)	40	20+	50	3	27								
x	x	AJ	7-8			100	20	38-75		25	5	7-45								
x	x	AJ	7-8			100	20	20		25	5	45								
x	x	AJ	7-8			100	15	20		15	5	7-45								
x	x	DM	7-8-13			150	15	25+		750	50	28	53							
x	x	DM	7-8-13			600	60	20+		50	0,1	29	30-53							
x	x	AJ	3-4-6-8			(13)	80	75		150	3	34								
x	x	AJ	1			150	25	10-30		0,8	5	9	18							
x	x	AJ	1-8-13			150	25	10-30		0,8	5	9	18-21							
x	x	AJ	1			150	25	30-50		1	5	9	18							
x	x	AJ	1-8-13			150	25	30-50		1	5	9	18-21							
x	x	AJ	1-13			150	25	50-70		1,5	5	9	18							
x	x	AJ	1-8-13			150	25	50-70		1,5	5	9	18-21							
x	x	AJ	1-13			150	15	70-100		2	5	9	18							
x	x	AJ	1-8-13			150	20	70-100		2	5	9	18-21							
x	x	AJ	1-13			150	10	100+		3	5	9	18							
x	x	AJ	1-8-13			150	10	100+		3	5	9	18-21							
x	x	AJ	6-8-13			(100)	(60)	9-22		0,2+	7	6	18							
x	x	AJ	6-8-13			(100)	(80)	9-22		6k	20	6	26							
x	x	AJ	6-8-13			(100)	(60)	19-42		6k	7	6	26							
x	x	AJ	6-8-13			(100)	(80)	19-42		6k	20	6	26							
x	x	core driver	8			200	20	20-60			20	5	45							
x	x	core driver	8			200	40	20-60			40	5	45							
x	x	photo trans.				25	(25)						59							
x	x	AJ	7-8			120	14	15		5	5	9	1)							
x	x	AJ	7-8			120	14	30		8	5	9	1)							
x	x	AJ	7-8			120	14	45		15	5	9	1)							
x	x	AJ	7-8			120	14	30		8	6	5	1)							
x	x	AJ	7-8			120	14	60		18	5	5	2)							
x	x	AJ	7-8			120	18	30		8	6	1	34							
x	x	AJ	7-8			120	25	60		18	5	1	34							
x	x	AJ	7-8			120	20	40		5	8	9	3)							
x	x	AJ	8			250	(45)	55			16	7	34							
x	x	AJ	7-8			150	30	20+			50	5	45							
x	x	MD	9-10-11-12			30	15	PG = 14		(200)	15	1	31-40							
x	x	AJ	3-4			50	32	70		10 k	50	1	34							
x	x		1-3-8			150	25	15+		0,4	3	9	18							
x	x		1-3-8			150	25	25+		0,6	3	9	18							
x	x		1-3-7-8-11			100	20	20-35		1,5+	5-	9	18							
x	x		1-7-8-11			100	15	35-50		3+	5-	9	18							
x	x		1-7-8-11			100	10	50		5+	5-	9	18							
x	x	AJ	8			250	40	70		8	10	9	11-31							
x	x	AJ	8			250	35	70-225		10	10	9	11-31							
x	x		8			250	30	175		18	10	9	11-31							
x	x	AJ	7-8			(0,75)	35	125		10	10	30	31							
x	x	AJ	7-8			(0,75)	30	175		18	10	30	31							
x	x	OR	7-8-11-12			120	20+	20-80		20"	3	9	18							
x	x	DR	7-8-11-12			120	20+	30-100		40"	3	9	18							
x	x	DR	7-8-11-12			120	20+	40-140		60"	4	9	18							
x	x	AJ	1-3-5			180	(25)	(100)		1,2	20	9	54							
x	x	AJ	1-3-5			180	(25)	(70)		1,1	20	9	54							
x	x	AJ	1-3-5			180	(25)	(45)		1	20	9	54							
x	x	AJ	1-3			180	(25)	(25)		0,6	20	9	54							
x	x	AJ	1-3			180	(25)	(33)		0,85	20	9	54							
x	x	AJ	11			125	20	(5)		3	3	9	54							
x	x	AJ	11			125	20	(8)		5	3	9	54							
x	x	AJ	11			125	20	(20)		9	3	9	54							
x	x	AJ	11			125	20	(14)		7	3	9	54							
x	x		1-3-6-8-13			(90)	60	60-140		8,5k+	3	3	27							

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{fe}	... H _{fs}	f _{ab} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
o	o	AJ	1-3-8	250	40	10-20	0,2	0,005	5	33										
o	o	AJ	1-3-8	250	35	20-40	0,25	0,005	5	33										
o	o	AJ	1-3-8	250	30	40-80	0,3	0,005	5	33										
x	x	DR	11	100	20	20+	12+	30	5	45										
o	x			(2,5)	30		20	0,1-	8	45										
o	x		1-3-6-8	(10)	30	30000	7k			2										
x	x	AJ	3-6-8-13	(90)	30	10-30	8k	4	3	27										
x	x	AJ	3-6-8-13	(90)	45	10-30	8k	4	3	27										
x	x	AJ	3-6-8-13	(90)	60	10-30	8k	4	3	27										
x	x	AJ	3-6-8-13	(90)	75	10-30	8k	4	3	27										
x	x	AJ	3-6	150	16	(150)	1,2	25	5	1)										
x	x	AJ	3-5-6	150	20	(100)	1	25	5	1)										
x	x	AJ	3-5-6	150	20	(60)	0,8	25	5	1)										
o	x	AJ	7-8	150	20	15+	5+	6	9	7-11										
o	x	AJ	7-8	150	20	40-120	8	6	5	16										
o	x	AJ	7-8	150	20	25+	10+	6	9	7-11										
o	x	AJ	7-8	150	20	80-240	12,5	6	5	16										
o	x	AJ	7-8	150	15	35+	15+	6	9	7-11										
o	x	AJ	7-8	150	15	100-300	17	6	5	16										
x	x		3-6-8	(25)	40	30-60	0,5	1	3	4										
x	x		3-6-8	(25)	70	30-60	0,5	5	3	4										
x	x		6-8	(25)	80	30-60	0,5	5	3	4										
x	x		3-6-8	(25)	40	20-40	0,5	1	3	4										
x	x		3-6-8	(25)	70	20-40	0,5	5	3	4										
x	x		6-8	(25)	80	20-40	0,5	5	3	4										
x	x		3-6-8	(25)	40	15-30	0,5	1	3	4										
x	x		3-6-8	(25)	70	15-30	0,5	5	3	4										
x	x		6-8	(25)	80	15-30	0,5	5	3	4										
x	x	DR	11	80	(34)	(60)	42	5	7	34										
x	x	DR	9	80	(34)	(60)	42	7	7	34										
x	x	DR	11-12	80	(34)	(60)	42	7	7	34										
x	x	DR	7-8	120	(30)	45	30"	10	9	34										
x	x	DR	7-8	120	(30)	45	50"	10	9	34										
x	x	DR	7-8	120	(30)	45	75"	10	9	34										
o	x	AJ	3-4-5-6	100	(25)	(70)		14	1	34										
o	x	AJ	3-4-5-6	100	20	(65)		14	1	34										
x	x	AJ	1-3	200	25	25-70	0,75	10	5	27										
x	x	AJ	1-3-8	200	30	33	0,75	10	5	27										
x	x	AJ	1-3	200	25	(50-125)	1	10	5	27										
x	x	AJ	1-3-8	200	30	45	1	10	5	27										
x	x	AJ	1-3	200	25	(100-250)	1,25	10	5	27										
x	x	AJ	1-3-8	200	30	80	1,25	10	5	27										
x	x	AJ	1-3	200	25	(30-70)	1,5	15-	5	27										
x	x	AJ	1-3	200	25	(50-125)	2	15-	5	27										
x	x	AJ	1-3	200	25	(100-250)	2,5	15-	5	27										
o	o	DM	6-8	(4)	(60)	30-90	6	0,1	5	36-47										
o	o	DM	6-8	(4)	(100)	30-90	6	0,1	5	2)										
x	x	AJ	7-8	150	18	25-80	5	2,5	5	33										
x	x	AJ	7-8	150	16	40-110	10	2,5	5	33										
x	x	AJ	7-8	150	14	60-150	15	2,5	5	33										
x	x	AJ	7-8	150	9	80+	20	2,5	5	33										
x	x	AJ	7-8	150	14	60	8	2,5	5	33										
x	x	AJ	3-6-8-13	(35)	40	40-80	0,2	(10)	3	12										
x	x	AJ	1-3-6	(10)	30	100-250	3k+	(3)	3	27										
x	x	AJ	4-8	300	40	40-250	0,5+	25	11	31										
x	x	AJ	4-6-8	(1)	40	40-250	0,5+	25	26	31										
x	x	AJ	4-8	300	25	125	25	25	11	31										
x	x	AJ	4-6-8	(1)	25	125	25	25	26	31										
x	x	AJ	4-8	300	75	(40-250)	0,4	100	11	31										
x	x	AJ	4-6-8	(1)	75	40-250	0,4	100	26	31										

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW (...) in W	V _{ce} in V (...) V _{cb} in V	HFE	(...) H _{fe}	... H _{fb}	fab in Mc/s ... ft	(...) f _{osc} max in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
x	x						1-3-8	(50)	30	20-60	0,5		2	3	4-45			
x	x						1-3-8	(50)	40	20-60	0,5		2	3	4-45			
x	x						1-3-8	(50)	70	20-60	0,5		5	3	4-45			
x	x						1-3-8	(50)	80	20-60	0,5		5	3	4-45			
x	x						1-3-8	(50)	30	50-100	0,5		2	3	4-45			
x	x						1-3-8	(50)	40	50-100	0,5		2	3	4-45			
x	x						1-3-8	(50)	70	50-100	0,5		5	3	4-45			
x	x						1-3-8	(50)	80	50-100	0,5		5	3	4			
o	x	AJ					7-8	150	20	20-25	2		25	5	45			
x	x						3	120	(20)	35			14		47			
x	x	DM					7-8-13	75	15	40	250"		3	17	27			
o	o	DD					1-3- +13	(2)	40	20-60	90"		1	5	1)			
o	o	DD					1-3- +13	(2)	40	40-120	120"		1	5	1)			
o	o	DM					1-3- +12	(2)	80	20+	90"		2	5	14-3			
o	o	DM					1-3- +13	(2)	80	40-120	120"		2	5	2)			
x	x	DM					8-9-11-+13	75	20	(10)	800		2	17	27			
x	x	DM					11-12	75	20	25	200				27			
o	o	DM					7-8-11-12	600	20	15-45	150"		20	18	3)			
o	o	DM					7-8-11-12	600	(25)	0,992"	150"			18	30-4			
x	x	DM					7-8-13	300	15	40	300		3	18	4)			
o	o	DM					3-7-+12	(1)	20	20+	(400)		0,5	18	5)			
x	o	DD					7-8	(1)	(25)	20-60	(400)		0,5	18	47			
o	o	DM					3-9-+12	(1)	28	9+	100		5	18	14-30			
x	x	DM					7-8-13	300	15	25+	300		3-	18	4)			
o	o	DM					7-8-11-12	500	35	10-50	150"			18	30-4			
o	o	DM					7-8-11-12	500	40	10-50	150"			18	30-4			
o	o	DM					1-3-7-+12	(1,5)	40	20+	90"		1	18	14			
o	o	DM					1-3-7-+12	(1,5)	40	40-120	120"		1	18	14			
o	o	DM					1-3-7-+12	(1,5)	80	20+	90"		2	18	14			
o	o	DM					1-3-7-+12	(1,5)	80	40-120	120"		2	18	14			
x	x						7-8	150	(15)	20+			100	18	45			
o	o						7-8	150	30	20	150		5	18	48			
o	o						7-8	150	15	20	150		5	18	48			
x	o	DD					7-8	(1,5)	40	20-60			1	18	47			
x	o	DD					7-8	(1,5)	40	40-120			1	18	47			
x	x	DM					2-9-11-12-13	300	15	10-25	(360)		3-	18	27			
x	o	DD					11-12	300	60	25+			0,1	18	30			
o	o						7-8-11	45	35	35	10		0,002	17	33			
o	o						7-8-11	45	60	60	10		0,002	17	33			
o	o						7-8-11	25	60	60	25		0,005	17	33			
o	o						7-8-11	30	30	30	25		0,005	17	33			
o	o						7-8-11	45	(10)	60	0,005		17	33				
o	o						7-8-11	50	(7)	25	0,005		17	33				
o	o						7-8-11	20	4	12	0,005		33					
o	o	DD					11-12	300	45	(40-150)			0,1	18	30			
o	x	AJ					8	150	25	40+	7+		15-	5	6)			
o	o						8-11	125	15	20-55	50				36			
o	o						8-11	125	15	45-150	50				36			
x	x						3-5-6-8	400	20	40-150	1		5	9	4			
x	x						3-4	400	40	40-150	1		5	9	4-45			
x	x						8	400	60	40-150	1		7	9	4			
x	x						3-4	150	25	(40)			0,8	9	45			
o	x	AJ					2-3	20	(10)	(35)	2		10	1	34			
x	x						3-+6-8-13	(35)	70	30-75	0,5		(15)	3	7)			
o	x	AJ					7-8	150	22	40+	3+		5	5	7-18			
x	x	AJ					3-4-5-6-8	(13)	(100)	75			150	3	34			
o	o	AJ					6	30	10	10	0,3			6	54			
o	o	AJ					6	60	10	10	0,3			6	54			
o	o	AJ					6	100	10	10	0,3			6	54			

¹⁾ 14-19-21-30-32-36-41-47-48-68 ²⁾ 14-21-30-36-41-68 ³⁾ 21-30-47
⁴⁾ 16-27-45-47 ⁵⁾ 14-21-27-30-36-41-47-68 ⁶⁾ 7-18-45 ⁷⁾ 4-12-27

Typing No.	p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{fe}	... H _{fb}	f _{ab} in Mc/s ... " fr	(...) f _{osc} max in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
2N1006	o	o	AJ	6							150		10			0,3			6	54	
2N1007	o	o	AJ	6							200		10			0,3			6	54	
2N1008	o	o	AJ	6							30		10			0,3			6	54	
2N1009	o	o	AJ	6							60		10			0,3			6	54	
2N1010	o	o	AJ	6							100		10			0,3			6	54	
2N1011	o	o	AJ	6																	
2N1012	o	o	AJ	6							150		10			0,3			6	54	
2N1013	o	o	AJ	6							200		10			0,3			6	54	
2N1014	x	x	AJ	7-8				150			10		70+			20		2	5	21-33	
2N1015	x	x	AJ	7-8				150			8		140			25		2	5	33	
2N1021	x	x	AJ	3-4-6-8				(50)		(100)			30-90			0,43"		(0,5)	3	47	
2N1022	x	x	AJ	3-4-6-8				(50)		(120)			30-90			0,43"		(0,5)	3	47	
2N1023	x	x	DR	7-+12				120					(40)			120		12	1	34	
2N1024	x	o	AJ	1-3-8-9-11				250			15		(9+)			1+		0,01	5	30-41	
2N1025	x	o	AJ	1-3-8-9-11				250			35		(9-22)			1+		0,01	5	30-41	
2N1026	x	o	AJ	1-3-8-9-11				250			35		(18-44)			2+		0,01	5	41	
2N1027	x	o	AJ	1-3-7-+9-11				250			15		(18+)			4+		0,01	5	41	
2N1028	x	o	AJ	1-3-7-+9-11				250			10		(9+)			4+		0,01	5	41	
2N1029	x	x		1-3-6-8				(50)			30		20-60			0,5		2	3	4	
2N1030	x	x		1-3-6-8				(50)			40		20-60			0,5		2	3	4	
2N1031	x	x		1-3-6-8				(50)			70		20-60			0,5		5	3	4	
2N1032	x	x		1-3-6-8				(50)			80		20-60			0,5		5	3	4	
2N1033	x	x		1-3-6-8				(50)			30		50-100			0,5		2	3	4	
2N1034	x	x		1-3-6-8				(50)			40		50-100			0,5		2	3	4	
2N1035	x	x		1-3-6-8				(50)			70		50-100			0,5		5	3	4	
2N1036	x	x		1-3-6-8				(50)			80		50-100			0,5		5	3	4	
2N1037	x	x		1-3-6-8				(50)			30		20-60			0,5		2	3	4	
2N1038	x	x		1-3-6-8				(50)			40		20-60			0,5		2	3	4	
2N1039	x	x		1-3-6-8				(50)			70		20-60			0,5		5	3	4	
2N1040	x	x		1-3-6-8				(50)			80		20-60			0,5		5	3	4	
2N1041	x	x		1-3-6-8				(50)			30		50-100			0,5		2	3	4	
2N1042	x	x		1-3-6-8				(50)			40		50-100			0,5		2	3	4	
2N1043	x	x		1-3-6-8				(50)			70		50-100			0,5		5	3	4	
2N1044	x	x		1-3-6-8				(50)			80		50-100			0,5		5	3	4	
2N1045	x	x		1-3-6-8				(50)			30		50-100			0,5		2	3	4	
2N1046	x	x		1-3-6-8				(50)			40		50-100			0,5		2	3	4	
2N1047	x	x		1-3-6-8				(50)			70		50-100			0,5		5	3	4	
2N1048	x	x		1-3-6-8				(50)			80		50-100			0,5		5	3	4	
2N1049	x	o	AJ	1-3				250		(15)	15					0,2		0,005	5	1)	
2N1050	x	o	AJ	1-3				250		(30)	30					0,3		0,005	5	1)	
2N1051	x	o	AJ	1-3				250		(60)	60					0,4		0,005	5	1)	
2N1052	x	o	AJ	1-2-3				250		(30)	30					0,25		0,005	5	1)	
2N1053	x	x	AJ	6				(20)		(40)	20-60					8k		125	7	47	
2N1054	x	x	AJ	6				(20)		(60)	20-60					8k		125	7	47	
2N1055	x	x	AJ	6				(20)		(80)	20-60					8k		125	7	47	
2N1056	x	x	AJ	6				(20)		(100)	20-60					8k		125	7	47	
2N1057	x	x	AJ	6				(20)		(40)	20-60					8k		125	7	47	
2N1058	x	x	AJ	6				(20)		(60)	20-60					8k		125	7	47	
2N1059	x	x	AJ	6				(20)		(80)	20-60					8k		125	7	47	
2N1060	x	x	AJ	6				(20)		(100)	20-60					8k		125	7	47	
2N1061	x	x	AD	6-8				(30)		(100)	40+					20*		(1)	3	47	
2N1062	x	x	AD	6-8				(30)		(140)	20					20*		(1)	3	47	
2N1063	x	x	AD	6-8				(30)		(140)	10					20*		(1)	3	47	
2N1064	o	o	DM	6				(40)			80		12-36			8		15		44-47	
2N1065	o	o	DM	6				(40)			120		12-36			8		0,015		44-47	
2N1066	o	o	DM	6				(40)			80		30-90			7		0,015		44-47	
2N1067	o	o	DM	6				(40)			120		30-90			7		15		44-47	
2N1068	o	o	DM	1-3-+6-11				600			40		30-100			140		0,1	29	53	
2N1069	x	x	AJ	7-8				240			50		18-43			0,5+		25	29	16	
2N1070	x	x	AJ	7-8				240			30		34-90			1,3		16		16	
2N1071	o	o	AJ	9-10				50			18		(10-23)			4		e 50	22	45	
2N1072	o	o	AJ	3-4				180			15		50-100			10k		50	22	45	
2N1073	o	o	DM	7-8-14				200			40					50		0,1	28	53	
2N1074	x	x	DR	7-8-11-+13				120			20		20-80			20+		8-	9	18	
2N1075	x	x	DR	7-+12				120			(40)		(60)			120		12	5	34	

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{FE}	... H _{ib}	f _{ab} in Mc/s	... ft	(...) f _{osc. max} in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
o	o	DM	3-4-6-8	(5)	(60)	35	1,5	(0,5)	8	34-44											
o	o	DM	3-4-6-8	(10)	(60)	38	1,5	(0,5)	8	34-44											
o	o	DM	3-4-6-8	(50)	(60)	20	1,2	(1)	3	34-44											
o	o	DM	3-4-6-8	(50)	(60)	20	1,2	(1)	3	34-44											
o	o	DD	1-3-4-8-11	(12)	75	15	0,1		8	53											
x	x	DA	1-3-+8	(35)	40	20-60	1,5	1	3	4											
x	x	DA	1-3-+8	(35)	80	20-60	1,5	2	3	4											
x	x	DA	1-3-+8	(35)	120	20-60	1,5	5	3	4-45											
o	o	AJ	1-3	250	(15)	15	0,2	0,005	5	33											
o	o	AJ	1-3	250	(28)	28	0,35	0,005	5	33											
o	o	AJ	1-3	250	(60)	60	0,5	0,005	5	33											
o	o	AJ	1-3	250	(25)	25	0,3	0,005	5	33											
x	x	AJ	1-3-5-6-13	(20)	45	30+	(2-)	13	7												
o	x	GJ	9-10	65	9	17-195	8	3	8	16											
o	x	GJ	9-10	65	9	17-195	8	3	8	16											
o	x	GJ	9-10	65	9	17-195	8	3	8	16											
o	x	AJ	7-8	120	(25)	50	7	8	5	1)											
o	x	AJ	7-8	120	(25)	70	13	8	5	1)											
o	o	DM	3-4-6-8	(2)	(60)	35	1,5	500	9	34											
x	x		7-8	150	(30)	(50)	8		9	47											
x	x	DM	3-5-6-11-12	150		13	750	1,2		53											
o	o	GJ	1-3-4-6	500	(60)	9+	3	5	22	5											
o	o	GJ	1-3-4-6	500	(90)	9+	3	6	22	5											
x	x	AJ	3-4	140	16	34-90	16	5	16												
x	x	AJ	3-4	140	16	25-90	16	5	16												
x	x	AJ	3-+8-13	(70)	(80)	35-70	0,1	(8)	8	12											
x	x	AJ	1-3-+8-13	(70)	(100)	25-50	0,1	(8)	8	12											
o	x	AJ	3-5-6	180	15	25-50	10k	50	22	45											
o	x	AJ	3-5-6	180	25	25-50	10k	50	22	45											
x	x	GJ	11	30	16	(34)	10	22	47												
x	x	GJ	9-10	30	16	(33)	10	22	47												
x	x	GJ	9	30	16	(20)	10	22	47												
x	x	GJ	11	30	16	(29)	10	22	47												
x	x	GJ	11	30	20	(25)	10	22	47												
x	x	GJ	3-11-12	30	20	(25)	10	22	47												
x	x	GJ	4-11-12	30	27	(25)	10	22	47												
o	x	AJ	7-8	150	15	40-180	7	30	5	45											
o	o	DJ	6	(5)	(60)	40	6	1,2	5	48											
o	o	DJ	6	(5)	(60)	40	6	0,4	5	48											
o	o	SA	9-11-13	150	(25)	(9+)	(8)	1	5	31-40											
o	o	SA	7-8-13	150	(10)	16	20"	0,1	5	31-40											
o	o	SA	9-11-13	150	25	(15-35)	(18)	1	5	31											
x	x		1-3-6-8-13	(45)	70	20-50	(15)	3	4-27												
o	x	GJ	11	65	15	34+	8	5	11	16											
x	x	MA	7-8	25	11	25+	(40)	5	24	31-40											
x	x	MA	7-8	25	14	25+	(40)	5	24	31-40											
x	x	AJ	6-8	750	40	70	3+	25		31											
x	x	AJ	1-6-8	300	35	(100)	1	75	11	31											
x	x	AJ	1-3-6-8	300	40	150	1+	75	11	31											
x	x	AJ	1-3-6-8	(1)	35	(40+)	4+	75	26												
x	x	AJ	1-3-6-8	(1)	40	50-150	1+	75	26												
x	x	AJ	3-4	150	18	(70-150)	1	20	11	31											
x	x	AJ	3-8	150	25	100-200	0,75	25	11	31											
x	x	AJ	3-8	150	30	30-165	0,75	25	11	31											
x	o	DM	1-3-+12	(2)	30	15-45	50	1	5	14											
x	o	DM	1-3-+12	(2)	30	30-90	60	1	5	14											
x	x		1-3-5-6-8	(60)	40	50-100	0,5	(0,5)	3	4											
x	x		1-3-5-6-8	(60)	70	50-100	0,5	(2)	3	4											
x	x		1-3-5-6-8	(60)	80	50-100	0,5	(2)	3	4											
x	x		1-3-5-6-8	(60)	40	75-150	0,5	(0,5)	3	4											

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW (...) in W	V _{ce} in V (...) V _{cb} in V	HFE (...) H _{FE} ... H _{FB}	f _{ab} in Mc/s ... fr	(...) f _{osc} max in Mc/s	I _{co} in μA (...) in mA	Diagram	Manufacturers
x	x	x	x				1-3-5-6-8	(60)	70	75-150	0,5	(2)	3	4	
x	x	x	x				1-5-6-8	(60)	80	75-150	0,5	(2)	3	4	
x	x	x	x				1-3-5-6-8	(60)	40	100-200	0,5	(0,5)	3	4	
x	x	x	x				1-3-5-6-8	(60)	70	100-200	0,5	(2)	3	4	
x	x	x	x				1-5-6-8	(60)	80	100-200	0,5	(2)	3	4	
o	o	o	o	o	o	o	8	500	15	20	150	5	5	48	
o	o	o	o	o	o	o	4-8	100	40	50	60	1		48	
x	x	x	x	x	x	x	11-12	750	35	(12)	750	5	5	47	
x	x	x	x	x	x	x	11-12	750	30	(10)	600	5	5	47	
x	x	x	x	x	x	x	11-12	750	25	(8)	480	5	5	47	
x	x	x	x	x	x	x	3-4	140	16	34-90		16	29	16	
x	x	x	x	x	x	x	3-4	140	16	25-90		16	29	16	
x	x	x	x	x	x	x	1-3-6-8	(70)	40	60-150	3k+	(4-)	3	9	
x	x	x	x	x	x	x	1-3-6-8	(70)	60	60-150	3k+	(4-)	3	9	
x	x	x	x	x	x	x	1-3-6-8	(70)	80	60-150	3k+	(4-)	3	9	
x	x	x	x	x	x	x	1-3-6-8	(70)	100	60-150	3k+	(4-)	3	9	
x	x	x	x	x	x	x	1-3-6-8	(70)	40	60-150	3k+	(4-)	3	9	
x	x	x	x	x	x	x	1-3-6-8	(70)	60	60-150	3k+	(4-)	3	9	
x	x	x	x	x	x	x	1-3-6-8	(70)	80	60-150	3k+	(4-)	3	9	
x	x	x	x	x	x	x	1-3-6-8	(70)	100	60-150	3k+	(4-)	3	9	
o	o	o	o	o	o	o	1-11	150	45	10	4			47	
o	o	o	o	o	o	o	1-11	150	45	20	5			47	
o	o	o	o	o	o	o	1-11	150	45	25	8+			47	
o	o	o	o	o	o	o	1-11	150	45	40	6		22	47	
o	o	o	o	o	o	o	1-11	150	45	80	7		22	47	
o	o	o	o	o	o	o	1-6	750	50	18	8		22	47	
o	o	o	o	o	o	o	1-6	750	80	18	8		22	47	
o	o	o	o	o	o	o	1-6	750	120	18	8		22	47	
x	x	x	x	x	x	x	6-8	(100)	(60)	38-84	0,2+	(7)	6	26	
x	x	x	x	x	x	x	6-8	(100)	(80)	38-84	0,2+	(20)	6	26	
x	x	x	x	x	x	x	3-4-5-6-8	(50)	60	30-75	0,1	(8)		12	
x	x	x	x	x	x	x	3-4-6-8-13	(50)	60	20-50	0,1	(8)	3	12	
x	x	x	x	x	x	x	1-6-8-13	(90)	35	15-60	4k	(15)	3	27	
x	x	x	x	x	x	x	1-6-8-13	(90)	35	15-125	4k	(15)	3	27	
x	x	x	x	x	x	x	1-6-8-13	(90)	60	15-125	4k	(15)	3	27	
x	x	x	x	x	x	x	1-6-8-13	(90)	60	15-125	4k	(15)	3	27	
x	x	x	x	x	x	x	1-6-8-13	(90)	75	15-60	4k	(15)	3	27	
x	x	x	x	x	x	x	1-6-8-13	(90)	75	15-60	4k	(15)	3	27	
x	x	x	x	x	x	x	3-5-6	(50)	50	70+	0,05	(8)	3	12	
x	x	x	x	x	x	x	1-3-4-5-6	(4)	30	30-90	0,1	200	38	12	
x	x	x	x	x	x	x	3-4-8	300	15	(20+)	1	10	9	4	
x	x	x	x	x	x	x	3-4-8	300	40	(20+)	1	12	9	4	
x	x	x	x	x	x	x	3-4-8	300	60	(20+)	1	15	9	4	
x	x	x	x	x	x	x	11-12	80	(30)	(100)	140	12	7	34	
x	x	x	x	x	x	x	9	80	(30)	(40)	140	12	7	34	
x	x	x	x	x	x	x	9-10	80	(30)	(80)	140	12	7	34	
x	x	x	x	x	x	x	11	80	(30)	(80)	100	12	7	34	
x	x	x	x	x	x	x	3-4-6-8	(1)	(45)	20+	0,5	30	8	34	
x	x	x	x	x	x	x	3-4-6-8	(1)	(60)	20+	0,5	30	8	34	
x	x	x	x	x	x	x	3-4-6-8	(1)	(80)	20+	0,5	30	8	34	
x	x	x	x	x	x	x	3-4-6-8	(1)	(45)	40+	0,5	30	8	34	
x	x	x	x	x	x	x	3-4-6-8	(1)	(60)	40+	0,5	30	8	34	
x	x	x	x	x	x	x	3-4-6-8	(1)	(80)	40+	0,5	30	8	34	
x	x	x	x	x	x	x	1-3-8-13	175	25	(30-70)	1,5	15	9	27	
x	x	x	x	x	x	x	1-3-8-13	175	25	(50-125)	2	15	9	27	
x	x	x	x	x	x	x	1-3-8-13	175	25	(100-250)	2,5	15	9	27	
x	x	x	x	x	x	x	1-5-6-11-12	250	(30)	(15,5db)	750	1,2	29	47-53	
o	o	o	o	o	o	o	7-8	65	25	17-90	9	1,5	8	16	
o	o	o	o	o	o	o	7-8	100	15	12-60	125"	0,1	9	31	
x	x	x	x	x	x	x	1-3-6	(32)	60	40-120	0,2+	2	10	26	

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{fe}	... H _{fb}	f _{eb} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
x	x	AJ					1-3-6-8	(32)		70		25-75			0,2+	2		10	26	
x	x	MD					7-8	200	(20)	35					320"	7		9	31	
o	o	DJ					8-11	150	(20)	30					27	0,05	5	48		
o	o	DJ					3	(1,2)	(60)	35						1		48		
o	o	DJ					3	(1,2)	(60)	50						1		48		
o	o	DJ					6-8	(85)	(60)	15					12	(10)	10	48		
o	o	DJ					6-8	(85)	(45)	30					12	(10)	10	48		
o	o	DJ					6-8	(45)		12					10	(10)	10	48		
x	x						9											34		
x	x						9	low power thyatron-type switching devices										34		
x	x						9											34		
x	x						9	low power thyatron-type switching devices										34		
o	x						6-8	(6)		45		30-120		7k	(3)			45		
x	o	AJ					7-8	225	25	18+		5+		0,1		5	41			
x	o	AJ					7-8	225	25	9+		2+		0,1		5	30-41			
x	o	AJ					11	225	25	(18+)		5+		0,1		5	30-41			
x	o	AJ					11	225	25	(9+)		2+		0,1		5	30-41			
x	o	AJ					8	225	40	(10)		2		0,1		5	30-41			
x	x	DR					7-+11	120	(40)	(60)		30		12		5	34-35			
x	x	DR					7-+12	120	(40)	60		100		12		5	34			
x	x	DR					7-+11	120	(60)	60		30		12		5	34			
x	o	AJ					1-3	400	15	14-32		1,2		0,1		5	1)			
x	o	AJ					1-3	400	15	28-65		1,2		0,1		5	1)			
x	o	AJ					1-3	400	35	14-32		1,2		0,1		5	1)			
x	o	AJ					1-3	400	35	28-65		1,2		0,1		5	1)			
x	o	AJ					1-3	400	60	14-32		1		0,1		5	1)			
x	o	AJ					1-3	400	60	28-65		1		0,1		5	1)			
x	o	AJ					1-3	400	110	14-32		0,8		0,1		5	1)			
x	o	AJ					1-3	(1)	15	14-32		1,2		0,1		20				
x	o	AJ					1-3	(1)	15	28-65		1,2		0,1		20				
x	o	AJ					1-3	(1)	35	14-32		1,2		0,1		20				
x	o	AJ					1-3	(1)	35	28-65		1,2		0,1		20				
x	o	AJ					1-3	(1)	60	14-32		1		0,1		20				
x	o	AJ					1-3	(1)	60	28-65		1		0,1		20				
x	o	AJ					1-3	(1)	110	14-32		0,8		0,1		20				
x	x	AJ					6	(20)	25	50		(5)				3	7			
x	x	AJ					6	(20)	25	150		(5)				3	7			
o	o	DJ					1	30	6	15+		5		0,005		5	48			
o	o	DJ					1-2	30	6	15+		5		0,01		5	48			
o	o	DJ					1-2	30	6	(20)		5		2			48			
o	o	DJ					6-8	(85)	(60)	15		6		(20)			48			
o	x						3-4	150	15	(70-250)		7,5k		50			45			
o	o	DM					7-8	(2)	20	15-45		80		0,1		5	2)			
o	o	DM					7-8	(2)	20	30-90		100		0,1		5	2)			
x	o	DD					8	250	15	25		75		0,2		5	20			
x	o	DD					8	250	15	55		55		0,2		5	20			
x	o	DD					8	250	30	25		55		0,2		5	20			
x	o	DD					8	250	30	55		75		0,2		5	20			
x	o	DD					8	250	50	25		55		0,2		5	20			
x	o	DD					8	250	50	55		75		0,2		5	20			
x	x	AJ					1-3-6-8	(32)	45	20-50		0,2"					10	26		
x	x	AJ					1-3-6-8	(32)	45	30-75		0,2"					10	26		
x	x	AJ					1-3-6-8	(32)	45	45-113		0,2"					10	26		
x	x	DR					11	50	(20)	15+				50			45			
x	x						3-4	50	10	25+		0,6					22	45		
x	x						11	80	10	10+				e 100			45			
o	o	AD					11-13	100	15	6-18		(43)		0,7		9	31			
o	o	AD					11-13	100	15	11-36		(43)		0,7		9	31			
o	o	AD					11-13	100	15	28-90		(43)		0,7		9	31			
o	o	AD					11-12-13	100	15	6-18		(125)		0,7		9	31			

	p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(. . .) in W	V _{ce} in V	(. . .) V _{cb} in V	HFE	(. . .) H _{fe}	. . . H _{fb}	f _{ab} in Mc/s	(...) _{osc} max in Mc/s	I _{co} in μA	(. . .) in mA	Diagram	Manufacturers
o	o	o	AD		11-12-13				100		15		11-36		(125)	0,7	9	31			
o	o	o	AD		11-12-13				100		15		28-90		(125)	0,7	9	31			
x	x	x	AJ		11-12-13				150		15		30-150		2	14		47			
x	x	x	AJ		3-6				150		25		30-150		2	14		47			
x	o	o	AJ		4-8				250		80		15		0,2	0,005	5	1)			
o	o	o			3-7-8				150		30		(9-22)		30	50	5	16			
o	o	o			3-7-8				150		30		(18-44)		30	50	5	16			
o	o	o			3-7-8				150		30		(37-90)		30	50	5	16			
o	o	o			3-7-8				150		30		(76-333)		34	50	5	16			
x	x	x	AJ		7-8				200		16		40		8	10	5	21			
x	x	x	AJ		7-8				200		16		60		10	10	5	21-26			
x	x	x	AJ		7-8				200		6		70		15	10	5	21			
x	x	x	AJ		7-8				150		15		30-150		8	6	5	21			
x	x	x			7-8				75		10		50-300		60	5	5	16			
x	x	x			7-8				75		15		50-300		60	5	5	16			
x	x	x	AJ		6-8				(20)		30		30-90		compl.	1,5-	3	7			
o	x	x	AJ		6-8				(20)		30		30-90		compl.	1,5-	3	7			
x	x	x	AJ		6-8				(20)		45		30-90		compl.	2-	3	7			
o	x	x	AJ		6-8				(20)		45		30-90		compl.	2-	3	7			
x	x	x	AJ		6-8				(20)		60		30-90		compl.	3-	3	7			
o	x	x	AJ		6-8				(20)		60		30-90		compl.	3-	3	7			
x	x	x	AJ		6-8				(20)		80		30-90		compl.	4-	3	7			
o	x	x	AJ		6-8				(20)		80		30-90		compl.	4-	3	7			
o	x	x			8				150		20		35-110			100		45			
x	x	x	DM		7-8				150		(30)		50		40	3	5	34			
x	x	x	DM		7-8				150		(30)		75		60	3	5	34			
o	x	x	AJ		7-8				150		25		50		4,5	6	5	2)			
x	x	x	AJ		7-8				150		30		50		4,5	6	5	11-47			
o	x	x	AJ		7-8				150		25		70		8	6	5	3)			
x	x	x	AJ		7-8				150		30		70		8	6	5	11-47			
o	x	x	AJ		7-8				150		25		100		12	6	5	3)			
x	x	x	AJ		7-8				150		30		100		12	6	5	11-47			
o	x	x	AJ		7-8				150		25		150		20	6	5	4)			
x	x	x	AJ		7-8				150		30		150		20	6	5	11-47			
o	x	x			4-8				120		(90+)		(20+)		1	3	5	18			
o	x	x			4-8				120		(15+)		(15+)		1,5	3	5	18			
o	x	x			4-8				120		(50+)		30		2	7-	5	18			
x	x	x	AJ		7-8-13				180		15		40-125		6+	25	5	21-49			
x	x	x			3-4-5-6				(13)		32		33		0,15	100-		1			
x	x	x			3-4-5-6				(12,5)		32		75		0,3	100-		1			
x	x	x	AJ		7-8				200		15		50-200		15	5	5	21			
x	x	x	AJ		7-8				200		12		45-180		15	6	5	21			
x	x	x	AJ		7-8				200		6		40-150		15	7	5	21			
x	x	x	AJ		5-6				(20)		30		30-90		compl.	(1,5)	10	7			
o	x	x	AJ		5-6				(20)		30		30-90		compl.	(1,5)	10	7			
x	x	x	AJ		5-6				(20)		45		30-90		compl.	(2-)	10	7			
o	x	x	AJ		5-6				(20)		45		30-90		compl.	(2-)	10	7			
x	x	x	AJ		5-6-8				(20)		60		30-90		compl.	(3-)	10	7			
o	x	x	AJ		5-6-8				(20)		60		30-90		compl.	(3-)	10	7			
x	x	x	AJ		5-6-8				(20)		80		30-90		compl.	(4-)	10	7			
o	x	x	AJ		5-6-8				(20)		80		30-90		compl.	(4-)	10	7			
x	x	x	AJ		5-6-8				(20)		30		30-90		compl.	(1,5)	13	7			
x	x	x	AJ		5-6-8				(20)		30		30-90		compl.	(1,5)	13	7			
o	x	x	AJ		compl. of 2N1078				(20)		45		30-90			(2-)	13	7			
x	x	x	AJ		5-6-8				(20)		60		30-90		compl.	(3-)	13	7			
o	x	x	AJ		5-6-8				(20)		60		30-90		compl.	(3-)	13	7			
x	x	x	AJ		5-6-8				(20)		80		30-90		compl.	(4-)	13	7			
x	x	x	AJ		5-6-8				(20)		80		30-90		compl.	(4-)	13	7			
x	x	x	TD		6-+12				(2,8)		(120)		13		170		9	32			

1) 30-33-41 2) 11-45-47 3) 11-16-45-47 4) 16-45-47

p-n-p	x	n-p-n	o	Germ. x	o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{FE}	(...) H _{FB}	f _{ab} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μA	(...) in mA	Diagram	Manufacturers
o	o	TD	5-+12	(2,8)	(120)	13		170											9	32
o	o	TD	5-+12	(2,8)	(120)	13		170											9	32
o	o	TD	5-+12	(2,8)	(120)			(220)											9	32
o	o	TD	5-+12	(2,8)	(120)			(250)											9	32
o	o	TD	5-+12	(2,8)	(120)			(280)											9	32
x	x	AJ	7-8	150	16	15		6		6		5	21							
x	x	AJ	7-8	150	10	60		12		10		5	21							
x	x	AJ	7-8	150	8	30-100		12		6		5	21							
x	x	AJ	7-8	150	10	40-250		12		50		5	21							
x	x	AJ	7-8	150	12	30		8		6		5	21							
x	x	AJ	7-8	200	12	45		5		10		5	21							
x	x	AJ	7-8	200	15	50		10		10		5	21							
x	x	AJ	7-8	200	20	45		8		20		5	21-51							
x	x	AJ	7-8	200	18	35		8		10		5	21-51							
x	x	AJ	3	150	20	40-100		2,5		5		5	21-51							
x	x	AJ	7-8	200	10	25-150		3,5		6		5	21-51							
x	x	AJ	7-8	200	15	25-150		4,5		6		5	21-51							
x	x	AJ	7-8	200	20	30-150		8		6		5	21-51							
x	x	AJ	7-8	200	20	40-140		8		6		5	21-51							
x	x	AJ	7-8	200	15	40-150		12		6		5	21-51							
x	x	AJ	3-4-5-6-8	(70)	40	40-80		0,1		8		6	12							
x	x		3-6-8	(90)	40	35-90		10k		(3-)		3	27							
x	x		3-6-8	(90)	40	60-140		8,5k		(3-)		3	27							
x	x		3-6-8	(90)	75	35-90		18k		(3-)		3	27							
x	x		3-6-8	(90)	75	60-140		8,5k		(3-)		3	27							
x	x		3-6-8	(90)	100	35-90		10k		(3-)		3	27							
x	x		3-6-8	(90)	100	60-140		8,5k		(3-)		3	27							
x	x	AJ	3-6	150	25	50-150		2		14		5	47							
x	x	AJ	3-6	150	45	50-150		2		14		5	47							
x	x	AJ	1	250	25	30-95		1,5		7		5	45-47							
x	x	AJ	1	250	45	30-95		1,5		7		5	45-47							
x	x	AJ	1	250	25	50-150		2		7		5	45-47							
x	x	AJ	1	250	45	50-150		2		7		5	45-47							
x	x	AJ	1	250	25	75-150		2		7		5	45-47							
x	x	AJ	1	250	45	75-150		2		7		5	47							
x	x	AJ	1	250	12	95-300		3		7		5	47							
x	x	AJ	1	250	25	95-300		3		7		5	47							
x	x	AJ	1	250	12	30-300		2		14		5	45-47							
x	x	AJ	1	250	25	30-300		2		14		5	45-47							
x	x	AJ	3-6	200	25	50-150		2		14		5	47							
x	x	AJ	3-6	200	25	50-150		2		14		5	47							
x	x	AJ	8	240	30	50		35		4		11	34							
x	x	DM	7-8	750	25	(8)		700		10		7	47							
o	o		7-8		25	60		25		0,006		5	33							
o	o		7-8		30	30		25		0,006		5	33							
o	o		11-12		45	(10)		75		0,01		5	33							
o	o		11		50	(7)		25		0,01		5	33							
o	o		11		20	(4)		12		0,05		5	33							
x	x		photo trans.	50	(20)	3+		1		8			18							
x	x		photo trans.	50	(20)	15+		3,4		8			18							
x	x		photo trans.	50	(10)	7		1		15			18							
x	x	DR	7-+11	120	(40)	90		30		12		5	34							
x	x	DR	7-+12	120	(40)	90		100		12		5	34							
x	x	DR	7-+12	120	(40)	90		120		12		5	34							
x	x	DM	10-11-12	35	30	1,4-3,3						5	47							
x	x	DM	10-11-12	35	30	1,4-3,3						5	47							
x	x	DM	9-11	35	30	1-2,2						5	47							
x	x	DM	9-11	35	30	1,2-2,9						5	47							
x	x	DM	9-11	35	30	1,2-2,9						5	47							
x	x	DM	9-11	35	30	1-3,3						5	47							

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{fe}	... H _{fs}	f _{ab} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
x	x	o	o	TD	7-8	3-8-13		150	(70)	20		6,5					7	9	18	
o	o	o	o	TD	7-8	(2,8)		(2,8)		30							10	9	32	
x	x	o	o	MA	7-8	25		25	5	20-75					70"		0,5	24	31	
x	x	o	o	AJ	3-4-5-6-8	(70)		(70)	65	25-50					0,1	(2)	6	12		
x	x	o	o	AJ	3-4	250		250	18	(70-150)					0,6	7	25	31		
o	o	o	o		6-8-13	(2)		(2)	30	100-300					10	1-	5	1)		
x	x	o	o	DR	11	80		80	(24)	455 kc amp					16	7	34			
x	x	o	o	DR	9-10	80		80	(24)	100					16	7	34			
x	x	o	o	MA	8	25		25	6	(120)					(60)	5	24	31		
x	o	o	o	SA	8-11	100		100	6	(30)					(18)	0,1	1	31		
x	o	o	o	SA	8-11	100		100	6	(30)					(18)	0,1	5	31		
o	x	o	o		4-5	180		180	15	75-150					10k	50		45		
x	x	o	o	DR	4	80		80	(35)	30-120					1500k	15		45		
x	x	o	o	AJ	6-8	50		50		20-50					5k	(2)	10	7		
x	x	o	o	AJ	6-8	50		50		45-115					5k	(2)	10	7		
x	o	o	o	AJ	6-8	50		50		30-75					5k	(2)	10	7		
x	o	o	o	AJ		400		40		(5-12)					1	0,025	5	30		
x	o	o	o	AJ	1-3	400		40		(9-20)					1+	0,025	5	30		
x	o	o	o	AJ	1-3	400		35		(18-36)					1+	0,025	5	30		
x	o	o	o	AJ		400		30		(30-65)					1	0,025	5	30		
x	o	o	o	AJ		400		25		(60-)					1	0,025	5	30		
x	x	o	o	AJ	3	200		25		16-45					2	10	5	21		
x	x	o	o	AJ	3	200		25		35-65					3	10	5	21		
x	x	o	o	AJ	3	200		25		50-90					4	10	5	21		
x	x	o	o	AJ	3	200		25		70-125					5	10	5	21		
x	x	o	o	AJ	3	200		20		20-65					1,5	15	5	21		
x	x	o	o	AJ	3	200		20		30-90					2,2	15	5	21		
x	o	o	o	8		70		70		Avalanche							5	33		
x	o	o	o	AJ		250		35		(36-88)					2+	0,001	5	41		
o	o	o	o	6		(55)		60		50					10	(1)	3	33		
x	x	o	o	AJ	3	200		12		100-250					5	5	5	21		
x	x	o	o	SD	7-8	100		25		35					140"	0,5	9	31		
o	x	o	o	8		200		20		25-80						100		45		
x	o	o	o	AJ	3-8	250		60		(9-44)					1+	0,005	5	41		
x	o	o	o	AJ	3-8	250		60		(18-44)					2+	0,005	5	41		
x	o	o	o	AJ	3-8	250		60		(36-88)					1+	0,005	5	41		
x	o	o	o	AJ	3-8	250		100		(12-36)					1+	0,05	5	41		
x	o	o	o	AJ	3-8	250		100		(30-66)					1+	0,05	5	41		
x	x	o	o	AJ	8	250		20		70					8	20	9	31		
o	o	o	o	6-8		(4)		(60)		15+					1,5	10	5	34		
o	o	o	o	3-6-8		(4)		(100)		15+					1,5	10	5	34		
o	o	o	o	3-6-8		(4)		(60)		35+					1,5	10	5	34		
o	o	o	o	3-6-8		(4)		(100)		35+					1,5	10	5	34		
o	o	o	o	DM	3-6-8	(15)		(60)		15-75					1,25	15	8	34-44		
o	o	o	o	DM	3-6-8	(15)		(100)		15-75					1,25	15	8	34-44		
o	o	o	o	DM	3-6-8	(15)		(60)		35-100					1,25	15	8	34-44		
o	o	o	o	DM	3-6-8	(15)		(100)		35-100					1,25	15	8	34-44		
o	o	o	o	DM	3-6-8	(60)		(60)		10-50					1	25	3	34-44		
o	o	o	o	DM	3-6-8	(60)		(100)		10-50					1	25	3	34-44		
o	o	o	o	DM	3-6-8	(60)		(60)		25-75					1	25	3	34-44		
o	o	o	o	DM	3-6-8	(60)		(100)		25-75					1	25	3	34-44		
x	o	o	o	DM	9-11	500		(30)		50							12	34		
x	o	o	o	DM	11	500		(60)		50							12	34		
x	o	o	o	DM	6-11	500		(100)		50							12	34		
x	x	o	o	MD	8	400		(20)		35					320	7	9	31		
x	x	o	o	MD	7-8	25		15		35						100-	9	31		
x	x	o	o	MD	7-8	50		12		50						100-	9	31		
x	x	o	o	AJ		(32)		40		25-100					0,2"		10	26		
x	x	o	o	AJ		(32)		40		25-100					0,2"		10	26		

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW (...) in W	V _{ce} in V (...) V _{eb} in V	HFE (...) Hfe	... Hfb	fab in Mc/s (...) fosc max in Mc/s	I _{co} in μ A (...) in mA	Diagram	Manufacturers
x	x						6-8	(20)	(60)	20			(1)	13	7
x	x					TD	6-11-12	(3)	(50)	7+		250	50	9	14
x	x					TD	6-11-12	(3)	(60)	10-50		250	10	9	14
o	o							600	30	100-300		50"	1	5	30-36
o	o						6	(60)	40	10-50		1	25	36	34
o	o						6	(60)	55	10-50		1	25	36	34
o	o						6	(60)	40	25-75		1	25	36	34
o	o						6	(60)	55	25-75		1	25	36	34
x	x					PD	9-10-11-12	83	(20)	(60)		70"		9	1
x	x					PD	9-10-11-12	83	(20)	(100)		70"		9	1
x	x					PD	9-10-11-12	83	(20)			70"		9	1
x	x						6-8	(70)	40	15-40		0,03	(4)	6	12
x	x						6-8	(70)	60	15-40		0,03	(4)	6	12
x	x						6-8	(70)	40	17-35		0,03	(4)	6	12
x	x						6-8	(70)	60	17-35		0,03	(4)	6	12
x	x						6-8	(70)	40	22-45		0,03	(4)	6	12
x	x						6-8	(70)	60	22-45		0,03	(4)	6	12
x	x						11	80	24	60		33	16	1	34
x	x						11	80	24	60		33	16	1	34
x	x						9	80	24	130		33	16	1	34
x	x						9	80	24	130		33	16	1	34
x	x						1-11		25	4		15	0,01	5	33
x	x					AJ	3	(90)	20	20-40		10k	200	3	27
x	x					AJ	3-6-8	(90)	30	20-40		10k	200	3	27
x	x					AJ	3-6-8	(90)	40	20-40		10k	200	3	27
x	x					AJ	3-6-8	(90)	50	20-40		10k	200	3	27
x	x					AJ	3-6-8	(90)	60	20-40		10k	200	3	27
x	x					AJ	3-6-8	(90)	20	35-70		8,5k	200	3	27
x	x					AJ	3-6-8	(90)	30	35-70		8,5k	200	3	27
x	x					AJ	3-6-8	(90)	40	35-70		8,5k	200	3	27
x	x					AJ	3-6-8	(90)	50	35-70		8,5k	200	3	27
x	x					AJ	3-6-8	(90)	60	35-70		8,5k	200	3	27
x	x					AJ	3-6-8	(90)	20	50-100		4k	200	3	27
x	x					AJ	3-6-8	(90)	30	50-100		4k	200	3	27
x	x					AJ	3-6-8	(90)	40	50-100		4k	200	3	27
x	x					AJ	3-6-8	(90)	50	50-100		4k	200	3	27
x	x					AJ	3-6-8	(90)	60	50-100		4k	200	3	27
x	x					AJ	3-6-8	(90)	20	75-150		4k	200	3	27
x	x					AJ	3-6-8	(90)	30	75-150		4k	200	3	27
x	x					AJ	3-6-8	(90)	40	75-150		4k	200	3	27
x	x					AJ	3-6-8	(90)	50	75-150		4k	200	3	27
x	x					AJ	3-6-8	(90)	60	75-150		4k	200	3	27
x	x					AJ	3-6-8	(90)	20	10-30		10k	200	3	27
x	x					AJ	3-6-8	(90)	30	10-30		10k	200	3	27
x	x					AJ	3-6-8	(90)	40	10-30		10k	200	3	27
x	x					AJ	3-6-8	(90)	50	10-30		10k	200	3	27
x	x					AJ	6-8	(90)	20	30-60		6k	200	3	27
x	x					AJ	6-8	(90)	30	60		6k	200	3	27
x	x					AJ	6-8	(90)	40	60		6k	200	3	27
x	x					AJ	6-8	(90)	50	60		6k	200	3	27
x	x					AJ	6-8	(90)	20	50-100		5k	200	3	27
x	x					AJ	6-8	(90)	30	50-100		5k	200	3	27
x	x					AJ	6-8	(90)	40	50-100		5k	200	3	27
x	x					AJ	6-8	(90)	50	50-100		5k	200	3	27
x	x					DM	5-6-11-12	(3)	25	10 db		500"	10-	17	27
x	x					DM	5-6-11-12	(3)	25	10 db		500"	10-	17	27
o	o					DM	3-8	(1,2)	60	(20-50)		1	5	5	30-47
o	o					DM	3-8	(1,2)	60	(40-100)		1	5	5	30-47
o	o					DM	3-8	(1,2)	60	(80-200)		1	5	5	30-47
x	x						8	150	24	40+		20			45

	p-n-p	x	n-p-n	o	Silic. o	Construction	Use	Dissipation in mW	(. . .) in W	V _{ce} in V	(. . .) V _{cb} in V	HFE	(. . .) H _{FE}	... " H _{fb}	f _{ab} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μA	(. . .) in mA	Diagram	Manufacturers
2N1650	o	x	GJ	7-8			7-8	200		40		40+			12		(20)	5		34-45
2N1651	x	x		1-3-+6-8			1-3-+6-8	(4)		60		30-75			0,1		100	38		12
2N1652	x	x		1-3-+6-8			1-3-+6-8	(4)		60		50-125			0,1		100	38		12
2N1653	x	x		1-3-+6-8			1-3-+6-8	(4)		40		30-75			0,1		100	38		12
2N1654	x	x		1-3-+6-8			1-3-+6-8	(4)		40		50-125			0,1		100	38		12
2N1655	x	o	DD	1-+12			1-+12	(3)		40		30+			100"		0,025	5		14-36
2N1656	o	o		6			6	(60)		60		35			15		15	10		48
2N1657	o	o		6			6	(60)		100		35			15		15	10		48
2N1658	o	o		6			6	(60)		100		35			15		12	10		48
2N1659	o	o		6			6	(60)		80		35			15		12	10		48
2N1660	o	o		6			6	(60)		100		35			15		12	10		48
2N1661	x	o		1-3			1-3	250		20		(14)			0,1		0,005	5		33
2N1662	x	x		11			11	80		34		80			45		16	1		34
2N1663	x	x		11			11	80		34		80			45		16	1		34
2N1664	x	x		11			11	80		34		75			40		16	1		34
2N1665	x	x		11			11	80		34		75			40		16	1		34
2N1666	x	x		9			9	80		34		75			45		16	1		34
2N1667	x	x		9			9	80		34		75			45		16	1		34
2N1668	x	x		11			11	80		34		80			45		5	1		34
2N1669	x	x		11			11	80		34		75			40		7	1		34
2N1670	x	x		9			9	80		34		75			45		7	1		34
2N1671	x	x	DA	1-6-7-8			1-6-7-8	(65)		60		40			1,5		(40)	3		4
2N1672	x	x	DA	1-6-7-8			1-6-7-8	(65)		100		40			1,5		(40)	3		4
2N1673	x	x	DA	1-6-7-8			1-6-7-8	(65)		120		40			1,5		(40)	3		4
2N1674	x	o	AJ	8			8			80		30			0,2		0,005	5		33
2N1675	x	o	AJ	8			8			125		15			0,2		0,005	5		33
2N1676	x	o	AJ	8			8			125		30			0,2		0,005	5		33
2N1677	o	o	DJ	3-4-6			3-4-6	(55)		60		15			10		(1)	39		33
2N1678	o	o	DJ	2-+7-10-12			2-+7-10-12	(85)		60		90			25"		(1)	39		33
2N1679	x	x	ME	7-8			7-8	150		12		85			80"		(40)	5		34
2N1680	x	x	ME	7-8-9-12			7-8-9-12	(3)		(25)					500"		(20)	31		27
2N1681	x	x	ME	7-8-9-12			7-8-9-12	(3)		(25)					450"		(20)	31		27
2N1700	o	o	DJ	5-7-8			5-7-8	(5)		40		20-80			1,2		(100)	5		34-44
2N1701	o	o	DJ	5-7-8			5-7-8	(25)		40		20-80			1		(300)	8		34-44
2N1702	o	o	DJ	5-7-8			5-7-8	(75)		40		15-60			1		(800)	3		34-44
2N1703	o	o	DJ	5-7-8			5-7-8	(75)		40		15-60			1		(800)	36		34
2N1704	o	o	PL	8			8	(1)		(25)		20+			(10)		(10)	46		34
2N1705	o	o	PL	1-3-7-9-12			1-3-7-9-12	(3)		(75+)		100-300			70+"		(150)	5		1)
2N1706	o	o	DJ	7-8			7-8	(40)		40		35-100			1,25		(750)	32		34-44
2N1707	o	o	DJ	7-8			7-8	(40)		55		35-100			1,25		(750)	32		34-44
2N1800	o	o	DJ	1-7-11			1-7-11	(3)		80		40			70"		0,01	5		68
2N1801	o	o	DJ	1-7-11			1-7-11	(3)		80		100			90"		0,01	5		68
2N1802	o	o	DJ	1-7-11			1-7-11	(3)		100		40			70"		0,01	5		68
2N1803	x	x	OR	3-7-8			3-7-8	(50)		(60)		90			7,5"		1 A	3		34
2N1804	x	x	OR	3-7-8			3-7-8	(50)		(100)		125			7,5"		5 A	3		34
2N1900	x	x	AJ	3-8			3-8	225		40		53-90			1,3+		(20)	5		2)
2N1901	o	o	DJ	2-3-9			2-3-9	(3)		80		(75)			85"		0,025	5		68
2N1902	o	o	DJ	2-3-9			2-3-9	(3)		80		(35)			70"		0,025	5		68
2N1903	o	o	DJ	2-3-9			2-3-9	(3)		80		(15)			50"		0,025	5		68
2N1904	o	o	DJ	2-3-9			2-3-9	(2)		25		(70)			50"		5	5		68
2N1905	o	o	DJ	2-3-9			2-3-9	(2)		25		(35)			50"		5	5		68
2N1906	o	o	DJ	2-3-9			2-3-9	(2)		25		(15)			50"		5	5		68
2N1907	o	o	DJ	1-11			1-11	(2)		40		60			50"		5	5		68
2N1908	o	o	DJ	1-11			1-11	(2)		40		20			50"		5	5		68
2N1909	o	o	DJ	1-11			1-11	(2)		60		35			50"		5	5		68
2N1910	o	o	DJ	1-11			1-11	(2)		60		20			50"		5	5		68
2N1911	o	o	DJ	4			4	(2)		(100)		20						5		68
2N1912	o	o	DJ	3-5-8			3-5-8	(150)		(100)		15-50					5 A	36		34
2N1913	o	o	DJ	3-5-8			3-5-8	(150)		(130)		15-50					5 A	36		34
2N1914	o	o	DJ	1-2-8-12			1-2-8-12	(3)		40		60			120"		0,01	5		68

1) 14-16-17-32-34-47
2) 16-27-29-67

p-n-p	x	o	n-p-n	o	Germ. x	Construction	Use	Disipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{fe}	... H _{fb}	f _{eb} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
o	x	o	o	o	PL	7-+10-12		(5)		(120)		20+			60		(100)	5	34	
x	x	o	o	o	PL	8		(1)		(25)		20+					(10)	18	34	
x	x	o	o	o	PL	8		(1)		(25)		40+					(10)	46	34	
x	x	o	o	o	PL	3-9-10-12		(5)		(60)		35+			60		(1)	5	34	
x	x	o	o	o	DJ	8		(150)		(60)								36	34	
x	x	o	o	o	DJ	8		(40)		(60)								32	34	
x	x	o	o	o	x	11-12		25		15		65			200		20		47	
o	o	o	o	o	DJ	9-11-12		125		30					100			5	47	
o	o	o	o	o	DJ	9-11-12		125		30					150			5	47	
o	o	o	o	o	o	9-10-11-12		30		6					50+		10		16	
o	o	o	o	o	o	9-10-11-12		30		6					90+		10		16	
x	x	o	o	o	AJ	5-6		(75)		35		30-120			0,6"				26	
x	x	o	o	o	AJ	5-6		(75)		50		20-80			0,3"				26	
x	x	o	o	o	AJ	5-6		(75)		25		30-120			0,5"				26	
x	x	o	o	o	AJ	5-6		(75)		40		20-80			0,3"				26	
x	x	o	o	o	AJ	5-6		(75)		35		30-120			0,6*				26	
x	x	o	o	o	AJ	5-6		(75)		50		20-80			0,3"				26	
x	x	o	o	o	AJ	5-6		(75)		25		30-120			0,5"				26	
x	x	o	o	o	AJ	5-6		(75)		40		20-80			0,3"				26	
x	x	o	o	o	GJ	1		150		60		9-49			2,5		10	22	47	
x	x	o	o	o	photo trans.			65		20									47	
o	o	o	o	o	GJ	1-11		150		45		10			4				47	
o	o	o	o	o	GJ	1-11		150		45		20			5				47	
o	o	o	o	o	GJ	1-11		150		45		25			8+				47	
o	o	o	o	o	GJ	1-11		150		45		40			6			22	47	
o	o	o	o	o	GJ	1-11		150		45		80			7			22	47	
x	x	o	o	o	AJ	5		666		18		25				8		43	61	
x	x	o	o	o	AJ	5		666		18		40				8		43	61	
x	x	o	o	o	2-3			83		(15)		(60)			2		2	43	1	
x	x	o	o	o	2-3-4			110		12		35			1,5		6	1	63	
x	x	o	o	o	2-3-4			110		12		65			2		6	1	63	
x	x	o	o	o	2-3-4			110		12		90			2		6	1	63	
x	x	o	o	o	3-4-5			625		20		50			3		5	1	63	
x	x	o	o	o	5			625		20		100			6		5	1	63	
x	x	o	o	o	2-3-4			125		24		50			3,5		6	1	63	
x	x	o	o	o	5			160		24		60			4		6	1	63	
x	x	o	o	o	5			210		32							10	1	63	
x	x	o	o	o	AJ	5		666		50		25					25	43	61	
x	x	o	o	o	5-8			(32)		32							(3)	48	63	
x	x	o	o	o	5-8			(32)		45							(3)	48	63	
x	x	o	o	o	5-8			(12)		45							(3)	48	63	
x	x	o	o	o	5			(43)		30							(5)	3	63	
x	x	o	o	o	5			(43)		45							(5)	3	63	
x	x	o	o	o	5			(43)		60							(5)	3	63	
x	x	o	o	o	5-8			(43)		20							(3)	49	63	
x	x	o	o	o	3			(13)		22							(3)	8	63	
x	x	o	o	o	AJ	10-11		50		12		50			7		7	43	61	
x	x	o	o	o	AD	9-10-12		83		(25)		(20)			180"		10	7	1	
x	x	o	o	o	AJ	11		50		12		50			20		30	43	61	
x	x	o	o	o	ME	9-10-12		50		(25)							2	18	63	
x	x	o	o	o	ME	12		260		15							3	29	63	
x	x	o	o	o	ME	12		260		15							3	29	63	
x	x	o	o	o	AD	12		83		20		(150)			75"		1,2	7	1-63	
x	x	o	o	o	AD	10-11-12		83		20		(150)			75"		1,2	7	1-63	
x	x	o	o	o	AD	11		83		20		(150)			75"		1,2	7	1-63	
x	x	o	o	o	AD	10-11		83		20		(150)			75"		1,2	7	1-63	
x	x	o	o	o	AD	12		420		50					175"		5	7	1	
x	x	o	o	o	AD	12		62		20							1,2	18	63	
x	x	o	o	o	AD	10-11-12		62		20							1,2	18	63	
x	x	o	o	o	AD	11		62		20							1,2	18	63	

	p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{fe}	... H _{fb}	f _{ab} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μA	(...) in mA	Diagram	Manufacturers
	x	x	x	x	AD		10-11		62		20							1,2	18	63	
	x	x	x	x	ME		9-10-12		42		15							1	18	63	
	x	x	x	x	ME		12		260		15							2	29	63	
	x	x	x	x	ME		12		260		15							2	29	63	
	x	x	x	x	ME		9-10-12		50		(25)							2	18	63	
	x	x	x	x	AJ		9		250		30		65			20		10	43	61	
	x	x	x	x			1-3-6-8		(10)		30		15000			7 k			2		
	x	x	x	x			1-3-6-8		(50)		40		10000						2		
	x	x	x	x			8		555		32							20	50	60	
	x	x	x	x			8		555		60							20	50	60	
	x	x	x	x			8		170		80							10	50	60	
	x	x	x	x	AJ		7		125		25					4"		3	33	1	
	x	x	x	x	AJ		7		125		20					6"		3	33	1	
	x	x	x	x	AJ		3-8		(16)		40		60			4		6	1	63	
	x	x	x	x	AJ		8		250		30		20			12		30	43	61	
	x	x	x	x	AJ		7-8		65		20		25			2		3	43	1	
	x	x	x	x	AJ		6-8		(30)		60		15			0,25	(0,1)	3	1		
	x	x	x	x	AJ		6-8		(30)		48		35			0,25	(0,1)	3	1		
	x	x	x	x	AJ		6-8		(30)		48		20			0,25	(0,1)	3	1		
	x	x	x	x	AJ		6-8		(30)		60		20			0,25	(0,1)	3	1		
	x	x	x	x	AD		8		83		6+							2	7	1	
	x	x	x	x	AJ		8		50		30		20			12		30	43	61	
	x	x	x	x	AD		8		100		60					120"		60	3	1	
	x	x	x	x	AJ		8		(43)		32						(3)	49	63		
	x	x	x	x	AJ		8		(43)		45						(3)	49	63		
	x	x	x	x	AJ		6-8		(6,6)		30		15			1,5		(0,1)	27	61	
	x	x	x	x			1-3-6				30		(150)						4		
	x	x	x	x			3-6				30		(40)						4		
	x	x	x	x			3-6				40		(25)						4		
	x	x	x	x	AJ		3-8		550		60							10	29	63	
	x	x	x	x	AJ		3-8		550		100							10	29	63	
	x	x	x	x	AJ		3-8		550		60							10	29	63	
	x	x	x	x	AJ		3-8		550		100							10	29	63	
	x	x	x	x	AJ		3		350		30		35			3,5		0,1	5	63	
	x	x	x	x	AJ		3		350		30		70			3,5		0,1	5	63	
	x	x	x	x	AJ		3		350		50		35			4,5		0,1	5	63	
	x	x	x	x	AJ		3		350		100		20			4		0,1	5	63	
	x	x	x	x	AJ		3		280		25		40			4			5	63	
	x	x	x	x	AJ		3		280		25		50			3,5			5	63	
	x	x	x	x	AJ		3		280		60		25			5			5	63	
	x	x	x	x	AJ		1-3		250		25		15			0,3		0,1	50	1	
	x	x	x	x	AJ		1-3		250		25		25			1		0,1	50	1	
	x	x	x	x	ME		1		650		40		45					1	51	63	
	x	x	x	x	ME		12		650		80							1	51	63	
	x	x	x	x	ME		12		650		110							1	51	63	
	x	x	x	x	ME		8		275		15								18	63	
	x	x	x	x			3-6		(40)		25					5 k+		15-	3	9	
	x	x	x	x			6-8				25		40-120			5 k+		15-	3	9	
	x	x	x	x			6-8				40		40-120			5 k+		15-	3	9	
	x	x	x	x			6-8				50		40-120			5 k+		15-	3	9	
	x	x	x	x			6-8				60		40-120			5 k+		15-	3	9	
	x	x	x	x			6-8				25		20-60			5 k+		15-	3	9	
	x	x	x	x			6-8				40		20-60			5 k+		15-	3	9	
	x	x	x	x			6-8				50		20-60			5 k+		15-	3	9	
	x	x	x	x			6-8				60		20-60			5 k+		15-	3	9	
	x	x	x	x	AJ		8-11		80		(24)					12			17	33	
	x	x	x	x	AJ		11		80		18					2,5		2	17	33	
	x	x	x	x	AJ		11		80		15		(60)			7		2	17	33	
	x	x	x	x	AJ		11		80		12		(80)			10		2	17	33	
	x	x	x	x	AJ		11		80		10		(140)			18		2	17	33	

p-n-p	x	n-p-n	o	Germ.	Silic.	Construction	Use	Dissipation in mW (...) in W	V _{ce} in V	H _{FE} (...) H _{fe}	H _{ib}	f _{ab} in Mc/s ... ft	(...) f _{osc} max in Mc/s	I _{co} in μA	(...) in mA	Diagram	Manufacturers
x	x	AJ	1-3-4	80	20	(90)						1,2	2		17	33	
x	x	AJ	7-8-11	80	20	20-40						4	2		17	33	
x	x	AJ	7-8-11	80	18	30-60						6	2		17	33	
x	x	AJ	7-8-11	80	15	40-80						11	2		17	33	
x	x	AJ	7-8-11	80	12	80						17	2		17	33	
x	x	AJ	1-3	80	29	(22)						0,8	2		17	33	
x	x	AJ	1-3	80	24	(45)						1	2		17	33	
x	x	AJ	1-3	80	20	(90)						1,2	2		17	33	
x	x	AJ	1-3	80	15	(180)						1,2	2		17	33	
x	x	AJ	1-2-3	100	10	300						1	5			33	
x	x		8	(2)	60								(4)		3	60	
x	x		3-6-8	(30)	25	28-39dB						15 k	20		37	9	
x	x		3-6-8	(30)	25	28-33 dB						15 k	20		37	9	
x	x		3-6-8	(30)	25	32-35 dB						15 k	20		37	9	
x	x		3-6-8	(30)	25	34-37 dB						15 k	20		37	9	
x	x		3-6-8	(30)	25	36-39 dB						15 k	20		37	9	
x	x		3-6-8	(30)	55	28-37 dB						15 k	30		37	9	
x	x		3-6-8	(30)	55	28-33 dB						15 k	30		37	9	
x	x		3-6-8	(30)	55	32-37 dB						15 k	30		37	9	
x	x		3-6	(40)	40							4 k+	2		3	9-60	
x	x		3-6	(40)	20							4 k+	2		3	9-60	
x	x		3-6	(32)	20							5 k+	2		3	9-60	
x	x		3-6	(32)	60	23-32 dB						5 k+	5		3	9-60	
x	x		8	(42)	75	20+						0,3	2		3	9	
x	x		3-6	(42)	40	100						5 k+	2		3	9	
x	x		3-6	(42)	35	40						20 k+	2		3	9	
x	x		3-6	(42)	40	75						5 k+	2		3	9	
x	x		6-8	40	40	30-75						5 k+	(20-)		3	9	
x	x		6-8	40	40	60-150						5 k+	(20-)		3	9	
x	x		6-8	50	50	30-75						5 k+	(20-)		3	9	
x	x		6-8	50	50	60-150						5 k+	(20-)		3	9	
x	x		6-8	25	25	30-75						5 k+	(20-)		3	9	
x	x		6-8	25	25	60-150						5 k+	(20-)		3	9	
x	x		6-8	60	60	30-75						5 k+	(20-)		3	9	
x	x		6-8	60	60	60-150						5 k+	(20-)		3	9	
x	x		8	(2,5)	60								(30)		3	60	
x	x		8	(2,5)	50								(30)		3	60	
x	x		8	(2,5)	35								(30)		3	60	
x	x		8	(2,5)	20								(30)		3	60	
x	x		6-8	(75)	30	25-75						5 k	(2)		3	9	
x	x		6-8	(75)	40	25-75						5 k	(2)		3	9	
x	x		6-8	(75)	20	25-75						5 k	(2)		3	9	
x	x		6-8	(75)	50	25-75						5 k	(2)		3	9	
x	x		3-6-8	(30)	25	30-75						20 k	20		37	9	
x	x		3-6-8	(30)	55	30-75						12 k	30		37	9	
x	x		3-6-8	(30)	65	30-75						12 k	30		37	9	
x	x		3-6-8	(30)	25	60-150						15 k	20		37	9	
x	x		3-6-8	(30)	55	60-150						9 k	30		37	9	
x	x		3-6-8	(30)	65	60-150						9 k	30		37	9	
x	x		3-6-8	(30)	40	30-75						20 k	20		37	9	
x	x		3-6-8	(30)	35	60-150						15 k	20		37	9	
x	x		6-8	(75)	30	25-75						5 k	(2)		3	9	
x	x		6-8	(75)	40	25-75						5 k	(2)		3	9	
x	x		6-8	(75)	20	25-75						5 k	(2)		3	9	
x	x		6-8	(75)	50	25-75						5 k	(2)		3	9	
x	x		6-8	(100)	35	25+							(20)		6	26	
x	x	AJ	3-+8-13	(70)	(80)	35-70						0,1	(8)		8	12	
x	x	AJ	1-3-+8-13	(70)	(100)	25-50						0,1	(8)		8	12	
x	x	AJ	1-3	300	30	150						1,5	5		52	16	

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	HFE	(...) H _{fe}	... H _{fb}	f _{ab} in Mc/s	f _{osc} max in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
x	x	AJ	1-3					300		30		90			1		5		52	16
x	x	AJ	1-3					300		30		100			1		5		52	16
x	x	AJ	1-3					444		40		60			0,9		9		53	16
x	x	AJ	2-3					300		15		0,98*			1		5		52	16
x	x	AJ	3-8					300		60		30			1		12		52	16
x	x	AJ	1-3					300		15		150			1,5		5		52	16
x	x	AJ	1-3					300		15		90			1		5		52	16
x	x	AJ	1-3					(1,2)		15					1		5		53	16
x	x	AJ	1-3					(1,2)		30		30			1		5		53	16
x	x	AJ	3-8					(1,2)		30		20			1,4		5		53	16
x	x	AJ	1-3							30		50			1				54	16
x	x	AJ	1-3							30		75			1,5				54	16
x	x	AJ	1-3							60		50			1				54	16
x	x	AJ	6					(32)		16		25			0,25		100		3	16
x	x	AJ	6-8					(32)		32		25			0,25		100		3	16
x	x	AJ	8					(32)		48		25			0,25		100		3	16
x	x	AJ	2-12					90		15		70			15				52	16
x	x	AJ	8					110		10		45			6		1,3		52	16
x	x	AJ	8					110		10		65			15		1,3		52	16
x	x	AJ	11					110		10		0,98*			6		1,3		52	16
x	x	AJ	10-11					110		10		0,98*			15		1,3		52	16
x	x	AJ	8					110		10		60			20		1,3		52	16
x	x	AJ	2					150		15		0,98*			8		0,6		54	16
x	x	AJ	8					100		10					6				54	16
x	x	AJ	8					100		10					15				54	16
x	x	AJ	8					100		10					20				54	16
x	x	AJ	12					150		15		0,98*			8		0,6		54	16
x	x	AJ	12					150		15		0,99*			12		0,6		54	16
x	x	AJ	12					150		15		0,98*			9		0,6		54	16
x	x	AJ	12					150		15		0,99*			15		0,6		54	16
x	x	AJ	8					100		10					6				54	16
x	x	AJ	8					100		10					15				54	16
replaced by 2N528																				
x	x		1-3					83		15		25			0,6		10		62	62
x	x		1-3-4					83		15		90			1,1		10		62	62
x	x		5					250		30		75					15		14	62
x	x		11-12					50		15		25			25		10		62	62
x	x		9-10-12					50		15		40			25		10		62	62
x	x		9-10					32		15		50			7		5		62	62
x	x		11					32		15		16			3		5		62	62
x	x		5-6-8					(20)		30		35					(10)		3	62
x	x		3-8-13					150		(70)		20					7		9	18
x	x	AJ	1-2-3-4					150		25		75					10		9	18
x	x	AJ	1-3-4					150		25		80-140					10		9	18
x	x	AJ	1-3-4					150		20		60-140					10		9	18
x	x	AJ	8					150		15		30-150			5+		6		5	18
x	x	AJ	1-3-6-8					(63)		60		20-40			0,75+		3		tetr.	
o	o	GJ	8					150		20		3					20		22	47
o	o	GJ	8					150		20		7					20		22	47
o	o	GJ	8					150		20		14					20		22	47
o	o	GJ	8					150		20		20					20		22	47
o	o	GJ	8					150		20		30					20		22	47
o	o	GJ	8					150		20		40					20		22	47
o	o	GJ	8					150		20		50					20		22	47
o	o	GJ	1					150		15		(9-27)			4		1		22	47
o	o	GJ	1					150		30		(9-27)			4		1		22	47
o	o	GJ	1					150		60		(9-27)			4		1		22	47
o	o	GJ	1					150		15		(25-75)			6		1		22	47
o	o	GJ	1					150		30		(25-75)			6		1		22	47
o	o	GJ	1					150		60		(25-75)			6		1		22	47

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(. . .) in W	V _{ce} in V	(. . .) V _{cb} in V	H _{FE}	(. . .) H _{fe}	. . . H _{fb}	f _{ab} in Mc/s	. . . f _r	(...)f _{osc} max in Mc/s	I _{co} in μA	(. . .) in mA	Diagram	Manufacturers
o	o	o	o	o	o	o	1	150	15	15	(70-210)	7	1	22	47	1	12	22	47	47	
o	o	o	o	o	o	o	1	150	30	30	(70-210)	7	1	22	47	1	12	22	47	47	
o	o	o	o	o	o	o	1	150	60	60	(70-210)	7	1	22	47	1	12	22	47	47	
o	o	o	o	o	o	o	1	675	30	30	(10-30)	12	12	22	47	12	12	22	47	47	
o	o	o	o	o	o	o	1	675	60	60	(10-30)	12	12	22	47	12	12	22	47	47	
o	o	o	o	o	o	o	1	675	100	100	(10-30)	12	12	22	47	12	12	22	47	47	
o	o	o	o	o	o	o	1	675	30	30	(20-60)	12	12	22	47	12	12	22	47	47	
o	o	o	o	o	o	o	1	675	60	60	(20-60)	12	12	22	47	12	12	22	47	47	
o	o	o	o	o	o	o	1	675	100	100	(20-60)	12	12	22	47	12	12	22	47	47	
o	o	o	o	o	o	o	1	675	30	30	(40-150)	12	12	22	47	12	12	22	47	47	
o	o	o	o	o	o	o	1	675	60	60	(40-150)	12	12	22	47	12	12	22	47	47	
o	o	o	o	o	o	o	1	675	100	100	(40-150)	12	12	22	47	12	12	22	47	47	
o	o	o	o	o	o	o	1	675	30	30	(10+)	12	12	22	47	12	12	22	47	47	
o	o	o	o	o	o	o	1	675	60	60	(10+)	12	12	22	47	12	12	22	47	47	
o	o	o	o	o	o	o	1	675	100	100	(10+)	12	12	22	47	12	12	22	47	47	
o	o	o	o	o	o	o	1	150	15	15	(9-27)	4	1	5	47	1	5	47	47		
o	o	o	o	o	o	o	1	150	30	30	(9-27)	4	1	5	47	1	5	47	47		
o	o	o	o	o	o	o	1	150	60	60	(9-27)	4	1	5	47	1	5	47	47		
o	o	o	o	o	o	o	1	150	15	15	(27-75)	6	1	5	47	1	5	47	47		
o	o	o	o	o	o	o	1	150	30	30	(25-75)	6	1	5	47	1	5	47	47		
o	o	o	o	o	o	o	1	150	60	60	(25-75)	6	1	5	47	1	5	47	47		
o	o	o	o	o	o	o	1	150	15	15	(70-210)	7	1	5	47	1	5	47	47		
o	o	o	o	o	o	o	1	150	30	30	(70-210)	7	1	5	47	1	5	47	47		
o	o	o	o	o	o	o	1	150	60	60	(70-210)	7	1	5	47	1	5	47	47		
o	o	o	o	o	o	o	6-8-13	(2)	30	100-300	10	1-5	1	5	1	1	5	1	1		
x	x	x	x	x	x	x	7-8	600	20	15+	200"	0,1	18	30	18	30	0,1	18	30	30	
x	x	x	x	x	x	x	9-11-12	600	45	120	200"	0,1	18	30	18	30	0,1	18	30	30	
x	x	x	x	x	x	x	3	50	10	20	0,8	41	64	41	64	0,8	41	64	64	64	
x	x	x	x	x	x	x	3-4	50	15	30	0,8	41	64	41	64	0,8	41	64	64	64	
x	x	x	x	x	x	x	11	50	15	30	0,8	41	64	41	64	0,8	41	64	64	64	
x	x	x	x	x	x	x	3-4	65	10			0,5							43	1	
x	x	x	x	x	x	x	5-6	130	12			0,35							43	1	
x	x	x	x	x	x	x	5-6-8	(6)	32	18		0,2	(0,1)	4	1	4	1	0,2	(0,1)	4	1
x	x	x	x	x	x	x	3-6-8	(10)	32	150	2,5	30	3	1	3	1	2,5	30	3	1	
x	x	x	x	x	x	x	6-8	(10)	40	150	2,5	30	3	1	3	1	2,5	30	3	1	
x	x	x	x	x	x	x	6-11	(10)	32	150	2,5	30	3	1	3	1	2,5	30	3	1	
x	x	x	x	x	x	x	3-4-5-6	(13)	32	33	0,15	100-	3	1	3	1	0,15	100-	3	1	
x	x	x	x	x	x	x	3-4-5-6	(12,5)	32	75	0,3	100-	1	1	1	1	0,3	100-	1	1	
x	x	x	x	x	x	x	6-8	(13)	80	32	0,2	100-	1	1	1	1	0,2	100-	1	1	
x	x	x	x	x	x	x	6-8	(13)	60	90	0,2	100-	1	1	1	1	0,2	100-	1	1	
x	x	x	x	x	x	x	3-4-6	(3,6)	32	35	0,3	12	3	1	3	1	0,3	12	3	1	
x	x	x	x	x	x	x	6-8	(13)	60	50	0,2	100-	1	1	1	1	0,2	100-	1	1	
x	x	x	x	x	x	x	6-8	(13)	80	70	0,2	100-	1	1	1	1	0,2	100-	1	1	
x	x	x	x	x	x	x	9-10	83	15	(100)	15	0,5	43	1	43	1	0,5	43	1	1	
x	x	x	x	x	x	x	11	83	15	(50)	6	0,5	43	1	43	1	0,5	43	1	1	
x	x	x	x	x	x	x	8	83	20	80-	3+	3-	43	1	43	1	3+	3-	43	1	
x	x	x	x	x	x	x	8	83	20	200-	5,5+	3-	43	1	43	1	5,5+	3-	43	1	
x	x	x	x	x	x	x	2-3	10	7	(35)	10 k	3,5	59	1	59	1	10 k	3,5	59	1	
x	x	x	x	x	x	x	2-3	10	7	(55)	10 k	3,5	59	1	59	1	10 k	3,5	59	1	
x	x	x	x	x	x	x	2-3	10	7	(80)	10 k	3,5	59	1	59	1	10 k	3,5	59	1	
x	x	x	x	x	x	x	3	10	7	80		3,5	59	1	59	1		3,5	59	1	
x	x	x	x	x	x	x	2-3	10	7	(35)	1,4	1,5	59	1	59	1	1,4	1,5	59	1	
x	x	x	x	x	x	x	2-3	10	7	(55)	1,6	1,5	59	1	59	1	1,6	1,5	59	1	
x	x	x	x	x	x	x	2-3	10	7	80	2,2	1,5	59	1	59	1	2,2	1,5	59	1	
x	x	x	x	x	x	x	3	10	7	60	1,6	1,5	59	1	59	1	1,6	1,5	59	1	
x	x	x	x	x	x	x	1-3	50	5	30	0,45	12	21	1	21	1	0,45	12	21	1	
x	x	x	x	x	x	x	1-3	50	5	47	0,47	12	21	1	21	1	0,47	12	21	1	
x	x	x	x	x	x	x	1-2-3-4-8	125	30	(20-40)	0,3	12	43	1	43	1	0,3	12	43	1	
x	x	x	x	x	x	x	1-3-4-6-8	125	30	(30-75)	0,3	12	43	1	43	1	0,3	12	43	1	
x	x	x	x	x	x	x	5-6-8-9	165	32	25	0,35	(0,1)	50	1	50	1	0,35	(0,1)	50	1	

p-n-p	x	o	n-p-n	o	Silic.	Construction	Use	Dissipation in mW	(. . .) in W	V _{ce} in V	(. . .) V _{cb} in V	HFE	(. . .) H _{fe}	. . . H _{fb}	f _{ab} in Mc/s	. . . " fr	(. . .) f _{osc} max in Mc/s	I _{co} in μA	(. . .) in mA	Diagram	Manufacturers
x	x	AJ	1					125	30	30					0,5	8	43	1			
x	x	AJ	3-4-6					550	20	65						10	50	1			
x	x	AJ	1					125	30	(90)					0,75	5	43	1			
x	x	AJ	8-9					165	32	25					0,35	0,1	50	1			
x	x	AJ	8-9					165	32						0,35	4,5	50	1			
x	x	AJ	3-4-6					550	26	42					1,2	10	50	1			
x	x	AJ	8					550	32	85					2	10	50	1			
x	x	AJ	6-7-8					295	32	180					1,3"	40	7	1			
x	x	AJ	7-8					295	50	160					1,5"	20	7	1			
o	x	AJ	7-8					100	20	45					3,5+	0,8	43	1			
o	x	AJ	7-8					100	20	75					4,5+	0,8	43	1			
o	x	AJ	7-8					100	20	150					9+	0,8	43	1			
x	x	AD	9-+12					83	(20)	(60)					70"		7	1			
x	x	PD	9-+12					83	(20)	(100)					70"		7	1			
x	x	PD	9-+12					83	(20)						70"		7	1			
x	o	AJ	1-3					250	25	(20)					1	0,01		1			
x	o	AJ	1-3					250	25	(30)					4	0,01		1			
x	x	AJ	3-7					112	15	24					0,75	15	30	60			
x	x	AJ	3-7					112	15	32					0,9	15	30	60			
x	x		3-7					110	8	150					15	10	30	60			
x	x		3-7					110	15	40					2	10	30	60			
x	x	AJ	8					166	30	25					0,12	15	50	60			
x	x	AJ	5					166	18	30					0,12	10	50	60			
x	x	AJ	8					166	60	25						10	50	60			
x	x	AJ	5					555	20							20	50	60			
x	x	AJ	3					75	15	24					0,8	15	55	60			
x	x	AJ	3					50	7	27					0,8	100	55	60			
x	x	AJ	3					75	15	70					1,1	15	55	60			
x	x	AJ	3					50	7	40					1,6	1,5	55	60			
x	x	AJ	3					50	7	65					4,5	1,5	55	60			
x	x	AJ	3					50	7	100					8	1,5	55	60			
x	x	AJ	3					75	8	150					2	15	55	60			
x	x	AJ	3					50	5	160					16	1,5	55	60			
x	x	AJ	2-3					75	15	20					0,8	15	55	60			
x	x	AJ	2-3					50	7	40					1,5	1,5	55	60			
x	x	AJ	2-3					50	7	65					4	1,5	55	60			
x	x	AJ	2-3					50	7	100					8	1,5	55	60			
x	x	AJ	2					50	7	70					3	1,5	55	60			
x	x	AJ	9-11					108	5	20					3	10	30	60			
x	x	AJ	9-11					108	5	20					5	10	30	60			
x	x	AJ	9-11					108	5	20					10	10	30	60			
x	o	AJ	3-7					240	10	10					1,8	0,4	30	60			
x	o	AJ	3-7					370	10	10					1,8	0,4	50	60			
x	o	AJ	3-7					240	30	10					1,8	0,4	30	60			
x	o	AJ	3-7					370	30	10					1,8	0,4	50	60			
x	o	AJ	3-7					240	25							0,1	30	60			
x	o	AJ	3-7					370	25							0,1	50	60			
x	o	AJ	3-7					240	50	10						0,4	30	60			
x	o	AJ	3-7					370	50	10						0,4	50	60			
x	o	AJ	3-7					240	60							0,1	30	60			
x	o	AJ	3-7					370	60							0,1	50	60			
x	o	AJ	3-7					240	75	20					1,8	2	30	60			
x	o	AJ	3-7					370	75	20					1,8	2	50	60			
x	o	AJ	3-7					240	10	30					6	0,4	30	60			
x	o	AJ	3-7					370	10	30						0,4	50	60			
x	o	AJ	9-11					240	10	30					0,6	0,4	30	60			
x	o	AJ	9-11					370	10	30					0,6	0,4	50	60			
x	o	AJ	3-7					240	20	30						0,4	30	60			
x	o	AJ	3-7					370	20	30						0,4	50	60			
x	o	AJ	2-3					240	10	30						0,4	30	60			

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	H _{FE}	(...) H _{FE}	... H _{fb}	f _{ab} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
x	o	AJ	2-3					370		10		30					0,4	50	60	
x	o	AJ	3-7					240		25		30			1,5		0,1	30	60	
x	o	AJ	3-7					370		25		30			1,5		0,1	50	60	
x	o	AJ	3-7					240		10		60					0,4	30	60	
x	o	AJ	3-7					370		10		60					0,4	50	60	
x	o	AJ	8					240		20							0,4	30	60	
x	o	AJ	8					370		20							0,4	50	60	
x	o	AJ	3-7					240		30		30					0,4	30	60	
x	o	AJ	3-7					370		30		30					0,4	50	60	
x	o	AJ	3-7					240		125		15					0,4	30	60	
x	o	AJ	3-7					370		125		15					0,4	50	60	
x	x	AJ	8					292		15		35					15	56	61	
x	x	AJ	2-3					85		12		20			1,1		10	43	61	
x	x	AJ	5					85		10		50			1,2		10	43	61	
x	x	AJ	3					85		12		17			1		10	43	61	
x	x	AJ	5					292		15		45					15	56	61	
x	x	AJ	11					50		10		30			3		10	43	61	
x	x	AJ	10					50		10		60			7		10	43	61	
x	x	AJ	10-11					50		12		60			15		30	43	61	
x	x	AJ	10-11					50		12		60			15		30	43	61	
x	x	AJ	3					50		15		20			0,5		10		61	
x	x	AJ	2-3					50		15		20			1,1		8		61	
x	x	AJ	3					50		15		50			0,7		9		61	
x	x	AJ	3-5-8						(32)	22					0,2		20	3	66	
x	x	AJ	3					125		30		30					5	43	66	
x	x	AJ	3					125		30		45					4,5	43	66	
x	x	AJ	5					170		(32)		15			0,35		4,5	50	66	
x	x	AJ	photo transistor						7,5			130			325	mA/L		43	1	
x	x	AJ	5-6						6,6			30					25	27	61	
x	x	AJ	5-6-8						6,6			15					25	27	61	
x	x	AJ	3							30					0,5		4,5	54	66	
x	x	AJ	3							30					0,5		4,5	54	66	
x	x	AJ	2							30					0,5		4,5	54	66	
x	x	AJ	3							30							4,5	54	66	
x	x	AJ	11							30					1,6		4,5	54	66	
o	o	TO	6-+11					(125)		50		10+			50		10	34	32	
o	o	TO	6-+11					(125)		100		10+			50		10	34	32	
o	o	DO	7-8					(3)		40		20-60					1	5	36	
o	o	DO	7-8					(3)		40		40-120					1	5	36	
o	o	DO	7-8					(3)		60		20-60					1	5	36	
o	o	DO	7-8					(3)		60		40-120					1	5	36	
x	o	AJ	1-3-7+9-11					150		25		(18)			(15)		0,001	5	41	
x	x	SB	7-+11					20		5		(11-33)			50		3	24	31	
x	x	AJ	1-3-6-8					(25)		30		(25)			0,5		0,42	3	31	
x	x	SB	7-+11					20		5		(20)			75		3	24	31	
x	x	AJ	3					350		(24)					1		20	57	67	
x	x	AJ	3					350		(24)					2		20	57	67	
x	x	AJ	3-6-8					350		(30)					2		25	57	67	
x	x	AJ	3					550		(24)					1		20	58	67	
x	x	AJ	3					550		(24)					2		20	58	67	
x	x	AJ	3-6-8					550		(30)					2		25	58	67	
x	x	AJ	3-6-8					350		(45)					1		25	57	67	
x	x	AJ	3-6-8					350		(45)					1,8		25	57	67	
x	x	AJ	3-6-8					550		(45)					1		25	58	67	
x	x	AJ	3-6-8					550		(45)					1,8		25	58	67	
x	x	AJ	6					(30)		(30)					0,3		(1)	3	67	
x	x	AJ	6					(40)		(40)					0,3		(1)	3	67	
x	x	AJ	6					(40)		(60)					0,3		(1)	3	67	
x	x	AJ	3-5-8					225		(30)					1,3		15	5	67	
x	x	AJ	3-5-8					225		(30)					1,6		15	5	67	

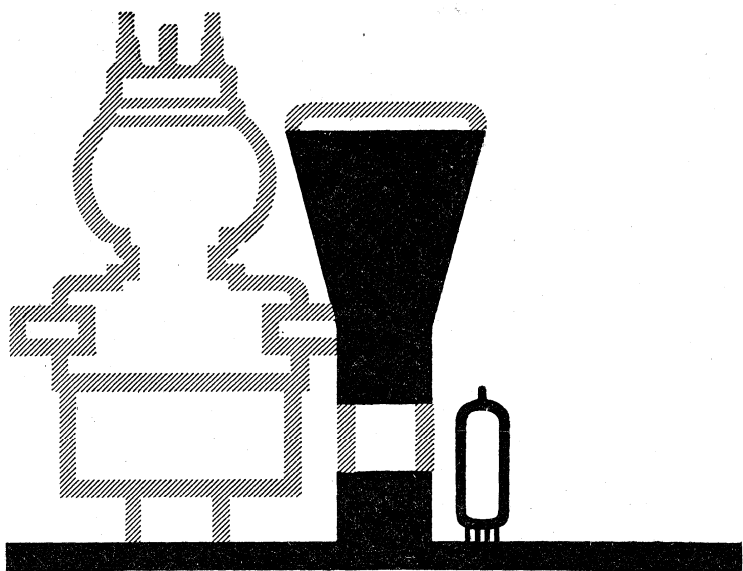
Type N°	p-n-p		o	n-p-n	o	Silic.	Construction	Use	Dissipation in mW (...) in W	V _{ce} in V	V _{cb} in V (...) V _{cb} in V	H _{FE}	H _{FE} (...) H _{FE}	H _{FE} (...) H _{FE}	f _{ab} in Mc/s (...) f _{osc} max in Mc/s	I _{co} in μA	I _{ce} in mA (...) in mA	Diagram	Manufacturers
	x	x		x	x														
9FT222	x	x	AJ	3-5-8				225	(30)						2,6	15	5	67	
9FT223	x	x	AJ	8				150	(40)						(5,5)	10	5	67	
9FT224	x	x	AJ	8				150	(30)						(7,5)	10	5	67	
9FT225	x	x	AJ	8				150	(24)						(12)	10	5	67	
9FT226	x	x	AJ	8				150	(18)						(20)	10	5	67	
9FT227	x	x	AJ	3-8				450	(40)						0,3	750	11	67	
9FT228	x	x	AJ	3-8				450	(60)						0,3	750	11	67	
9FT229	x	x	AJ	3-8				450	(80)						0,3	750	11	67	
9FT230	x	x	AJ	3-8				450	(100)						0,3	750	11	67	
9FT231	x	x	AJ	2-3-4				150	(15)						3	8	5	67	
9FT232	x	x	AJ	6-8				(45)	(40)						0,3	(3)	3	67	
9FT233	x	x	AJ	6-8				(45)	(60)						0,3	(3)	3	67	
9FT234	x	x	AJ	6-8				(45)	(80)						0,3	(3)	3	67	
9FT235	x	x	AJ	2-3-4-8				225	(45)						1,6	15	5	67	
9FT236	x	x	AJ	2-3-4-8				225	(45)						2	15	5	67	
9FT237	x	x	AJ	2-3-4-8				225	(60)						2	15	5	67	
9FT238	x	x	AJ	6				(40)	(80)						0,3	(1)	3	67	
9FT239	x	x	AJ	2-3-4				225	(30)						1,2	15	5	67	
9FT240	x	x	AJ	2-3-4				225	(30)						1,6	15	5	67	
9FT241	x	x	AJ	2-3-4				225	(30)						2,4	15	5	67	
9FT242	o	x	AJ	8				150	(20)						(5)	10	5	67	
9FT243	o	x	AJ	8				150	(20)						(9)	10	5	67	
9FT244	o	x	AJ	8				150	(20)						(13)	10	5	67	
9FT245	x	x	AJ	6-8				(70)	(40)						0,3	(8)	36	67	
9FT246	x	x	AJ	6-8				(70)	(60)						0,3	(8)	36	67	
9FT247	x	x	AJ	6-8				(70)	(80)						0,3	(8)	36	67	
9FT248	x	x	AJ	8				150	(24)						7	10	5	67	
9FT249	x	x	AJ	11				150	(18)						3	10	1	67	
9FT250	x	x	AJ	11				150	(18)						7	10	1	67	
9FT251	x	x	AJ	11				150	(18)						13	10	1	67	
9FT252	x	x	DR	12				120	(40)						(30)	15	44	67	
9FT253	x	x	DR	12				120	(20)						(30)	15	44	67	
9FT254	x	x	DR	9-10-12				150	(20)						(35)	15	1	67	
9FT255	x	x	DR	11				150	(20)						(25)	15	1	67	
9FT256	x	x	DR	9-10-12				150	(20)						(30)	15	1	67	
9FT257	x	x	AJ	3				200	(24)						1,3	15	1	67	
9FT258	x	x	AJ	3				200	(24)						1,6	15	1	67	
9FT259	x	x	AJ	3				200	(24)						2,6	15	1	67	
9FT260	x	x	AJ	3-4				200	(24)						1,2	15	1	67	
9FT261	x	x	AJ	3-4				200	(24)						1,6	15	1	67	
9FT262	x	x	AJ	3-4				200	(24)						2,4	15	1	67	
9FT263	x	x	DR	9-10-12				120	(20)						(55)	15	44	67	
9FT264	x	x	DR	9-10-12				120	(20)						(70)	15	44	67	
9FT265	x	x	DR	9-10-12				120	(30)						(75)	30	44	67	
9FT266	x	x	DR	12				120	(20)						(70)	15	44	67	
9FT267	x	x	AJ	9-11				25	5	10					10	10	24	64	
9FT268	x	x	AJ	11				25	5	7					5	10	24	64	
9FT269	o	o	DJ	6-8				(85)	(60)	15					6	(20)	39	48	
9FT270	o	o	DJ	6-8				(85)	45	30					6	20		48	
9FT271	o	o	DJ	6-8				(50)	60	30					6	20		48	
9FT272	o	o		6				(25)	60	10							10	48	
9FT273	o	o		6				(25)	60	10							39	48	
9FT274	o	o		8-12					(45)	15						0,05	54	16	
9FT275	o	o		8-12					(45)	30						0,05	54	16	
9FT276	o	o		8-12					(45)	50						0,05	54	16	
9FT277	o	o	GJ	1-8-11				150	30	16					7	0,1		48	
9FT278	o	o	GJ	1-3-11				150	13	18+					9	10	22	48	
9FT279	o	o	GJ	1-3-11				150	30	36+					10	10	22	48	
9FT280	o	o	GJ	1-8-11				150	30	140					11	0,1		48	
9FT281	o	o	DJ	1				30	6	15+					5	0,005	5	48	

p-n-p	x	n-p-n	o	Germ. x	o	Construction	Use	Dissipation in mW	(. . .) in W	V _{ce} in V	(. . .) V _{cb} in V	H _{FE}	(. . .) H _{FE}	. . . H _{fb}	f _{ab} in Mc/s	(. . .) f _{osc} max in Mc/s	I _{co} in μA	(. . .) in mA	Diagram	Manufacturers
o	o	o	o	o	o	o	1-2	30		6		15+		5			0,01	5	48	
o	o	o	o	o	o	o	1-2	30		6		20		5			2	5	48	
x	x	x	x	x	x	x	1-3-11	300		100		60		30			5	18	48	
x	x	x	x	x	x	x	1-3-11	300		60				30			5	18	48	
x	x	x	x	x	x	x	8	300		30				30			5	18	48	
o	o	o	o	o	o	o	7-8			15		12		50			1	5	48	
o	o	o	o	o	o	o	7-8			20		20		70			1	5	48	
x	x	x	x	x	x	x	8	50		clipper								5	48	
o	o	o	o	o	o	o	7-8	150		30		20		150			5	18	48	
o	o	o	o	o	o	o	7-8	150		15		20		150			5	18	48	
o	o	o	o	o	o	o	DM 3-6-8	(85)		60		10-50		1			25	36	44	
o	o	o	o	o	o	o	DM 3-6-8	(85)		100		10-50		1			25	36	44	
o	o	o	o	o	o	o	DM 3-6-8	(85)		60		25-75		1			25	36	44	
o	o	o	o	o	o	o	DM 3-6-8	(85)		100		25-75		1			25	36	44	
x	x	x	x	x	x	x	SA 8-11	100		6		(30)		(18)			0,1	1	31	
x	x	x	x	x	x	x	MA 7-8	25		5		20-75		70"			0,5	24	31	
x	x	x	x	x	x	x	MD 7-8	50		12		50		120"			100-	9	31	
x	x	x	x	x	x	x	AJ 8	250		20		70		8			20	9	31	
x	x	x	x	x	x	x	MA 8	25		6		(120)		(60)			5	24	31	
x	x	x	x	x	x	x	AJ 3-4	250		18		(70-150)		0,6			7	25	31	
x	x	x	x	x	x	x	MD 7-8	25		15		35					100-	9	31	
x	x	x	x	x	x	x	8	150		40		20+		0,5			35	11	31	
x	x	x	x	x	x	x	SD 7-8	100		25		35		140"			0,5	9	31	
x	x	x	x	x	x	x	8	100		(15)		15		4			6	1	63	
x	x	x	x	x	x	x	1-3	100		16		15		0,35			10	1	63	
x	x	x	x	x	x	x	1-3-4	100		32		15		0,35			10	1	63	
x	x	x	x	x	x	x	5-6	150		16		40		1				1	63	
x	x	x	x	x	x	x	5-6	150		32		40		1				1	63	
x	x	x	x	x	x	x	AJ 3-8	100		45		60		4			6	1	63	
o	o	o	o	o	o	o	1-3	110		30		7,4		0,25			10	22	63	
o	o	o	o	o	o	o	1-3-4	75		30		16		0,4			10	22	63	
o	o	o	o	o	o	o	1-3	50		30		49		0,5			10	22	63	
x	x	x	x	x	x	x	4-5-6	833		16		8,5					20	8	63	
x	x	x	x	x	x	x	5-6-8	833		32		8,5					20	8	63	
x	x	x	x	x	x	x	AJ 3-8	330		45		45		4			10	8	63	
x	x	x	x	x	x	x	5-6-8	(10)		32		10					(0,1)	19	63	
x	x	x	x	x	x	x	5-6-8	(10)		64		10					(0,1)	19	63	
x	x	x	x	x	x	x	5-6-8	(10)		80		10					(0,2)	19	63	
x	x	x	x	x	x	x	5-6-8	(23)		32		25						20	63	
x	x	x	x	x	x	x	5-6-8	(23)		64		25						20	63	
o	o	o	o	o	o	o	3	600		100		10	at 100° C:		5			21	63	
x	x	x	x	x	x	x	AJ 8	300		12		40		6			0,7	60	65	
x	x	x	x	x	x	x	AJ 3-8	200		20		22		2			1,5	60	65	
x	x	x	x	x	x	x	AJ 3	300		30		60		1,1			1,2	60	65	
x	x	x	x	x	x	x	AJ 3-8	200		20		40		3,5			1,5	60	65	
x	x	x	x	x	x	x	AJ 8	200		6		50		11			0,7	60	65	
x	x	x	x	x	x	x	AJ 8	200		25		46					0,5	60	65	
x	x	x	x	x	x	x	AJ 8	200		10		35		6			2,4	60	65	
x	x	x	x	x	x	x	AJ 8	200		5		50		11			2,4	60	65	
o	o	o	o	o	o	o	AJ 8	100		12		(30)		5			2,5	60	65	
o	o	o	o	o	o	o	AJ 8	100		6		(60)		8+			2	60	65	
x	x	x	x	x	x	x	8	200		10		40		2"			4	60	65	
x	x	x	x	x	x	x	8	200		10		55		3,7"			4	60	65	
x	x	x	x	x	x	x	8	200		10		70		7"			4	60	65	
x	x	x	x	x	x	x	8	200		10		100		12"			4	60	65	
x	x	x	x	x	x	x	AJ 3-5	200		20		55		1,8			5	60	65	
x	x	x	x	x	x	x	AJ 3-6	200		20		35		1,1			5	60	65	
x	x	x	x	x	x	x	AJ 3-6	200		15		53		1,2			5	60	65	
x	x	x	x	x	x	x	AJ 3	200		15		(66)		1,4			5	60	65	
x	x	x	x	x	x	x	AJ 8	200		10		50		0,5+			12	60	65	

p-n-p	x	n-p-n	o	Germ. x	o	Silic.	Construction	Use	Dissipation in mW	(. . .) in W	V _{ce} in V	(. . .) V _{cb} in V	HFE	(. . .) H _{fe}	(. . .) H _{ib}	f _{ab} in Mc/s	(. . .) f _{osc} max in Mc/s	I _{co} in μA	(. . .) in mA	Diagram	Manufacturers
x	x	AJ	8						200		(20)	20	20			0,5+	12	60	65		
x	x	AJ	8						150		20	10	10			0,5+	1,7	60	65		
o	x	AJ	8						100		10	15+	15+				8	60	65		
o	o	DM	7-8						(10)		20	(8+)	(8+)			50"	1	3	65		
o	o	DM	7-8						(10)		20	(42)	(42)			150"	0,004	3	65		
o	o	DM	7-8						(10)		20	(10+)	(10+)			50"+	0,05	3	65		
o	o	DM	7-8						(10)		20	(20+)	(20+)			100"+	0,05	3	65		
o	o	DM	4-8						600		20	(8+)	(8+)			50"+	1	29	65		
o	o	DM	4-8						(2,1)		20	37	37			150"	0,004	29	65		
o	o	DM	4-8						600		20	(10+)	(10+)			50"+	0,05	29	65		
o	o	DM	4-8						600		20	(20+)	(20+)			100"+	0,05	29	65		
o	o	DD	12						600		25	5	5			200"+	0,01	29	65		
o	o	DM	8						300		15	40	40			200"+	0,025	5	65		
o	o	DM	8						300		15	80	80			200"+	0,025	18	65		
o	o	DD	12						300		25	(25+)	(25+)			200"+	0,01	18	65		
x	x		5-6-7						(30)		15	15+	15+			0,25	100		65		
x	x		5-6-7						(30)		40	20+	20+			0,25	100		65		
x	x		5-6-7						(30)		80	50+	50+			0,25	100		65		
x	x		5-6-7						(30)		100	20+	20+			0,25	100		65		
x	x	AJ	9						100		7	(50)	(50)			10	3	5	51		
x	x		11						100		7	(40)	(40)			7	3	5	51		
x	x	AJ	3-4						100		9	(40)	(40)			2	3	5	51		
x	x	AJ	3-5-6						120		12	(60)	(60)			1	3	5	51		
x	x	AJ	1-3						120		25	10-20	10-20			1,6	20	5	21		
x	x	AJ	8						200		24	40	40			12	2	5	21		
x	x	AJ	1-3-5-6						150		20	34	34			2	16	5	21		
x	x	AJ	1-3-5-6						150		16	50	50			2,5	16	5	21		
x	x	AJ	1-3-5-6						150		16	80	80			3,1	16	5	21		
x	x	AJ	1-3-5-6						150		16	50	50			2	16	5	21		
x	x	AJ	1-3						150		12	75	75			2,5	16	5	21		
x	x	AJ	1-3-5-6						150		16	95	95			3	16	5	21		
x	x	AJ	5-6						200		15	72	72			1,8	25	5	21		
x	x	AJ	9-10-11						150		10	(20)	(20)			3,5	10	5	21		
x	x	AJ	3						150		12	125	125			3,5	16	5	21		
x	x		3						150		25	(25-70)	(25-70)			2	15	5	21		
x	x		3						150		15	(25-70)	(25-70)			2	15	5	21		
x	x		1-3-5-6						150		22	(40-150)	(40-150)			3	20	5	21		
x	x		1-3-5-6						150		22	(15-45)	(15-45)			2,5	20	5	21		
x	x	AJ	3						50		(20)	30	30			0,5	10	61	65		
x	x	AJ	5						50		(20)	50	50			0,5	10	61	65		
x	x	AJ	10-11						70		12	20	20			4		61	65		
x	x	AJ	9-10						70		6	20	20			8,5		61	65		
x	x	AJ	5-6						130		28	40	40			0,6		61	65		
x	x	AJ	1-3						70		20	40	40			0,6		61	65		
x	x	AJ	1-3						70		20	20	20			0,5		61	65		
x	x	AJ	5-6-8						130		18	40	40			0,6		61	65		

SUPPLEMENT TRANSISTORS

p-n-p	x	n-p-n	o	Germ. x	Silic. o	Construction	Use	Dissipation in mW	(...) in W	V _{ce} in V	(...) V _{cb} in V	H _{FE}	(...) H _{fe}	H _{ib}	f _{ab} in Mc/s	(...) f _{osc} max in Mc/s	I _{co} in μ A	(...) in mA	Diagram	Manufacturers
x	x	AJ	4					140		16		60			2,5		16		5	68
x	x	AJ	4					140		16		25			3		16		5	68
x	x	AJ	11					200		10					7		6		5	68
x	x	AJ	11					200		10					8		6		5	68
x	x	AJ	8-9-10					200		10					11		6		5	68
x	x	AJ	8-9-10					200		10					12		6		5	68
x	x	AJ	3-4-6					240		20		45			2,5		16		5	68
x	x	AJ	3-4-6					240		20		85			3,1		16		5	68
x	x	AJ	3-4-5-6					200		20		33			2		16		5	68
x	x	AJ	3-4-5-6					200		20		48			2,5		16		5	68
x	x	AJ	3-4-5-6					200		20		80			3,1		16		5	68
x	x	AJ	3-4					150		16		48			2,5		16		5	68
x	x	AJ	3-4					150		16		80			3,1		16		5	68
x	x	AJ	3-4					150		16		95			3,4		16		5	68
x	x	AJ	7-8					150		15		20			4,5		6		5	68
x	x	AJ	7-8					150		20		30			8		6		5	68
x	x	AJ	7-8					150		15		40			12		6		5	68
x	x	AJ	8					150		60		55			1,4		30		5	68
x	x	AJ	3-4					150		16		125			3,5		16		5	68
x	x	AJ	1-3-6-8					225		30		35			2		10		5	68
x	x	AJ	1-3-6-8					225		30		52			2,5		10		5	68
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x	x	AJ	1-3-8-9-11					225		40		35			2		30		5	68
x	x	AJ	1-3-8-9-11					225		40		52			2,5		30		5	68
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x	x	AJ	1-3-8-9-11					225		40		91			3,3		30		5	68
o	o	DJ	8				(1,2)	15		75							0,025		18	34-68
x	x	DJ	7					150		12		20+					3		18	1)
o	o	DM	8					300		(25)		75			450*				18	27
x	x	DJ	7-8					150		(30)		75			60		3		18	34
x	x	DJ	7-8					150		(30)		75			60		3		5	34
x	x	DJ	7-8					150		12		85			80*		(40)		18	34
x	x	DJ	8					150		(15)		25+			300*		3		18	27-34
o	o	DJ	8					300		30		25+			350*		0,5		18	27-34
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x	x	AJ	1-6-8-13				(50)	75		75		25			4 k		(3)		3	27
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x	x	AJ	7-8					120		(30)		20+					10		9	34

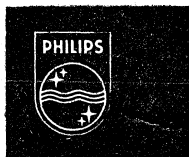


PHILIPS

elektronenbuizen en halfgeleiders

Produkten die in een uitgebreid toepassingsgebied
hun betrouwbaarheid hebben bewezen.

*Voor technici en amateurs die over
volledige technische gegevens van bui-
zen en halfgeleiders willen beschikken,
zijn bij de radiohandel verschillende
Philips publikaties beschikbaar*



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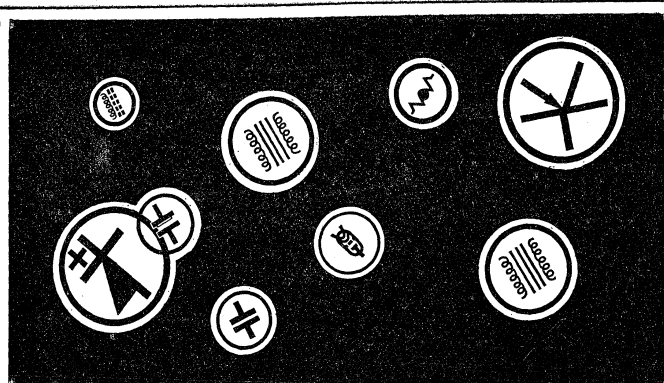
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BETROUWBAARHEID LANGE LEVENSDUUR

Gebiedende eis voor telecommunicatieapparatuur! International Telephone and Telegraph System werkt op het gehele gebied van de communicatie- en vele daaraan nauw verwante technieken, zoals onder andere informatieverwerking, automatisatie, telecontrole. - Nederlandsche Standard Electric Maatschappij N.V., lid van het ITT-System, beschikt ook op deze gebieden over grote ervaring - Professionele ITT apparatuur, en óók de bouwelementen hiervoor worden in eigen fabrieken vervaardigd teneinde aan de hoogste eisen te voldoen. Dag en nacht worden ITT bouwelementen zoals transistors, elektronenbuizen, relais, dioden, gelijkrichters, en dergelijke gefabriceerd; zij voldoen aan de eis van uiterste betrouwbaarheid - Betrouwbaarheid is een kwestie van kennis en ervaring, welke te uwen dienste staat. Bij leden van het ITT-System, die praktische adviezen geven:

Nederlandsche Standard Electric Mij N.V., Postbus 1013, 's-Gravenhage

LEVERINGSPROGRAMMA: Elektronenbuizen o.m. van speciale kwaliteit: „Trustworthy” • transistors • germaniumdioden • weerstanden met negatieve en positieve temperatuurscoëfficiënt: Thermistors, Brimistors en Silistors • selenium- en siliciumelementen • gelijkrichters • fotocellen • zener- en tunneldioden • condensatoren op JAN, MIL en Z-specificaties • trimpotentiometers: T-pots • luidsprekers • kristallen • relais • telmagneten • kleine motoren • dwarsstroomventilatoren.

uiterst betrouwbare bouwelementen



GA 21 C

INTERNATIONAL TELEPHONE & TELEGRAPH SYSTEM

Voor België: BELL Telephone Manufacturing Cy., Antwerpen

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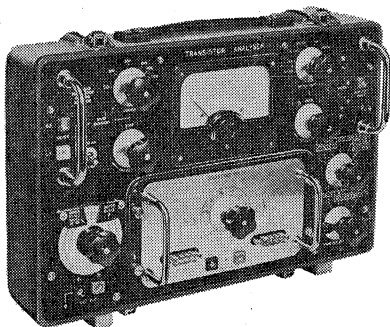
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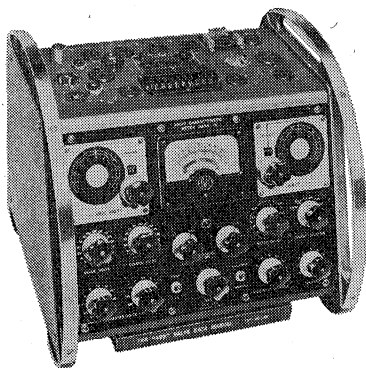


AVO TRANSISTOR-ANALYSER

Een draagbaar, op batterijen werkend instrument, geschikt voor het testen van PNP, NPN en puntkontakt-transistoren, in de gearde emitter-schakeling. Het meten van transistoren onder bedrijfsomstandigheden is mogelijk. Het instrument wordt verstrekt, compleet met uitgebreide bedienings-instructies en een AVO Internationaal Transistor Handboek, dat de testgegevens inhoudt van ongeveer 3000 transistoren.

Beknopte specificatie:

Het bereik van de collectorspanningen: 1,5 V tot 10,5 V (tot 150 V bij het gebruik van uitwendige spanningsbron).
De lekstroom I_{co} = Een eerste-aanwijzing van 2 μ amp.
Basisstroom 0—1 mA, 0—40 mA
Collectorstroom 0—1 amp.
Beta 0—25, 0—250 gemeten bij 1 Kc/s
Ruismeting 1—20, 21—40 dB



f 1090,- netto
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AVO BUISKARAKTERISTIEK-METER Mk. IV

Dit instrument is ontworpen om elke standaard ontvang- of zendbuis te testen, waarvan de anode-dissipatie de 25 W niet te boven gaat. De isolatie-waarde tussen de diverse elektroden, anodestroom, de steilheid en de roosterlekstroom kunnen worden gemeten, en indien een complete serie van metingen wordt genomen, kunnen de karakteristieken uitgetekend worden. Gelijkrichters en diode's worden onder de juiste belastingscondities getest. Een uitgebreid handboek, dat zowel instructies als testgegevens bevat, wordt bij het instrument verstrekt.

Beknopte specificatie:

Anodespanningsbereik 12,6—400 V
Schermroosterspanning 12,6—300 V
Gloeidraadspanning 0,625—117,5 V
Gloeidraadstroom max. 3 amp.
Anodestroom max. 100 mA
Steilheid 0,1—60 mA/V
Negatieve roosterspanning 0—100 V in 9 bereiken
Roosterlekstroom eerste aanwijzing 2 μ amp.



MEETINSTRUMENTEN

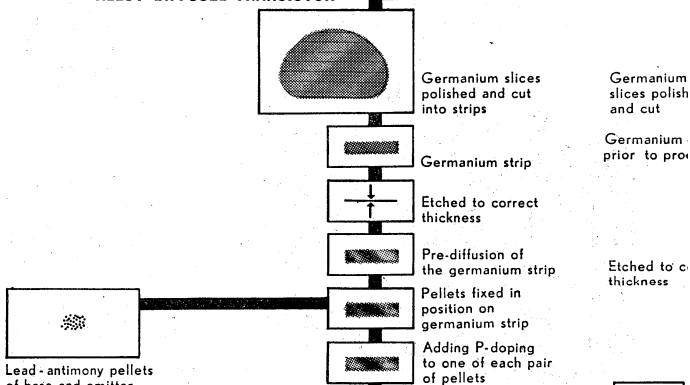
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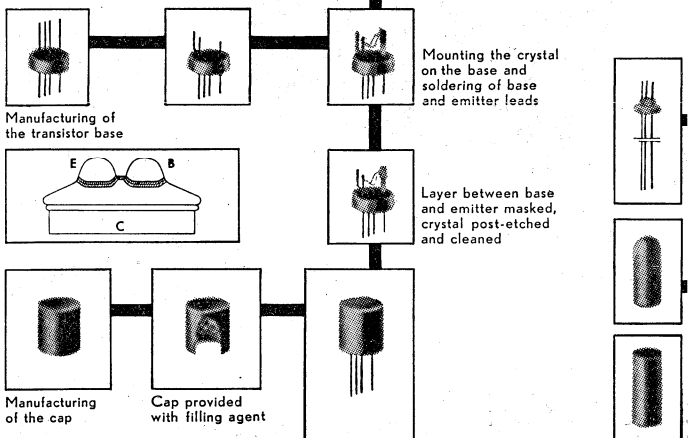
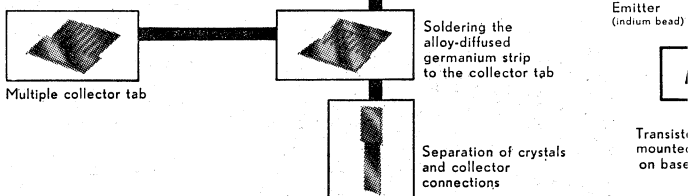
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