R. DESCHEPPER

TÉLÉ TUBES

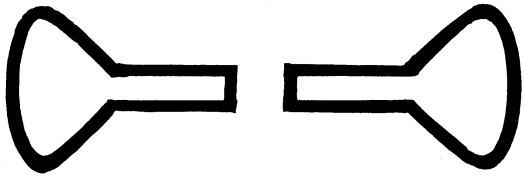
9e ÉDITION mise à jour

S. E. C. F.

ÉDITIONS RADIO

TÉLÉ-TUBES

9eme ÉDITION



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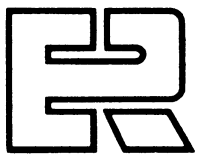


R. DESCHEPPER

Essential constants and
practical circuit diagrams

Caracteristicas esenciales
y esquemas de utilizacion

Wichtigsten Charakteristiken
und Schaltungs-Schemata

Caractéristiques essentielles
et schémas d'utilisation

Caratteristiche essenziali
e schemi di impiego

Omnisbare karakteristieken
en gebruikschema's

Éditions Radio
3, RUE DE L'ÉPERON 75006 PARIS
TÉL. 329.63.70-C.C.P. La Source 340.37.40 H

Du même auteur chez SECF Éditions Radio :

LE MAGNÉTOPHONE ET SES UTILISATIONS (en collaboration avec Ch. Dartevelle) 4e édition

RADIO TUBES (en collaboration avec E. Aisberg et L. Gaudillat) 18e édition

Imprimerie Berger-Levrault, Nancy

Dépôt légal : 3e trimestre 1981
Éditeur n° 866 - Imprimeur : 779472
I.S.B.N. 2 7091 0866 6

PRÉFACE

En collaboration avec MM. E. Aisberg et L. Gaudillat, nous avons conçu, en 1949, une nouvelle façon de présenter les caractéristiques des tubes électroniques en les incorporant dans des schémas-types d'utilisation. Sur cette base, nous avons réalisé un ouvrage qui, sous le titre RADIO-TUBES, a connu dans le monde entier un prodigieux succès.

Les techniciens de la Radio et de l'Electronique ont vivement apprécié la manière claire, pratique et explicite de présenter ainsi les caractéristiques essentielles et la disposition des culots des tubes. Régulièrement, de nouvelles éditions nous permettent de maintenir cet ouvrage à jour, en tenant compte des nouveaux modèles de tubes ayant fait leur apparition.

Rançon inévitable du succès : RADIO-TUBES a été imité et plagié. Les auteurs de ces contrefaçons sont, bien entendu, poursuivis devant les tribunaux de leurs pays respectifs.

Encouragé par le succès de RADIO-TUBES et tenant compte du rapide essor de la Télévision, nous avons, en 1958, présenté TELE-TUBES, ouvrage beaucoup plus spécialisé qui, grâce à des remaniements réguliers, reste toujours d'actualité.

Cet ouvrage se compose des parties suivantes :

1. — Tubes Cathodiques utilisés en Europe occidentale dans les téléviseurs noir et blanc ou couleur.

2. — Tubes Electroniques dans leur application à la télévision. En plus de leurs caractéristiques statiques, nous présentons des schémas-types dans lesquels ils assument les fonctions auxquelles ils sont le mieux adaptés ou dans lesquelles on les trouve le plus souvent.

3. — Diodes utilisées dans les circuits de télévision.

4. — Tableaux d'équivalence.

Pour toutes les indications relatives aux caractéristiques et aux fonctions des tubes, nous avons fait usage, partout où cela était possible, de signes conventionnels ou d'idéogrammes, dont on trouvera plus loin le tableau complet, de manière à en rendre l'interprétation facile, quelle que soit la langue du lecteur.

Les tubes-images sont représentés selon le même principe que les autres tubes en supposant le *culot vu du côté des broches.*

Toutes les dimensions sont exprimées en millimètres.

Le classement de tous les tubes ainsi que celui des diodes est *alphabétique d'abord, numérique ensuite,* les lettres ayant priorité sur les chiffres.

Le but de notre ouvrage est de permettre de trouver rapidement soit les caractéristiques d'un tube inconnu, soit un tube de remplacement, soit encore le meilleur tube à utiliser pour une fonction déterminée. Il en est de même pour les diodes. Nous pensons que cet ouvrage rendra service à tous ceux qui s'occupent de Télévision ou d'une technique connexe.

VORWORT

In Zusammenarbeit mit den Herren E. Aisberg und L. Gaudillat hatten wir im Jahre 1949 eine neue Methode für die Darstellung der Röhrendaten eingeführt, nach der diese Daten in typische Anwendungsschaltungen einbezogen worden waren. Auf dieser Grundlage haben wir mit dem Titel RADIO-TUBES ein Werk geschaffen, welches auf der ganzen Welt ein ausserordentlicher Erfolg geworden ist.

Die Radiotechniker und Elektroniker haben die klaren, praktischen und deutlichen Darstellungen der wichtigsten Kennwerte und der Sockelanschlüsse der Röhren sehr gut aufgenommen. Seitdem haben wir dieses Werk regelmässig durch neue Auflagen auf dem neuesten Stand gehalten, unter Berücksichtigung der neu aufgekommenen Röhrenmodelle.

Bei diesem grossen Erfolg war es fast unvermeidlich, dass unser Werk RADIO-TUBES nachgeahmt und sogar kopiert wurde. Selbstverständlich sind wir in den jeweiligen Ländern gegen die Verletzung unserer Urheberrechte eingeschritten.

Der Erfolg des Werkes RADIO-TUBES und die rasche Entwicklung des Fernsehens haben uns veranlasst im Jahre 1958 ein sehr viel spezialisierteres Werk unter dem Titel TELE-TUBES herauszubringen, welches ständig auf dem neuesten Stand gehalten wird, und deshalb immer aktuell bleibt.

Dieses Werk umfasst folgende Teile:

1. — Die Bildröhren (Kathodenstrahlröhren), welche in Westeuropa für das schwarz/weiss und das Farbfernsehen verwendet werden.

2. — Die Elektronenröhren in ihrer Anwendung beim Fernsehen. Ausser ihren statischen Kennwerten geben wir die typischen Schaltungen für die sie am besten geeignet sind, oder in denen man diese Röhren am häufigsten findet.

3. — Dioden, welche in den Fernseh-Schaltungen benutzt werden.

4. — Tafeln der gleichwertigen Typen.

Für alle Hinweise zu den Daten und Funktionen der Röhren haben wir, soweit möglich die üblichen Symbole und Bildzeichen verwendet, welche etwas später vollständig in einer Aufstellung zusammengefasst sind, so dass dieses Werk ohne weiteres von allen Lesern, unabhängig ihrer Sprachkenntnisse, verstanden werden kann.

Die Bildröhren sind in der gleichen Weise dargestellt, wie die anderen Röhren auch, und zwar so, dass der Beobachter auf die Kontaktstifte der Röhre blickt.

Alle Abmessungen werden in Millimeter ausgedrückt.

Die Einordnung aller Röhren, wie auch der Dioden erfolgt erst alphabetisch und dann nach den Zahlen, wobei die Buchstaben gegenüber den Zahlen vorrangig behandelt werden.

Der Zweck dieses Werkes ist dreifach, es ermöglicht das schnelle Auffinden entweder der Kennwerte einer unbekannten Röhre oder einer als Ersatz verwendbaren Röhre, oder auch der Röhre, welche am besten einer bestimmten Funktion entspricht. Das gleiche gilt auch fur die Dioden. Wir glauben mit diesem Werk allen denen die sich mit dem Fernsehen oder einer verwandten Technik befassen, einen guten Dienst erwiesen zu haben.

PREFACE

Since 1949 we have, in collaboration with Mr. E. Aisberg and Mr. L. Gaudillat, evolved a new system for presenting tube characteristics and incorporating these in tube utilisation circuits. Based on this system, we have produced a publication which, under the title RADIO TUBES, has proved a tremendous success all over the world.

Radio and Electronic engineers and technicians have been quick to appreciate the clear, practical and explicit presentation of both a tube's basic characteristics and its base connections. Regular new editions allow us to keep this publication up to the minute and include new tubes which have newly made their appearance.

The success of RADIO-TUBES has its inevitable sequel : it has been imitated and copied. The authors of these imitations have understandably been brought before the authorities of their respective countries.

Encouraged by the success of RADIO-TUBES and bearing in mind the rapid growth of television, in 1958 we presented TELE-TUBES, a much more specialised publication which, owing to regular revision, is always up-to-date.

It is made up of the following sections :

1. — CATHODE RAY TUBES used in Western Europe in black-and-white and colour television sets.

2. — ELECTRONIC TUBES as applied to television. In addition to their static characteristics, we also present circuits to which they are best adapted or in which they are most often found.

3. — DIODES used in television circuits.

4. — EQUIVALENCE TABLES.

For all the figures given on the characteristics and functions of the tubes, we have wherever possible made use of conventional signs or symbols. Further on there is the complete picture, in a clearly interpreted form, no matter which language is spoken by the reader. The picture tubes follow the same convention used in describing normal tubes in that the base connections on the tube are as seen *looking down on the tube* base from the pins.

All dimensions in millimeters.

The classification of all tubes including the diodes is firstly in *alphabetical order,* then in *numerical order,* where letters have priority over numbers.

The object of this publications is to allow rapid reference to the characteristics of either an unknown tube, or a replacement tube, or even to arrive at the best tube to use for a given function. This applies equally well in the case of diodes. We trust that this publication will be of service to all those who work with television or in an allied science.

PREFACIO

En colaboración con los Srs. E. Aisberg y L. Gaudillat, concebimos, en 1949, una nueva forma de dar a conocer las caracteríticas de las lámparas electrónicas incorporándolas a esquemas prácticos de uso corriente. Sobre esta base, hemos dado a luz una obra que, bajo el título de RADIO-TUBES, ha obtenido un prodigioso éxito el mundo.

Los técnicos de la Radio y de la Electrónica han apreciado intensamente esta manera clara, práctica y explícita de presentar las características esenciales y disposición de las conexiones de las lámparas. Regularmente, una nueva edición nos permite mantener esta obra al día con la adición de los nuevos modelos de válvulas de más reciente creación.

Consecuencia inevitable del éxito : RADIO-TUBES ha sido imitado y plagiado. Los autores de estas imitaciones son, téngase bien entendido, persequidos por los tribunales de sus respectivos paises.

Alentados por el éxito de RADIO-TUBES y teniendo en cuenta el rápido desarrollo de la Televisión, hemos presentado — en 1958 — TELE-TUBES, que es una obra especializada y que, debido a las novedades introducidas regularmente, permanece constantemente al día.

Esta obra se compone de las partes siguientes :

1. — Tubos Catodicos, utilizados en Europa occidental, en los televisores en blanco y negro y en colores.

2. — Las Valvulas Electronicas en sus aplicaciones a la Televisión. Además de sus características estáticas, presentamos esquemas específicos en los cuales ejecutan funciones proprias de su diseño o en las cuales se las encuentra más corrientemente.

3. — Diodos utilizados en los circuitos de televisión.

4. — Tablas de equivalencias

Para todas las indicaciones relativas a las características y a las funciones desempeñadas por las válvulas, hemos hecho uso, siempre que nos ha sido posible, de signos convencionales o de ideogramas, de los cuales se encontrará después la tabla completa, con el objeto de hacer la interpretación fácil, sea cual fuere el idioma del lector.

Los tubos de imagen se presentan según el mismo principio que sirve para las válvulas electrónicas, es decir, suponiendo que se observan *por la parte inferior.*

Todas las dimensiones figuran indicadas en milimetros.

La clasificación de todas las válvulas electrónicas, así como la de los diodos se hace teniendo en cuenta, primeramente, *la disposición alfabética y, a continuación, la numérica,* es decir, a las letras se les concede prioridad sobre los números.

El objeto primordial se nuestra obra es el de permitir encontrar rápidamente, bien las características de un tubo o válvula desconocida, bien un tubo de repuesto o, tambien, incluso, el mejor tubo que debemos utilizar para una función determinada. Exactamente lo mismo decimos en relación a los diodos. Nosotros creemos que esta obra será se gran utilidad para todos aquellos que se dediquen a la Televisión o a cualquier técnica que tenga relación con la misma.

VOORWOORD

In samenwerking met de Heeren E. Aisberg en L. Gaudillat, hebben wij in 1949 een totaal nieuwe methode uitgewerkt om de karakteristieken van electronische buizen voor te stellen door zij in typische gebruikschema's in te schakelen.

Op deze wijze hebben wij een werk tot stand gebracht die, onder de titel RADIO-TUBES, in de gehele wereld een buitengewone succes heeft gekend.

De radio en electronica technici hebben voor deze klare, praktische en duidelijke methode om de voornaamste karakteristieken en hulsverbindingen der buizen voor te stellen, een grote waardering getoond.

Door regelmatig een nieuwe editie te laten verschijnen is het ons mogelijk onze lezers op de hoogte te houden van de nieuwe buizen die op de markt worden gebracht.

Ingevolge het grote succes werd RADIO-TUBES nagevolgd en nagebootst. Da daders werden vervolgd en voor de rechtbank gebracht in hun respectievelijke landen.

Door het grote succes van RADIO-TUBES aangemoedigd, en rekening houdend met het feit dat de televisie een snelle evolutie doormaakt, hebben wij in 1958 een veel meer gespecialiseerd werk aangeboden, TELE-TUBES die, dankzij regelmatige wijzigingen, steeds actueel blijft.

Het werk bevat de volgende delen :

1. — BEELDBUIZEN, die in West Europa gebruickt worden voor zwaart-wit of kleur televisieontvangers.

2. — ELECTRONISCHE BUIZEN die in de televisietechniek worden aangewend. Buiten de statische karakteristieken geven wij voor elke buis een of meer schema's waarin zij normaal functioneren en meestal voorkomen.

3. — DIODES die bij televisie schakelingen gebruikt worden.

4. — GELIJKWAARDIGHEID TABELLEN.

Voor al de aanduidingen die betrekking hebben op de kenmerken en functies van de buizen, hebben wij overal waar dit mogelijk was, symbolen of ideogrammen gebruikt waarvan U verder een volledige tabel zult vinden.

Hierdoor werd de verklaring vergemakkelijkt, welke ook de taal zij van de lezer.

De beeldbuizen zijn volgens hetzelfde metode voorgesteld als de andere buizen, namelijk met de *hulsverbindingen van onder gezien.*

De classificatie van alle buizen en dioden is *vooreerst alphabetisch en daarna numeriek*. De letters hebben voorrang op de cijfers.

Alle afmetingen zijn uitgedruckt in millimeters.

Het doel van ons werk is het de lezer mogelijk te maken op een vlugge wijze karakteristieken van een ongekende buis, functie te vinden. Hetzelfde geldt voor de dioden.

Wij hopen dat ons werk aan al diegenen die zich met televisie of een overeenstemmige techniek bezig houden grote diensten zal bewijzen.

PREFAZIONE

In collaborazione coi Sigg. E. Aisberg e L. Gaudillat, noi abbiamo sin dal 1949 ideato un nuovo sistema di presentare le caratteristiche dei tubi elettronici incorporandoli in schemi-tipo di utilizzazione.

Su questa base, abbiamo realizzato un'opera che, sotto il titolo RADIO-TUBI, ha incontrato un successo eccezionale nel mondo intero.

I tecnici della Radio e dell'Elettronica hanno grandemente apprezzato il modo semplice, pratico ed evidente di presentare così le caratteristiche essenziali e la disposizione degli zoccoli dei tubi.

Periodicamente, una nuova edizione ci permette di tenere aggiornata quest'opera, tenendo conto dei nuovi tipi di tubi che fanno la loro apparizione sul mercato.

Conseguenza inevitable del successo: RADIO-TUBI è stato subito imitato e plagiato. Gli autori di tali contraffazioni sono, beninteso, perseguiti davanti ai tribunali dei loro rispettivi paesi.

Incoraggiati dal successo di RADIO-TUBI ed in considerazione del rapido sviluppo della Televisione abbiamo presentato, nel 1958, TELE-TUBI, opera molto più specializzata, che, grazie a regolari ritocchi, resta sempre d'attualità.

Quest'opera si compone delle seguenti parti :

1. — Tubi Catodici utilizzati nell'Europa occidentale nei ricettori televisivi in bianco e nero e a colori.

2. — Tubi Elettronici d'uso comune nelle applicazioni alla Televisione. Oltre le loro caratteristiche statiche, presentiamo degli schemi-tipo, nei quali vengono ad assumere le funzioni ad usi più adatti o più correntemente attribuiti.

3. — Diodi utilizzati nei circuiti di televisione.

4. — Tabelle di equivalenza.

Per tutte le indicazioni relative alle caratteristiche ed alle funzioni dei tubi, abbiamo fatto uso appena ciò era possibile, di segni convenzionali o di ideogrammi, raccolti più avanti in un quadro completo, in modo di rendere facile l'interpretazione per qualsiasi lingua del lettore.

I tubi catodici sono rappresentati secondo lo stesso principio degli altri tubi, sipponendo lo *zoccolo visto dal lato dei piedini.*

La classificazione di tutti i tubi, come pure quella dei diodi, *è inizialmente alfabetica, numerica in seguito,* con priorità delle *lettere* sulle *cifre.*

Tutte le dimensioni sono espresse in millimetri.

Lo scopo della nostra opera è quello di permettere di trovare rapidamente sia le caratteristiche di un tubo sconosciuto, sia un tubo di rimpiazzo, sia ancora il tubo più adatto per una funzione determinata. Lo stesso accade per i diodi.

Noi riteniamo che quest'opera renderà un ottimo servizio a tutti coloro che si occupano di Televisione o di una tecnica affine.

o SIGNES CONVENTIONNELS

o SYMBOLE UND ZEICHEN

o CONVENTIONAL SIGNS

o SIGNOS CONVENCIONALES

o SYMBOLEN OF IDEOGRAMMEN

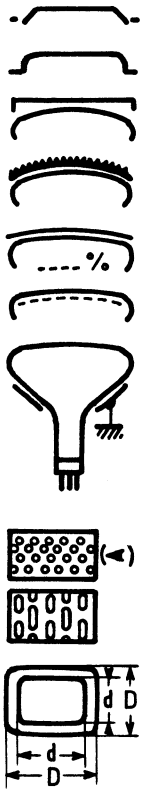
o SEGNI CONVENZIONALI

ACr	Amplification de chrominance	Chrominanz Verstärkung	Chrominance amplification
AF	Basse fréquence	Niederfrequenz	Audio frequency
B	Canon bleu	Blau Strahlsysteme	Blue gun
C	Changeur de fréquence	Mischstufe, Mischröhre, Mischer	Converter or frequency changer
CAF(AFC)	Contrôle automatique de fréquence	Automatisch Frequenz regelung	Automatic Frequency Control
CAG(AGC)	Contrôle automatique de gain	Automatisch Schwund regelung	Automatic Gain Control
Co	Télévision en couleurs	Farbfernseh	Color television
D	Détecteur	Demodulator	Demodulator or detector
DR	Diode de récupération	Booster-Diode, Schalter-Diode	Booster diode
G	Canon vert	Grün Strahlsysteme	Green gun
H	Partie heptode	Heptoden-Teil	Heptode section
HF	Haute fréquence	Hochfrequenz	High frequency
MF	Fréquence intermédiaire	Zwischenfrequenz	Intermediate frequency
Os	Oscillateur	Oszillator	Oscillator
Os ⎍⎍	Oscillateur non sinusoïdal (multivibrateur, oscillateur bloqué)	Kippgenerator (Multivibrator, Sperrschwinger)	Non sinusoidal oscillator (multivibrator, blocking oscillator)
P	Partie pentode	Pentoden-Teil	Pentode section
R	Canon rouge	Rot Strahlsysteme	Red gun

Amplificacion de crominancia	Chrominancie versterking	Amplificazione di crominanza	ACr
Baja frecuencia	Laagfrequencie	Audio frequenza	AF
Capa azul	Blauw Kanon	Cannone blè	B
Conversor de frecuencia	Mengtrap	Convertitore	C
Control automatico de frecuencia	Automatisch frekwentie controle	Controllo automatico della frequenza	CAF(AFC)
Control automatico de ganancia	Automatisch versterking controle	Controllo automatico del guadagno	CAG(AGC)
Television en color	Kleurentelevisie	Televisione a colori	Co
Detector	Detector	Rivelatore	D
Diodo de recuperacion	Spaardiode	Diode di ricuperc	DR
Capa verde	Groen Kanon	Cannone verde	G
Parte heptodo	Heptode onderdeel	Parte eptodo	H
Alta frecuencia	Hoogfrequencie	Radio frequenza	HF
Frecuencia intermedia	Middel frequencie	Frequenza intermedia	MF
Oscilador	Oscillator	Oscillatore	Os
Oscilador non sinusoidal (multivibrador, oscilador de bloquèo)	Multivibrator of blokker oscillator	Oscillatore a rilassamento (multivibrayore, oscillatore bloccato)	Os MM
Parte pentodo	Pentode onderdeel	Parte pentodo	P
Capa rojo	Rood Kanon	Cannone rosso	R

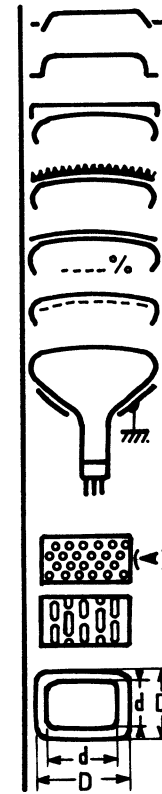
RE	Redresseur	Gleichrichter	Rectifier
Req	Résistance équivalente de souffle	Aquivalenter Gitter-Rauschwiderstand	Equivalente noise resistance
R=	Restitution de la composante continue	Schwarzwerthaltung, Gleichspannungs - Wiederherstellung	DC restorer
S	Pente du tube (mA/V)	Steilheit (mA/V)	Mutual conductance (mA/V)
Sc	Pente de conversion (mA/V)	Konversions - Steilheit (mA/V)	Conversion conductance (mA/V)
St	Stabilisateur haute tension	Hochspannung Stabilisator	High tension stabilizer
Sy	Signal de synchronisation	Synchron-signal	Synchronisation signal
T	Partie triode	Trioden-Teil	Triode section
V	Pente variable	Veränderliche Steilheit	Variable slope
Vg-Vg1	Tension de grille de commande	Spannung des Steuergitters	Control grid voltage
ϱ	Résistance interne (Ω)	Innenwiderstand (Ω)	Internal resistance (Ω)
μ	Facteur d'amplification	Verstärkungs-Faktor	Amplification factor
(M)	Culot miniature (7 br.)	Miniatur (7 St.)	Miniature tube base (7 p.)
(N)	Culot noval (9 br.)	Noval (9 St.)	Small button Noval (9 p.)
(MN)	Culot magnoval (9 br.)	Magnoval (9 St.)	Large button Noval (9 p.)
(O)	Culot octal (8 br.)	Oktal (8 St.)	Octal (8 p.)
(S)	Culot decal (10 br.)	Dekal (10 St.)	Decal (10 p.)

Rectificador	Gelijkrichter	Raddrizzatore	RE
Resistencia equivalente de ruido	Equivalente ruisweerstand	Resistenza equivalente di disturbo	Req
Restauracion de la corriente continua	Zwartniveau diode	Restitutore di c.c.	R=
Pendiente de la valvula (mA/V)	Steilheid (mA/V)	Pendenza del tubo (mA/V)	S
Pendiente de conversion (mA/V)	Conversie steilheid (mA/V)	Pendenza di conversione (mA/V)	Sc
Estabilizador de alta tension	Hoogspanning stabilisator	Stabilizzatore alta tensione	St
Senal de sincronizacion	Synkronisatiesignaal	Segnale di sincronizzazione	Sy
Parte triodo	Triode onderdeel	Parte triodo	T
Pendiente variable	Variabele steilheid	Inclinazione variabile	V
Tension de rejilla de control	Spanning van het stuurrooster	Tensione di griglia di comando	Vg-Vg1
Resistencia interna (Ω)	Inwendige weerstand (Ω)	Resistenza interna (Ω)	ρ
Factor de amplificacion	Versterkingsfactor	Coefficiente di amplificazione	μ
Casquillo miniatura (7 c.)	Miniatuur (7 p.)	Virola miniatura (7 sp.)	(M)
Casquillo noval (9 c.)	Noval (9 p.)	Virola novale (9 sp.)	(N)
Casquillo magnoval (9 c.)	Magnoval (9 p.)	Virola magnovale (9 sp.)	(MN)
Casquillo octal (8 c.)	Octal (8 p.)	Virola ottale (8 sp.)	(O)
Casquillo decal (10 c.)	Decal (10 p.)	Virola decale (10 sp.)	(S)



Ecran dégagé	Freier Bildschirm	Push through arrangement
Cadre métallique (Tube auto-protégé)	Metallwand	Métal face rimband
Double face avant (Tube auto-protégé)	Sicherheitsglas	Twin panel ; Bondel shield Protective window
Face en verre anti-reflets	Mattierte Frontplatte	Frosted face plate
Face en verre filtrant . . . % : transmission	Vorderseite aus Filterglas . . % Durchlässigkeit	Filter face plate . . . % light transmission
Ecran aluminisé	Aluminisiertem Schirm	Aluminized screen
Couche extérieure conductrice	Leitender Aussenbelag	External conductive coating
Masque (avec compensation de température)	Maske (mit Temperaturausgleich)	Shadow-mask (temperature compensed)
Masque à fentes	Schlitzmaske	Line mask
D = Encombrement maximal de la face avant	D = Maximaler Raumbedarf der Vorderseite	D = Maximun dimensions of front side
d = Dimensions minimale de l'écran	d = Mindestabmessungen des Schirmes	D = Minimum screen dimensions

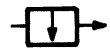
Pantalla despejada	Open scherm	Schermo libero
Armadura metalica	Metalen wand	Quadro metallico
Vidrio de proteccion	Zekerheid glas	Specchio de securita
Superficie vidrio deslustrado	Ruwglass Voorzijde	Schermo con vetro ghiacciato
Parte frontal de vidrio filtrante . . . % transmision	Filtrerend glass oppervlakte . . . % transmissie	Faccia in cristallo filtrante . . . % transmissione
Tubo con pantalla aluminizada	Buis met Gealuminizeerd scherm	Tubo catodico con schermo alluminato
Capa conductora externa	Geleindende uitwendige deklaag	Rivestimento esterno conduttivo
Mascara (con compensacion de temperatura)	Masker (met temperatuur compensatie)	Schermatura (con compenso di temperatura)
Mascara de hendiduras	Sleuf masker	Mascherina a feritoie
D = Dimension maxima del frente delantero	D = Maximale omvang van de voorzijde	D = Ingombro massimo della faccia anteriore
d = Dimensiones mınimas de la pantalla	d = Minimale afmetingen van het beeldscherm	d = Dimensioni minime dello schermo

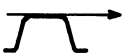
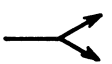


	Angle maximum de déflexion (en degrés)	Maximaler Ablenkwinkel (in Grad)	Maximum deflection angle (in degrees)
	Piège à ions champ magnétique (Gauss)	Ionenfalle Magnetische Feldstärke (Gauss)	Ion traps Magnetic field strength (Gauss)
	Tube sans piège à ions	Röhre ohne Ionenfalle	Tube without ion traps
	Canons en delta	Kanonen in Delta-Anordnung	Delta guns
	Canons en ligne (coplanaires)	Kanonen in Reihe (koplanar)	Line guns (coplanar)
	Blindage magnétique interne	Innere magnetische Abschirmung	Internal magnetic shielding
	Déviation magnétique	Magnetische Ablenkung	Magnetic deviation
	Diamètre du col	Durchmesser des Halses	Neck diameter
	Concentration magnétique	Magnetische Fokussierung	Magnetic focus control
	Concentration électrostatique	Elektrostatische Fokussierung	Electrostatic focus control
	Concentration automatique	Automatischer Fokus	Automatic focusing

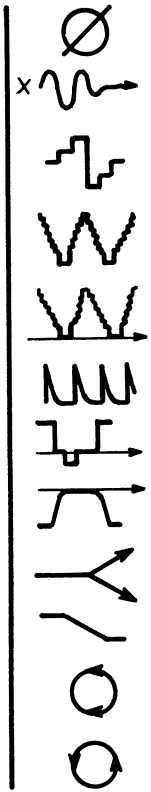
Angulo maximo de deflexion (en grados)	Maximum afbuighoek	Massimo angolo di deflessione (in gradi)	
Trampa de iones Intensidad del campo magnético (Gauss)	Ionenval Veldsterkte in Gauss	Trappola ionica intensita campo magnet (Gauss)	
Tubo sin trampa de iones	Beeldbuis zonder ionenval	Tubo senza trappola ionica	
Canones en delta	Kanon in deltavorm	Cannoni a delta	
Canones en linea (coplanares)	Kanon in lijnvorm (met evenwijdige vlakken)	Cannoni in linea (complanari)	
Blindaje magnético interno	Inwendig magnetische afscherming	Blindaggio magnetico interno	
Blindaje magnético interno	Interne magnetische afscherming	Schermatura magnetica interna	
Diametro de cuello.	Hals diameter	Diametro del collo	
Control magnético de foco	Magnetische focusseering	Controllo focalizzazione magnetica	
Control electrostatico de foco	Electrostatische focusseering	Controllo focalizzazione elettrostatica	
Enfoque antomatico	Automatische focusseering	Focalizzazione automatica	

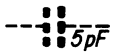
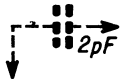
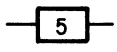
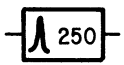
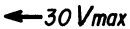
	Convergence magnétique	Magnetische Konvergenz	Magnetic convergence
	Convergence automatique	Automatische Konvergenz	Automatic convergence
	Axe horizontal par rapport aux broches du culot	Waagrechte Achse in Bezug auf die Stecker der Fassung	Horizontal axis in relation to base pins
	Cathode à chauffage rapide	Kathode mit Schnellheizung	Quick heating cathode
	Commande de luminosité	Helligkeitsregler	Brightness control
	Tension d'extinction du faisceau	Strahlsperrspannung	Cut off voltage for visual extinction of spot
	Commande de contraste	Kontrastregler	Contrast control
	Commande de linéarité	Linearitäts-Regler	Linearity control
	Déflexion verticale	Bildablenkung. Vertikal-Ablenkung	Vertical deflection
	Tube de sortie images	Bildkipp-Endröhre	Frame output tube
	Déflexion horizontale	Zeilenablenkung. Horizontal-Ablenkung	Horizontal deflection
	Tube de sortie lignes	Zeilen-Endröhre. Zeilenkipp-Endröhre	Line output tube

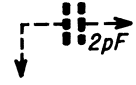
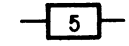
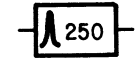
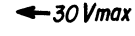
Convergencia magnética	Magnetische konvergentie	Convergenza magnetica	
Convergencia automatica	Automatische convergentie	Convergenza automatica	
Azel horizontal (Eje horizontal en relacion con las espigas del casquillo	Horizontale as (Horizontale as met pools tot de buisvoet)	Azel orizzontalo (Asse orizzontale rispetto alle spine dello zoccolo	
Catodo de calentamiento rapido	Snel verhitte katode	Catodo a riscaldamento rapido	
Control de brillo	Helderheid regeling	Controllo luminosita	
Tension de extincion del haz (tension de corte)	Blusspanning	Tensione di interdizione per l'estinzione dello spot	
Control de contraste	Contrast regeling	Controllo del contrasto	
Control de linealidad	Lineariteit regeling	Controllo linearità	
Barrido vertical (deflexion vertical)	Vertikale afbuiging	Deflessione verticale	
Tubo de salida de imagen	Beelduitgangbuis	Tubo uscita verticale	
Barrido horizontal (deflexion horizontal)	Horizontale afbuiging	Deflessione orizzontale	
Tubo de salida (lineas)	Lijnuitgangbuis	Tubo uscita orizzontale	

	Commande du diamètre du faisceau	Steuerung der Strahldurchmessers	Beam diameter control
	Rayonnement x	X Strahlen	X Radiation
	Signal de chrominance	Chrominanz-Signal	Chrominance signal
	Vidéo-fréquence	Video-Frequenz	Video frequency
	Tube de sortie vidéo	Video-Endstufe	Video output tube
	Impulsions en général	Impulse im allgemeinen	Pulses in general
	Séparation des impulsions de synchronisation	Impuls-Trennstufe, Impulssieb.	Sync. pulse separator
	Limiteur, écrêteur	Begrenzer, Abschneidröhre	Limiter, clipper
	Triage des impulsions	Trennung von Horizontal und Vertikal-Impulsen	Pulse separation
	Tube de glissement	Reaktanzröhre	Variable reactance tube
	Comparateur de phase	Phasendiskriminator	Phase discriminator
	Déphaseur	Phasenwender	Phase inverter

Control para el diametro del haz	Electronenstraal dichteid regeling	Controllo diametro del pennello elettronico	
Radiacion x	X Straling	Irraggiamento X	
Senal de crominancia	Chrominantiesignaal	Segnale di crominanza	
Video-frecuencia	Video frequencie	Video frequenza	
Lampara de salida de video	Video eindbuis	Tubo finale video	
Impulsos en general	Impulsen in 't algemeen	Impulsi in generale	
Separadora de impulsos de sincronizacion	Synchronisatie scheiding	Separatore d'impulsi	
Limitador, recortador	Begrensertrap	Limitatore, tosatore	
Seleccion de los impulsos horizontales y verticales	Impulsen sortering	Separazione degli impulsi verticali e orizzontali	
Tubo de reactancia	Reactantiebuis	Tubo a reattanza	
Descriminador de fase	Fazevergelijking stelsel	Comparatore di fase	
Inversor de fase	Fazesplitser	Inversore di fase	

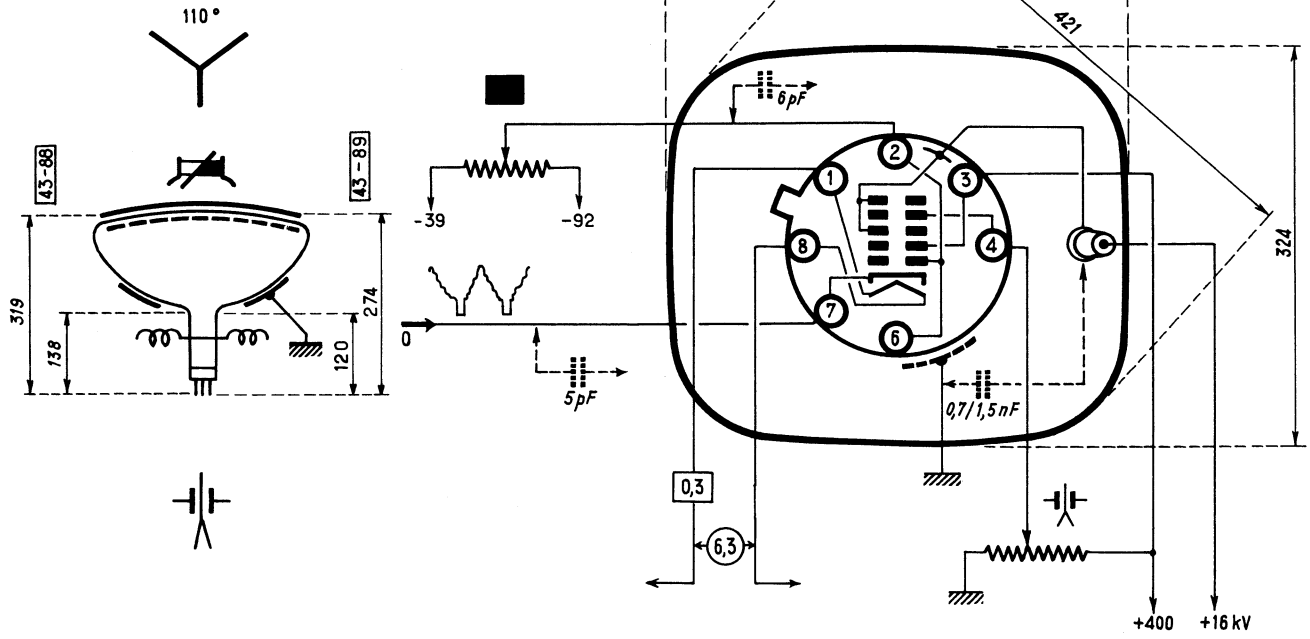


	Cascode	Kaskode-Stufe	Cascode (H.F.) stage
	Tube final B.F.	Tonendröhre, NF-Endröhre	Audio output tube
	Impédance d'utilisation Puissance disponible Taux de distorsion	Arbeitswiderstand Ausgangsleistung Klirrfaktor	Load Power output Harmonic distorsion
	Impédance d'entrée	Eingangs-Impedanz	Input impedance
	Capacité entre électrodes (à froid)	Elektroden-Kapazitäten (bei kalter Röhre)	Interelectrode capacitance (in cold state)
	Capacité d'entrée ou de sortie	Eingangs -oder Ausgangs Kapazität	Input or output capacitance
	Tension continue (V) Tension alternative de chauffage	Gleichspannung (V) Heizwechselspannung	DC voltage AC heater voltage
	Intensité (mA) (en ampères pour le chauffage)	Strom (mA) (in A für den Heizfaden)	Current (mA) (in Amps for the heater circuit)
	Intensité de pointe (en régime d'impulsion)	Spitzenstromstärke (bei Impulsbetrieb)	Peak current (in pulse mode)
	Tension alternative efficace	Effektivwert der Wechselpannung (V eff)	RMS voltage
	Tension inverse maximum	Maxiamle Anodensperrspannung	Maximum inverse voltage

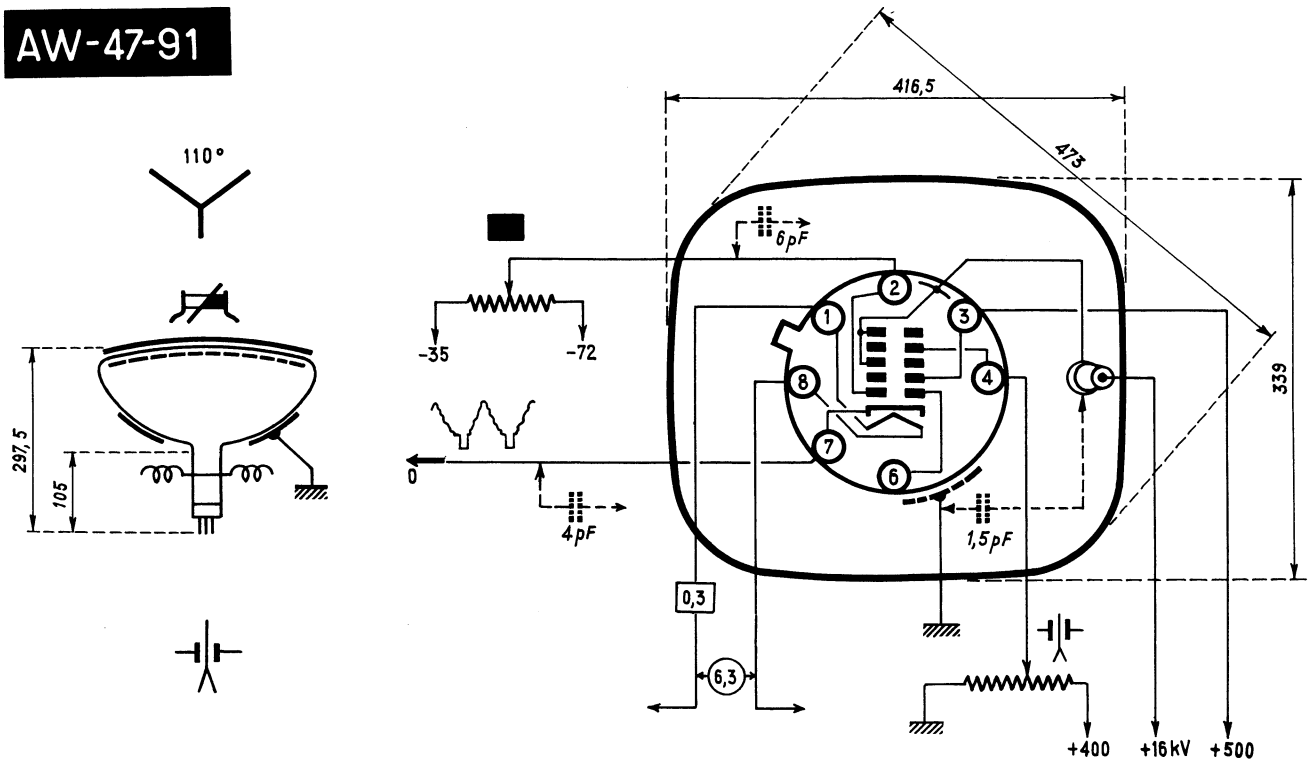
Etapa R.F. amplificacion cascode"	Cascode schakeling	Cascode (stadi a radio frequenza)	
Lampara de salida de audio	LF eindbuis	Tubo finale audio	
Impedancia de carga potentia de salida tanto por ciento de distorsion armonica	Belastingweerstand (Ω) Uitgangsenergie (W) Totale vervorming (%)	Carico Potenza d'uscita Distorsione armonica.	
Impedancia de entrada	Ingang impedantie	Impedanza d'entrata	
Capacidad interelectrodica (en frio)	Capaciteit tussen electroden	Capacita interelettrodica (a freddo)	
Capacidad de entrada o de salida	Ingang of uitgang capaciteit	Capacita d'entrata o d'uscita	
Tension continua (V) Tension alterna de caldeo	Gelijkspanning (V) Gloiwisselspanning	Tensione corr. continua (V) Tensione alternata di riscaldamento	
Intensidad de corriente (mA) (en amperios para el circuito de caldeo)	Voedingstroom (mA) Gloistroom (A)	Corrente (mA) (in Amp per il circuito di riscald.)	
Intensidad de punta (en régimen de impulsion)	Hoogste sterkte (bij impulsie modus)	Intensita di punta (in regime d'impulso)	
Voltaje eficaz	Signaalspanning (V eff)	Tensione alternata efficace	
Tension inversa maxima	Maximum tegenspanning top waarde	Tensione massima inversa	

	Broche connectée intérieurement. Doit obligatoirement rester libre.	Innen verbundener Anschluss. Nicht benutzen.	Pin connected internally, to a live electrode. Must remain free from any external connection	Pata connectada al interior. Debe quedar libre obligatoriamente.	Aansluitpen inwending doorverbonden. Mag niet aangesloten worden.	Piedino avente una connessione interna. Deve restare libero in modo assoluto.
	Broche connectée à un écran ou à une structure interne devant être mise à la masse.	Anschluss des Abschirmung oder Innenteil, mit Masse zu verbinden.	Pin connected internally to a shield or to an internal structure to be grounded.	Pata conectada a una pantalla o a un soporte interno. Debe reunirse a la masa.	Aansluitpen verbonden met een scherm of met een inwendige constructie die geaard dient te worden.	Piedino collegato ad uno schermo oppure ad una struttura interna, deve essere collegato alla massa.
	Broche non connectée intérieurement	Innen nicht verbundener Anschluss	Pins that are not internally connected	Contacto sin conexion interna	Mag gebruikt worden als steunpunk	Spilla non connessa internamente

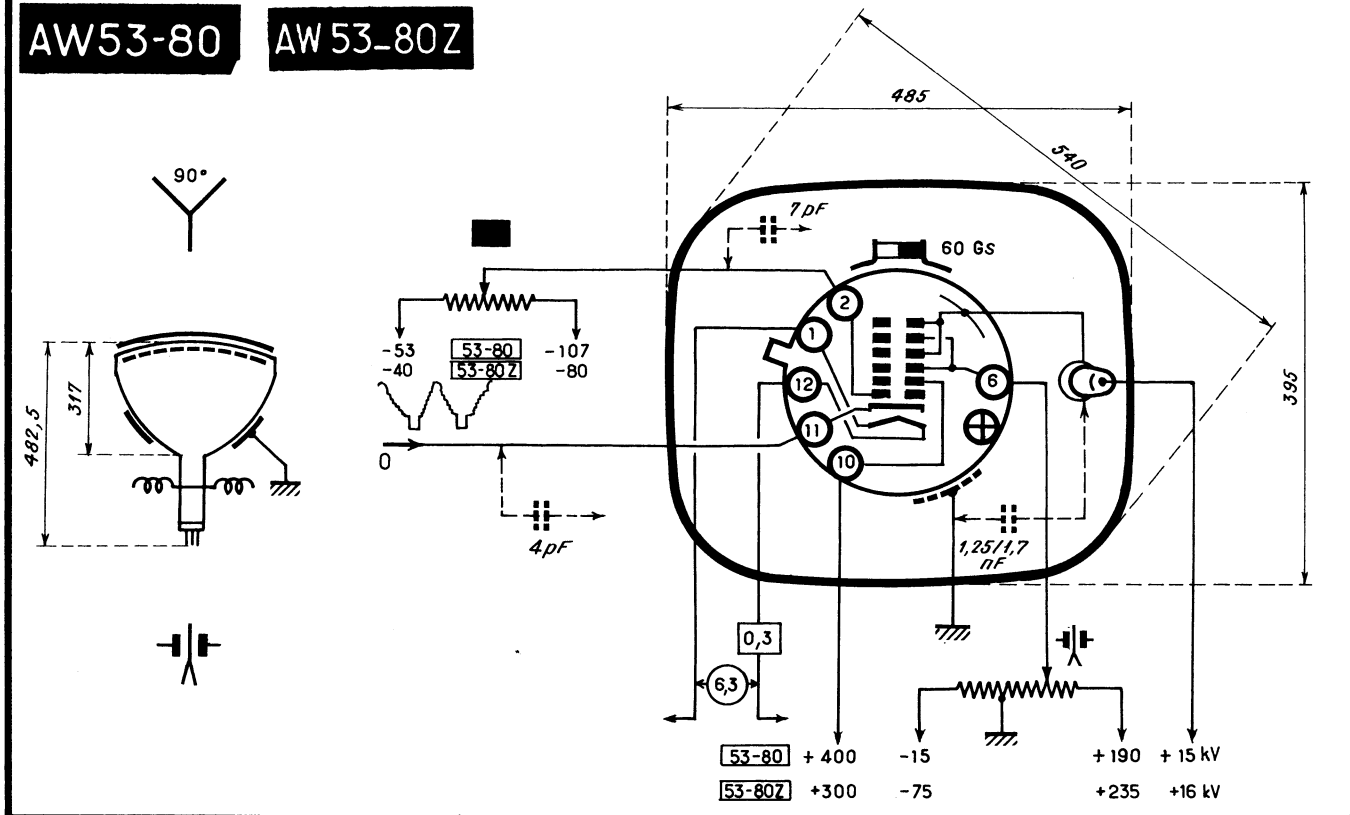
AW 43-88 AW 43-89



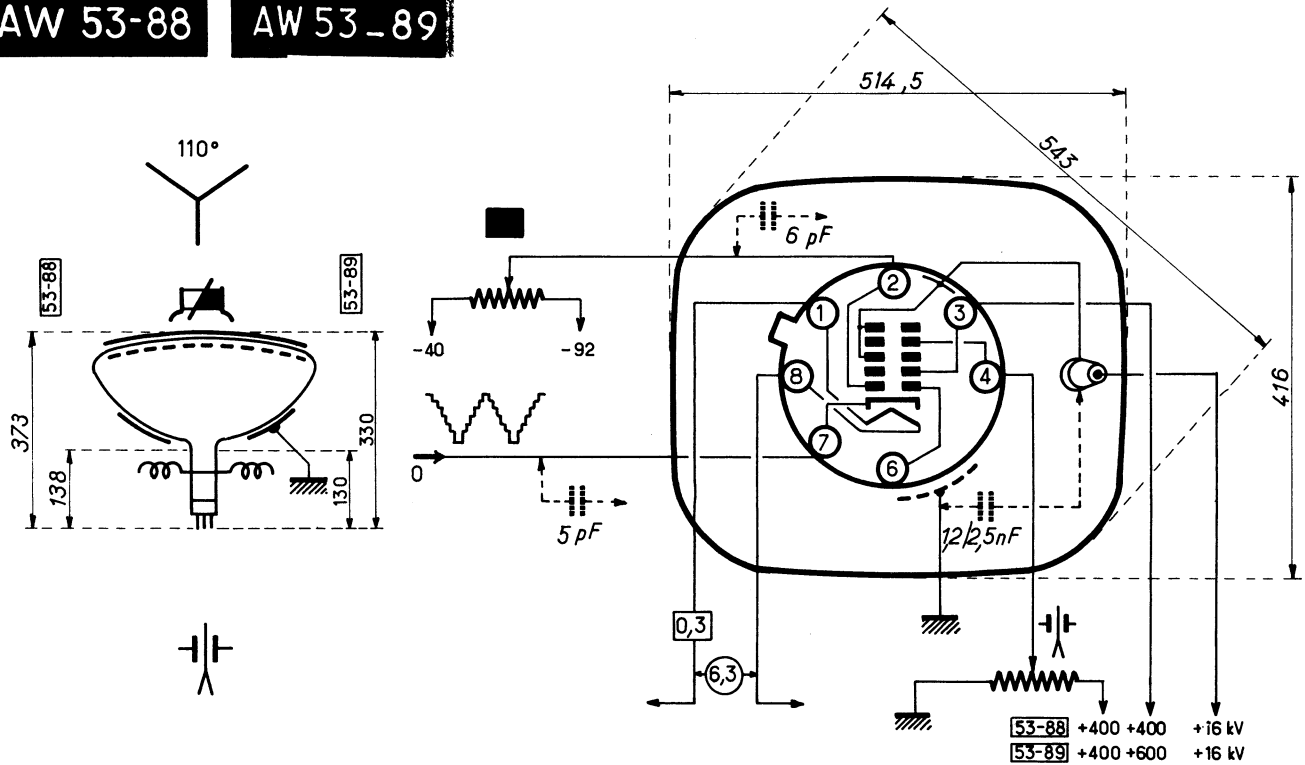
AW-47-91


110°
297,5
105
416,5
473
339
6pF
-35
-72
0
4pF
1,5pF
0,3
6,3
1
2
3
4
6
7
8
+400
+16kV
+500

AW53-80 AW53-80Z

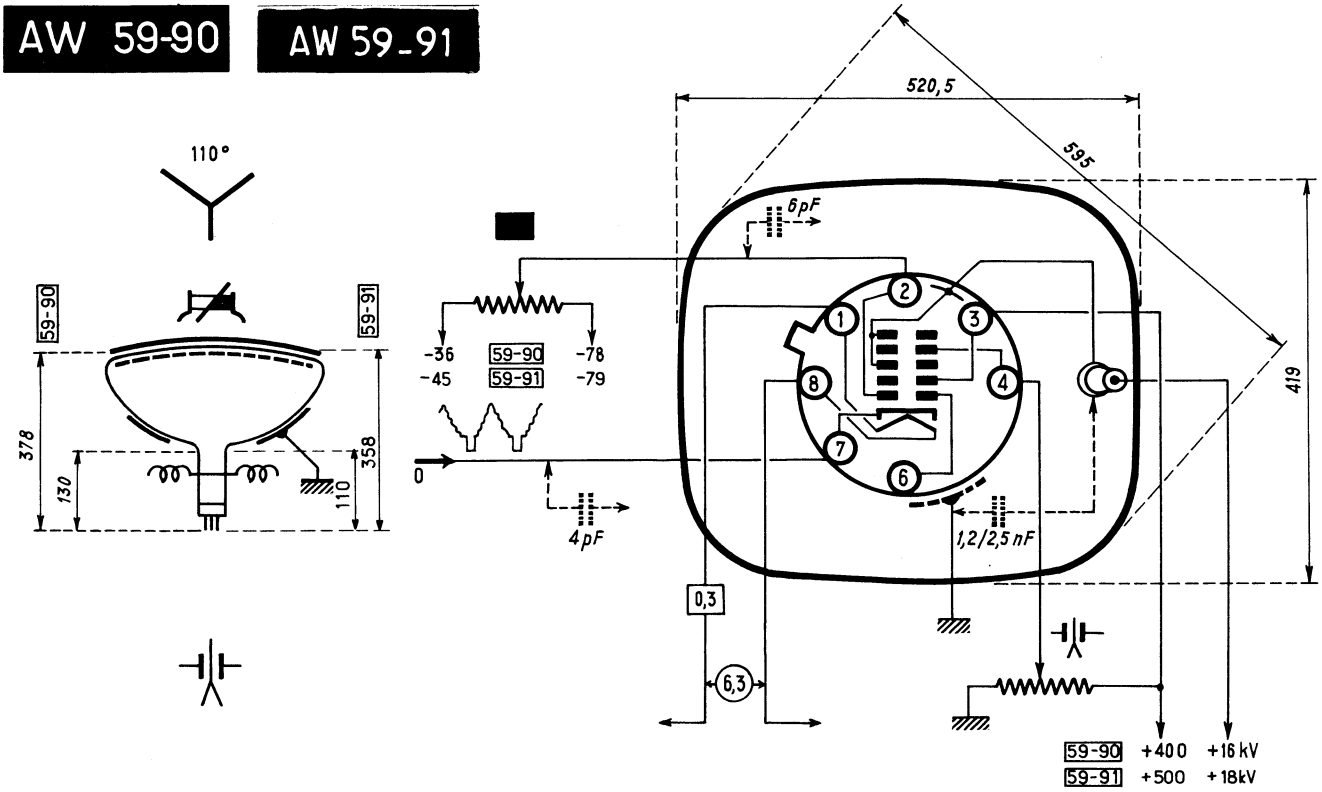


AW 53-88 AW 53_89

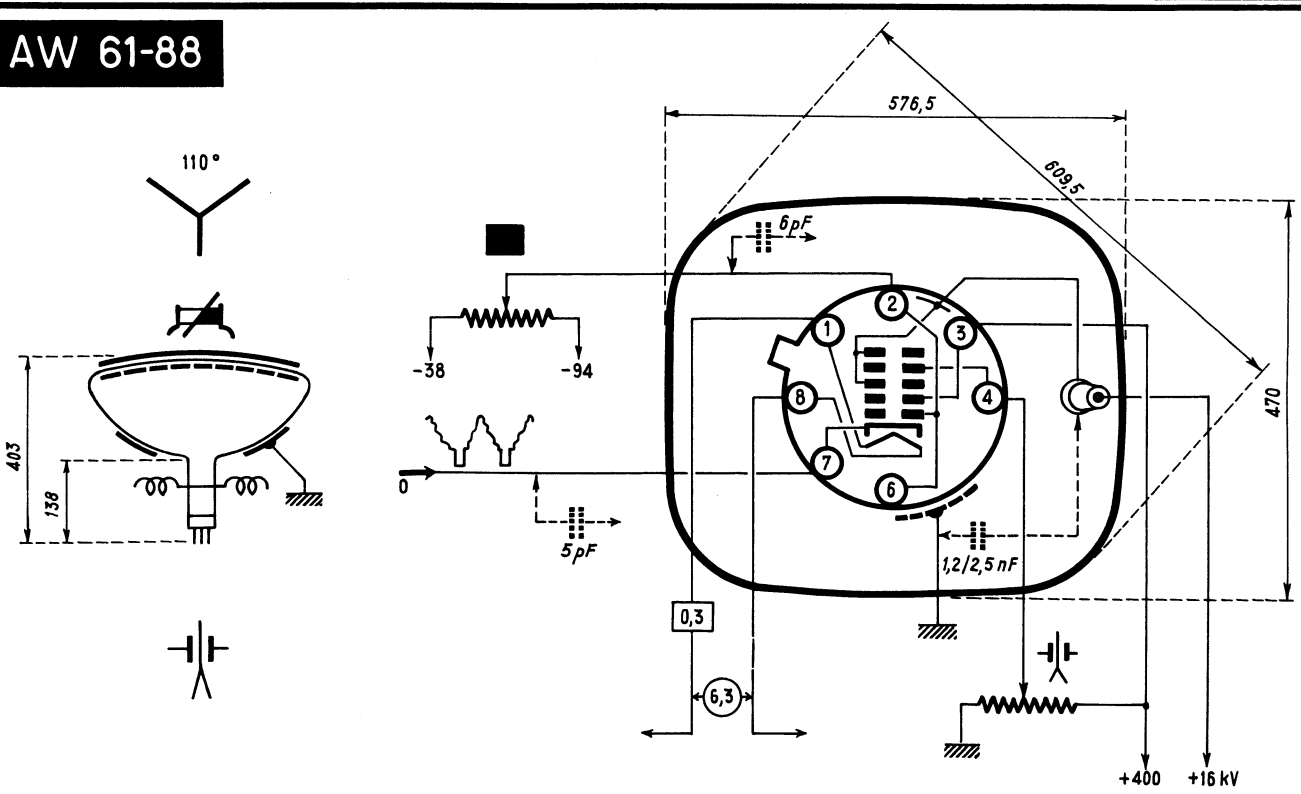


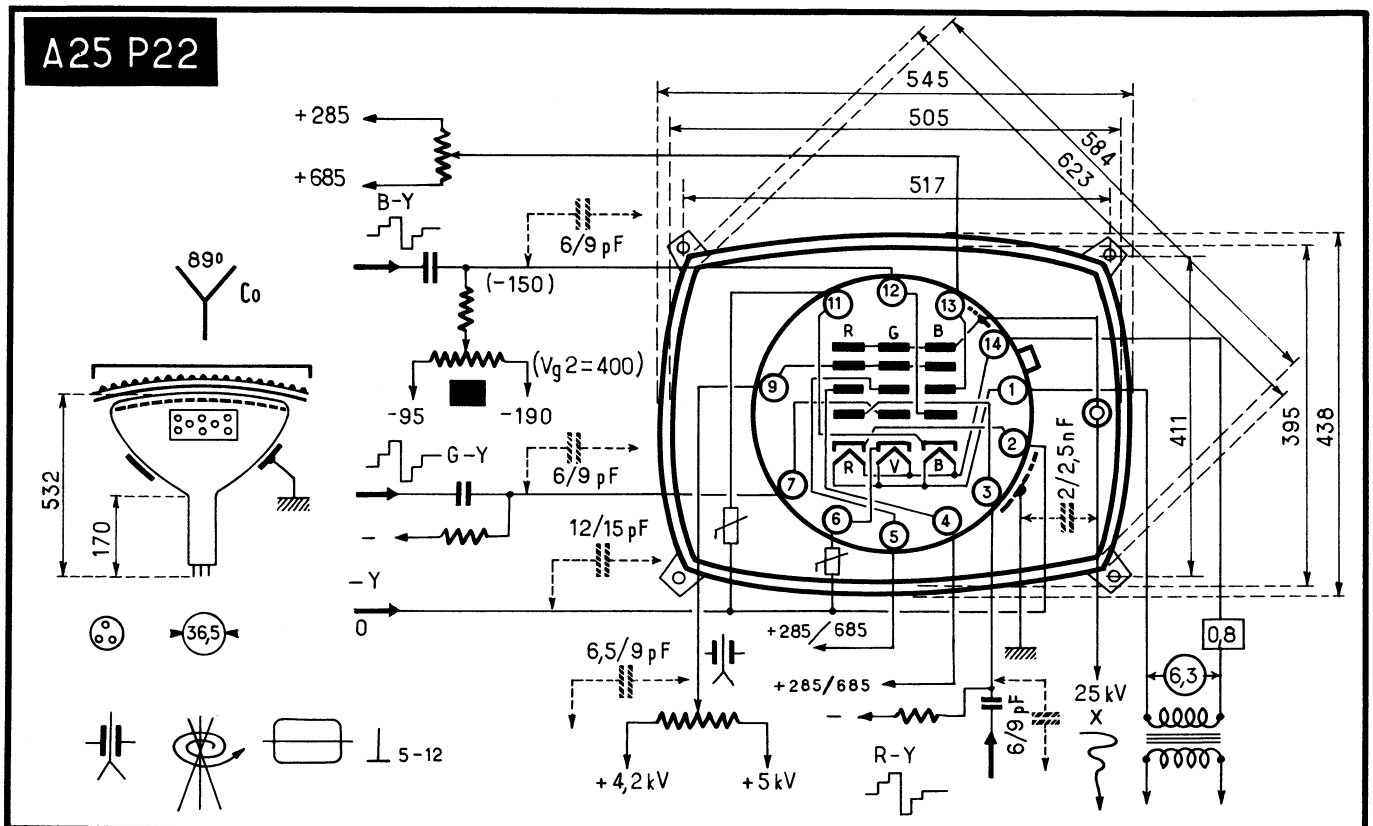
AW 59-90

AW 59_91



AW 61-88

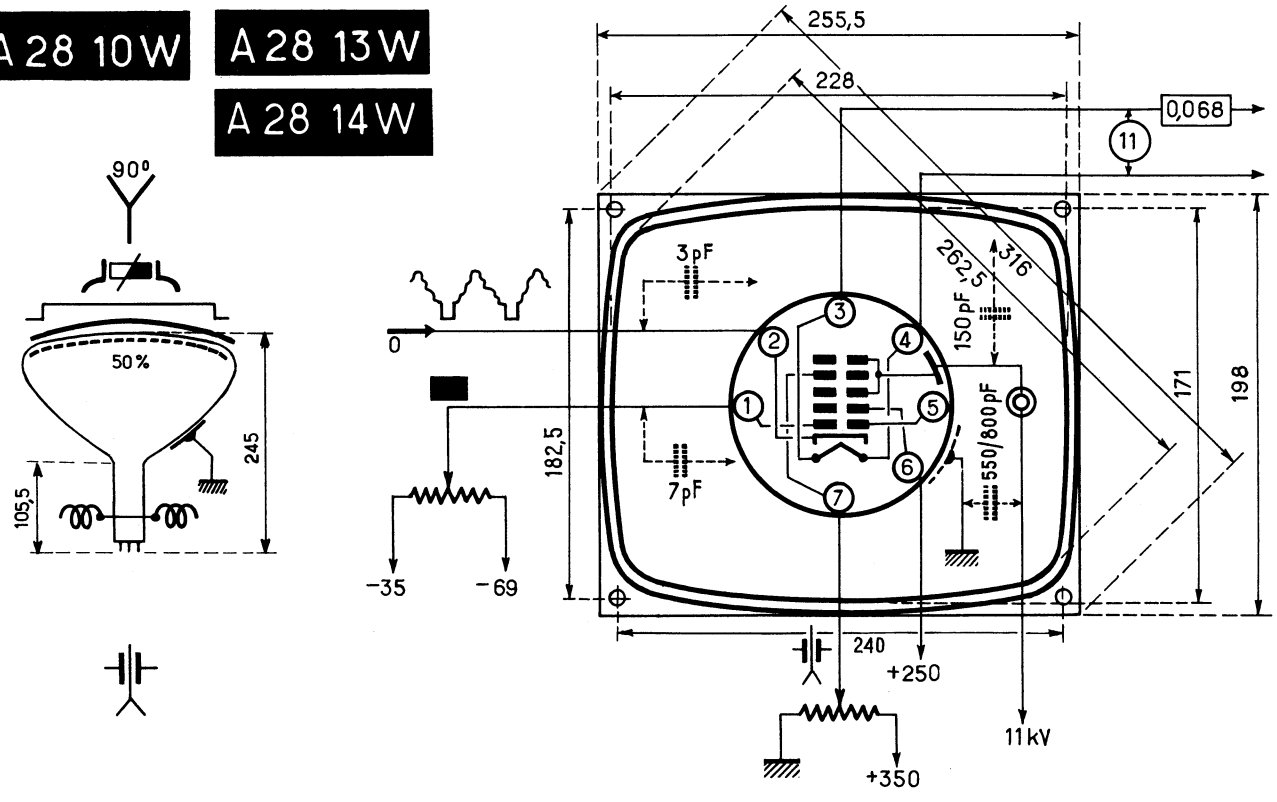

110°
403
138
576,5
609,5
470
6pF
-38
-94
0
5pF
1,2/2,5 nF
0,3
6,3
+400
+16 kV
1
2
3
4
6
7
8


A25 P22
+285
+685
B-Y
6/9 pF
(-150)
(Vg2=400)
-95
-190
G-Y
6/9 pF
12/15 pF
-Y
0
89°
Co
532
170
36,5
5-12
545
505
584
623
517
411
395
438
2/2,5 nF
R
G
B
R
V
B
+285/685
6,5/9 pF
+285/685
+4,2 kV
+5 kV
R-Y
6/9 pF
25 kV
X
0,8
6,3

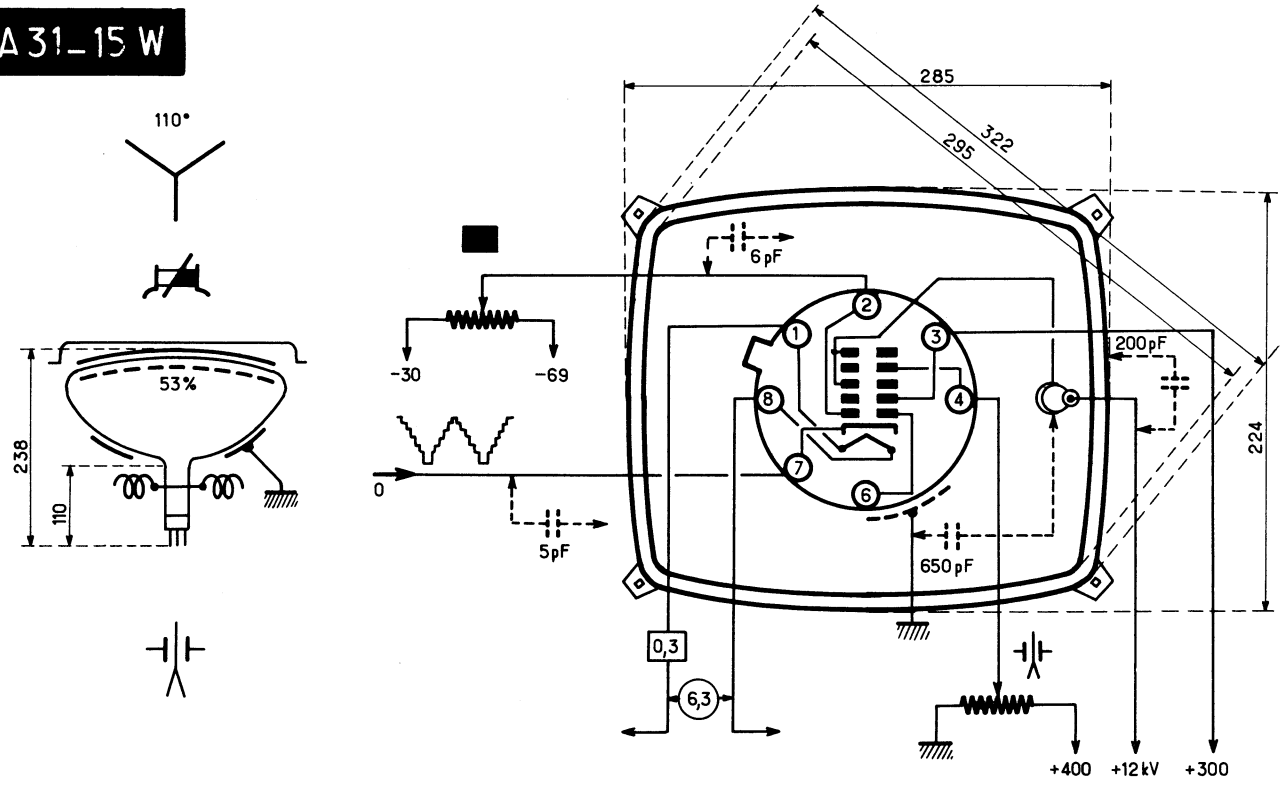
A 28 10W

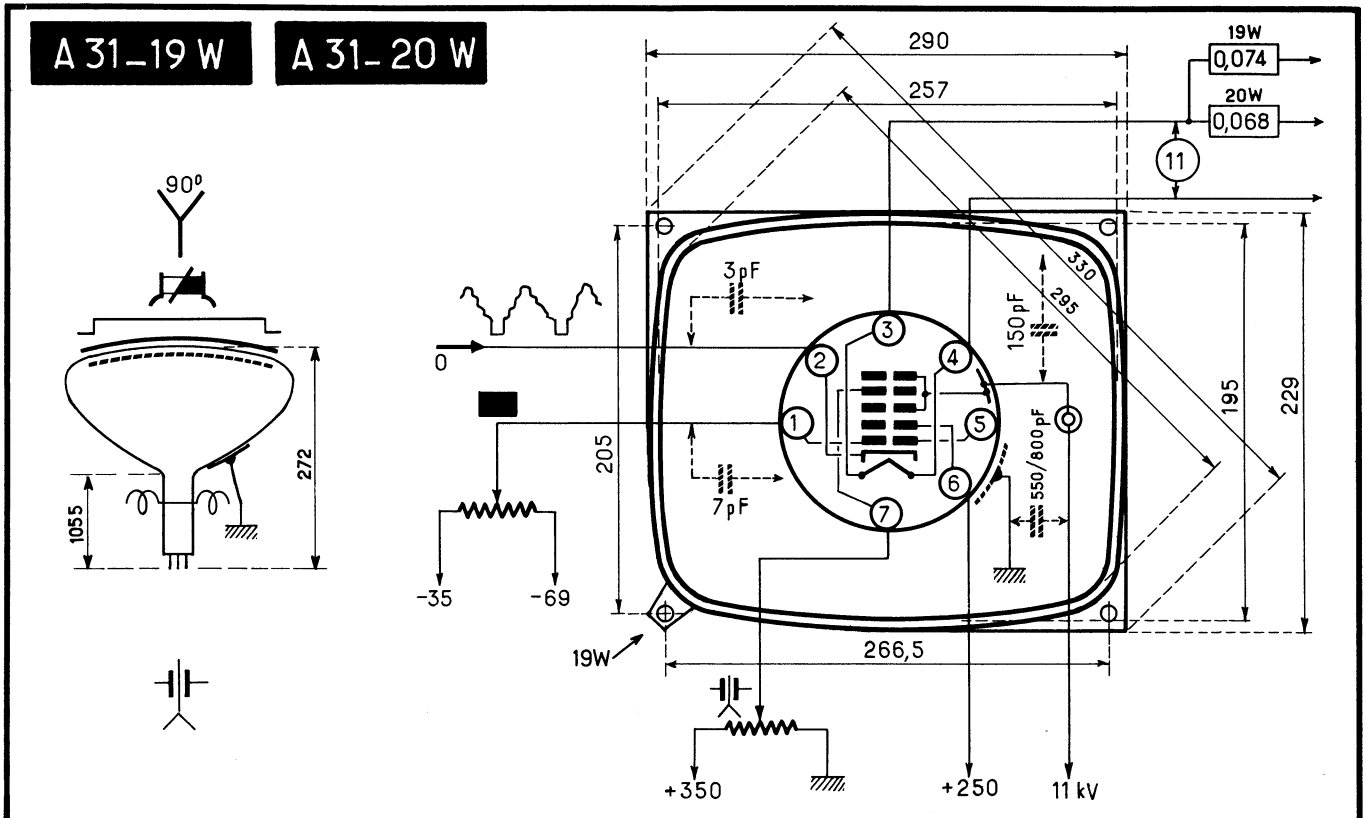
A 28 13W

A 28 14W



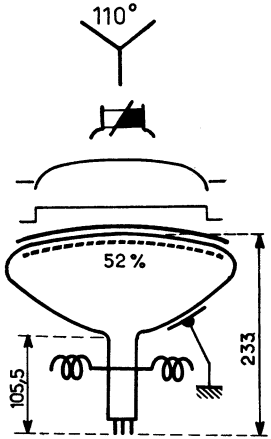
A31_15W

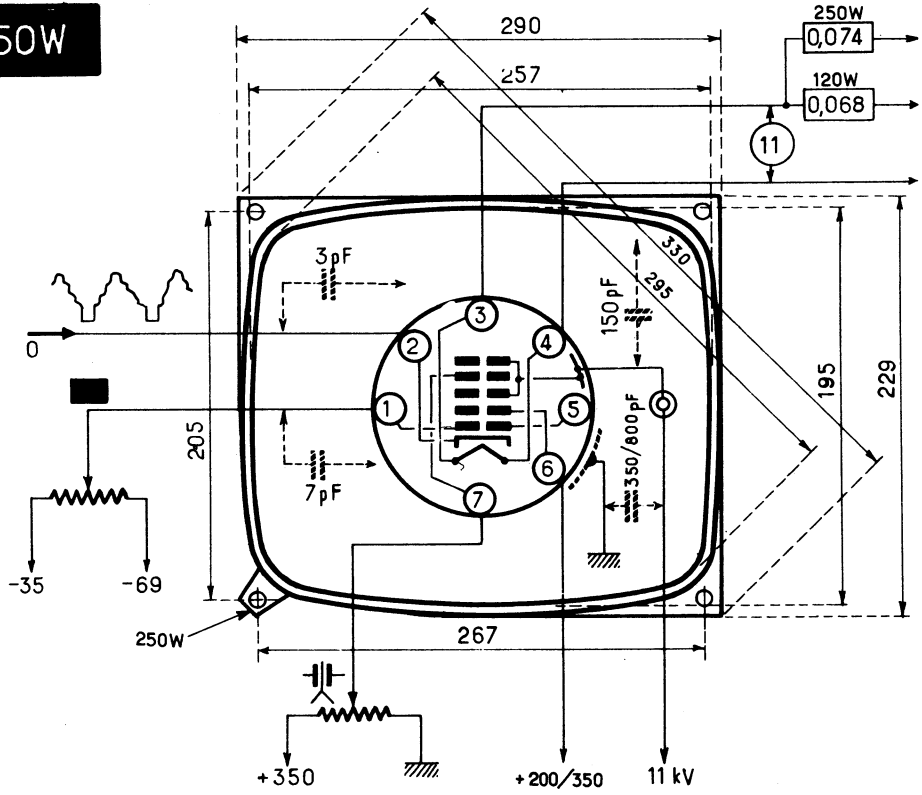

110°
53%
238
110
285
322
295
224
6pF
-30
-69
0
5pF
200pF
650pF
0,3
6,3
+400
+12kV
+300
1
2
3
4
6
7
8


A 31_19 W
A 31_20 W
90°
272
1055
290
257
19W
0,074
20W
0,068
11
330
295
3pF
150pF
0
205
7pF
550/800pF
195
229
-35
-69
19W
266,5
+350
+250
11 kV

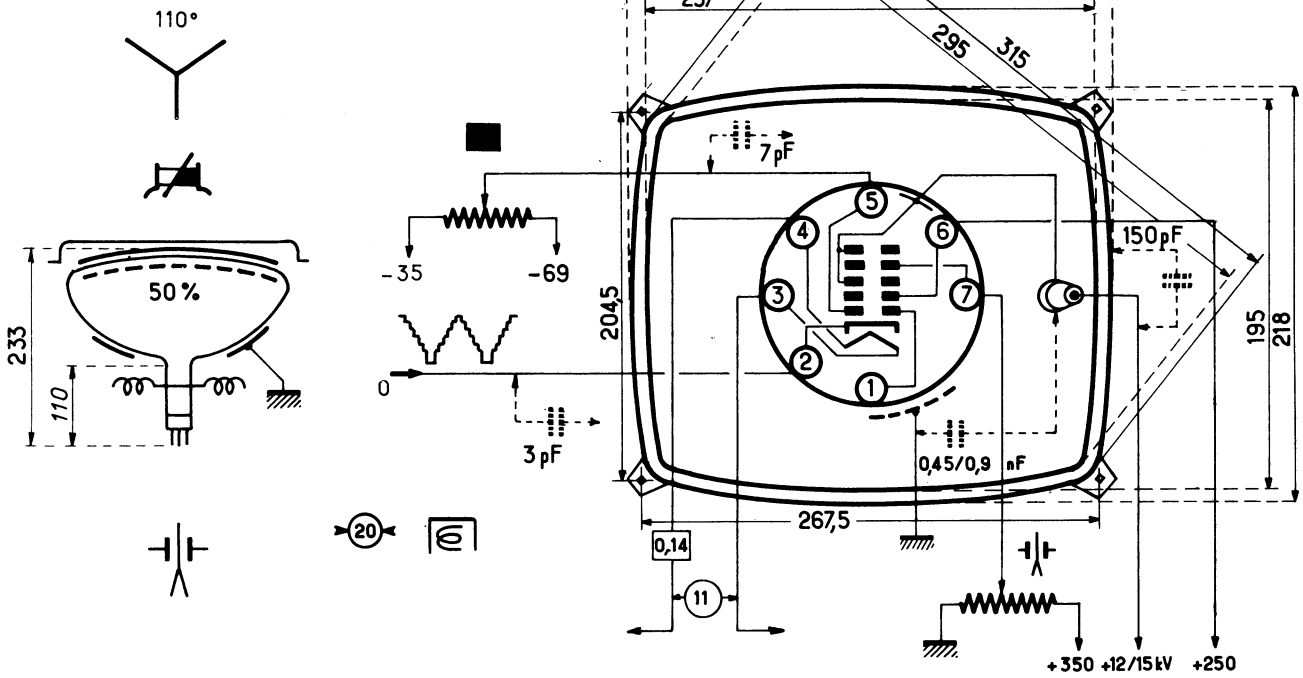
A 31-120 W

A 31-250W

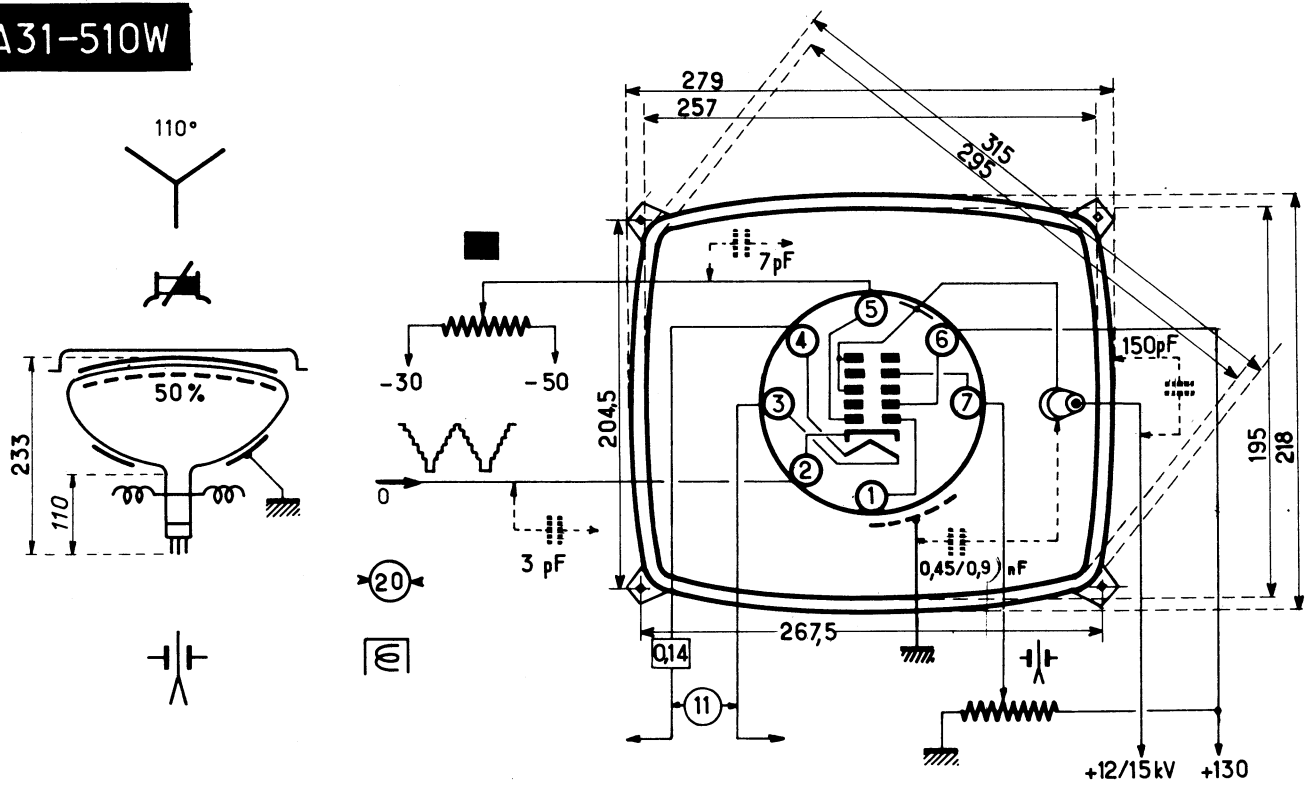




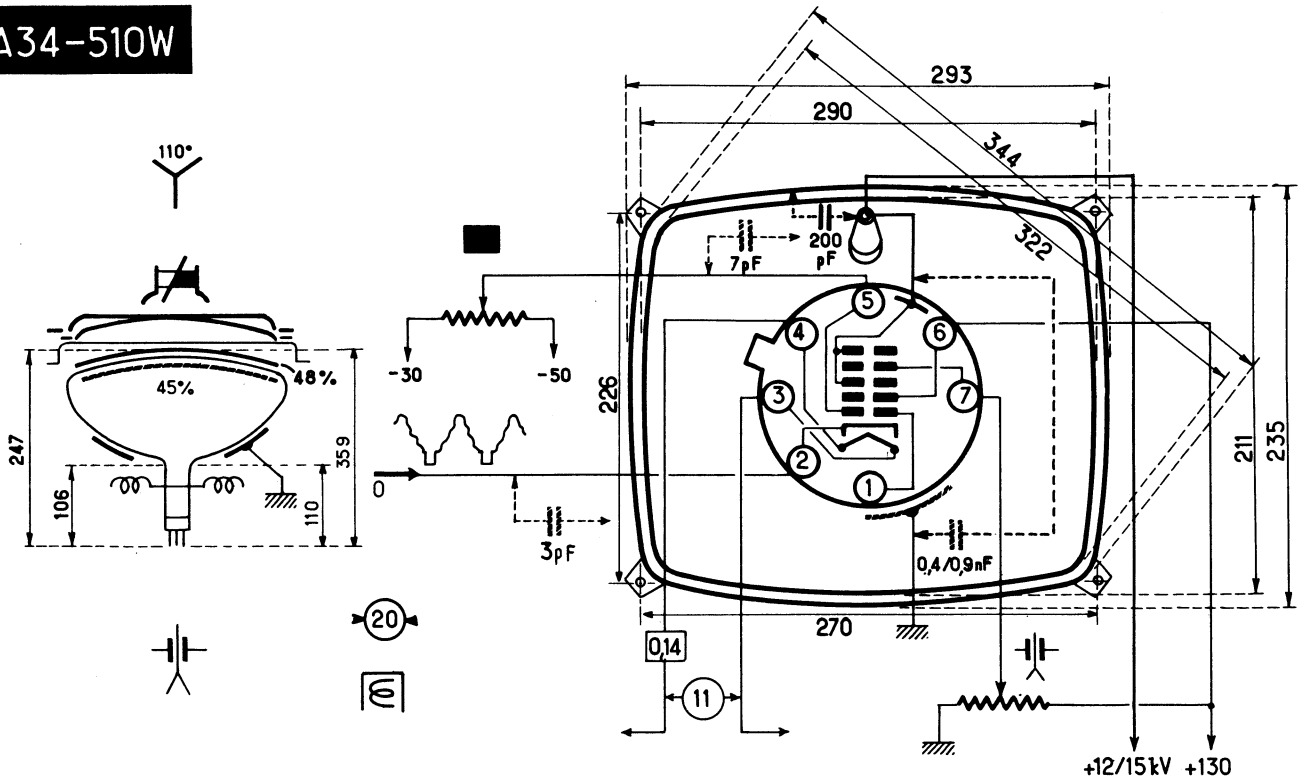
A31-410W


110°
50%
233
110
-35
-69
0
3pF
7pF
279
257
295
315
204,5
150pF
195
218
0,45/0,9 nF
267,5
0,14
11
20
+350
+12/15kV
+250
1
2
3
4
5
6
7

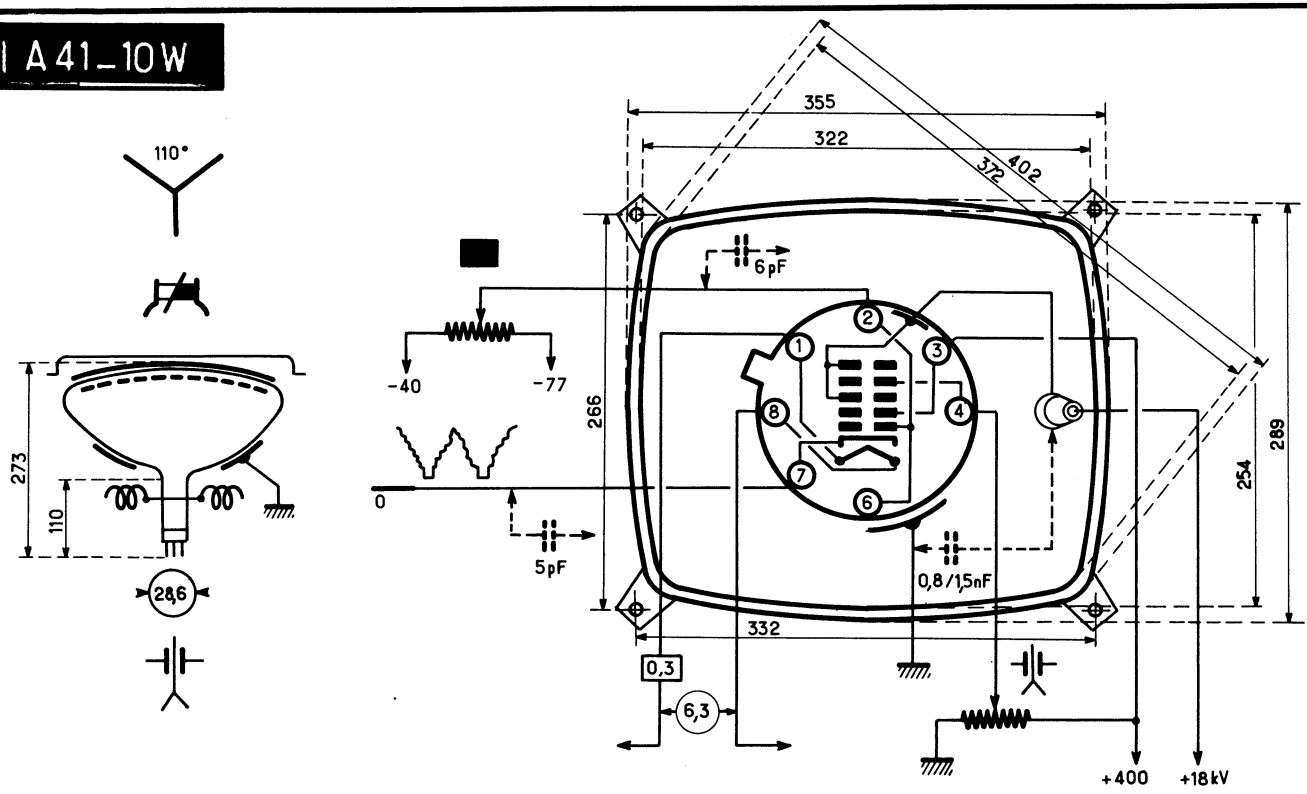
A31-510W

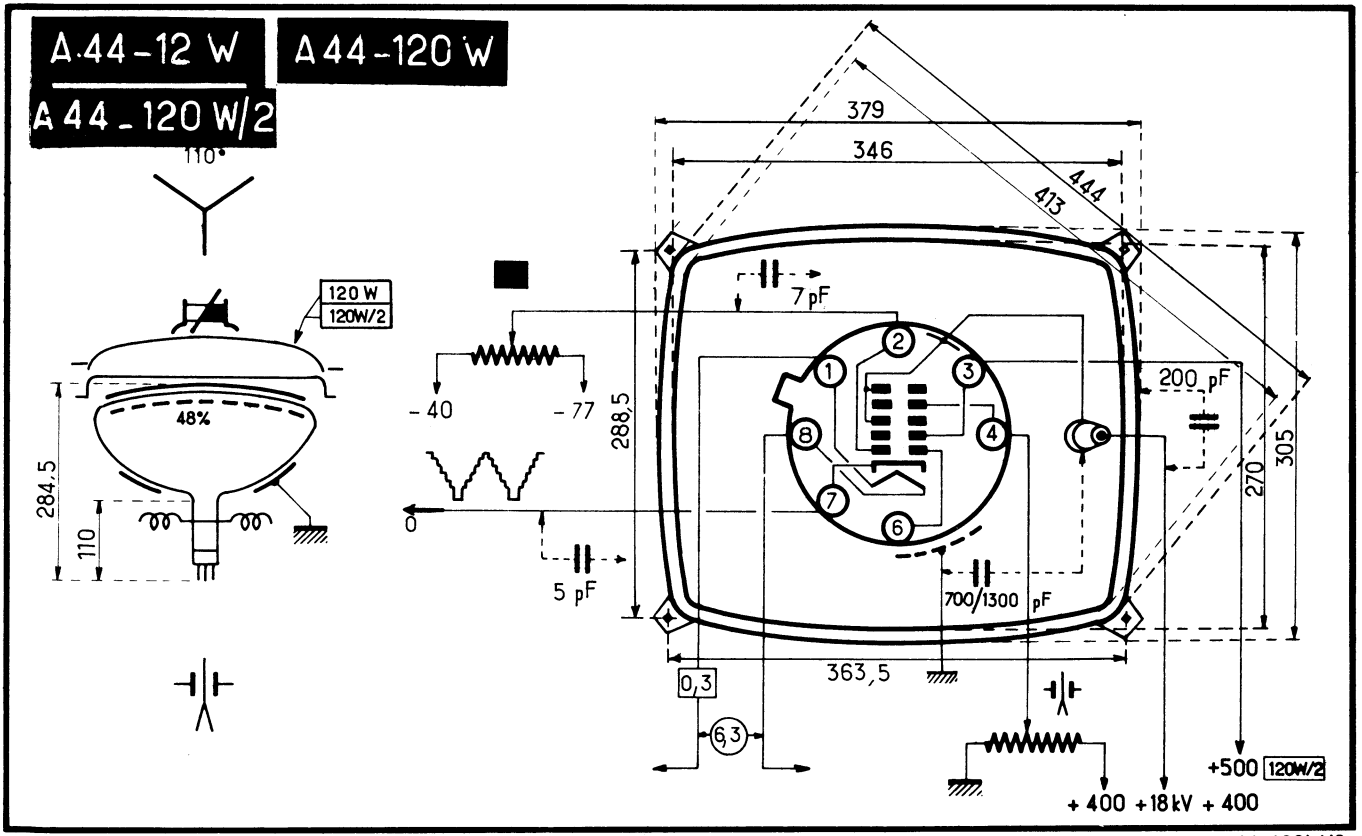

110°
50%
233
110
-30
-50
0
3 pF
20
279
257
315
295
7pF
204,5
150pF
195
218
0,45/0,9 nF
267,5
0,14
11
+12/15kV
+130
1
2
3
4
5
6
7

A34-510W

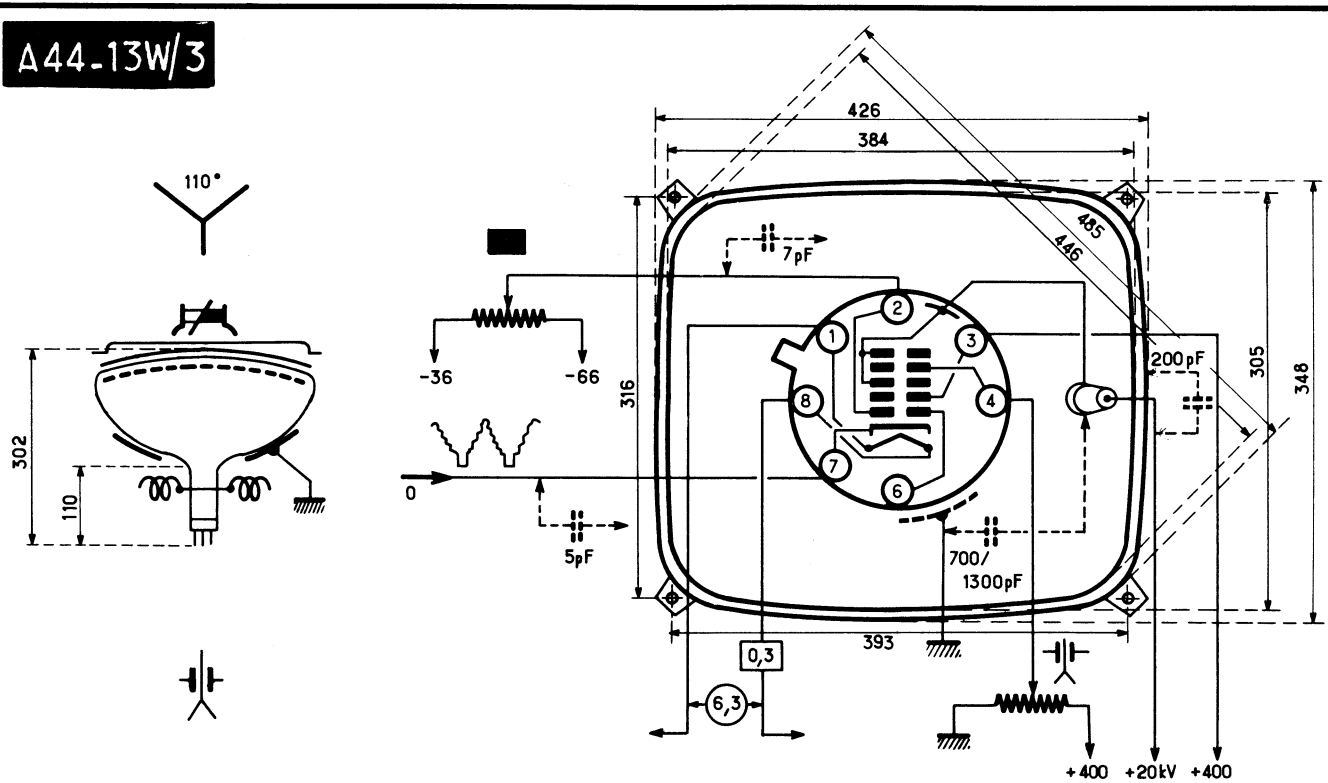

110°
45%
48%
247
359
106
110
-30
-50
0
3pF
226
293
290
344
322
7pF
200 pF
0,4/0,9nF
270
211
235
0,14
11
20
+12/15kV
+130
1
2
3
4
5
6
7

A41-10W

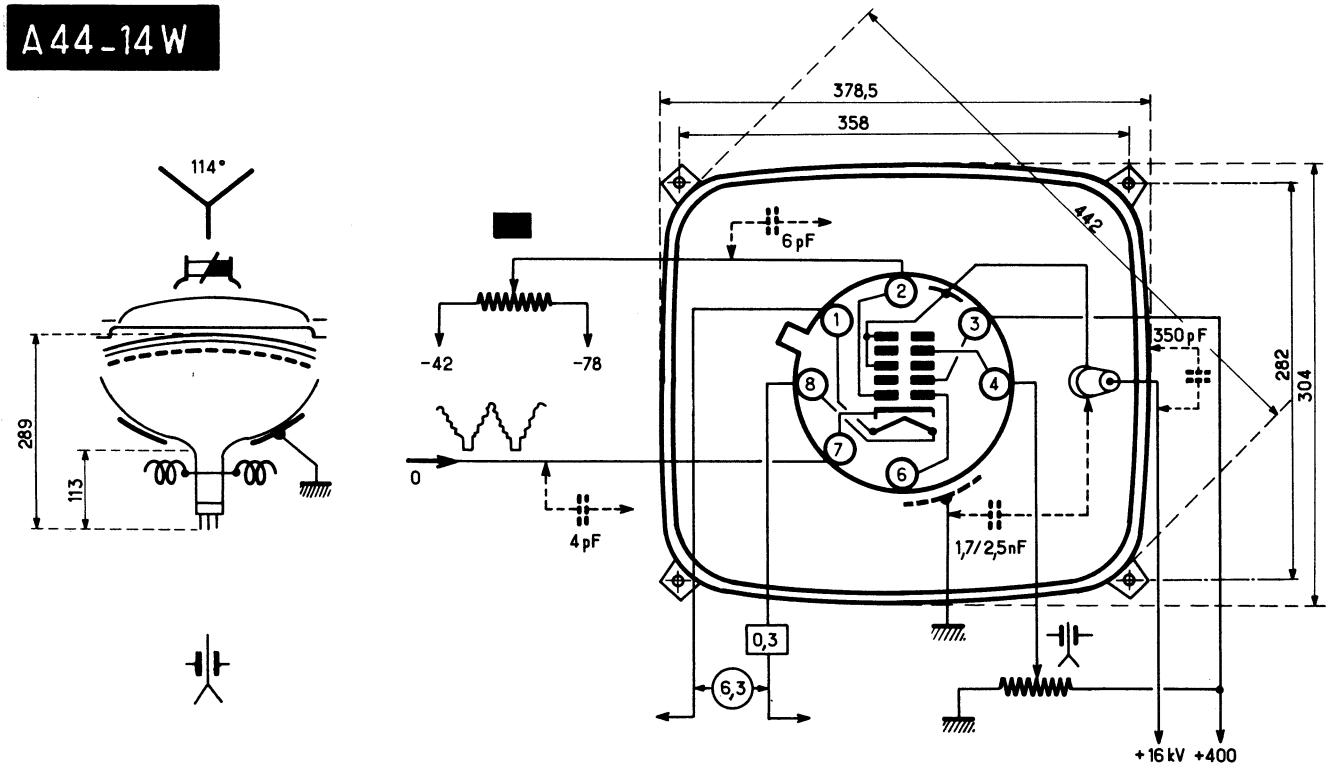

110°
273
110
28,6
355
322
372
402
6pF
-40
-77
266
0
5pF
0,8/1,5nF
332
0,3
6,3
254
289
+400
+18kV
1
2
3
4
6
7
8


A44-12 W
A44-120 W
A44-120 W/2
110°
120 W
120W/2
48%
284,5
110
- 40
- 77
0
5 pF
288,5
7 pF
379
346
444
413
200 pF
270
305
700/1300 pF
363,5
0,3
6,3
+500 120W/2
+ 400 +18kV + 400

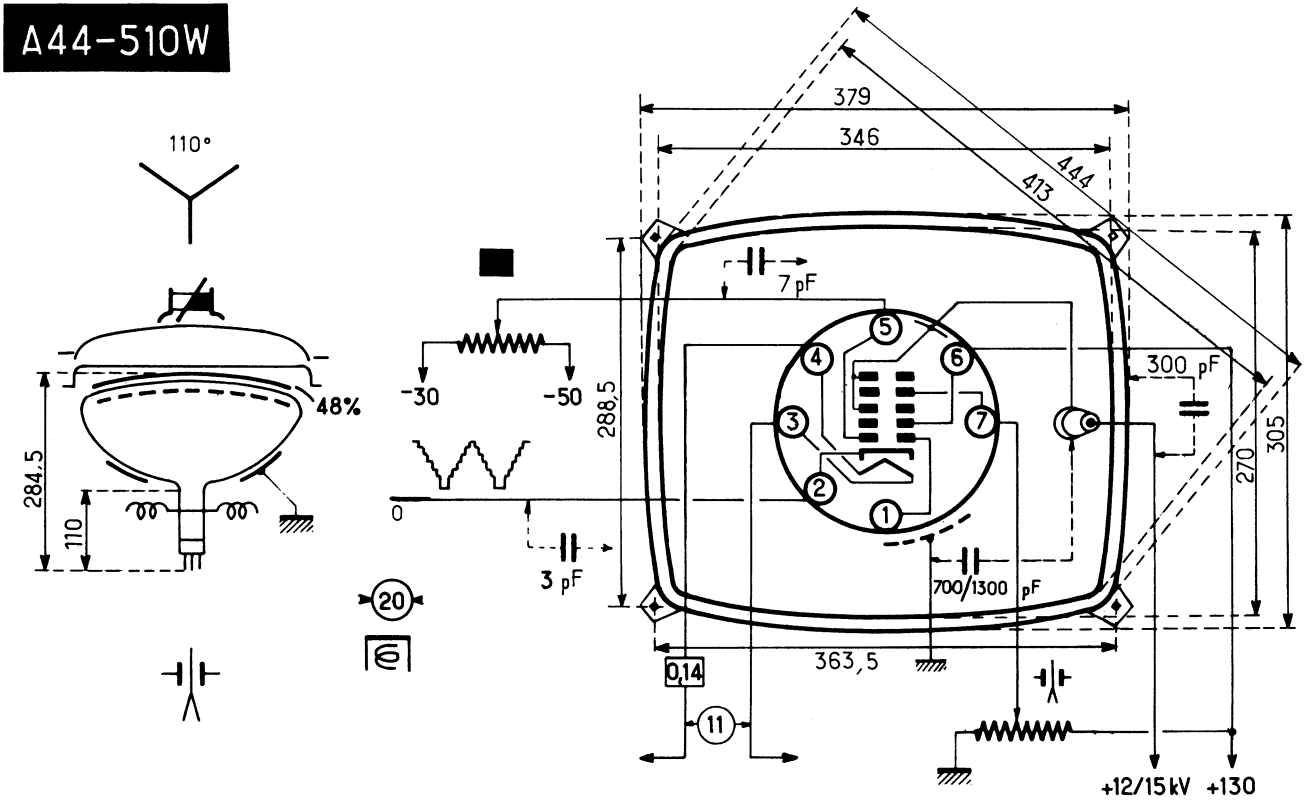
A44-13W/3


110°
302
110
426
384
485
446
7pF
-36
-66
316
0
5pF
200pF
305
348
700/
1300pF
393
0,3
6,3
+400
+20kV
+400

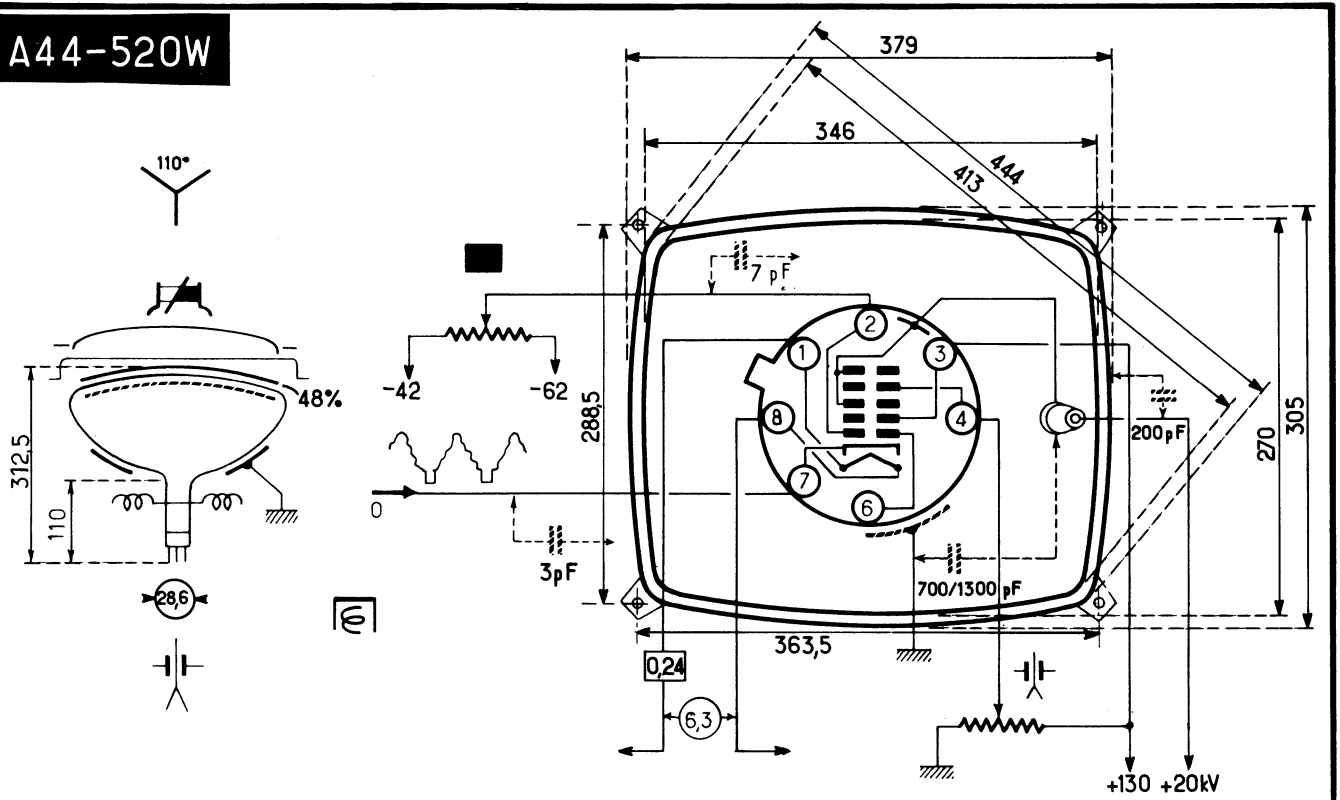
A44-14W


114°
289
113
378,5
358
442
6pF
-42
-78
0
4pF
350pF
282
304
1,7/2,5nF
0,3
6,3
+16kV
+400
1
2
3
4
6
7
8

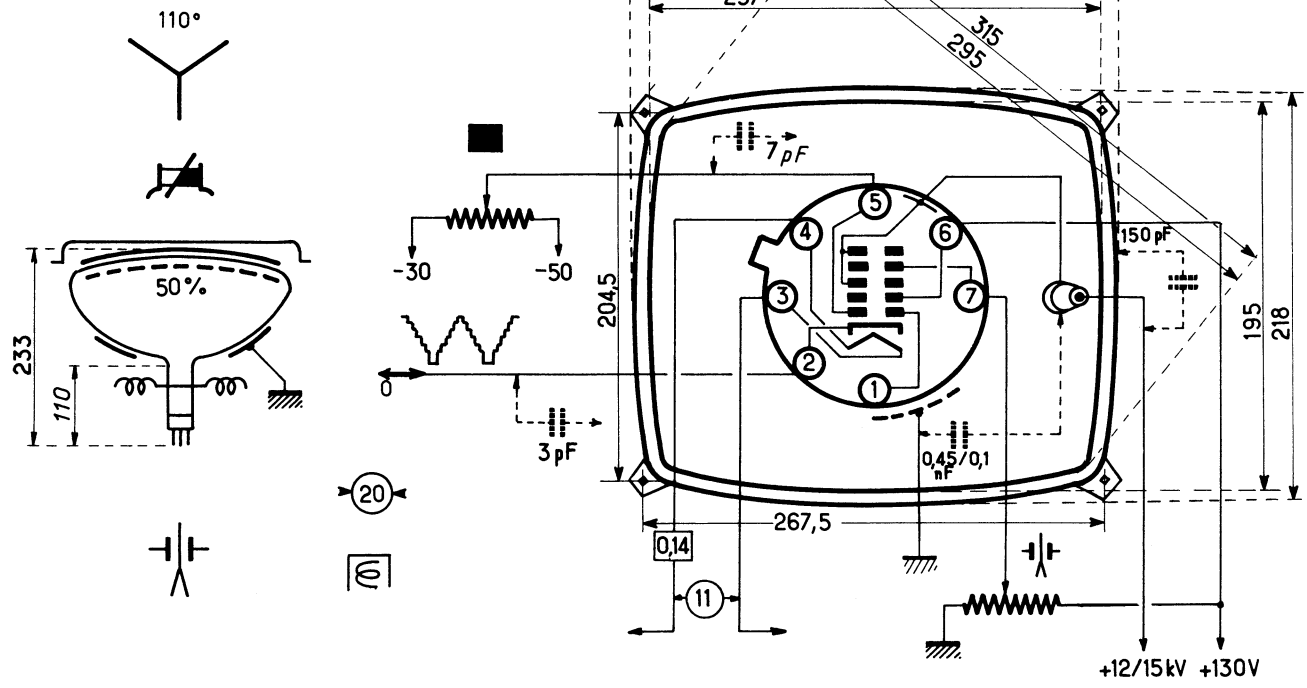
A44-510W


110°
48%
284,5
110
-30
-50
0
3 pF
7 pF
288,5
379
346
444
413
300 pF
270
305
700/1300 pF
363,5
0,14
11
20
+12/15 kV
+130

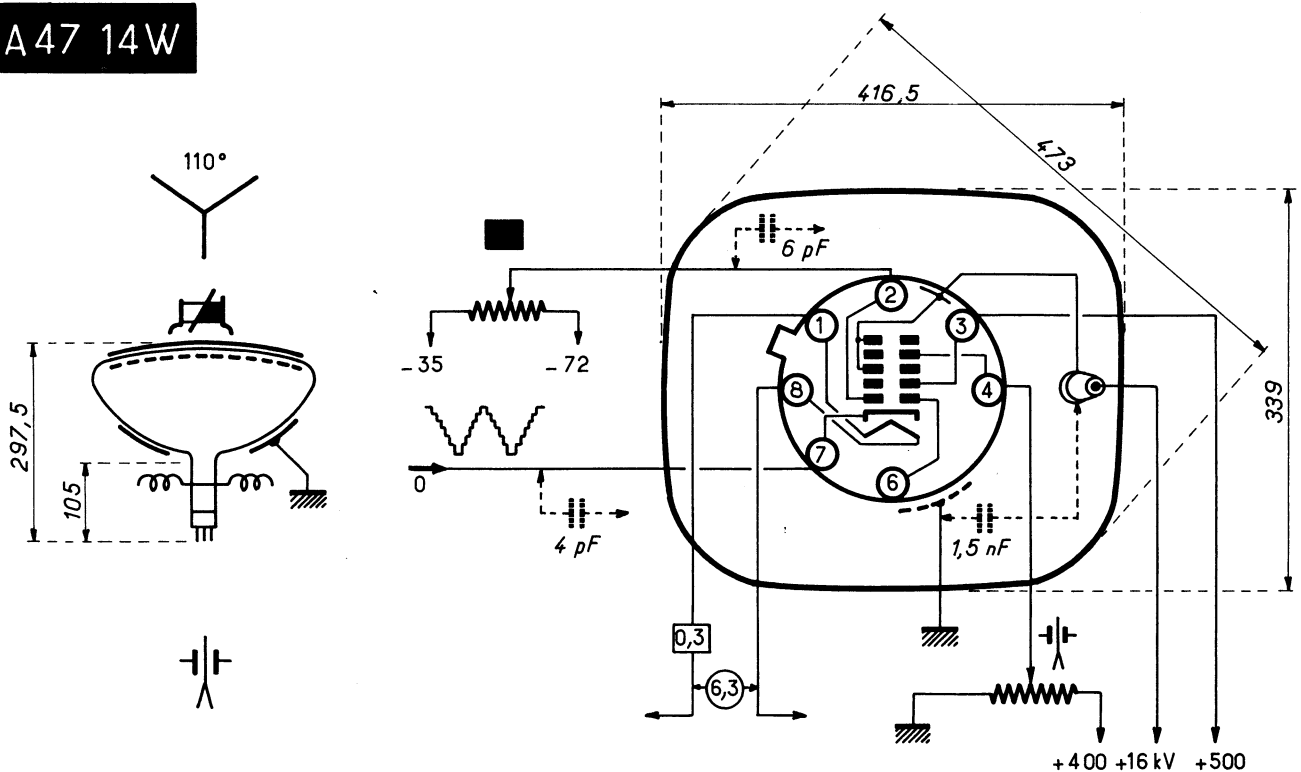
A44-520W


110°
48%
312,5
110
28,6
-42
-62
0
3pF
288,5
7 pF
379
346
444
413
200pF
270
305
700/1300 pF
363,5
0,24
6,3
+130
+20kV
1
2
3
4
6
7
8

A47 11W


110°
50%
233
110
279
257
315
295
7 pF
-30
-50
0
3 pF
204,5
150 pF
195
218
0,45/0,1 nF
267,5
0,14
11
20
+12/15kV
+130V

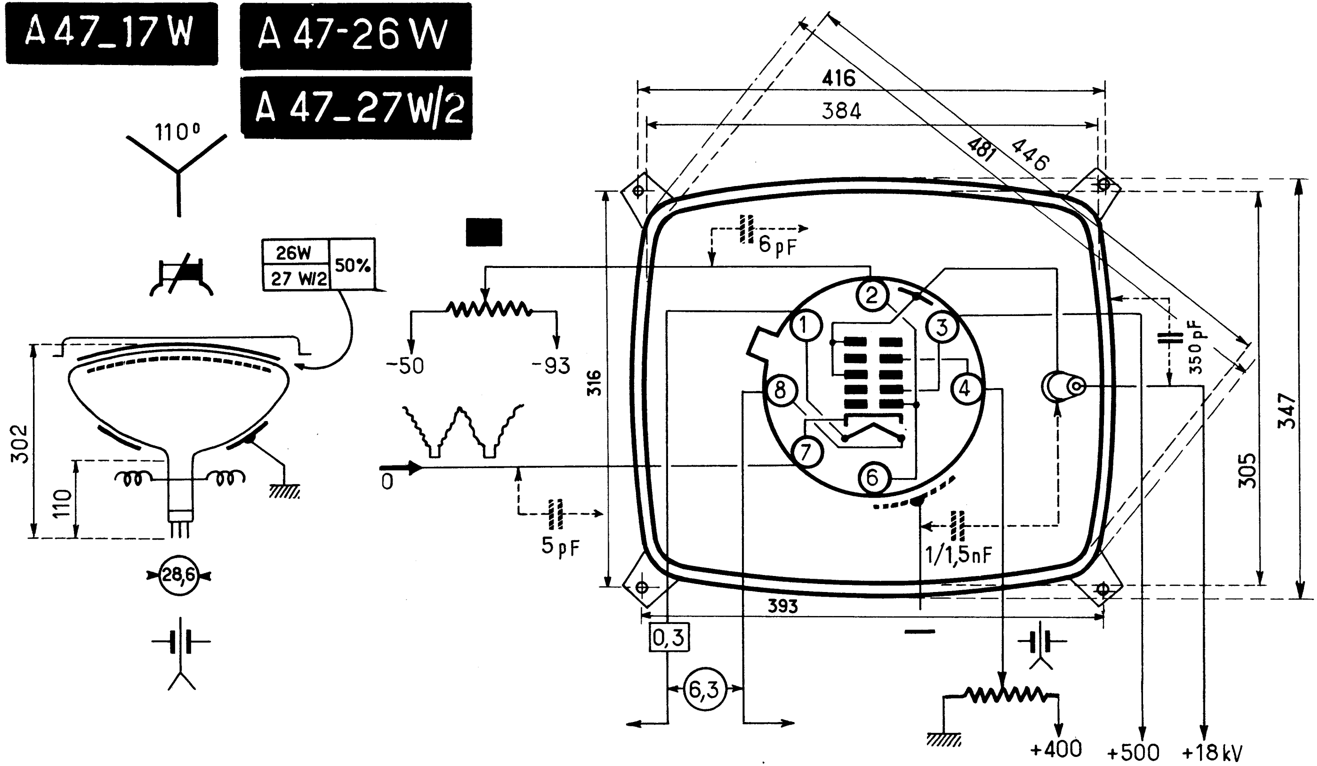
A47 14W

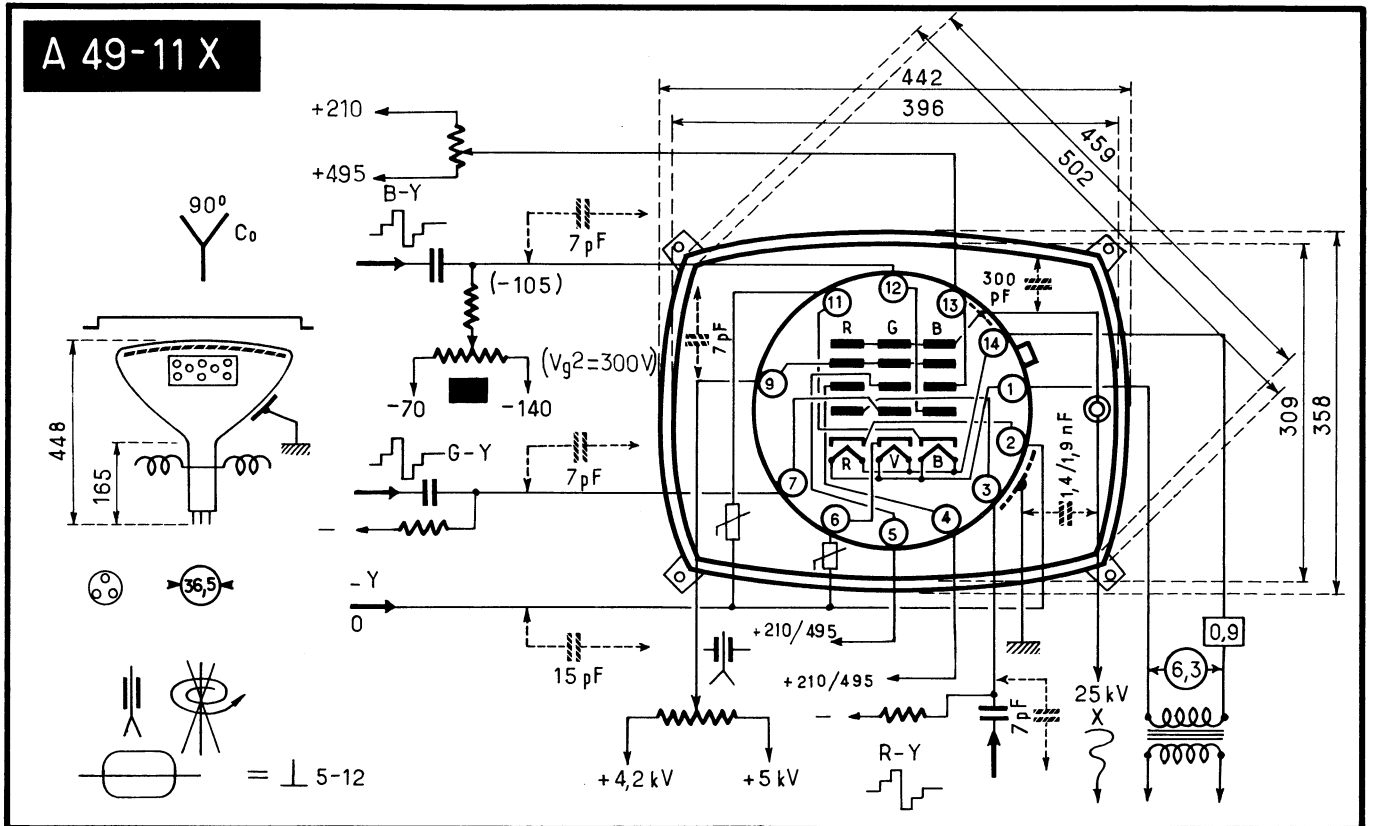

110°
297,5
105
416,5
473
339
6 pF
- 35
- 72
0
4 pF
1,5 nF
0,3
6,3
+400
+16 kV
+500
1
2
3
4
6
7
8

A 47_17 W

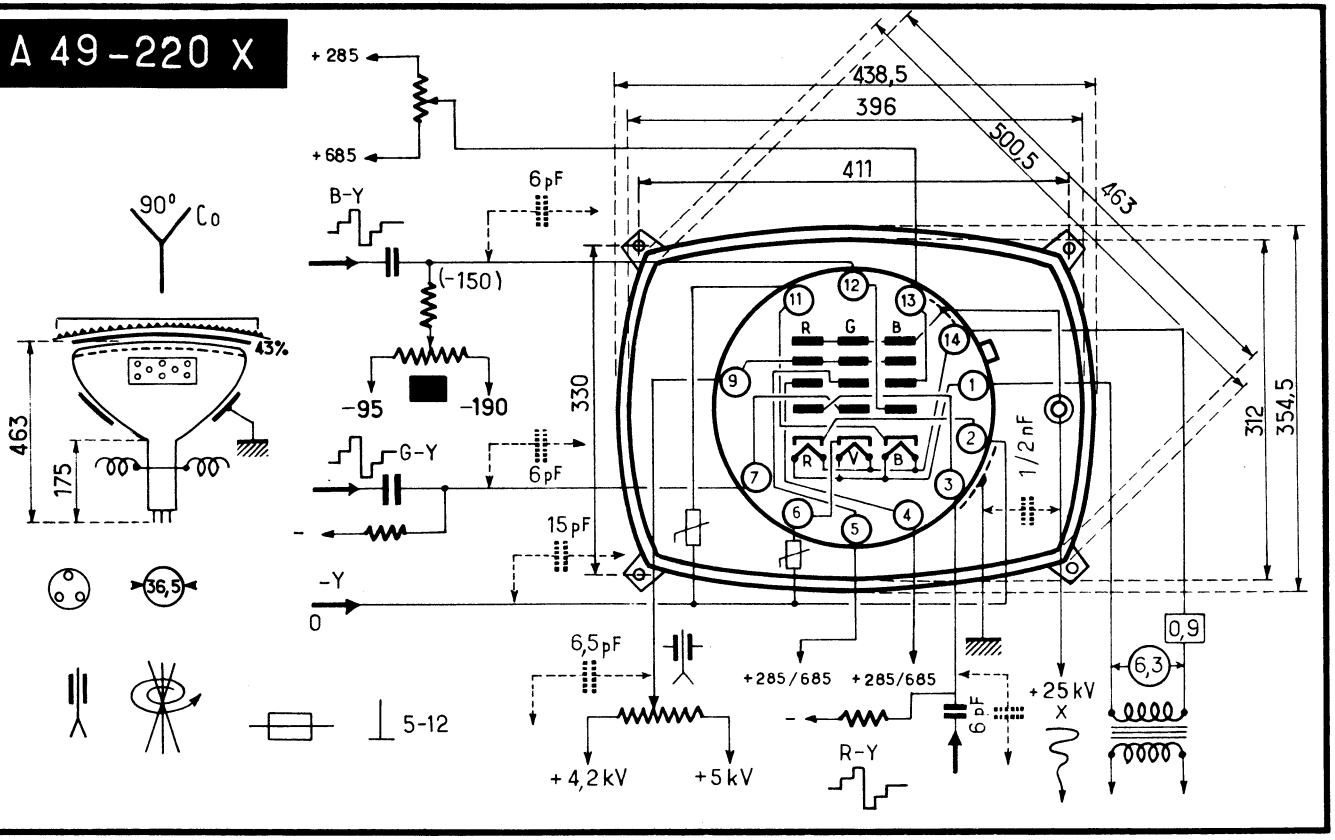
A 47-26 W

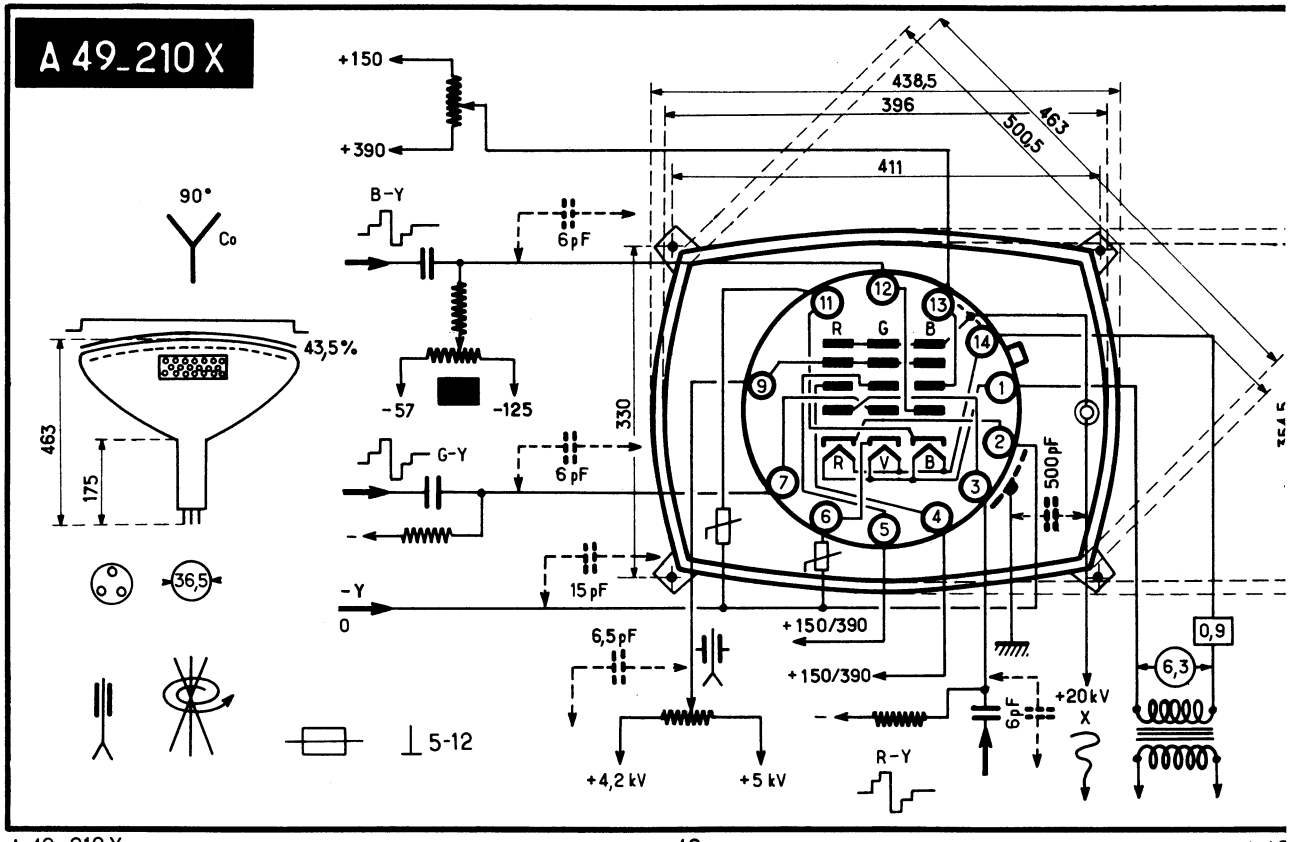
A 47_27W/2

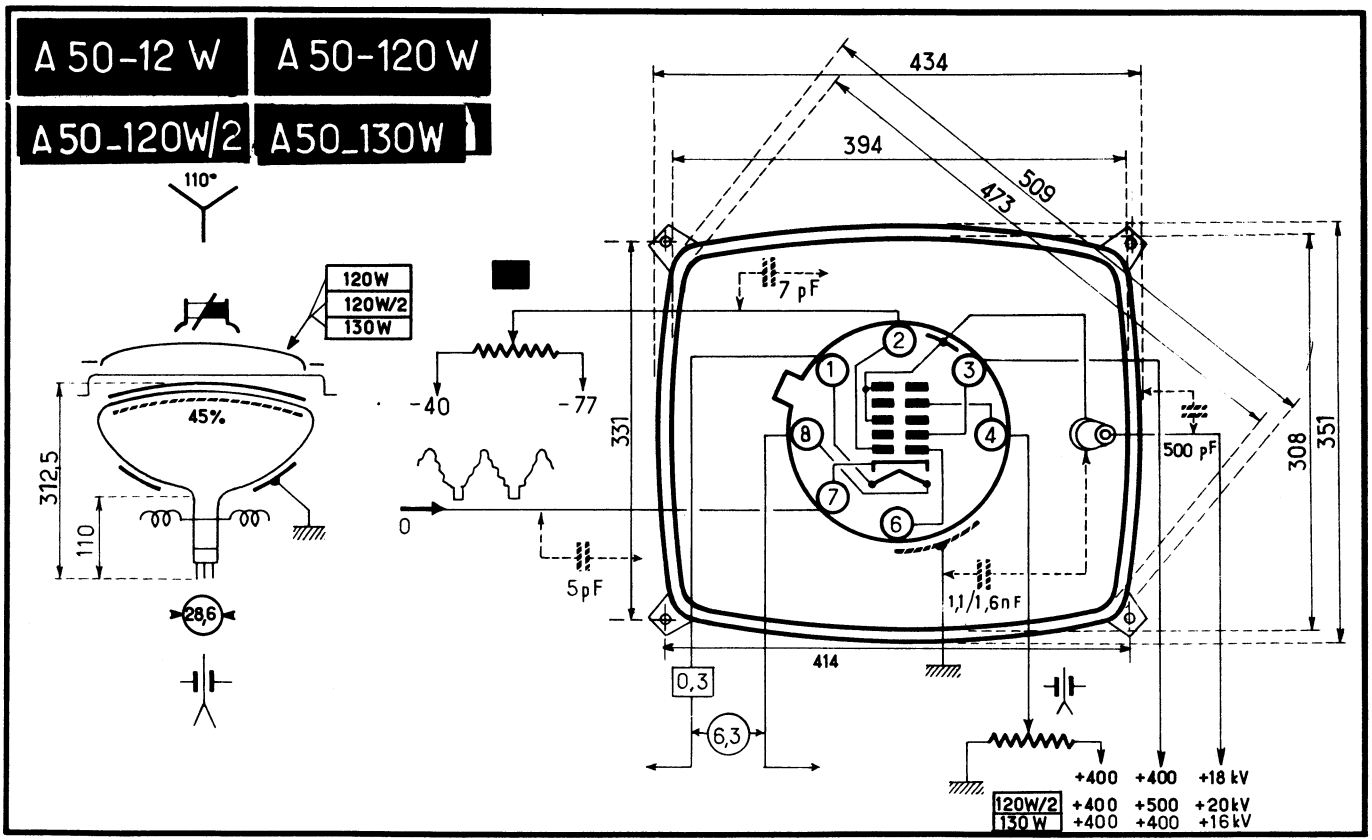



+210
+495
B-Y
90°
Co
7 pF
(-105)
(Vg2=300V)
-70
-140
G-Y
7 pF
-Y
0
15 pF
448
165
36,5
= ⊥ 5-12
442
396
459
502
309
358
300 pF
7 pF
1,4/1,9 nF
R G B
R V B
+210/495
+210/495
+4,2 kV
+5 kV
R-Y
7 pF
25 kV
X
6,3
0,9

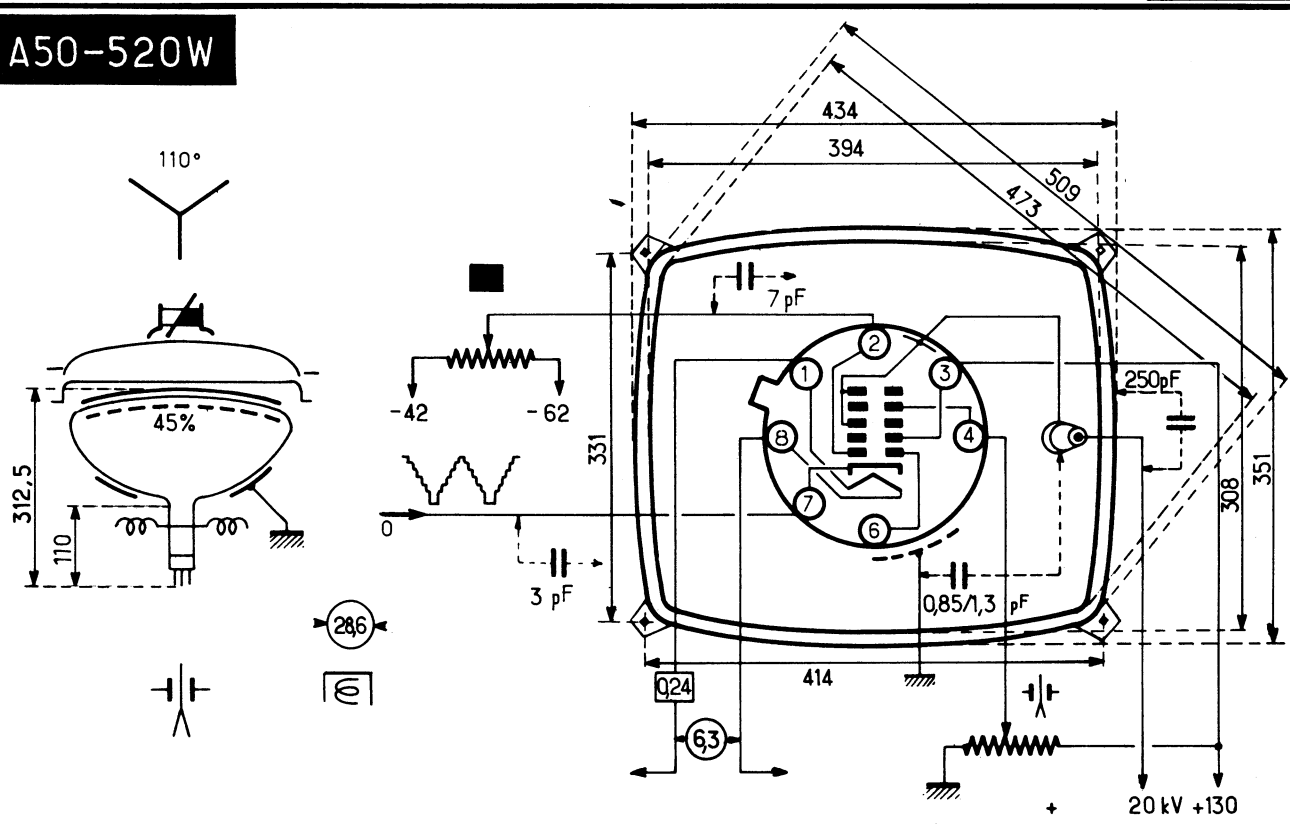
A 49-220 X


+ 285
+ 685
438,5
396
500,5
463
411
6 pF
B-Y
90°
Co
(-150)
43%
463
175
-95
-190
330
G-Y
6 pF
15 pF
-Y
0
36,5
5-12
6,5 pF
+ 4,2 kV
+ 5 kV
+285/685
+285/685
6 pF
R-Y
+ 25 kV
X
1/2 nF
312
354,5
0,9
6,3
R
G
B
R
V
B

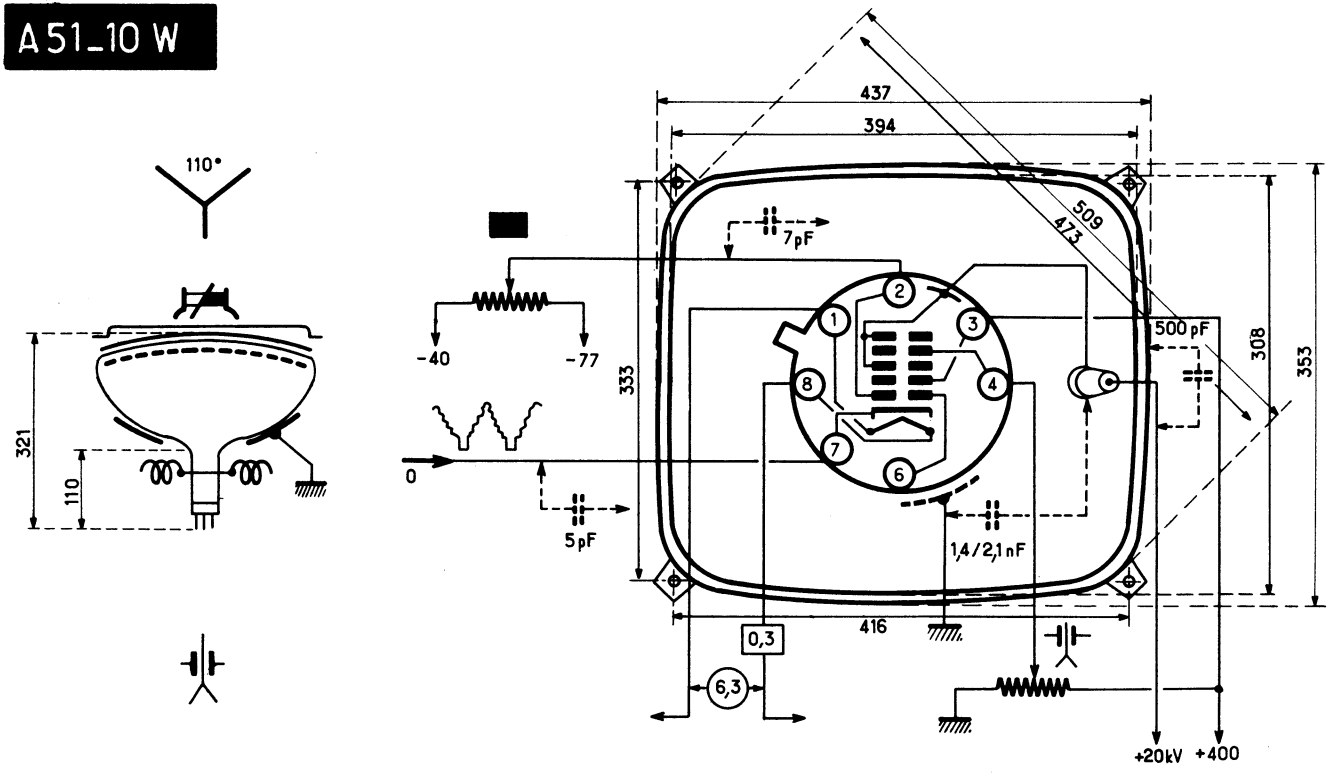

A 49-210 X
+150
+390
90°
Co
B-Y
6pF
438,5
396
500,5
463
411
43,5%
463
175
-57
-125
330
G-Y
6pF
500pF
36,5
-Y
0
15pF
+150/390
6,5pF
+150/390
0,9
6,3
+20kV
X
6pF
R-Y
+4,2 kV
+5 kV
⊥5-12
R
G
B
R
V
B

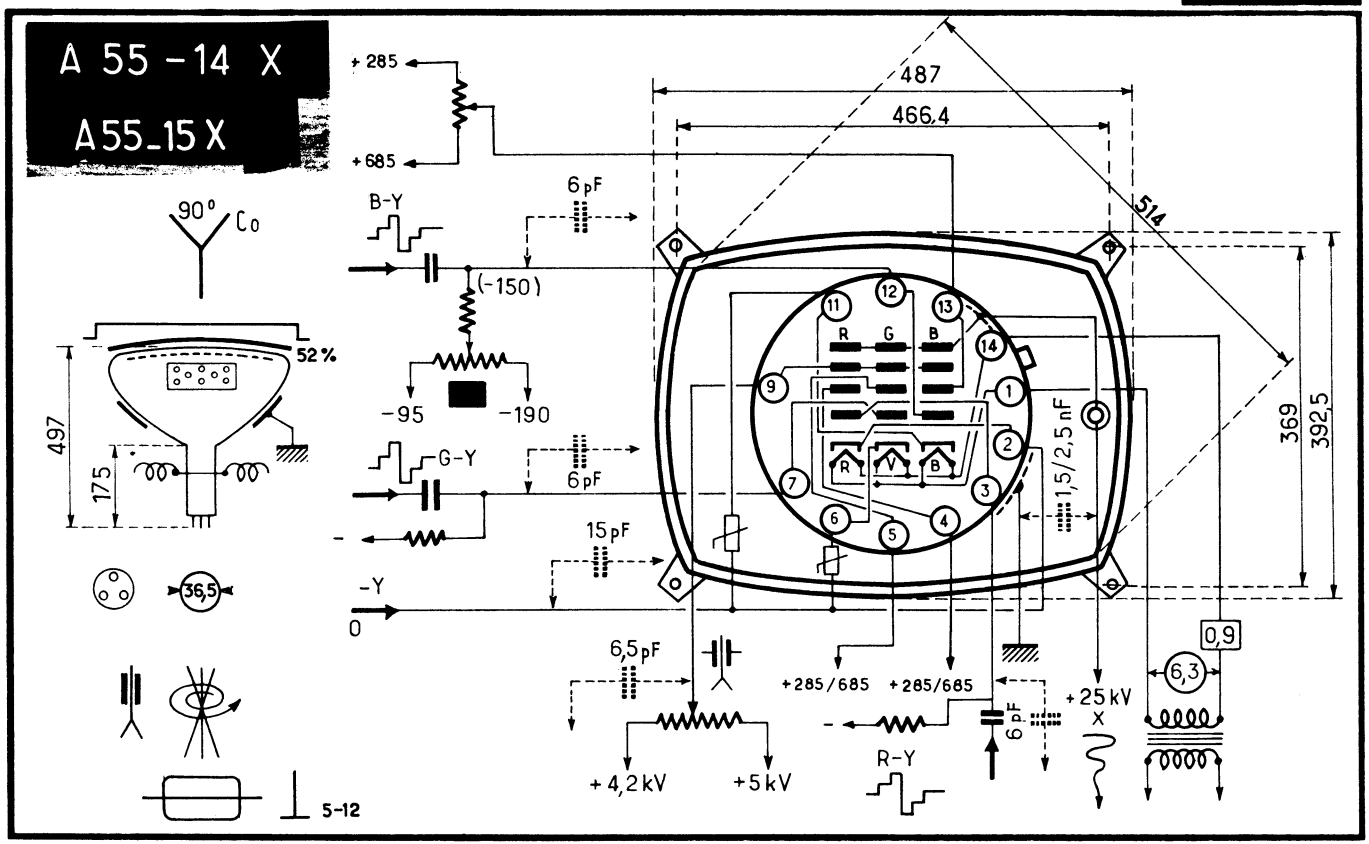

A 50-12 W
A 50-120 W
A 50-120W/2
A 50_130W
110°
120W
120W/2
130W
45%
312,5
110
28,6
-40
-77
0
5pF
331
7 pF
500 pF
1,1/1,6nF
434
394
509
473
308
351
414
0,3
6,3
+400 +400 +18 kV
120W/2 +400 +500 +20kV
130 W +400 +400 +16kV

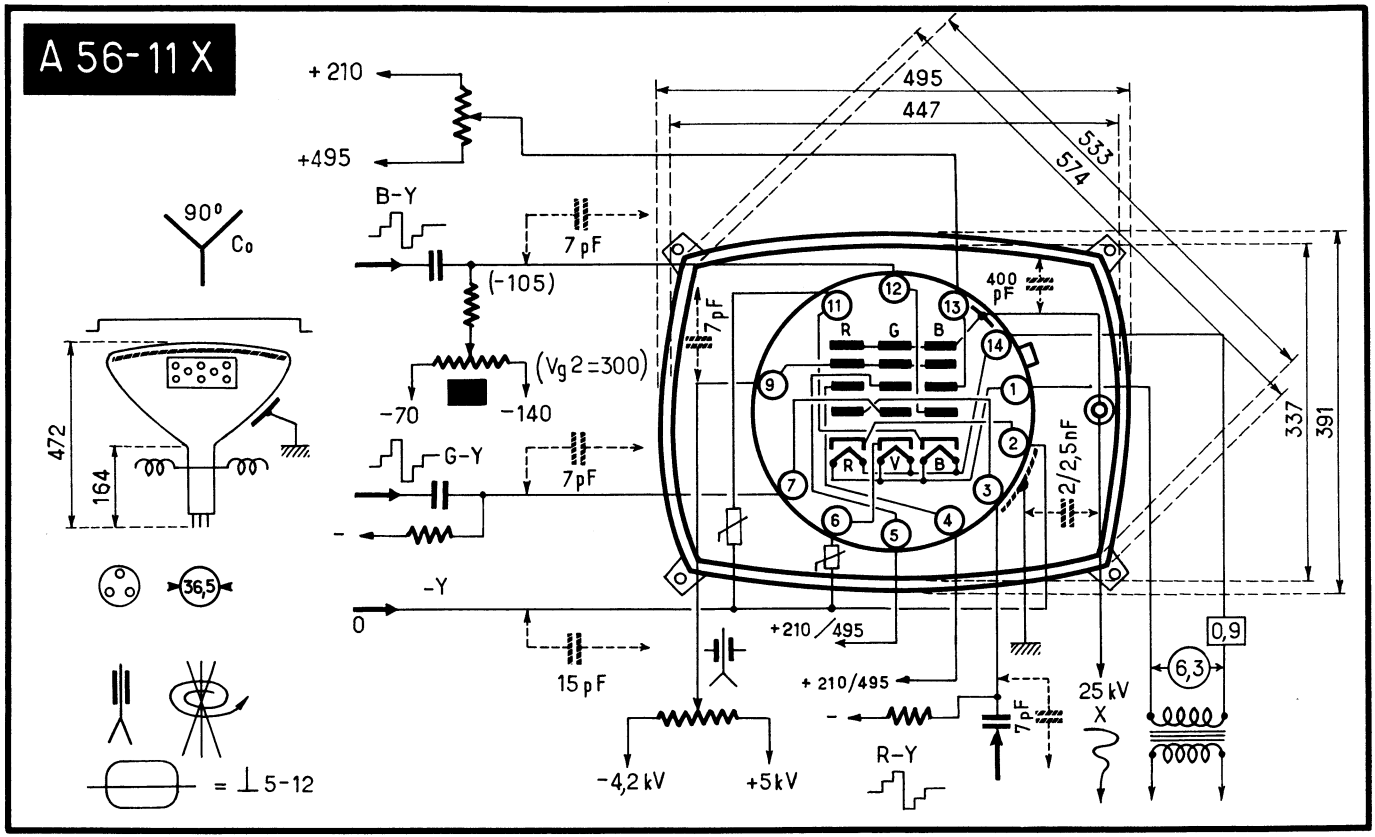
A50-520W


110°
45%
312,5
110
28,6
-42
-62
0
3 pF
7 pF
331
434
394
509
473
250pF
0,85/1,3 pF
308
351
414
0,24
6,3
20 kV +130
+
1
2
3
4
6
7
8

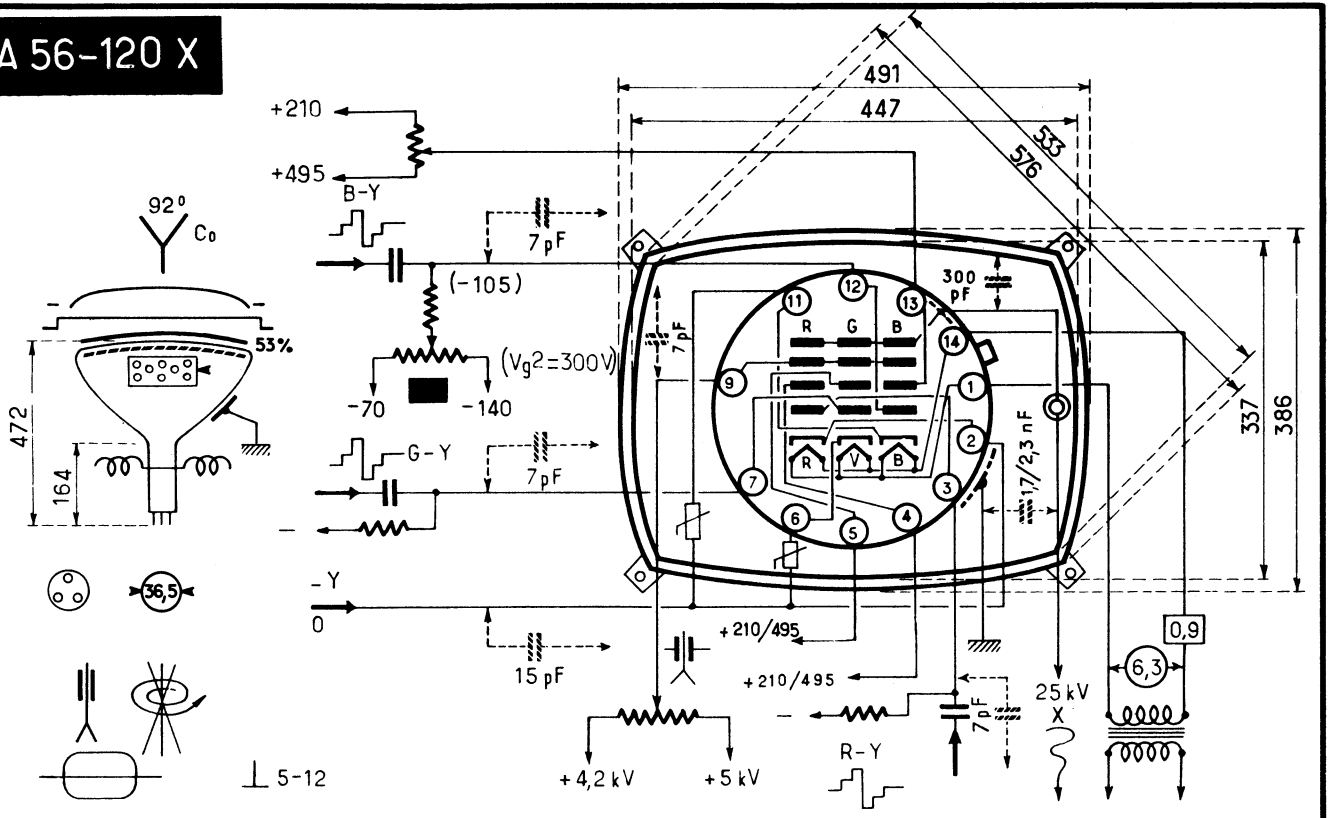
A 51_10 W

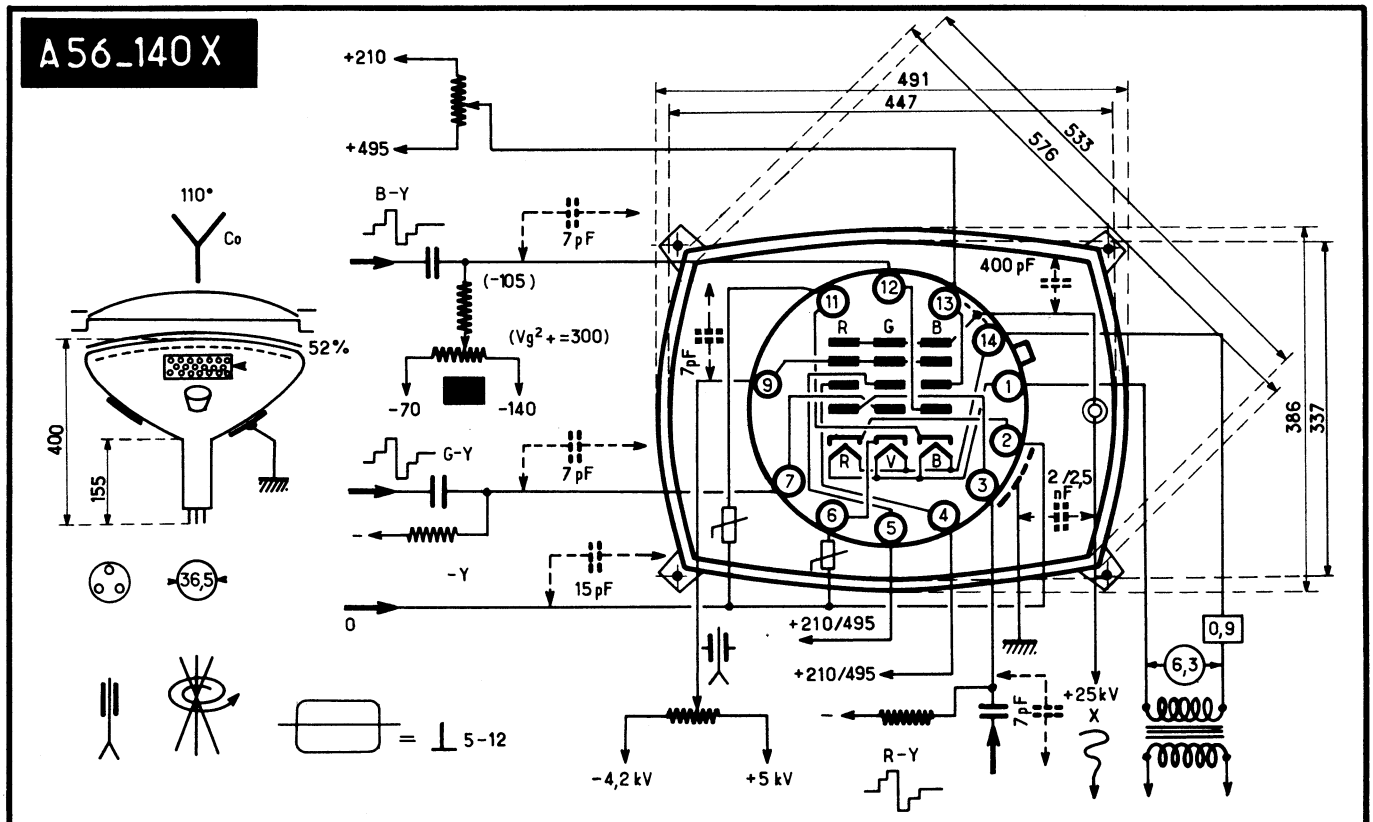

110°
321
110
437
394
509
473
7pF
-40
-77
333
0
5pF
500 pF
308
353
1,4/2,1nF
416
0,3
6,3
+20kV
+400
1
2
3
4
6
7
8

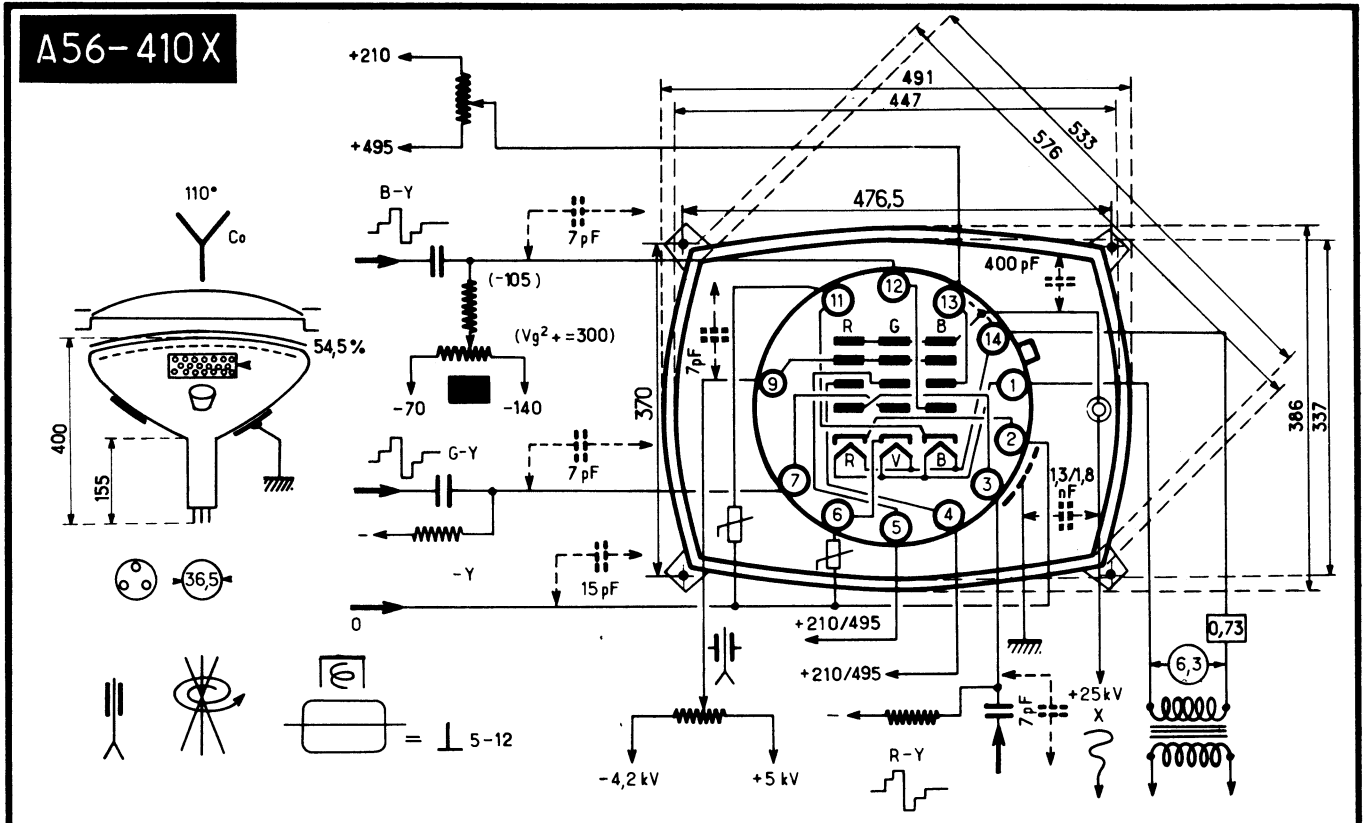

A 55 - 14 X
A55_15 X
+ 285
+ 685
B-Y
6 pF
(-150)
-95
-190
G-Y
6 pF
15 pF
-Y
0
90°
Co
52 %
497
175
36,5
5-12
487
466,4
514
369
392,5
1,5/2,5 nF
R
G
B
R
V
B
6,5 pF
+ 4,2 kV
+ 5 kV
+ 285/685
+ 285/685
R-Y
6 pF
+ 25 kV
X
0,9
6,3

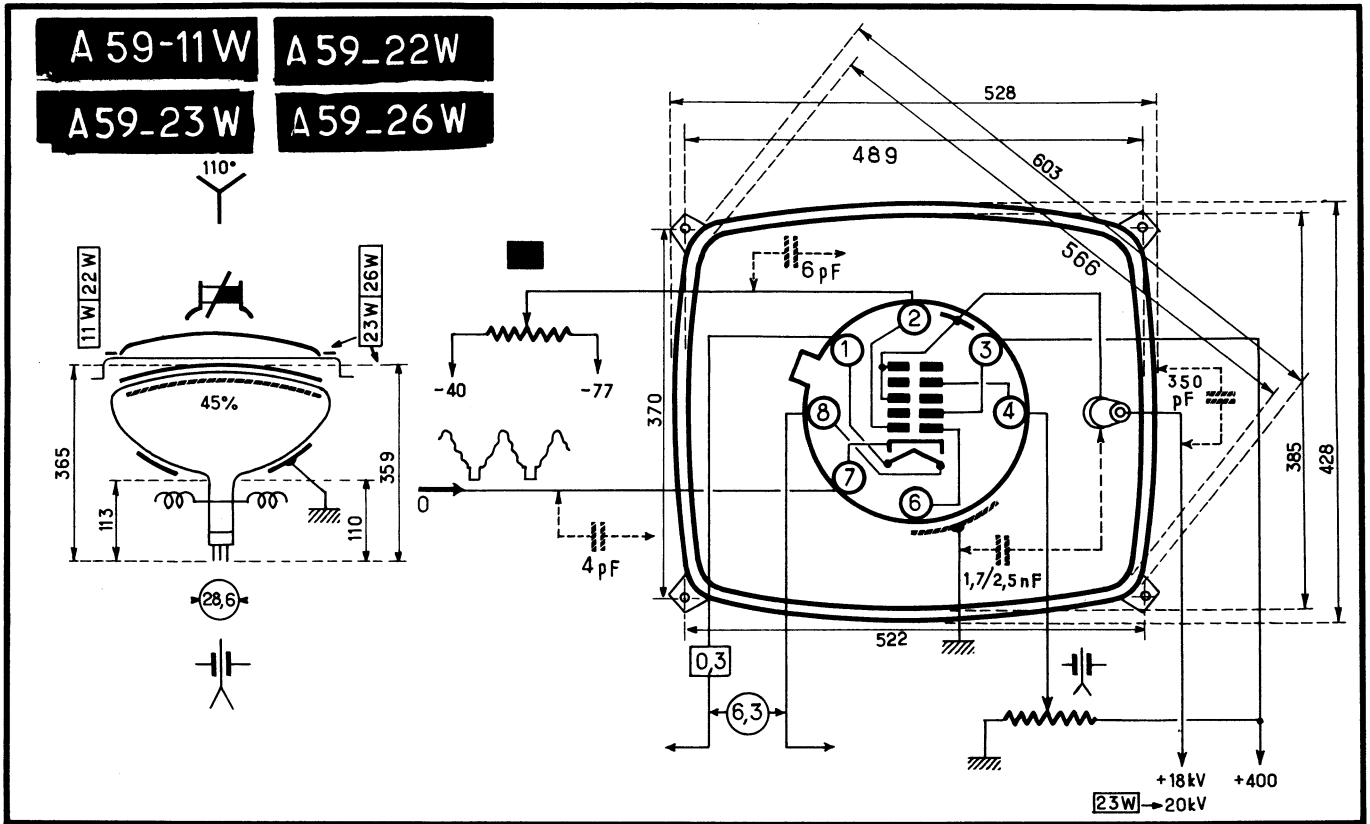

A 56-11 X
+ 210
+495
B-Y
7 pF
(-105)
(Vg 2 =300)
-70
-140
G-Y
7pF
-Y
0
15 pF
90°
Co
472
164
36,5
= ⊥5-12
495
447
533
574
400 pF
7pF
2/2,5nF
337
391
R
G
B
R
V
B
+210/495
+ 210/495
-4,2 kV
+5kV
R-Y
7pF
25 kV
X
0,9
6,3

A 56-120 X


491
447
533
516
+210
+495
B-Y
7 pF
(-105)
(Vg2=300V)
-70
-140
G-Y
7pF
-Y
0
15 pF
92°
Co
53%
472
164
36,5
⊥ 5-12
+4,2 kV
+5 kV
+210/495
+210/495
R-Y
7pF
25 kV
X
0,9
6,3
300 pF
7 pF
1,7/2,3 nF
337
386
R
G
B
R
V
B

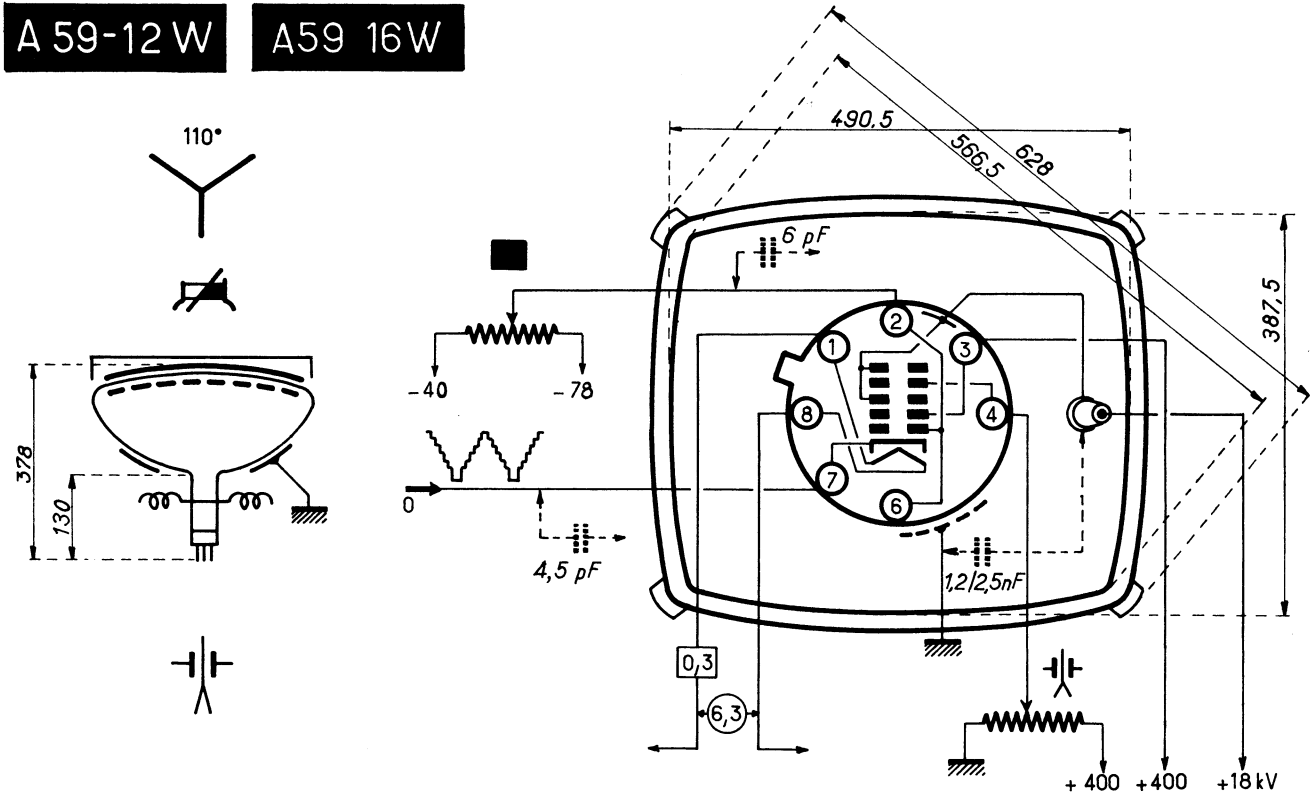

A56_140X
+210
+495
491
447
576
533
110°
Co
52%
400
155
36,5
B-Y
7pF
(-105)
(Vg2+=300)
-70
-140
G-Y
7pF
-Y
15pF
0
400pF
7pF
R
G
B
R
V
B
2 /2,5 nF
386
337
+210/495
+210/495
0,9
6,3
+25kV
X
7pF
R-Y
-4,2 kV
+5 kV
= ⊥ 5-12


+210
+495
B-Y
7pF
(-105)
(Vg2 + =300)
-70
-140
G-Y
7pF
-Y
15pF
0
110°
Co
54,5%
400
155
36,5
= ⊥ 5-12
491
447
533
576
476,5
400pF
370
7pF
386
337
R
G
B
R
V
B
1,3/1,8 nF
+210/495
+210/495
0,73
6,3
+25kV
X
7pF
-4,2 kV
+5 kV
R-Y

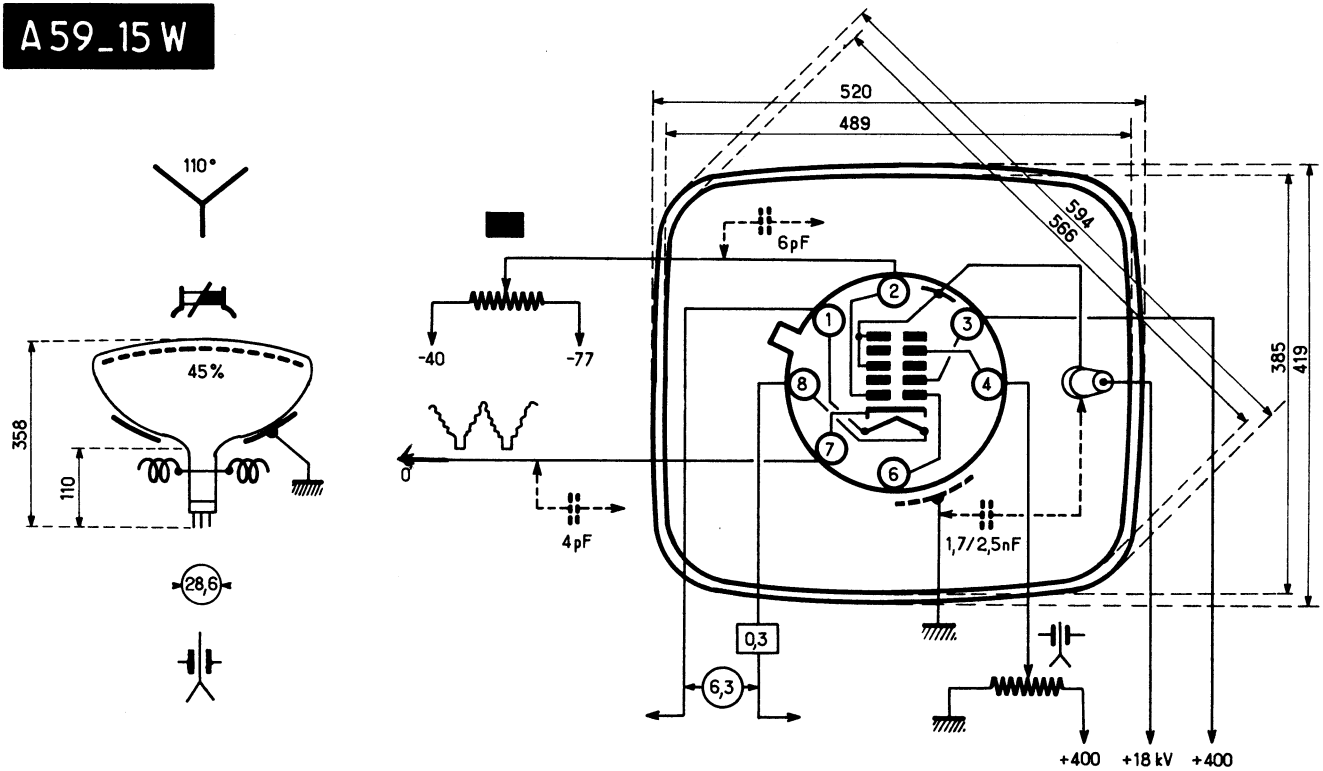

A 59-11W
A 59_22W
A 59_23W
A 59_26W
110°
11 W 22 W
23 W 26 W
45%
365
359
113
110
28,6
-40
-77
0
4 pF
6 pF
370
528
489
603
566
350 pF
385
428
1,7/2,5 nF
522
0,3
6,3
+18 kV
+400
23W → 20kV

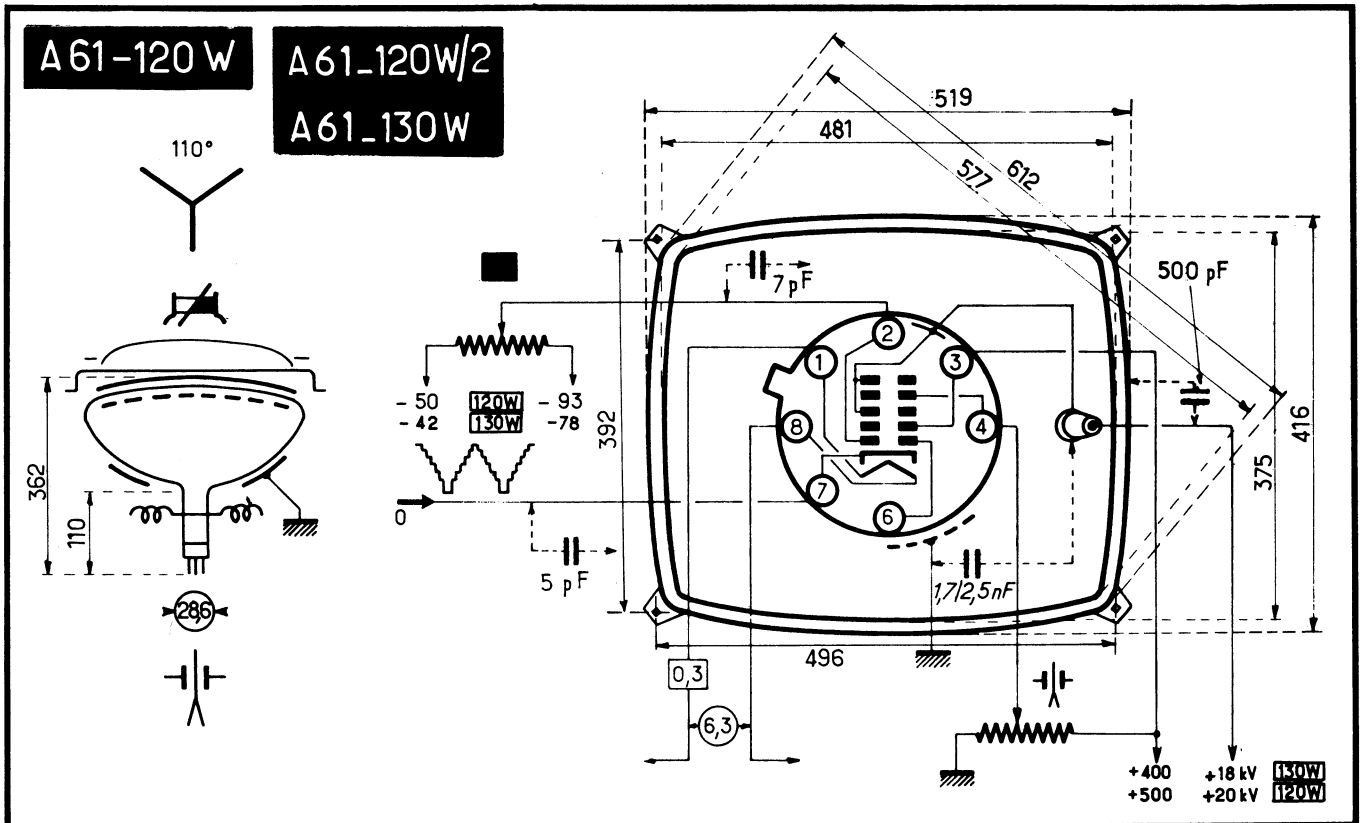
A 59-12 W

A59 16W

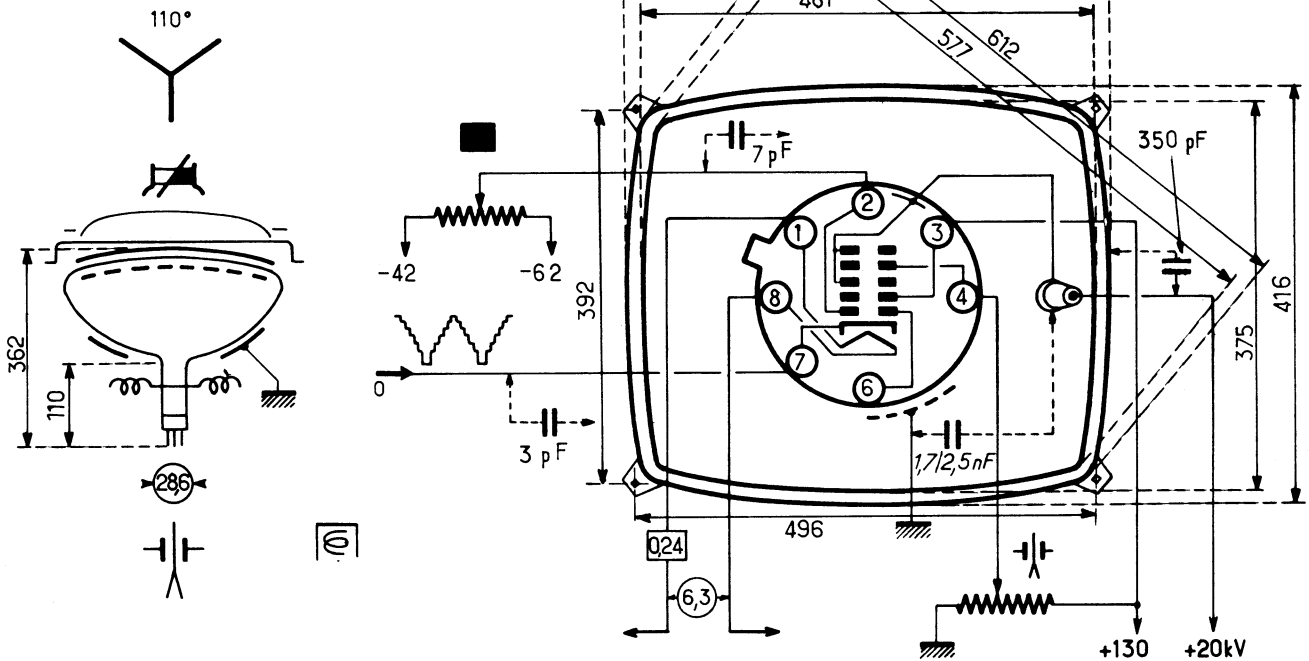


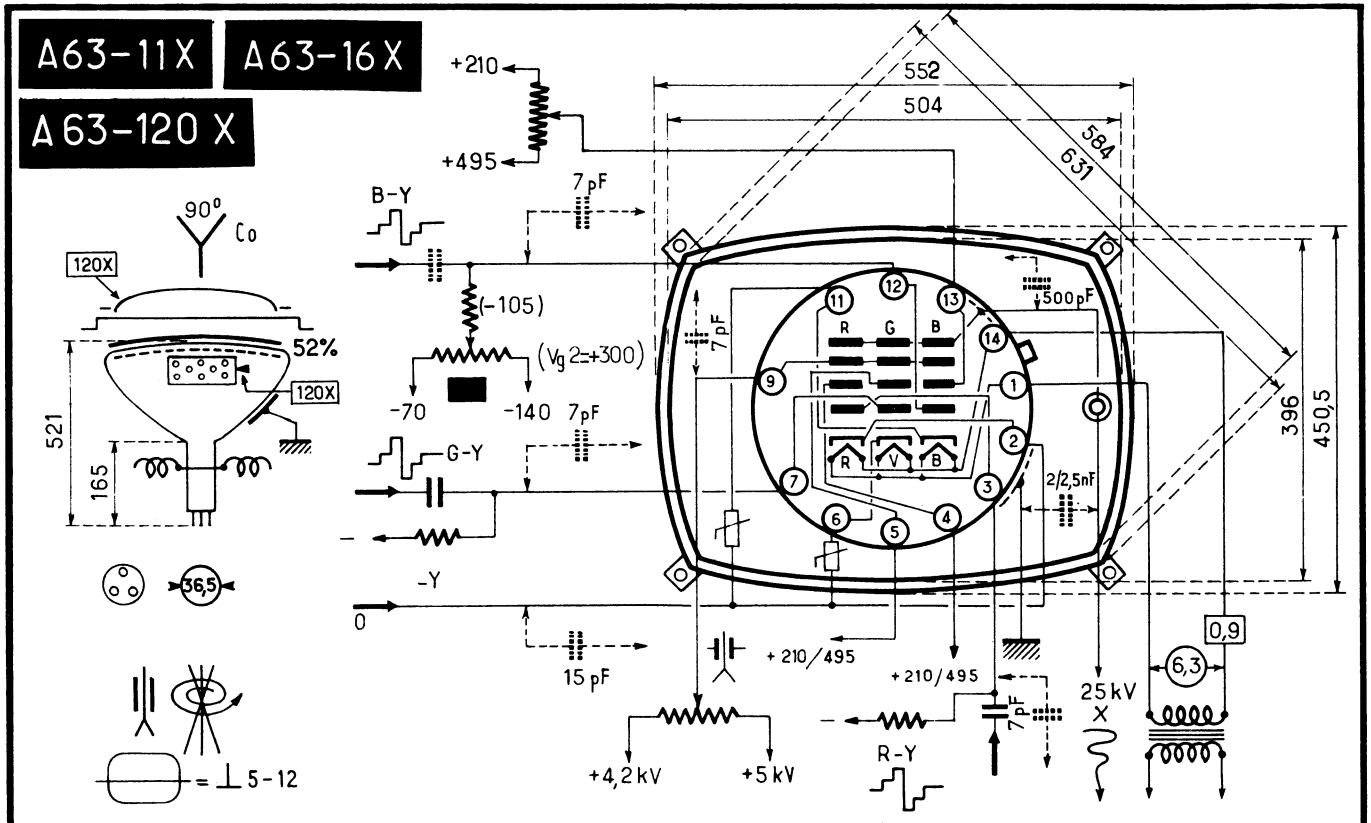
A59_15W

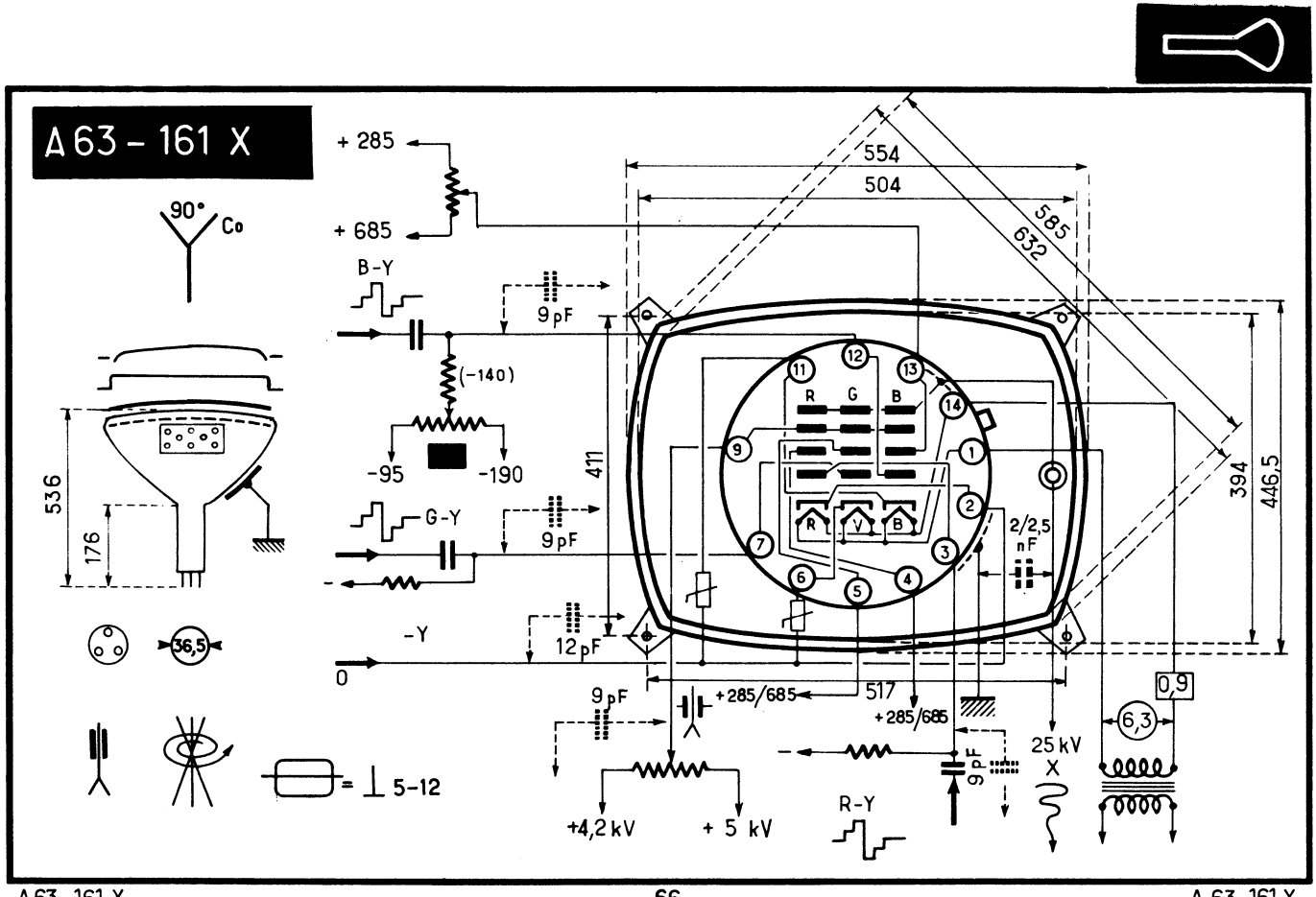

110°
45%
358
110
28,6
520
489
594
566
6pF
-40
-77
0
4pF
1,7/2,5nF
385
419
0,3
6,3
+400
+18 kV
+400
1
2
3
4
6
7
8

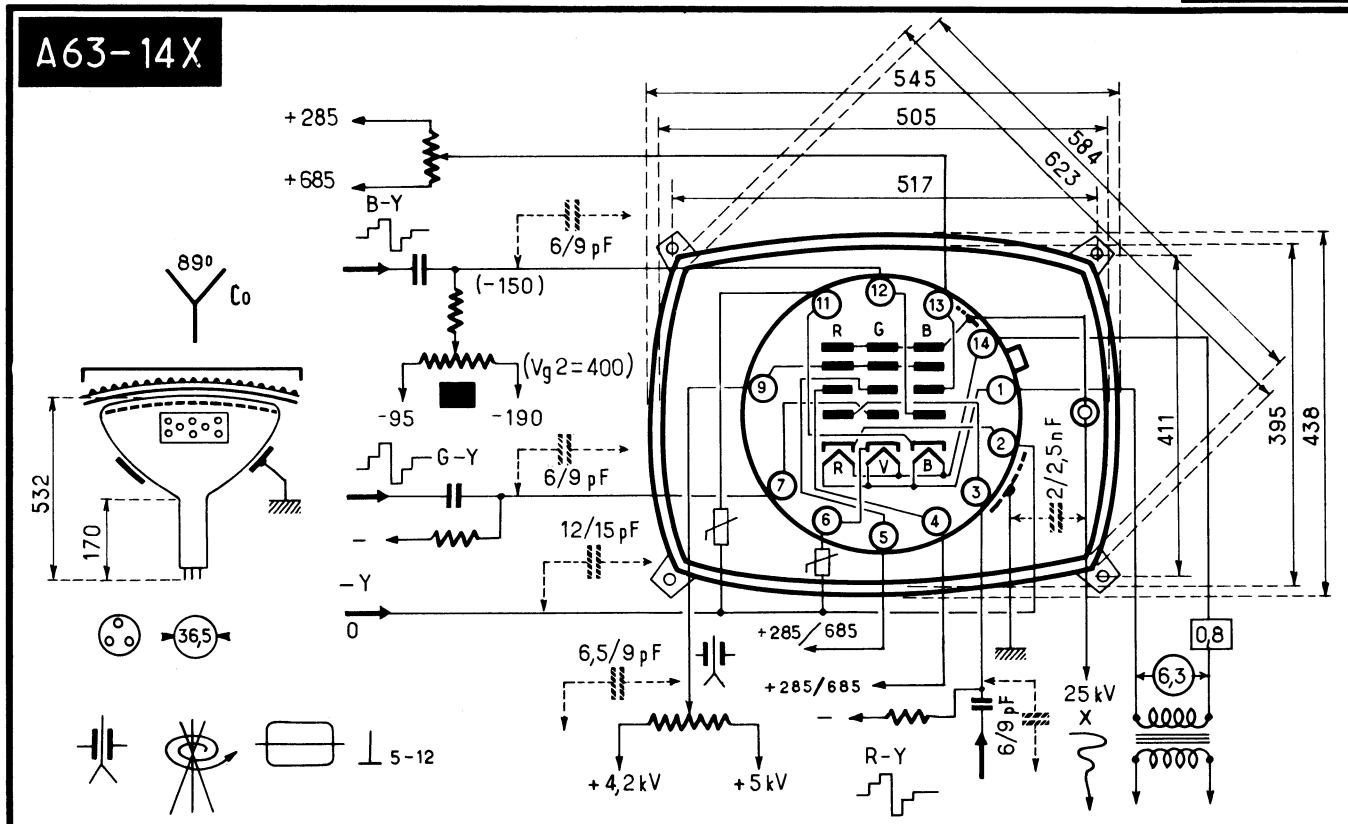

A 61-120 W
A 61_120W/2
A 61_130 W
110°
362
110
286
519
481
577
612
7 pF
500 pF
- 50
- 42
120W
130W
- 93
-78
392
0
5 pF
1,7/2,5nF
375
416
496
0,3
6,3
+400
+500
+18 kV
+20 kV
130W
120W

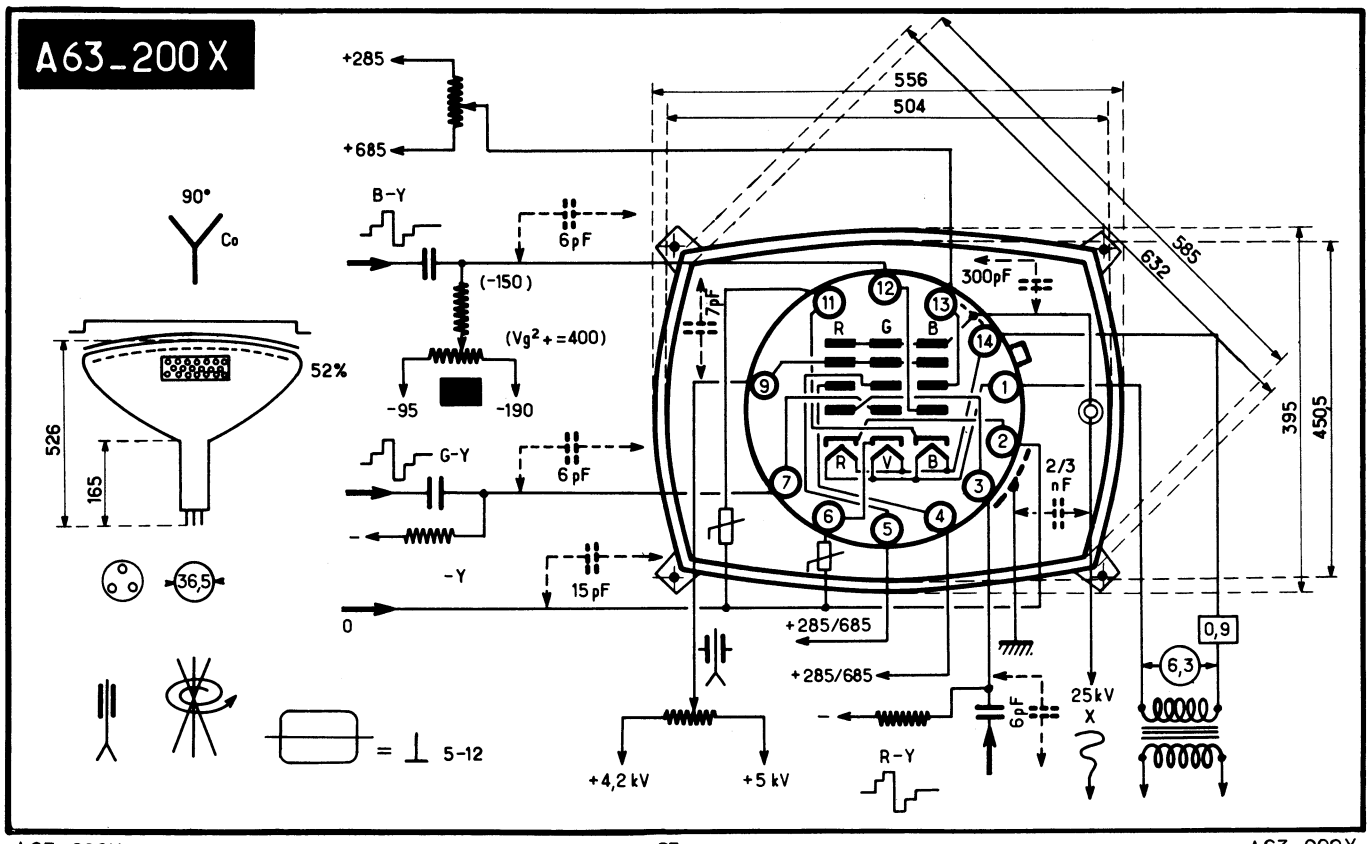
A61-520W


110°
362
110
28,6
519
481
577
612
7 pF
350 pF
-42
-62
392
0
3 pF
1,7/2,5nF
416
375
496
0,24
6,3
+130
+20kV
1
2
3
4
6
7
8

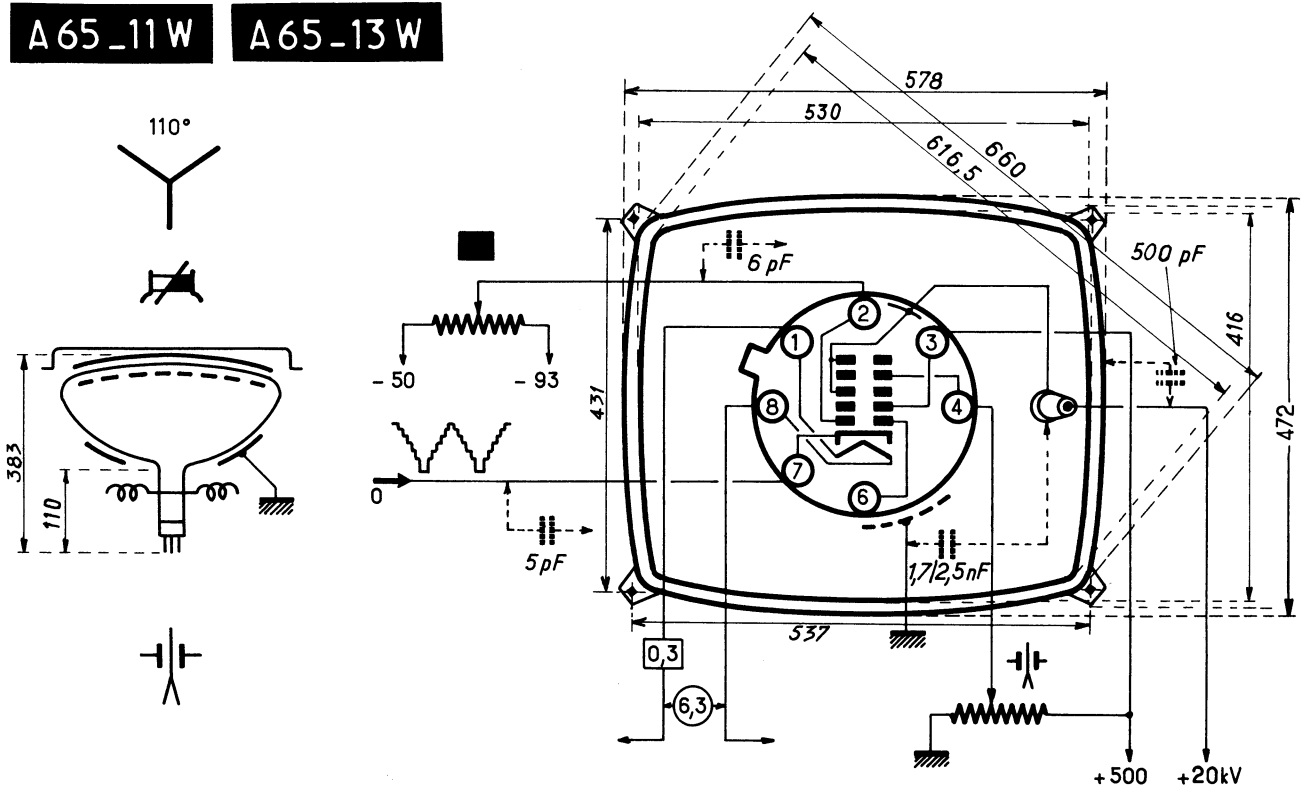

A63-11X
A63-16X
A63-120X
+210
+495
7pF
B-Y
(-105)
(Vg2=+300)
-70
-140
7pF
G-Y
-Y
0
15pF
90°
Co
120X
52%
120X
521
165
36,5
= ⊥ 5-12
552
504
584
631
500pF
7pF
R G B
R V B
2/2,5nF
396
450,5
+210/495
+210/495
7pF
+4,2kV
+5kV
R-Y
25kV
X
0,9
6,3

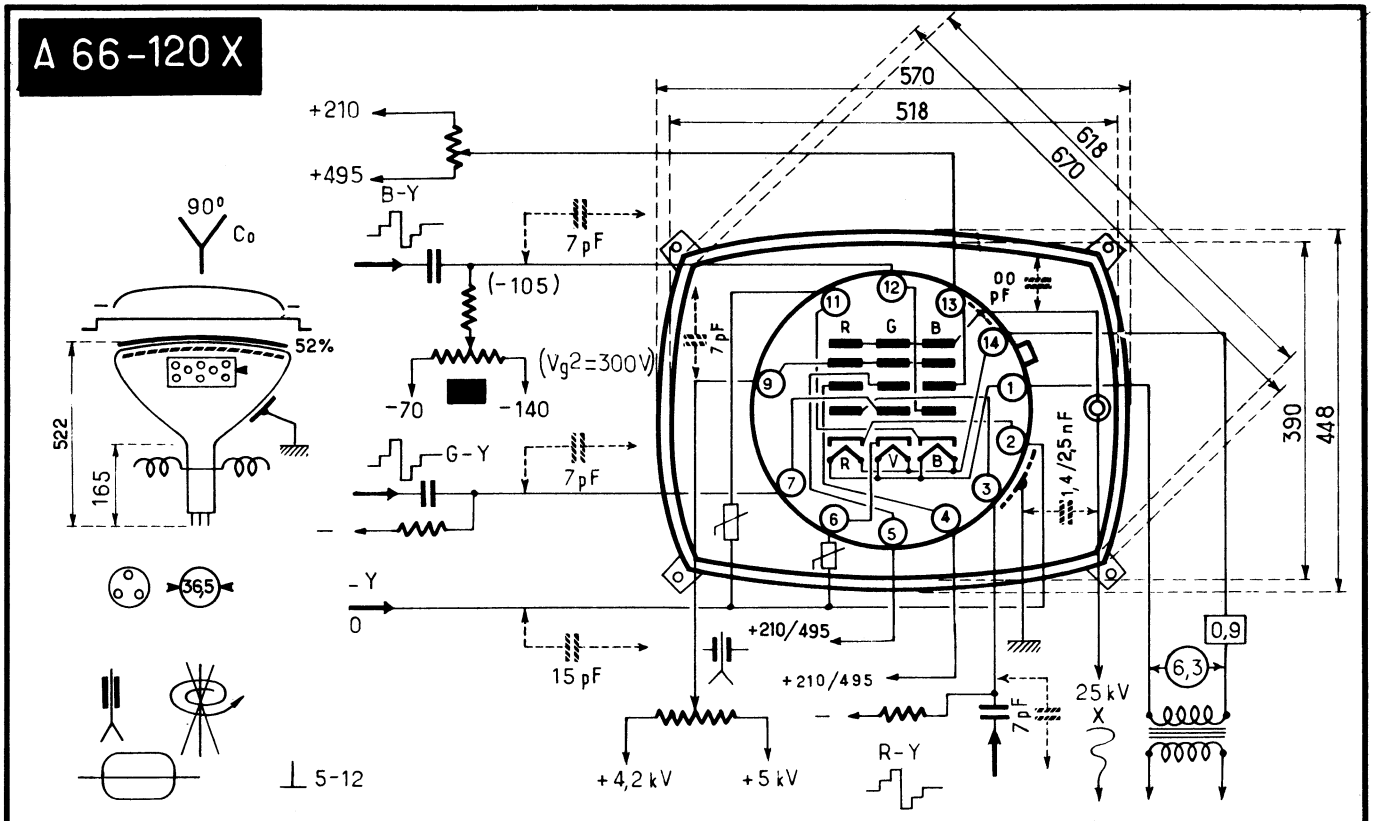

A 63 - 161 X
+ 285
+ 685
90°
Co
B-Y
9 pF
(-140)
-95
-190
411
G-Y
9 pF
-Y
12 pF
0
536
176
36,5
= ⊥ 5-12
554
504
585
632
394
446,5
R
G
B
R
V
B
2/2,5 nF
517
+285/685
+285/685
9 pF
+4,2 kV
+ 5 kV
R-Y
9 pF
25 kV
X
6,3
0,9

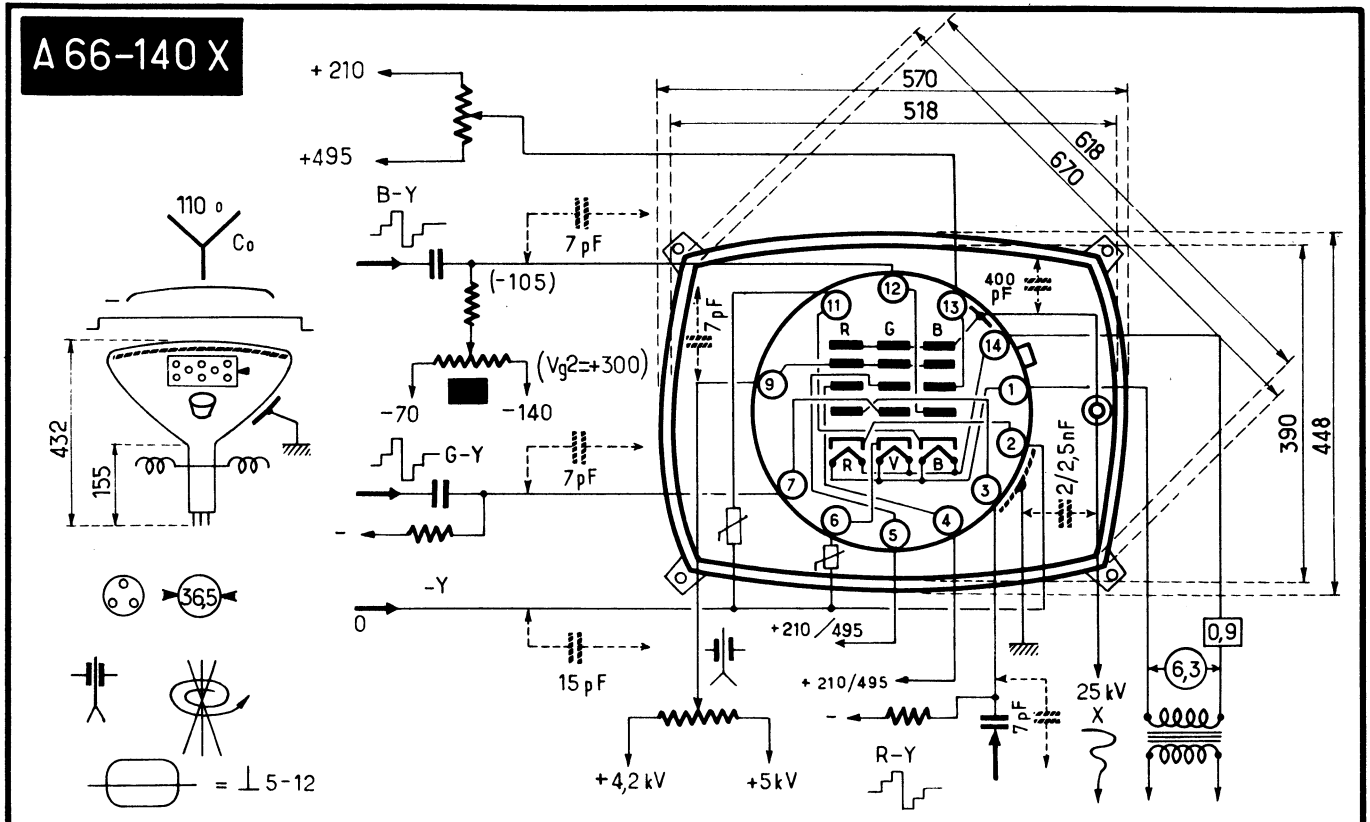

A63-14X
+285
+685
B-Y
6/9 pF
(-150)
(Vg2=400)
-95
-190
G-Y
6/9 pF
12/15 pF
-Y
0
89°
Co
532
170
36,5
5-12
545
505
584
623
517
R G B
R V B
2/2,5 nF
411
395
438
+285/685
6,5/9 pF
+4,2 kV
+5 kV
+285/685
6/9 pF
R-Y
25 kV
X
6,3
0,8

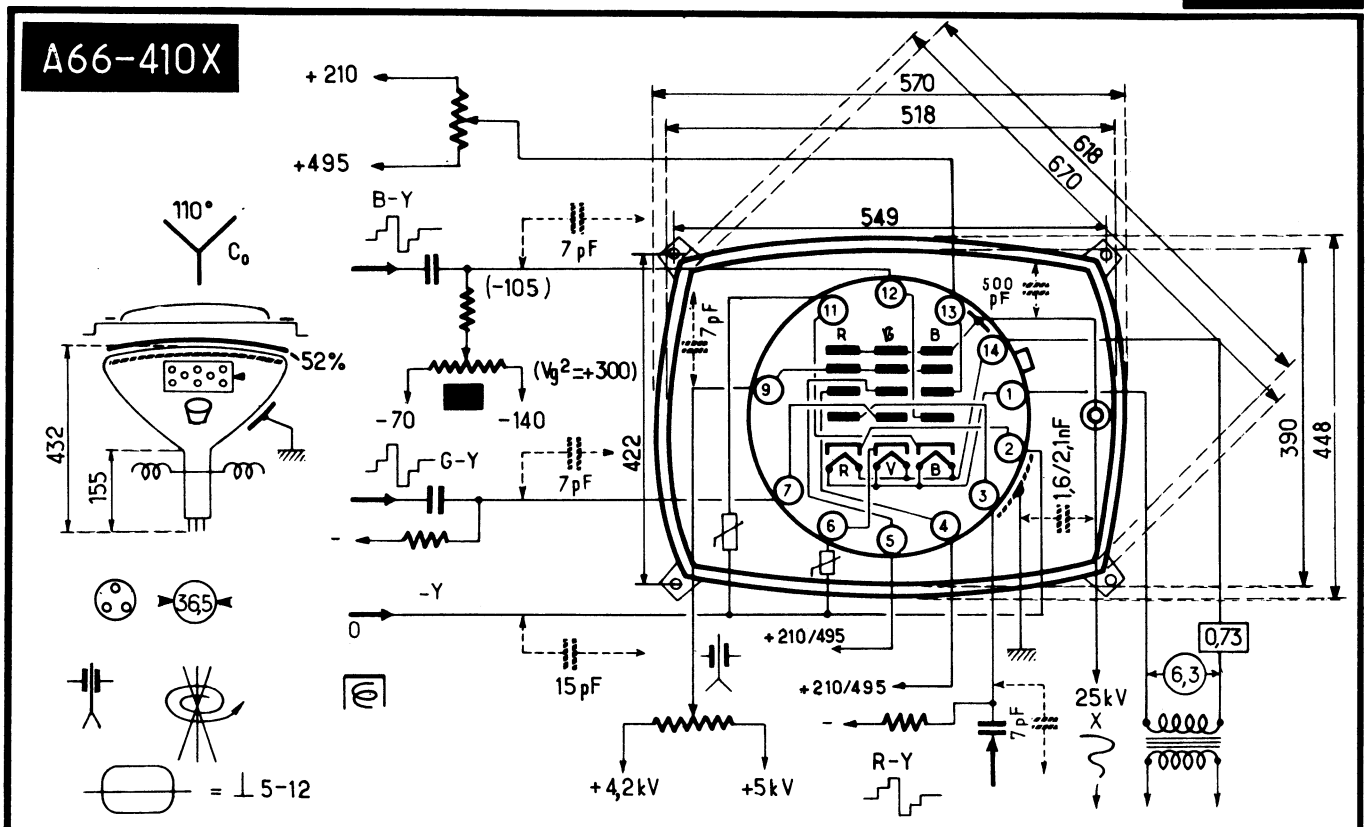

A63_200X
+285
+685
90°
Co
B-Y
6pF
(-150)
(Vg2 + =400)
-95
-190
52%
526
165
G-Y
6pF
-Y
15pF
0
36,5
= ⊥ 5-12
556
504
585
632
300pF
17pF
R
G
B
R
V
B
2/3 nF
395
450,5
+285/685
+285/685
+4,2 kV
+5 kV
R-Y
6pF
25kV
X
0,9
6,3

A65_11W A65_13W

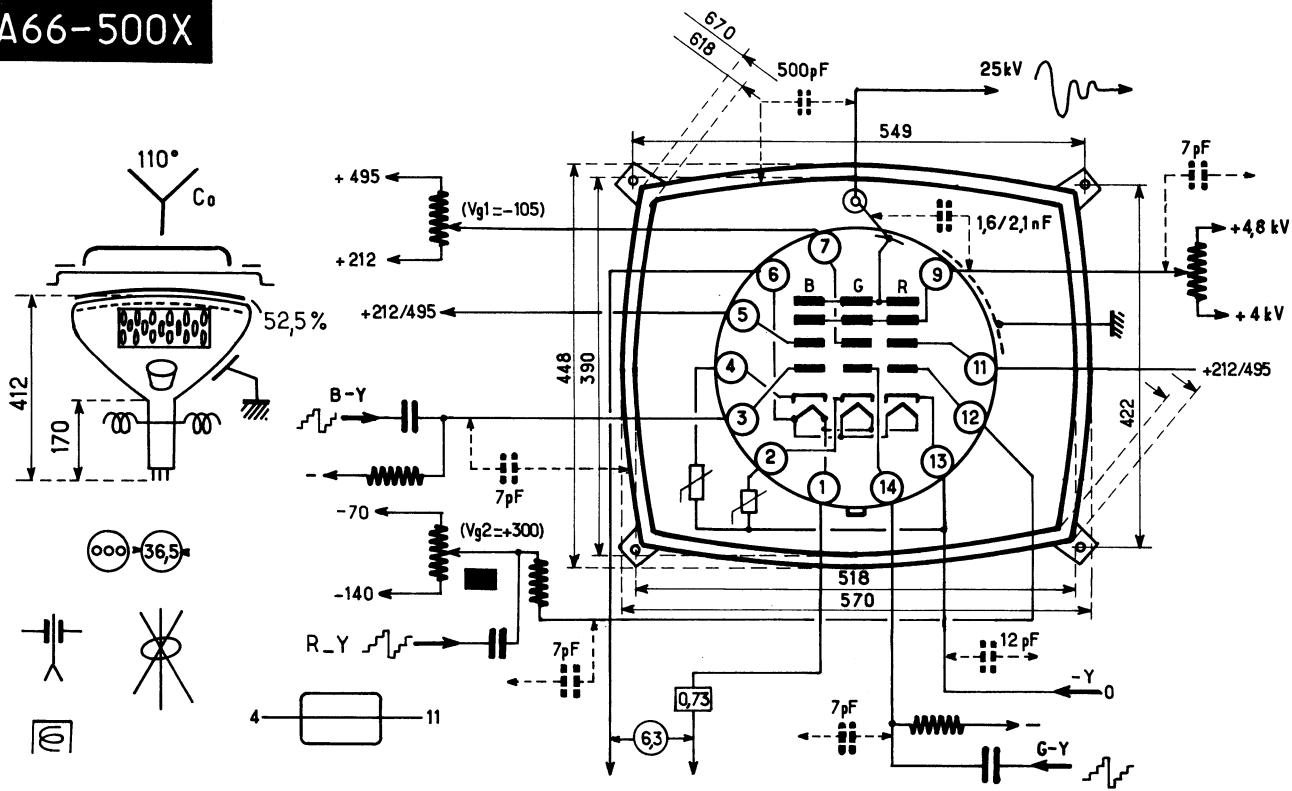



A 66-120 X
570
518
618
670
+210
+495
B-Y
7 pF
(-105)
(Vg2=300V)
-70
-140
G-Y
7pF
-Y
0
15 pF
90°
Co
52%
522
165
365
⊥ 5-12
+4,2 kV
+5 kV
+210/495
+210/495
R-Y
7pF
25 kV
X
1,4/25 nF
390
448
0,9
6,3
R
G
B
R
V
B

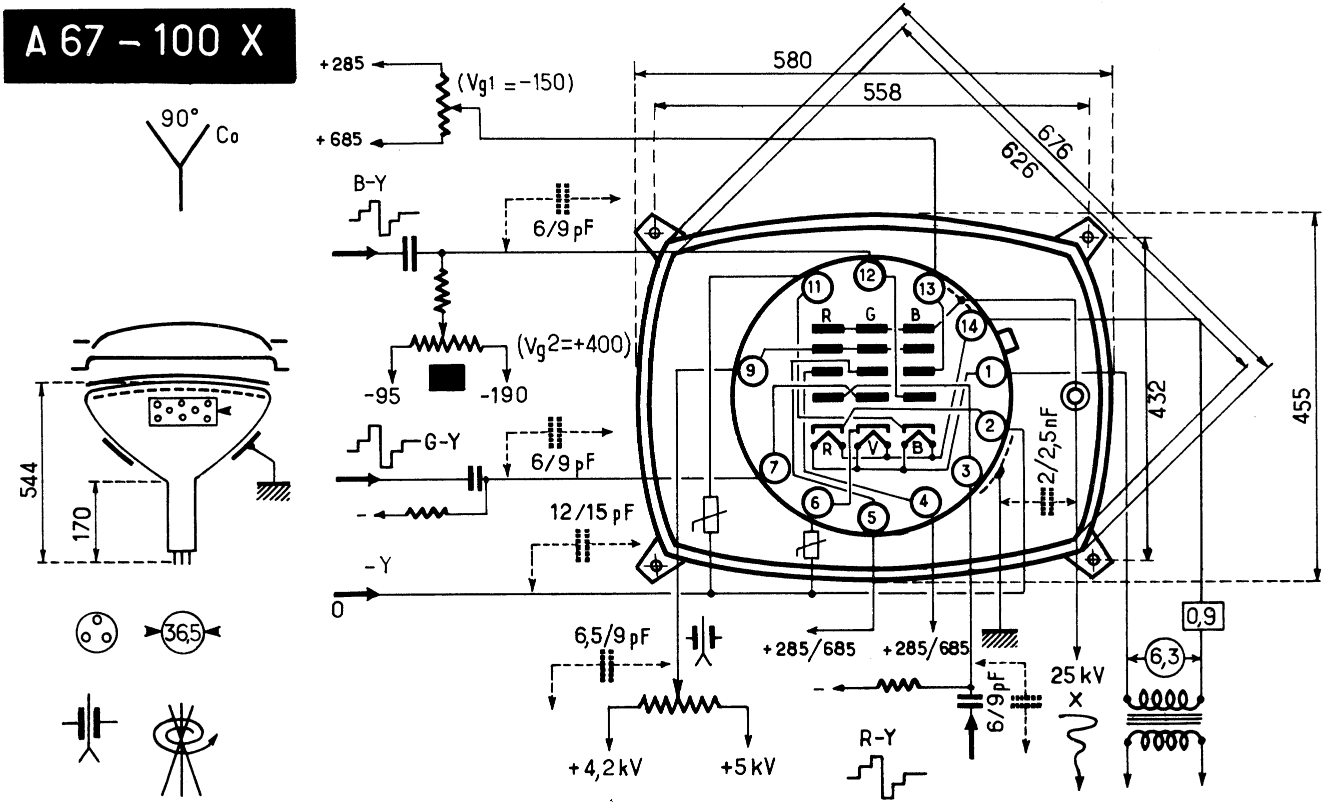

+ 210
+495
B-Y
7 pF
(-105)
(Vg2=+300)
-70
-140
G-Y
7pF
-Y
0
15 pF
110 °
Co
432
155
36,5
= ⊥ 5-12
570
518
618
670
400 pF
7pF
R G B
R V B
2/2,5nF
390
448
+210 / 495
+ 210/495
+4,2 kV
+5kV
R-Y
7 pF
25 kV
X
0,9
6,3

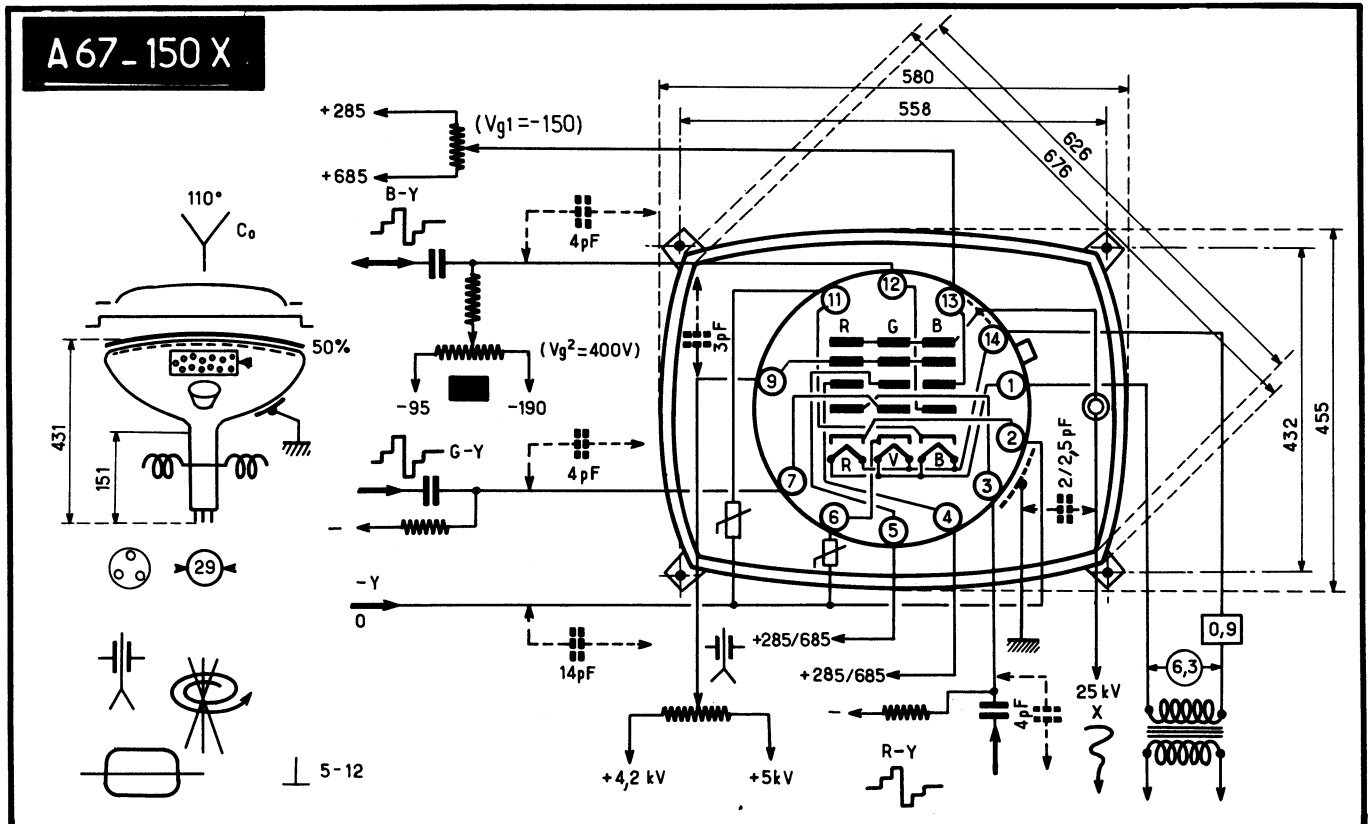

+ 210
+495
B-Y
7 pF
(-105)
(Vg2=+300)
-70
-140
G-Y
7pF
422
-Y
0
15pF
110°
C0
52%
432
155
36,5
= ⊥ 5-12
570
518
618
670
549
500 pF
7pF
R
G
B
V
1,6/2,1nF
390
448
+210/495
+210/495
0,73
6,3
25kV
X
R-Y
+4,2kV
+5kV
7pF

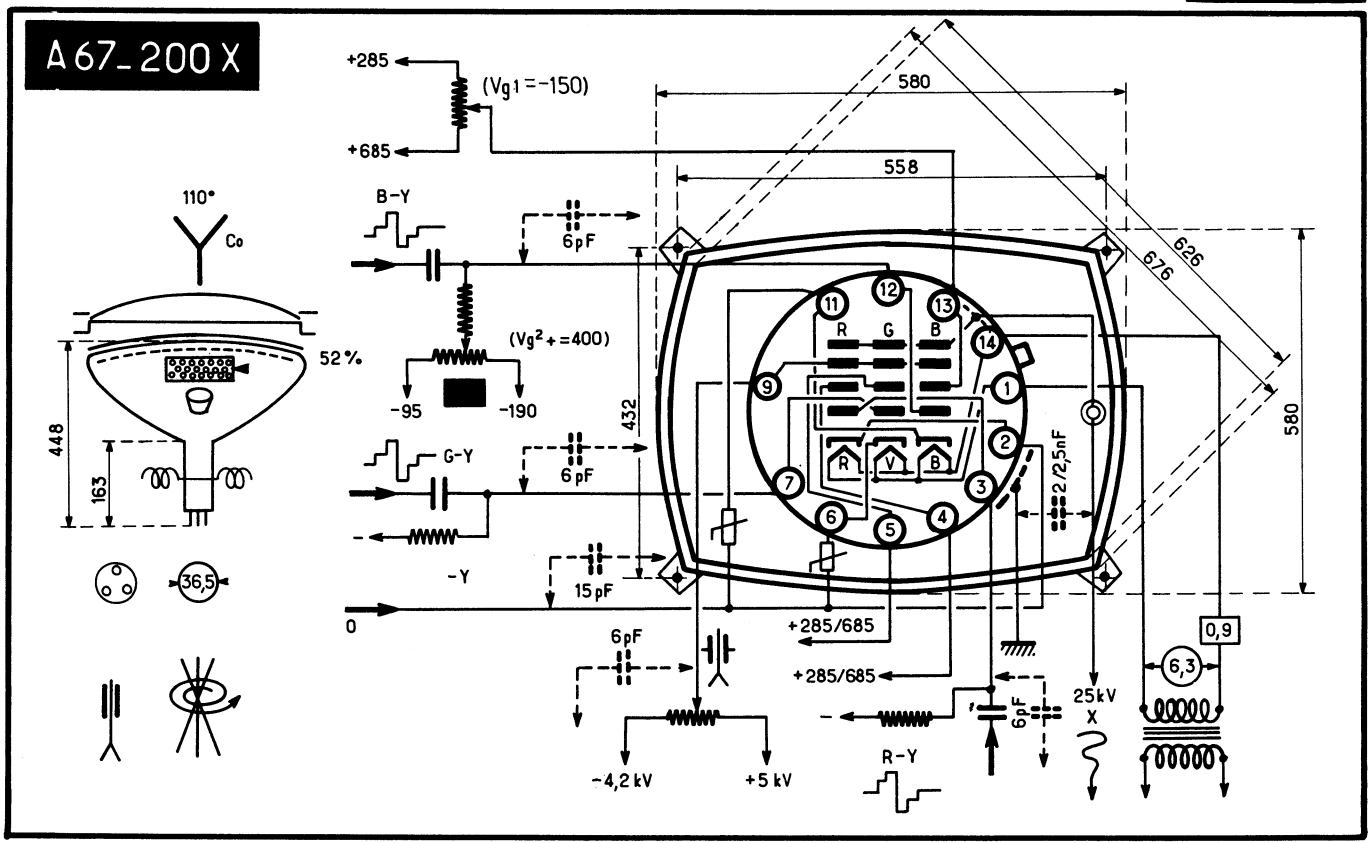
A66-500X

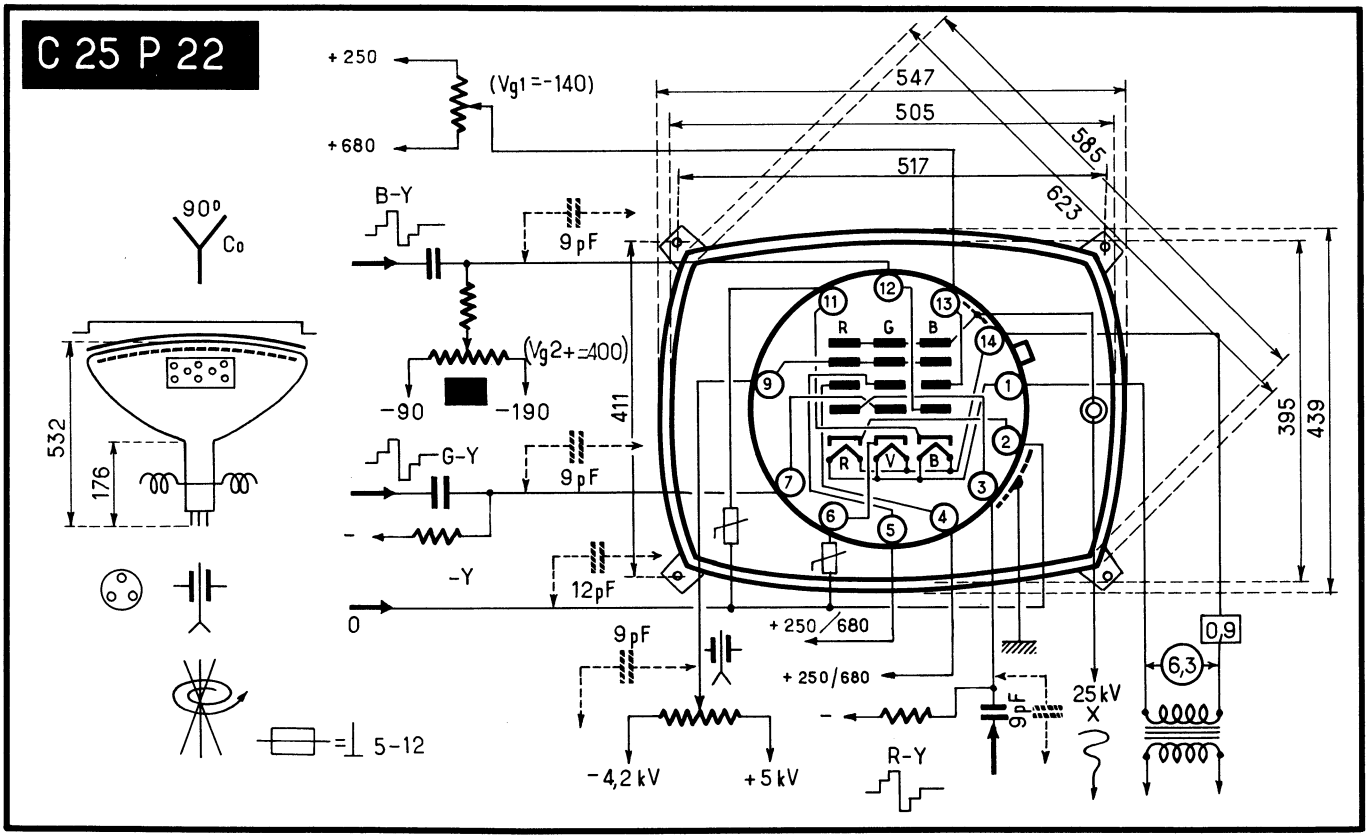

670
618
500pF
25kV
549
7pF
+4,8 kV
+4 kV
1,6/2,1nF
110°
Co
52,5 %
412
170
+ 495
(Vg1=-105)
+ 212
+212/495
448
390
B
G
R
B-Y
7pF
+212/495
422
-70
(Vg2=+300)
-140
36,5
518
570
R_Y
7pF
12 pF
-Y
0
0,73
6,3
7pF
G-Y
4
11

A 67 - 100 X

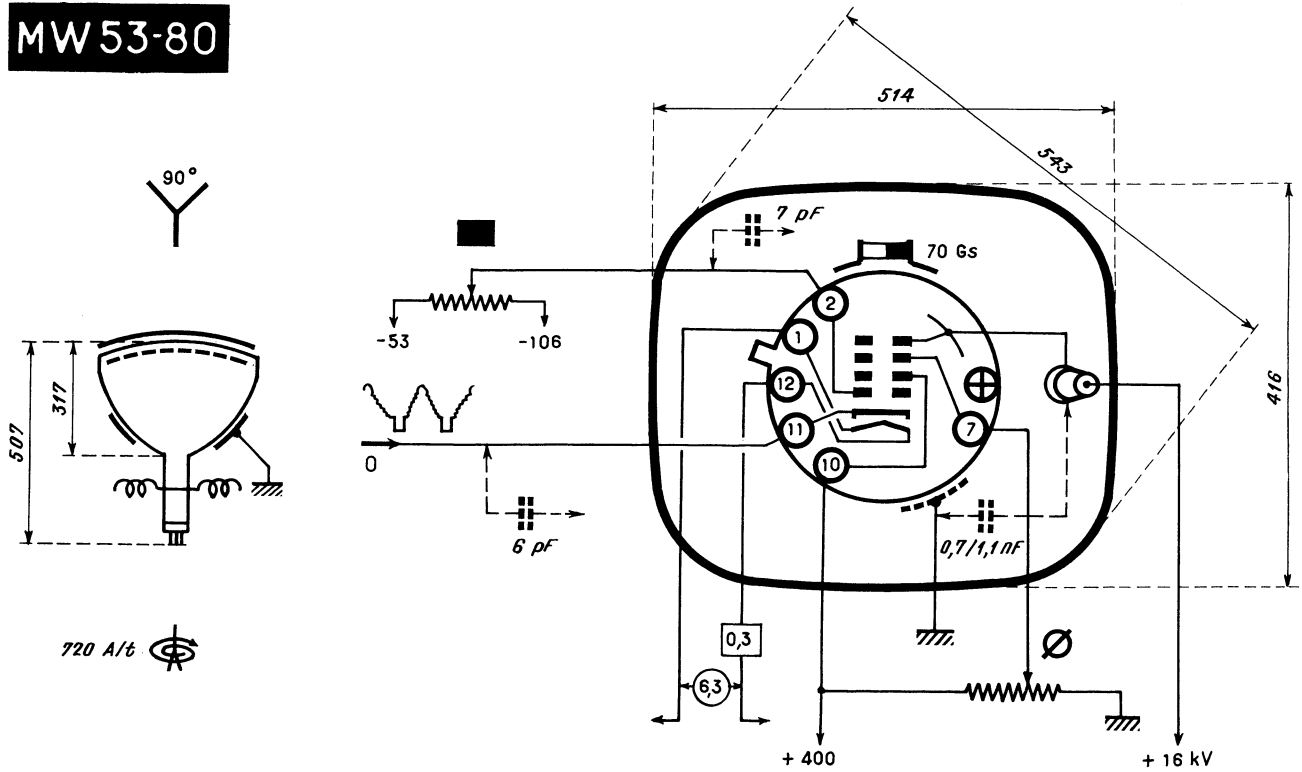

90°
Co
544
170
36,5
+285
+685
(Vg1 =−150)
B-Y
6/9 pF
(Vg2=+400)
-95
-190
G-Y
6/9 pF
12/15 pF
-Y
0
6,5/9 pF
+4,2 kV
+5 kV
+285/685
+285/685
R-Y
6/9 pF
25 kV
2/2,5 nF
580
558
676
626
432
455
0,9
6,3
R
G
B
R
V
B


A 67-150 X
+285
(Vg1=-150)
+685
B-Y
4pF
110°
Co
50%
431
151
29
(Vg2=400V)
-95
-190
G-Y
4pF
-Y
0
14pF
5-12
580
558
626
676
3pF
R G B
11
12
13
14
9
1
2
7
3
6
5
4
R V B
2/2,5 pF
432
455
+285/685
+285/685
4pF
25 kV
X
0,9
6,3
+4,2 kV
+5kV
R-Y

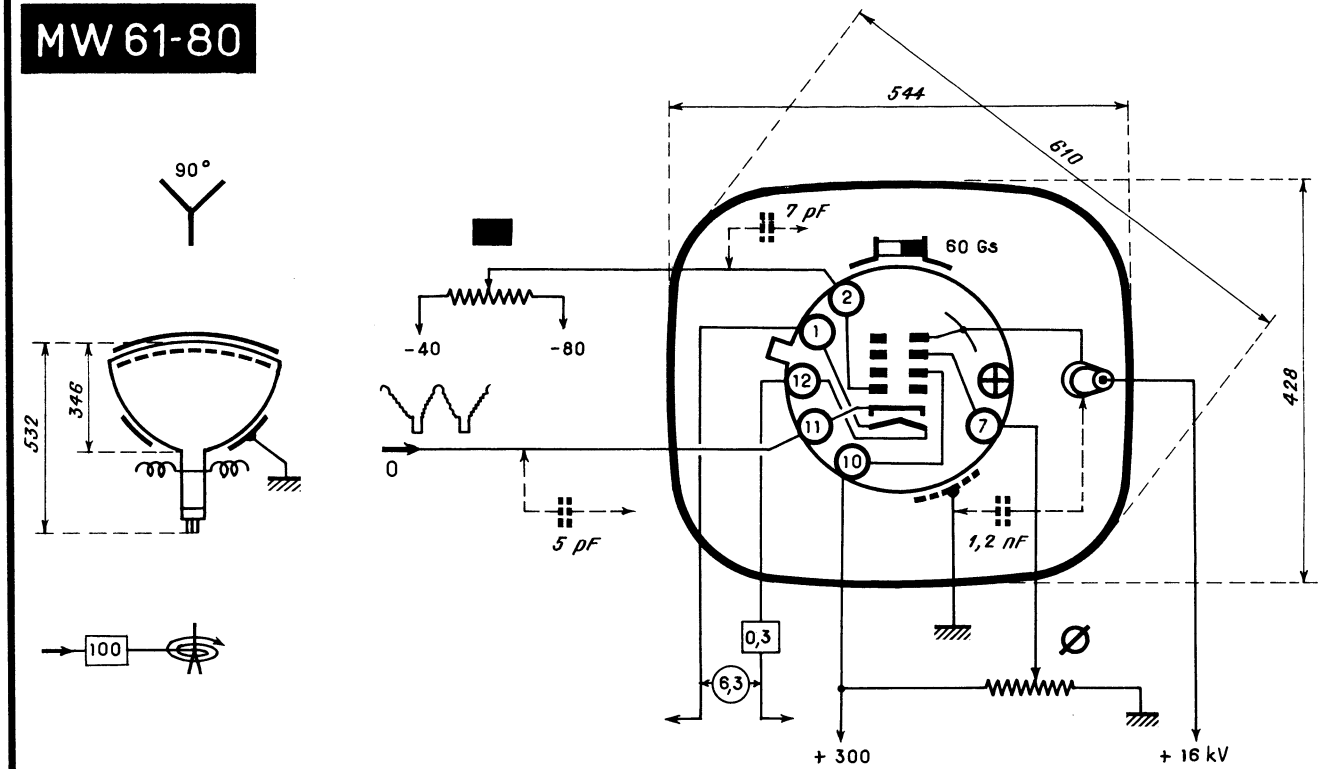

A 67_200 X
+285
(Vg1 = -150)
+685
580
558
626
676
580
110°
Co
52 %
448
163
36,5
B-Y
6pF
(Vg2 + = 400)
-95
-190
432
G-Y
6pF
-Y
15pF
0
R
G
B
R
V
B
2 /2,5nF
+285/685
+285/685
6pF
-4,2 kV
+5 kV
R-Y
6pF
25kV
X
0,9
6,3


C 25 P 22
+ 250
(Vg1 =-140)
+ 680
547
505
585
517
623
B-Y
9 pF
90°
Co
(Vg2+=400)
-90
-190
411
532
176
G-Y
9 pF
-Y
12pF
0
9 pF
+ 250/680
+ 250/680
0,9
6,3
25kV
X
9pF
R-Y
-4,2 kV
+5 kV
5-12
R
G
B
R
V
B
395
439

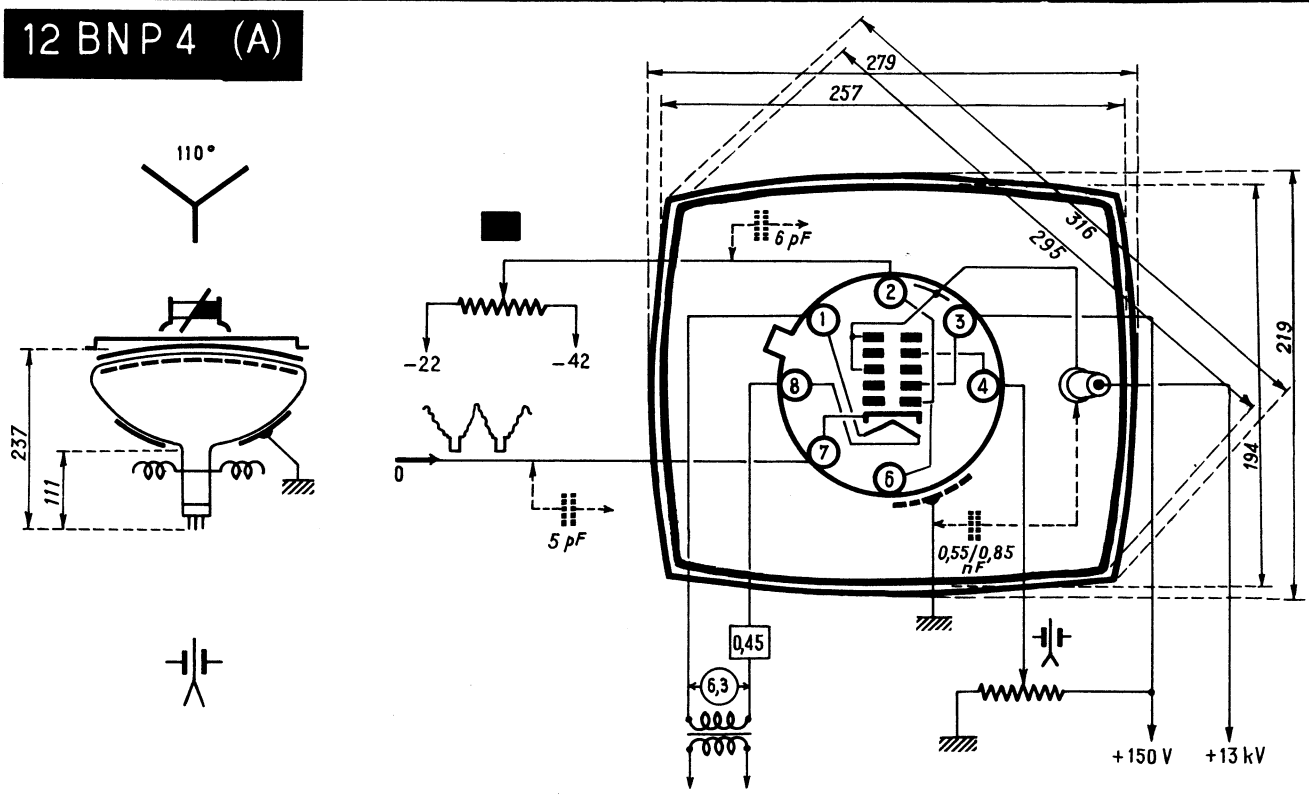
MW 53-80


514
543
416
90°
7 pF
70 Gs
-53
-106
0
6 pF
0,7/1,1 nF
507
317
720 A/t
0,3
6,3
+ 400
+ 16 kV
1
2
7
10
11
12

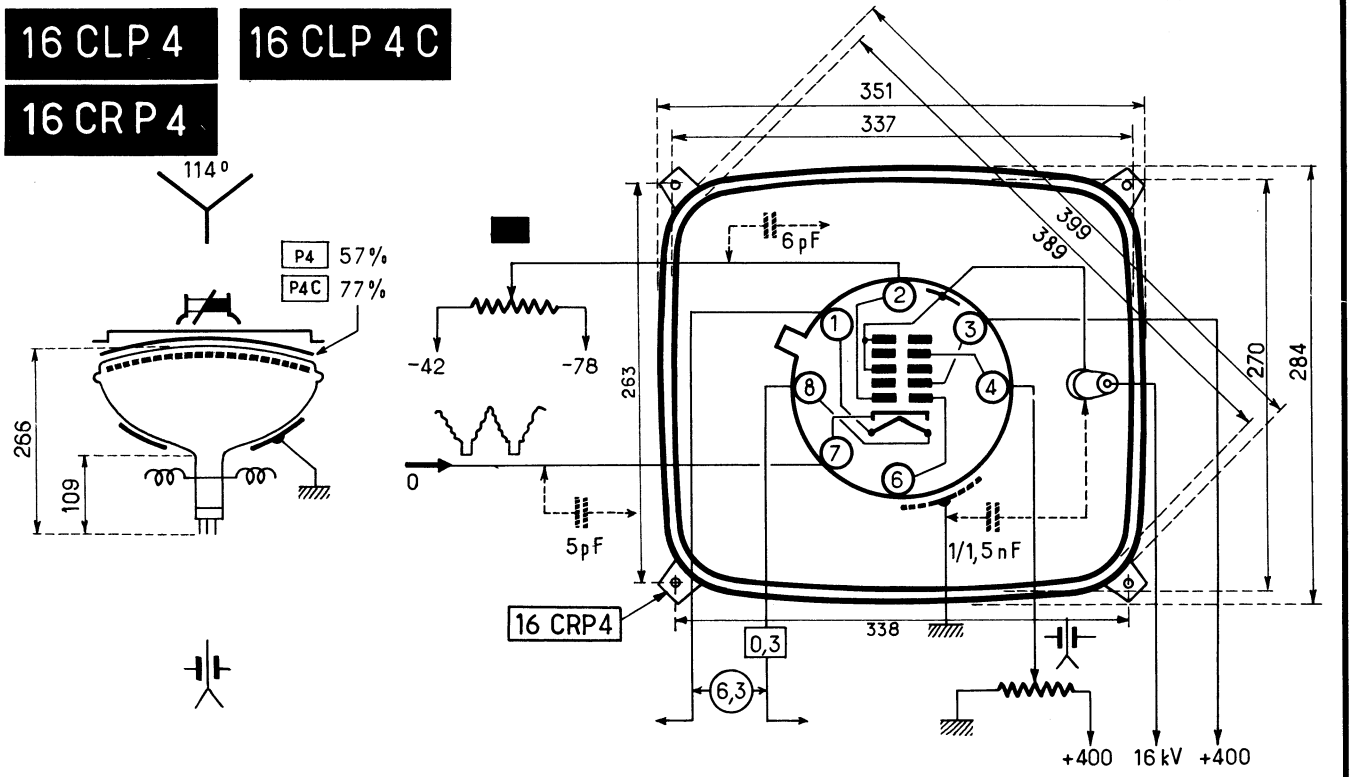
MW 61-80


544
610
428
90°
346
532
100
7 pF
60 Gs
-40
-80
0
5 pF
1,2 nF
0,3
6,3
+ 300
+ 16 kV
1
2
7
10
11
12

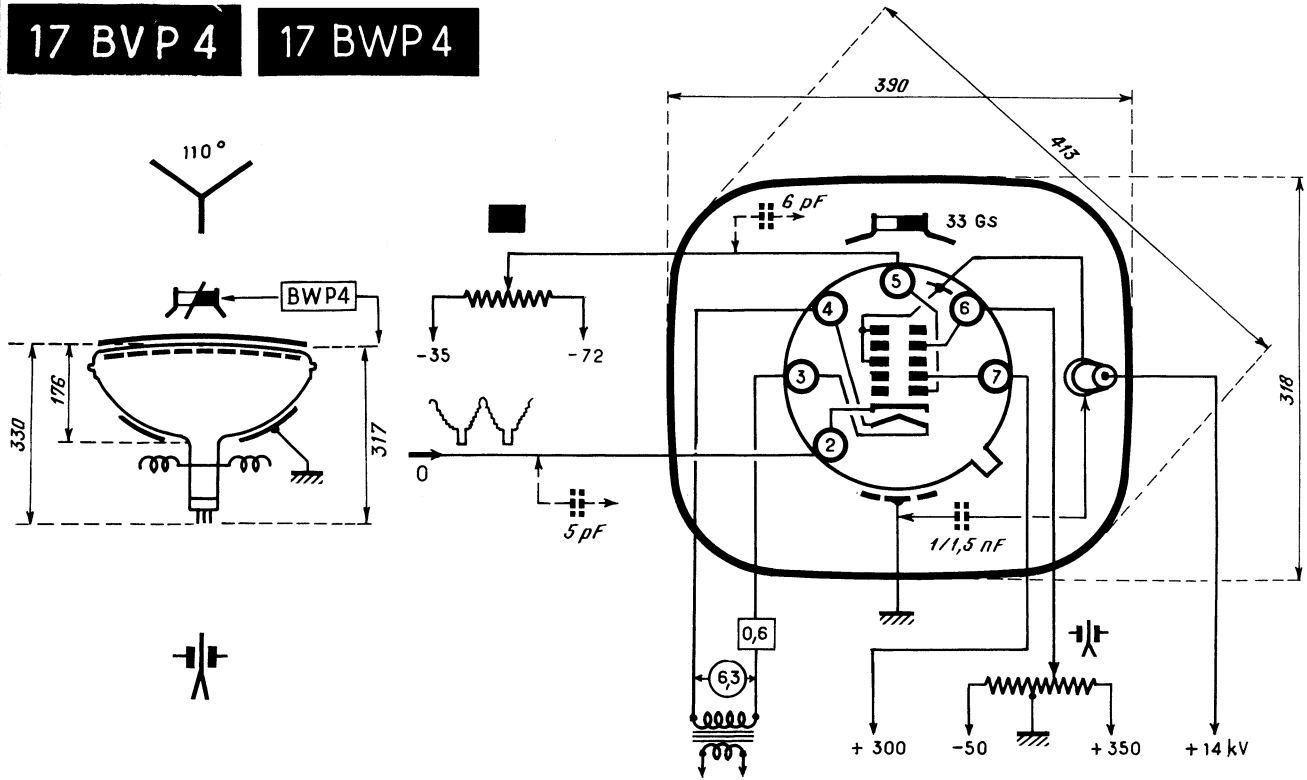
12 BNP 4 (A)


110°
237
111
279
257
316
295
219
194
6 pF
-22
-42
0
5 pF
0,55/0,85 nF
1
2
3
4
6
7
8
0,45
6,3
+150 V
+13 kV

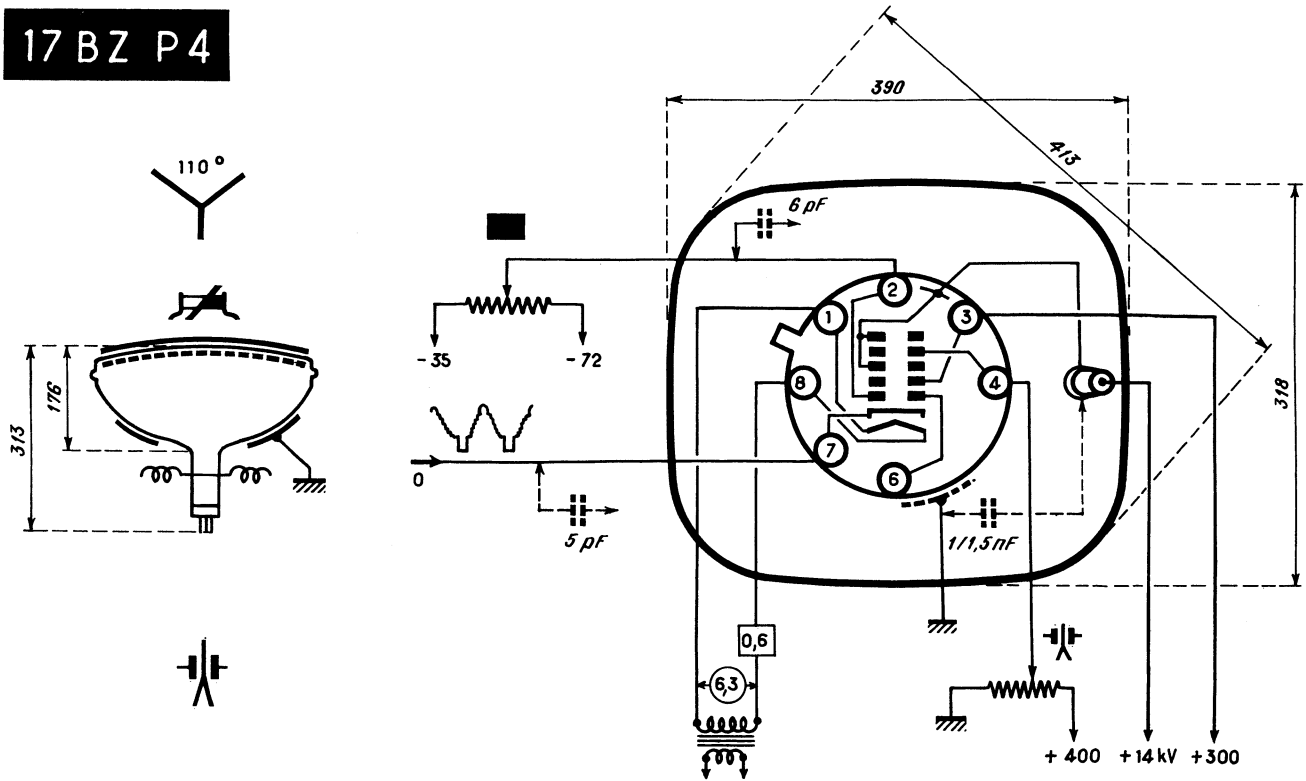
16 CLP 4 — 16 CLP 4 C — 16 CR P 4



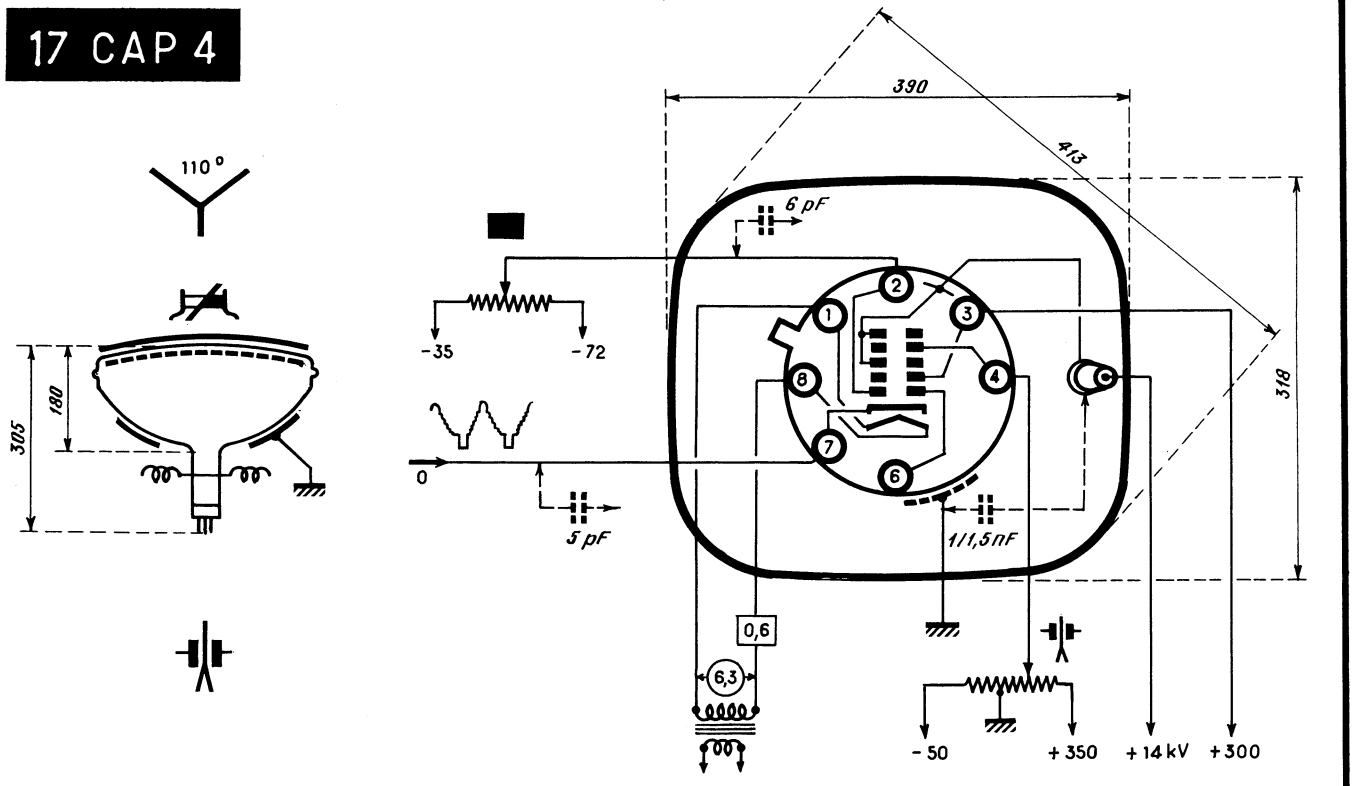
17 BVP 4 / 17 BWP 4



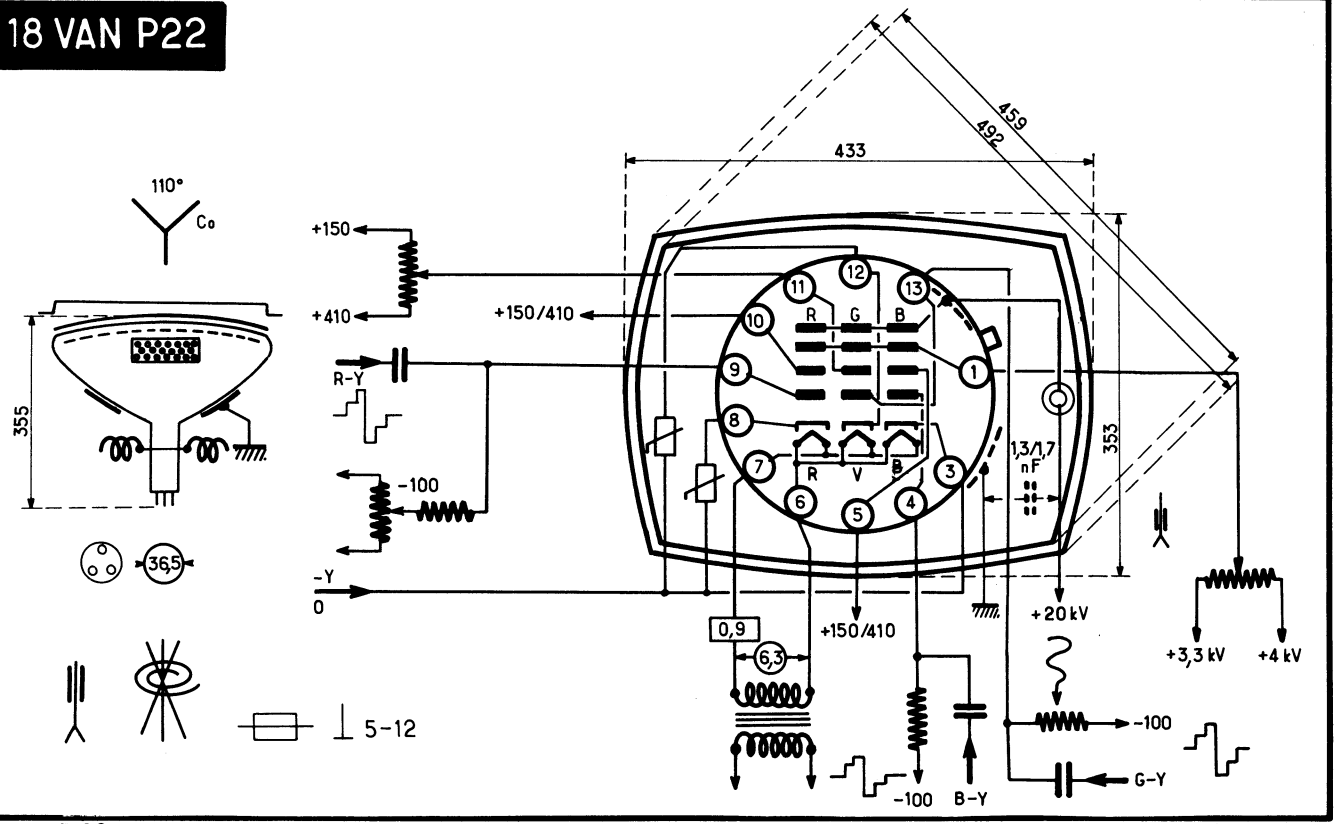
17 BZ P4


110 °
313
176
390
413
318
6 pF
- 35
- 72
0
5 pF
1/1,5 nF
0,6
6,3
+ 400
+ 14 kV
+ 300
1
2
3
4
6
7
8

17 CAP 4

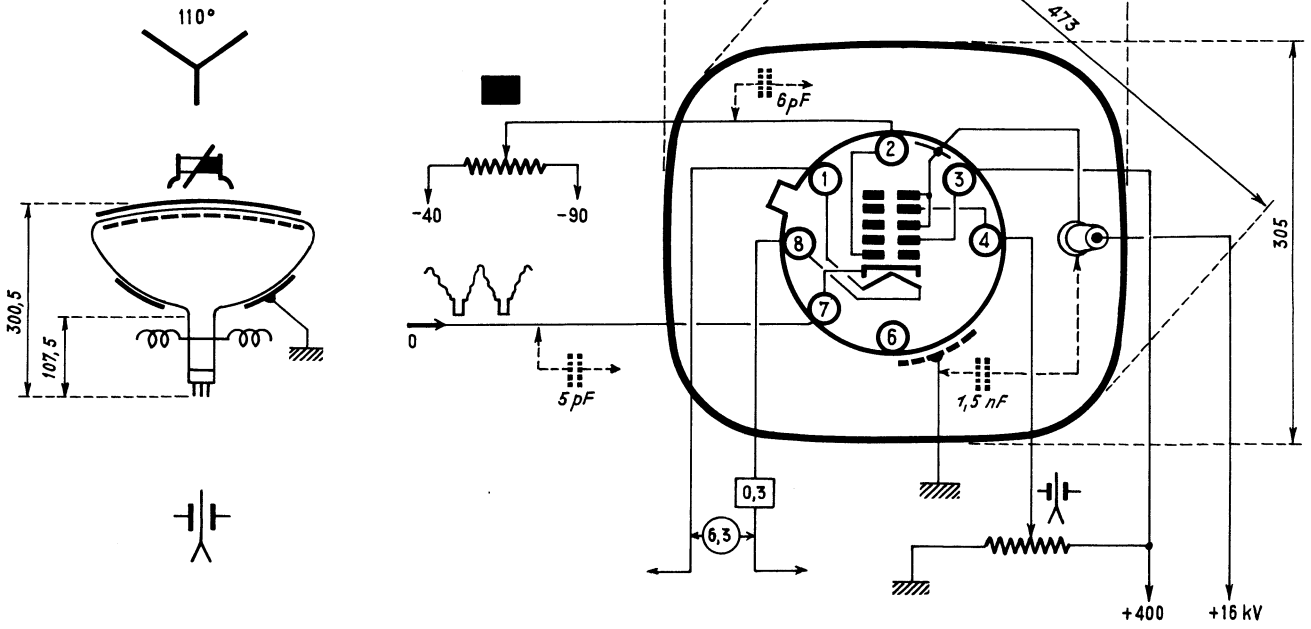

110°
305
180
390
413
318
6 pF
-35
-72
0
5 pF
1/1,5 nF
0,6
6,3
1
2
3
4
6
7
8
- 50
+ 350
+ 14 kV
+ 300

18 VAN P22

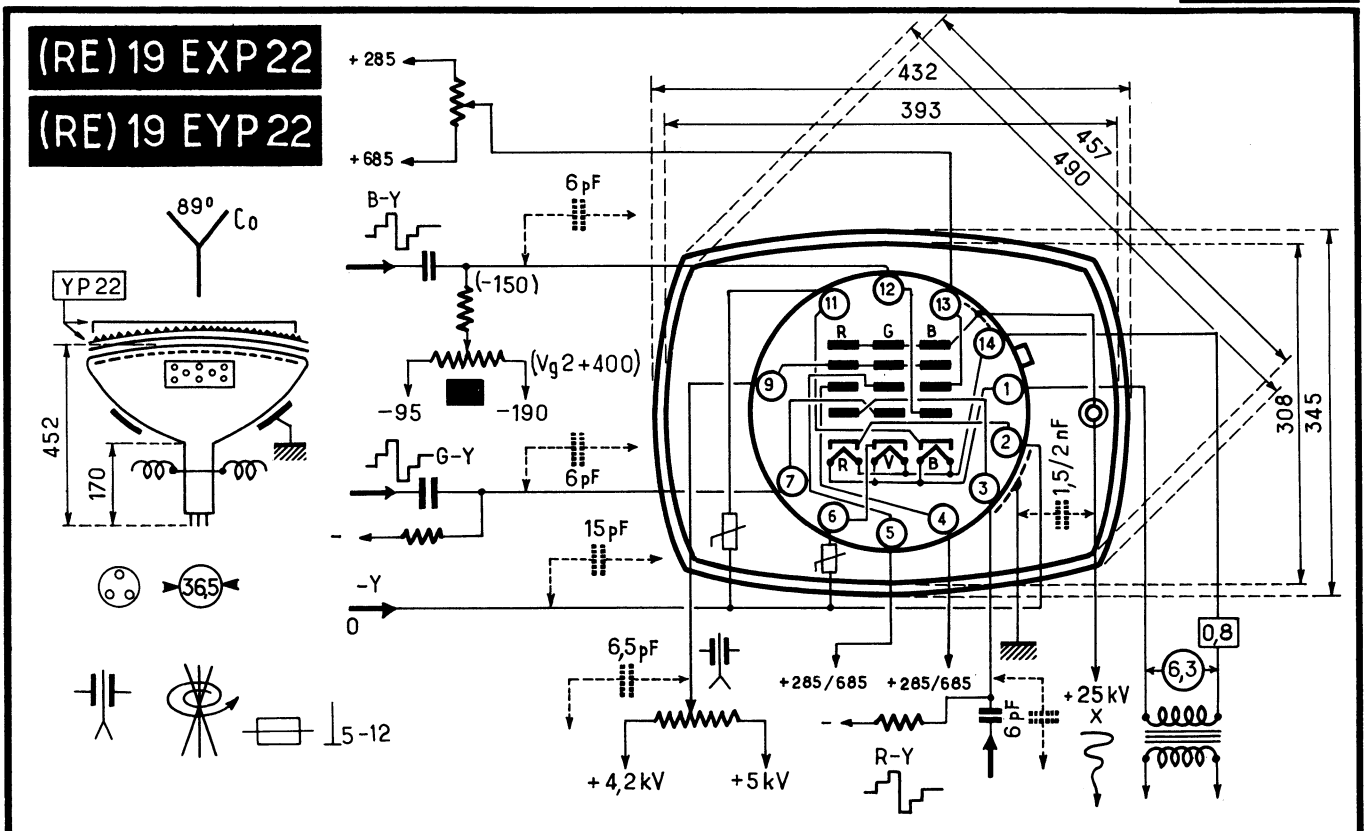

459
492
433
110°
Co
355
+150
+410
+150/410
R-Y
-100
-Y
0
36,5
11
12
13
10
9
8
7
6
5
4
3
1
R
G
B
R
V
B
1,3/1,7
nF
353
+20 kV
+3,3 kV
+4 kV
0,9
6,3
+150/410
-100
B-Y
-100
G-Y
5-12

19 BEP 4

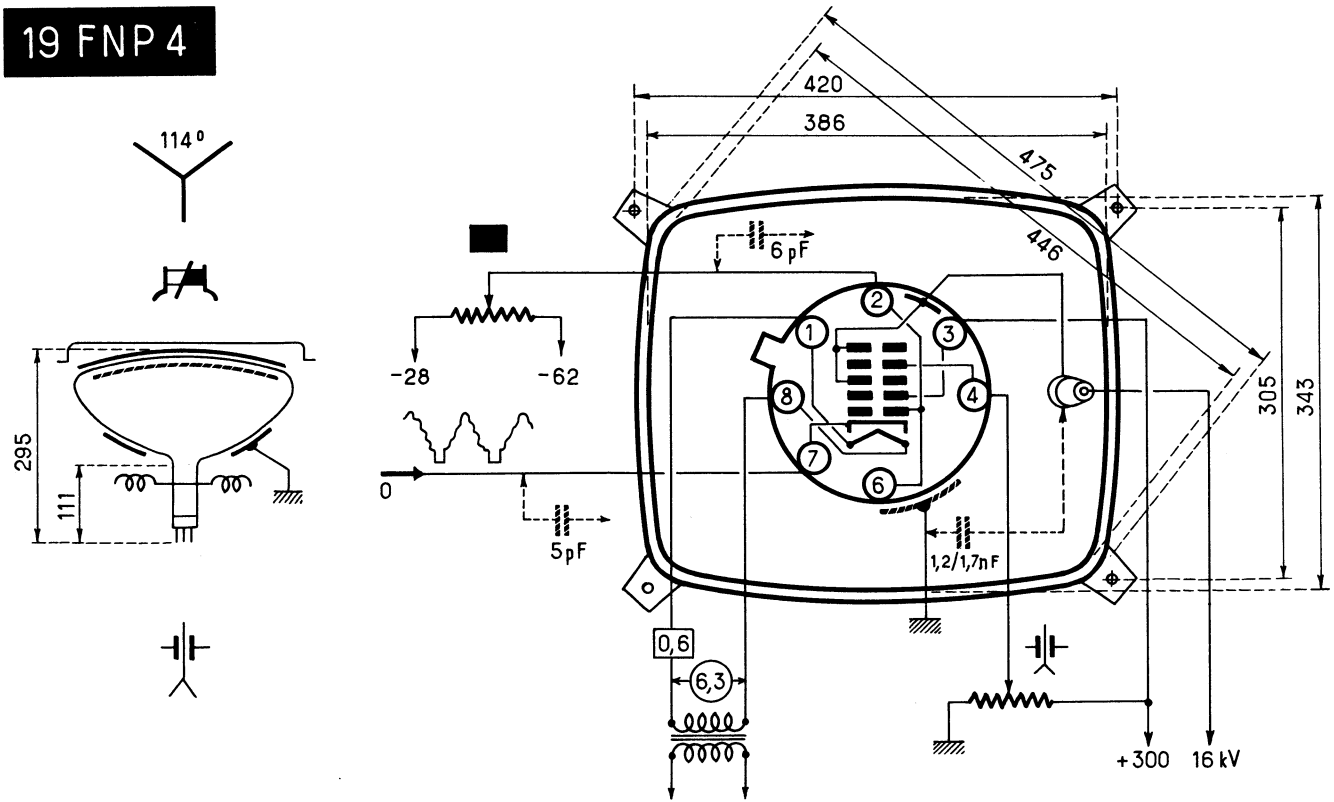
19 CTP 4



(RE) 19 EXP 22
(RE) 19 EYP 22

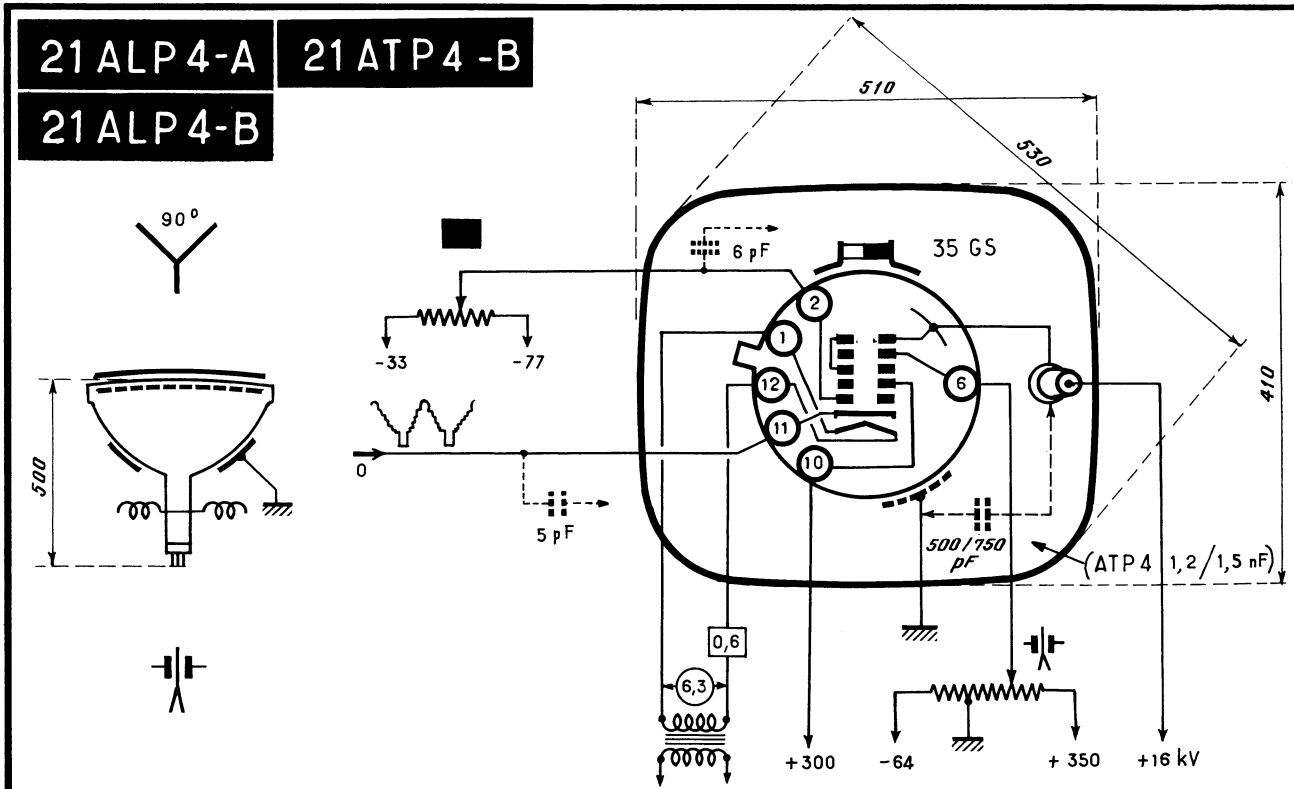


19 FNP 4

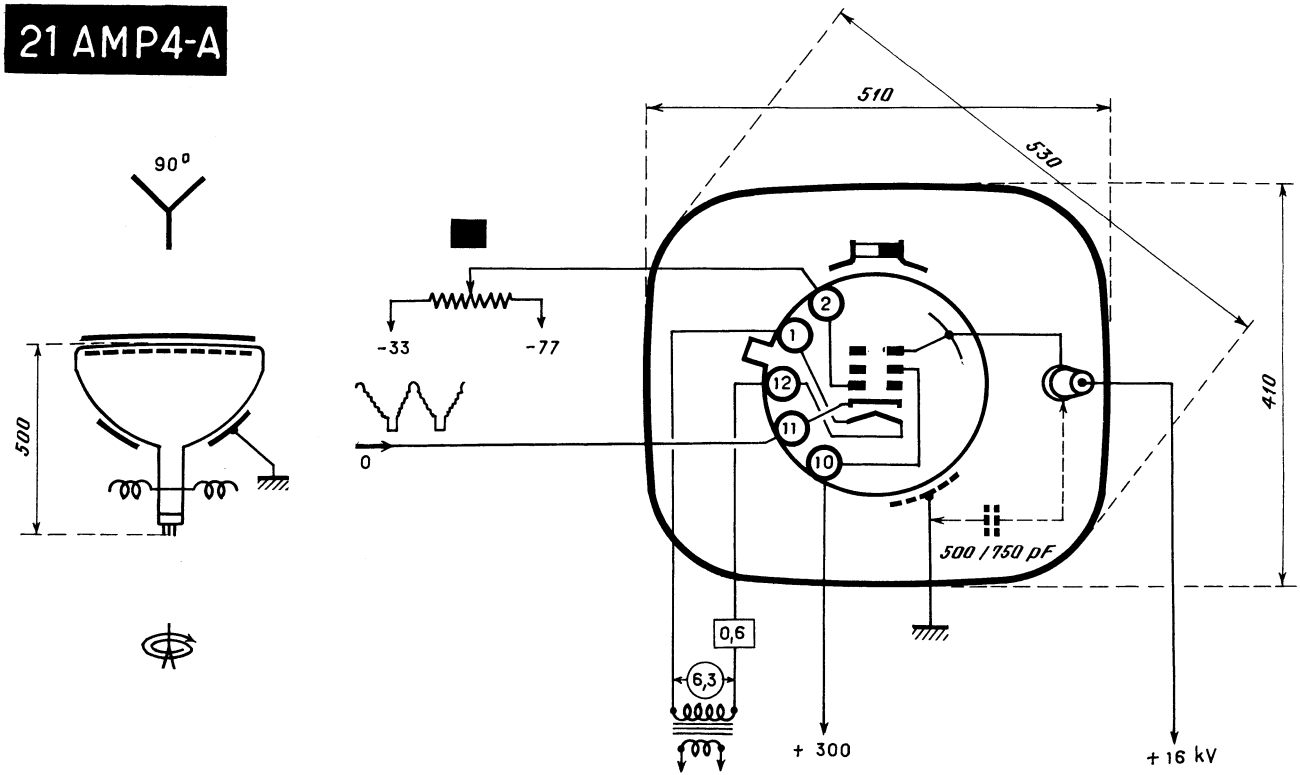

114°
295
111
420
386
475
446
305
343
6 pF
-28
-62
0
5pF
1,2/1,7nF
0,6
6,3
+300
16 kV
1
2
3
4
6
7
8

21 ALP 4-A | 21 ATP 4 -B

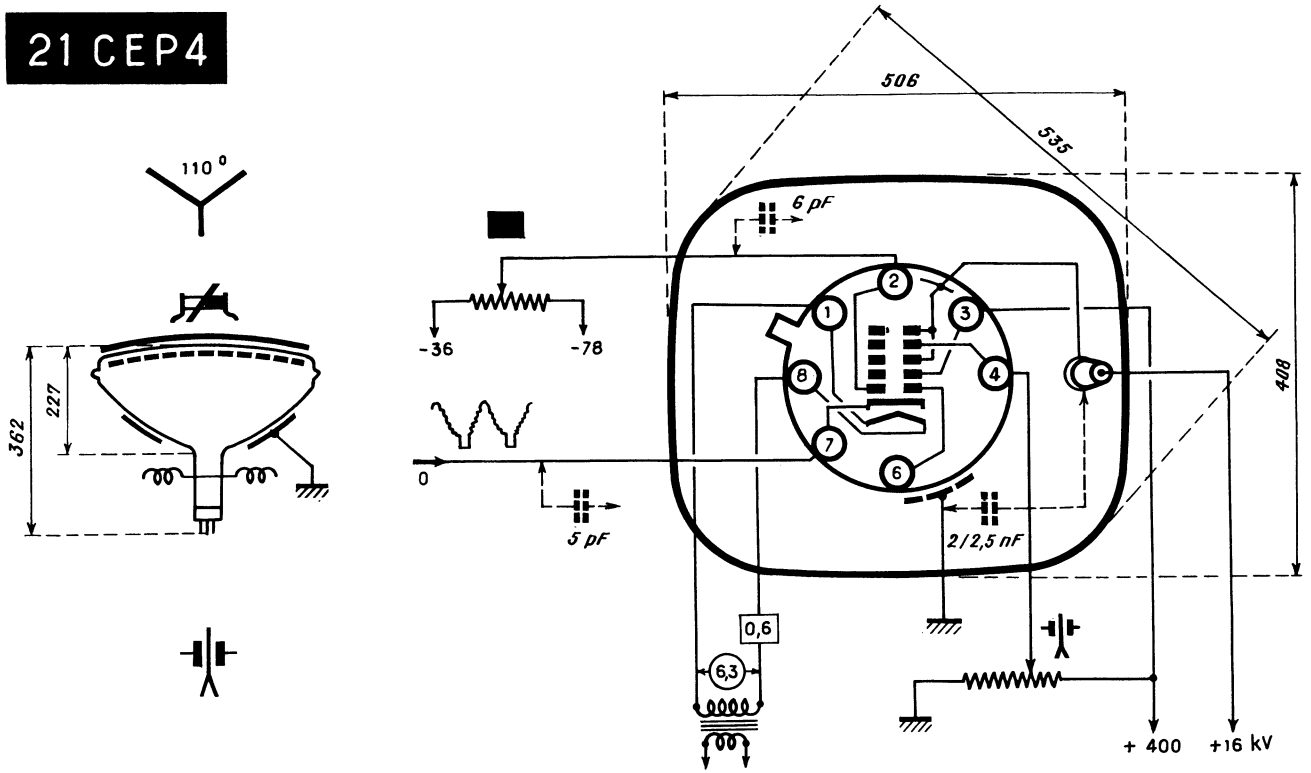
21 ALP 4-B



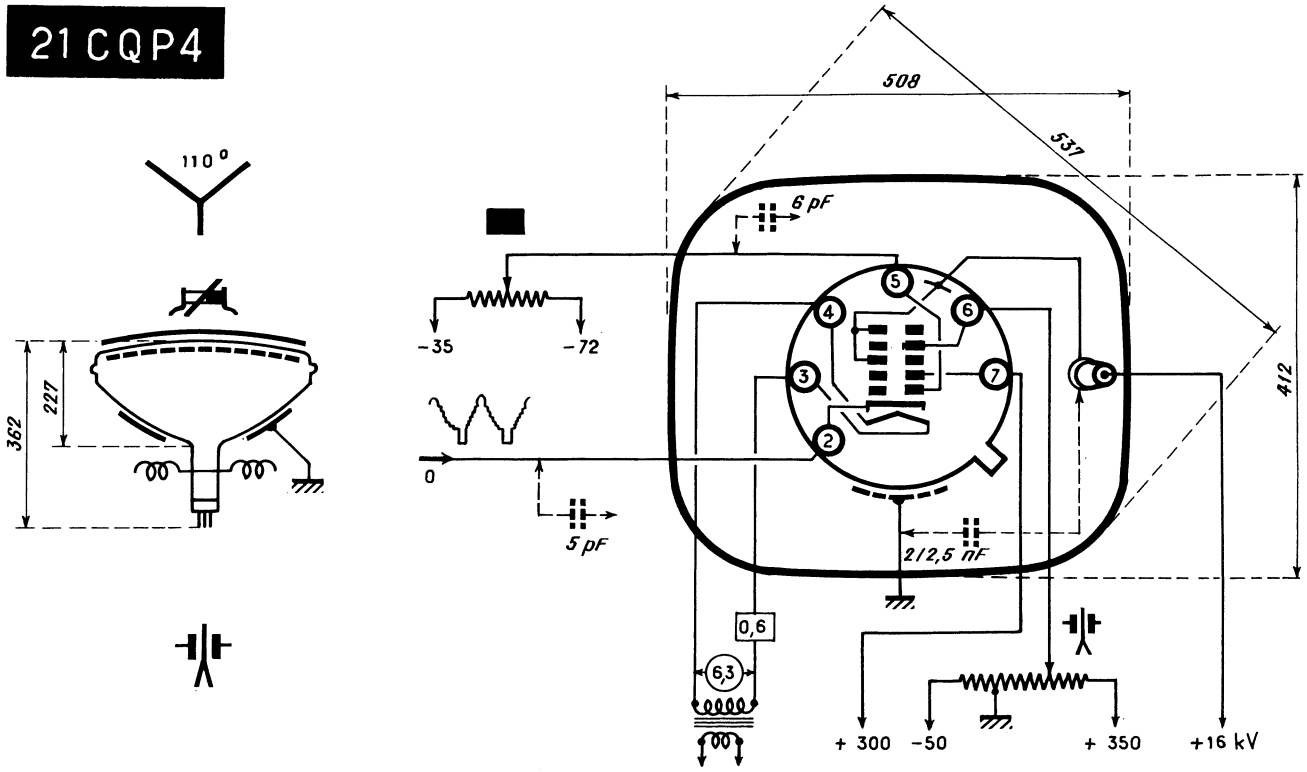
21 AMP4-A



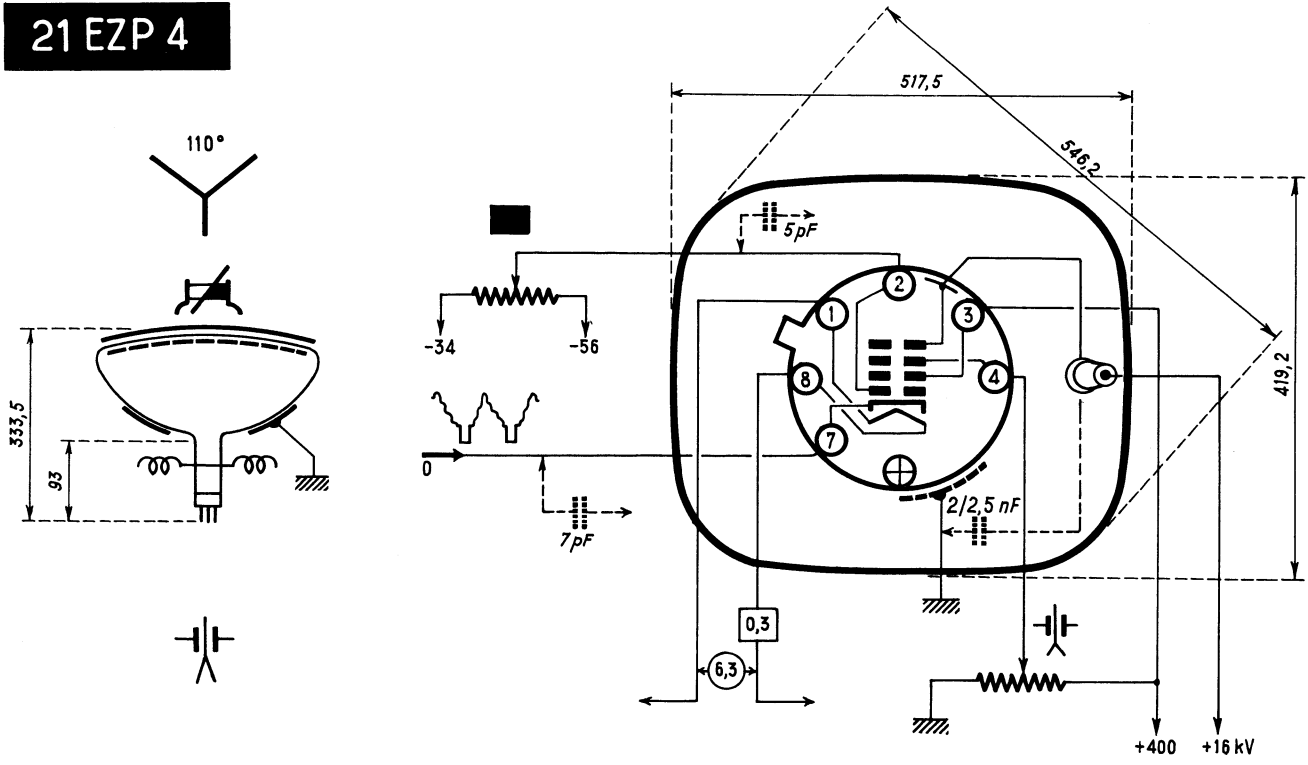
21 CEP4


110°
362
227
506
535
408
6 pF
-36
-78
0
5 pF
2/2,5 nF
0,6
6,3
+ 400
+16 kV
1
2
3
4
6
7
8

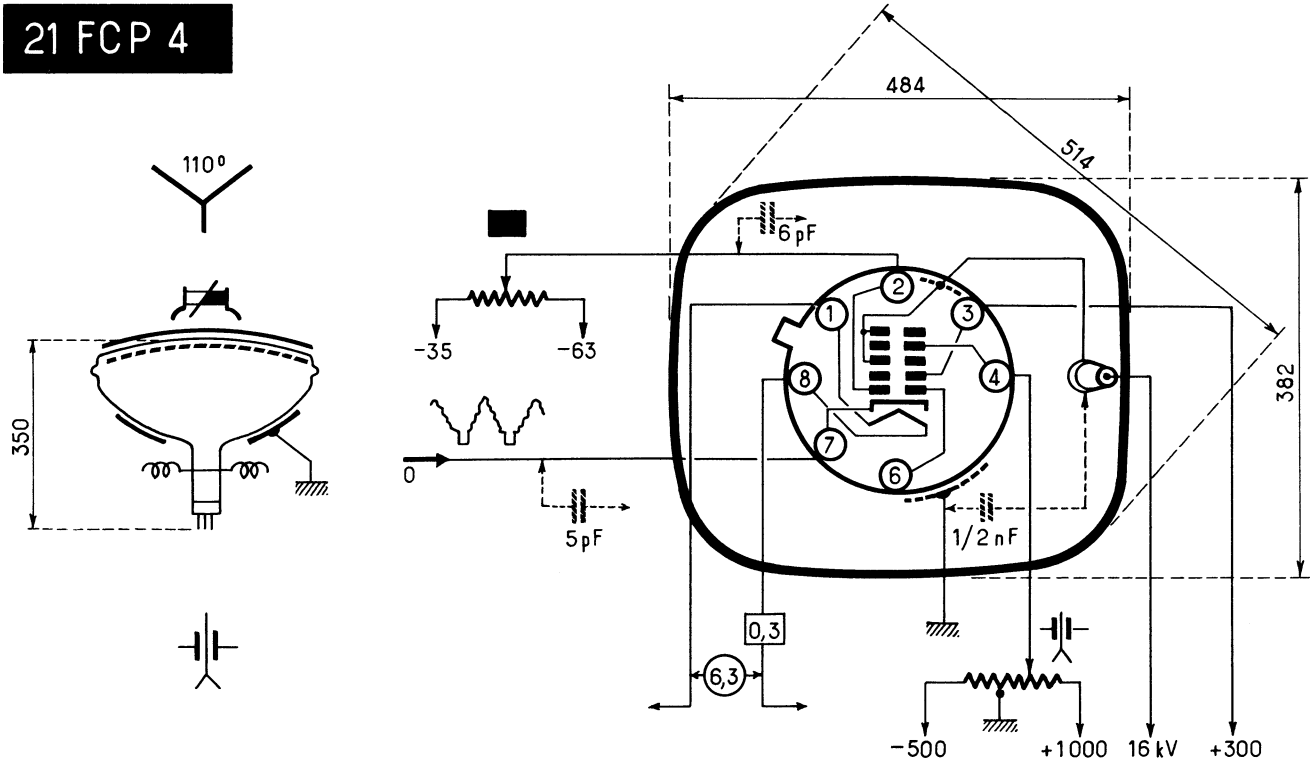
21 CQP4


110°
362
227
508
531
412
6 pF
-35
-72
0
5 pF
2/2,5 nF
0,6
6,3
+ 300
-50
+ 350
+16 kV

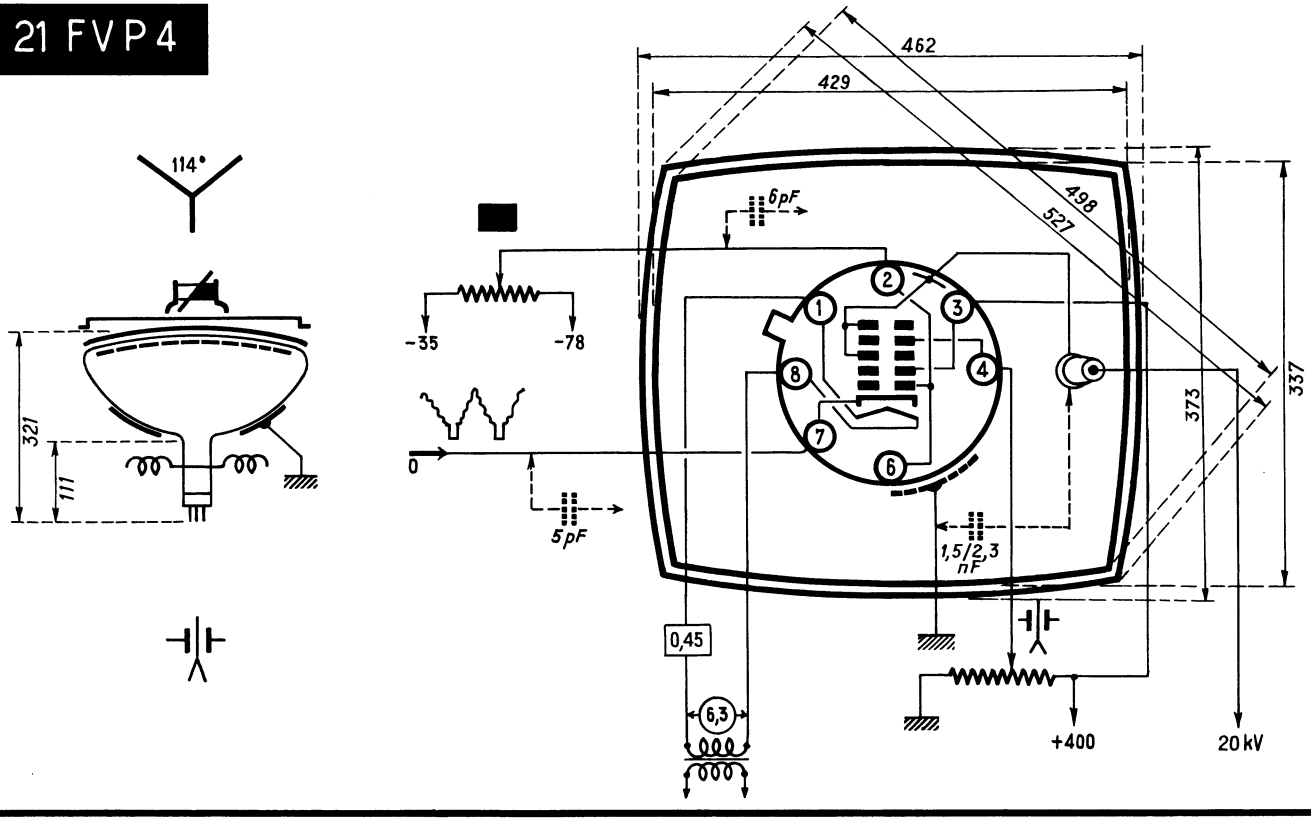
21 EZP 4

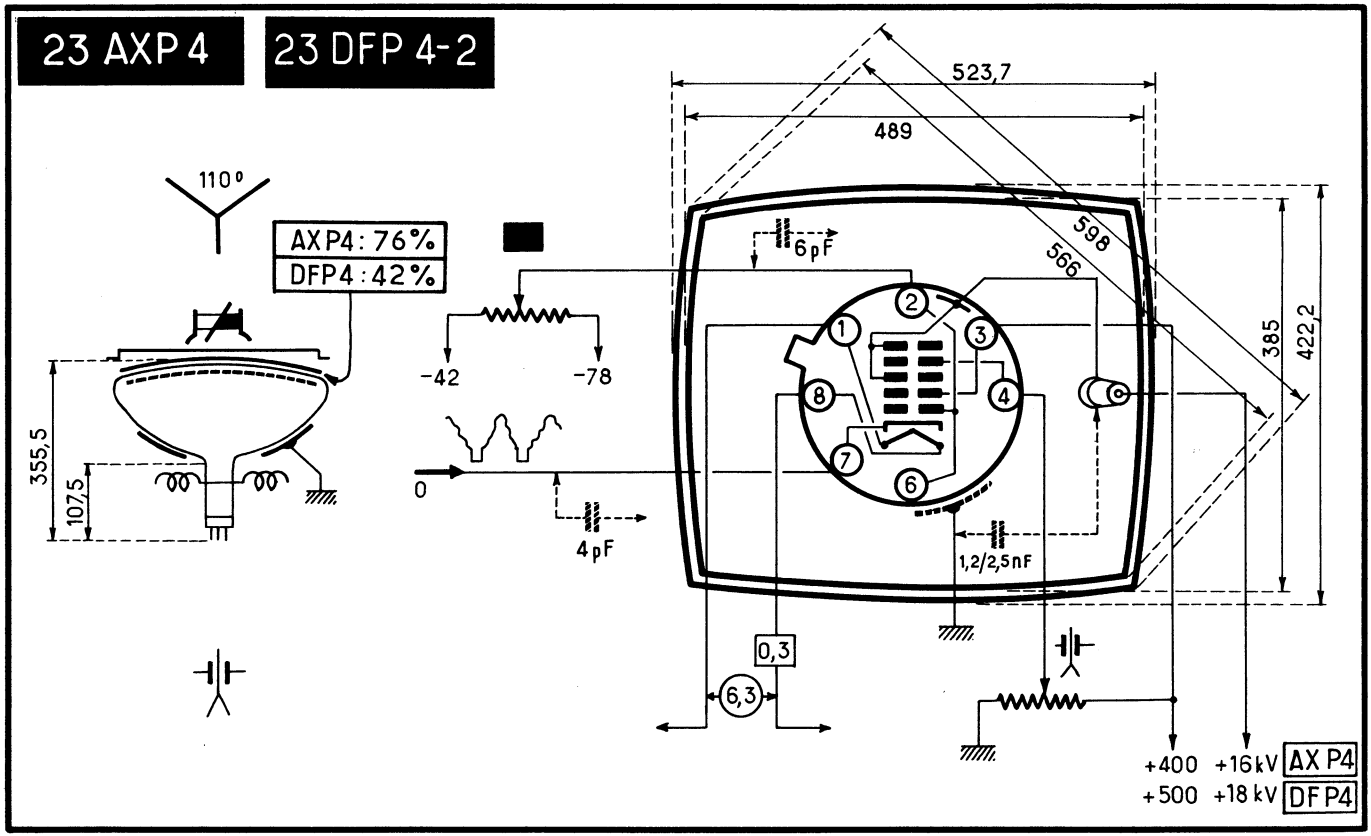

110°
333,5
93
517,5
546,2
419,2
5pF
-34
-56
0
7pF
2/2,5 nF
0,3
6,3
+400
+16 kV
1
2
3
4
7
8

21 FCP 4

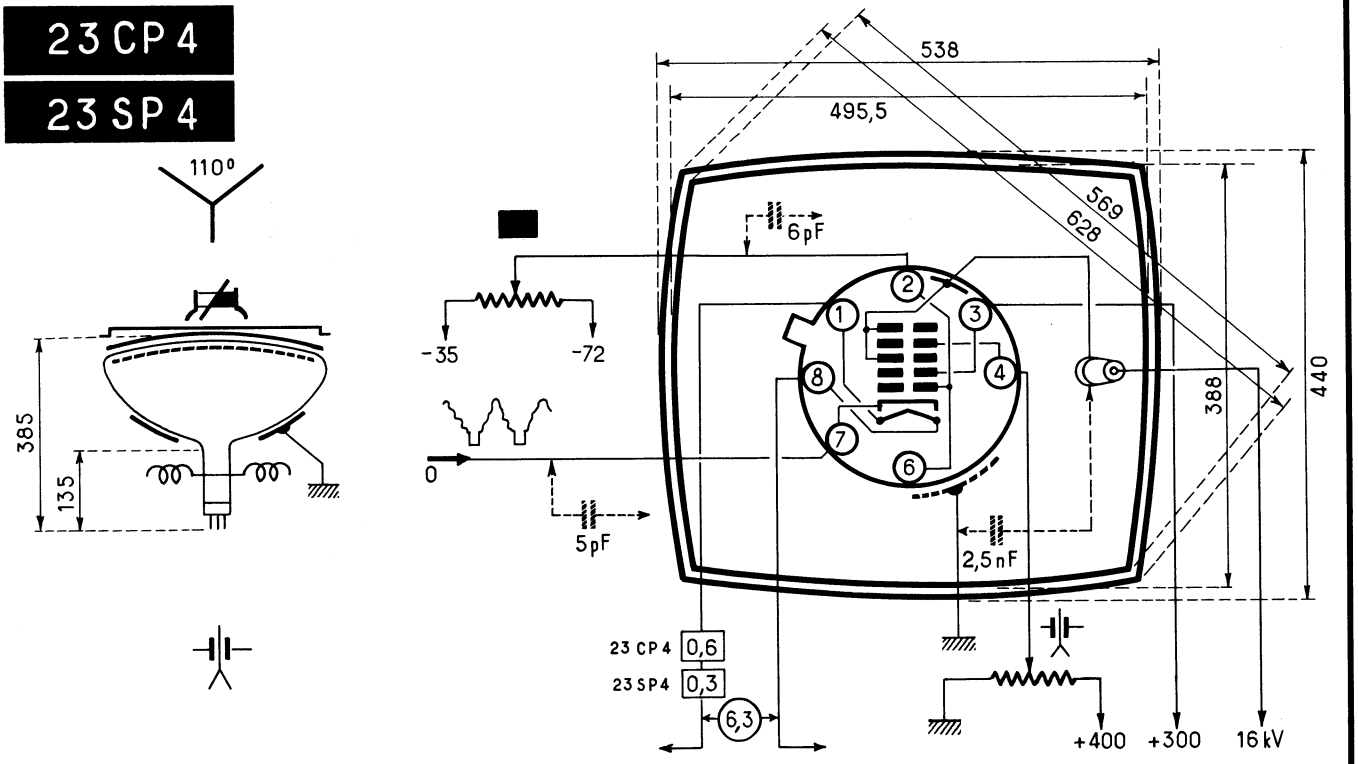

484
514
382
110°
350
6 pF
-35
-63
0
5 pF
1/2 nF
0,3
6,3
-500
+1000
16 kV
+300
1
2
3
4
6
7
8

21 FVP 4

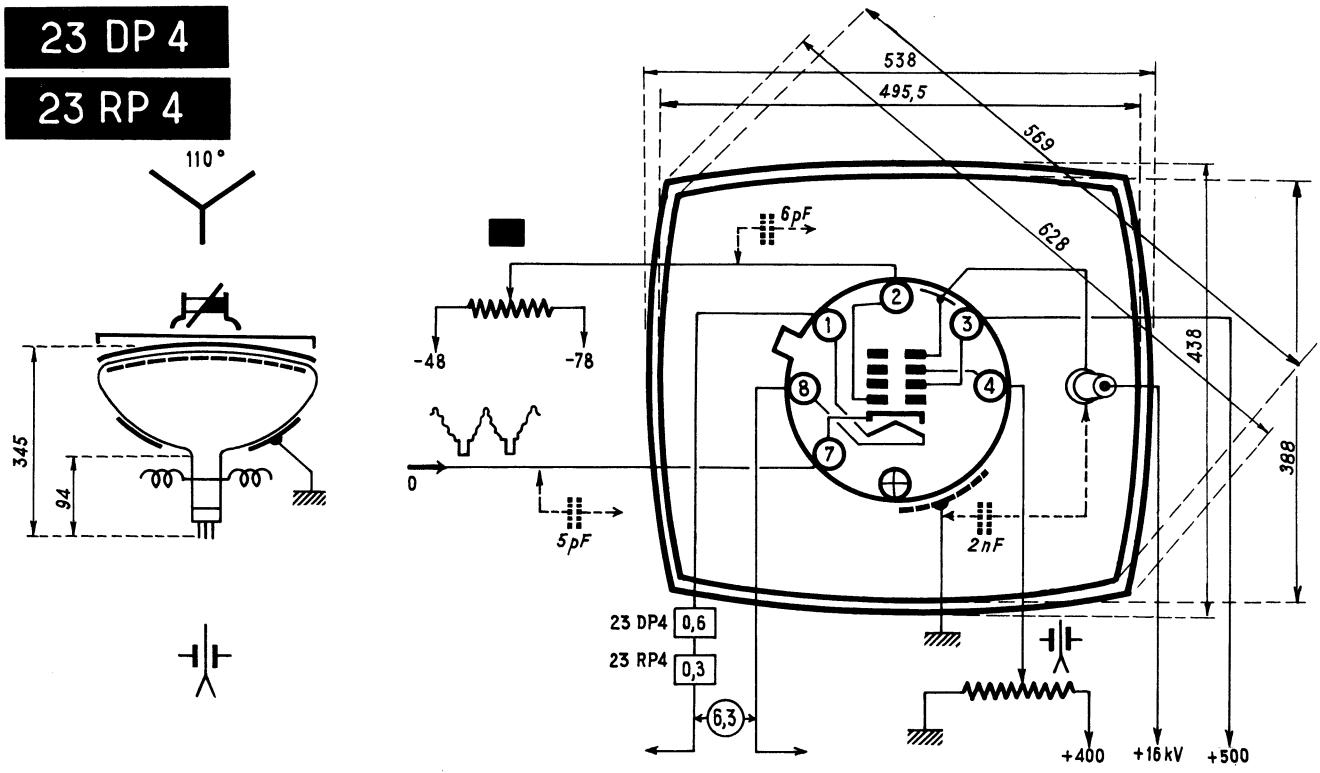

114°
321
111
462
429
498
527
337
373
6pF
-35
-78
0
5pF
1,5/2,3 nF
0,45
6,3
+400
20 kV
1
2
3
4
6
7
8


23 AXP 4
23 DFP 4-2
110°
AXP4: 76%
DFP4: 42%
355,5
107,5
-42
-78
0
4pF
6pF
523,7
489
598
566
385
422,2
1
2
3
4
6
7
8
1,2/2,5nF
0,3
6,3
+400 +16kV AX P4
+500 +18 kV DF P4

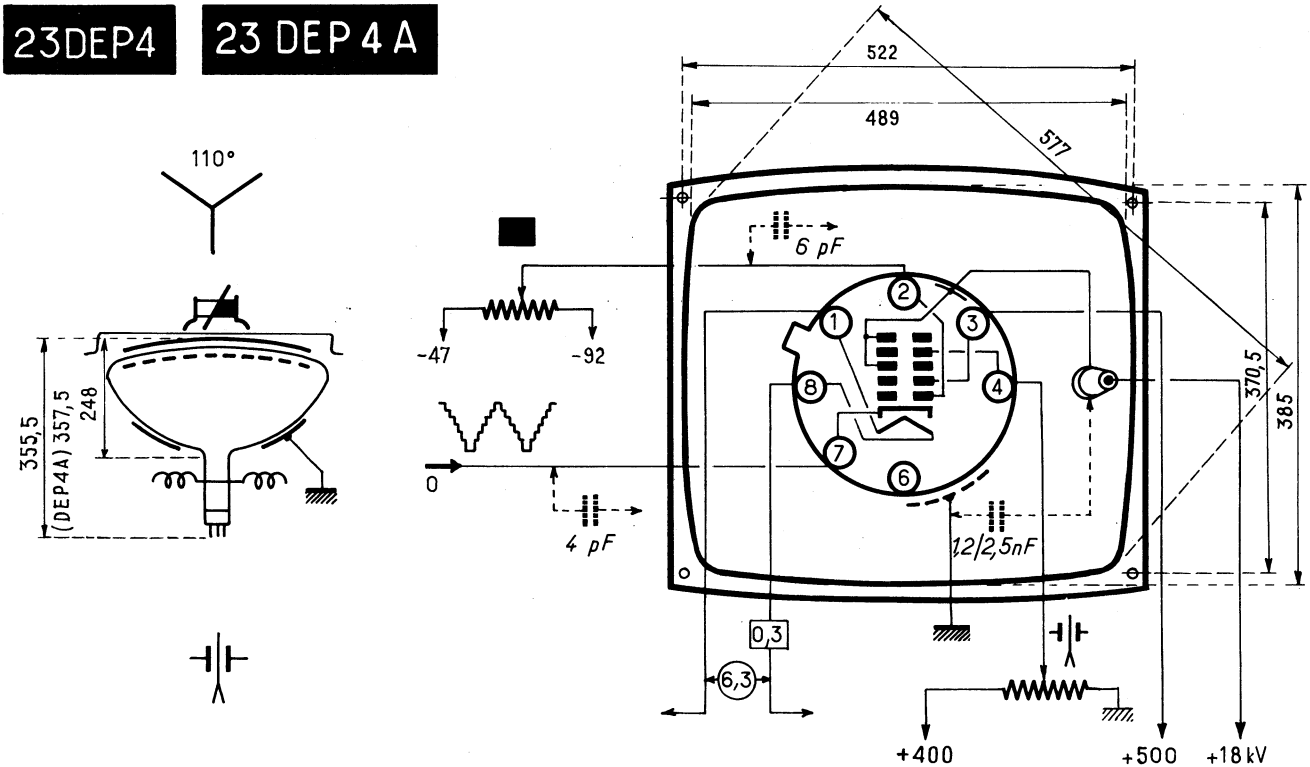
23 CP 4
23 SP 4


110°
385
135
538
495,5
569
628
6pF
-35
-72
0
5pF
2,5nF
388
440
1
2
3
4
6
7
8
23 CP 4
0,6
23 SP 4
0,3
6,3
+400
+300
16 kV

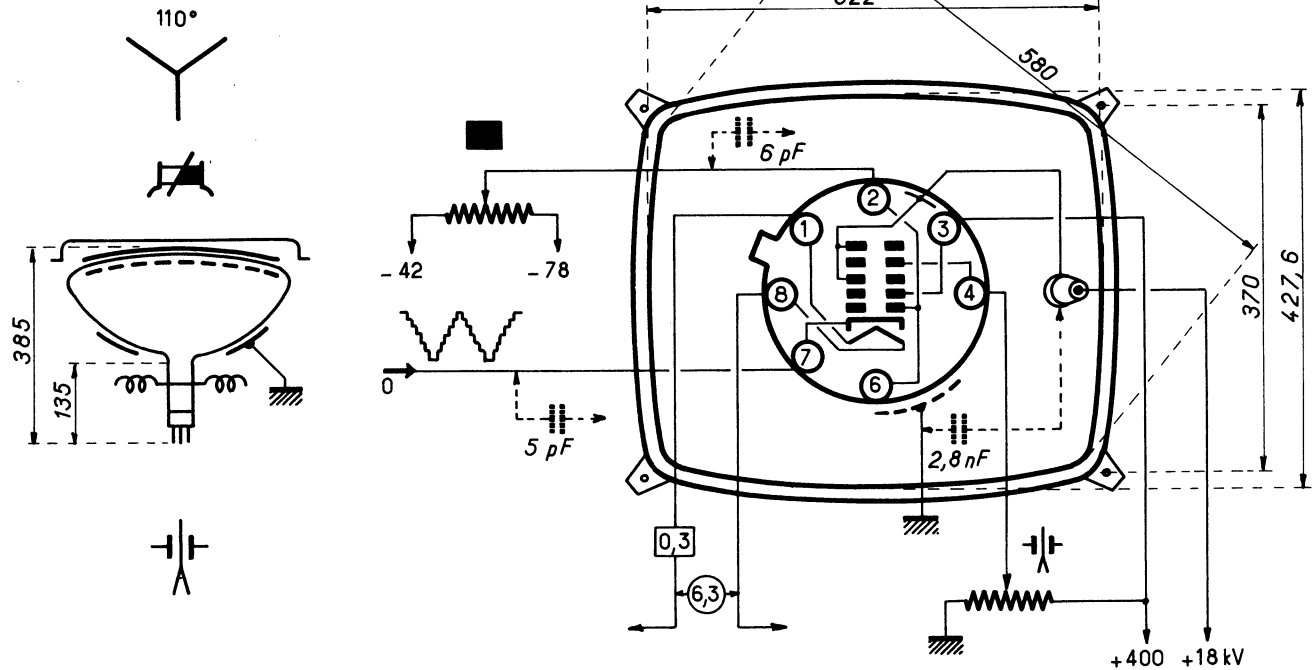
23 DP 4
23 RP 4

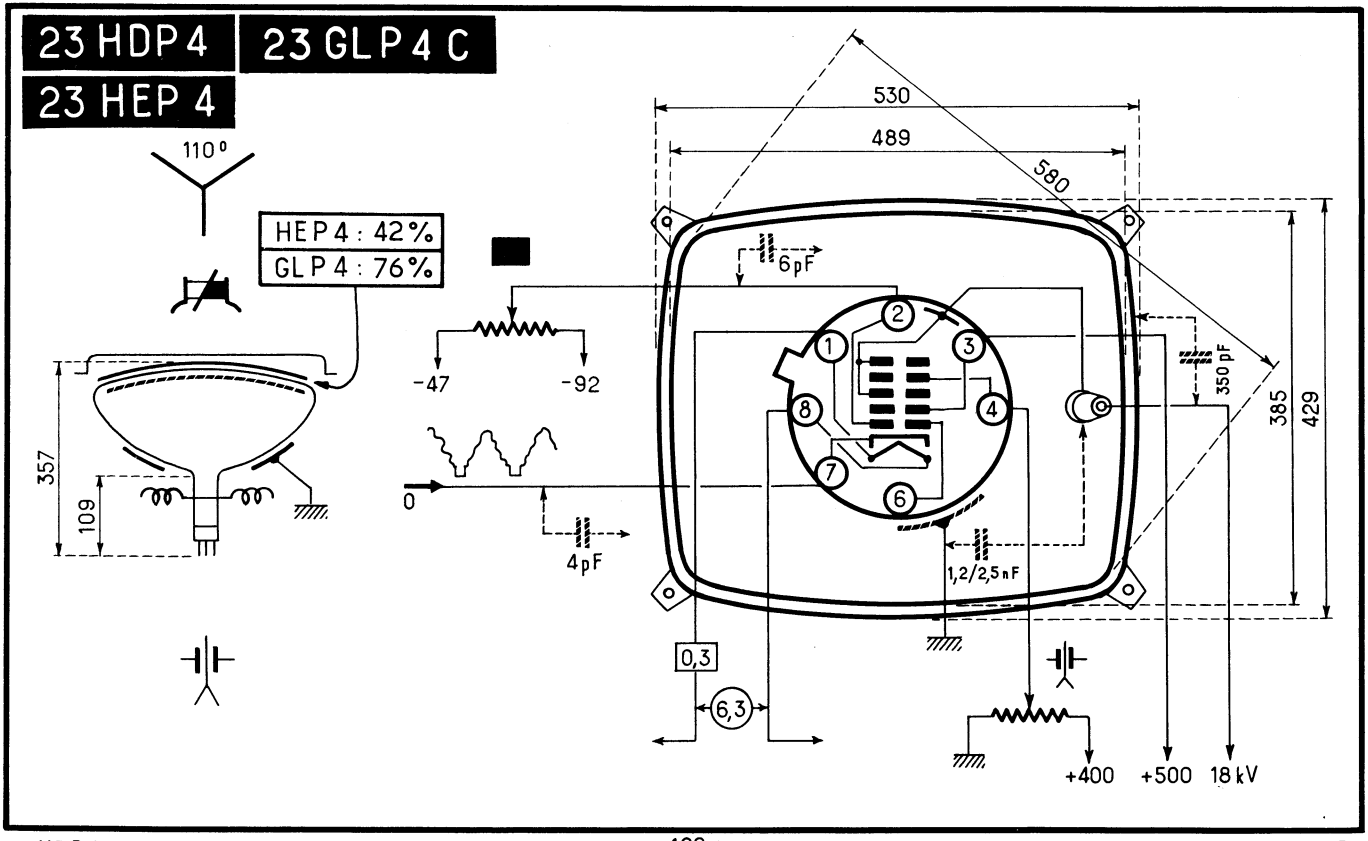

110°
345
94
538
495,5
569
628
438
388
6pF
-48
-78
0
5pF
2nF
1
2
3
4
7
8
23 DP4
0,6
23 RP4
0,3
6,3
+400
+16 kV
+500

23DEP4 23 DEP 4 A

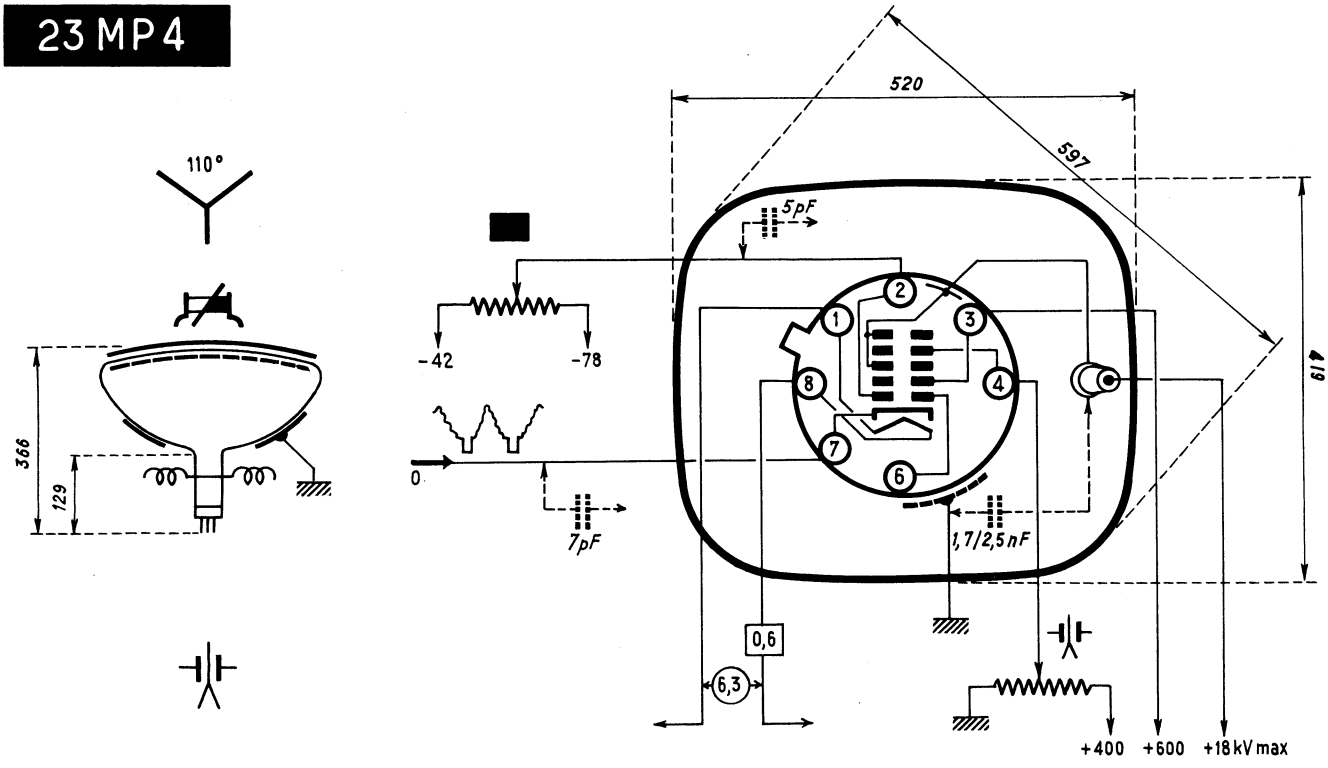


23EVP4


110°
385
135
522
580
370
427,6
6 pF
- 42
- 78
0
5 pF
2,8 nF
1
2
3
4
6
7
8
0,3
6,3
+400
+18 kV

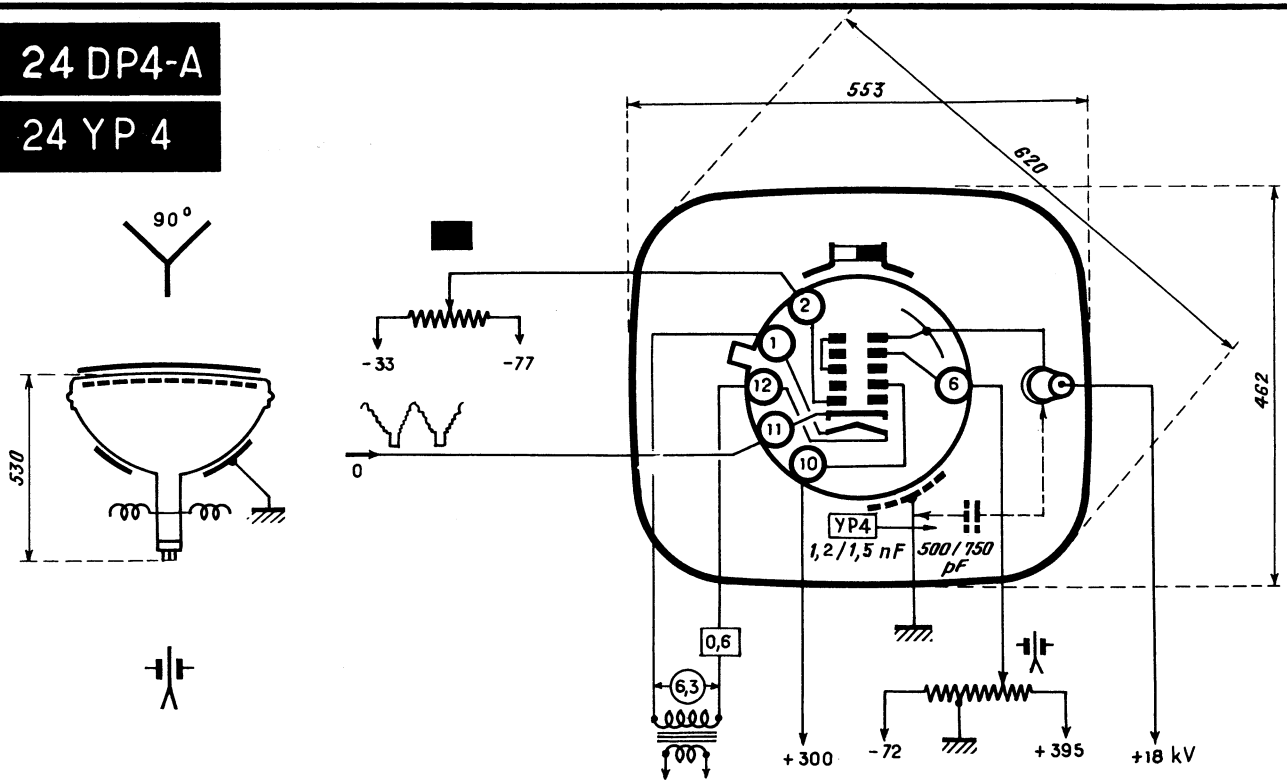

23 HDP4
23 GLP4C
23 HEP4
110°
HEP4 : 42%
GLP4 : 76%
530
489
580
6pF
350 pF
385
429
357
109
-47
-92
0
4pF
1,2/2,5nF
0,3
6,3
+400
+500
18 kV
1
2
3
4
6
7
8

23 MP 4

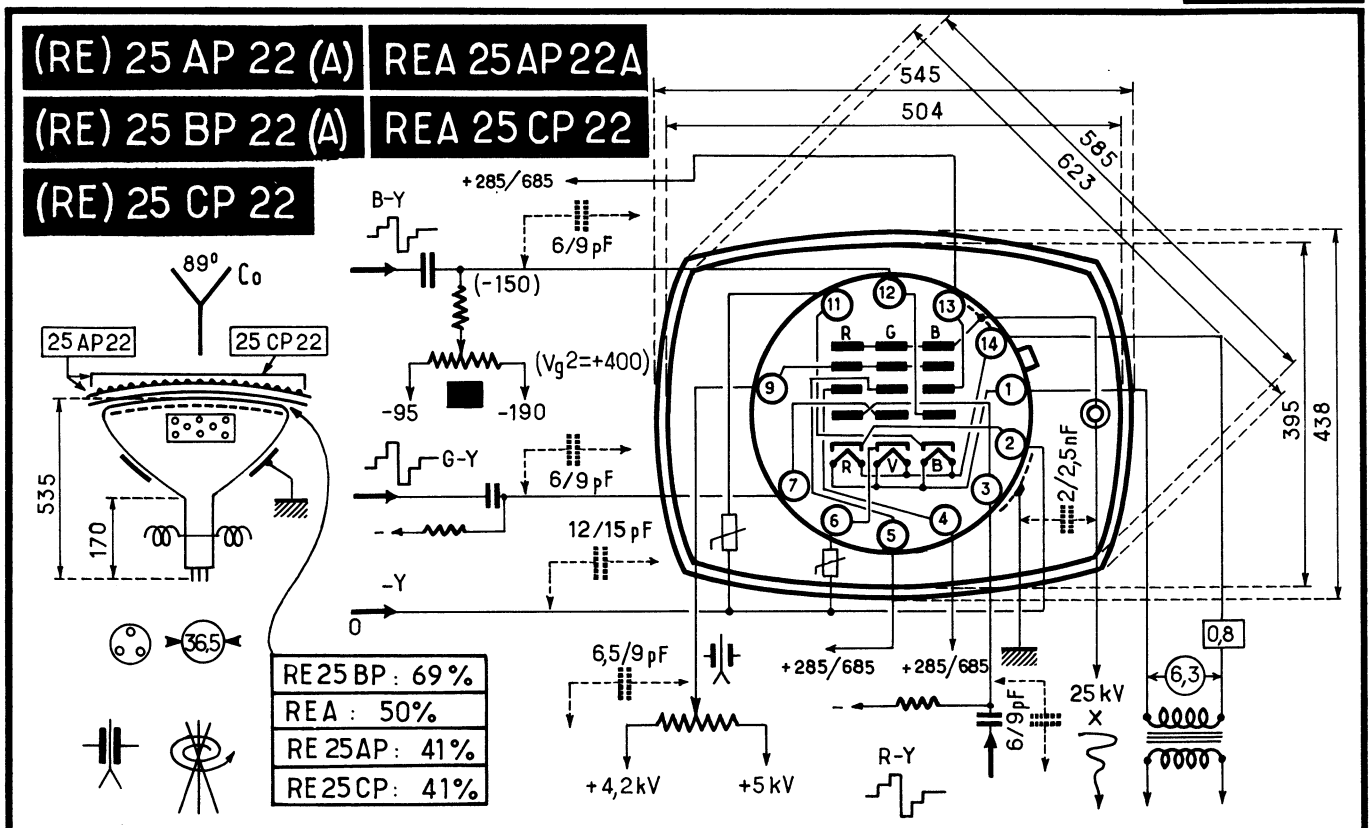

110°
366
129
520
597
419
5pF
-42
-78
0
7pF
1,7/2,5nF
0,6
6,3
1
2
3
4
6
7
8
+400
+600
+18kV max

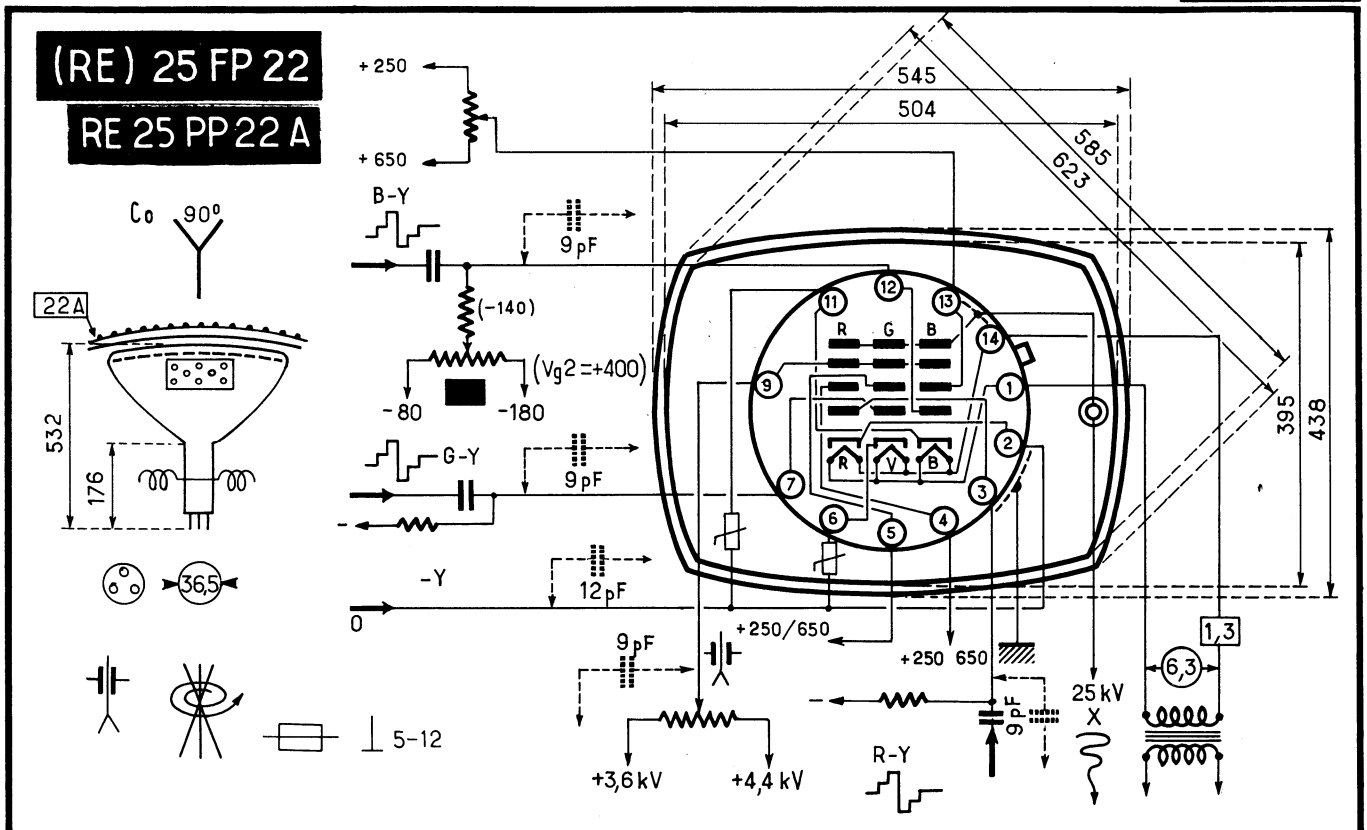
24 DP4-A

24 YP 4

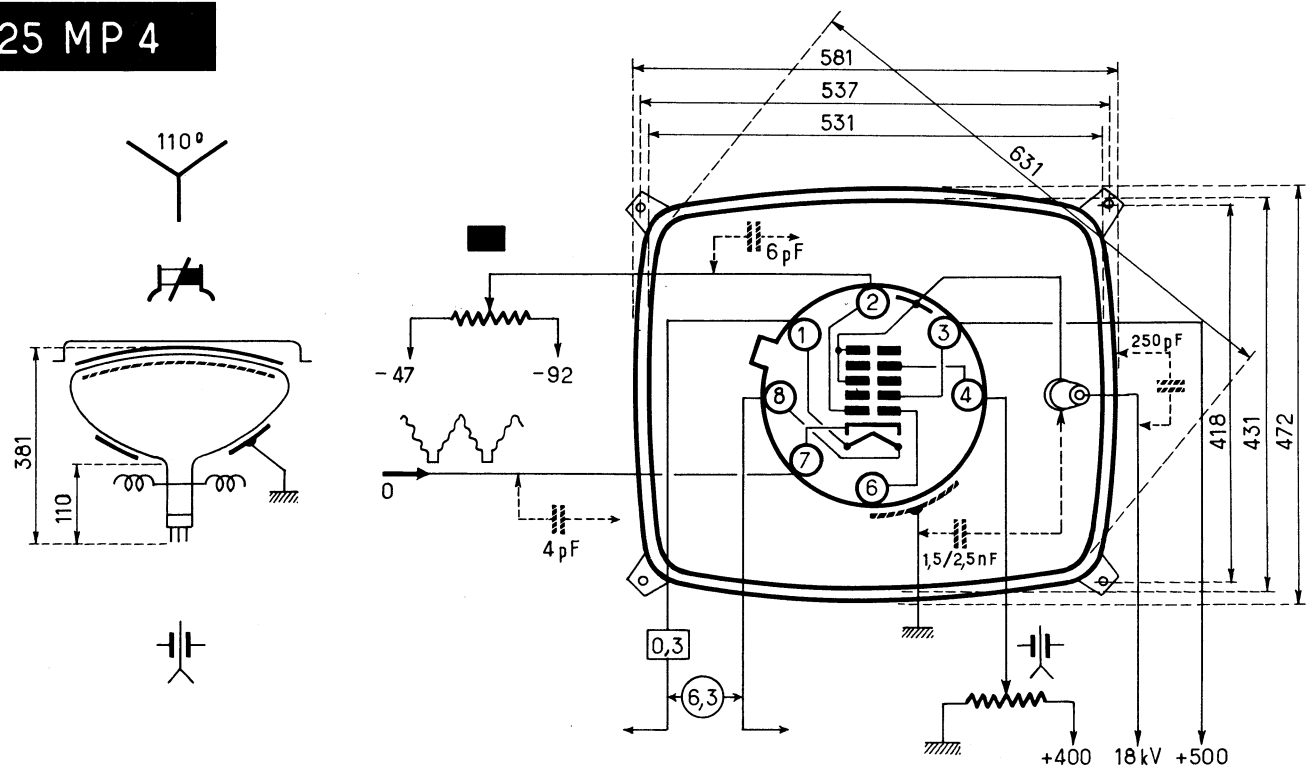


(RE) 25 AP 22 (A) | REA 25AP22A
(RE) 25 BP 22 (A) | REA 25 CP 22
(RE) 25 CP 22

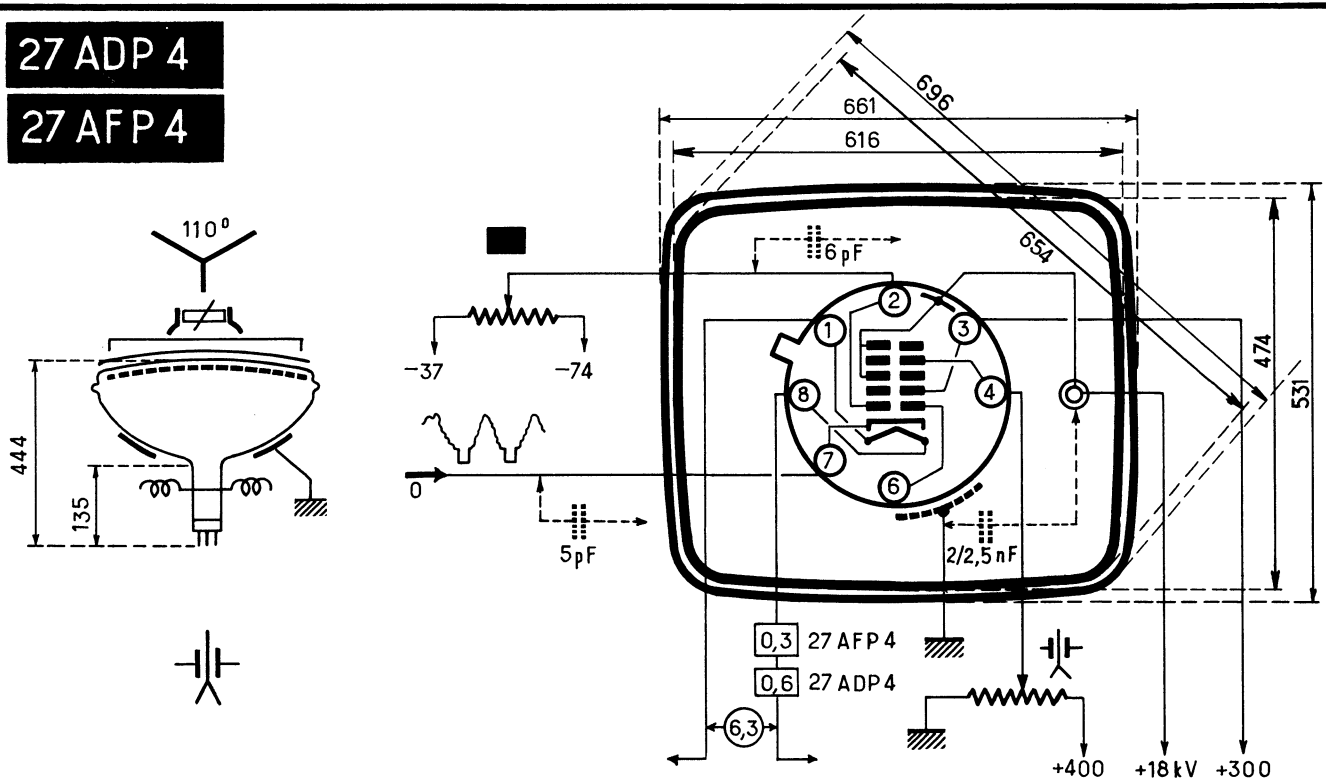



(RE) 25 FP 22
RE 25 PP 22 A
+ 250
+ 650
B-Y
9 pF
(-140)
(Vg2 =+400)
- 80
-180
G-Y
9 pF
-Y
12 pF
0
+250/650
9 pF
+3,6 kV
+4,4 kV
R-Y
+250 650
9 pF
25 kV
X
1,3
6,3
545
504
585
623
395
438
R
G
B
V
Co
90°
22A
532
176
36,5
5-12

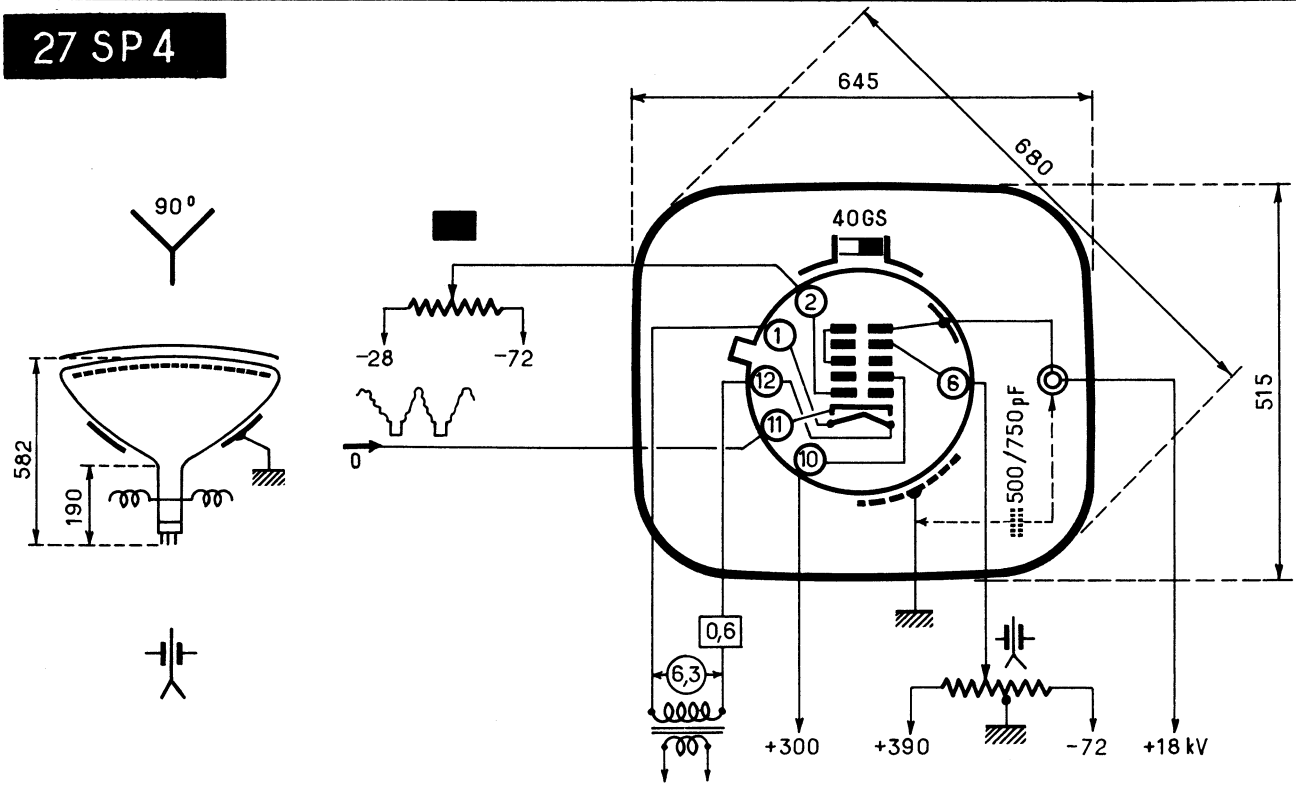
25 MP 4


110°
381
110
581
537
531
631
6pF
-47
-92
0
4pF
250pF
1,5/2,5nF
418
431
472
0,3
6,3
+400
18kV
+500
1
2
3
4
6
7
8

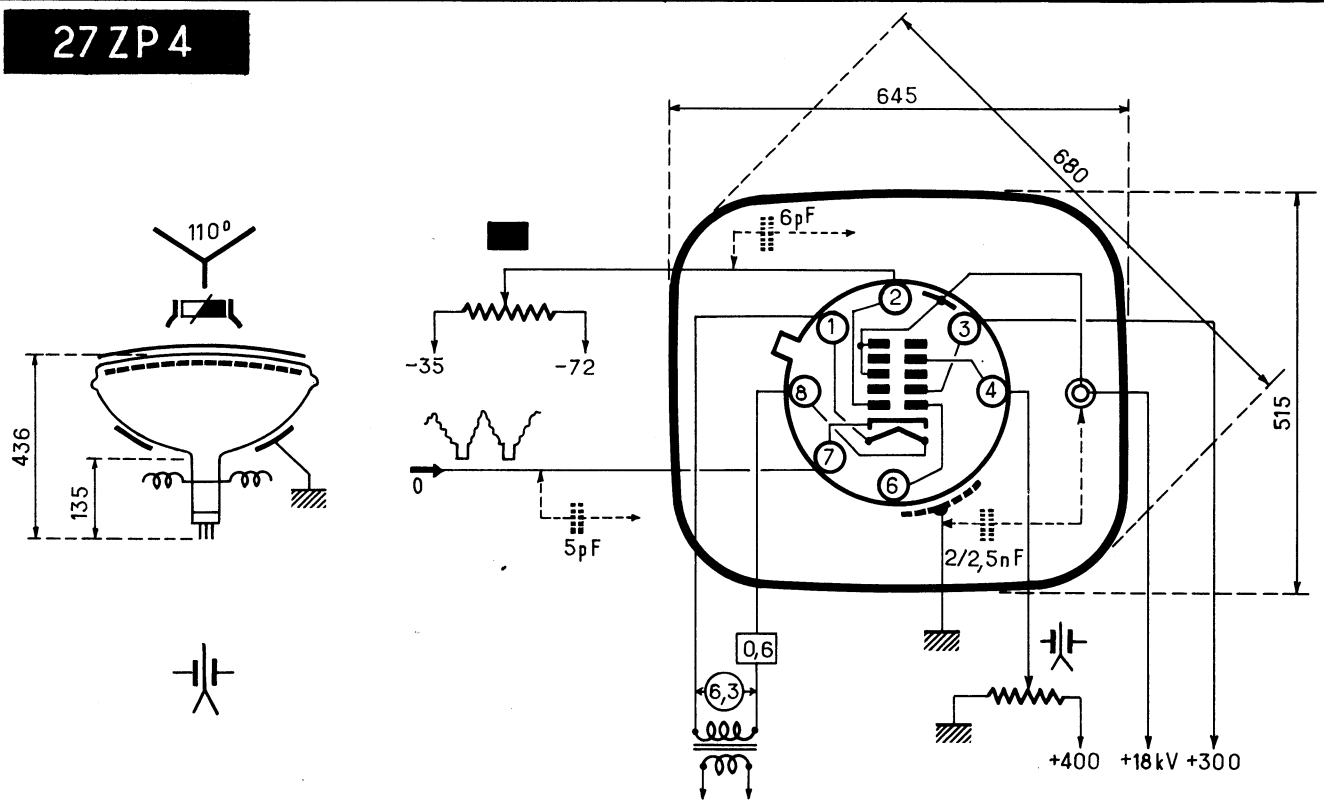
27 ADP 4
27 AFP 4

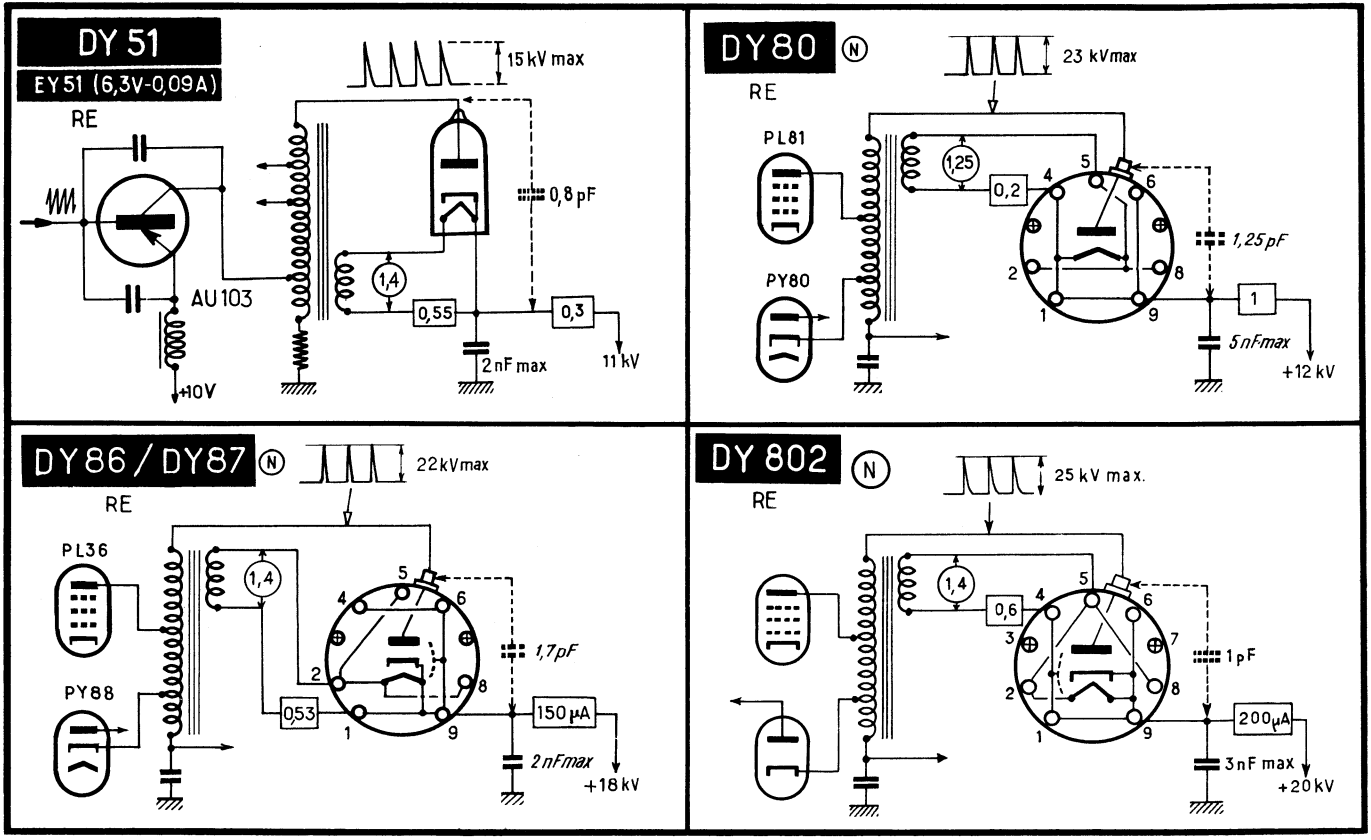


27 SP 4

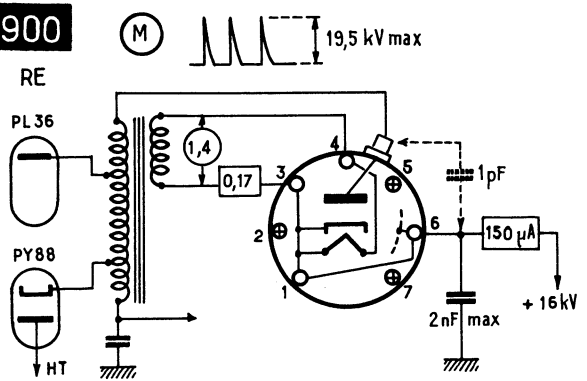

645
680
515
582
190
90°
40GS
-28
-72
0
2
1
12
6
11
10
500/750 pF
0,6
6,3
+300
+390
-72
+18 kV

27 ZP 4

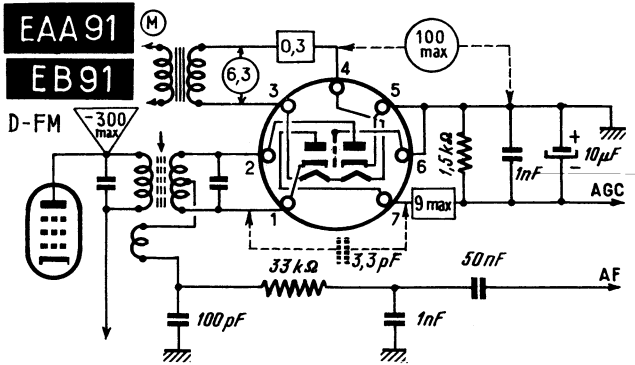

645
680
515
110°
436
135
-35
-72
0
6pF
5pF
2/2,5nF
0,6
6,3
1
2
3
4
6
7
8
+400
+18kV
+300


DY 51
EY51 (6,3V-0,09A)
RE
AU103
+10V
15 kV max
0,8 pF
1,4
0,55
0,3
2 nF max
11 kV
DY80
N
RE
PL81
PY80
23 kVmax
1,25
0,2
1,25pF
5nFmax
1
+12 kV
DY86 / DY87
N
RE
PL36
PY88
22kVmax
1,4
0,53
1,7pF
150µA
2nFmax
+18 kV
DY 802
N
RE
25 kV max.
1,4
0,6
1pF
200µA
3nF max
+20 kV

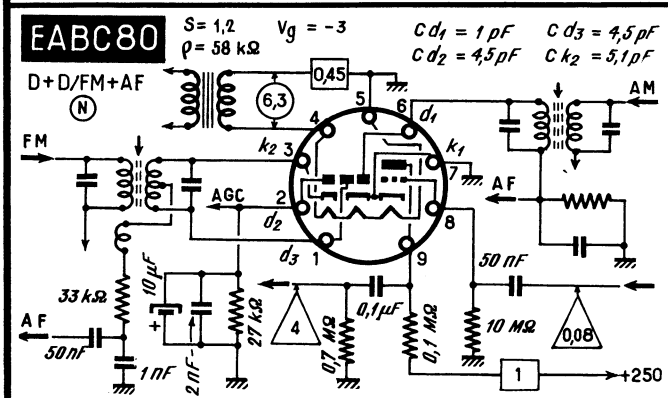
DY900



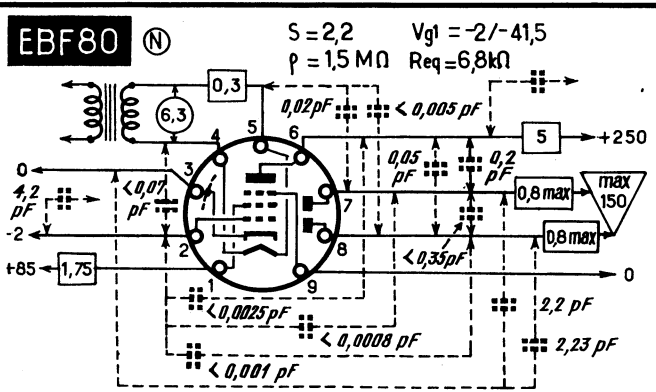
EAA 91 / EB 91

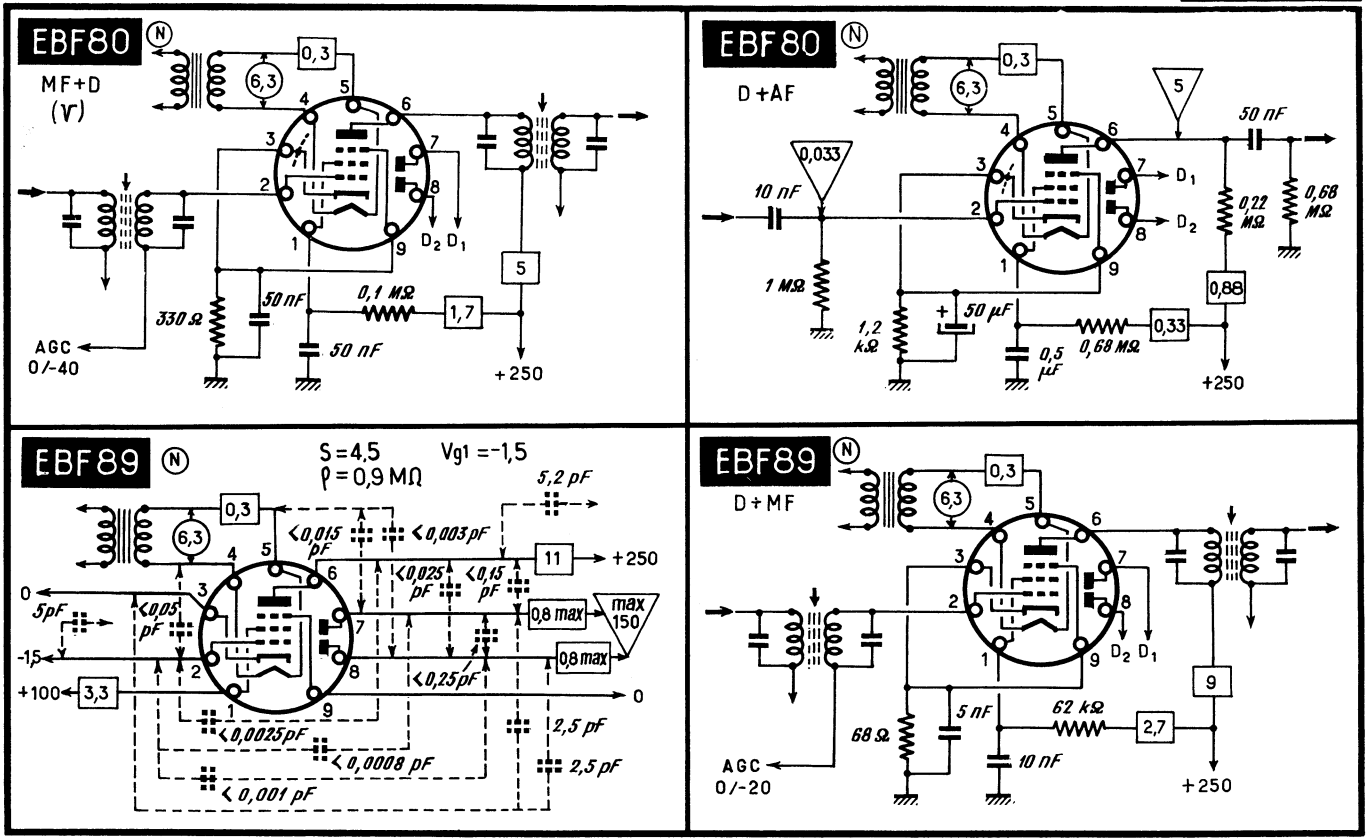


EABC80

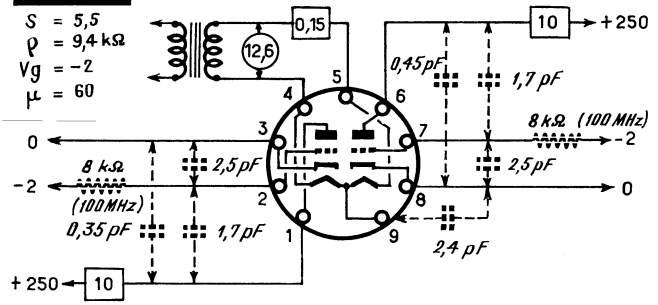


EBF80

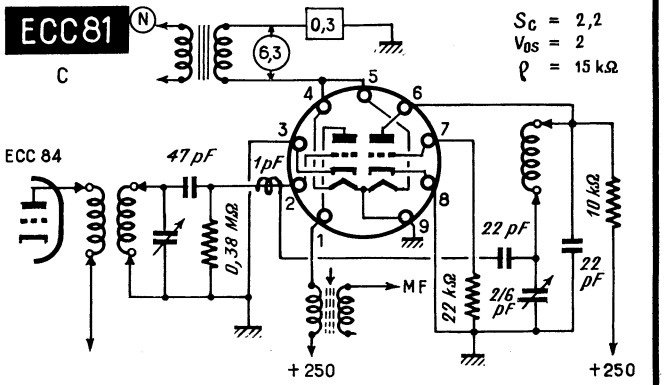



EBF80
N
MF+D
(V)
0,3
6,3
D2 D1
5
330 Ω
50 nF
0,1 MΩ
1,7
50 nF
AGC
0/-40
+250
EBF80
N
D+AF
0,3
6,3
5
50 nF
0,033
10 nF
D1
D2
0,22 MΩ
0,68 MΩ
1 MΩ
0,88
1,2 kΩ
50 µF
0,5 µF
0,33
0,68 MΩ
+250
EBF89
N
S=4,5
Vg1 =-1,5
ρ=0,9 MΩ
0,3
6,3
5,2 pF
<0,015 pF
<0,003 pF
11
+250
0
5pF
<0,05 pF
<0,025 pF
<0,15 pF
0,8 max
max 150
-15
0,8 max
+100
3,3
<0,25 pF
0
<0,0025 pF
2,5 pF
<0,0008 pF
2,5 pF
<0,001 pF
EBF89
N
D+MF
0,3
6,3
D2 D1
9
68 Ω
5 nF
62 kΩ
2,7
10 nF
AGC
0/-20
+250

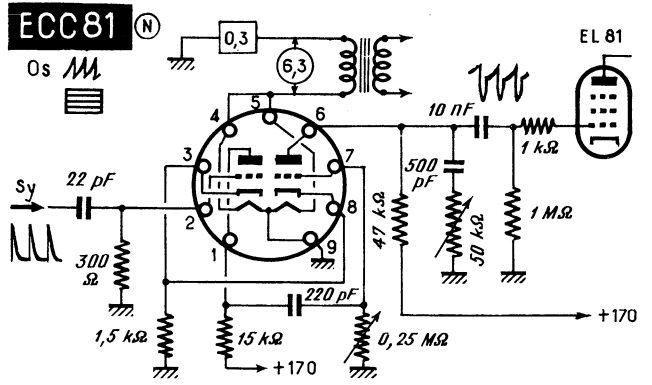
ECC81 (N)



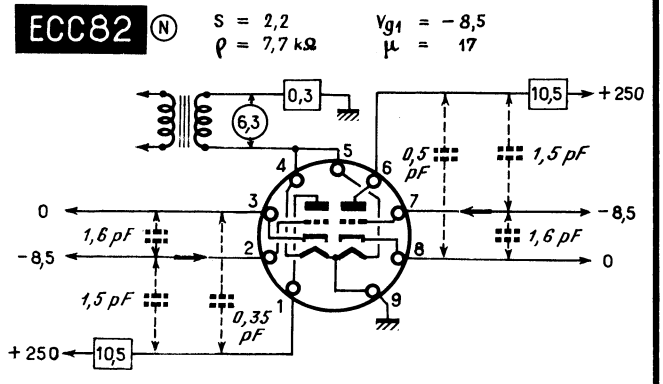
ECC81 (N)

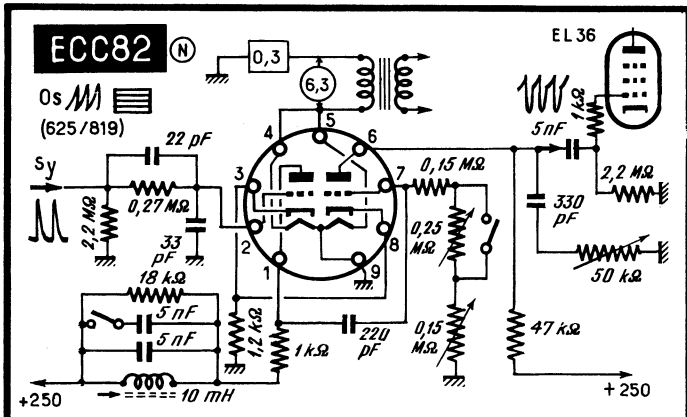


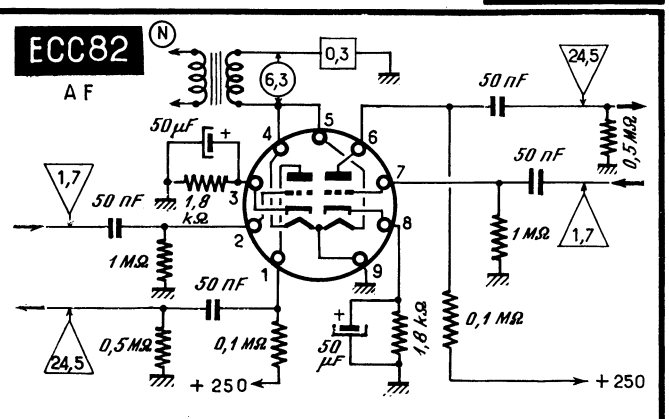
ECC81 (N)

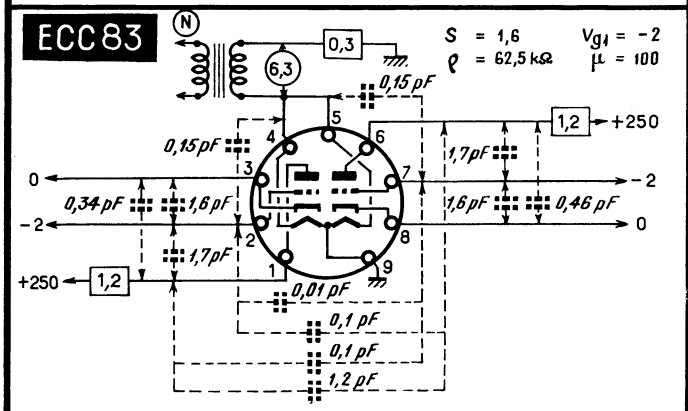


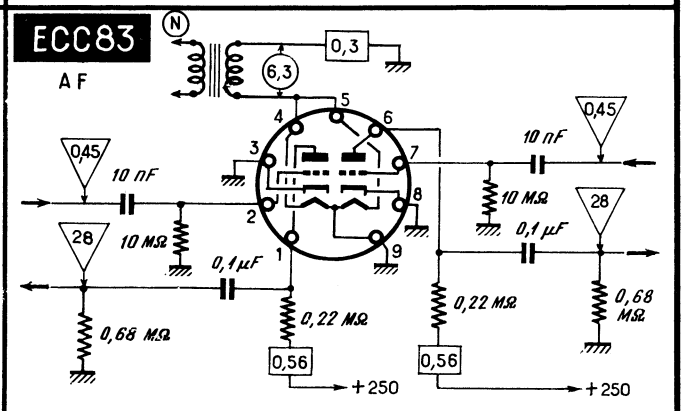
ECC82 (N)

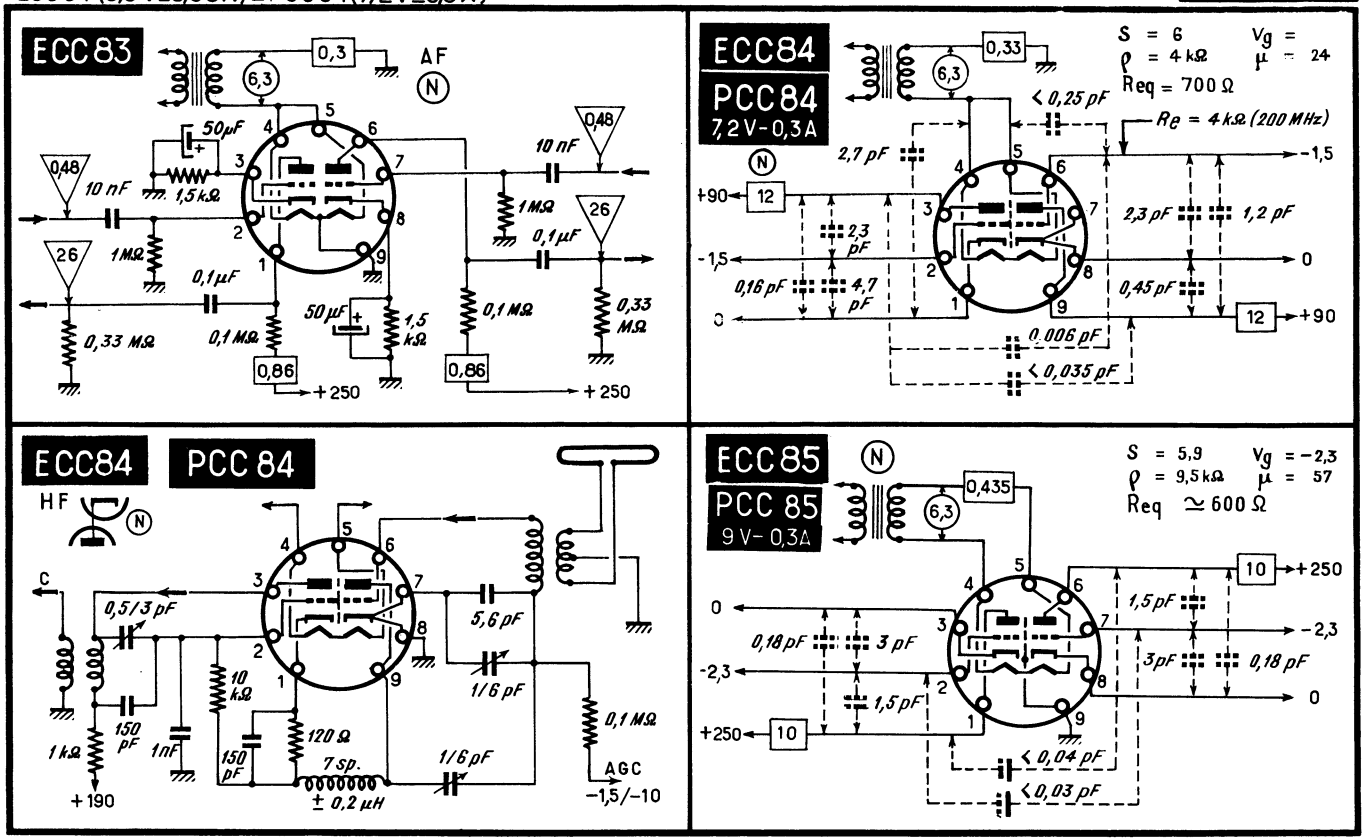


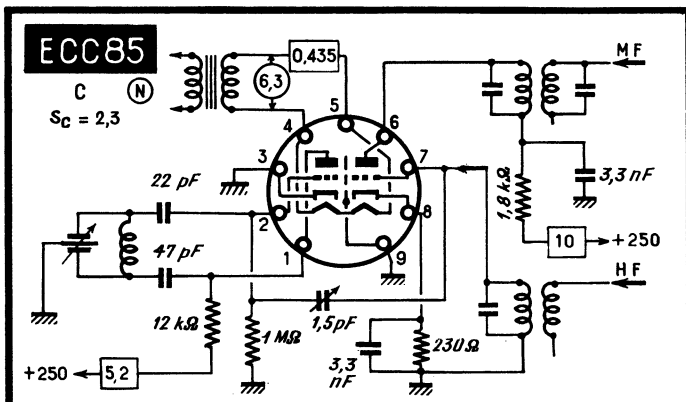

ECC82
N
0,3
6,3
EL36
Os
(625/819)
Sy
22 pF
2,2 MΩ
0,27 MΩ
33 pF
18 kΩ
5 nF
5 nF
1,2 kΩ
1 kΩ
220 pF
0,15 MΩ
0,25 MΩ
0,15 MΩ
1 kΩ
5 nF
330 pF
2,2 MΩ
50 kΩ
47 kΩ
+250
10 mH
+250

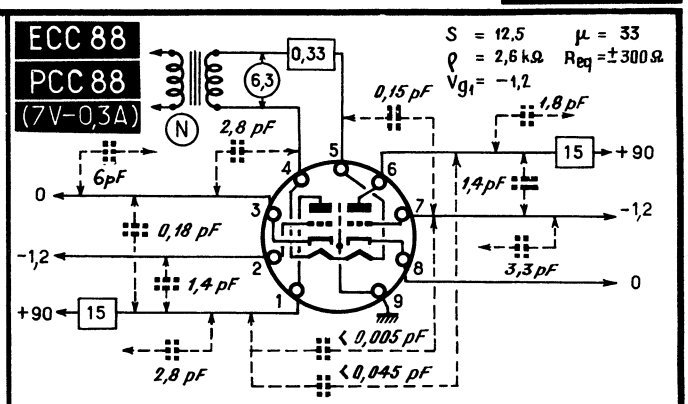

ECC82
N
AF
0,3
6,3
50 µF
1,8 kΩ
1,7
50 nF
1 MΩ
50 nF
0,5 MΩ
0,1 MΩ
50 µF
24,5
50 nF
0,5 MΩ
1 MΩ
1,7
0,1 MΩ
1,8 kΩ
+250
+250

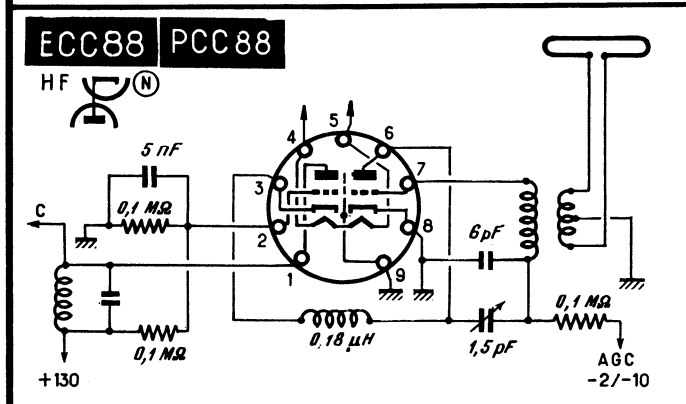

ECC83
N
0,3
6,3
S = 1,6
ϱ = 62,5 kΩ
Vg1 = −2
µ = 100
0,15 pF
0,15 pF
1,2
+250
1,7 pF
0
−2
0,34 pF
1,6 pF
1,6 pF
0,46 pF
−2
0
1,7 pF
+250
1,2
0,01 pF
0,1 pF
0,1 pF
1,2 pF

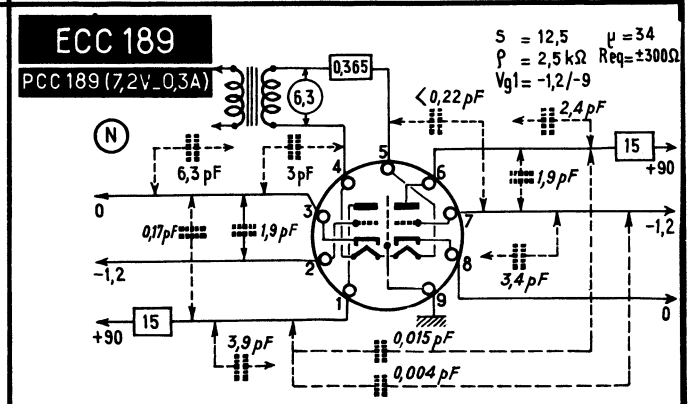

ECC83
N
AF
0,3
6,3
0,45
10 nF
0,45
10 nF
10 MΩ
28
10 MΩ
0,1 µF
28
0,1 µF
0,68 MΩ
0,22 MΩ
0,22 MΩ
0,68 MΩ
0,56
0,56
+250
+250


ECC 83
6,3
0,3
AF
N
50µF
1,5kΩ
10 nF
0,48
1MΩ
26
0,1µF
0,33 MΩ
0,1 MΩ
0,86
+250
1,5 kΩ
0,1µF
0,33 MΩ
ECC84
PCC84
7,2V-0,3A
S = 6
ϱ = 4 kΩ
Req = 700 Ω
Vg =
µ = 24
0,33
< 0,25 pF
Re = 4 kΩ (200 MHz)
2,7 pF
+90
12
-1,5
2,3 pF
1,2 pF
0,16 pF
4,7 pF
0,45 pF
0
0,006 pF
< 0,035 pF
ECC84
PCC 84
HF
C
0,5/3 pF
10 kΩ
150 pF
1nF
1 kΩ
+190
120 Ω
7 sp.
± 0,2 µH
5,6 pF
1/6 pF
0,1 MΩ
AGC
-1,5/-10
ECC 85
PCC 85
9V-0,3A
S = 5,9
ϱ = 9,5 kΩ
Req ≃ 600 Ω
Vg = -2,3
µ = 57
0,435
10
+250
1,5 pF
-2,3
0,18 pF
3 pF
3pF
< 0,04 pF
< 0,03 pF


ECC85
C
S_C = 2,3
0,435
6,3
MF
3,3 nF
1,8 kΩ
22 pF
47 pF
10
+250
HF
12 kΩ
1 MΩ
1,5pF
3,3 nF
230Ω
+250
5,2

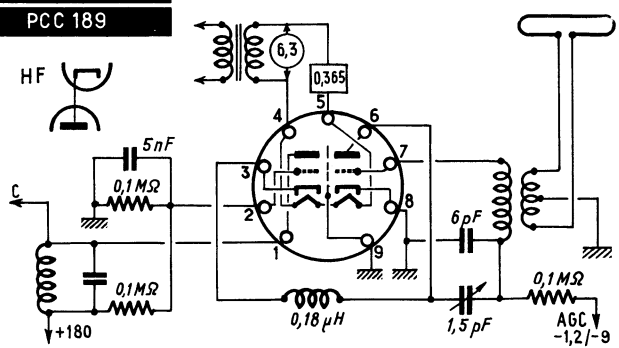

ECC 88
PCC 88
(7V-0,3A)
S = 12,5 μ = 33
ρ = 2,6 kΩ Req = ±300Ω
V_{g1} = −1,2
0,33
6,3
0,15 pF
1,8 pF
2,8 pF
6pF
15
+90
1,4pF
0
−1,2
0,18 pF
3,3pF
1,4 pF
2,8 pF
< 0,005 pF
< 0,045 pF


ECC88 PCC88
HF
5 nF
0,1 MΩ
C
6pF
0,1 MΩ
0,18 μH
1,5 pF
0,1 MΩ
AGC
−2/−10
+130

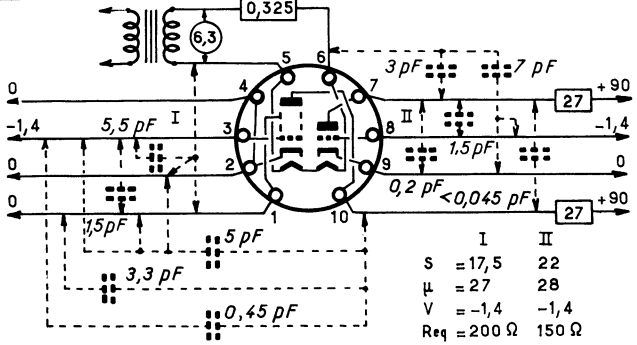

ECC 189
PCC 189 (7,2V_0,3A)
S = 12,5 μ = 34
ρ = 2,5 kΩ Req = ±300Ω
V_{g1} = −1,2/−9
0,365
6,3
< 0,22pF
2,4pF
6,3 pF
3pF
15
+90
1,9pF
0
0,17pF
1,9 pF
−1,2
3,4pF
−1,2
15
+90
3,9 pF
0,015 pF
0,004 pF

ECC 189

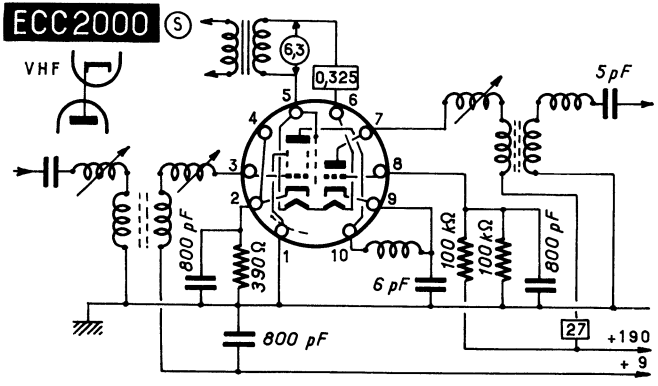
PCC 189



ECC2000



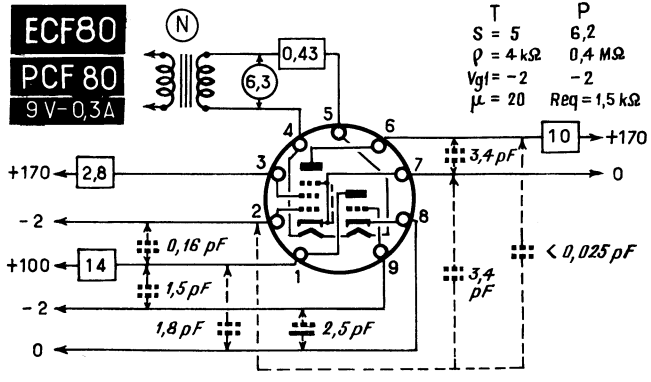
ECC2000

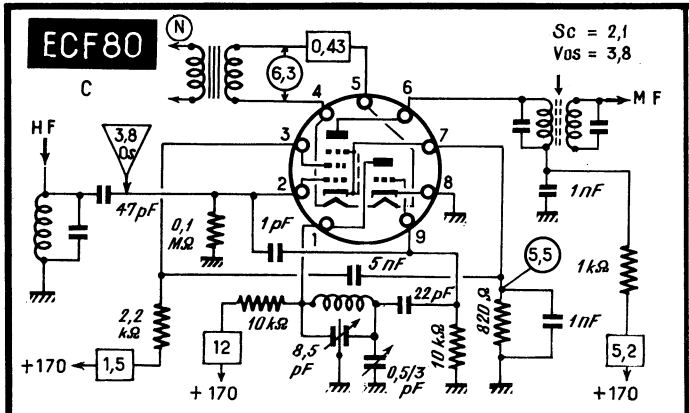


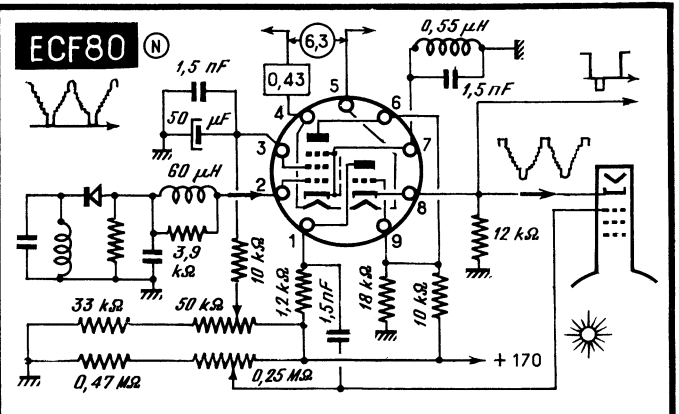
ECF80

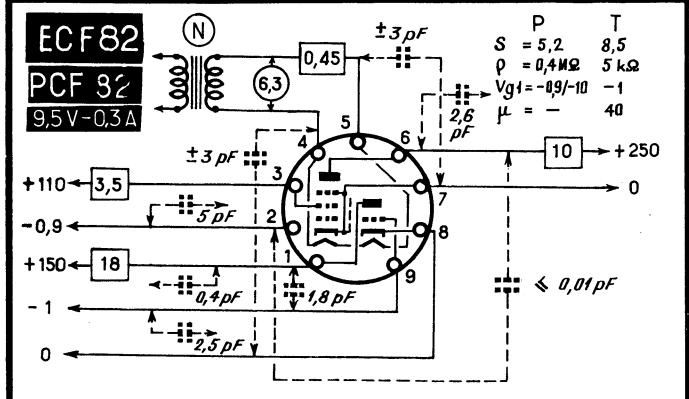
PCF 80

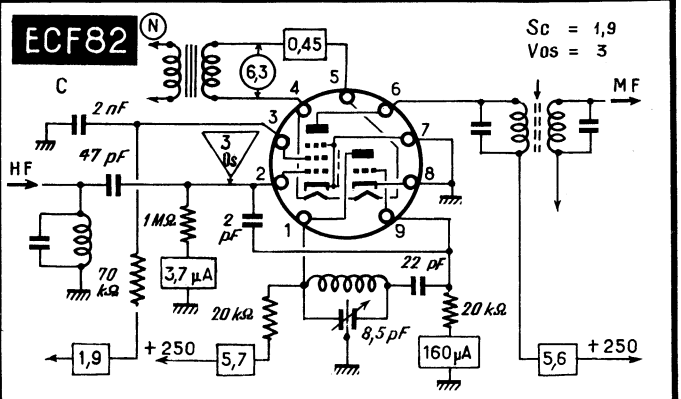
9 V-0,3A




ECF80
C
Sc = 2,1
Vos = 3,8
0,43
6,3
HF
MF
3,8 Ω
47pF
0,1 MΩ
1pF
5nF
22pF
1nF
1kΩ
2,2 kΩ
10kΩ
8,5 pF
0,5/3 pF
820Ω
5,5
12
1,5
5,2
+170
+170
+170

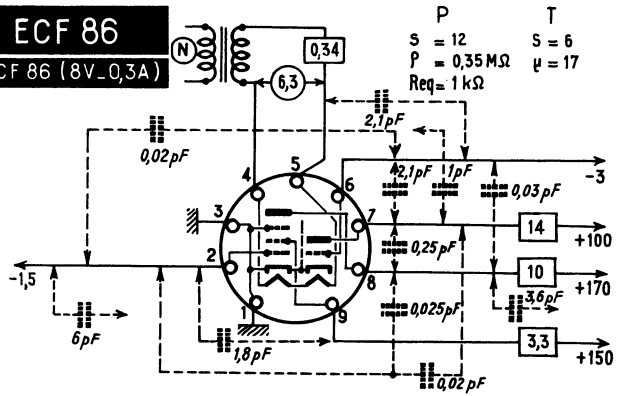

ECF80
0,55 µH
1,5 nF
6,3
0,43
1,5 nF
50 µF
60 µH
3,9 kΩ
10 kΩ
12 kΩ
33 kΩ
50 kΩ
1,2 kΩ
1,5nF
18 kΩ
10 kΩ
0,47 MΩ
0,25 MΩ
+ 170


ECF82
PCF 82
9,5V-0,3A
0,45
6,3
±3pF
P T
S = 5,2 8,5
ρ = 0,4MΩ 5 kΩ
Vg1 = -0,9/-10 -1
µ = — 40
2,6 pF
10
+250
0
+110
3,5
-0,9
5pF
+150
18
0,4pF
1,8pF
-1
2,5pF
0
0,01pF


ECF82
Sc = 1,9
Vos = 3
0,45
6,3
C
MF
2nF
47pF
HF
3 Ω
1MΩ
2 pF
70 kΩ
3,7µA
22 pF
20kΩ
20 kΩ
8,5pF
160µA
1,9
+250
5,7
5,6
+250

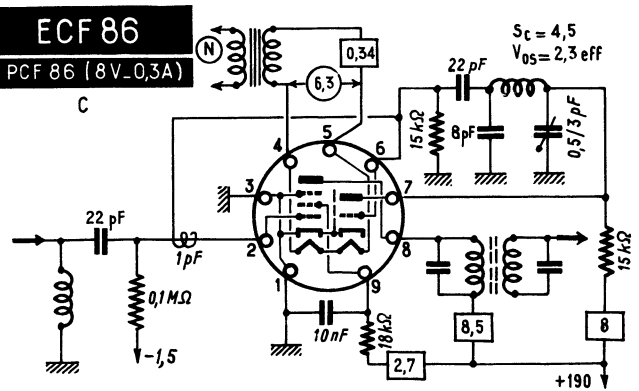
ECF 86

PCF 86 (8V_0,3A)



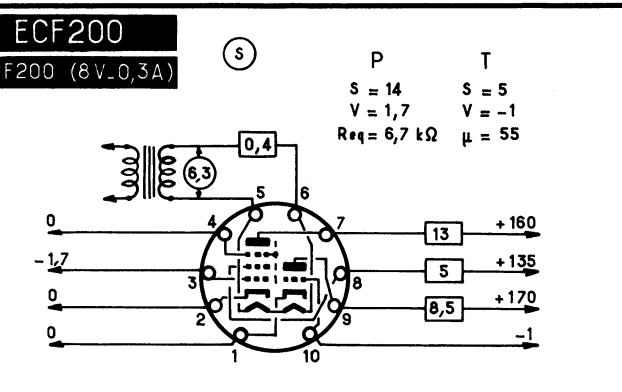
ECF 86

PCF 86 (8V_0,3A)



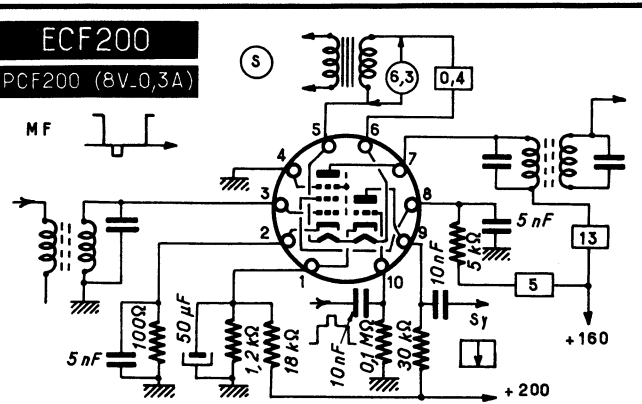
ECF200

PCF200 (8V_0,3A)



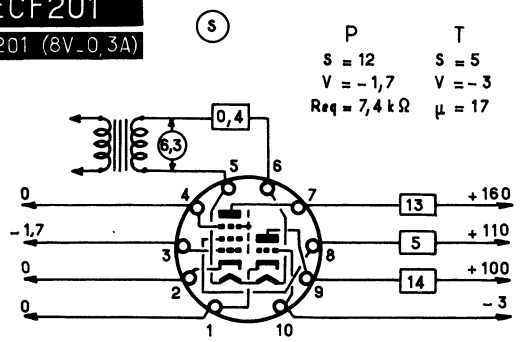
ECF200

PCF200 (8V_0,3A)



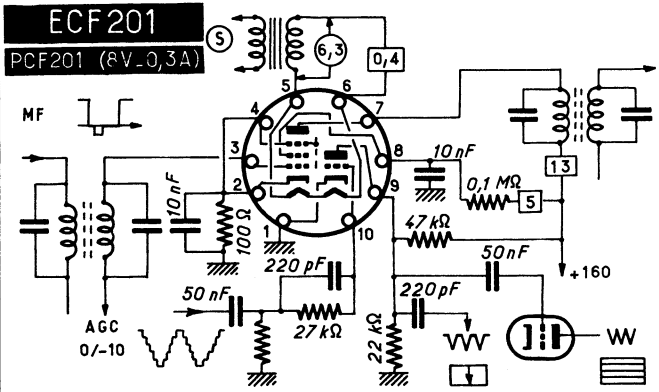
ECF201

PCF201 (8V_0,3A)

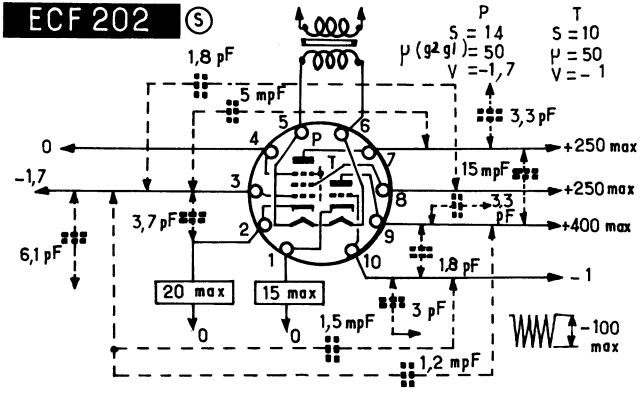


ECF201

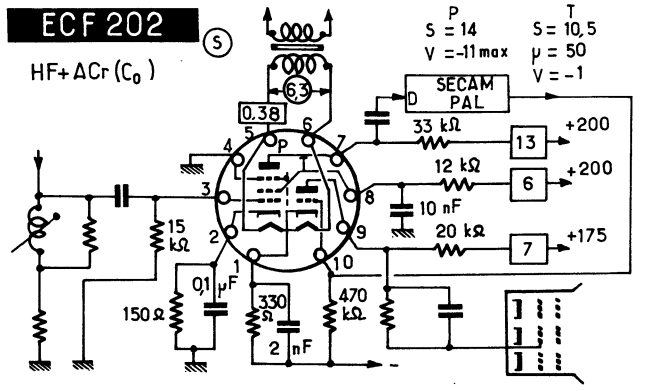
PCF201 (8V_0,3A)

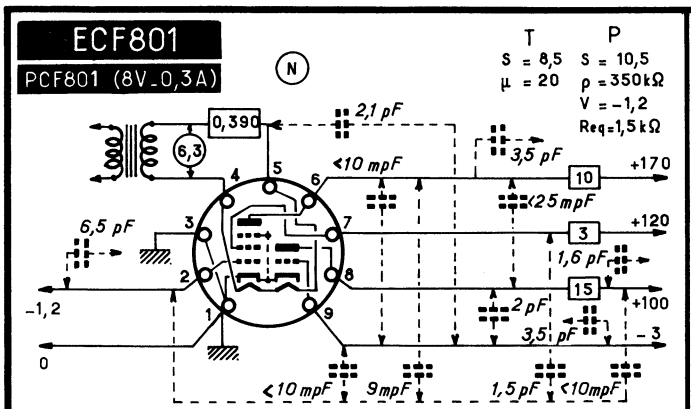


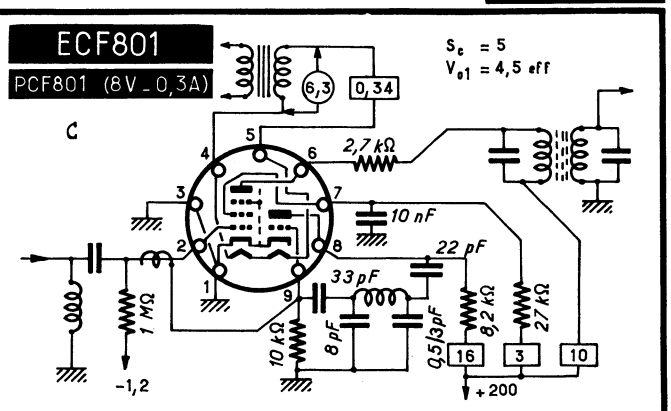
ECF 202

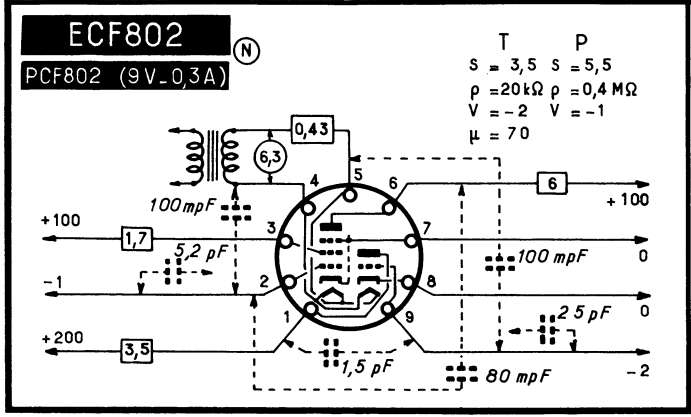


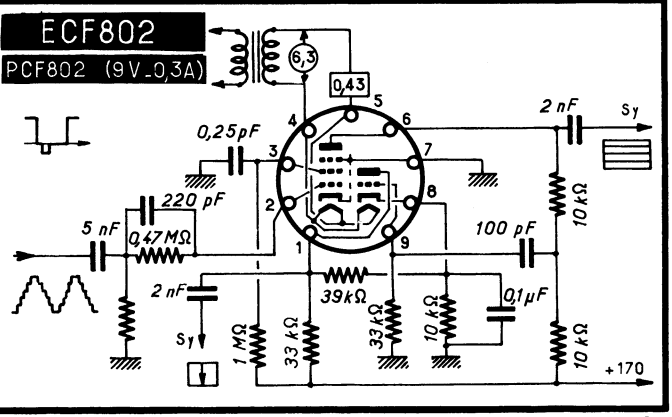
ECF 202



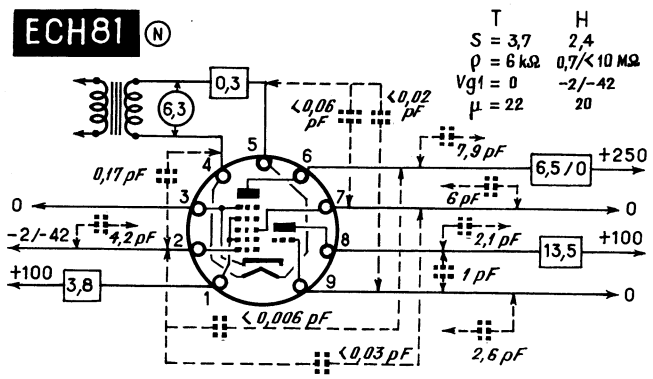

ECF801
PCF801 (8V_0,3A)
N
T P
S = 8,5 S = 10,5
μ = 20 ρ = 350kΩ
V = -1,2
Req=1,5kΩ
0,390
6,3
2,1 pF
<10 mpF
3,5 pF
+170
10
<25 mpF
6,5 pF
+120
3
1,6 pF
15
+100
2 pF
3,5 pF
-3
-1,2
0
<10 mpF
9mpF
1,5 pF
<10mpF


ECF801
PCF801 (8V_0,3A)
S_c = 5
V_{o1} = 4,5 eff
C
6,3
0,34
2,7 kΩ
10 nF
22 pF
33 pF
1 MΩ
10 kΩ
8 pF
0,5/3pF
8,2 kΩ
27 kΩ
16
3
10
-1,2
+200

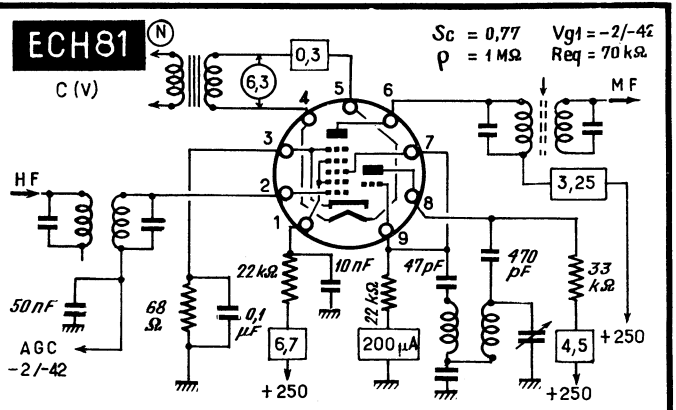

ECF802
PCF802 (9V_0,3A)
N
T P
S = 3,5 S = 5,5
ρ = 20kΩ ρ = 0,4 MΩ
V = -2 V = -1
μ = 70
0,43
6,3
100mpF
6
+100
+100
1,7
5,2 pF
100 mpF
0
-1
25 pF
0
+200
3,5
1,5 pF
80 mpF
-2


ECF802
PCF802 (9V_0,3A)
6,3
0,43
2 nF
Sy
0,25pF
220 pF
5 nF
0,47MΩ
100 pF
10 kΩ
2 nF
39kΩ
0,1μF
Sy
1 MΩ
33 kΩ
33 kΩ
10 kΩ
10 kΩ
+170

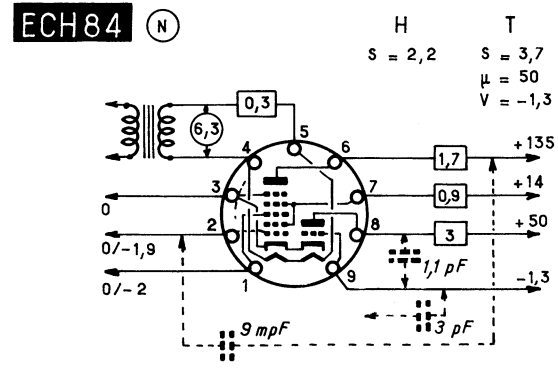
ECH81 (N)



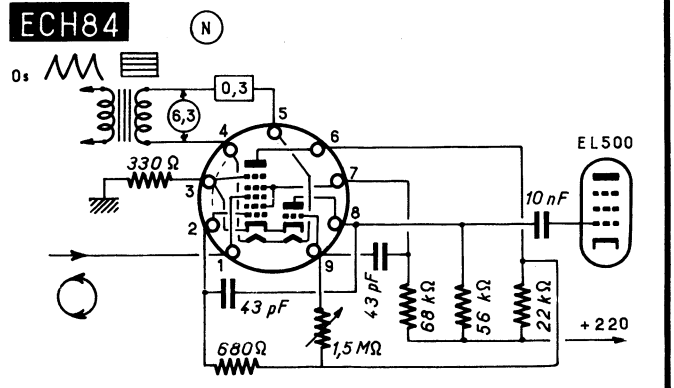
ECH81 (N)



ECH84 (N)

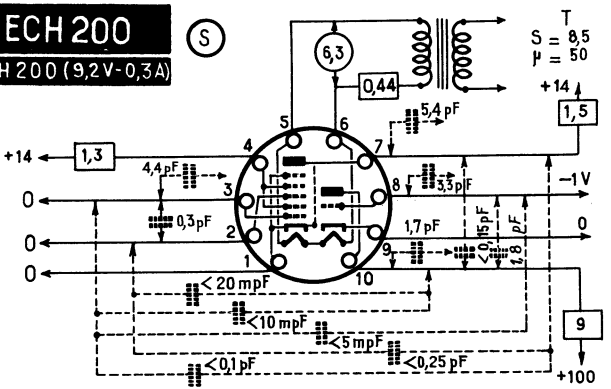


ECH84 (N)



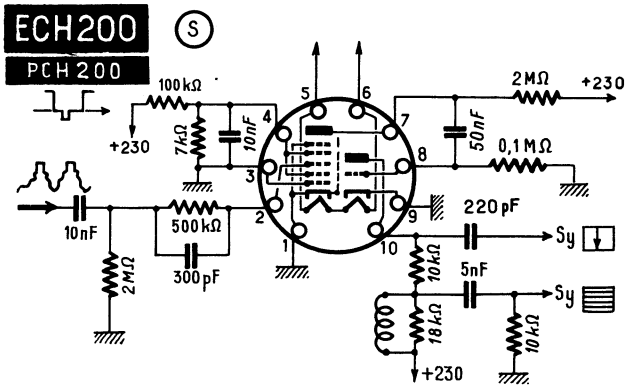
ECH 200

PCH 200 (9,2V-0,3A) (S)



ECH200

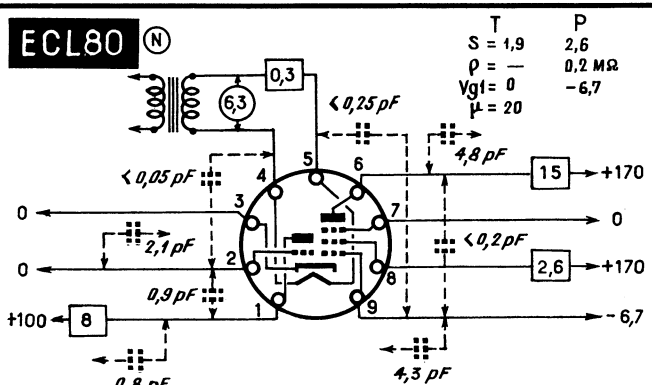
PCH 200 (S)



ECL80

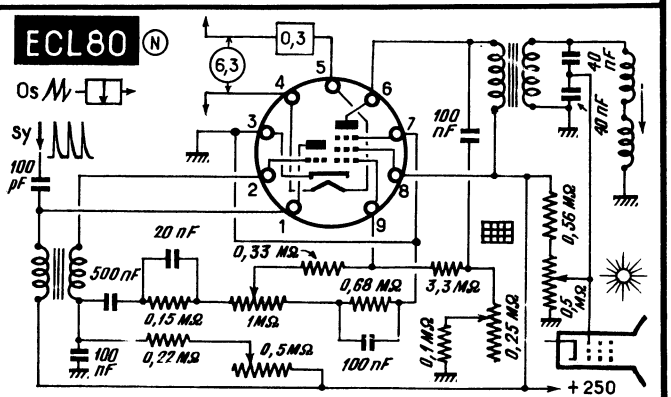
(N)

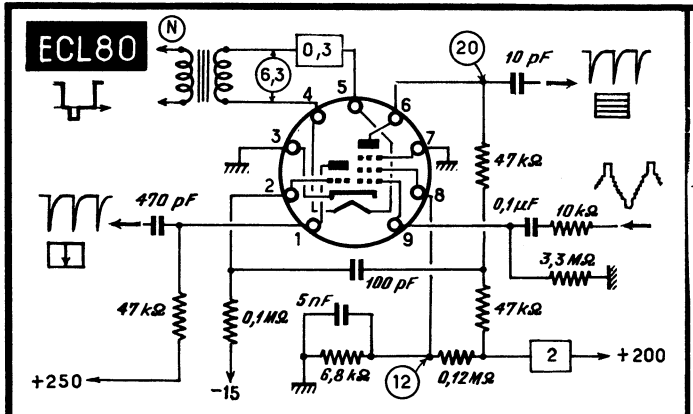
T P
S = 1,9 2,6
ρ = — 0,2 MΩ
Vg1 = 0 −6,7
μ = 20

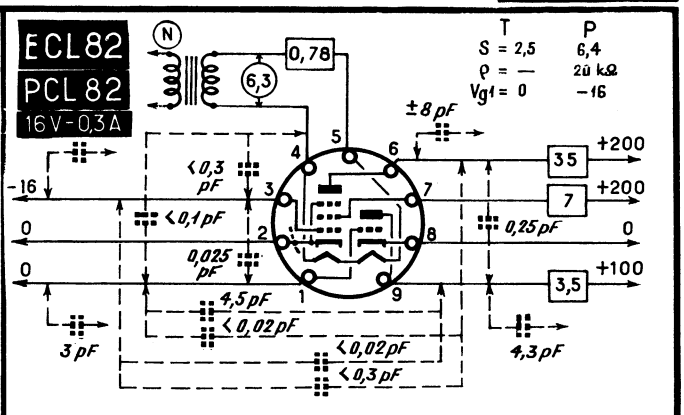


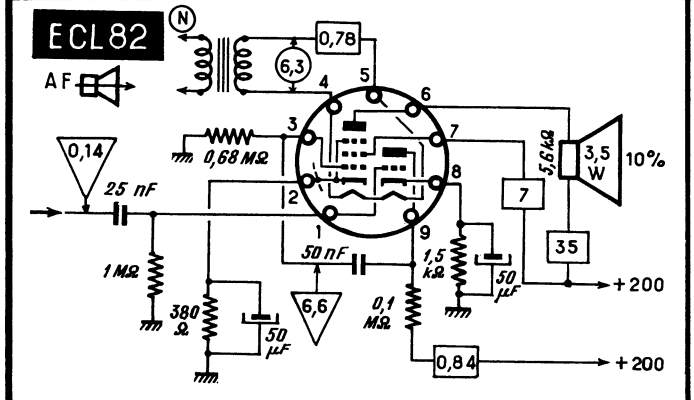
ECL80

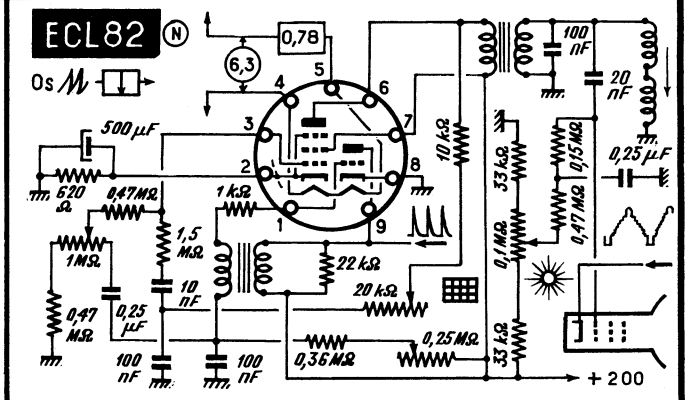
(N)



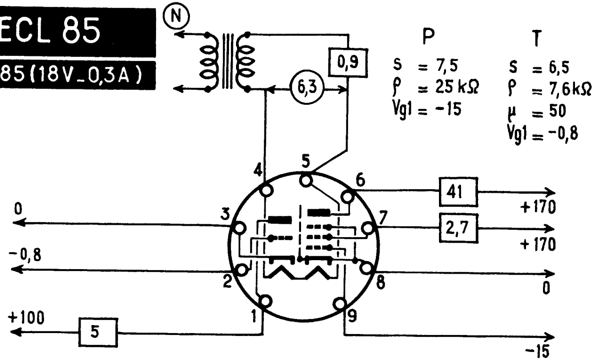

ECL80
N
0,3
6,3
20
10 pF
47 kΩ
470 pF
0,1 µF
10 kΩ
3,3 MΩ
100 pF
47 kΩ
0,1 MΩ
5 nF
47 kΩ
+250
−15
6,8 kΩ
12
0,12 MΩ
2
+200


ECL82
PCL 82
16 V - 0,3 A
N
0,78
6,3
T
P
S = 2,5
6,4
ρ = —
2ü kΩ
Vg1 = 0
−16
±8 pF
< 0,3 pF
< 0,1 pF
0,025 pF
4,5 pF
< 0,02 pF
< 0,02 pF
< 0,3 pF
3 pF
4,3 pF
0,25 pF
−16
0
0
+200
+200
0
+100
35
7
3,5

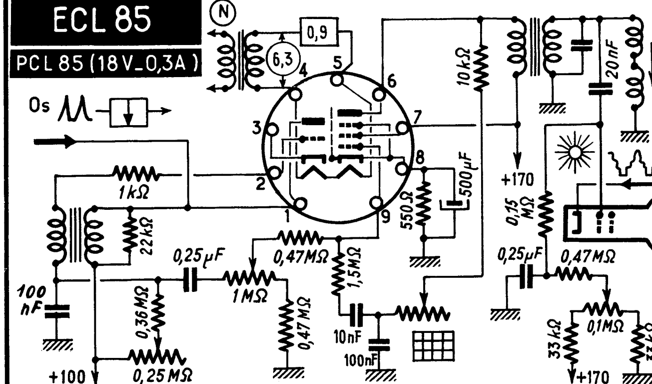

ECL82
N
AF
0,78
6,3
0,14
25 nF
0,68 MΩ
1 MΩ
380 Ω
50 µF
50 nF
6,6
0,1 MΩ
1,5 kΩ
50 µF
0,84
5,6 kΩ
3,5 W
10%
7
35
+200
+200


ECL82
N
Os
0,78
6,3
500 µF
620 Ω
0,47 MΩ
1 kΩ
1 MΩ
1,5 MΩ
10 nF
0,25 µF
0,47 MΩ
100 nF
100 nF
22 kΩ
20 kΩ
0,36 MΩ
0,25 MΩ
10 kΩ
33 kΩ
0,1 MΩ
33 kΩ
100 nF
20 nF
0,15 MΩ
0,47 MΩ
0,25 µF
+200

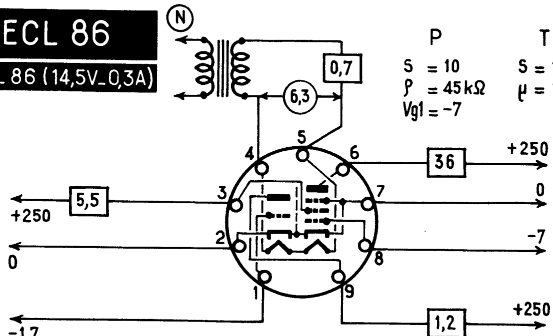
ECL 85
PCL 85 (18 V_0,3 A)



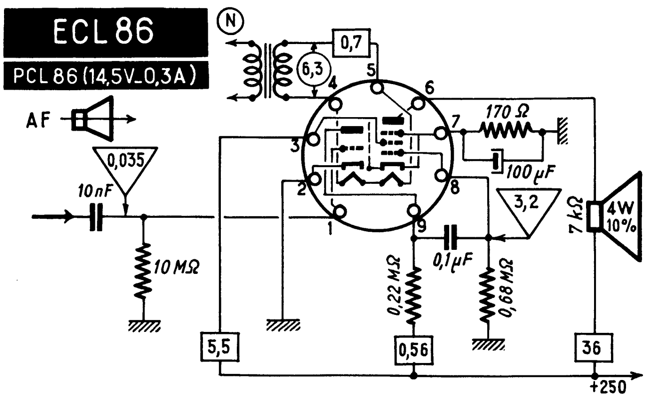
ECL 85
PCL 85 (18 V_0,3 A)



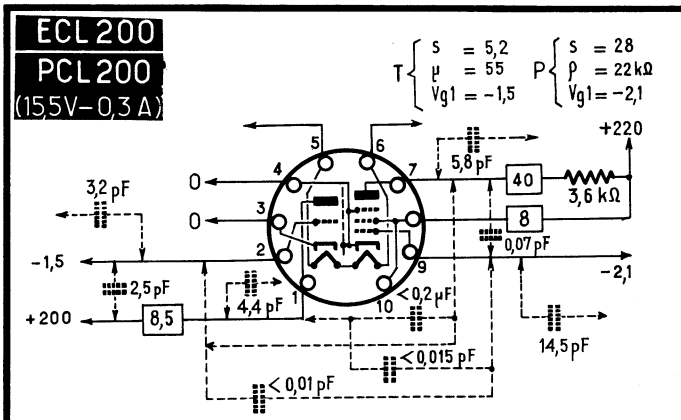
ECL 86
PCL 86 (14,5 V_0,3 A)



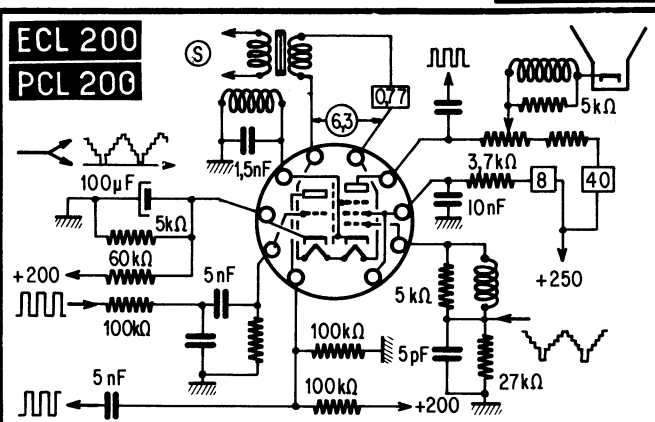
ECL 86
PCL 86 (14,5 V_0,3 A)



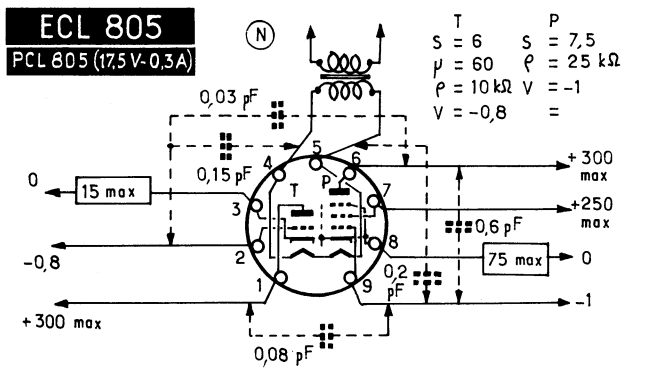
ECL 200
PCL 200
(15,5V–0,3 A)



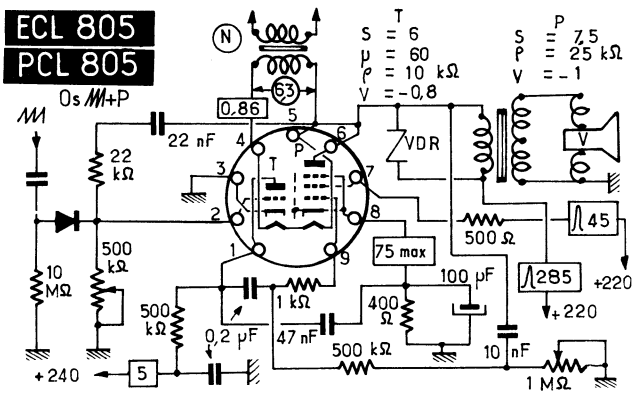
ECL 200
PCL 200

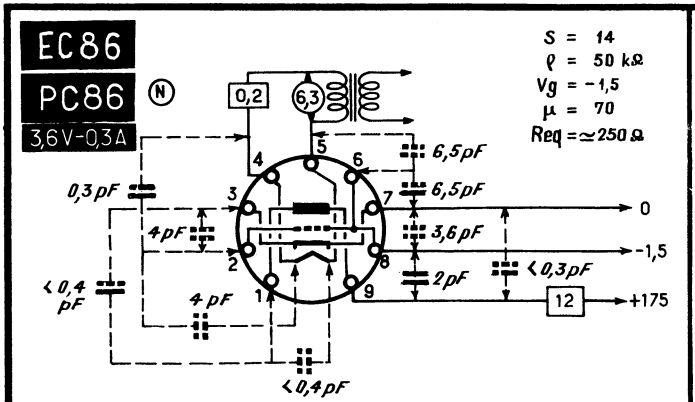


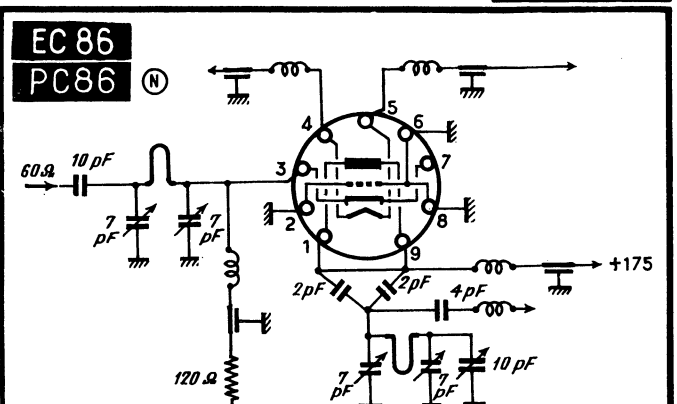
ECL 805
PCL 805 (17,5 V-0,3A)

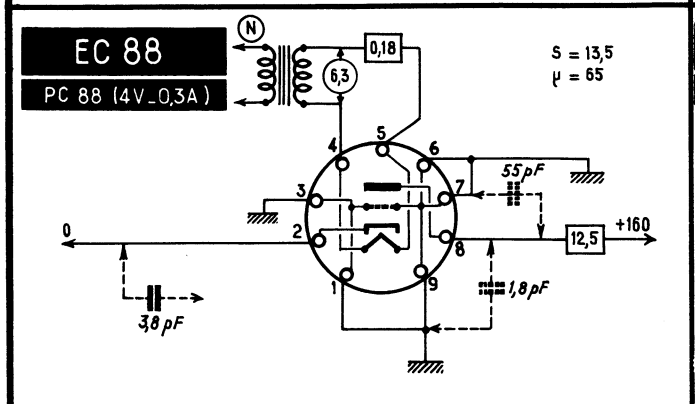


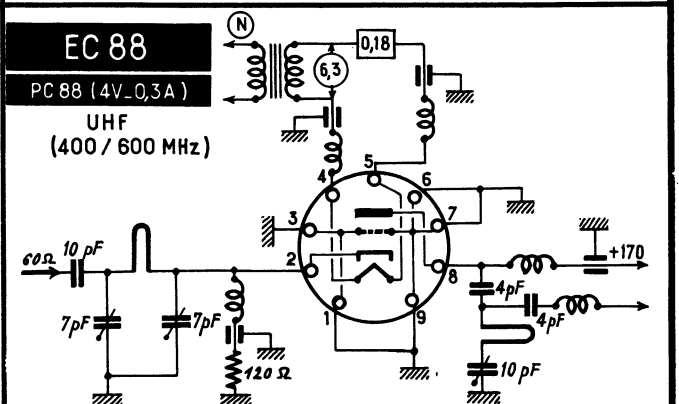
ECL 805
PCL 805

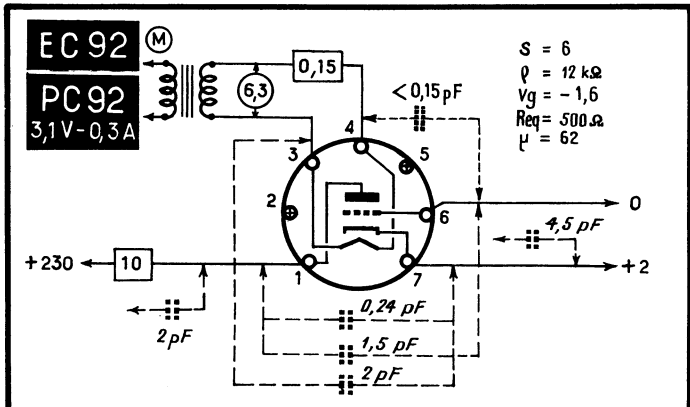


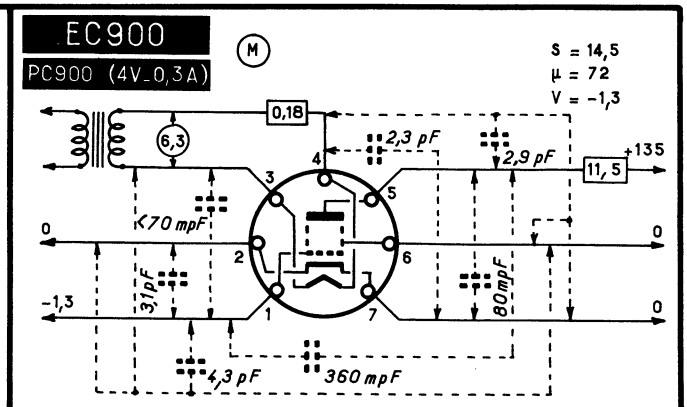

EC86
PC86
N
3,6V-0,3A
0,2
6,3
S = 14
ϱ = 50 kΩ
Vg = −1,5
μ = 70
Req = ≃250 Ω
6,5pF
6,5pF
3,6pF
2pF
0,3pF
4pF
< 0,4 pF
4pF
< 0,4pF
< 0,3pF
0
-1,5
12
+175

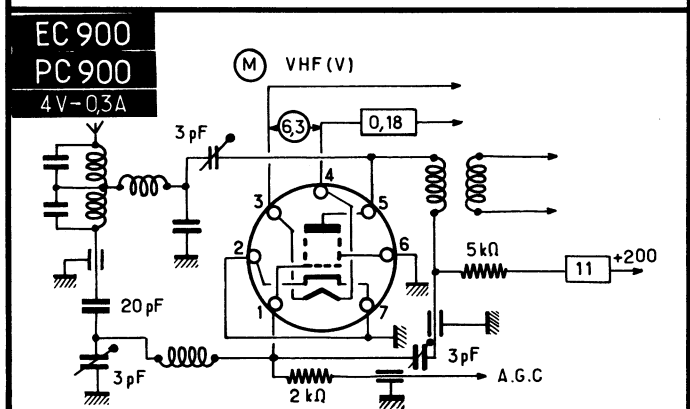

EC 86
PC86
N
60Ω
10pF
7 pF
7 pF
120 Ω
2pF
2pF
4pF
7 pF
7 pF
10 pF
+175

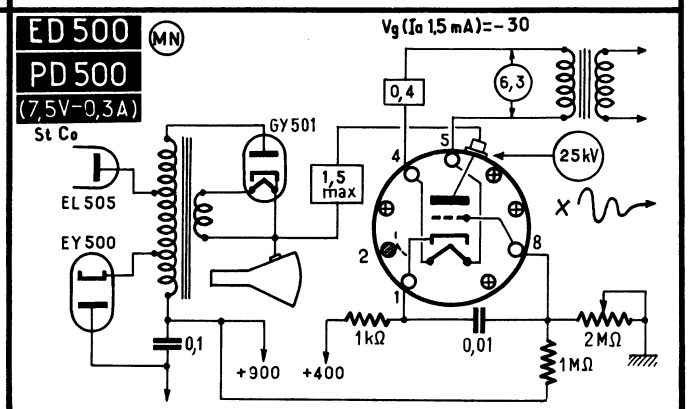

EC 88
PC 88 (4V_0,3A)
N
0,18
6,3
S = 13,5
μ = 65
55pF
0
12,5
+160
3,8pF
1,8pF


EC 88
PC 88 (4V_0,3A)
UHF
(400 / 600 MHz)
N
0,18
6,3
60Ω
10pF
7pF
7pF
120 Ω
+170
4pF
4pF
10 pF


EC 92
PC 92
3,1V-0,3A
M
6,3
0,15
< 0,15pF
S = 6
ρ = 12 kΩ
Vg = -1,6
Req = 500 Ω
μ = 62
4,5 pF
+230
10
2pF
0,24 pF
1,5 pF
2 pF
0
+2

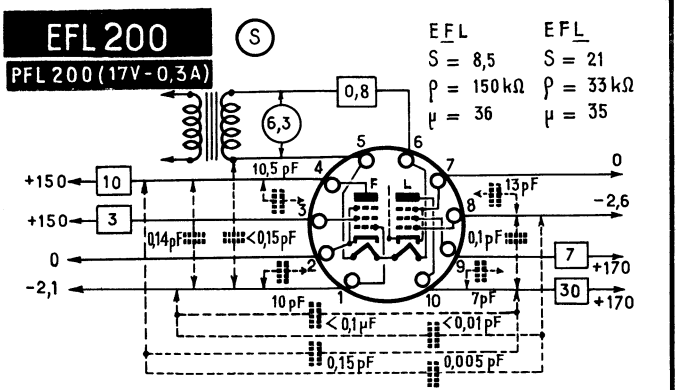

EC900
PC900 (4V-0,3A)
M
S = 14,5
μ = 72
V = -1,3
6,3
0,18
2,3 pF
2,9 pF
+135
11,5
K70 mpF
0
-1,3
3,1 pF
80mpF
4,3 pF
360 mpF


EC 900
PC 900
4V-0,3A
M
VHF (V)
6,3
0,18
3 pF
20 pF
3 pF
5 kΩ
11
+200
3 pF
2 kΩ
A.G.C


ED 500
PD 500
(7,5V-0,3A)
MN
Vg (Ia 1,5 mA) = -30
St Co
EL 505
EY 500
GY 501
0,4
6,3
1,5 max
25kV
X
1kΩ
0,01
2MΩ
1MΩ
0,1
+900
+400

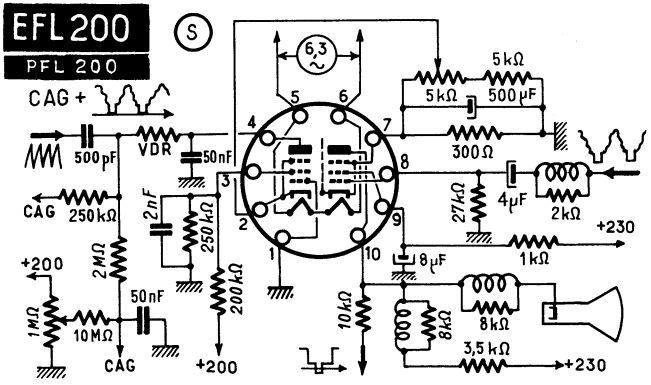
EFL 200

PFL 200 (17V - 0,3A)

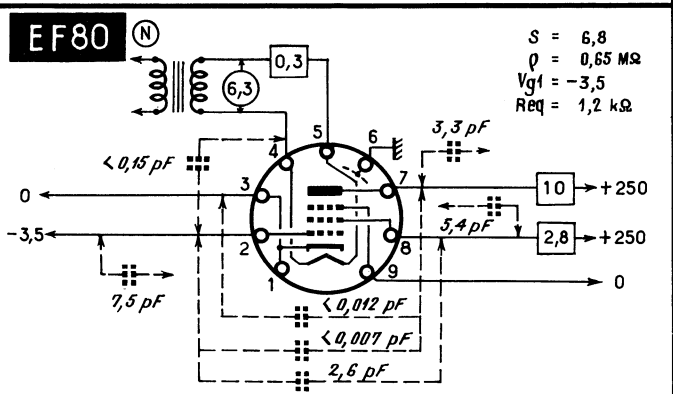


EFL 200

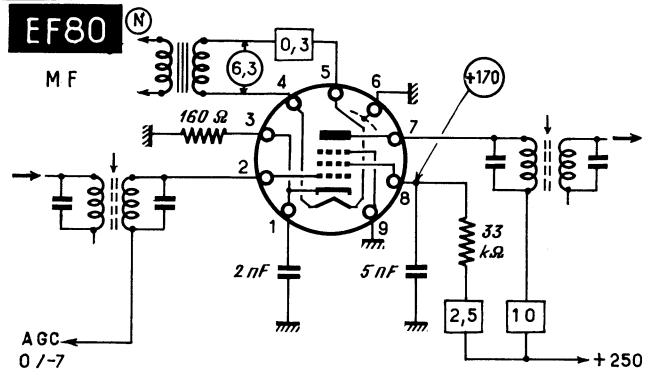
PFL 200



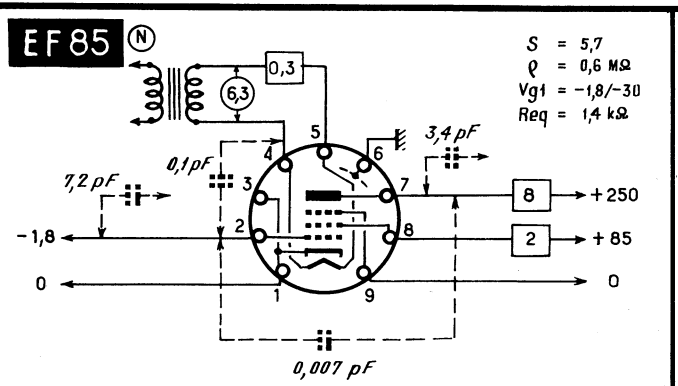
EF80



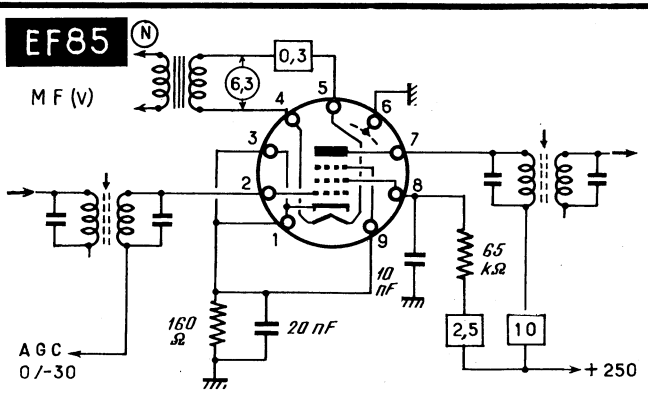
EF80



EF 85 (N)

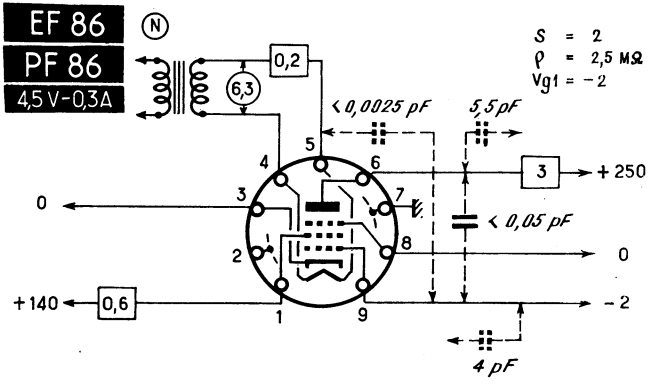


EF 85 (N)



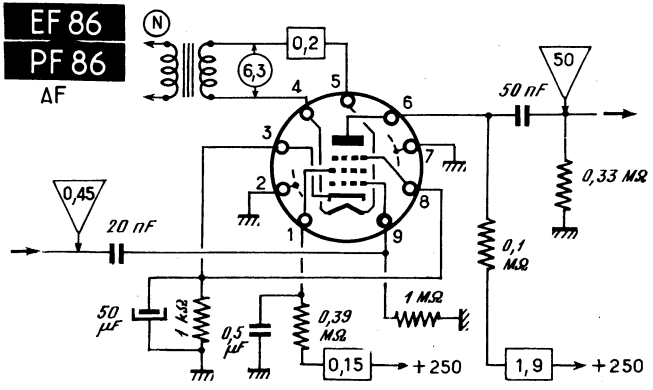
EF 86 / PF 86 (N)

4,5 V-0,3A



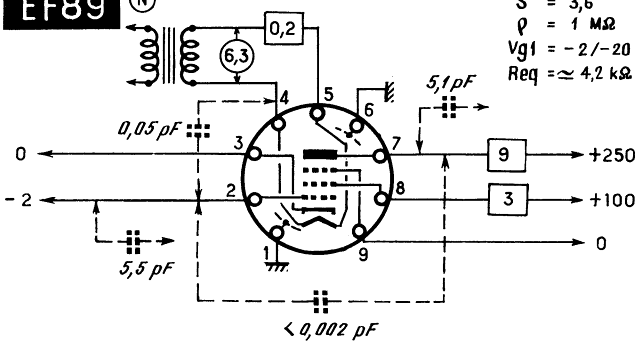
EF 86 / PF 86 (N)

AF



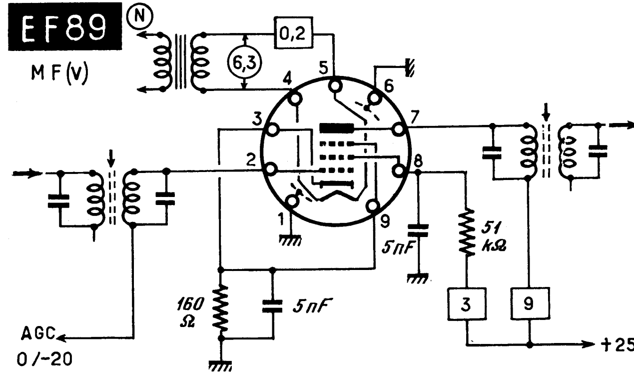
EF89 (N)

S = 3,6
ρ = 1 MΩ
Vg1 = −2/−20
Req =≃ 4,2 kΩ



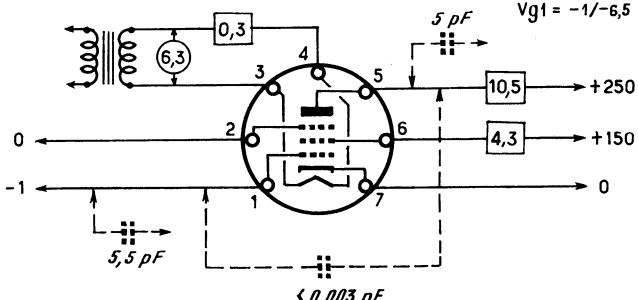
EF89 (N)

MF(V)



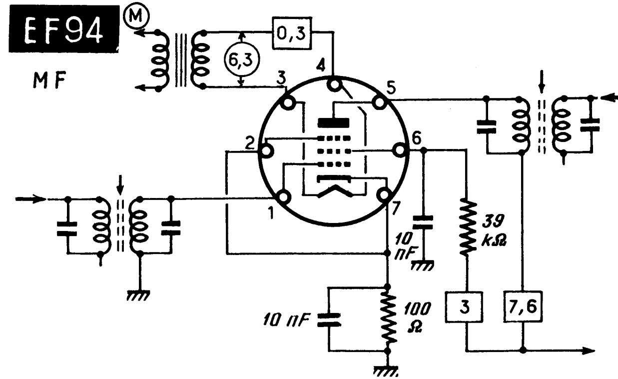
EF94 (M)

S = 5,2
ρ = 1 MΩ
Vg1 = −1/−6,5



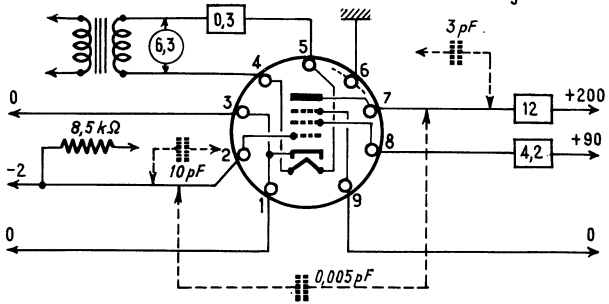
EF94 (M)

MF



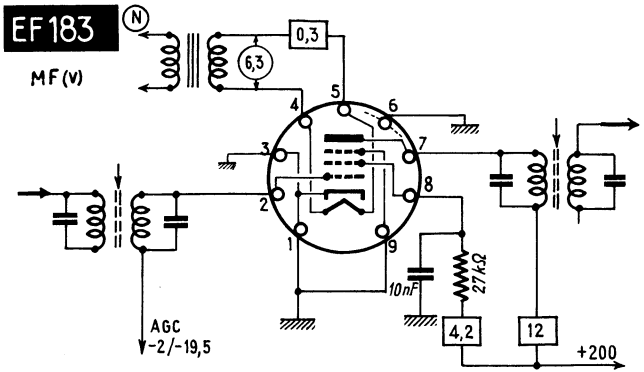
EF 183 (N)

S = 12,5
ρ = 0,5 MΩ
Vg1 = −2



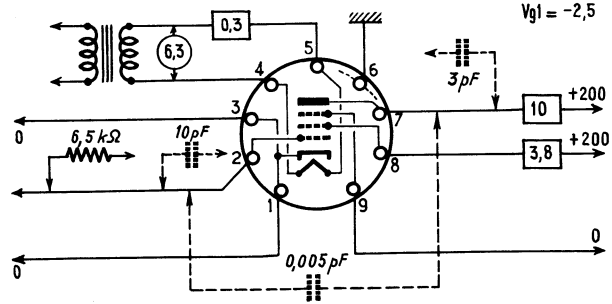
EF 183 (N)

MF (V)



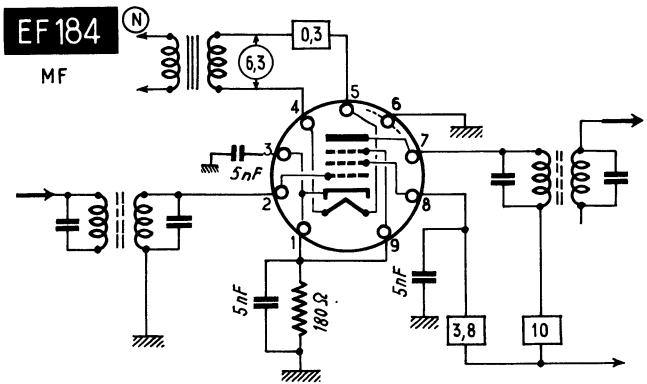
EF 184 (N)

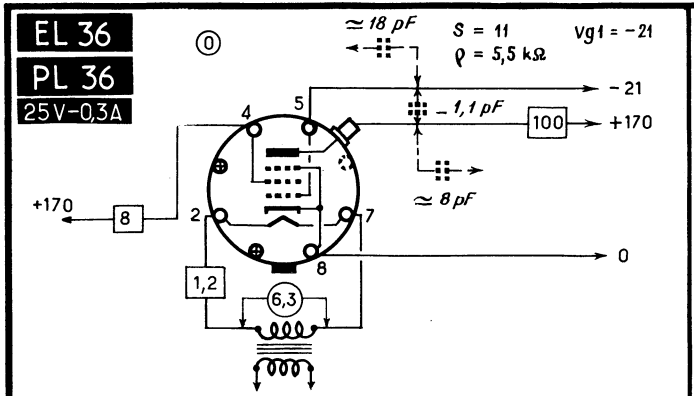
S = 15
ρ = 0,35 kΩ
Vg1 = −2,5

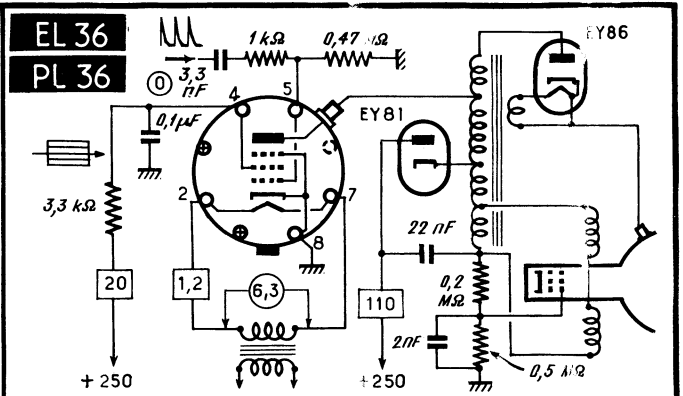


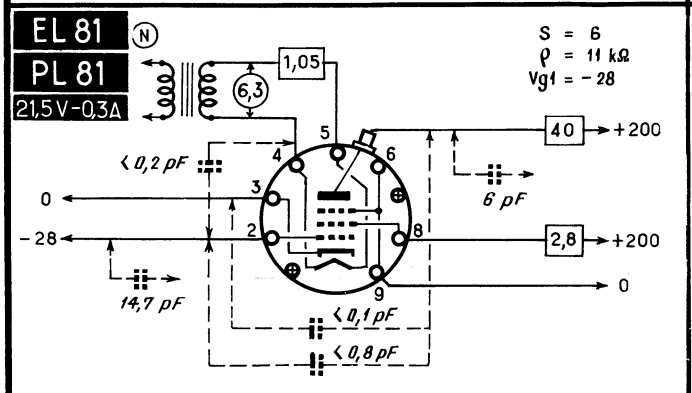
EF 184 (N)

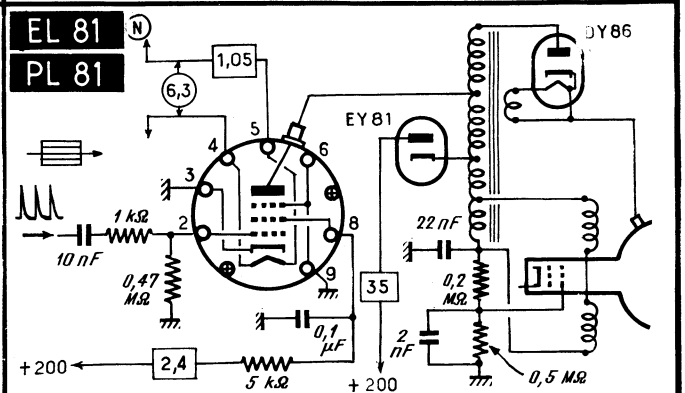
MF



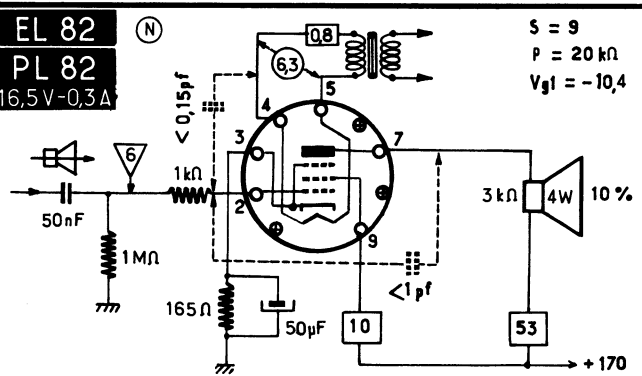

EL 36
PL 36
25V-0,3A
⓪
≃ 18 pF
S = 11
Vg1 = −21
ϱ = 5,5 kΩ
− 21
− 1,1 pF
100
+170
≃ 8 pF
+170
8
2
4
5
7
8
0
1,2
6,3


EL 36
PL 36
⓪
1 kΩ
0,47 MΩ
3,3 nF
EY86
EY81
0,1 µF
3,3 kΩ
22 nF
0,2 MΩ
20
1,2
6,3
110
2nF
0,5 MΩ
+ 250
+ 250

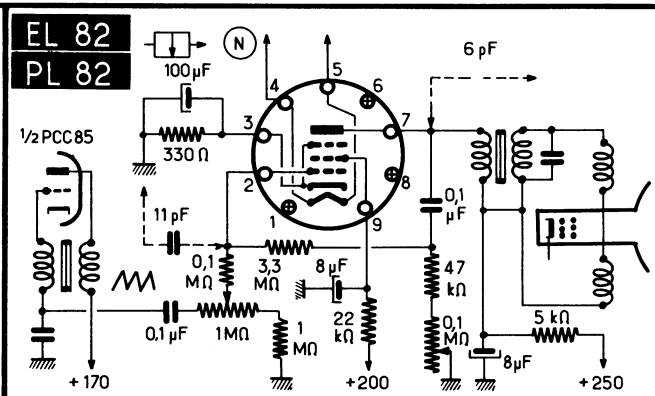

EL 81
PL 81
21,5V-0,3A
Ⓝ
S = 6
ϱ = 11 kΩ
Vg1 = − 28
1,05
6,3
40
+200
< 0,2 pF
6 pF
0
− 28
2,8
+200
14,7 pF
0
< 0,1 pF
< 0,8 pF


EL 81
PL 81
Ⓝ
1,05
6,3
EY86
EY81
1 kΩ
10 nF
22 nF
0,47 MΩ
0,2 MΩ
35
0,1 µF
2 nF
+200
2,4
5 kΩ
+ 200
0,5 MΩ

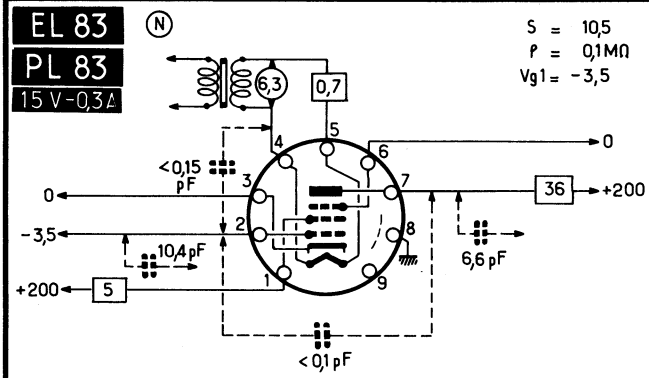
EL 82
PL 82
16,5 V-0,3 A



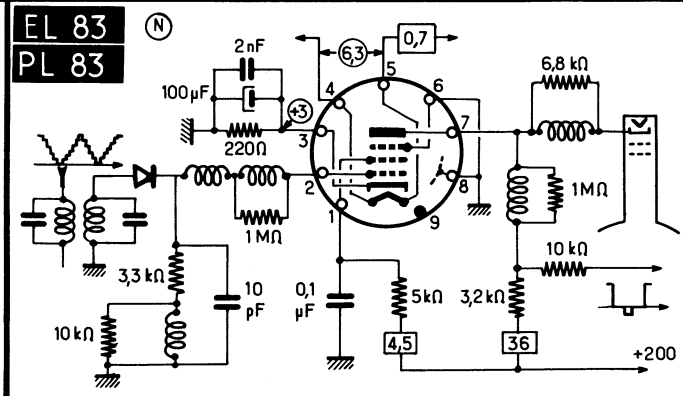
EL 82
PL 82

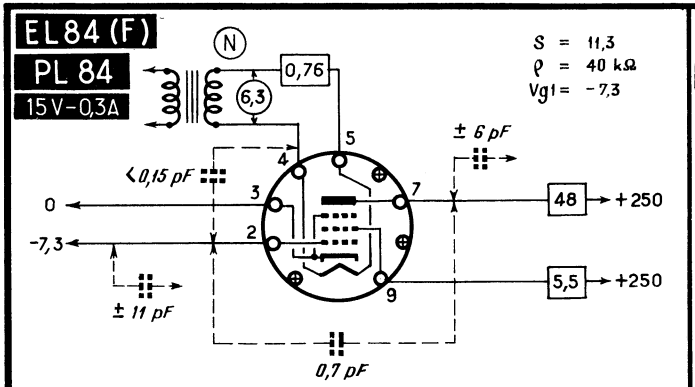


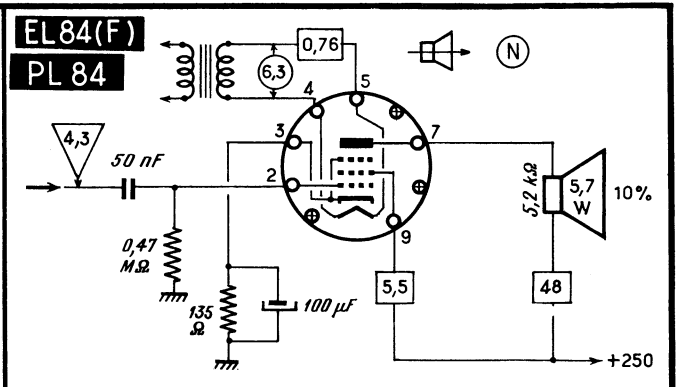
EL 83
PL 83
15 V-0,3 A

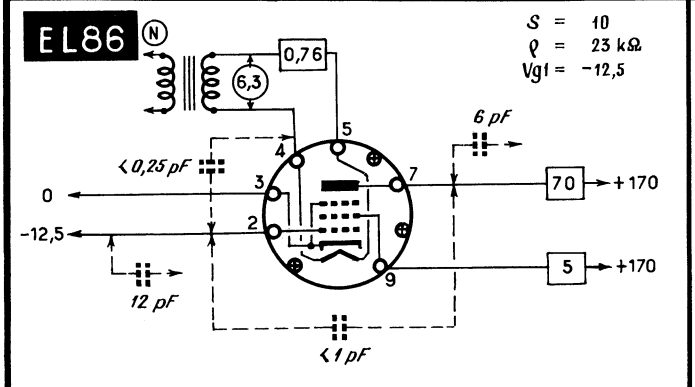


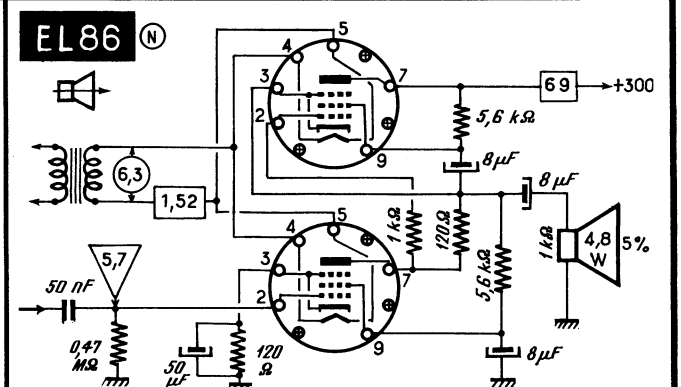
EL 83
PL 83




EL84 (F)
PL 84
15 V–0,3 A
N
0,76
6,3
S = 11,3
ϱ = 40 kΩ
Vg1 = −7,3
± 6 pF
< 0,15 pF
0
−7,3
± 11 pF
0,7 pF
48
+250
5,5
+250

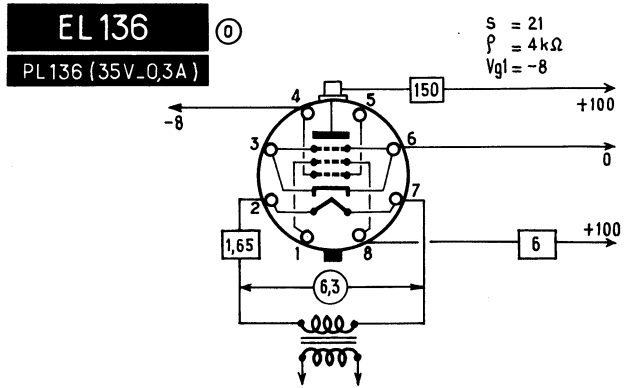

EL84(F)
PL 84
0,76
6,3
N
4,3
50 nF
0,47 MΩ
135 Ω
100 µF
5,5
48
+250
5,2 kΩ
5,7 W
10%


EL86
N
0,76
6,3
S = 10
ϱ = 23 kΩ
Vg1 = −12,5
6 pF
< 0,25 pF
0
−12,5
12 pF
< 1 pF
70
+170
5
+170


EL86
N
6,3
1,52
5,7
50 nF
0,47 MΩ
50 µF
120 Ω
69
+300
5,6 kΩ
8 µF
8 µF
1 kΩ
120 Ω
5,6 kΩ
1 kΩ
4,8 W
5%
8 µF

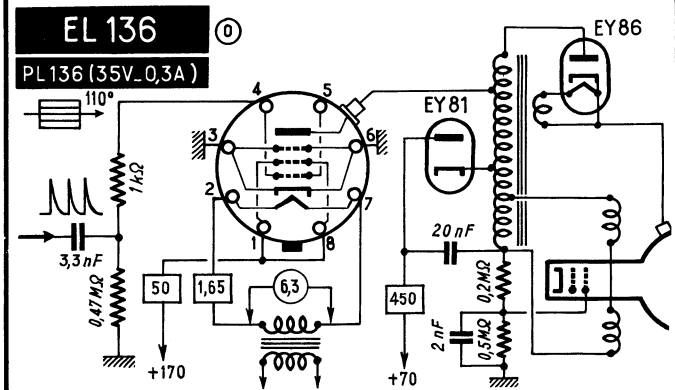
EL 136

PL 136 (35V_0,3A)

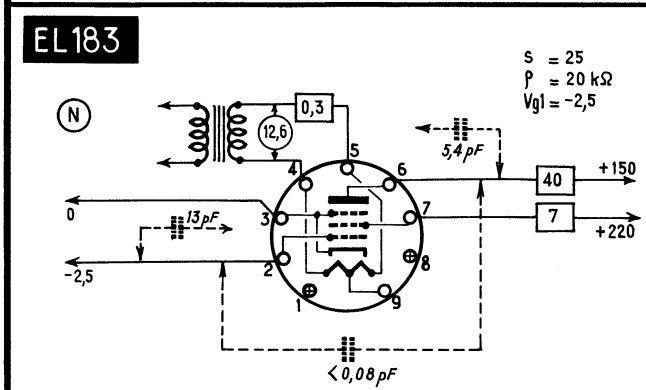


EL 136

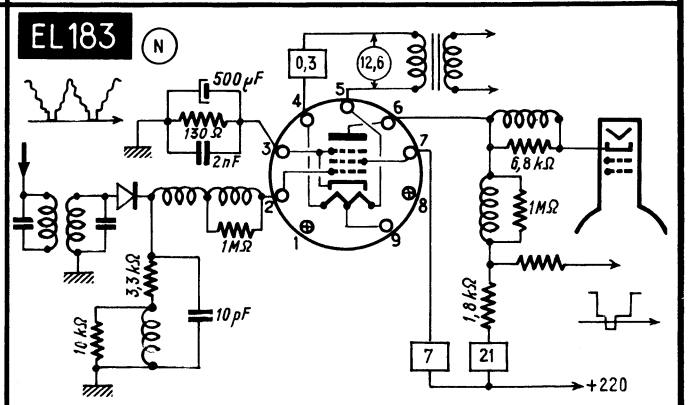
PL 136 (35V_0,3A)



EL 183

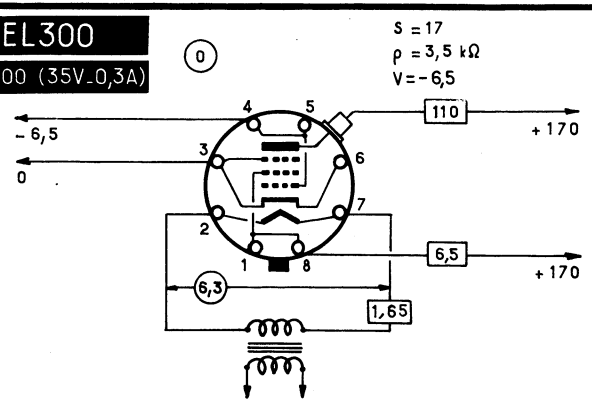


EL 183



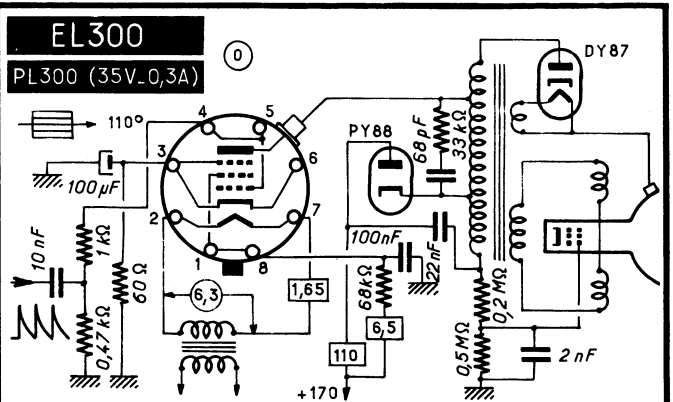
EL300

PL300 (35V_0,3A)



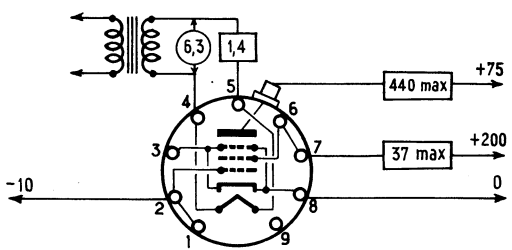
EL300

PL300 (35V_0,3A)



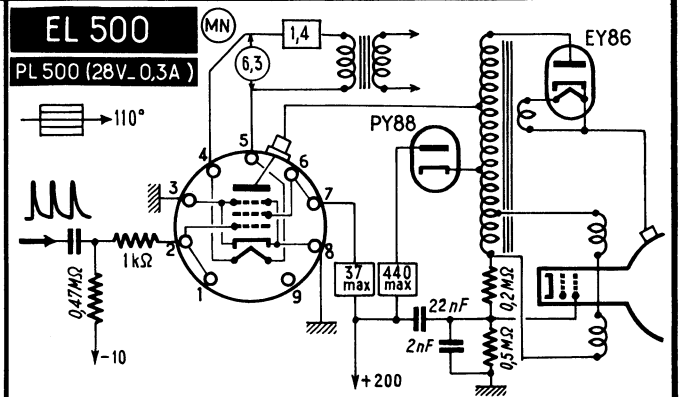
EL 500

PL 500 (28V_0,3A)



EL 500

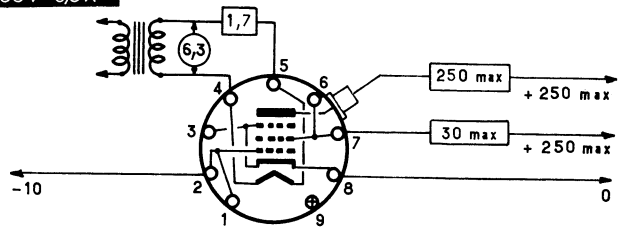
PL 500 (28V_0,3A)



EL 502
PL 502

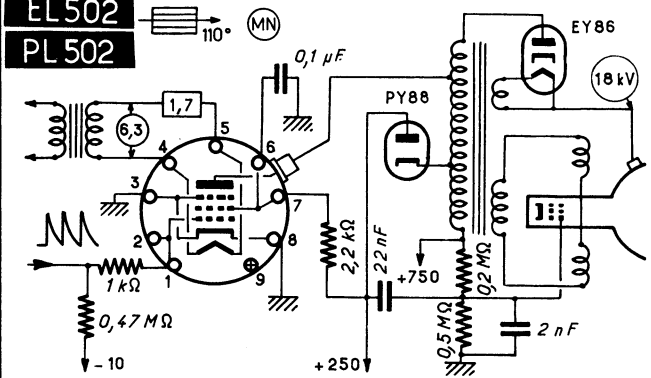
35V-0,3A

MN



EL 502
PL 502

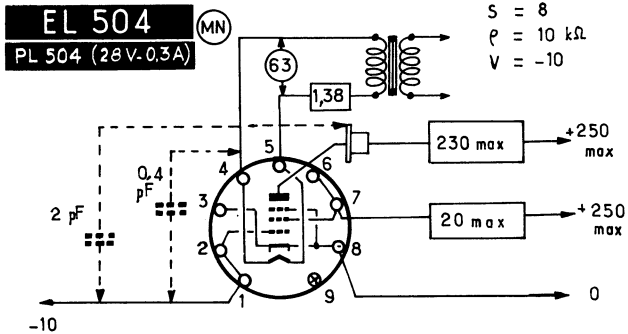
MN 110°



EL 504
PL 504 (28V-0,3A)

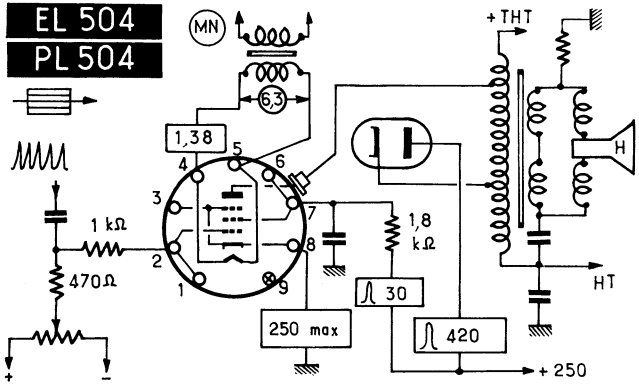
MN

S = 8
ρ = 10 kΩ
V = -10



EL 504
PL 504

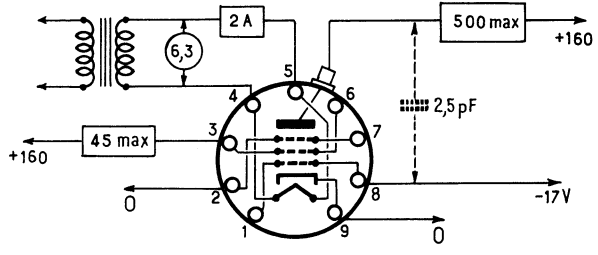
MN



EL505

PL505 (40V-0,3A)

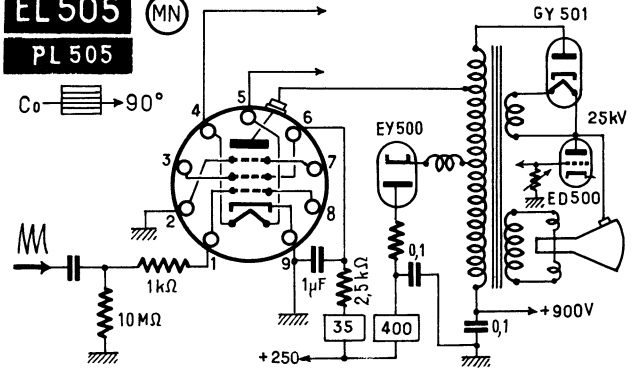
MN



EL505

PL505

MN

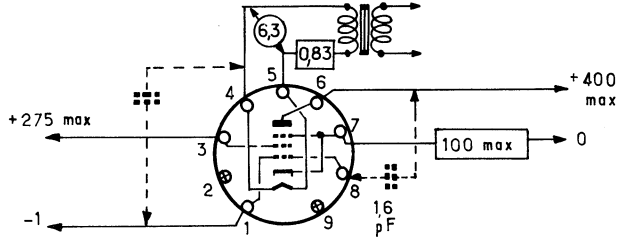


EL 508

PL 508 (17V-0,3A)

MN

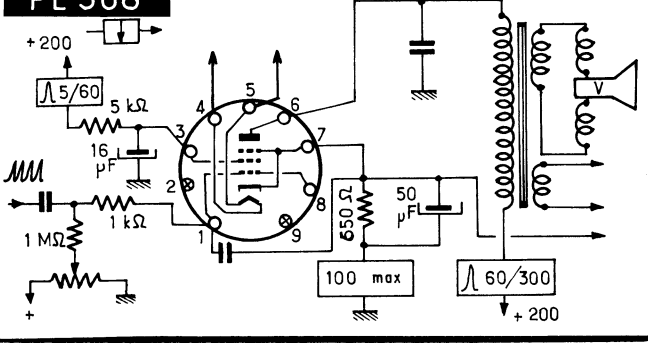
S = 9
μ g1 g2 = 8
V = -5



EL 508

PL 508

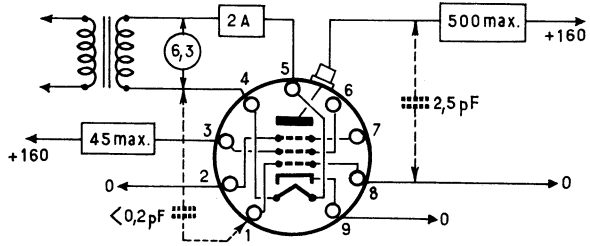
MN



EL 509

PL 509 (40V-0,3A)

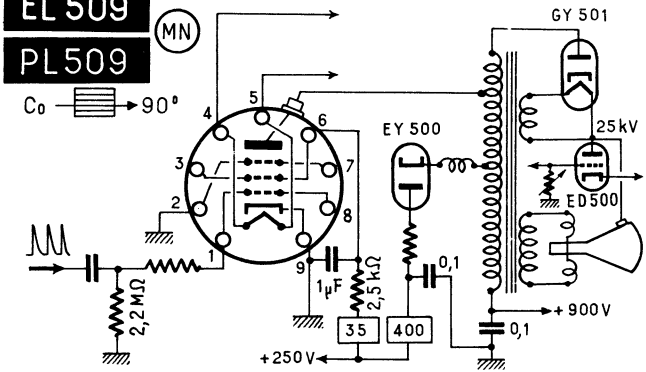
MN



EL 509

PL 509

MN

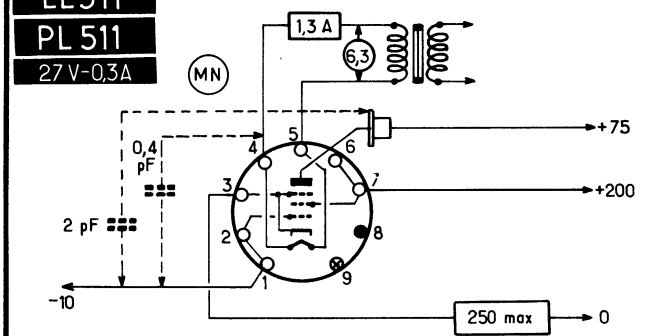


EL 511

PL 511

27 V-0,3A

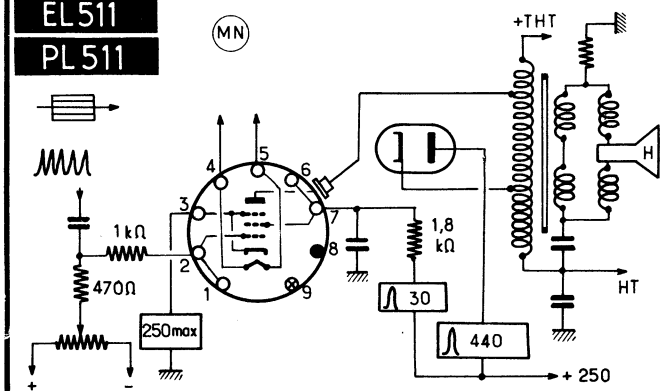
MN



EL 511

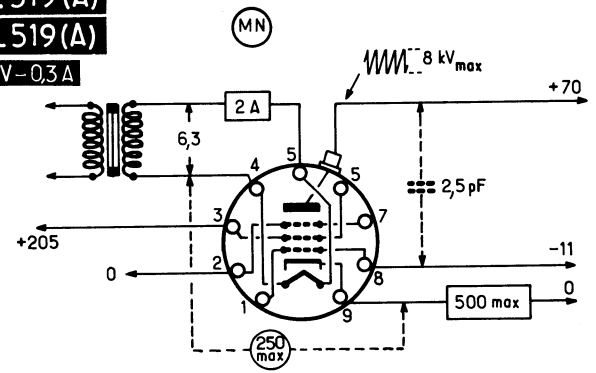
PL 511

MN

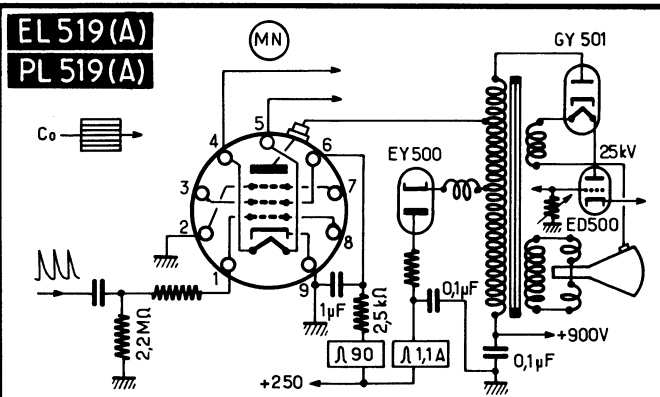


EL519(A) PL519(A)

40V – 0,3A

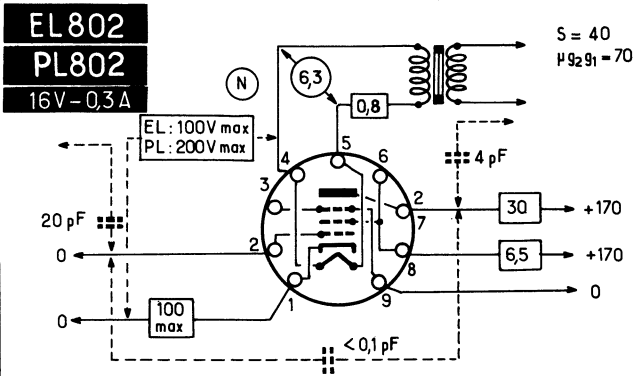


EL519(A) PL519(A)

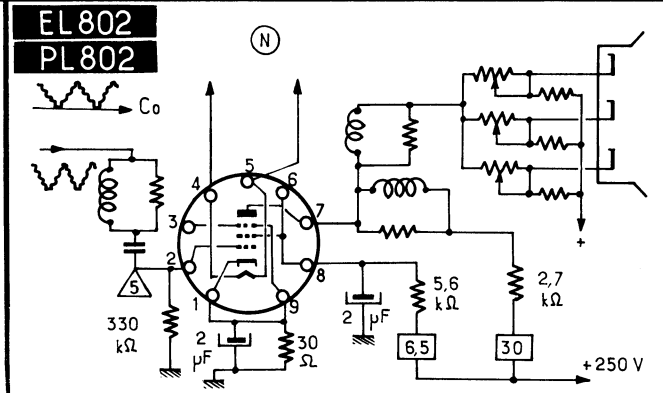


EL802 PL802

16V – 0,3A

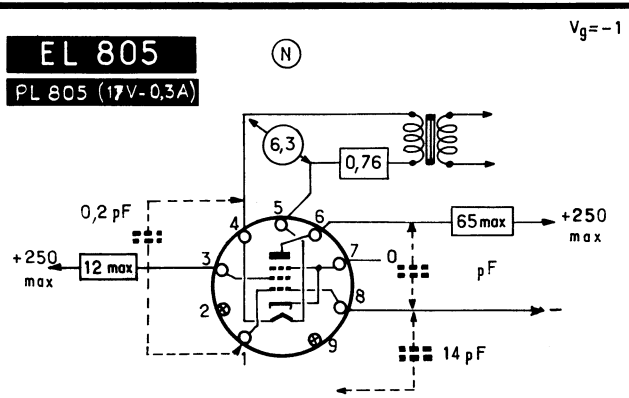


EL802 PL802

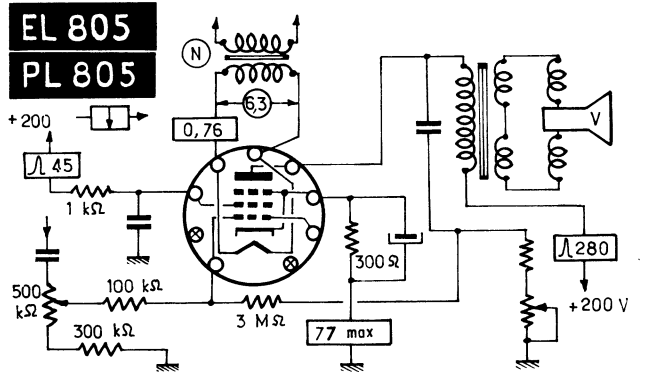


EL 805

PL 805 (17V-0,3A)

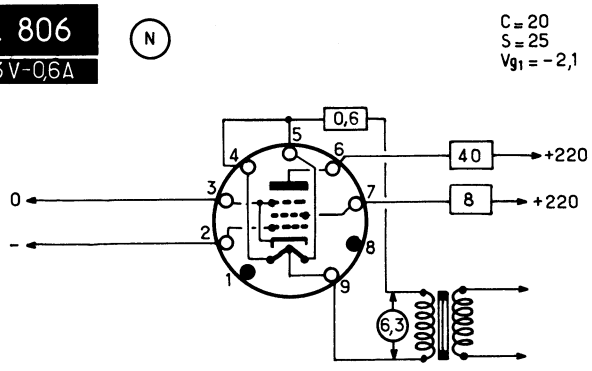


EL 805
PL 805



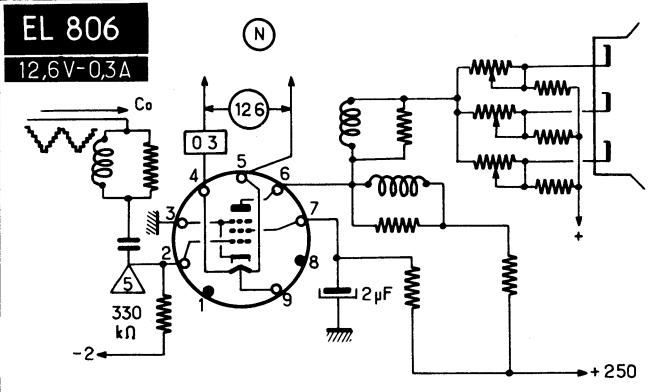
EL 806

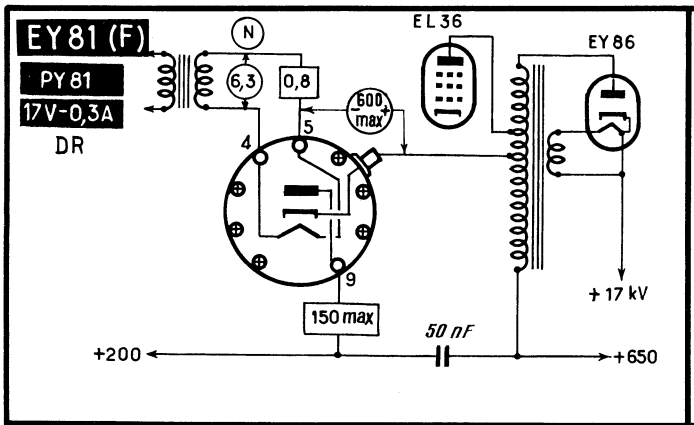
6,3 V-0,6A

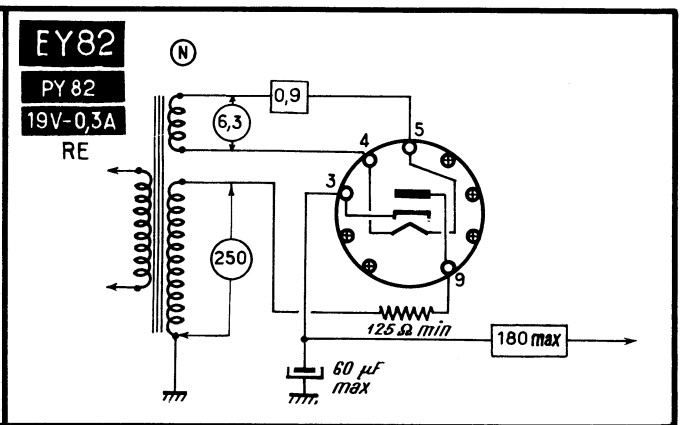


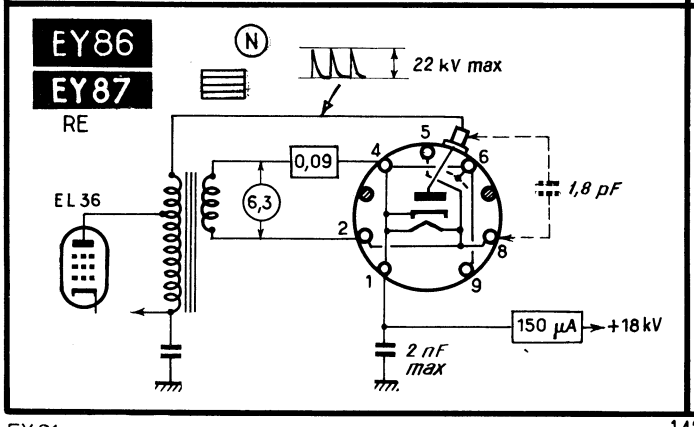
EL 806

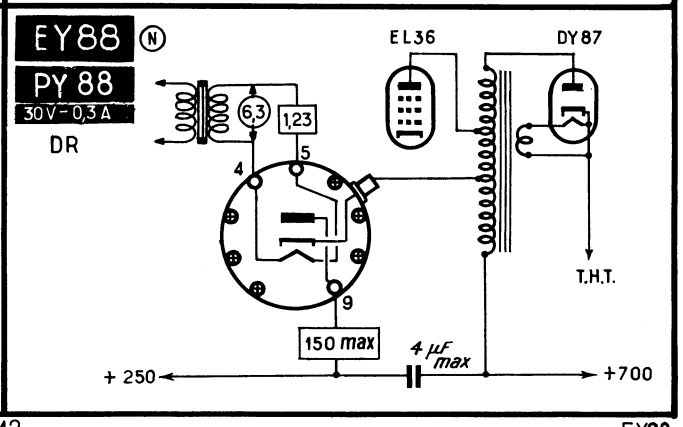
12,6V-0,3A

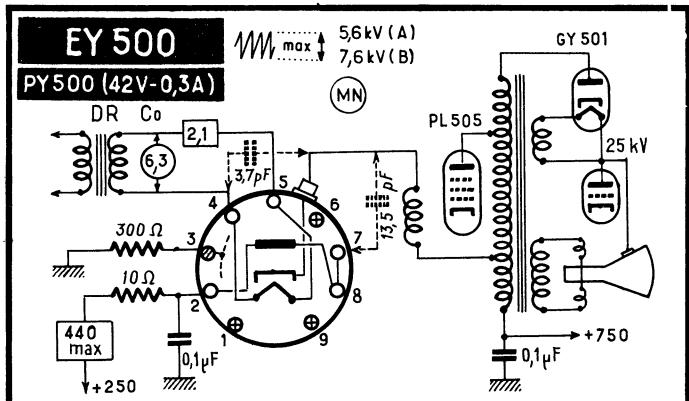


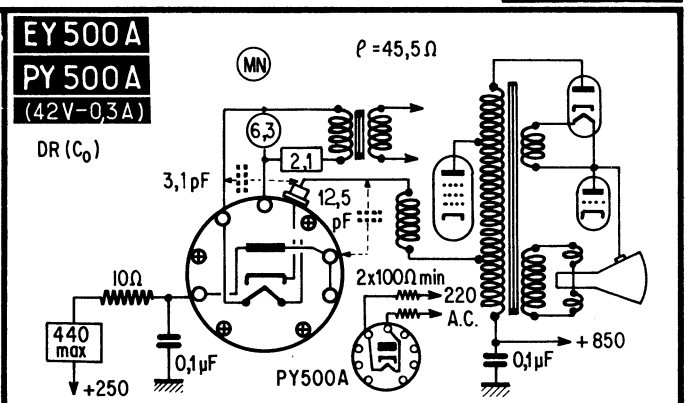

EY 81 (F)
PY 81
17V-0,3A
DR
N
6,3
0,8
600 max
EL 36
EY 86
4
5
9
150 max
50 nF
+200
+650
+ 17 kV

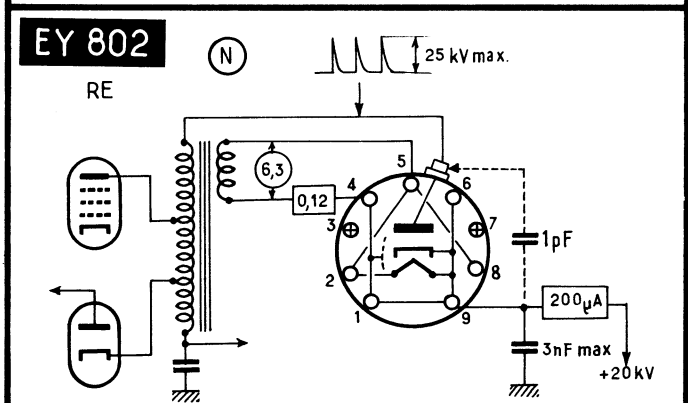

EY82
PY 82
19V-0,3A
RE
N
0,9
6,3
4
5
3
9
250
125 Ω min
180 max
60 µF max

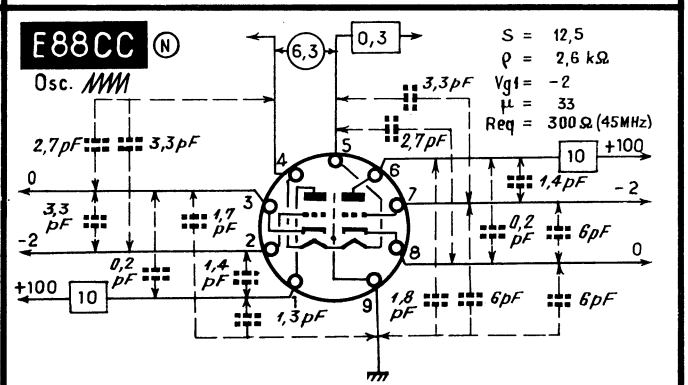

EY86
EY87
RE
N
22 kV max
0,09
6,3
EL 36
4
5
6
2
8
1
9
1,8 pF
150 µA
+18 kV
2 nF max


EY88
PY 88
30V-0,3A
DR
N
EL36
DY87
6,3
1,23
5
4
9
T.H.T.
150 max
4 µF max
+ 250
+700

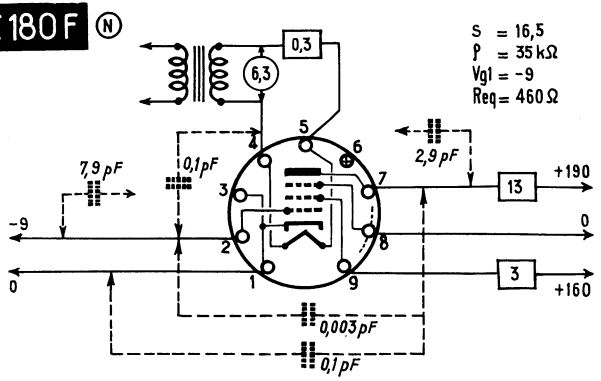

EY 500
PY500 (42V-0,3A)
max
5,6kV (A)
7,6kV (B)
MN
GY 501
PL505
25 kV
DR Co
2,1
6,3
3,7pF
13,5 pF
300 Ω
10 Ω
440 max
+250
0,1µF
+750


EY500A
PY500A
(42V-0,3A)
MN
ρ =45,5Ω
DR (C0)
6,3
2,1
3,1pF
12,5 pF
10Ω
2x100Ω min
220
A.C.
440 max
+250
0,1µF
PY500A
+850

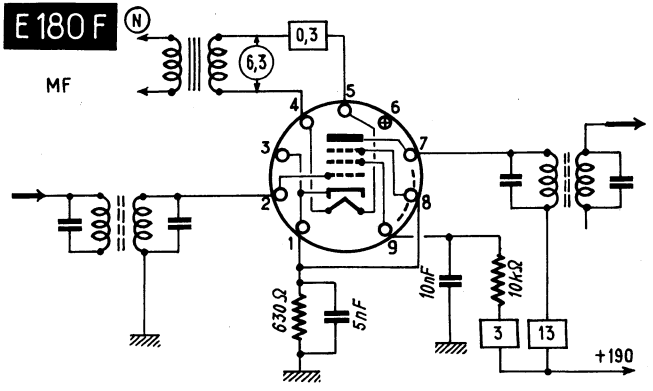

EY 802
N
RE
25 kV max.
6,3
0,12
1pF
200µA
3nF max
+20kV


E88CC
N
Osc.
6,3
0,3
S = 12,5
ρ = 2,6 kΩ
Vg1 = -2
µ = 33
Rag = 300Ω (45MHz)
3,3pF
2,7pF
3,3pF
2,7pF
+100
10
1,4pF
-2
0
3,3 pF
1,7 pF
0,2 pF
6pF
0,2 pF
1,4 pF
1,3pF
1,8 pF
6pF
6pF

E 180 F (N)

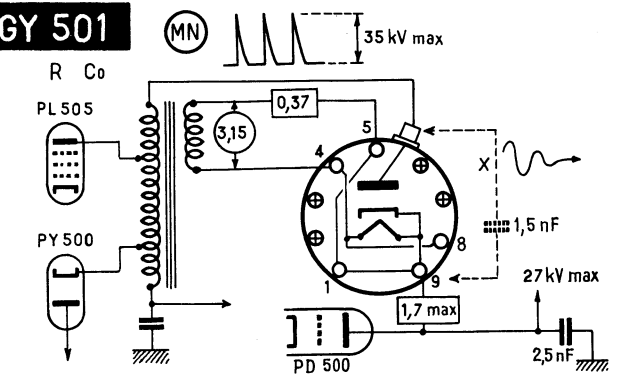


E 180 F (N)



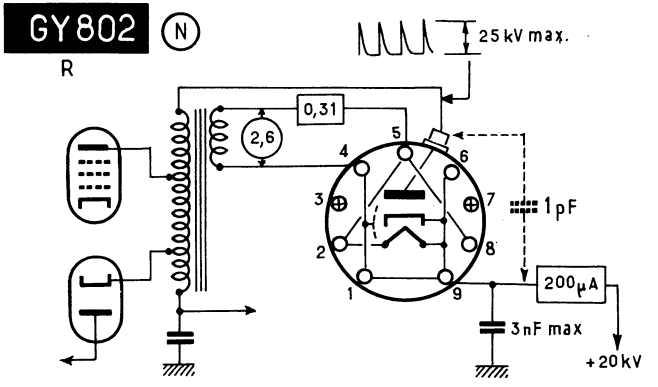
GY 501 (MN)

R Co

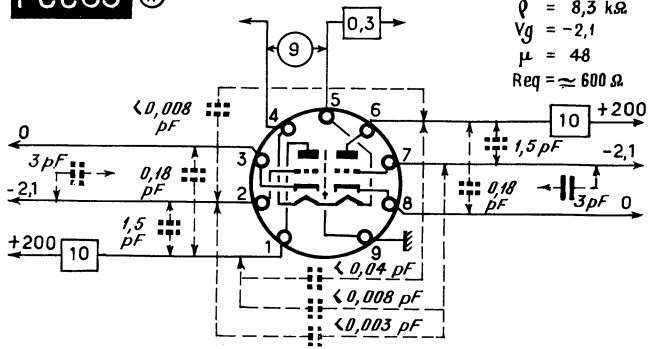


GY 802 (N)

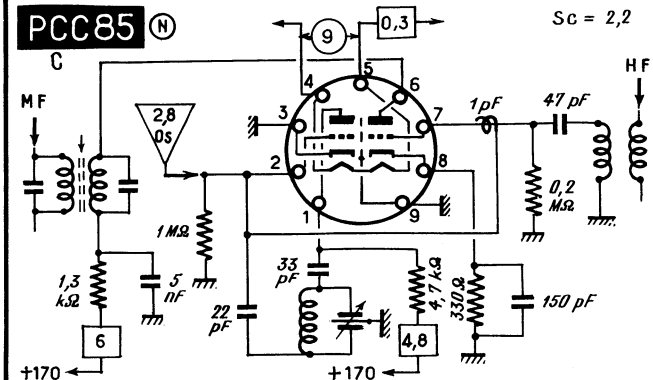
R



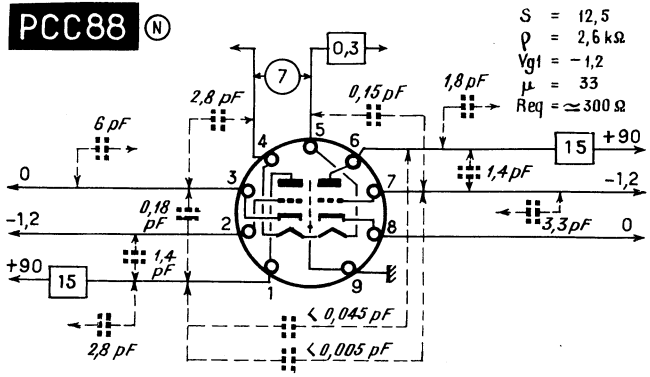
PCC85 (N)



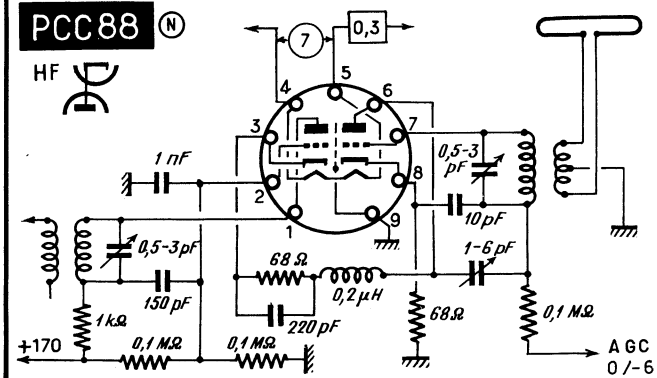
PCC85 (N)



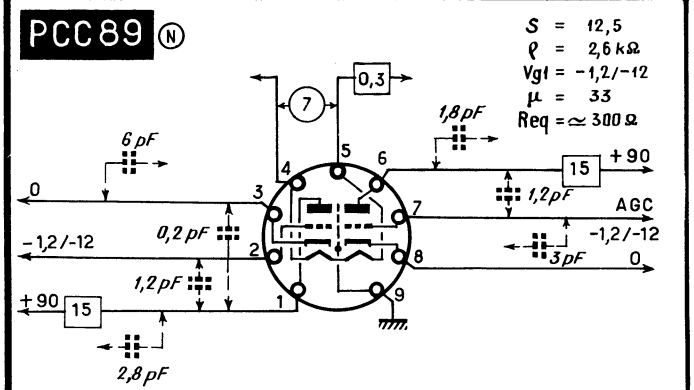
PCC88 (N)



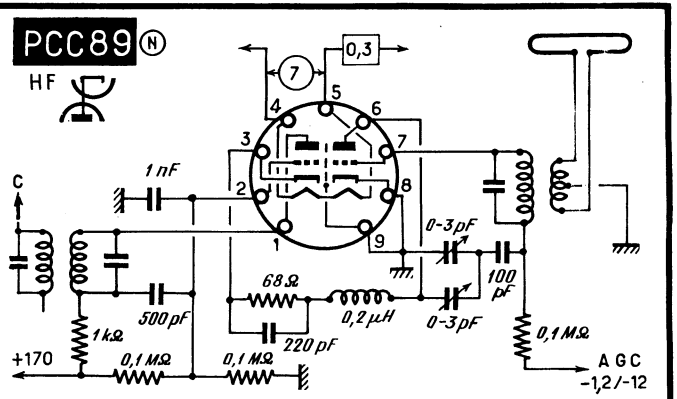
PCC88 (N)



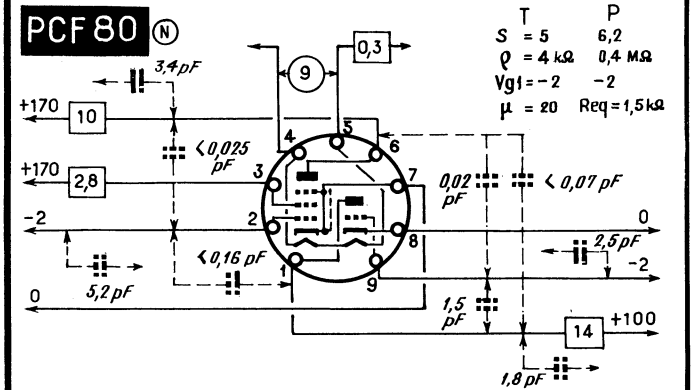
PCC89 (N)



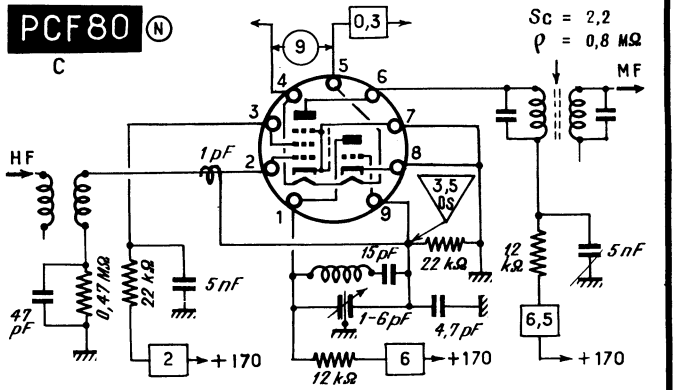
PCC89 (N)



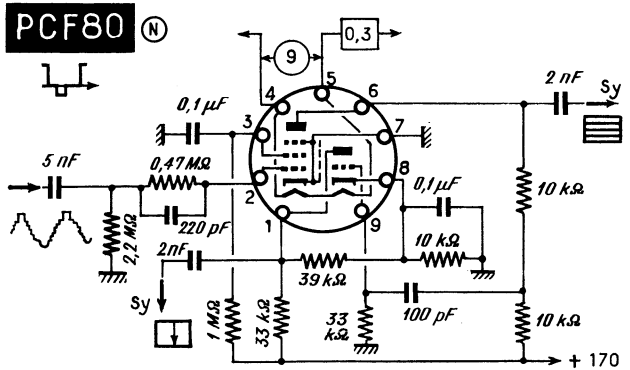
PCF80 (N)



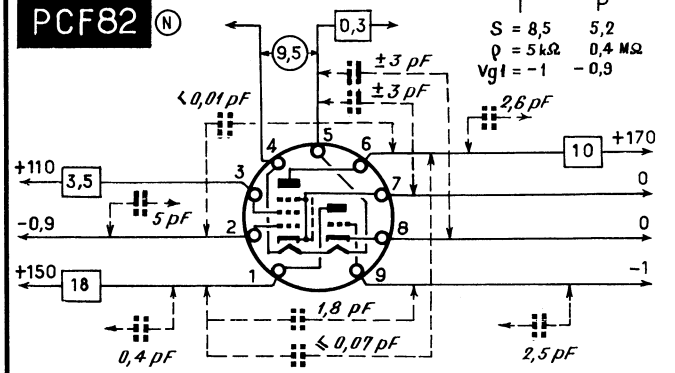
PCF80 (N)



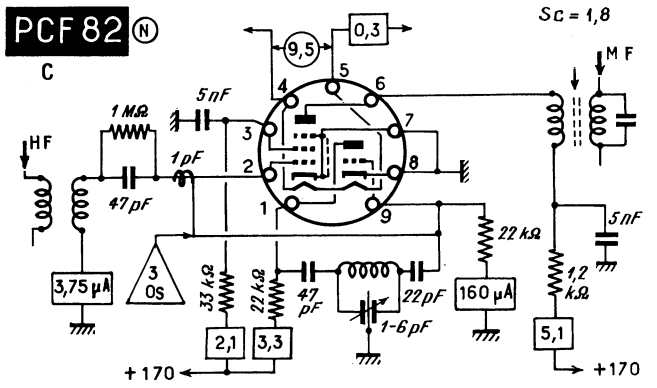
PCF80 (N)



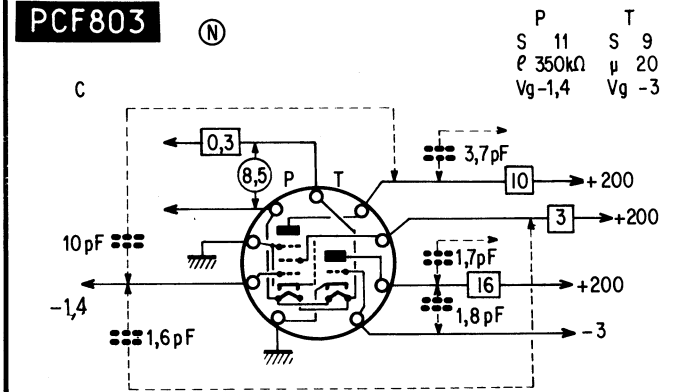
PCF82 (N)



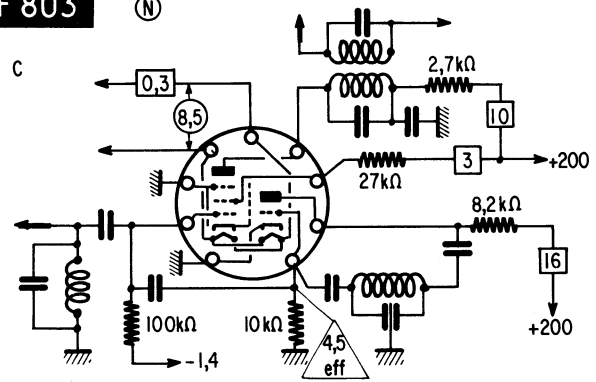
PCF82 (N)



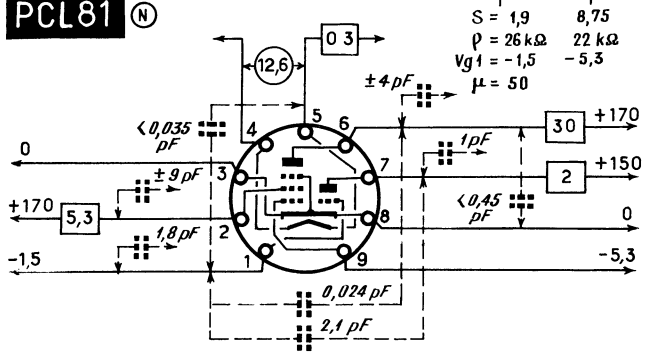
PCF803 (N)



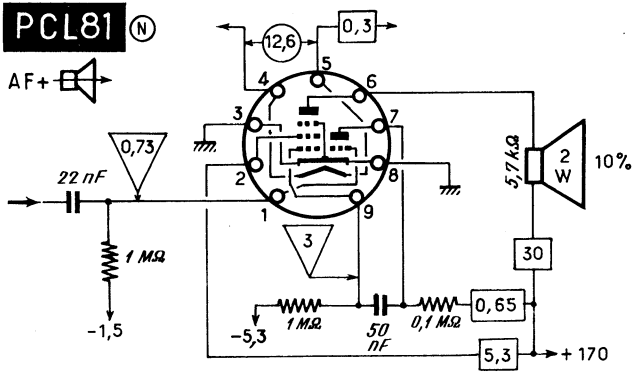
PCF 803



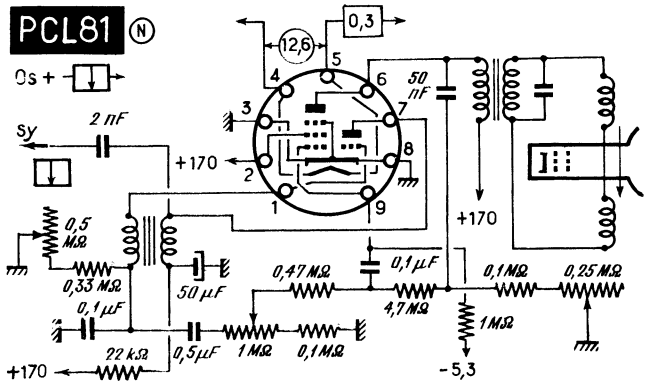
PCL81

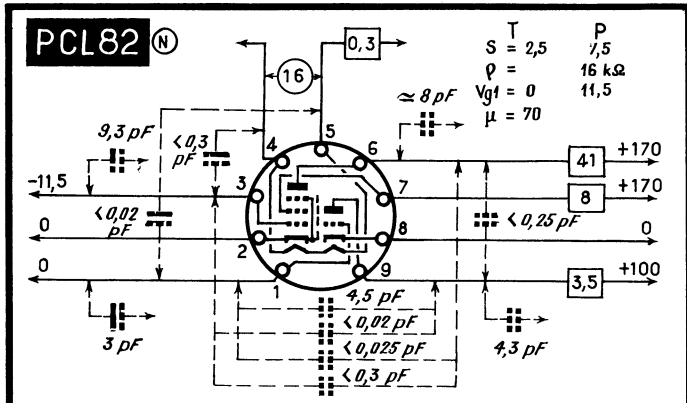


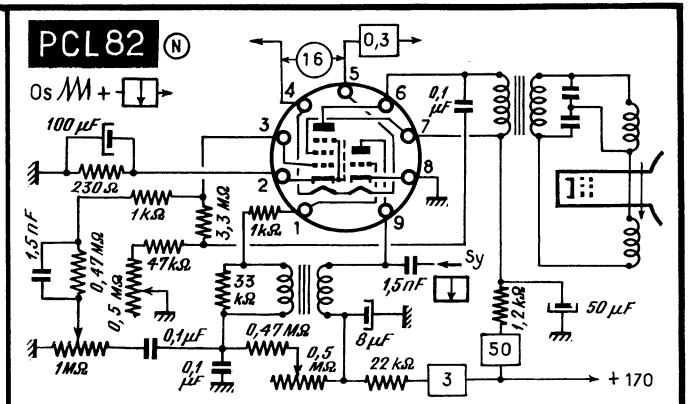
PCL81

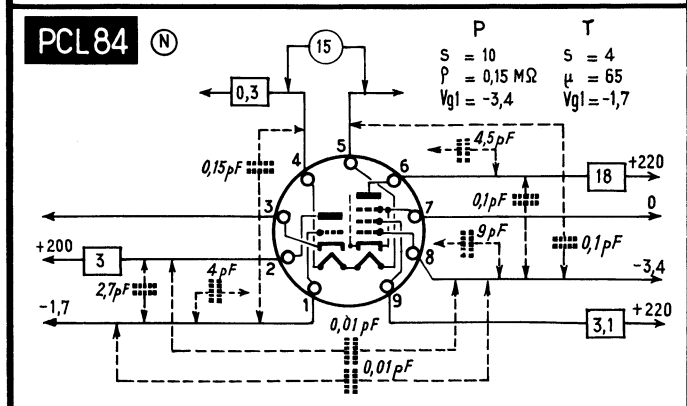


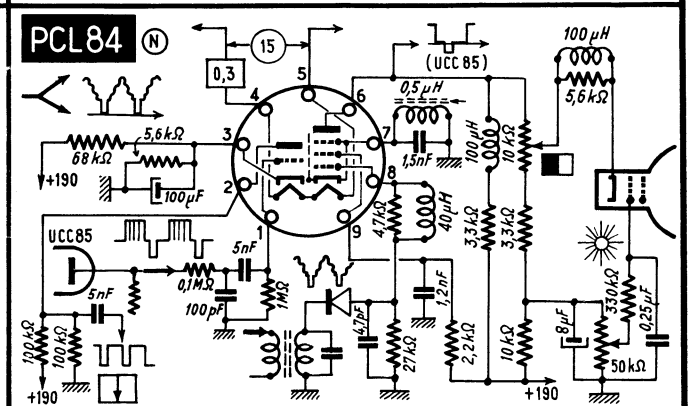
PCL81




PCL82 (N)
T
S = 2,5
ρ =
Vg1 = 0
μ = 70
P
1,5
16 kΩ
11,5
≃ 8 pF
9,3 pF
< 0,3 pF
< 0,02 pF
< 0,25 pF
4,5 pF
< 0,02 pF
< 0,025 pF
< 0,3 pF
3 pF
4,3 pF
0,3
16
41
8
3,5
+170
+170
+100
0
0
-11,5


PCL82 (N)
Os
Sy
100 μF
230 Ω
1 kΩ
3,3 MΩ
1 kΩ
1,5 nF
0,47 MΩ
0,5 MΩ
47 kΩ
33 kΩ
1,5 nF
0,1 μF
0,47 MΩ
8 μF
1 MΩ
0,1 μF
0,5 MΩ
22 kΩ
0,1 μF
1,2 kΩ
50 μF
50
3
+ 170
0,3
16

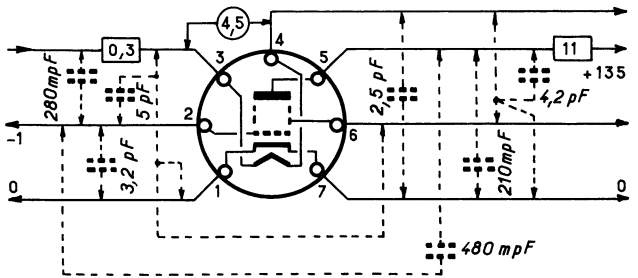

PCL84 (N)
P
S = 10
ρ = 0,15 MΩ
Vg1 = -3,4
T
S = 4
μ = 65
Vg1 = -1,7
0,3
15
4,5 pF
0,15 pF
0,1 pF
9 pF
0,1 pF
4 pF
2,7 pF
0,01 pF
0,01 pF
18
3
3,1
+220
0
-3,4
+220
+200
-1,7


PCL84 (N)
0,3
15
(UCC 85)
0,5 μH
100 μH
5,6 kΩ
5,6 kΩ
68 kΩ
+190
100 μF
1,5 nF
100 μH
10 kΩ
40 μH
4,7 kΩ
3,3 kΩ
3,3 kΩ
UCC85
5 nF
0,1 MΩ
100 pF
1 MΩ
5 nF
4,7 nF
1,2 nF
27 kΩ
2,2 kΩ
330 kΩ
8 μF
0,25 μF
10 kΩ
50 kΩ
120 kΩ
100 kΩ
+190
+190

PC97

(M)

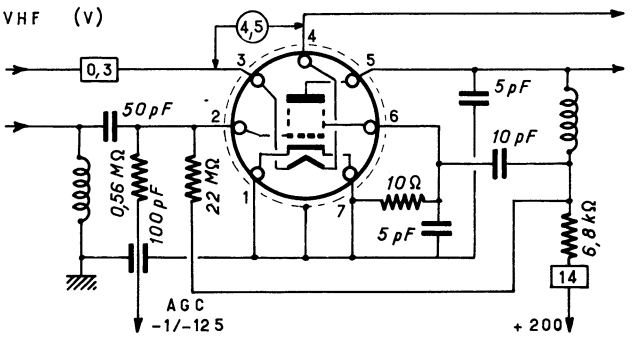
S = 13
ρ = 5 kΩ
μ = 65
V = -1



PC97

(M)

VHF (V)

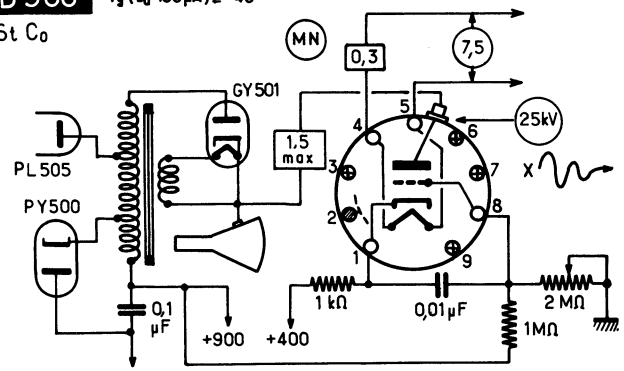


PD500

Vg (Ia 100μA) = -40

St Co

(MN)

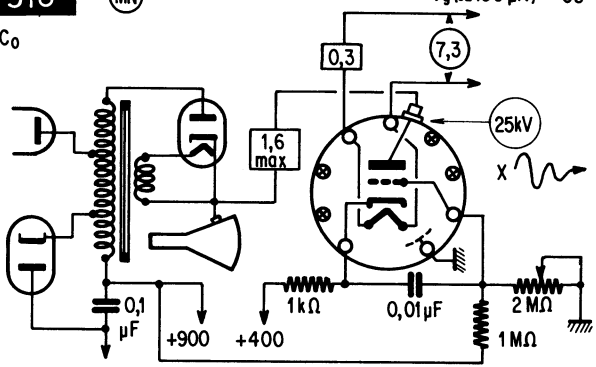


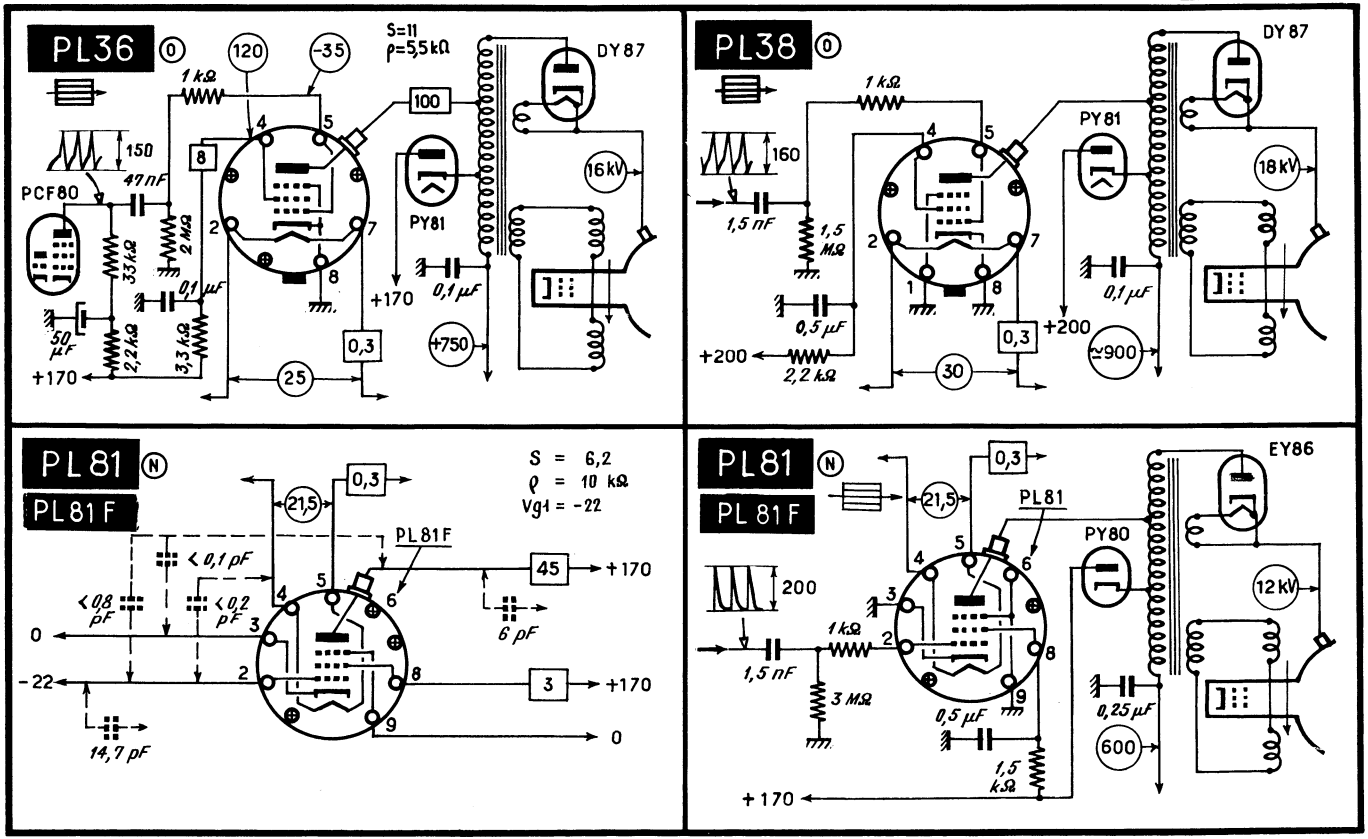
PD510

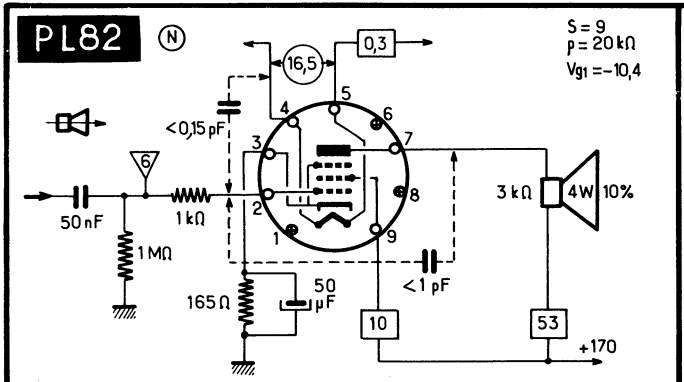
(MN)

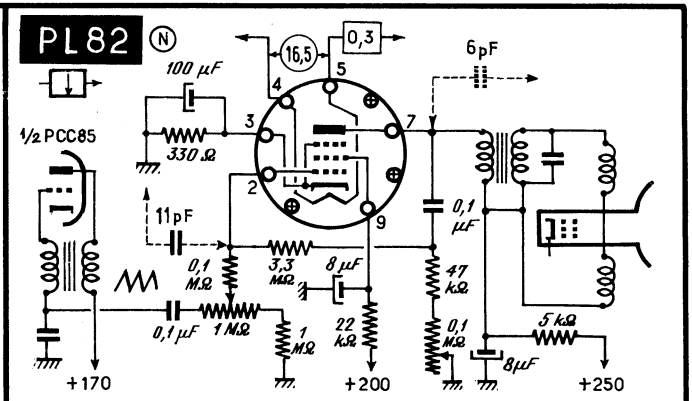
Vg (Ia 100 μA) = -38

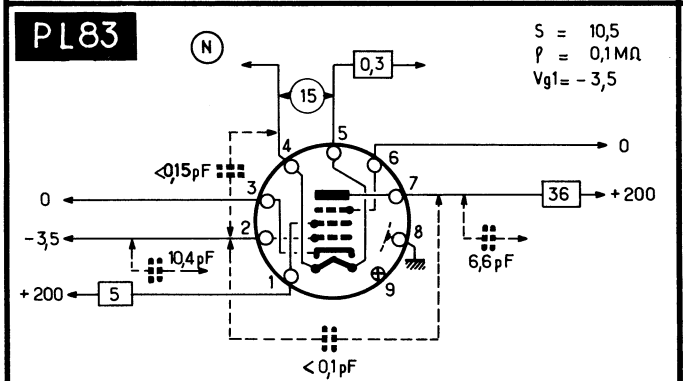
St Co

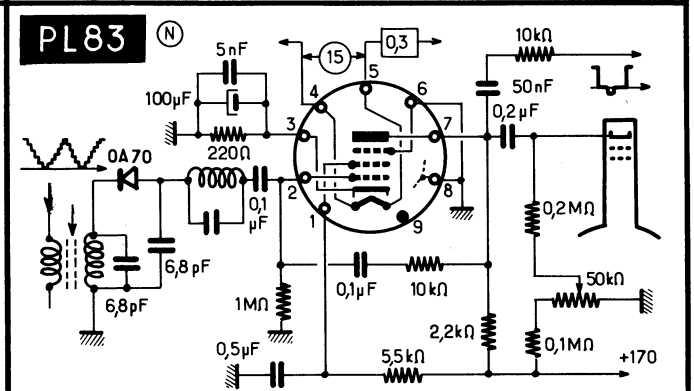



PL36
PCF80
PY81
DY 87
S=11
ρ=5,5kΩ
1 kΩ
120
-35
100
150
47 nF
33 kΩ
2 MΩ
0,1 µF
50 µF
2,2 kΩ
3,3 kΩ
+170
25
0,3
+750
16 kV
PL38
PY81
DY 87
160
1,5 nF
1,5 MΩ
0,5 µF
2,2 kΩ
+200
30
0,1 µF
≈900
18 kV
PL81
PL81F
S = 6,2
ρ = 10 kΩ
Vg1 = -22
21,5
PL81F
< 0,1 pF
< 0,8 pF
< 0,2 pF
45
6 pF
0
-22
3
14,7 pF
PL81
PL81F
PY80
EY86
200
1,5 nF
1 kΩ
3 MΩ
0,5 µF
1,5 kΩ
0,25 µF
600
12 kV

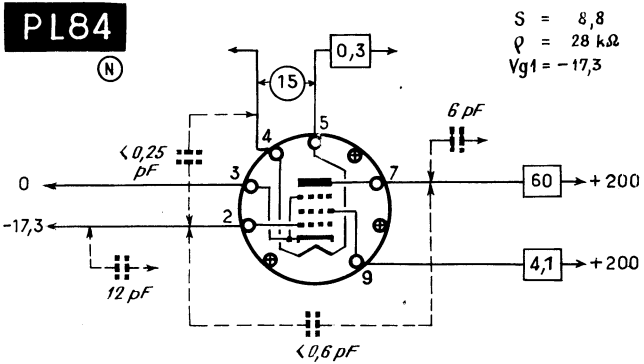

PL82
N
S = 9
p = 20 kΩ
Vg1 = −10,4
16,5
0,3
<0,15 pF
50 nF
1 kΩ
1 MΩ
165 Ω
50 µF
<1 pF
3 kΩ
4W 10%
10
53
+170


PL82
N
16,5
0,3
100 µF
330 Ω
½ PCC85
11 pF
0,1 MΩ
3,3 MΩ
8 µF
0,1 µF
1 MΩ
1 MΩ
22 kΩ
+170
+200
6 pF
0,1 µF
47 kΩ
0,1 MΩ
5 kΩ
8 µF
+250

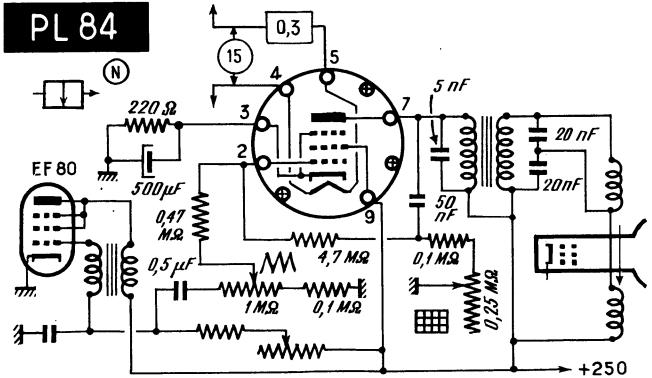

PL83
N
S = 10,5
ρ = 0,1 MΩ
Vg1 = −3,5
15
0,3
<0,15 pF
0
−3,5
+200
10,4 pF
5
36
+200
6,6 pF
<0,1 pF


PL83
N
5 nF
100 µF
15
0,3
10 kΩ
50 nF
0,2 µF
0A70
220 Ω
0,1 µF
6,8 pF
6,8 pF
0,2 MΩ
1 MΩ
0,1 µF
10 kΩ
50 kΩ
2,2 kΩ
0,1 MΩ
0,5 µF
5,5 kΩ
+170

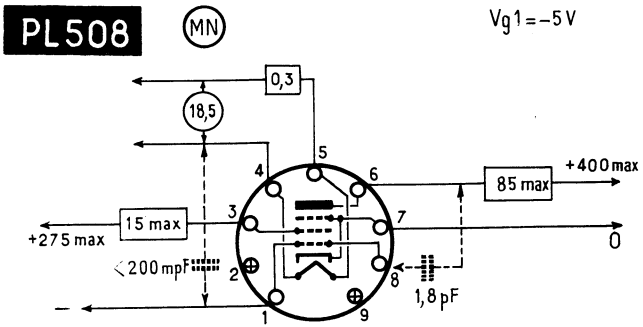
PL84



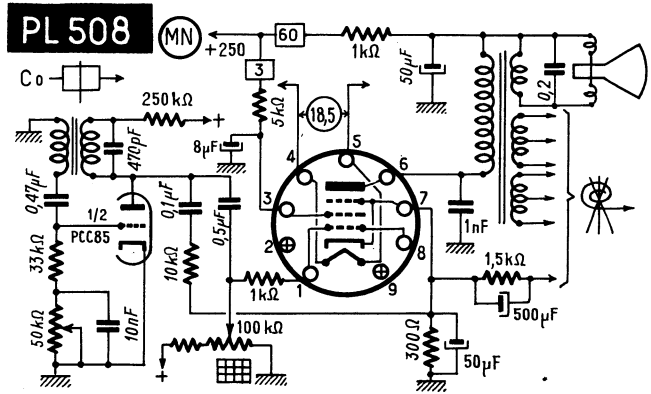
PL 84



PL508



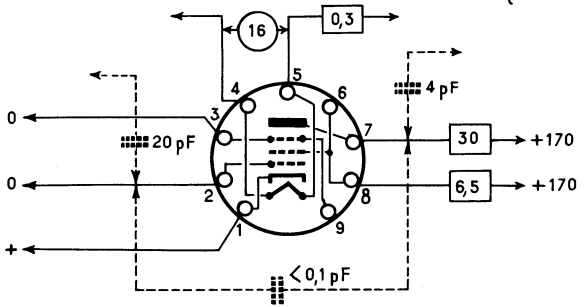
PL 508



PL 802

Ⓝ

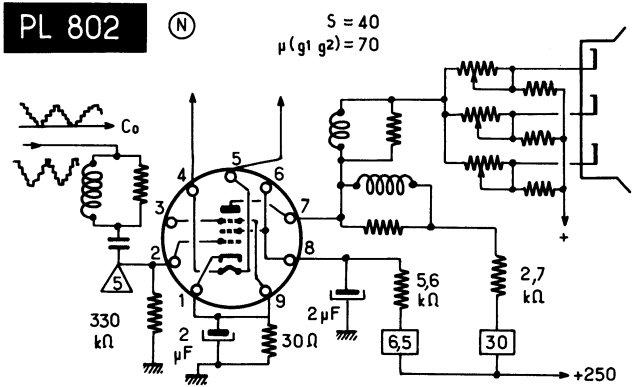
S = 40
μ = 70



PL 802

Ⓝ

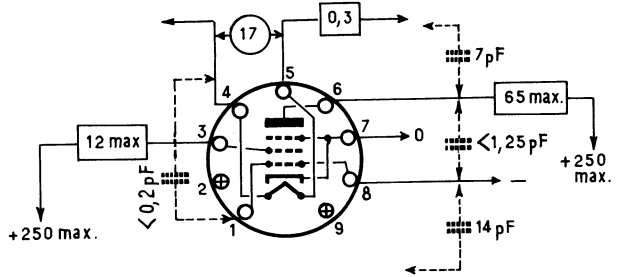
S = 40
μ (g1 g2) = 70



PL 805

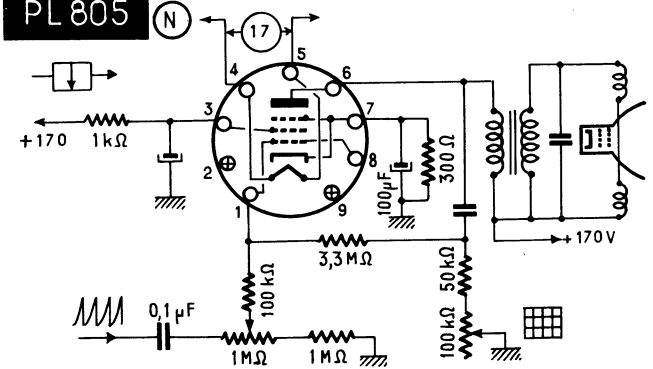
Ⓝ

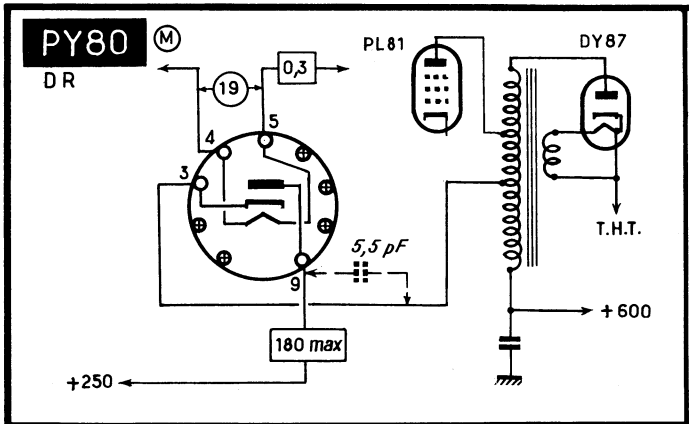
Vg1 = −1

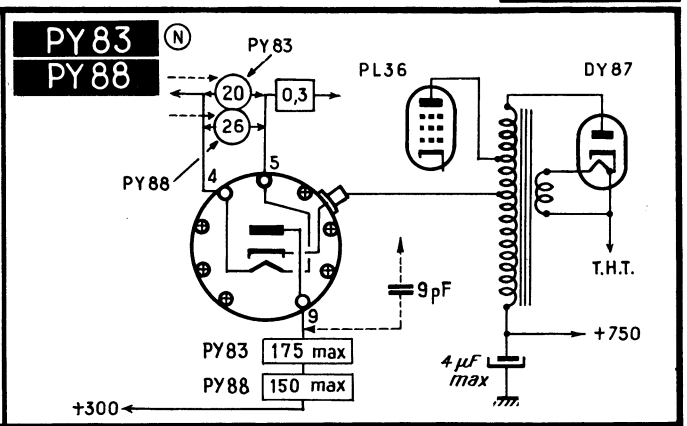


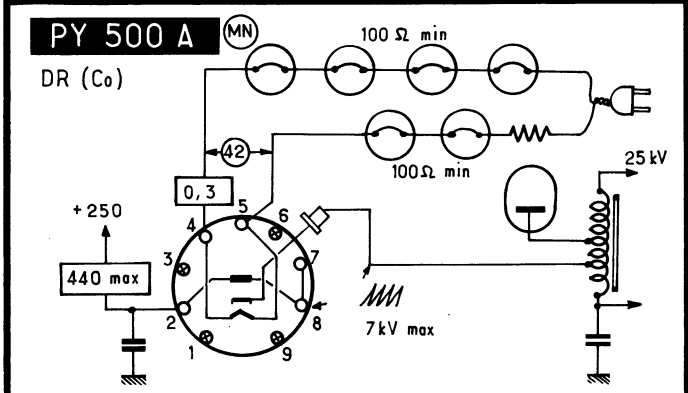
PL 805

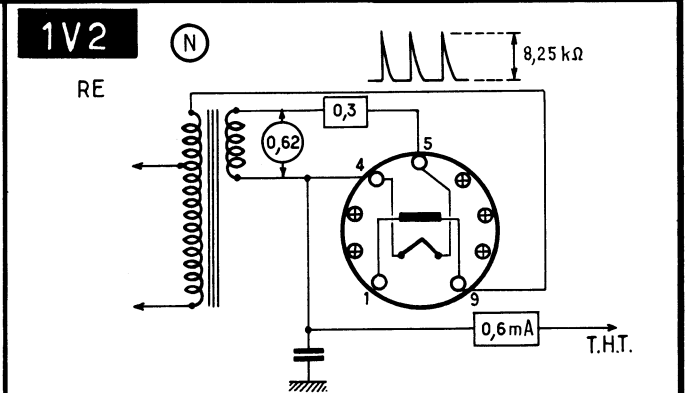
Ⓝ




PY80
M
DR
19
0,3
PL81
DY87
4
5
3
9
5,5 pF
T.H.T.
+600
180 max
+250


PY83
PY88
N
PY83
PL36
DY87
20
26
0,3
PY88
4
5
9
9pF
T.H.T.
+750
PY83 175 max
PY88 150 max
4 µF max
+300

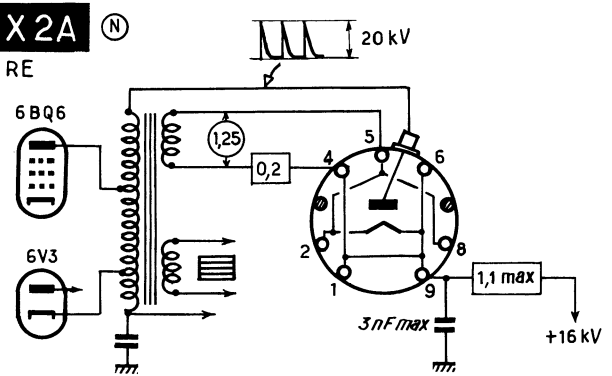

PY 500 A
MN
DR (Co)
100 Ω min
42
100Ω min
25 kV
0,3
+250
440 max
4
5
6
3
7
2
8
1
9
7kV max


1V2
N
RE
8,25 kΩ
0,3
0,62
5
4
1
9
0,6mA
T.H.T.

1X2A

Ⓝ

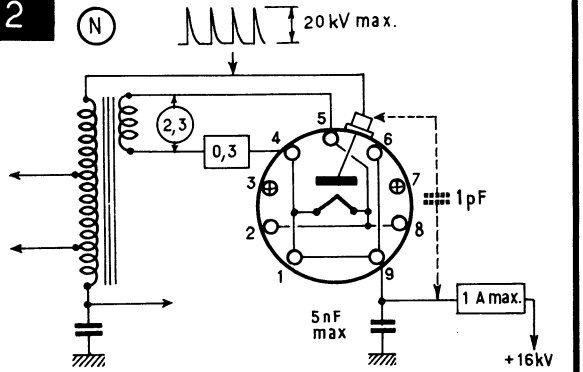
RE



2BJ2

Ⓝ

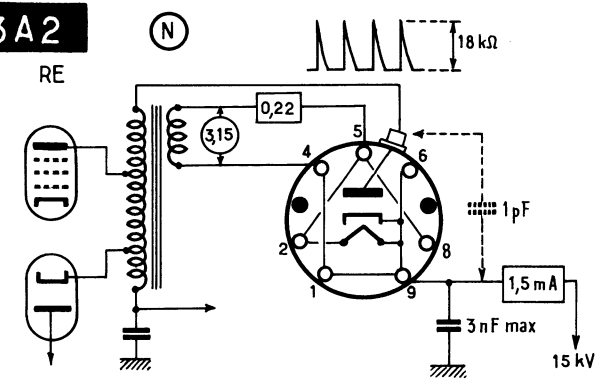
R



3A2

Ⓝ

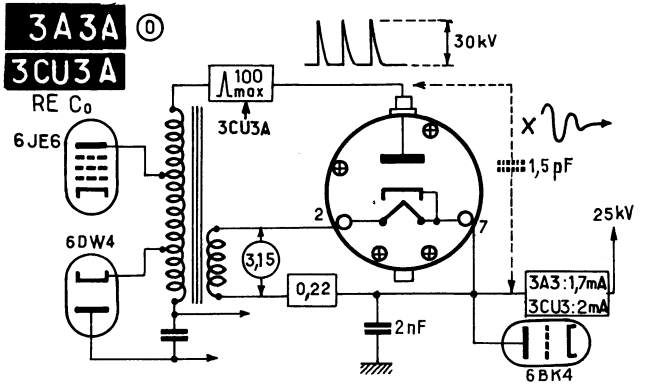
RE



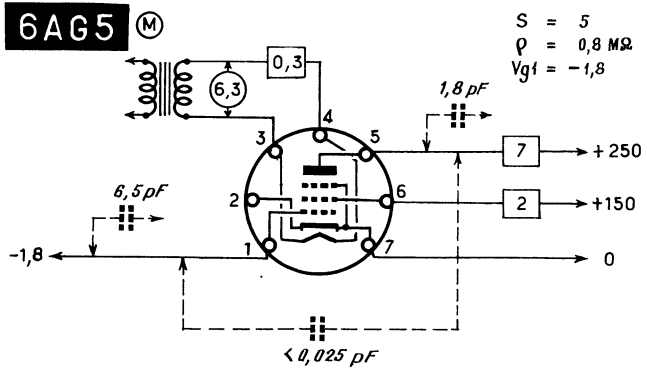
3A3A
3CU3A

Ⓞ

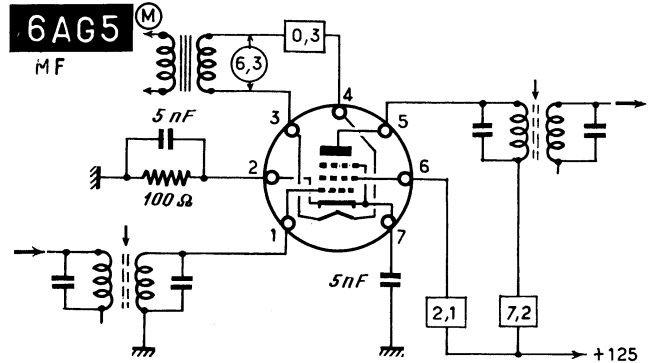
RE Co



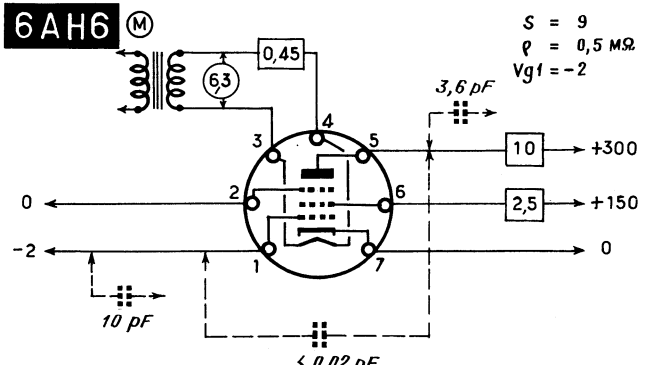
6AG5 Ⓜ



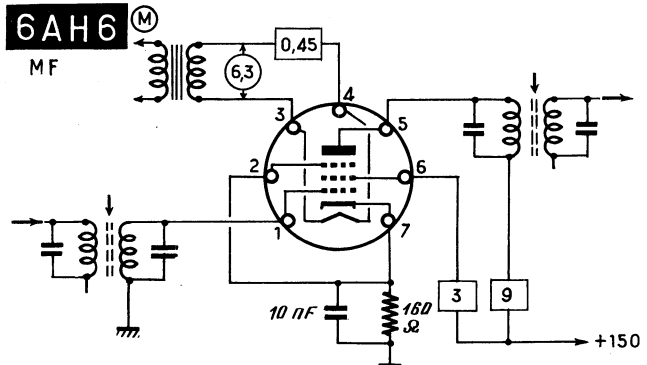
6AG5 Ⓜ MF



6AH6 Ⓜ



6AH6 Ⓜ MF

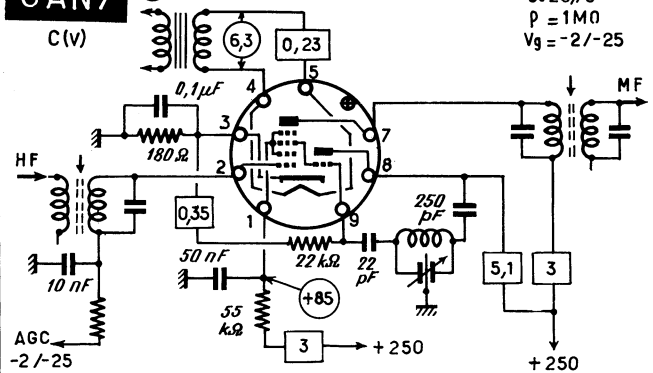


6 AN 7

Ⓝ

C(V)

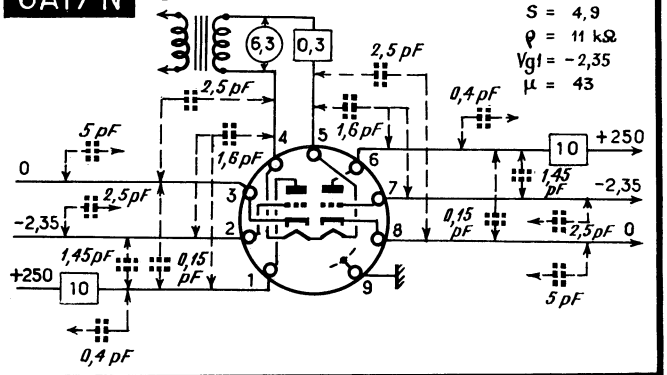
Se = 0,75
ρ = 1 MΩ
Vg = -2 / -25



6 AT 7 N

Ⓝ

S = 4,9
ρ = 11 kΩ
Vg1 = -2,35
µ = 43

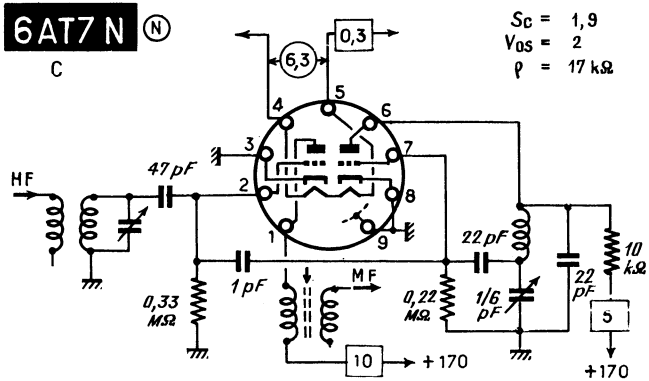


6 AT 7 N

Ⓝ

C

Sc = 1,9
Vos = 2
ρ = 17 kΩ

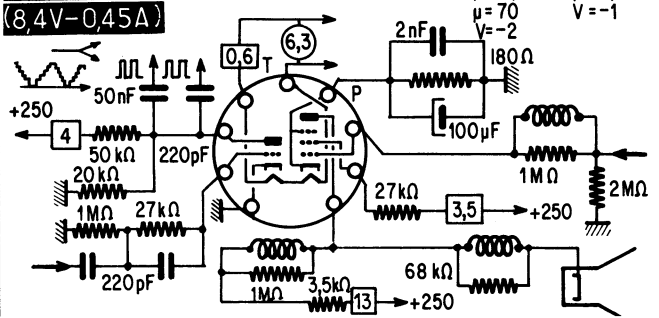


6 AW 8 (A)
8 AW 8 (A)
(8,4V-0,45A)

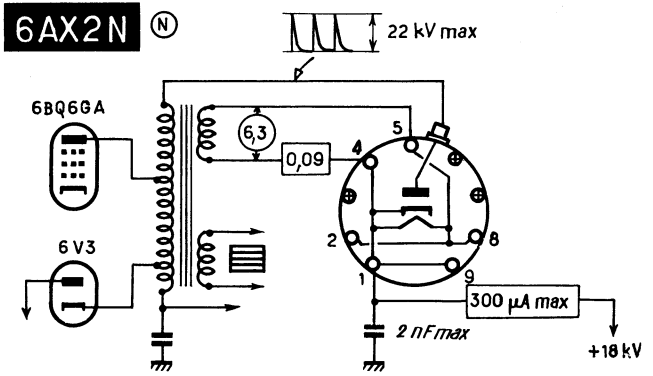
Ⓝ

T
ρ = 17,5 kΩ
µ = 70
V = -2

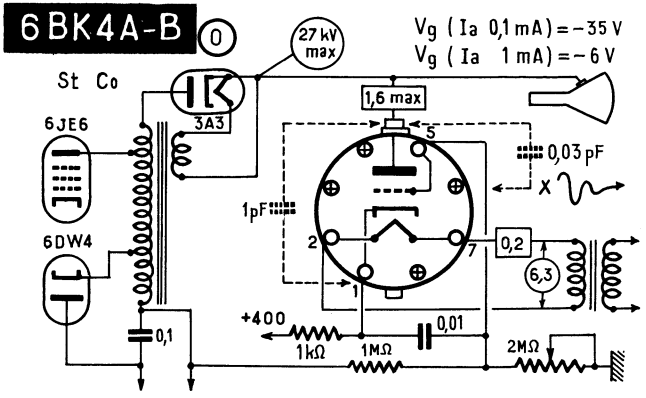
P
ρ = 0,3 MΩ
V = -1



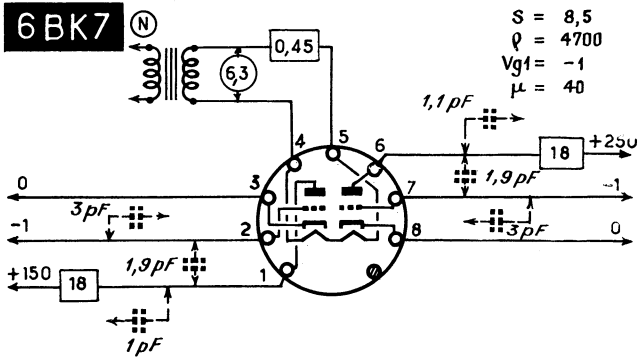
6AX2N (N)



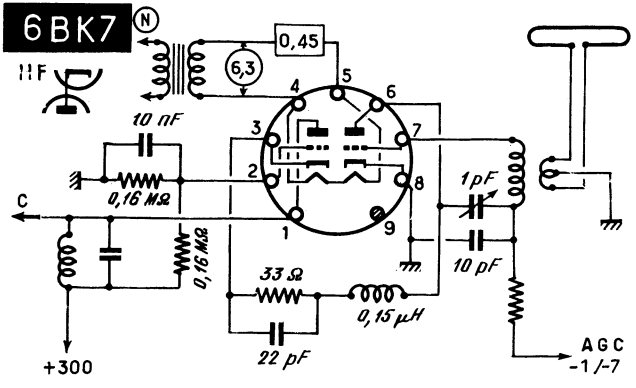
6BK4A-B (O)



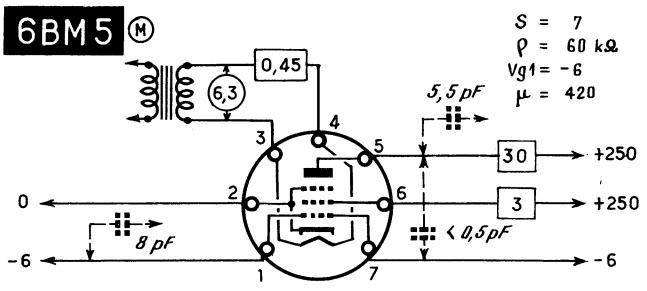
6BK7 (N)



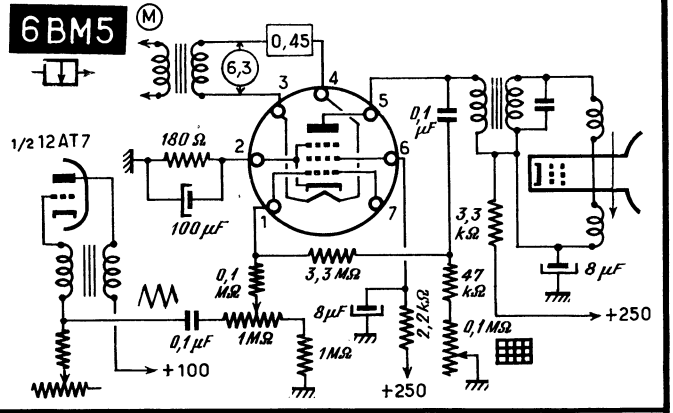
6BK7 (N)



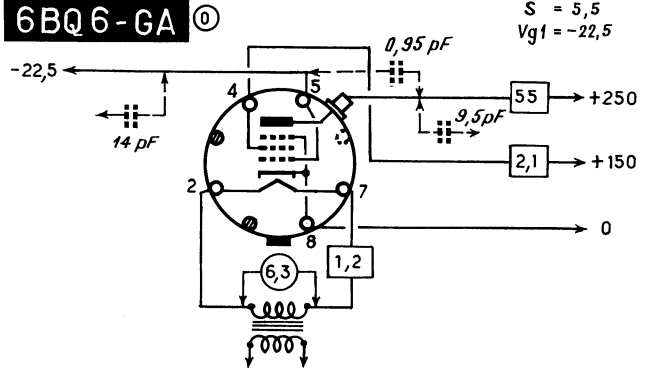
6BM5 Ⓜ



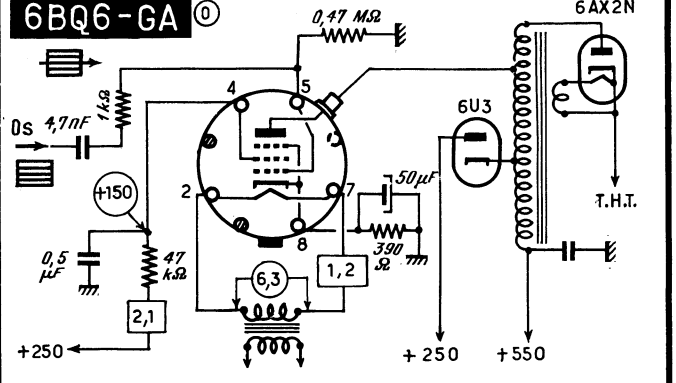
6BM5 Ⓜ

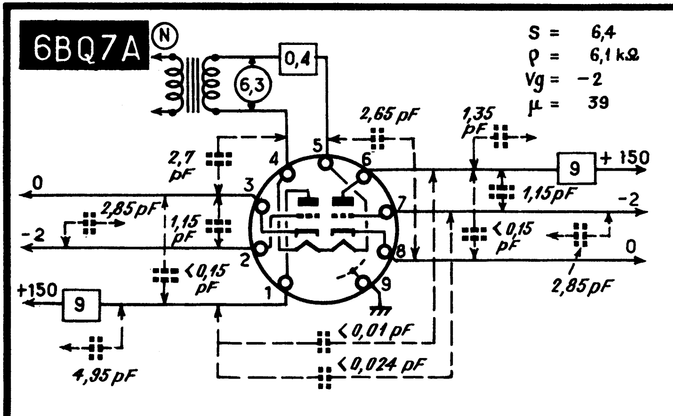


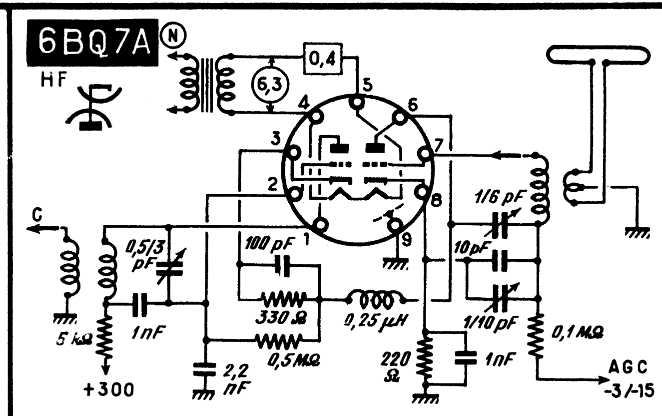
6BQ6-GA Ⓞ

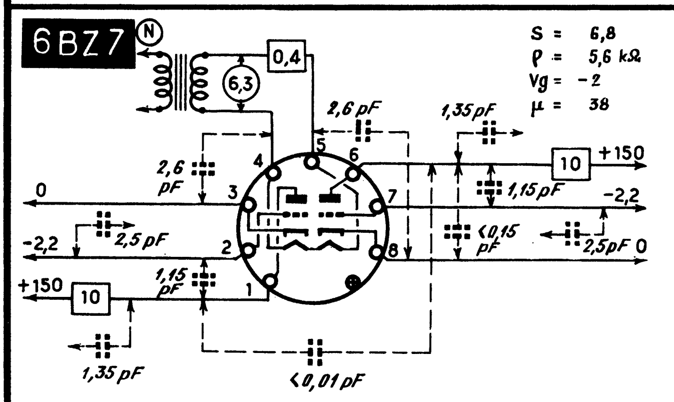


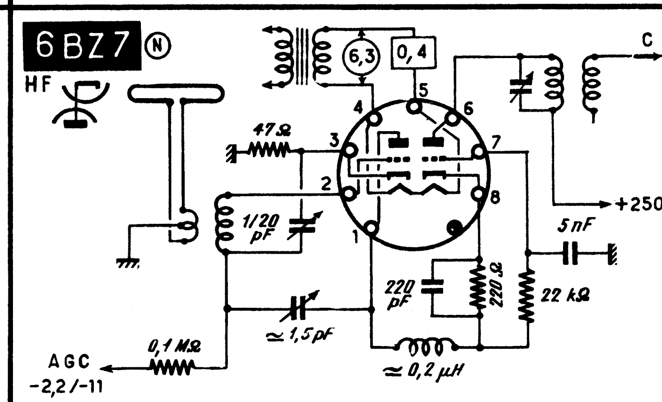
6BQ6-GA Ⓞ



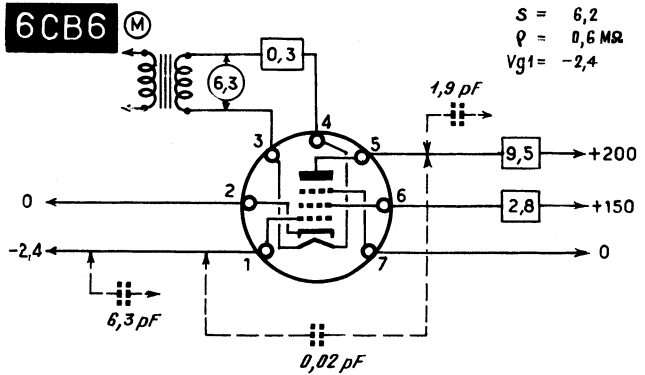

6BQ7A
S = 6,4
ρ = 6,1 kΩ
Vg = −2
μ = 39
0,4
6,3
2,65 pF
1,35 pF
2,7 pF
+ 150
9
1,15 pF
−2
2,85 pF
1,15 pF
< 0,15 pF
0
< 0,15 pF
2,85 pF
+150
< 0,01 pF
< 0,024 pF
4,95 pF


6BQ7A
HF
0,4
6,3
C
1/6 pF
0,5/3 pF
100 pF
10 pF
330 Ω
0,25 μH
1/10 pF
0,1 MΩ
5 kΩ
1 nF
0,5 MΩ
220 Ω
1 nF
2,2 nF
+300
AGC
−3/−15

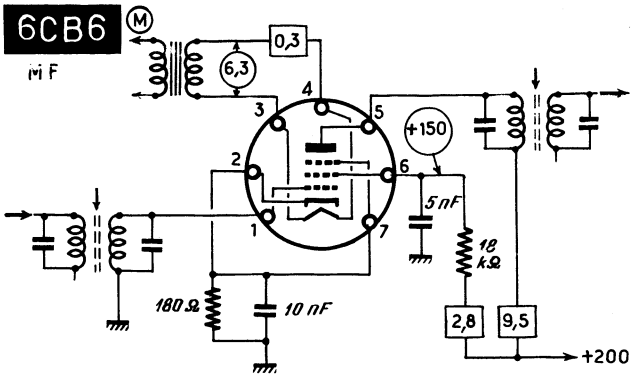

6BZ7
S = 6,8
ρ = 5,6 kΩ
Vg = −2
μ = 38
0,4
6,3
2,6 pF
1,35 pF
2,6 pF
10
+150
1,15 pF
0
−2,2
2,5 pF
< 0,15 pF
2,5 pF
0
−2,2
1,15 pF
+150
10
1,35 pF
< 0,01 pF


6BZ7
HF
6,3
0,4
C
47 Ω
1/20 pF
+250
5 nF
220 pF
220 Ω
22 kΩ
≃ 1,5 pF
0,1 MΩ
≃ 0,2 μH
AGC
−2,2/−11

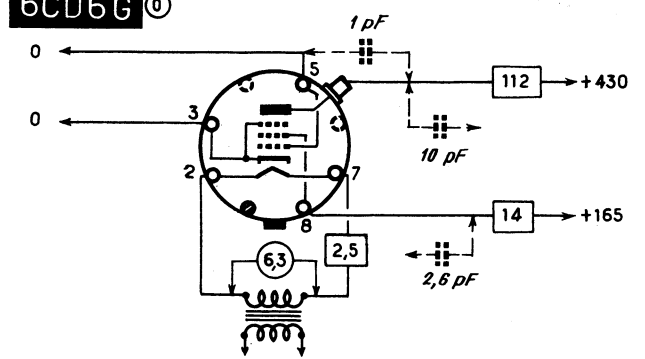
6CB6 (M)



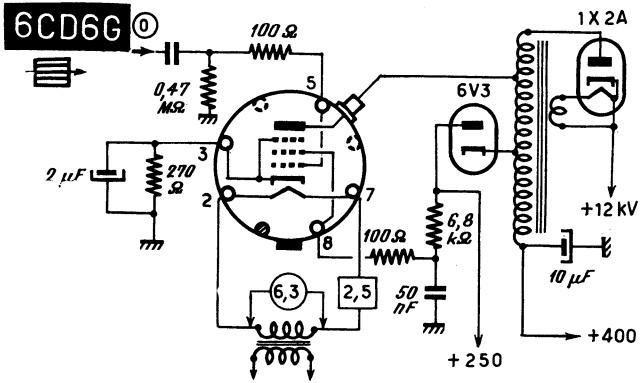
6CB6 (M)

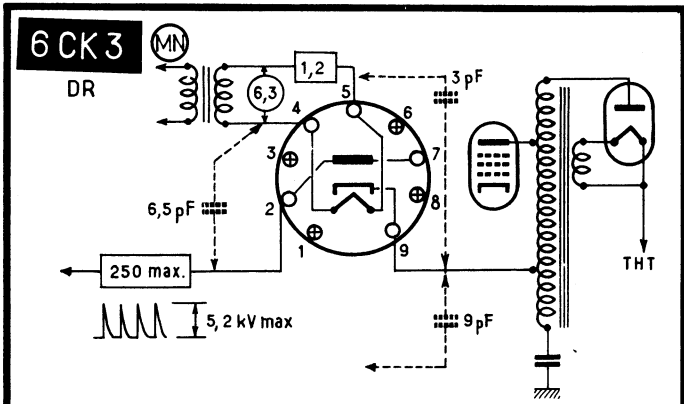


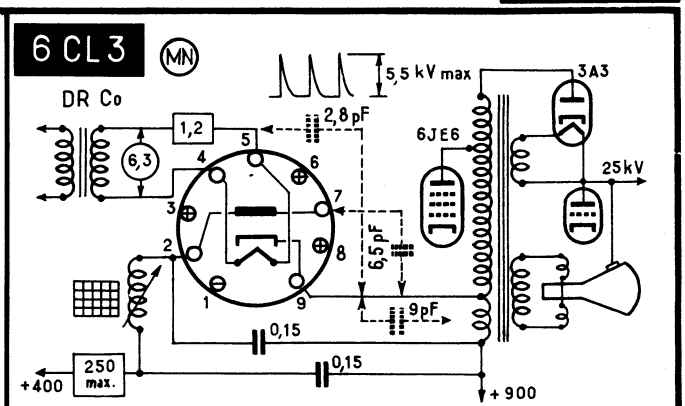
6CD6G (0)

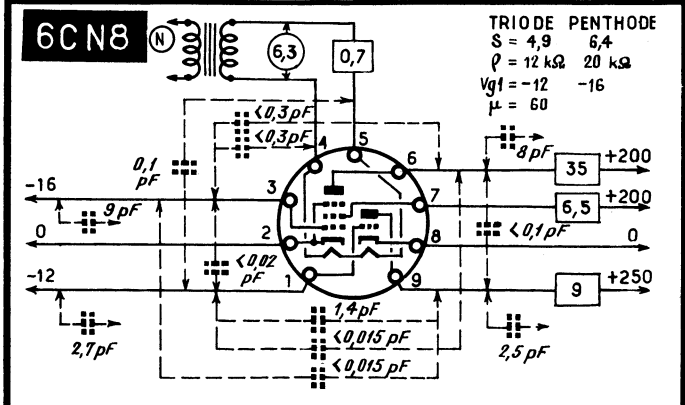


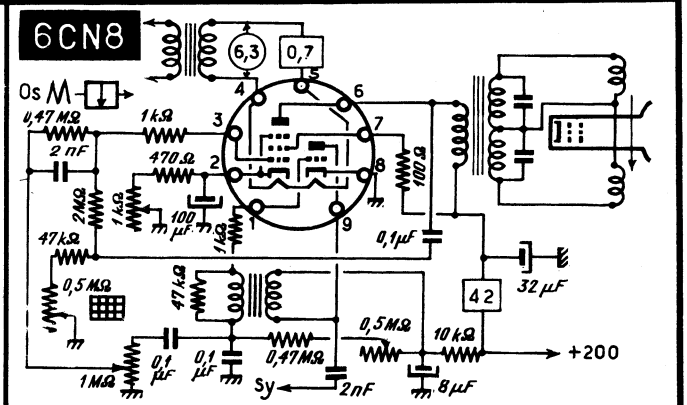
6CD6G (0)

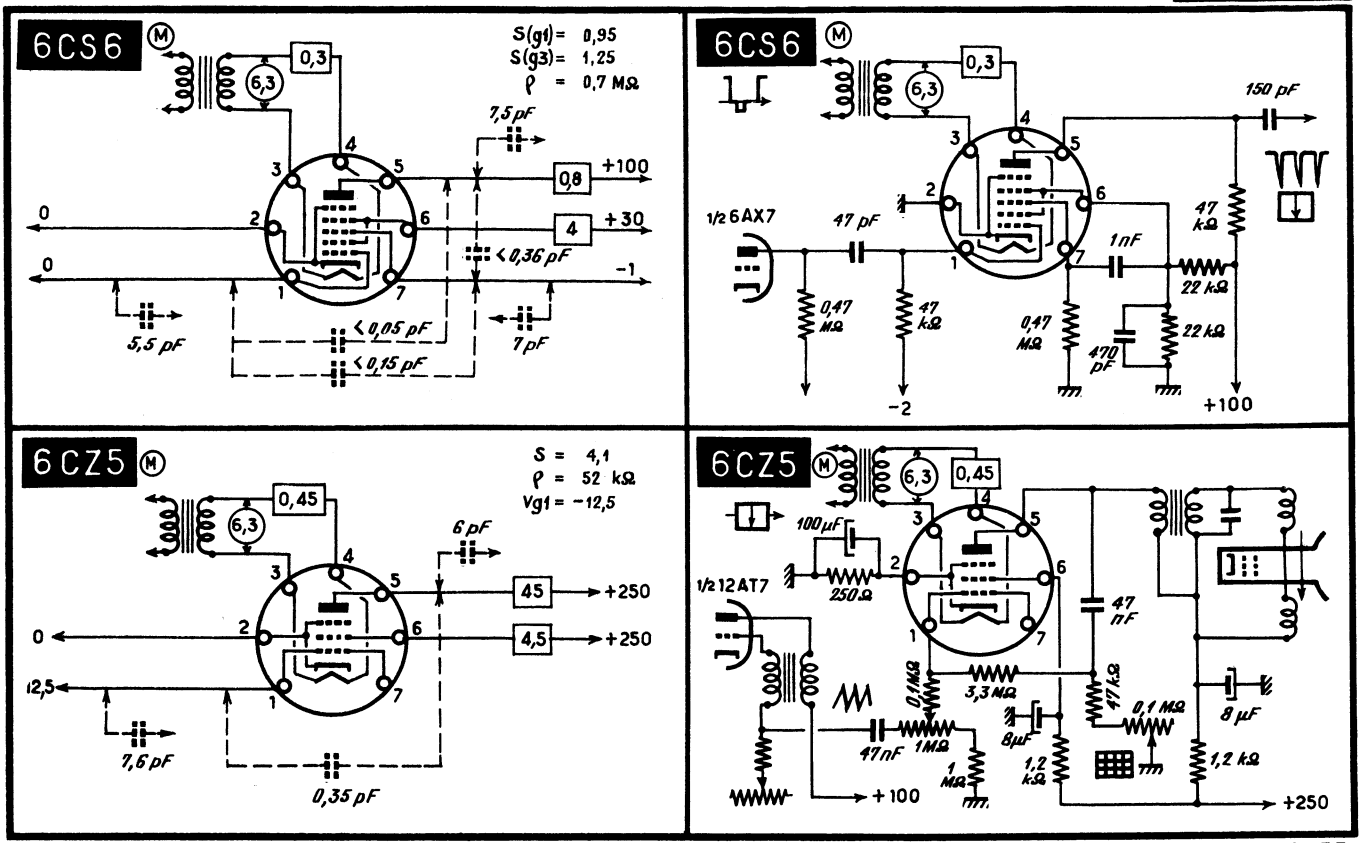


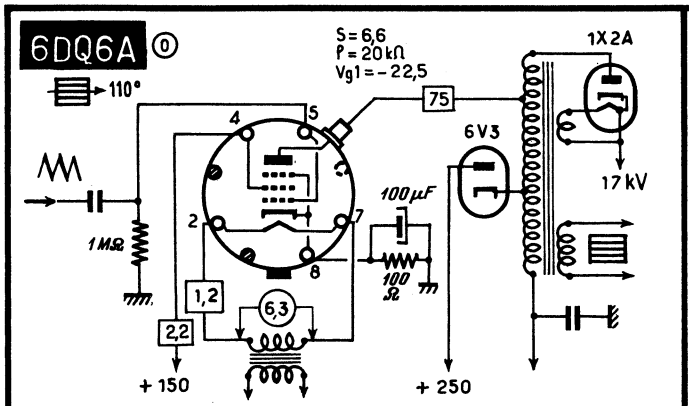

6 CK3
MN
DR
1,2
6,3
3 pF
6,5 pF
250 max.
5,2 kV max
9 pF
THT

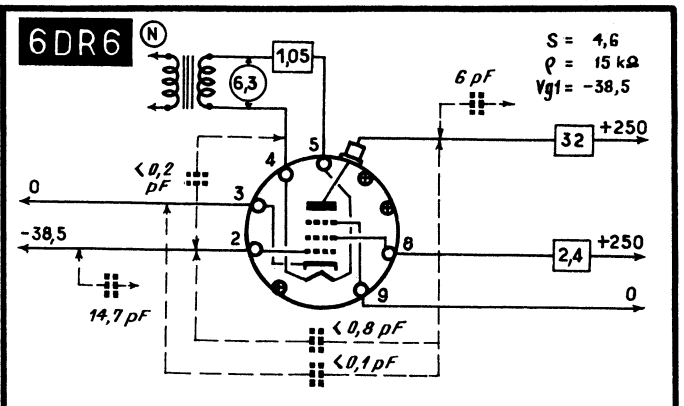

6 CL3
MN
DR Co
5,5 kV max
3A3
6JE6
25kV
1,2
6,3
2,8 pF
6,5 pF
9 pF
0,15
0,15
250 max.
+400
+900

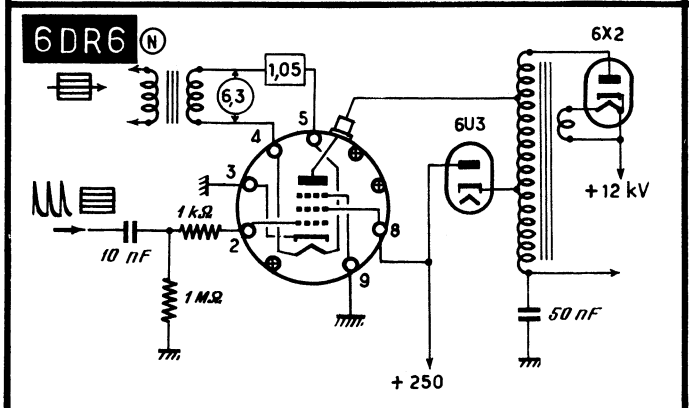

6 CN8
N
6,3
0,7
TRIODE PENTHODE
S = 4,9 6,4
ρ = 12 kΩ 20 kΩ
Vg1 = −12 −16
μ = 60
< 0,3 pF
< 0,3 pF
8 pF
0,1 pF
9 pF
< 0,1 pF
< 0,02 pF
1,4 pF
< 0,015 pF
< 0,015 pF
2,5 pF
2,7 pF
35
+200
6,5
+200
0
9
+250
-16
0
-12

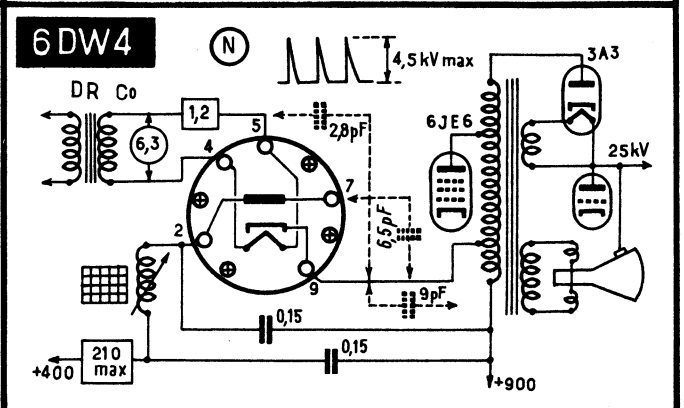

6 CN8
6,3
0,7
Os
0,47 MΩ
2 nF
1 kΩ
470 Ω
100 Ω
2 MΩ
1 kΩ
100 μF
1 kΩ
47 kΩ
0,1 μF
0,5 MΩ
47 kΩ
42
32 μF
0,5 MΩ
10 kΩ
+200
0,1 μF
0,1 μF
0,47 MΩ
1 MΩ
Sy
2 nF
8 μF


6CS6
S(g1) = 0,95
S(g3) = 1,25
ρ = 0,7 MΩ
0,3
6,3
7,5 pF
0,8
+100
4
+30
-1
< 0,36 pF
< 0,05 pF
< 0,15 pF
5,5 pF
7 pF
6CS6
0,3
6,3
150 pF
1/2 6AX7
47 pF
1 nF
47 kΩ
22 kΩ
0,47 MΩ
47 kΩ
0,47 MΩ
470 pF
22 kΩ
-2
+100
6CZ5
S = 4,1
ρ = 52 kΩ
Vg1 = -12,5
0,45
6,3
6 pF
45
+250
4,5
+250
12,5
7,6 pF
0,35 pF
6CZ5
0,45
6,3
100 µF
1/2 12AT7
250 Ω
47 nF
0,1 MΩ
3,3 MΩ
47 kΩ
0,1 MΩ
8 µF
8 µF
47 nF
1 MΩ
1 MΩ
1,2 kΩ
1,2 kΩ
+100
+250

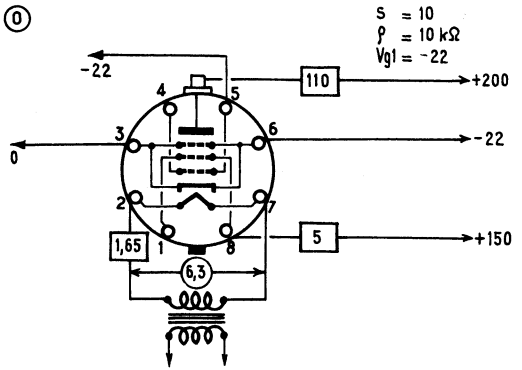

6DQ6A
S=6,6
P=20kΩ
Vg1=-22,5
110°
1X2A
75
6V3
17 kV
100µF
1MΩ
100 Ω
1,2
6,3
2,2
+150
+250


6DR6
N
1,05
6,3
S = 4,6
P = 15 kΩ
Vg1 = -38,5
6 pF
32
+250
< 0,2 pF
0
-38,5
2,4
+250
0
14,7 pF
< 0,8 pF
< 0,1 pF

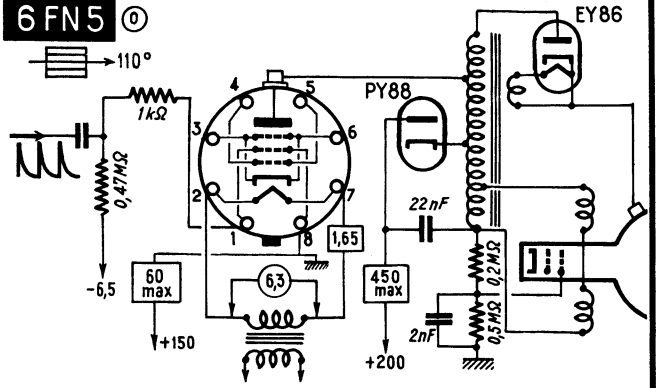

6DR6
N
1,05
6,3
6X2
6U3
+12 kV
1 kΩ
10 nF
1 MΩ
50 nF
+250


6DW4
N
4,5 kV max
3A3
DR Co
1,2
6,3
2,8pF
6JE6
25kV
6,5pF
9pF
0,15
0,15
210 max
+400
+900

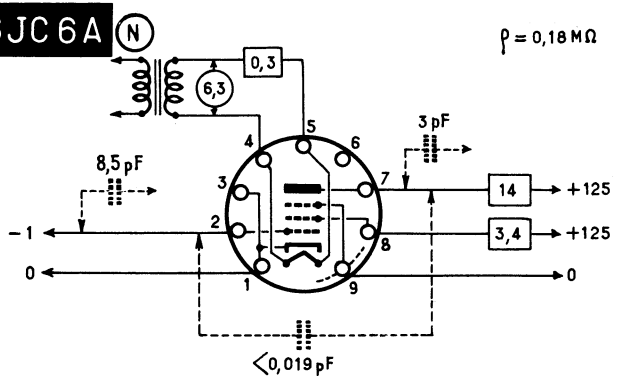
6FN5 ⓪



6FN5 ⓪

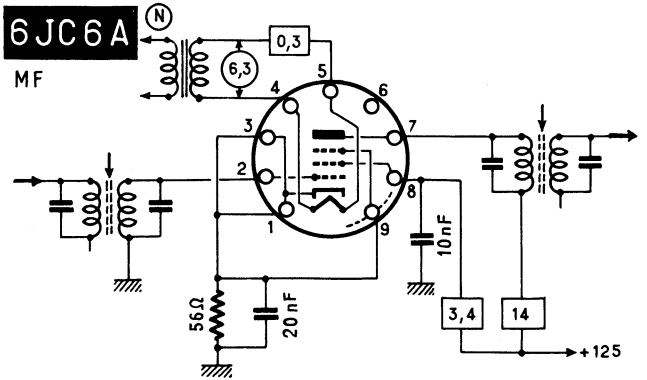


6JC6A Ⓝ



6JC6A Ⓝ

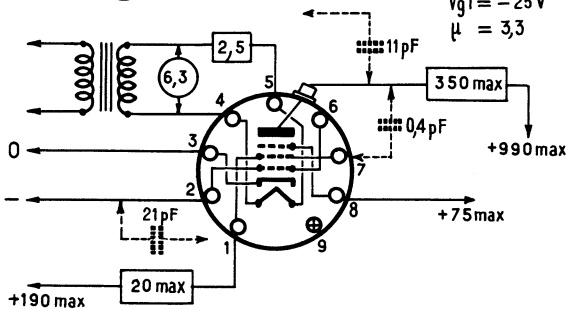
MF



6JE6

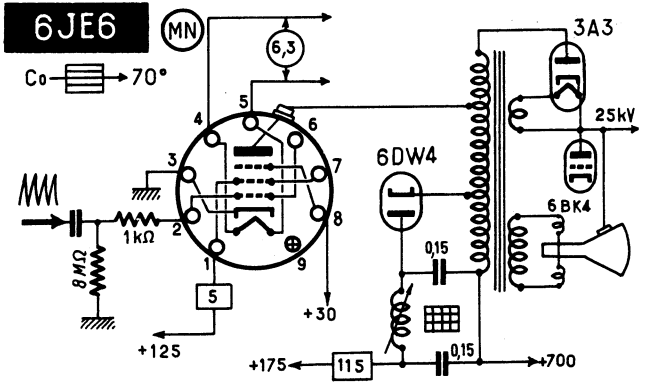
MN

ρ = 5,5 kΩ
V_{g1} = −25 V
μ = 3,3



6JE6

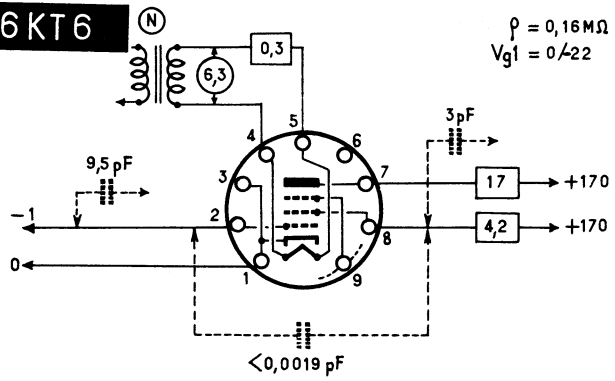
MN



6KT6

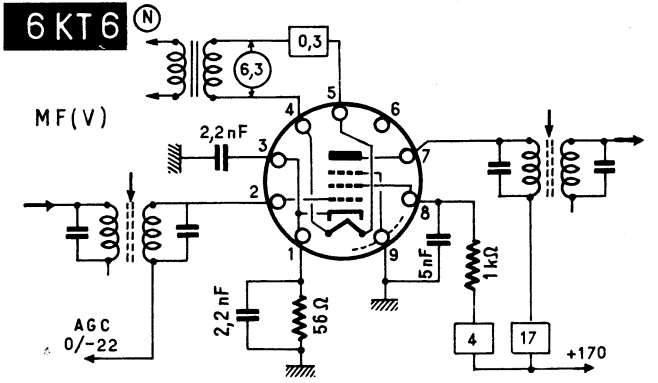
N

ρ = 0,16 MΩ
V_{g1} = 0/−22

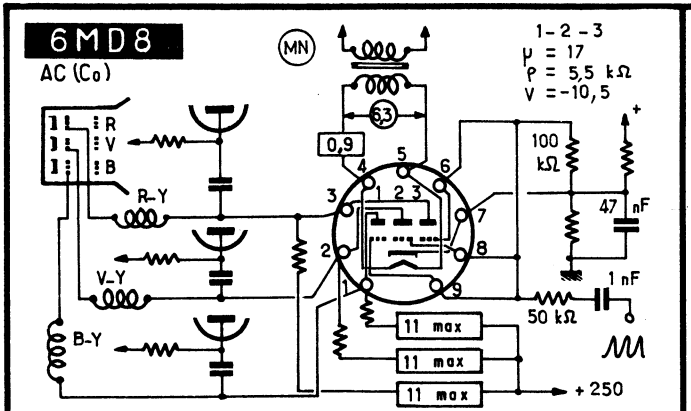


6KT6

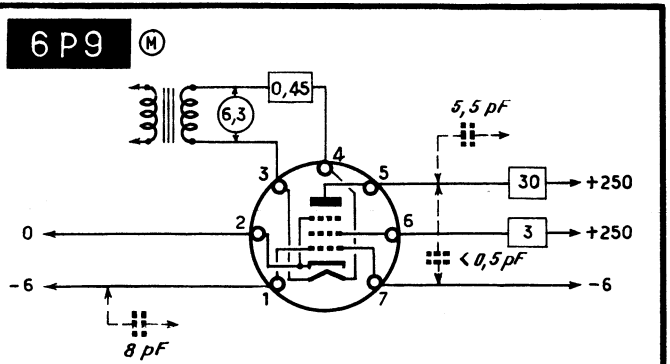
N



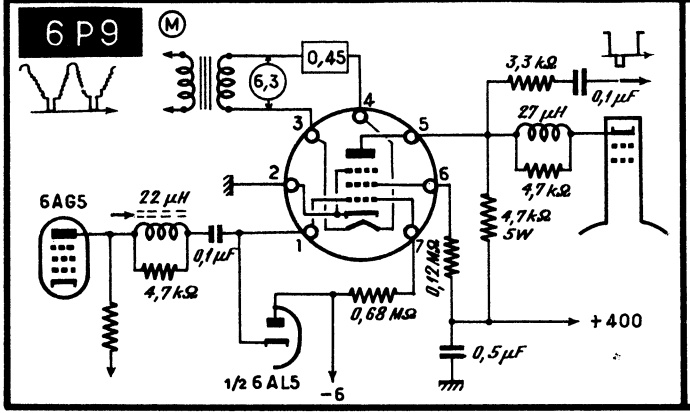
6MD8



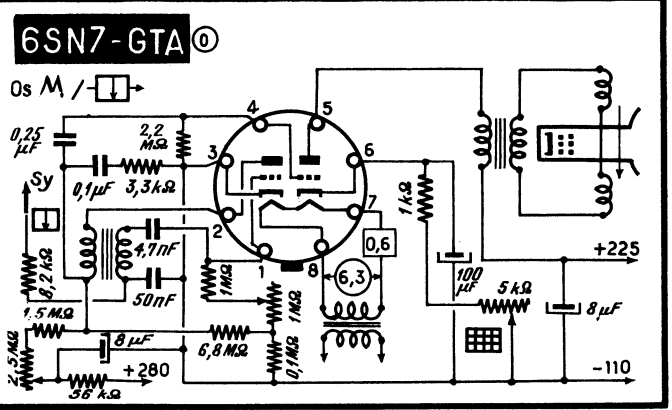
6P9 (M)

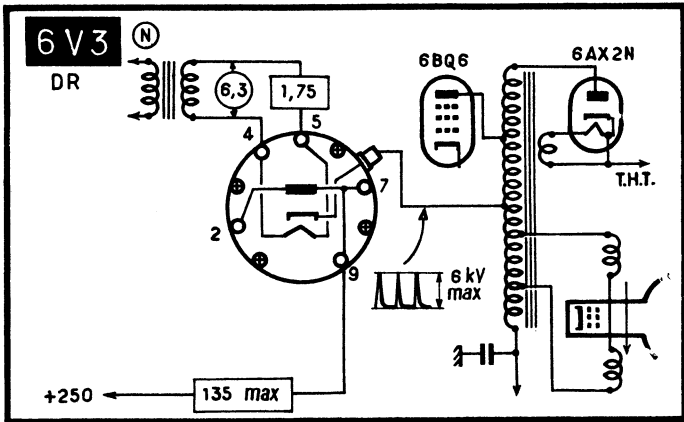


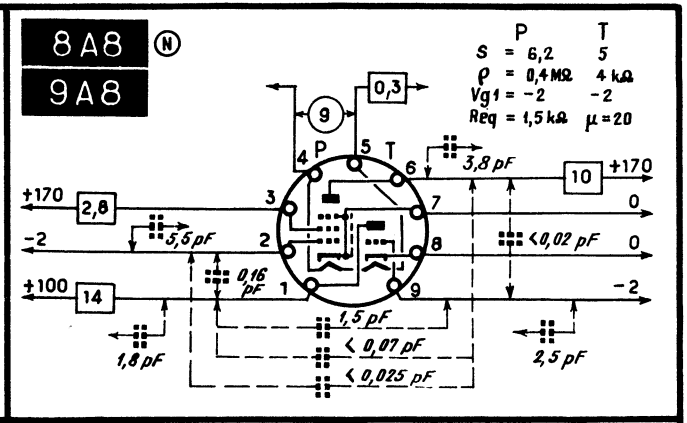
6P9 (M)

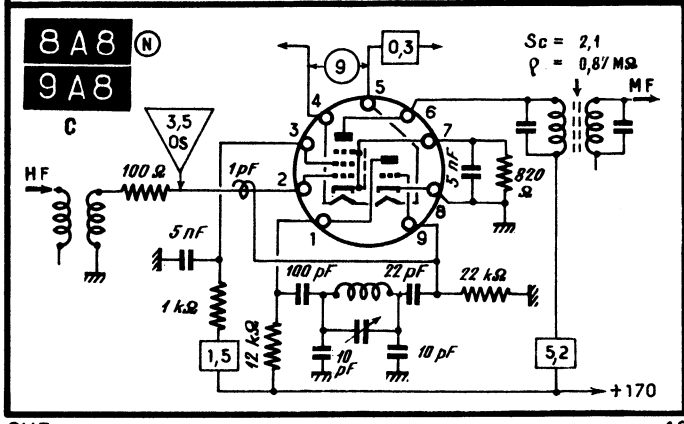


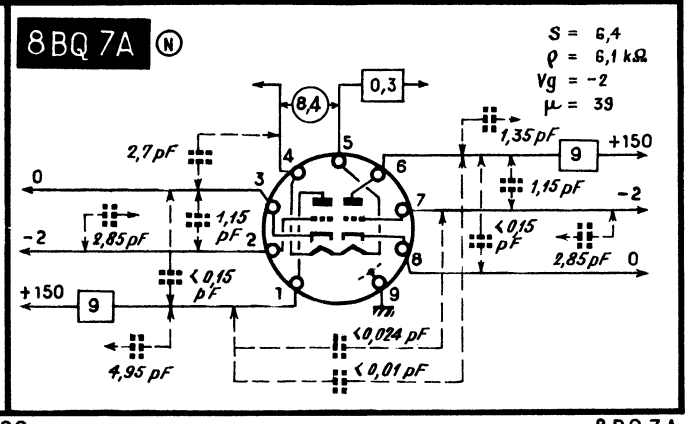
6SN7-GTA (O)



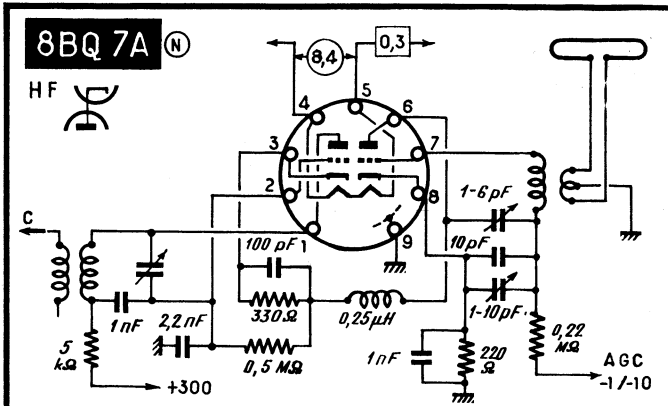

6V3
N
DR
6,3
1,75
6BQ6
6AX2N
T.H.T.
6 kV max
+250
135 max


8A8
9A8
N
P
T
S = 6,2
5
ρ = 0,4 MΩ
4 kΩ
Vg1 = −2
−2
Req = 1,5 kΩ
μ = 20
0,3
+170
2,8
−2
±100
14
3,8 pF
5,5 pF
0,16 pF
1,5 pF
< 0,07 pF
< 0,025 pF
1,8 pF
2,5 pF
< 0,02 pF
10
0
−2

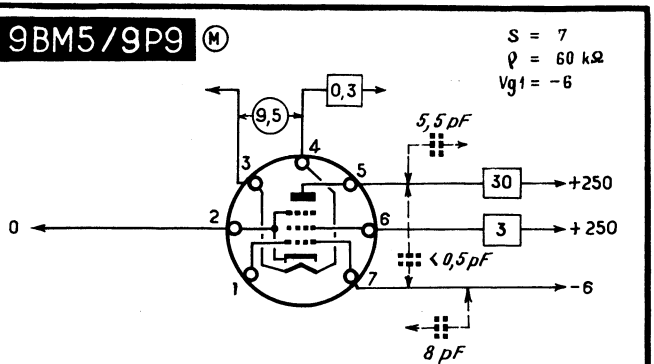

8A8
9A8
N
C
3,5
Os
HF
100 Ω
1pF
5 nF
1 kΩ
1,5
12 kΩ
100 pF
22 pF
22 kΩ
10 pF
10 pF
5,2
+170
0,3
Sc = 2,1
ρ = 0,87 MΩ
MF
5 nF
820 Ω


8BQ7A
N
S = 6,4
ρ = 6,1 kΩ
Vg = −2
μ = 39
0,3
8,4
2,7 pF
1,15 pF
2,85 pF
< 0,15 pF
1,35 pF
1,15 pF
< 0,15 pF
2,85 pF
9
+150
−2
0
< 0,024 pF
< 0,01 pF
4,95 pF

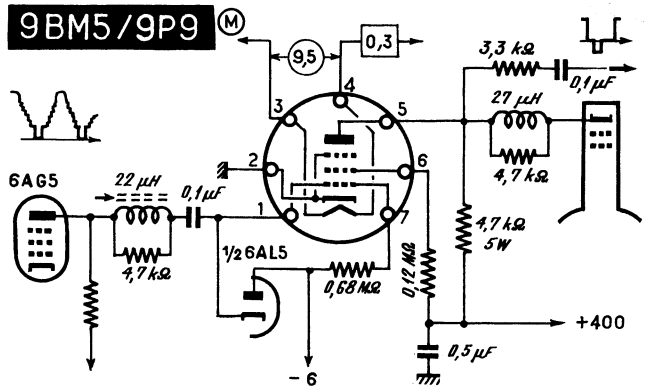
8BQ 7A (N)



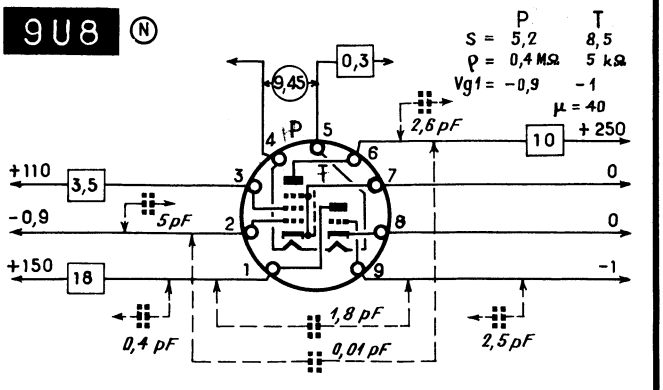
9BM5/9P9 (M)



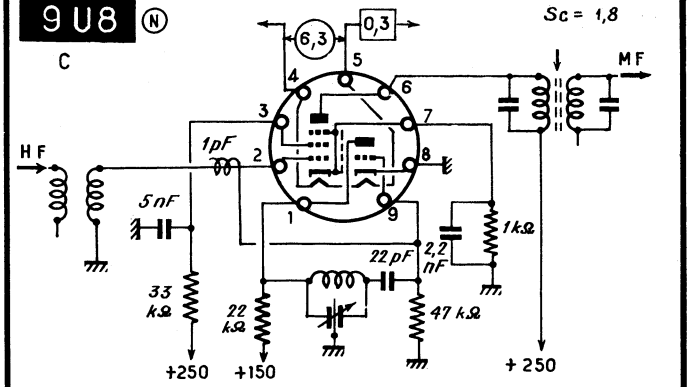
9BM5/9P9 (M)



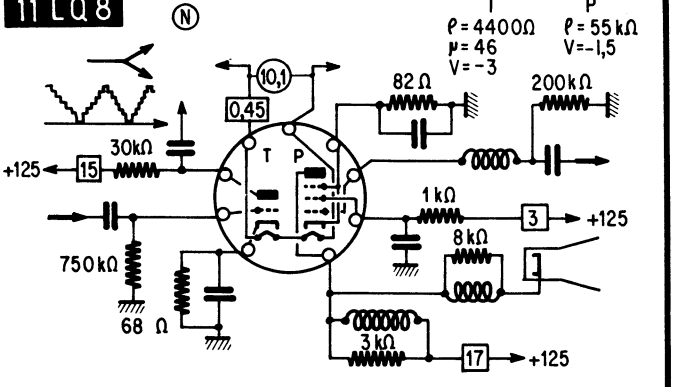
9U8 (N)



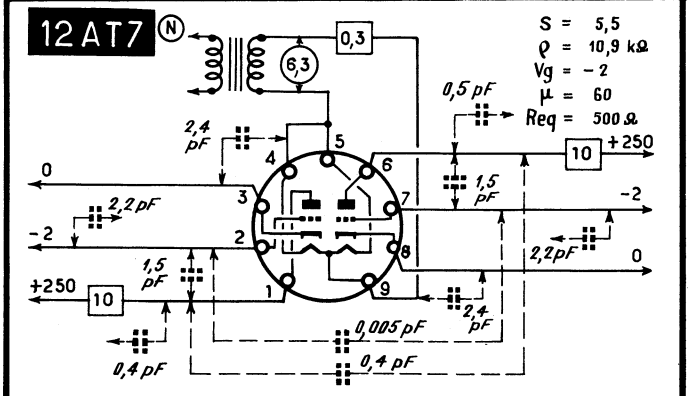
9 U8



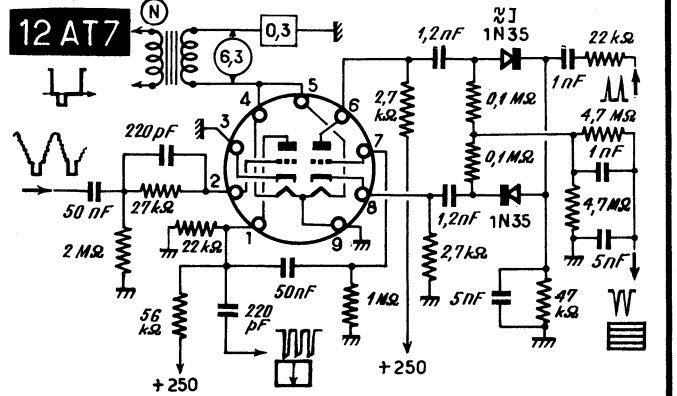
11 LQ8



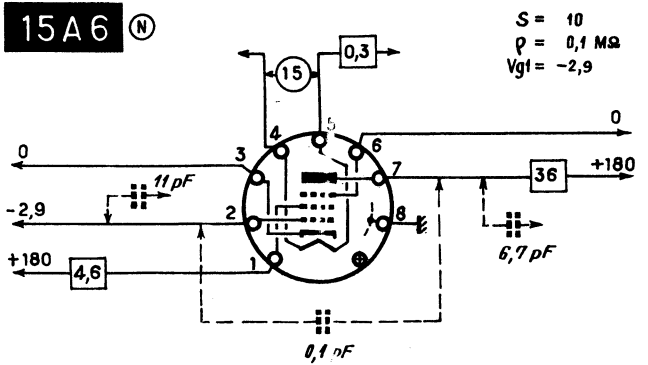
12 AT7



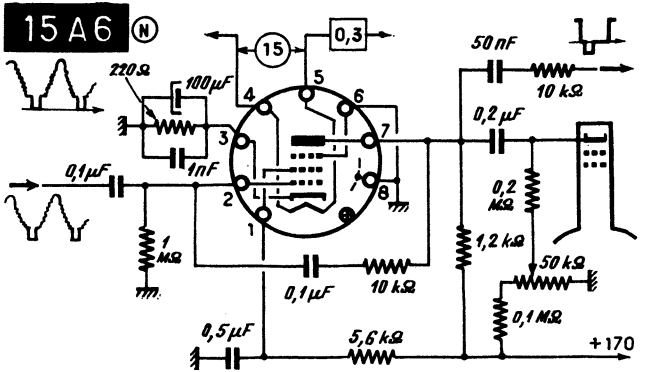
12 AT7



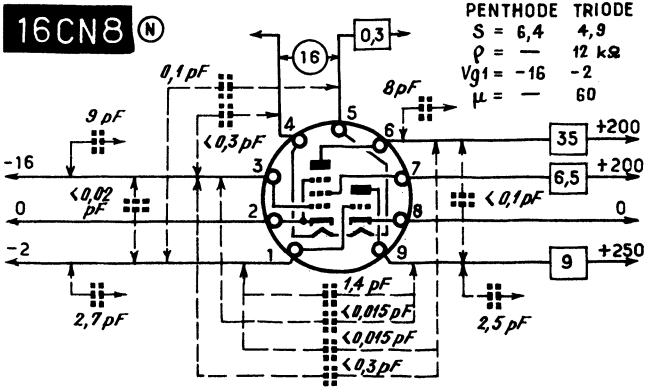
15 A 6 (N)



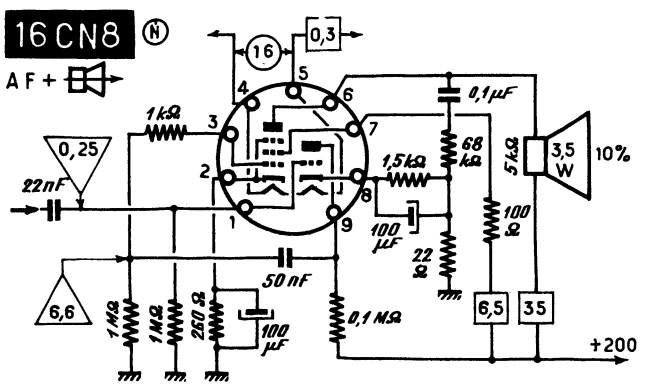
15 A 6 (N)

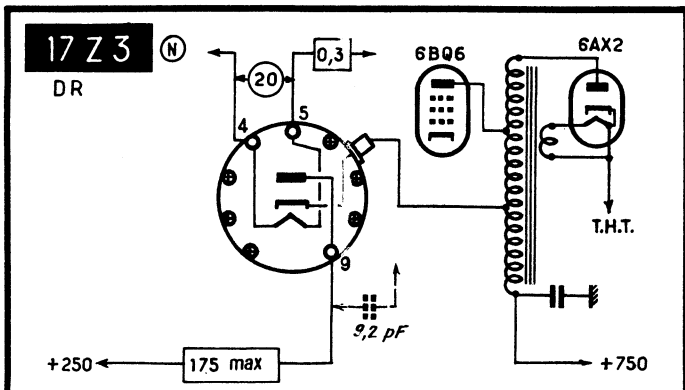


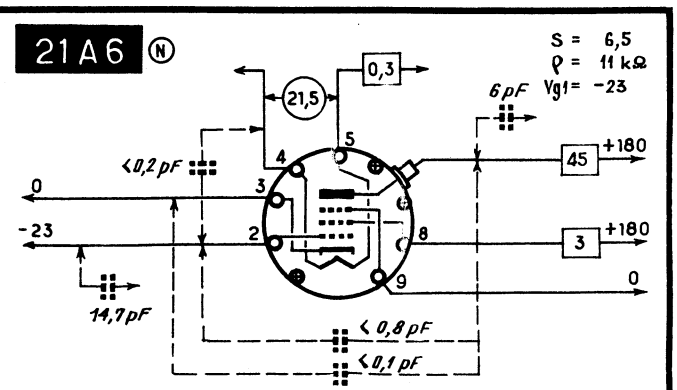
16 CN8 (N)

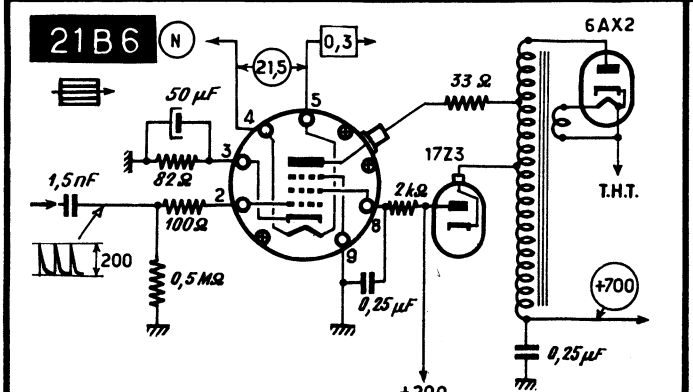


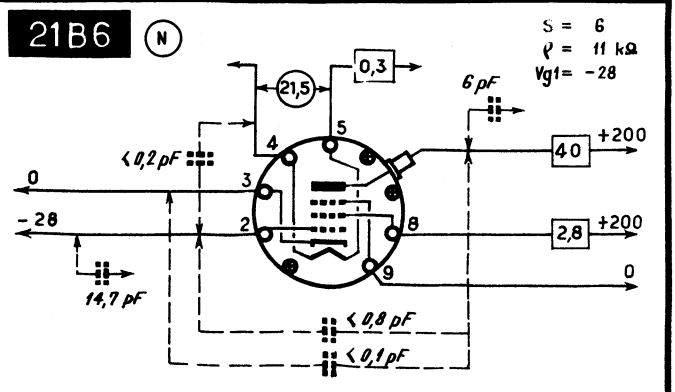
16 CN8 (N)

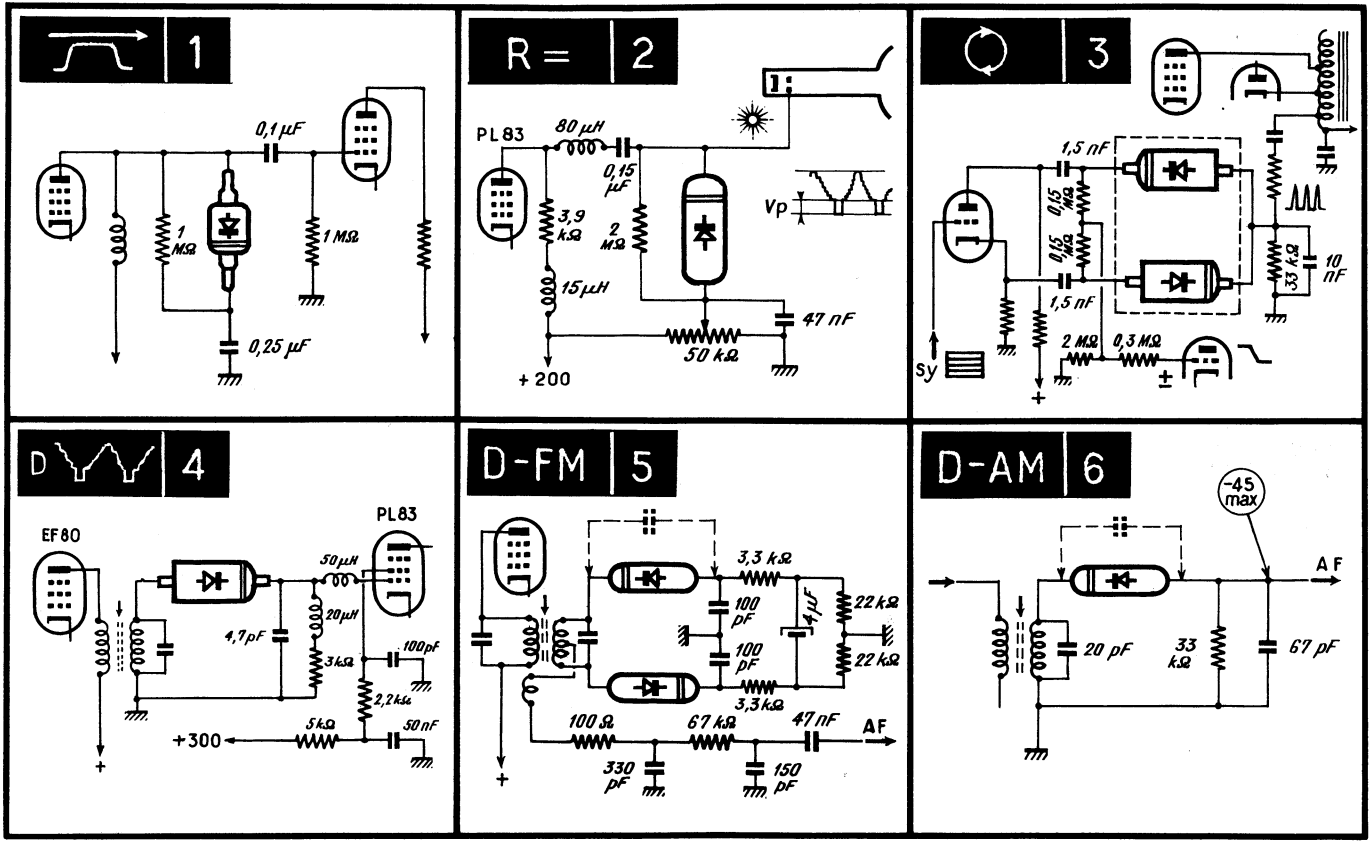



17 Z 3
N
DR
20
0,3
6BQ6
6AX2
4
5
9
T.H.T.
9,2 pF
+250
175 max
+750

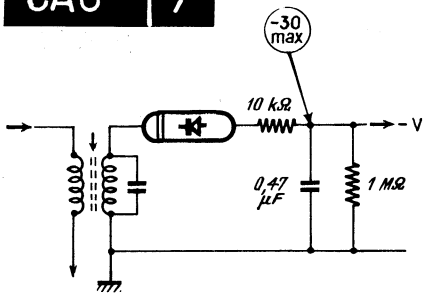

21 A 6
N
S = 6,5
ρ = 11 kΩ
Vg1 = -23
0,3
21,5
6 pF
< 0,2 pF
4
5
3
2
8
9
0
-23
45
+180
3
+180
0
14,7 pF
< 0,8 pF
< 0,1 pF


21 B 6
N
21,5
0,3
6AX2
50 µF
33 Ω
4
5
3
82 Ω
17Z3
1,5 nF
2
100 Ω
2 kΩ
T.H.T.
8
9
200
0,5 MΩ
0,25 µF
+700
+200
0,25 µF

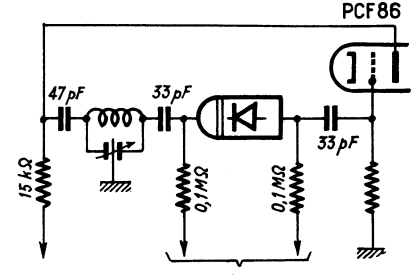

21 B 6
N
S = 6
ρ = 11 kΩ
Vg1 = -28
0,3
21,5
6 pF
< 0,2 pF
4
5
3
2
8
9
0
-28
40
+200
2,8
+200
0
14,7 pF
< 0,8 pF
< 0,1 pF


1
0,1 µF
1 MΩ
1 MΩ
0,25 µF
R = 2
PL 83
80 µH
0,15 µF
3,9 kΩ
2 MΩ
15 µH
Vp
47 nF
50 kΩ
+ 200
3
1,5 nF
0,15 MΩ
0,15 MΩ
33 kΩ
10 nF
1,5 nF
2 MΩ
0,3 MΩ
sy
D 4
EF 80
PL 83
50 µH
20 µH
4,7 pF
3 kΩ
100 pF
2,2 kΩ
5 kΩ
50 nF
+300
D-FM 5
3,3 kΩ
100 pF
100 pF
4 µF
22 kΩ
22 kΩ
3,3 kΩ
100 Ω
67 kΩ
47 nF
AF
330 pF
150 pF
D-AM 6
-45 max
AF
20 pF
33 kΩ
67 pF

CAG 7

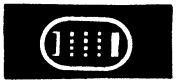


CAF 8



	(pF)	MAX (V)	
AA111	0,14	30	5
AA112	0,12	15	5
AA113	0,08	60	5
AA116		20	5
AA117		90	1-2-7
AA118		90	1-5-7
AA119		45	5-6
AA132	0,5	100	1-2-6-7
AA133		130	1-2-6-7
AA134	0,5	55	1-7
AA137	0,7	30	7
AA138	0,7	15	4
BAY66	25/65	100	8
BAY70	5	30	8
BAY96	28/39	120	8
BA101	15	25	8
BA102	30	20	8
BA109	20/45		8
BA110	10	27	8
BA111	55	18	8
BA112	100	18	8
BA121	10	30	8
BA123	2000	10	8
BA124	55	20	8
BB102	30	20	8
BB104B	14/40	30	8
BB104G	14/36	30	8
BB105	2	30	8
BB106	20	30	8
BB110B	11/32	30	8
BB110G	11/29	30	8
BB117	3/11	20	8
OA60		25	4
OA61		100	2
OA70	1	15	4

	(pF)	MAX (V)	
OA72		30	5-6-7
OA73	1	15	4
OA79		30	5-6
OA81		75	1-2-5-7
OA85		75	2-3-6-7
OA90		30	4
OA91		75	1-2-5-7
OA95		75	2-3-6-7
OA150	0,5	100	1-2-6-7
OA159		40	7
OA160	0,7	25	4
OA161		130	1-2-6-7
OA172	0,7	30	5
OA174	0,5	55	1-7
OA202		150	1-2-3-7
SFD104		25	4
SFD106		25	4-6
SFD107		10	6
SFD110		45	1à7
SFD112		24	7
SFD115		45	5
1N34		60	6
1N35		50	6
1N48			5
1N60		25	4
1N64		25	4
1N65		60	1
1N105		25	4
1N132		25	4
1N541		45	4-5-6
1N542		45	5
12BB105A	2,6/11	28	8
12BB105B	2,2/11	28	8
12BB105G	2/11	28	8
12BB106	4,5/11	28	8



1S2A = DY87
4AH5 = PC900
4CM4 = PC86
4DL4 = PC88
6AB4 = EC92
6AB8 = ECL80
6AJ8 = ECH81
6AK8 = EABC80
6AL3 = EY88
6AL5 = EAA91
6AQ8 = ECC85
6AU6 = EF94
6BL8 = ECF80
6BM8 = ECL82
6BQ5 = EL84
6BX6 = EF80
6BY7 = EF85
6CF8 = EF86
6CJ6 = EL81
6CK6 = EL83
6CM4 = EC86
6CM5 = EL36
6CW5 = EL86
6CW7 = ECC84
6DA6 = EF89
6DC8 = EBF89
6DJ8 = ECC88
6DL4 = EC88
6EH7 = EF183
6EJ7 = EF184

6ES8 = ECC189
6GB5 = EL500
6GJ7 = ECF801
6GV8 = ECL85
6GW8 = ECL86
6HA5 = EC900
6HG8 = ECF86
6JW8 = ECF802
6JX7 = ECH4
6N8 = EBF80
6R3 = EY81
6S2 = EY86
6T8 = EABC80
6U3 = EY80
6U8 = ECF82
6U9 = ECF201
6V9 = ECH200
6W9 = EFL200
6X2 = EY51
6X9 = ECF200
7AN7 = PCC84
7DJ8 = PCC88
7ES8 = PCC189
7FC7 = PCC89
7HG8 = PCF86
8GJ7 = PCF801
8U9 = PCF201
8X9 = PCF200
9AK8 = PABC80
9AQ8 = PCC85

9A8 = PCF80
9JW8 = PCF802
9U8(A) = PCF82
9V9 = PCH200

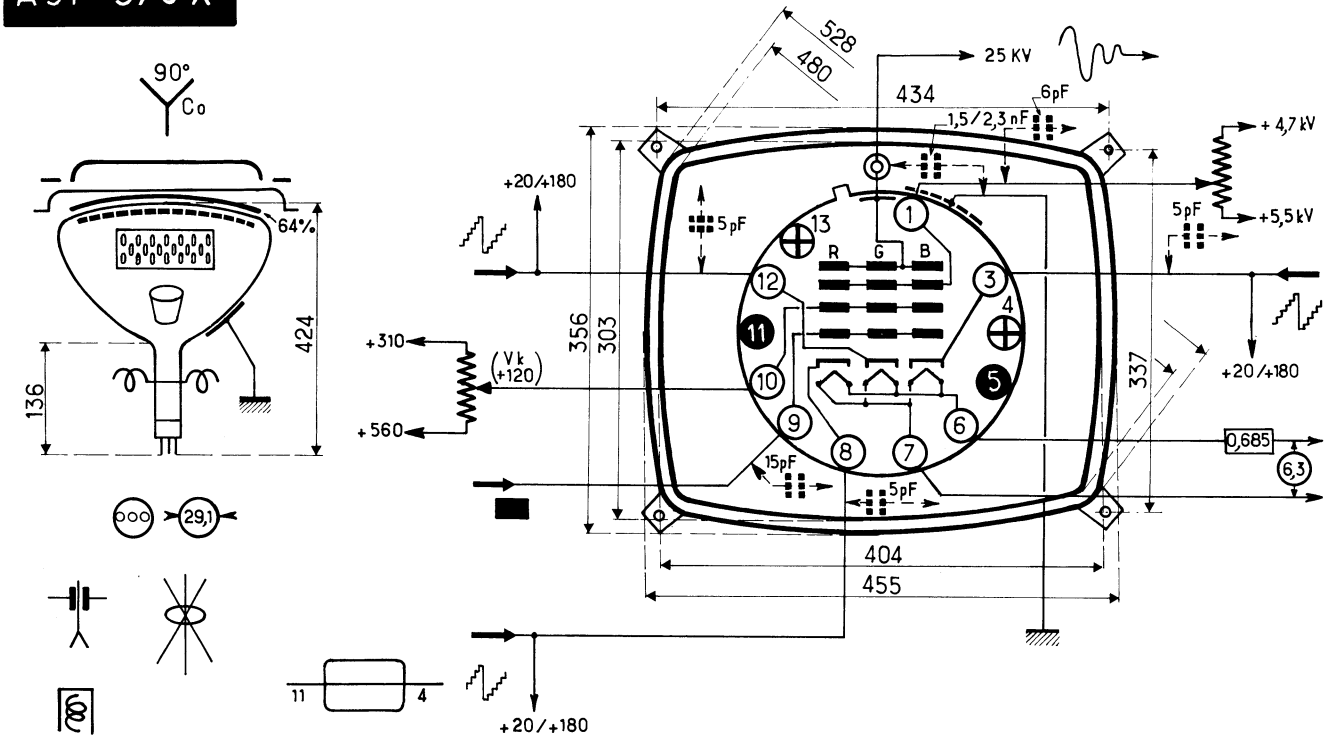
12AT7 = ECC81
12AU7 = ECC82
12AX7 = ECC83

14GW8 = PCL86
15A6 = PL83
15CW5 = PL84
15DQ8 = PCL84
16A5 = PL82
16A8 = PCL82
17Y9 = PFL200
17Z3 = PY81

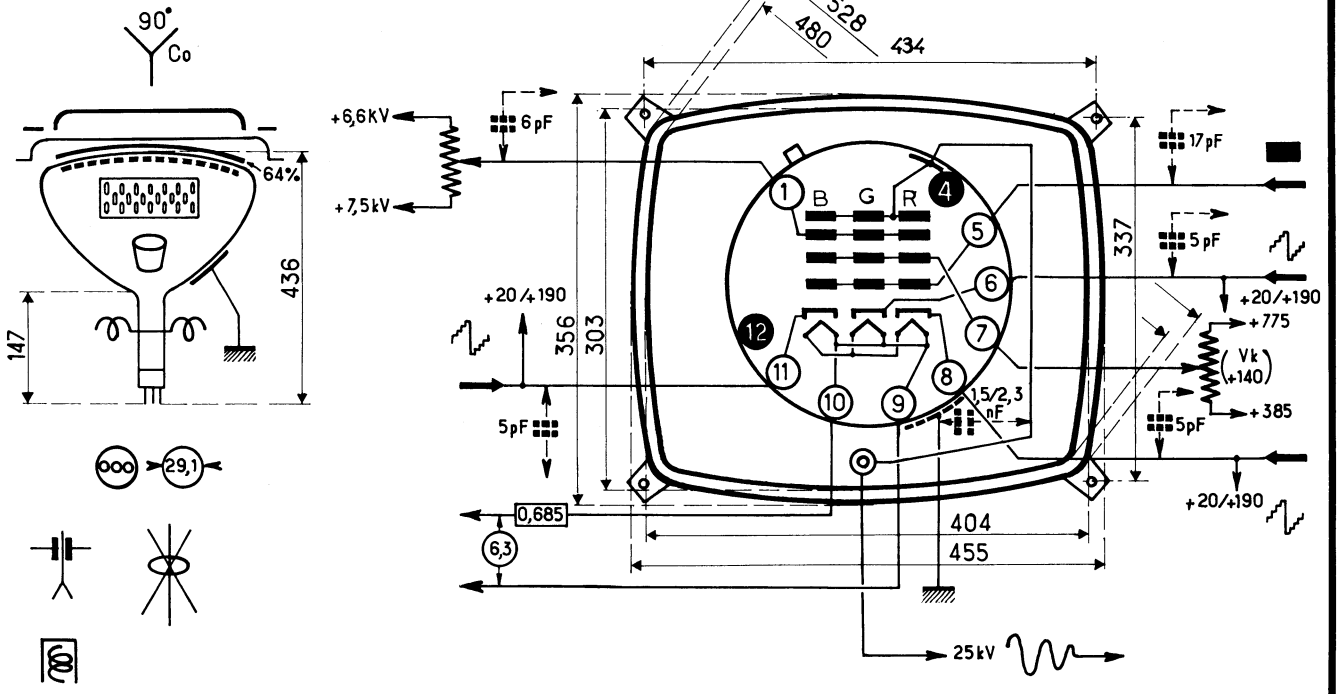
18GV8 = PCL85
19W9 = PFL200
19X3 = PY80
19Y3 = PY82
21A6 = PL81
25E5 = PL36
28GB5 = PL500
30AE3 = PY88
35FN5 = PL300
40KG6 = PL505
6267 = EF86
7025 = ECC83

CME 1908 = A4714W
CME 2302 = A5915W
CME 2303 = A5915W
CME 2308 = A5915W
CME 2313 = A5926W
CME 2501 = A65-11W
CTA 1950 = A49-220X
CTA 2550 = A63-161X
RT 6544 = A65-11W
16 CRP 4 = A41-10W
17 ATP 4(A) = AW 4380
17 BOP 4 = MW-4369
17 BTP 4 = AW-4380
17 CVP 4 = AW-4388
17 DJP 4 = AW-4380
19 ASP 4 = A47-14W
19 CTP 4 = A47-14W
21 ATP 4 = AW-5380
21 CLP 4 = AW-5380
21 DKP 4 = AW-5388
23 AMP 4 = AW-59 11
23 DEP 4(A) = A59-26W
23 DFP 4 = A59-15W
23 EVP 4(B) = A59-26W
23 FGP 4 = A59-11W
23 HDP 4 = A59-26W
23 JCP 4 = A59-26W
25 MP 4 = A65-11W
25 UP 22 = A63-161X

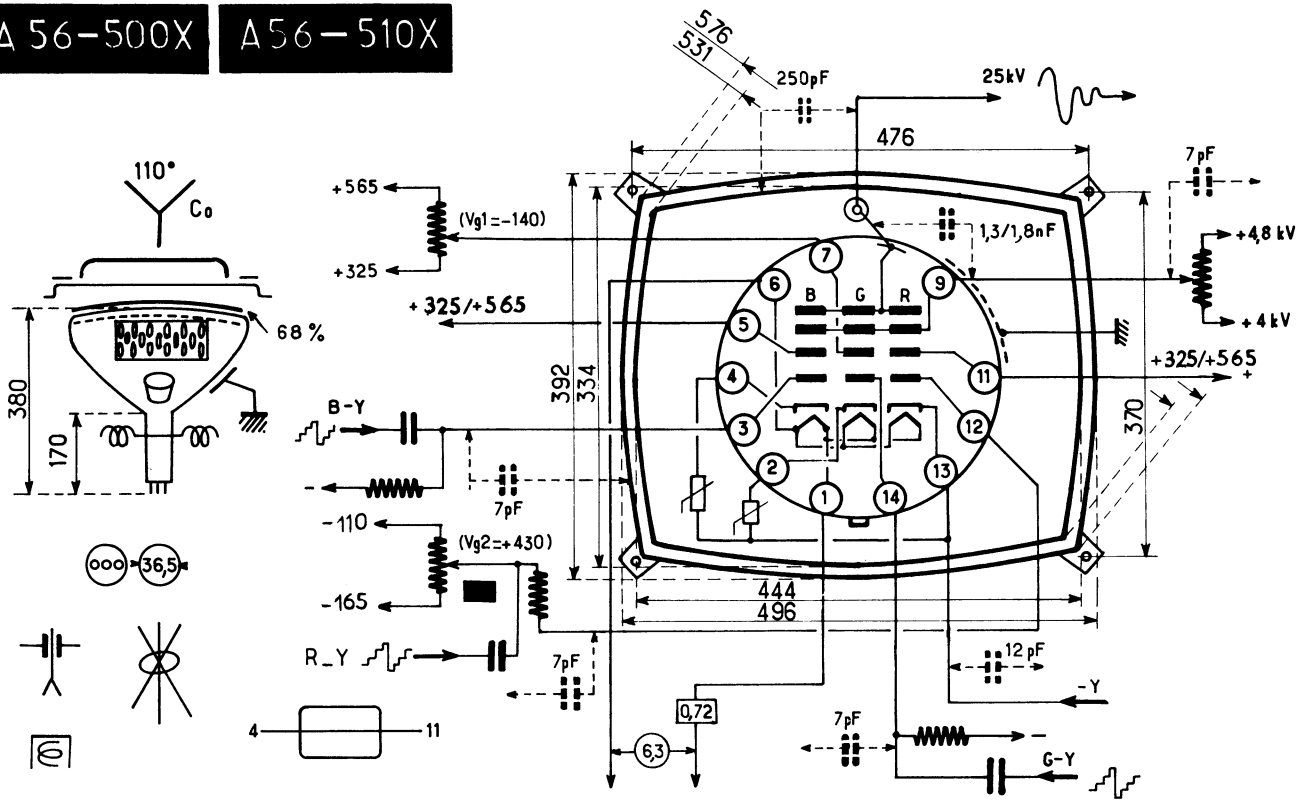
A 51-570 X


90°
Co
64%
424
136
29,1
11
4
528
480
434
6pF
1,5/2,3nF
25 KV
+ 4,7 kV
+5,5 kV
+20/180
5pF
13
R
G
B
1
12
3
4
11
10
5
9
6
8
7
15pF
5pF
356
303
337
+310
(Vk +120)
+560
+20/+180
0,685
6,3
404
455
+20/+180

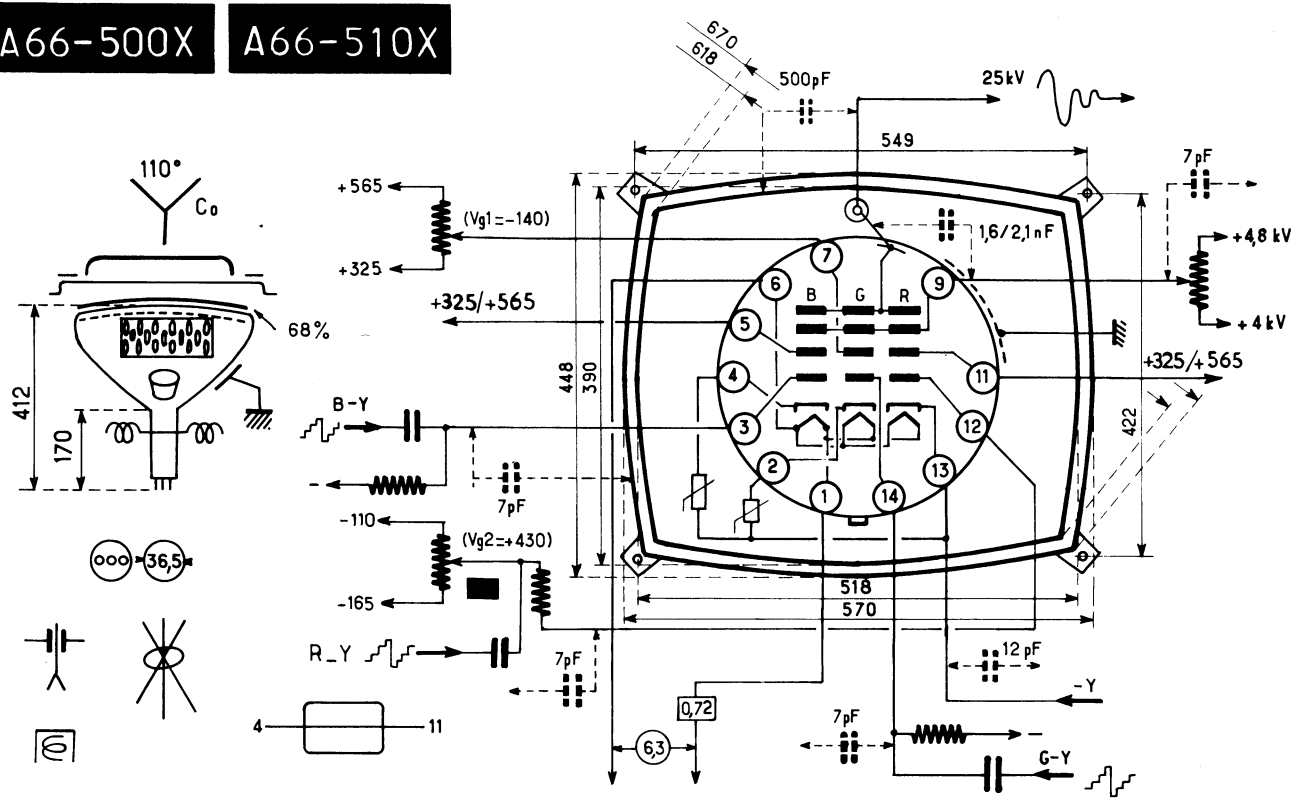
A51-580 X


90°
Co
64%
436
147
29,1
528
480
434
+6,6kV
+7,5kV
6pF
17pF
5pF
+20/+190
+775
Vk
(+140)
+385
1,5/2,3
nF
356
303
337
B
G
R
1
2
3
4
5
6
7
8
9
10
11
12
0,685
6,3
404
455
25kV

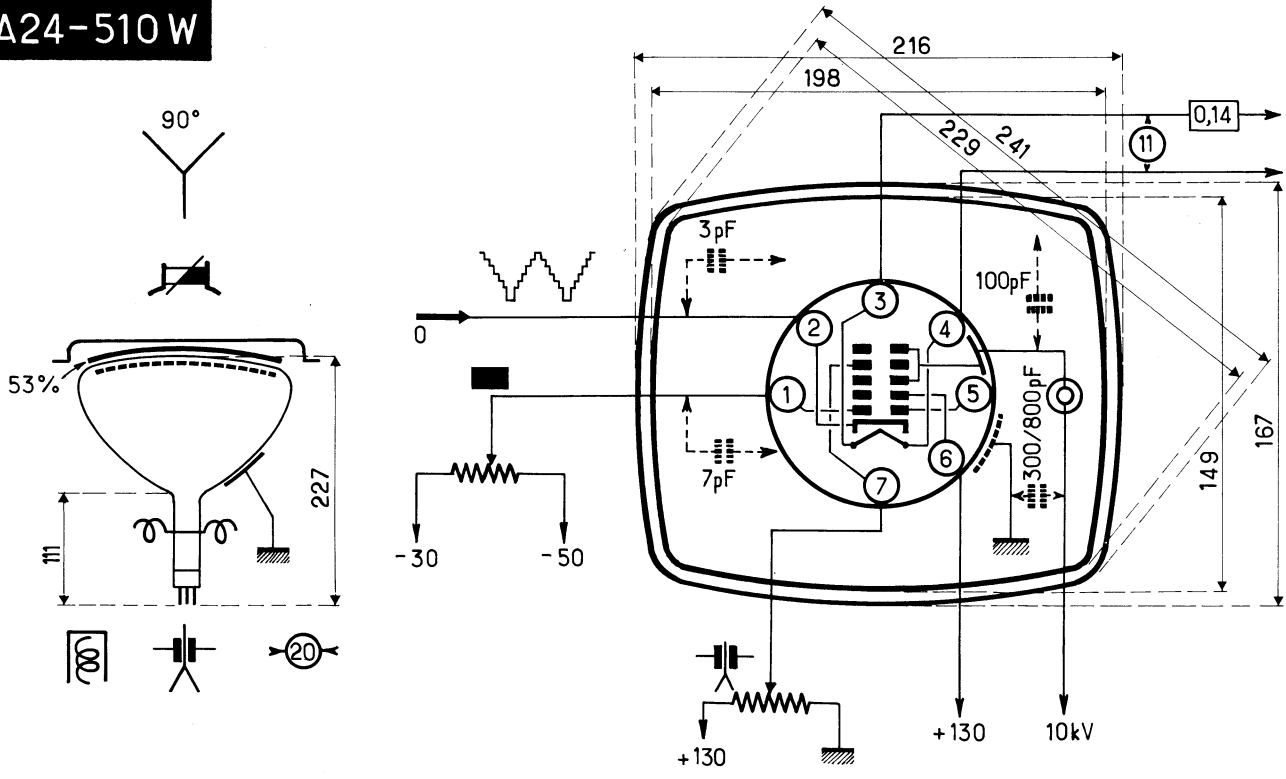
A 56-500X A 56-510X



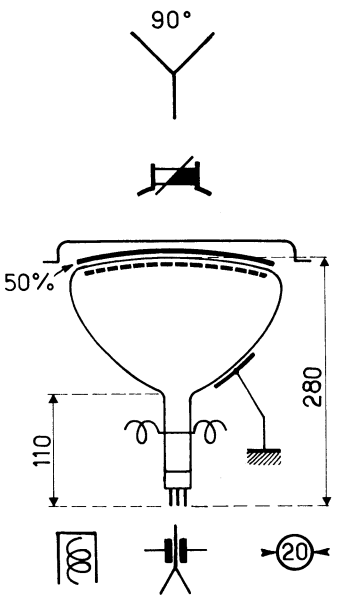
A66-500X A66-510X

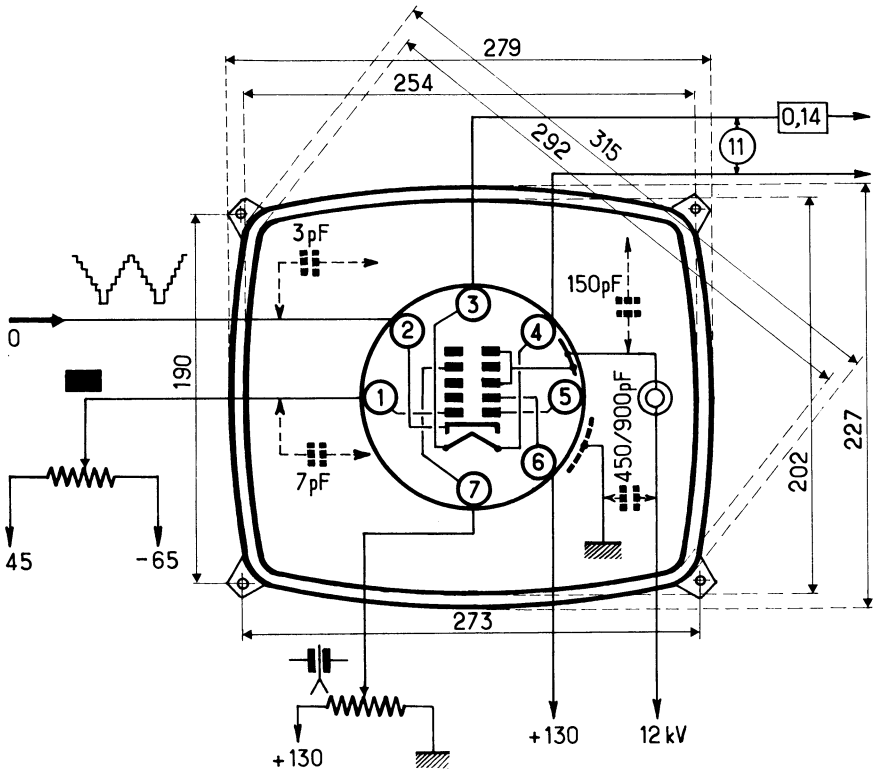


A24-510W

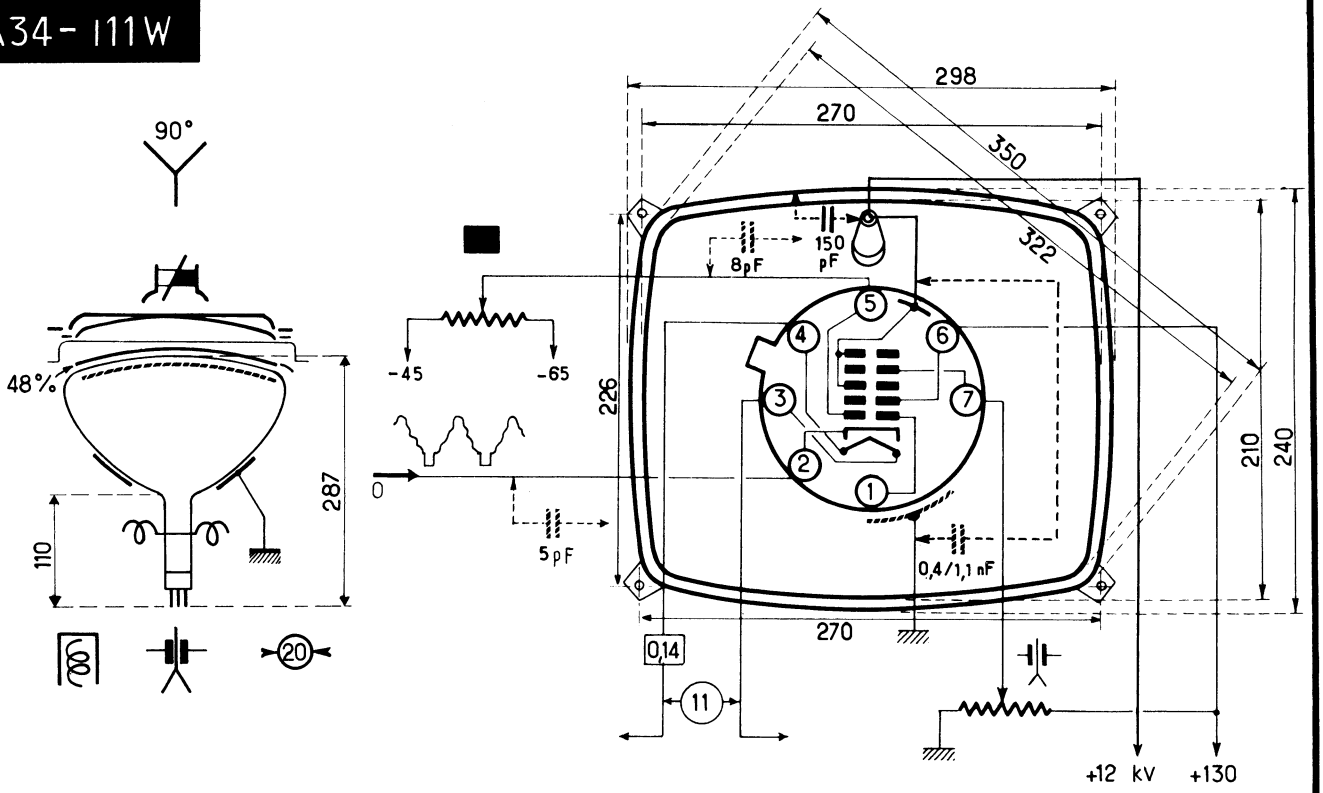

90°
53%
227
111
20
216
198
229
241
0,14
11
3pF
100pF
0
2
3
4
1
5
6
7
7pF
300/800pF
149
167
-30
-50
+130
+130
10kV

A31-322W

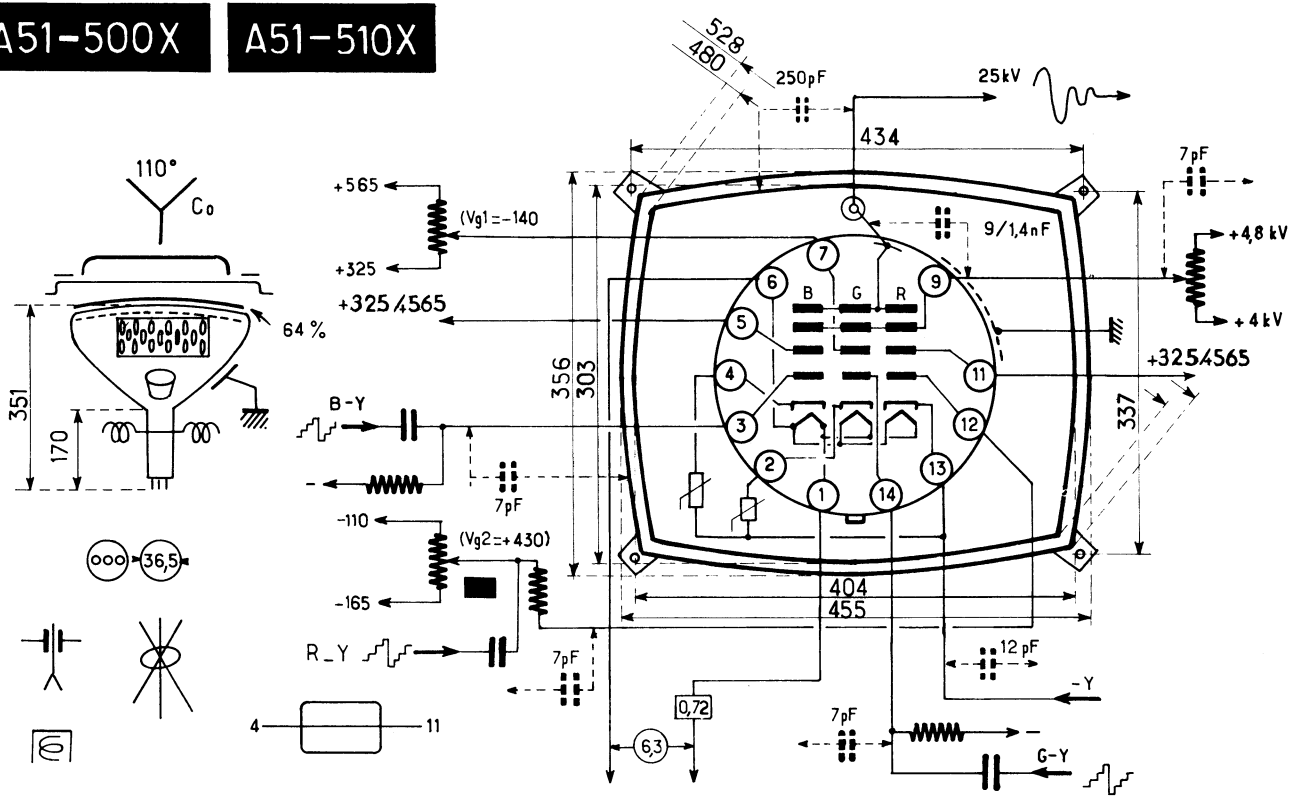

90°
50%
280
110
20


279
254
292
315
0,14
11
3pF
150pF
0
190
1
2
3
4
5
6
7
7pF
450/900pF
227
202
-45
-65
273
+130
+130
12 kV

A34-111W


90°
48%
287
110
20
-45
-65
0
5pF
298
270
350
322
8pF
150 pF
226
210
240
0,4/1,1 nF
270
0,14
11
+12 kv
+130
1
2
3
4
5
6
7

A51-500X A51-510X



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