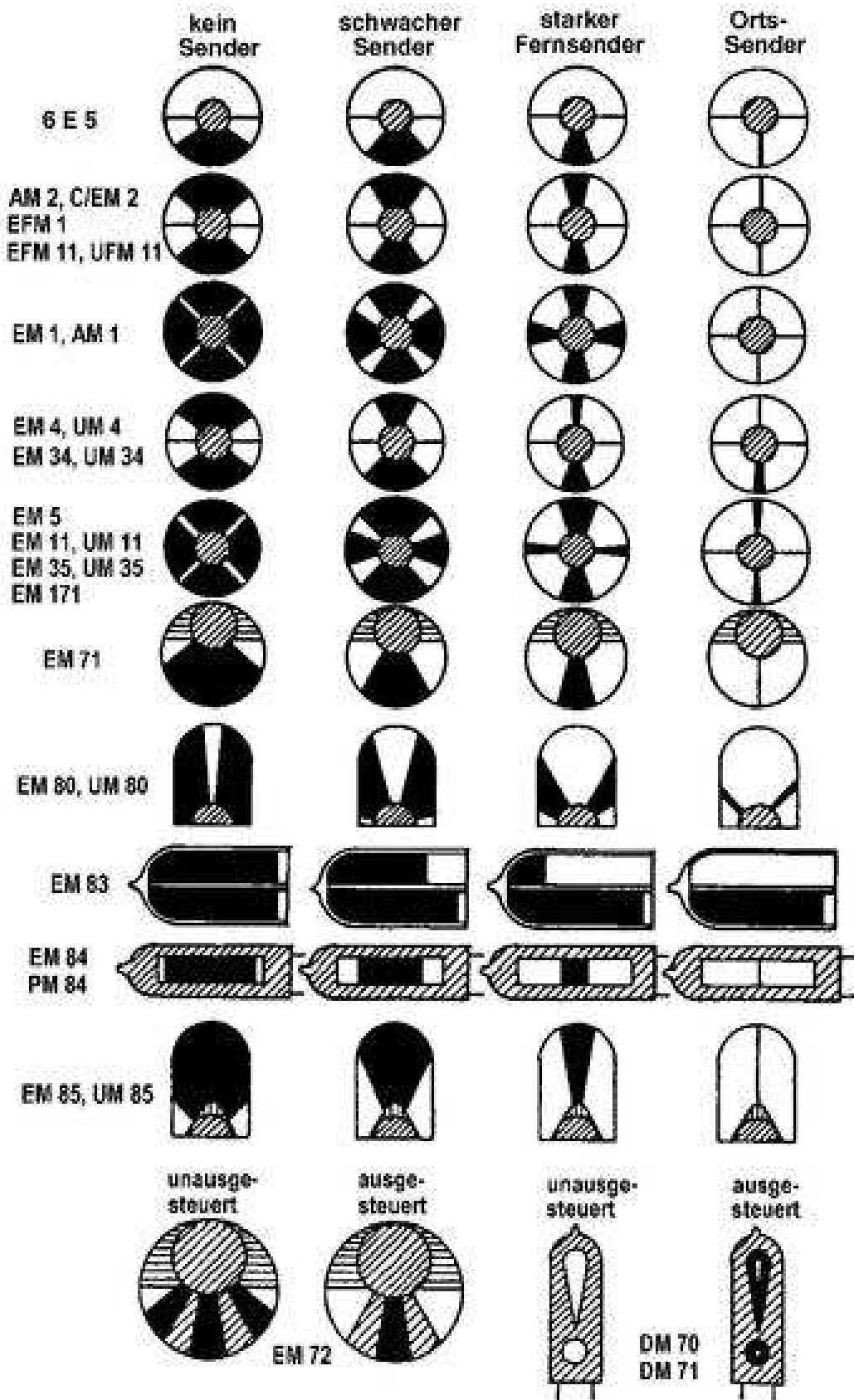


**The 6E1P / 6BR5 / EM80 "Magic Eye"
and Other Indicator Tubes**

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Graphical Illustration of Types and Patterns



Text Chart : Type and Physical Description

2E5	top circle, 6 pin, ST bulb
6AB5/6N5	top circle, 6 pin
6AD6	top split circle, octal
6AF6	top split circle, short octal
6AL7	top double rectangle, octal
6U5/6E5	top circle, 6 pin, ST bulb or cylinder
DM70	side exclamation point, wire pins
DM160	side rectangle, wire pins
EAM86/6GX8	side split bar and on/off, 9 pin
EFM11	top circle, octal
EM35	top circle, octal
EM71	top fan, locktal
EM72	top fan, locktal
EM80/6BR5/6E1P	side fan, 9 pin
EM83	side double bar, 9 pin
EM84/6FG6/6E3P	side split bar, 9 pin
EM87/6HU6	side split bar, 9 pin
EM840	side split bar, 9 pin
ME41	top circle, octal
UM84	side split bar, 9 pin, 12V
JAN-CRC-1629/VT-138	top circle octal
C/EM2	top circle, octal

Oeils magiques - Magic Eyes

reference: <http://paillard.claude.free.fr/lampes/oeils/oeils.html>

We forgive this fault for Employment "of eyelets" instead of "eyes", but we were never able to reconcile ourselves to evoke "magic eyes" on radio stations that do have that a.

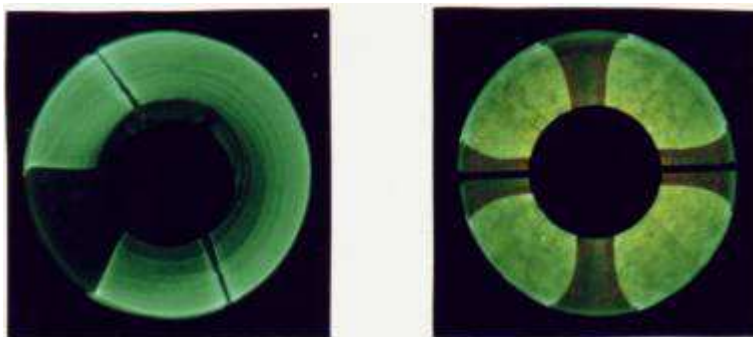
Besides the large **Larousse** dictionary, end of last century, admits that sometimes there are "oeil". Anyway what is magical is unquestionable: we believe in ... "I saw Mr. Moi, yes, with my own eyes ...". Good enough, named cathode clover by some who believe in their luck, magic eye by those who ... (See above), the most learned say it is an indicator of agreement ... We will not take advantage before the little band of menacing Cyclops of photography ...



6E5 and EM1

Until about 1935 fine tuning of the receivers, at least for those with an automatic gain control (VCA) is a milliammeter uses a combination of fluorescent tubes (Tunoscope).

In 1936 arrived the 6E5 (United States) and EM1 **PHILIPS**. Apart from the support, U.S. 6 pin for a transcontinental and for the other, the main difference is the appearance of the bright area at the end of the tube:



The luminous disk of 6E5 has a single line of shadow that passes 90 degrees, no signal received, a gradual closure giving a full circle on a strong station.

This circular, with a cover in center, recalls the appearance of an eye.

The side of EM1 is found for the same reception conditions, four bright areas, like four-leaf clover, separated by four gray areas, the edges end up meeting to listen to a strong station .

The disadvantage common to these two tubes, is to be insensitive and, instead, quickly saturated by the reception of a station so slightly powerful.

Never mind, we go out, in Europe the EM4, 6U5-6G5 and the United States, the latter being identical to the point that some copies bear the double numbers.

Compared to their predecessors they are applicable to all levels of reception, with the slope of the variable part of the tube triode, where the use of two different sensitivities triodes acting one after the other.

From this new generation, and until the late '40s, there is an outbreak of many models that differ in most cases only by the base type and the heating voltage:



TV4A 1629 VT138 6AF7EM34 EM4 Y61 Y63 6U5 6AF6 6AL7 UM4 EM1 EFM1:

- TV4A subplate transcontinental neighbor EM1 but with filament 4 volts
- 1629 (VT138) similar to the 6E5, but octal base and 12 volt heating, widely used on U.S. issuers BC458 series of "Command Set", where it controls the timing frequency with a reference crystal
- 6AF7 neighbor EM4, and the pellet heating current closely, we note some of these tubes on the end part through which we observe the screen, instead of hollow pronounced usual slight bulging
- EM34 EM4-6AF7 comparable to pellets except
- Y61 and Y63 similar to 6U5

Some originals are noticed in particular:

- 6AF6G: this indicator agree, much shorter than previous ones, however, request the assistance of an outer tube (6K7) to work in good conditions
- 6AL7GT, also of short length, has two rectangular areas light end of the tube. Receptor for emission frequency modulated (FM) control its electrodes are connected to the output of the frequency discriminator



- The UM4 is not just a EM4 which would have changed the filament voltage to rise to 12 volts ... besides its base becomes transcontinental octal
 - EM11 which belongs to the family "harmony" **TELEFUNKEN** fairly uncommon
 - The EFM1 whose beautiful glass, a little "plump", home to more than the "four-leaf clover" a pentode amplifier low frequency variable slope, all on transcontinental cap. This assembly broadening the scope of the tube, it becomes a truly active element of the receiver. With the EM71 is done with the transition indicators "modern" post-war 1939/45. This tube has several peculiarities: it is probably the only indicator of agreement reached on base locktal. This is also the last (?) Whose screen is at the end of the tube opposite the pellet. Finally, and this is the most interesting point, this is the first realization in the form of "rabbit ear". Indeed the cup which form the light image, eccentrically with respect to all the controlling electron emission, vaguely resembling an ear ... The photograph displayed above gives a better idea of the appearance of this tube precursor
-

If the family of miniature tubes does not count as an indicator of agreement in its ranks, we find two, almost identical in the series subminiature: DM70 son of long flexible, long enough to be welded directly to the receiver circuits and equipped with short DM71 son, provided for mounting on a support similar to conventional tubes, although much smaller.



DM70 and DM71

These two tubes are used to 1953/1955 on the talkies whose lamps are powered by batteries 1.5 volt filaments and 67 or 90 volts for the plates. The target-shaped **light!** (Exclamation point) is located laterally on the height of the tube and not end as usual. The length and brightness varies with the voltage of the control gate.

Both tubes prefigure the general provision of the last series (Novale) indicators of Understanding was born in 1955. Due to the small diameter tubes family Novale limits has little hypothetical light area, and the presence of the exhaust tube dump the top of the tube, it is difficult to place the target on top. So we take the lateral arrangement of DM70/71 and shape "rabbit ear" has extended well suited Novale glassware. The EM80 brings together these two features and is quickly followed by the EM81 and EM85 which bring some improvement on the target size or sensitivity. This time the reference to "rabbit ear" is fully justified as confirmed by the following photograph.



EM80 Family

In fact it is a possible shape "rabbit's foot" would more likely chance that the "four-leaf clover"? The question remains unanswered.

Other tubes, also with the target side, will follow, but this time with one or two bright ribbons, the latter version being used more particularly on FM receivers, such as EM84 6AL7GT then in 1959 with two ribbons followed in 1965 by EM87 of the same type.

Further references follow ... EM800 - EMM801 - EMM803, but they will not resist for long rows of multicolored LEDs that pervade the entire hi-fi equipment.

In addition to their use in fundamental indicator agree it is perfectly possible to use these tubes as a conventional triode. Witness the "grid-dip" that we use, since the fifties, to set the tuned circuits: made in a pattern very popular at that time, he uses an EM85, which combined the functions of oscillator and indicator " dip ", that up to 200 MHz via interchangeable chokes. An amateur will use the same program in low power of course.

reference: <http://paillard.claude.free.fr/lampes/oeils/oeils.html>

6E1P / EM80 / 6BR5

EM80 Functional Images

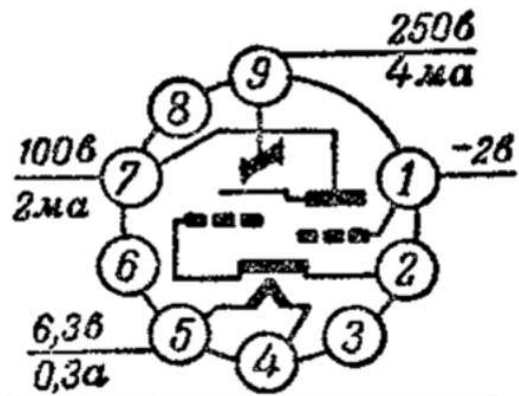




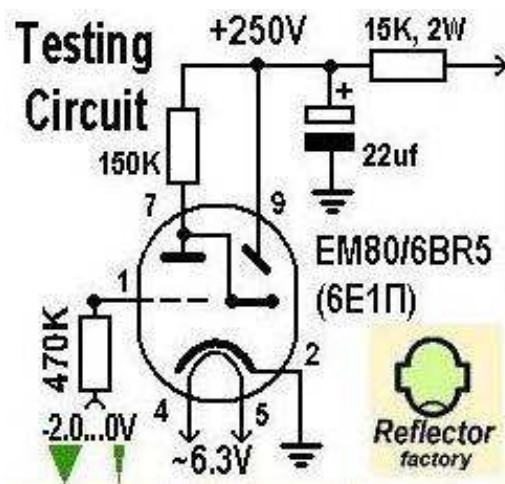
EM80 Circuits

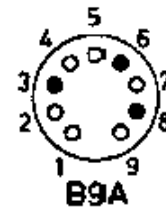
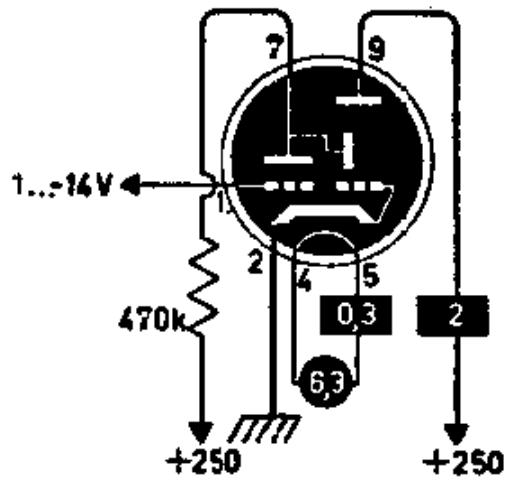
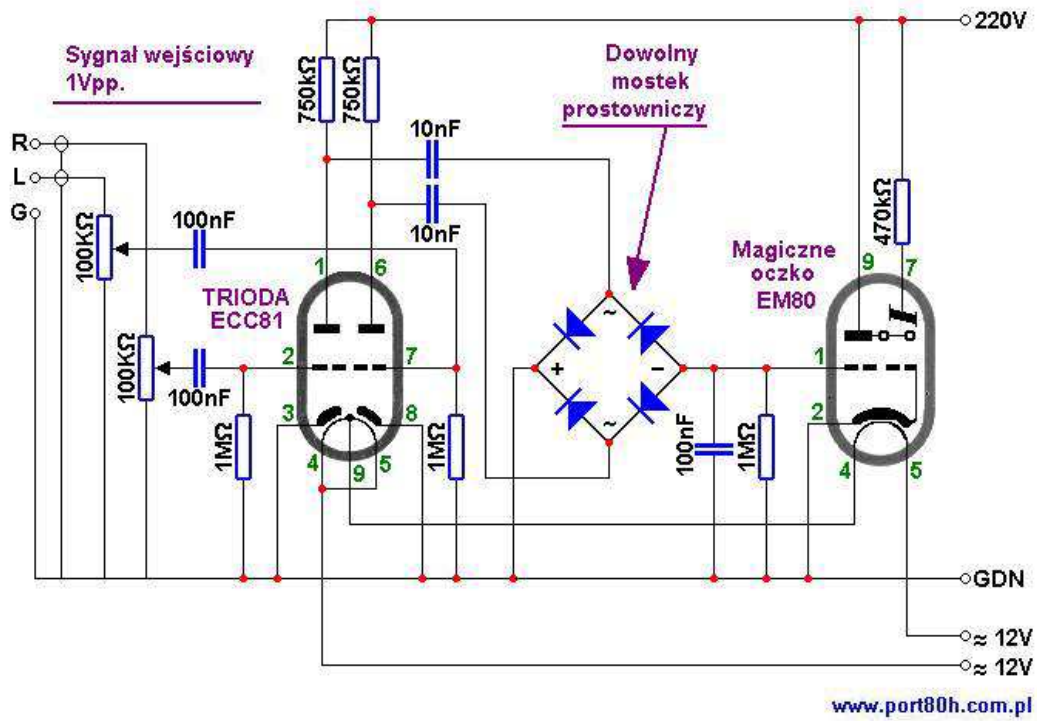
6E1П

Индикатор настройки

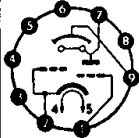


S	K	R _a
0.5	24	1000





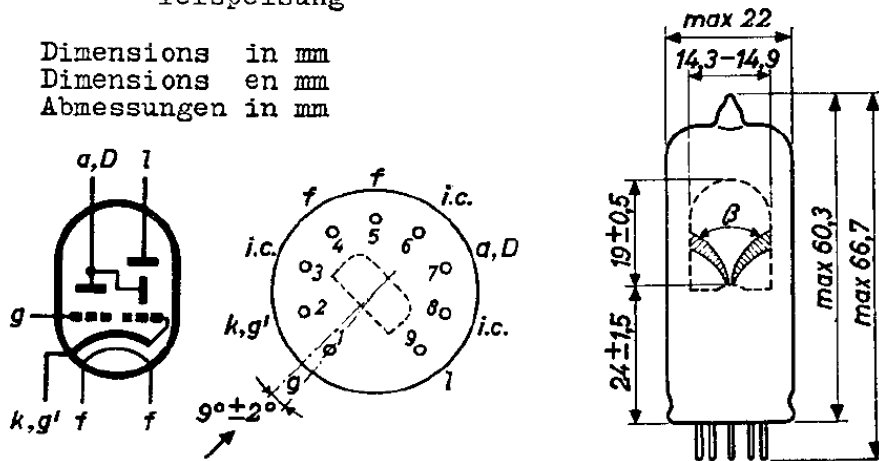
EM80 Datasheets

Type	Allgemeine Daten General data		Betriebswerte Typical operation			Grenzwerte Maximum ratings		
EM 80 Abstimm- anzeigeröhre Tuning indicator	Pico 9	$U_f = 6,3 \text{ V}$	$U_L = U_b =$	200	250	V	$U_a =$	= 300 V
	Novol	$I_f \text{ ca. } 300 \text{ mA}$	$R_a =$	0,5	0,5	MΩ	$N_a =$	= 0,2 W
	Größe 10	$I_f = 300 \text{ mA}$	$U_g =$	0...-16	0...-20	V	$U_L =$	= 300 V
	Outlines 10	$U_f \text{ ca. } 6,3 \text{ V}$	$I_L =$	1,5...2,7	2...3,6	mA	$R_g =$	= 3 MΩ
	Stift · Pin	indirekt geheizt	$I_a =$	380... 40	480... 50	μA	$U_{fk} =$	= 100 V
	1 g	indir. heated	$\alpha^1) =$	0... 26	0... 26	mm		
	2 k		¹⁾ Bogen des Leuchtwinkels in mm Arc of fluorescent angle in mm					
	3 —							
	4 f							
	5 f							
	6 —							
	7 a							
	8 —							
	9 L							
								

TUNING INDICATOR for A.M. receivers
 INDICATEUR D'ACCORD pour des récepteurs A.M.
 ABSTIMMANZEIGERÖHRE für AM-Empfänger

Heating : indirect by A.C. or D.C.
 parallel supply
 Chauffage: indirect par C.A. ou C.C. - $V_f = 6,3$ V
 alimentation- Parallèle $I_f = 0,3$ A
 Heizung : indirekt durch Wechsel-
 oder Gleichstrom; Paral-
 lelspeisung

Dimensions in mm
 Dimensions en mm
 Abmessungen in mm



Base, culot, Sockel: NOVAL

Operating characteristics
 Caractéristiques d'utilisation
 Betriebsdaten

V_b	=	250	V
V_l	=	250	V
R_a	=	0,5	MΩ
R_g	=	3	MΩ
V_g	=	-1	-14 V
β	=	5	50 °
I_a	=	0,37	0,01 mA
I_l	=	2	2,3 mA

EM 80**PHILIPS**

Limiting values
Caractéristiques limites
Grenzdaten

V_{a0}	= max. 550 V
V_a	= max. 300 V
W_a	= max. 0,2 W
V_{l0}	= max. 550 V
V_l	= max. 300 V
V_l	= min. 165 V
$-V_g(I_g=+0,3\mu A)$	= max. 1,3 V
I_k	= max. 3 mA
R_g	= max. 3 M Ω
V_{kf}	= max. 100 V
R_{kf}	= max. 20 k Ω

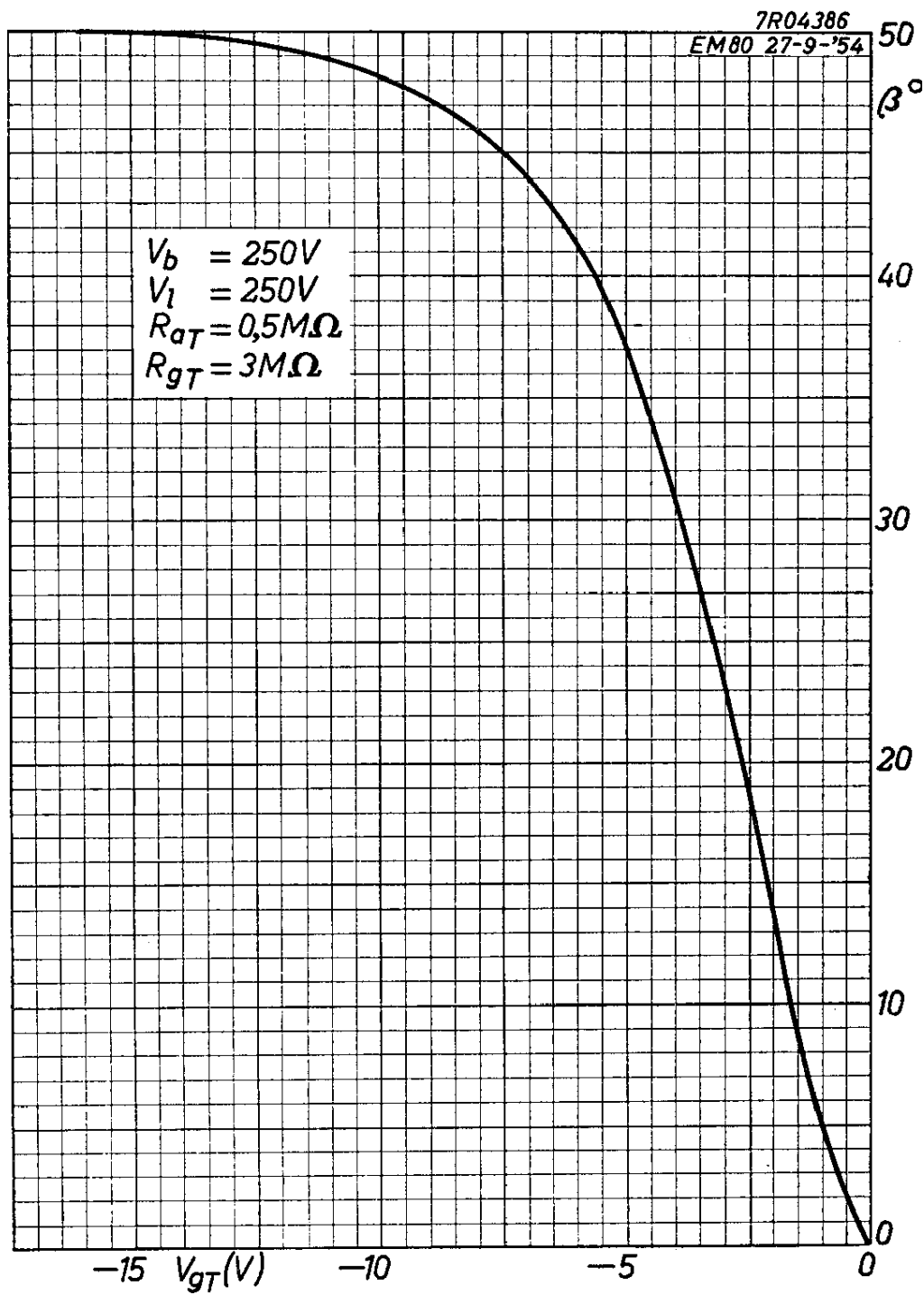
Remark : The tube is to be mounted in such a tube-holder that the frontside of the tube can be placed against the station name dial.

Observation: Le tube sera placé dans tel support que la face du tube peut être montée contre le cadran d'accord

Bemerkung : Die Röhre soll mit einer derartigen Fassung gebraucht werden dass die Vorderseite der Röhre gegen die Abstimmkala montiert werden kann.

PHILIPS

EM 80



11.11.1954

A



	EM80	
page	sheet	date
1	1	1954.11.11
2	2	1954.11.11
3	A	1954.11.11
4	FP	1999.07.10