

## S.Q. TUBE

Special quality pentode designed for use as A.F. and R.F. amplifier, output tube, oscillator a.o.

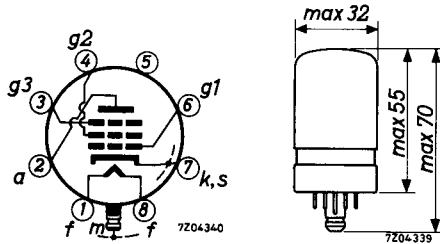
### QUICK REFERENCE DATA

Life test	10 000 hours	
Base	Loctal	
Heating	Indirect A.C. or D.C. Series or parallel supply	
Heater voltage	$V_f$	20 V
Heater current	$I_f$	125 mA
Anode current	$I_a$	16 mA
Mutual conductance	$S$	6.5 mA/V
Equivalent noise resistance	$R_{eq}$	1200 $\Omega$
Hum voltage	$V_{g_{eq}}$	10 $\mu V_{RMS}$

### DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Loctal



**CHARACTERISTICS**

- Column I Nominal value or setting of the tube
- II Range values for equipment design: Initial spread
- III Range values for equipment design: End of life

		I	II	III	
Heater voltage	$V_f$	20			V
Heater current	$I_f$	125	120 - 130		mA
Anode supply voltage	$V_{ba}$	225			V
Grid No. 2 supply voltage	$V_{bg2}$	155			V
Grid No. 3 voltage	$V_{g3}$	0			V
Cathode resistor	$R_k$	250			$\Omega$
Anode current	$I_a$	16	13.5 - 19	min. 11.5	mA
Grid No. 2 current	$I_{g2}$	3	2 - 4		mA
Mutual conductance	S	6.5	5.5 - 7.8	min. 4.5	mA/V
Internal resistance	$R_i$	250	min. 200		k $\Omega$
Amplification factor	$\mu_{g2g1}$	19			
<u>Negative grid current</u>	$-I_g$		max. 0.5	max. 1.0	$\mu A$
<u>Output power</u>	$W_o$	1.5			W
Anode load resistance $R_{a\sim} = 10\text{ k}\Omega$					
Total distortion $d_{tot} = 10\%$					
<u>Cathode heating time</u>		26	19 - 33		sec
Anode current $I_a = 4\text{ mA}$					
<u>Equivalent noise resistance</u>					
R. F.	$R_{eq}$	1200	max. 2000		$\Omega$
R. F. connected as triode	$R_{eq}$	650			$\Omega$
A. F. (500 - 3000 Hz)	$R_{eq}$	5000			$\Omega$

**CHARACTERISTICS** (continued)

		II	III	
<u>Insulation between cathode and heater</u>	$I_{kf}$	max. 0.5	max. 1.0	$\mu A$
Voltage between cathode and heater $V_{kf} = 50$ V (cathode positive)				
<u>Insulation between two electrodes</u>	$R_{ins}$	min. 1000	min. 300	$M\Omega$
Voltage between electrodes $V = 50$ V				
<u>Hum voltage</u>	$V_{geq}$	max. 10		$\mu VRMS$

Grid No. 1 resistor  $R_{g1} = 500$  k $\Omega$ Cathode by-pass capacitor  $C_k = 100$   $\mu F$ 

Heater centre earthed

**CAPACITANCES**

		I	II	
Grid No. 1 to grid No. 2, grid No. 3, cathode, heater and screen	$C_{g1/g2g3kfs}$	8.5	7.5 - 9.5	pF
Grid No. 1 to grid No. 2, grid No. 3, cathode, heater and screen	$C_{g1/g2g3kfs}$	10.5		pF
Cathode current $I_k = 19$ mA				
Anode to grid No. 2, grid No. 3, cathode, heater and screen	$C_{a/g2g3kfs}$	6.0	4.5 - 7.7	pF
Grid No. 1 and anode to grid No. 3, grid No. 2, cathode, heater and screen	$C_{g1a/g3g2kfs}$		max. 16	pF
Anode to grid No. 1	$C_{ag1}$	14	max. 18	mpF
Grid No. 1 to grid No. 2	$C_{g1g2}$	3		pF
Grid No. 2 to grid No. 3	$C_{g2g3}$	2.2		pF
Grid No. 1 to cathode and screen	$C_{g1/ks}$	4.5		pF
Anode to grid No. 3	$C_{ag3}$	1.2		pF
Grid No. 1 to heater	$C_{g1f}$	20	max. 40	mpF
Anode to heater	$C_{af}$	120		mpF
Cathode and screen to heater	$C_{ks/f}$	7		pF

**CAPACITANCES** (continued)

As triode (Grid No. 2 and grid No. 3 connected to anode)

	I	II	
Grid No. 1 to cathode, heater and screen	5	max. 6	pF
Anode, grid No. 2 and grid No. 3 to cathode, heater and screen	7.5	max. 9	pF
Anode, grid No. 2 and grid No. 3 to grid No. 1	3.2	max. 4	pF

**LIFE**

Production samples are tested to be within the end of life values (column III) under the following conditions during 10 000 hours.

Heater voltage	$V_f$	20	V
Anode supply voltage	$V_{ba}$	225	V
Grid No. 2 supply voltage	$V_{bg2}$	155	V
Grid No. 3 voltage	$V_{g3}$	0	V
Cathode resistor	$R_k$	250	$\Omega$

**LIMITING VALUES** Design centre rating system.

Anode voltage	$V_{a0}$	max.	550	V
	$V_a$	max.	300	V
Anode dissipation	$W_a$	max.	4	W
	$V_{g30}$	max.	550	V
Grid No. 3 voltage	$V_{g3}$	max.	300	V
	$W_{g3}$	max.	1	W
Grid No. 3 dissipation	$V_{g20}$	max.	550	V
	$V_{g2}$	max.	300	V
Grid No. 2 voltage	$W_{g2}$	max.	1	W
	Dissipation of anode, grid No. 2 and grid No. 3 (triode connected)	$W_{a+g2+g3}$	max.	5
Grid No. 1 voltage	$-V_{g1}$	max.	100	V
Grid No. 1 dissipation	$W_{g1}$	max.	50	mW
Cathode current	$I_k$	max.	30	mA

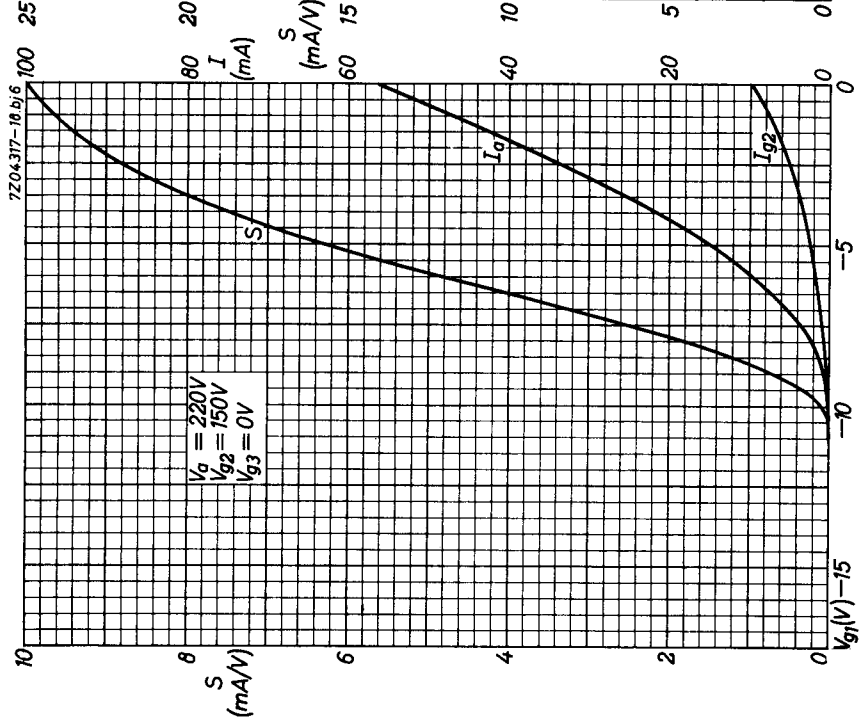
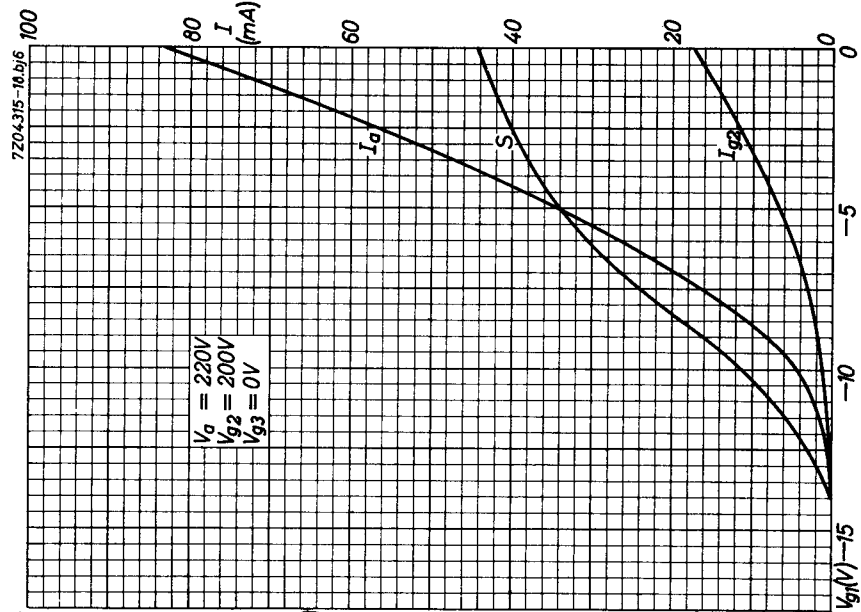
**LIMITING VALUES** (continued)

Grid No. 1 resistor Anode dissipation > 1.5 W	$R_{g_1}$	max.	0.5 $M\Omega$
Grid No. 1 resistor Anode dissipation < 1.5 W	$R_{g_1}$	max.	3 $M\Omega$
Voltage between cathode and heater	$V_{kf}$	max.	120 V
Bulb temperature (Metal envelope)	$t_{bulb}$	max.	120 °C

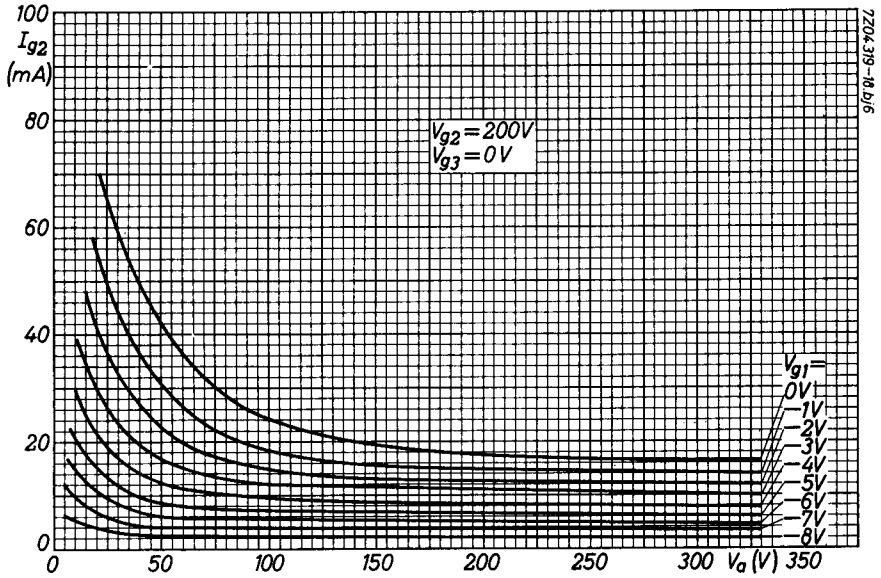
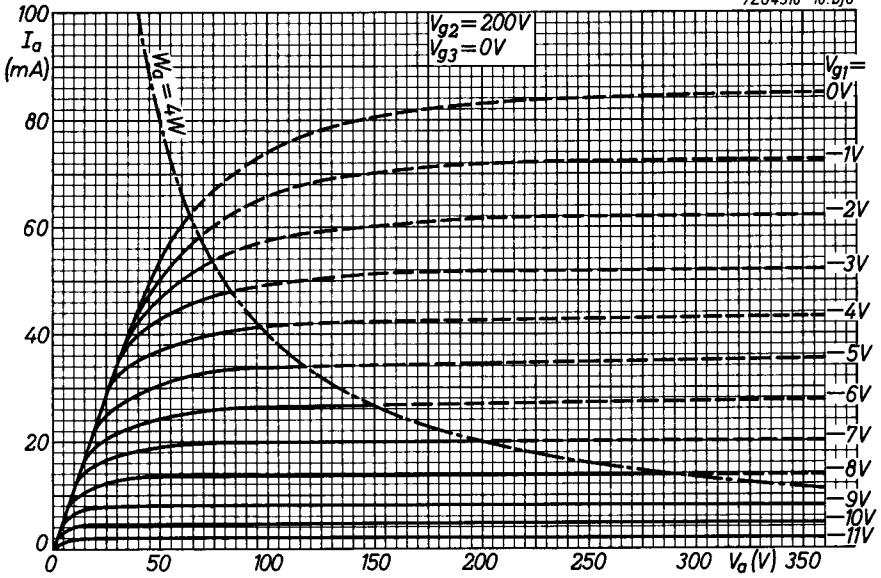
Heater voltage: The average heater voltage should be 20 V.

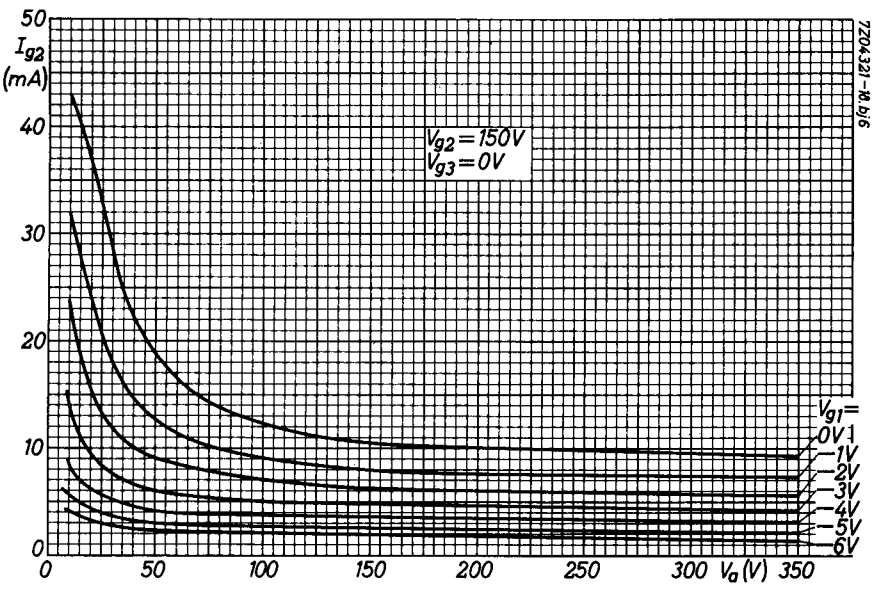
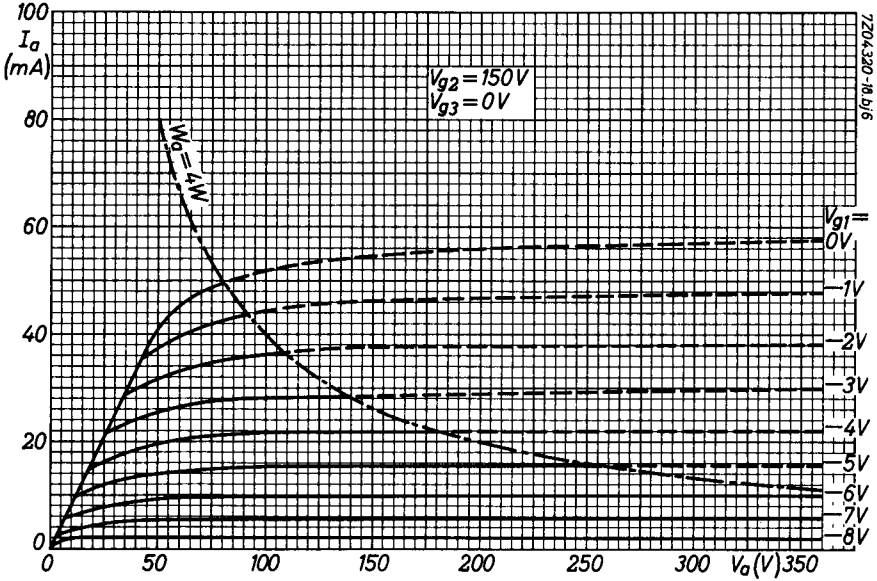
Variations of the heater voltage exceeding the range of 19 V to 21 V will shorten the tube life.

The tolerance of heater current (column II) should be taken into account.

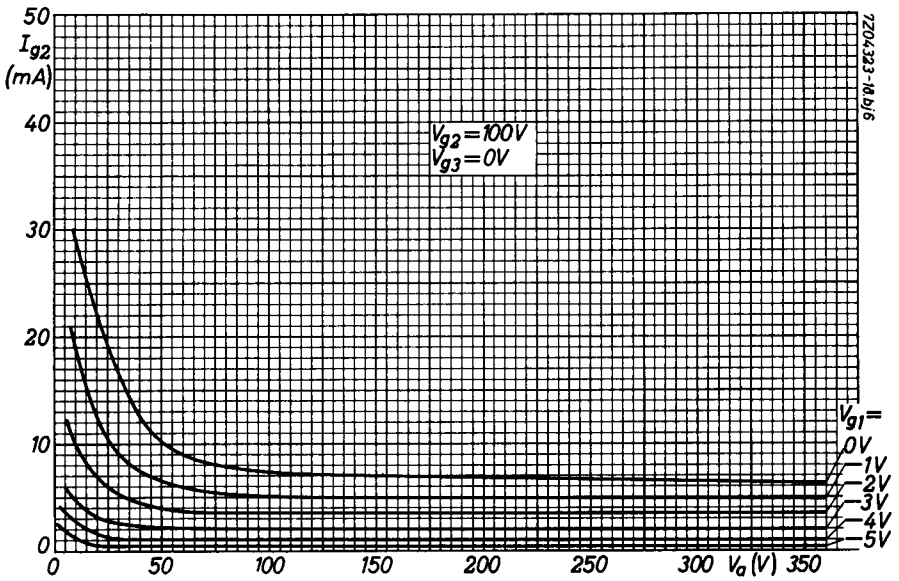
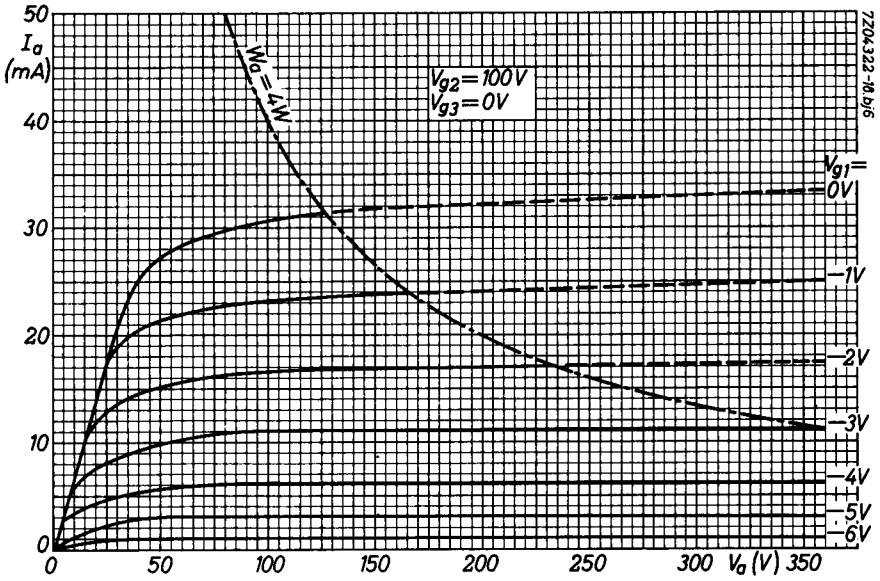


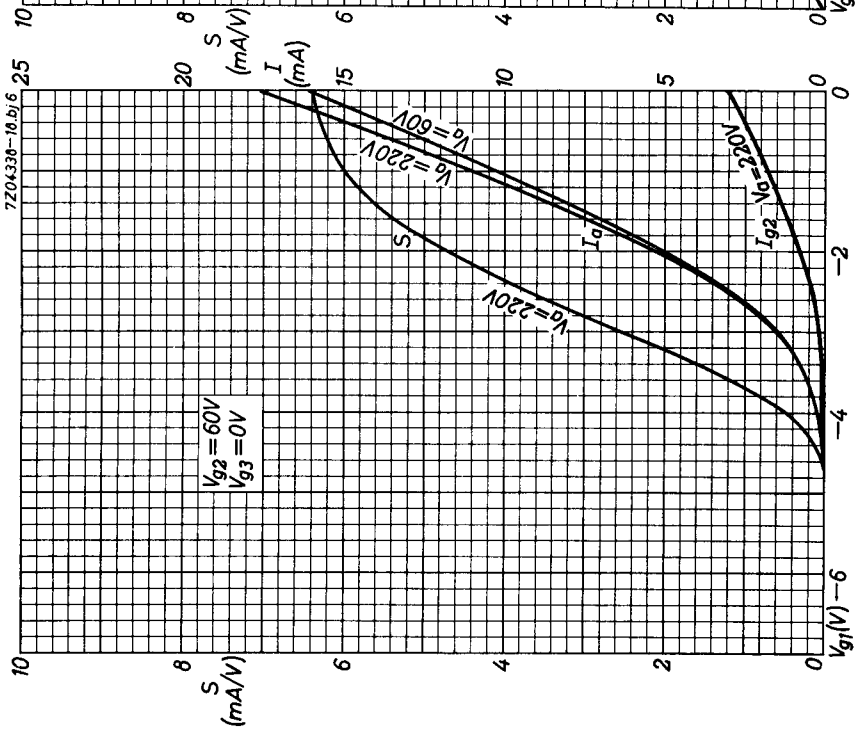
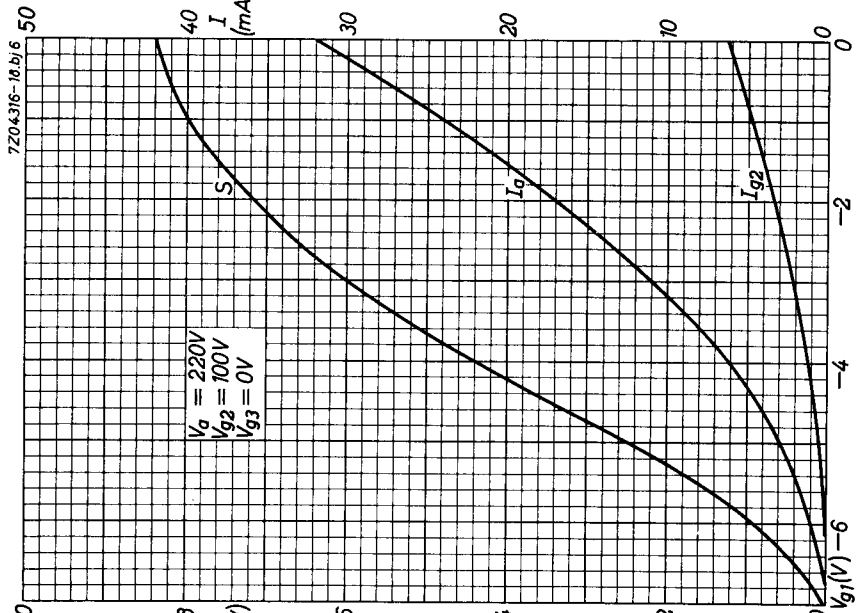
7204318-18.bj6

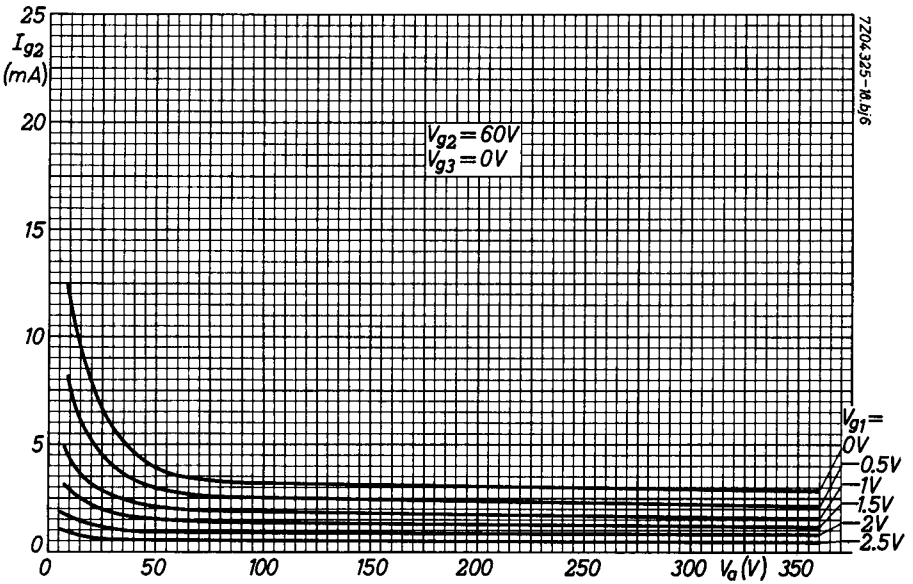
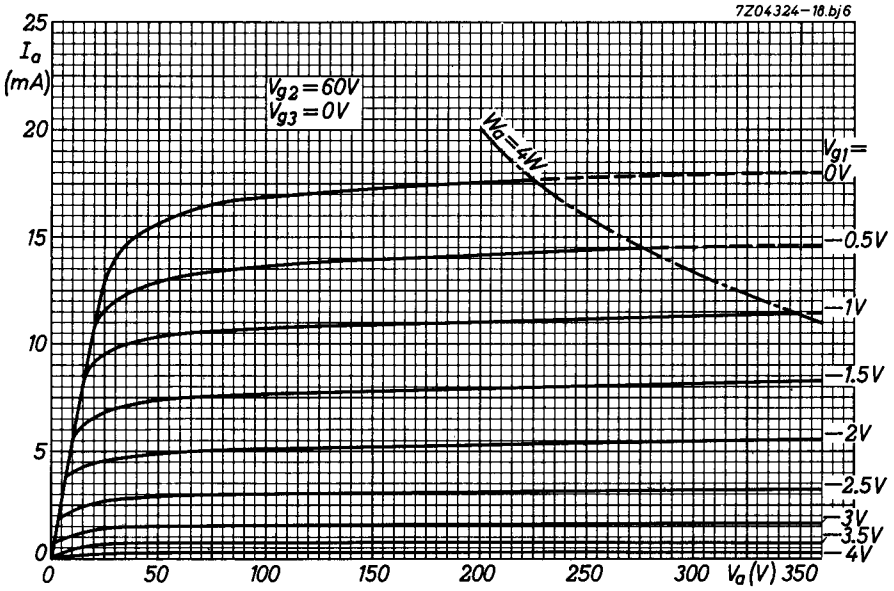


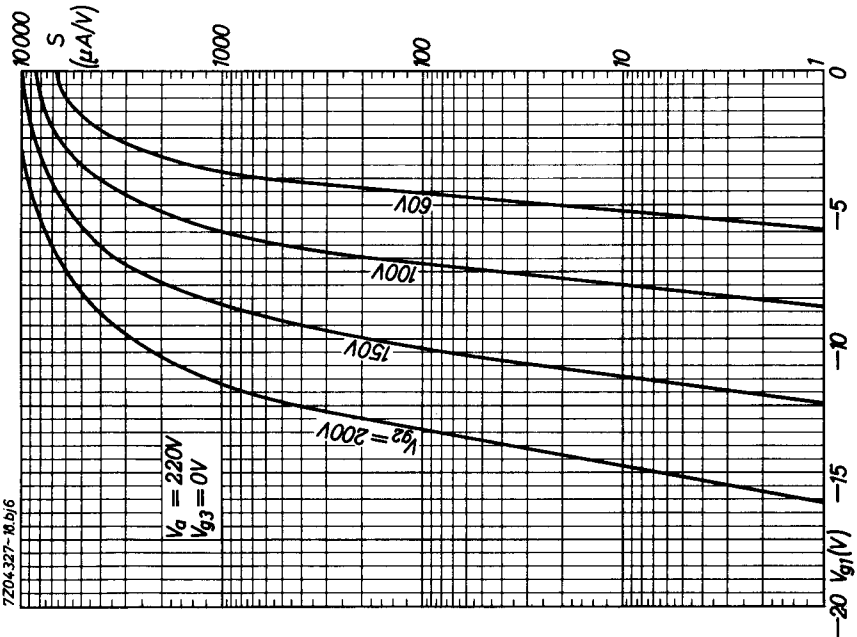
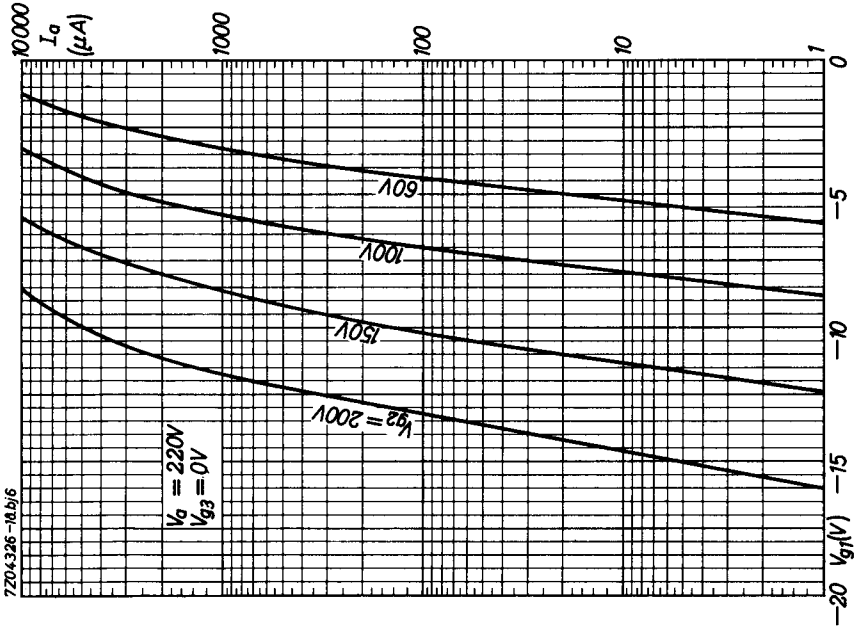


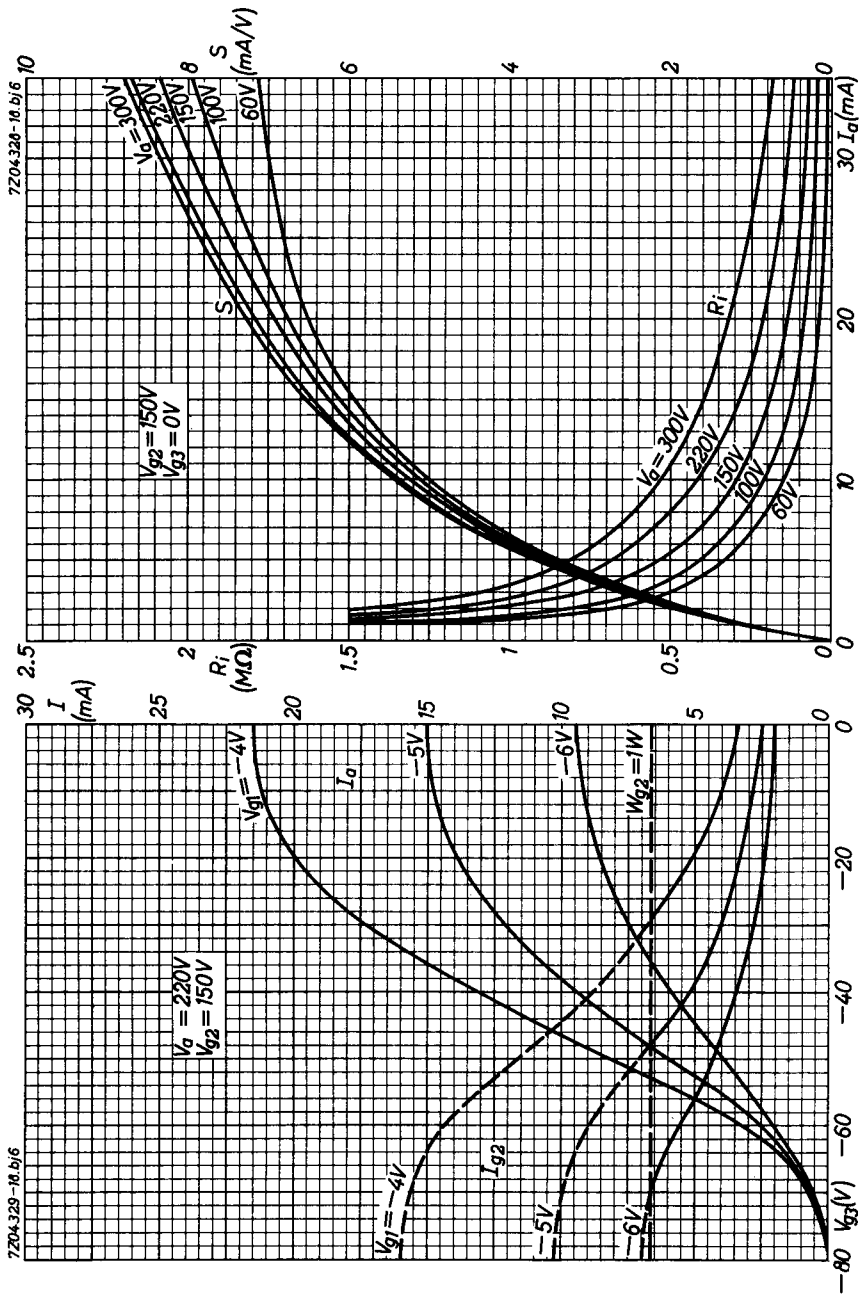


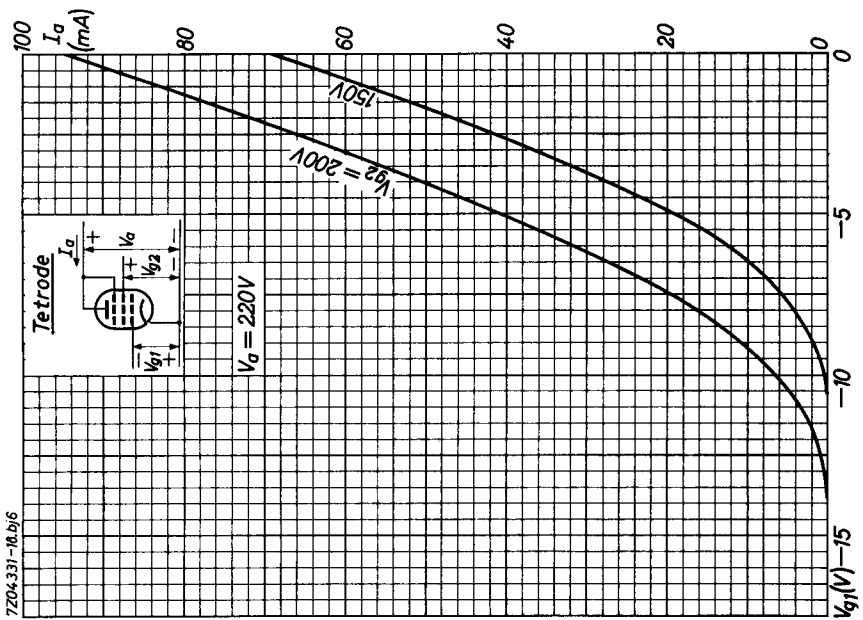
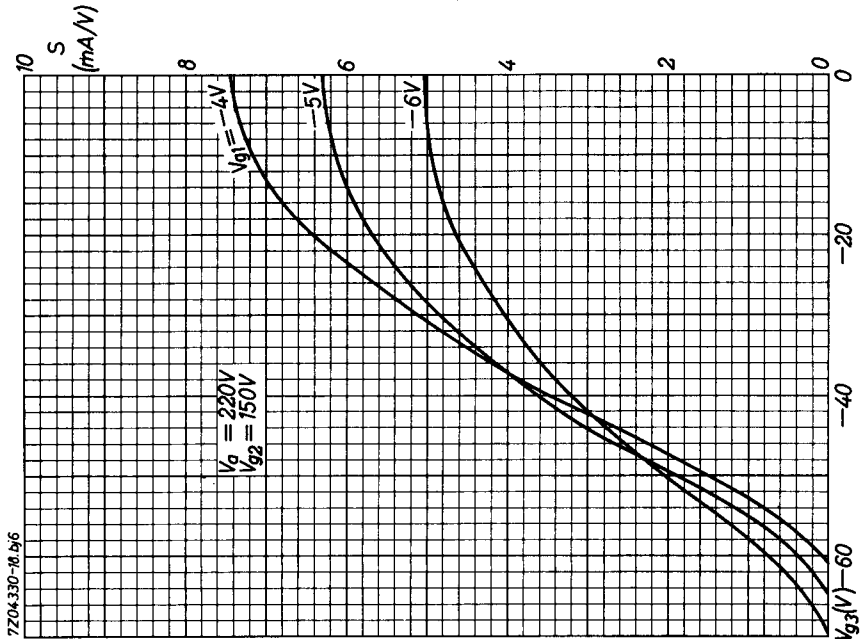


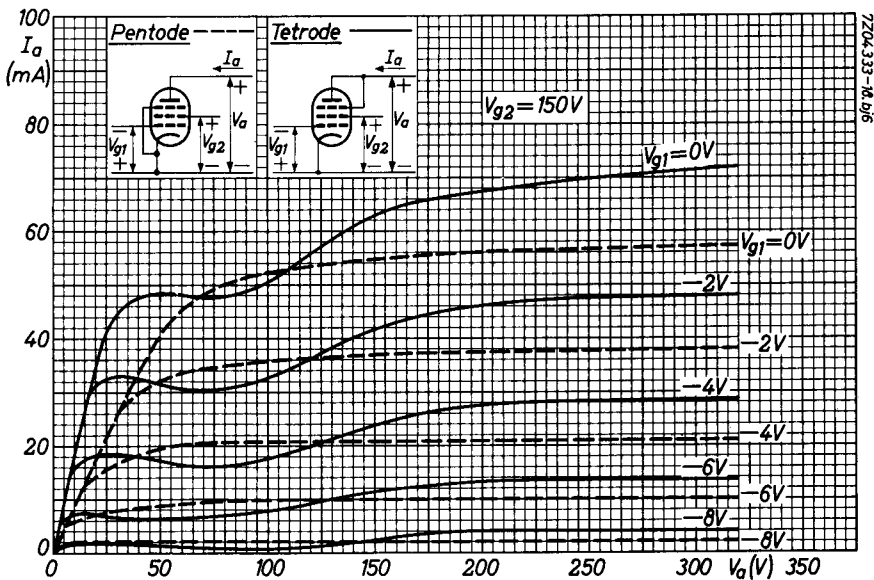
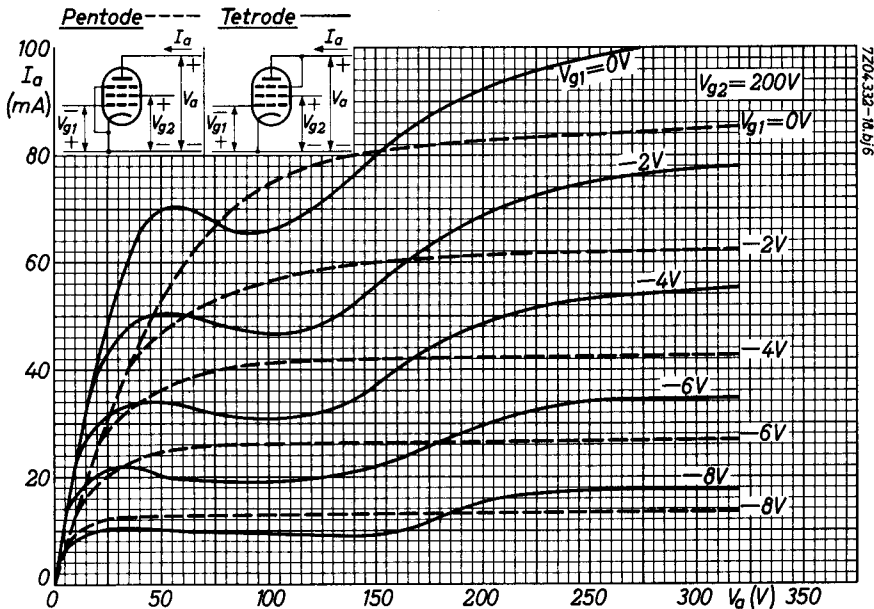




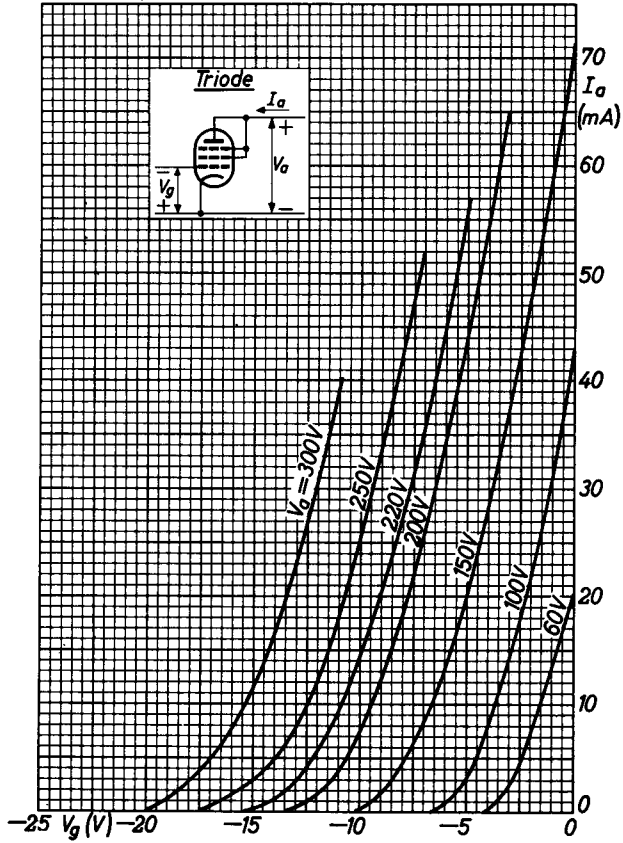






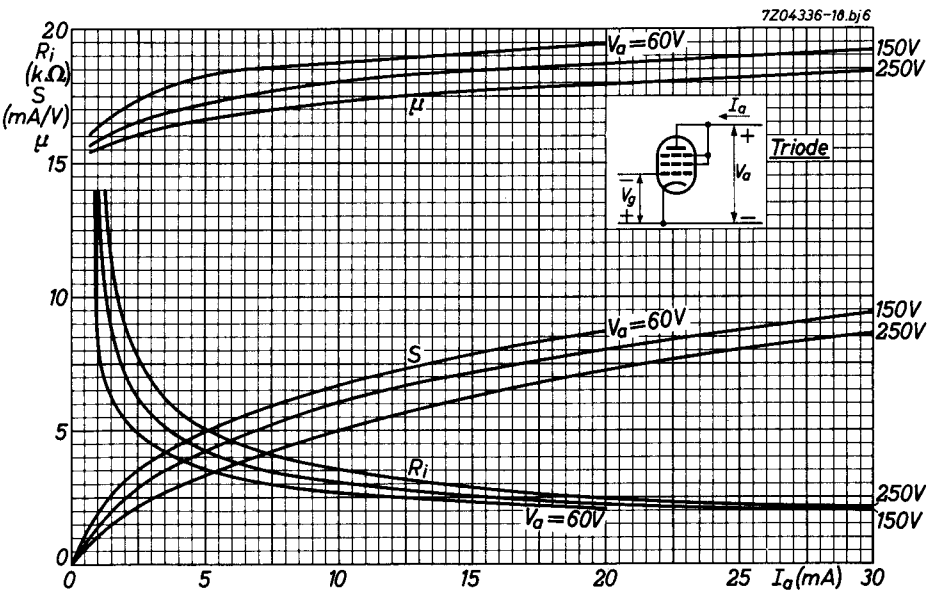
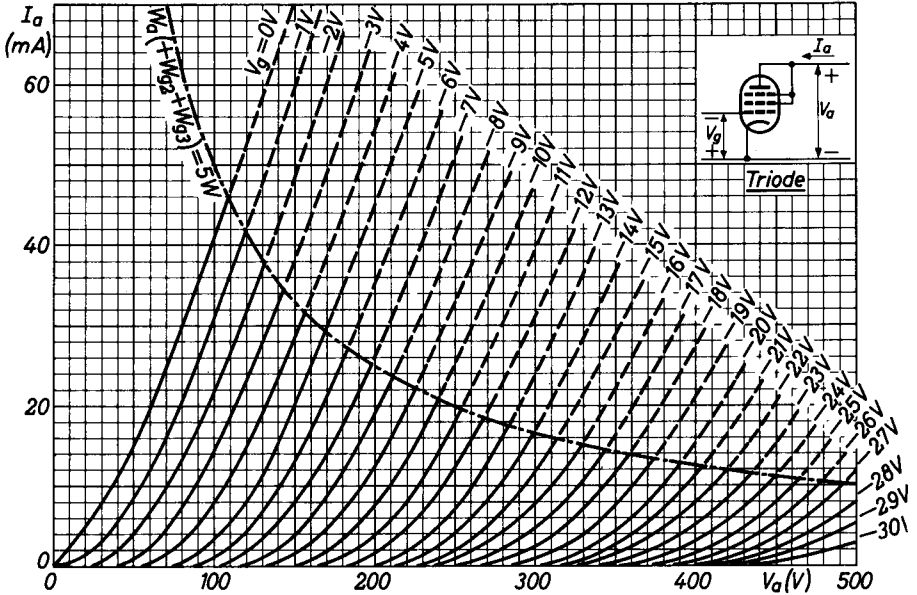


7Z04-334-18.bj6

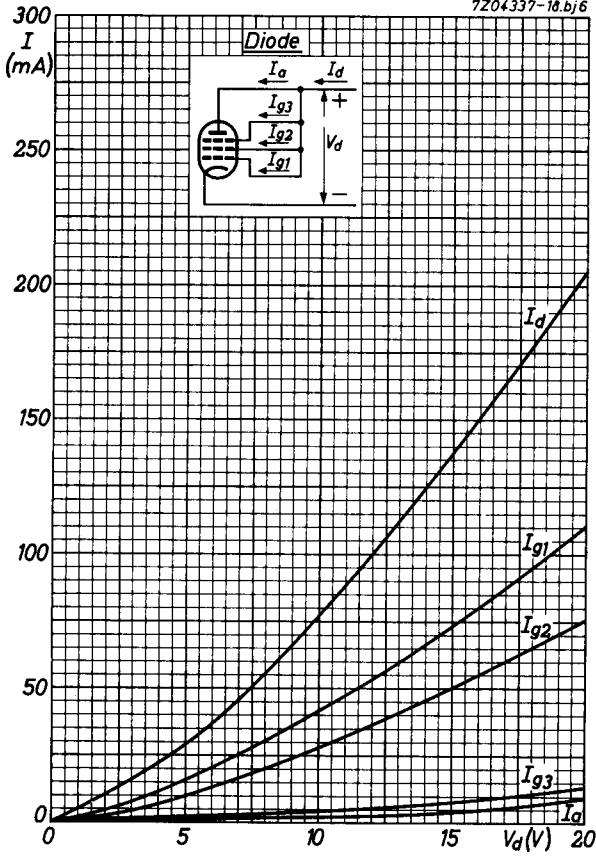




7Z04.335-18.bj.6



7204337-18.bj6



# PHILIPS

Data handbook



Electronic  
components  
and materials

## C3m

<b>page</b>	<b>sheet</b>	<b>date</b>
1	1	1968.12
2	2	1968.12
3	3	1968.12
4	4	1968.12
5	5	1968.12
6	6	1968.12
7	7	1968.12
8	8	1968.12
9	9	1968.12
10	10	1968.12
11	11	1968.12
12	12	1968.12
13	13	1968.12
14	14	1968.12
15	15	1968.12
16	16	1968.12
17	17	1968.12
18	18	1968.12
19	FP	2000.08.22