

Tubes with common screen grid (G2)

The Problem:

There exist tubes with two tetrode sections (or two pentode sections) where the screen grids of the two sections are connected to a common socket pin.

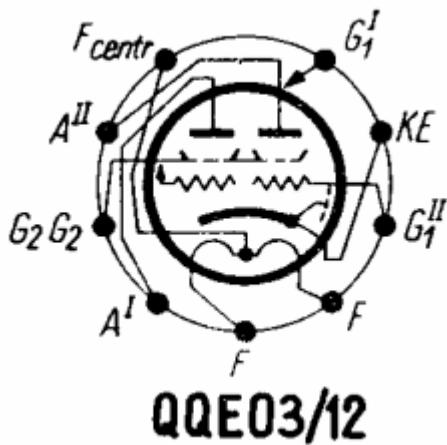
This causes the following problem in measurement: When one section is measured the other (unmeasured) section also has the full screen grid voltage, but no anode voltage and no grid voltage. Since the cathodes of both sections are emitting electrons, all electrons emitted in the second section are absorbed by the screen grid. The common screen grid is thus overloaded. Then, because an excessive current is detected, the RoeTest shuts down. Any measurement is impossible.

Solution:

The unmeasured section must be disabled. This is easily achieved by placing a high negative voltage on the control grid (G1) of the unmeasured section, driving that section into cutoff.

Implementation in RoeTest:

The RoeTest provides a convenient way to do this, since a second negative-voltage source is available. As an example, refer to the type QQE03-12. This is a double tetrode with common screen grid connection.



As the socket diagram shows, the screen grids of both sections are connected to pin 7.

To enable the software to apply the voltage to the control grid of the unmeasured section, we must first create a new tube type. I have called it "Tetrode X". There is also "Pentode X" for pentodes with a common G2 connection.

Röhrenart: Tetrode X

m/k (muß/kann)	A	K	G1	G2	G3	G4	G5	F1	F2	FM	IV	S	L	A1	A2	ST1	ST2	X
	m	k	m	m				m	m	k	k	k						m
an Schiene Nr.	2	0	3	4				0	1			0						5

Bezeichnung der Schienen:

Schiene 0: Masse	0
Schiene 1: + (ext) Heizung	H
Schiene 2: + 306V/ 250 mA	A
Schiene 3: -51V (-5,1V)	G1
Schiene 4: +306V/ 50 mA	G2
Schiene 5: -51 V (extHeiz.)	barrier(X)

erlaubte Tests:

Fadentest:	<input checked="" type="checkbox"/>	manueller Modus	<input checked="" type="checkbox"/>
statische Tests:	<input checked="" type="checkbox"/>	manueller Modus mit Vorwiderstand	<input type="checkbox"/>
Steilheit:	<input checked="" type="checkbox"/>	Nixie	<input type="checkbox"/>
Durchgriff Anode:	<input type="checkbox"/>	Stabi/Glimmlampe	<input type="checkbox"/>
Durchgriff Schirmgitter:	<input checked="" type="checkbox"/>	Zenerdiode	<input type="checkbox"/>
Innenwiderstand:	<input type="checkbox"/>	Dekatron	<input type="checkbox"/>
Vakuumtest:	<input checked="" type="checkbox"/>	Thyratron	<input type="checkbox"/>
Kathodenschlußprüfung	<input checked="" type="checkbox"/>	Kennlinien G1:	<input checked="" type="checkbox"/>
Überschlag in Sperrrichtung (Dioden)	<input type="checkbox"/>	Kennlinien Anode:	<input checked="" type="checkbox"/>
		Kennlinie G2:	<input type="checkbox"/>

Bemerkungen:

X = Sperrspannung für nicht getestetes System, blockade voltage for not tested system

Navigation Datensatz:

← → ⌂ neu duplizieren

Elektrodenbezeichnungen:

- A = Anode
- G1-G5 = Gitter
- K = Kathode
- F1,F2,FM = Heizfaden
- S = Schirmung
- IV = nicht verbinden
- L = Leuchtschirm
- A1,A2 = Anode Mag. Auge
- ST1,ST2 = Steuergitter

Here an electrode (X) is defined. This electrode is assigned to rail 5 (the second negative-voltage source in RoeTest).

In the Tube database, an entry is created for the QQE03-12 like this:

Röhrenname:	QQE03-12	System 1 System 2 System 3		
Hersteller:	--	Tetrode X	Tetrode X	
s. Vergleichsröhre:		Röhren-(System)art		
Philips code:	Uf			
Heizung:				
Heizspannung [V]:	12,60	Regelung:		
Heizstrom [A]:	0,410			
Heizart:	indirekt			
Kaltwiderstand				
Heizfaden [Ohm]:	4,30			
Allg.Data				
Herstelljahr:	1952			
getestet:	<input checked="" type="checkbox"/>			
Datenherkunft:	RTT,Tesla			
Daten erfaßt durch:	H. Weigl			
Daten geändert (oder neu):	<input checked="" type="checkbox"/> (hier markieren, falls Daten zur Zusammenführung übersandt werden)			
Daten geändert durch:	H. Weigl			
Bemerkungen zu Änderungen:				
Sockel/Fassung:  8x36° 1.02φ PC s: 11.9 mm B9A 				
Stift 1: G1 Stift 2: K Stift 3: X Stift 4: F1 Stift 5: F2 Stift 6: A Stift 7: G2 Stift 8: Stift 9: (ext. Seite) FM Stift 10: (ext. oben) FM Kolbenhöhe [mm]: 71,4 Kolbendurchmesser [mm]: 22,0 Gewicht [g]: 16				
A = Anode G1-G5 = Gitter K = Kathode F1,F2,FM = Heizfaden S = Schirmung IV = nicht verbinden L = Leuchtschirm, A1,A2,St1,S2				
Bemerkungen zur Röhre: <input type="button" value="Hilfe zu Röhrenart:"/> = TT24, GU17, QQV03-10, QQE03/12Y, QQV03/10, QQE03/12, TT24, RS1029, 11E13, 6360, 6360A, V: Doppelte Sendetetrode ICAS_Grenzwerte Na=7W, Ng=2W pro System X: Spannung zur Sperrre des zweiten Systems				
Navigation Datensatz: <input type="button" value="←"/> <input type="button" value="→"/> <input type="button" value="neu"/> <input type="button" value="duplicieren"/> <input type="button" value="drucke Datenblatt"/> <input type="button" value="X abbrechen"/> <input type="button" value="✓ speichern"/>				

The tube type "Tetrode X" is selected for both systems. As you can see, as each section is measured, the control grid of the other section is connected to the X negative-voltage source.

RoeTest - Datenbank

Röhrenname:	QQE03-12	K	
Hersteller:	---		
s. Vergleichsröhre:			
Philips code:	Uf		
Heizung:			
Heizspannung [V]:	12,60	Regelung: <input checked="" type="radio"/>	
Heizstrom [A]:	0,410	<input type="radio"/>	
Heizart	indirekt		
Kaltwiderstand Heizfaden [Ohm]:	4,30		
Allgem.Daten			
Herstelljahr:	1952		
getestet:	<input checked="" type="checkbox"/>		
Datenherkunft:	RTT,Tesla		
Daten erfaßt durch:	H. Weigl		
Daten geändert (oder neu):	<input checked="" type="checkbox"/> (hier markieren, falls Daten zur Zusammenführung übersandt werden)		
Daten geändert durch:	H. Weigl		
Bemerkungen zu Änderungen:			
Navigation Datensatz:			

Röhren-(System)art: Tetrode X Tetrode X -

typische Werte: S2 +1 UA/L [V *] 200,0 200,0 0,0
 S3 -1 UG1 [V *] -13,00 -13,00 0,00
 S4 +2 UG2/An/Stn [V *] 175,0 175,0 0,0
 S5 -2 UG3/G4Okt. [V *] -50,0 -50,0 0,0
= Stiftzuordnung gemäß Röhrenart
 UG4/G5 [V *]

 IA/L Soll [mA]: 30,00 30,00 0,00
 IG2/An Soll [mA]: 3,00 3,00 0,00
 S [mAV]: 3,30 3,30 0,00
 μ : 7,5 7,5 0,0
 D: 0,0 0,0 0,0
 Ri [KOhm]: 0,0 0,0 0,0

*) bei Hexoden, Heptoden, Oktoden, Nonoden können die Spannungsquellen auch mit anderen Elektroden verbunden sein (z.B. G3,G4,G5) - siehe Zuordnung in der Datenbank "Röhrenart"
 = TT24, GU17, QQV03-10, QQE03/12Y, QQV03/10, QQE03/12, TT24, RS1029, 11E13, 6360, 6360A,
 V: Doppelte Sendetetrode
 ICAS_Grenzwerte Na=7W, Ng2=2W pro System
 X: Spannung zur Sperrre des zweiten Systems

In the tube data, the X voltage is set to the high negative value of -50V.

As a result, during the measurement, -50V is applied to the control grid of the non-measured section resulting in complete cutoff . Thus the other section can be measured as usual with no overcurrent shutdown.