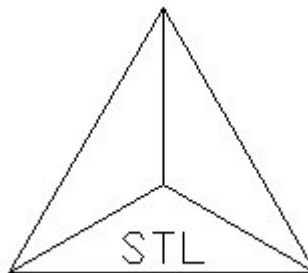


User Manual

Audio Tube Tester

ATT-4.0

Ver. 1.01





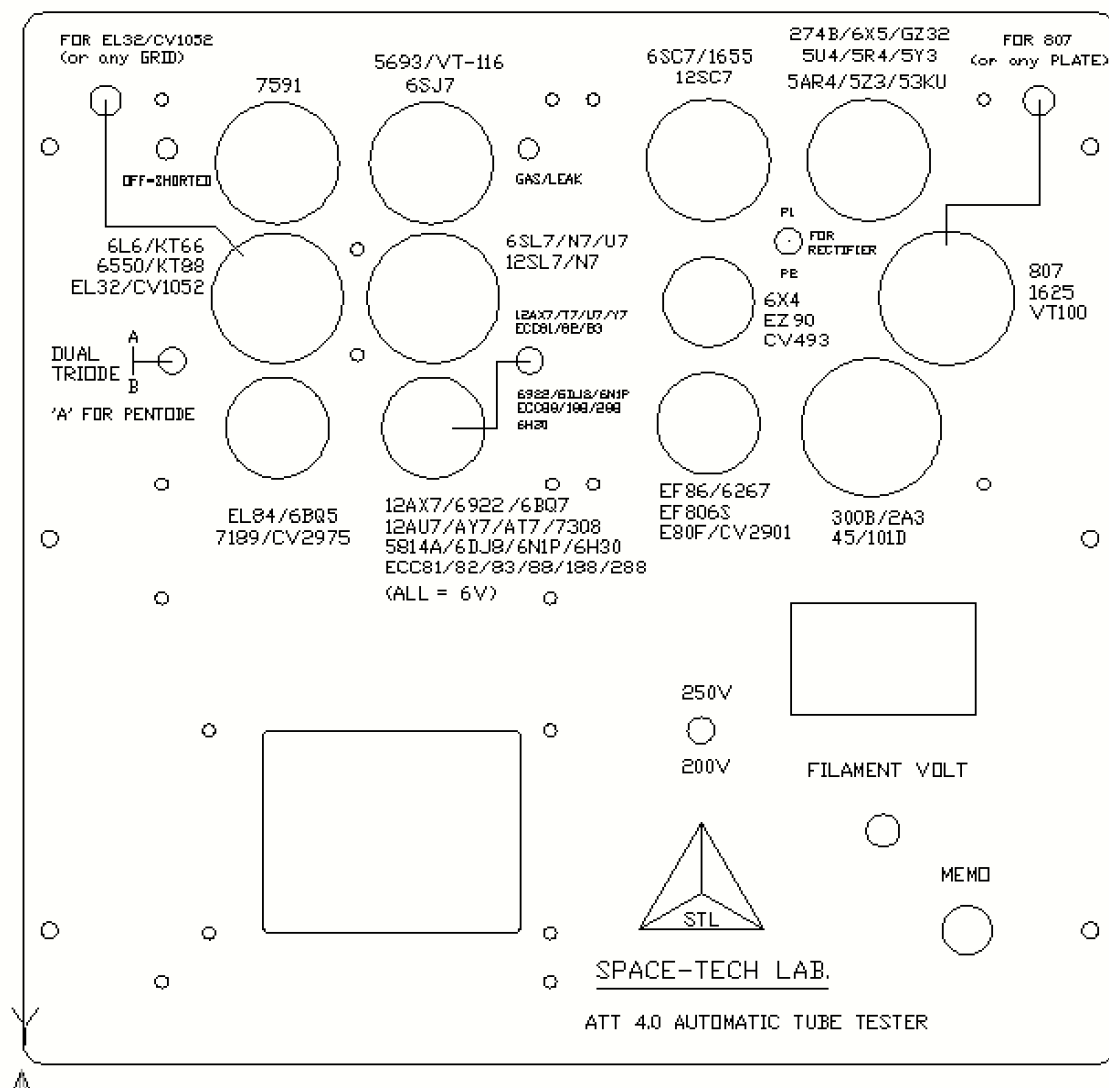
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Product description:

This is an automatic audio tubes tester with super user friendly human interface, no need for steep learning curve, just plug and play and get a very reliable and repeatable result on 'Gain', 'Gm mutualconductance (mS)' and 'anode current (mA)', so that you can select and match them for best audio experience. There are 6 test sockets include single pentode in octal 8 pin + regular 9 pin socket, as well as dual triode in octal 8 pin + regular 9 pin sockets. Please do not leave tubes under test for unreasonable long period of time (over 20-30 minutes) without attention, since the test condition might be reaching the maximum spec of the tubes under test, a very old tube might be damaged due to extreme stress. Maximum test voltage is 200V with max.150mA current limit for safety of the tubes under test.

This tester equipped with an advanced A.I. Algorithm and will perform self-calibration when power up the system (recommend after warm up and run the calibration again), which can eliminate the biggest problem in old school tube testers. You will need to spend several hundred dollars to completely calibrate an old school tube tester for proper operation. With this intelligent self-calibrate features, thousands of dollars can be saved and still keep the tester in top notch condition.

Since this tester offer 200V and 250V high voltage for testing, please make sure the model of tubes under test can withstand this level of voltage, if you are not sure then you can consult data sheet on line before practice. Over voltage will damage the tube under test. So if you are not sure then better off set to 200V all the time. Gain testing will not vary too much between 200 /250V, Gm testing might have a bigger impact.



FILAMENT VOLT : this knob calibrate the filament voltage from 2V to 12V , the display above it shows the actual voltage and current (auto switch between power and current). 12AX7/AU7/AT7/AY7 or ECC81/82/83 or 5751.... or equivalents should set to 6V for testing

OFF = SHORTED : ON = normal , OFF = tube is short circuit

GAS LEAK : ON = LEAK inside the tube

DUAL TRIODE A/B : This switch select between the A side and B side of a dual Triode (such as 6922, 12AX7, 6SL7...etc) . For testing of power tubes and single Pentodes, always set to A side.

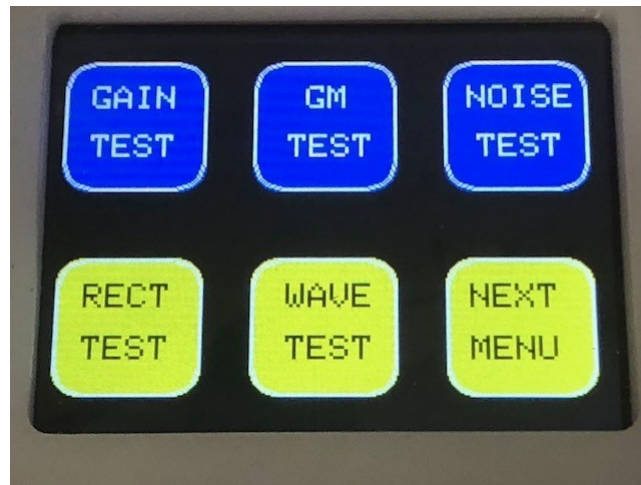
12AX7/6922 : this switch select between 12v filament or 6V filament for 9 pin dual Triodes , wrong setting just will not lit up the filament of the tube and will not create any damage to the tube if filament voltage is set to 6V

200/250V : this switch select between 200v or 250V high voltage for the testing

MEMO : this button store the test data as reference for comparison in matching mode

P1/P2 : This switch select between the A or B section of a dual Triode or fully wave rectifier

Main Menu:



Next Menu:

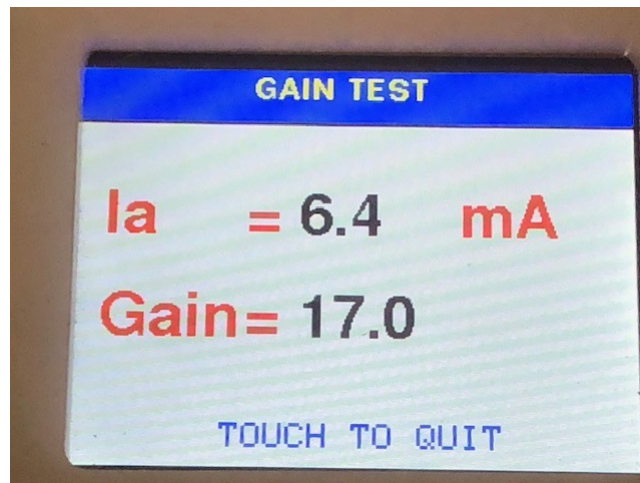


Press "PREV MENU" goes back to "Main Menu"

TEST FUNCTIONS via touch screen

1. GAIN TEST
2. GM TEST
3. NOISE TEST
4. WAVEFORM TEST
5. RECTIFIER TEST
6. TUBE MATCHING (GAIN)
7. TUBE MATCHING (GM)
8. LIFE TEST
9. SELF-CALIBRATE

1. GAIN TEST



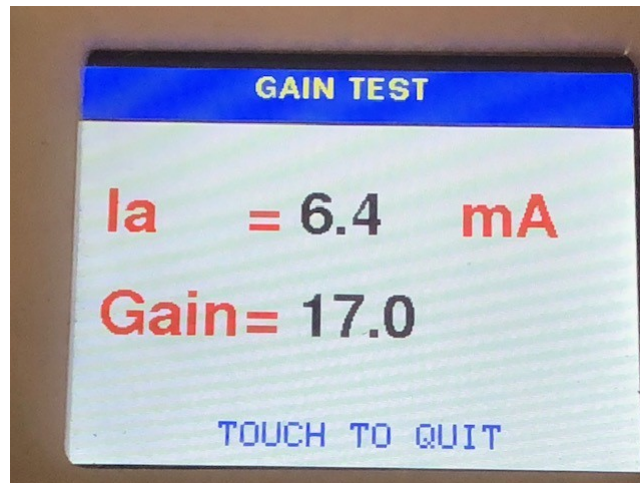
Select this function to perform Gain Test on the tube under test. Fully automatic and no need to set anything and get the reading directly. Due to the need of proper warm up of tubes in order to get the most accurate result, please wait till the reading is stable, then you can take the test data.

<Ia> reading is anode or plate current of the tube under test

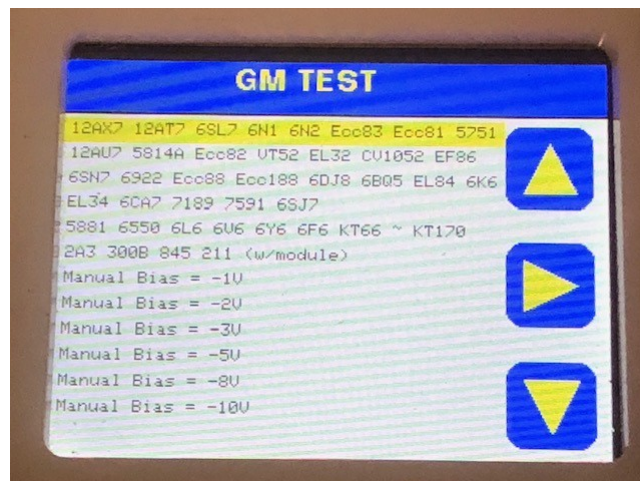
<Gain> is the mu or gain of the tube under test

Due to the difference of the test circuit, test conditions and the variation of the tubes under test, the tested data might not exactly match the data sheet.

2. GM TEST

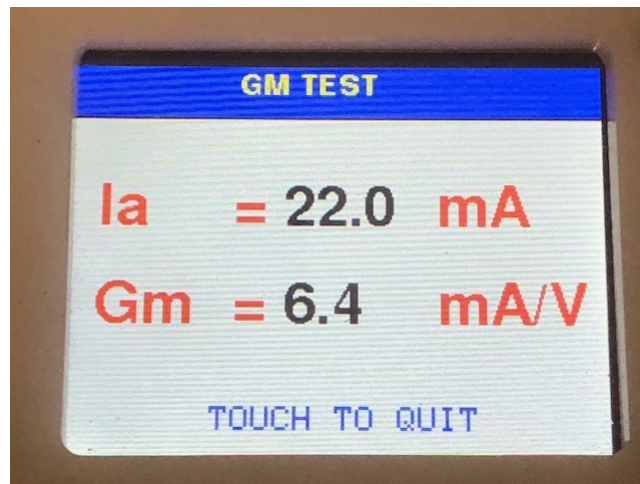


When first enter into the GM test, you will prompt with following choices to choose from with the up and down arrow, right arrow start the testing



If you want to use a specific -ve bias voltage for the testing, then you can choose "Manual Bias", in there you can choose between 0 to -10V as the -ve bias voltage..

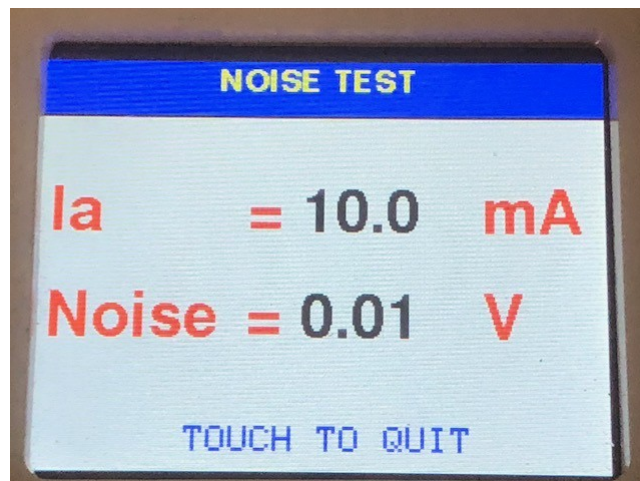
Once you have chosen the proper setting, then the GM test will be started. Please note that tubes need warm up to have a stable reading, you will see the testing result increase with time, when it reaches a stable reading which means the tube is fully warm up. The Due to different test conditions and circuit, the reading might not exactly match the data sheet, but as long as it is stable after warm up, it will be sufficient for tube matching purpose.



<Ia> reading is anode or plate current of the tube under test

<GM> is the mutual conductance in mA/V (1 mA/V = 1000 μ A/V)

3. NOISE TEST

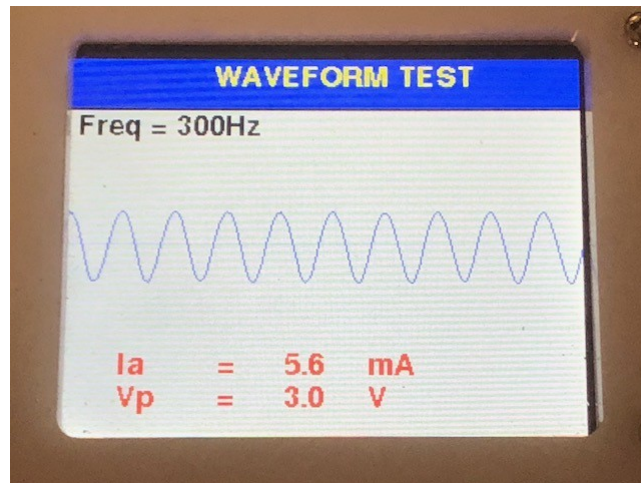


<Ia> reading is anode or plate current of the tube under test

<Noise> is the noise level in Volt. You can also connect CRO or amplifier to the noise output RCA socket at the rear side of the tester for further monitoring purpose. Knob on the glass of the tube under test for high gain tubes can trigger a significant noise for verification of the readings.

When hook up RCA output for noise monitoring, you can neglect the fixed pattern noise and just concentrate on the random noise, the fixed pattern noise might be some internal or external interference and not originate from the tubes.

4. Waveform TEST

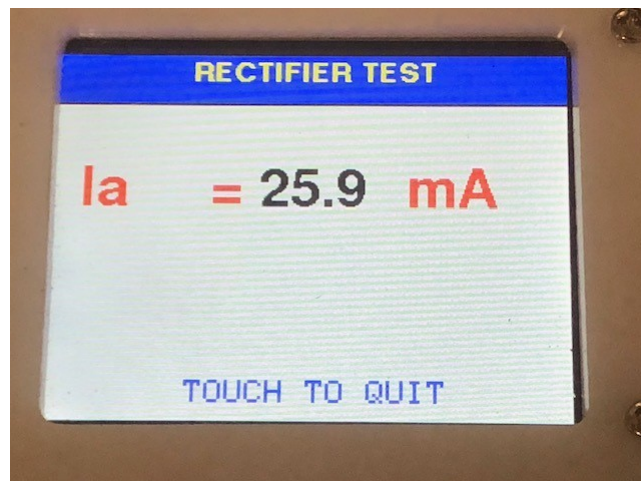


This is a very powerful feature which no other tube tester can offer up to this day.

With this function you can real time monitor and check the output waveform of the tube under test as a pure class A common cathode amplifier.

Even though a tube shows good Gain and Gm reading, it might have distorted sine wave output due to the faulty fabrication of the tube. This feature can detect the problem which no other tester can.

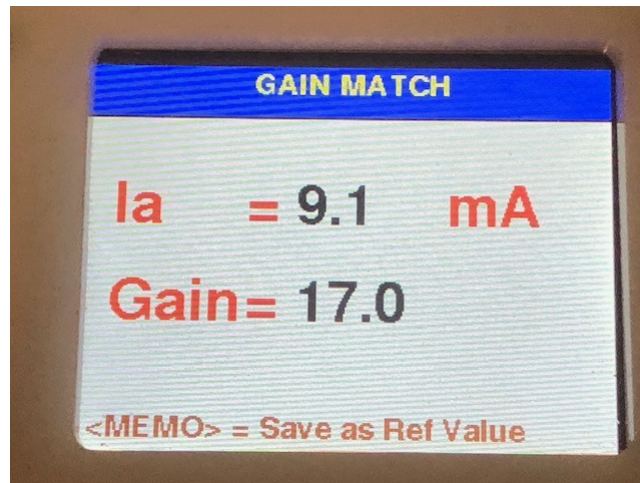
5. RECTIFIER TEST



I_a reading is anode or plate current of the rectifier tube under test (This testing feature requires an optional rectifier testing module).

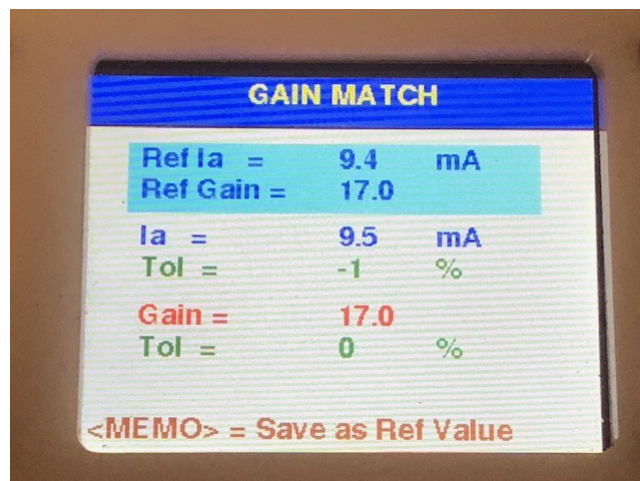
You can also use this feature to test the zero bias current of a signal tube when use as a rectifier. Max. I_a can be 120mA, for rectifier tubes with higher capable current will be capped with this max. value for safety reason, it is good enough to test whether the tube is in good working conditions.

6. TUBE MATCHING (Gain)



Initially this testing display is the same as GAIN TEST . Assuming you have 10 tubes of the same model want to be matched. Just put in the first tube to the tester, A/B switch set to A , then wait for a stable reading.

Then press “MEMO” to memorize the tested data as the reference set of data.



If you are testing a dual triode, set the A/B switch to side B, it will then show the difference (Ia and Gain) of the B side from the A side in %, you can drop down the TOL reading to a label and stick to this tube.

If you are testing a single pentode, keep the A/B switch in the A position and proceed.

Take out the first tube and put in the second tube , set A/B to A and wait for it to warm up, take the Tol reading of A and B (if it is a dual triode) respectively and label to the 2nd tube.

Repeat this testing process and you will end up 10 tubes with 10 sets of difference TOL data for Ia and Gain.

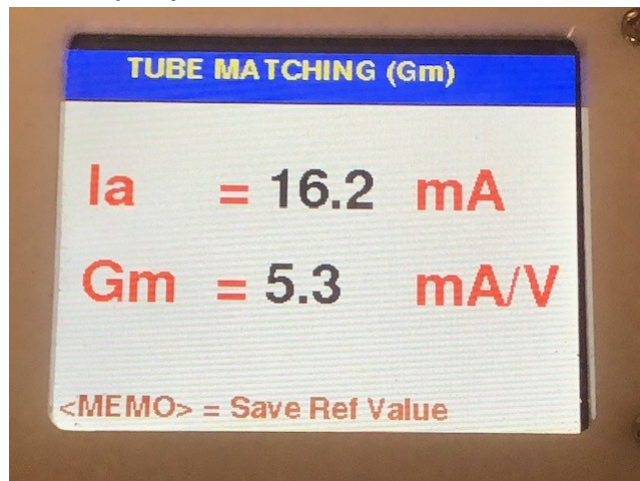
You can then found out the closest pair or quad or sextet or octet of tubes according to the TOL data.

The first priority is to find tubes with the closest gain as a match. If a lot of tubes has the same gain

then find out the tubes with closest I_a for further matching.

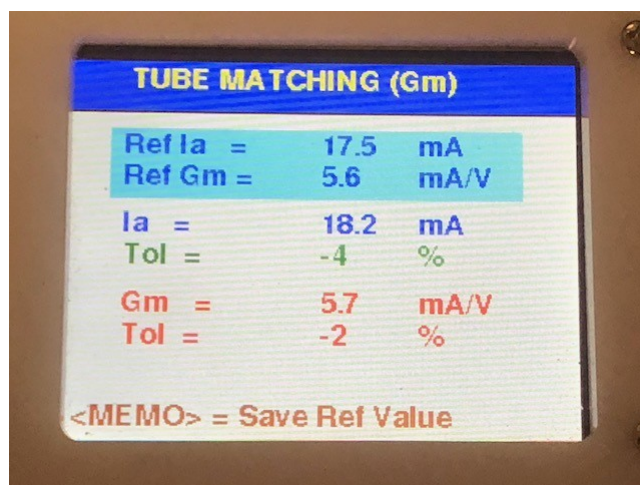
You can press "MEMO" key during the comparison and memorize the current reading as Reference

7. TUBE MATCHING (Gm)



Initially this testing display is the same as GM TEST . Assuming you have 10 tubes of the same model want to be matched. Just put in the first tube to the tester, A/B switch set to A , then wait for a stable reading.

Then press "MEMO" to memorize the tested data as the reference set of data.



If you are testing a dual triode, set the A/B switch to side B, it will then show the difference (I_a and Gain) of the B side from the A side in %, you can drop down the TOL reading to a label and stick to this tube.

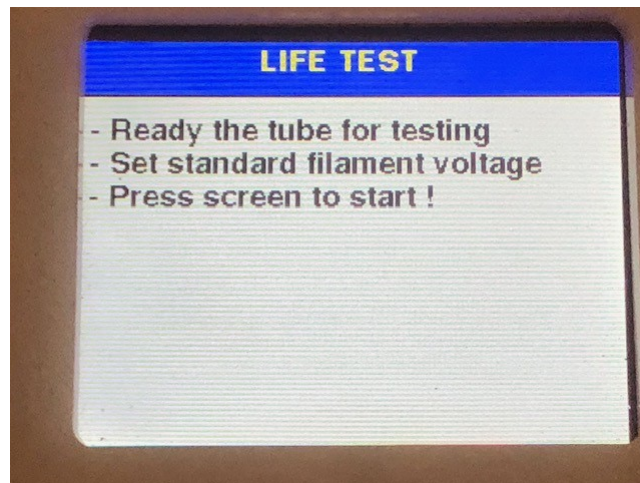
If you are testing a single pentode, keep the A/B switch in the A position and proceed.

Take out the first tube and put in the second tube , set A/B to A and wait for it to warm up, take the Tol reading of A and B (if it is a dual triode) respectively and label to the 2nd tube.

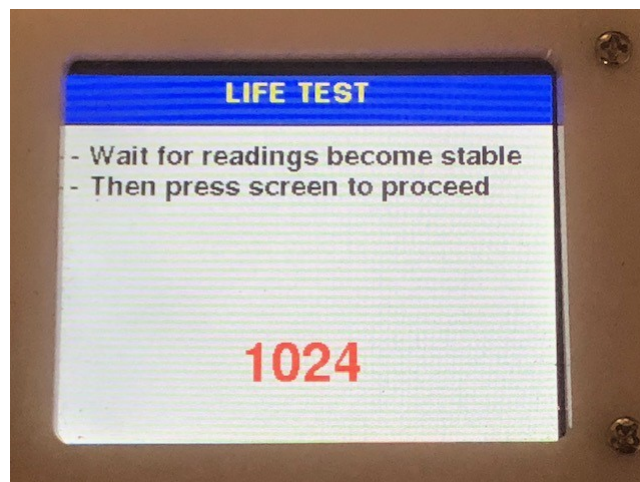
Repeat this testing process and you will end up 10 tubes with 10 sets of difference TOL data for I_a and Gain.

You can then found out the closest pair or quad or sextet or octet of tubes according to the TOL data. The first priority is to find tubes with the closest gain as a match. If a lot of tubes has the same gain then find out the tubes with closest Ia for further matching.

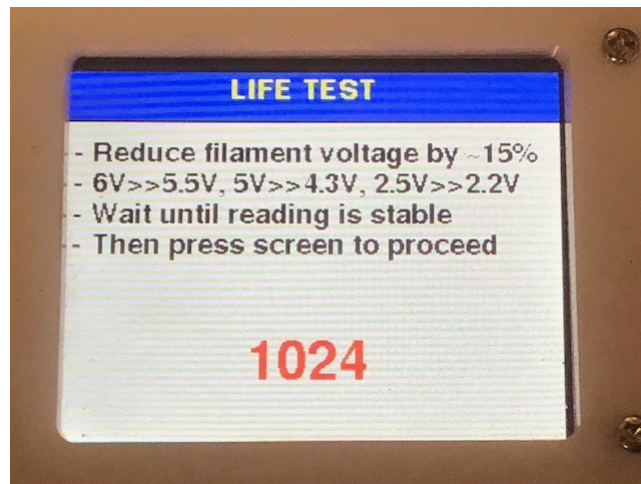
8. LIFE TEST



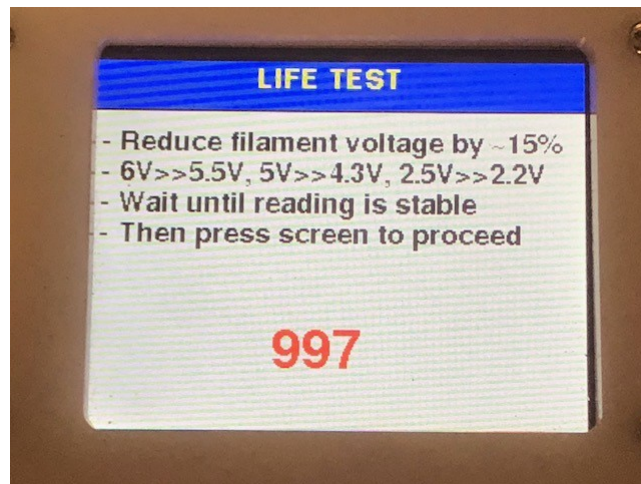
You can put in the tube in their correct sockets and perform the life test, make sure to set the proper filament voltage and 200V/250V test voltage. Press the screen to start



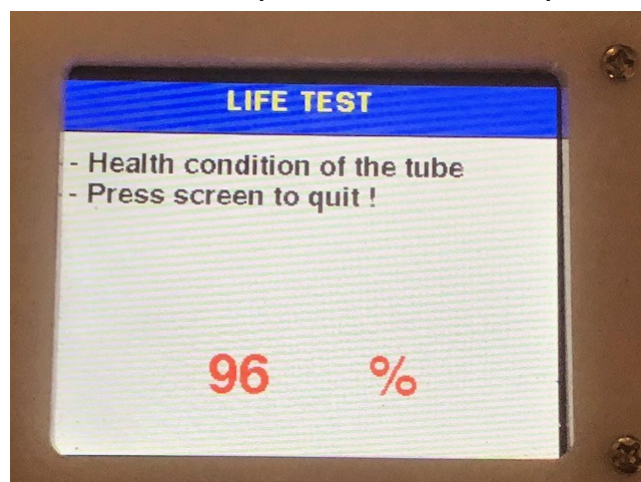
The test reading will increase with warm up time, until stable then you can press the screen again to register this value as reference



After register the data, you can then manually adjust the filament voltage to 10~15% lower than the regular filament voltage. If you want a bit loosen testing result then you can set to -5~-10%, in case if you want a tighter testing result then you can set to -10~-15%.



After adjust to proper lowered filament voltage you will see the reading drop and just wait for it become stable then press the screen for comparison, and show the expected life span in percentage





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The following tubes can be tested, as well as all their pin compatible models with proper Vf

(for 6922 / 12AX7 socket) 6V filament tubes set to 6922 position, 12V filament tubes set to 12AX7 position.

12AX7, 12AU7, 12AT7, 12AY7, 12AV7, 12BH7, ECC81, ECC82, ECC83, ECC85, ECC88, 5814A, 5751, 6922, 6H30, 6N1P, 6DJ8 and all their pin compatibles..etc

(for 6SL7 / 6SN7 socket)

6SL7, 6SN7, 6SU7, ECC32, ECC33, ECC35, 5691, 5692 and all their pin compatibles..etc

(for 6L6 / KT66 socket)

6L6, 6V6, 6Y6, 6G6, 6F6, 6550, EL34, KT66, KT77, KT88, KT99, KT100, KT120, KT150, KT170, 6CA7, 5881, EL32, CV1052, VT52 and all their pin compatibles..etc

(for 6BQ5 / EL84 socket)

6BQ5, SV-83, EL84 and all their pin compatibles..etc

(for 7591 socket)

7591, 7591A and all their pin compatibles..etc

(for 6SJ7 socket)

6SJ7, 5693, VT-116 and all their pin compatibles..etc

(for 6SC7 socket)

6SC7, 1655, 12SC7 and all their pin compatibles..etc

(for 6X4 socket)

6X4, EZ90, CV493 and all their pin compatibles..etc

(for EF86 socket)

EF86, 6267, EF806S, E80F, CV2901 and all their pin compatibles..etc

(for 807 socket)

807, 1625, VT100 and all their pin compatibles..etc

(for 300B socket)

300B, 2A3, 45, 245, 345, 50, 250, 101D and all their pin compatibles..etc

(for 274B socket)

274B, 5U4G, 5AR4, 5Y3, 6X5, GZ32, GZ33, GZ34, GZ35, 5R4, 5Z3, 53KU, and all their pin compatibles..etc

(with 5U4G to 80/83 converter, you can test 80, 83, 3B22, 3B27, 3B28, 1616, 836, 866A and their pin compatibles)

(for 300B socket)

300B, 2A3, 45, 245, 345, 50, 250, 101D and all their pin compatibles..etc

You can order an external 845 test module for testing of 845, 211, 805, 805A and all their pin compatibles within the allowable filament voltage and current

Those tubes not in the above listing can still be tested as long as the pin configurations and filament voltage and current range can fit within the spec of this tester



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Power input :

AC 100~240V 50~60Hz

Filament voltage : 2,5V to 12V , max. current 5A

Test voltage : 200V / 250V DC

Max. measurable current : 120~150mA

note : different data sheet use different terms, equivalents as follows

Gain = μ = amplification factor (no units)

Gm = transconductance = μ (units can be mA/V= mS , uA/V= μ S= μ MHOS)

(Gm also = mutual conductance in certain databook)

1 mA/V = 1000 μ A/V = 1 mS = 1000 μ S

The above data is just for reference purpose, different tubes will have certain variations as well as different manufacturers, most of the cases a +/- 20% variation should be well expected and still consider a healthy working tube.

The Gm reading is highly depends on the testing bias - V, change of the -V can change the test result accordingly. For tube matching just simply use our preset value will be fine.

Caution: There is high voltage inside this unit and its attached modules , should not open the box unless by qualified technician, or under proper instruction. Make sure you know what you are doing, and do it at your own risk !!

Disclaimer:

In no event shall our company be liable for any direct, indirect, punitive, incidental, special consequential damages, to property or life, whatsoever arising out of or connected with the use or misuse of our products

Warranty : One year free parts and labor warranty apply under normal operation condition , buyer pay for shipping. Physical damage or abuse of system will not covered.