Subject: New Production Tung Sol 6550, Penta KT88s
Posted by positron on Thu, 19 Jan 2023 05:01:55 GMT
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My first question is, what do you think of the general sonic quality
of these two tubes. Does each have a sonic reputation?
Try to be as specific as possible with any response.

Thanks and cheers

pos

Subject: Re: New Production Tung Sol 6550, Penta KT88s
Posted by positron on Sun, 22 Jan 2023 00:24:55 GMT
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Evidently no one uses them?

My testing has found both tubes to be rather thin, anemic sounding compared to JJs and Winged Cs.

So I demagetized both, using my 100 watt soldering gun magnetic field (gun windings), and both tubes became fuller than the JJs and Winged Cs. Quite a sonic change. The new Pentas just slightly fuller than the new Tung Sols.

When the tubes are manufactured, induction heating of the plate removes gases. Evidently, the switch/field is simply flipped, rather than gradual field removal.

So when one purchases a new output tube, what you purchase and hear is not necessarily what the tube sounds like after being demagnetized.

One could probably use a dryer, a motor, anything that produces an AC magnetic field. Simply rotate each tube around the AC device field, and then gradually distance the tube from close to 3 feet or more from the device, and power off the device.

cheers

pos

Subject: Re: New Production Tung Sol 6550, Penta KT88s
Posted by Wayne Parham on Sun, 22 Jan 2023 02:48:03 GMT
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Who'da thunk it?

Degaussing a tube! Interesting observation!

Subject: Re: New Production Tung Sol 6550, Penta KT88s
Posted by positron on Sun, 22 Jan 2023 03:33:35 GMT
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Neither tube initially sounded very good at all in my system Wayne.
But I have performed this trick before, so I degaussed both and the
sound sure improved. The zingy highs, the thin sound are no longer.

Best guess of the top of my head is it creates random molecular orientations.? I would have to delve more deeply with a
physics/chemistry expert.

Caveat: My system was a lab system (now in my apartment) is
extremely sensitive. The sound is also not sterile, but very natural.

There are multiple tweaks that I can perform to cross check and
see if the sensitivity results match.

One is being able to alter a crossover resistor by 1/1,000,000 of an
ohm with timber, sound stage change etc heard.

Another is, for each speaker leg, I use ten 18 gauge wires in parallel, 6 feet long. If I change to 9 or 11 wires in one leg, the timber, sound stage changes etc.

Audiophile Dan comes over (50 mi) so we have opportunities to make changes
and decide if a tweak is an improvement or detriment.

Cheers

pos

Subject: Re: New Production Tung Sol 6550, Penta KT88s
Posted by positron on Sun, 22 Jan 2023 23:28:53 GMT

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Another tidbit is the frequency response change of 1/1,000,000 equates to
-114 to -120db down from the fundamental (one to one on the steepest part of the signal slope).

Even though small, the change covers octaves of bandwidth. Rane Corp found a change covering 1/3rd octave or less is generally not perceived.

A spec of +/- 0,1db equates a change of only about -54db. Not surprising to me that we notice sonic differences of different manufacturer's components even though the frequency response are the same, +/- 0,1db 20 to 20khz.

Cheers

pos

Subject: Re: New Production Tung Sol 6550, Penta KT88s
Posted by gofar99 on Tue, 24 Jan 2023 02:25:27 GMT
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Hi, something I would not have guessed. I agree that really small changes in components can make a difference. 0.1db of the wrong stuff in the wrong place can really mess up a good design. The saving grace if you want to call it that is the speaker and if you use a turntable the cartridge errors are far worse and will mask a lot of ones internal to the electronics.

Subject: Re: Demagnetizing Tung Sol 6550, Penta KT88s
Posted by positron on Tue, 24 Jan 2023 04:12:52 GMT
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gofar99 wrote on Mon, 23 January 2023 20:25Hi, something I would not have guessed. I agree that really small changes in components can make a difference. 0.1db of the wrong stuff in the wrong place can really mess up a good design. The saving grace if you want to call it that is the speaker and if you use a turntable the cartridge errors are far worse and will mask a lot of ones internal to the electronics.
Hi Bruce,

Over the years, the sensitivity of the ear has certainly surprised me
as well.

What is just as surprising to me is that the electronic designs/parts
heavily influence as well. Consider that I am using a two way speaker
to perceive sonic differences to astonishing low levels.

This is a long lab experiment for me,

1. to find out just how sensitive one's ear is,

2. that some electronics designs (and parts available) are better than others. Finding the best design, and parts.
3. what is possible, just how accurate to the source can the electronics be under the best conditions.

Just trying to help out in the electronics as Wayne is doing with his excellent speaker designs.

Back to the topic at hand. I believe the new production Tung Sols and Pentas can be used to good effect if the plates are demagnetized. Otherwise, I did not like either.

Cheers

pos

Subject: Re: Demagnetizing Tung Sol 6550, Penta KT88s
Posted by positron on Wed, 22 Feb 2023 04:45:58 GMT
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After more testing/auditioning, I prefer the Pentas over the Tung Sols. I find the new Tung Sols are still zingy in the highs. The Pentas are just slightly fuller compared to the Tung Sols.

That is it for now.

Cheers

pos

Subject: Re: Demagnetizing Tung Sol 6550, Penta KT88s
Posted by positron on Thu, 16 Mar 2023 20:30:54 GMT
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Well, more testing between the new tong sols and Pentas, the tung sols still have a little too much zing in the highs.

However, the Pentas do sound wonderful now. A little less bass and the highs still do not zing imo. When playing time after time, the guitar always sounded a little too full with the JJs, but the Pentas seem to do the job nicely. It may be my favorite KT88 besides the original Winged Cs from St Pete.

Have not tried the Psvanes, Treasures etc and the expensive ones from Europe.

cheers

pos

Subject: Re: Demagnetizing Tung Sol 6550, Penta KT88s
Posted by gofar99 on Fri, 17 Mar 2023 02:28:51 GMT
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Hi, A diyer of some of my projects reported issues a while back (4-5 years) with Psvane KT88s. They were not thermally stable and were unable to dissipate anywhere near the ratings for a KT88. This parameter is vip in the amps I design as they run class A. He reported that they would only handle about 50% of the rating before serious red plating began. He had them replace several set and all did the same thing... They may be OK now but I have no way of knowing.

Subject: Re: Demagnetizing Tung Sol 6550, Penta KT88s
Posted by positron on Fri, 17 Mar 2023 03:17:29 GMT
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Are the Penta tubes manufactured by Psvane Bruce?

I do not know how old these tubes are.

Supposively not many hours.

Metal band around bottom is hanging/extremely loose on one tube.

No red plating is occuring. I am running the idle plate dissipation around 30 watts, in triode mode, so includes the screen, and the output is around 20 watts. So not a real test of the quad given your information.

The bass is shy to me, midrange sounds great though, but I can't pull the trigger on them. They are loaned to me, so not out money for this test.

Cheers and thanks for the info Bruce.

pos

Subject: Re: Demagnetizing Tung Sol 6550, Penta KT88s
Posted by positron on Tue, 27 Feb 2024 03:44:08 GMT
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positron wrote on Tue, 21 February 2023 22:45After more testing/auditioning, I prefer the Pentas over the
Tung Sols. I find the new Tung Sols are still zingy in the highs.
The Pentas are just slightly fuller compared to the Tung Sols.

That is it for now.

Cheers

pos

I am eating some crow now. I just checked and the new Tung Sols (gift years ago) I have been using needed to be demagnetized again. The JJs not so. There is also a difference in the midrange I think I like better with the JJ KT88s.

cheers

pos

Subject: Re: Demagnetizing Tung Sol 6550, Penta KT88s
Posted by positron on Fri, 21 Jun 2024 22:29:57 GMT
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positron wrote on Mon, 26 February 2024 21:44positron wrote on Tue, 21 February 2023 22:45After more testing/auditioning, I prefer the Pentas over the
Tung Sols. I find the new Tung Sols are still zingy in the highs.
The Pentas are just slightly fuller compared to the Tung Sols.

That is it for now.

Cheers

pos

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cheers

pos

Minute changes in speaker crossover can make a sonic difference. The Penta (Chinese KT88-sc) is outclassed by both new JJ and Russian Tung Sol.

Tung Sol and JJ have their plus and minus. The JJ has less but tighter bass, maybe too tight.

Tung Sol has fuller and maybe more realistic bass (I have never heard a double bass indoors that was super tight like outdoors and JJs) but the depth is, I think, accurate.
But then the JJs have more hours than the Tung Sols which have moderate usage.

Harmonic distortion wise, The Chinese Penta and JJ have nearly twice the HD as the Tung Sols.

Plate dissipation wise, The Chinese is 50 watt, the JJ is 42 watt, and the Tung Sol is 35 watt. I ran all three at approximately 29 watt idle plate dissipation.

All and all, over the months of testing, changes in minor xover design, electronic conditions, a music lover would probably choose between the JJ and
new Russian Tung Sol 6550 over the other Russian brands. (I received the Tung Sol many years before the war.)

I have never tried the western continental, expensive European brands.

Cheers

pos

Subject: Re: Demagnetizing Tung Sol 6550, Penta KT88s
Posted by gofar99 on Sat, 22 Jun 2024 01:50:28 GMT
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Hi, Personally I prefer the JJs. In class A amps (like all my designs) they have a solid and clean bass with good mids and nice extension on the top end. They are also really consistent and stay "biased" over a long time. I use them at about 35-36 watts dissipation (each tube A+S). For a seemingly "crisper" sound the JJ EL34s are great at about 25 watts (A+S) dissipation. But my go to now in the amps are TS KT120s running at 25 watts dissipation (A+S) into 8K load. Magical IMO. Obviously class A U/L P-P is not efficient. A good source of heat in the winter though.

Subject: Re: Demagnetizing Tung Sol 6550, Penta KT88s
Posted by positron on Fri, 28 Jun 2024 16:28:59 GMT

gofar99 wrote on Fri, 21 June 2024 20:50Hi, Personally I prefer the JJs. In class A amps (like all my designs) they have a solid and clean bass with good mids and nice extension on the top end. They are also really consistent and stay "biased" over a long time. I use them at about 35-36 watts dissipation (each tube A+S). For a seemingly "crisper" sound the JJ EL34s are great at about 25 watts (A+S) dissipation. But my go to now in the amps are TS KT120s running at 25 watts dissipation (A+S) into 8K load. Magical IMO. Obviously class A U/L P-P is not efficient. A good source of heat in the winter though.
Hi Go,

Don't get me wrong Go. The JJ KT88 is right at the top of tubes
I prefer. The only issue I have is the bass, although very tight,
just seems a little light in my system. Playing Moody Blues
at Royal Albert Hall, the music sounds 30 feet behind the
front wall, a little more than I like. The russian Tung Sols sound
15 feet or so. Could be old/used JJ tubes that I am using though.

I did some checking and found out that JJ uses
lead free solder in their pin connections (EU law)
so I added some quad solder with lead. Not many can perform
such adjustments though.

Bass increased some as well as the harmonic structure.
The JJ KT88s are still highly favored.

The JJ E88CC (similar to 6DJ8) is the only tube I use in my
monoblocks, preamps, and phono stage. The HD is the lowest
I have ever measured in any small signal tube, ~1/9th,
some 18db less.

I just started performing some cathode testing by
lowering the filament voltage to see if I can lengthen
tube life.

For newbies, cathode life is mainly determined by:

1. residual gas which forms positive ions which strikes/destroys
the oxides

2. high filament voltage evaporates oxides. Some transfers to the
grid etc.

3. low filament voltage tends to deplete the space cloud protecting
the oxides

4. cathode sleeve impurities poison the oxides

5. Even the temperature of the Plate structure affects the oxide

temperature (reference for given filament voltage).

Pt 3 is important. If we operate at reduced maximum/peak cathode current, we may also reduce the cathode temperature and still retain a descent space cloud, and lessen the oxide evaporation.

Since each tube manufacturer is different (including NOS tubes) I hope the experiment allows me to determine if cathode temperature is the main culprit in new JJ tube life span or another point listed above is more important.

cheers

pos

Subject: Re: Demagnetizing Tung Sol 6550, Penta KT88s
Posted by gofar99 on Sat, 29 Jun 2024 01:46:40 GMT
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Hi, I get asked all the time on the Oddblock amps as to how often the tubes should be replaced. I used the original tubes (blue glass JJ KT88s) for 12 years in class A U/L at 36 watts dissipation (A+S) and they still were sounding fine and tested good. My estimate was nearly 8000 hours. Well beyond the 2K or so they spec for. Since I switched to the KT120s in the amps I figure they will last to the next century at about 25 watts dissipation. That BTW is a sweet spot in the sound, not done to be be frugal. The preamp and drivers either NOS Phillips JAN 5751 or NOS JAN Sylvania 12SL7s will likely never need replacing. In the past 15 years I have had one fail due to an internal short but none ever tested or sounded bad. BTW I suspect the Blue JJs were probably not no lead but I could be wrong. Sometimes the socket is the issue and not the tube. I normally use Belton ones. They can be testy as they grab the tube really hard though and can make it difficult to get out. I now always use SMPS for heater power that are well filtered, isolated and closely regulated.

Subject: Re: Demagnetizing Tung Sol 6550, Penta KT88s
Posted by positron on Tue, 02 Jul 2024 05:14:46 GMT
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gofar99 wrote on Fri, 28 June 2024 20:46Hi, I get asked all the time on the Oddblock amps as to how often the tubes should be replaced. I used the original tubes (blue glass JJ KT88s) for 12 years in class A U/L at 36 watts dissipation (A+S) and they still were sounding fine and tested good. My estimate was nearly 8000 hours. Well beyond the 2K or so they spec for. Since I switched to the KT120s in the amps I figure they will last to the next century at about 25 watts dissipation. That BTW is a sweet spot in the sound, not done to be be frugal. The preamp and drivers either NOS Phillips JAN 5751 or NOS JAN Sylvania 12SL7s will likely never need replacing. In the past 15 years I have had one fail due to an internal short but none ever tested or

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Hi Go,

I thought the russians were having trouble with the KT120/150s? But then at 25 watt plate dissipation, that is quite easy operation.

Personally, due to rising NOS prices decades ago, I set out to design the perfect preamplifier and amplifier using new tubes. (Proper ics are extremely important along with proper component jacks, part of the accuracy equation.)

I used the JJs E88CCs due to the extremely low distortion, and very wide frequency response without global feedback. The JJ KT88s are not known for low distortion, about twice that of the russian tubes. Chinese tubes are also known for high distortion, although I have not measured all the output tubes available.

The ultra, ultra low distortion of the JJ E88CCs basically eliminates the higher orders created by combining the driver and output tube harmonics.

Another reason I designed around new tubes because I saw that the prices were rising and limited quantity. Although not as long lasting, the JJs do allow me to produce a perfectly accurate preamplifier and near perfect amplifier. This after sophisticated listening testing.

I have heard good things concerning the Beltons.

I have to be really really careful as a near all poly cap power supply audio system is extremely, extremely sensitive. For instance, it is extremely important to have the speaker wires connected wrench tight at the amplifier's jacks for consistent bass tightness. Finger tight is insufficient.

Next few months, will keep track of the filament hours and oxide quality of the E88CCs. Thanks for the tip on the KT88s. I am running approximately 6.0 volts on the filaments.

cheers

pos

I've been meaning to reply to this thread for a long time, but keep forgetting. When a post is made here, I read it, make a mental note to respond when I get time, then eventually forget 'til the next post. :lol:

I have an Audio Note Kit 2, which uses a 6550 tube wired as a triode and run Class A. I love it, but it did show some oddities over the years, some of which may have been due to things other than the basic circuit.

One of which was a predisposition to draw excessive output circuit current after a tube had been run for a few years. I use this amplifier often, so a few years means several thousand hours. At that time, it would usually start overheating the cathode resistor. This, of course, raised the voltage across it and its bypass capacitor. After a few years, I installed a 1/4A fuse in series with the cathode resistor, and that was magic. When a fuse pops now, I swap both fuses and both tubes. That makes everything very predictable.

I have noticed, though, that after moving from Tulsa to Bella Vista, the excessive current problem seems to happen less often. Seems like we've gone from maybe every four years to every six or maybe even longer. It just seems rarer now.

But none of that is scientific at all. I haven't measured the voltage in either place, haven't looked at the waveform, nothing. I mean, I've seen both voltage and waveform in both places. From time to time, I've needed to troubleshoot something and on those occasions, I look at power sometimes. But just for a few seconds, just enough to get a reading, and no real deep dive into what's happening. Just noting that I've got 170V peak, sine looks smooth, nothing deeper than that. In fact, I'm surprised that Bella Vista power is "better" than Tulsa 'cause no other utility services are.

Anyway, all that was just a qualifier to show what "m working with when I talk about 6550 and KT88 tubes in my particular setup.

For me - I have tended to really like Tung-Sol and Electro-Harmonix for new production tubes. They both sound great and they both behave. They last a long time.

I also have RCA and Tung-Sol 6550 tubes that were manufactured decades ago. They're strong, almost could be called NOS but they have been used. Just lightly. They're too precious for me to run full-time, all the time.

I like Svetlana tubes too, but for whatever reason, I don't like 'em as much as the Tung-Sol and Electro-Harmonix tubes. It may just be psychological, because without the Cyrillic letter on them, they're "pretenders" to me. And these days, I'm not sure I'd want the "real thing" if it existed anyway. So that bias may have nothing at all to do with quality.

The one that really stands out as a "bad part" for my amplifier is the JJ 6550. It's a "snap-crackle-pop" tube for me. Many of them actually make strange noises in my Audio Note

circuit and they always fail very rapidly, like in months. Not sure what's up with that, but it has happened more than once.

This seems to track with many of the KT88 tubes as well. I have a handful of different brands, and I'm sure some are better than others in my application. But all of the KT88 tubes seem to fail sooner than 6550 tubes. I'm not sure what the actual structural differences are, but KT88s don't seem to fare as well as 6550s in my Audio Note Kit 2.

Subject: Re: New Production Tung Sol 6550, Penta KT88s
Posted by positron on Wed, 03 Jul 2024 04:41:28 GMT
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Wayne Parham wrote on Tue, 02 July 2024 13:50
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Hi Wayne,

Increasing cathode current over the years could be caused by excessive Gas causing grid leakage, thus bias changes. This can occur even though the top getters show no gas absorption.

Speaking of gas absorption, top getters are not the best placement for gas absorption. It just does not get as hot as along the sides of the tubes. I noticed that my Tung Sol side getters collecting gas after a few hundred hours. However, the tube's side getters have been getting hotter and connecting more gas than I care to see. By the way, I run my output tubes at ~29 watts plate dissipation, though rated at 35 watt plate dissipation.

Another situation could be caused by fluctuating AC line voltage; higher would cause faster cathode oxide evaporation, some of which settles on the control grid 1. Just a thought.

I have a little plug in AC line voltage meter. Here is a link showing a typical one. My line voltage varies just a volt, maybe 2 volts extreme. YMMV.

Eversame AC Voltage Meter

I compared the Svetlana KT88s vs the Winged C KT88s, they are

sonically different in my experience. I have an octet of both WC KT88s and WC 6550, and they sound different as well. Fortunately, I have not tried the JJ 6550s. Thanks for the heads up Wayne.

I am wondering what the idle plate dissipation is with the Audio Note kit 2?

Cheers

pos

Subject: Re: New Production Tung Sol 6550, Penta KT88s
Posted by gofar99 on Wed, 03 Jul 2024 16:09:14 GMT
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Hi, I suspect that there are a number of other factors involved as well. Class of operation (A,AB,U/L etc) actual load impedance and any possible output load side anomalies, stability of the B+ from no load to full load. Regardless there is considerable room for all of us to find tubes that sound and perform well in our gear. Good discussion.

Subject: Re: New Production Tung Sol 6550, Penta KT88s
Posted by positron on Mon, 08 Jul 2024 01:26:00 GMT
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gofar99 wrote on Wed, 03 July 2024 11:09Hi, I suspect that there are a number of other factors involved as well. Class of operation (A,AB,U/L etc) actual load impedance and any possible output load side anomalies, stability of the B+ from no load to full load. Regardless there is considerable room for all of us to find tubes that sound and perform well in our gear. Good discussion.
Yes, there are some other possibilities. However, my designs are superior designs, and well within parameters. For instance, my line voltage only varies 1 volt, 2 volts maximum during all conditions.

Concerning Class of operation, for newbies.

Class A has maximum plate dissipation at idle (some add a few ma. at Max signal output). How close to maximum plate dissipation will affect gas release by the heated plate. As the output wattage increases (louder volume), that output wattage goes to the speaker, not in the form of heat on the plate. Thus the output power is subtracted from the maximum plate dissipation.

UL operation is similar to triode, unless the screen dissipation is exceeded, then possible catastrophic consequences.

Class AB normally has higher peak cathode current vs idle current, thus higher peak plate dissipation vs idle dissipation. The average cathode current, and plate dissipation is a consideration.

I would think the main worries are space charge depletion at peak cathode current and a higher average cathode current, which shortens life in general. The peak, and thus average is often determined by the output transformer. A 2k ohm to secondary X output transformer will have a higher peak and average cathode current vs a 5k ohm to secondary X transformer.

A poorly designed amplifier design could have oscillation problems,
low frequency and/or high frequency. This can cause high peak and average cathode currents, which would shorten tube life vs lighter running of the tube(s).

An oscillation often causes a rectangular waveform, thus extended high
cathode currents. Of course rectangular waveforms have very high distortion characteristics. Guitar amps often use distortion in expression of their music. But it can occur in high fidelity amplifiers if a designer is not careful.

Stability of the high voltage usually results from two areas, line voltage
variations and inferior DC filter section designs.

Anyway, I shall see if I can determine, via experiments, what is the main
limitation of the JJ E88CC small signal tubes, and the new Tung Sol output
Tubes under excellent operating conditions.

One last consideration is the lack of plate dissipation. It takes a quite hot temperature for getters to work. I have noticed over the decades that the top getters are not as efficient as side getters, which are near the hotter plate structure. That tells me that tubes without side getters could easily have more internal gas than tubes with side getters, thus faster poisoning of the cathode oxides.

Cheers

pos

Subject: Re: New Production Tung Sol 6550, Penta KT88s
Posted by positron on Thu, 29 Aug 2024 04:11:56 GMT
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I just saw on Penta's website the KT88s are lacking the SC lettering.

I don't know if the tube is different or they just decided to remove
the lettering. I believe it is the former.

pos

Subject: Re: New Production Tung Sol 6550, Penta KT88s
Posted by positron on Mon, 07 Oct 2024 03:36:27 GMT
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I performed a check between a used pair of new Tung Sol 6550 with hundreds of hours on them vs a brand new pair of TS 6550s. All were part of a matched octet.

I ran each output tube at 30 watt plate dissipation and 6.0 vac, no regulation. The digital measured line voltage has always been 121/122 vac.

Comparing idle cathode current, the used tubes averaged 68 ma while the brand new tubes averaged 69.3 ma. Pretty amazing since the side getters were absorbing internal gas, ~1/3 milky.

Lately, I have dropped the filament voltage to ~5.75 vac to see the results. So far, working nicely. Will keep informed.

cheers

pos