

# VALVE

VINTAGE AUDIO LISTENERS AND VALVE ENTHUSIASTS

**in this issue -**

**Quasimodo - PP 805 amp**

**restoring a Scott 340 in 75 min.**

**the Lowther connection**

**cool cable deal**

**THIS MAY BE YOUR LAST ISSUE!**

**SEE JULY MEETING NOTES**

## **upcoming meetings**

July 9, 1995 12 noon

preamps, preamps -

bring your favorite!

NOTE: LOCATION CHANGED TO  
ELECTRONIC TONALITIES,  
POULSBO

August 6, 1995

TBA

**volume 2**

**number 7**

**July**

**1995**

# VALVE

*is the newsletter of  
Vintage Audio Listeners and Valve  
Enthusiasts  
dedicated to the preservation and  
dissemination of vintage audio  
knowledge.*

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*Membership Rates:*

*Full Memberships & Foreign Sub-  
scriptions: \$ 35.00 a year*

*Stateside Newsletter Only Sub-  
scriptions: \$ 20.00 a year*

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sibility for anyone harming them-  
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tents of this magazine. We believe  
electrons flow from minus to plus,  
and they can kill you along the way  
if you're not careful. Vintage audio  
equipment operates at potentially  
lethal voltages. Always treat it with  
respect.*

## editor's thing

Time to say thanks to those of you who have been so prompt in renewing your memberships. Hope to get more renewals at the next meeting (see July, p.8).

We've been getting lots of new inquiries about the club lately. It seems that summer is the time when folks' interest in this stuff picks up. I will make an educated guess that this is due primarily to the fact that summer is garage sale season, when we cheapskates find our dream equipment (dream systems are more often than not composed of stuff we got for \$15, which is a cheap enough price that we convince ourselves that it's the greatest sounding thing we ever heard, even if it isn't).

Once someone finds an old amp or whatever, they remember the club listing they saw in Glass Audio, or the conversation they had with one of us members, and give a call.

That's how we grow and come up with interesting new stuff to audition. So get out there and promote VALVE a bit. Now is the time when new bottleheads are getting the bug.

And speaking of buying, don't forget to visit some of our local audio retailers this summer. No, you can't buy a Mac 60 for \$15 at Classic Audio, or get \$2000 in trade for your WA-P2 when you buy a Conrad Johnson preamp at Nuts about Hi Fi, but these folks are being very generous to us cheapo scrounger types in letting us use their facilities for meetings. They deserve some business, and you deserve a good splurge once in a while!

Also, don't forget to put that great article you have in mind to paper. It doesn't have to be technical. Tell us what you hear when you listen to a particular piece of equipment, or how you organize your gigantic record collection. We all want to hear from you!

Don't let the blue smoke out,

DAN

## Lowther club of America

This month's interesting call was from Tony Glynn, of the Lowther Club of America. Tony is the local distributor for Lowther drivers, the exotic full range loudspeakers from Britain, which sport enormous magnets and high sensitivity. Tony tells me that he can offer these rather pricey drivers at a good discount to VALVE members.

Tony says that the frequency response of the typical system ranges from about 40-50 Hz up to 22 kHz. Rear horn loaded cabinets are a must, and Tony can supply several different cabinet designs approved by Lowther-Voigt.

At least one pair of these drivers, which have everybody from Mike LeFevre to Joe Roberts buzzing, will be submitted in suitable enclosures to the efficient speaker contest all the mags have been talking about.

Seeing as I plan on entering my speaks, whose finished pair parts cost equals the price of a one PM6A, I may have my work cut out for me.

I have a copy of a review of the Thomas Transducer's Brio, a rear horn loaded-speak using the PM6A driver, from HiFi World, if anybody would like to get an idea of their sound. Apparently very good, not super low bass (40Hz), a peak around 2kHz (ala Altec 604?), and highs rolling off at around 10 kHz, at 101 dB. Interestingly, Lowther only claims 96 dB.

Tony will try to get up to one of our meetings this summer. He is quite certain at least one of you needs to buy his product. I asked if he could bring up a system to demo, but he doesn't have anything built yet.

You can contact Tony at :

Lowther Club of America  
PO Box 4758  
Salem, OR 97302  
tel/fax 503-370-9115

## cables for clubbies

Realizing that we have never gotten a consensus on a volume purchase of some cool audio item, I'll take one very specific stab at it.

I have been pleased with the big fat cables I made from RG-8 coax I picked up from a ham's estate. They really do work better than the cheapo, breaking all the time Radio Shack jobs I used before.

Digging through some catalogs got me putting together some good quality cables on paper.

Here's an example of a high quality cable we could all purchase for fairly cheap.

Mouser OFC two conductor shielded cable, with a pair of 12 strands of .18mm oxygen-free copper conductors, shielded with braided OFC, polyethylene insulation, and red PVC (I think) sheath, 6.5mm dia. This cable is supposed to be very soft and flexible, with good high end response and very low noise.

Dalbani has a beefy looking RCA plug with gold plating and a Teflon insulator, that looks to have particularly sturdy outer contact. It might even be the cool kind that tightens on to the jack. They could be wired with the shield grounded at only one end if you desire (you know, like the cables with the arrows).

We would need to order 25 one meter pairs of these for a member cost of \$26 per pair. If fewer than 25 pairs are ordered, the price would be \$32 per pair. If you want to make yourself some quality cables, send me your check for \$32 per pair by July 15. If we get orders for 25 pairs, I'll give a \$6 per pair refund.

I'll have the plugs and cable you order at the August meeting, or I will ship to you subscriber types. Send me a couple extra bucks to cover shipping.

## quasimodo - brute power from the bell tower

*It's big and ugly, with a definite lopsidedness to its shape. It used to work in a bell tower and possesses superhuman power. What else would you call a 250+ wpc triode output carillon amplifier?*

I mentioned last month that Dave called me to tell me that George had something so weird that Dave immediately thought of me (hey, wait a minute...).

Dave says, "George has been given a pair of amps from a church. Do you know what a carillon is?"

"Sure", I said, "it's the big PA system in the bell tower they use to broadcast the organ chime sound all over town... Wow".

"Yeah," says Dave, "and George doesn't want it. I thought of you and your power hungry Magnepans."

So I call George and arrange to see the beast.

George's place is worthy of a couple issues. Imagine being into tube gear for 30+ years, and being a technician with the skills to build just about anything. I mean, this guy scratch builds FM tuners!

After going past a huge studio built to record off the air onto open reel machines, a library of hundreds of 10" reels and thousands of records, store rooms full of radios, and an incredible shop/radio shack with about 50 linear feet of bench space, we ended up in the garage, which was also full of radios, tape transports, etc.

Sitting on the floor were four big chassis, with bigass tubes on them. Two power supplies and two output amps. Each chassis was 17"x13"x4", with 6" tall potted transformers on it. And big, beautiful tubes. 805's. Wow. Not puny 8005's like those dinky MI 200's. Not teeny 211's like the miniscule Cary 805

(what a dumb name for a 211 ampl). Big beefy 805's, with a plate dissipation of 125 watts. We're talking 200-300 watts of class B ear damage. I almost wet my pants.

Well, we risked hernias and loaded the chassis into the old Dodge, and I took 'em home, after promising to trade something that took up less space to George.

George was told by the guy who gave him the amps that there used to be another chassis with this amp, and he would try to find it. We guessed that it may have been a driver stage. The RCA manual specs a pair of 2A3's for 7W to drive the 805's. Maybe that was what the driver was, or a 6L6 amp.

As it stood, the amps had power supplies with 1080VDC B+, rectified by 3B25 gas rectifiers, and 10V, 8A filament transformers. Luckily I was able to determine this from my 1944 Radio's Master, which lists specs for the Kenyon transformers used. The plate trannie is rated for 250 mA., and the choke is a 5-20 H swinging choke, rated 400-50 mA. Unfortunately the output and interstage transformers on the amp chassis had special numbers. So I went to the RCA manual and found the suggested primary impedance. 6700 ohms plate to plate. The output trannie secondaries were paralleled, and "wired for 45 ohm output" was printed on the chassis. This appeared to be a custom version of the stock T479 trannie. How to get 6ohms for my Maggies was going to be a problem.

Even more confusing was the interstage transformer. First of all, the primary was single ended. Secondly, why would it sit on one chassis and the driver tubes on another? Well, Kenyon made a 500 ohm to push-pull grids matching transformer, rated for 18W, and the dimensions matched the can on Quasimodo. Maybe that's what this trannie was. A look through the PA amp listings in some of my old catalogs bore some pictures

of amplifiers called 'booster amps'. These were usually high (like 60W) power amps with 16-500 ohm inputs, designed to be added to an existing PA amp so more speakers could be added. Maybe Quasimodo, with only an output stage and a power supply, boosted the signal from the organ's power amp? Well, I decided I would try this approach when I fired up.

My original Triophoni PP 6CK4 amp output transformers had 250 and 500 ohm secondary taps. With 15 watts output, they should theoretically give enough drive.

However, there's a second set of center tapped 'primary winding-like' taps on the output tranny. The signal from the driver amp passes through half of this winding on its way to the interstage tranny. Tertiary feedback? This may call for more power from the driver amp. Boy, this reverse engineering is a pain.

Stan coaxed me into seeing if the amps even powered up, before I got too carried away with my theories. The power supply primary wiring was run through four different relays and a momentary switch. One relay used a motor to throw the filament tranny contacts before the B+ tranny contacts. Another seemed to go to some remote switch, and a third cut the signal to the output stage. Confusing as hell. I managed to jumper enough contacts to get the filaments to light up. Then I got the motor driven relay to switch on the B+. Pop. A small purple lightning bolt shot through one of the 805's. Goodbye filament. Closer inspection revealed a tube with a gone getter. I guess the already soft tube probably went super soft after sitting unused for god knows how long. Oh well, at least I had enough left to try one amp. All those relays went in the trash, and the Sound Practices two switch system went in.

Ok fire up, with three 16 ohm speakers in series, and the input transformer's input grounded. Throw one switch. Thori-

ated filaments light, real purdy. Throw the second switch a minute later, and the power transformer makes a satisfying, slightly too loud hum like a good commercial amp, that sits in the other room from the speakers, should. Output is nice and quiet, with just a teeny bit of hum and a small 'tic' when B+ is switched off. Cool!

On goes Triophoni, with its 500 ohm tap connected to the input. A little bit of sorting on the input socket gets some really distorted sound, like the driver amp is maxxed and the big amp isn't working.

I check the signal coming out of the interstage transformer (the side that goes to the 805 grids) and it's really distorted. Hey, wait a minute. What the hell is that 5000 ohm resistor across the 805 grids? Take it out and the crazy oscillation stuff stops. Grid swing is pretty good, maybe 200V grid to grid.

I fire the whole thing up again and get music! Not 300 watts I don't think, but pretty loud through four 16 ohm speakers in series.

So that's where it stands.

I tried a 120V to 51V power transformer as a 45 ohm to 6 ohm matching transformer, but the output was about the same as the 15W driver amp put out alone, only with more bass and rolled off highs.

Maybe I don't know as much as I think I know about matching transformers, and there's some huge power loss when you use one, or maybe the 805's are pooping out. Or maybe the tertiary feedback winding is reducing the gain. Or maybe my preamp is running out of steam into the driver amps. AUUGHHHH!

Anybody out there got some suggestions? I really want to get these working so I can show off, I mean, share them with club members.

signed,

Getterless in Poulsbo

## what's brewin'?

Eric is deep in the middle of restoring a couple of Fisher 50A/AZ's (one is an A with the AZ upgrade, the other is a stock AZ). Heard the first one running one of his refrigerator size Altec 605 systems. I found him a pair of Barzilay cabinets for his JBL D130's and 075's, so I'll talk him into putting those together and using them instead. Then we'll lean on him to demo this stuff for us here at the shop, with a 400 preamp and maybe an FM 1000 tuner.

Eric has been getting so much cool stuff lately that we really need to have a meeting at his place when it's all organized. A QUAD system in the living room, Altecs and Fisher in the basement listening/store room, another Fisher/Altec setup in the den and family room, and even a National Criterion mono system in the bedroom!

Eric also wants folks to know he's selling his MC30's.

Subscriber Jim has been working on a three way speaker system-

"This 3-way modular system is down to this: a pair of 15" Peaveys in transmission lines, a pair of pipe loaded 8" silver voice coil Audio Note drivers and a pair of Focal T112-Ti02 tweeters...I also have a pair of Edgarhorns with 2"LPG domes that I insert when I want to go low-powered (this raises the cross-over from 180 Hz to 500 Hz...highs cross over at 2.5 kHz); there's also a pair of 8" Newform ribbon tweeters that sound quite excellent, but are only 86 dB efficient! Know anyone that could use the ribbons? I'd let them go for \$175... I know they would work really well for someone... and of course, I'm always open to trades."

Jim is really interested in prerecorded open reel tapes, as well as some other items. If you are interested in contacting him, give me a call, and I'll put you in touch. - dan

### any requests?

I could use some help finding the following:

-805 tubes - mine are probably worn out. Anybody ever heard of a tube tester for transmitting tubes?

-A used record cleaning machine. I can't afford a new one, but we sure could use some clean recordings for our auditions!

-I could also use some sage advice on matching the 45 ohm output of my big new triode amps to a 6 ohm load? Any transformer gurus willing to give a poor newsletter publisher a hand for a plug in the old rag?

-I'm getting itchy to start playing the few 78's I've collected. Anybody got a tired TD124, or a Perpetuum Ebner PE 2040 changer they would part with?

-I'm also looking for trashed Telefunken table radios and consoles for a long term project. You keep the smooth plate 12AX7's. I'm looking for chassis and drivers.

-Anybody want to build a pair of Edgarhorns for the club? I'll supply the plans and the drivers, you do the woodwork. Should be easy.

With the baby coming any day, I'll not be remodeling the garage to a listening room any time soon. So I'll try to redo the shop into a better listening room, moving my work-space to open up the loudspeaker end, and adding lots of shelves. Let me know if you might be able to spend an afternoon doing the LEDE treatment to the room.

# dinkin'around

*tech tips and other unsolicited advice*

## the 75 minute restoration

Bill called a couple Saturdays ago to tell me that he had traded a Mac 1700 (a hybrid receiver, with tube tuner and solid state amp) for a Scott 340 receiver. The person he traded with acknowledged a greater value for the Mac than the Scott and offered to pay a set amount for service by yours truly to balance the deal. Would I be available this weekend to do check it out?

I asked Bill if it ran and he said yes. Knowing that the weak point on Scotts was their coupling caps, I suggested he run it for a while, constantly monitoring the output tubes for red plates.

He called back a bit later and said that one tube's plate had started to glow red, at which point he turned the 340 off. I said bring it by and I'd get it going.

Well, he brought it by the next day. I knew Bill had to get back, but I told him I could probably get the receiver going while he waited. The only requirement was that he listen and evaluate my new speakers while I worked.

First the tubes came out for testing. The 7591 outputs were good, luckily. The tubes I suspected to be bad, however, were bad. These were the driver tubes, 6U8 triode-pentodes. Ask any technician who used Tektronix scopes in the 50's and 60's about 6U8's. They always wore out or shorted elements. Even worse, they can test OK in an emission tester even though bad. We put this pair on a TV-10 transconductance tester and they didn't look so hot. I suggested we replace them with a pair of new 6GH8A's, a pin for pin replacement, which seems a bit more reliable. Bill said OK.

Next, I went for the coupling caps between drivers and outputs. This is the

third or fourth Scott I've looked at for Bill (and about the tenth one I've worked on this year), so I know that Bill is sensitive to the sound of the coupling caps in these units. We put in some big black 600V rated film caps that I got from a Carver employee. They looked really serious and were supposed to sound great, but Bill's a really nice guy, so I let him have them instead of sticking them in one of my amps. I knew they had to sound better than the stock Ceracaps.

Note here, that I did not replace the filters. This was due to the fact that they checked OK, hum was very low on the scope, and there was both a monetary and a temporal budget to consider. I suggested to Bill that he monitor hum and maybe replace the filters in the future if it ever starts up.

Next, on to the AC balance. Driver tubes out, load across the outputs, and monitor output on the scope while turning the balance pot for minimum hum.

Lastly, a speedy alignment of the tuner. A weak RF amp tube was replaced first. Then peak each IF, using the built in meter. Adjust the discriminator can for best audio, rocking the core for good centering. Then back to peak the first IF again. Repeat to get it just right, listening for bass distortion and separation. Now check pointer alignment. OK, so tweak RF and antenna trimmers at the high end of the dial, and once again toward the stations Bill likes to listen to. Compare separation with another tuner. OK, so don't fool with the MPX alignment. Yes, all this is done without a scope or MPX generator. You can get away with this if time is short and you've done a bunch of similar sets with the full test setup, so you know what your hearing.

The final result, one more totally unorthodox "speed restoration" by yours truly, one great sounding 340 (one of my favorite Scott pieces), and one happy customer, who made it to the ferry home in time.

### Notice: July meeting location changed to Electronic Tonalities (dan's place)

OK. Jim has to go do a family visit the weekend of the 9th, so we will change venues.

But the show will still be great.

Bring your favorite tube preamp, preferably a stereo model. Dave's HP analyzer is still in my possession, so we can do response curves like we did for amps at the last meeting.

Then we'll hook them into the system and see how they sound. I'll have a couple choices for speakers and amps so we can see how the preamps work with different equipment.

Don't forget your favorite software!

I'll also have some new magazines and catalogs to look at, my big ugly 805 amps, my almost finished speakers, a couple tube preamps of my own (I just got an Eico HF-85, not bad), and those wacky Newcomb PA amps I had, but didn't get going, for our commercial amp showdown last April.

Also please remember to bring your dues! I have only collected enough to put out this month's newsletter, and I will be forced to curtail subscriptions to any member who doesn't renew this month.

*Note to subscribers: this doesn't affect you. You get twelve issues for your \$20.*

I also want to encourage folks to bring anything they think might be of interest to the membership to any meeting. You needn't call me first, just bring it.

Along those lines, Eric has been finding some nice toys lately and may bring a few surprises.

Come at 12 noon July 9th (or earlier) for a day of bottleology.

This month's new magazine was sent from Italy. Audion is a super quality rag devoted to valve audio. Editor Luciano Macri asked to trade subscriptions, and I'm glad I did, even though I haven't had to use my feeble Italian in ten years.

Yes, the entire mag is written in Italian, but, as with most non-english technical journals, you can get the gist of what's being said.

I was sent issue 1994 - N.2. Articles include (I think):

a translation of a 1960 *Radio & Television* article on transformers

A review of some Davis transmission line speaks

Russian vs. American/European tube cross reference

Easy Pre, an easy preamp construction article using 12AX7s and a 12AU7

An article on the 300B, the WE91-A and a following article on construction of a huge SE 300B monoblock.

Sig. Macri is rather a prolific editor, publishing several books and mags related to electronics. These are listed on the front inside, and include:

*Manuale hi fi a valvole, schemario. Vol.1 e 2.*, which contains 200 schematics including the common Dynaco, Eico, etc. as well as hard to find current stuff like Quicksilver, Conrad Johnson, Audio Innovations, Luxman, etc.;

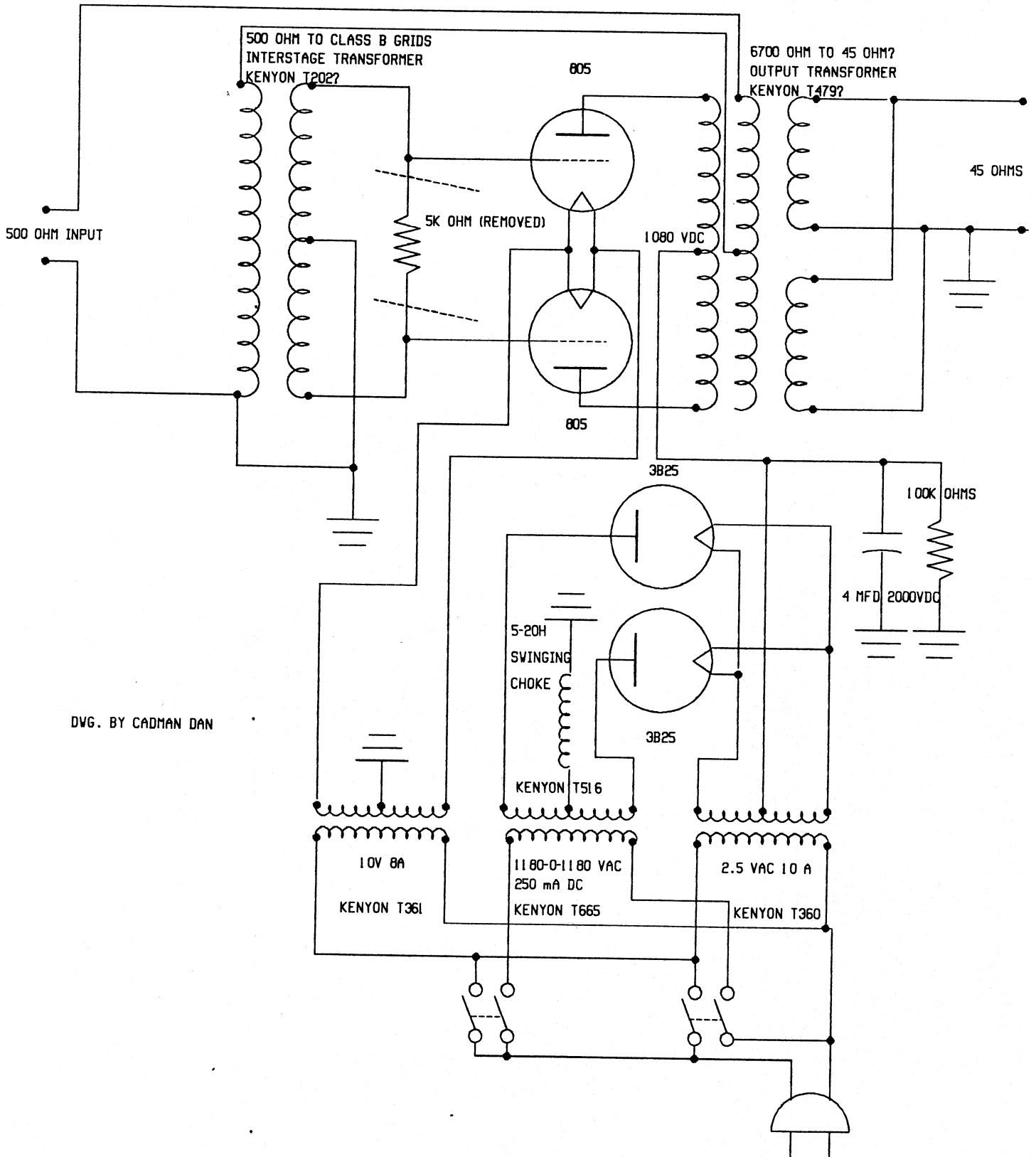
*Amplificatori a valvole per alte fidelita, pre, finale, trasformatori di uscita*, a reprint of a 1959 Phillips publication; and other publications dealing with IC's and TV's.

I will have copies of Audion and Vacuum Tube Valley (mentioned in last month's VALVE) available to peruse at the next meeting.

If you can't wait, call 055-293267 to subscribe. I didn't find a foreign subscription price, but the regular price is 45000 lire for three issues.



# QUASIMODO - SLIGHTLY MODIFIED SCHULMERICH 6-124 CARILLON AMPLIFIER





# TRANSMITTING TUBE DATA



## TRANSMITTING TRIODE

### LOW-DISTORTION CLASS B MODULATOR

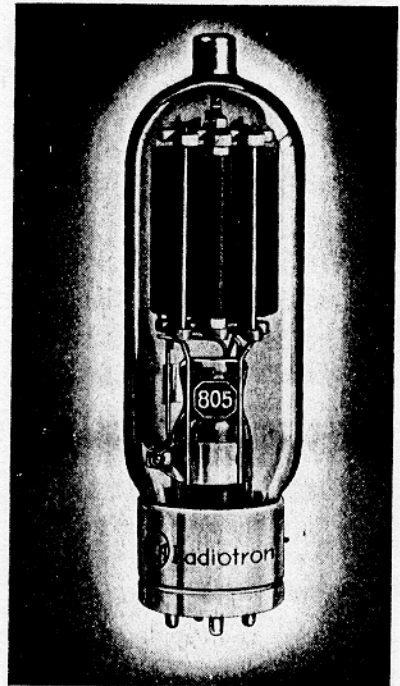
315 WATTS INPUT (CCS)

List Price **\$13.50**

#### Features

- HIGH-POWER OUTPUT WITH LOW PLATE VOLTAGE
- CLASS B A-F OUTPUT DISTORTION BELOW 3%
- 30-Mc OPERATION AT FULL RATINGS
- SPECIAL-PROCESSED GRAPHITE ANODE

# 805



RCA-805 is a husky high-mu transmitting triode of the thoriated-tungsten filament type with a maximum plate dissipation of 125 watts (CCS). It is designed both for class B modulator service and for r-f amplifier service. Grid-bias requirements of the tube are unusually low. For example, at the maximum plate-voltage rating of 1500 volts in class C telegraphy, a bias of only -10 volts is needed to protect the tube against loss of grid-excitation voltage.

The grid of the 805 is designed so that the amplification of the tube varies with the amplitude of the input signal. This feature facilitates the design of class B a-f amplifiers and modulators to give high output with low distortion.

RCA-805 contains a graphite plate that is processed to insure high thermal radiation and a minimum of gas. The plate lead is brought out to a rugged terminal at the top of the bulb. The small overall size of the tube lends itself to compact circuit layout. As an r-f power amplifier, RCA-805 may be operated at maximum ratings at frequencies as high as 30 Mc.

#### RATINGS

FILAMENT VOLTAGE (A.C. or D.C.)	10.0	Volts
FILAMENT CURRENT	3.25	Amperes
DIRECT INTERELECTRODE CAPACITANCES:		
Grid-Plate	6.5	$\mu\text{f}$
Grid-Filament	8.5	$\mu\text{f}$
Plate-Filament	10.5	$\mu\text{f}$
MAXIMUM HEIGHT	8 1/2"	
MAXIMUM DIAMETER	2-5/16"	
SOCKET	Transmitting 4-contact, such as the RCA type UT-541-A	

#### MAXIMUM CCS RATINGS and TYPICAL OPERATING CONDITIONS

##### As A-F Power Amplifier and Modulator—Class B

D-C PLATE VOLTAGE	1500 max.	Volts
MAX. SIGNAL D-C PLATE CURRENT*	210 max.	Ma.
MAX. SIGNAL PLATE INPUT*	315 max.	Watts
PLATE DISSIPATION*	125 max.	Watts

TYPICAL OPERATION:

*Unless otherwise specified, values are for 2 tubes*

D-C Grid Voltage	1250	1500	Volts
D-C Plate Voltage	0	-16	Volts
Peak A-F Grid-to-Grid Voltage	235	280	Volts
Zero-Sig. D-C Plate Current	148	84	Ma.
Max. Sig. D-C Plate Current	400	400	Ma.
Load Resistance (per tube)	1675	2050	Ohms
Effective Load Res. (Plate-to-Plate)	6700	8200	Ohms
Max. Sig. Driving Power (Approx.)	6	7	Watts
Max. Sig. Power Output (Approx.)	300†	370‡	Watts

##### As R-F Power Amplifier—Class C

	Plate Modulation	C.W.
D-C PLATE VOLTAGE	1250 max.	1500 max.
D-C GRID VOLTAGE	-500 max.	-500 max.
D-C PLATE CURRENT	175 max.	210 max.
D-C GRID CURRENT	70 max.	70 max.
PLATE INPUT	220 max.	315 max.
PLATE DISSIPATION	85 max.	125 max.

TYPICAL OPERATION:

D-C Plate Voltage	1250	1500	Volts
D-C Grid Voltage:			
From fixed supply of	-160	-105	Volts
From cathode resistor	—	440	Ohms
From grid resistor	2700	2600	Ohms
Peak R-F Grid Voltage	300	235	Volts
D-C Plate Current	160	200	Ma.
D-C Grid Current (Approx.)	60	40	Ma.
Driving Power (Approx.)	16	8.5	Watts
Power Output (Approx.)	110	215	Watts

\* Averaged over any audio-frequency cycle of sine-wave form.  
 † Approximately 4% harmonic distortion.  
 ‡ Approximately 3% harmonic distortion.

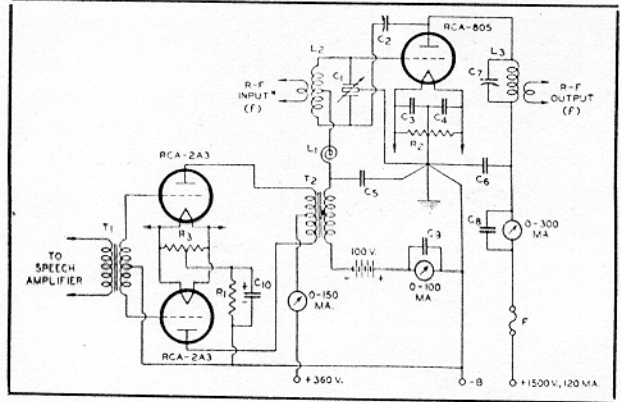
#### APPLICATION

In class B a-f amplifier and modulator service employing two 805's, it is practical to limit the a-f distortion in the output to less than 3% by using a small amount of grid-bias voltage at reduced plate voltage. Typical operating conditions are approximately the same as those for the 1250-volt conditions. The exceptions are: grid-bias voltage, -14 volts; peak a-f grid-to-grid voltage, 250 volts; and zero-signal d-c plate current, 60 milliamperes (two tubes).

#### Max. Permissible Percentage of Max. Rated Plate Voltage and Plate Input for High-Frequency Operation

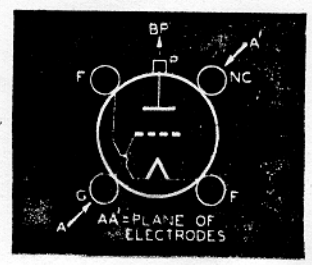
FREQUENCY	CLASS C			
	30	45	85	Mc
Telegraphy	100	75	50	Per Cent
Plate-Mod. Telephony	100	75	50	Per Cent

#### GRID-MODULATED R-F AMPLIFIER Power Output 60 Watts (Approx.)



- C<sub>1</sub>=1.5  $\mu\text{f}$ /meter/section
- C<sub>2</sub>=6.5  $\mu\text{f}$  (approx.), 4000 v.
- C<sub>3</sub> C<sub>4</sub> C<sub>5</sub> C<sub>6</sub>=0.005  $\mu\text{f}$ , mica
- C<sub>7</sub>=0.0005  $\mu\text{f}$ , mica
- C<sub>8</sub>=0.005  $\mu\text{f}$ , 2000 v.
- C<sub>9</sub>=1.0  $\mu\text{f}$ /meter
- C<sub>10</sub>=25 to 50  $\mu\text{f}$ , 100 v.
- R<sub>1</sub>=775 ohms, 10 watts
- R<sub>2</sub>=50 ohms, c.t., wire-wound
- R<sub>3</sub>=20 ohms, c.t., wire-wound
- L<sub>1</sub>=R-f choke
- L<sub>2</sub> L<sub>3</sub>=Tune to frequency "f"
- T<sub>1</sub>=Interstage a-f transformer
- T<sub>2</sub>=Modulation transformer
- F=3/16 a. high-voltage fuse

#### Bottom View of Socket Connections



\* The r-f driver should have plate regulation under the conditions of the grid-modulated amplifier.