

Preliminary paper on the NTV amplifier(s)

The NTV amplifier consists of three stages:

- The audio frequency stage
- The driver stage
- The power output stage

The audio frequency stage or input consists of one half of a 12AU7A medium mu triode. This stage operates in anode follower "class A" and provides voltage amplification for the driver stage as well as buffering for some preamplifiers that require low input capacitance loads.

The driver stage consists of a 6S4A medium mu power triode originally intended for vertical deflection output amplifier in black and white televisions. It is a very linear tube designed to operate in a transformer coupled "class A" single ended mode. It is capable of providing more than enough drive than that required for the power output stage while maintaining high linearity and low distortion. It has also proven to be highly reliable in this application. This tube is also operated in anode follower mode.

The power output stage consists of a UX-250 power triode. This tube has been involved in a great deal of controversy as to its developer but as history has it, RCA was the company that primarily used it for their theatre amplifiers (Photophone) and their high end radios of the late 1920's and early 1930's. It is a robust tube with 20+ watts plate dissipation and good linearity. It is also rumored to have been RCA's answer to the Western Electric telephone repeater tube, the WE300(A,B). We have also found it to have extremely long life when operated in a fixed bias mode.

The NTV amplifier uses the UX-250 power triode in a single ended "class A" mode. To prevent "creeping" of the UX-250 (inherent in this tube) idle current a 200 henry grid choke is used instead of a grid leak resistor. This also has the advantage of reducing the load on the driver stage.

The output transformer is built in the United States and utilizes an M-6 core and interleaved primary/secondary. It is capable of handling more than twice the rated current of the UX-250 without saturation. It is used in a standard B+ fed system and this eliminates "exotic" and troublesome other connection methods primarily aimed at reducing magnetic saturation of a lower priced output transformer.

The primary goal of the NTV amplifiers is two fold:

- One: Provide the best sound for the price. This was easily accomplished by using the UX-250 output tube and our matching premium output transformer.
- Two: Provide the best reliability and ease of service possible. This part took serious consideration after investigating failure in many other single-ended and push-pull amplifiers.

With the exception of UX-250 availability, almost all parts are easily obtainable. Great care was taken to avoid "proprietary" parts as many often they cannot be substituted. A separate filament transformer for the front end provides excellent isolation from the demands on the power transformer.

Also, DC on all filaments helps in reducing over all hum in the amplifier.

The power supply utilizes a 5AR4 full wave rectifier which while providing low voltage drop also provides slow turn-on to reduce strain on the audio tubes.

Each amplifier is hand built and listened to extensively before it is turned over to its owner. This gives us, the designer and builders the ability to weed out any premature parts failures if they occur.

The amplifier is provided with all rectifier and front end tubes. The UX-250's supplied are reproductions made for us expressly in China. We find the sound quality exceptional, sometimes exceeding some original UX-250 tubes.

While we encourage use of the vintage tubes, we know availability is very limited and very expensive. All we ask is that they are tested prior to installation and monitored for the first few hours (bias) as these tubes can be damaged in shipment and become gassy, causing excessive uncontrolled "creeping" and failure. The output stage is fused to prevent damage in this case.

Base price is \$6,000 for the amplifier, extra for exotic woods.

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