



ToneGrinder

12AX7 / ECC83 / 7025

March 15, 2010

WATTGRINDER, A "SOUND" INVESTMENT!

WHAT'S IN YOUR SOCKET?

ToneGrinder

“Tubes for the 21st Century”

Traditional 12AX7 vacuum tubes have been around since the 1940's, the majority of which are now manufactured in China and Russia. It is common to experience poor quality, inconsistent audio performance, and, oftentimes they are dead on arrival. Amplifier companies and others who manufacture/repair tube amplifiers report rejects/failures ranging from 30% to 90%. Continued supply and availability is a concern.

Utilizing today's technology, WattGrinder Engineering has developed dynamic product lines of 12AX7 tube devices that address the issues mentioned above in addition to other concerns of the traditional vacuum tube. There is no compromising when it comes to premium performance, tone, and, quality construction of our tubes. Each and every tube is built in the United States.

The 12AX7 ToneGrinders are a direct replacement for 12AX7 dual triode vacuum tubes. Currently, ToneGrinders are available in three Series, the X100, the Expanded Output (EOS), and the EX/100.

The X100 Series and the Expanded Output Series each have four triode designs (4 Standard models); each Standard model has the same triode performance characteristics for each triode in the same dual triode package. The Custom models are combinations of each of the 4 Standard models, each having different performance characteristics for each triode in the same dual triode package.

The EX/100 Series uses a combination of triodes, one from the Expanded Output Series and one from the X100 Series creating 16 custom models.

There is no wrong choice; each tube allows for greater flexibility to change tone and performance always knowing you can return to a favorite configuration.

Key Features

MICROPHONICS All vacuum tubes will exhibit some degree of microphonics. Microphonic tubes ring, howl or produce general feedback all of which are more noticeable at higher volumes or when used in close proximity to a speaker, typically in combo amps. *ToneGrinder will not microphonic.*

NOISE Noise is more of an issue than microphonics. A noisy tube makes random popping noises, crackles occasionally or just hums. *ToneGrinder is very low noise and will not become noisy over time.*

GAIN High gain vacuum tubes are typically susceptible to background noise. *Higher gain ToneGrinder models remain very low noise.*

AMP DESIGNS Tube amp designers are designing equipment with what is available today. Many circuits are designed around the traditional vacuum tube. *With ToneGrinder designers have a consistent device with which to evaluate designs without compromise.*

Additional Features

Excellent Dynamic Range

Touch Sensitive and Responsive

Quality of Harmonics and Overtones are equal to and in most cases improved

ToneGrinders sustain at the fundamental note and/or overtone and will fold to the next harmonic

Performance levels in most amps are vastly improved

No deterioration; sound quality and performance is consistent

Sorting and Pairing are eliminated

All ToneGrinders will get warm, not hot

Durable construction is not susceptible to vibration damage

While powered on, ToneGrinders will not fail if an amp is moved or "jarred"

Every ToneGrinder produces a premium tone and is repeatable from tube to tube

ToneGrinder tubes may last the lifetime of the equipment

Other Things You Need To Know

Musicians adjust their amp settings and/or effects units based on their favorite 12AX7 vacuum tubes. With any ToneGrinder 12AX7 model you will experience a more dynamic sound field; therefore, modifications to various settings may be necessary. Don't be afraid to experiment!

Please Note: Typically in V1 (Position 1), ToneGrinder models from the Expanded Output Series and the EX/100 Series may not be appropriate for amplifiers with built in Overdrive Preamps or Lead Channel Overdrive circuits; for example, a Marshall JCM-800. Tubes from the X100 Series should be used in these applications.

All 12AX7 ToneGrinder models work well with distortion pedals and other effects units.

Understanding ToneGrinder Colors

Triode Descriptions

Four colors are used to identify the various ToneGrinder models in the X100, the Expanded Output and the EX/100 Series. Each color represents a triode technology as described in the following four pages.

BLUE Triode

Suggested Uses

Guitar Amps Produces a clean full bodied tone. Great for Jazz, Blues and Country. Also popular for rock with front end effects.

Bass Amps Excellent performance for all styles of bass players. Produces an amazing open full body tone with exceptional clarity and overtones across the frequency range.

Tube Microphones Produces an output with a Wide Dynamic Range resulting in excellent tone and greater audio detail.

Audio Preamps / Home Theater Excellent Dynamic Range produces a wider sound field with well balanced frequency response. More audible detail can be experienced by the listener.

Triode Characteristics

Wide Dynamic Range
Well balanced frequency response across the curve
Subtle low and high frequency rolloff
Produces a bold clean tone
Output is clean, clear and focused

Summary

The BLUE triode design offers a solution to applications requiring clean output performance with bold (fat) tonal character that accentuates sonic detail. The subtle frequency rolloff characteristics are beneficial for those applications with a need for tight and focused tube performance. The use of front end distortion and other effects also add to the performance.

GREEN Triode

Suggested Uses

Guitar Amps Produces a clean full bodied tone. Great for Jazz, Blues and Country. Also popular for rock with front end effects.

Bass Amps Excellent performance for all styles of bass players. Produces an amazing open full body tone with exceptional clarity and overtones across the frequency range.

Tube Microphones Produces an output with a Wide Dynamic Range resulting in excellent tone and greater audio detail.

Audio Preamps / Home Theater Excellent Dynamic Range produces a wider sound field with well balanced frequency response. More audible detail can be experienced by the listener.

Triode Characteristics

Wide Dynamic Range

Well balanced frequency response across the curve

Produces a bold clean tone

Output is clean, clear and focused

Summary

The GREEN triode design is similar to the BLUE triode but without the subtle low and high frequency rolloff characteristics. This allows the tube to produce more frequencies in the audible spectrum. It also offers a solution to applications requiring clean output performance with bold (fat) tonal character that accentuates sonic detail. The use of front end distortion and other effects also add to the performance.

ORANGE Triode

Suggested Uses

Guitar Amps Produces a higher output with a brighter tone. Great for Blues, Rock and Metal. Front end effects add for a dramatic range of possibilities. Country players can enjoy this triode due to its emphasis on mids and higher frequency response.

Bass Amps Produces a unique tone if you like rich mids with more emphasis on high frequency response. Same exceptional clarity and overtones as experienced with guitar amps.

Triode Characteristics

More focused Dynamic Range

More low end rolloff

Frequency response is tightly focused on the mids and highs

Produces a brighter tone

Output is strong and tight, more crunch and sustain

Summary

The ORANGE triode design offers a solution for applications requiring muscle and bite. There is less bottom end than the BLUE and GREEN triodes and has excellent balance in the mids and highs. Sonic detail and clarity plus the generation of harmonics and overtones are exceptional. The use of front end distortion and other effects also add to the performance.

This tube can also be used in a clean mode. Great for Country, Blues or any style that prefer more mids and highs. With most guitars, using the neck pickup produces a very pleasing tone that has nice bottom end with great mids and highs, a very rich sound.

RED Triode

Suggested Use

Guitar Amps Produces a higher output with a brighter tone. Great for Blues, Rock and Metal. Front end effects add for a dramatic range of possibilities. Country players can enjoy this triode due to its emphasis on mids and higher frequency response.

Bass Amps Produces a unique tone if you like rich mids with more emphasis on high frequency response. Same exceptional clarity and overtones as experienced with guitar amps.

Triode Characteristics

More focused Dynamic Range

More low end rolloff

Frequency response is tightly focused on mids and highs

Produces a brighter tone

Output is strong and tight, more crunch and sustain

More focused output dynamics when overdriven

Summary

The RED triode design is similar to the ORANGE triode and offers a solution for applications requiring muscle and bite. There is less bottom end than the BLUE and GREEN triodes and has excellent balance in the mids and highs. This device produces a more focused sound field than the ORANGE device. Same great sonic detail and clarity plus the generation of harmonics and overtones are also exceptional. The use of front end distortion and other effects also add to the performance.

This tube can also be used in a clean mode. Great for Country, Blues or any style that prefers emphasis on the mids and highs. With most guitars, using the neck pickup produces a very pleasing tone that has nice bottom end with great mids and highs, a very rich sound.

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Product Series

X100 Series – Available in BX100A, GX100A, OX100A and RX100A in 4 Standard and 12 Custom models, they are designed to produce a similar output level as compared to the traditional 12AX7 vacuum tube.

Because the gain is closely matched to traditional 12AX7 vacuum tubes, the X100's can be used in one or more tube positions (in most amplifiers) for enhancing, improving and creating unique tone characteristics and performance.

Expanded Output Series – Available in BLUE, GREEN, ORANGE and RED in 4 Standard and 12 Custom models. This Series is designed to produce a higher output level (above the gain of 100) than a traditional 12AX7 vacuum tube.

Commonly used in the V1 or first position, the Expanded Output Series is designed for a stronger, higher output level thereby creating more drive and effect from the amplifier. In most amplifiers they can be used in additional tube positions for enhancing, improving and creating unique tone characteristics and performance.

Expanded Output models may not be appropriate for amplifiers with built in Overdrive Preamps or Lead Channel Overdrive circuits. Tubes from the X100 Series should be used in these applications.

EX/100 Series – Available in 16 Custom models, each model uses a combination of triodes, one from the Expanded Output Series and one from the X100 Series.

The purpose of the EX/100 Series is to have the benefits of the Expanded Output Series in the first triode creating more drive and effect. The X100 in the second triode helps to not overdrive the next stage in the signal path in those amplifiers that are sensitive to signal level (gain).

Tube Replacement Guideline

When replacing traditional 12AX7 vacuum tubes with any 12AX7 ToneGrinder Series, start with V1 or first position, or, as it is also referred to, the instrument input. It is possible to use more than one ToneGrinder in most amplifiers with multiple 12AX7 locations.

ToneGrinder

X100 Series

Colors are used to identify each ToneGrinder X100 model. Each color represents triode performance characteristics.

Standard models have the same two triodes and are therefore the same color. The first color represents Triode 1; the second color represents Triode 2.

Example: BX100A / BX100A = Triode 1 / Triode 2

STANDARD MODEL CONFIGURATIONS

MODEL	TRIODE 1	TRIODE 2	PART NUMBER
BX100A/BX100A	BX100A	BX100A	125-0201
GX100A/GX100A	GX100A	GX100A	125-0202
OX100A/OX100A	OX100A	OX100A	125-0203
RX100A/RX100A	RX100A	RX100A	125-0204

Custom models have two different triodes (two of any Standard model combination) and therefore each triode is a different color.

Example: OX100A / GX100A = Triode1 / Triode2

CUSTOM MODEL CONFIGURATIONS (available Summer 2010)

MODEL	TRIODE 1	TRIODE 2	PART NUMBER
BX100A/GX100A	BX100A	GX100A	125-0205
BX100A/OX100A	BX100A	OX100A	125-0206
BX100A/RX100A	BX100A	RX100A	125-0207
GX100A/BX100A	GX100A	BX100A	125-0208
GX100A/OX100A	GX100A	OX100A	125-0209
GX100A/RX100A	GX100A	RX100A	125-0210
OX100A/BX100A	OX100A	BX100A	125-0211
OX100A/GX100A	OX100A	GX100A	125-0212
OX100A/RX100A	OX100A	RX100A	125-0213
RX100A/BX100A	RX100A	BX100A	125-0214
RX100A/GX100A	RX100A	GX100A	125-0215
RX100A/OX100A	RX100A	OX100A	125-0216

ToneGrinder

Expanded Output Series

Colors are used to identify each ToneGrinder Expanded Output model. Each color represents triode performance characteristics.

Standard models have the same two triodes and are therefore the same color. The first color represents Triode 1; the second color represents Triode 2.

Example: Blue / Blue = Triode 1 / Triode 2

STANDARD MODEL CONFIGURATIONS

MODEL	TRIODE 1	TRIODE 2	PART NUMBER
BLUE/BLUE	BLUE	BLUE	125-0101
GREEN/GREEN	GREEN	GREEN	125-0102
ORANGE/ORANGE	ORANGE	ORANGE	125-0103
RED/RED	RED	RED	125-0104

Custom models have two different triodes (two of any Standard model combination) and therefore each triode is a different color.

Example: Orange / Green = Triode1 / Triode2

CUSTOM MODEL CONFIGURATIONS

MODEL	TRIODE 1	TRIODE 2	PART NUMBER
BLUE/GREEN	BLUE	GREEN	125-0105
BLUE/ORANGE	BLUE	ORANGE	125-0106
BLUE/RED	BLUE	RED	125-0107
GREEN/BLUE	GREEN	BLUE	125-0108
GREEN/ORANGE	GREEN	ORANGE	125-0109
GREEN/RED	GREEN	RED	125-0110
ORANGE/BLUE	ORANGE	BLUE	125-0111
ORANGE/GREEN	ORANGE	GREEN	125-0112
ORANGE/RED	ORANGE	RED	125-0113
RED/BLUE	RED	BLUE	125-0114
RED/GREEN	RED	GREEN	125-0115
RED/ORANGE	RED	ORANGE	125-0116

ToneGrinder

EX/100 Series

The EX/100 models use 1 Triode from the Expanded Output Series and 1 Triode from the X100 Series to create a truly unique ToneGrinder.

Colors are used to identify each ToneGrinder EX/100 model. Each color represents triode performance characteristics.

Example: Orange / GX100A = Triode1 / Triode2

EX/100 MODEL CONFIGURATIONS (available Summer 2010)

MODEL	TRIODE 1	TRIODE 2	PART NUMBER
BLUE/BX100A	BLUE	BX100A	125-0301
BLUE/GX100A	BLUE	GX100A	125-0302
BLUE/OX100A	BLUE	OX100A	125-0303
BLUE/RX100A	BLUE	RX100A	125-0304
GREEN/BX100A	GREEN	BX100A	125-0305
GREEN/GX100A	GREEN	GX100A	125-0306
GREEN/OX100A	GREEN	OX100A	125-0307
GREEN/RX100A	GREEN	RX100A	125-0308
ORANGE/BX100A	ORANGE	BX100A	125-0309
ORANGE/GX100A	ORANGE	GX100A	125-0310
ORANGE/OX100A	ORANGE	OX100A	125-0311
ORANGE/RX100A	ORANGE	RX100A	125-0312
RED/BX100A	RED	BX100A	125-0313
RED/GX100A	RED	GX100A	125-0314
RED/OX100A	RED	OX100A	125-0315
RED/RX100A	RED	RX100A	125-0316

ToneGrinder™ is a product of WattGrinder Engineering, Inc.
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